Maine's Sustainability Science Initiative

Year 2 Annual Report

For EPSCoR award EPS-0904155

Covering the time period of:
July 1, 2010 to June 30, 2011

Revised as of 7/28/11

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Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS 09-04155)
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YEAR 2 ANNUAL REPORT for the period July 1, 2010 to June 30, 2011
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A) EXECUTIVE SUMMARY

1) General Information & RII vision:

The mission of the Maine EPSCoR Sustainability Solutions Initiative (SSI) group is to connect knowledge with action in ways that promote strong economies, vibrant communities and healthy ecosystems in and beyond Maine. The vision is that this will lead to the creation of the Center for Sustainability Solutions (CSS) at the University of Maine, a national and international center of excellence in sustainability science. The overall research goal is to focus on the dynamics of social-ecological systems (SES) with an understanding and strengthening of connections between knowledge and action (K-A). During YR2 of this NSF EPSCoR RII project, significant progress was made in establishing 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.

2) Overview of Project Efforts:

a) Research:

The overarching goal of the Sustainability Solutions Initiative (SSI) is to develop Maine's capacity to conduct world-class, solutions-driven research in sustainability science that is distinguished by its innovative approaches to interdisciplinary collaboration and deep commitment to diverse stakeholder partnerships. A central premise of SSI is that natural science and engineering are necessary but not sufficient for understanding and solving pressing sustainable development problems, which by definition have intersecting ecological, social, and economic dimensions. Using Maine as a laboratory, SSI examines both the coupled dynamics of social-ecological systems (SES) and the connections between SES knowledge and stakeholder actions (K-A). SSI's 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 has made significant progress during YR2 on: 1) advancing SES and K-A research; 2) strengthening interdisciplinary and university-stakeholder partnerships via organizational innovation (OI) research; and 3) building statewide, inter-institutional capacity through research collaborations at partner colleges and universities (SSPs). Our research continues to focus on interactions among three primary arenas of landscape change: urbanization; forest ecosystem management; and linked climate-energy futures. An overarching goal of these activities has been to develop integrated systems for collecting, interpreting, and disseminating knowledge across boundaries represented by disciplines, geography, expertise, stakeholders, and decision-making contexts.

Particular attention during YR2 focused on the growing and integrating SSI's research capacity. Collaborations between research teams and institutions are ongoing to address key problems of sustainability. The research supported by the project has produced substantial scholarly outputs, including 34 peer-reviewed publications, 37 other technical publications, and over 100 presentations at 60 professional conferences. Internally, SSI's capacity was increased via research presentations at eight team meetings. Further opportunities for project-wide

interaction and synthesis occurred at a full day SSI research workshop in April, 2011 and a two-day SSI research retreat in May, 2011.

Another key aspect of SSI is collaboration with stakeholders via a dynamic, interactive approach to problem-solving. During YR2, SSI engaged in research collaborations with 224 individual collaborators at 138 stakeholder organizations. (Maine EPSCoR collaborated with an additional 34 individuals at 20 organizations in workforce development, education outreach and communication, and human resource development.) Participation included over 200 meetings with 5 SSI/SSP institutions, 22 institutions of higher education, 18 private-sector organizations, 46 governmental agencies, 44 non-profit organizations, two K-12 schools and 1 private landowner. Thirty-five stakeholder groups represent national or international interests. SES or K-A models have been used in 22 public presentations and 5 formal presentations of testimony. These activities have resulted in 22 researchers serving on external boards and scientific advisory committees, demonstrating SSI's long-term commitment to stakeholder engagement.

