Maine's Sustainability Science Initiative

Year 4 Annual Report

For EPSCoR award EPS-0904155

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Preview of Award 0904155 - Annual Project Report

Cover

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Accomplishments

*** What are the major goals of the project?**

During YR4, Maine EPSCoR's Sustainability Solutions Initiative (SSI) continued to work towards it overarching goal of developing Maine's capacity to conduct world-class, solutions-driven research in sustainability science that is distinguished by its innovative approach to interdisciplinary collaboration and deep commitment to stakeholder engagement. The overall vision is that this will lead to the creation of the Center for Sustainability Solutions at the University of Maine, which will be recognized as a national international center of excellence in sustainability science.

SSI continued its focus on the overall research goals to examine the coupled dynamics of social-ecological systems (SES) with an understanding and strengthening of connections between SES knowledge and stakeholder actions (K-A), and to perform Organizational Innovation (OI) research to improve university-stakeholder partnerships. Other integrated goals addressed diversity, workforce development, cyberinfrastructure, external engagement, evaluation and assessment, sustainability, and management for this large statewide infrastructure project. During YR4, significant progress was made in furthering a strong research and education infrastructure for Maine in this sustainability area, which has positioned the project to solidify and strengthen the enterprise and have a major impact in the state.

SSI's continued research focus on landscape dynamics reflects a broad consensus that land change science is a critical research frontier as well as a pressing challenge for sustainable development. SSI not only seeks to understand the causes and consequences of landscape change, but also to facilitate efforts that chart a more sustainable path for economic and community development in and beyond Maine. Using Maine as a sustainability science laboratory, SSI continued its approach to landscape change research with two novel components: 1) a focus on interactions among three pressing drivers of landscape change (i.e. urbanization, forest ecosystem management, and climate/energy concerns), rather than examining each in isolation; and 2) our research is strongly shaped by the information needs of individuals and institutions that transform and use scientific

information. This integrative strategy facilitates the development of models to improve decision-making processes of individuals and institutions that vary in function, geography, and authority.

The RII project's goals are all focused to grow Maine's research and development capacity and competitiveness in sustainability science:

Goal 1 – Overall SSI Research: Create a world-class, solutions-driven sustainability science research center recognized for its innovative approaches to interdisciplinary research and deep commitment to collaboration with diverse stakeholders.

Goal 2 – Social-Ecological Systems: Investigate the dynamics of social-ecological systems, with particular emphasis on SES resilience.

Goal 3 – Knowledge to Action: Examine connections between scientific knowledge regarding SES dynamics and stakeholder actions that potentially affect SES resilience.

Goal 4 – Organizational Innovation: Test models from organizational science to understand and improve interdisciplinary collaboration and university – stakeholder partnerships.

Goal 5 – Diversity: Engage all aspects of the state's human and institutional resources in the achievement of the RII project goals and objectives.

Goal 6 – SSI Workforce Development: Foster the next generation of sustainability science professionals through K-20 programs that are linked to the diverse challenges and opportunities in the emerging field.

Goal 7 – General Workforce Development: Prepare Maine's current and future STEM workforce through coordinated programs and opportunities, training, and knowledge dissemination.

Goal 8 - Cyberinfrastructure: Utilize cyberinfrastructure to improve communication, collaboration, and visualization capabilities that enable innovation and competitiveness in the sustainability science focus area.

Goal 9 – External Engagement: Create and maintain an effective outreach & communication network through strategies that encompass all participants, stakeholders, and the general public.

Goal 10 – Evaluation & Assessment: Utilize multiple formative and summative evaluation processes to improve the project's effectiveness and assess its impact in relation to its goals.

Goal 11 – Sustainability Beyond the RII: Sustain the SSI infrastructure, impacts, and achievements through the continued integration of scientific entrepreneurship, institutional and external support, partnerships, education, workforce development, and constituency outreach.

Goal 12 – Overall RII Project Management: Implement an effective management plan that will support and ensure the overall success of the Maine EPSCoR RII project.

Goal 13 – SSI Research Project Management: Broad coordination of management and decision-making results in a shared vision for SSI research and integrated education, effective interdisciplinary outcomes, and participatory project management.

The Maine EPSCoR SSI Strategic Plan details the objectives, strategic actions, milestones, and metrics for each of these goals. Information on all of the above for YR4 (and YR5) can be found in the attached project benchmarks table, and in the attached progress detail tables for each goal.

*** What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?**
Major Activities:

Major activities accomplished during YR4 are briefly summarized below, with the detail for each goal provided in the attached Goal detail tables and benchmarks table.

Goals 1-4: SSI Research:

During YR4, SSI faculty from the UMaine, USM, and nine other PUIs continued to participate in SSI research and integrated education activities. The focus continued on landscape change as an important nexus for sustainability science research, including the development of multi-scale complex systems models of urban, semi-urban, and rural regions. SSI's progress in understanding the causes and consequences of landscape change is contributing to broad-based efforts in Maine to chart a more sustainable path for economic and community development.

During YR4, the SSI portfolio contained 20 projects that have addressed SES research objectives in order to increase understanding of SES dynamics and resilience. This has been accomplished through the development of models; increased capacity in interdisciplinary research; and increased stakeholder participation in problem definition and planning as a means to build support and trust across multiple institutions. The portfolio has applied these methods to the challenges of landscape change within the arenas of urbanization, forest-ecosystem management, and climate/energy futures. Specifically, research has studied how active stakeholder engagement and dialogue can be used to identify and rank problems, define research questions, and utilize knowledge systems. Models have been developed to simulate certain biophysical relationships, human responses to different types of information, or to predict system-level changes under different decision-making constraints.

Accomplishments within the SSI portfolio are based on numerous metrics for interdisciplinary research, scholarly productivity, increased number of best practices, student education in STEM, cross-institutional collaboration, increased effectiveness in stakeholder engagement, and contributions to decision-making. For the sake of simplicity components of the portfolio are identified by project identification numbers (see attached Goals 1-4 table) to show the connections that weave across all of the component parts of SSI. During YR4, 89 SSI faculty collaborated across 26 academic disciplines to study core challenges of sustainability science. In YR4, outputs included 239 publications. In total, 52 graduate and 131 undergraduate students have been directly involved in SSI related research and classes. Team interactions that directly focus on research include monthly all-team meetings, monthly SSI Research Council meetings, 6 topical special lectures, and an SSI retreat in May 2013 for all SSI members.

Scholarly efforts have focused on the connections between scientific knowledge about SES and societal actions regarding landscape change that are dependent on effective collaboration between researchers and diverse stakeholders. Continued progress occurred with interactions between SSI research teams and Maine stakeholders. Within the SSI portfolio, research teams at the 11 colleges and universities collaborated with individuals from 24 institutions of higher learning, 12 private sector organizations, 40 governmental agencies, 41 non-profit organizations, and three K-12 schools, including 36

representing national or international interests and Maine's tribal Indian Nations.

In response to a panel recommendation received following the Reverse Site Visit in Sept. 2012, we are also focusing greater effort on publishing in top science journals. At the present time, we are working on two manuscripts. The first manuscript (draft title: Evolving approaches to conserving small wetlands on private lands in the face of uncertainty) will soon be submitted to the Proceedings of the National Academy of Sciences. The second manuscript (draft title: What are the roles of knowledge institutions in sustainability?) is in preparation for Science.

One noted strength of SSI's portfolio is a strong connection between knowledge and action (K-A). Observational and experimental research and integrative models have been used in 36 public presentations and formal presentations of testimony.

During YR4, there was a continued focus on the stated Strategic Plan activities planned for each of the other RII goals (see attached project benchmarks table and progress detail tables for each goal):

Goal 5 – Diversity: continued to increase diversity in directly supported personnel, and indirectly supported outreach participants by expanding involvement of women and underrepresented groups, while simultaneously working to expand the involvement of primarily undergraduate institutions and community colleges, and increasing the number and breadth of collaborating stakeholders. In YR4, of the total number of individuals directly supported by this project 49% were female and 9% were from underrepresented groups. Of indirectly supported participants, 53% were female and 9% were from underrepresented groups. Diversity partnerships and programs included the Native Scholar Program, Maine Girls Collaborative Project, Expanding Your Horizons, Camp Capella, UMaine's Center for Community Inclusion and Disabilities Studies (CCIDS), and Upward Bound. During YR4, in addition to research collaborators reported above, Maine EPSCoR's collaborations included non-SSI statewide institutions of higher learning (2), corporations and businesses (2), government (2), K-12 institutions (5), and non-profits and other NGOs (3).

Goal 6 - SSI Workforce Development: engaged in YR4 activities to directly support, train, and mentor 407 individuals including 89 faculty, 5 postdocs, 52 graduate students, 131 undergraduate students, 21 high school students, and 109 professional/technical/administrative staff. Faculty and students were supported in professional and educational development activities.

Goal 7 - General Workforce Development: collaborated to implement and support related STEM opportunities in YR4 that engaged 3,016 K-20 students and teachers, including direct participation in research, mentorship programs, after-school activities, camps, and events. Faculty and teachers were supported in professional development activities.

Goal 8 – Cyberinfrastructure: expanded physical CI (virtual collaboration, cloud cluster capacity), provided training workshops, activated visualization wall, hired two data integration specialists to begin developing systems for data handling across the SSI portfolio.

Goal 9 – External Engagement: stakeholder network communications; dissemination to scientific community (239 publications/products); hosted seminars, workshops, conferences; 3 MPBN documentaries, newsletters, websites, social media for general public.

Goal 10 – Evaluation: external evaluators YR4 review; AAAS assessment May 2013; on-going SSI Advisory Board; NSF EPSCoR RSV Sept. 2012; on-going internal management evaluation.

Goal 11 – Sustainability: human infrastructure development, external funding support, seed funding, and other supportive activities.

Goal 12 – Overall Proj Mgt: on-going management structure ensures project integrity and success.

Goal 13 – SSI Res Proj Mgt: on-going research structure, systems, communications, and feedback loops ensure project integrity and success.

Specific Objectives: The SSI Strategic Plan details the objectives, strategic actions, milestones, and metrics for each of the RII goals. Detailed information on all for YR4 (and YR5) can be found in the attached project benchmarks table and progress detail tables for each goal.

Goals 1-4 Objectives – SSI Research

SES research objectives focus on indicators, thresholds and feedback mechanisms that can be used to analyze systems and predict changes within the context of landscape change. YR4 research explored how and why SES thresholds and feedbacks differ in arenas of urbanization, forest management, and climate/energy futures and whether patterns observed in these arenas reflect systematic characteristics. Observational and experimental methods were used to analyze how the likelihood of encountering and crossing thresholds is affected by scale-dependent components and to analyze how scales affect the capacity to monitor and understand system feedbacks. This research is used to define what indicators best measure change and permit detection of proximity to thresholds. Examples of pursuing SES objectives from within the portfolio include: 1) Investigate the persistence of pool-breeding amphibians in urbanizing landscapes with a focus on ecology and socioeconomic implications of conservation on private lands; 2) Develop computer models to examine the interrelationship among socioeconomic and technological forces shaping Maine's urban areas. 3) Develop Sebago Lake hydrological models that capture dynamic interactions with population growth areas; 4) Investigate urban-rural landscape change to derive relationships between ecological and social resources and human decisions; 5) Develop integrative land suitability indices for the Lower Penobscot River Watershed and Casco Bay Region to test how stakeholders understand and react to alternative futures scenarios; 6) Analyze rainfall occurrence and intensity patterns in Maine to be used as a tool for stormwater management planning in municipalities; 7) Develop methods to monitor for the emerald ash borer (an invasive forest pest) and work as a boundary organization to help tribal communities, federal agencies, and state agencies prepare; 8) Analyze the dynamic interactions of fisheries, fishing communities, and tidal energy power developers to develop best-practices for tidal energy development; 9) Conduct social, economic, and ecological studies of fisheries restoration and the effects

on public perception and local economies; 10) Use physical and biological studies of Belgrade Lakes ecology integrated with social science studies of human values and sense of place to inform specific, place-based actions targeted at promoting sustainable practices; 11) Develop ecological and sociological indicators and monitoring methods that integrate and create feedback loops for ecosystem health, community values, and land-use policies and practices in the Saco River estuary; 12) Conduct ecological field experiments on the effects of disturbance in hemlock forest plots to simulate wooly adelgid infestation and model affects on both forest structure and public perceptions; 13) Assess the feasibility of grass biomass production through evaluation of the resource base, production economics, and stakeholder interest; 14) Conduct aquatic and riparian habitat research in Rangeley Lakes Watershed to evaluate regional sustainability practices and economic opportunities; 15) Develop solution-targeted research that promotes economic development (agriculture and hunting) while protecting ecosystem health and fostering community well-being using re-introduced species (turkeys) as a model system.

Research on connections between Knowledge and Action (K-A) has progressed in YR4 via the analysis of factors that affect interactions between scientific knowledge and stakeholder actions. This includes a rigorous assessment of alternative methods for assessing stakeholder knowledge. Research has also evaluated how K-A connections are affected by communication processes, social learning, and trust. SSI recognizes that K-A is a reciprocal process, so research has also focused on how individual and institutional actions can influence the process of problem formulation and knowledge generation. As such it is explicit in some parts of the portfolio and implicit in other parts. Examples of pursuing K-A objectives from within the portfolio during YR4 are: 1) Use to identify and analyze processes of alignment required to deliver a wide range of solutions; 2) Determine the context in which SSI solutions are designed and delivered; 3) Identify and evaluate the pathways to creating greater social resilience at both individual and institutional levels to identify, design, and adopt solutions; 4) Conduct a forum for key policy stakeholders to address an urgent need to develop a response before destructive invasive species arrive; 5) Design and assemble a facility for sustainability experiments to test human-natural systems interactions; 6) Facilitate and assess stakeholder readiness, market demand, and producer capabilities for a grass biomass industry in the St. John Valley.

SSI's Organizational Innovation (OI) research investigated the individual and institutional factors that facilitate and hinder collaborative, solutions-driven research, whether in the context of interactions among faculty and students participating on interdisciplinary research teams, or in the context of researcher-stakeholder partnerships. YR4 OI theories and best practices were aligned with strategic objectives to address these project goals: 1) Conduct interviews and surveys of SSI team to assess factors affecting collaboration, research, and mentoring of students; 2) Conduct longitudinal analysis of the organizational innovation occurring in SSI toward its interdisciplinary and organizational change goals; 3) Develop methods to define of metrics of success.

During YR4, there was a continued focus on the stated Strategic Plan objectives for each of the other RII goals (see attached project benchmarks table and progress detail tables for each goal):

Goal 5 Diversity: broaden overall participation through increased individual and institutional diversity. Specific programs reached Native Americans, girls, and persons with disabilities.

Goal 6 SSI Workforce: provide direct support, training, mentoring, and opportunities for research personnel at all levels.

Goal 7 General Workforce: work with partners to directly engage K-20 students and teachers in STEM programs and opportunities to the research focus, and to play a leadership role in the state in STEM education.

Goal 8 Cyberinfrastructure: expand physical CI, provide new communications and visualization tools, and develop systems for data handling across the SSI portfolio.

Goal 9 External Engagement: stakeholder networks, dissemination to scientific community, and building scientific literacy for the general public & K-12 community.

Goal 10 Evaluation: multi-method approach that includes external evaluators, AAAS, SSI Advisory Board, NSF EPSCoR mechanisms, and internal management evaluation & assessment.

Goal 11 Sustainability: mechanisms for post-RII sustainability include meeting targeted outputs, human infrastructure development, external funding support, seed funding, and other supportive activities.

Goal 12 Overall Proj Mgt: effective organizational and management structure ensures project integrity and success.

Goal 13 SSI Res Proj Mgt: organizational research structure, systems, communications, and feedback loops ensure project integrity and success.

Significant Results: **Goals 1-4 Research:**

Significant SES results for the portfolio are summarized in the attached tables, but key examples include:

Alternative Futures (6): mapped land-use changes using a Bayesian-Belief network model. Model runs and GIS maps produced for the Lower Penobscot River Watershed, and the Casco Bay Region. Northern States Research Cooperative is using outputs to examine the effects of changing land use scenarios on future timber supplies. Model is now basis of exploratory research to define thresholds and feedbacks via the Maine Community Mapper, and used to identify new land use issues using the suitability indices.

Sustainable Urban Regions (2): focused on a model to show the complex interactions of land use change, economics, and demographics in response to different types of natural and social drivers. Developed new methods to collect and manage the large amounts of data needed to analyze regional issues of

landscape sustainability, as well as engaging new partnerships in the analyzing and modeling of sustainability issues across the urban regions.

Vernal Pools (1): submitted a draft Special Area Management Plan (SAMP) to the US Army Corps of Engineers for consideration as an alternative federal regulation of vernal pools in Region 1. Continuing integration of SES and K-A research has facilitated the development of solutions by focusing on improving networks among stakeholders and building a collaborative, polycentric approach to conservation.

Coastal Adaptation (11): analyzed precipitation patterns over the last 50+ years and found that the post-1980 records exhibited an increased magnitude of extreme events with corresponding change in seasonality. This output has been integrated into decision-making tools that were derived from interviews, surveys and focus groups with Maine coastal communities to help them better assess their vulnerability to climate change and prepare for increased flooding. This includes an increased awareness of the vulnerability of culverts and other infrastructure in urbanizing areas.

Belgrade Lakes (20): made progress in the analysis of coupled social-ecological systems. Research suggested that current methods of lake conservation are not protecting Maine lakes because of problems with the way lake scientists communicate the ecological status of the lakes, raise community awareness of lake health, and specify actions available to stakeholders to mitigate anthropogenic impacts. Research highlighted the importance of reciprocal information flow that influences stakeholder-based actions and conservation behaviors.

Saco River Estuary (21): new understanding of bacteria dynamics. Observed bacterial concentrations were found to vary seasonally in response to precipitation and adjacent land-use. These results have been used to build a model to predict beach closure that uses remotely sensed precipitation data to produce real-time outputs for managers.

K-A: progress in modeling how urbanization, as a major force in landscape change, is affected by stakeholder needs, the supply of knowledge, and individual and community decision-making (1, 2, 3, 4, 5, 6, 11, 20, and 21). Model development lead to the publication of two reports that provide substantive data for decision-makers: (1) Changing Maine: Maine's Changing Population and Housing 1990-2010 and (2) Changing Maine: Maine's Changing Population and Housing 1990-2010: Focus on Southern Maine (2). Collaboration with the external Maine Road Salt project was used to define how build capacity in the management of road salt in Maine across diverse geographical areas by strengthening communication and knowledge exchange across stakeholder groups (5). The coupling of climate models, precipitation trends, and extreme weather events into decision-making tools are being used by coastal communities to assess their vulnerability to climate change and prepare for the future (11).

Forest Ecosystem Management arena: progress occurred in the context of a changing landscape (1, 4, 5, 6, 13, 22, and SS-2). Stakeholder-derived future scenarios now serve as potential endpoints for consideration in planning and policy formulation (6). The problems associated with invasive species that threaten forest integrity and diversity affect a broad number of stakeholders and

our research is showing how to prepare ecological, economic, and social responses (4, 6, 13, 22). Particularly, work on the emerald ash borer and the hemlock wooly adelgid have resulted in key outputs for critical habitat mapping, emergency response plans, and outreach to landowners (13, 22).

Climate Change/Energy arena: strong integration of stakeholder processes and perspectives into SSI's sea-floor tidal power project that is the first US project to generate electricity to the grid. (18). Has resulted in strong national and international collaboration to study how information is used for decision-making by environmental and energy interests.

OI: indicated major factor influencing interdisciplinary success is the degree to which researchers think that they have a voice in shaping SSI, and that satisfaction with SSI has increased in response to organizational interventions suggested by OI research. Results have been published as a best practices for interdisciplinary endeavors in *Change Magazine*.

Goal 5 Diversity: Native Americans engaged through emerald ash borer research and Native STEM Scholarship Development program for K-20 students (96 participants). Of directly supported individuals, 49% female, 9% underrepresented. Diversity programs & partnerships: NSF ADVANCE Rising Tide Center, Maine Girls Collaborative Project, Expanding Your Horizons, the Native STEM Scholarship Development Program, Camp CaPella, the Center for Community Inclusion & Disability Studies, and Upward Bound. Ten PUI partner institutions (in addition to UMaine): Bates, Bowdoin, Colby, Unity, UNE, UMaine Presque Isle, UMaine Farmington, UMaine Fort Kent, UMaine Augusta, and Univ Southern Maine. Eastern Maine Community College and Maine Maritime Academy workforce partners. SSI researchers engaged in 120 other institutional collaborations; Maine EPSCoR collaborated with 14 additional partners in workforce development.

Goal 6 SSI Workforce Development: 407 individuals directly supported: 88 faculty, 5 postdocs, 52 graduate students, 131 undergraduate students, 21 high school students, and 109 professional/technical/ administrative staff and board members. New courses developed; seminars, conferences, workshops offered; related educational and training opportunities.

Goal 7 General Workforce Development: supported related STEM programs and opportunities that directly engage K-20 students and teachers (3,016 participants); educator professional and leadership development in STEM; leadership role in statewide STEM workforce development.

Goal 8 Cyberinfrastructure: research and education enabled by cyberinfrastructure investments (physical, human, virtual collaboration).

Goal 9 External Engagement: communication mechanisms enabled dissemination and awareness of SSI research and workforce development activities.

Goal 10 Evaluation & Assessment: all YR4 evaluation reports are pending.

Goal 11 Sustainability: 407 directly supported participants; $32M grant proposals submitted/$4.8M awarded to date; seed funding & leveraging of NSF

programs (see Goal 11 detail table); 239 publications/products; economic development projects;

Goal 12 Overall RII Project Management: on-going management actions.

Goal #13 SSI Research Project Management: on-going management actions.

Key outcomes or Other achievements:

Goals 1-4 Research:

One aggregate indicator of SSI's continued progress in strengthening connections between SES and K-A. Such outcomes are well represented across the SSI portfolio in Y4. This is particularly noted by the national and international recognition of SSI in the past year. The Tidal Energy project team was invited to present three papers at the 1st Marine Energy International Symposium- Approaches to Marine Renewable Energy Development on stakeholder engagement, resource assessment, and engineering. The advancement of sustainability science as represented by SSI was highlighted in symposia held by the National Academy of Sciences and the American Association for the Advancement of Science (AAAS). SSI's leadership role in advancing innovative approaches to sustainability science was particularly evident at the annual meeting of the AAAS. Specifically, SSI organized a symposium ("What are the roles of knowledge institutions in sustainability") that brought together thought leaders representing some of the leading universities across the United States.

These accomplishments are exemplified by successes across the portfolio as follows:

Outputs reached beyond immediate Maine stakeholders as our reputation for developing innovative, science-based models for wetland management spreads through exposure through our website, international presentations, airing of a public broadcasting program focused on SSI research, and requests for assistance from people in New Brunswick, New York, Virginia, Georgia, Wisconsin, Minnesota, Michigan, and Ohio.

Initiated new work with the Department of Transportation, Maine Turnpike Authority, and the Portland Area Comprehensive Transportation System to complete long-term population, employment, and transportation forecasts for the Portland region.

Connected research to the development of an online mapping tool that will be used by the Portland Water District to solicit input regarding the presence of invasive species in Sebago Lake from community members and stakeholders.

Increased capacity to conduct sustainability science research with other institutions through the SESYNC rural forest working group to contribute to national and international research to improve the linking of scientific knowledge with action on land and forest management issues.

Employed landscape models to explore a wide range of issues such as small-scale land use within municipalities to larger-scale questions regarding alternative development strategies and resource protection policies.

Developed new research method to assess and visualize climate variability.

Developed mapping methods to capture the traditional ecological knowledge of ash harvesters to communicate to the next generation of harvesters.

Developed a new organization with representatives from industry, small business, environmental NGOs, municipal and state government along with individual stakeholders to provide an open forum for discussion of economic and environmental issues along the Androscoggin River in order to bring science into the discussion as a politically neutral means of addressing specific applied questions.

The extensive collaborations formed through this work have catalyzed interest in lake conservation across the state. Academics from multiple institutions are now collaborating with lake professionals throughout the state to develop solutions to the nutrient enrichment of Maine lakes. This network of passionate, committed, and intellectually engaged scientists, lake managers, and citizens would be difficult to create without the catalytic effects of this grant opportunity.

Created and sustained a collaborative network of people whose combined efforts contribute to the structure and function of the Saco River estuary by connecting human values and actions with the ecological health of the estuary.

Produced a variety of qualitative summaries of historical land uses accessible to public to test how discussions about the past can lead to meaningful discussions about the future.

Integrated cadastral mapping and property transaction data into a regional analysis of land ownership change to support hedonic analysis of open space in order to inform future conservation acquisition strategies.

Goal 5 – Diversity**:** In YR4 SSI experienced increased involvement of women and underrepresented groups at both the directly supported and indirectly supported levels. Directly supported participants saw a 1% increase of both females (49 up from 48) and underrepresented groups (9 up from 8), which met or exceeded the targeted benchmarks (36 and 8, respectively). Indirectly supported participants saw a 6% increase for females (53 up from 47) and 1% (9 up from 8) increase for underrepresented groups, which also met or exceeded the targeted benchmarks (36 and 8, respectively). Through continued partnerships and program support, SSI is broadening participation among women, persons with disabilities, first-generation students, and the Native communities of Maine. SSI is also expanding institutional and partner diversity through expanded collaborations with undergraduate institutions and community colleges, as well as increasing the breadth of stakeholder collaborations in both research and workforce development.

Goal 6 – SSI Workforce Development: Fostered the next generation of sustainability science professionals by increasing Maine's capacity to produce and support sustainability science professionals. Undergraduates, graduates and post docs gained experience working as part of multi-level SSI teams and were trained in cutting-edge, interdisciplinary sustainability research techniques. All students gained a greater understanding of the interdisciplinary nature of sustainability science, and are better prepared to continue their educational or career paths in a sustainability-related area.

Goal 7 – General Workforce Development**:** Addressed the need to prepare Maine's current and future STEM workforce through coordinated programs and opportunities, training, and knowledge by networking statewide to engage educators, policy makers and community members in educational opportunities focused on SSI related research work. Thru these opportunities students at all levels gained a deeper understanding of sustainable science and exposure to STEM related career pathways.

Goal 8 Cyberinfrastructure: research and education enabled by cyberinfrastructure investments (physical, human, virtual collaboration).

Goal 9 External Engagement: communication mechanisms enabled dissemination and awareness of SSI research and workforce development activities.

Goal 10 Evaluation & Assessment: all YR4 evaluation reports are pending.

Goal 11 Sustainability: all strategic actions leading to sustainability beyond the RII project.

Goal 12 Overall RII Project Management: on-going management actions provide project integrity and ensure success.

Goal #13 SSI Research Project Management: on-going management actions provide project integrity and ensure success.

*** What opportunities for training and professional development has the project provided?**

With Maine ranking 50 out of 52 in 2009 in earned doctorates in science or engineering, the workforce development goal to foster the current and next generations of sustainability science professionals is critical for the state. The SSI Strategic Plan outlines an approach that will assist in the creation of a trained STEM workforce for Maine's future. Strategies occur at many different levels of the project, and span two goals for workforce development: one for workforce development and education embedded in the sustainability science research component (Goal 6), and one for more general workforce development and STEM education related to sustainability science (Goal 7).

Detailed information on all for YR4 (and YR5) can be found in the attached project benchmarks table and progress detail tables for each goal. Note that objectives for Goal 5 Diversity are incorporated into all training and professional development activities.

Goal 6: objective 6.1 is to provide direct research support for SSI participation and engagement at all levels. During YR4 of this RII project, a total of 407 individuals were directly supported under this project: 88 faculty, five postdocs, 52 graduate students, 131 undergraduate students, 21 high school students, and 109 professional/technical/administrative staff. The project fully supported four new SSI faculty hires and five SSI postdoctoral fellows in YR4. Strategies for YR4 included providing integration opportunities for these positions across the project. A cohort of 3 PhD students joined the team in fall 2012 bringing the number of SSI cohort PhD students to 22. See Table B participant data for a summary of participation.

Engaging graduate students in SSI mentoring, programs and opportunities is a key objective of this project (6.2). The first cohort of SSI PhD students presented on their research progress at YR4 All-Team Meetings. SSI-related course offerings continued in YR4 with 14 graduate-level courses being offered. Progress on the graduate certificate in sustainability science has continued. SSI is working with the Ecology and Environmental Sciences program at UMaine to create internship and service learning opportunities in sustainability science for

students. SSI has actively pursued opportunities for graduate students and postdoctoral fellows to participate in career development activities in YR4.

The new undergraduate EES curriculum that includes the sustainability concentration received final approval and is in the process of being implemented. This concentration reflects a number of new courses and a growing interest in sustainability science and is a key milestone in meeting objective 6.3: engaging undergraduate students in SSI mentoring, programs, and opportunities. SSI faculty taught 18 sustainability-related undergraduate courses in YR4. Mentorship of undergraduate students has increased in YR4 with 131 undergraduate students paired with SSI faculty, postdocs, and graduate students.

Objective 6.4 is to support faculty development across the SSI project. SSI is collaborating with 2 UMaine organizations to support training and mentoring of SSI faculty, postdoctoral fellows and graduate students; the Center for Excellence in Teaching and Assessment, and the ADVANCE Rising Tide Center. Both organizations offer workshops and conferences for students. Also offered are targeted mentoring programs for new and junior faculty that can be utilized by SSI team members. Formal and informal mentoring has continued in YR4. Other mentoring opportunities have taken place in YR4 that are focused on active participatory learning in interdisciplinary teamwork.

Collaborative learning for YR4 (6.5) has continued with SSI seminars, workshops, meetings and conferences. A retreat is planned for May. The Maine EPSCoR State Conference provided unique opportunities for SSI team learning and integration. Following a two-day meeting with a small group of UNH faculty in summer 2012, SSI faculty collaborated with UNH in fall 2012 to develop a joint proposal for NSF EPSCoR's RII Track 2 solicitation. It is anticipated that research collaborations with UNH will continue in the future.

Special awards went to 5 SSI faculty, 4 graduate students, and 1 postdoc. Three Maine EPSCoR MPBN documenataries were nominated for Emmy awards.

Goal 7: addresses the need to prepare Maine's STEM workforce through coordinated programs and opportunities, training, and knowledge dissemination. The first objective (7.1) works with statewide STEM partners to implement integrated K-20 STEM activities related to the sustainability science research. Maine EPSCoR developed a partnership with UMaine Cooperative Extension and Maine Project Learning Tree to develop curriculum for teachers. Maine EPSCoR continued its collaboration with the REACH Center, which is a joint project with Maine Math and Science Alliance and the Maine School of Science and Mathematics.

Participating SSI Partner institutions continued to implement K-20 STEM activities related to sustainability science research focus (7.2). Researchers provided opportunities for middle school students to participate in day-long lake programs, high school students to participate in research, and undergraduates to create a documentary. Faculty is developing K-12 curriculum that integrates SSI research for teachers.

Maine EPSCoR provides high school research internship experiences (7.3). During the summer of 2012, Orono High School students served as interns on research teams with faculty at the UMaine. The program is continuing with another cohort of students. Currently, one Old Town high school student is interning at UMaine to develop online tools to search and process SSI research data by K-20 classrooms.

Objective 7.4 is to promote educator professional and leadership development in STEM, and foster STEM approaches and activities that value prior learning across subjects. During YR4, the Maine Center for Research in STEM Education partnered with ME EPSCoR to provide STEM professional development opportunities for K-12 teachers and pre-service teachers. ME EPSCoR will be partnering with them to hold a 2013 teacher workshop. Maine EPSCoR collaborates with Project REACH to address the needs of Maine's English Learner populations in regard to STEM education with a focus on sustainability science. Workshops will be offered during 2013-2014 to teachers throughout the state to improve their ability to teach Maine's English Learner populations STEM related skills. Maine EPSCoR partnered with Acadia Learning Project to host a workshop where teachers worked with scientists to develop data literacy skills.

Maine EPSCoR and Department of Labor and the Department of Education created a partnership to expand upon the four baseline STEM Education studies that had previously been conducted by Maine EPSCoR in 2012. (7.3) Due to recent state budget cuts additional follow-up work has not been able to occur as planned. The Maine STEM Collaborative aims to integrate best practices in STEM. In order to have a greater effect on statewide STEM workforce development and education, Maine EPSCoR is a key member of the Collaborative. In 2013, Laurie Bragg, Maine EPSCoR's Outreach and Program Manager, was elected to join the STEM Collaborative as a member of the advisory council. Maine EPSCoR worked with Educate Maine to help implement a new online STEM internship database for students. In YR4, UMaine's Foster Student Center for Innovation, the Reach Center, and Maine EPSCoR collaborated together to produce a STEM database. Maine EPSCoR continues to explore potential strategies with Maine Department of Education.

*** How have the results been disseminated to communities of interest?**

SSI Strategic Plan Goal 9 addresses the need to create and maintain an effective outreach and communication network for external engagement through strategies that encompass all participants, stakeholders, and the general public. Detailed information on all for YR4 (and YR5) can be found in the attached project benchmarks table and progress detail tables for each goal.

Outreach and communication are fully integrated throughout all aspects of this project, as it is a key component of the sustainability theme. Therefore, many relevant activities and programs are discussed in other sections of the annual report.

Objective (9.1) is to establish stakeholder communication networks that allow for two-way sharing and for information dissemination on SSI research. SSI's research approach requires that all project teams develop and maintain working relationships with appropriate stakeholder groups. These relationships have continued to build and strengthen as the project has moved forward. In many cases, this has lead to a clearer understanding of research problems and pathways forward between researchers and stakeholders. For example, a workshop on Emerald Ash Borer (#13) scenario development clearly identified where the regulators needed to find common ground. From this, the team hosted the first of a series of meetings leading to the signing of memoranda of understanding for the initial response to an EAB detection.

Dissemination of information on SSI research is also critical to SSI's long-term success. We continue efforts to maintain and expand our email database (1700 subscribers) which is used to distribute information on SSI-related news and events and links people directly back to the SSI website. Printed and display materials have all been updated to reflect the SSI brand. Printed materials include a brochure, two newsletters and various fact sheets. These are used for mailings to interested parties and for distribution at events, conferences and workshops. We also mail and distribute DVDs of the MPBN documentaries and copies of the SSI Maine Policy Review. The SSI external website is the updated on a regular basis and is used as the "hub" for information pertaining to research, team members, news and events. Work on a new website will take place in summer 2013. The site will combine SSI project information with that of the Senator George J. Mitchell Center.

Public participation at many SSI-sponsored events is encouraged and information is distributed through our email database and through other public and university forums. Major events include the Mitchell Lecture on Sustainability and the Maine Water Conference. Other events open to the public include SSI seminars and workshops.

Objective (9.2) is to disseminate and communicate research results to the scientific community. Our approach to this has been to engage in scholarly research outputs such as publications and technical presentations, sponsor and participate in conferences, seminars and workshops, and host visiting scholars. Lists of major publications and technical presentations are presented in the "products" section of this report.

SSI continues to sponsor and participate in various conferences, seminars and workshops including the annual ME EPSCoR Conference, Maine Water Conference, Mitchell Lecture on Sustainability and SSI Seminar Series.

All of these events are well attended by academics and researchers from UMaine and other Maine institutions. One symposium of significant note in YR4, was the SSI led symposium at the annual meeting of the American Association for the Advancement of Science in Boston on February 18th. The symposium focused on innovative university programs designed to address the challenges of sustainable development. The symposium included presentations by six academic leaders from across the U.S. who are immersed in, and learning from, novel institutional strategies for developing solutions to pressing societal problems at the intersection of economic, social, and environmental issues. A full proposal is in process for submission to NSF EPSCoR for consideration to sponsor a national sustainability science workshop in spring 2014.

The SSI Seminar Series brings scholars to the UMaine campus on a regular basis. SSI team members who invite scholars to participate in the seminar series are encouraged to host scholars for 2-3 days and provide opportunities for the UMaine community to interact and learn from them outside of the scheduled seminar. For YR4, five scholars and Mitchell Lecturer Pam Matson visited campus and participated in across campus meetings with a variety of interested faculty, postdocs and graduate students.

Objective 9.3 is to build scientific literacy for the general public & K-12. During YR4, Maine EPSCoR again partnered with the Maine Public Broadcasting Network (MPBN) to produce 3 additional documentaries for its Sustainable Maine series. The documentaries are accessible from MPBN's website as well as Maine EPSCoR and SSI websites as well as Facebook and YouTube. Maine EPSCoR is developing related K-12 curriculum to coordinate with the series. The episodes are planned to air in Fall 2013. Maine EPSCoR also plans to redesign its website during summer 2013; has enhanced activity through social media; and implemented other communication strategies.

*** What do you plan to do during the next reporting period to accomplish the goals?**

Detailed information on all for YR4 and YR5 can be found in the attached project benchmarks table and progress detail tables for each goal.

Goals 1-4 Research:

During the final year, accomplishments will include strengthening the infrastructure, governance and external funding for the new Center for Sustainability Solutions at UMaine. This Center is already beginning to be regarded as a national and international center of excellence in sustainability science. Across this whole project, the goals for Maine will result in: 1) An expanded capacity for sustainability science research, including greater collaboration among participating institutions and statewide stakeholders; 2) Solutions-targeted research that promotes economic development while protecting ecosystem health and fostering community well-being; 3) A STEM workforce that can engage in interdisciplinary research in sustainability science, and who are prepared to create new technologies, services, and businesses in support of a green innovation economy.

YR5 plans includes activities of specific projects as well as activities that span and aggregate across the entire research portfolio. All will contribute to sustainability science in attainment of the objectives for SSI. 1) Create the Center for Sustainability Solutions at the University of Maine; 2) Support statewide primarily undergraduate institutions through involvement in SSI research; 3) Engage a wide breadth of interdisciplinary expertise with diverse faculty; 4) Continue active collaborations with a wide range of stakeholder groups; 5) Expand collaborations with national & international groups; 6) Foster collaboration and integration between research teams and institutions; 7) Continue development of new research methods and adoption of best practices; 8) Submit additional external collaborative proposals; 9) Support completion of peer-reviewed publications; 10) Present results at relevant professional conferences; 11) Apply models to inform decision-making; 12) Provide formal public presentations or public testimony.

SSI will continue work on the following SES objectives: 1) Develop models of SES dynamics for specific context across the portfolio; 2) Identify and analyze thresholds, feedback and indicators for context dependent problems; 3) Use SSI outputs to inform stakeholder mitigation and adaption strategies; 4) Continue research to characterize and evaluate linkages of SES models with K-A.

SSI will address these K-A objectives: 1) Create models to assess reciprocal interactions among biophysical, socioeconomic, and stakeholder contexts affecting K-A; 2) Continue development of methodological frameworks & best practices; 3) Identify linkages of K-A research with SES; 4) Identify best practices for strengthening K-A interactions; 5) Give presentations of evidence-based strategies for communicating complex scientific information; 6) Create K-A models that are both internally and externally-oriented for stakeholder and research purposes.

OI objectives for longitudinal studies of SSI projects and partnerships are central to the process will be addressed in YR5: 1) Develop models of OI that examine the influences on interdisciplinary collaboration in university-stakeholder partnerships; 2) Develop methodological frameworks and best practices for promoting interdisciplinary collaboration and university-stakeholder partnerships; 3) Produce presentations and technical reports on OI research findings, suggested implementation, and recommendations for improvement; 4) Develop mechanisms for informing external stakeholders of relevant results.

Goal 5 – Diversity: For YR5, broaden participation through: 1) increased diversity through directly supported personnel (women 37%, diverse 9%); 2) indirectly supported outreach participants (women 37%, diverse 9%); 3) expand Native American program to 70 participants; 4) expand programs for women and girls to include 600 participants; 5) implement disability programs for 15 participants; 6) expand PUI and community college institutions collaborating to 13; 7) increase the number and breadth of stakeholder collaborations to 100 stakeholder groups.

Goal 6 – SSI Workforce Development: Continue: 1) Support, mentor and retain all staff hired; 2) Support 90 faculty, 35 graduate student research assistantships, 110 undergraduate research assistantships; 3) Continue two graduate course series, service learning, and internships; 4) Provide formal and informal faculty, postdoc, graduate, and undergraduate student training and mentoring opportunities; 5) Support travel for all SSI participants; 6) Sponsor three SSI workshops, five seminars, the state EPSCoR conference and SSI retreat; 7) workforce development projects at two community colleges and add another.

Goal 7 – General Workforce Development: Continue: 1) collaborations and partnerships; 2) support related STEM programs and activities for 650 K-12 students; 3) 30 participants in the high school research internship program; 4) Support teacher workshops; 5) Support SSI curriculum; 6) Support statewide STEM Summit in 2014.

Goal 8 – Cyberinfrastructure: Continue: 1) expand cloud cluster environment for SSI researcher and student use; 2) Deploy additional visualization capabilities; 3) Add video conference capabilities as needed and continue training; 4) Complete all data integration strategies for SSI project components, with all SSI research data catalogued and available online.

Goal 9 – External Engagement: Continue: 1) stakeholder communications networks; 2) disseminate research updates through presentations, conferences, email, newsletter, website, and display materials; 3) research updates through seminars, workshops, sponsored conferences, and state conference; 4) major publications and technical presentations; 5) Host visiting scholars; 6) web and online presence; 7) Communicating Science workshops for faculty and students; 8) Produce materials for Maine STEM Collaborative and support 2014 Summit.

Goal 10 – Evaluation & Assessment: Continue: 1) External year-round evaluation leads to summative report; 2) Ongoing SSI Advisory Board meetings; 3) NSF EPSCoR oversight mechanisms; 4) internal management review.

Goal 11 – Sustainability: Continue: 1) Meet output targets; 2) Support SSI faculty and students and develop plans for continuation; 3) Leverage NSF and other programs for funding; 4) Provide grant development support for SSI teams; 5) Host scoping meetings and new agency contacts; 6) Finalize for post-RII continuation of partnerships, stakeholder networks; 7) Add equipment as needed for Communications Center and Social Science Lab; 8) Partner with private sector for internships and exchange programs.

Goal 12 – RII Proj Mgt: Continue: 1) weekly meetings, recommendations, strategic planning; 2) updates to state EPSCoR committee; 3) financial integrity; 4) work with sponsored research and attend trainings to stay abreast of federal program compliance updates.

Goal 13 – SSI Research Proj Mgt: Continue: 1) weekly SSI Stewardship Council; 2) monthly Research Council; 3) SSI committees; 4) internal website materials and listerv; 5) All-team meetings, workshops, seminars; 6) annual research retreat; 7) Co-sponsor Water Conference; 8) refine OI systems; 9) review of portfolio progress; 10) opportunities for team to share research and network.

Supporting Files

Filename	Description	Uploaded By	Uploaded On
ME EPSCoR YR4 APR - Goals 1-4 Research Detail.pdf	ME EPSCoR YR4 - Goals 1-4 Research detail	Michael Eckardt	06/18/2013
ME EPSCoR YR4 APR - Goals 5-13 Detail.pdf	ME EPSCoR YR4 - Goals 5-13 detail	Michael Eckardt	06/19/2013
ME EPSCoR YR4 APR - Appendix 1-6 Detail Tables.pdf	ME EPSCoR YR4 - Appendix 1-6 detail	Michael Eckardt	06/19/2013
ME EPSCoR YR4 APR - Strategic Plan Benchmarks & Progress.pdf	ME EPSCoR YR4&5 - Strategic Plan Benchmarks & Progress	Michael Eckardt	06/19/2013

Products

Journals

Noblet, Caroline L., Mark W. Anderson and Mario F. Teisl. (7/24/12). An empirical test of anchoring the NEP scale in environmental ethics. *Environmental Education Research*. N/A 1-12.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1080/13504622.2012.704899

Thøgersen, John and Caroline L. Noblet (12/1/12). Does Green Consumerism increase the acceptance of windpower?. *Energy Policy*. 51 854-862.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Mark W. Anderson, Mario F. Teisl, and Caroline Noblet (12/1/12). Giving Voice to the Future in Sustainability Science: Retrospective Assessment to Learn Prospective Stakeholder Engagement. *Ecological Economics*. 84 1-6.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

McCoy, S. K., & Gardner, S. K. (11/1/12). Interdisciplinary collaboration on your campus: Five questions. *Change: The Magazine of Higher Learning*. 44 (6), 44-49.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Pavri, F., Springsteen, A., Dailey, A., and MacRae, J. D. (10/9/12). Land use and socioeconomic influences on a vulnerable freshwater resource in northern New England, United States. *Environment, Development, and Sustainability*. N/A 1-19.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Willis TV, Wilson KA, Alexander KE, Leavenworth WB (1/31/13). Tracking cod diet preference over a century in the northern Gulf of Maine: historic data and modern analysis. *Marine Ecology Progress Series*. 474 263-276.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Thornton, T. & Leahy, J. (10/1/12). Trust in Citizen Science Groundwater Research: A Case Study of the Groundwater Education Through Water Evaluation & Testing Program. *Journal of the American Water Resources Association*. 48 (5), 1032-1040.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Popescu, V.D., B.S. Brodie, M.L. Hunter, and J. Zydlewski (9/1/12). Use of olfactory cues by newly metamorphosed wood frogs (Lithobates sylvaticus) during emigration. *Copeia*. 2012 (3), 424-431.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Volker Bahn, Brian J. McGill (3/1/13). Testing the predictive performance of distribution models. *Oikos*. 122 (3), 321-331.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Colgan, Charles S. (1/1/13). The Ocean Economy of the United States: Measurement and Trends. *Journal of Ocean and Coastal Management*. 71 334-343.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Cook, Benjamin J, Elizabeth M Wolkovich, T Jonathan Davies, Toby R Ault, Julio L Betancourt, Jenica M Allen, Kjell Bolmgren, Elsa E Cleland, Theresa M Crimmins, Nathan J B Kraft, Lesley T Lancaster, Susan J Mazer, Brian J McGill, Gregory J McCabe, Camille (9/5/12). Sensitivity of spring phenology to warming across temporal and spatial climate gradients in two independent databases. *Ecosystems*. 15 (8), 1283-1294.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Cronin-Fine, L., J. D. Stockwell, Z. T. Whitener, E. M. Labbe, T. V. Willis, and K. A. Wilson (1/1/13). Application of Morphometric Analysis to Identify Alewife Stock Structure in the Gulf of Maine. *Marine and Coastal Fisheries*. 5 11-20.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Dornelas , M , Magurran , A , Buckland , S T , Chao , A , Chazdon , R L , Colwell , R K , Curtis , T , Gaston , K J , Gotelli , N J , Kosnik , M A , McGill , B , McCune , J L , Morlon , H , Mumby , P J , Øvreås , L , Studeny , A & Vellend (1/1/13). Quantifying temporal change in biodiversity : challenges and opportunities. *Proceedings of the Royal Society B: Biological Sciences*. 280 (1750), 1.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Hutchins, K. & Stormer, N. (3/5/13). Articulating Identity in and through Maine's North Woods. *Environmental Communication*. 7 (1), 24-41.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Loftin, C.S., A.J.K. Calhoun, S. Nelson, A. Elskus, and K. Simon (11/4/12). Does mercury bioaccumulate in wood frogs developing in seasonal woodland pools in Maine, USA?. *Northeastern Naturalist*. 19 579-600.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Maurer, Brian A., Steven Kembel, Andrew Rominger, Brian J. McGill (1/1/13). Estimating metacommunity extent using data on species abundances, environmental variation, and phylogenetic relationships across geographic space. *Ecological Informatics*. 13 114-122.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Neupane, B., A. Halog, and R.J. Lilieholm (4/1/13). Environmental sustainability of wood-derived ethanol: A life cycle evaluation of resource intensity and emissions in Maine. *Journal of Cleaner Production*. 44 77-84.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Samson, J ; Berteaux, D; McGill, Brian J. and Humphries, M (10/24/12). Demographic Amplification of Climate Change Experienced by the Contiguous United States Population during the 20th Century. *PLoS ONE*. 7 (10), e45683.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Yongmi Lee, Young Jin Jung, Kwang Woo Nam, Silvia Nittel, Kate Beard and Keun Ho Ryu (12/12/12). Geosensor Data Representation Using Layered Slope Grids Sensors. *Sensors*. 12 (12), 17074-93.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes ; DOI: 10.3390/s121217074

Books

Johnson, B.J., Chiao, C., Willis, T., Wilson, K., Dostie, P. (2013). *Abstract - Alewife migration, nutrient dynamics, and sedimentation in Nequasset Lake, Woolwich Maine*

Status = ACCEPTED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Martin, Danielle M., A. S. Reeve and Sean M. Smith (2013). *Abstract - Calibrating a lumped parameter drainage basin model to estimate stream discharge to Sebago Lake*

Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Nyhus, P., F. Russell Cole, Daniel Homeier, Sophie Sarkar, Noah Teachey, Catherine Bevier, D. Whitney King (2012). *Abstract - Cameras, Satellites, and Surveys: A Multi-Platform Approach to Monitoring Lake Conservation Practice*

Status = ACCEPTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Daly, J., Lavorgna, S., Doughty, M., and Rousseau, C. (2013). *Abstract - Comparison of winter stratification and ice duration between subalpine lakes and large, low elevation lakes*

Status = ACCEPTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Bevier, Catherine, F. Russell Cole, Sylvia Doyle, Nathaniel Moore, Johanna Salay, Peter Smithy, William Supple, Molly Susla, Emily Arsenault, Colin Cummings, Monica Davis, Marianne Ferguson, Andrew Mealor, Corey Reichler, Philip Nyhus, Whitney King (2012). *Abstract - Effects of Residential Shoreline Development on Characteristics of Littoral Habitats in the Belgrade Lakes of Maine*

Status = ACCEPTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

P. W. Milligan, A. Lichtenwalner, K. Sullivan, and J. Brown (2013). *Abstract - Exposure to Infectious Agents in Maine Wild Turkeys*

Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Meyer, Cronan, Johnson, Foster, Lilieholm (2013). *Abstract - Historical Patterns and Drivers of Land Conservation in Northern New England: 1850-2010*

Status = ACCEPTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

J. King, A. Bean, H. Dyer, and Milligan, P. W. (2013). *Abstract - Isolation of Salmonella and Staphylococci from Maine Wild Turkeys*

Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Forgrave, Rebecca, Dan Chiniara. The Belgrades SSI team at Colby, BRCA, BLA, MLRC (2012). *Abstract - Modeling Resilience and Adaptation in the Belgrade Lakes Watershed*

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

King, D. Whitney, John Peckenham, Maggie Shannon, Peter Kallin, Peter Lowell (2012). *Abstract - The Challenges and the Rewards of Creating a State-Wide Lakes Research Collaboration*

Status = ACCEPTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Chiao, C., Johnson, B., Dostie, P. (2013). *Abstract - The effect of the 2012 alewife migration on nutrient dynamics in Nequasset Lake, Woolwich, Maine*

Status = ACCEPTED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Johnson, M.L., Bell, K.P., and M.T. Teisl (2013). *Abstract - The Role of Geographic Scale in the Saliency of Scenarios*

Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Johnson, M.L., S.R. Meyer, R.J. Lilieholm, and C.S. Cronan (2012). *Abstract - The Role of Transparency in Developing a Stakeholder-Engaged Qualitative-Quantitative Landscape Scenario Process*

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Lilieholm R.J., C.S. Cronan, M. Johnson and S. Meyer (2012). *Abstract - University of Maine's Sustainability Solutions Initiative: Forecasting the Future of the Lower Penobscot River Basin*

Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Meyer, S.R., M.L. Johnson, R.J. Lilieholm, and C.S. Cronan (2012). *Abstract - Using Historical Patterns and Drivers of Land Conservation in Northern New England: 1850-2010*

Status = ACCEPTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Colgan, Dailey, Lloyd, McWilliams, Workman, and Kartez (2012). *Technical Report - Changing Maine: Maine's Changing Population and Housing 1990-2010 Portland: Muskie School of Public Service*

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Vail, David and Jason Johnston (2013). *Technical Report - Fort Farifield Landowner Survey: Perspectives on Grass Biomass*

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Lindenfeld, L., Smith, H., & Suldovsky, B. (2012). *Technical Report - University of Maine Pathway One Communication Research & Implementation Project: Phase One*

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Vanderlugt, B., Bell, K.P., Frisch, A., Quartuch, M., and J. Colby-George (2013). *Technical Report - 2012 Maine Landowner Survey: Bangor Metropolitan Area Results*

Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Vanderlugt, B., Bell, K.P., Frisch, A., Quartuch, M., and J. Colby-George. 2013 (2012). *Technical Report - 2012 Maine Landowner Survey: Key Findings and Implications for Policy, Outreach, and Landowner Solutions*

Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Vanderlugt, B., Bell, K.P., Frisch, A., Quartuch, M., and J. Colby-George (2012). *Technical Report - 2012 Maine Landowner Survey: Summary Technical Report*

Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Lilieholm, R.J., C.S. Cronan, M.L. Johnson, S.R. Meyer, and D. Owen (2012). *Technical Report - Alternative Futures Modeling in Maine's Penobscot River Watershed: Forging a Regional Identity for River Restoration, Working paper 12RL1* Lincoln Institute of Land Policy.

Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = No

Andrew Barton with Alan White and Charles Cogbill (2012). *The Changing Nature of the Maine Woods* Hanover, NH: University Press of New England.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Kim, Yuseung (2013). *A Comparative Study of Land Use and Building Permitting Processes in Portland and Other Cities* University of Southern Maine.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Barry, E., Johnson, B., Lea, F. (2013). *Abstract - A comparison of the major ion chemistry of two Maine watersheds, Pleasant River (Bethel, ME) and Stetson Brook (Lewiston, ME)*

Status = ACCEPTED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Filoso, S., Smith, S.M.C., and M. Palmer (2012). *Abstract - Nitrogen and sediment flux in engineered coastal streams*

Status = ACCEPTED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes

Sharik, Lilieholm and Richardson (2013). *Abstract - Diversity Trends in the U.S. Natural Resource Workforce and Undergraduate Student Population*

Status = ACCEPTED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Aber, J., F. Pavri, and S. Aber (2012). *Wetland Environments: A Global Perspective* Wiley- Blackwell.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = Yes ; ISBN: 978-1-4051-9841-7

Foertsch, I., J.E. Leahy, J.S. Wilson, and R.J. Lilieholm (2012). *Technical Report - Maine's Landowner Survey: Technical Report* University of Maine.

Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Book Chapters

Meyer, S.R., M.L. Johnson, and R.J. Lilieholm (2012). Land Conservation in the United States: Evolution and Innovation Across the Urban Rural Interface. *Urban-Rural Interfaces: Linking People and Nature* Laband, D.N., Lackby, B.G., and W. Zipperer. 225.

Status = PUBLISHED; Acknowledgement of Federal Support = Yes ; Peer Reviewed = Yes

S.I. Zeeman & P.Weinstein (2012). Water, water quality, and health. *Environmental Tracking for Public Health Surveillance* 87.

Status = PUBLISHED; Acknowledgement of Federal Support = No ; Peer Reviewed = No

Feurt, C. (2012). Collaborative Learning Strategies to Overcome Barriers to Ecosystem Management in Coastal Watersheds of the Gulf of Maine. *Advancing an Ecosystem Approach in the Gulf of Maine* 1.

Status = PUBLISHED; Acknowledgement of Federal Support = No ; Peer Reviewed = No

Isaac, Nicholas, Carbone, Chris and McGill Brian J (2012). Population and Community Ecology. *Metabolic Ecology: A Scaling Approach* James Brown, Astrid-Kodric Brown and Richard Sibley. Wiley-Blackwell. 77.

Status = PUBLISHED; Acknowledgement of Federal Support = No ; Peer Reviewed = Yes

McGill, Brian (2013). A macroecological approach to the equilibrial vs. nonequilibrial debate using bird populations and communities. *The Balance of Nature and Human Impact* Klaus Rohde. Cambridge University Press. Unknown.

Status = AWAITING_PUBLICATION; Acknowledgement of Federal Support = No ; Peer Reviewed = Yes

Popescu, V. and M.L. Hunter, Jr. (2012). Assisted Colonization of Wildlife Species at Risk from Climate Change. *Wildlife Conservation in a Changing Climate* Jedidah F. Brodie, Eric Post, and Daniel F. Doak. University of Chicago Press. 347.

Status = PUBLISHED; Acknowledgement of Federal Support = No ; Peer Reviewed = Yes

Rueger, B.F., and Beck, E.N (2012). Benedict Arnold's march to Quebec in 1775: An historical characterization using Google Earth. *GSA Special Papers 492, 2012 Google Earth and Virtual Visualizations in Geoscience Education and Research* Whitmeyer, S.J., Bailey, J.E., De Paor, D.G., and Ornduff, T.. Geological Society of America. 347.

Status = PUBLISHED; Acknowledgement of Federal Support = No ; Peer Reviewed = Yes

Silka, Linda (2013). Becoming part of the solution: engaged research on sustainability. *University Engagement and Environmental Sustainability* P. Inman and D. Robinson. Manchester University Press. Unknown.

Status = UNDER_REVIEW; Acknowledgement of Federal Support = Yes ; Peer Reviewed = Yes

Linda Silka, Mario Teisl, and James Settele (2013). Place-Based Approaches to Engagement: Can Universities Be Local and Global?. *Community Engagement in Higher Education: Policy Reforms and Practice* W.J. Jacob,

S.E. Sutin, J.C. Weidman, and J.L. Yeager. Institute for International Studies in Education. University of Pittsburgh. Unknown.

Status = UNDER_REVIEW; Acknowledgement of Federal Support = Yes ; Peer Reviewed = Yes

Farrow, K., Teisl, M. F., Noblet, C. L., McCoy, S.K., Rubin, J. (2013). Does money grow on trees? People's willingness to pay for celluosic wood ethanol.. *Biofuel/Book 1* InTech Publishing. Unknown.

Status = ACCEPTED; Acknowledgement of Federal Support = No ; Peer Reviewed = No

Lilieholm, R,.J., and M. Eaton (2013). Land as Sustenance and Sanctuary: Settlement History and Resource Use in and around Utah's Grand Staircase-Escalante National Monument. *National Parks: Sustainable Development, Conservation Strategies, and Environmental Effects* D.P. Bigman. Nova Science Publishers. Hauppauge, NY. Unknown.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes ; Peer Reviewed = No

Saura, S, E. Martin, and M.L. Hunter, Jr. (2013). Forest landscape change and biodiversity conservation. *Forest Landscapes and Global Change* J.C. Azevedo, A.H. Perera, and M.A. Pinto. Springer-Verlag. Unknown.

Status = ACCEPTED; Acknowledgement of Federal Support = No ; Peer Reviewed = Yes

Thesis/Dissertations

Conference Papers and Presentations

Johnson, B.J., Chiao, C., Willis, T., Wilson, K., Dostie, P. (3/19/13). *Alewife migration, nutrient dynamics, and sedimentation in Nequasset Lake, Woolwich Maine*. Maine Water Conference. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Cline, B.B., D.V. Popescu, and M.L. Hunter (8/8/12). *Amphibians in complex landscapes: Effects of forestry and urbanization on juvenile movements*. World Congress of Herpetology. Vancouver, Canada.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Aumann, H., E. Kus, B. Cline, and N.W. Emanetoglu (7/8/12). *An Asymmetrical Dipole Tag with Optimum Harmonic Conversion Efficiency*. International Symposium on Antennas and Propagation & UNSC/URSI National Radio Science Meeting. Chicago, IL.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Haley Engelberth, Mario Teisl, Caroline Noblet, Kathleen Bell, Andrew Smith, Eric Frohmberg and Karyn Butts (8/12/12). *An econometric analysis of Maine's mercury advisory Selected paper*. Annual meeting of the Agricultural and Applied Economics Association. Seattle, WA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Judy Colby-George and Laxmi Ramasubramanian (10/1/12). *An Introduction to Public Participation GIS: Using GIS to Support Community Decision Making*. Urban and Regional Information Systems Association (URISA) Annual Meeting. New York, NY.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Rueger, Bruce (3/18/13). *Bringing the Highlands Home: Creating a Virtual Field Guide to the Kennebec Highlands of Central Maine (USA)*. 48th Annual Meeting of the Northeastern Section Geological Society of America. Bretton Woods, NH.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Johnson, T.R. (9/24/12). *Building Partnerships for Sustainability Solutions: The Maine Tidal Power Initiative*. Maine EPSCoR State Conference. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lindenfeld, L.A. (10/1/13). *Building SES Capacity Workshops*. USVI NSF EPSCoR Workshop. Virgin Islands.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Martin, Danielle (3/20/13). *Calibrating a lumped parameter drainage basin model to estimate stream discharge to Sebago Lake*. Geological Society of America Northeastern Section Meeting. Bretton Woods, NH.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Philip J. Nyhus, F. Russell Cole, Daniel D. Homeier, Sophie Sarkar, Noah Teachey, Catherine R. Bevier, D. Whitney King (11/7/12). *Cameras, satellites, and surveys: A multi-platform approach to monitoring lake conservation practice*. 32nd North American Lakes Management Society Conference. Madison, Wisconsin.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Wilson, Karen (3/19/13). *Challenges for river herring upstream migration in a post-industrial landscape*. Maine Water Conference. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Arnett, Amy (4/15/13). *Changes in forest ant biodiversity with logging and invasive species*. Northeastern Naturalist Conference. Springfield, MA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Thornbrough, Lauren (7/2/12). *Co-Defining Best Management Practices (BMPs) for Municipal Road Salt Application: A model for group communication and decision making to improve water resources resilience*. Interdisciplinary Environmental Association Annual Conference. Portland, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Thornbrough, L., Hutchins, K, Landry, N., Livingston, W., Sherman, D., Johnson, M., McCord, M., Buckley, D. (9/24/12). *Collaborating for Student Success in Interdisciplinary Research and Education*. Maine State EPSCoR Conference. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Feurt, Christine (9/18/12). *Collaborative Watershed Management in Maine*. 6th Annual Drinking Water Protection Symposim of the Maine Water Utilities Association. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Parr, T.B., C.S. Cronan, and K.T. Simon (5/1/13). *Comparison of detrital processing in storm drain systems versus natural stream ecosystems*. Society for Freshwater Science. Florida.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Daly, Julia (3/18/13). *Comparison of winter stratification and ice duration between subalpine lakes and large, low elevation lakes*. Northeast Geological Society of America. Bretton Woods, NH.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Suldovsky, B. and Lindenfeld, L. (11/1/12). *Connecting local seafood to inland communities. Member of a panel, Community food initiatives for the ˜From Famine to Foodies'*. National Communication Association. Orlando, FL.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lilieholm, Robert (11/1/12). *Developing a Replicable, Stakeholder-engaged Qualitative-Quantitative Landscape Scenario Process*. American Association of Collegiate Schools of Planning. Cinncinnati, OH.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Parr, T., C. Cronan, T. Ohno, and K. Simon (3/19/13). *Distinguishing urban biogeochemistry: the fingerprints of urbanization on dissolved organic matter quality in Maine USA*. Maine Water Conference. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Engelberth, H., Teisl, M., Bell, K.P., Noblet, C., Frohmberg, E.,Butts, K., and A. Smith (8/12/12). *Econometric Analysis of Maine's Mercury Advisory. Annual Meeting of the Agricultural and Applied Economics Association*. Annual Meeting of the Agricultural and Applied Economics Association. Seattle, WA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Catherine Bevier, F. Russell Cole, Sylvia Doyle, Nathaniel Moore, Johanna Salay, Peter Smithy, William Supple, Molly Susla, Emily Arsenault, Colin Cummings, Monica Davis, Marianne Ferguson, Andrew Mealor, Corey Reichler, Philip Nyhus, Whitney King (11/7/12). *Effects of residential shoreline development on characteristics of littoral habitats in the Belgrade Lakes of Maine*. 32nd North American Lakes Management Society Conference. Madison, Wisconsin.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Thornbrough, Lauren (9/24/12). *Experience as an Undergraduate Researcher Working with an SSI Mentor*. Maine EPSCoR State Conference. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Milligan, Peter (5/18/13). *Exposure to Infectious Agents in Maine Wild Turkeys*. 113th general meeting for the American Society for Microbiology. Denver, CO.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Smith, H., & Lindenfeld, L. (11/1/12). *Framing the Solution: An Examination of Renewable Energy Coverage in Maine Newspapers*. National Communication Association. Orlando, FL.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Rueger Bruce (3/18/13). *From the Depths of Great Pond (Maine): Anthropogenic and Natural Influences on Bottom Sediments and the Impact on Local Sustainability*. 48th Annual Meeting of the Northeastern Section Geological Society of America. Bretton Woods, NH.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Meyer, S.R., C.S. Cronan, R.J. Lilieholm, M.L. Johnson, D.R. Foster (4/1/13). *Historical Patterns and Drivers of Land Conservation in Northern New England: 1850-2010*. International Association of Landscape Ecology. Austin, TX.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Johnson, T.R. and J.S. Jansujwicz. (7/12/12). *Human dimensions and stakeholder involvement in marine renewable energy utilization*. 1st Marine Energy International Symposium Approaches to Marine Renewable Energy Development. Aomori City, Japan.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Gardner, S. K., Hutchins, K., Jansujwicz, J., Cline, B., & Levesque, V. (4/30/13). *Interdisciplinary doctoral student socialization*. American Educational Research Association. San Francisco, CA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Silka, Linda (8/2/12). *Interdisciplinary Sustainability Perspectives: Graduate Students Researching Policy and Environmental Issues*. American Psychological Association Annual Convention. Orlando, FL.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hart, David (2/18/13). *Introduction to the Symposium, What are the roles of knowledge institutions in sustainability?*. American Association for the Advancement of Science annual meeting. Boston, MA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Kim, Yuseung (11/1/12). *KISS or KILL: A Comparative Study of Land Use-Transportation Simulation Models*. ACSP Annual Conference. Cinncinnati, OH.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Daly, Julia (6/22/13). *Lakes as Sentinels*. Maine Council of Lake Associations annual meeting. Waterville, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Firooza Pavri, Abraham Dailey, Paul Bourget, Tony Cole (3/24/13). *Landscape ecology and land use dynamics across a vulnerable freshwater system*. American Society for Photogrammetry and Remote Sensing. Baltimore, Maryland.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Levesque, V., A.J.K. Calhoun, K.P. Bell (7/16/12). *Municipal Vernal Pool Policy Development: Sustainability Science in Action*. Society for Conservation Biology " North American Congress. Oakland, CA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Linda Silka, Mario F. Teisl and Robin Toof (10/10/12). *Place-based approaches to engagement: Can universities be local and global?*. International Workshop on Higher Education Reform. Pittsburgh, PA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Quartuch, Mike (6/4/13). *Predicting development intentions of private family forest landowner in Maine through attitudes, norms, perceived control, and stewardship ethics*. International Symposium on Society and Resource Management. Estes Park Center, Colorado.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Livingston, William (10/1/12). *Predicting high-quality sites of Black Ash (Fraxinus nigra) Across Maine and northern New York: An approach to prioritizing preparedness and management of emerald ash borer*. Eastern Canada/United States Forest Resources Conference. Durham, NH.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Caroline Noblet, Shannon McCoy and Mario Teisl (11/12/12). *Primed for Action? The potential role of priming in renewable energy acceptance*. Behavior, Energy and Climate Change Conference. Sacramento, CA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Colby-George, Judy (11/14/12). *Public Participation GIS: Tools to Tell a Story*. NorthEast Arc/Info Users Conference. Rockland, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

McGreavy, B., Hutchins, K., Lindenfeld, L., Silka, L. (9/24/12). *Research, Social Learning & Innovation in Partnerships for Sustainabilit*. Maine EPSCoR State Conference. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

McGreavy, B., Lindenfeld, L., Silka, L., Hutchins, K., Smith, H., Budzinski, C. (8/1/12). *Social Learning and Resilience: Identifying decision making models, collaboration challenges and engagement strategies to build adaptive capacity*. International Interdisciplinary Conference on the Environment. Portland, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Quartuch, Mike (10/26/12). *Stewardship versus development: Exploring landowner ethics and behavioral intentions*. Society of American Foresters. Spokane, Washington.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Capps, Krista (5/19/13). *Summarizing patterns of consumer-driven nutrient dynamics in freshwater ecosystems*. Society for Freshwater Sciences. Jacksonville, FL.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hutchins, K., Lindenfeld, L.A., Bell, K.P, Silka, L., & Leahy, J. (11/1/12). *Testing the Waters: Assessing the Potential for Community-University Partnerships*. National Communication Association 98th Annual Convention. Orlando, FL.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

6 Enquist, BJ 1 , B Boyle 1 , JC Donoghue II 1 , B Thiers 2 , P Jorgensen 3 , BJ McGill 4 , JC Svenning 5 , R Condit 6 , N Morueta-Holme 5 , LL Sloat 1 and T BIEN Working Group 7 , (1)University of Arizona, (2)The New York Botanical Garden, (3)Missouri Botanical Garden, (4) McGill University, (5)Aarhus University, (6)Smithsonian Tropical Research Institute, (7)National Center for Ecological Analysis and Synthesis (8/1/12). *The commonness and distribution of rarity: Quantifying the botanical diversity of all plant species in the Americas*. Ecological Society of America. Portland, OR.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Willis, Theodore (3/18/13). *The effect of the 2012 alewife migration on nutrient dynamics in Nequasset Lake, Woolwich Maine*. Northeast Geological Society of America. Bretton Woods, NH.

Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Willis, Theodore (3/19/13). *The Influence of Alewives on the Biogeochemical Cycling of Nitrogen in Nequasset Lake, Woolwich, Maine*. Maine Water Conference. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Rueger, Bruce (11/7/12). *The Land Between the Lakes: Virtual Geologic Field Trips in the Kennebec Highlands of Central Maine*. North American Lake Management Society 32nd International Symposium. Madison, Wisconsin.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Levesque, Vanessa (6/5/13). *The role of networks in developing municipal environmental policy*. International Association for Society and Natural Resources. Estes Park Center, Colorado.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Johnson, M.L., Meyer, S.R., Lilieholm, R.J., and C.S. Cronan (11/1/12). *The Role of Transparency in Developing a Stakeholder-Engaged, Qualitative-Quantitative Landscape Scenario Process*. ACSP. Cinncinnati, OH.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Johnson, Eileen (3/19/13). *Translating Knowledge to Action: Using a Boundary Approach to Connect Researchers to Stakeholders*. Maine Water Conference. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Jansujwicz, J. and T.R. Johnson (8/19/12). *Understanding and Informing the Process of Tidal Energy Development in Maine*. Annual meeting of the American Fisheries Society. St. Paul, Minnesota.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Jansujwicz, J.S. and T.R. Johnson (3/22/13). *Understanding Factors Influencing Stakeholder Acceptability in Marine Renewable Energy Development*. Annual Meeting Society for Applied Anthropology. Denver, CO.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Dunckel, K. L., E. Latty, A. Arnett, A. Remsburg, B. Bibles (11/12/12). *Using GIS to Support Sustainability Solutions Initiatives*. 27th Annual Northeast Arc Users Group Conference. Rockland, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Meyer, Spencer (4/17/13). *Using Historical Patterns and Drivers of Land Conservation in Northern New England: 1850-2010*. International Association of Landscape Ecology Conference. Austin, TX.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Karen Wilson, Theodore Willis (4/8/13). *Using Natural Tags to Determine Marine and Freshwater Habitat Use by Juvenile Blueback Herring (Alosa aestivalis)*. Northeast Fish and Wildlife Conference. Saratoga Springs, NY.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

McCourt, Matthew with Dora Plancon and Gabriel Perkins (4/9/13). *Ways of Taking Care: Mapping Commoning Practices in Rangeley, Maine*. Annual Meeting of the Association of American Geographers. Los Angeles, CA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Wilson, Karen (3/19/13). *When perceptions become reality? River restoration potential in Maine and the role of legacies*. Maine Water Conference. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lewis, Lynne (11/16/12). *Willingness to Pay for Anadromous Fisheries Restoration: Distance Decay and River Reputation*. Southern Economics Association Annual Meeting. New Orleans, LA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

McGreavy, B., Silka, L., Lindenfeld, L. (12/12/12). *Building Connections, Finding Alignment*. A Knowledge-Action Workshop. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lilieholm presenting, with Slotten, Mahung, Levitt and Davis (3/1/13). *Poster - Acadian Internship in Regional Conservation and Stewardship*. Conference on Students as Catalysts for Large Landscape Conservation. Colby College, Waterville, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lilieholm presenting, with Cronan, Meyer, and Johnson (3/1/13). *Alternative Futures Modeling in Maine*. Conference on Students as Catalysts for Large Landscape Conservation. Colby College, Waterville, ME.

Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Lilieholm presenting, with Cronan, Meyer and Johnson (3/17/13). *Alternative Futures Modeling in Maine: Understanding the Past... Envisioning the Future*. Belfast Bay Watershed Coalition. Belfast, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

A. Calhoun, K.P. Bell, P. deMaynadier, E. Richert, and J. Clement (9/24/12). *Building Partnerships for Sustainability Solutions: Protecting Natural Resources at the Community Scale*. 2012 Maine EPSCoR State Conference. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

McGreavy, B., Lindenfeld, L., Silka, L., Hutchins, K., Smith, H., Budzinski, C. (10/23/12). *Collaboration and Social Resilience: Interdisciplinarity and engagement in a learning organization*. Acadia National Park Science Symposium. SERC Institute, Winter Harbor, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

McCourt, Matthew (10/20/12). *Commoning Woods, Water and Wildlife: Actually Existing Sustainabilities in Rangeley, Maine*. New England-St. Lawrence Valley Geographical Society Annual Meeting. University of Maine at Farmington.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Silka, Linda (8/4/12). *Community-Based Participatory Research: A Rigorous Approach Contributing to Science*. Public Participation in Scientific Research. Portland, OR.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Calhoun, AJK. (12/12/12). *Conserving vernal pools with innovative local approaches*. Belfast Bay Watershed Coalition monthly seminar. Belfast, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

McGreavy, B. & Hutchins, K. (2/12/13). *Creating an Effective Poster: Communication and Content Strategies*. Graduate Student Government Workshop. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Donihue, Michael (7/21/12). *Demographic and labor market indicators for the Belgrade Lakes Watershed*. East Pond Lake Association Meeting. Oakland, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Donihue, Michael (7/26/12). *Demographic and labor market indicators for the Belgrade Lakes Watershed*. Colby Undergraduate Summer Research Retreat. Colby College, Waterville, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Colgan, Charlie (11/14/12). *Engineering Sustainability a presentation on SSI for the American Council of Engineering Companies- Maine Chapter*. American Council of Engineering Companies-Maine. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Levesque, Vanessa (10/5/12). *Innovative Municipal Planning in Maine (Panel)*. Northern New England Chapter of the American Planning Association regional meeting. Brunswick, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lindenfeld, L. (1/2/13). *Interdisciplinary Complexity: Lessons learned from the Sustainability Solutions Initiative*. Climate Change Institute's IGERT Fellows program. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Pavri, Firooza (10/20/12). *Poster - Land use and habitat fragmentation across sub-watersheds of the Sebago Lake basin*. New England/St. Lawrence Valley Society of Geographers. University of Maine at Farmington.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Capps, Krista (2/1/13). *Linking biodiversity & ecosystem function: understanding the functional role of species across anthropogenically modified landscapes*. School of the Environment Seminar Series. Washington State University.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Meyer, Johnson, Lilieholm, and Cronan (11/15/12). *Linking Development and Conservation Suitability Mapping with Watershed Risk. Presentation to the Maine Department of Environmental Protection*. Maine DEP Meeting. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Colgan, Charlie (3/13/13). *LL Bean/Lee Surace Lecture on the Maine Economy, University of Southern Maine: Maine: The New Energy Crossroads*. LL Bean/Lee Surace Lecture. University of Southern Maine, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hutchins, K., Thornbrough, L., Finnemore, L., Zollitsch, B., Arter, B., and Lindenfeld, L.A. (2/6/13). *Maine Salt Management Scoping Project*. Division of Environmental Assessment Division Meeting, Maine Department of Environmental Protection. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hutchins, K., Thornbrough, L., Finnemore, L., Zollitsch, B., Arter, B., & Lindenfeld, L.A. (2/22/13). *Maine Salt Management Scoping Project*. Maine Salt Management Taskforce Meeting. Bangor, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hart, David (2/15/13). *Maine's Sustainability Solutions Initiative (SSI): Linking Knowledge with Action via Innovative Partnerships*. Invited seminar at US EPA Region 1 headquarters. Washington, DC.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lindenfeld, L.A. (7/29/12). *Maine's Sustainability Solutions Initiative: Linking knowledge with action and the role of communication research*. International Communication Colloquium. San Francisco, CA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hutchins, K. (11/3/12). *Maine's Sustainability Solutions Initiative. Panel Participant. Sharing Sustainability: Building Resilient Communities*. Sharing Sustainability: Building Resilient Communities Conference. Farfield, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hart, David (9/24/12). *Maine's Sustainability Solutions Initiative: Crossing multiple boundaries on the road to solutions*. Maine EPSCoR State Conference. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hart, David (11/1/12). *Making Science Matter: A Shift from Producing Knowledge to Linking it with Action*. Dept of Ecology and Evolutionary Biology Seminar. University of Connecticut.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Beard-Tisdale, Mary Kate (9/26/12). *Managing Sustainability Solutions Data*. NERACOOS/NECOSP DATA Management meeting. Unknown.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Owen, Dave (7/20/12). *Mapping, Modeling, and the Fragmentation of Environmental Law*. University of Washington School of Law. University of Washington.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Ryan, K. , A.J.K. Calhoun, J. Zydlewski (7/15/12). *Poster - Monitoring eastern spadefoot (Scaphiopus holbrookii) burrow emergence with passive integrated transponders*. North American Section Society for Conservation Biology. Oakland, CA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Silka, L., Hutchins, K., Morris, C., & Pelletier, R. (10/23/12). *National Initiatives with Statewide Impact*. GrowSmart Maine Summit. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lindenfeld, L.A. (presenter), Hutchins, K., McGreavy, B., Smith, H., Silka, L. (12/1/12). *New strategies for linking knowledge with action on Maine's Sustainability Solutions Initiative*. Leuphana University. Lueneburg, Germany.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Meyer, S.R., M.L. Johnson, R.J. Lilieholm, and C.S. Cronan (8/1/12). *Of the People, By the People, and For the People: Stakeholder-Driven Alternative Futures Research across the Maine Landscape. Future Scenarios of Landscape Change: Tools and Tactics*. Harvard Forest Conference and Webinar. Petersham, MA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Calhoun, AJK (8/9/12). *Planning for vernal pools*. Northern New England Chapter of the American Planning Association. Topsham, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Morgan, Pam (9/8/12). *Plant Species Diversity and Salinity on the Saco River Estuary, Maine*. Summer Undergraduate Research Experience (SURE) Symposium. University of New England.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Colgan, Charlie (1/28/13). *Workforce, Downtowns, and Small Business on population and economic changes in Maine*. Select Committee of the Legislature. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Colgan, Charlie (1/29/13). *Labor, Commerce, Research, and Economic Development on Maine economy and demographic change*. Maine Legislature LCRED Committee. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Willis, Theodore (11/26/12). *Rivers, Estuaries & Coastal Fisheries/ General alewife life history, fishery information and summary of SSP project*. Maine Rivers Talk. Yarmouth, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Wilson, Karen (11/26/12). *Rivers, Estuaries & Coastal Fisheries: the many roles of river herring*. Royal River Restoration Project Outreach Meeting - Sponsored by Maine Rivers. Yarmouth, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Morgan, Pam (9/17/12). *Saco River Estuary Project*. Biddeford Conservation Committee meeting. Biddeford, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

McGreavy, B., Lindenfeld, L. (7/1/12). *Science Communication and Acadia: An approach to making meaning in a landscape*. Acadian Internship Program. Schoodic PPeninsula, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Johnson, T.R. (9/18/12). *Stakeholder engagement and collaborative research*. Maine Tidal Power Initiative Review Meeting. Trescott ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lilieholm presenting, with Johnson, Meyer and Cronan (3/1/13). *Stakeholder Engagement in Future Land Use Scenarios*. Conference on Students as Catalysts for Large Landscape Conservation. Colby College, Waterville, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hutchins, K. (10/22/12). *Strengthening the Development of Community-University Partnerships Through Interdisciplinary Research*. Department of Communication and Journalism Colloquium Series. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Ranco, Darren (9/12/12). *Sustainability Science and Indigenous Research Methods: Moving Beyond the Loading Dock Approach to Science*. University of New Hampshire Sustainability Science Meeting. University of New Hampshire.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Jansujwicz, Jessica (2/27/13). *Sustainable Energy from Maine's Tidal Waters*. Sustainable Energy from Maine's Tidal Waters. Penobscot Valley Chapter Maine Audubon. Fields Pond Audubon Center, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lilieholm, Robert (12/1/12). *The Acadian Internship in Large Landscape Conservation*. School of Forest Resources Seminar Series. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Davis presenting, with Lilieholm and Levitt (9/1/12). *The Acadian Internship in Regional Conservation and Stewardship*. Acadia National Park Science Symposium. SERC Institute, Winter Harbor, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Cronan, Christopher (12/1/12). *The biogeochemical fingerprint of urbanization: increasing carbon quality in Maine headwater streams*. AGU fall meeting. San Francisco, CA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hoffmann, Kristine (3/16/13). *The Blue-Spotted Salamander Complex: Maine's Amphibian Enigma*. Sunkhaze Cafe - science outreach. Old Town, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Johnston, Jason (12/17/12). *The Potential of Grass Biomass and Interdisciplinary Curriculum Development*. CACE high school teacher meeting. Unknown.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Suldovsky, Brianne (12/1/12). *The Tools to Enhance Scientific Communication*. SSI Knowledge <-> Action Workshop. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Capps, Krista (2/1/13). *Understanding the functional role of aquatic organisms in ecosystem nutrient dynamics*. University of South Dakota, Department of Biology, Seminar SeriesAssociation for the Study of Food and Society. University of South Dakota.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Jansujwicz, J.S. and T.R. Johnson (9/18/12). *Understanding the regulatory process for tidal energy development in Maine*. MTPI Review Meeting. Cobscook Community Learning Center, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hutchins, K., Richert, E., & Silka, L. (10/1/12). *University Expertise at Your Fingertips*. Maine Municipal Association Annual Convention. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Meyer, S.R., M.L. Johnson, R.J. Lilieholm, and C.S. Cronan (11/12/12). *Using GIS to Support Maine's Sustainability Solutions Initiative. Panel Participant*. Northeast Arc Users Group. Rockland, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Wang, Chunzeng (2/26/13). *Using high-resolution CIR data for high-precision land-cover-land-use mapping and flood and soil-erosion mapping in central Aroostook County*. Climate Change GIS Round-table. Presque Isle, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Calhoun, AJK (12/7/12). *Using local initiatives to conserve natural resources on private property*. University of New Brunswick seminar series. Fredericton, NB.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Karen Wilson, Theodore Willis (1/9/13). *Using Natural Tags to Determine Marine and Freshwater Habitat Use by Juvenile Blueback Herring (Alosa aestivalis)*. Diadromous Species Research and Restoration Symposium. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Colby-George, Judy (12/6/12). *Using Visualization to Communicate Complex Ideas: Maps for Storytelling*. Knowledge-Action Workshop. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Calhoun, AJK (9/12/12). *Vernal pool conservation in Maine Towns*. Blue Hill Lecture Series. Blue Hill, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Anderson, Mark (8/31/12). *Weaving the Environment Into the College Curriculum*. Maine Maritime Academy fall faculty meeting. Castine, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lewis, Lynne (6/6/13). *Willingness to Pay for Anadromous Fisheries Restoration: Distance Decay and River Reputation*. American Association of Environmental and Resource Economists annual workshop. Alberta, Canada.

Status = SUBMITTED; Acknowledgement of Federal Support = Yes

Hutchins, K., Thornbrough, L. & Lindenfeld, L.A. (11/1/12). *Winter Road Maintenance in Maine*. Maine Salt Management Taskforce. Augusta, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Feurt, Christine (8/22/12). *Collaborative Learning and Research to Support Ecosystem Based Management*. Collaborative Learning and Research to Support Ecosystem Based Management. Wells National Estuarine Research Reserve.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Feurt, Christine (11/30/12). *Collaborative Learning for Coastal Management*. NERRS Annual Conference. West Virginia.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Hunter, M. (10/11/12). *Conservation in 2012: the year in review*. Student Conservation Science Conference. American Museum of Natural History.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Gayle B. Zydlewski* and Jason D. Stockwell (8/19/12). *Deepcwind: Application of Active and Passive Acoustics to Evaluate Potential Impacts of Deepwater Offshore Wind Technology on Fish*. 142nd Annual Meeting of the American Fisheries Society. St. Paul, MN.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Sharik presenting, with Lilieholm and Richardson (4/15/13). *Diversity Trends in the U.S. Natural Resource Workforce and Undergraduate Student Population*. Natural Resources Diversity Conference. Blacksburg, VA.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Teisl, Mario F. (8/12/12). *Ecolabeling food: How are we doing? Symposium paper (Ten thousand labels: Creedence attributes, product differentiation, and information flows in the food system)*. Annual meeting of the Agricultural and Applied Economics Association. Seattle, WA.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Willis, Theodore (8/28/12). *Ecological Role of Alewife in the St. Croix River*. Passamaquoddy Federal Govt meeting. Unknown.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Lindenfeld, L.A (10/1/12). *Feasting our eyes. Food films, identity, and cultural Citizenship*. 2012 Peace and Global Studies Annual Symposium. Le Moyne College.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Sullivan, Abigail (9/24/12). *Poster - Feedback and theory in social-ecological systems: A review and future directions*. Maine EPSCoR State Conference. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Lars Dalby, Brian J. McGill, Anthony David Fox and Jens-Chrisian Svenning (1/9/13). *Poster - Global species richness patterns and their drivers among the order Anseriformes*. International Biogeography Society. Miami, FL.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Willis, Karen (1/11/13). *Habitat requirements of diadromous fishes: characteristics, heterogeneity and connectivity*. Diadromous Species Restoration Science 2013: Migration, Habitat, Species Interactions, and Management. University of Maine, Orono, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Beard-Tisdale, Mary Kate (9/18/12). *High-Level Event Detection in Spatially Distributed Multi-variate Time Series*. GIScience 2012. Columbus, OH.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Daly, Julia (5/4/13). *Ice duration, lake habitat, and monitoring alpine environments*. International Appalachian Trail, Maine chapter annual meeting. Shin Pond Village, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Adam M. Wilson, Benoit Parmenier, Brian McGill, Robert Guralnick and Walter Jetz (1/9/13). *Poster - Incorporating satellite derived cloud climatologies to improve high resolution interpolation of daily precipitation*. International Biogeography Society. Miami, FL.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Cline, Brittany (9/15/12). *Juvenile amphibian movement in complex landscapes: Insights about dispersers from terrestrial experiments*. Sunkaze Cafe (Friends of the Sunkhaze National Wildlife Refuge (USFWS). Old Town, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Johnson, Eileen (11/12/12). *Learning GIS: Courses and Programs to Give You a Leg Up in the Workforce*. Northeast Arc Users Conference. Rockland, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Calhoun, AJK (7/20/12). *Local natural resources stewardship*. Acadian Internship Program. SERC Institute, Winter Harbor, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Daigle, John (7/20/12). *Looking forward panel*. First Stewards Conference, Museum of the American Indian. Washington, DC.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Dunckel, Kathleen (12/5/12). *Natural Resource Inventory of Elwell Farm: Service Learning with the Maine Farmland Trust*. Meeting with the Maine Farmland Trust. Unknown.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Smith, Sean (7/20/12). *Nitrogen and sediment flux in engineered coastal streams*. Biogeomon - 7th International Conference on Ecosystem Behavior. Lincolnville, ME.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Morueta-Holme, N1 , BJ Enquist 2 , BJ McGill 3 and JC Svenning 1 , (1)Aarhus University, (2)University of Arizona, (3)University of Maine. (8/5/12). *Patterns and processes behind the range size distributions of the New World plants*. Ecological Society of America. Portland, OR.

Status = ACCEPTED; Acknowledgement of Federal Support = No

McCourt, Matthew (10/20/12). *Plenary Dialogue: A Conversation with Robert Kates*. Annual Meeting of the New England-St. Lawrence Valley Geographical Society. University of Maine at Farmington.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Hunter, M. (10/11/12). *Reaching beyond the choir and other career lessons from the history of conservation biology*. Student Conservation Science Conference. American Museum of Natural History.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Zydlewski, Gayle (7/17/12). *Regarding the Ecological Affects of Marine Renewable Energy Utilization*. 1st Marine Energy International Symposium. Aomori City, Japan.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Viehman, H., G. B. Zydlewski, J.D. McCleave, G. Staines (7/2/12). *Single-beam hydroacoustics for assessing fish at tidal power sites*. European Conference for Underwater Acoustics. Edinburgh, United Kingdom.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Brian J. Enquist 1,8,9,10 , Brad Boyle 1,8,9 , John C. Donoghue II 1,8,9 , Barbara Thiers 2,8 , Peter Jorgensen 3,8 , Brian J. McGill 4,8 , Jens-Chrisian Svenning 5,8 , Richard Condit 6,8 , Naia Morueta-Holme 5,8 , Lindsey L. Sloat 1,8 , Robert Peet 7,8 and The BIEN Working Group 8 (1/9/13). *Poster - The commonness and distribution of rarity: Quantifying the botanical diversity of all plant species in the Americas*. International Biogeography Society. Miami, FL.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Jeffrey Vieser, Gayle B. Zydlewski, James McCleave, and Garrett Staines (8/19/12). *The Fish Community of Cobscook Bay, Maine: Patterns of Abundance and Diversity*. 142nd Annual Meeting of the American Fisheries Society. St. Paul, Minnesota.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Feurt, Christine (11/27/12). *The Nuts and Bolts of Bridge Building & Building Sustainable Partnerships*. NERRS Annual Conference. West Virginia.

Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Calhoun, AJK (9/12/12). *Vernal pool mitigation: a last resort*. CT state agencies, and EPA. Pittsfield, MA.

Status = ACCEPTED; Acknowledgement of Federal Support = No

Other Publications

Beard, K. (11/7/12). *A Semantic Web based Gazetteer Model for VGI*. Proceedings of ACM SIGSpatial Workshop.

Status = PUBLISHED; Acknowledgement of Federal Support = No

Milligan, Peter (11/1/12). *EPSCoR Wild Turkey Project Summary: Evaluating interactions between wild turkeys and Maine agriculture*. University of Maine at Augusta Newsletter.

Status = SUBMITTED; Acknowledgement of Federal Support = Yes

Rude, A. and Beard, K. (9/18/12). *High-Level Event Detection in Spatially Distributed Multi-variate Time Series*. Proceeding GIScience 2012 (LNCS 7478:160).

Status = PUBLISHED; Acknowledgement of Federal Support = No

Technologies or Techniques

Nothing to report.

Patents

Inventions

Invention Title: A harmonic direction finding (HDF) radar system

Description: A harmonic direction finding (HDF) radar system is proposed being developed and built for direct tracking of small animals such as amphibians, birds and insects over entire seasons and life cycles. Development of this integrated research instrument will occur by an interdisciplinary team of researchers, with

the potential for widespread application (and commercialization) of the technology within and across fields. For specific applications in wildlife ecology, the proposed HDF radar will transform the frontiers of knowledge about the movements of small and understudied species (i.e., critical aspects of their ecology heretofore limited in study by technological constraints and transmitter lifespan).

Inventor(s): Dr. Nuri Emanetoglu (ECE); Dr. Herbert Aumann (ECE, and MIT Lincoln Labs), and (to a lesser degree on the electronics and more on the ecological applications), Brittany Cline, Malcolm Hunter

Licenses

Websites

Title: MeSSI
URL: http://www.messi.maine.edu
Description: Internal website for SSI team members

Title: Knowledge-Action Workshop
URL: http://knowledgeactionworkshop.wordpress.com/
Description: Website for the Knowledge-Action Workshop: Building connections, finding alignment

Title: Senator George J. Mitchell Center
URL: http://umaine.edu/mitchellcenter/
Description: Website for the Senator George J. Mitchell Center

Title: Sustainability Solutions Initiative
URL: http://umaine.edu/sustainabilitysolutions/index.htm
Description: External website for Sustainability Solutions Initiative

Title: Local Sustainability Practices
URL: http://stateofthelakes.umf.maine.edu/rwtc/
Description: Website to share bottom-up inventory of local sustainability practices

Title: Bowdoin College
URL: http://research.bowdoin.edu/rivers-estuaries-and-coastal-fisheries/
Description: Bowdoin College partner website

Title: Vernal Pools
URL: http://www.umaine.edu/vernalpools
Description: Vernal pool informational website

Title: MLRC Weather Data
URL: http://www.colby.edu/chemistry/Weather/Weather/MLRC_Weather.html
Description: Colby College MLRC weather data website

Title: Belgrade Lakes

URL: http://web.colby.edu/epscor/

Description: Belgrade lakes project web site

Title: Web-GIS of Non-Motorized Trails

URL: http://www.goaroostookoutdoors.com/trails

Description: Saco River sampling

Title: http://faculty.une.edu/cas/szeeman/SacoRiversamplingsites/

URL: UNE website

Description: Sustaining Maine's Brown Ash Resource

Title: http://www.umaine.edu/brownash/

URL: EAB website

Description: Unity College

Title: https://sites.google.com/a/unity.edu/hemlock-ecosystem-management-study/home

URL: Unity College project website

Other Products

Product Type: Audio or Video Products

Description: Videos of talks given at the review of the Maine Tidal Power Initiative in Trescott, ME, on September 18, 2012. Available online at umaine.edu/mtpi/home/mtpi-review-in-washington-county. Talks specifically related to environmental studies available online at youtube.com/watch?v=Y5FkGpcgE2g&feature=youtu.be

Other: Other

Product Type: These Google Earth files represent the synthesis of fieldwork in the Kennebec Highlands as user-frindly downloads for use by stakeholders and visitors to the region

Description:

Other: Google Earth Files

Product Type: Audio or Video Products

Description: Basket Trees: Saving a Tradition. An MPBN documentary, which can be streamed on the MPBN web site and is also available on DVD

Other: Audio or Video Products

Product Type: Talk of the Towns 5/11/12; Producer/Host: Ron Beard, University of Maine Cooperative Extension Studio Engineer: Amy Browne; Issue: Renewable Energy Options; Program Topic: Community and Ecological Impacts of tidal energy in Cobscook Bay; http://archives.weru.org/talk-of-the-towns/talk-of-the-towns-51112

Description:

Other: Audio or Video Products

Product Type: Saving our Lakes. An MPBN Documentary, which can be streamed from the MPBN web site and is also available on DVD

Description:

Other: Audio or Video Products

Product Type:	Pools, Policies and People Maine's Vernal Pools. An MPBN documentary, which can be streamed on the MPBN web site and is also availale on DVD
Description:	
Other:	Audio or Video Products
Product Type:	2013 Mitchell Lecture on Sustainability. Pamela Matson, speaker. " A Call to Arms for a Transition to Sustainability" with remarks by Senator George J. Mitchell. September 25, 2012. Available for streaming at https://vimeo.com/51780215
Description:	
Other:	Audio or Video Products
Product Type:	SSI Seminar Series - David Secord (for SSI team members) on 11/6/2012.
Description:	Audio or Video Products
Other:	SSI Seminar Series - Michael Fotos talk on Operational Polycentricity: Sustainable Governance and Governance for Sustainability. October 25, 2012
Product Type:	Audio or Video Products
Description:	SSI Seminar Series - Tom Schueler talk on Can Urban Watersheds Be Sustainable? November 13, 2012
Other:	Audio or Video Products
Product Type:	SSI Seminar Series - Vic Sher talk on Communicating Science in the Courtroom: What Scientists Need to Know. April 2, 2013.
Description:	
Other:	

Participants

Research Experience for Undergraduates (REU) funding

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Laurie Bragg	Other Professional	6
Mark Anderson	Faculty	1
Michael Angelides	Technician	1
Andrew Barton	Faculty	1
Anna Bass	Faculty	1
Christopher Bennett	Faculty	1
Brent Bibles	Faculty	1
Aram Calhoun	Faculty	1

Name	Most Senior Project Role	Nearest Person Month Worked
Phil Camill	Faculty	1
Russell Cole	Faculty	1
Barbara Cole	Faculty	1
Charles Colgan	Faculty	1
Robin Crocker	Other Professional	1
Christopher Cronan	Faculty	1
John Daigle	Faculty	1
Michael Daley	Faculty	1
Julia Daly	Faculty	1
Michael Donihue	Faculty	1
Kathleen Dunckel	Faculty	1
Christine Feurt	Faculty	1
James Fleming	Faculty	1
Todd Gabe	Faculty	1
Susan Gardner	Faculty	1
Ben Goundie	Technician	1
Wendy Harper	Faculty	1
Guillermo Herrera	Faculty	1
Malcolm Hunter	Faculty	1
Shaleen Jain	Faculty	1
Beverly Johnson	Faculty	1
Teresa Johnson	Faculty	1

Name	Most Senior Project Role	Nearest Person Month Worked
Jack Kartez	Faculty	1
D. Whitney King	Faculty	1
Christopher Lage	Faculty	1
Erica Latty	Faculty	1
Lynne Lewis	Faculty	1
John Lichter	Faculty	1
Robert Lilieholm	Faculty	1
John Martin	Faculty	1
Matthew McCourt	Faculty	1
Shannon McCoy	Faculty	1
Laura Lindenfeld	Faculty	1
Peter Milligan	Faculty	1
Pamela Morgan	Faculty	1
Caroline Noblet	Faculty	1
Philip Nyhus	Faculty	1
David Owen	Faculty	1
Firooza Pavri	Faculty	1
Noah Perlut	Faculty	1
Alysa Remsburg	Faculty	1
Bruce Rueger	Faculty	1
Kimberly Sebold	Faculty	1
Bruce Segee	Faculty	1

Name	Most Senior Project Role	Nearest Person Month Worked
Linda Silka	Faculty	1
Esperanza Stancioff	Faculty	1
Joseph Szakas	Faculty	1
Mario Teisl	Faculty	1
Leo Trudel	Faculty	1
Catherine Turcotte	Faculty	1
Chunzeng Wang	Faculty	1
Clifford Wilbur	Other Professional	1
Karen Wilson	Faculty	1
Stephan Zeeman	Faculty	1
Amy Arnett	Faculty	2
Darren Ranco	Faculty	2
Christian Wilson	Technician	2
Elizabeth England	Other Professional	5
Jennifer Isherwood	Other Professional	5
Andrea Littlefield	Other Professional	5
Colleen Budzinski	Other Professional	6
Yuseung Kim	Faculty	10
Brian McGill	Faculty	10
Sean Smith	Faculty	10
Timothy Waring	Faculty	10
Krista Capps	Postdoctoral (scholar, fellow or other postdoctoral position)	12

Name	Most Senior Project Role	Nearest Person Month Worked
Nirajan Dhakal	Postdoctoral (scholar, fellow or other postdoctoral position)	12
Jessica Jansujwicz	Postdoctoral (scholar, fellow or other postdoctoral position)	12
Christine Lamanna	Postdoctoral (scholar, fellow or other postdoctoral position)	12
Crista Straub	Postdoctoral (scholar, fellow or other postdoctoral position)	12
Gayle Zydlewski	Faculty	1
Mark Adams	Faculty	1
Sharon Barker	Other Professional	1
Christopher Bartlett	Other Professional	1
Sudarshan Chawathe	Faculty	1
Krista Delahunty	Other Professional	1
Ruth Hallsworth	Other Professional	10
Barbara Ives	Other Professional	2
Jason Johnston	Faculty	1
Martha Kendrick	Other Professional	2
Alan Kurtz	Other Professional	2
Linda Labas	Other Professional	1
Jessica Leahy	Faculty	1
William Livingston	Faculty	1
Jean MacRae	Faculty	1
Janet May	Other Professional	2
Erica Nadelhaft	Faculty	1

Name	Most Senior Project Role	Nearest Person Month Worked
John Peckenham	Faculty	8
Lisa Phelps	Other Professional	1
Andrew Plant	Faculty	1
Kim Raymond	Other Professional	8
Andrew Reeve	Faculty	1
Jasmine Saros	Faculty	1
Sarah Sparks	Other Professional	1
James Sulikowski	Faculty	1
Theodore Willis	Other Professional	1
Laura Wilson	Other Professional	1
Mary Kate Beard-Tisdale	Faculty	1
Daniel Buckley	Faculty	1
Cynthia Loftin	Faculty	1
Anthony Sutton	Faculty	1
Ronald Butler	Faculty	1
Becky Colannino	Other Professional	1
Kelly Ilseman	Other Professional	1
Susan McKay	Other Professional	1
Sarah Nelson	Faculty	1
David Vail	Faculty	1
Alex Gray	Other Professional	1
Ami Gaspar	Other Professional	2

Name	Most Senior Project Role	Nearest Person Month Worked
Damian Brady	Faculty	1
Brian Olsen	Faculty	1
Marnie Morneault	Other Professional	1
Aaron Weiskittel	Faculty	1
Catherine Elliott	Faculty	1
Kathleen Bell	Faculty	1
Vicki Nemeth	Co PD/PI	11
David Hart	Co PD/PI	9
Michael Eckardt	PD/PI	2

What other organizations have been involved as partners?

Name	Location
Acadia Learning	Maine
Acadia National Park	Maine
Acadia University	Canada
Ames Laboratory	Iowa
Androscoggin Valley Council of Governments	Maine
Argonne National Laboratory	Illinois
Arizona State University	Arizona
Bangor City Council	Maine
Bangor High School	Maine
Bates College	Maine
Belgrade Farmers Market	Maine

Name	Location
Belgrade Lakes Regional Business Group	Maine
Belgrade Regional Conservation Alliance	Maine
Boston University	Massachusetts
Bowdion College	Maine
Brunswick-Topsham Land Trust	Maine
Center for Ecological Research	Maine
Chewonki Foundation	Maine
City of Bangor	Maine
City of Biddeford	Maine
City of Ellsworth	Maine
City of Saco	Maine
City of South Portland	Maine
Clark University	Massachusetts
Clemson Univeristy	South Carolina
Cobscook Bay Resource Center	Maine
Colby College	Maine
E.D. Bessey & Son	Maine
Eastern Maine Community College	Maine
Educate Maine	Maine
Education Development Center	Maine
Georgia Institute of Technology	Georgia
Gulf of Maine Council	Maine
Gulf of Maine Research Institute	Maine

Name	Location
Halcyon Marine Hydroelectric	Utah
Hampden Academy	Maine
Hancock County Planning Commission	Maine
Harvard University	Massachusetts
Hirisaki University	Japan
Holbrook Island Sanctuary	Maine
Indigenous Education Institute	Oregon
Institute for Broadening Participation	Maine
Institute for Civic Leadership	Maine
Introspective Systems	Maine
Jackson Labatory	Maine
James F. Doughty School	Maine
Johns Hopkins University	Maryland
Kennebec Estuary Land Trust	Maine
Kennebec Homeowners' Association	Maine
Kennebec River Initiative	Maine
Kennebec Valley Council of Governments	Maine
Kimberly Ridley	Maine
Lakes Environmental Association	Maine
Leuphana University Lueneburg	Germany
Lincoln Institute of Land Policy	Massachusetts
Lobsters on the Fly	Maine
Maine Academy of Natural Sciences	Maine

Name	Location
Maine Campus Compact	Maine
Maine Center for Disease Control	Maine
Maine Cooperative Fish and Wildlife Research Unit	Maine
Maine Department of Education	Maine
Maine Department of Environmental Protection	Maine
Maine Department of Inland Fisheries and Wildlife	Maine
Maine Department of Labor Center for Workforce Research and	Maine
Maine Department of Marine Resources	Maine
Maine Department of Transportation	Maine
Maine Medical Center Research Institute	Maine
Maine Space Grant Consortium	Maine
National Estuarine Research Reserve System	Maryland
Ocean Renewable Power Company	Maine
OceansWide	Maine
Ohio State University	Ohio
Oregon Museum of Science and Industry	Oregon
Oregon State University	Oregon
Orono Economic Development Corporation	Maine
Orono High School	Maine
Orono Village Association	Maine
Pelletco	Maine
Penobscot Nation	Maine
Pierce Atwood LLP	Maine

Name	Location
Portland Water District	Maine
Rachel Carson National Wildlife Refuge	Maine
Rangeley Lakes Heritage Trust	Maine
Rangeley Lakes Region Logging Museum	Maine
Rangeley Lakes Regional School	Maine
Saco River Corridor Commission	Maine
Saco River Salmon Club	Maine
Sappi Fine Paper North America	Maine
Sheepscot Wellspring Land Alliance	Maine
Sierra Club, Maine Chapter	Maine
Skowhegan Area Middle School	Maine
Southern Maine Community College	Maine
St Regis Mohawk Tribe	New York
Thanks But No Tank	Maine
The Nature Conservancy of Maine	Maine
Tidal Energy Device Evaluation Center	Maine
TideWalker Associates	Maine
Town of Belgrade	Maine
Town of Orono	Maine
Town of Topsham	Maine
Town of Woolwich	Maine
Troy Howard Middle School	Maine
U.S. Department of Energy, Pacific Northwest National Labora	Washington

Name	Location
US Army Corps of Engineers	Mississippi
US Army Corps of Engineers	Massachusetts
US Army Corps of Engineers	Maine
US Environmental Protection Agency	Maine
US Fish and Wildlife Service	Maine
USDA Animal & Plant Health Inspection Service	Maine
USDA Forest Service	Oregon
USDA Forest Service	Vermont
USDA Forest Service	New Hampshire
USDA Forest Service	Washington, D.C.
USDA Natural Resources Conservation Service	Maine
USGS Conte Anadromous Fish Lab	Massachusetts
USGS Maine Cooperative Fish and Wildlife Research Unit	Maine
United States Geological Survey	Virginia
United States Geological Survey	Missouri
United States Geological Survey	Maine
Unity College	Maine
University of Colorado	Colorado
University of Guelph	Canada
University of Maine	Maine
University of Maine Augusta	Maine
University of Maine at Farmington	Maine
University of Maine at Presque Isle	Maine

Name	Location
University of Massachusetts Boston	Massachusetts
University of New England	Maine
University of New Hampshire	New Hampshire
University of South Carolina Beaufort	South Carolina
University of Southern Maine	Maine
University of Washington	Washington
Unum	Maine
Vaughn Homestead Foundation	Maine
Verso Paper	Maine
Volunteer Lake Monitoring Program	Maine
Waterview Consulting	Maine
Wells National Estuarine Research Reserve	Maine
Yale University	Connecticut
iPlant Collaborative	Arizona

Have other collaborators or contacts been involved? Y

Impacts

What is the impact on the development of the principal discipline(s) of the project?

SSI's overarching goal is to increase the capacity of the emerging field of sustainability science to solve or manage wicked problems (sensu Rittel and Webber 1973, Policy Sciences 4: 155–169) related to the challenge of sustainable development (e.g. problems with intersecting environmental, social and economic dimensions). Although SSI includes a research component that focuses on the dynamics of social-ecological systems (SES) and another that examines interactions between knowledge and action (K↔A), we believe that SSI's greatest impact on sustainability science is through its integration of these two research components as an innovative pathway for the development of real-world solutions.

SSI's emphasis on stakeholder engagement processes that are active, inclusive, and iterative is also having an impact on the field. By definition, stakeholders include individuals and organizations that have a stake in or are affected by a societal problem or issue. As illustrated in Appendix 3, SSI engages with a wide range of stakeholders to define problems, identify research needs, establish a research agenda, and conduct research.

Another important way in which SSI is impacting the field is by its use of a research portfolio of place-based projects focused on specific sustainability challenges (e.g. urban planning, forest management, climate adaptation, renewable energy development). This portfolio facilitates efforts to perform comparative analyses of the factors that influence the solutions-development process, and to identify potential “best practices” for linking scientific knowledge with societal action. Although we are still in the early stages of these comparative analyses, they suggest that at least three factors contribute to greater success in developing solutions: 1) the ability of SSI teams to redefine the problem(s) and reframe their research questions based on their interactions with stakeholders; 2) the ability of the co-production process to generate multiple solutions or policy options in response to complex problems; and 3) a commitment to long-lasting and mutually respectful researcher-stakeholder partnerships

What is the impact on other disciplines?

Engaging diverse disciplines in sustainability science:

One of SSI’s primary strategies for impacting other disciplines has been to appeal to researchers in various fields (e.g. economics, ecology, communication) to contribute their expertise to advance the theory and practice of sustainability science. Through invited presentations and published papers (e.g. Lindenfeld et al. 2012, Hart and Bell 2013) stemming from those presentations, we have addressed audiences representing different disciplines that can contribute to the development of sustainability science and benefit from their participation in this growing field. For example, we recently published a paper in Agricultural and Resource Economics Review (Hart and Bell 2013) that explains why the methods, skills, and norms of agricultural and resource economists can add value to the problem-focused, interdisciplinary research of sustainability science.

Identifying best practices for organizational innovation in sustainability science:

SSI’s research on organizational innovation is helping institutions of higher education overcome organizational challenges in building their capacity to advance the theory and practice of sustainability science. In the past, many universities and colleges have found it difficult to foster an organizational culture that includes a strong commitment to interdisciplinary collaboration and stakeholder engagement. SSI is using the large-scale investment by NSF EPSCoR in the University of Maine and other Maine colleagues and universities as a “laboratory” for the study of organization innovation. Teams of social scientists representing fields including social psychology, economics, communication, and higher education are conducting research to identify the factors that facilitate and hinder interdisciplinary collaboration and stakeholder engagement. Among other results, SSI’s research has recently identified a number of key ingredients to successful interdisciplinary collaboration (McCoy and Gardner 2012):

1) Sufficient time is needed to overcome disciplinary barriers and interpersonal differences that can hinder effective teamwork.

2) Personality factors (e.g. tolerance for ambiguity) and disciplinary background (e.g. basic vs. applied training) influence the degree to which faculty find interdisciplinary research to be a rewarding endeavor.

3) Academic departments need to give credit for interdisciplinary research in their promotion and tenure policies, and not simply view such activities as service.

4) Incentives (e.g. summer salary, travel funds, support for students) often facilitate interdisciplinary research.

5) Institutional policies need to give adequate credit for interdisciplinary teaching and grants, co-advising students, etc

What is the impact on institutional resources that form infrastructure?

One of the most profound impacts of the NSF EPSCoR Track 1 grant is that it is leading to the creation of a new interdisciplinary research center at the University of Maine, the Senator George J. Mitchell Center for

Sustainability Solutions. Considerable effort during YR 4 has focused on the organization, governance and long-term support of this center. For example, the SSI Research Council and Stewardship Council are currently developing policies for the leadership and management of the Mitchell Center based on their experiences leading and managing SSI for the past four years. Senator Mitchell will be present at the University of Maine on September 25, 2013 for the public announcement of the launch of this new center. Building on its success in leading SSI, the new Mitchell Center for Sustainability Solutions will serve as the statewide hub for interdisciplinary collaborations and university-community partnerships focused on understanding and solving pressing sustainability problems.

SSI's innovative approach to solutions-oriented, stakeholder-engaged, interdisciplinary research and education is also shaping the future of the entire University of Maine and many other Maine universities and colleges. For example, two SSI faculty played leadership roles in developing the University of Maine's new strategic plan (http://umaine.edu/blueskyplan/files/2009/06/Blue-Sky-Plan1.pdf). As a result of their involvement, the strategic plan calls for a university-wide commitment to interdisciplinary collaboration and community engagement in the development of innovative solutions to pressing societal problems in and beyond Maine. Moreover, a number of major research proposals (total request ~ $20 million) have been developed by SSI faculty in the last year that seek to integrate disciplinary expertise in natural science, social science and engineering, and that focus explicitly on connecting scientific knowledge with societal action regarding sustainability challenges. For instance, a $6 million research proposal led by UMaine will support an innovative partnership in which four Maine universities collaborate with a similar number of New Hampshire institutions to improve the scientific management of their shared coastal zone. Similarly, Colby College has dramatically increased its capacity for interdisciplinary research, expanded its partnerships with diverse stakeholders, and developed a major new collaborative proposal that would have been impossible prior to their involvement in SSI.

What is the impact on the development of human resources?

By providing direct research support for SSI participation at all levels and engaging all aspects of the state's human and institutional resources, Maine EPSCoR is broadening participation in STEM and fostering the next generation of sustainability science professionals. Specific examples of SSI's roles in positively impacting Maine's human resources include:

1. Increased capacity for students in grades 9-20 to participate and make meaningful contributions to cutting edge interdisciplinary research.
2. Increased opportunities for all students to participate in STEM-related activities statewide.
3. Increased number of professional K-12 teachers who have a deeper understanding of research methodologies and have now begun to incorporate real world research into their curriculums.
4. Increased number of students pursuing higher degrees in SSI-related and STEM-related fields.
5. Increased number of informal and formal networking opportunities for researchers, professionals, and educators to work together and collaborate to increase the number of educational STEM opportunities for students statewide.
6. Increased number of women and underrepresented minorities participating in and pursuing SSI and STEM-related research.
7. Fostering the next generation of sustainability science professionals will aid in solving complex challenges at the intersecting ecological, social, and economic dimensions of sustainable development.
8. Investing in significant human infrastructure allows for Maine to build capacity and competitiveness in sustainability science.

What is the impact on physical resources that form infrastructure?

Major progress has been made this year on the design and construction of the new Social Science Lab which is housed in the Innovative Media Research and Commercialization (IMRC) building, and which will be utilized by SSI researchers (supported through a voluntary cost share) to facilitate the social science research components.

The new SSI Communications Center at the Mitchell Center is completed and used regularly for SSI meetings, workshops and events, and is helping to establish an active communication network to increase research collaboration and improve integration and synergy between institutional partners.

New SSI faculty Tim Waring, in collaboration with Arizona State University's Center for Institutional Diversity, and with additional funding from UMaine's School of Economics, has designed and is assembling an experimental economics lab (Xecon lab) for SSI/SOE sustainability experiments. The facility includes hardware, software, and organizational capacity to conduct complex interactive behavioral experiments.

Completed the installation of high bandwidth Gigabyte Ethernet switchgear modules at 2-4 additional UMaine SSI researcher buildings to take advantage of the upgraded high-speed bandwidth now available in the state over MaineREN network. (Completes 5-year benchmarks for this strategy.) Facilitates virtual collaboration opportunities for more SSI researchers.

Need identified for additional large capacity, long-term cloud storage on the Advanced Computing Group supercomputer system: 324 TB raw/250 TB usable storage array installed spring 2013 for SSI researcher use (cloud hosts multiple DSpace, Geoportal, and web servers for SSI). Provides enhanced cloud cluster environment in place for SSI shared data handling and intranet

What is the impact on institutional resources that form infrastructure?

This SSI project is a unique solutions-driven sustainability science program focused on the dynamics of coupled social-ecological systems and connections between knowledge and action that enhance individual and institutional decision-making. It will lead to the creation of the Senator George J. Mitchell Center for Sustainability Solutions at the University of Maine, which will strive to be a national and international center of excellence in sustainability science. This new infrastructure will become another signature research center for the University of Maine.

What is the impact on information resources that form infrastructure?
Nothing to report.

What is the impact on technology transfer?

SSI's impact on technology transfer is being achieved in two ways: 1) through the transfer of results to entities in government, the private sector and non-governmental organizations; and 2) via the adoption of new practices by those organizations. Specific examples of SSI's roles in technology transfer include:

1) The creation of decision tools for stormwater management to map culvert locations, schedule maintenance, estimate needed culvert size, and analyze replacement needs and costs. (Project #11)

2) The development of new algorithms to project population and employment distribution and technological change to develop improved estimates of use in Maine's two largest metropolitan areas, Portland and Bangor. These algorithms are being transferred to both private sector firms (companies that do transportation modeling in support of public agency planning) and public sector organizations (where transportation modeling is done "in house". This project is also developing new ways to display the outputs of urban simulation and transportation models using video gaming technologies, in partnership with Introspective Systems of Brunswick (a startup company in Maine). (Project #2)

3) The development of new data-driven planning tools that provide municipalities with greater flexibility to promote residential and commercial development while protecting natural resources. (Project #1)

4) The adoption of new stakeholder engagement practices by government agencies and the private sector for identifying community concerns and information needs related to the development of tidal energy. (Project #18)

What is the impact on society beyond science and technology?

Given SSI's emphasis on understanding and strengthening connections between scientific knowledge and societal action, our research includes a major focus on generating benefits to society by informing public policy. During YR 4, SSI has informed public policy in many ways, including:

1) Analyzing and improving policies for the development of tidal energy (#18): SSI researchers are playing a major role in informing public policies regarding the regulation of tidal energy development. Because this is such a novel technology, considerable uncertainty exists regarding the information needs and regulatory processes for approving permits to develop tidal energy. Such uncertainty represents a major scientific and policy challenge for government regulators (e.g. federal and state agencies), tidal energy developers, and diverse stakeholders, including tribal communities and other affected municipalities and citizens. This project has demonstrated the value of an adaptive management approach in which researchers interact with regulators to identify key gaps in scientific knowledge and then initiate new investigations to fill those gaps. For example, little prior knowledge was available regarding the effects of moving turbines on fish, so SSI biophysical researchers worked with agencies and local fishing communities to evaluate these potential environmental effects. Similarly, SSI social scientists have identified and implemented iterative processes for engaging with local stakeholders that increase the ability of research to address the concerns of municipal officials, fisherman and the general public. SSI's research is increasing the potential for developing tidal energy in ways that are not only technologically feasible, but also economically viable and socially acceptable. One key indication of the policy impact of this innovative research partnership is that this is the first commercial project in the United States in which tidally-driven hydrokinetic turbines are generating electricity to the grid.

2) Analyzing and improving policies for stormwater management (#11): SSI researchers are informing public policies regarding the management of stormwater runoff, which has become a growing problem in Maine due to increased flooding resulting from extreme precipitation. An SSI team with expertise in climate science, hydrology, civil engineering, stakeholder engagement and governance has demonstrated that there has been a significant increase in peak runoff and flood-related damage during the last several decades, and that more peak run-off is occurring during the summer than was previously observed. In collaboration with multiple levels of government (e.g., municipalities, federal and state transportation departments and emergency management agencies) and other stakeholders, this SSI team has identified the maintenance and replacement of culverts as a major source of vulnerability in stormwater management. Specifically, existing culverts have generally been large enough to convey the magnitude of stormwater runoff that was typical in the past, but these culverts are too small to handle the increased magnitude of present-day runoff and the runoff predicted in the future. SSI research is contributing to the development of increased adaptive capacity by creating decision tools to map culvert locations, schedule maintenance, estimate needed culvert size, and analyze replacement needs and costs.

3) Analyzing and improving policies for reducing vulnerability to the emerald ash borer (#13): Maine's forests are currently threatened by the emerald ash borer (EAB). This species has already destroyed 50-100 million ash trees in the Great Lakes region of the U.S. and Canada, and has rapidly expanded its range beyond its original detection in Michigan to New York, Connecticut and Massachusetts. Given this rapid range expansion, EAB could potentially arrive in Maine in the next five years, and there is currently little prospect of eradicating the pest. This project has provided an important opportunity for the university to work with diverse partners and perspectives, including Wabanaki basket makers, brown ash harvesters and tribal resource managers along with federal and state resource agencies that traditionally lead the development and implementation of invasive species detection and response plans in the U.S. Because tribal knowledge and concerns have often been underrepresented in such planning processes, this project has sought to ensure that tribal members are active participants in the planning process.

Initial discussions indicated that vulnerability to EAB's potential impact will fall very unevenly across different communities and stakeholders in Maine. On the one hand, the three species of ash in Maine comprises less than 2% of the state's forests, and ash is not a commercially important species for the forest products industry. On the other, EAB represents an enormous threat to the identity, traditions and economy of the Wabanaki confederacy that includes the Penobscot, Passamaquoddy, Maliseet and Micmac Nations. Specifically, tribal culture and livelihoods are intimately tied to the basket tree or brown ash, Fraxinus nigra. Basket making using brown ash

has been an integral part of Wabanaki culture for centuries, and these baskets are among the most ancient and acclaimed indigenous art forms in North America.

The composition of the research team for this project also reflects a strong commitment to the inclusion of tribal perspectives as 2 of the SSI faculty on the team are tribal members and come from basket-making families. The team's research expertise includes indigenous knowledge and tribal sovereignty as well as the human dimensions of natural resources, forest ecology, and forest economics and policy. This team also strives to help facilitate connections between science and policy and between researchers and communities. Particular attention by the researchers is made to how the group interacts in a context where power and knowledge are unevenly shared, and how the group is able to manage and create power-sharing through a 'learning' environment where "researchers and practitioners both share learning experiences with equal power to implement them in their respective contexts." Representatives of multiple tribes have regularly participated in the planning meetings, and tribal members often comprise about half of the total participants. Two representatives of the Maine Indian Basketmakers Alliance are also members of the project's leadership team.

This research project is making important contributions to reduce vulnerability to a potential EAB invasion and, in doing so, enlivening old and creating new partnerships and infrastructure between the University, state and federal agencies and Wabanaki basketmakers and tribal governments. Expert testimony by team members contributed to the passage of legislation banning the importation of firewood to Maine from other regions. Tribal knowledge is also being combined with statistical models of habitat preference to identify stands of basket-quality trees that could potentially be protected from the EAB. Perhaps most importantly, this team has filled key roles as a boundary organization that convenes key parties, builds trust, identifies research needs, and searches for policies and practices to cope with the potential impacts of an EAB invasion. Because of the trust and effective working relationships that have been created, this research team is currently leading the development of a first-of-its-kind Memorandum of Understanding between tribal, federal, and state governments to facilitate coordinated responses to the expected arrival of EAB in Maine.

Changes

Changes in approach and reason for change

General and Jurisdiction Specific Terms and Conditions:

Maine EPSCoR has adhered to all PTCs: 1) Cost sharing provided at the required amount of $800,000 plus significant voluntary cost contributions; 2) Participant support is utilized only for activities falling under that category, and funds are tracked separately, with written policies and procedures in place. 3) All general PTCs have been met, with no key personnel changes or changes in project scope. All reporting requirements have been addressed in the sections above or in the supplementary tables provided.

YR4 NSF EPSCoR Reverse Site Visit Recommendations:

1) Recommendation: Focus more on publishing in top science journals. Action: SSI has taken steps to achieve this, with two manuscripts in the works that are intended for top science journals. The first manuscript (draft title: Evolving approaches to conserving small wetlands on private lands in the face of uncertainty) will soon be submitted to the Proceedings of the National Academy of Sciences. The second manuscript (draft title: What are the roles of knowledge institutions in sustainability?) is in preparation for Science.

2) Recommendation: Increase engagement with state agencies, businesses, and NGO partners to place SSI students and develop metrics to track students' long-term success. Action: SSI is collaborating with EES Director and SSI faculty Aram Calhoun to establish sustainability internships for both graduate and undergraduate students with Maine-based companies. A survey of economic interactions across the SSI portfolio was done in January 2013, and is being analyzed. Once completed, it will assist SSI faculty and students to expand and strengthen their interactions with private sector organizations.

3) Recommendation: Consider alternatives to DSpace for data integration and management. Action: two new data integration specialists were hired in March 2013, and have begun the process of building the SSI data portal using Dataverse and incorporating the current DSpace system.

4) Recommendation: Finalize a plan to sustain the effort beyond current EPSCoR funding. Action: a) SSI faculty submitted proposals for over $32M in YR4, including NSF CNH (2), SEES, EPSCoR RII Track 2, IGERT, IGERT CIF21, and CAREER. b) An inventory of key representatives of government agencies (e.g. municipal, regional, state, federal) as well as representatives of Maine tribes has been created to assess progress in existing collaborations and explore new collaborative opportunities. c) Identification of foundations and cultivation of relationships continued, with connections made to leaders at three national foundations. David Secord, Director of Strategic Programs at Tides Canada visited campus in fall 2012 to discuss his work at the foundation. d) Work continued on identifying potential private donors through our network of contacts. e) A two-day collaborative meeting with the New Hampshire EPSCoR RII Track I members in summer 2012 resulted in the submission of a collaborative Track 2 proposal. Additional areas for future research collaboration were also identified. f) SSI hired a Program Coordinator in Feb. 2013 who is working to continue the development of opportunities and collaborations for SSI teams, such as researching funding opportunities and assisting SSI faculty, postdocs, and graduate students in proposal preparation.

Recommendations from External Evaluators:

The YR4 reports and recommendations from the external evaluators and the May 2013 AAAS review panel are still pending (summer 2013). Once received, all recommendations will be reviewed by the Maine EPSCoR Management Team and the SSI Stewardship Council, and any changes needed to the SSI Strategic Plan will be made accordingly.

The YR3 report by the external evaluators served both as continuing formative input and early summative evidence of Maine EPSCoR outcomes. The following recommendations were made and addressed during YR4:

1) Recommendation: Integrate students more in publication activities. The evaluation analysis showed that a few students have been successfully integrated in publication activities, but that this is the exception rather than a norm, and that while there was a doubling of article submissions to journals by students, only one in five students reports such activity and nearly all is conducted by graduate students. Action: Since SSI students are integral participants on the research teams, SSI faculty have been strongly encouraged from the start to include them in the publications process, and this discussion has been held at the SSI Research and Stewardship Council meetings and conveyed to all SSI teams.

2) Recommendation: Develop cross institutional statewide collaborative opportunities and expectations. The survey results show that there has been some cross institutional research activity by students. However, most of this interaction is based on the presentation of research by UMO/USM to partner institutions. Maine EPSCoR should work with the smaller schools to develop opportunities that will enhance the ability to build student capacity for academic writing and presentation. Action: During YR4, the Maine EPSCoR Management Team continued to: 1) provide supplemental funding for publications production; 2) require publications and presentations in annual metrics for all teams; 3) encourage all students to participate in networking mechanisms (All-Team meetings, SSI research retreat, state EPSCoR conference, etc.)

3) Recommendation: Expand faculty production. This year's evaluation shows the development of journal articles. Results show positive movement in integration across subject and disciplinary areas. In the next two years we expect to see dramatic increases in this production, including across institutions and disciplines. Action: During YR4, the Maine EPSCoR Management Team continued to: 1) provide supplemental funding for publications production; 2) require publications, grants, and presentations in annual metrics for all teams; 3) encourage cross-institutional collaborations through communications and networking mechanisms (All-Team meetings, SSI research retreat, state EPSCoR conference, etc.)

4) Recommendation: Clarify desired and targeted production outlets. The citation data show that Maine EPSCoR publications are achieving some early visibility. It was striking that 60 publications were in 49 different journals. While many of these journals were in journals at the median or slightly above median journal impact factors, many others were not. It may be worthwhile to hold discussions about appropriate and desirable publication outlets across the EPSCoR community. Action: During YR4, the Maine EPSCoR Management Team continued to: 1) provide supplemental funding for high-level publications production; 2) require publications in annual metrics for all teams; 3) encourage collaborative synthesis publications.

5) Recommendation: Continue to work on personnel and publication records maintenance and tracking. Action: Maine EPSCoR continued to refine its on-line data collection tool, as well as its reporting capabilities using the raw data. YR4 data uploading to external evaluators went smoother.

SSI Advisory Board recommendations are pending the fall meeting. There have been no changes in project management. Only minor revisions to the SSI Strategic Plan have been made based on evaluation feedback loops. All goals, objectives, outcomes, impacts, and major milestones remain the same.

Actual or Anticipated problems or delays and actions or plans to resolve them
Nothing to report.

Changes that have a significant impact on expenditures

Unobligated funds:

$3,807,660 (95%) of the YR4 NSF awarded funds ($4M) have been obligated, which means that they meet NSF's definition of having been actually expensed, encumbered through a purchase order, or otherwise contractually obligated. The remaining $192,340 (4.8%) of YR4 NSF funds have been committed to specific purposes and activities that will occur over the next few months, but by NSF's definition remain unobligated. These funds are budgeted to support workforce development and other outreach, travel, conferences, workshops, printing, supplies, etc. in the next months for on-going projects.

Out of the $16M in NSF awarded funds for all four years, the total amount of unobligated funds to date carried over for all four years is updated in the templates to be $1,190,708 (7.4%). These are funds that are committed to specific purposes and activities, but by NSF's definition remain unobligated. These funds are budgeted to support workforce development and other outreach, travel, conferences, workshops, printing, supplies, etc. for on-going projects.

Maine EPSCoR has met the required YR4 cost share of $800,000 (20%), and will have contributed a significant additional amount of voluntary cost contributions towards this project from all participating institutions and workforce development partners.

Significant changes in use or care of human subjects
Nothing to report.

Significant changes in use or care of vertebrate animals
Nothing to report.

Significant changes in use or care of biohazards
Nothing to report.

Special Requirements

Responses to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.

Specific terms and conditions in the RII agreement have been met and include:

1) Cost sharing provided at the required amount of $800,000 plus significant voluntary cost contributions.