YR2 also witnessed major progress in the implementation of multiple, coordinated strategies to ensure project-wide research integration. For example, we used UMaine funds to initiate research that is developing common conceptual frameworks, data management systems, and analytical tools for advancing the theory and practice of sustainability science. This emphasis on integration has also led to the merger of several research sub-projects, thereby increasing both research capacity and synergy. In January, we initiated the Integration Discussion Group, which meets on a bi-weekly basis and is explicitly focused on understanding integrative challenges and strengthening SSI-wide integration. Finally, the SSI Research Council (a new governing body created in YR2) has been working on a plan to produce a dramatic increase in project-wide integration during YR3.

b) Diversity:

Maine EPSCoR continues to develop strategies for improvement, including a targeted effort to engage the Native American population through research that targets the emerald ash borer threat (affecting traditional basketmaking), and the Native STEM Scholarship Development program for students. In YR2, of the total number of individuals directly supported by this project, 45% were female and 7% were from underrepresented groups. Of indirectly supported participants, 72% were female and 7% were from underrepresented groups. Diversity partnerships included: the National Girls Collaborative Project; Expanding Your Horizons program; the Native STEM Scholarship Development Program and tribal communities; the Institute for Broadening Participation; UMaine Center for Community Inclusion and Disability Studies; and Camp CaPaella.

This RII project was an important step for Maine EPSCoR, in that it represented the first opportunity to begin to really reach out statewide in a research theme that resonated will all institutions of higher education (the University of Maine is the state's only PhD-granting institution in STEM, and its flagship research institution). This enabled 12 partner institutions (in addition to UMaine) to receive YR2 project funding from Maine EPSCoR and includes: Bates College, Bowdoin College, Colby College, College of the Atlantic, Unity College, University of New England, University of Maine Presque Isle, University of Maine Farmington, University of Maine Fort Kent, University of Maine Augusta, University of Maine Machias, and University of Southern Maine. 1-2 community colleges will be added as planned this year.

Since the SSI research focus is strongly dependent on collaborations with stakeholders, SSI/SSP researchers engaged in 138 other institutional collaborations during YR2, and Maine

EPSCoR collaborated with 20 additional partners in workforce development, education outreach and communication, and human resource development. (These numbers do include SSP partner institutions with additional non-participant individual collaborators.)

c) Workforce Development:

Maine EPSCoR's SSI Strategic Plan outlines a holistic approach to workforce development – education, employment, and economic development are all important components of the process of creating a STEM workforce to ensure Maine's future. Strategies occur at many different levels of the RII project, and encompass: 1) K-12 outreach for students and teachers to develop the "pipeline"; and 2) employment opportunities and professional development for faculty, postdocs, graduate and undergraduate students, and professional/technical staff.

Through the end of YR2 of this RII project, a total of 345 individuals were directly supported under this project (received salary/wages). Of that, 177 were existing personnel who had been supported during YR1 and continued in YR2, with the following breakdown: 82 faculty, 1 postdoc (started June 2010), 23 graduate students, 40 undergraduate students, 18 high school students, and 13 professional/technical staff.

An additional 168 personnel were newly supported during YR2. Of that, 29 were existing University positions that were new to the SSI project for YR2 and included 24 faculty and 5 professional/technical staff. An additional 140 were newly hired positions, and included: 3 faculty, 1 postdoc (started August 2010), 26 graduate students, 104 undergraduate students, 2 high school students, and 3 professional/technical staff.

New courses were developed, conferences and workshops were offered, and related educational outreach programs targeted students at all levels.

d) Cyberinfrastructure (CI):

During YR2 of the SSI project, and in alignment with the 5-year Cyberinfrastructure strategy for the state, Maine EPSCoR continued to address the communication, collaboration, visualization, and data needs of the Maine EPSCoR/SSI research and education teams. This included: 1) communication training (videoconferencing, webcams); 2) visualization cyberinfrastructure (large-scale visualization walls); and 3) data management planning (SSI data plan and cloud compute capacity).

e) Outreach and Communication:

Understanding and strengthening connections between knowledge and action is a key component of the SSI project. As such, SSI/SSP teams at the 13 participating institutions have developed research partnerships with 138 collaborators, including academic, government, private sector and NGOs. In addition, the Maine EPSCoR team is collaborating with an additional 20 other partners in workforce development, educational outreach and communication, and human resource development (in addition to the SSI and SSP partner institutions). Multiple levels of communication activities, which are also integral to the research and education focus, involved presentations, film and video productions, printed materials, websites, conferences and workshops, and a new collaboration with Maine Public Broadcasting Network.

f) Evaluation and Assessment:

The Management Team has a five-pronged approach to project evaluation and assessment that includes formative evaluation processes to improve the project's effectiveness, and summative evaluation processes to assess its impact in relation to its goals. All evaluations will determine: 1) the appropriateness of the investment relative to accomplishments; 2) if the investment strategy yields substantial improvement in research and competitiveness; 3) if linkages between the project's research, education, and innovation efforts are effective; 4) if

strategies increase participation. Findings will enhance efficacy, identify obstacles, assist in developing corrective action plans as needed, and help plan improvements. The levels of evaluation include: 1) external evaluation by two independent evaluators; 2) AAAS assessment; 3) SSI Advisory Board reviews; 4) NSF EPSCoR Reverse Site Visits and Site Visits; and 5) internal project evaluation and assessment.

g) Sustainability:

Nine months into YR2, the Maine EPSCoR RII project has achieved the majority of its project output benchmarks for the year (see Appendix 2) including direct support of 345 individuals at 13 institutions throughout the state; 1,709 participants indirectly supported through various outreach, workforce development, and collaborative activities; 34 related peer-reviewed scientific journal articles and six websites; 49 grant proposals submitted with 33 awards so far.

During YR2, SSI continued to develop the research and education infrastructure to support a large project of this size, and also engaged in several other steps that will begin the process of building long-term sustainability for the project and enhancing research competitiveness. These included: 1) inter-institutional strategies; 2) University-stakeholder partnerships; 3) government and private sector support; 4) foundation and private support; 5) establishing Maine as a leader.

Seed funding mechanisms were utilized to support faculty new hires and integration efforts, and ME EPSCoR RII support allowed us to leverage six other NSF programs.

h) RII Project Management & Structure:

The Maine EPSCoR Office at UMaine has been formally established under a Memorandum of Understanding with the Maine Office of Innovation, and acts as the fiscal agent/proposing organization for the state's NSF EPSCoR programs; coordinates responses to NSF EPSCoR funding solicitations; is responsible for the implementation, administration, and evaluation of funded projects; and is the liaison to the NSF EPSCoR Office.

In recognition that a successful project of this magnitude and scope depends on a strong management team and sufficient staff and expertise to develop, implement, and oversee it, a strong project management structure has been put into place. The Maine EPSCoR office and the SSI research office at the Senator George J. Mitchell Center are both based at UMaine and operate under the aegis of the VP for Research (RII PI/PD), which provides a strong, synergistic foundation for success. The addition of a multi-level, parallel organizational structure for this RII project also provides effective programmatic and administrative oversight and successful implementation. The Maine EPSCoR office is responsible for overall management and all non-research components, while the SSI research office is responsible for all research-related components. Both offices are staffed and coordinate with each other fully. The Maine Innovation Economy Advisory Board serves as the State EPSCoR committee, and several other committees and advisory boards help to guide the project.

3) Overview of Key Accomplishments:

a) Project highlights:

- 26 interdisciplinary research teams with 109 faculty at 13 institutions of higher learning in Maine make up the integrated SSI research portfolio
- direct support of 345 individuals in YR2 included 177 existing YR1 personnel and168 new positions. Includes 193 students participating in research internships with SSI/SSP faculty.
- programs to increase diversity resulted in increased participation, and programs involving Maine's Native American tribes actively engaged them in relevant research and education

b) Intellectual Merit:

SSI is advancing the emerging field of sustainability science in three important and integrative ways: 1) examining interactions between social and ecological systems (SES) as landscapes change in response to urbanization, forest management, and climate variability, with a goal of expanding our understanding of SES thresholds, feedbacks, and resilience; 2) investigating how such SES knowledge affects, and is influenced by, the actions and decisions of diverse stakeholders, with a goal of strengthening connections between knowledge and action; 3) evaluating the factors that facilitate and impede interdisciplinary collaboration, with a goal of identifying and implementing individual and institutional best practices that are needed to support successful interdisciplinary research programs in sustainability science. We believe that all three of these components are required to support the investment priority identified in NSF's strategic plan of fostering "…research that improves our ability to live sustainably on earth."

c) Broader Impacts:

This RII project is a fully integrated research and education program that advances discovery and understanding while promoting teaching, training, and learning. All aspects seek to broaden the participation of women and underrepresented groups, and includes a geographically and institutionally-diverse portfolio of projects.