2) Participant support is utilized only for approved activities falling under that category, and funds are tracked separately, with written policies and procedures in place.

3) General Programmatic Terms and Conditions: all terms and conditions have been met, with no key personnel changes or changes in project scope. All reporting requirements have been addressed in the sections above, or in the supplementary tables provided.

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS-0904155)

YR4 Annual Report: Additional Detail on Research

Sustainability Solutions Initiative (SSI) Cross-cutting Themes and Arenas

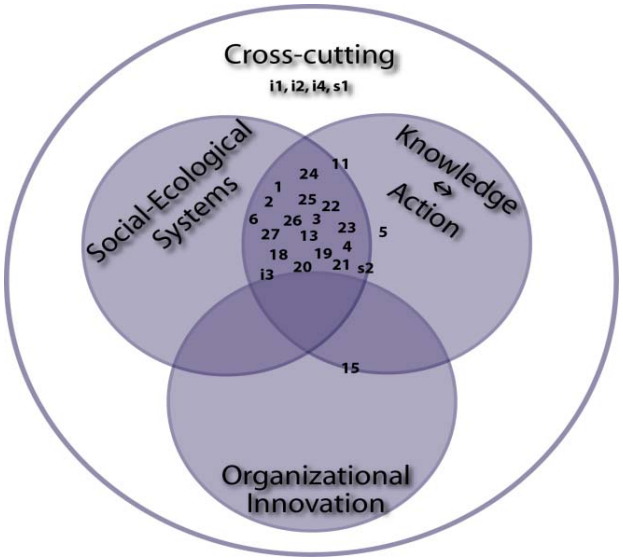

Figure 1. Venn Diagram of SSI's Cross-Cutting Themes.

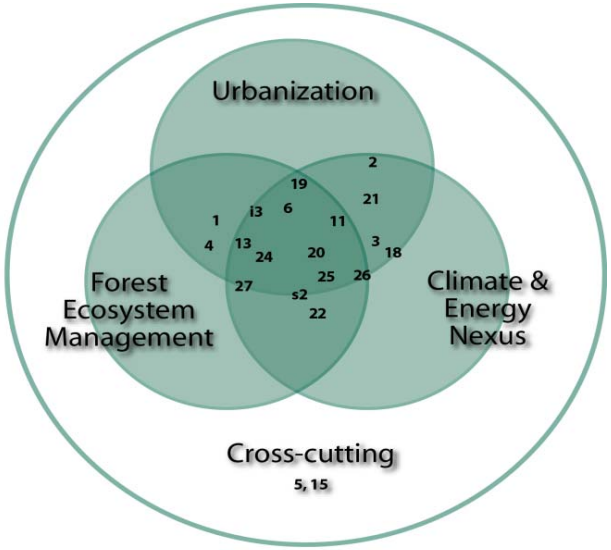

Figure 2. Venn Diagram of SSI's Arenas.

SSI Portfolio Design:

SSI is designed as a portfolio of research projects, where each project constitutes a place-based, multi-scale investigation of SES and K↔A processes, patterns, and interactions. While each project offers important learning opportunities in its own right, one of SSI's central goals is to create a quasi-experimental design in which particular groups of projects can be used to compare and contrast the influence of different processes shaping SES and K↔A. This integrative strategy also increases the potential for drawing inferences about the role of contextual factors (e.g. biophysical, socioeconomic, and decision-making characteristics) and scale on system behavior.

SSI used two design principles to populate the portfolio with place-based, use-inspired interdisciplinary research projects. These principles are intended to promote sufficient among-project consistency to accelerate the solutions development process and increase opportunities for synthesis and learning via comparative analysis and rapid feedbacks. The first design principle is that research endeavors with a proactive stakeholder engagement process are likely to pre-select candidate problems that, if solved, will fill an important knowledge gap with an urgent societal context. The second design principle is that numerous sustainable development challenges are inherently complex and multi-faceted, thus necessitating team-based problem solving.

The integrative structure of SSI can be illustrated in two Venn diagrams. These diagrams show how the different collaborative teams are working to weave together the themes and arenas of SSI. Starting with the themes (Figure 1), most of the projects fall within the overlap of SES and K↔A. (Note that projects are identified by numbers as listed in the table below.) This is reflective of a primary objective of SSI to integrate research into SES dynamics with actions (decision-making) on the human side of coupled human-natural systems. The small dispersion of projects in the diagram is indicative of the cohesive nature of the research question and to some degree, the location of the team (SSI involves 11 institutions across the state). The Organizational Innovation (OI) theme has fewer projects showing because in part the internal research is a longitudinal study of SSI as a whole and independence is necessary to derive valid results. Also, four projects do not plot onto this diagram because they are integration projects that are analyzing the whole SSI portfolio of projects to develop broad theory and methods for sustainability science.

SSI research projects can also be represented in terms of their emphasis on different arenas (or drivers) of landscape change, as shown in the second Venn diagram (Figure 2). As this diagram clearly shows, the majority of SSI projects examine the roles of all three drivers of landscape change in their place-based efforts to advance the theory and practice of sustainability science. This focus on multiple drivers of landscape change increases SSI's ability to evaluate the independent and interactive effects of different drivers. For the purposes of summarizing the research accomplishments of specific SSI research teams during YR3, however, the projects are grouped within specific arenas (see below). One consequence of this organizational arrangement is that it necessarily under-represents the extent to which SSI projects consider interactions among landscape change arenas. Please note that two projects do not plot well on this diagram but are referenced overall. These projects are working across all the arenas with the goal of applying uniform methods of data collection and analysis to develop analytical procedures that are broadly applicable to the emergent problem of generalization in sustainability science.

Maine EPSCoR Sustainability Solutions Initiative – NSF EPSCoR RII Track 1 Project Team Organizational Matrix

	Urbanization	Forest Resources	Climate/Energy
Social-ecological systems	1, 2, 3, 4, 6, 11, 13 19, 20, 21, 24, 25 i3	1, 4, 6, 13 19, 20, 22, 24, 25, 26, 27 i3, ss2	2, 3, 6, 11, 18 19, 20, 21, 22, 24, 25, 26 ss2
Knowledge-Action	1, 2, 3, 4, 6, 11, 13 19, 20, 21, 24, 25 i3	1, 4, 6, 13 19, 20, 22, 24, 25, 26, 27 i3, ss2	2, 3, 6, 11, 18 19, 20, 21, 22, 24, 25, 26 ss2
Organizational innovation			

i1, i2, i4, ss1

5

15

SSI Research Goals #1-4: Detail of YR4 Portfolio Major Activities, Progress, & Outcomes

Goal #1: Overall SSI Research ***Create a world-class, solutions-driven sustainability science research center recognized for its innovative approaches to interdisciplinary research and deep commitment to collaboration with diverse stakeholders.***
Goal #2: Social-Ecological Systems ***Investigate the dynamics of social-ecological systems, with a particular emphasis on SES resilience.***
Goal #3: Knowledge to Action ***Examine the connections between scientific knowledge regarding SES dynamics and stakeholder actions that potentially affect SES resilience.***
Goal #4: Organizational Innovation ***Test models of organizational science to understand and improve interdisciplinary collaboration and university-stakeholder partnerships.***

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
Vernal Pools (1)	Investigate the persistence of pool-breeding amphibians in urbanizing landscapes with a focus on ecology and socioeconomic implications of conservation on private lands. Develop alternatives to traditional top-down regulation to innovative conservation planning at the landowner and municipal level.	Continued study of the ecology of vernal pools in an urbanizing landscape and the associated socioeconomic constraints on conservation association with private and public lands.	Submitted a draft Special Area Management Plan (SAMP) to the US Army Corps of Engineers for consideration as an alternative federal regulation of vernal pools in municipalities in Region 1. Developed solutions by focusing on improving networks among stakeholders and building a long-term, collaborative, polycentric approach to conservation. Helped stakeholders to identify what the questions and problems	Outputs reached beyond immediate Maine stakeholders as our reputation as progressive vernal pool managers spreads through exposure through our website (3,000 hits in this reporting period) and international presentations. Provided research results, base materials and standardization of methods for pool conservation used by diverse audiences (e.g.

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
	SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.		are and offer approaches that incorporate their concerns and needs into the research.	New Brunswick, NY, VA, GA, WI, MN, MI, & OH).
Sustainable Urban Regions Project (SURP) (2)	Develop data sets and computer modeling capabilities to examine the interrelationship among the socioeconomic and technological forces shaping Maine's urban areas with a particular emphasis on Portland and Bangor. Develop stakeholder partnerships that focus on the public and nonprofit agencies involved in shaping growth and environmental policies in urban areas and with the private sector organizations in the real estate industry. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	Completed alpha phase of modeling urban landscape change. Started testing the models with stakeholders and developing the beta versions.	Completed and released two reports: (1) *Changing Maine: Maine's Changing Population and Housing 1990-2010* and (2) *Changing Maine: Maine's Changing Population and Housing 1990-2010: Focus on Southern Maine*. Developed in cooperation with Sustain Southern Maine. Completed a functioning prototype model of Urban Sim for the Portland region Completed data collection for parcels, zoning, and tax values for 31 towns in the Portland metro area and 7 towns in the Bangor area. The project also collected elements of these data for 15 other towns in Portland and Bangor regions. Worked with the Department of Transportation, Maine Turnpike Authority, and the Portland Area Comprehensive Transportation System to complete new long-term population, employment,	Developed methods to collect and manage the large amounts of data needed to analyze regional issues of landscape sustainability. Engaged new partnerships that are analyzing and modeling sustainability issues across the urban regions. Established a process to test stakeholder reactions to landscape and transportation model outputs and different forms of visualization.

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
			and transportation forecasts for the Portland region.	
Decision tools to support water resources sustainability of managed lake systems (Sebago) (3)	Following the SSI model, project goals and objectives have been adjusted to complement studies related to the Sebago Lake watershed. Develop models that have a greater emphasis on the rim watershed of the lake to conform with the areas of greatest existing and projected population growth. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	Analyzed new and historic hydrological data sets to develop computer models that quantify change (land use and climate) and interactions between hydrology and water quality within the Sebago Lake System. Made a watershed model accessible through an internet application, and created a screencast outlining how the model could be used. Met with stakeholder focus groups and administered surveys to assess the use of a simple watershed model for managing water resources. Analyzed how stakeholders understand their perception of computer modeling of	Fact sheets were developed that describe characteristics of smaller waterbodies within the Sebago Lake Watershed and are now available through web postings. Stream gaging data have been analyzed to create rating curves for streams that flow into Sebago Lake; now water-level measurements can be converted to discharge rates to fill in gaps in the data record.	Project outputs inform lake management practices including operation (and importance to lake level) of the dam that regulates the outflow from Sebago Lake to the Presumpscot River, show the importance of different water sources to the Sebago Lake water budget, and identify the timing of water fluxes and implications for chemical loading to the lake. Models simulate change in the watersheds under different scenarios of future change to help our stakeholders make better decisions and balance the needs of the different interest groups in this important region. Data are publicly available through a web site and include stream stage data collected in tributaries flowing into Sebago Lake

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
		the Sebago hydrological system. Continued monitoring of algae biomass in Sebago Lake at the Portland Water District inlet and gauging of streamflow in small inlet streams.		and data sheets. Contributed to an online mapping tool that will be used by the Portland Water District to solicit input of the presence of invasive species in Sebago Lake from community members and stakeholders.
People, Landscapes, and Communities (PLACE) (4)	Apply sustainability science research approach to study urban-rural landscape change to explore relationships between ecological and social resources and human decisions, with the goal of advancing solutions to diverse forest and land management problems. Develop data measurement and analysis methods to help manager, officials, NGOs, and businesses anticipate landowner and landscape change and engaging with landowners about this change and devise new methods for	Increased quantitative understanding of landowner attitudes and behavior and advanced simulation of natural and social outcomes contingent on these social processes at local, community, and landscape scales. Team modeling, statistical analysis, and qualitative research produced relevant, research-based outputs that reflect and serve the needs of land and forest management stakeholders.	Strengthened research collaborations through institutional and stakeholder networks. Refined a mutual mentoring model designed to nurture the sustainability science careers of participating undergraduate and graduate students, post-doctoral research associates, and faculty researchers. Implemented and analyzed the Maine Landowner Survey.	Strengthened key networks for collaborative research. Expanded connections with sustainability science researchers at other institutions and elevated awareness of SSI research through the SESYNC rural forest working group. Cross-institutional networks with other CNH teams focused on landscape change enable PLACE researchers to compare and contrast stakeholder needs and engagement contexts in different regions and to contribute to national and international discussions of

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
	landowners to access resources and information regarding landscape change. Continue research on landscape processes interactions with human attitudes and behaviors to support short- and long-term solutions to escape the inefficiencies of information failures and promote flexible and adaptive institutions and decision-making processes. Solutions include: improved communication networks; service networks; decision-support tools and communication products; and revised forest and land management policies. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.			ways to improve the linking of scientific knowledge with action on land and forest management issues.

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Knowledge-Action (K↔A) Collaborative (5)	Overall, use K↔A to identify and analyze processes of alignment required to deliver a wide range of solutions. Determine the context in which solutions are designed and delivered. Identify and evaluate the pathways to creating greater social resilience (at both individual and institutional levels) to identify, design, and adopt solutions. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 3.1; 3.2; 3.3; and 3.4.	Researched individual behavior incorporating psychological variables (e.g., measures of economic stress, social norms), and psychological models (e.g., the theory of planned behavior) into economic models of behavior (e.g., driving, recycling, choosing electricity products, choosing eco-labeled cars). Researched institutional behavior to assess factors that influence partnership formation and success, both through a survey of municipal agents in Maine and in a new research project focused on building capacity between Maine's legislature and UMaine. Assessed K↔A approaches across SSI.	The K↔A Collaborative has made significant contributions to understanding the role of individual and institutional circumstances in determining people's and institutions' sustainability behavior, values, and willingness to collaborate with SSI. Developed an empirical understanding of Municipal agents' willingness to and interest in collaborating with the university. Used research to inform decision-making and communication processes on SSI-SES teams. Teams that use decision-making structures that involve a variety of team members are more likely to persist and to be successful at stakeholder engagement. Developed integrative theory and cross-disciplinary empirical modeling approaches to better understand the factors that influence people to act	Partnered with cooperative extension to design research aimed at better understanding these relationships and to build capacity. Derived methods on how institutions and individuals can use language more effectively to create stronger K↔A alignment. Work with the Orono Village Association led to the development of an organized communication and implementation plan for Orono. Work with the Micmac Farms helped identify gaps in the communication structure that were impeding progress. Collaboration with The Maine Road Salt project was used to define how to help build stronger capacity in the management of road salt in Maine across diverse geographical areas by strengthening communication and

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		Designed and implemented a survey that reflects the 41 interviews conducted with faculty, staff, and students about K↔A research and practice. Developed a comprehensive database of energy discourse in Maine's primary newspapers to use for statistical and qualitative analysis. Conducted interviews with policy makers and researchers involved in renewable energy research and implementation.	sustainably.	knowledge exchange across diverse stakeholder groups. Team has received national and international recognition for our work. Other outcomes included: assisting Maine CDC in evaluating the effectiveness of health advisories where the findings from this study motivates the importance of understanding why information about sustainable choices is crucial to policy success; enabled the quantification of Maine citizen's willingness to pay and social acceptance of renewable energy options (wind energy vs. hydroelectric); and forming an innovative collaboration with the Maine State Legislature, the Maine Municipal Association, the Bangor Area Stormwater Working Group, and non-profits like Lobsters on the Fly.

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
Analysis of Alternative Futures in the Maine Landscape using Spatial Models of Coupled Social and Ecological Systems (Alternative Futures) (6)	Develop land suitability indices for the Lower Penobscot River Watershed (LPRW) and Casco Bay Region (CBR). Identify how stakeholders understand and react to alternative futures scenarios. Characterize new land use issues using the suitability indices such as ecological and regulatory thresholds associated with urban streams. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	Developed land suitability indices for the LPRW and CBR. Analyzed how stakeholders understand and react to alternative futures scenarios via the Maine Community Mapper and various surveys. Identified new land-use issues using the suitability indices developed from research – especially ecological and regulatory threshold associated with urban streams.	LPRW – finalized land suitability maps for four focal land uses (i.e., development, agriculture, forestry and conservation) based on focus group meetings and our All-Stakeholder Workshop. Leveraged the impact of futures research through: (1) the Maine Community Mapper (grant funded by the Elmira Sewall Foundation); (2) Northern States Research Cooperative funding that examined the effects of changing land use scenarios on future timber supplies.	Models of the 2.5-milion-acre Lower Penobscot River Watershed (LPRW), and the 1.9-million-acre Casco Bay Region (CBR). The foundation constructed in LPRW and CBR offer opportunities to explore a wide range of issues going forward such as small-scale land use within municipalities, to larger-scale questions regarding alternative development strategies and resource protection policies.
Coastal Adaptations (Adaptation Strategies in a Changing Climate) (11)	Analyze rainfall occurrence and intensity patterns in Maine. Inventory and assess municipal decision calendars regarding infrastructure repair and maintenance. Evaluate infrastructure planning approaches using focus groups.	Completed the study of the extreme rainfall and seasonality in Maine using the linear and circular methods. Met with town officials to assess their decision calendar regarding infrastructure repair and maintenance; local mapping and modeling	The post-1980 precipitation records exhibited an increased magnitude of extreme rainfall events with corresponding change in seasonality. Developed decision-making tools derived from interviews, surveys and focus groups with Maine coastal communities to help them better assess their vulnerability to climate change	Collaborated and integrated with other research teams and institutions, such as obtaining LIDAR data and land use maps. Developed new research method to assess climate variability.

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	Conduct surveys of stormwater knowledge across communities. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	initiatives; and future needs. Organized stakeholder meeting via focus groups including: city manager, consulting engineers, code enforcement officer, public works director, fire chief, police chief, wastewater superintendent, city council chairman and DOT engineer. Used UMaine/Ellsworth collaboration as a model for stakeholder engagement in other communities. Prepared survey regarding knowledge about the stormwater management and climate change.	and prepare for the future. Conducted meetings and surveys with stakeholders to gather and analyze information regarding extreme rainfall and hurricanes to develop watershed model under different climate scenarios.	
Emerald Ash Borer (13)	Work as a boundary organization to help the regulatory agencies prepare	Established a number of monitoring sites using peeled ash trees.	Hosted a workshop on EAB scenario development that clearly identified where the	Developed maps of critical areas of brown ash growth in the State of Maine with a

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	for the arrival of the Emerald Ash Borer (EAB). Conduct a forum for key policy stakeholders to come together and address an urgent need, along with scholarship, to develop a response before the EAB gets here. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	Developed and implemented strategic communications plan with stakeholders. Developed mapping methods to capture the Traditional Ecological Knowledge (TEK) of ash harvesters to communicate to the next generation of harvesters.	regulators need to find common ground, and, from this, hosted the first of a series of meetings having them sign memoranda of understanding for the initial response to an EAB detection.	biological science and site-specific approach. Established solutions-oriented joint research goals that include: 1) mapping ash resources; 2) developing policy guidance; 3) public education and stakeholder engagement; and 4) seed collection. These are all oriented to prepare for and mitigate potential impacts from EAB. Developed table top scenarios and identified the need for MOUs with the tribes.
Systems Analysis of SSI: Navigating Perspectives, Paradigms, and Problemscapes. Organizational Innovation (OI) (15)	Compile data analysis from interviews and surveys collected from SSI constituents in previous years -- over 500 pages of transcribed data. Conduct longitudinal analysis of the organizational innovation	Continued data collection using surveys and interviews on the dynamics of collaborative research and team building. Conducted the analysis and synthesis of results for publications and	Provided ongoing feedback to our stakeholders – the SSI Team – in order to better facilitate their work. This feedback has played a direct role in re-visioning the structure and organization of aspects of SSI, such as in the formation of the Research Council and the organization of the Year 4	Published a "best practices" piece on interdisciplinary endeavors to *Change Magazine*, which is one of the main information outlets for university administrators. Continued research related to comparing and

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	occurring in SSI toward its interdisciplinary and organizational change goals. Develop methods to define of "metrics of success". SSI Objectives: 1.1; 1.2, 1.3; 1.4; 4.1; 4.2; and 4.3.	presentations, to identify paradigmatic differences in SSI researchers. Conducted an almost constant state of data collection; data emanate not only from formal sources such as through one-on-one interviews with SSI constituents and in surveys of these individuals, but also from informal sources such as observations of team meetings, events, and committee meetings, as well as conversations within SSI peers.	retreat. Continued embedded and interactive research while simultaneously anticipating and responding to changes in the SSI organization and ongoing relationships among the faculty, students, and leaders of SSI.	contrasting doctoral student and faculty socialization to interdisciplinarity. Completed manuscripts examining the role of voice in interdisciplinary collaborations within SSI using social network analysis and using text analysis to identify stressors among the SSI team.
Tidal Energy (18)	Analyze the dynamic interactions of fisheries, fishing communities, and tidal energy power development. Conduct quantitative analysis through participant observation, semi-structured interviews,	Major activities have focused on field-based social and fisheries data collection, and stakeholder outreach. In parallel the research effort has grown through new regional and international collaborations.	Since tidal energy power has gone operational the project team conducted a daylong community meeting in Trescott, Maine to update stakeholders, including regulators (NMFS, USCG, DEP, DMR), small site partners and stakeholders. Invited to Japan to present three	Submitted four manuscripts to a special issue of *Estuaries and Coasts* (Co-PI Zydlewski is the Guest Editor). Presented at seven international or national conferences.

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	focus groups, and a quantitative mail survey. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.		papers: stakeholder engagement; resource assessment; and engineering at the 1st Marine Energy International Symposium- Approaches to Marine Renewable Energy Development (July 17, 2012). Engaged new interest groups in workshops and discussions on research methods, preliminary findings, and expected outcomes.	Key outcomes directly inform our biophysical work (e.g., sampling locations and gear types), while active and iterative involvement with the community has informed our stakeholder engagement and public outreach efforts.
Finding and applying best practices in socioecological systems modeling and outreach (SES Synergy) (SS-1)	Research fundamental methods to improve specificity in the social-ecological systems with respect to the nature of human-natural systems interactions over time. Incorporate human cultural adaptation into bio-economic models. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.3; 2.4; 2.5; 3.1; 3.3; and 3.4.	Completed the construction and preliminary testing of a break-through agent-based model of social-ecological systems evolution that simulates emergence following Ostrom's core design principles. Designed and assembled an SSI/SOE facility for sustainability experiments. The facility includes hardware, software, and organizational capacity	Designed SSI's first coupled SES model with endogenous social-ecological dynamics. This agent-based model fills a gap revealed in the SES Synthesis Report on SSI's progress in addressing fundamental questions of coupled S-E systems dynamics. Applied experimental economics to SES dynamics to design a context-general experimental study on social-ecological boundaries. Established an experimental	Meaningful couplings of social and ecological processes are challenging for scholars around the world to study and explain. The new models that are developed are able to quantitatively represent co-dynamic S-E relationships.

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		housed in the School of Economics.	facility for sustainability science within SSI. Laboratory based sustainability experiments provided a complementary approach to quantitative models and field studies.	
Effects of Climate Change on Organisms (ECCO) (SS-2)	Using a large stakeholder council meeting to identify priority questions. Following stakeholder meeting develop research agenda. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; and 3.2.	Stakeholder process used to develop a problem typology and strategic plan to guide future research activities. Contributions came from primarily the conservation and the medical perspectives. Developed 40 questions with prioritization to identify leading questions. Stakeholder outreach and research has started on maple syrup timing and relationship to climate. This was chosen to represent agriculture and forestry. Began collecting biotic inventory data and planning for a	Since the meeting, we have defined research in response to questions. Executing this research will be a major focus for year 5.	Key lessons learned from meta-research questions from the stake holder engagement process noted that the participants had strong opinions regarding who should be involved in defining the questions and implementation, but strongly want to leave the research and even interpretation to the researchers.

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		downscaled climate model to develop climate-envelope models (a request of the stakeholder group).		
Ecological and economic recovery and sustainability of the Kennebec and Androscoggin rivers and their common estuary and nearshore marine environment. (Bowdoin College, Bates College, and University of Southern Maine) (SSP-19)	Complete ecological fieldwork and biogeochemical studies of Nequasset Lake in Woolwich to determine the influence of the alewife run on lake water quality along with estimates of young-of-year fish production. Implement a major public survey in the Kennebec watershed with analysis and comparison to previous work in the Androscoggin watershed. Collaborate with the Maine Department of Environmental Protection in the development of a spatial database for tracking progress achieved under Maine's Water Classification Act.	Developed and parameterized bio-economic model that estimates potential economic benefits of ecological recovery of ground fish and their forage base. Developed new organization with representatives from industry, small business, environmental NGOs, municipal and state government along with individual stakeholders to provide an open forum for discussion of economic and environmental issues along the Androscoggin River. A role of this entity is to bring science into the discussion as a	Field studies and data analyses concluded for parameterization of the model. Public surveys conducted in the Kennebec watershed for comparison with the information collected last year along the Androscoggin; 4,800 surveys were sent to households in the Kennebec watershed. A broad watershed organization has emerged along the Kennebec River as a result of our November 2011 symposium. The Kennebec collaboration is comprised of municipalities, nonprofits, and economic development agencies. The focus of the Kennebec group is to develop a means to leverage restoration progress made to date with a particular focus on conservation, land protection,	Engaged with the Institute for Civic Engagement in Portland to charter a boundary organization called the Androscoggin River Institute. At the Maine Water Conference, presented to a general audience on the Nequasset Lake nutrient budget project, the bio-economic model and preliminary results from that research tool regarding the benefits of river restoration, as well as a summary of boundary organization interactions with the public and stakeholders in the Kennebec and Androscogin watersheds, and an overview of the two rivers (Androscoggin vs.

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	SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	politically neutral means of addressing specific applied questions. Worked with the Kennebec Collaboration to identify mechanisms, such as the formation of a boundary organization to facilitate achievement of its goals. Field, laboratory, modeling, public surveys, institutional analyses, and K-A efforts continued with stakeholders as a component of supporting the development of boundary organizations within the Androscoggin and Kennebec Watersheds. Survey analysis identified similarities and differences between the rivers in public perceptions, attitudes and willingness to pay.	river restoration including fish passage, and downtown revitalization. Organized a special session at the Maine Water Conference focused on the Kennebec-Androscoggin project.	Kennebec) and factors that affect their restoration potential.

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Modeling Resilience and Adaptation in the Belgrade Lakes Watershed (Colby College) (SSP-20)	Build on the fundamental science conducted in Years I through III and move toward specific, place-based actions targeted at promoting sustainable practices in the Belgrade Lakes watershed and beyond. Complete physical and biological studies of lake ecology and social science studies of human values and sense of place. Test and disseminate best management practices to promote sustainability of the lake ecosystems. Conduct education and outreach to stakeholders and the broader Belgrade Lakes community centered at the Maine Lakes Resource Center (MLRC). Analyze how accessibility, speed, and type of scientific data inform,	Expanded focus from a detailed study of lake cultural eutrophication drivers to incorporate an assessment of the cultural and socioeconomic factors that characterize the Belgrade Lakes Watershed and specific actions that lake stakeholders can take to reverse the decline in water quality observed in the Belgrade area lakes as well as many other Maine lakes. Purchased with internal college funds a major new research buoy to be deployed in Great Pond.	Research suggested that current methods of lake conservation are not protecting Maine lakes because of a fundamental disconnect between the way lake scientists communicate the ecological status of the lakes, raise community awareness of lake health, and specify actions available to stakeholders to mitigate anthropogenic impacts. Research highlighted the importance of reciprocal information flow in this coupled human natural system that influences stakeholder-based actions and conservation behaviors. Project outputs help in enhancing lake management and stewardship strategies to protect the water quality of ME lakes. Provided significant economic benefits by promoting models to positively impact watershed property valuations and sustaining Maine's tourism-based economy.	The lessons learned serve as a national model for developing place-based solutions to environmental problems caused by coupled human natural systems operating at regional and national scales. The extensive collaborations formed through this work have catalyzed interest in lake conservation across the state. Academics from multiple institutions are now collaborating with lake professionals throughout the state to develop solutions to the anthropogenic eutrophication of Maine lakes. This network of passionate, committed, and intellectually engaged scientists, lake managers, and citizens would be difficult to create without the catalytic effects of this grant opportunity.

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	modify, and motivate stakeholder behavior to preserve resilience in the lake. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.		Research has resulted in a statistical abstract that is a collection of data presented in tables, charts, and maps from a variety of sources to provide a snap-shot of important regional characteristics in a consistent format. This document takes a non-traditional approach in reporting information according to the boundaries of a physical land form to provide a unique context in which to tie the socioeconomic linkages that inherently define the communities that exist within the Belgrade Lakes Watershed to their physical environment.	Maine Public Broadcasting Network produced Sustainable Maine: Saving Our Lakes as part of a broader SSI publication plan. Outputs presented at a Belgrade's Special Session at the North American Lake Management Society Meeting in Madison, WI.
Sustaining Quality of Place in the Saco River Estuary through Community Based Ecosystem Management (University of New England) (SSP-21)	Develop and refine ecological and sociological indicators and monitoring methods that integrate and create feedback loops for ecosystem health, community values, and land-use policies and practices in the Saco River estuary. Use a focus on water	Sampled water monthly at established stations; coordinated efforts and shared results with ME DEP. Mapped invasive Phragmites patches to determine genetic similarities among patches, explored flow dynamics for dispersal,	Modeled bacterial concentrations, which vary seasonally in response to precipitation and with land-use, to predict beach closure based on remotely sensed precipitation data. Completed stakeholder engagement via training for climate adaptation planning for municipal staff from Biddeford	Undergraduates worked with the Saco River Corridor Commission and the City of Biddeford to improve water quality testing throughout the year. Developed a new initiative to determine probable causes of an algal bloom in Biddeford Pool.

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	quality to strengthen the coordination between UNE and the Saco River Corridor Commission, along with collaboration and data sharing with ME DEP to develop nutrient criteria for Maine's estuaries. Determine factors contributing to establishment and spread of invasive plant species in tidal wetlands and work with stakeholders in Saco and Biddeford to develop a management plan for controlling their further spread. Create maps showing various sea level rise scenarios in the estuary and the impact of SLR on coastal wetlands and uplands. Work with stakeholders in Biddeford and Saco to develop conservation plan for tidal wetlands under various	and developed management plan. Created shoreland map using methods developed by Pete Slovinsky, ME Geological Survey. Mapped land uses in SLZ and tidal marsh extent from 1962, 1985 and 2003 aerial photos. Sampled nekton, invertebrates, birds in tidal marshes and fish in river to aid in selection of final indicators. Held State of the Science Conference.	and Saco. Mapped changes in land use in the Shoreland Zone over the past 50 years. Developed scientifically rigorous indicators of ecosystem health and outreach materials for disseminating this information.	Explored transport regimes of the invasive plant, *Phragmites australis*, using drifters, tracking devices and genetic analysis, in order to inform future management efforts to prevent its further spread. Created and sustained a collaborative network of people whose combined efforts contribute to the structure and function of the Saco River estuary by connecting human values and actions with the ecological health of the estuary.

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	SLR scenarios. Determine the effectiveness of the Shoreland Zoning ordinance in limiting development in the Shoreland Zone (Biddeford and Saco) and in protecting natural resources. Continue to use Collaborative Learning to engage estuary stakeholders and interdisciplinary researchers in a Community of Practice to bridge cultural, perceptual and cognitive barriers to improved land use practices and policies that sustain valued attributes of the Saco River estuary. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.			

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A Study of Socioeconomic and Ecological Changes Associated With Hemlock Decline and Logging (Unity College) (SSP-22)	Quantitatively summarize stakeholder survey information. Analyze forest inventory analysis (FIA) data and combine into ecological data model development. Conduct field ecological experiments on the effects of disturbance in hemlock forest plots. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	Collected data at all 58 hemlock forest study plots and set up deer exclosure fencing at multiple plots. Extracted GIS and satellite data for Forest Inventory Analysis (FIA) plots using ArcGIS Spatial Analyst Completed survey questionnaire process & prepared for analysis using Tukey-Kramer multiple comparison tests.	Collected environmental and biological data from hemlock forest study plots and girdled 15 plots to mimic the effects of hemlock woolly adelgid. Surveyed Maine residents to assess forest values and management goals (>600 responses).	Survey data analyzed and summarized in a newsletter for stakeholders. Methodology and preliminary results presented at NEARC 2012. Collaborated with the USFS and faculty at UMaine to analyze FIA data that will contribute to a spatial model of hemlock distribution in Maine.
Assessing the Feasibility and Sustainability of Grass Biomass Production in the Central Aroostook Co. Through Research and Stakeholder Partnerships (UMaine-Presque Isle) (SSP-24)	Assess the feasibility of grass biomass production through evaluation of the resource, production economics, and stakeholder interest. Identify local attitudes toward landscape change and best methods to engage discussions and actions toward sustainable landscape change.	Classified and quantified the potential grass biomass area using GIS, satellite imagery, and ground-truthing. Assessed the interest of landowners with 10+ acres in Fort Fairfield in growing grass biomass using key informant interviews and focus group discussions with active farmers, other	Completed land-use analyses based on satellite imagery for Fort Fairfield and shared results with town officials. Completed analysis of landowner surveys and the historical analysis of population and agricultural censuses of 4 towns for 1850-1880 to use as a tool in engaging locals in discussions of future landscape change.	Classified GIS layers by town with statistical summary of survey results. Expanded farm enterprise analysis that quantifies net revenue potential under different scenarios. Yield comparisons for managed versus unmanaged hay plots. Summaries of both individual level and average farm crops produced, yields, and

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	Identify ecological risks and opportunities associated with shifts in land use to grass biomass production. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	landowners, custom operators, and potential biomass consumers. Conducted farm-level economic analysis in collaboration with UM Cooperative Extension. Conducted a test plot to measure yield differences in timothy hay with and without soil amendments. Completed third year of grassland bird surveys and nesting surveys to compare grassland bird use of reed canary grass fields versus control fields managed for grassland birds. Completed analysis of historical land use in Fort Fairfield from 1840-1940.	Measured reed canary grass dispersal from an established plantings.	acreage. Produced a variety of qualitative summaries of historical land uses accessible to public to test how discussions about the past can lead to meaningful discussions about the future.

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Charting the Rangeley Region's Social-Ecological System and Identifying Community Sustainability Strategies (University of Maine-Farmington) (SSP-25)	Conduct aquatic and riparian habitat research in Rangeley Lakes Watershed. Conduct terrestrial plant invasives research. Evaluate regional sustainability practices. Conduct econometric studies to value economic opportunities and environmental amenities related to regional environmental setting. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	Continued evaluation of riparian habitat on shores of ponds and lakes in Rangeley area to establish ecological risks in terms of changes land use patterns. Continued surveys of rare or endangered indicator insect species associated with key wetlands in the Rangeley lakes region. Continued water quality assessment (including D.O. and phosphate conc.) of eight lakes and ponds in the Rangeley Region with an analysis of existing data to determine if additional lakes should be surveyed. Complete shoreline photographic survey of Mooselookmeguntic Lake.	Compiled existing and new field data onto GIS maps and analyzed riparian habitat surrounding 120 ponds and lakes in Rangeley region. Quantified species list and locations of invasive species on road sides, fields, water courses, landscaping sites, and nurseries. Participated in lake remediation efforts and realigned research outputs to an ongoing comprehensive planning process.	In collaboration with stakeholders, expanded and enhanced understanding of the Rangeley region's social-ecological system. Made findings accessible to a broader audience through collaborative design of mobile device applications, a web-based public archive of research and activities, and continuing development of a State of the Lakes report. Developed spatially explicit maps of the distribution of rare and listed endangered species. Provided regional evaluation of water quality in Rangeley's more developed lakes and ponds. Provided shoreline surveys to Rangeley Planning Committee and RLHT summer 2013.

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
		In collaboration with the Rangeley Lakes Heritage Trust (RLHT), surveyed terrestrial plant invasive species in Rangeley area to assess risk to future invasion of lands surrounding the lakes and rivers. Expanded the Rangeley Ways of Taking Care project (RWTC), incorporating interactive functionality, K-A assessment, and multimedia content.		Integrated cadastral mapping and property transaction data into a regional analysis of land ownership change to support hedonic analysis of open space in order to inform future conservation acquisition strategies. Presented findings on lake quality, climate change impacts and sustainability practices at regional and national conferences.
Biomass Energy Resources in the St. John Valley, Aroostook County, Maine: Landscaping Implications and Sustainable Devel. Center (UMaine- Fort Kent) (SSP-26)	Determine market demand for a grass biomass industry in the St. John Valley. Determine producer capabilities for a grass biomass industry in the St. John Valley. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 3.1; and 3.2.	Conducted stakeholder surveys. Held informational meetings and develop stakeholder focus groups. Conducted additional research into local energy resources available for the project.	Stakeholder meeting with farmers/land owners assessed the interest and capacity for grass farming specifically for biomass pellet production. Focus group were used to determine what if any questions farmers may need answered in the future as it pertained to this topic. Conducted a symposium with Mr. Kalvin Ernst, specialist in	Ernst symposium and meeting with 35 farmers/landowners. His presentation allowed farmers to ask pertinent questions about grass varieties, production of both grass and pellets, insect and pest control among others.

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
			biograss seed selection, harvesting, and invasive species as it pertains to seed selection.	
Evaluating Interactions Between Wild Turkeys and Maine Agriculture (University of Maine-Augusta) (SSP-27)	Develop solutions-targeted research that promotes economic development (agriculture and hunting) while protecting ecosystem health and fostering community well-being. Expand capacity for sustainability science research in Maine, including greater collaboration among participating institutions across the region. Develop a cohesive and well-functioning research team and a robust network of stakeholder partnerships to respond to complex human-wildlife interactions. SSI Objectives: 1.1; 1.2, 1.3; 1.4; 2.1; 2.2; 2.3; 2.4; 2.5; 3.1; 3.2; 3.3; and 3.4.	Sampled turkey populations from multiple agricultural sites in Maine using rocket nets and drop nets under the direction of Maine DIFW biologists for microflora and pathogen analysis, and population genetic analysis. Optimized PCR conditions for eight nuclear microsatellite markers specific to *Meleagris* sp. and all data compared with and compiled into the University of Maine Molecular Forensics Laboratory wild turkey database for use in poaching case analysis for the Maine Warden Service. Land classification from 2011 was available from	No clear population-genetic structuring has been observed among Maine wild turkeys, consistent with historic reintroduction trap/transfer activities. Multiple pathogens have been discovered in Maine wild turkeys including *Salmonella* and *Staphylococcus* bacteria. The identification of a coagulase positive *S. saprophyticus* isolate is unusual and PCR testing of skin samples from the clinically ill turkeys was positive for lymphoproliferative disease virus (LPDV) and avian poxvirus. This is the first report of LPDV in Maine wild turkeys. Wild turkeys were analyzed for exposure to select agricultural pathogens and infection with hemoparasites using blood samples. Relevant findings included 23 turkeys with	Assessment of infectious disease in avian wildlife is increasingly important for the management of the resource, as well as possible impacts on agricultural animals. Our data showed that wild turkeys in Maine are an avian reservoir for vector born blood parasites, and may be part of the life cycle of an emerging virus, LPDV. The Maine inland Fisheries and Wildlife department has temporarily halted wild turkey relocation-repopulation programs in Maine due to this result. Stakeholders will benefit from increased access to the project through a new website containing data, forums, citizen science

Portfolio Name (Team #)	YR4 Objectives	Major YR4 Activities	YR Progress/ Significant Results	Key Outcomes
		the Maine State GIS agency. A satellite receiver was attached to the female turkey in March 2012. As a turkey's habitat is normally in wooded areas, there was a realistic expectation that the positional accuracy would be somewhat degraded. Developed a project website and an expanded stakeholder-survey. Analyzed GIS tracking data from one satellite-tagged bird and mapped against habitat-type. Provided a summary of all research-related data to the MDIFW Wild Turkey Working Group and to the Maine Joint Standing Committee on Inland Fisheries and Wildlife. Updates will be provided.	evidence of leukocytozoon infection and 4 contained merozoite-like bodies indicating either leukocytozoon or haemoproteus infection. This is the first recognition of LPDV in Maine wild turkeys.	links and opportunities, and through improved knowledge of the behavior, pathology, patterns of, and stakeholder attitudes (more broadly defined to include community members) toward wild turkeys in the state of Maine. Additionally, a survey design has been refined to obtain data on acceptance capacities of stakeholder groups and community members (to include recreational hunters and enthusiasts, community members, and members of wildlife groups and organizations).

(Note: all portfolio projects also include significant stakeholder collaborations with government, non-profits, business & industry, etc. as well as additional faculty at the participating institutions and collaboration between teams.)

Maine EPSCoR SSI RII: Directory of Research Portfolio Teams

Maine EPSCoR SSI Core Research Projects at UM/USM (NSF support)							
STATUS: A=active; NA=not active; C=combined with another project							
Proj	**YR5**	**YR4**	**YR3**	**YR2**	**YR1**	**Project Title:**	**Institutions & Team Members:**
#1	**A**	**A**	**A**	**A**	**A**	**Protecting Natural Resources at the Community Scale: Using Population Persistence of Vernal Pool Fauna as a Model System to Study Urbanization, Climate Change and Forest Management**	UMaine Faculty: Aram Calhoun, Kathleen Bell, Mac Hunter, Cyndy Loftin Postdoc: Krista Capps Graduate students: Brittany Cline, Luke Groff, Kristine Hoffmann, Vanessa Levesque
#2	**A**	**A**	**A**	**A**	**A**	**Sustainable Urban Regions Project (SURP)**	USM faculty: Charles Colgan, Jack Kartez, Yuseung Kim UMaine faculty: Kathleen Bell, Rob Lilieholm Graduate students: Judy Colby-George, Samantha Brend, Jennifer Rowe, Eric Larrson
#3	**A**	**A**	**A**	**A**	**A**	**Decision Tools to Support Water Resources Sustainability of Managed Lake Systems (Sebago)**	UMaine faculty: Andrew Reeve, Shaleen Jain, Jean MacRae, John Peckenham, Sean Smith USM faculty: Firooza Pavri Postdoc: Crista Straub Graduate students: Mussie Beyene, Brett Gerard, Danielle Martin
#4	**A**	**A**	**A**	**A**	**A**	**People, Landscapes, and Communities (PLACE)**	UMaine faculty: Jessica Leahy, Kathleen Bell, John Daigle, Aaron Weiskettel Graduate students: Michael Quartuch, Emily Silver

Proj	YR5	YR4	YR3	YR2	YR1	Project Title:	Institutions & Team Members:
#5	A	A	A	A	A	**The Knowledge-Action Collaborative**	UMaine faculty: Laura Lindenfeld, Linda Silka, Mario Teisl, Shannon McCoy, Mark Anderson, Caroline Noblet Graduate students: Stacia Dreyer, Bridie McGreavy, Hollie Smith, Brianne Suldovsky, Angela Mercado, Ryan Pickering, Sarah Morehead, Lauren Hawthorne
#6	A	A	A	A	A	**Analysis of Alternative Futures in the Maine Landscape using Spatial Models of Coupled Social and Ecological Systems**	UMaine faculty: Rob Lilieholm, Chris Cronan, Sean Smith UMaine School of Law: Dave Owen Graduate students: Michelle Johnson, Spencer Meyer, Thomas Parr
#7	NA	NA	NA	A	A	**(Combined with #6 from YR3 on)** **Sustaining and Restoring Urban Stream Resources in Maine**	UMaine School of Law: Dave Owen UMaine: Chris Cronan, Laura Lindenfeld, Kevin Simon, Peter Vaux.
#8	NA	NA	NA	A	A	**(Combined with #4 from YR3 on)** **Spatial Forest Planning to Meet Multiple Natural Resource Goals: Developing geospatial tools to forecast management outcomes across a diverse landscape of ownership types and stakeholder interests**	UMaine faculty: Jeremy Wilson, Steven Sader, Jessica Leahy
#9	NA	NA	NA	A	A	**(YR1 & YR2 project only)** **Linking Knowledge with Action: Refining Maine's Mercury Fish Consumption Advisory**	UMaine faculty: Aria Amirbahman, Kathleen Bell, Linda Bacon, Kevin Simon, Steve Norton, Ivan Fernandez
#10	NA	NA	NA	NA	A	**(YR1 project only)** **Development of a Spatial Landscape Simulation Suite**	UMaine faculty: David Hiebeler, Frank Drummond, Jim Wilson, Charlene Donahue

Proj	YR5	YR4	YR3	YR2	YR1	Project Title:	Institutions & Team Members:
#11	A	A	A	A	A	**Adaptation Strategies in a Changing Climate: Maine's Coastal Communities and the Statewide Stakeholder Process**	UMaine faculty: Shaleen Jain, Esperanza Stancioff Postdoc: Nirajan Dhakal
#12	NA	NA	NA	NA	A	**(YR1 project only)** **A Complexity-based Approach to Research-on-Research and Enhanced Systems Outcomes**	UMaine faculty: Terry Porter
#13	A	A	A	A	A	**Mobilizing Diverse Interests to Address Invasive Species Threats to Coupled Natural/Human Systems: The Case of the Emerald Ash Borer in Maine**	UMaine Faculty: Darren Ranco, John Daigle, Bill Livingston Graduate Students: Kara Lorion, Suzanne Greenlaw MIBA: Jennifer Neptune, Theresa Secord
#14	NA	NA	NA	A	A	**(Combined with #5 from YR3 on)** **Modeling Stakeholder Acceptance of Solutions to Environmental Problems**	UMaine faculty: Mario Teisl, Shannon McCoy, Caroline Noblet, Laura Lindenfeld, Jessica Leahy, Linda Silka, Mark Anderson
#15	A	A	A	A	A	**Systems Analysis of SSI: Navigating Perspectives, Paradigms, and Problemscapes (OI)**	UMaine faculty: Susan Gardner, Shannon McCoy Graduate Student: Lauren Hawthorne
#16	NA	NA	NA	A	A	**(Combined with #15 from YR3 on)** **Perceptions of the System and Interdisciplinary Success (RoR)**	UMaine faculty: Shannon McCoy
#17	NA	NA	NA	A	A	**(Combined with #5 from YR3 on)** **Developing a Framework for Linking Researcher and Stakeholder Values with Knowledge to Action Effectiveness (RoR)**	UMaine faculty: Mark Anderson, Mario Teisl, Caroline Noblet
#18	A	A	A	A	A	**Maine Tidal Power Initiative: Linking Knowledge to Action for Responsible Development of Tidal Power**	UMaine faculty: Teresa Johnson, Gayle Zydlewski Postdoc: Jessica Jansujwicz Graduate student: Jeff Vieser

Proj	YR5	YR4	YR3	YR2	YR1	Project Title:	Institutions & Team Members:
SSI Partner Institution (SSP) Research projects for broadening participation and research capacity at Primarily Undergraduate Institutions (NSF support)							
SSP #19	**A**	**A**	**A**	**A**	**A**	**Ecological and Economic Recovery and Sustainability of the Kennebec and Androscoggin Rivers and Their Common Estuary and Nearshore Marine Environment**	Bates: Lynne Lewis & Bev Johnson Bowdoin: John Lichter, Phil Camill, Guillermo Herrera USM: Theo Willis & Karen Wilson
SSP #20	**A**	**A**	**A**	**A**	**A**	**Modeling Resilience and Adaptation in the Belgrade Lakes Watershed**	Colby: Whitney King, Russell Cole, Philip Nyhus, James Fleming, Michael Donihue, Catherine Bevier, Bruce Rueger Other: Peter Kallin, Charlie Baeder (BRCA); Maggie Shannon (COLA); Kathleen Wall (MLRC)
SSP #21	**A**	**A**	**A**	**A**	**A**	**Sustaining Quality of Place in the Saco River Estuary through Community Based Ecosystem Management**	UNE: Pamela Morgan, Christine Feurt, Michel Daley, Noah Perlut, James Sulikowski, Stephen Zeeman, Mark Adams, Anna Bass
SSP #22	**A**	**A**	**A**	**A**	**A**	**Understanding the Relationships Among Biodiversity, Forest Management, and Invasive Species Disturbance**	Unity: Amy Arnett, Erika Latty, Alysa Remsburg, Kathleen Dunckel, Brent Bibles
SSP #23	**NA**	**NA**	**NA**	**A**	**A**	**(Elected not to participate in YR3 on) Developing our Energy Future: A Community-based Research Project**	CoA: J. Gray Cox, Davis Taylor, Don Cass, John Anderson
SSP #24	**A**	**A**	**A**	**A**	**A**	**Modeling Evolving Ecological, Cultural, and Economic Systems of the Aroostook River Watershed of Northern Maine for Sustainable Development**	UMPI: Jason Johnson, Kimberly Sebold, Chunzeng Wang, Cooperative Extension: Andrew Plant Other: David Vail
SSP #25	**A**	**A**	**A**	**A**	**A**	**Promoting Watershed-Based Sustainable Development through Ecological and Socio-Economic Research and Educational Initiatives**	UMF: Matt McCourt, Wendy Harper, Dan Buckley, Ron Butler, Julia Daly, Drew Barton, David Heroux, Chris Bennett

Proj	YR5	YR4	YR3	YR2	YR1	Project Title:	Institutions & Team Members:
SSP #26	**A**	**A**	**A**	**A**	**A**	**Biomass Energy Resources in the St. John Valley, Aroostook County, Maine: Development Potential, Landscape Implications, and Replication Possibilities**	UMFK: John Martin, Leo Trudel, Erica Nadelhaft
SSP #27	**A**	**A**	**A**	**A**	**A**	**Evaluating the Effects of Turkeys on Maine Agriculture**	UMA: Christopher Lage, Peter Milligan, Joseph Szakas, Catherine Turcotte
SSP #28	**NA**	**NA**	**NA**	**NA**	**NA**	**(Elected not to participate)**	UMM
Maine EPSCoR SSI Seed Funding Research Projects (NSF support - newly hired faculty start-up projects)							
#SS-1	**A**	**A**	**A**	**NA**	**NA**	**SES synergy: Finding and applying best practices in socio-ecological systems modeling and outreach**	UMaine Faculty: Tim Waring Graduate students: Sandra Goff, Julia McGuire
#SS-2	**A**	**A**	**A**	**NA**	**NA**	**ECCO (Effects of Climate Change on Organisms)**	UMaine Faculty: Brian McGill Postdoc: Christine Lamanna Graduate student: Jenny Shrum
SSI Core Integration Projects (non-NSF support – leveraging a UMaine voluntary cost contribution)							
#I-1	**NA**	**NA**	**A**	**A**	**NA**	**Lessons from a diverse portfolio: Building applicable knowledge through a multi-method framework for coupled-systems research**	UMaine: Kathleen Bell, Brian McGill, Tim Waring, Jim Wilson
#I-2	**NA**	**NA**	**A**	**A**	**NA**	**An SSI Cyber-Informatics Development Plan**	UMaine: Kate Beard, Shaleen Jain, Brian McGill, Bruce Segee USM: Charles Colgan
#I-3	**NA**	**NA**	**A**	**A**	**NA**	**Application of an Integrative Decision Support Tool and Spatial Modeling to Assess the Implications of Future Growth Scenarios on Sensitive Aquatic Resources in Maine**	UMaine: Rob Lilieholm & Chris Cronan UMaine School of Law: David Owen

Proj	YR5	YR4	YR3	YR2	YR1	Project Title:	Institutions & Team Members:
#I-4	**NA**	**NA**	**A**	**A**	**NA**	**Building Capacity and Coherence: Integration of Socio-Economic Data Collection**	UMaine: Mario Teisl, Caroline Noblet, Shannon McCoy, Mark Anderson, Linda Silka, Laura Lindenfeld, Teresa Johnson, James Acheson, Kathleen Bell USM: Charlie Colgan, Jack Kartez

(Note: Projects also include significant stakeholder collaborations with government, non-profits, business & industry, etc. as well as additional faculty at the participating institutions.)

Updated 6-15-13

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS 09-04155)

YR4 Annual Report – Strategic Plan Goals Detail continued

Goal #5: Diversity ***Engage all aspects of the state's human and institutional resources in the achievement of the RII project goals and objectives.***		
Objective 5.1: Broaden overall participation through increased individual diversity.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 5.1a: Actions increase diversity in directly supported personnel.		
Directly supported participants & new hires	In YR4, of the total number of individuals directly supported (407), 49% were female and 9% were from underrepresented groups. This is an increase over YR3 diversity figures of 48% female and 8% underrepresented groups, and meets or exceeds our targeted benchmarks for YR4 of 36% female and 8% underrepresented.	Increased involvement of women and underrepresented groups in the research project.
Strategic Action 5.1b: Actions increase diversity in indirectly supported outreach participants.		
Indirectly supported participants	Of indirectly supported participants in YR4 (3,016), 53% were female and 9% were from underrepresented groups. This is an increase over YR3 diversity figures of 47% female and 8% underrepresented groups, and meets or exceeds our targeted benchmarks for YR4 of 36% female and 8% underrepresented.	Increased involvement of women and underrepresented groups in STEM education.
Strategic Action 5.1c: Expand Native American program involvement.		
Overall Native Scholar Program	Through the revitalized commitment of two new graduate students, along with their SSI faculty advisor, three new collaborative programs have been implemented during YR4 between SSI, the University of Maine as a whole, and the Wabanaki people. These programs form the foundation for a stronger approach to collaborative STEM education and outreach by integrating each into the other, ultimately increasing the number of contacts, thus increasing the level of impact. Through the Teen Center and AISES, the internship program, and summer practicum, Native youths are currently or soon-to-be, involved in sustainability science-related educational activities and research, as well as mentoring at all	Maine fluctuates between the first and second least diverse state in the nation. With such small numbers, it is even more important that our workforce development efforts be strategic and high-impacting. The foundation laid in YR4 has set up

		levels. In addition to increasing the number of Native people reached this year, this programming is forming new and stronger ties between SSI and the tribes of Maine.	systemic change for education and research efforts between SSI's academic community and the Wabanaki people.
	Native Scholar Program Graduate Students	SSI faculty members and two new SSI Native American Collaborative Research Assistants continued to impact the Native American community, linking research and STEM education with cultural components significant to the Wabanaki peoples. Joshua Crofton-MacDonald joined SSI in the fall of 2012 as a Master's student in ecology & environmental sciences. His primary focus has been starting an AISES chapter at the University of Maine and integrating that group in outreach efforts to the Native community. Tish Carr joined SSI in January of 2013 as a Master's student in forestry. She has taken the lead on workforce development programs with the Penobscot Indian Nation including working with the nation's Teen Center, developing an internship program, and is now working on designing a summer practicum that will reach all of the tribes of Maine.	The SSI Native American Collaborative Research Assistants are integral to Maine EPSCoR and SSI's ability to reach and work with the tribal communities of Maine.
	Penobscot Nation Teen Center TEK Program	Since January 2013, SSI faculty and graduate students, undergraduate members of the American Indian Science & Engineering Society (AISES), and the Penobscot Nation Teen Center staff have been meeting to develop and implement a program focused on engaging middle school and high school students in sustainable science-related activities linked with traditional ecological knowledge (TEK). This spring graduate students and undergraduate AISES members have been and will be conducting SSI research-related activities for Native students in grades 6-12. 16 Native students have participated in the initial sessions so far; a total of 13 sessions are planned through YR4.	Through this program, Native graduate and undergraduate students in STEM have been connected with Native youths in small groups, working on SSI-related activities, giving them impactful mentoring experiences and exposure to fields within SSI.
	Summer Practicum	Currently an SSI Native American Collaborative Research Assistant is developing a long-term program involving Native American students in the life sciences. This August they will be conducting the Northeast Intertribal Summer Practicum. The course will be hosted by the	This program is being designed in order to involve all of the Wabanaki tribes of Maine

		Penobscot Nation with the goal of developing a strong foundation of STEM-related skills, Native American cultural knowledge, and an understanding of sustainable science. Planning of this course has been a collaborative effort by the tribes of the Wabanaki Nation as well as the Native American Fish and Wildlife Society and an SSI graduate student.	in SSI-related activities. This is intended to strengthen relations and open opportunities for further collaboration, for example expansion of the internship program piloted with the Penobscot Nation.
	AISES	SSI faculty and graduate students have been engaging native undergraduate AISES members in a variety of activities to support their STEM-related career goals and increase their awareness and understanding of challenging issues being addressed by researchers as part of the SSI project. Students have been engaged in workshops and conferences to prepare them for jobs in STEM-related careers. AISES students have also been teaching middle and high school students SSI-related science programs through the TEK program with the Penobscot Nation Teen Center (see above).	The University of Maine did not previously have an AISES chapter; now it has an approximately 10-member active community that is eager to expand to include more of the university's Native population in the fall. This group also serves as a valuable mentor resource to each other and the younger Native population through the Penobscot
	Student Internships	Establishing internships for students is the next step after the TEK programs. Planning and implementation of these internship programs is underway. This summer four students will be involved in an internship pilot program. These students will serve with the Penobscot Nation's Department of Natural Resources on SSI-related topics for the summer with internships being extended into the school year for students who wish to carry on with their work. Outcomes from this program will be used to design the internship program for additional students who have been part of the summer practicum. Initial planning for this program was started in the spring and summer of 2013.	These internships are intended to provide "real-world" experience to Native students, giving them opportunities to see how a STEM education could translate into a career in sustainability science that would benefit their tribe.

	Strategic Action 5.1d: Expand programs involving women and girls.		
	NSF ADVANCE: Rising Tide Center	Maine EPSCoR continued to collaborate with UMaine's NSF ADVANCE grant in YR4 by providing travel scholarships to non-UMS STEM faculty to attend their spring conference, as well as filming the keynote and breakout speakers for podcasting online following the event.	Maine EPSCoR's support allowed 3 additional female faculty to attend this event. In addition, allowing the content to be viewed online exposes it to those faculty unable to attend in-person, particularly SSI faculty around the state.
	Maine Girls Collaborative Project	The MGCP has been awarded $10,000 from the National Girls Collaborative Project in order to offer $1,000 mini-grants to collaborating organizations to serve girls in STEM. Maine EPSCoR has committed additional support to provide a second tier of mini-grants ($3,000), which is designed to provide more resources for greater impacts. Collaborations in this category will be charged with providing sustainability science-related programming for girls through more in-depth and integrated activities. Proposals are submitted June 2013 and awards are anticipated for June-July 2013. Maine EPSCoR has continued to partner with MGCP as they embark on their third year NSF award period (5 years). Maine EPSCoR's Program Assistant and Diversity Specialist, Jennifer Dunham, serves as a member of MGCP's Leadership Team and has been participating in the strategic planning activities on how to implement these new focuses, and where Maine EPSCoR involvement and support can be most strategic. In addition, Expanding Your Horizons is now a committee-planned event through MGCP. (See below.)	Involvement with the National Girls Collaborative Project strengthens Maine EPSCoR's ability to create fundamental systemic change for girls engaging in STEM education, particularly girls involved in programs focused on sustainable science initiatives.
	Expanding Your Horizons	During YR4, 484 7th and 8th grade girls participated in the 2013 Expanding Your Horizons Conference at UMaine, which Maine EPSCoR continued to support. Girls attended a full-day conference on pursuing	Provide an opportunity for middle school girls to participate in hands-on

		STEM careers, with each girl attending two workshops on a variety of STEM fields facilitated by primarily female role models in those fields. They also attended a gender equity workshop. Hardy Girls Healthy Women provided programming for the opening session while the Girl Scouts of Maine designed the gender equity workshop that was facilitated by volunteer mentors. Additional support was provided by Maine EPSCoR, the Women's Resource Center, Conference Services, and UMaine graduate students. STEM presenters, volunteer mentors, and gender equity workshop facilitators were recruited from industry, non-profit organizations, and the K-20 community. Concurrently, two educational forums were held for accompanying adults and the general public on campus. The first on serving girls with disabilities was coordinated by Janet May from the University's Center for Community Inclusion & Disability Studies with Jane Disney from the Mount Desert Island Biological Laboratory. The second on serving Native girls was presented by Maria Girouard from the University's Wabanaki Center. The STEM workshops for EYH are designed to introduce middle school girls to a STEM field and career they could consider and otherwise might not be exposed to or encouraged to pursue. The rest of the day is designed to do what the conference title suggests, "expand their horizons", to not let stereotypes, a lack of role models, or any other obstacles stand between them and the career path of their choice. Several of the STEM workshops scheduled this year related to sustainability science. This means that not only were a large number of middle school girls introduced to fields within sustainability science and potentially sparked an interest in those fields, but they were encouraged throughout the day to pursue those interests. This will lead to these girls either entering or remaining in the pipeline and potentially becoming the sustainability scientists of tomorrow.	STEM activities and learn from female role models, in order to encourage aspirations in STEM careers and college education.

		Also, this event is, by its very nature, a recruitment tool for the University of Maine. At a young age, these girls are brought to the university, some for the first time, from around the state and are given a fun, interactive, and educational tour of the campus, as workshops are held throughout. Thus, these students are, in addition to being encouraged to pursue STEM fields, encouraged to study them in Maine, which greatly increases their odds of staying in their home state and entering its STEM workforce. Finally, the adult educational forums better informed parents, teachers, and other adult advocates and role models on how to promote STEM to two uniquely diverse groups, as well as teaching them the importance of promoting STEM to these groups. They were given the opportunity to network and form collaborations with other attendees, both informally and formally, as they were also given information on mini-grant opportunities from the Maine Girls Collaborative Project with additional funding from Maine EPSCoR.	
	Strategic Action 5.1.e: Implement disability and at risk programs		
	Camp CaPella	Building on the 2011 pilot program, in the summer of 2012 Camp CaPella fully integrated sustainable science-related activities into its programming. Termed "Wild Adventures", this segment is now part of each day, every week, for all campers from grade school to adults. With support from Maine EPSCoR, Camp CaPella's Wild Adventures coordinator, a middle school science teacher, has developed curriculum that ties sustainability science to the campers' lake surroundings. Using assistive technology and adapted materials, campers are scientists, learning about the complex world around them, as well as career paths to continue to follow their interests. Over seven weeks of programming, 125 campers with disabilities were impacted. This is 125 people that otherwise would not be given the opportunity to experience scientific inquiry, let alone encouraged to	Through its collaboration with Camp CaPella, Maine EPSCoR is exposing a large number of young people with disabilities to topics and careers related to sustainability science who are often left out of STEM activities in their classrooms, sparking interests otherwise untapped.

		explore and pursue STEM careers. Beth Smyth-Handley, the camps Wild Adventures Coordinator said, in reporting on the success of the program, *"It seems to be inherent to our population of campers to love the outdoors and all it encompasses. However, they are often left out of the experience. When the campers were told they were going to be scientists, they got so excited."* Planning is underway to continue in the summer of 2013.	
	Center for Community Inclusion and Disabilities Studies (CCIDS)	In YR4, Maine EPSCoR's partner CCIDS completed the group workshop sessions with the first cohort, scheduled and implemented individualized planning meetings with those students and families, and developed individual plans to further STEM engagement for the students. They have also connected some of those students with internship mentorship opportunities. Post-intervention data is being collected so that progress of students in the project can be evaluated. Additionally, recruiting for the second cohort began in August 2012, enrollment began in September-November 2012, the initial round of data was collected, and workshops for the second cohort (10 students) began in December 2012. While recruiting cohort two, CCIDS also revised workshop materials based on formal evaluations of the project by cohort one participants and on informal feedback. Two significant changes implemented included increasing the group workshop sessions from three to four days and shortening the length of the sessions from eight to six hours. Sessions were held at a central location (Augusta, Maine) and brought all of the students together. Cohort two workshops were held in December 2012, January, February and March 2013. The process of scheduling individual planning meeting with the students and families is underway. These meetings facilitate preparing for the transition into postsecondary STEM education programs and in identifying appropriate internship and mentorship opportunities. The February 22nd 2013 visit to UMaine STEM programs was a highlight for many of the current students.	At least two students from cohort 1 have been accepted into UMaine STEM programs. Two others have been accepted into community college STEM programs. One of those individuals is planning to enter a University of Maine engineering program after he has completed two years in a community college. For others, who are not seniors, participation in the project helped them clarify their career goals and postsecondary education interests.

		Cohort two has 10 students currently enrolled. Plans have been formulated to add the publication of a “STEM Planning Toolkit” that can be used in other locations to help students with disabilities who are interested in STEM careers plan for the transition from high school to postsecondary education. This toolkit has the potential to impact a greater number of kids who may be reluctant to enroll in the program.	
	Upward Bound	Maine EPSCoR's support of Upward Bound continued in YR4 (summer 2012) as it focused its group research project on climate change and the sustainability of human behaviors. Experts including SSI faculty and graduate students led workshops in the classroom and in the field on sustainability topics spanning human behavior and examining climate change through ice & peat bog coring, and the study of sensitive species. Over the course of 5 weeks the students gained a comprehensive understanding of the effects of climate change coupled with human behavior which they used to write group academic research papers and give group presentations. The students that participate in Upward Bound come from low-income backgrounds and often will be the first generation within their immediate families to attend college. Their schools are often greatly deprived of up-to-date scientific equipment, software programs, etc. Upward Bound gives them access to university laboratories with state-of-the-art equipment, and trained scientists as one-on-one mentors. Maine EPSCoR's support ensures they experience first-hand cutting-edge research that is impacting the state of Maine and beyond. During spring of 2013, planning has been underway for the summer 2013 program, set to begin June 24th. Students will be introduced to the SSI project as a whole through a short presentation at orientation, followed	28 college-preparatory "at-risk" students from both rural Maine and inner-city Southern Maine and Boston gained in-depth knowledge and understanding of a field within sustainability science. Many of the students expressed great interest in climate change and were particularly thoughtful about human impacts and the sustainability of human actions.

	by in-depth presentations and activities from several SSI research teams over the course of two weeks.	

Objective 5.2: Expand institutional and partner diversity in this project (type, geographic, disciplinary)

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
Strategic Action 5.2a: Expand # PUI & community college institutions collaborating		
Academic institution collaborations	During YR4, 13 institutions participated in this project: University of Maine, University of Southern Maine, University of Maine at Augusta, University of Maine at Farmington, University of Maine at Fort Kent, University of Maine at Presque Isle, Bates College, Bowdoin College, Colby College, University of New England, Unity College, Eastern Maine Community College, Maine Maritime Academy	Expanded collaborations with PUI and community college institutions allow for statewide impact.
Strategic Action 5.2b: Increase the number and breadth of stakeholder collaborations		
SSI/SSP institutions with additional collaborators	4 in YR4: Additional faculty at University of Maine, University of Southern Maine, Bowdoin College, University of New England	Increased number and breadth of stakeholder collaborations in research
Institutions of higher education (non-SSI)	Research: 20 in YR4: Arizona State University, Boston University, Clark University, Clemson University, Georgia Institute of Technology, Harvard University, Johns Hopkins University, Leuphana University Lueneburg, Ohio State University, Oregon State University, University of Colorado, University of Guelph, University of Massachusetts Boston, University of New Hampshire, University of South Carolina Beaufort, University of Washington, Yale University, Acadia University, Hirosaki University, Lincoln Institute of Land Policy Workforce Development: 2 in YR4: Eastern Maine Community College, Maine Maritime Academy	Increased number and breadth of stakeholder collaborations in research & workforce development
Industry/business partners	Research: 12 in YR4: E.D. Bessey & Son, Halcyon Marine Hydroelectric, Introspective Systems, Kimberly Ridley, Ocean Renewable Power Company, Pelletco, Portland Water District, Sappi Fine Paper North America, Tidal Energy Device Evaluation Center, TideWalker Associates, Verso Paper, Waterview Consulting Workforce Development: 2 in YR4: Jackson Laboratory, Pierce Atwood LLP	Increased number and breadth of stakeholder collaborations in research & workforce development

	Government & municipal partners	Research: 40 in YR4: Acadia National Park, Ames Laboratory, Androscoggin Valley Council of Governments, Argonne National Laboratory, Bangor City Council, City of Biddeford, City of Ellsworth, City of Saco, City of South Portland, Gulf of Maine Council, Hancock County Planning Commission, Kennebec Valley Council of Governments, Maine Center for Disease Control, Maine Cooperative Fish and Wildlife Research Unit, Maine Department of Environmental Protection, Maine Department of Inland Fisheries and Wildlife, Maine Department of Marine Resources, Maine Department of Transportation, Maine Forest Service, Maine Geological Survey, Maine Local Roads Center, Maine State Planning Office, National Estuarine Research Reserve System, Orono Economic Development Corporation, Rachel Carson National Wildlife Refuge, Saco River Corridor Commission, St Regis Mohawk Tribe, Town of Belgrade, Town of Orono, Town of Topsham, Town of Woolwich, U.S. Department of Energy, Pacific Northwest National Laboratory, United States Geological Survey, US Army Corps of Engineers, US Environmental Protection Agency, US Fish and Wildlife Service, USDA Animal & Plant Health Inspection Service, USDA Forest Service, USDA Natural Resources Conservation Service, USGS Conte Anadromous Fish Lab Workforce Development: 2 in YR4: City of Bangor, Penobscot Nation	Increased number and breadth of stakeholder collaborations in research & workforce development
	Non-profit and other organizations	Research: 41 in YR4: Acadia Learning, Belgrade Farmers Market, Belgrade Lakes Regional Business Group, Belgrade Regional Conservation Alliance, Brunswick-Topsham Land Trust, Center for Ecological Research, Chewonki Foundation, Cobscook Bay Resource Center, Gulf of Maine Research Institute, Indigenous Education Institute, Institute for Civic Leadership, iPlant Collaborative, Kennebec Estuary Land Trust, Kennebec Homeowners' Association, Kennebec River Initiative, Lakes Environmental Association, Lobsters on the Fly, Maine Development Foundation, Maine Discovery Museum, Maine Federation of Farmers Markets, Maine Lakes Resource Center, Maine Medical Center Research Institute, Maine TREE Foundation, Mount Desert Island	Increased number and breadth of stakeholder collaborations in research & workforce development

		Biological Laboratory, National Center for Ecological Analysis & Synthesis, Natural Capital Project, New England Aquarium, North Pond Association, OceansWide, Oregon Museum of Science and Industry, Orono Village Association, Rangeley Lakes Heritage Trust, Rangeley Lakes Region Logging Museum, Saco River Salmon Club, Sheepscot Wellspring Land Alliance, Sierra Club, Maine Chapter, Thanks But No Tank, The Nature Conservancy of Maine, Vaughn Homestead Foundation, Volunteer Lake Monitoring Program, Wells National Estuarine Research Reserve Workforce Development: 3 in YR4: Educate Maine, Holbrook Island Sanctuary, Maine Campus Compact	
	K-12 institutions	Research: 3 in YR4: Maine Academy of Natural Sciences, Rangeley Lakes Regional School, Skowhegan Area Middle School Workforce Development: 5 in YR4: Bangor High School, Hampden Academy, James F. Doughty School, Orono High School, Troy Howard Middle School	Increased number and breadth of stakeholder collaborations in research & workforce development

Goal #6: SSI Workforce Development

Foster the next generation of sustainability science professionals through efforts that are linked to the diverse challenges and opportunities in this emerging field.

Objective 6.1: Provide direct research support for SSI participation & engagement at all levels.

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
a) Support & mentor SSI faculty hires	All four SSI faculty hires (Brian McGill, Sean Smith, Timothy Waring, Yuseung Kim) are actively part of the project. Integration of the faculty continues to be encouraged through funding of projects, providing SSI postdoctoral and graduate student support, providing opportunities for collaboration on integration and core projects, and encouraging participation on committees.	Increased statewide capacity to produce and support sustainability science professionals.
b) Directly support SSI faculty at all participating institutions	During YR4, 89 faculty members at 11 participating colleges and universities throughout the state were directly supported to be part of 20 interdisciplinary research teams engaging in SSI portfolio research.	Support of statewide faculty increases capacity and competitiveness in sustainability science.
c) Support & mentor postdoctoral associates	Five postdoctoral fellows at UM were supported during YR4: Krista Capps, Jessica Jansujwicz, Crista Straub, and Christina Lamanna had started later in YR3, and Nirajan Dhakal started during YR4. These postdocs are collaborating on research with several SSI project teams, and also provide mentorship to SSI graduate and undergraduate students.	Postdocs play an active role in advancing sustainability science research of six SSI teams as well as providing collaborative roles for the team as a whole.
d) Provide graduate student research assistantships & admit new SSI cohorts	A total of 52 graduate research assistantships were supported during YR4 at UMaine (48) and the University of Southern Maine (4). This included support of an incoming cohort of three new SSI PhD students at UMaine in the fall of 2012, which were in addition to 19 continuing SSI PhD cohort students from YR1-3 (these students were all recruited and admitted specifically as SSI students). (Note that many departments provided other sources of funding for graduate students to work on the SSI research.)	Graduate students play an active role in advancing sustainability science research, and are trained in cutting-edge, interdisciplinary sustainability education techniques.

e) Provide undergraduate student research assistantships & other opportunities	A total of 131 undergraduate student research assistantships were supported during YR4 at all participating institutions. (Note: additional students were also indirectly involved i.e. doing SSI research through classes.) There is a continued focus on recruiting more undergraduate students to work directly with the SSI research teams. An additional 34 students participated in research as a component of a college class. Eighteen undergraduate UMF students paired with Rangeley K-12 students are workingtogether to administer, collect, analyze and interpret survey data from the Rangeley Snodeo during the spring and early summer of 2013. Sixteen additional UMF students are conducting water quality assessments, photographic surveys and GIS analysis of aerial photographs as part of their biology class.	Students gain experience working as part of multi-level SSI teams, and are trained in cutting-edge, interdisciplinary sustainability education techniques.
f) Provide high school student research assistantships	Eighteen high school student research assistantships were supported in during summer 2012 (YR4) through the Orono High School workforce development program. Three additional high school student research internships were supported in YR4. The program continues in summer 2013. One additional high school student from Old Town High School has been placed with the Advanced Computer Group and is working on data management.	Students gain experience working as part of multi-level SSI teams, and are trained in cutting-edge, interdisciplinary sustainability education techniques.
g) Support other professional/ technical/ administrative staff	During YR4, an additional 109 technical, professional, and administrative staff were supported on the project throughout the state. This included those involved in research as well as those from workforce development partners and board members. (Note: this is a change in counting for this year to include workforce partners and board members.)	Additional supportive personnel are engaged in the overall research and workforce development enterprise.

Objective 6.2: Engage graduate students in SSI mentoring, programs, and opportunities.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 6.2.a: Develop SSI graduate courses, certificate, service learning, internships, & other programs at UM.		
SSI graduate courses	The “Readings in Sustainability Science” course is the first of the	SSI has created a flexible training

		SSI two-course sequence that had been developed, and was offered in fall 2013. The course was co-taught fall 2012 by Anderson (SSI faculty), Capps (SSI postdoc), and McGreavy (SSI graduate student). This teaching structure created new mentoring opportunities across the faculty-postdoc-graduate spectrum. The second course, "Sustainability Science Research," was not able to be offered spring 2013, as we were unable to locate a critical mass of faculty to co-teach the course. Plans are underway to continue both courses in YR5.	environment for students from different disciplinary departments with differing needs to be able to engage in learning around sustainability science.
	Other sustainability science courses	Thirteen sustainability-related graduate courses taught by SSI faculty were also offered during YR4 including: *Advanced Biometry* (McGill), *Large Scale Ecology* (McGill), *Human Dimensions of Global Change* (Anderson), *Mathematical Models of Social Evolution* (Waring), *Principles of Town Design* (Kim), *Water Resources* (Owen), *Natural Resources* (Owen), *Introduction to Survey Research* (Colgan), *State and Regional Economic Development* (Colgan), *Community Planning Analysis: Land Use* (Kartez), *The American College Professor* (Gardner), *Grant Writing* (Silka), *Critical Zone Processes and Sustainability* (Smith).	SSI has created a flexible training environment for students from different disciplinary departments with differing needs to be able to engage in learning around sustainability science.
	SSI Graduate Certificate	SSI has established a relationship with the Ecology and Environmental Sciences (EES) program, an existing interdisciplinary program based at UMaine, to deliver coursework that supports SSI graduate students. Using this model, a graduate certificate in sustainability science was designed. Unfortunately, as the approval process moved forward, it became clear that this certificate program would not be sustainable over the long-term and it was decided to pursue the certificate through the existing EES program instead. The newly created EES Graduate Advisory Board, which includes four SSI faculty, will pursue this issue as part of their broader review of the EES graduate curriculum this spring. Recommendations from the board are anticipated in fall 2013. The Dean of College of Natural Sciences, Forestry, and	Outcomes pending approval of new graduate certificate.

		Agriculture has expressed his support of a graduate certificate in sustainability science as part of the EES program.	
	Service learning and internships	SSI is collaborating with EES Director Aram Calhoun to establish sustainability internships for students with Maine-based companies. Currently two EES internships programs are available though state-based environmental consulting firms at the undergraduate level. In spring 2013, we have been actively working with Calhoun utilizing SSI's stakeholder network and economic development program to connect more closely with other businesses and industry with the goal of increasing internship and service learning opportunities for students.	Prepare SSI students for future careers in sustainability science areas.
	Strategic Action 6.2.b: Provide formal & informal graduate student mentoring		
	Graduate mentoring	Graduate students continue to meet on a regular basis with the SSI Graduate Coordinator (Anderson), who provides on-going group and individual support and mentorship. SSI faculty provide one-on-one mentorship and meet as a group on a regular basis to discuss lessons learned in advising SSI PhD students.	Multiple levels of mentoring allow for individualization based on needs.
	Presentations at SSI meetings	All students are an active part of interdisciplinary research teams and many students are co-advised. The first cohort of SSI students has presented on their research progress at YR4 All-Team Meetings, providing them with an interdisciplinary forum not encountered at other meetings. A 10-minute Q&A to stimulate research discussion across all team members follows talks.	Graduate students have a thorough understanding of the interdisciplinary nature of sustainability science, and are well prepared for future careers in this area.
	Career development	SSI has actively pursued opportunities for graduate students to participate in career development activities in YR4. These have included: a campus visit (Nov. 2012) with David Secord, Director of Strategic Programs, Tides Canada (seminar and meeting opportunities); a panel discussion on "The Non-Profit Career Track" (Feb. 2013); and a May 2013 graduate course "The American College Professor" offered by SSI faculty Gardner.	Prepare SSI students for future careers in sustainability science areas.

Strategic Action 6.2.c: Support graduate student involvement in SSI & other professional activities.		
Travel Support	21 SSI graduate students received travel support to attend and present at 40 regional and national conferences.	Prepare SSI students for future careers in sustainability science areas.
SSI conference and workshop participation	There were 57 SSI graduate student attendees at 11 SSI-sponsored conferences, workshops and seminars. Highlighted examples include three students who presented (1 oral and 2 poster) at the Maine Water Conference (March 2013), and 23 students who participated in the ME EPSCoR State Conference (September 2012).	Prepare SSI students for future careers in sustainability science areas.

Objective 6.3: Engage undergraduate students in SSI mentoring, programs and opportunities.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 6.3.a: Develop & implement SSI undergraduate curriculum opportunities at UMaine.		
UMaine SSI undergraduate curriculum	In the fall of 2011, UMaine EES Director and SSI faculty member Aram Calhoun initiated a curriculum review and update of the undergraduate EES curriculum. EES is an interdisciplinary program that offers B.S., M.S. and Ph.D. degrees. As part of this process, a new concentration was drafted that addressed the mission of SSI to offer undergraduate training in sustainability science. The new concentration, entitled "*Sustainability, Environmental Policy, and Natural Resource Management,"* reflects a number of newly available courses and a growing interest of the student population in sustainability science. Faculty from a number of disciplines contributed to building this concentration and it offers courses from the School of Economics, School of Biology and Ecology, School of Forest Resources, Department of Wildlife Ecology, Anthropology, and others. The new curriculum was approved by the College of Natural Sciences, Forestry, and Agriculture on February 8, 2013 (YR4) and is in the process of being implemented. The new	Implementation of a sustainability concentration in the EES program is a major step forward in meeting SSI and campus-wide goals in sustainability programming. Undergraduate students have a greater understanding of the interdisciplinary nature of sustainability science, and are better prepared to continue their educational or career paths in a sustainability-related area.

	concentration has already generated a great deal of interest and we anticipate it will be a popular program in the EES and SSI areas.	
Strategic Action 6.3.b: Develop & implement SSI undergraduate curriculum opportunities at participating PUIs.		
Other primarily undergraduate institution curriculum opportunities	Thirty five students participated in the SSI related class *"Sustaining Water"* during the fall and spring semesters at the University of New England. Students conducted a Community Dialogue about Low Impact Development and sustainable stormwater management and created sustainability science outreach products for stakeholder groups. Seventy two students learned about SSI current research that was incorporated into fall and spring Bowdoin courses in Environmental Studies and Economics. The fall course incorporated community based projects on water quality and the spring course included other related community based projects.	Undergraduate students have a greater understanding of the interdisciplinary nature of sustainability science, and are better prepared to continue their educational or career paths in a sustainability-related area.
Statewide sustainability curriculum	Maine EPSCoR Director Vicki Nemeth and Stephen Mulkey, President at Unity College (SSI Partner), continued working with a statewide group that is part of a multi-state collaborative project under a grant from the NSF-funded SESYNC (National Socio-Environmental Synthesis Center). This collaboration is focusing on transforming state undergraduate STEM education through sustainability curriculum and policy changes.	Statewide collaboration in exploring options for sustainability curriculum development.
Strategic Action 6.3.c: Support student involvement in SSI & other professional activities (poster competitions, conferences, etc.)		
Undergraduate travel support	Travel support was provided to 1 undergraduate student to attend a regional/national conference.	Prepare SSI students for future careers in sustainability science areas.
SSI Conference and workshop participation	There were 22 SSI undergraduate student attendees at SSI-sponsored conferences, workshops and seminars, and 11students who participated in the ME EPSCoR State Conference (September 2012).	Prepare SSI students for future careers in sustainability science areas.

Career development activities	During YR4, 131 undergraduate students were directly mentored in research assistantship opportunities by SSI faculty, postdocs, and graduate students.	Prepare SSI students for future careers in sustainability science areas.

Objective 6.4: Support SSI faculty and postdoc development through mentoring, programs, and opportunities.

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
Strategic Action 6.4.a: Support professional development, training, & peer mentoring through formal activities.		
Training opportunities	SSI is collaborating with two UMaine entities to support training and mentoring of SSI faculty, postdoctoral fellows and graduate students: the Center for Excellence in Teaching and Assessment (CETA) and the ADVANCE Rising Tide Center. Both offer regular workshops and conferences on leadership, career advancement, and research and teaching topics, and many have been specially targeted for SSI. Also offered are targeted mentoring programs for new and junior faculty that can be utilized by SSI team members.	Collaborations with CETA and ADVANCE have improved our ability to provide training and mentorship activities to faculty, postdocs and graduate students.
Communications training	Maine EPSCoR project personnel have continued to train additional SSI teams in NSF's "Communicating Science" techniques; in YR4, the three teams participating in MPBN documentaries received this training.	SSI team members have the ability and knowledge to communicate to and work with diverse collaborators, stakeholders and the general public.
Formal mentoring	SSI Research Director David Hart provides formal mentoring to the three UMaine SSI faculty hires and informal mentoring to many other core SSI faculty including partnering faculty at other institutions. SSI faculty Colgan serves in this role for the new faculty hire at USM. Other SSI faculty who provide mentorship to junior team members include Rob Lilieholm, Laura Lindenfeld, Andrew Reeve, Mario Teisl, and Gayle Zydlewski. SSI faculty who are mentoring graduate students participated in a discussion group in March 2013 to explore common issues and best practices.	SSI faculty have a greater understanding of, and comfort with, the interdisciplinary nature of sustainability science. SSI faculty have the ability and knowledge to work with diverse collaborators and stakeholders beyond their field.

Travel Support	13 SSI faculty and postdocs received travel support to attend and present at 23 regional and national conferences.	Grow capacity and competitiveness through professional development opportunities in sustainability science areas.
Strategic Action 6.4.b: Support peer mentorships through informal networking activities.		
Informal mentoring	Informal faculty mentoring partnerships continue to take place across the project. Multiple opportunities are provided that encourage networking and shared-learning across the teams leading to informal partnerships and collaborations. Examples include: team-taught SSI courses; co-mentoring of graduate students and postdocs; committee participation; team meetings and other discussion groups; faculty peer review committees; annual retreat.	Faculty have a greater understanding of the interdisciplinary nature of sustainability science, and are better prepared to continue their career paths in a sustainability-related area.
Collaborative opportunities	Other mentoring opportunities have taken place in YR4 that are focused on active participatory learning in interdisciplinary teamwork – moving faculty from "discussion" to "doing". Examples include: providing incentives to write collaborative proposals and publications; communication trainings for MPBN documentaries; interdisciplinary workshops led by SSI team members such as "Ecology and Evolution" and "Knowledge to Action"; three major interdisciplinary NSF proposals (two IGERT, one RII Track 2), and graduate advisor meetings (lessons learned focus).	SSI faculty have a greater understanding of, and comfort with, the interdisciplinary nature of sustainability science. SSI faculty have the ability and knowledge to work with diverse collaborators and stakeholders beyond their field.
Postdoc mentoring	All postdoctoral advisors use the SSI Postdoctoral Mentoring Plan as a basis for their mentoring of SSI postdoctoral fellows and each has established an individual development plans with the fellow. The overall goal is to provide the skills, knowledge and experience to prepare the postdoctoral researchers to excel in their career path by offering a structured mentoring plan, career planning assistance, and opportunities to learn a number of career skills such as writing grant proposals, teaching students, writing articles for publication and communication skills.	Postdocs have a greater understanding of the interdisciplinary nature of sustainability science, and are better prepared to continue their career paths in a sustainability-related area.

Objective 6.5: SSI interdisciplinary project & team structure fosters collaborative learning, development, and solutions approaches.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 6.5.a: Sponsor SSI seminars, workshops, conferences, research retreats, etc.		
SSI Seminar Committee	The SSI Seminar Committee continues to oversee the process for faculty and students to request sponsorship to bring external speakers to campus for seminars and workshops. Speakers must advance knowledge and learning of SSI goals and objectives. The committee considers requests and recommends appropriate speakers to the Stewardship Council. In general, speakers are co-sponsored by a department, which provides cross-connections and additional resources for SSI. YR4 seminars at UMaine have included:"*Operational Polycentricity: Sustainable Governance and Governance for Sustainability"*, Mike Fotos, Dept. of Political Science, Yale University; "*Can Urban Watersheds be Sustainable"*, Tom Schueler, Chesapeake Stormwater Network; "*Linking sustainability theory and practice: Lessons learned from place-based philanthropy"*, David Secord, Director of Strategic Programs, Tides Canada; "*Communicating Science in the Courtroom: What Scientists Need to Know*", Victor Sher, Vic Sher Law; "*Integrating Biophysical and Economic Data for Ecosystem Service Valuation: From Cooling Water to Coastal Flooding*", Robert J. Johnston, Clark University.	Enhanced training promotes collaborative, interdisciplinary approaches to problem-solving, fosters innovation, and allows for the successful integration of the production of knowledge with solutions. SSI seminars brought in a diverse group of external speakers to engage team members and the larger campus community in shared learning opportunities and experiences.
Grant Writing Workshop	SSI faculty Linda Silka offered a graduate grant-writing course in Spring 2013. The course provided a detailed, hands-on introduction to grant writing.	Students gained valuable skills that will help them in their pursuit of scientific research opportunities.

	SES Workshops	Learning opportunities have included a course on "Ecology and Evolution Across Disciplines" that meets weekly in spring semester. SSI faculty McGill and Waring are actively participating in hosting this workshop. In May, Waring will also host a small collaborative paper and grant-writing workshop on the evolution of sustainability in social-ecological systems. The workshop will provide a unique learning opportunity and special access for graduate students to a productive workshop environment. An SES workshop is also planned for the 2013 Research Retreat in May.	SSI faculty & students gained valuable skills that will help them in their pursuit of scientific research opportunities.
	Knowledge to Action (K-A) Workshops	Based on feedback from the 2012 SSI Retreat, a one-day Knowledge to Action workshop was offered in Dec. 2012. The workshop "Building Connections, Finding Alignment" was led by SSI's K-A Collaborative and included sessions on stakeholder engagement and science communication. Graduate student McGreavy and science writer Ridley have continued to work on developing communication strategies and message triangles to prepare teams who have been selected to be featured in the Maine Public Broadcasting Network "Sustainable Maine" documentaries. A number of SSI team members are also actively participating in CERTS (Community Engaged Research, Teaching and Service). Activities included a free public workshop and discussion on university-community partnerships in February. The guest speaker was SSI stakeholder and Orono Town Planner Evan Richert.	Provided opportunities for learning across the SSI team and the wider Maine EPSCoR community through presentations, panel discussions and informal networking.
	ME EPSCoR Conference	The 2012 Maine EPSCoR State Conference (Sept. 2012) provided unique opportunities for SSI team learning and integration. The theme for the meeting was, "Building Partnerships for Sustainability Solutions." The keynote speaker was Carl Dierker, Regional Counsel, U.S. Environmental Protection Agency Region 1 who spoke on "*Sustainable Solutions for New England*." Other plenary presentations included a talk by David Hart on "*Crossing Multiple Boundaries on the Road to Solutions*" and a presentation by graduate student Bridie McGreavy titled, "*The Role of Research, Social Learning and Innovation in Partnerships for*	The Maine EPSCoR State Conference, "Building Partnerships for Sustainability Solutions" provided opportunities for learning across the SSI team and the wider campus community through presentations and panel discussions.

		Sustainability." This was followed by three panel discussions on the different approaches SSI teams are taking in building effective partnerships. NSF EPSCoR Program Officer Sian Mooney participated in this event and provided valuable feedback to the Maine EPSCoR Management Team and SSI faculty. In addition, Eva Zanzerkia, NSF Program Director, Division of Earth Sciences, Directorate for Geosciences provided an overview of NSF programs and opportunties in this area. She also met individually with SSI researchers throughout the day.	
Strategic Action 6.5.b: Support faculty involvement in SSI & other professional development & team-building activities			
	SSI Team Building	*SSI Team-Building:* Efforts to establish and maintain activities and events to encourage informal networking and build integration and synergy across the team continued in YR4. 1. *SSI All-Team Meetings:* YR4 team meetings have focus on postdoctoral and graduate student research projects with a specific focus on cross-team discussions and learning. 2. *Research Retreat:* Scheduled for May 13-14, 2013. Goal is to provide creative opportunities for teams to learn from each other in major areas of SSI focus such as K-A, SES, OI, solutions, stakeholder engagement, etc. 3. *Other:* Other informal activities designed to build team integration in a more relaxed environment, and included a fall welcome (Sept. 2012), holiday mixer (Dec. 2012), and various networking socials.	Provided opportunities for expanded learning across the SSI team and the wider campus community.
	Living On Earth Conference	October 2012, Maine EPSCoR sent 5 SSI faculty to the "Living on the Earth" workshop in the Virgin Islands. This workshop built on the prior LOE workshop in Alaska that took place in Feb. 2011. The LOE workshops have helped strengthen UMaine's ties with other sustainability science projects funded by EPSCoR.	Provided opportunities for learning across the wider EPSCoR community through presentations, panel discussions, and informal networking opportunities.

Collaboration with UNH	Following a two-day collaboration meeting with a small group of UNH faculty in summer 2012, SSI faculty approached the UNH team in fall 2012 to see if there was interest in developing a proposal for NSF EPSCoR's RII Track 2 solicitation. The collaboration resulted in a joint proposal being selected by UMaine and UNH for submission to NSF. The proposed project is titled, "*Collaborative Research: Strengthening the scientific basis for decision-making: Advancing sustainability science and knowledge-action capacities in coupled coastal systems*". It is anticipated that research collaborations with UNH will continue.	The two-day meeting provided an opportunity for learning across the SSI team and the wider EPSCoR community. As result Maine EPSCoR and NH EPSCoR will be collaborating on upcoming research and SENCER projects.
Travel Support	Travel support was provided for 84 faculty, postdocs, and staff to attend and present at regional and national conferences and workshops.	Provided opportunities for professional development.

Objective 6.6: Engage the state's community colleges and primarily undergraduate colleges in sustainability-related workforce development activities.

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
a) Eastern Maine Community College	Eastern Maine Community College is in the process of developing a new SENCER service learning course that focuses on water quality in urban streams. EMCC faculty from several disciplines will design a course that will introduce sustainability science concepts through water quality monitoring in six streams in Bangor. The College is partnering with the City of Bangor to provide service learning experiences. The project allows EMCC to build connections with community and research partners, and will expose students to real-world issues through civic engagement.	Students will gain knowledge and encouragement to pursue majors and careers in sustainability-related areas.

	b) Maine Maritime Academy	Laurie Flood, Associate Prof. of Engineering, is currently creating curriculum that emphasis research ethics and engineering in the area of sustainable design. This curriculum will be developed for three separate audiences including middle school students, undergraduates, and practicing engineers. All three lessons will be accompanied by hands-on projects for each level of learner. This curriculum will be piloted at MMA for both faculty and current students as well as at a local middle school. Target audiences include: approximately 20 6-8th graders at Adams Elementary School, the 537 undergraduate engineering students at MMA, and 23 engineering professionals at MMA.	Students and faculty will have a better understanding of sustainable science and design.
	c) Southern Maine Community College	Maine EPSCoR is currently working with Southern Maine Community College on two projects: 1) the NSF EPSCoR-Campus Compact-SENCER project; and 2) the SESYNC Strategic Synergies project. During YR5 we will also pursue their involvement in workforce development activities to enhance and expand curriculum around sustainability science.	Maine EPSCoR and SMCC continue to work together to increase STEM related opportunities for students attending Maine's community college students.
	d) Other colleges	Maine EPSCoR staff are engaged in exploring workforce development opportunities with other Maine community colleges and primarily undergraduate institutions who are not current partners.	Maine EPSCoR continues to work to increase STEM related opportunities for students attending Maine's community college students.

Goal #7 General Workforce Development: *Prepare Maine's current and future STEM workforce through coordinated programs, opportunities, training, and knowledge dissemination.*		
Objective 7.1: Implement and support related STEM programs and opportunities that directly engage students and teachers at all levels.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 7.1a: The Maine EPSCoR office works with statewide STEM partners to implement integrated K-20 STEM activities that are related to the sustainability science research focus.		
Cooperative Extension and 4-H	During YR4, Cooperative Extension, 4-H staff, and Maine EPSCoR staff worked to identify and develop opportunities for collaboration. Three SSI research projects were selected to begin developing curriculum and toolkits that will be used throughout Maine by 4-H clubs, after school groups, classroom teachers, and summer camp staff members. Two graduate students, one undergraduate student and four professional teachers will be hired by summer 2013 to develop the SSI related toolkit curriculum featuring 40 SSI research related activities. In the fall of 2013, the curriculum will be tested with youth 2-3 times for a total of 40-120 tests. The kits will be deployed in early 2014, and available for use by a variety of audiences. The two graduate students will conduct a series of 12 professional teacher development toolkit workshops for both formal and informal educators statewide.	With this newly developed partnership, Maine EPSCoR has the potential to provide 1,000 students and 450 educators with curriculum activities related to Sustainable Science during YR5.
Maine Tree Foundation	Maine project Learning Tree will host a yearlong teacher professional development workshop for Maine high school teachers to with work with SSI research teams to learn research methodologies, interdisciplinary practices and integrative approaches that build new learning models for understanding sustainability and engage Maine students in an understanding of economically vibrant communities and healthy ecosystems in Maine. Online tools will be used for follow up as teachers design classroom lessons related to current Sustainability research and practices. Lessons will be peer reviewed.	The workshop will be provided for up to 20 Maine high school teachers from all STEM disciplines Trained teachers will reach between 500 and 1000 ME students.

	Northern Maine Children's Water Festival	Maine EPSCoR partnered with the Mitchell Center to support this event. Approximately 700 4th, 5th, and 6th grade students from across Northern Maine attended a 1-day event that is held at the University of Maine. Water resource professionals provided presentations and activities about water, wetlands, human health, and aquatic life. Teachers were provided materials to assist in curriculum preparation relating to the day.	Students and teachers from across northern Maine (primarily rural and low-income) are exposed to sustainable water practices and education during the day and provided materials for long-term impacts in the classroom.
	Native STEM Scholarship Development Program	See Goal #5: Diversity	
	Programs for women & girls	See Goal #5: Diversity	
	Disability & at-risk programs	See Goal #5: Diversity	
	Community College programs	See Goal #6: SSI Workforce Development	
	Reach Center	During YR4, Maine EPSCoR continued its collaboration with the REACH Center, which is a joint project with Maine Math and Science Alliance (MMSA) and the Maine School of Science and Mathematics (MSSM). Laurie Bragg, Maine EPSCoR's new Outreach and Program Manager has been exploring ways to collaborate with the Reach Center's upcoming efforts in their STEM/sustainability/environment strand. This ongoing partnership can strengthen Maine EPSCoR's ability to support statewide initiatives in STEM education particularly focused on sustainable science and engaging students in real world research.	Maine EPSCoR has a statewide partnership to engage middle school students in educational opportunities focused on SSI related research work.

	Strategic Action 7.1b: Participating SSI Partner institutions also implement integrated K-20 STEM activities that are related to the sustainability science research focus.		
	USM, Bates, Bowdoin SSP Project	Researchers worked with their Upward Bound and MERITS programs to provide opportunities for high school students to participate in research activities during the summer 2013.	This opportunity gave students gained a deeper understanding of their region's social-ecological system and exposure to STEM related career pathways.
	Colby College SSP Project	Four hundred middle school students and their teachers participated in a day-long lakes program at the Maine Lakes Resource Center. Activities included exploring their virtual watershed, classifying shoreline fauna, and water sampling on Great Pond. Undergraduate students also continued to offer an after school program at the Skowhegan Area Middle School. Four undergraduate students served as mentor leaders and ten additional students participated as mentors for participating middle school students. Students focused largely on teaching students about aquatic invasive plants in the Belgrade Lakes area.	This opportunity gave K-16 students in a rural area a unique opportunity to gain a deeper understanding of the real environmental and socio-economic factors facing their communities. By teaching lake management this project is ensuring that the next generation will be active and engaged stewards of the environment and community.
	University of Maine Fort Kent SSP Project	The University of Maine Fort Kent developed an SSI research related documentary with students, which is available online and will be placed on their Center for Rural Sustainability website.	This opportunity gave students gained a deeper understanding of their region's social-ecological system.
	University of Maine Presque Isle SSP Project	UMPI has been developing K-12 curricula integrating historical and current land use, GIS, and grassland ecology with six public school teachers in Fort Fairfield, ME. The project is currently scheduled to perform an online in-service workshop, in collaboration with Central Aroostook Council on Education to provide teachers with curriculum plans based on the SSI integrated research. Chunzeng Wang, Ph.D., Associate Professor of Geology, Environment, Energy, and GIS Faculty member is mentoring	K-12 students will be better prepared to engage in STEM related careers and educational pursuits as a direct result of their teacher's increased understanding and ability to present integrated lessons plans about current environmental challenges.

		three high school students in research related activities. These rural high school students have had the unique opportunity to work directly with SSI faculty and gain a better understanding of their community's socio-economic and environmental challenges.	Students will develop a better understanding of place and ultimately become better stewards of their communities.
	University of New England	A NSF-GK12 fellow is in engaged in teaching SSI-related research related findings at local public schools two days a week.	Students in K-16 also gained a deeper understanding of their region's social-ecological system.
	Unity College	Unity College provided critical professional development for public school teachers and informal educators in Maine. Faculty worked with Project Learning Tree to make sure Sustainable Forestry curriculum is appropriate for audience and doable by high school teachers.	Students of all ages throughout the state will gain a better understanding of sustainable forestry practices as a result of teachers and informal educators being exposed to locally relevant, real world research.
	Strategic Action 7.1.c: Provide high school research internship experiences.		
	Orono High School Research Internship Program	The OHS-UM Research Experience program provided 18, (10 Males, 8 females), Orono High School Students with the opportunity to participate directly in cutting-edge research with faculty teams at the University of Maine in STEM areas. Students worked 30 hours for a minimum of 6 weeks during the summer as active participants of a cutting edge research team. They attended research related meetings, seminars, wrote progress reports, research final report and publically presented their findings. Several Students continued to work on their projects during the course of the YR4 academic year. Thirty UMaine faculty, postdocs, and graduate students participated in the program acting as advisors, mentors and colleagues for participating high school students.	The program both expands their interests if they were not interested in STEM and focuses them if they already were. Each year many of these students subsequently enroll at UMaine, and several are able to continue their internships as undergraduate students, as faculty have actively taken on a mentor role with them.

	During the 2013 summer, 21 Orono High School students will participate directly in cutting-edge research while at the same time increase their understanding of sustainable science initiatives.	
Cyberinfrastructure internships	Currently, one Old Town high school student is working as an intern with Bruce Segee, UMaine Associate Professor of Electrical and Computer Engineering to develop online tolls to search and process SSI research data by teachers and students in K-20 classrooms.	The program both expands their interests in STEM and provides a hands-on research experience.

Objective 7.2: Promote Professional and leadership development for educators in STEM, and foster STEM approaches and activities that value prior learning across subjects.

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
Strategic Action 7.2.a: Support STEM opportunities for K – 12 & pre-service teachers		
Maine Center for Research in STEM Education (RiSE)	The conference **"**Integrating STEM Education Research into Teaching: Knowledge of Student Ideas" was held June 20th-22nd, 2012 on the campus of UMaine in Orono. This conference provided a program of in-depth workshops and panels to communicate and discuss findings and best practices in teaching STEM disciplines, with an emphasis on understanding student thinking and incorporating current SSI research related content into their curriculum. The conference 73 teachers attended, 10 pre-service teachers, and 50 researchers attended. There was a poster session and 17 workshops conducted. These 73 teachers taught approximately 4,818 students during the 2012-2013 academic year. Currently, plans are underway to hold a June 2013 statewide conference for teachers and researchers on the UMaine Campus to continue to provide teachers with STEM best practices and incorporating current SSI research related content into their curriculum.	83% indicated that the conference was very beneficial in understanding how discipline-based education research is being conducted and how this research is influencing K-16+ curriculum and instruction to improve student learning. 65.4% felt that providing hands-on exploration of research-based curricula that brings cutting edge STEM content into classrooms was important. 78% felt they were introduced to new resources. 65% felt encouraged to read and study more in their teaching

			disciplines. 68% felt supported to make changes to topics taught.
	Project Reach	Several SSI faculty, SSI Research Project Director David Hart and Maine EPSCoR Director, Vicki Nemeth have been collaborating on this U.S. Department of Education National Professional Development Program. This statewide project addresses the special needs of Maine's English Learner populations in regard to STEM education with a particular focus on skills for sustainability science fields, by providing professional development for pre-service and in-service teachers during the summer of 2013. Professional development courses will be offered during 2013 thru 2014 to teachers throughout the state to improve their ability to teach Maine's English Learner populations STEM related skills and increase their awareness of local issues being addressed by Maine EPSCoR's SSI research project.	Teacher professional development creates opportunities for Maine's English Learner populations to increase their understanding of STEM related skills and broaden their understanding issues being addressed by Maine EPSCoR's SSI research project.
	Biogeomon 2012	The 7th International Symposium on Ecosystem Behavior, Biogeomon, was hosted by UMaine's Climate Change Institute in July 2012. Fourteen teachers attended the conference and participated in a one day teacher-focused workshop. These teachers worked in small groups with 7 scientists to develop data literacy skills using authentic datasets. The workshop culminated with each group creating a "data story" that they performed and recorded on video to use in their classroom. Over 930 students have been taught data literacy this during the 2012-2013 school year by the 14 teachers who participated in this workshop. Currently, two teachers have presented workshops to their colleagues. Seven teachers have continued to pursue an understanding of data literacy by participating in other teacher professional development courses held by UMaine faculty as a result of attending this course.	Teachers who participated in and completed this workshop had a rare opportunity to work one-on-one with SSI researchers. They gained a better understanding of biogeochemistry, learned how to design research questions, developed their data literacy skills and created "data stories" based on real problems facing the state of Maine for their students.

Objective 7.3: Take a leadership role in working with partners throughout the state to build integrate, and implement best practices in STEM		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 7.3.a: Conduct STEM baseline & impact studies related to STEM education.		
STEM baseline & impact studies	Maine EPSCoR, Department of Labor and the Department of Education had created a partnership to expand upon the four baseline STEM Education studies that had previously been conducted by Maine EPSCoR in 2012. Due to recent budget cuts to Maine's Department of Labor and Department of Education, work to identify trends and impacts in student STEM participation longitudinal study have been halted. Work on this joint effort will be resumed when funding has been restored.	The initial groundwork to create a robust roadmap for Maine's STEM education has been created. Policies and procedures have been enacted and partnerships have been formed to ensure that subsequent STEM efforts in the state can have an impact on students.
Strategic Action 7.3.b: Work with other statewide groups in strategic planning, coordination, and program implementation for STEM education and workforce development.		
Maine STEM Collaborative	The Maine STEM Collaborative aims to build, integrate, and implement best practices in STEM across Maine. In order to have a greater effect on statewide STEM workforce development and education, Maine EPSCoR is a key member of the Collaborative, which is comprised of members from the education, research, business, government, and nonprofit sectors to foster improvement of STEM education in the state. In January 2013, Laurie Bragg, Maine EPSCoR's new Outreach and Program Manager, was newly elected to join the STEM Collaborative as a member of the advisory council. In the Spring of 2013, Maine EPSCoR led the efforts to publish the most recent Maine STEM SUMMIT Report on behalf of the STEM Collaborative. This document will be used to promote best practices amongst Maine's educators. Laurie continues to work with this group to advance mutual STEM educational goals for the state. Planning is underway for the 2014 STEM Summit.	Maine EPSCoR and the Maine STEM Collaborative thru public outreach and communications increased public awareness for the critical need of STEM educational opportunities for the students in Maine.

	Educate Maine & Project Login	In January 2013, Laurie Bragg, Maine EPSCoR's new Outreach and Program Manager, was appointed to join the Educate Maine and Project Login statewide committee. This committee was responsible for implementing a new website and creating opportunities for students 9 -20 to participate in STEM related internship opportunities. Currently, the committee is reorganizing to begin planning for phase two of their goals to increase the number of students graduating with STEM related majors in the state of Maine.	Improving student performance in Science, Technology, Math and Engineering is necessary for the future of Maine. This online database can serve as a clearinghouse for STEM activities for the state and provide pathways for students to engage in STEM careers.
	Maine STEM Database	During YR4, UMaine's Foster Student Center for Innovation, the Reach Center, and Maine EPSCoR collaborated together to produce a pilot for an online STEM database for students. This database includes STEM organizations and opportunities, and is searchable in a variety of ways and addresses a critical need of knowing who is doing what throughout the state. Further exploration on the best ways to develop a "definitive" database for the state continues, as there are several other partners engaging in similar efforts.	Improving student performance in Science, Technology, Math and Engineering is necessary for the future of Maine. This online database can serve as a clearinghouse for STEM activities for the state and provide pathways for students to engage in STEM activities throughout the year.
	Maine Department of Education	Maine EPSCoR continues to explore potential strategies based on Maine's Environmental Literacy Plan and the state Department of Education's STEM Strategic Plan. Maine EPSCoR has developed key partnerships with state and nationally recognized organizations working to improve STEM education for students of all ages throughout Maine.	Maine EPSCoR has developed key partnerships that will continue to work together past the funding cycle of the grant to develop an environmentally literate citizenry who engage in sustainable practices.

	SESYNC S3	Maine EPSCoR continues to work with the statewide SESYNC funded S3 group on policy & programs for undergraduate sustainability to develop curriculum to increase the number of Maine students enrolling and graduating in STEM related fields.	Increased network for STEM education statewide.
	SENCER and Campus Compact	Maine EPSCoR continues to partner closely with Maine Campus Compact and SENCER to increase student involvement in STEM related careers and sustainability science and research, by training faculty to incorporate real world problem solving, research and transformative experiences for students into their curriculum. Currently, Maine EPSCoR and Campus Compact are hosting a Presidential Summit in June 2013 for all Maine college presidents as well as planning for upcoming events in YR5 including statewide faculty training and workshops.	Increased network for STEM education statewide. Increased number of faculty trained to incorporate research into their curriculum with a focus on sustainable science.

Goal #8: Cyberinfrastructure

Utilize cyberinfrastructure to improve communication, collaboration, visualization, and data management capabilities that enable innovation and competitiveness in the sustainability science focus area.

Objective 8.1: Expand statewide cyberinfrastructure capabilities through upgraded high bandwidth fiber interconnections, hardware, and CI support.

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
Strategic Action 8.1a: Expand SSI researcher CI capabilities through upgraded hardware & other.		
Install switchgear modules	Completing the installation of high bandwidth Gigabyte Ethernet switchgear modules at 2-4 additional UMaine SSI researcher buildings to take advantage of the upgraded high-speed bandwidth now available in the state over MaineREN network. (Completes 5-year benchmarks for this strategy.)	Facilitate virtual collaboration opportunities for more SSI researchers.
Advanced Computing Group & high performance/cloud computing	Maine EPSCoR assisted in the process to formally establish the Advanced Computing Group for the University of Maine System, which had been operating ad hoc for 10 years. This group serves the supercomputing, visualization, data, and cloud needs for UMaine (flagship PhD institution) and the six other PUI campuses of the UMaine System. They manage the new high performance computer that was installed at UMaine in 2012, and is available for all SSI researchers and students throughout the state to utilize.	Provides a permanent & effective organizational structure that allows for on-going CI support for Maine EPSCoR SSI researchers.
Strategic Action 8.1b: Create a cloud cluster environment for SSI researcher and student use.		
Add additional cloud cluster capacity	Need identified for additional large capacity, long-term cloud storage on the Advanced Computing Group supercomputer system: 324 TB raw/250 TB usable storage array installed spring 2013 for SSI researcher use (cloud hosts multiple DSpace, Geoportal, and web servers for SSI).	Enhanced cloud cluster environment in place for SSI shared data handling and intranet.
Provide relevant training to SSI researchers & students	Two introductory workshops were held in spring 2013 on Cloud Computing and High Performance Computing (22 participants). Additional workshops to follow in YR5. Advanced Computing Group personnel also presented at SSI All-Team meetings, YR4 SSI Research Retreat (spring 2013), and one-on-one meetings with SSI researchers.	Encouraged expanded utilization of cloud cluster resources & capabilities by SSI researchers and students.

Objective 8.2: Provide new communications and visualization tools.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 8.2a: Deploy large scale visualization capabilities.		
SSI Communications Center vWall	During the YR3 construction phase, a large-scale visualization wall had been installed in the newly created SSI Communications Center. During YR4, the system was tested and made operational. An introductory training session was held in spring 2013 for 7 SSI participants. Additional workshops will follow in YR5, and our Advanced Computing Group personnel are working one-on-one with SSI researchers to demonstrate utilization potential. The installation of additional vWalls is pending an analysis of SSI needs for additional capacity, as upgraded, high performance 3D visualization capabilities were part of the new Advanced Computing Group's new supercomputer, and will benefit SSI.	Visualization capabilities allow for greater data resolution & understanding for SSI researchers and students.
Strategic Action 8.2b: Videoconference and other communication capabilities available at all SSI partners.		
Expand videoconferencing capabilities	To take advantage of the upgraded videoconferencing capacity and new high-speed bandwidth now available in the state, continued to provide Movi licenses to statewide SSI researchers, as well as webcams and training. Will continue during YR5 for additional researchers.	Increased virtual collaboration capabilities for SSI researchers throughout the state.
SSI Communications Center	The new SSI Communications Center created in YR3 continues to be refined for multiple purposes, and is utilized on an almost daily basis for videoconferencing and virtual collaboration.	Increased virtual collaboration capabilities for SSI researchers throughout the state.

Objective 8.3: Develop systems for data handling across the SSI portfolio and institutions.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 8.3a: Create and implement the SSI data management plan.		
New hires to implement data strategies	Based on YR3 recommendations from the SSI Cyberinformatics Group, Maine EPSCoR worked with the Advanced Computing Group in YR4 to conduct a national search and hire two new CI professionals who will support the SSI research initiative full-time through the end of the grant period, and part-time beyond that. A Data Outreach Specialist (Ami Gaspar) and a Data Specialist (Chris Wilson) were hired onto the project in March 2013, and are 50% supported by Maine EPSCoR in order to achieve our data management plan objectives for SSI.	Effective support infrastructure in place to implement final stages of SSI data management plan
Provide training for SSI researchers & students	An introductory workshop in Data Management was held in spring 2013 (9 participants). Additional workshops to follow in YR5. Advanced Computing Group personnel also presented at SSI All-Team meetings, YR4 SSI Research Retreat (spring 2013), and one-on-one meetings with SSI researchers.	Encouraged expanded knowledge of data management resources & capabilities by SSI researchers and students.
Advanced Computing Group infrastructure	During YR4, the Advanced Computing Group submitted 4 grant proposals (total over $5M) in order to asses statewide data needs and significantly increase the diversity and magnitude of the computing, data storage, and visualization resources that would be available to SSI researchers and students throughout the state.	Work to build effective CI supporting infrastructure for SSI research.
Strategic Action 8.3b: Utilize a common data storage server for all SSI data.		
Refine needs analysis	The new Data Outreach Specialist and Data Specialist have begun meeting with SSI teams to make a final determination of their data needs and usage. (The initial needs analysis was done by an SSI CI group in YR3.) This will drive the refinement and re-development of the data integration system in YR5.	Provides an accurate assessment of SSI research data needs & usage.

	Expansion of data management capabilities	Based on the findings from the above meetings with SSI teams, the Data Outreach Specialist and Data Specialist are working to refine the existing DSpace data systems, and to develop a new Maine Dataverse Network system. This new system will dovetail with the existing DSpace system, offer multiple levels of data sharing, and offers a more convenient and secure system for archiving and sharing data. They are also working to develop the necessary data protocols, and the researcher & public portals for data access. Work will continue during YR5 to finalize all aspects and incorporate all SSI research data onto this data network.	Expanded platform and support for data management provides an effective strategy for achieving data management goals by June 2014.

Goal #9: External Engagement Create and maintain an effective outreach and communication network through strategies that engage project participants, stakeholders, and the general public.		
Objective 9.1: Establish communication networks that allow for two-way sharing, and for general information dissemination about the SSI research.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 9.1a: Build and maintain active partnerships between researchers and stakeholders.		
Stakeholder partnerships	This is a major component already embedded in the SSI research. As a result, faculty and students have held over 120 formal and informal meetings with stakeholders across the state to discuss the SSI project and related interests. In addition, SSI faculty and students have participated in numerous local and state activities to disseminate information about the project.	Effective communication networks enable successful collaboration and sharing of ideas and information with stakeholders.
Strategic Action 9.1b: Develop and implement SSI research communication plan media activities.		
Branding	An SSI "brand" and logo have been established and are used throughout the project including for publications, email communications, website (new), displays, etc. During YR4, UMaine revisions in branding required us to re-visit how SSI & Maine EPSCoR branding worked in conjunction with the University of Maine brand.	Consistent messaging and program recognition.
SSI Newsletter	The second edition of the SSI Solutions newsletter was published in August 2012. The newsletter was distributed in print to our mailing list and posted to the SSI website with notification to the email distribution list. All key stakeholders (stakeholders directly partnering with project teams) and team members received a copy of the newsletter. Solutions is also available to other interested stakeholders and is distributed at SSI seminars and events. The next edition is scheduled for publication in late spring 2013.	Stakeholders gain greater understanding of sustainability science issues and what SSI is doing to find solutions to the challenges.
SSI External Website	The SSI website at http://www.umaine.edu/sustainabilitysolutions/ has general information and updates on SSI research projects and progress. Due to implementation of new branding policies at UMaine, construction of a new SSI external website was put on hold. The plan is now to merge the SSI external site with the Mitchell Center website over the summer for a fall launch date.	Stakeholders gain greater understanding of sustainability science issues and what SSI is doing to find solutions to the challenges.

Other websites	Seven additional websites provide information to stakeholders and the general public regarding SSI research and education projects. These sites are listed under the "Products" section of the report.	Stakeholders gain greater understanding of sustainability science issues and what SSI is doing to find solutions to the challenges.
E-mail communications	We continue to communicate on a regular basis with our email subscription list of 1,700 contacts via MailChimp. Mailings to the list occur once or twice per month and include short-term news and events and other items of interest to our stakeholders and subscribers (14 sent to date).	Stakeholders gain greater understanding of sustainability science issues and what SSI is doing to find solutions to the challenges.
Communications consultant	A freelance writer continues to assist the SSI team with various materials that are written for a public audience. This includes research project summaries, Solutions, and faculty and student profiles.	Professional and clear messaging.
Other communications	Other on-going communication projects for YR4 include maintenance and expansion of the database, maintenance and update of the SSI website, and updates of printed materials for public distribution including faculty and student profiles. An SSI brochure is available for distribution.	Stakeholders gain greater understanding of sustainability science issues and what SSI is doing to find solutions to the challenges.
Strategic Action 9.1c: Disseminate research updates through presentations, conferences, etc.		
Annual SSI conference	SSI partnered with the Maine Water Conference (MWC) on March 19, 2013 to provide a forum for dissemination of research information and project progress. The MWC provides an opportunity for SSI teams to present and discuss their research with a diverse audience of stakeholders including representatives from academia, NGOs, private sector, and government. Of the 185 participants, over 30 SSI team members participated in the conference. Presentations (oral and poster) included three SSI graduate students and 12 SSI undergraduate students.	Researchers and stakeholders gain greater understanding of sustainability science issues and what SSI is doing to find solutions to the challenges.

Mitchell Lecture	Pamela Matson, Dean of the School of Earth Sciences at Stanford University, was the keynote speaker at the 2012 Senator George J. Mitchell Lecture on Sustainability that took place on September 25, 2012. Dr. Matson's talk was titled, "A Call to Arms for a Transition to Sustainability". This is an annual, top-level campus event which attracts over 450 people. A key goal is to attract external stakeholders to campus for the event. External participants represented 25% of attendees at the 2012 lecture.	Researchers and stakeholders gain greater understanding of sustainability science issues.

Objective 9.2: Disseminate and communicate research results to the scientific community		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 9.2a: Engage in standard scholarly research outputs,		
Publications	During YR4, SSI researchers across all institutions produced 110 peer-reviewed journal articles related to their SSI research; 20 abstracts; 15 book chapters; 13 technical reports; 1 magazine article; 8 proceedings; 2 books; 5 other publications/products; 51 posters; and 14 newsletters.	SSI is established as a successful model for creating place-based collaborations and synergies in sustainability science
Technical presentations	During YR4, SSI researchers gave 103 technical presentations at the state, regional, and national level.	SSI is established as a successful model for creating place-based collaborations and synergies in sustainability science
Strategic Action 9.2b: Sponsor and participate in conferences.		
AAAS Symposium	At the annual meeting of the American Association for the Advancement of Science (AAAS) in Boston on February 18th, SSI led a symposium focused on innovative university programs designed to address the challenges of sustainable development. The symposium included presentations by six academic leaders from across the U.S. who are immersed in, and learning from, novel institutional strategies for developing solutions to pressing societal problems at the intersection of economic, social, and environmental issues. Following the presentations, speakers participated in a panel discussion highlighting the best practices that are emerging.	SSI led a dynamic session at AAAS, providing it with visibility in a nationwide context as a leading institution developing solutions to pressing societal problems.

Maine EPSCoR State Conference	This annual event was held in September 2012 for 151 participants from throughout the state including: 39 faculty, 28 professional/technical/ administrative personnel, 26 graduate students, 17 undergraduate students, and 17 stakeholders. (See Goal 6.5a)	Share lessons learned, best practices, and creative solutions with a broad audience.
UMaine Presentations	SSI faculty, postdoctoral fellows and graduate students have given over 30 talks to the UMaine campus & System community during YR4. Many were also available virtually, or videotaped for on-line podcasting.	Provides visibility to the center and establishes SSI as a model for creating place-based collaborations and synergies in sustainability science.
National NSF EPSCoR workshop	A full proposal is in process for submission to NSF EPSCoR for consideration to sponsor a national conference in spring/summer 2014 that focuses on sustainability issues.	The conference will provide visibility in a nationwide context as a leading institution developing solutions to pressing societal problems.
Strategic Action 9.2c: Host visiting scholars.		
Visiting scholars	This series has brought five external speakers to campus in YR4 and Pam Matson for the Mitchell Lecture. A key component of these visits is to provide an opportunity for speakers to spend at least two days on-campus so there are ample opportunities for faculty with shared interests to meet and learn with them. Professional development opportunities for graduate students and postdoctoral fellows are also built into these visits. (See Goal 6 and 9)	The seminar series provides professional development opportunities for graduate students and postdoctoral fellows.

Objective 9.3: Build scientific literacy for the general public and K-12 community in areas related to the sustainability science research focus

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
Strategic Action 9.3a: Collaborate with MPBN on SSI documentary series.		
YR2-3 documentaries	Maine EPSCoR continued it partnership with the Maine Public Broadcasting Network (MPBN) to produce documentaries for the "Sustainable Maine" series about SSI research. During YR4, 3 additional documentaries were	General public gains a greater understanding of how sustainability

		produced. All of the episodes in the "Sustainable Maine" series are available online at MPBN's website: (http://www.mpbn.net/Television/LocalTelevisionPrograms/SustainableMaine.aspx). Links are also available from the Maine EPSCoR and SSI websites, and from the Maine EPSCoR Facebook page. Accompanying activities include additional videocasts and links to research project materials and faculty profiles. Maine EPSCoR will also seek to develop related K-12 curriculum materials to accompany the episodes. The three episodes created during YR3 premiered in fall 2012 (YR4) – "Saving Our Lakes", "Basket Trees", and "Pools, Policies and People". All three also aired again throughout the year, as did the YR2 documentaries. Each documentary was nominated for New England Regional Emmy awards. Maine EPSCoR distributed 100 copies of each episode, and there were 10 DVD requests to purchase the programs through MPBN. For the YR2 & YR3 documentaries, the following downloads and page views were logged on MPBN's website: 1,328 – Sustainability Maine webpage unique views 774 – Desperate Alewives 593 – Saving Our Lakes 450 – Triple Bottom Line 441 – Basket Trees 347 – Pools, Policies and People Unfortunately we will not be continuing with this series in YR5, as MPBN had to lay off all of their local TV production staff due to severe budget cuts.	science issues relate to their lives, and what SSI is doing to find solutions to the challenges. (Estimated 190,000 viewers watch MPBN Television each week.)
	YR4: "Return of a River"	The first YR4 episode, "Return of a River" shows how the Saco River estuary has become a laboratory where scientists, students, and community members are working together to examine the economic impact of a cleaner estuary and to find ways to safeguard it's future for the region's people, economy, and returning wildlife. Maine EPSCoR through the Sustainability Solutions Initiative (SSI) is partnering with the University of New England to conduct this research. The Saco River watershed is the largest watershed in Southern Maine, encompassing more than 1,500 square miles. Will air fall 2013, and up to 100 DVD copies will be made for distribution.	General public gains greater understanding of how sustainability science issues relate to their lives, and what SSI is doing to find solutions to the challenges.

	YR4: "Culvert Operations"	The second YR4 episode, "Culvert Operations" describes how Maine EPSCoR at the University of Maine through the Sustainability Solutions Initiative (SSI) is studying ways to help Maine's coastal communities adapt to climate change, plan and design for the future, and minimize damage from future storms. Will air fall 2013, and up to 100 DVD copies will be made for distribution.	General public gains greater understanding of how sustainability science issues relate to their lives, and what SSI is doing to find solutions to the challenges.
	YR4: "Preserving Paradise"	The third YR4 episode, "Preserving Paradise" shows the importance of a technique called alternative futures modeling to simulate how different land use policies, changing demographics, and other key variables could affect the Maine landscape. The process and models the UMaine SSI researchers are creating synthesize human knowledge and complex data from many sources to generate computerized maps that will help users identify land most suitable for various purposes including development, conservation, and working forests and farmlands. These models also will help users identify potential compatibilities and conflicts in land use. Will air in fall 2013, and up to 100 DVD copies will be made for distribution.	General public gains greater understanding of how sustainability science issues relate to their lives, and what SSI is doing to find solutions to the challenges.
	Strategic Action 9.3b Develop and manage project web & social media presence.		
	Maine EPSCoR website	Maine EPSCoR is currently in the process of developing an overall communications strategy which includes redevelopment of the Maine EPSCoR website and expansion of its social media presence. Its current website is located at www.umaine.edu.epscor. Maine EPSCoR also continues to maintain the Maine STEM Collaborative website (www.umaine.edu/epscor/STEMCollab.htm). Also underway are plans to better track access and use of the Maine EPSCoR websites through Google Analytics or other similar source program.	General public gains greater understanding of how sustainability science issues relate to their lives, and what SSI is doing to find solutions to the challenges.
	Maine EPSCoR social media	Work has begun to enhance its Facebook page by adding University of Maine associated sites, project partners, stakeholder groups, other EPSCoR states, NSF-related pages, and others to the list of groups/pages "liked" by the page. The number of "likes" by individuals increased from 39 to 112 in four months. Engagement with the site has improved as more content is added. Maine EPSCoR has established a Twitter account and will be working on incorporating use of this social media	Facebook expands outreach and knowledge of the Sustainability Solutions Initiative and STEM education for the general public.

	Strategic Action 9.3c Develop and implement other communication strategy activities.		
	Overall communications strategy	With the addition to the Maine EPSCoR staff in January 2013 of a new Communications and Program Coordinator, Andrea Littlefield, we are now in the process of re-organizing and re-developing an overall communications strategy which includes planning for regular communications vehicles through many channels to reach a variety of audiences.	General public gains greater understanding of how sustainability science issues relate to their lives, and what SSI is doing to find solutions to the challenges.
	Maine EPSCoR Newsletter	Maine EPSCoR produced a fall 2012 newsletter (1,000 hard copies distributed, plus on-line and e-mail) and has begun planning for the next edition of the newsletter for release in the summer of 2013.	General public gains greater understanding of how sustainability science issues relate to their lives, and what SSI is doing to find solutions to the challenges.
	Videos	Maine EPSCoR continued video production to help showcase SSI research and workforce development activities. During YR4, work began on several short videos that will be completed in YR5: a 20-30 minute video that highlights the overall SSI research activities; Orono High School Internship Program; Camp Capella summer camp for disabled individuals; Upward Bound program; additional videos highlighting students, faculty, postdocs, and others involved in Maine EPSCoR programs. Distribution of the videos will be through a variety of channels including the Maine EPSCoR website, YouTube, Vimeo, Facebook, and Twitter to reach the broadest audiences. As a result of participation in the Becoming the Messenger workshop at NSF's January meeting in Delaware, Maine EPSCoR also went through the exercise of creating a 3 minute video describing and illustrating its economic benefit to the state of Maine, and will finalize this.	General public gains greater understanding of how sustainability science issues relate to their lives, and what SSI is doing to find solutions to the challenges.
	Other materials	General Maine EPSCoR brochures, presentations, posters, exhibits, etc. continue to be produced as needed and utilized in numerous venues.	Add to the overall effectiveness of the communications strategy.