SSI has begun to generate a diverse set of broader impacts due to its innovative approach and integrative goals, including: 1) creating a research portfolio that includes teams with remarkably diverse interdisciplinarity (109 researchers representing 26 fields of natural science, social science, and engineering); 2) engaging with over a hundred stakeholders from across the state (including members of Maine's tribal communities) to identify pressing problems for the state, define research needs, and develop effective solutions; 3) recruiting new faculty, postdoctoral fellows, and graduate students to enhance our culture of interdisciplinary research and practice; 4) launching a statewide collaboration of colleges and universities focused on the theory and practice of sustainability science that currently includes 13 different institutions; 5) initiating new courses and partnerships designed to advance workforce and economic development and help grow Maine's green innovation economy. Collectively, these activities are helping to increase Maine's research capacity and competitiveness at the same time as they enhance our ability to link scientific knowledge with improved actions and decision.

4) Actions Taken in Response to Recommendations:

ME EPSCoR participated in an NSF Reverse Site Visit in September 2010, from which 13 recommendations were made, and responses submitted to NSF EPSCoR. The ME EPSCoR Management Team and the SSI Stewardship Council have utilized these recommendations to make revisions to the SSI Strategic Plan, which was submitted to NSF EPSCoR March 2011.

In addition, detail is provided in this report regarding recommendations from the SSI Advisory Board during YR1 and YR2, and the corresponding actions that have been subsequently taken by SSI during YR2.

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B) FINAL REPORT DETAIL

1) RII Project Participants

This RII project for Maine EPSCoR is designed to have a large impact for the state through the enhancement of research and education in sustainability science. In order to accomplish this, there also needs to be a corresponding investment in human resource infrastructure, workforce development, outreach and communication, and diversity and broadened participation.

Through the end of YR2 of this RII project, a total of 345 individuals were directly supported under this project (received salary/wages). Of that, 177 were existing personnel who had been supported during YR1 and continued in YR2, with the following breakdown: 82 faculty, 1 postdoc, 23 graduate students, 40 undergraduate students, 18 high school students, and 13 professional/technical staff.

An additional 168 personnel were newly supported during YR2. Of that, 29 were existing University positions that were new to the SSI project for YR2 and included 24 faculty and 5 professional/technical staff. An additional 140 were newly hired positions, and included: 3 faculty, 1 postdoc, 26 graduate students, 104 undergraduate students, 2 high school students, and 3 professional/technical staff.

(Note: Student research internships are very specifically not fellowships, and are considered employee positions at our universities and colleges, whether at the graduate, undergraduate, or high school level. All student positions include job descriptions specific to the SSI project.)

These personnel have all been reported in NSF Fastlane as participants.

An additional 1,709 participants were indirectly supported through various outreach, workforce development, and collaborative activities that were sponsored and supported by Maine EPSCoR. (Note: These participants are considered indirectly supported because they did not directly receive funding support for salary/wages, but the activities they took part in were supported with Maine EPSCoR funding as part of its programming and external engagement efforts.) Participants included: 104 faculty at academic research institutions, 53 faculty at primarily undergraduate institutions, 93 graduate students, 87 undergraduate students at academic research institutions, 90 undergraduate students at primarily undergraduate institutions, 82 technical/ professional/administrative staff, 103 K-12 teachers/pre-service teachers, 17 high school students, 619 middle school students, 20 elementary school students, 18 business/industry representatives, 320 NGO/government representatives, and 103 members of the general public through conferences and workshops.

2) RII Project Description

a) Research Accomplishments and Plans:

During this second year, 109 faculty from the University of Maine, the University of Southern Maine, and 11 other partner undergraduate institutions throughout the state participated in SSI research and integrated education activities in sustainability science.