Goal #10: Evaluation & Assessment *Employ multiple qualitative and quantitative evaluation processes to improve project effectiveness and assess achievement toward goals.*		
Objective 10.1: Utilize external evaluators to assess the project's performance, with a particular focus on the evolution and outcomes of collaborative relationships, student integration in the research process, and external stakeholder interaction		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 10.1a: Annual assessment of overall project performance.		
SSI faculty interviews	External evaluators Julia Melkers, Georgia Institute of Technology, and Eric Welch, University of Illinois Chicago, conducted a set of semi-structured interviews with key faculty across SSI institutions during a February 2013 site visit. The primary purpose of these interviews was to address the interaction with external stakeholders, the role of the social science team in facilitating and enhancing those and other collaborative interactions, capacity development in interacting with applied external communities, and progress toward sustainability of the SSI. These are critical aspects of Maine SSI work and are appropriate to address at this time. The interviews are also important in continual tracking of project outcomes and areas for improvement, as well as for addressing institutional benefits and related issues.	(Pending their completion of the YR4 evaluation report – end of June 2013)
SSI faculty surveys	The evaluation team continued to collect behavioral and attitudinal data from EPSCoR faculty to allow the tracking of collaboration, and production within the Maine EPSCoR community. The focus of the spring 2013 survey was on outcomes and developments that will lead to sustainability and productivity. Given the Maine EPSCoR work on stakeholder needs and interactions, it is important to address the mechanisms by which those efforts have strengthened and expanded the overall Maine EPSCoR activities and outcomes. Issues regarding faculty-stakeholder interaction were addressed, primarily using traditional survey question format, as well as social network questions designed to capture stakeholder ties.	(Pending their completion of the YR4 evaluation report – end of June 2013)

	SSI student surveys	The evaluation team continued to collect data from EPSCoR students to allow the tracking of collaboration, interaction and production within the EPSCoR SSI and SSP community. A modified and shorter version of earlier surveys was administered in spring 2013 to undergraduate and graduate students funded by Maine EPSCoR SSI. This is important in the on-going tracking of student outcomes.	(Pending their completion of the YR4 evaluation report – end of June 2013)
	Bibliometric analysis	In multi-year research grants, traditional research outcomes, such as publications, tend to occur following a lag of startup and research process. During YR4, the external evaluators continued to track academic production and impacts (May-June 2013). This analysis involves the coding of Maine EPSCoR publications, and subsequent comparison of other faculty publications drawn from the Web of Science (WoS), as well as other sources.	(Pending their completion of the YR4 evaluation report – end of June 2013)
	Grant proposal analysis	Another important outcome of the Maine SSI work, particularly as it moves to its final year, is the generation of grant proposals. Using data from the University of Maine and other SSI institutions Office of Sponsored Research Programs, collaboration on grant proposals is being tracked as another indication of collaborative activity (May-June 2013). This analysis will replace the stakeholder survey that had been delayed to this year, and will depend on data records provided through Maine EPSCOR.	(Pending their completion of the YR4 evaluation report – end of June 2013)
	Strategic Action 10.1b: Utilize feedback loops.		
	Management Team	During YR4, the Maine EPSCoR Management Team consulted with the external evaluators throughout the year via in-person visits, videoconferences, phone consultations, and e-mail. Upon receipt of the formal YR4 evaluation report (summer 2013), the Management Team will perform a review of the recommendations and outcomes. During August 2012, the Management Team reviewed the YR3 Evaluation report and recommendations (see RPPR section 1.16 B7 Changes).	Revisions to the SSI Strategic Plan as needed to meet the YR4 & YR5 objectives and milestones, and to strengthen linkages.
	SSI Stewardship Council	The SSI Stewardship Council (SC) will also review the YR4 evaluation report during summer 2013. During fall 2012, the SC reviewed the YR3 Evaluation report and made recommendations to the Management Team (see RPPR section 1.16 B7 Changes).	Recommendations to the Maine EPSCoR Management Team.

SSI Advisory Board	The SSI Advisory Board will also review the YR4 evaluation report at their meeting in the fall of 2014.	Feedback to the SSI Research Project Dir.
Dissemination	After review, the final YR4 external evaluation report will be disseminated to all SSI participants via the MeSSI intranet, and to NSF EPSCoR (late summer/early fall 2013). Key recommendations are incorporated into a report to the MIEAB (state EPSCoR committee).	Common understanding and knowledge of results.

Objective 10.2: Utilize AAAS to provide scientific peer review to help ensure high quality program delivery.

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
Strategic Action 10.2a: Bi-annual AAAS on-site assessment with national panel.		
Actions prior to site visit	Maine EPSCoR contracted with the Research Competitiveness Program (RCP) of the American Association for the Advancement of Science (AAAS) to provide bi-annual review and guidance to the Maine EPSCoR SSI project. Their previous visit was May 2011 (YR2). Therefore this visit was an assessment of progress for YR3 and YR4. As such, the panel was provided with annual reports and other information for that time period.	(Pending their completion of the assessment report July 2013)
AAAS Panel Review	On April 29-20, 2013, a 5-member AAAS panel spent two days at the University of Maine doing a project site review that included one-on-one interactions with project leadership teams, key administrators (including UMaine President), and project personnel (faculty, postdocs, graduate & undergraduate students). The panel examined focal questions on the project objectives to help ensure continued success. Their assessment report will be completed mid-summer 2013, and will include both formative and summative perspectives. The YR4 panelists included (4 were same from YR2): Mark Milutinovich, AAAS; Dorothy Anderson, North Carolina State University; Gregory Anderson, University of Connecticut; James Coleman, Virginia Commonwealth University (new panel member).	(Pending their completion of the assessment report July 2013)

Strategic Action 10.2b: Utilize feedback loops.		
Management Team	At the conclusion of the review sessions, and after a deliberation time by the panel, the Maine EPSCoR Management Team met with the review team for a discussion of initial perceptions. Upon receipt of the formal AAAS assessment report (July 2013), the Management Team will perform a review of the recommendations and outcomes.	Revisions to SSI Strategic Plan actions as needed to meet objectives and milestones.
SSI Stewardship Council	The SSI Stewardship Council (SC) will also review the AAAS report during summer 2013.	Recommendations to the Maine EPSCoR Management Team.
SSI Advisory Board	The SSI Advisory Board will also review the AAAS report at their meeting in the fall of 2014.	Feedback to the SSI Research Project Dir.
Dissemination	After review, the final AAAS report will be disseminated to all SSI participants via the MeSSI intranet, and to NSF EPSCoR (late summer/early fall 2013). Key recommendations are incorporated into a report to the MIEAB (state EPSCoR committee).	Common understanding and knowledge of results.

Objective 10.3: An SSI Advisory Board provides on-going scientific assessment and guidance to the research project team.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 10.3a: On-going interactions with SSI leadership.		
On-going advising	The SSI Advisory Board was formed in the fall of 2009, and is comprised of 10 members who represent state, regional, and national experts in fields of relevance to the SSI research mission. Their primary focus is on the scientific research foundation of SSI. SSI Research Project Director David Hart confers with Advisory Board Chair Robert Kates on at least a monthly basis, and board members attend SSI events whenever possible, such as the 2012 Mitchell Lecture, where they have a chance to talk with SSI members. The Board also meets via conference calls as needed. (see RPPR section 1.16 B7 Changes).	Revisions to SSI Strategic Plan actions as needed to meet objectives and milestones.
Site visit	An SSI Advisory Board two-day site visit is being scheduled for fall 2013 at UMaine. Board members will interact with SSI leadership and research teams regarding progress, future directions, and sustainability.	Recommendations to the Maine EPSCoR Management Team.

Strategic Action 10.3b: Utilize feedback loops.		
Management Team	The Maine EPSCoR Management Team reviews any recommendations and feedback as it occurs.	Revisions to SSI Strategic Plan actions as needed to meet objectives and milestones.
SSI Stewardship Council	The SSI Stewardship Council (SC) works directly with the Research Project Director to review Advisory Board recommendations and feedback as it occurs.	Recommendations to the Maine EPSCoR Management Team.
Dissemination	Feedback and recommendations from the SSI Advisory Board are provided to SSI participants through various mechanisms (MeSSI intranet, All-Team meetings), and to NSF EPSCoR. Key recommendations are incorporated into a report to the MIEAB (state EPSCoR committee).	Common understanding and knowledge of results.

Objective 10.4: Participate in NSF EPSCoR evaluation and other activities to continually refine RII project.		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
NSF EPSCoR Reverse Site Visit	On September 11, 2012, we had our YR4 Reverse Site Visit at NSF. The four presenters from Maine EPSCoR included: PI Mike Eckardt, Co-PI David Hart, Co-PI Vicki Nemeth, and SSI Stewardship Council Member Laura Lindenfeld. RSV recommendations were received on September 21, 2012, and the Maine EPSCoR Management Team and SSI Stewardship Council met to review them and develop the response, which was submitted to NSF on October 30, 2012. (see RPPR section 1.16 B7 – Changes for additional information)	Recommended strategies were incorporated into our Strategic Plan actions for YR4.
NSF Program Officer site visits	At our 2012 Maine EPSCoR State Conference on September 24, 2012, our NSF EPSCoR Program Director Sian Mooney was able to attend and give a brief update on NSF EPSCoR, and to network with Maine EPSCoR SSI participants. Under NSF EPSCoR Outreach support, Eva Zanzerkia, Program Director in the Division of Earth Sciences, also presented on opportunities in that area, and met individually throughout the day with interested conference participants.	New knowledge regarding NSF programs and opportunities; NSF EPSCoR Program Director opportunity for firsthand updates.

	NSF EPSCoR meetings, conferences, workshops	Maine EPSCoR supported participants to attend the following NSF events: 1) NSF EPSCoR-Campus Compact-SENCER Workshop, Santa Clara, CA, August 2-6, 2012: Vicki Nemeth 2) NSF EPSCoR Project Directors/Project Administrators Meeting, DE, January 23-25, 2013: Mike Eckardt, Vicki Nemeth, Laurie Bragg, Andrea Littlefield, Jennifer Dunham 3) NSF EPSCoR Project Directors/Project Administrators Meeting, Arlington, VA, May 20-22, 2013: Mike Eckardt, Vicki Nemeth, Laurie Bragg, Andrea Littlefield, Jennifer Dunham 4) NSF EPSCoR Workshop: Biometrics to Foster Collaborative Research, Little Rock, AR, March 3-5, 2013: presenter Clare Bates Congdon (USM); participant Anna Bass (UNE). 5) NSF EPSCoR Workshop: Living on Earth III, St. Thomas, VI, October 23-26, 2012: Laura Lindenfeld (UM), Timothy Waring (UM), Christine Feurt (UNE), Michael Donihue (Colby College), Firooza Pavri (USM)	New knowledge gained assisted in on-going program and administrative strategic planning.
	Feedback loops	The Maine EPSCoR Management Team reviews any recommendations and feedback as it occurs.	Revisions to SSI Strategic Plan actions as needed to meet objectives and milestones.
	Objective 10.5: Project management teams engage in on-going review to ensure that the project achieves goals, objectives, and benchmarks.		
	Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**

	Internal review of SSI research portfolio	All SSI teams are managed/organized in a holistic, comprehensive matrix system, with a hierarchy of evaluation and decision-making mechanisms to ensure on-going monitoring and success. The SSI goals, objectives, and benchmarks detailed in the SSI Strategic Plan apply to every research project in the integrated portfolio, and all projects are evaluated using a common set of metrics for the sustainability science focus. The Maine EPSCoR Management Team oversees the SSI research review and budget allocation process, with the SSI Stewardship Council providing input. SSI research progress is monitored, evaluated, and reported at three levels: 1) overall SSI project progress on the main goals and objectives for the three cross-cutting research themes of SES, K-A, and OI; 2) overall progress on project-wide integration in the model problem set being studied; and 3) other individual team project progress as applicable. All SSI teams are part of year-round, multiple mechanisms for monitoring and evaluation of research progress, the results of which are then utilized by the various layers of management and advisory teams in decision-making. Internal evaluation mechanisms include: 1) progress reports; 2) annual team site visits; 3) on-going peer-critique and feedback; and 4) on-going review and feedback by SSI Research Project Director.	Timely achievement of project milestones; revisions to SSI Strategic Plan actions as needed to meet objectives and milestones.
	Internal review of other project components	The Maine EPSCoR Management Team monitors and evaluates the progress for the non-research components of this project on an on-going basis, through various formal and informal assessment mechanisms.	Revisions to SSI Strategic Plan actions as needed to meet objectives & milestones.
	Internal review of external recommendations	Different external evaluation mechanisms frequently offer widely different recommendations, and the Management Team and SSI Stewardship Council carefully consider & weigh the pros & cons of all in relation to the realities of the project, & make decisions accordingly.	Revisions to SSI Strategic Plan actions as needed to meet objectives & milestones.
	State review	Maine EPSCoR Project Director Mike Eckardt reported on SSI progress at quarterly meetings of the Maine Innovation Economy Advisory Board, which serves as the State EPSCoR Committee.	Continued alignment with state goals.

Goal #11: Sustainability Beyond the RII ***Sustain the SSI infrastructure, impacts, and achievements through the continued integration of scientific entrepreneurship, institutional and external support, partnerships, education, workforce development, and constituency outreach.***		
Objective 11.1: Mechanisms for post-RRI sustainability are put into place during the RII project.		
Major YR4 Activities	**Year 4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 11.1a: Support activities to ensure that all targeted outputs are met.		
Positions supported	During YR4, a total of 407 individuals were directly supported: 88 faculty, 5 postdocs, 52 graduate students, 131 undergraduate students, 21 high school students, and 109 professional/technical/ administrative staff and board members. Of those totals, 181 were continuing personnel who had also been supported on the SSI project during YR3: 75 faculty, 4 postdocs, 31 graduate students, 32 undergraduate students, 18 high school students, and 20 professional/technical/administrative staff. An additional 226 personnel were newly supported on the SSI project during YR4. Of that, 91 were existing institutional positions that were new to the SSI project during YR4 and included the addition of 13 faculty and 78 professional/technical/administrative staff and board members. An additional 135 were newly hired positions and included: 1 postdoc, 21 graduate students, 99 undergraduate students, 3 high school students, and 11 professional/technical/administrative staff.	An emphasis on developing human infrastructure for the state in sustainability science research will lead to greater capacity and competitiveness.
Participants in supported activities	An additional 3,016 participants were indirectly supported through various outreach, workforce development, and collaborative activities that were sponsored and supported by Maine EPSCoR. These included: 176 faculty at academic research institutions, 102 faculty at primarily undergraduate institutions, 6 postdocs, 126 graduate students, 94 undergraduate students at academic research institutions, 434 undergraduate students at primarily undergraduate institutions, 83 K-12 teachers/pre-service teachers, 101 high school students, 553 middle school students, 59 elementary school students, 212 professional/technical/administrative higher education staff, 305 business/industry representatives, 468 NGO/government representatives, and 297 members of the general public.	The engagement of participants in workforce development and other outreach activities related to the sustainability science research focus helps to enable the development of stakeholder partnerships for research, and Maine's pipeline of future STEM researchers.

	Publications	During YR4, SSI researchers across all institutions produced 110 peer-reviewed journal articles related to their SSI research; 20 abstracts; 15 book chapters; 13 technical reports; 1 magazine article; 8 proceedings; 2 books; 5 other publications/products; 51 posters; and 14 newsletters.	SSI is established as a successful model for creating place-based collaborations and synergies in sustainability science.
	Grant proposal submissions	During YR4, SSI continued to recognize that the long-term sustainability of SSI will depend on many sources of funding, and to prioritize efforts in this area. SSI project teams have made significant progress on competitive proposals to other federal agencies, state government, and private entities that can sustain the SSI research and education enterprise. During YR4, 67 grant proposals were submitted by SSI researchers to external funders for a total of $32,934,792. Of that, 23 awards have been received so far in YR4 for a total of $1,410,037, and 32 submissions are still pending for a total of $22,490,667. In addition, 17 proposals that had been submitted in YR3 were awarded during YR4 for a total of $3,425,755. A complete list of grants submitted/awarded in YR4 can be found in Appendix 4.	Increase in grant proposals awarded helps to sustain the SSI infrastructure and research agenda.
	Other project outputs	YR4 targets have been met or exceeded across almost all major benchmarks. Please see the YR4 benchmarks table for details.	Majority of benchmarks met or exceeded for YR4.
	Strategic Action 11.1b: Provide seed funding for special opportunities.		
	Maine EPSCoR Management Team awards	The Maine EPSCoR Management Team began a seed funding program at the end of YR2 to support the development of high-profile SSI collaborative publications and grants. The Management Team issued another round of these RFPs in March 2012 in order to support additional projects in YR4. During YR4, two awards were given to support collaborative grants development, and one award was given to support collaborative publications development.	Providing incentives for collaborative grants has resulted in a CNH award, and a well-reviewed IGERT proposal (not funded on first round); the awarded publications team is still in the process of writing.

	New faculty seed funding	Seed funding is provided to two of the new faculty hires for projects on SES Synergy (Waring) and ECCO: Effects of Climate Change on Organisms (McGill). These projects continued through YR4 and are subject to the same review process as the regular SSI research projects for additional YR5 support.	New faculty hires provided with tools to assist in research project development and project integration.
	Special projects	On the recommendation of the SSI Economic Development Task Force, the Maine EPSCoR Management Team supported a special project to examine the effects of the knowledge economy on regional productivity and growth.	Research will provide an in-depth profile of Maine's knowledge economy, and its strengths and gaps, which will guide SSI strategic planning.
	Maine EPSCoR travel scholarships	Another funding mechanism that is utilized by Maine EPSCoR is that of travel scholarships. These allow faculty and students throughout the state to take advantage of conferences, workshops, or collaboration opportunities that they would normally not have the funding to participate in. During YR4, Maine EPSCoR supported 10 faculty and 4 students through this mechanism.	Provided opportunities for professional development and presentation of research results.
	Strategic Action 11.1c: Focus on SSI human infrastructure development.		
	SSI faculty	During YR4, 89 faculty members at 11 participating colleges and universities throughout the state were directly supported to be part of 20 interdisciplinary research teams engaging in SSI portfolio research.	Support of statewide faculty increases capacity and competitiveness in sustainability science.
	SSI postdocs	Five postdoctoral fellows at UM were supported during YR4: Krista Capps, Jessica Jansujwicz, Crista Straub, and Christina Lamanna had started later in YR3, and Nirajan Dhakal started during YR4. These postdocs are collaborating on research with several SSI project teams, and also provide mentorship to SSI graduate and undergraduate students.	Postdocs play an active role in advancing sustainability science research of six SSI teams as well as providing collaborative roles for the team as a whole.

	SSI graduate students	A total of 52 graduate research assistantships were supported during YR4 at UMaine (48) and the University of Southern Maine (4). This included support of an incoming cohort of three new SSI PhD students at UMaine in the fall of 2012, which were in addition to 19 continuing SSI PhD cohort students from YR1-3 (these students were all recruited and admitted specifically as SSI students). (Note that many departments provided other sources of funding for graduate students to work on the SSI research.)	Graduate students play an active role in advancing sustainability science research, and are trained in cutting-edge, interdisciplinary sustainability education techniques.
	SSI undergraduate students	A total of 131 undergraduate student research assistantships were supported during YR4 at all participating institutions. (Note: additional students were also indirectly involved i.e. doing SSI research through classes.) There is a continued focus on recruiting more undergraduate students to work directly with the SSI research teams.	Students gain experience working as part of multi-level SSI teams, and are trained in cutting-edge, interdisciplinary sustainability education techniques.
	SSI high school students	18 high school student research assistantships were supported in during summer 2012 (YR4) through the Orono High School workforce development program. Three additional high school student research internships were supported in YR4. The program continues in summer 2013.	Students gain experience working as part of multi-level SSI teams, and are trained in cutting-edge, interdisciplinary sustainability education techniques.
	Other professional/ technical/administrative	During YR4, an additional 109 technical, professional, and administrative staff were supported on the project throughout the state. This included those involved in research as well as those from workforce development partners and board members. (Note: this is a change in counting for this year to include workforce partners and board members.)	Additional supportive personnel are engaged in the overall research and workforce development enterprise.

Strategic Action 11.1d: Leverage NSF and other programs.		
Leveraging NSF Programs	During YR4, SSI worked to leverage other NSF programs, with SSI teams submitting 20 proposals to NSF. Some examples are: CAREER (not awarded); CNH (awarded); Coastal SEES (pending); IGERT (not awarded); SYNERGY IGERT CIF21 (not awarded); EPSCoR RII Track 2 (award pending); DEB (Unity College - pending); REESE (pending); AISL (pending); RUI (pending); SEP (submitted YR3, awarded YR4); RCN-SEES (awarded). Collaborations have continued with the following UMaine projects: 1) NSF ADVANCE - Rising Tide Center: (See Goal 5: Diversity) 2) NSF Math Science Partnership (MSP): UMaine's Center for Research in STEM Education's (RiSE). (See Goal 7: Workforce Development) 3) NSF National Girls Collaborative Project (See Goal 5: Diversity) In addition, Maine EPSCoR's NSF EPSCoR RII Track 1, Track 2 (high-speed fiber network), and C2 (last-mile connectivity) projects (and an NIH INBRE supplement providing equipment to "light up" the dark fiber) have been all very closely integrated with regard to the development of cyberinfrastructure capabilities for the state. This coordination allows us to effectively implement an overall Cyberinfrastructure plan for the state in a manner that thoroughly leverages funding sources and activities that build on each other. To ensure this, all of these projects are under the oversight of the Maine EPSCoR Cyberinfrastructure Committee.	Leveraging NSF programs helps to build capacity, competitiveness, and synergy for the SSI research enterprise.
Other programs	SSI teams submitted 47 additional grant proposals to external funding agencies in YR4 in order to help leverage their research work under this Track 1.	Leveraging other programs helps to build capacity, competitiveness, and synergy for the SSI research enterprise.
Objective 11.2: Provide post-RII sustainability for SSI efforts through external grants, contracts, and other support		
Major YR4 Activities	**Year 4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 11.2a: Provide grant development support for SSI teams		

	Grant development support	SSI faculty member Linda Silka offered a graduate grant-writing course in Spring 2013, which provided a detailed, hands-on introduction to grant-writing.	SSI has a post-RII diverse portfolio of external funding – including grants and contracts from federal and state agencies, private sector contracts, private foundation grants, and philanthropic gifts from individual donors- that allows it to retain a critical mass of expertise for sustainability science research.
	Specialized support	During YR4, SSI was committed to providing grants support for SSI researchers through the following: 1) Presentations & networking with NSF Program Officers at Maine EPSCoR State Conference 2) Meetings with other federal agencies. 3) Formation of proposal action teams (Management Team seed funding) 4) proposal submission support (SSI office) *5)* finding appropriate RFPs (SSI office)	Providing support for SSI teams to obtain external funding will assist in building capacity and competitiveness.
	Strategic Action 11.2b: Expand state and federal agency relationships.		
	External funding inventory	An inventory of key representatives of government agencies (e.g. municipal, regional, state, federal) as well as representatives of Maine tribes has been created and continues to be expanded. SSI leaders meet frequently with government and tribal partners to assess progress in existing collaborations and explore new collaborative opportunities. For example, David Hart traveled to Boston in February to meet with USEPA Regional Administrator Curt Spaulding and his Sustainability Leadership Team to develop new research partnerships. Meetings and discussions also take place on a regular basis between specific SSI project teams and the government and tribal partners with whom they work.	Continued focus on maintaining and building relationships with state and federal agencies helps to build a lasting communications network.

Funding Opportunities database	An undergraduate student in the Maine EPSCoR office maintains the UMaine Funding Opportunities Database, which currently has over 7,500 records. This is available on-line for anyone in the state to search for potential external funding opportunities (through the UMaine Office of Sponsored Research website), and SSI researchers are encouraged to utilize it.	Assisting SSI researchers with being able to find funding opportunities increases their ability to build capacity and competitiveness.
Strategic Action 11.2c: Develop a base of foundation and private support.		
Foundation support	Identification of foundations whose mission and goals align closely with SSI has continued in YR4. Cultivation of foundation relationships has also progressed with connections made to leaders at three national foundations. David Secord, Director of Strategic Programs at Tides Canada visited campus in fall 2012 presenting a seminar on, "Linking sustainability theory and practice: Lessons from place-based philanthropy" and meeting with SSI team members to discuss his work at the foundation.	On-going development of relationships with major foundations will lead to potential funding support in YR5.
Private support	During YR4, we continued to work to identify potential private donors through our network of contacts and have made progress in this area.	On-going development of relationships with private donors will lead to potential funding support in YR5.

Objective 11.3: SSI is established as a leader in Maine and beyond in creating synergies to solve place-based sustainability science problems.		
Major YR4 Activities	**Year 4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 11.3a: Maximize inter-institutional collaborations.		
Inter-institutional collaboration	SSI is working as a catalyst for building inter-institutional synergy in solving sustainability-related problems. It is significant for the state that undergraduate educational institutions from across Maine have become active participants in the SSI project through the SSI Partners program. Site visits by the Maine EPSCoR Management Team continue to assist with how this program can be further refined to maximize participation and integration. Further detail is included in other sections of this report.	Inter-institutional partnerships are leading to increased networking and collaborative partnerships (i.e. collaborative NSF CNH proposal).

Strategic Action 11.3b: Build a network of university-stakeholder partnerships.		
University-stakeholder partnerships	SSI is building an interconnected, statewide network of university-stakeholder partnerships. All SSI research projects are required to have stakeholder participation. As a result, researchers are collaborating with over 83 stakeholder groups across the SSI project. Teams have strengthened this network as their research projects have developed with over 120 researcher-stakeholder meetings in YR4. Additional information on strategies being used to support university-stakeholder partnerships is discussed in other sections of this report.	SSI teams continue their work with stakeholders on local, place-based projects building and strengthening these relationships for the long-term.
Strategic Action 11.3c: Provide physical & other infrastructure to support the R&D agenda.		
Physical & other infrastructure	Major progress has been made this year on the design and construction of the new Social Science Lab which is housed in the Innovative Media Research and Commercialization (IMRC) building, and which will be utilized by SSI researchers (supported through a voluntary cost share) to facilitate social science research. The new SSI Communications Center at the Mitchell Center is completed and is used regularly for SSI meetings, workshops and events, and is helping to establish an active communication network to increase research collaboration and improve integration and synergy between institutional partners. New faculty Tim Waring, in collaboration with Arizona State University's Center for Institutional Diversity, and with additional funding from UMaine's School of Economics, has designed and assembled an experimental economics lab (Xecon lab) for SSI/SOE sustainability experiments. The facility includes hardware, software, and organizational capacity to conduct complex interactive behavioral experiments.	The SSI Communications Center allows for increased cross-institution collaboration for meetings and workshops. Stakeholders are also able to participate remotely. For example, representatives from EPA Region 1 participated remotely at a recent seminar. Social science physical infrastructure will facilitate SSI research components.
Strategic Action 11.3d: Foster economic development and private sector involvement, with a focus on clean technology & a green economy.		
SSI Economic Development Task Force	This SSI committee is charged with developing and implementing an action plan related to SSI's economic development goals.	Task force advises SSI leadership on potential economic development steps.

	Special economic development support	In YR3, the EDT solicited ideas and proposals from across the University of Maine System who share SSI's economic development objectives and who could assist SSI in meeting its long-term economic development goals. The Management Team reviewed these proposals and two proposals were approved for funding. One project analyzed the direct and indirect contribution of the SSI project on Maine's economy. The second project was designed to strengthen connections between SSI projects that are addressing energy issues and energy-related representatives from the private sector. The lead investigator initiated the planning process for this funded proposal but had to withdraw due to demands from other responsibilities. SSI is currently seeking new leadership for this project	Pending results in YR5.
	SSI Team economic development	Recognition that many SSI research projects have already developed substantial private sector relationships also led to the creation of a more systematic process for quantifying and expanding these project-level interactions with the private sector. In January 2013, Charles Colgan (PI for SSI Project #11 and former Maine State Economist) created a survey to gather information on economic development interactions across the SSI portfolio. The survey covered the three broad types of actions where SSI researchers might contribute to economic development: technology transfer, start-ups, and cluster networks. Teams were asked to describe any activities their team has been involved in for each category. These surveys have been compiled and are under review by Charles Colgan, David Hart, and John Peckenham. The next step will be to follow up with teams on questions and requests for clarification or additional information where appropriate. Following a full assessment of the economic development surveys, we will begin planning for meetings at which SSI researchers will have opportunities to expand and strengthen their interactions with private sector organizations. These meeting will be designed to identify promising strategies for accelerating economic development that is informed by SSI research. Information on these opportunities will be provided in spring 2013. As part of this	Provides a more systematic approach to quantifying SSI team economic development.

		process, key SSI staff met with representatives of the Association of Consulting Engineering Companies at their fall 2012 conference. Charlie Colgan was keynote speaker at this conference, and his presentation focused on specific ways that SSI research can enhance private sector innovation.	
	Student industry & stakeholder internships	SSI has the opportunity to contribute to Maine's knowledge economy. Maine's ability to achieve sustainable economic growth will depend on the strength of its knowledge assets – particularly the skills and knowledge available in the state's businesses and workforce. In an effort to meet these needs, SSI is collaborating with EES Director and SSI faculty Aram Calhoun to establish sustainability internships for both graduate and undergraduate students with Maine-based companies. Currently two EES internships programs are available through state-based environmental consulting firms at the undergraduate level. In spring 2013, we will actively work with Calhoun utilizing SSI's stakeholder network and economic development program to connect more closely with other businesses and industry with the goal of increasing internship and service learning opportunities for graduate and undergraduate students.	Internships with stakeholders will allow students to gain non-academic perspective on sustainability issues.
	Stakeholder database	The SSI stakeholder database has been completed and will be used to produce a systematic stakeholder analysis to improve connections across SSI and outside of the university. This is an essential first step in characterizing the knowledge economy. Ultimately, the database will be used as a tool to drive economic development through SSI outputs and expertise. In a related effort, a number of SSI faculty and students are participating in a university-wide planning process focused on Community-engaged Research, Teaching, and Service. This process is not only strengthening SSI's relationships with diverse stakeholders, but also expanding SSI's approaching to stakeholder engagement throughout the university.	SSI teams continue their work with stakeholders on local, place-based projects building and strengthening these relationships for the long-term.

Strategic Action 11.3d: Sponsor state, regional, and national conferences & sessions focused on sustainability science areas.		
Mitchell Lecture	See Goal 9: External Engagement	
Annual SSI conference/ Maine Water Conference	See Goal 6: SSI Workforce Development & Goal 9: External Engagement	
AAAS Symposium	See Goal 9: External Engagement	
NSF EPSCoR workshop	In July 2012, SSI submitted a white paper for a national workshop concept to NSF EPSCoR. In fall 2012, we received permission to move forward with a full proposal to NSF for a national workshop titled, "Advancing Solutions Through Sustainability Science". This proposal is in process and will be submitted to NSF in July 2013. The 3-day workshop would be scheduled for Junde 2014.	Plans for a national conference will help to showcase Maine EPSCoR's focus on stakeholder-driven, interdisciplinary research and knowledge to action, and provide a forum for other EPSCoR states to share best practices and lesson learned.

Goal #12: Overall RII Project Management
Implement an effective management plan that will support and ensure the overall success of the Maine EPSCoR RII project.

Objective 12.1: Use effective organizational and management systems for administration and oversight of the overall RII project.

Major YR4 Activities	YR4 Progress/Significant Results	Key Outcomes
Strategic Action 12.1a: Maine EPSCoR Management Team provides primary oversight.		
Management Team meetings & on-going oversight	The Maine EPSCoR Management Team consists of: a) NSF EPSCoR Project Director/PI Michael Eckardt (UMaine Vice President for Research); b) Associate Project Director/Co-PI Vicki Nemeth (UMaine Director of Research Administration & Maine EPSCoR); and c) SSI Research Project Director/Co-PI David Hart (Director, Senator George J. Mitchell Center, UMaine). This team formally meets at least monthly, but interacts via phone, e-mail, webcam, and in person several times a week. Their main actions during YR4 centered around the further development of the SSI organizational structure, policies, and procedures; strengthening the research focus and integration; addressing research team progress and funding allocations; monitoring any new hire processes; reviewing evaluation and assessment recommendations; revising the SSI Strategic Plan as needed; and addressing issues.	Strong leadership provides a solid foundation for the success of the RII project. .
SSI Team site visits, on-going monitoring, and mentoring	The Management Team conducts site visits at least annually with each research team at all institutions to 1) review progress towards the planned benchmarks and milestones; 2) provide suggestions for any changes (based on evaluation feedback loops); 3) continue to maintain the one-on-one relationships with SSI researchers; 4) provide mentoring on any special issues; 5) review objectives for the coming year; and 6) brainstorm sustainability strategies. On-going videoconference, phone consultations, and e-mail also occurs with all participants.	On-going evaluation allows for timely feedback on progress and adjustments as needed.

	Overall participation in SSI activities	The Management Team participates in the weekly SSI Stewardship Council meetings, the monthly SSI Research Council meetings, monthly SSI All-Team meetings, SSI Integration Discussion meetings, annual SSI Research Retreat, the annual State EPSCoR Conference, and most other SSI activities.	Keeping visibly active and informed provides an environment for success, and allows for better decision-making.
	Strategic Action 12.1b: Other boards and committees serve in an advisory capacity.		
	Maine EPSCoR Cyberinfrastructure Committee	During the proposal-writing process for this SSI project, Maine EPSCoR had created a Cyberinfrastructure Committee that developed a cyberinfrastructure plan to address the needs of the state's research and education communities. Members of this committee are integrally involved with this NSF EPSCoR Track 1 RII project, as well as NSF EPSCoR Track 2 RII and C2 projects and a corresponding NIH IdeA supplement for cyberinfrastructure. All projects have been administered by Maine EPSCoR with input from this committee.	Ensures effective coordination and leveraging of efforts and resources in this area.
	SSI Advisory Board	The SSI Advisory Board provides scientific assessment and guidance to the research project and is comprised of 10 members who represent state, regional, and national experts in fields of relevance to the SSI sustainability science research mission. (see Goal #10 Evaluation & Assessment, and RPPR Section 1.16 B7 - Changes)	Provides scientific oversight, national perspective, and a resource for information.
	Maine STEM Collaborative	The Maine STEM Collaborative is a statewide partnership of education, research, business, government, and non-profit sectors who have come together to foster the improvement of STEM education in the state. Maine EPSCoR Director Vicki Nemeth is past-Chair, and Maine EPSCoR Outreach and Program Manager Laurie Bragg currently serves on the Steering Committee. Maine EPSCoR seeks input from the group to ensure that the RII STEM education and workforce development programs are aligned with Maine's overall STEM efforts.	Provides a resource for statewide STEM alignment and coordination of effort.

Strategic Action 12.1c: State EPSCoR committee provides oversight**.**		
Maine Innovation Economy Advisory Board	The Maine Innovation Economy Advisory Board (MIEAB) serves as the EPSCoR governing committee for the state, and is under the Maine Office of Innovation. The MIEAB is responsible for oversight and coordination of the state's EPSCoR portfolio to ensure synergy with the Maine Science and Technology Plan. In 2010, the MIEAB developed a revised S&T Action Plan for the state that places an even greater emphasis on the areas that this Maine EPSCoR SSI project addresses. In addition, STEM education and workforce development strategies were added for the first time at the urging of Maine EPSCoR. While the MIEAB's primary role is to oversee the selection process for NSF RII and other federal EPSCoR/IDeA proposals, RII Project Director Mike Eckardt serves on the MIEAB, which meets quarterly, and he provides on-going updates on the progress of Maine EPSCoR projects. There were no recommendations during YR4 on this project.	State involvement ensures alignment with S&T Action Plan.

Objective 12.2 Systems ensure administrative, programmatic, and fiscal integrity for all project components and institutions		
Major YR4 Activities	**YR4 Progress/Significant Results**	**Key Outcomes**
Strategic Action 12.2a: Maine EPSCoR & SSI office tandem organizational structure.		
Joint coordination & synergy	This RII project utilizes a multi-level, parallel organizational structure that provides effective programmatic and administrative oversight and contributes to successful implementation. (See Appendix 6: Organizational/Management Matrix.) This parallel organizational structure consists of 1) the Maine EPSCoR office, and 2) the SSI office at the Senator George J. Mitchell Center. Both are based at UMaine and operate under the aegis of Michael Eckardt, Vice President for Research and NSF EPSCoR Project Director/PI. The staff of both offices interact daily, and formally meet monthly.	Provides a strong, synergistic foundation for success, and allows for the application of the appropriate technical or administrative expertise as needed, with strong on-going coordination between both offices.

	Sufficient staffing & expertise	The Maine EPSCoR office consists of: 1) Vicki Nemeth, Maine EPSCoR Director; 2) Laurie Bragg, Outreach and Program Manager; 3) Andrea Littlefield, Communications and Program Coordinator; 4) Cindy Growe, Financial Administrator; 5) Jennifer Dunham, Program Assistant and Diversity Specialist; and 6) 1-3 graduate and undergraduate students (media production, administrative, etc.). The SSI research office includes: 1) David Hart, SSI Research Project Director; 2) John Peckenham, SSI Research Project Operations Coordinator; 3) Ruth Hallsworth, Strategic Program Manager; 4) Kim Raymond, Outreach & Communication Coordinator; 5) Carol Hamel, Administrative Assistant; 6) Holly Chapman, Administrative Assistant, 7) Elizabeth England, SSI Coordinator; and 7) 1-2 undergraduate students or temporary employees.	Sufficient staff and expertise in several layers ensures that effective coordination is fostered between all project components.
	Clearly defined policies, procedures, & lines of responsibilities	A high level of communication, coordination, and synergy between the staff of the Maine EPSCoR office and the SSI office allows for the appropriate technical or administrative expertise to be applied in any situation. The SSI Research office engages directly with the SSI research faculty and students, while the Maine EPSCoR office handles administrative responsibilities and engages with collaborators for other program components. Written policies and procedures are in place and utilized for all administrative aspects of the project.	Common understanding and project integrity.
	Strategic Action 12.2b: Formalized leadership structure, policies, and procedures.		
	Project Director	NSF EPSCoR Project Director Eckardt provides overall scientific, technical, and administrative leadership for the RII project. Eckardt and Nemeth have served as Maine's NSF EPSCoR Project Director and Assistant Director for over nine years, and both bring over 30 years of experience each in implementing and managing large-scale programs.	Provides highest administrative level of oversight.
	Associate Project Director	Maine EPSCoR Director Vicki Nemeth is responsible for the overall administration and implementation of the RII project, provides the day-to-day oversight, serves as the primary liaison to the NSF EPSCoR office, and is also responsible for the implementation of the non-research components of the RII project.	Provides day-to-day and big picture oversight.

	Research Project Director	SSI Research Project Director David Hart oversees all aspects of the sustainability science research and integrated education component, which is based at UMaine's Senator George J. Mitchell Center.	Provides day-to-day research oversight.
	Partner Institution Coordination	Maine EPSCoR Director Vicki Nemeth serves as the administrative liaison for all of the participating institutions, and John Peckenham, SSI Research Project Operations Coordinator, also serves as the SSI Partner Institution (SSP) Coordinator, addressing any programmatic and research issues. They work in tandem to ensure effective communication and coordination among the partner institutions. Each institution has a designated research leader and a designated administrative contact.	Defined roles ensures effective communication and coordination.
	Clearly defined policies & procedures	All aspects of this project operate under written policies and procedures that are in place and utilized at all levels and institutions.	Common understanding and project integrity.
	Strategic Action 12.2c: Annual fiscal responsibility.		
	Centralized purchasing & human resources	All SSI financial, purchasing, and human resource transactions for all six of the participating University of Maine System campuses are done through the Maine EPSCoR office. The five private colleges are under formal sub-contracts, and as such submit quarterly invoices and detail to UMaine's Office of Research and Sponsored Programs for approval by Maine EPSCoR. Other entities participating in workforce development activities operate under formal contractual agreements, with invoices and expenditure detail.	High level of oversight for allowable expenses & compliance ensures fiscal responsibility.
	Authorizations and fiscal responsibility	Fiscal oversight begins in the SSI research office, which works directly with researchers on allowable expenses, compliance, and budget allocations, and provides initial transaction approvals. The second level of oversight is in the Maine EPSCoR office, with Financial Administrator Cindy Growe reviewing all transactions for compliance, and Maine EPSCoR Director Vicki Nemeth (or PI Mike Eckardt) providing final approvals before processing. Monthly reviews of the final journal transactions in the UM financial System are performed by Growe and Nemeth.\	Multiple levels of authorizations and on-going fiscal monitoring ensure fiscal integrity.

	Strategic Action 12.2d: Overall program compliance.		
	Sponsored Research & other office interactions	Maine EPSCoR Director Vicki Nemeth works closely with UMaine's Office of Research and Sponsored Programs to ensure adherence to NSF policies and procedures, and with other relevant offices such as Purchasing, Human Resources, and Equal Opportunity. She also works with similar offices at the other participating institutions.	Networking with institutional offices ensures project integrity.
	Training updates	Maine EPSCoR Director Vicki Nemeth, Financial Administrator Cynthia Growe, and Outreach and Program Manager Laurie Bragg attended relevant university, state, and national workshops to keep abreast of changes and clarifications in University System policies and procedures, and federal program requirements and policies.	Knowledge levels ensure compliance with changing policies and procedures.

Goal #13: SSI Research Project Management ***Broad coordination of management and decision-making results in a shared vision for SSI research and integrated education, effective interdisciplinary outcomes, and participatory project management.***		
Objective 13.1: Establish organizational structure and systems that ensure effective communication, coordination, and exchange among SSI research teams and SSI management committees.		
Major YR4 Activities	**Year 4 Progress/Significant Results**	**Key Outcomes**
Strategic Action: 13.1.a: Create and utilize an effective SSI organizational structure for the research component		
SSI Stewardship Council	During YR4, this council continued to have oversight and responsibility for management of the SSI research and integrated education project. It consists of seven SSI members with SSI Research Director David Hart chairing. The council continues to meet weekly, and also sets the agenda for, and participates in, the monthly SSI All-Team meetings, annual SSI Research Retreat, and most other SSI activities. SC refers actions to the Maine EPSCoR Management Team as needed.	Stewardship Council has taken on more responsibility for management decisions across the project. This has shifted some of this decision-making process from Research Council enabling this group to focus more directly on research.
SSI Research Council	This council was established in YR2 and continued to meet monthly during YR4. It is chaired by Brian McGill, one of the four faculty hired as a part of the SSI project. The council provides recommendations about important research-related decisions for the SSI project, and ensures continued discussion and involvement in important decisions that guide how research is being managed and conducted. The council consists of 24 members, including one representative from each SSI research team, committee chairs, the SSI Partner Institution Coordinator, two postdoctoral representatives, and one graduate student representative. The SSI Partner Coordinator represents the partnering institutions on Research Council.	Research Council has moved towards discussions focused on research-related tasks. For example, current discussions include a potential "special issue" journal. This is also helping to build collaborative processes among team members.
Strategic Action: 13.1b: Utilize SSI committees.		
SSI Committees	The activities of many SSI committees have evolved since they were originally created. For example, the Graduate Student Recruitment Committee has now completed its work, because graduate students were not actively recruited in YR4. Any	All councils and committees have adjusted to meet the changing needs of the organization as it moves forward, and have reorganized and adapted as

		items needing attention from this committee were handled by email in YR4. The only committee still functioning in its original format is the Seminar Committee that meets once per semester to discuss recommendations for SSI seminar speakers.	roles and needs have changed.
	Curriculum & Culture Committee	The Curriculum and Culture Committee split into two subcommittees in YR3-4 to handle the major tasks of undergraduate and graduate curriculum in sustainability science. The Dean of the College of Natural Science, Forestry and Agriculture has now approved the Ecology and Environmental Sciences (EES) undergraduate concentration in sustainability science, so the subcommittee's work is completed in this area. The SSI subcommittee for the graduate student curriculum has joined with the EES graduate faculty committee will meet in April 2013 to pursue this goal	All councils and committees have adjusted to meet the changing needs of the organization as it moves forward, and have reorganized and adapted as roles and needs have changed.
	Economic Development Task Force	The Economic Development Task Force made recommendations to fund several projects to advance SSI's economic development efforts. Additional information on this process is available in the Sustainability section (Goal 11).	All councils and committees have adjusted to meet the changing needs of the organization as it moves forward, and have reorganized and adapted as roles and needs have changed.
	Cyberinformatics Committee	The Cyberinformatics/ Data Management Committee worked with the Advanced Computing Group (ACG) to hire two data specialists who are now assisting SSI in meeting its data management goals. These positions will take over most of the work that was being conducted by the committee, although the committee will still provide oversight regarding the SSI project's data management goals and needs.	All councils and committees have adjusted to meet the changing needs of the organization as it moves forward, and have reorganized and adapted as roles and needs have changed.
	SSI Advisory Board	This group continues to provide guidance to the SSI management team. Details of YR4 activities are outlined in the Evaluation section (Goal #10).	The Advisory Board provides an additional resource for ensuring organizational effectiveness.
	Objective 13.2: Create internal communications mechanisms, feedback loops, and strategies to ensure the effectiveness of the interdisciplinary SSI research project.		

Major YR4 Activities	Year 4 Progress/Significant Results	Key Outcomes
Strategic Action: 13.2a: Create internal SSI communication networks and opportunities.		
SSI meetings	All SSI team members are encouraged to attend the monthly SSI All-Team meetings, the annual SSI Research Retreat, and all SSI workshops and seminars. Participation of members at the partner institutions is encouraged via video conference through the new Communication Center. (See Goal #6 for more information)	Multiple avenues for networking and communication allow participants in the interdisciplinary SSI project to collaborate successfully across disciplines, teams, and institutions.
Team Communication Tools	- The internal SSI newsletter doSSIer continues to be published on a bi-weekly basis and is distributed to all SSI team members via the listserv. - The internal meSSI website provides a central location for team members to share information, access important documents, locate resources, retrieve contact information for other team members, and find information on upcoming meetings and events. The site is password protected for access by team members only. - The SSI listserv provides an avenue for team members to post items of interest to the SSI team (including partner institutions and graduate students). This has become an easy and convenient tool for inter-team communications. Postings are restricted to SSI-related topics.	Internal communications take place across multiple venues in an effort to reach all team members.
Strategic Action: 13.2b: Utilize organizational innovation research to refine SSI systems.		
Organizational Innovation (OI) Research	Research undertaken by SSI team members that advances our understanding of interdisciplinary collaboration and effective teamwork is outlined in the Research section of this report. During YR4, results from their findings were presented in various formats to the SSI Stewardship Council, SSI Research Council, and SSI members at large, and all are reviewed for possible strategic action changes.	Feedback loops continue to play an important role in figuring out how to meet the changing needs of the organization.

Objective 13.3: Establish a system for effectively managing the SSI interdisciplinary research portfolio.		
Major YR4 Activities	**Year 4 Progress/Significant Results**	**Key Outcomes**
a) Integrated matrix management system	During YR4, SSI continued to utilize its matrix organizational structure as a portfolio of research projects, where each project constitutes a place-based, multi-scale investigation of SES and K↔A processes, patterns, and interactions. While each project offers important learning opportunities in its own right, one of SSI's central goals is to create a quasi-experimental design in which particular groups of projects can be used to compare and contrast the influence of different processes shaping SES and K↔A. This integrative strategy also increases the potential for drawing inferences about the role of contextual factors (e.g. biophysical, socioeconomic, and decision-making characteristics) and scale on system behavior. (See Goals #1-4 Research)	A matrix organizational approach and a high level of diligence leads to the successful implementation of the SSI portfolio.
b) Formal process to support & review portfolio	See Goal #10 Evaluation & Assessment	

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS 09-04155)

YR4 Annual Report Detail
APPENDIX 1: SSI Project Personnel

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
University of Maine							
Faculty	Amirbahman	Aria	Civil & Environmental Engineering	x	x		
Faculty	Anderson	Mark	School of Engineering	x	x	x	x
Faculty	Beard-Tisdale	Kate	Spatial Information Science & Engineering		x	x	x
Faculty	Bell	Kathleen	School of Economics	x	x	x	x
Faculty	Blackstone	Amy	Sociology			x	
Faculty	Brady	Damian	Marine Sciences				x
Faculty	Calhoun	Aram	Wildlife Ecology	x	x	x	x
Faculty	Chawathe	Sudarshan	Computer Science			x	x
Faculty	Cole	Barbara	Chemistry	x	x	x	x
Faculty	Cronan	Christopher	School of Biology & Ecology	x	x	x	x
Faculty	Daigle	John	School of Forest Resources	x	x	x	x
Faculty	Drummond	Francis	School of Biology & Ecology	x	x	x	
Faculty	Elliott	Catherine	Cooperative Extension		x	x	x
Faculty	Emanetoglu	Nuri	Electrical & Computer Engineering			x	
Faculty	Fernandez	Ivan	Plant, Soil, & Environmental Science	x	x		
Faculty	Gabe	Todd	Resource Economics & Policy				x
Faculty	Gallandt	Eric	Plant, Soil, & Environmental Science	x	x	x	
Faculty	Gardner	Susan	Education	x	x	x	x
Faculty	Hakola	Judith	English	x			
Faculty	Halteman	William	Mathematics & Statistics	x			
Faculty	Hart	David	Senator George J. Mitchell Center	x	x	x	x
Faculty	Hiebeler	David	Mathematics & Statistics	x		x	
Faculty	Hornsby	Stephen	Canadian-American Center	x	x		
Faculty	Hunter	Malcolm	Wildlife Ecology	x	x	x	x
Faculty	Jain	Shaleen	Civil & Environmental Engineering	x	x	x	x
Faculty	Johnson	Teresa	School of Marine Sciences	x	x	x	x
Faculty	Judd	Richard	History	x	x		
Faculty	King	Roger	Philosophy			x	

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Faculty	Kuykendall	William	New Media	x	x		
Faculty	Leahy	Jessica	School of Forest Resources	x	x	x	x
Faculty	Lichtenwalner	Anne	Animal & Veterinary Sciences			x	
Faculty	Lilieholm	Robert	School of Forest Resources	x	x	x	x
Faculty	Lindenfeld	Laura	Communication & Journalism/Margaret Chase Smith Policy Center	x	x	x	x
Faculty	Livingston	William	School of Forest Resources			x	x
Faculty	Loftin	Cynthia	Wildlife Ecology	x	x	x	x
Faculty	Maasch	Kirk	Earth Sciences	x			
Faculty	MacRae	Jean	Civil & Environmental Engineering	x	x	x	x
Faculty	McCoy	Shannon	Psychology	x	x	x	x
Faculty	McGill	Brian	Sustainability Solutions Initiative		x	x	x
Faculty	McKay	Susan	Physics & Astronomy/ Center for Research in STEM Education				x
Faculty	Nelson	Sarah	Water Research Institute				x
Faculty	Noblet	Caroline	School of Economics	x	x	x	x
Faculty	Norton	Steve	Earth Sciences	x	x		
Faculty	Olsen	Brian	School of Biology & Ecology			x	x
Faculty	Peckenham	John	Senator George J. Mitchell Center	x	x	x	x
Faculty	Peterson	Michael	Mechanical Engineering		x	x	
Faculty	Plant	Andrew	Cooperative Extension				x
Faculty	Porter	Terry	School of Business	x			
Faculty	Ranco	Darren	Anthropology/Senator George J. Mitchell Center	x	x	x	x
Faculty	Reeve	Andrew	Earth Sciences	x	x	x	x
Faculty	Sader	Steve	School of Forest Resources	x	x		
Faculty	Saros	Jasmine	School of Biology & Ecology	x			x
Faculty	Scott	Michael	New Media	x	x	x	
Faculty	Segee	Bruce	Electrical & Computer Engineering	x	x	x	x
Faculty	Silka	Linda	Margaret Chase Smith Policy Center	x	x	x	x
Faculty	Simon	Kevin	School of Biology & Ecology	x	x		
Faculty	Smith	Sean	Sustainability Solutions			x	x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
			Initiative				
Faculty	Stancioff	Esperanza	Cooperative Extension	x	x	x	x
Faculty	Teisl	Mario	School of Economics	x	x	x	x
Faculty	Vaux	Peter	Senator George J. Mitchell Center	x	x		
Faculty	Waring	Timothy	Sustainability Solutions Initiative		x	x	x
Faculty	Weiskittel	Aaron	School of Forest Resources	x	x	x	x
Faculty	Wilson	James	School of Marine Sciences	x	x	x	
Faculty	Wilson	Jeremy	School of Forest Resources	x	x	x	
Faculty	Zhu	Yifeng	Electrical & Computer Engineering	x	x	x	
Faculty	Zydlewski	Gayle	School of Marine Sciences	x	x	x	x
Grad Student	Albee	Emily	Education	x			
Grad Student	Andrle	Katie	Wildlife Ecology	x			
Grad Student	Bacon	Linda	School of Biology & Ecology	x	x		
Grad Student	Beyene	Mussie	Civil & Environmental Engineering			x	x
Grad Student	Bourgoin	Nathan	Electrical & Computer Engineering	x			
Grad Student	Brown	Vance	Communication & Journalism/School of Forest Resources	x	x		
Grad Student	Budzinski	Colleen	Communication & Journalism	x	x	x	x
Grad Student	Call	Erynn	Wildlife Ecology	x	x		
Grad Student	Carr	Tish	Forest Resources				x
Grad Student	Cline	Brittany	Sustainability Solutions Initiative/ Wildlife Ecology	x	x	x	x
Grad Student	Colby-George	Judy	Ecology & Environmental Sciences		x	x	x
Grad Student	Cooper	George	Earth Sciences			x	
Grad Student	Cosley	Brandon	School of Business/Psychology	x			
Grad Student	Crofton-MacDonald	Joshua	Ecology & Environmental Sciences				x
Grad Student	Debartolo-Stone	Michelle	Economics				x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Grad Student	Ditzler	Kristin	Ecology & Environmental Sciences		x		
Grad Student	Dreyer	Stacia	Economics		x	x	x
Grad Student	Engelberth	Haley	Economics			x	
Grad Student	Fisher	Meaghann	Modern Languages & Classics	x			
Grad Student	Forbes	Kent	Maine EPSCoR Office				x
Grad Student	Gerard	Brett	Earth Science				x
Grad Student	Girouard	Maria	Wabanaki Center	x			
Grad Student	Goff	Sandra	Ecology & Environmental Science			x	x
Grad Student	Gorczyca	Erika	School of Forest Resources	x		x	
Grad Student	Gray	Alex	Civil & Environmental Engineering	x	x	x	
Grad Student	Groff	Luke	Wildlife Ecology		x	x	x
Grad Student	Harris	Megan	Biochemistry, Micriobiology, & Molecular Biology		x		
Grad Student	Hassett	Katherine	Resource Economics & Policy	x			
Grad Student	Hawthorne	Lauren	Psychology			x	x
Grad Student	Hayden	Anne	School of Marine Sciences	x			
Grad Student	Hill	Jack	Mathematics & Statistics	x			
Grad Student	Hoffmann	Kristine	Wildlife Ecology			x	x
Grad Student	Hutchens	Stan	Sustainability Solutions Initiative/ Wildlife Ecology	x	x		
Grad Student	Hutchins	Karen	Sustainability Solutions Initiative/ Communication & Journalism	x	x	x	x
Grad Student	Jansujwicz	Jessica	Sustainability Solutions Initiative/ Wildlife Ecology/ School of Forest Resources	x	x	x	
Grad Student	Johnson	Eileen	Economics	x	x	x	x
Grad Student	Johnson	Michelle	School of Forest Resources		x	x	x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Grad Student	King	Robert	Electrical & Computer Engineering		x	x	
Grad Student	Lannan	Andrew	Plant, Soil, & Environmental Science			x	
Grad Student	Letarte	Danielle	School of Economics	x			
Grad Student	Levesque	Vanessa	Sustainability Solutions Initiative/School of Economics	x		x	x
Grad Student	Lisac	Nicholas	Sustainability Solutions Initiative				x
Grad Student	Lizotte	Molly	Parks, Recreation, & Tourism			x	
Grad Student	Lorion	Kara	School of Forest Resources			x	x
Grad Student	Lyons	Patrick	School of Forest Resources	x	x	x	
Grad Student	Manandhar	Eva	Economics				x
Grad Student	Marrinan	Sarah	Economics		x	x	
Grad Student	Martin	Danielle	Earth Sciences			x	x
Grad Student	McGreavy	Bridie	Communication & Journalism		x	x	x
Grad Student	McGuire	Julia	Ecology & Environmental Science			x	x
Grad Student	Mercado	Andrea	Margaret Chase Smith Policy Center				x
Grad Student	Meyer	Spencer	School of Forest Resources		x	x	x
Grad Student	Michelle	Natalie	Public Administration		x	x	x
Grad Student	Morehead	Sarah	Economics				x
Grad Student	Morgan	Dawn	Wildlife Ecology		x		
Grad Student	Mullen	Amanda	Education	x			
Grad Student	Neville	Melinda	Ecology & Environmental Science			x	
Grad Student	Newell	Ellen	Psychology/Education	x	x	x	x
Grad Student	Parr	Thomas	Ecology & Environmental Science		x	x	x
Grad Student	Payzant	Diane	Research & Sponsored Programs				x
Grad Student	Pickering	Ryan	School of Economics	x	x	x	x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Grad Student	Plowden	Jennifer	School of Economics	x	x	x	
Grad Student	Purinton	Karen	Economics				x
Grad Student	Quartuch	Michael	School of Forest Resources		x	x	x
Grad Student	Quigley	Erin	School of Forest Resources		x	x	x
Grad Student	Ravis	Charles	Sustainability Solutions Initiative		x		
Grad Student	Reed	Kristine	Anthropology				x
Grad Student	Rice	Emily	Communication & Journalism				x
Grad Student	Ryan	Kevin	Wildlife Ecology	x	x	x	
Grad Student	Sapiel	Minquansis	Wabanaki Center	x			
Grad Student	Saros	Misa	Civil & Environmental Engineering		x		
Grad Student	Seitz	Eleanor	Communication & Journalism	x			
Grad Student	Shrum	Jenny	Ecology & Environmental Science			x	x
Grad Student	Silva	Bernardita	Economics		x		
Grad Student	Silver	Emily	Forest Resources				x
Grad Student	Small	Heather	Intermedia	x	x	x	
Grad Student	Smith	Heather	Environmental Science				x
Grad Student	Smith	Hollie	Communication & Journalism		x	x	x
Grad Student	Spencer	Erin	Sustainability Solutions Initiative	x	x		
Grad Student	Springsteen	Anna	Ecology & Environmental Sciences		x	x	
Grad Student	Stoll	Eliza	Earth Science				x
Grad Student	Suldovsky	Brianne	Communication & Journalism				x
Grad Student	Sullivan	Abigail	Economics				x
Grad Student	Sutton	Anthony	Communication & Journalism		x	x	x
Grad Student	Thornbrough	Lauren	Communication & Journalism				x
Grad	Titterington	Meredith	Ecology & Environmental			x	

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student			Science				
Grad Student	Trosper	Stacy	Sustainability Solutions Initiative		x		
Grad Student	Truesdell	Samuel	School of Marine Sciences	x			
Grad Student	Utley	Lindsay	Communication & Journalism		x	x	
Grad Student	Vanderlugt	Blair	Resource Economics & Policy			x	x
Grad Student	Vieser	Jeffrey	School of Marine Sciences			x	x
Grad Student	Wellman	Joseph	Psychology/Education	x	x	x	
Grad Student	West	Andrea	Education	x			
Grad Student	Wibberly	Megan	School of Economics			x	
Grad Student	Willett	Sara	Wabanaki Center	x			
Grad Student	Withee	Jason	Electrical & Computer Engineering	x			
Grad Student	Zimmerman	Jacquelyn	School of Forest Resources	x	x		
High School Student	Balaban-Garber	Rachel	Orono High School	x	x		
High School Student	Benoit	Philip	Orono High School	x	x	x	
High School Student	Bird	Norah	Orono High School	x	x	x	
High School Student	Brewer	Addison	Bangor High School		x		
High School Student	Bulteel	Alex	Orono High School	x	x	x	
High School Student	Caron	Zachary	Orono High School	x	x		
High School Student	Chase	Samuel	Orono High School		x	x	x
High School Student	Chasse	Taylor	Orono High School		x	x	
High	Claar	Joseph	Orono High School		x	x	x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
School Student							
High School Student	Clement	Leah	Orono High School			x	x
High School Student	Cole	Avery	Orono High School	x	x		
High School Student	Cole	Hannah	Orono High School			x	x
High School Student	Crocker	Brandon	Orono High School			x	x
High School Student	Desisto	Joseph	Orono High School			x	x
High School Student	Foster	Andria	Orono High School	x	x	x	
High School Student	Guo	Mengting	Orono High School	x	x	x	
High School Student	Hamilton	Laurie	Orono High School			x	x
High School Student	Harrity	Siobhan	Orono High School	x	x	x	
High School Student	Hecker	Olivia	Orono High School		x	x	x
High School Student	Innis	Nicholas	Orono High School		x	x	x
High School Student	Introne	Chris	Orono High School			x	x
High School Student	Koehler	Benjamin	Orono High School	x	x	x	
High School Student	Koehler	Karl	Orono High School	x	x		
High School Student	Landis	Audrey	Orono High School		x	x	
High School	Lesser	Daniel	Orono High School	x	x		

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student							
High School Student	MacDougall	Kenneth	Old Town High School				x
High School Student	Mares	Ruth	Orono High School		x	x	
High School Student	Marquis	Kayla	Orono High School			x	x
High School Student	Mayfield	Lillie	Orono High School		x	x	
High School Student	McKaig	Conor	Orono High School			x	x
High School Student	McKillen-Godfried	Isaac	Orono High School			x	x
High School Student	Ohno	Paul	Orono High School	x	x		
High School Student	Pasquine	Laura	Bangor High School		x		
High School Student	Perry	Daniel	Orono High School		x	x	x
High School Student	Richards	Jessica	Orono High School	x	x	x	
High School Student	Robinson	John	Orono High School	x	x		
High School Student	Robinson	Paul	Orono High School	x	x	x	
High School Student	Rowe	Mark	Orono High School	x	x		
High School Student	Seavey	Emilie	Orono High School			x	x
High School Student	Tozer	Caroline	Orono High School		x	x	x
High School Student	Walton	Allison	Orono High School	x	x		

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
High School Student	Weigang	Anna	Orono High School		x	x	x
High School Student	Zou	Jiawei	Orono High School			x	x
Postdoc	Capps	Krista	Sustainability Solutions Initiative			x	x
Postdoc	Dhakal	Nirajan	Sustainability Solutions Initiative				x
Postdoc	Hall	Damon	Sustainability Solutions Initiative	x	x	x	
Postdoc	Jansujwicz	Jessica	Sustainability Solutions Initiative			x	x
Postdoc	Kim	Jong-Suk	Sustainability Solutions Initiative/Civil & Environmental Engineering	x			
Postdoc	Lamanna	Christina	Sustainability Solutions Initiative			x	x
Postdoc	Lazarus	Eli	Sustainability Solutions Initiative		x	x	
Postdoc	Straub	Crista	Sustainability Solutions Initiative			x	x
Staff	Barker	Sharon	Women's Resource Center				x
Staff	Bartlett	Christopher	Sea Grant	x	x	x	x
Staff	Boyle	Faye	Women's Resource Center				x
Staff	Bragg	Laurie	Maine EPSCoR Office				x
Staff	Budzinski	Colleen	Sustainability Solutions Initiative				x
Staff	Chapman	Holly	Sustainability Solutions Initiative				x
Staff	Colannino	Becky	Upward Bound				x
Staff	Couture	Joshua	Sustainability Solutions Initiative				x
Staff	Dunham	Jennifer	Maine EPSCoR Office	x	x	x	x
Staff	Eckardt	Michael	Office of the Vice President for Research	x	x	x	x
Staff	England	Elizabeth	Sustainability Solutions Initiative				x
Staff	Fitzgerald	Caragh	Cooperative Extension		x		
Staff	Gaspar	Ami	Advanced Computing Center				x
Staff	Gray	Alex	Sea Grant				x
Staff	Greenlaw	Suzanne	Sustainability Solutions Initiative				x
Staff	Growe	Cynthia	Maine EPSCoR Office	x	x	x	x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Staff	Hallsworth	Ruth	Senator George J. Mitchell Center	x	x	x	x
Staff	Hamel	Carol	Sustainability Solutions Initiative	x	x	x	x
Staff	Hart	Angela	ADVANCE Rising Tide Center				x
Staff	Hermann	Michael	Canadian-American Center	x			
Staff	Homerding	Margaret	School of Marine Sciences	x			
Staff	Ilseman	Kelly	Upward Bound				x
Staff	Isherwood-Iobst	Jennifer	Maine EPSCoR Office			x	x
Staff	Kendrick	Martha	Center for Community Inclusion & Disability Studies				x
Staff	Kurtz	Alan	Center for Community Inclusion & Disability Studies				x
Staff	Kuykendall	Adam	Maine EPSCoR Office	x	x	x	
Staff	Labas	Linda	Center for Community Inclusion & Disability Studies				x
Staff	Littlefield	Andrea	Maine EPSCoR Office				x
Staff	May	Janet	Center for Community Inclusion & Disability Studies				x
Staff	McIntyre	Andrew	Senator George J. Mitchell Center			x	
Staff	Mitchell	John	Wabanaki Center	x			
Staff	Morgan	Dawn	Wildlife Ecology		x	x	
Staff	Morneault	Marnie	Center for Community Inclusion & Disability Studies				x
Staff	Nemeth	Vicki	Maine EPSCoR Office	x	x	x	x
Staff	Peckenham	Emily	Senator George J. Mitchell Center			x	
Staff	Peek	Madeline	Sustainability Solutions Initiative				x
Staff	Pelletier	Kayla	Wildlife Ecology			x	
Staff	Perkins	Joan	ADVANCE Rising Tide Center				x
Staff	Phelps	Lisa	Cooperative Extension				x
Staff	Raymond	Kim	Senator George J. Mitchell Center	x	x	x	x
Staff	Smith	Hollie	Sustainability Solutions Initiative		x		
Staff	Sparks	Sarah	Cooperative Extension				x
Staff	Wilson	Laura	Cooperative Extension				x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Staff	Zollitsch	Brenda	Sustainability Solutions Initiative	x	x		
Technician	Cousins	Stephen	School of Marine Sciences			x	
Technician	Crocker	Robin	Research & Sponsored Programs			x	x
Technician	Finlayson	Christy	Sustainability Solutions Initiative/Anthropology	x			
Technician	Kormendy	Zsolt	Sustainability Solutions Initiative/Wildlife Ecology	x			
Technician	Lake	Bjorn	Sustainability Solutions Initiative/School of Biology & Ecology	x			
Technician	Legaard	Kasey	Sustainability Solutions Initiative/School of Forest Resources	x			
Technician	McCloskey	Jon	Sustainable Solutions Initiative/School of Forest Resources	x			
Technician	Melanson	Jesse	Maine EPSCoR Office	x			
Technician	Mercier	Wilfred	Sustainability Solutions Initiative/School of Forest Resources	x			
Technician	Post	Dylan	Sustainability Solutions Initiative		x	x	
Technician	Simons	Erin	School of Forest Resources	x			
Technician	Staines	Garrett	School of Marine Sciences			x	
Technician	Tremblay	Jill	Sustainability Solutions Initiative	x			
Technician	Wilbur	Clifford	Research & Sponsored Programs			x	x
Technician	Wilson	Christian	Advanced Computing Center				x
Technician	Yan	Liying	School of Marine Sciences	x			
Undergrad Student	Amatya	Jyoti	Chemical & Biological Engineering			x	
Undergrad Student	Armfield	Robert	Wabanaki Center	x	x	x	
Undergrad Student	Armstrong	John	Biology			x	x
Undergrad Student	Arsenault	Chad	New Media		x		
Undergrad Student	Ballard	Meghan	Forestry				x
Undergrad	Baughman	Jessica	School of Economics	x			