Following the editors of the Proceedings of the National Academy of Sciences (http://www.pnas.org/site/misc/sustainability.shtml), SSI has formally adopted the definition of sustainability science as "…an emerging field of research dealing with the interactions between natural and social systems, and with how those interactions affect the challenge of sustainability:

meeting the needs of present and future generations while substantially reducing poverty and conserving the planet's life support systems."

Overall Research Progress:

The overarching goal of the Sustainability Solutions Initiative (SSI) is to develop Maine's capacity to conduct world-class, solutions-driven research in sustainability science that is distinguished by its innovative approaches to interdisciplinary collaboration and deep commitment to diverse stakeholder partnerships. A central premise of SSI is that natural science and engineering are necessary but not sufficient for understanding and solving pressing sustainable development problems, which by definition have intersecting ecological, social, and economic dimensions. Using Maine as a laboratory, SSI examines both the coupled dynamics of social-ecological systems (SES) and the connections between SES knowledge and stakeholder actions (K-A). SSI's 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 has made significant progress during YR2 on: 1) advancing SES and K-A research; 2) strengthening interdisciplinary and university-stakeholder partnerships via organizational innovation (OI) research; and 3) building statewide, inter-institutional capacity through research collaborations at partner colleges and universities (SSPs). Our research continues to focus on interactions among three primary arenas of landscape change: urbanization; forest ecosystem management; and linked climate-energy futures. An overarching goal of these activities has been to develop integrated systems for collecting, interpreting, and disseminating knowledge across boundaries represented by disciplines, geography, expertise, stakeholders, and decision-making contexts.

Particular attention during YR2 focused on growing and integrating SSI's research capacity. The 109 SSI researchers have engaged in collaborative efforts that span research teams, projects, and institutions to address key problems of sustainability. The research supported by the project has produced substantial scholarly outputs, including 34 peer-reviewed publications, 37 other technical publications, and over 100 presentations at 60 professional conferences. Internally, SSI's capacity was increased via research presentations at monthly team meetings and at 7 Integration Discussion Group meetings. Further opportunities for project-wide interaction and synthesis occurred at a full day SSI research workshop in April 2011 and a two-day SSI research retreat in May 2011.

Another key aspect of SSI is collaboration with stakeholders via a dynamic, interactive approach to problem-solving. SSI researchers engaged in research collaborations with 5 SSI/SSP institutions, 22 other institutions of higher education, 18 private-sector organizations, 46 governmental agencies, 44 non-profit organizations, two K-12 schools and 1 private landowner. Thirty-five stakeholder groups represent national or international interests. SES or K-A models have been used in 22 public presentations and 5 formal presentations of testimony. These activities have resulted in 22 researchers serving on external boards and scientific advisory committees, demonstrating SSI's long-term commitment to stakeholder engagement.

YR2 also witnessed major progress in the implementation of multiple, coordinated strategies to ensure project-wide research integration. For example, we used UMaine funds to initiate research that is developing common conceptual frameworks, data management systems, and analytical tools for advancing the theory and practice of sustainability science. This emphasis on integration has also led to the merger of several research sub-projects, thereby increasing both research capacity and synergy. In January, we initiated the Integration Discussion Group, which

meets on a bi-weekly basis and is explicitly focused on understanding integrative challenges and strengthening SSI-wide integration. Finally, the SSI Research Council (a new governing body created in YR2) has been working on a plan to produce a dramatic increase in project-wide integration during YR3.

Progress in Cross-Cutting Research Themes and Arenas:

During YR1, SSI had a portfolio of 23 projects that included 18 core research projects at UM/USM, and an additional 5 projects aimed at broadening participation and research capacity at primarily undergraduate institutions. For YR2, two of the core research projects at UM/USM were retired after YR1 based on the on-going review, evaluative, and feedback processes built into SSI, and the remaining 16 continued. An additional 5 primarily undergraduate institutions were added during YR2 with broadening participation and research capacity projects, bringing the SSP total to 10. SSI also added four overarching integration projects as part of a voluntary cost contribution to the research portfolio (not funded by NSF).

Based on on-going review, evaluative, and feedback processes during YR2, decisions were made regarding which projects would continue into YR3. As a direct result of the integrated and collaborative nature of the SSI project, four of the YR2 core projects at UM/USM are combining with other core projects in order to maximize synergies in YR3. In addition, one project was not approved to continue, bringing the total number of UM/USM core research projects for YR3 down to 10.

A listing of these projects, their status, team members, and a summary of their research is included in Appendix 13.

All research projects directly address the goals and objectives defined in the Strategic Plan for Maine's Sustainability Science Initiative, and are evaluated based on the plan's specific strategies, benchmarks and timelines. Details on benchmark progress for YR2 can be found in Appendix 2: Objectives, Strategies & Benchmarks. For YR3, all teams will be pursuing the strategies, benchmarks, and timelines as detailed in the Maine EPSCoR SSI Strategic Plan.

The research focus for team-based efforts centers on SSI's three cross-cutting themes:

1) Goal 2- Investigate the dynamics of social-ecological systems (SES);
2) Goal 3- Examine connections between scientific knowledge of SES dynamics and stakeholder actions (K-A);
3) Goal 4- Test models of organizational science to improve interdisciplinary collaboration (OI).

Three critical arenas of landscape change continued to be examined inYR2 as the model problem system – urbanization, forest ecosystem management, and climate and energy futures – with an emphasis on interactions among these landscape arenas. By tailoring its portfolio of research projects, SSI is determining how the characteristics of different place-based problems influence the potential for generalization and cross-problem integration.

Models across the SSI portfolio are providing information that is very specific to project stakeholder needs. For example, some stakeholders have experience with a very particular model and understand how to use model outputs. In other cases different techniques are needed to accommodate unique data uncertainties, spatial scales, and specificity. It would be counter-productive, if not impossible, to attempt to solve sustainability problems using just one type of model. Considerable care has been exercised in evaluating the existing model frameworks and databases that are being utilized by SSI teams.

The following summary of research progress in the cross-cutting themes and arenas includes references to specific team projects by number as listed in Appendix 13. Each team project incorporates aspects of the cross-cutting themes and arenas while having specific topics of concentration. Because the research purposely spans many of the boundaries that exist between the themes and arenas, it is not possible to assign most team projects to a single theme or arena. The following summary uses the predominating thrust of a team project as the organizational motif but some projects cut across the width and breadth of SSI.

Social-Ecological Systems (SES):

Significant progress was made during YR2 towards our goal of examining how the dynamics of SES are influenced by thresholds and feedbacks, and the way such dynamics differ among landscape arenas. One key indicator of progress is the development of models tailored to particular biophysical and socioeconomic settings, which can then provide a foundation for comparing the context-dependence of SES dynamics. Progress is being made in developing a variety of SES modeling strategies, including systems, simulation, optimization, forecasting, econometric and expert models. There are three areas where significant modeling advances have occurred during YR2: 1) developing the ability to analyze decision-making in small forest holdings (agent-based model, #4); mapping human response to changing landscapes (Bayesian belief network model, #6); and 3) predicting how urbanization occurs in coupled human-natural systems (Urban Simulation Model Framework, #2). The identification and analysis of thresholds, feedbacks, and indicators are also a major part of SES research (#1, #19, #21, #24, #26, #27). Across the project, five new methods or best practices were established to link SES outputs with society's use of new knowledge in the arenas of urbanization, forestry, and climate/energy futures. Five of these new methods or practices were included in K-A research (#1, #14,#17) that was conducted through 11 surveys and two focus groups. These different approaches are needed to address specific stakeholder needs.

<u>Urbanization</u>

Urbanization (landscape change) is an area of concern or interest to many stakeholders in the state. The dynamics of the human interactions with the landscape have been modeled to understand human response to changing landscapes (Bayesian belief network model, #6) and to predict how urbanization occurs in coupled human-natural systems (Urban Simulation Model Framework, #2). Contrasting urbanization patterns are being studied using the dynamics of the Portland and Bangor Metropolitan Regions (#2, #6). The Bayesian belief network (BBN) model is an arena-crossing effort to examine the dynamics of coupled SES that involve strong interactions among forested and urban arenas (#6). Many of the problems being addressed are uniquely place-based with specific stakeholder needs. For example, spatial land-use models were designed to reflect suitability for development based on current conditions and expert knowledge (#6, #20, #25). Other spatial models deal with vulnerability to landscape changes that will require new management strategies (#6, #10, #27). We are also using these models to examine how biophysical feedbacks at various stages of urbanization affect thresholds for stream water quality and ecological integrity (#3, #7). Our watershed-scale model will be compared to a state-level model to better understand how socioeconomic thresholds and feedbacks vary with spatial scale (#3).