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student							
Undergrad Student	Becker	Amy	Communication & Journalism/School of Forest Resources			x	
Undergrad Student	Beckwith	Walter	School of Marine Sciences		x		
Undergrad Student	Benoit	Philip	Pre-Pharmacy				x
Undergrad Student	Bird	Norah	School of Forest Resources			x	x
Undergrad Student	Bouchard	Dylan	Economics			x	
Undergrad Student	Buckley	Karl	Communication & Journalism/School of Forest Resources	x			
Undergrad Student	Bussell	Mallory	Communication & Journalism/School of Forest Resources	x			
Undergrad Student	Carle	Brittany	Recreation, Parks, & Tourism		x		
Undergrad Student	Chasse	Taylor	School of Nursing			x	
Undergrad Student	Chavis	Emily	Wabanaki Center	x			
Undergrad Student	Churchill-Vogt	Zoe	Psychology		x		
Undergrad Student	Claar	Joseph	Biology & Ecology				x
Undergrad Student	Co	Aileen	Chemical & Biological Engineering		x		
Undergrad Student	Cole	Avery	Biology & Ecology				x
Undergrad Student	Cole	Kaitlin	Communication & Journalism				x
Undergrad Student	D'Urso	Eleanor	Wildlife Ecology				x
Undergrad Student	Daigle	Kristyn	Sustainability Solutions Initiative		x		
Undergrad Student	Dandy	Michael	Civil & Environmental Engineering				x
Undergrad Student	Dimoulas	Ariadne	Marine Sciences				x
Undergrad Student	Doyen	Katherine	Marine Sciences				x
Undergrad Student	Doyon	Tyler	Economics				x
Undergrad Student	Drown	Peter	Sustainability Solutions Initiative		x		
Undergrad	Dulac	Ryan	Psychology		x		

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student							
Undergrad Student	Dulin	Nathaniel	Ecology & Environmental Sciences		x		
Undergrad Student	Dunn	Christopher	School of Economics	x	x		
Undergrad Student	Dyer	Kristine	English		x	x	x
Undergrad Student	Engelmann	Nichole	Ecology & Environmental Sciences		x		
Undergrad Student	Fetahu	Flavio	Economics				x
Undergrad Student	Finer	Matthew	School of Business			x	x
Undergrad Student	Finnemore	Luke	Economics			x	x
Undergrad Student	Fisher	Susannah	Economics			x	
Undergrad Student	Fitch	Matthew	New Media	x	x		
Undergrad Student	Fournier	Maria	Economics		x		
Undergrad Student	Frisch	Alicia	Economics				x
Undergrad Student	Gilbert	Christine	Liberal Arts & Sciences				x
Undergrad Student	Godin	Hilary	Sustainability Solutions Initiative			x	
Undergrad Student	Grant	Jonathan	Wildlife Ecology	x	x		
Undergrad Student	Gray	Kristy	Biology			x	
Undergrad Student	Han	Chuck	Electrical & Computer Engineering		x	x	
Undergrad Student	Haskins	Thomas	History			x	x
Undergrad Student	Hecker	Lee	Wildlife Ecology	x	x	x	x
Undergrad Student	Helmke	Scott	Wildlife Ecology	x	x		
Undergrad Student	Hoyt	Margaret	Natural Sciences, Forestry, & Agriculture			x	x
Undergrad Student	Huang	Kang	Electrical & Computer Engineering		x		
Undergrad Student	Hubbard	Malissa	Ecology & Environmental Sciences		x		
Undergrad Student	Hutchinson	Sean	Communication & Journalism/School of Forest Resources	x			

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Undergrad Student	Innes	Gregory	Wildlife Ecology				x
Undergrad Student	Jackson	Randi	Forestry				x
Undergrad Student	Jordan	Mira	Communication & Journalism			x	
Undergrad Student	Judd	Lillian	School of Forest Resources		x		
Undergrad Student	Kacer	Nikita	Academic and Career Exploration		x	x	
Undergrad Student	Kennedy	Cody	Wildlife Ecology	x	x		
Undergrad Student	Kent	Sarah	History		x		
Undergrad Student	Koboski	Theo	Marine Sciences				x
Undergrad Student	Kus	Evan	Electrical & Computer Engineering		x	x	x
Undergrad Student	Lajoie	Caitlyn	School of Economics	x			
Undergrad Student	Lamond	William	Liberal Arts & Sciences			x	
Undergrad Student	Landry	Nicole	Ecology & Environmental Science			x	x
Undergrad Student	Lankist	Amanda	Chemistry		x		
Undergrad Student	Ledoux	Annie	Economics			x	
Undergrad Student	Ledoux	Haylea	Chemical & Biological Engineering		x		
Undergrad Student	Legere	Matthew	Earth Sciences	x	x	x	
Undergrad Student	Li	Bo	Civil & Environmental Engineering		x		
Undergrad Student	Lizotte	Molly	Parks, Recreation, & Tourism		x		
Undergrad Student	Lyden	John	Chemistry			x	
Undergrad Student	Manning	Joshua	School of Marines Sciences		x	x	
Undergrad Student	Marcroft	Robert	Psychology		x		
Undergrad Student	Mattos	Emily	School of Business		x		
Undergrad Student	Mauricette	Eric	School of Forest Resources		x		
Undergrad Student	McGuire	Timothy	Mechanical Engineering		x		
Undergrad	McIntyre	Andrew	School of Biology &			x	

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student			Ecology				
Undergrad Student	McMullan	Barrett	Economics			x	
Undergrad Student	Melanson	Jesse	New Media	x			
Undergrad Student	Mitchell	Alexa	Liberal Arts & Sciences				x
Undergrad Student	Moore	Zeraph	Ecology & Environmental Science			x	
Undergrad Student	Morrow	Danielle	School of Biology & Ecology			x	
Undergrad Student	Nadeau	Christopher	Sustainability Solutions Initiative				x
Undergrad Student	Ortiz	Anthony	School of Forest Resources		x		
Undergrad Student	Pandey	Upasana	Biology & Ecology				x
Undergrad Student	Parkhill	Nathaniel	Wildlife Ecology			x	x
Undergrad Student	Peavey	Lauren	Sustainability Solutions Initiative		x		
Undergrad Student	Peckenham	Phoebe	Sustainability Solutions Initiative			x	x
Undergrad Student	Pelletier	Kayla	Wildlife Ecology		x		
Undergrad Student	Perkins	Randy	Earth Science			x	
Undergrad Student	Perry	Alexandra	Biology & Ecology				x
Undergrad Student	Petrakovich	Joseph	Liberal Arts & Sciences			x	
Undergrad Student	Pinkham	Matthew	Liberal Arts & Sciences				x
Undergrad Student	Porter	Sarah	Psychology			x	
Undergrad Student	Post	Dylan	Communication & Journalism		x		
Undergrad Student	Price	Kevin	School of Economics	x	x		
Undergrad Student	Purinton	Karen	School of Economics	x	x	x	x
Undergrad Student	Rancourt	Arielle	Psychology				x
Undergrad Student	Reeves	Lauren	Liberal Arts & Sciences			x	
Undergrad Student	Rideout	Sarah	Psychology			x	
Undergrad Student	Ross	Brittany	School of Forest Resources		x		

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Undergrad Student	Rounds	Alan	Economics			x	
Undergrad Student	Roy	Briana	Communication & Journalism				x
Undergrad Student	Rudnicki	Cara	Forest Resources				x
Undergrad Student	Saucier	Katie	Child Development & Family Relations				x
Undergrad Student	Shank	Elijah	School of Forest Resources		x	x	
Undergrad Student	Sherman	Dane	School of Engineering Technology			x	x
Undergrad Student	Smith	Kathryn	Business				x
Undergrad Student	Stanhope	Joshua	Forest Resources				x
Undergrad Student	Stewart	Nicholas	New Media				x
Undergrad Student	Stewlow	Allison	Biology & Ecology				x
Undergrad Student	Stickney	Matthew	Computer Science		x		
Undergrad Student	Stiles	Benjamin	Sustainability Solutions Initiative		x		
Undergrad Student	Thomas	Erin	Communication & Journalism			x	
Undergrad Student	Thornbrough	Lauren	Communication & Journalism			x	x
Undergrad Student	Tomes	Andrew	School of Biology & Ecology	x			
Undergrad Student	Tooher	Alexander	Electrical & Computer Engineering		x		
Undergrad Student	Tremblay	Jill	Anthropology	x			
Undergrad Student	Veitch	Eric	Natural Sciences, Forestry, & Agriculture			x	x
Undergrad Student	Vivian	Sabrina	Ecology & Environmental Sciences				x
Undergrad Student	Vo	Giang	School of Business	x	x		
Undergrad Student	Walus	Brandon	Wabanaki Center	x			
Undergrad Student	Wibberly	Megan	School of Economics	x	x		
Undergrad Student	Wolfe	Kristine	Psychology			x	
University of Southern Maine							
Faculty	Briggs	David	Computer Science	x	x	x	

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Faculty	Colgan	Charles	Muskie School of Public Service	x	x	x	x
Faculty	Kartez	Jack	Muskie School of Public Service	x	x	x	x
Faculty	Kim	Yuseung	SSI/Muskie School of Public Service		x	x	x
Faculty	Owen	David	School of Law	x	x	x	x
Faculty	Pavri	Firooza	Geography & Anthropology	x	x	x	x
Faculty	Wilson	Karen	Environmental Science & Policy	x	x	x	x
Grad Student	Bojarski	Slawomir	Muskie School of Public Service	x	x	x	
Grad Student	Capponi	Randa	School of Law	x	x		
Grad Student	D'Alessandro	Daniel	School of Law			x	
Grad Student	Dailey	Abraham	Geology			x	x
Grad Student	Dikeman	Barry	Muskie School of Public Service		x		
Grad Student	Glaser	Peter	School of Law	x			
Grad Student	Goff	Sandra	Muskie School of Public Service	x	x		
Grad Student	James	Liana	School of Law				x
Grad Student	Lloyd	Sadie	Muskie School of Public Service			x	
Grad Student	Nixon	Matthew	Muskie School of Public Service				x
Grad Student	Payne	Molly	Biology			x	x
Grad Student	Riley	Jennifer	Muskie School of Public Service		x		
Grad Student	Workman	Scott	Community Planning & Development			x	
Grad Student	Youngs	Thea	Muskie School of Public Service	x	x		
High School Student	Puleio	Audrey	Thornton Academy				x
Staff	Ives	Barbara	Muskie School of Public Service		x	x	x
Staff	Thurston	Scott	Sustainability Solutions Initiative			x	
Staff	Valentine	Vinton	Geography/Anthropology			x	
Technician	Willis	Theodore	Adjunct Faculty	x	x	x	x
Technician	Workman	Scott	Sustainability Solutions			x	

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
			Initiative				
Undergrad Student	Barajas	Miguel	Environmental Science			x	x
Undergrad Student	Bartlett	Todd	Environmental Science			x	
Undergrad Student	Begin	Leonora	Geology		x		
Undergrad Student	Bourget	Paul	Geography/Anthropology			x	
Undergrad Student	Bryant	Corey	Environmental Science				x
Undergrad Student	Bullis	Meghan	Muskie School			x	
Undergrad Student	Carroll	Shannon	School of Law	x			
Undergrad Student	Cole	Tony	Environmental Science				x
Undergrad Student	Dailey	Abraham	Geography/Anthropology	x	x		
Undergrad Student	Duff	Jason	Environmental Science				x
Undergrad Student	Glaser	Peter	School of Law	x			
Undergrad Student	Hope	Zach	Biology				x
Undergrad Student	Keene	Matthew	Geology/Anthropology			x	
Undergrad Student	Monroe	Joshua	Environmental Science			x	
Undergrad Student	Ogren	Meghan	School of Law	x			
Undergrad Student	Poppas	Shane	Environmental Science			x	x
Undergrad Student	Pooler	William	Muskie School of Public Service		x	x	
Undergrad Student	Sanford	Cole	Geography & Anthropology	x			
Undergrad Student	Shuttle	Shannon	Environmental Science		x	x	
Undergrad Student	Smith	Cecilia	Muskie School of Public Service				x
Undergrad Student	Thurston	Scott	Muskie School of Public Service		x	x	
Undergrad Student	Webb	Amy	Environmental Science				x
Undergrad Student	Wood	Richard	School of Law	x	x		
Bates College							
Faculty	Johnson	Beverly	Geology	x	x	x	x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Faculty	Lewis	Lynne	Economics	x	x	x	x
Technician	Dostie	Phil	Chemistry	x		x	
Technician	Goundie	Ben	Geology				x
Technician	Locke	Bill	Biology			x	
Technician	Ross	Zach	Economics			x	
Undergrad Student	Barry	Eric	Geology				x
Undergrad Student	Chiao	Chester	Geology				x
Undergrad Student	Geng	Tianen	Economics				x
Undergrad Student	Kim	BoRa	Economics				x
Undergrad Student	Lauden	Andrea	Geology				x
Undergrad Student	Lindelof	Jennifer	Geology	x			
Undergrad Student	Ross	Zach	Economics	x			
Undergrad Student	Sandstrom	Ursula	Economics/Environmental Studies			x	x
Undergrad Student	Thompson	Lindsay	Environmental Studies			x	
Undergrad Student	Wool	Dava	Geology	x			
Bowdoin College							
Faculty	Camill	Phil	Environmental Studies & Biology	x	x	x	x
Faculty	Herrera	Guillermo	Economics	x	x	x	x
Faculty	Lichter	John	Biology	x	x	x	x
Faculty	Vail	David	Economics			x	x
Staff	Ames	Ted	Biology		x	x	x
Undergrad Student	Bell	Andy	Biology	x			
Undergrad Student	Berghoff	Henry	Biology	x			
Undergrad Student	Elowe	Cory	Biology	x			
Undergrad Student	Hinman	Paul	Economics	x			
Undergrad Student	Jacobson	Holly	Biology	x			
Undergrad Student	Johnston	Catherine	Biology	x			
Undergrad Student	McFarlane	Alithea	Environmental Studies			x	
Undergrad Student	Towne	Ben	Biology	x			

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Colby College							
Faculty	Bevier	Catherine	Biology	x	x	x	
Faculty	Cole	Russell	Biology	x	x	x	x
Faculty	Donihue	Michael				x	x
Faculty	Fleming	James	Science, Technology, and Society	x	x	x	x
Faculty	King	Whitney	Chemistry	x	x	x	x
Faculty	Nyhus	Philip	Environmental Studies	x	x	x	x
Faculty	Rueger	Bruce	Geology		x	x	x
Faculty	Wilson	Herbert	Biology	x	x		
Staff	Elliott	Alice	Goldfarb Center for Public Affairs & Civic Engagement	x			
Staff	Lessing	Lauren	Museum of Art	x			
Undergrad Student	Anderson	Elizabeth	Environmental Science				x
Undergrad Student	Arsenault	Emily	Biology				x
Undergrad Student	Bicher	Clara	Geology				x
Undergrad Student	Bittler	Kim	Chemistry	x	x		
Undergrad Student	Bradley	Sharonda	Biology	x			
Undergrad Student	Bruno	Jasmine	Biology	x	x		
Undergrad Student	Chang	Anne	Biology	x			
Undergrad Student	Cross	Angela	Environmental Science				x
Undergrad Student	Cummings	Colin	Environmental Science				x
Undergrad Student	Davis	Monica	Biology				x
Undergrad Student	Ferguson	Marianne	Environmental Science				x
Undergrad Student	Forgrave	Rebecca	Chemistry				x
Undergrad Student	Hoyt	Eleanor	Biology	x	x		
Undergrad Student	Junker	Alexa	Environmental Science				x
Undergrad Student	Kawamura	Malia	Chemistry		x		
Undergrad Student	Martin	Corey	Biology	x	x		
Undergrad Student	Mauel	Jack	Environmental Science				x
Undergrad	McCullough	Ian	Environmental Studies	x			

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student							
Undergrad Student	Mealor	Andrew	Biology				x
Undergrad Student	Murray	Katherine	Chemistry		x		
Undergrad Student	Papanastissiou	Nicholas	Economics				x
Undergrad Student	Reichler	Corey	Environmental Science				x
Undergrad Student	Schnettler	Erin	Science, Technology, Society	x	x		
Undergrad Student	Sheppard	Danielle	Science, Technology, Society	x	x		
Undergrad Student	Shimer	Sarah	Geology				x
Undergrad Student	Theile	Josie	Chemistry		x		
Undergrad Student	Todd	Alexandra	Biology	x	x		
Undergrad Student	Treachey	Noah	Environmental Science				x
Undergrad Student	Vorlicek	Caitlin	Economics				x
Undergrad Student	Westhafer	James	Science, Technology, Society	x			
Unity College							
Faculty	Arnett	Amy	Ecology	x	x	x	x
Faculty	Bibles	Brent	Wildlife Biology			x	x
Faculty	Dunckel	Kathleen	Computers & Geographic Information Systems	x	x	x	x
Faculty	Latty	Erika	Botany	x	x	x	x
Faculty	Remsburg	Alysa	Biology	x	x	x	x
Undergrad Student	Alexander	Camille	Biodiversity				x
Undergrad Student	Anderson	Deborah	Wildlife Biology			x	x
Undergrad Student	Arsenault	Arielle	Biology	x	x		
Undergrad Student	Barber	Kelly	Sustainability & Global Change	x	x		
Undergrad Student	Beers	Alyssa	Wildlife Biology				x
Undergrad Student	Bell	Nils	Biodiversity	x	x		
Undergrad Student	Crowe	John	Biodiversity			x	x
Undergrad Student	Dowler	Elizabeth	Wildlife Biology			x	
Undergrad	Follette	Taylor	Wildlife Biology			x	x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student							
Undergrad Student	Greer	Jasmine	Biology	x	x		
Undergrad Student	Grundl	Rachel	Biodiversity				x
Undergrad Student	Lamppa	Thomas	Biology	x	x		
Undergrad Student	Leach	Arianna	Resource Management	x	x	x	
Undergrad Student	Lee	Caitlin	Biodiversity				x
Undergrad Student	Longo	Samantha	Sustainability & Global Change				x
Undergrad Student	Mann	Zachary	Biodiversity				x
Undergrad Student	Michaud	Jennifer	Wildlife Biology			x	
Undergrad Student	Miller	Andrea	Biodiversity	x	x		
Undergrad Student	Moran	Jennifer	Wildlife Biology			x	x
Undergrad Student	Morrison	Ryan	Wildlife Biology				x
Undergrad Student	Nolan	Katherine	Wildlife Biology			x	
Undergrad Student	Orcutt	Elizabeth	Biodiversity			x	x
Undergrad Student	Priest	Destiney	Wildlife Biology				x
Undergrad Student	Robinson	Michael	Wildlife Biology				x
Undergrad Student	Rowe	Teneele	Biodiversity				x
Undergrad Student	Salvino	Cayce	Biodiversity	x	x		
Undergrad Student	Tway	Courtney	Biology		x	x	x
Undergrad Student	Wanham	Constant	Biology		x	x	
Undergrad Student	Whitney	Elizabeth	Biodiversity				x
Undergrad Student	Zukas	Alison	Resource Management	x	x		
University of Maine at Augusta							
Faculty	Lage	Christopher	Biology		x	x	x
Faculty	Milligan	Peter	Biology		x	x	x
Faculty	Szakas	Joseph	Computer Information Systems		x	x	x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Faculty	Turcotte	Catherine	Socieal Sciences				x
Undergrad Student	Bansmer	Jacob	Biology			x	
Undergrad Student	Bean	Amanda	Biology			x	
Undergrad Student	Couture	Amanda	Biology			x	
Undergrad Student	Davis	Cali	Biology			x	
Undergrad Student	Dyer	Heather	Biology			x	
Undergrad Student	Gray	Kristy	Biology			x	
Undergrad Student	Hamm	Ryan	Social Sciences				x
Undergrad Student	Hostetter	Ryan	Social Sciences				x
Undergrad Student	Howard	Candis	Biology				x
Undergrad Student	Johnston	Julie	Biology				x
Undergrad Student	King	Jillian	Biology				x
Undergrad Student	LaClaire	Nathaniel	Computer Information Systems			x	
Undergrad Student	Roy	Louis	Biology & Ecology				x
Undergrad Student	Tantoco	Rolando	Biology				x
Undergrad Student	Theberge	Karen	Biology			x	x
University of Maine at Farmington							
Faculty	Barton	Andrew	Biology		x	x	x
Faculty	Bennett	Chris	Computer Science		x	x	x
Faculty	Buckley	Daniel	Natural Sciences	x	x	x	x
Faculty	Butler	Ron	Biology		x	x	x
Faculty	Clawson	Mellisa	Education		x	x	
Faculty	Daly	Julia	Geology		x	x	x
Faculty	Harper	Wendy	Economics	x	x	x	x
Faculty	Heroux	David	Chemistry		x	x	
Faculty	McAnneny	Cathleen	Geography		x		
Faculty	McCourt	Matthew	Geography	x	x	x	x
Technician	Angelides	Michael	Social Sciences, Business, & Global Studies				x
Technician	Plancon	Dora	Geography				x
Undergrad Student	Abrams	Robert	Environmental Science			x	
Undergrad	Adams	Sara	Geology			x	

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student							
Undergrad Student	Angelides	Michael	English		x	x	
Undergrad Student	Bond	Christopher	Computer Science			x	x
Undergrad Student	Buys	John	Education		x	x	
Undergrad Student	Case	Tyler	Biology				x
Undergrad Student	Colbry	Dustin	Environmental Planning & Policy		x	x	
Undergrad Student	Corson	Hunter	Biology		x	x	
Undergrad Student	Doughty	Murphy	Geology				x
Undergrad Student	Dumont	Natalie	Biology				x
Undergrad Student	Durant	Nathan	Biology			x	
Undergrad Student	Fenning	Blair	Art				x
Undergrad Student	Ferrari	Tom	Biology		x	x	
Undergrad Student	Hughes	Ty	Geography				x
Undergrad Student	Lavorgna	Sarah	Geology			x	x
Undergrad Student	Littlefield	Emily	Biology			x	x
Undergrad Student	Masse	Rebeca	Education		x	x	
Undergrad Student	Ottman	Kelsey	Biology			x	
Undergrad Student	Perkins	Gabriel	Geology				x
Undergrad Student	Plancon	Dora	Geography			x	
Undergrad Student	Rousseau	Cree	Geology				x
Undergrad Student	Scott	Jediah	Environmental Planning & Policy		x		x
Undergrad Student	Skoog	Dimitri	Biology		x		
Undergrad Student	Small	Cassidy	Visual Arts		x	x	
Undergrad Student	St. Germain	Aimee	Geography				x
Undergrad Student	Wilson	Tyler	Natural Sciences	x	x		

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Undergrad Student	Winter	Daniel	Education			x	
University of Maine at Fort Kent							
Faculty	Borges-Therien	Kim	Natural & Behavioral Sciences		x	x	
Faculty	Cardenas	Soraya	Natural & Behavioral Sciences		x	x	
Faculty	Hicks	Bruno	Education		x		
Faculty	Hobbins	Dave	Natural & Behavioral Sciences		x	x	
Faculty	Holzhausen	Kurt	Natural & Behavioral Sciences			x	
Faculty	Martin	John	Natural & Behavioral Sciences				x
Faculty	Nadelhaft	Erica	Humanities				x
Faculty	Trudel	Leo	Professional Management				x
Staff	Bjerklie	JR	Institutional Research & Assessment		x		
Staff	Kermath	Brian	Center for Rural Sustainable Development		x		
Staff	Trudel	Julie-Ann	Forestry		x		
Undergrad Student	Aldrich	Patrick	Environmental Studies			x	
Undergrad Student	Allen	Steven	Environmental Studies			x	
Undergrad Student	Berube	Shannon	Natural & Behavioral Sciences		x		
Undergrad Student	Biggs	Theresa	Education				x
Undergrad Student	Garrison	Amber Skye	Nat		x		
Undergrad Student	Jerkins	Martin	Environmental Studies		x		
Undergrad Student	Kurensky	Joshua	Business				x
Undergrad Student	Lebroke	Ryan	Natural & Behavioral Sciences			x	
Undergrad Student	McDermott	Timothy	Environmental Studies			x	
Undergrad Student	McIntosh	Gregory	Environmental Studies			x	
Undergrad Student	Michaud	Bernice	Environmental Studies			x	
Undergrad Student	Michaud	Charles	Environmental Studies		x		
Undergrad Student	Mosquera	Sandy	Environmental Studies		x		
Undergrad Student	Nadeau	Travis	Environmental Studies		x		

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Undergrad Student	Ouellette	Greg	Forest Management		x		
Undergrad Student	Petrashune	Maxwell	Environmental Studies			x	x
Undergrad Student	Planchet	David	Environmental Studies			x	
Undergrad Student	Plourde	Joshua	Environmental Studies				x
Undergrad Student	Sutton	Lisa	Behavioral Sciences			x	
Undergrad Student	Theriault	Kristin	Behavioral Sciences			x	
University of Maine at Machias							
Faculty	Otto	William	Environmental & Biological Science		x		
University of Maine at Presque Isle							
Faculty	Johnston	Jason	Math & Science	x	x	x	x
Faculty	Putnam	David	Math & Science	x	x	x	
Faculty	Sebold	Kimberly	History		x	x	x
Faculty	Wang	Chunzeng	Math & Science	x	x	x	x
Faculty	Whittington	Anja	Recreation & Leisure Studies		x		
High School Student	Day	Elizabeth	Fort Fairfield High School			x	
High School Student	Sawyer	Aidan	Presque Isle High School				x
Technician	Delahunty	Krista	Biology			x	x
Undergrad Student	Bailey	Deana	History				x
Undergrad Student	Belair	Scott	Math & Science		x		x
Undergrad Student	Bennett	Logan	History			x	x
Undergrad Student	Crandall	Matthew	Environmental Studies		x		x
Undergrad Student	Cyr	Justine	Biology				x
Undergrad Student	Ellis	Chelsey	Math & Science		x		x
Undergrad Student	Emery	Robert	Recreation & Leisure Studies		x		
Undergrad Student	Filimonow	Ashley	Math & Science		x		x
Undergrad Student	Gerrish	Brianna	History		x	x	
Undergrad Student	Grivois	Keith	Math & Science	x	x		

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Undergrad Student	Hitchcock	Melinda	Environmental Studies				x
Undergrad Student	Howe	Justin	Arts & Science				x
Undergrad Student	Mink	Michael	Arts & Science				x
Undergrad Student	Parent	Gary	Math & Science		x		
Undergrad Student	Paul	Angie	Math & Science	x	x		
Undergrad Student	Peters	Ashlee	Arts & Science				x
Undergrad Student	Plissey	Dylan	Biology				x
Undergrad Student	Pond	Cody	History				x
Undergrad Student	Ryan	Sarah	Math & Science	x	x		
Undergrad Student	Sirois	Gary	Outdoor Recreation		x		
Undergrad Student	Young	Samantha	Arts & Science				x
University of New England							
Faculty	Adams	Mark	Environmental Studies				x
Faculty	Bass	Anna	Marine Sciences				x
Faculty	Daley	Michael	Management	x	x	x	x
Faculty	Feurt	Christine	Environmental Studies	x	x	x	x
Faculty	Morgan	Pamela	Environmental Studies	x	x	x	x
Faculty	Perlut	Noah	Environmental Studies		x	x	x
Faculty	Steen-Adams	Michelle	Environmental Studies			x	
Faculty	Sulikowski	James	Marine Science Academic	x		x	x
Faculty	Zeeman	Stephan	Marine Sciences	x	x	x	x
Faculty	Zogg	Greg	History & Politics	x	x	x	
Staff	Davis	Jenna	Office of the Vice President for Research	x			
Technician	Carlson	Amy	Environmental Studies	x			
Undergrad Student	Almeida	William	Environmental Studies	x	x		
Undergrad Student	Amaio	Chelsea	Environmental Studies	x			
Undergrad Student	Bergeron	Jessica	Marine Sciences	x	x		
Undergrad Student	Carlson	Amy	Chemistry & Physics	x	x		
Undergrad	Crettien	Chloe	Sustainability Solutions		x		

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Student			Initiative				
Undergrad Student	Hammond	Marissa	Environmental Studies/Marine Sciences	x	x		
Undergrad Student	Johnson	Samantha	Marine Sciences	x			
Undergrad Student	Kelly	Lindsay	Environmental Studies	x	x		
Undergrad Student	Loesher	Gale	Sustainability Solutions Initiative	x	x		
Undergrad Student	Madore	Justine	Environmental Studies	x			
Undergrad Student	Ouillette	Amanda	Sustainability Solutions Initiative		x		
Undergrad Student	Sargent	Deidra	Environmental Studies	x			
Undergrad Student	Simon	Matt	Sustainability Solutions Initiative		x		
Undergrad Student	Smith	Kayla	Sustainability Solutions Initiative		x		
Undergrad Student	Wright	Derek	Sustainability Solutions Initiative	x			
Other Institution Participants							
Faculty	Maclean	David	Forestry, University of New Brunswick	x	x		
Staff	Baeder	Charles	Belgrade Regional Conservation Alliance		x		x
Staff	Briendel	Deb	Camp CaPella				x
Staff	Dionne	Michele	Wells National Estuarine Research Reserve		x	x	
Staff	Donahue	Charlene	State of Maine Insect & Disease Laboratory	x			
Staff	Drummond	Marjorie	GrowSmart Maine	x			
Staff	Kallin	Peter	Belgrade Regional Conservation Alliance	x	x	x	x
Staff	Meadow	Curtis	TreFoil Corporation	x			
Staff	Mosher	Dana	Camp CaPella				x
Staff	Neptune	Jennifer	Maine Indian Basketmakers Alliance		x	x	x
Staff	Secord	Theresa	Maine Indian Basketmakers Alliance		x	x	x
Staff	Shannon	Maggie	Maine Congress of Lakes Association	x	x	x	x
Staff	Smyth-Handley	Beth	Camp CaPella				x
Staff	Wall	Katherine	Maine Lakes Resource Center			x	x
Technician	Allen	Brad	Maine Department of Inland Fish & Wildlife			x	
Technician	Shively	Kirk	US Department of			x	

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
			Agriculture				
Technician	Sullivan	Kelsey	Maine Department of Inland Fish & Wildlife			x	
State EPSCoR Advisory Board							
Board Member	Agneta	Leonard	University of Maine School of Law				x
Board Member	Anderson	Andrew	University of Southern Maine				x
Board Member	Baker	Pamela	Bates College				x
Board Member	Ballesteros	LuAnn	The Jackson Laboratory				x
Board Member	Burns	John	Small Enterprise Growth Fund				x
Board Member	Dagher	Habib	University of Maine				x
Board Member	Davis	Christopher	Maine Aquaculture Innovation Center				x
Board Member	Ferland	John	Ocean Renewable Power Company				x
Chair	Ford	Tim	University of New England				x
Board Member	Gregory	Karin	Furman Gregory Deptula				x
Board Member	Hand	Patricia	Mount Desert Island Biological Laboratory				x
Board Member	Lad	Robert	University of Maine				x
Board Member	Langley-Turnbaugh	Samantha	University of Southern Maine				x
Board Member	Martin	Robert	Maine Technology Institute				x
Board Member	Merrill	Peter	Hunting Dearborn, Inc.				x
Board Member	Murray	Peter	Quantrix				x
Board Member	Peacock	Robert	R.J. Peacock Canning Co.				x
Board Member	Pendse	Hemant	University of Maine				x
Board Member	Perkins	Donald	Gulf of Maine Research Institute				x
Board Member	Sheehan	Jane	Foundation for Blood Research				x
Board Member	Shimmield	Graham	Bigelow Laboratory for Ocean Sciences				x
Board Member	St. Germain	Donald	Maine Medical Center Research Institute				x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Board Member	Syphers	Dale	Bowdoin College				x
Board Member	Theeman	Miles	Affiliated Healthcare Systems				x
Board Member	Von Vogt	Stephen	Maine Marine Composites				x
Board Member	Whitney	Brian	Maine Department of Economic & Community Development				x
Board Member	Wise	John	University of Southern Maine				x
Maine STEM Collaborative							
Board Member	Berger	Tom	Colby College				x
Board Member	Bernhardt	Anita	Maine Department of Education				x
Board Member	Boudreau	Christopher	Canter for Workforce Research & Information				x
Board Member	Buffington	Pam	Education Development Center, Inc.				x
Board Member	Gauthier	Anne	National Semiconductor				x
Board Member	Johnson	Christy	Colby College				x
Board Member	Keller	Tom	Maine Mathematics & Science Alliance				x
Board Member	Leander	Marcia	Unum				x
Board Member	Lishness	Alan	Gulf of Maine Research Institute				x
Board Member	McKernan	Michael	Mt. Desert Island Biology Lab				x
Board Member	Mickelson	Peter	Maine Engineering Promotional Council				x
Board Member	Mokros	Jane	Maine Mathematics and Science Alliance				x
Board Member	Newlin	John	Maine International Center for Digital Learning				x
Board Member	Pound	Steve	Cianbro Institute				x
Board Member	Shehata	Terry	Maine Space Grant Consortium				x
Board Member	Shorty	Luke	Maine School of Science and Mathematics				x
Board Member	Valaitis	Susie	Institute for Broadening Participation				x
Board Member	Wing	Michael	University of Southern Maine				x

Type	Last Name	First Name	Department	YR1	YR2	YR3	YR4
Maine EPSCoR Cyberinfrastructure Committee							
Committee Member	Gregory	John	University of Maine				x
Committee Member	Letourneau	Jeff	University of Maine System				x
Sustainability Solutions Initiative Advisory Board							
Board Member	Dickson	Nancy	Harvard University				x
Board Member	Grove	J. Morgan	USDA Forest Service				x
Board Member	Hanson	Susan	Clark University				x
Board Member	Jacobson	George	University of Maine and Maine State Climatologist				x
Board Member	Kates	Robert	University of Maine				x
Board Member	Koffman	Ted	Maine Audubon				x
Board Member	Parris	Thomas	ISciences, LLC				x
Board Member	Person	Pamela	League of Women Voters				x
Board Member	Peterson	Tarla Rai	Texas A&M University				x
Board Member	Young	Ken	Kennebec Valley Council of Government				x

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS 09-04155)

YR4 Annual Report Detail
APPENDIX 2: YR4 Project Personnel Diversity

Directly Supported Personnel:	YR4 Benchmarks						
	Total	**Males**	**Females**	**Blacks or African Americans**	**Hispanics**	**Other Ethnic**	**Persons with Disabilities**
Faculty	89	54	35	0	1	4	4
Postdocs	5	1	4	0	0	0	0
Graduate students	52	15	37	1	1	5	1
Undergraduate students	131	61	70	4	1	4	3
High school students	21	12	9	0	0	0	0
Tech/Professional/ Administrative staff/Board members	109	55	54	1	0	3	4
TOTALS:	407	198	209	6	3	16	12
Direct Overall %:		49%	51%	1%	1%	4%	3%
Indirectly Supported Participants:	**YR4 Benchmarks**						
	Total	**Males**	**Females**	**Blacks or African Americans**	**Hispanics**	**Other Ethnic**	**Persons with Disabilities**
ARI Faculty	176	108	68	1	0	3	2
PUI Faculty	102	49	53	0	1	2	0
Postdocs	6	0	6	0	0	0	0
Graduate students	126	51	75	0	2	4	1
ARI Undergrad students	94	42	52	1	2	18	2
PUI Undergrad students	434	212	222	7	12	3	0
K-12 teachers & pre-service teachers	83	30	53	0	0	1	0
High school students	101	56	45	4	3	18	55
Middle school students	553	36	517	0	0	7	21
Elementary school students	59	36	23	1	0	1	59
Tech/Professional/ Administrative staff	212	121	91	4	6	0	0
Business/Industry	305	213	92	0	0	0	0

NGO/Government	468	282	186	3	0	9	0
General Public	297	180	117	0	0	14	0
TOTALS:	3016	1416	1600	21	26	80	140
Indirect Overall %:		47%	53%	1%	1%	3%	5%

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1(EPS 09-04155)

YR4 Annual Report Detail
APPENDIX 3: Project Collaborators

SSI Research Collaborations

Institution/Organization	SSI Collaborator	Title/Position
Acadia Learning	Bill Zoellick	National Park Service Educator
Acadia National Park	Abe Miller Rushing	Science Coordinator
Acadia University	Anna Redden	Director
Ames Laboratory	Rama Nemani	Lab director
Androscoggin Valley Council of Governments	Bob Thompson	Executive Director
	Ferg Lea	Planning Director
Argonne National Laboratory	Mark Grippo	Ecological Risk and Restoration
Arizona State University	Alan Murray	Professor
	Allen Lee	Research Professional
	Luc Anselin	Professor
	Marco Janssen	Director
Bangor City Council	Benjamin Sprague	City Conucilor
Belgrade Farmers Market	Alice vanDerwerken	Chief Marketer
	Avery Richter	Treasurer
	Carey Bor	Market Manager
Belgrade Lakes Regional Business Group	Diane Oliver	Business Owner
	Laura Richter	Vice President
	Meghan Loubier	President
Belgrade Regional Conservation Alliance	Gail Rizzo	Board Member
	Mel Croft	President
Boston University	Dana Bauer	Assist Professor
Bowdoin University	Erik Nelson	Assistant Professor
Brunswick-Topsham Land Trust	Angela Twitchell	Executive Director
Center for Ecological Research	Peter Vickery	President
Chewonki Foundation	Peter Arnold	Sustainability Coordinator
City of Biddeford	Bill Durkin	Open Space Committee Chair
	Greg Tansley	Planner
	Tom Milligan	City Engineer
City of Ellsworth	Elena Piekut	Planning Assistant
	Michele Beal	City Manager
	Michele Gagnon	Senior Planner
City of Saco	Bob Hamblen	City Planner

City of South Portland	Fred Dillon	Storm Water Coordinator
Clark University	Robert Johnston	Director
	Verna DeLauer	Research Professor
Clemson Univeristy	Amber Pitt	Postdoc
	Robert Baldwin	Professor
Cobscook Bay Resource Center	Will Hopkins	Director
E.D. Bessey & Son	Chip Bessey	Owner
Georgia Institute of Technology	David Lee	Research Scientist
Gulf of Maine Council	Slade Moore	Habitat Restoration Coordinator
Gulf of Maine Research Institute	Christine Voyer	Vital Signs Community Specialist
	Sarah Kirn	Vital Signs Project Director
Halcyon Marine Hydroelectric	Ramez Atiya	Founder
Hancock County Planning Commission	Thomas Martin	Executive Director
Harvard University	David Foster	Professor
Hirosaki University	Hirotada Nanjo	Assistant to the President
Indigenous Education Institute	David Begay	Vice President and Founder
	Nancy Maryboy	President and Founder
Institute for Civic Leadership	Jan Kearce	Executive Director
	Laura Moorehead	Director of Training
Introspective Systems	Kay Aikin	Vice President
iPlant Collaborative	Martha Narro	Program Manager
Johns Hopkins University	Paul Smaldino	Postdoctoral Researcher
Kennebec Estuary Land Trust	Alicia Heyburn	Project Manager
	Carrie Kinne	Executive Director
Kennebec Homeowners' Association	Dot Kelly	President
Kennebec River Initiative	Josh Platt	Project Director
Kennebec Valley Council of Governments	Ken Young	Executive Director
Kimberly Ridley	Kimberly Ridley	Science Writer & Editor
Lakes Environmental Association	Colin Holme	Assistant Director
	Peter Lowell	Executive Director
	Sean Dundon	Board President
Leuphana University Lueneburg	Harald Heinrichs	Professor
Lincoln Institute of Land Policy	Jim Levitt	Coordinator
Lobsters on the Fly	Monique Combs	Founder
Maine Academy of Natural Sciences	Jeff Chase	Teacher
Maine Center for Disease Control	Andrews Tolman	Assistant Director

Maine Cooperative Fish and Wildlife Research Unit	Joseph Zydlewski	Associate Professor and Assistant Leader-Fisheries
Maine Department of Environmental Protection	Angela Dubois	Section Leader, Marine Unit, Bureau of Land and Water Quality
	Mike Mullen	Land and Water Quality Acting Bureau Director
Maine Department of Inland Fisheries and Wildlife	Beth Swartz	Wildlife Biologist
	Brad Allen	Wildlife Biologist
	Kelsey Sullivan	Migratory and Upland Game Bird Biologist
	Phillip deMaynadier	Biologist
	Steve Walker	Wildlife Biologist
Maine Department of Marine Resources	Claire Enterline	Marine Resource Specialist
Maine Department of Transportation	Don Cooper	Transportation Planner
	Herb Thomson	Director of Planning
	Kevin Hooper	Modeler, PACTS
	Sara Devlin	Project Manager
Maine Development Foundation	Ed Cervone	Director, MDF
Maine Discovery Museum	Niles Parker	Director
	Trudy Plumber	Educational Director
Maine Federation of Farmers Markets	Colleen Hanlon-Smith	Executive Director
Maine Forest Service	Coleen Teerling	Entomologist
	Dave Struble	State Entomologist
Maine Geological Survey	Henry Berry	Geologist
	Peter Slovinsky	Coastal Geologist
	Robert Johnston	Senior Geologist
	Thomas Weddle	Geologist
	Woodrow Thompson	Geologist
Maine Lakes Resource Center	Mel Croft	President BRCA
	Tom Klingenstein	Board Member
Maine Local Roads Center	Jerry Douglass	Program Manager
	Peter Coughlin	Director
	Phil Curtis	Road Ranger
Maine Medical Center Research Institute	Charles Lubelczyk	Biologist
Maine State Planning Office	Elizabeth Hertz	Director
Maine TREE Foundation	Patricia Maloney	Maine PLT coordinator
Mount Desert Island Biological Laboratory	Emma Fox	AmeriCorps Member
	George Kidder	Staff Scientist

	Jane Disney	Staff Scientist
National Center for Ecological Analysis & Synthesis	Benoit Parmentier	GIS Scientist
	Jim Regetz	Scientific Programmer/Analyst
National Estuarine Research Reserve System	Matt Chasse	Program Specialist
Natural Capital Project	Richard P. Sharp	Lead Software Developer.
New England Aquarium	Moira Brown	Senior Scientist
North Pond Association	Rick Watson	President
Ocean Renewable Power Company	Chris Sauer	President and CEO
	Herbert Scribner	Director, Environmental Affairs
	Jarlath McEntee	Vice President of Technology & Engineering
	Nate Johnson	Director of Environmental Affairs
OceansWide	Campbell "Buzz" Scott	President/Founder
Ohio State University	Darla Munroe	Associate Professor
Oregon Museum of Science and Industry	Lori Erickson	Curator
	Victoria Coats	Manager of Exhibit Research & Development
Oregon State University	Anita Morzillo	Assistant Professor
	Eric White	Assistant Professor
Orono Economic Development Corporation	Stevenson Sheppard	Board of Directors President
Orono Village Association	Michele Goldman	Chair
Pelletco	James Knight	Chief Executive Officer
Portland Water District	Kirsten Ness	Specialist
	Paul Hunt	Environmental Services Director
Rachel Carson National Wildlife Refuge	Ward Feurt	Refuge Manager
Rangeley Lakes Heritage Trust	Chris Devine	Director
	Nancy Perlson	former Executive Director
	Rebecca Kurtz	Environmental Education Program Director
	Shelby Rousseau	Stewardship Director
Rangeley Lakes Region Logging Museum	Peggy Yocom	Archivist
Rangeley Lakes Regional School	Kelsey Orestis	Teacher
Saco River Corridor Commission	Dennis Finn	Director
Saco River Salmon Club	R. J. Mere	President
Sappi Fine Paper North America	Brad Goulet	Hydro Manager/Utilities Engineer
Sheepscot Wellspring Land Alliance	Anna Fiedler	Executive Director
	Buck O'Herin	Board Member
	Jim Reed	Member, land owner

Sierra Club, Maine Chapter	Jim Frick	Executive Committee Member
	Karen Woodsum	Senior Regional Representative
Skowhegan Area Middle School	Kelley Greenleaf	Education Technician
St Regis Mohawk Tribe	Les Benedict	Assistant Director
Thanks But No Tank	Steve Hinchman	Project Attorney
The Nature Conservancy of Maine	Alex Mas	Director of Strategic Partnerships
	Craig Leisher	TNC Senior Social Scientist
Tidal Energy Device Evaluation Center	Rick Armstrong	Executive Director
TideWalker Associates	Normand Laberge	Director
Town of Belgrade	Ernest Rice	Vice Chair
	Greg Gill	Town Manager
	Rich Baker	Planning Board
Town of Orono	Evan Richert	Town Planner
Town of Topsham	John Shattuck	Economic Development Director
	Rich Roedner	Town Planner
	Rod Melanson	Natural Resources Planner
Town of Woolwich	Bill Potter	Chair
U.S. Department of Energy, Pacific Northwest National Laboratory	Andrea Copping	Research Scientist
United States Geological Survey	Dahlia Varanka	Research Geographer, CEGIS
	E. Lynn Usery	Research Geographer & Director, CEGIS
	Robert Dudley	Hydrologist
University of Colorado	Robert Guralnick	Associate Professor
University of Guelph	Jim Bogart	Profesor Emeritus
University of Maine, Animal & Veterinary Sciences	Anne Lichtenwalner	Assistant Professor
University of Maine, Climate Change Institute	Jasmine Saros	Associate Director, Climate Change Institute
University of Maine, College of Natural Sciences, Forestry, & Agriculture	Fred Servello	Professor
University of Maine, Cooperative Extension	Sarah Sparks	4-H Youth Development Professional
University of Maine, Department of Industrial Cooperation	Jake Ward	Assistant Vice President for Research, Economic Development, and Governmental Relations
University of Maine, Electrical & Computer Engineering	Herbert Aumann	Adjunct Professor
	Nuri Emanetoglu	Assistant Professor

University of Maine, Forest Bioproducts Research Institute	Hemant Pendse	Professor & Director
University of Maine, Foster Center for Innovation	Margo Lukens	Co-director, Foster Center
University of Maine, Mathematics	Andre Khalil	Assistant Professor
University of Maine, Mechanical Engineering	Michael Peterson	Professor
University of Maine, Project Reach	Nancy Mullins	Director of ESL/Bilingual Programs
	Shelly Chasse-Johndro	Director
University of Maine, School of Biology & Ecology	Judith Rhymer	Associate Professor
University of Maine, School of Computer & Information Science	Sudarshan Chawathe	Associate Professor
University of Maine, School of Marine Sciences	Huijie Xue	Professor
	Irv Kornfield	Professor
	James McCleave	Professor Emeritus
University of Maine, Sea Grant	Catherine Schmitt	Communicatons Coordinator
	Chris Bartlett	Marine Extension Team
	Paul Anderson	Director
University of Massachusetts Boston	Ellen Douglas	Associate Professor
University of New England	Charles Tilburg	Associate Professor, Marine Science
	Steven Travis	Associate Professor
University of New Hampshire	Cameron Wake	Research Associate Professor
	David Burdick	Research Associate Professor
	Dolores Leonard	Communications Manager
	Jennifer Jacobs	Professor
	Jo Daniel	Associate Professor
	Kalle Matso	Program Manager
	Paul Kirshen	Research Associate Professor
University of South Carolina Beaufort	Brandon Cosley	Assistant Professor
University of Southern Maine	Sam Merrill	Director
	Terry Theodose	Associate Professor
University of Washington	Brian Polagye	Research Assistant Professor, Mechanical Engineering
	John Horne	Research Assistant Professor
US Army Corps of Engineers	Andrew Goodwin	Research Environmental Engineer
	Greg Penta	Project Manager
	Jay Clement	Project Manager
	Ruth Ladd	Chief, Policy Analysis & Technical

		Support
US Environmental Protection Agency	Mark Kern	Maine office
US Fish and Wildlife Service	Jed Wright	Senior Fish and Wildlife Biologist
	Susan Adamowicz	Land Management Research & Demonstration Biologist
USDA Animal & Plant Health Inspection Service	Kirk Shively	Wildlife Disease Biologist
USDA Forest Service	Jeff Kline	Research Forester
	Marla Emery	Research Geographer
	Nathan Siegert	Forest Entomologist
	Susan Stein	Private Forest-Land Studies Coordinator
	Thomas Spies	Research Ecologist
USDA Natural Resources Conservation Service	Sigrid Houlette	District Coordinator
USGS Conte Anadromous Fish Lab	Adria Elskus	Research Scientist
Vaughn Homestead Foundation	Tracy Weber	Program Director
Verso Paper	Bill Mitchell	Director, Public Outreach
	Cherilee Budrick	Communications
	Ken Gallant	Environmental Manager
Volunteer Lake Monitoring Program	Roberta Hill	Program Director, Maine Center for Invasive Aquatic Plants
	Scott Williams	Executive Director
Waterview Consulting	Peter Taylor	Principle
Wells National Estuarine Research Reserve	Jacob Amman	Research Associate
	Jeremy Miller	Research Associate
	Michele Dionne	Research Director
	Tin Smith	Stewardship Coordinator
Yale University	Walter Jetz	Associate Professor

*****University of Maine counted once as an institution

Maine EPSCoR Office – Other Collaborators (STEM Education & Workforce Development, External Engagement, Cyberinfrastructure, etc.)

Institution/Organization	EPSCoR Collaborator	Title/Position
Bangor High School	Kate Hayes	High School Physics Teacher
Chewonki Foundation	Keith Crowley	Program Director, Traveling Natural History Programs
City of Bangor	Wynne Guglielmo	City of Bangor Environmental Coordinator

Eastern Maine Community College	Pamela Proulx-Curry	Academic Deam
Educate Maine	Jay Collier	Project Login Program Manager
	Tanna Clews	Director
Hampden Academy	Bill Leathem	High School Chemistry Teacher
Holbrook Island Sanctuary	Tammy Bishop	Park Manager
Jackson Labatory	Lisa John	Assistant for Educational Programs
	Randy Smith	Director of Educational Programs
James F. Doughty School	Patricia Bernhardt	Middle School Science Teacher
Maine Campus Compact	Sally Slovenski	Executive Director
Maine Maritime Academy	Darrell Donahue	Research Director
Orono High School	Jim Chasse	Principal
	William Cowan	High School Teacher
	Jeff Owen	High School Teacher
	Leslie Boyd	High School Teacher
	John Norris	High School Teacher
Penobscot Nation	Andrea Sockabasin	Coordinator, Teen Center
	John Banks	Director, Natural Resources Department
	Sonia Lacoute-Dana	Director, Teen Center
Pierce Atwood LLP	Andrea Cianchette Maker	Consultant/Program Manager/Educate Maine
Troy Howard Middle School	Beth Haynes	Middle School Science Teacher
Univeristy of Maine, Cooperate Extension & 4-H	Susan Jennings	Oxford County Extension Educator
University of Maine, College of Education & Human Development	Dan Capps	Assistant Professor of Science Education; member of conference planning committee
	MacKenzie	Assistant Professor of Physics; member of conference planning committee
University of Maine, Wabanaki Center	Kyle Lolar	Undergraduate Student

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS 09-04155)

YR4 Annual Report Detail
APPENDIX 4: YR4 Grant Proposals Submitted & Awarded

SSI Grant Proposals Submitted in Year 4

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
7/1/2012	Noblet, C.	University of Maine	Economic Impact of Maine's Clean Technology Sector	Maine Technology Institute	$25,000	$12,500
7/2/2012	Bell, K., Hart, D., Johnson, T., Leahy, J., Lindenfeld, L., Ranco, D., Silka, L., Zydlewski, G.	University of Maine	IGERT: Advancing renewable energy solutions by linking knowledge with action	National Science Foundation	$3,441,304	Not Funded
7/9/2012	Ranco, D.	University of Maine	Passamaquoddy NARCH-Building Health Research Infrastructure	US Dept of Health & Human Services through Passamaquoddy Tribe	$926,679	Pending
7/13/2012	Reeve, A.	University of Maine	Collaborative Research: Transforming Paradigms of Salt Marsh Evolution	National Science Foundation	$186,011	Not Funded
7/13/2012	McCoy, S.	University of Maine	Understanding and Predicting Interdisciplinary Research Success	National Science Foundation	$465,834	Not Funded
7/18/2012	Lindenfeld, L., Leahy, J.	University of Maine	Project Reach Yr 2	US Dept of Education	$381,903	$381,903
7/19/2012	Waring, T.	University of Maine	NSF CAREER: Cultural Evolution of Social-Ecological Systems	National Science Foundation	$470,727	Not Funded
7/27/2012	Ranco, D.	University of Maine	Native American Student Persistence and Success at the University of Maine	Finance Authority of Maine	$41,400	$41,400
7/30/2012	Leahy, J.	University of Maine	Life Cycle Sustainability Assessment of Palm Oil Biodiesel	National Science Foundation	$7,062	Not Funded

8/1/2012	Milligan, P.	University of Maine, Augusta	Evaluating interactions between wild turkeys and Maine agriculture	NSF EPScoR	$89,575	$22,394
8/2/2012	Bell, K.	University of Maine	Associations between mass media coverage and personal protective behaviors	US Dept of Health & Human Services through ME Dept of Health and Human Services	$5,000	$5,000
8/8/2012	Jain, S.	University of Maine	SYNERGY IGERT-CIF21: Synergistic Data Integration, Modeling, and Knowledge	National Science Foundation	$3,378,112	Not Funded
8/10/2012	Willis, T.	University of Southern Maine	Continuing River Herring Restoration in the Kennebec River	National Fish and Wildlife Foundation	$299,100	Not Funded
8/15/2012	Wilson, K.	University of Southern Maine	Conceptualizing the resilience potential of diadromous species.	North Atlantic Landscape Conservation Cooperative Priority Science Program	$10,000	Not Funded
8/15/2012	Wilson, K.	University of Southern Maine	Developing a Geospatial Dataset for Evaluation of Hydro-chemical Response Units, their Association with Intermediate Sized Watersheds, and Implications to Aquatic Habitat for Freshwater Mussels.	North Atlantic Landscape Conservation Cooperative Priority Science Program	$10,000	Not Funded
8/17/2012	Smith, S.	University of Maine	Hydro-chemical Response Units, their Association with Intermediate Sized Watersheds, and Implications to Aquatic Habitat for Freshwater Mussels	North Atlantic Landscape Conservation Cooperative	$158,531	Pending
9/6/2012	Teisl, M.	University of Maine	IGERT: Adaptation to Abrupt Climate Change Yr 2	National Science Foundation	$649,931	$649,931
9/7/2012	McGill, B.	University of Maine	Integrating Global Species	National Aeronautics &	$15,535	$15,535

			Distribution Data Yr 2	Space Administration through Yale University		
9/7/2012	Feurt, C.	University of New England	Qualitative Research Methods On line Training	NERRS Science Collaborative	$10,000	$2,500
9/30/2012	Parr, T.	University of Maine	Fall Travel grant for American Geophysical Union Attendance	Graduate Student Government	$850	$625
10/1/2012	Pavri, F.	University of Southern Maine	Maine Space Grant Consortium Student Fellowship Program	Maine Space Grant Consortium	$2,500	$1,250
10/1/2012	Capps, K.	University of Maine	USGS Toxic Substances Hydrology Program Research Grant	USGS	$15,733	$7,867
10/5/2012	Lorion, K.	University of Maine	Graduate Student Government Grant	University of Maine	$850	$850
10/11/2012	Lilieholm, R., Cronan, C.	University of Maine	Doctoral Dissertation Research: Evaluating Public Perceptions and Attitudes of	National Science Foundation	$9,770	Pending
10/15/2012	Arnett, A.	Unity College	land conservation and forest management	National Fish and Wildlife Foundation	$250,000	Not Funded
10/25/2012	McGill, B.	University of Maine	Integrating Global Species Distribution Data Yr 2 Inc 2	National Aeronautics & Space Administration through Yale University	$17,343	$17,343
11/7/2012	Zydlewski, G.	University of Maine	Application of Eulerian-Lagrangian-agent Method (ELAM) to the Risk Assessment	US Dept of Energy	$166,044	$166,043
11/19/2012	Calhoun, A., Bell, K., Capps, K., Hunter, M.	University of Maine	Of pools and people: small natural features with large ecosystem functions in	National Science Foundation	$1,488,950	Pending

11/20/2012	King, W., Bevier, C., Nyhus, P., Rueger, B., Linfeld, L., Silka, L.	Colby College	Building Ecological and Societal Resilience to Sustain Healthy Lake Ecosystems: Influence of Information on Conservation Behavior	National Science Foundation	$1,500,000	Pending
11/20/2012	Leahy, J.	University of Maine	When natural disturbance meets land use change: an analysis of disturbance	National Science Foundation	$248,742	Pending
11/21/2012	Milligan, P.	University of Maine, Augusta	Presidents research grant	University of Maine at Augusta	$7,201	$7,201
12/1/2012	Waring, T.	University of Maine	The Cultural Evolutionary Dynamics of Social-Ecological Systems	UMAPIT, ORSP	$19,042	$17,280
12/1/2012	Zeeman, S.	University of New England	TURBO: The Undergraduate Saco River Biodiversity Observatory; an LTER-style research experience to enhance STEM education	National Science Foundation	$499,235	Pending
12/3/2012	Straub, C.	University of Maine	Forest Pest Outreach Evaluation	Department of Agriculture, Conservation, & Forestry	$74,000	Pending
12/12/2012	Elliott, C.	University of Maine	ELLMS - EPA EE	US Environmental Protection Agency	$216,000	Not Funded
12/13/2012	Peckenham, J., Lilieholm, R.	University of Maine	Increasing Drinking Water Awareness in Rural New England Communities	US Environmental Protection Agency	$192,938	Not Funded
12/14/2012	Hutchins, K.	University of Maine	AAC&U Seminar Proposal - Institutionalizing Engaged Research at the University of Maine	Association of American Colleges and Universities	$1,000	$200

12/14/2012	Hutchins, K.	University of Maine	Institutionalizing Community Engaged Research Teaching and Service (CERTS) at the University of Maine	University of Maine	$750	$150
12/15/2012	Lindenfeld, L.	University of Maine	Pathway One Communication Research and Implementation Project	Vice President for Community Engagement and Economic Development, UMaine	$14,406	$14,406
12/18/2012	Beard-Tisdale, M.K.	University of Maine	The Forgotten Letter in STEM: Promoting K-12 Engineering Instruction	National Science Foundation	$7,999,763	Pending
1/1/2013	Lindenfeld, L., Willis, T., Hutchins, K., Wilson, K., Silka, L.	University of Maine	Citizen Science Role in Sustainable River Herring Harvest	National Fish and Wildlife Federation	$96,661	Pending
1/2/2013	Wall, K.	Maine Lakes Resource Center	Technology	Norcross Foundation	$0	$1,000
1/4/2013	Beard-Tisdale, M.K.	University of Maine	Informatics approaches for reuse and modeling of heterogeneous mercury data	US Dept of the Interior	$12,974	$7,159
1/10/2013	Elliott, C.	University of Maine	RSF Social Finance - The Parking Lot Giving Fund	RSF Social Finance	$30,000	$30,000
1/11/13	Willis, T., Hutchins, K.	University of Southern Maine	Citizen Science role in sustainable river herring harvest	National Fish and Wildlife Foundation	$96,662	Pending
1/14/2013	Lindenfeld, Laura A, Silka, L., Calhoun, A.	University of Maine	The COLLECTS Project	National Science Foundation	$1,495,689	Pending
1/15/2013	Wall, K.	Maine Lakes Resource Center	Development grant	Sewall Foundation	$75,000	Pending
1/17/2013	Jansujwicz, J.	University of Maine	Coastal SEES (Track 2): Sustainability of coastal energy development: Understanding the	National Science Foundation	$2,999,814	Pending

			effects and impacts on a coupled natural and human system			
1/18/2013	King, W.	Colby College	IOS Preliminary Proposal: Linking Physiological Adaptation to Ecological Advantage in an Iron-dependent Microbial Ecosystem	NSF	$0	Pending
1/23/2013	Johnston, J., Wang, C.	University of Maine, Presque Isle	Preliminary Proposal RUI: Trophic interactions as a mechanism of bird range expansion and contraction at the boreal-deciduous ecotone	National Science Foundation	$150,000	Pending
1/23/2013	Latty, E.	Unity College	Preliminary Proposal, RUI: Understanding the interactions among ants, earthworms, and understory plants in Maine hemlock forests threatened by an invasive pest	NSF DEB	$300,000	Pending
1/23/2013	Silver, E.	University of Maine	Resolving a critical question in predicting woody biomass supply to the Northern Forest industry: Estimating risk perception and willingness to harvest from small woodland owners	Northeastern States Research Cooperative	$10,000	$7,500
1/25/2013	Arnett, A.	Unity College	Forest invertebrate biodiversity and logging	National Science Foundation	$250,000	Pending

1/27/2013	Wall, K.	Maine Lakes Resource Center	Development Grant	Jane's Trust	$67,000	Pending
1/30/2013	Johnson, E.	University of Maine	Socioecological resilience in Maine communities: undergraduate roles in boundary organizations	Thoreau Foundation	$34,930	Pending
1/31/2013	Beard-Tisdale, M. K., Bell, K., Hart, D., Lindenfeld, L., McGill, B., Ranco, D., Teisl, M., Colgan, C.	University of Maine	Collaborative Research: Strengthening the scientific basis for decision-making: Advancing sustainability science and knowledge-action capacities in coupled coastal systems	National Science Foundation	$3,000,000	Pending
2/1/2013	Martin, D.	University of Maine	Quantifying Groundwater Fluxes in Sebago Lake for Development of an Integrated Groundwater and Surface Water Model for Water Resources Management	Geological Society of America, Graduate Student Grant Program	$2,500	Pending
2/5/2013	McGreavy, B.	University of Maine	Travel to Present, Conference on Communication and the Environment	UMaine Graduate Student Government	$850	Pending
2/7/2013	Groff, L.	University of Maine	GSG Individual Grant	University of Maine Graduate Student Government	$438	Pending
2/8/2013	Parr, T.	University of Maine	Spring Travel to Present Grant	Graduate Student Government	$850	Pending
2/14/2013	McGreavy, B.	University of Maine	The 610 Project	Maine Community Foundation	$10,000	Pending
2/15/2013	Willis, T.	University of Southern Maine	Abarent pH levels in the St. George River Estuary	Maine Sea Grant	$56,000	Pending
2/21/2013	Colgan, C.	University of Southern Maine	Acquisition of Memory Intensive Maine Super Computer	National Science Foundation	$500,000	Pending

2/22/2013	Noblet, C.	University of Maine	Assessing Affects of the Lobster Culture on Maine's Coastal Tourism	Northeast Seagrant	$99,435	Pending
2/22/2013	Noblet, C.	University of Maine	Connecting Neighbors: Promoting Sustainable Seafood in Inland Areas for Stronger Coastal Communities	Northeast Seagrant	$136,416	Pending
3/1/2013	Calhoun, A.	University of Maine	Development and Implementation of Coordinated Regional Monitoring Protocols for Vernal Pools and Associated Species of Greatest Conservation Need	Northeast Association of Fish and Wildlife Agencies RCN Program	$62,752	Pending
4/25/2013	Colgan, C.	University of Southern Maine	The Technology of Place: Developing information Technology for Shaping Places	University of Southern Maine	$150,000	Pending
Totals in YR4:					**23 awards**	**$1,410,037**
					67 submissions	**$32,934,792**
					32 pending submissions	**$22,490,667**

SSI Grant Proposals Submitted in Year 3 – Awarded YR4

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
2/1/2012	Leahy, J., Noblet, C., Silka,L., Teisl, M.	University of Maine	SEP Integrated National Framework for Cellulosic Drop In Fuels	National Science Foundation	$1,999,786	$1,800,000
2/15/2012	McGreavy, Bridie	University of Maine	Five Star Restoration Program, Eel Grass in Frenchman Bay	National Fish and Wildlife Foundation	$25,000	$7,500

3/9/2012	Meyer, S., Lilieholm, R.	University of Maine	Potential Impacts of Alternative Future Land Uses on Forest Management and Wood	US Dept of Agriculture	$58,201	$58,201
4/23/2012	Johnson, T.	University of Maine	Aquaculture in Shared Waters	US Dept of Commerce	$107,202	$107,202
6/1/2012	Wilson, K.	University of Southern Maine	Using Natural Tags to Determine Marine and Freshwater Habitat Usage by Juvenile Blueback Herring (Alosaaestivalis)	Maine Sea Grant	$7,500	$7,500
2/10/2012	Feurt, Christine	University of New England	Integrating Science Into Policy: Adaptation Strategies for Marsh Migration	NOAA	$199,389	$199,389
11/18/2011	Jain, Shaleen	University of Maine	Sea Grant Climate Adaptation 2011: City of Ellsworth, ME	US Dept of Commerce	$100,000	$100,000
2/3/2012	Kartez, Jack	University of Southern Maine	RCN-SEES: Engineering Research Collaboratory on Infrastructure in a Changing Climate	National Science Foundation	$750,000	$750,000
1/17/2012	Lilieholm, Robert, Meyer, S.	University of Maine	The Maine Futures Community Mapper: Fostering Economic Growth and Healthy Landsc	Elmina B. Sewall Foundation	$86,861	$86,861
10/28/2011	Lindenfeld, L., Johnson, T., Silka, L.	University of Maine	The Seafood Links Project	US Dept of Commerce	$46,299	$46,299
1/1/2012	McGill, Brian	University of Maine	Pursuit: Rural forest communities at a tipping point? trends and actionable research opportunities	SESYNC (Socio-Ecological Synthesis Center)	$100,000	$100,000
11/16/2011	McGuire, Julia	University of Maine	NSF Graduate Research Fellowship	National Science Foundation	$40,500	$40,500

			Program			
3/9/2012	Meyer, Spencer	University of Maine	Potential Impacts of Alternative Future Land Use on Forest Management and Wood Supply Across Maine	Northeastern State Research Cooperative, U.S. Forest Service	$41,765	$41,765
9/13/2011	Peckenham, John	University of Maine	Improving Data to Build Trust for Community Generated Knowledge of Groundwater	US Dept of the Interior	$7,644	$7,644
1/13/2012	Peckenham, John	University of Maine	Investigating the Impact of Pollutants in Street Dust on the Long Creek	US Dept of the Interior	$18,983	$18,983
1/13/2012	Peckenham, John	University of Maine	Maine Water Resources Research Institute-Information Transfer	US Dept of the Interior	$21,208	$21,208
10/28/2011	Zydlewski, Gayle	University of Maine	Fish distribution in relation to tidal hydropower in Downeast Maine	US Dept of Commerce	$73,203	$73,203
SUBTOTAL AWARDED IN YR4					**17 Awards**	**$3,425,755**

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1(EPS 09-04155)

YR4 Annual Report Detail
APPENDIX 5: YR4 Publications

Institution	Type of Publication	Citation	SSI-Related
Bates College	Abstract	**Barry, E.**, **Johnson, B.**, Lea, F., 2013. A comparison of the major ion chemistry of two Maine watersheds, Pleasant River (Bethel, ME) and Stetson Brook (Lewiston, ME), NE GSA March 18-20, Bretton Woods, NH.	Indirect
Bates College	Abstract	**Chiao, C., Johnson, B**., Dostie, P., 2013. The effect of the 2012 alewife migration on nutrient dynamics in Nequasset Lake, Woolwich, Maine. NE GSA, March 18-20, Bretton Woods, NH.	Direct
Bates College	Abstract	**Johnson, B.J.**, **Chiao, C.**, **Willis, T.**, **Wilson, K.**, Dostie, P., 2013. Alewife migration, nutrient dynamics, and sedimentation in Nequasset Lake, Woolwich Maine, Maine Water Conference, March, 18, Augusta, ME.	Direct
Bowdoin College	Abstract	Do Alewives Initiate The Formation Of Cod Spawning Groups? ICES/NAFO Conference. St. Andrews, NB.	Direct
Bowdoin College	Journal Article	**Ames** and **Lichter**. 2012. Fisheries Research, in press.	Direct
Bowdoin College	Journal Article	**Lichter** and **Ames**. 2012. Maine Policy Review Winter/Spring 2012: 96-103.	Direct
Colby College	Abstract	**Bevier, Catherine**, **F. Russell Cole**, Sylvia Doyle, Nathaniel Moore, Johanna Salay, Peter Smithy, William Supple, Molly Susla, **Emily Arsenault**, **Colin Cummings**, **Monica Davis**, **Marianne Ferguson**, **Andrew Mealor**, **Corey Reichler**, **Philip Nyhus**, **Whitney King**. (2012). Effects of Residential Shoreline Development on Characteristics of Littoral Habitats in the Belgrade Lakes of Maine. NALMS, Madison Wisconsin	Direct
Colby College	Abstract	**Forgrave, Rebecca**, Dan Chiniara. The Belgrades SSI team at Colby, BRCA, BLA, MLRC (2012). Modeling Resilience and Adaptation in the Belgrade Lakes Watershed. Maine Congress of Lake Association Conference, Waterville Maine	Direct
Colby College	Abstract	**King, D. Whitney, John Peckenham**, **Maggie Shannon**, **Peter Kallin**, Peter Lowell (2012). The Challenges and the Rewards of Creating a State-Wide Lakes Research Collaboration. NALMS, Madison Wisconsin	Direct

Institution	Type of Publication	Citation	SSI-Related
Colby College	Abstract	**Nyhus, P.**, F. **Russell Cole**, Daniel Homeier, Sophie Sarkar, Noah Teachey, **Catherine Bevier**, **D. Whitney King** (2012). Cameras, Satellites, and Surveys: A Multi-Platform Approach to Monitoring Lake Conservation Practice. NALMS, Madison Wisconsin.	Direct
Colby College	Book Chapter	**Rueger, B.F.**, and Beck, E.N. (2012). Benedict Arnold's march to Quebec in 1775: An historical characterization using Google Earth, in Whitmeyer, S.J., Bailey, J.E., De Paor, D.G., and Ornduff, T., eds., Google Earth and Virtual Visualizations in Geoscience Education and Research: Geological Society of America Special Paper 492, p. 347-354.	Indirect
Unity College	Journal Article	**Remsburg, A.J.** and G.W. Saunders. (submitted) Guided ecological inquiry: a graphical approach to demystify complex data. The Science Teacher.	Direct
Unity College	Newsletter	**Latty, E.F**., 2012. Results of Ecological Assessment. Sheepscot Wellspring Land Alliance Newsletter. 25:4.	Indirect
University of Maine	Abstract	Filoso, S. and **S. Smith**. 2013. Physical Modifications to Coastal Plain Drainage Networks and their Implications to Nutrient and Sediment Delivery. Geological Society of America, Northeastern Section Meeting. March, 2013.	Indirect
University of Maine	Abstract	Filoso, S., **Smith, S.M.C.**, and M. Palmer. 2012. Nitrogen and sediment flux in engineered coastal streams. Biogeomon - 7th International Conference on Ecosystem Behavior. Lincolnville, Maine	Indirect
University of Maine	Abstract	Historical Patterns and Drivers of Land Conservation in Northern New England: 1850-2010. U.S. International Association of Landscape Ecology. Austin, TX (Meyer presenting, with Cronan, Johnson and Foster).	Direct
University of Maine	Abstract	**Johnson, M.L.**, **Bell, K.P., and M.T. Teisl**. 2013. The Role of Geographic Scale in the Saliency of Scenarios. Abstract for ISSRM 2013, Estes Park, CO.	Direct
University of Maine	Abstract	**Johnson, M.L.**, **Meyer, S.R.**, **Lilieholm, R.J.**, and **C.S. Cronan**. 2012. The Role of Transparency in Developing a Stakeholder-Engaged, Qualitative-Quantitative Landscape Scenario Process. Presentation at the American Collegiate Schools of Planning. November 1, 2012.	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Abstract	**Lilieholm R.J., C.S. Cronan, M. Johnson and S. Meyer**. 2012. University of Maine's Sustainability Solutions Initiative: Forecasting the Future of the Lower Penobscot River Basin. Lincoln Institute of Land Policy, Cambridge, MA	Direct
University of Maine	Abstract	**Martin, Danielle M., A. S. Reeve** and **Sean M. Smith** (2013) Calibrating a lumped parameter drainage basin model to estimate stream discharge to Sebago Lake. Abstracts from the 48th GSA Northeastern Section Meeting, Abstracts with Programs - Northeastern 2013. Vol. 45, no. 2	Direct
University of Maine	Abstract	**Meyer, S.R.**, **M.L. Johnson**, **R.J. Lilieholm**, and **C.S. Cronan**. 2012. Using Historical Patterns and Drivers of Land Conservation in Northern New England: 1850-2010. U.S. International Association of Landscape Ecology. Austin, TX	Direct
University of Maine	Abstract	Sharik, **Lilieholm** and Richardson. 2013. DIVERSITY TRENDS IN THE U.S. NATURAL RESOURCE WORKFORCE AND UNDERGRADUATE STUDENT POPULATION	Indirect
University of Maine	Book Chapter	Erik Albert and **Sudarshan S. Chawathe**, A REST Framework for Dynamic Client Environments. In REST: From Research to Practice. 2011. Springer ISBN 978-1-4419-8302-2.	Indirect
University of Maine	Book Chapter	Farrow, K., **Teisl, M. F., Noblet, C. L., McCoy, S.K.**, Rubin, J. (in press). Does money grow on trees? People's willingness to pay for celluosic wood ethanol. Chapter in Biofuel/Book 1; InTech Publishing	Indirect
University of Maine	Book Chapter	Isaac, Nicholas, Carbone, Chris and **McGill Brian J** Chapter 8 Population and Community Ecology chapter in The Metabolic Theory of Ecology edited by James Brown, Astrid-Kodric Brown and Richard Sibley (Wiley-Blackwell May 2012)	Indirect
University of Maine	Book Chapter	**Lilieholm, R,.J.**, and M. Eaton. 2013. Land as Sustenance and Sanctuary: Settlement History and Resource Use in and around Utah's Grand Staircase-Escalante National Monument. Chapter to appear in D.P. Bigman, ed., National Parks: Sustainable Development, Conservation Strategies, and Environmental Effects. Nova Science Publishers, Hauppauge, NY (in press).	Indirect

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Book Chapter	**Linda Silka, Mario Teisl**, and James Settele. In review. Place-Based Approaches to Engagement: Can Universities Be Local and Global? Community Engagement in Higher Education: Policy Reforms and Practice (W.J. Jacob, S.E. Sutin, J.C. Weidman, and J.L. Yeager, eds.) Institute for International Studies in Education, University of Pittsburgh	Direct
University of Maine	Book Chapter	**McGill, Brian J** A macroecological approach to the equilibrial vs. nonequilibrial debate using bird populations and communities in Nonequilibrial ecology and global change edited by Klaus Rohde, Cambridge University Press	Indirect
University of Maine	Book Chapter	**Meyer, S.R., M.L. Johnson, and R.J. Lilieholm**. 2012. Land Conservation in the United States: Evolution and Innovation Across the Urban/Rural Interface. Chapter 13 in Rural-Urban Interfaces: Linking People and Nature, Laband, D.N., Lackby, B.G., and W. Zipperer, eds. Pp. 225-258.	Direct
University of Maine	Book Chapter	Popescu, V. and **M.L. Hunter, Jr.** Assisted colonization of wildlife species at risk from climate change. Pages 347-368 in: Brodie J. (Ed.) Conserving wildlife populations in a changing climate. Island Press, Washington D.C.	Indirect
University of Maine	Book Chapter	Saura, S, E. Martin, and **M.L. Hunter, Jr.** Forest landscape change and biodiversity conservation. Chapter in J.C. Azevedo, A.H. Perera, and M.A. Pinto (eds). Forest Landscapes and Global Change. Springer-Verlag	Indirect
University of Maine	Book Chapter	**Silka, L.** Becoming part of the solution: Engaged research on sustainability. Under review for P. Inman & D. Robinson (Eds.), University Engagement and Environmental Sustainability. Book to be published by Manchester University Press.	Direct
University of Maine	Book Chapter	**Silka, L., Teisl, M.**, & Settelle, J. (under review). Place-based approaches to engagement: Can universities be local and global? In Jacob, W. J., Sutin, S. E., Weidman, J. C., & Yeager, J. L. (Eds.), Community Engagement in Higher Education: Policy Reforms and Practice. Pittsburgh Studies in Comparative Education Book Series.	Indirect
University of Maine	Journal Article	**Anderson, Mark W., Teisl, Mario F. and Noblet, Caroline L.** 2012. Giving Voice to the Future in Sustainability: Retrospective Assessment to Learn Prospective Stakeholder Engagement. Ecological Economics 84, 1-6.	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	Bahn, Volker and **Brian J. McGill** Testing the predictive performance of distribution models (Oikos 2013 122(3):321-331)	Indirect
University of Maine	Journal Article	**Bell, K.P., Lindenfeld, L.,** Speers, A., **Teisl, M.** and **J. Leahy**. (2013). Creating opportunities for improving lake-focused stakeholder engagement: knowledge-action systems, pro-environmental behavior, and sustainable lake management, Lakes & Reservoirs: Research & Management.	Indirect
University of Maine	Journal Article	**Bell, K.P., Lindenfeld, L.A., Speers, A. E., Teisl, M.F., Leahy, J.E.**, Identifying opportunities for improving lake-focused stakeholder engagement: Knowledge-action systems, pro-environmental behavior, and sustainable lake management. Lakes & Reservoirs: Research and Management.	Direct
University of Maine	Journal Article	**Calhoun, A,** R. Brooks, and **M. Hunter**. Submitted. Building vernal pools, but will the right species come? Restoration Ecology.	Direct
University of Maine	Journal Article	**Caroline L. Noblet, Mario F. Teisl**, Katherine H. Farrow, Jonathan Rubin. 2012. Biofuels development in Maine: Using trees to oil the wheels of sustainability. Maine Policy Review 21(2): 56-65	Direct
University of Maine	Journal Article	**Caroline L. Noblet, Mark W. Anderson and Laura A. Lindenfeld**. Environmental Worldviews: A point of common contact, or barrier? Environmental Communication: A Journal of Nature & Culture	Direct
University of Maine	Journal Article	**Cline, B.B. and M.L. Hunter, Jr**. 2012. Open-canopy vegetation and dispersal in a forest amphibian: An experimental assessment of permeability. Journal of Applied Ecology (submitted).	Direct
University of Maine	Journal Article	**Cline, B.B. and M.L. Hunter, Jr.** Juvenile amphibians discriminate among open-canopy habitats: An experimental investigation of habitat permeability. Journal of Applied Ecology	Direct
University of Maine	Journal Article	Cook, Benjamin J, Elizabeth M Wolkovich, T Jonathan Davies, Toby R Ault, Julio L Betancourt, Jenica M Allen, Kjell Bolmgren, Elsa E Cleland, Theresa M Crimmins, Nathan J B Kraft, Lesley T Lancaster, Susan J Mazer, **Brian J McGill**, Gregory J McCabe, Camille Parmesan Stephanie Pau, James Regetz, Nicolas Salamin, Mark D Schwartz, Steven E Travers - Sensitivity of spring phenology to warming across temporal and spatial climate gradients in two independent databases (Ecosystems 15(8):1283-1294)	Indirect

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	Cosley, B., **McCoy, S.K.**, **Gardner, S.** (2011). Collaborative voice: Examining the role of voice in interdisciplinary collaboration. Journal of Applied Psychology.	Direct
University of Maine	Journal Article	**Cronan, C.S.** 2012. Biogeochemistry of the Penobscot River Watershed, Maine, USA: Nutrient Export Patterns for Carbon, Nitrogen, and Phosphorus. Environmental Monitoring and Assessment 184: 4279-4288. DOI 10:1007/s10661-011-2263-8.	Direct
University of Maine	Journal Article	Danielson, T.J., **C.S. Loftin**, and F. Drummond. Comparison of benthic diatom models for estimating nutrient concentrations in Maine streams and rivers. Freshwater Biology.	Indirect
University of Maine	Journal Article	Dibello, F., **AJK Calhoun**, D.E. Morgan, A.F. Shearin. Mapping efficacy of digital and analog methods for identifying vernal pools remotely: a Maine case study. Wetlands	Direct
University of Maine	Journal Article	Douadia Bougherara, Sandrine Costa and **Mario Teisl**. forthcoming. Making or buying environmental public goods: Do consumers care? Land Economics.	Indirect
University of Maine	Journal Article	Elizabeth M. Wolkovich, B. I. Cook, J. M. Allen, T. M. Crimmins, J. L. Betancourt, S. Travers, S. Pau, J. Regetz, T. J. Davies, N. J. B. Kraft, T. R. Ault, K. Bolmgren, S. J. Mazer, G. J. McCabe, **B. J. McGill**, C. Parmesan, N. Salamin, M. D. Schwartz & E. E. Cleland Warming experiments underpredict plant phenological responses to climate change (Nature 2012 485(24 May):494-497)	Indirect
University of Maine	Journal Article	G Voggesser, **J Daigle**, FK Lake, K Lynn, **D Ranco**, 2013, "Cultural Impact to Tribes from Climate Change Influences on Forests"	Indirect
University of Maine	Journal Article	**Gardner, S. K.** (2012). Paradigmatic differences of faculty involved in an interdisciplinary research collaboration. Sustainability Science.	Direct
University of Maine	Journal Article	**Gardner, S. K., Jansujwicz, J., Hutchins, K., Cline, B.**, & **Levesque, V.** (under review). Socialization to interdisciplinarity: Faculty and student perspectives. Submitted to Higher Education.	Direct
University of Maine	Journal Article	**Gardner, S.K., Jansujwicz, J., Hutchins, K., Cline, B.**, & **Levesque, V**. (2012). Interdisciplinary Doctoral Student Socialization. International Journal of Doctoral Studies, 7, 377-394. http://ijds.org/Volume7/IJDSv7p377-394Gardner0385.pdf.	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	Glover, R., & **Silka, L.** (under review). Choice, power, and perspective. Under review for Gateways: International Journal of Community Research and Engagement.	Indirect
University of Maine	Journal Article	Gomben, P.C., **R.J. Lilieholm**, and M. Gonzalez-Guillen. 2012. Impact of Demographic Trends on Future Development Patterns and the Loss of Open Space in the California Mojave Desert. Environmental Management 49(2):305-324.	Indirect
University of Maine	Journal Article	Gorcyzca, E., **Leahy, J., Bell, K.**, Wilson, J., and **Straub, C.** Social Learning to Improve Acceptance and Use of Small-Scale Forestry Models in Policy Decision Making, Revise & resubmit to Small-scale Forestry.	Direct
University of Maine	Journal Article	Gorcyzca, E., Lyons, P., **Leahy, J.**, **Johnson, T., and Straub, C.** Improving Family Forest Knowledge Transfer through Social Network Analysis, Accepted to Journal of Applied Environmental Education & Communication.	Direct
University of Maine	Journal Article	Gorczyca, E., P. Lyons, **J. Leahy, T. Johnson, C. Straub**. Improving Family Forest Knowledge Transfer through Social Network Analysis. Journal of Applied Environmental Education and Communication (In press)	Indirect
University of Maine	Journal Article	**Groff, L. A.**, A.L. Pitt, R. F. Baldwin, **A.J.K. Calhoun**, **C. S. Loftin**. Attaching radio transmitters to anurans: a comparison and evaluation of a novel technique used in four studies. Journal of Wildlife Research.	Direct
University of Maine	Journal Article	**Hall, D., Silka, L., and Lindenfeld, L.** Advancing Science: Linking Knowledge with Action in Maine's Sustainability Solutions Initiative. Maine Policy Review	Direct
University of Maine	Journal Article	**Hart and Bell.** 2013. Sustainability science: A call to collaborative action. Agricultural and Resource Economics Review, in press.	Direct
University of Maine	Journal Article	**Hart** et al. Strengthening the role of universities in the theory and practice of sustainability science: Maine as a model system. Ecology and Society, in review.	Direct
University of Maine	Journal Article	**Hart**, Biggs, Nikora and Flinders. 2013. Flow effects on periphyton patches and their ecological consequences in a New Zealand river. Freshwater Biology, in press.	Indirect
University of Maine	Journal Article	**Hart, D., and K.P. Bell** (2013). Sustainability Science: A Call to Collaborative Action. Agricultural and Resource Economics Review	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	**Hutchins, K.** & Stormer, N. (2013). Articulating Identity in and through Maine's North Woods. Environmental Communication, 7(1).	Indirect
University of Maine	Journal Article	**Hutchins, K., Lindenfeld, L.A., Bell, K.P., Leahy, J. and Silka, L.** (2013) Assessing the Potential for Community-University Partnerships in Sustainability Research and Planning. Landscape and Urban Planning.	Direct
University of Maine	Journal Article	**Jansujwicz, J., A.J.K. Calhoun, J.E. Leahy, and R.J. Lilieholm**. 2013. Using Framing Theory with Mixed Methods to Develop a Private Landowner Typology. Society and Natural Resources (in press).	Direct
University of Maine	Journal Article	**Jansujwicz, J.S. and T.R. Johnson**. Understanding and informing permitting decisions for tidal energy development using an adaptive management framework. Estuaries and Coasts.	Direct
University of Maine	Journal Article	**Jansujwicz, J.S., A.J.K. Calhoun, and R. Lilieholm**. 2013. Using citizen science education and outreach to engage municipal officials and private landowners in vernal pool conservation. Environmental Management (in press).	Direct
University of Maine	Journal Article	**Jansujwicz, J.S., A.J.K. Calhoun, and R. Lilieholm**. Using citizen science education and outreach to engage municipal officials and private landowners in vernal pool conservation. Submitted to Environmental Management	Direct
University of Maine	Journal Article	**Jansujwicz, J.S., A.J.K. Calhoun, J.E. Leahy, R.J. Lilieholm**. Using mixed methods to develop a private landowner typology. Society and Natural Resources, in press.	Direct
University of Maine	Journal Article	**Johnson, T., Zydlewski, G.B.** 2012. Research for the Sustainable Development of Tidal Power in Maine. Maine Policy Review. 21(1): 58-64.	Direct
University of Maine	Journal Article	**Johnson, T.R., J. Jansjuwicz, G. Zydlewski**. Stakeholder perspectives of tidal power development in Maine. Manuscript in development for Estuaries and Coasts.	Direct
University of Maine	Journal Article	K Lynn, **J Daigle**, J Hoffman, FK Lake, **N Michelle, D Ranco**, C Viles, G Voggesser, P Williams, 2013, "The Impacts of Climate Change on Tribal Traditional Foods"	Indirect
University of Maine	Journal Article	**Leahy, J.**, Gorcyzca, E., **Bell, K.**, **Straub, C.** and Wilson, J. Social Learning to Improve Acceptance and Use of Small-Scale Forestry Models in Policy Decision Making, Submitted to Small Scale Forestry.	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	**Leahy, J.**, Gorczyca, E., **Bell, K., Straub, C.**, and Wilson, J. Agent-Based Modeling of Harvest Decisions by Small Scale Forest Landowners in Maine, USA, Submitted to International Journal of Forestry Research	Direct
University of Maine	Journal Article	**Lilieholm, R.J., S.R. Meyer, M.L. Johnson and C.S. Cronan**. 2012. Land Conservation in the Northeastern United States: An Assessment of Historic Trends and Current Conditions. Environment (in review).	Direct
University of Maine	Journal Article	**Lindenfeld, L., Smith, H.,** & Norton, T. (Submitted/Under Review). Risk Communication & Sustainability Science: Lessons from the Field. for Sustainability Science	Direct
University of Maine	Journal Article	**Loftin, C.S., A.J.K. Calhoun**, **S. Nelson,** A. Elskus, and K. Simon. 2012. Does mercury bioaccumulate in wood frogs developing in seasonal woodland pools in Maine, USA? Northeastern Naturalist 19:579-600.	Indirect
University of Maine	Journal Article	Lynn, K., **Daigle, J.**, Hoffman, J., Lake, F., **Michelle, N., Ranco, D.**, Viles, C., Voggesser, G., and Williams, P. 2013. The impacts of climate change on tribal traditional foods. Climate Change Journal.	Indirect
University of Maine	Journal Article	Lyons, P., **Leahy, J., Lindenfeld, L., & Silka, L.** "Knowledge to Action: Investigating implicit Knowledge Production Models held among Forest Science Researchers. Under review at Society and Natural Resources.	Direct
University of Maine	Journal Article	Marciano, J.A., **R.J. Lilieholm, J. Leahy** and T. Porter. 2013. Social Acceptability of Establishing Forest-based Biorefineries in Maine: A Comparison of Mill Towns and the General Public. Biomass and Bioenergy.	Indirect
University of Maine	Journal Article	Marciano, J.A., **R.J. Lilieholm, M.F. Teisl and J. Leahy**. 2013. Factors Affecting Public Support for Forest-based Biorefineries: A Comparison of Mill Towns and the General Public in Maine. Energy Policy.	Indirect
University of Maine	Journal Article	**Mario F. Teisl, Shannon McCoy, Sarah Marrinan, Teresa Johnson, Caroline L. Noblet**, Robert Roper and Sharon Wagner. In review. Will offshore energy face fair winds and following seas?: Understanding the factors influencing marine energy support Estuaries and Coasts	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	Maurer, Brian A., Steven Kembel, Andrew Rominger, **Brian J. McGill** Estimating metacommunity extent using data on species abundances, environmental variation, and phylogenetic relationships across geographic space (Ecological Informatics 13:114-122)	Indirect
University of Maine	Journal Article	**McCoy, S. K., Newell, E. E., Hawthorne, L., & Gardner, S. K.** (under review). Can you be a woman in science? The cost of gender identification for women faculty in STEM disciplines. Submitted to Current Research in Social Psychology.	Indirect
University of Maine	Journal Article	**McGreavy, B. and Lindenfeld, L.** Cultural Consumption and Climate Change: Discursive Intersections of Ecology and Equity. International Journal of Sustainable Development.	Direct
University of Maine	Journal Article	**McGreavy, B., and Lindenfeld, L.** Entertaining our way to engagement? Climate change films and sustainable development values. International Journal of Sustainable Development. Forthcoming 2013.	Direct
University of Maine	Journal Article	**Meyer, S.R., C.S. Cronan, R.J. Lilieholm, M.L. Johnson** and D.R. Foster. 2013. Spatio-temporal Patterns of Open Space Conservation in Northern New England from 1800 to 2010. Conservation Biology.	Direct
University of Maine	Journal Article	Neupane, B., A. Halog, and **R.J. Lilieholm**. 2013. Environmental sustainability of wood-derived ethanol: A life cycle evaluation of resource intensity and emissions in Maine, USA. Journal of Cleaner Production	Indirect
University of Maine	Journal Article	**Noblet, Anderson, Teisl.** An Empirical Test of Anchoring the NEP Scale in Environmental Ethics. Environmental Education Research.	Direct
University of Maine	Journal Article	**Noblet, C., Bell, K.P., Colgan, C. and M. Teisl.** (2012). Economic Development and Maine's Sustainability Solutions Initiative. Maine Policy Review 21(1): 128-136	Direct
University of Maine	Journal Article	**Noblet, Caroline L., Mark W. Anderson and Laura Lindenfeld**. (In Review). Environmental Worldviews: A point of common contact, or barrier? Environmental Communication: A Journal of Nature and Culture	Direct
University of Maine	Journal Article	**Noblet, Caroline L.**, **Mark W. Anderson and Mario F. Teisl**. 2012. An empirical test of anchoring the NEP scale in environmental ethics. Environmental Education Research, July	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	Patrick Lyons, **Jessica Leahy**, David Kitteridge, and **Mark W. Anderson**, There's No Place like Home: The role of Place Attachment in understanding Family Forest Landowner Behavior, Submitted to Journal of Forestry	Direct
University of Maine	Journal Article	**Pavri, F**., Springsteen, A., **Dailey, A.**, **MacRae, JD**. Land use and socioeconomic influences on a vulnerable freshwater resource in northern New England, United States. Accepted for publication in Environment, Development and Sustainability. DOI 10.1007/s10668-012-9397-x Available online 9 October, 2012	Direct
University of Maine	Journal Article	**Peckenham, J.** and T. Ashtankar, 2012. A Management Decision-Support Tool for Source Water Protection, Journal American Water Works Association.	Direct
University of Maine	Journal Article	**Peckenham, J.M., D. Hart, S. Smith, S. Jain, and W. King** (2012). The path to sustainable water resources solutions. Maine Policy Review, 21:46-57.	Direct
University of Maine	Journal Article	Popescu, V.D., B.S. Brodie, **M.L. Hunter**, and J. Zydlewski. 2012. Use of olfactory cues by newly metamorphosed wood frogs (Lithobates sylvaticus) during emigration. Copeia 2012(3):424-431.	Direct
University of Maine	Journal Article	**Quigley, E., R.J. Lilieholm, D. Ranco, W. Livingston, and J. Daigle**. 2013. Adaptive Partnerships for Invasive Species Policy: State-level Emergency Response Planning for Emerald Ash Borer. Ecosystems and Sustainable Development (in review)	Direct
University of Maine	Journal Article	Ranco R, **Arnett A**, **Latty E**, **Remsburg A**, **Dunckel K**, **Quigley E**, **Lilieholm R, Daigle J**, Livingston B, Neptune J, Secord T. 2012. Two Maine forest pests: a comparison of approaches to understanding threats to hemlock and ash trees in Maine. Maine Policy Rev 21:76-89.	Direct
University of Maine	Journal Article	**Ranco, Lilieholm** and others. 2012. Two Maine Forest Pests: A Comparison of Approaches to Understanding Threats to Hemlock and Ash Trees in Maine. Maine Policy Review 21(1):76-89.	Direct
University of Maine	Journal Article	Ryan, K.J., **J. Zydlewski**, and **A.J.K. Calhoun**. Using passive integrated transponder (PIT) systems for terrestrial detection of blue-spotted salamanders in situ. Journal of Herpetology	Indirect

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	Samson, J ; Berteaux, D; **McGill, Brian J.** and Humphries, M Demographic Amplification of Climate Change Experienced by the Contiguous United States Population during the 20th Century (PLOS One 7(10):e45683, doi:10.1371/journal.pone.0045683, 8 pages)	Indirect
University of Maine	Journal Article	Sergio Estrada-Villegas, **McGill, Brian J**.; Kalko, Elisabeth K. V. - Climate, habitat and species interactions at different scales determine the structure of a neotropical bat community (Ecology 93(5):1183:1193)	Indirect
University of Maine	Journal Article	**Silka, L.** (in press). "Silos" in the democratization of science. Journal of Deliberative Mechanisms in Science.	Indirect
University of Maine	Journal Article	**Silka, L. Bell, K. Hutchins, K. Lindenfeld, L., McGreavy, B. & Smith, H.** Case Study: Building Collaborative Partnerships on a Statewide Scale. Journal of Empirical Research on Human Research Ethics. Under review, January, 2013	Direct
University of Maine	Journal Article	**Silka, L., B. McGreavy. B. Cline, and L. Lindenfeld**. 2012. Introduction to Sustainability: Special Issue from the Margaret Chase Smith Policy Center. Maine Policy Review 21:10-13.	Direct
University of Maine	Journal Article	**Silka, L.**, Glover, R., **Hutchins, K., Lindenfeld, L.** Blackstone, A., **Elliott, C.**, Ladenheim, M., & Sullivan, C. (under review). Moving beyond the single disciplines: Building a scholarship of engagement that permeates higher education. Under review for TAMARA: Journal of Critical Organization Inquiry.	Indirect
University of Maine	Journal Article	**Silka, L.,** Glover, R., **Hutchins, K., Lindenfeld, L**., Blackstone, A., **Elliott, C.,** Ladenheim, M., and Sullivan, C. (Under review at TAMARA). Moving beyond the single discipline: Building a scholarship of engagement that permeates higher education.	Direct
University of Maine	Journal Article	**Silka, L., Hutchins,** K., Jones, M., & Rector, C. (2012). Improving Maine's Future through Education: Overcoming Challenges and Learning Together. Maine Policy Review, 21(2), 14-22. http://digitalcommons.library.umaine.edu/mpr/.	Direct
University of Maine	Journal Article	**Smith, H. & Lindenfeld, L.** Integrating media studies of climate change into interdisciplinary research. Which direction should we be heading? Under Review at Environmental Communication	Direct
University of Maine	Journal Article	**Smith, H.** (Submitted/Under Review). I, Us, & Them: Exploring the Narrative Boundaries of University Research. Kaleidoscope: A Graduate Journal of Qualitative Communication Research	Indirect

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	Snell, M., **Bell, K.P.**, and **J. Leahy**. 2013. Local institutions and lake management. Lakes & Reservoirs: Research & Management	Indirect
University of Maine	Journal Article	Snell, M., **Straub, C.,** and **Leahy, J.** Constraint Negotiation Strategies for Overcoming Environmental Education Barriers in Maine Elementary School, Revise & resubmit to Journal of Environmental Education.	Direct
University of Maine	Journal Article	Socialization to interdisciplinarity: Faculty and student perspectives. Higher Education.	Direct
University of Maine	Journal Article	Stone, I., Benjamin, J., **Leahy, J.** 2012. Innovation Impacts on Biomass Supply in Maine's Logging Industry Forest Prod. J. 61(7):579-585.	Indirect
University of Maine	Journal Article	Stormer, N. & **McGreavy, B.** Rhetoric and Materiality: Capacity, vulnerability, & resilience. Under review, January, 2013.	Indirect
University of Maine	Journal Article	**Straub, C. and Leahy, J.** Applying the Health Belief Model to the Pro-Environmental Behavior of Private Well Water Testing, Revise & resubmit to Journal of the American Water Resources Association.	Direct
University of Maine	Journal Article	**Straub, C. and Leahy, J.** Environmental Perception, Concern, and Behavior of 4-H Participants: Pre- and Post- Groundwater Education, In Review to Journal of Natural Resources & Life Sciences Education.	Direct
University of Maine	Journal Article	**Teisl, M.F**, **McCoy, S.**, Marrinan, S., **Johnson, T., Noblet, C.L.**, Roper, R., Wibberly, M. and Wagner, S. (In review). Will offshore energy face fair winds and following seas?: Understanding the factors influencing marine energy support. Estuaries and Coasts	Direct
University of Maine	Journal Article	**Teisl, M.F., S. McCoy, C.L. Noblet, T.R. Johnson**, M. Wibberly, S. Marrinen, S, Dreyer, R. Roper, and S. Wagner. What drives people's evaluations of, and support for, offshore energy? Manuscript submitted to Estuaries and Coasts.	Direct
University of Maine	Journal Article	Tessema, M.E., **R.J. Lilieholm**, D.J. Blahna, and L.E. Kruger. 2013. Community Resource-use Linkages in Southeast and Southcentral Alaska. Society and Natural Resources.	Indirect
University of Maine	Journal Article	**Thagersen, John and Caroline L. Noblet**. 2012. Does Green Consumerism increase the acceptance of windpower? Energy Policy 51, 854-862	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Journal Article	Thornton, T. & **Leahy, J.** (2012). Trust in Citizen Science Groundwater Research: A Case Study of the Groundwater Education Through Water Evaluation & Testing Program, Journal of the American Water Resources Association, 48(5):1032-1040.	Direct
University of Maine	Journal Article	Thornton, T., & **Leahy, J.** (2012). Changes in Social Capital and Networks: A Study of Community-Based Environmental Management Through a School-Centered Research Program. Journal of Science Education & Technology, 21(1), 167-182.	Direct
University of Maine	Journal Article	Viehman, H., **Zydlewski, G.** submitted. Fish interaction with a commercial-scale tidal energy device in a field setting. Estuaries and Coasts.	Indirect
University of Maine	Journal Article	Viehman, H.S., **Zydlewski, G.B.,** McCleave, J.D. Using acoustics to understand fish presence and vertical distribution in a tidally dynamic region targeted for energy extraction. Estuaries and Coasts.	Indirect
University of Maine	Journal Article	Vogesser, G., **Daigle, J.,** Lake, F., Lynn, K., and **Ranco, D.** (pending) Cultural impacts to tribes from climate change influences on forests. Climate Change Journal.	Indirect
University of Maine	Journal Article	Wang, Q., **Peckenham, J.**, J. Pinto, and H. Patterson. (2012). Kinetics and equilibrium properties of the biosorption of Cu2+ by algae. Environmental Science and Pollution Research, 19, pp. 3889-3894.	Indirect
University of Maine	Journal Article	**Waring, T. M.** (2012). Wicked Tools: The Value of Scientific Models for Solving Maine's Wicked Problems. Maine Policy Review, 21(1)30-39.	Direct
University of Maine	Journal Article	Yongmi Lee, Young Jin Jung, Kwang Woo Nam, Silvia Nittel, **Kate Beard** and Keun Ho Ryu Geosensor Data Representation Using Layered Slope Grids Sensors 2012, 12(12), 17074-17093; doi:10.3390/s121217074	Indirect
University of Maine	Magazine Article	**McCoy, S. K., & Gardner, S. K.** (2012). Interdisciplinary collaboration on your campus: Five questions. Change: The Magazine of Higher Learning, 44(6), 44-49.	Direct
University of Maine	Other	**Mark W. Anderson & Mario Teisl**, Values , in Berkshire Encyclopedia of Sustainability, Volume 10: The Future of Sustainability, pp 212-218	Indirect
University of Maine	Other	Sharik, T.L., and **R.J. Lilieholm**. 2012. A National Perspective on Forestry Education. Western Forester 57(2):1-5.	Indirect

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Other	St. John, J., **Lindenfeld, L.A**., Andresen, K. (Lead Writing Team), The Blue Sky Project: Reaffirming Public Higher Education at Maine's Flagship University (2012), University of Maine.	Indirect
University of Maine	Other	Steady State Economy, in Berkshire Encyclopedia of Sustainability, Volume 10: The future of Sustainability.	Indirect
University of Maine	Proceedings	**Beard, K.** 2012. A Semantic Web based Gazetteer Model for VGI. Proceedings of ACM SIGSpatial Workshop. Redondo Beach , CA.	Indirect
University of Maine	Proceedings	**Calhoun, A., J. Jansuwicz, M. Hunter, and K. Bell**. Evolving approaches to conserving small wetlands on private lands in the face of uncertainty. Proceedings of the National Academy of Science.	Direct
University of Maine	Proceedings	Dornelas, M., Magurran, A., Buckland, S., Chazdon, R., Chao, A., Colwell, R., Curtis, T., Gotelli, N., Kosnik, M., **McGill, B.,** , Morlon, H., Mumby, P., Ãvres, L., Studeny, A. and Vellend, M. Quantifying temporal change in biodiversity: challenges and opportunities (Proceedings of the Royal Society B 2013 280(1750)	Indirect
University of Maine	Proceedings	**Johnson, M.L., S.R. Meyer, R.J. Lilieholm, and C.S. Cronan**. 2012. The role of transparency in developing a stakeholder-engaged, qualitative-Quantitative Landscape Scenario Process. Annual Conference of American Collegiate Schools of Planning. Submitted.	Direct
University of Maine	Proceedings	**Peckenham, J.** (2011). Fluoride, arsenic, and chloride in private water wells in eastern Maine, Private Well Symposium, Southbury, CT, November 15, 2011.	Indirect
University of Maine	Proceedings	Rude, A. and **Beard, K.** 2012. High-Level Event Detection in Spatially Distributed Multi-variate Time Series. Proceeding GIScience 2012. LNCS 7478. Columbus OH.	Indirect
University of Maine	Technical Report	Foertsch, I., J.E. **Leahy, J.S.** Wilson, and **R.J. Lilieholm**. 2012. Maine's Landowner Survey: Technical Report. Center for Research on Sustainable Forests, University of Maine. 104 pages.	Indirect
University of Maine	Technical Report	**Hutchins, K.** & Zollitsch, B. (2013). Capisic Brook Social Marketing Initiative Online Survey.	Direct
University of Maine	Technical Report	**Hutchins, K., Thornbrough, L., Finnemore, L.**, Zollitsch, B., Arter, B., **Lindenfeld, L.A.** Maine Salt Management Taskforce Scoping Project: Technical Report. Technical report under development.	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Technical Report	**Lilieholm, R.J., C.S. Cronan, M.L. Johnson, S.R. Meyer, and D. Owen**. 2012. Alternative Futures Modeling in Maine's Penobscot River Watershed: Forging a Regional Identity for River Restoration. Lincoln Institute of Land Policy. Working Paper 12RL1	Direct
University of Maine	Technical Report	**Lindenfeld, L.**, Smith, H., & Suldovsky, B. (Nov 2012). University of Maine Pathway One Communication Research & Implementation Project: Phase One Technical Report.	Direct
University of Maine	Technical Report	**Lindenfeld, L., Smith, H., & Suldovsky, B.** (Nov 2012). University of Maine Pathway One Communication Research & Implementation Project: Phase One Technical Report.	Indirect
University of Maine	Technical Report	**Vanderlugt, B., Bell, K.P., Frisch, A., Quartuch, M., and J. Colby-George**. 2013. 2012 Maine Landowner Survey: Bangor Metropolitan Area Results.	Direct
University of Maine	Technical Report	**Vanderlugt, B., Bell, K.P., Frisch, A., Quartuch, M., and J. Colby-George**. 2013. 2012 Maine Landowner Survey: Key Findings and Implications for Policy, Outreach, and Landowner Solutions.	Direct
University of Maine	Technical Report	**Vanderlugt, B., Bell, K.P., Frisch, A., Quartuch, M., and J. Colby-George**. 2013. 2012 Maine Landowner Survey: Summary Technical Report.	Direct
University of Maine at Augusta	Abstract	**J. King**, A. Bean, H. Dyer, and **Milligan, P. W.** 201. Isolation of Salmonella and Staphylococci from Maine Wild Turkeys. Abstr. 113th Meeting. Am Soc. Microbiol. Denver, CO.	Direct
University of Maine at Augusta	Abstract	**P. W. Milligan**, A. Lichtenwalner, K. Sullivan, and J. Brown 2013. Exposure to Infectious Agents in Maine Wild Turkeys. Abstr. 113th Meet. Am Soc. Microbiol. Denver, CO.	Direct
University of Maine at Farmington	Abstract	**Daly, J., Lavorgna, S.,** Doughty, M., and **Rousseau, C.** (2013, March). Comparison of winter stratification and ice duration between subalpine lakes and large, low elevation lakes. Paper presented at annual meeting of the Northeast region of the Geological Society of America, Bretton Woods, NH.	Direct
University of Maine at Farmington	Book	**Andrew Barton** with Alan White and Charles Cogbill, The Changing Nature of the Maine Woods (Hanover, NH: University Press of New England), 2012	Indirect
University of Maine at Presque Isle	Technical Report	Fort Farifield Landowner Survey: Perspectives on Grass Biomass **Vail, David** and **Jason Johnston**	Direct
University of Maine at Presque Isle	Technical Report	**Vail, David** and **Jason Johnston**. 2013. Fort Fairfield Landowner Survey: Perspectives on Grass	Direct

Institution	Type of Publication	Citation	SSI-Related
		Biomass.	
University of New England	Book Chapter	Co-editor (with P. Weinstein, Univ. of South Australia), Adelaide) of Chapter 3, Water, water quality, and health, pp 87-127 In : Environmental Tracking for Public Health Surveillance, The International Society for Photogrammetry and Remote Sensing, published by CRC Press.	Indirect
University of New England	Book Chapter	**Feurt, C.** 2012. Collaborative Learning Strategies to Overcome Barriers to Ecosystem Management in Coastal Watersheds of the Gulf of Maine. Chapter in Stephenson, R. L., J. H. Annala, J. A. Runge, and M. Hall-Arber, editors. 2012. Advancing an ecosystem approach in the Gulf of Maine. American Fisheries Society, Symposium 79, Bethesda, Maryland.	Indirect
University of New England	Other	**Feurt, C.** 2012. Working Together to Get Things Done. Training Curriculum Workbook for the National Estuarine Research Reserve System. NERRS Science Collaborative, UNH/NOAA.	Indirect
University of Southern Maine	Book	Aber, J., **F. Pavri**, and S. Aber. 2012. Wetland Environments: A Global Perspective. Wiley-Blackwell, p. 437.	Indirect
University of Southern Maine	Book Chapter	Alternative Futures Modeling in Maine's Penobscot River Watershed: Forging a Regional Identity for River Restoration	Direct
University of Southern Maine	Journal Article	**Colgan, Charles S.** (2013) The Ocean Economy of the United States: Measurement and Trends. Journal of Ocean and Coastal Management.	Indirect
University of Southern Maine	Journal Article	Cronin-Fine, L., J. D. Stockwell, Z. T. Whitener, E. M. Labbe, **T. V. Willis**, and **K. A. Wilson**. 2013. Application of Morphometric Analysis to Identify Alewife Stock Structure in the Gulf of Maine. Marine and Coastal Fisheries 5:11-20.	Indirect
University of Southern Maine	Journal Article	Larsen, P., **K.A. Wilson** and D. Morse. 2013. Observations on the expansion of a relict Population of Eastern Oysters (Crassostrea virginica) in a Maine Estuary. Northeast Naturalist, In Press.	Indirect
University of Southern Maine	Journal Article	Mapping, Modeling, and the Fragmentation of Environmental Law, 2013 Utah L. Rev. __	Direct
University of Southern Maine	Journal Article	**Willis TV, Wilson KA, Alexander KE**, Leavenworth WB Tracking cod diet preference over a century in the northern Gulf of Maine: historic data and modern analysis MEPS 474:263-276	Direct
University of Southern Maine	Journal Article	**Yuseung Kim**, "A Comparative Study of Land Use-Transportation Simulation Models", Computer, Environment and Urban Systems	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Southern Maine	Journal Article	**Yuseung Kim**, B. Muller, Developer Preferences and Sustainability: Attitudes Toward Location, Design and Environmental Innovation" , Urban Geography	Indirect
University of Southern Maine	Journal Article	**Yuseung Kim**, Dynamics of the Amenity City: An Agent-Based Simulation of Neighborhood Location Decision, Journal of Urban Technology	Indirect
University of Southern Maine	Proceedings	**Yuseung Kim**, (2012) KISS or KILL: A Comparative Study of Land Use-Transportation Simulation Models, Paper Presented at the Association of Collegiate Schools of Planning 53rd Annual Conference, Cincinnati, OH.	Direct
University of Southern Maine	Proceedings	**Yuseung Kim**, (2013) "Developer Preferences and Sustainability" Paper Presented at 2013 AESOP-ACSP Joint Congress, Dublin, Ireland	Indirect
University of Southern Maine	Technical Report	**Colgan, Dailey**, Lloyd, McWilliams, Workman, and **Kartez** (2012) Changing Maine: Maine's Changing Population and Housing 1990-2010 Portland: Muskie School of Public Service	Direct
University of Southern Maine	Technical Report	**Yuseung Kim**, (2013) A Comparative Study of Land Use and Building Permitting Processes in Portland and Other Cities. Technical Report Submitted to the City of Portland. Maine Center for Business and Economic Research, University Southern Maine	Indirect

Please note: These publications and posters are not included in the database listing for Research.gov due to size restrictions.

YR4 Publications – Newsletters and Posters

Institution	Type of Publication	Citation	SSI-Related
Bates College	Poster	Chiao, C., Johnson, B., Dostie, P., The effect of the 2012 alewife migration on nutrient dynamics in Nequasset Lake, Woolwich, Maine. NE GSA, March 18-20, 2013, Bretton Woods, NH.	Direct
Colby College	Poster	Rueger, Bruce, Anthropogenic and natural influences on bottom sediments from Great Pond, Central Maine, and their impact on local sustainability, 2012 Annual Meeting of the Geological Society of America, Charlotte, NC, November 4, 2012.	Direct

Institution	Type of Publication	Citation	SSI-Related
Colby College	Poster	Buffering Shoreline Development in the Belgrade Lakes Watershed Emily Arsenault ('14), Andrew Mealor ('14), Cathy Bevier and Russell Cole, Colby Undergraduate Summer Research Retreat, July 2012.	Direct
Colby College	Poster	Cruising Great Pond and Dredging for Sediments: Determining Natural and Anthropogenic Impacts on the Lake, Colby Undergraduate Summer Research Retreat, July 2012.	Direct
Colby College	Poster	Development of user-friendly virtual geologic field guides to the Kennebec Highlands, Central Maine, USA, 2012 Annual Meeting of the Geological Society of America, Charlotte, NC, November 4, 2012.	Direct
Colby College	Poster	Impact of Shoreline Development in the Belgrade Lakes Authors: Colin Cummings ('14), Marianne Ferguson ('14), Emily Arsenault ('14), Monica Davis ('13), Andrew Mealor ('14), Corey Reichler ('13), Russell Cole, and Cathy Bevier, Colby Undergraduate Summer Research Retreat, July 2012.	Direct
Colby College	Poster	Influence of Shoreline Development on Riparian Habitats in the Belgrade Lakes Authors: Emily Arsenault '14, Colin Cummings '14, Monica Davis '13, Marianne Ferguson '14, Drew Mealor '14, Corey Reichler '13, Russell Cole, and Catherine Bevier, Colby Undergraduate Summer Research Retreat, July 2012.	Direct
Unity College	Newsletter	Latty, E.F., 2012. Results of Ecological Assessment. Sheepscot Wellspring Land Alliance Newsletter. 25:4.	Indirect
Unity College	Poster	Hemlock forest management solutions: coupling social, economic, and ecological needs in Maine (Dunckel, K. L., A. Remsburg, E. Latty, A. Arnett, B. Bibles) 2012 Maine EPSCoR State Conference, Orono, ME (Poster)	Direct
University of Maine	Poster	McGreavy, B., Fox, E., Disney, J., Miller, M., Lindenfeld, L., Silka, L., Petersen, C., A Collaborative Model for Conservation Action Planning: Group Communication and partnership development for ecological and economic resilience in Frenchman Bay. Poster presentation at the Maine Water Conference, Augusta, ME, March 2013.	Direct
University of Maine	Poster	Assessing the Concerns of Maine Landowners. Alicia Frisch, Kathleen Bell, Michael Quartuch, Blair Vanderlugt, and Judy Colby-George. Poster presentation, Maine EPSCoR Conference, Orono, Maine, September 2012.	Direct
University of Maine	Poster	Quartuch, Mike, Attached to what and to whom: Using sense of place and sense of community to	Direct

Institution	Type of Publication	Citation	SSI-Related
		examine forest landowner intentions to parcelize or develop private property, International Sympostium on Society and Resource Management, Estes Park Center, CO, June 4, 2013.	
University of Maine	Poster	McGreavy, B., Lindenfeld, L., Silka, L., Hutchins, K., Smith, H., Budzinski, C., Collaboration and Social Resilience: Interdisciplinarity and engagement in a learning organization. Poster presentation at UMaine EPSCoR Annual Conference, Orono, ME, September 2012.	Direct
University of Maine	Poster	Environmental and population growth concerns may be different across socioeconomic status groups Authors: Ryan M. Pickering, John J McAuliffe, Shannon K. McCoy, Ellen E. Newell, Lauren M. Hawthorne, Elizabeth L. Tull, Association for Psychological Science, Washington, DC, May, 23, 2013.	Direct
University of Maine	Poster	Goff, Sandra, Evolving sustainability: Can group selection create sustainable socio-ecological systems? Maine EPSCoR Conference, University of Maine, Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	Groff, Luke, Habitat Use by Pool-Breeding Amphibians in Maine's Montane Region, Maine EPSCoR Conference, University of Maine, Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	Groff, Luke, Hibernaculum selection by wood frogs (Lithobates sylvaticus) in Maine's montane region, Northeast Natural History Conference, Springfield, MA, April 4, 2013.	Direct
University of Maine	Poster	Martin, Danielle Creating a Water Budget for Sebago Lake: Quantifying Surface Water Flow Sebago Lake supplies approximately 200,000 people in Maine with drinking water and is a multi-use recreational resource, Maine EPSCoR Conference, University of Maine, Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	Landowner Choices and Landscape Level Change: An Agent Based Model Designed to Engage the Public Authors: Judy Colby-George, Timothy Waring, Kathleen Bell, Charles Colgan, Maine EPSCoR Conference, University of Maine, Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	Hutchins, K., Lindenfeld, L.A., Bell, K.P., Silka, L., & Leahy, J., Linking Knowledge with Action Through Municipality-University Partnerships, Public Participation in Scientific Research, Portland, OR, August 4, 2012.	Direct
University of Maine	Poster	Linking Knowledge with Action for Sustainable	Direct

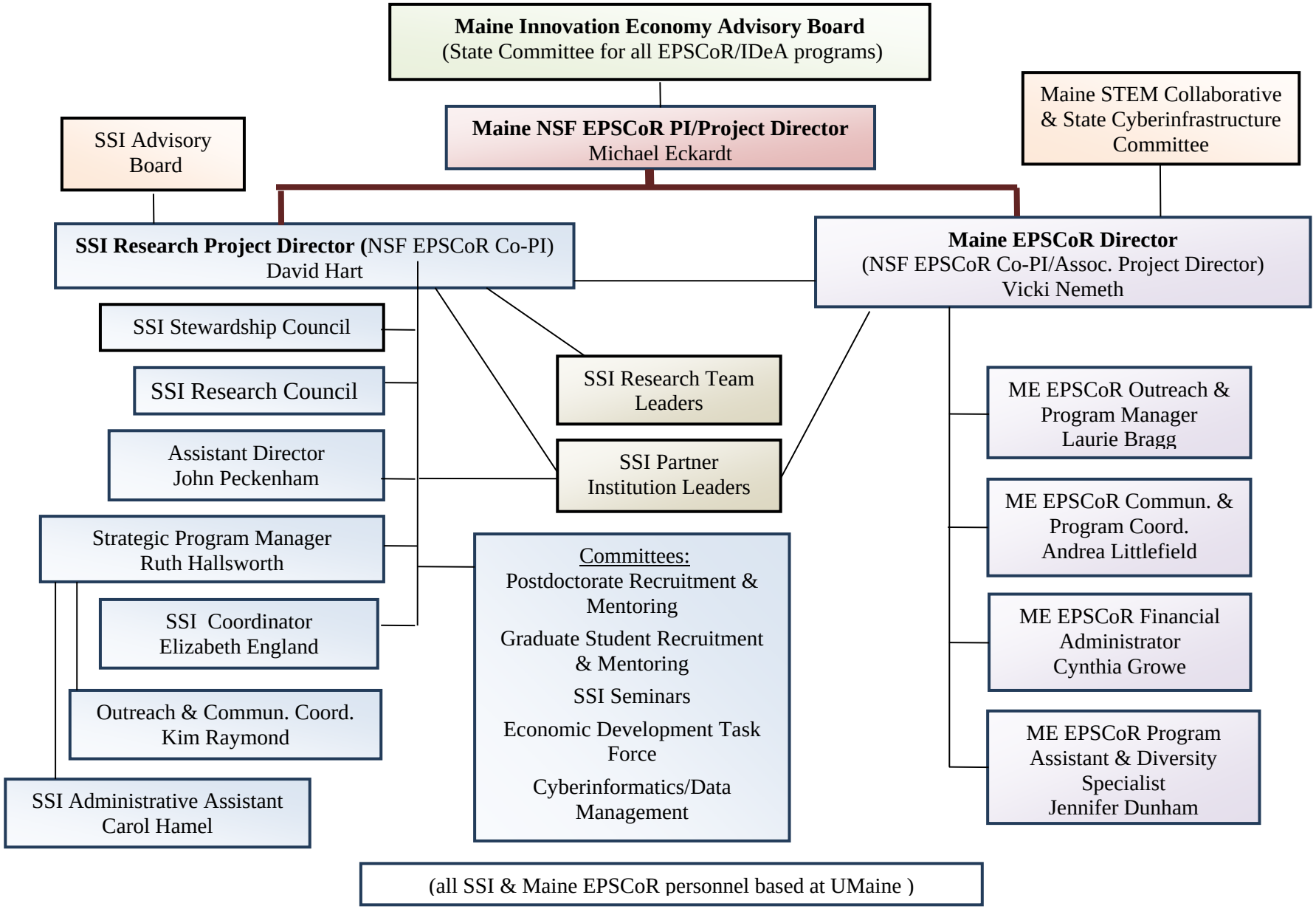
Institution	Type of Publication	Citation	SSI-Related
		Solutions: Learning Organization Research Models in an Interdisciplinary Sustainability Science Portfolio, 18th Annual International Interdisciplinary Conference on the Environment, Portland, ME.	
University of Maine	Poster	Ryan, K. , A.J.K. Calhoun, J. Zydlewski, Monitoring eastern spadefoot (Scaphiopus holbrookii) burrow emergence with passive integrated transponders SCB North America Congress for Conservation Biology, Oakland, CA, July 16, 2012.	Direct
University of Maine	Poster	Levesque, Bell, Calhoun, Municipal Vernal Pool Policy: Sustainability Science in Action. Maine EPSCoR Conference, University of Maine, Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	McCoy, Shannon, Outdoor Recreation Increases Environmental Concern, but only for the Wealthy, Association for Psychological Science, Washington, DC, May 25, 2013.	Direct
University of Maine	Poster	McGreavy, B., Lindenfeld, L.A., Silka, L., Hutchins, K. Smith, H., Budzinski, C. , Participation in a Sustainability Science Project: Perspectives on stakeholder engagement, partnerships, and agency, Public Participation in Scientific Research Preconference, Ecological Society of America Annual Convention, Portland, OR, November 1, 2012.	Direct
University of Maine	Poster	Lindenfeld, L., Silka, L., Anderson, M., McCoy, S., Noblet, C., Teisl, M., Eliott, C., Hutchins, K., McGreavy, B., Smith, H., Suldovsky, B., Thornbrough, L., Knowledge-Action Collaborative, UMaine EPSCoR Annual Conference, Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	Beyene, M. D. Brady, S. Jain, J. MacRae, D. Martin, F. Pavri, J. Peckenham, A.S. Reeve, S.M.C. Smith, C. Straub, Safeguarding a vulnerable lake-watershed system: the Sebago Lake watershed. Maine EPSCoR Conference. Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	Martin, D., A.S. Reeve, S. Smith, Sebago Lake stream monitoring. Maine Water Conference. Augusta, ME, March 19, 2013.	Direct
University of Maine	Poster	McGreavy, B., Lindenfeld, L., Silka, L., Hutchins, K. Smith, H., Budzinski, C., Participation in a Sustainability Science Project: Perspectives on stakeholder engagement, partnerships, and agency. Public Participation in Scientific Research Preconference, Ecological Society of America Annual Convention, Portland, OR, November 1, 2012.	Direct
University of Maine	Poster	People, Landscapes, and Communities Team.	Direct

Institution	Type of Publication	Citation	SSI-Related
		Kathleen P. Bell, Jessica Leahy, Michael Quartuch, Blair Vanderlugt, Alicia Frisch, Crista Straub, Judy Colby-George, and Aaron Weiskettel. 2012 Maine EPSCoR Conference, September 24, 2012.	
University of Maine	Poster	McGreavy, B., Miller, M., Disney, J., Lindenfeld, L., Silka, L., Planning for Resilience: Integrating citizen perspectives in a Conservation Action Planning process Public Participation in Scientific Research Preconference, Ecological Society of America Annual Convention, Portland, OR, November 1, 2012.	Direct
University of Maine	Poster	Livingston, William, Predicting high-quality sites of Black Ash (Fraxinus nigra) Across Maine and northern New York: An approach to prioritizing preparedness and management of emerald ash borer, North Central Insect and Disease Work Conference, Sault St. Marie, Ontario, September 19, 2012.	Direct
University of Maine	Poster	Livingston, William, Predicting high-quality sites of Black Ash (Fraxinus nigra) Across Maine and northern New York: An approach to prioritizing preparedness and management of emerald ash borer, New England and New York SAF Joint Meeting, Saratoga Springs, NY, January 30, 2013.	Direct
University of Maine	Poster	Livingston, William, Predicting high-quality sites of Black Ash (Fraxinus nigra) Across Maine and northern New York: An approach to prioritizing preparedness and management of emerald ash borer, 24th USDA Research Forum on Invasive Species, Annapolis, MD, January 9, 2013.	Direct
University of Maine	Poster	Levesque, V., KP Bell, AJK Calhoun, Sustainability in Maine Municipalities. Maine Water Conference, Augusta, ME, March 19, 2013.	Direct
University of Maine	Poster	Kus, E., Aumann, H., Emanetoglu, N., Cline, B., Hunter, M., Tracking Juvenile Amphibians with Harmonic RADAR, Maine EPSCoR Conference. Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	Parr, T., Urbanization changes carbon composition in Maine USA, American Geophysical Union Annual Meeting, San Francisco, CA, December 5, 2012.	Direct
University of Maine	Poster	Quartuch, M., Using sense of place and sense of community to understand landscape change behaviors, Maine EPSCoR Conference. Orono, ME, September 24, 2012.	Direct
University of Maine	Poster	Groff, Luke, Habitat Use by Pool-breeding Amphibians in Maine's Montane Region. Northeast Partners in Amphibian and Reptile Conservation; Crawford Notch, NH, March 21, 2013.	Direct

Institution	Type of Publication	Citation	SSI-Related
University of Maine	Poster	Identifying Opportunities for Watershed Protection and Regional Planning in a Mixed-Land Use Modeling Framework (Meyer, Johnson, Lilieholm, and Cronan), Conference on Students as Catalysts for Large Landscape Conservation, Colby College, Waterville, ME, March 1, 2013.	Direct
University of Maine	Poster	Groff, L, Northeast Partners in Amphibian and Reptile Conservation; Crawford Notch, NH, July 25, 2013	Direct
University of Maine	Poster	Pickering, R., Outdoor Recreation Increases Environmental Concern, but only for the Wealthy, Society for Personality and Social Psychology, New Orleans, LA, January 17, 2013.	Direct
University of Maine	Newsletter	Hallsworth, R., Ridley, K., Raymond K. (2012). Solutions Issue 02.	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 49. http://www.messi.maine.edu/?page_id=2483	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 50. http://www.messi.maine.edu/?page_id=2523	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 51. http://www.messi.maine.edu/?page_id=2551	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 52. http://www.messi.maine.edu/?page_id=2577	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 53. http://www.messi.maine.edu/?page_id=2599	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 54. http://www.messi.maine.edu/?page_id=2643	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 55. http://www.messi.maine.edu/?page_id=2678	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 56. http://www.messi.maine.edu/?page_id=2702	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 57. http://www.messi.maine.edu/?page_id=2728	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 58. http://www.messi.maine.edu/?page_id=2773	Direct
University of Maine	Newsletter	Raymond, K. & Hallsworth R. (2012) DoSSIer Issue # 59. http://www.messi.maine.edu/?page_id=2801	Direct
University of Maine at Augusta	Poster	Milligan, Peter, Isolation of Salmonella and Staphylococci from Maine Wild Turkeys, 113th General Meeting for the American Society for Microbiology, Denver, CO, May 15, 2013.	Direct
University of Maine at Augusta	Poster	Milligan, Peter, Isolation of Salmonella and Staphylococci from Maine Wild Turkeys, State	Direct

Institution	Type of Publication	Citation	SSI-Related
		House Undergraduate Research Day, Augusta, ME, March 1, 2013.	
University of Maine at Augusta	Poster	Lange, C., Population Genetics of Wild turkeys in Maine (at upcoming 2013 Maine State Undergraduate Research Day, March 1, 2013.	Direct
University of Maine at Farmington	Poster	Daly, Julia, Impact of atypical air temperatures on development and persistence of winter stratification and ice cover on Subalpine lakes, Western Maine, Bretton Woods, NH, March 19, 2013.	Direct
University of Maine at Farmington	Poster	Sustainability Strategies in the Rangeley Lakes Region (with Andrew Barton, Chris Bennett, Daniel Buckley, Ronald Butler, Julia Daly, Wendy Harper, Rebecca Kurtz, Nancy Perlson and Shelby Rousseau), Maine Water Conference. Augusta, ME, March 19, 2013.	Direct
University of Maine at Presque Isle	Poster	Grass Biomass Potential for Central Aroostook County, Maine EPSCoR Conference, University of Maine, Orono, ME, September 24, 2012.	Direct
University of New England	Poster	Morgan, P., Being a Sustainability Intern: Learning to Stand on Your Own through Community Involvement and Ecological Field Work, Summer Undergraduate Research Experience (SURE) Symposium, September 8, 2012.	Direct
University of New England	Poster	Perlut, N., Causal Relationships Between Plant and Bird Species Diversity in the Saco River Tidal Marshes, UNE College of Arts and Sciences Summer Research Symposium, November 1, 2012.	Direct
University of Southern Maine	Poster	Barajas, M., Willis, T.V., Wilson, K.A. and B. Kulik, Smallmouth bass predation on river herring in the Kennebec/Androscoggin River systems, Maine Water Conference. Augusta, ME, March 19, 2013.	Direct
University of Southern Maine	Poster	Tracking landscape and habitat shifts for the Sebago Lake region over two decades. Firooza Pavri, Abraham Dailey, Paul Bourget, Tony Cole, Maine Water Conference. Augusta, ME, March 19, 2013.	Direct

Maine EPSCoR NSF EPSCoR RII Track 1 Project - Maine's Sustainability Science Initiative



Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS-0904155)

YR4 & YR5 Objectives, Strategies, Benchmarks, & Progress

Goal #1: Overall Research Goals - Summary of Strategies & Benchmarks (strategies & benchmarks common to this goal and all three research goals)				
Goal #1 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
1) Use Maine as a laboratory and incubator for sustainability science research, and grow state capacity to respond to a broad array of sustainability challenges.	a) Create the Center for Sustainability Solutions	File for formal research center status	Center name change will take place in fall 2013. Planning for post-award funding continues across all areas	Achieve formal research center status: secure base budget10
	b) Foster collaboration and integration between research teams and institutions	36 project-wide	36 collaborations with other research teams/institutions	36 project-wide
	c) Research models/processes framed and modified by stakeholder input to inform decision-making	25 project-wide	31 research models/processes framed and/or modified by stakeholder input	30 project-wide
2) Increase Maine's competitiveness and funding in this sustainability area through an interdisciplinary, multi-institutional collaboration.	a) Support state PUI involvement	10 PUI institutions	10 PUI institutions supported	10 PUI institutions
	b) Expand collaborations to include national &international groups	20 project-wide	36 national/international collaborations	20 project-wide
	c) Active collaborations with a wide range of stakeholder groups	90 project-wide	120 active collaborations with stakeholder groups (research)	100 project-wide

	d) Engage a wide breadth of interdisciplinary expertise	25 disciplines collaborating	26 disciplines collaborating	25 disciplines collaborating
	e) Support development of new research methods or adoption of best practices	24 project-wide	25 new research methods developed or best practices adopted	24 project-wide
	f) External collaborative proposals submitted	25 proposals @ $3.75M project-wide	76 proposals submitted for $35,978,474	30 proposals @ $4.86M project-wide
	g) Peer-reviewed publications submitted/accepted/published	75 project-wide	239 total - 110 journal articles, 20 abstracts, 2 books, 15 book chapters, 13 technical reports, and 79 other.	105 project-wide
	h) Presentations at relevant professional conferences	40 project-wide	103 presentations at relevant professional conferences	40 project-wide
	i) Formal related public presentations or public testimony	25 project-wide	32 formal related public presentations. 4 public testimony	25 project-wide

Goal #2: Dynamics of Coupled Social-Ecological Systems – Summary of Specific Strategies & Benchmarks				
Goal #2 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
1) Improved understanding of SES dynamics and resilience and capacity across all objectives:	a) Development of model(s) of SES dynamics for a specific SES context	Develop 15 models project-wide	Continued development and refinement of models across the SES project portfolio	Develop 15 models project-wide
	b) Identify/analyze thresholds/feedback, and indicators for a specific context	12 project-wide	Continued to identify and analyze thresholds, feedbacks and indicators integral to 17 projects in the portfolio	15 project-wide

	c) Informing stakeholder mitigation/adaptation strategy	15 project-wide	Continued to inform stakeholder through 17 projects in the portfolio	15 project-wide
	d) Determine linkages of SES model with K↔A research	15 project-wide	Continued analysis of linkages of models with K-A research through 18 projects in the portfolio	15 project-wide

Goal #3: Knowledge to Action - Summary of Specific Strategies & Benchmarks				
Goal #3 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
1) Improved understanding and capacity across all objectives:	a) Models assess reciprocal interactions among biophysical, socioeconomic, and stakeholder contexts affecting K↔A	20 project-wide	Continued development and refinement of models developed during Years 1 to 3	20 project-wide
	b) Develop methodological framework & best practices.	20 project-wide	Worked continued on this goal across the whole SSI portfolio of 22 projects.	20 project-wide
	c) Find evidence of linking K↔A research with SES.	20 project-wide	Progress has occurred in multiple settings within the SES portfolio	20 project-wide
	d) Identify best practices for strengthening K↔A interactions in the 3 targeted problem areas.	15 project-wide	At least 15 best practices have been identified in SES projects	20 project-wide

	e) Give presentations of evidence-based strategy for communicating complex scientific information.	10 project-wide	Many more than 10 presentations were completed	10 project-wide
	f) Create K↔A models that are both internally and externally-oriented for stakeholder and research purposes.	10 project-wide	Nearly every SES project in the portfolio has created models for application	10 project-wide

Goal #4: Organizational Innovation - Summary of Specific Strategies & Benchmarks				
Goal #4 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
1) Improved understanding and capacity across all objectives:	a) Develop models of OI that examine the influences on interdisciplinary collaboration in university-stakeholder partnerships	4 project-wide	Work continued on the development and refinement of OI models	4 project-wide
	b) Develop methodological framework & best practices for promoting interdisciplinary collaboration and university-stakeholder partnerships	4 project-wide	Methodological work has continued across SSI within projects and by OI investigators (22 projects)	4 project-wide
	c) Presentations and technical reports on OI research findings, suggested implementation, and recommendations for improvement	6 presentations and 4 technical reports project-wide	Completed 6 presentations and 2 reports	8 presentations and 6 technical reports project-wide

	d) Develop mechanisms for informing external stakeholders of relevant results	6 project-wide	Development continued and 3 mechanisms were implemented	8 project-wide

Goal #5: Diversity Strategies & Benchmarks				
Goal #5 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
5.1 Broaden overall participation through increased individual diversity	a) Actions increase diversity in directly supported personnel	Women: 36% Diverse: 8%	Women: 49% Diverse: 9%	Women: 37% Diverse: 9%
	b) Actions increase diversity in outreach participants	Women: 36% Diverse: 8%	Women: 53% Diverse: 9%	Women: 37% Diverse: 9%
	c) Expand Native American program involvement	60 participants	80 participants	70 participants
	d) Expand programs involving women & girls	550 participants	1,600 participants	600 participants
	e) Implement disability programs	12 participants	140 participants	15 participants
5.2 Expand institutional and partner diversity in this project (type, geographic, disciplinary)	a) Expand # PUI & community college institutions collaborating	12 institutions	11 institutions	13 institutions
	b) Increase # and breadth of stakeholder collaborations	90 stakeholder groups involved	134 stakeholder groups	100 stakeholder groups

Goal #6: SSI Workforce Development & STEM Education – Strategies & Benchmarks				
Goal #6 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
6.1 Directly support SSI participation and engagement at all levels	a) Hire 4 new SSI faculty	Support, mentor, retain	4 supported, mentored and retained	Support, mentor, retain
	b) Directly support SSI faculty at all institutions	90 faculty supported	89 faculty supported	90 faculty supported
	c) Hire 4 new postdoctoral associates	Support, mentor, retain	4 postdocs supported, mentored and retained. 1 postdoc hired (9/12), supported, mentored and retained	Support, mentor, complete
	d) Provide graduate student research assistantships and admit new SSI cohorts	Admit 5 SSI cohort students; support 30 total students	3 cohort students admitted (9/12). 52 total graduate students supported	Support 35 total students
	e) Provide undergraduate student research assistantships	110 undergrad students supported	131 undergraduate students supported	110 undergrad students supported
	g) Provide high school student research assistantships	30 high school students supported	21 high school students supported	30 high school students supported
6.2 Engage graduate students in SSI mentoring, programs, and opportunities	a) Develop SSI graduate courses, certificate, service, learning, internships, and programs at UM	Continue 2 grad course series; SSI Certificate program approved; pilot service learning project	1 SSI grad course continued; 13 sustainability-related grad courses taught by SSI faculty; continued progress on SSI graduate certificate program (see details in Goal 6 table); internships/service learning project underway in collaboration with EES	Continue 2 grad course series; service learning; internships

	b) Provide formal and informal graduate student mentoring	Monthly Coord/student meetings	On-going group and individual meetings with grad coordinator. Informal mentoring with SSI faculty and postdocs across many aspects of SSI project.	Monthly Coord/student meetings
	c) Support student involvement in SSI and other professional activities (post competitions, conferences, etc.)	20 travel support; all participate in on-going SSI activities	21 graduate students travel supported. All students participate in SSI activities (seminars, meetings, conferences, retreat).	20 travel support; all participate in on-going SSI activities
6.3 Engage undergraduate students in SSI mentoring, programs, and opportunities	a) Develop and implement SSI undergraduate curriculum at UM	Offer 2 undergrad courses; SSI concentration curriculum implemented	Sustainability concentration curriculum approved through EES (2/13). 18 sustainability-related undergraduate courses taught by SSI faculty.	Offer 2 undergrad courses; SSI concentration
	b) Explore statewide undergraduate sustainability curriculum	SESYNC team planning process	Completed	Supporting policies & curriculum implemented
	c) Support student involvement in SSI and other professional activities (poster competitions, conferences, etc.)	5 travel support; all participate in ongoing SSI activities and mentoring	1 undergraduate student travel supported. 45 students are mentored by SSI postdocs and graduate students.	5 travel support; all participate in ongoing SSI activities and mentoring
6.4 Support SSI faculty development through mentoring, programs and opportunities	a) Support peer mentorship networks through formal faculty partnerships.	Implement program for 4 mentor pairs; add special workshops	4 mentor pairs implemented. On-going mentorships of other junior team members by senior SSI faculty. Collaboration with CETA and ADVANCE to provide workshops and trainings.	Implement program for 8 mentor pairs; plan for mentor sustainability

	b) Support peer mentorships through informal networking and collaboration.	Build on networks	New networking opportunities include: incentives for collaborative publications and proposals; 3 SSI-led interdisciplinary proposals (2 IGERT, 1 RII Track 2); LOE Virgin Islands workshop; proposal for NSF national sustainability workshop.	Build on networks; plan for mentoring sustainability
6.5 SSI interdisciplinary project and team structure fosters collaborative learning, development, and solution approaches	a) Sponsor SSI seminars, workshops, conferences, research retreats, etc.	3 workshops (70); 5 seminars (80); state EPSCoR conference (150); retreat (80)	5 seminars (112 participants to date); 3 team communication workshops (25), K-A workshop (37); ME EPSCoR conf. 150; retreat (61)	3 workshops (80); 5 seminars (90); state EPSCoR conference (150); retreat (80)
	b) Support faculty involvement in SSI and other professional development and team-building activities	20 travel support; all participate in on-going SSI activities	32 faculty & postdocs travel supported. All faculty participate in SSI activities.	20 travel support; all participate in on-going SSI activities; national EPSCoR conference
6.6 Engage the state's community colleges in sustainability-related workforce development activities	a) Support workforce development projects at community colleges	Continue 2 collaborations and add one	Piloted one MMA and continued work with EMCC & exploring others.	Continue 2 collaborations and add one

Goal #7: General Workforce Development & STEM Education – Strategies & Benchmarks				
Goal #7 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
7.1 Implement and support related	a) Work with STEM partners to maximize	Add Upward Bound; 4-H	Continued collaboration with Upward Bound - 28 students	Ongoing

STEM programs and opportunities that directly engage students and teachers at all levels	effectiveness in K-20 activities		in July-August 2012, 40 students planned for June 2013.	
	b) Support related STEM programs and activities for K-12	600 students participate directly	713 students participated directly	650 students participate directly
	c) High school research internship program	30 participants	18 participants from Orono High School in summer 2012, approximately 20 students anticipated to start June 2013. 1 Old Town High School student placed with SSI faculty in spring 2013. 2 additional high school interns working with SSI faculty in YR4	30 participants
7.2 Promote professional and leadership development for educators in STEM, and foster STEM approaches and activities that value prior learning across subjects	a) Support STEM opportunities for K-12 & pre-service teachers	Support 2 teacher workshops (40 participants)	50 teachers (73 teachers attended), 10 pre-service teachers (25 UMaine students, most in the Master of Science Teaching Program, attended), and 50 researchers (55 Faculty, postdoctoral research associates and graduate students). There was a poster session and 17 workshops conducted.	Support 2 teacher workshops (60 participants)
	b) Support K-12 curriculum development related to SSI project	Support 2 additional curriculum modules	Over 930 students have been taught data literacy this during the 2012-2013 school year by the 14 teachers who participated in this workshop.	Support 2 additional curriculum modules
7.3 Take a	a) Conduct STEM baseline	Expand on key areas	Follow-up work halted due to	Expanded study completed and

leadership role in working with partners throughout the state to build, integrate, and implement best practices in STEM	and impact studies	from original studies; link to DoL data	state budget cuts.	results distributed
	b) Work with statewide groups in strategic planning	On-going projects with RiSE Center MDP; Reach Center; Governor's STEM Council, etc.	All completed.	On-going
	c) Support statewide STEM programs and activities	Add UM Cooperative Extension and 4-H	Two graduate students, one undergraduate student and six professional teachers will be hired by summer 2013 to begin working on these tool kits.	Add 2014 STEM Summit

Goals #8: Cyberinfrastructure - Strategies & Benchmarks				
Goal #8 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
8.1 Expand statewide cyberinfrastructure capabilities through upgraded high bandwith fiber interconnections and hardware	a) Expand SSI researcher CI capabilities through upgraded hardware	Install 6 switchgear modules in SSI researcher buildings	2-4 additional UMaine SSI researcher buildings being completed	YR4 Progress to date completes 5-year benchmarks for this strategy.
	b) Create a cloud cluster environment for SSI researcher and student use	Training to encourage SSI utilization of cloud	2 introductory workshops (spring 2013 - 22 participants). Advanced Computing Group personnel also presented at SSI All-Team meetings, YR4 SSI Research Retreat (spring 2013), and one-on-one meetings with SSI researchers.	Finalize usage of SSI cloud cluster by all SSI teams

8.2 Provide new communication and visualization tools	a) Deploy large scale visualization capabilities	Deploy 2nd portal at an SSI partner institution	Installation of additional vWalls is pending an analysis of SSI needs for additional capacity, as upgraded, high performance 3D visualization capabilities were part of the new Advanced Computing Group's new supercomputer.	Deploy 3rd portal at an SSI partner institution
	b) Videoconference and other communication capabilities available at all SSI partners	SSI partner Movi licenses and webcams; add videoconference capabilities as needed and provide training	Continued to provide Movi licenses to statewide SSI researchers, as well as webcams and training.	Add videoconference capabilities as needed; continue training
8.3 Develop systems for data handling across the SSI portfolio and institutions	a) Create and implement data management plan	Implement data integration strategies (i.e. new hire)	A national search resulted in two new CI professionals who will support the SSI research initiative full-time through the end of the grant period, and part-time beyond that.	Complete all data integration strategies for SSI project components
	b) Utilize common data storage server for all SSI data	Continue to populate D-Space server; refine user privileges and procedures	The new Data Outreach Specialist and Data Specialist are working to refine the existing DSpace data systems, and to develop a new Maine Dataverse Network system. They are also working to develop the necessary data protocols, and the researcher & public portals for data access.	All SSI researcher data is catalogued on D-Space server

Goal #9: Outreach and Communication – Strategies & Benchmarks				
Goal #9 Objectives:	**Strategies:**	**Year 4 Benchmarks:**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
9.1: Establish stakeholder communication networks that allow for two-way sharing, and for information dissemination about the SSI research	a) Build and maintain active partnerships between researchers and stakeholders	Add SSI researcher participation in stakeholder activities	(See goals 1-4, Research)	On-going
	b) Develop and implement SSI research communication plan media activities	Add SSI exhibit materials	Web-based email communications (1700 subscribers) sent regularly (14 to date); 1 newsletter published (Aug. 2012), 1 newsletter in process (Jun. 2013); mailing list maintenance and expansion on-going; website updates and maintenance on-going; brochure published; display materials completed.	On-going
	c) Disseminate research updates through presentations, conferences, etc.	Add presentations to civic and community groups	5 seminars, 1 workshop, 1 lecture. Co-sponsored Maine Water Conference with 185 participants (March 2013); Maine EPSCoR State Conference held for 150 participants (Sept. 2013); 32 formal public presentations.	On-going
9.2: Disseminate and communicate research results to the scientific community	a) Engage in standard scholarly research outputs	7 major publications; 60 technical presentations	17 peer-reviewed journal articles, 103 technical presentations; website maintained and updated.	9 major publications; 70 technical
	b) Sponsor and participate in conferences	Sponsor national Sustainability Science conference	NSF proposal in process for spring 2014 national conference. SSI led symposium at AAAS annual meeting (2/18/13)	Present at National NSF EPSCoR conference

	c) Host visiting scholars	2 visiting scholars	Visiting scholars: Pamela Matson, Mike Fotos, Tom Schueler, David Secord, Victor Sher, Robert Johnston.	2 visiting scholars
9.3 Build scientific literacy for the general public and K-12 community in areas related to the sustainability science research focus	a) Collaborate with MPBN on SSI documentary series	Produce and air 3 SSI videos	Continued production on three episodes of documentary series. Return of River, Culvert Operations, and Mapping Maine's Future will complete production this summer and air in the fall.	Produce and air 3 SSI videos
	b) Develop and manage project web presence	Re-develop Maine EPSCoR website; expand social media	Website to be redesigned this summer. Building capacity on Facebook and Twitter. Growth on Facebook 36 likes (January) to 157 likes (June).	On-going
	c) Develop and implement other communication strategy activities	Refine exhibits; develop K-12 materials	Continue to support the Maine STEM Collaborative to produce materials and update website.	On-going

Goal #10: Evaluation & Assessment - Strategies & Benchmarks				
Goal #10 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
10.1 Utilize external evaluators to assess the project's performance, with a particular focus on the evolution and outcomes of the collaborative relationships, student integration in the	a) Annual assessment of overall project performance	Year-round review; case analysis; surveys; 1-2 site visits; annual report	On target to be completed by June 2013	Year-round review; case analysis; surveys; 1-2 site visits; annual report
	b) Feedback loop	Disseminate report to SSI teams; Management review & recommendations	On track for August 2013	Disseminate report to SSI teams; Management review & recommendations

research process, and external stakeholder interaction				
10.2 Utilize AAAS to provide scientific peer review to help ensure high quality program delivery	a) AAAS onsite assessment with national panel	Two-day site visit; 2-year report	Site visit completed April 2013; report pending (July 2013)	
	b) AAAS report & feedback loop	Disseminate report to SSI teams; Management review & recommendations	On track for August 2013	Disseminate report to SSI teams; Management review & recommendations
10.3 An SSI Advisory Board provides ongoing scientific assessment and guidance to the research project team	a) On-going advising by Board Chair; full Board site visit every 18-24 months; phone/videoconf. Input as needed	On-going Chair; 1-2 phone or videoconference meetings	On-going	On-going Chair; 1-2 phone or videoconference meetings; site visit
	b) Feedback loops	SSI Stewardship & Research Council review/action; Management Team review/action	On-going (MeSSI intranet, All-Team meetings, etc.)	SSI Stewardship & Research Cncl review/action; Management Team review/action
10.4 Participate in NSF EPSCoR evaluation &other activities to continually refine RII project	a) NSF EPSCoR Reverse Site visit	Reverse Site Visit Fall 2012	Completed September 2012	
	b) NSF program officer visits	ME EPSCoR State Conference	Completed September 2012	ME EPSCoR State Conference
	c) Attend NSF EPSCoR national conferences & workshops	NSF EPSCoR National Conference, 2-3 PD/PA meetings, 2 special EPSCoR training workshops	Maine EPSCoR supported participants to attend 5 NSF conferences and workshops	NSF EPSCoR National Conference, 2-3 PD/PA meetings, 2 special EPSCoR training workshops

	d) Feedback loops	Management Team review/action	On-going	Management Team review/action
10.5 Management teams engage in on-going review to ensure that the project achieves goals, objectives, and benchmarks	a) Review by ME EPSCoR & SSI Stewardship Council	Management Team monthly; SC weekly	Completed	Management Team monthly; SC weekly
	b) MIEAB update	September 2012	Completed	September 2013

Goal #11: Sustainability Beyond the RII - Strategies & Benchmarks				
Goal #11 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
11.1 Mechanisms for post-RII sustainability are put into place during the RII project	a) All targeted outputs are met through supported efforts	Targets met for directly and indirectly supported participants; publications; grants, etc.	The majority of YR4 benchmarks have been met or exceeded.	Targets met for directly and indirectly supported participants; publications; grants, etc.
	b) Provide seed funding for special opportunities	SSI new faculty start-ups; travel scholarships; Management Team awards; economic development awards	Seed funding provided for faculty start-ups (3), new faculty research projects (2), travel scholarships (14), grants for collaborative publications (1) and collaborative proposals (2)	SSI new faculty start-ups; travel scholarships; Management Team awards
	c) Focus on SSI human infrastructure development	SSI faculty and students supported	88 faculty, five postdocs, 52 graduate students, 131 undergraduate students, 21 high school students supported.	SSI faculty and students supported; plans for continuation developed
	d) Leverage NSF and other programs	NSF EPSCoR C2; ADVANCE; MSP; 2 others	20 proposals submitted to NSF; CNH, SEP, RCN-SEES awarded; collaborating with ADVANCE, MSP, 2 others	ADVANCE; MSP; 2 others

11.2 Provide post-RII sustainability for SSI efforts through external grants, contracts, and other support	a) Provide grant development support for SSI teams	Management Team support for collaborative writing; NSF Program Office outreach	Seed funding for development of 2 collaborative proposals. Support for researchers to meet with NSF Program Officers. Maintenance and update of Funding Opportunities Database with over 7,500 records.	Management Team support for collaborative grantwriting; NSF Program Office outreach
	b) Expand state and federal agency relationships	Host 3 more scoping meetings; make 2 new agency contacts	3 scoping meetings with agency contacts. 2 agency contacts added to database.	Host 3 more scoping meetings; make 2 new agency contacts
	c) Develop a base of foundation and private support; build SSI endowment	Add 2 more foundation relationships; potential endowment donors	Building relationships with 3 new major foundations. In initial contact with 5 potential private donors.	Add 2 more foundation relationships; potential endowment donors
11.3 SSI is established as a leader in Maine and beyond in creating synergies to solve place- based sustainability science problems	a) Maximize inter-institutional collaboration	Expand collaboration via virtual organization capabilities	Meetings & workshops are open to all institutional partners via video conferencing. See research section also.	Prepare for post-RII continuation of partnerships
	b) Build a network of university-stakeholder partnerships	Explore ways to further the stakeholder network	See research and external engagement sections.	Plan for post-RII continuation of stakeholder networks
	c) Provide physical and other infrastructure to support R&D agenda	Complete soc. Science lab; equip SSI Communications Ctr.	Communications Center completed. Social Science Lab close to completion.	Add equipment as needed to both
	d) Foster private sector involvement with a focus on clean technology and a green economy	Support key economic development investments; co-host business conference	Stakeholder database maintained. Two economic development projects funded. Team survey initiated. Meetings with private sector entities to be developed in spring 2013	Partner for internship and exchange programs
	e) Sponsor national Sustainability Science conference	Submit proposal	Full proposal in process for submission spring 2013	Follow-up efforts based on conference

Goal #12: Overall ME EPSCoR RII Project Management – Strategies & Benchmarks				
Goal #12 Objectives:	**Strategies:**	**Year 4 Benchmarks**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
12.1 Use an effective organizational and management hierarchy for administration and oversight of overall RII project	a) Maine EPSCoR Management Team primary oversight	Participate in weekly meetings provide recommendations, strategic planning, etc.	Monthly formal meetings; weekly informal contact	Participate in weekly meetings provide recommendations, strategic planning, etc.
	b) Other advisory boards and committees utilized	Monthly to quarterly input	On-going	Monthly to quarterly input
	c) State EPSCoR Committee oversight	Annual updates	On-going	Annual updates
12.2 Systems ensure administrative, programmatic, and fiscal integrity for all project components and institutions.	a) Maine EPSCoR and SSI Research Office work in tandem	On-going collaborative admin.; meet monthly	Monthly formal meetings; daily informal contact	On-going collaborative admin.; meet monthly
	b) Formalize project leadership structure, policies, procedures	On-going mentoring in policy & procedures; site visits	On-going	On-going mentoring in policy & procedures; site visits
	c) Annual fiscal responsibility	NSF unobligated funds <20%, with corresponding match met	Unobligated NSF funds below 20% carry-over level; match met	All NSF funding spent; match met
	d) Keep abreast of federal program compliance updates	Work with Sponsored Research; attend trainings	On-going	Work with Sponsored Research; attend trainings

Goal #13: SSI Research Project Management – Strategies & Benchmarks				
Goal #13 Objectives:	**Strategies:**	**Year 4 Benchmarks:**	**Year 4 Progress to Date**	**Year 5 Benchmarks**
13.1 Establish organizational structure and systems that ensure effective communication, coordination and exchange among SSI research teams and SSI management committees.	a) Create an SSI organizational/management structure for research component	SSI partner institutions represented on Research Council	Stewardship Council meets weekly (on-going). Research Council meets monthly (on-going). SSI Partner Coordinator John Peckenham represents partner institutions on the Research Council.	On-going
	b) Utilize SSI committees	Committees meet regularly. Timeframe determined by required tasks. (on-going)	Evolution of many SSI committees to meet strategic needs of the project. See management section for detail.	On-going
13.2 Create internal communication mechanisms, feedback loops, and strategies to ensure the effectiveness of the interdisciplinary SSI research project.	a) Create internal SSI communication networks and networking opportunities	SSI Communications Center allows for virtual participation by all institutions	Team listserv and internal website maintained; 8 all-team meetings, 5 seminars, on-going bi-weekly newsletter, annual retreat, 6 visiting scholars (Secord, Schueler, Fotos, Sher, Johnston, Matson), 3 workshops, co-sponsor Maine Water Conference, 1 lecture. Communications Center. Video conferencing is available for all meetings and used regularly (21 meetings and seminars)	On-going

	b) Utilize OI to refine systems	On-going	See research section.	On-going
13.3Establish a system for effectively managing the SSI interdisciplinary research portfolio	a) Utilize an integrated matrix management system for portfolio of research projects	On-going refinement	Refinement of mgt system and matrix is on-going as feedback is received from the OI research team.	On-going refinement
	b) Create a formal process to annually support and review all projects in portfolio	On-going	YR4 reporting guidelines established by SC based on YR3 guidelines. YR5 RFP established by SC, issued Feb. 2013. YR5 proposals to be reviewed by Mgt Team. Site visits conducted in April 2013.	On-going
	c) Develop mechanisms for integration across portfolio	Continue integration activities	Continue to create opportunities for team to share research and network: All-team meetings, Research Council meetings, research retreat. Incentivize production of collaborative publication and proposals. Provide opportunities to work on large interdisciplinary proposals (IGERT, RII Track 2, CNH).	Continue integration activities

Maine NSF EPSCoR Research Infrastructure Award EPS-00904155
Maine's Sustainability Science Initiative

Research and Education Highlight #1

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Transmitters, Travel and Terrain

Just where and how far amphibians travel from the vernal pool where they were hatched are questions researchers are trying to answer in the Sustainability Solutions Initiative (SSI), a Maine EPSCoR program at the University of Maine

Juvenile wood frogs are the long-distance travelers of theirspecies, keeping the gene poolhealthy as a small percentage may journey miles from the vernalpools where they were hatched in search of suitable habitat to begin their lives on land. Increasingly, however, these froglets must traverse landscapes altered by humans.

Britt Cline, an SSI PhD student in UMaine's Wildlife Ecology department, is studying how forestry, agriculture and suburban development affect the movements of juvenile wood frogs. Her findings will yield information that could be used by municipal officials, regulatory agencies, landowners and othersto more effectively manage land and habitat around vernal pools. Wood frogs typically use three kinds of habitat—the pools for breeding, forested wetlands forsummering, and well-drained upland forests for hibernating—but little is understood about how land use practices affect their ability to travel between these places. The movements of the juvenile woodfrogs are particularly difficult to study because they are forest-floorbrown and tiny—about the size of a human's pinky fingernail.

Cline is collaborating with Nuri Emanetoglu, an assistant professor in the UMaine Department of Electrical and Computing Engineering, and Herbert Aumann, a senior technical staff member at Lincoln Laboratory at MIT, on an ingenious way to solve this tracking problem: tiny harmonic radar tags to help researchers followfrog movements. Research is continuing to see if these little tags enable further pinpointing of juvenile frog movements through the landscape. The findings could helpaddress challenges ranging from seasonal land management practices to the improvement of vernal pool management zonesthat better connect and protect crucial habitat for different life stages of pool breeding amphibians.

Simultaneously, Luke Groff, an SSI PhD student in UMaine's Department of Wildlife Ecology, is studying a different part of the wood frog lifehistory: hibernation. Groff's research is showing that in addition to the frogs going back to the same pools to breed, some may alsoreturn to the same places to hibernate.

Knowledge-to-Action is an important component of sustainability science research. So Aram Calhoun, UMaine Professor of Wetland Ecology and Director of the Ecology and Environmental Sciences Program at UMaine, and other SSI researchers are using the results from this important habitat research to work with the US Army Corps of Engineers, other federal and state agencies, and Maine stakeholders, to create Special Area Management Plans to develop flexible vernal pool regulations that better accommodate economic development ina town or municipality by balancing conservation of vernal pools with the economic needs of local communities.

This is an example of how Maine EPSCoR's SSI research is serving as a valuable model system to explore more proactive, cost-effective approaches to sustainable development. SSI's ultimate goal is to provide the research-based knowledge that can help generate solutions to a wide array of sustainability-related challenges in and beyond Maine.

Support for this project was provided by National Science Foundation award #EPS-0904155 to Maine EPSCoR at the University of Maine.

Photo by Maine EPSCoR at the University of Maine

Maine NSF EPSCoR Research Infrastructure Award EPS-00904155
Maine's Sustainability Science Initiative

Research and Education Highlight #2

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Testing and Tracking Turkeys

Approximately 50,000 wild turkeys reside across all 16 counties in Maine. Wild turkeys are perceived as a nuisance species by some stakeholder groups and a welcome addition to the landscape by others. To complicate matters, turkeys are susceptible to a number of infectious diseases and may be in close contact with hunters, agricultural workers, and other animals.

At the University of Maine at Augusta (UMA), a partner in the Sustainability Solutions Initiative (SSI) of Maine EPSCoR at the University of Maine, undergraduate students have been learning how to apply SSI models to investigate this particular place-based challenge. This is the first time research has been conducted at the undergraduate level at UMA. Through range tracking, genetic analysis, and sampling for microbial health, the students are helping evaluate the impact the turkeys have on the agricultural and recreational landscape.

The UMA team integrates the research into their undergraduate biology and social science programs. Students who participate, present their work in posters, reports, and as part of peer-reviewed publications. The incorporation of student research into the classroom experience enhances STEM activities in the UMA curriculum.

Like other SSI partners, UMA is building collaborations with diverse stakeholders and helping to strengthen public support for the role of science in solving societal problems. SSI develops interdisciplinary research programs focused on solving real-world problems, place-based stakeholder driven research questions, and Knowledge to Action.

UMA's research project enhances stakeholder outreach and communication, evaluation of stakeholder acceptance of repopulated wild turkeys, and knowledge to action activities within the group. On-going review of the research through group and stakeholder meetings continues to refocus research on achieving sustainability goals.

In collaboration with their partners, the UMA team has discovered multiple pathogens in Maine wild turkeys including *Salmonella* and *Staphylococcus* bacteria and an unusual avian pox virus (LPDV). Based on research available, this is the first report of LPDV in Maine wild turkeys and the significance of LPDV for wild turkey populations or the risks for domestic fowl are not currently understood. Based on these results, the Maine Inland Fisheries and Wildlife Department has temporarily halted wild turkey relocation-repopulation programs.

The hope is that methods developed at UMA will easily transfer to any Maine community who wishes to participate in an evaluation of its wild turkey population in the future. Collaborations around the project are strengthening stakeholder partnerships and creating a lasting network to support research and management of Maine's wild turkey population.

Support for this project was provided by National Science Foundation award #EPS-0904155 to Maine EPSCoR at the University of Maine.

Photo by Maine EPSCoR at the University of Maine

Maine NSF EPSCoR Research Infrastructure Award EPS-00904155
Maine's Sustainable Science Initiative

Research and Education Highlight #3

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Expanding STEM Experiences to Students with Disabilities

Who wouldn't want to participate in a "Wild Adventure"? For students with disabilities, this represents a unique opportunity to be a scientist every day, something many of these campers don't get the chance to do on a regular basis in school or in their lives.

Two years ago, Maine EPSCoR at the University of Maine began a unique partnership with Camp CaPella of Dedham, Maine to provide STEM programming to its summer campers. Camp CaPella provides services to children (aged 5 and older) and adults with a primary diagnosis of physical and/or developmental disabilities.

The pilot collaboration began as a one day experience during the camp week and has expanded to a daily, regular part of the camp's programming. Campers have the chance to look at aquatic plants under a microscope, build self-propelled "boats" out of water bottles, and use supportive educational applications on iPads.

Throughout the program, campers are also encouraged to explore careers related to sustainability science. One of the goals of the program is to spark an interest in learning more about the interactions of the natural and social world around them.

Beth Smyth-Handley, a local middle school science teacher, has led the project. She guides the campers in activities and outdoor exploration, like listening to bird calls on an iPad app and then going out and identifying birds that reside at camp. She has designed activities with the assistance of the Chewonki Foundation, an academic institution on the coast of Maine that provides traveling lessons in natural history. Live animals and myriad teaching tools, such as a whale skeleton or a container full of biodiesel, help students learn important lessons about the natural world and the conservation of life and resources on Earth. With support from Maine EPSCoR, educators from Chewonki are able to visit the camp each week.

This year's program has expanded to include a day trip to a local bird sanctuary and taking specially adapted kayaks out to explore the lake around the camp. The program runs for seven weeks and serves more than 125 campers with disabilities each summer. This is 125 people that otherwise would not be given the opportunity to experience scientific inquiry, let alone encouraged to explore and pursue STEM careers.

Beth Smyth-Handley, the camps Wild Adventures Coordinator said, in reporting on the success of the program, *"It seems to be inherent to our population of campers to love the outdoors and all it encompasses. However, they are often left out of the experience. When the campers were told they were going to be scientists, they got so excited."*

Support for this project was provided by National Science Foundation award #EPS-0904155 to Maine EPSCoR at the University of Maine.

Photo by Maine EPSCoR at the University of Maine

A. SALARY SUPPORT

*Include detail regarding **RII Track-1** support for all faculty and equivalent listed as participants in the RII project during the current reporting period*

Institution	Department	Faculty Name (Last, First)	Faculty and Faculty Equivalent Individual Funded Effort (in months)	Salary Funding for Group Member(s) (in $K)	Comments
			EPSCoR RII **(Track-1 only)**	EPSCoR RII **(Track-1 only)**	
UM	Resource Economics & Policy	Anderson, Mark	0.5	$5	RII: Anderson receives 2 weeks summer salary.
UM	School of Economics	Bell, Kathleen	0.5	$35	RII: Bell receives 2 weeks summer salary, and support for 1 Undergraduate Assistant and 1 Graduate Assistant.
UM	School of Marine Sciences	Brady, Damian	1	$3	RII: Brady receives 1 month of summer salary.
UM	Wildlife Ecology	Calhoun, Aram	0.5	$47	RII: Calhoun receives 2 weeks summer salary and support for 2 Undergraduate Assistants and 1 Graduate Assistant.
UM	Postdoctoral	Capps, Krista	12	$60	RII: Capps is a Postdoctoral Associate.
UM	Chemistry	Cole, Barbara	1	$4	RII: Cole receives 1 month summer salary.
UM	School of Biology & Ecology	Cronan, Chistopher	0.5	$42	RII: Cronan receives 2 weeks summer salary.
UM	School of Forest Resources	Dailge, John	0.5	$11	RII: Daigle receives 2 weeks summer salary and support for 1 Undergraduate Assistant.
UM	Economics	Gabe, Todd	1	$33	RII: Gabe receives 1 month summer salary and support for 1 Graduate Assistant.
UM	College of Education & Human Development	Gardner, Susan	0.5	$20	RII: Gardner receives 2 weeks summer salary and support for 1 Graduate Assistant.
UM	Wildlife Ecology	Hunter, Malcolm	0.5	$85	RII: Hunter receives 2 weeks summer salary and support for 3 Undergraduate Assistants and 1 Graduate Assistant.

UM	Civil & Environmental Engineering	Jain, Shaleen	0.5	$41	RII: Jain receives 2 weeks summer salary and support 1 Undergraduate Assistant and 1 Graduate Assistant.
UM	Postdoctoral	Jansujwicz, Jessica	12	$60	RII: Jansujwicz is a Postdoctoral Associate.
UM	School of Marine Sciences	Johnson, Teresa	0.5	$30	RII: Johnson receives 2 weeks summer salary and support for 1 Temporary Professional, 3 Undergraduate Assistants and 1 Graduate Assistant.
UM	Postdoctoral	Lamanna, Christine	12	$60	RII: Lamanna is a Postdoctoral Associate.
UM	School of Forest Resources	Leahy, Jessica	0	$51	RII: Leahy receives support for 5 Undergraduate Assistants, and 2 Graduate Assistants.
UM	School of Forest Resources	Lilieholm, Robert	0.5	$46	RII: Lilieholm receives support for 2 weeks summer salary, and support for an hourly Temporary Professinal, 1 Undergraduate Assistant, and 2 Graduate Assistants.
UM	Communications & Journalism/Margaret Chase Smith Center for Public Policy	Lindenfeld, Laura	0.5	$110	RII: Lindenfeld receives 2 weeks summer salary and support for 5 Undergraduate Assistants and 5 Graduate Assistants.
UM	School of Forest Resources	Livingston, William	0.5	$4	RII: Livingston receives 2 weeks summer salary.
UM	Psychology	McCoy, Shannon	0.5	$13	RII: McCoy receives 2 weeks summer salary and support for 1 Undergraduate Assistant and 0.5 Graduate Assistant.
UM	School of Biology & Ecology	McGill, Brian	10	$164	RII: McGill receives support for 9 month Acadmic and 1 month summer salary and support for 1 Undergraduate Assistant and 1 Graduate Assistant.
UM	Postdoctoral	Dhakal, Nirajan	12	$47	RII: Dhakal is a Postdoctoral Associate.

UM	School of Economics	Noblet, Caroline	0.5	$9	RII: Noblet receives 2 weeks summer salary and support for 1 Undergraduate Assistant and 0.5 Graduate Assistant.
UM	Anthropology/Native American Research	Ranco, Darren	1.5	$71	RII: Ranco receives 6 weeks summer salary and support for 2 Undregraduate Assistants, 3 Graduate Assistants and 1 Temporary Professional.
UM	Earth Sciences	Reeve, Andrew	0	$30	RII: Reeve receives support for 1 Graduate Assistant.
UM	Electrical & Computer Engineering	Segee, Bruce	1	$63	RII: Segee receives 1 month summer salary and support for 1 High School Student.
UM	School of Economics/Margaret Chase Smith Center for Public Policy	Silka, Linda	0.5	$8	RII: Silka receives 2 weeks summer salary.
UM	Earth Sciences	Smith, Sean	9.5	$144	RII: Smith receives support for 9 month Academic Appointment and 2 weeks summer salary and support for 1 Graduate Assistant.
UM	Cooperative Extension/Sea Grant	Stancioff, Esperanza	0.5	$4	RII: Stancioff receives 2 weeks summer salary.
UM	Postdoctoral	Straub, Crista	12	$60	RII: Straub is a Postdoctoral Associate.
UM	School of Economics	Teisl, Mario	1	$38	RII: Teisl receives 1 month summer salary and support for 1 Graduate Assistant.
UM	School of Economics	Waring, Timothy	10	$153	RII: Waring receives support for 9 month Academic Appointment and 1 month summer salary, and support for 3 Undergraduate Assistants and 2 Graduate Assistants.
UM	School of Forest Resources	Weiskittel, Aaron	0.5	$4	RII: Weiskittel receives 2 weeks summer salary.
Totals for University of Maine			**104.5**	**$1,555**	
USM	Muskie School of Public Service	Colgan, Charles	1	$68	RII: Colgan receives 1 month of summer salary and support for 4 Graduate Assistants.

USM	Muskie School of Public Service	Kartez, Jack	1	$11	RII: Kartez receives 1 month of summer salary.
USM	Muskie School of Public Service	Kim, Yuseung	10	$200	RII: Kim receives support for 9 month Academic Year, 1 month summer salary and 1
USM	Muskie School of Public Service	Merrill, Samuel	0	$10	RII: Merrill receives for support for Professional Employee.
USM	Law School	Owen, David	0.5	$9	RII: Owen receives 2 weeks summer salary.
USM	Geography & Anthorpology	Pavri, Firooza	0	$4	RII: Pavri receives support for 1 Undergraduate Assistant.
USM	Environmental Science & Policy	Willis, Theodore	1	$6	RII: Willis receives 1 month summer salary.
USM	Environmental Science & Policy	Wilson, Karen	1	$18	RII: Wilson receives 1 month summer salary, support for 1 Graduate Assistant and 1 Undergraduate Assistant.
Total for University of Southern Maine			**14.5**	**$326**	
UMA	Biology	Lage, Christopher	1	$11	RII: Lage receives 1 month summer salary and support for 1 Undergraduate Assistant.
UMA	Biology	Milligan, Peter	1	$15	RII: Milligan receives 1 month summer salary, and support for 2 Undergraduate Assistants.
UMA	Computer Information Systems	Szakas, Joseph	0	$1	RII: Szakas receives no summer salary, but support for 1 Undergraduate Assistant.
UMA	Social Sciences	Turcotte, Catherine	1	$11	RII: Turcotte receives 1 month summer salary and support for 1 Undergraduate Assistant.
Totals for Unviersity of Maine, Augusta			**3**	**$38**	
UMF	Social Science, Business & Global Science	Harper, Wendy	0.5	$6	RII: Harper receives 2 week summer salary; and support for 1 Undergraduate Assistant.
UMF	Biology	Barton, Drew	0.5	$4	RII: Barton receives 2 weeks of summer salary.

UMF	Computer Science	Bennett, Christopher	1	$9	RII: Bennett receives 3.5 weeks of summer salary and support for 1 Undergraduate Assistant.
UMF	Natural Sciences	Buckley, Daniel	0.8	$7	RII: Buckley receives 3.5 weeks of summer salary.
UMF	Biology	Butler, Ronald	0.8	$8	RII: Butler receives 3.5 weeks of summer salary.
UMF	Social Science, Business & Global Science	McCourt, Matthew	1.5	$15	RII: McCourt receives 4.5 weeks summer salary, support for 1 Hourly Temporary; and 1 Undergraduate Assistant.
Totals for Unviersity of Maine, Farmington			**5.1**	**$49**	
UMFK	Professional Management	Gauvin, Anthony	1	$4	RII: Gauvin receives 1 month summer salary.
UMFK	Natural & Behavioral Science	Martin, John	1	$18	RII: Martin receives 1 month summer salary, Release Time, and support for 1 Undergraduate Assistant.
UMFK	Professional Management	Trudel, Leo	1	$8	RII: Trudel receives 1 month summer salary, Release Time, and support for 1 Undergraduate Assisitant.
Totals for Unviersity of Maine, Fort Kent			**3**	**$30**	
UMPI	Math & Science	Johnston, Jason	0	$9	RII: Johnston receives no support, but support for 3 Undergraduate Assistants.
UMPI	Cooperative Extension	Plant, Andrew	0.75	$4	RII: Plant receives 3weeks summer salary.
UMPI	History	Sebold, Kimberly	1.5	$15	RII: Sebold receives 6 weeks summer salary; and support for 3 Undergraduate Assistants, 1 High School Student.
UMPI	Math & Science	Wang, Chunzeng	2	$20	RII: Wang receives 2 months summer salary, and support for 2 Undergraduate Assistants.
Totals for Unviersity of Maine,Presque Isle			**4.25**	**$48**	
Bates	Economics	Lewis, Lynne	1	$13	RII: Lewis receives 1 montn summer salary.

Bates	Geology	Johnson, Beverly	1	$15	RII: Johnson receives 1 month summer salary, and support for 1 Undergraduate Assistant.
Totals for Bates College			**2**	**28**	
Bowdoin	Biology	Lichter, John	1	$32	RII: Lichter receives 1 month summer salary, support for 1 Professional/Technical Personnel and 3 Undergraduate Assisatants.
Bowdoin	Environmental Studies	Camill, Phil	0.75	$19	RII: Camill receives .75 weeks summer salary and support for 1 Professional/Technical Personnel.
Bowdoin	Economics	Herrera, Guillermo	0.75	$12	RII: Herrera receives .75 weeks summer salary.
Bowdoin	Economics	Vail, David	0	$1	RII: Vail receives no summer salary, but support 1 Undergraduate Assistant through UMPI.
Totals for Bowdoin College			**2.5**	**$64**	
Colby	Biology	Bevier, Catherine	0.8	$9	RII: Bevier receives 3.4 weeks summer salary.
Colby	Biology	Cole, Russell	0.18	$12	RII: Cole receives 1.8 weeks summer salary and support for 1 Undergraduate Assistant.
Colby	Economics	Donihue, Michael	0.52	$12	RII: Donihue receives 2.2 weeks of summer salary, and support for 1 Undergraduate Assistant.
Colby	Science, Technology, and Society	Fleming, James	0.55	$12	RII: Fleming receives 2.5 weeks summer salary; and support for 1 Undergraduate Assistant.
Colby	Chemistry	King, Whitney	0.8	$13	RII: King receives 3.5 weeks of summer salary.
Colby	Environmental Studies	Nyhus, Philip	0.8	$9	RII: Nyhus receives 3.4 weeks summer salary.
Colby	Geology	Rueger, Bruce	0.55	$8	RII: Rueger receives 2.4 weeks summer salary and support for 1 Undergraduate Assistant.

Totals for Colby College			**4.2**	**$75**	
Unity	Ecology	Arnett, Amy	1.5	$21	RII: Arnett recieves 6 weeks summer salary and support for 1 Undergraduate Assistant.
Unity	Wildlife Ecology	Bibles, Brent	0.75	$10	RII: Bibles receives 3 weeks summer salary and support for 2 Undergradaute Assistants.
Unity	Computers & Geographic Information Systems	Dunckel, Kathleen	0.75	$13	RII: Dunckel receives 3.5 weeks summer salary and support for 1 Undergradaute Assistant.
Unity	Botany	Latty, Erika	1.5	$19	RII: Latty receives 6 weeks summer salary and support for 2 Undergraduate Assistants.
Unity	Ecology	Remsberg, Alysa	0.75	$15	RII: Remsberg receives 3 weeks summer salary and support for 2 Undergradauate Assistants.
Totals for Unity College			**5.25**	**$78**	
UNE	Environmental Studies	Adams, Mark	0	$5	RII: Adams receives no summer salary but support for 1 Undergraduate Assistant.
UNE	Marine Science	Bass, Anna	0.75	$4	RII: Bass receives 3 weeks summer salary.
UNE	Management	Daley, Micheal	0.5	$1	RII: Daly receives 0.5 week summer salary.
UNE	Well National Estuarine Research Reserve (NGO Sub)	Dionne, Michele	0	$2	RII: Dionne receives no summer salary but support for 2 Undergraduate Assistant.
UNE	Environmental Studies	Feurt, Christine	1.25	$11	RII: Feurt receives 5 weeks summer salary and support for 1 Undergraduate Assistant.
UNE	Environmental Studies	Morgan, Pamela	0.25	$2	RII: Morgan receives 1 week summer salary.
UNE	Environmental Studies	Perlut, Noah	0.55	$7	RII: Perhut receives 2.5 weeks summer salary and support for 1 Undergraduate Assistant.
UNE	Marine Science	Sulkowski, James	0	$7	RII: Sulkowski receives no summer salary, but support for 2 Undergraduate Assistants.

UNE	Marine Science	Zeeman, Stephen	0.5	$3	RII: Zeeman receives 0.5 weeks summer salary; and support for 1 Undergraduate Assistant.
Totals for University of New England			**3.8**	**$42**	
Total for All Institutions			**152.1**	**2332.5**	

Maine EPSCoR Notes:

Four new faculty hires are supported full-time on this award: Smith, Waring, McGill at UM; Kim at USM.

Notes:

(1) This table should include **all** RII Track-1 salary support spent across the project for the current reporting period.

(2) The total dollar support should include **salary, fringe benefits, and overhead** of a faculty member (or faculty equivalent) and that person's salary support for students and postdocs (and other relevant personnel). Do not include cost of equipment, travel, or supplies.

(3) If a senior personnel does not receive individual funding but members of their group do, include that group's funding in this table.

(4) No one should be listed who has all of the values for effort and funding equal to zero.

(5) Salary support for the full reporting period should be included (actual and projected). Effort (in months) should be not more than 12 months per year per individual.

(6) Include NSF funds only, not cost sharing or cost contributions. Cost sharing and cost contributions should not be included in this table, but reported in Tables G and H.

(7) Indicate total amount for each institution by summing the entries as shown.

(8) Provide information for all faculty-equivalent staff at all institutions in this single table.

(9) If there are reported funded effort-months for an individual, then there must be corresponding funding amounts in dollars on the right hand side.

(10) Anyone listed in Table A must appear in the list of Research.gov participants for this year. However, there may be faculty listed in Research.gov who are not included in this table.

B.PARTICIPANTS

Enter number of participants for the current reporting period

Institution or RII Totals	*Category*	*Total individuals in category*	*Male*	*Female*	*Blacks or African Americans*	*Hispanics*	*Other Ethnic*	*Persons with Disabilities*	*New Investigators**
University of Maine	Faculty participants (or equivalent)	40	21	19	0	0	3	3	5
	Technical support staff	8	3	5	0	0	2	0	0
	Non-technical support staff	31	4	27	0	0	1	4	0
	Post docs	5	1	4	0	0	0	0	1
	Graduate students	48	13	35	1	1	5	1	
	Undergraduate students	46	21	25	1	0	1	0	
	RII Leadership Team	3	2	1	0	0	0	0	0
University of Southern Maine	Faculty participants (or equivalent)	6	4	2	0	0	0	1	0
	Technical support staff	1	1	0	1	0	0	0	0
	Non-technical support staff	1	0	1	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	4	2	2	0	0	0	0	
	Undergraduate students	8	6	2	0	1	0	1	
	RII Leadership Team	0	0	0	0	0	0	0	0
University of Maine at	Faculty participants (or	4	3	1	0	0	1	0	1
	Technical support staff	0	0	0	0	0	0	0	0
	Non-technical support staff	0	0	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	
	Undergraduate students	8	4	4	0	0	1	0	
	RII Leadership Team	0	0	0	0	0	0	0	0
University of Maine at Farmington	Faculty participants (or equivalent)	7	5	2	0	0	0	0	0
	Technical support staff	2	1	1	0	0	0	0	0
	Non-technical support staff	0	0	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	
	Undergraduate students	12	7	5	0	0	0	1	
	RII Leadership Team	0	0	0	0	0	0	0	0

University of Maine at Fort Kent	Faculty participants (or equivalent)	3	2	1	0	0	0	0	3
	Technical support staff	0	0	0	0	0	0	0	0
	Non-technical support staff	0	0	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	
	Undergraduate students	4	3	1	1	0	0	1	
	RII Leadership Team	0	0	0	0	0	0	0	0
University of Maine at Presque Isle	Faculty participants (or equivalent)	3	2	1	0	0	0	0	0
	Technical support staff	1	0	1	0	0	0	0	0
	Non-technical support staff	0	0	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	
	Undergraduate students	14	7	7	0	0	1	0	
	RII Leadership Team	0	0	0	0	0	0	0	0
Bates College	Faculty participants (or equivalent)	2	0	2	0	0	0	0	0
	Technical support staff	1	1	0	0	0	0	0	0
	Non-technical support staff	0	0	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	
	Undergraduate students	6	3	3	0	0	0	0	
	RII Leadership Team	0	0	0	0	0	0	0	0
Bowdoin College	Faculty participants (or equivalent)	4	4	0	0	1	0	0	0
	Technical support staff	0	0	0	0	0	0	0	0
	Non-technical support staff	1	1	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	
	Undergraduate students	0	0	0	0	0	0	0	
	RII Leadership Team	0	0	0	0	0	0	0	0
Colby College	Faculty participants (or equivalent)	6	6	0	0	0	0	0	0
	Technical support staff	4	2	2	0	0	0	0	0
	Non-technical support staff	0	0	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	

	Undergraduate students	16	6	10	0	0	1	0	
	RII Leadership Team	0	0	0	0	0	0	0	0
Unity College	Faculty participants (or equivalent)	5	1	4	0	0	0	0	0
	Technical support staff	0	0	0	0	0	0	0	0
	Non-technical support staff	0	0	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	
	Undergraduate students	17	4	13	2	0	0	0	
	RII Leadership Team	0	0	0	0	0	0	0	0
University of New England	Faculty participants (or equivalent)	8	5	3	0	0	0	0	2
	Technical support staff	0	0	0	0	0	0	0	0
	Non-technical support staff	0	0	0	0	0	0	0	0
	Post docs	0	0	0	0	0	0	0	0
	Graduate students	0	0	0	0	0	0	0	
	Undergraduate students	0	0	0	0	0	0	0	
	RII Leadership Team	0	0	0	0	0	0	0	0
RII total	Faculty participants (or	88	53	35	0	1	4	4	11
	Technical support staff	17	8	9	1	0	2	0	0
	Non-technical support staff	33	5	28	0	0	1	4	0
	Post docs	5	1	4	0	0	0	0	1
	Graduate students	52	15	37	1	1	5	1	
	Undergraduate students	131	61	70	4	1	4	3	
	RII Leadership Team	3	2	1	0	0	0	0	0
	Advisory Board(s)	57	40	17	0	0	0	0	4

***New investigators are those at the faculty, junior faculty, and post doc level who are new to the RII project during the reporting period.**

Notes:

(1) This table states 88 faculty participants (compared to 89 in the report narrative) due to David Hart also being a member of the RII Leadership Team.

(2) This table states 33 non-technical support staff (compared to 109 in the report narrative) due to Michael Eckardt and Vicki Nemeth also being members of the RII Leadership Team.

(3) This table excludes 21 high school students who are reported in the narrative as research interns.

C. COLLABORATIONS

Enter number of relationships for the current reporting period

Category	*Within the Jurisdiction but Not Solely Among Participants*		*External to the Jurisdiction-U.S. Domestic*		*External to the Jurisdiction-Foreign*	
	Number of Institutions	*Number of Collaborators*	*Number of Institutions*	*Number of Collaborators*	*Number of Institutions*	*Number of Collaborators*
Academic Research Institutions (without Minority Serving Institution status)	2	26	15	28	2	2
Primarily Undergraduate Institutions	4	5	1	1	2	2
Historically Black Colleges and Universities	0	0	0	0	0	0
Hispanic Serving Institutions	0	0	0	0	0	0
Tribal Colleges and Universities	0	0	0	0	0	0
National Laboratories	0	0	1	1	0	0
Industry	13	20	1	1	0	0
Government	33	63	8	15	0	0
Non-Profit Organizations	38	65	6	9	0	0
K-12 Education	8	12	0	0	0	0
Total	98	191	32	55	4	4

Notes:

(1) Values in Table C MUST NOT include any person counted in Table A or Table B. Do not include funded partners.

(2) The number of institutions MUST be less than or equal to the number of collaborators.

D. EXTERNAL ENGAGEMENT

Enter number involved for the current reporting period

	Academic Research Institutions (without Minority Serving Institution status)		Primarily Undergraduate Institutions		Minority Serving Institutions		K-12 Institutions			Other (see footnote 7)	Total
	Faculty	Students	Faculty	Students	Faculty	Students	Teachers	Students Reached Directly	Students Reached via Teacher Training		
Project Total	176	220	102	434	0	0	83	713	0	1,288	3,016
Male	108	93	49	212	0	0	30	128	0	796	1,416
Female	68	127	53	222	0	0	53	585	0	492	1,600
Underrepresented Minority	6	30	3	22	0	0	1	169	0	36	267

Notes:

(1) Include the number of people (faculty, student, etc.) who have been engaged in outreach activities. Do not include anyone listed in Tables A, B, or C.
(2) Underrepresented minorities include **ONLY** Alaska Natives, Native Americans, Blacks or African American, Hispanics, Native Hawaiians and other Pacific Islanders, and Persons with Disabilities [nsf_frameworkforaction_0808.pdf].

(3) Other participants may include those reached by work with museums or general public - please specify in the table and give details in the narrative.
(4) Each column lists the type of attendee, not the location of the event.

(5) The Project Total enumerates all individuals who participated in the external engagement activities. If participants did not report their gender and/or ethnicity, include them in the Project Total, but do not include them in the Male/Female or Underrepresented Minority rows. Do not add rows to the table.

(6) Sum across each row to compute the "Total" value in Column L.
(7) Other includes 6 postdocs, 212 higher education staff, 305 business/industry members, 468 NGO and government representatives, and 297 members of the general public.

E. OUTPUTS

Category	Total for Current Reporting Period		Cumulative Total for the Award	
Patents	***0***		***0***	
Awarded	0		0	
Pending	0		0	
Licensed	0		0	
Proposals / Grants / Contracts	***Number***	***Funds requested***	***Number***	***Funds requested***
Submitted	67	$32,934,792	207	$135,303,077
Awarded	40	$4,835,792	127	$10,902,795
Pending	32	$22,490,667	32	$22,490,667
Published Publications	***110***		***277***	
Primary RII Support	73		150	
Partial RII Support	37		127	
Total New Faculty Hired	0		4	
Male	0		4	
Female	0		0	
Underrepresented minority	0		0	
Disabled	0		0	
Total Post Docs Involved	***5***		***8***	
Male	1		4	
Female	4		4	
Underrepresented minority	0		0	
Disabled	0		0	
Total Graduate Students Graduated	***10***		***23***	
Male	4		11	
Female	6		12	
Underrepresented minority	2		4	
Disabled	0		0	
Total Undergraduates Graduated	***23***		***58***	
Male	13		28	
Female	10		30	
Underrepresented minority	3		4	
Disabled	0		0	

Maine EPSCoR Notes:

1) Grants include thos submitted in YR3 but awarded in YR4.

Notes:

(1) Include only published work in the publication count. Do not include submitted, accepted, pending, etc.

(2) Publication counts should match what is listed in the narrative report, section B.7.

F. EXPENDITURES INCLUDING OBLIGATIONS

Summarize overall support levels for each of the major activities of the project

Expenditure Category	**Current Reporting Period**		**Cumulative**	
	$K	***% of annual budget***	***$K***	***% of cumulative budget***
Research Area 1				
Salaries and Fringe Benefits	$ 2,248	58%	$ 6,856	42.85%
Seed Funding	$ -	0%	$ -	0.00%
Equipment	$ -	0%	$ -	0.00%
Other Research-Related Expenditures (specify)	$ 125	3%	$ 1,385	8.66%
Total Research	**$ 2,373**	**59%**	**$ 8,241**	**51.50%**
Diversity Plan	$ 66	2%	$ 199	1.24%
Workforce Development Plan	$ 246	6%	$ 507	3.17%
Cyberinfrastructure Plan	$ 70	2%	$ 696	4.35%
External Engagement Plan	$ 20	1%	$ 630	3.94%
Evaluation and Assessment plan	$ 104	3%	$ 362	2.26%
Sustainability Plan	$ -	0%	$ -	0.00%
Management Plan (include all administration expenses)	$ 3	0%	$ 236	1.48%
Indirect Cost	$ 925	23%	$ 3,938	24.61%
Other (specify)	$ -	0%	$ -	0.00%
Total	**$ 3,807**	95%	**$ 14,809**	92.55%

ME EPSCoR Notes:

1) Rounding occurs when calculating

2) Other Research Related Expenditures refers to travel, participant costs, materials & supplies, publications & printing costs, consultant

NSF Notes:

(1) Provide separate entries for each research area, including salaries and fringe benefits for participants, seed funding, relevant equipment, and other RESEARCH RELATED expenditures. (Specify what these are.) Add an additional research section if the original proposal contained more than three research areas, or remove extra research areas if your proposal had only one. For all other entries, include the cost of the implementation of the related plan. Do not add any other additional rows in the non-Research section.

(2) Do not include cost sharing or cost contributions.

(3) Include computational facilities (hardware), networking, storage, shared software, and personnel in cyberinfrastructure.

(4) If this is the final report, for this table, the current reporting period is the final report year, not the cumulative amount.

(5) This table should reflect actual expenditures, which may be different from the originally proposed budgets.

(6) Obligated funds are those which have in place a contract or purchase order when the report is submitted.

(7) For any unobligated funds (for example, planned expenditures for which there is NOT a contract currently in place), please describe them only in the narrative. Do not include unobligated funds in this table. The values in the table may not equal 100% of the original budget.

G. COST SHARING AND COST CONTRIBUTIONS

Enter values for the current reporting period

Category	***Cost Sharing ($K)*** *(reported on line M)*	***Cost Contributions ($K)*** *(not included on line M)*
University/Institution		$1,603
State Government	$800	
Local Government		
Private Foundation		
Industry		
International		
Other (specify)		
Total	**$800**	**$1,603**

Notes:

(1) Provide cost sharing explanations in the narrative report. The total cost share shown must equal line M in the respective Total Budget.

(2) Provide cost contribution explanations in the narrative report. Cost contributions can include any complementary support for RII activities not listed on line M in the budget. Do not include buildings.

(3) Cash and in-kind contributions may apply to both categories.

H. LEVERAGED SUPPORT

Include values covering the full current reporting period

Expenditure Category	**NSF RII Expenditures including Obligations ($K)**	**Cost Sharing ($K)**	**Cost Contributions ($K)**	**Total of all sources of support (sum of 3 columns)**
Research Area 1				
Salaries and Fringe Benefits	$ 2,248	$ 523	$ 294	$ 3,065
Seed Funding	$ -	$ -	$ -	$ -
Equipment	$ -	$ -	$ -	$ -
Other Research-Related Expenditures (specify)	$ 125	$ 273	$ 249	$ 647
Total Research	**$ 2,373**	**$ 796**	**$ 543**	$ 3,712
Diversity Plan	$ 66			$ 66
Workforce Development Plan	$ 246			$ 246
Cyberinfrastructure Plan	$ 70			$ 70
External Engagement Plan	$ 20			$ 20
Evaluation and Assessment Plan	$ 104			$ 104
Sustainability Plan	$ -		$ -	$ -
Management Plan (include all administration expenses)	$ 3	$ 4	$ 289	$ 296
Indirect Cost	$ 925		$ 771	$ 1,696
Other (specify)	$ -		$ -	$ -
Total	**$ 3,807**	**$ 800**	**$ 1,603**	**$ 6,210**

Notes:

(1) If needed, include more sections for Research (e.g., Research Area 4), but do not add any rows below the Research Sections.

(2) The column "NSF RII Expenditures including Obligations ($K)" should match "Current Reporting Period ($K) in Table F.

(3) The sum of the "Cost Sharing" and "Cost Contributions" columns should match what is listed in Table G.