Forest Ecosystem Management

An agent-based model was designed to examine the behaviors of family forest landowners, a group that collectively owns approximately one-third of the forested land in Maine (#4). This model provides for agent profile generation, agent decision making, tying the US Forest Service Forest Vegetation Simulator (FVS) into the model, agent communication, and general population dynamics. Model calibration and data generation is continuing for three scenarios: a baseline model, a social change (increased/reduced property taxes), and a biophysical change (an invasive insect outbreak by increasing tree mortality) (#4, #6, #13). Explicit spatial land-use models were designed to reflect suitability for operations management based on current conditions and expert knowledge (#4). Other spatial models deal with vulnerability to invasive species, susceptibility to disease organisms, and changes in management strategies (#8,#13, #22).

Climate-Energy Futures

Changes in climate and energy systems are having noticeable effects on stakeholder attitudes and behaviors. The identification and analysis of thresholds, feedbacks, and indicators are also a major part of this arena (#19, #24, #26). The climate-energy futures arena neatly crosses numerous SES boundaries that are being studied (#11, #18, #23, #24, #26). For example, research on tidal energy development has shown that agency personnel and community members have important contributions to shape the direction of engineering, physical, and biological research (#18). Also, communities need new knowledge on how climate changes can affect infrastructure so that disasters can be averted or mitigated (#11).

Knowledge – Action (K-A):

Major progress has been made during Year 2 in analyzing the processes that influence connections between scientific knowledge and stakeholder actions. As highlighted below, social science researchers have employed a variety of methodologies to investigate the reciprocal processes influencing interactions between knowledge generation and knowledge use, as well as factors influencing stakeholder cooperation and the potential for collective action (#5, #9, #19, #20, #21, #25).

More than five different types of models are used in the project to assess K-A interactions that are tailored to the needs and expectations of stakeholders (e.g. econometric, analytical process, agent-based, Bayesian-belief, simulation, social network). These modeling approaches have been applied in Year 2 to develop research methods and best practices for SSI in 10 unique problem settings that span the arenas of urbanization, forestry, and climate-energy futures. Through 200 meetings with 148 stakeholder entities, progress has been documented across the project with substantive advances occurring in research on 10 sustainability problems. Best practices for K-A research and methods for communicating complex scientific information have resulted from work in five problem areas, respectively (#5, #I1, #I4). The results of this research have been shared with other researchers via 62 oral presentations and 50 posters at scientific workshops and conferences. Early applications of models are being evaluated with stakeholders (#2, #3, #5, #6, #7,#20, #21)

Urbanization

Stakeholder groups are working with researchers to test the application of spatial pattern analyses (#1, #6, #8) and decision support models related to changing landscapes (#2, #3, #19, #20, #21, #25). The stakeholders will provide input to improve the process of K-A for their

specific place-based situations. As part of this research a survey of all 499 municipalities in Maine yielded responses from 1,176 municipal officers. Results are still being analyzed but one key finding of this survey is that towns place socio-economic issues ahead of environmental ones. Going into Year 3 of SSI, a greater emphasis will be placed on this theme across SSI.

Forest Ecosystem Management

Significant progress has also been made in the forest ecosystem management arena to establish a research program that represents the interests of key stakeholders (#4, #8, #22, #23), especially tribal communities (#13). Specifically, the Wabanaki basket-makers and other stakeholders are working with SSI researchers to prevent, detect, and respond to the emerald ash borer, a potentially devastating invasive threat to ash trees in Maine (#13). This research focused particular attention during Year 2 on shared goal-setting with stakeholders, a strategy that is helping build a productive partnership for identifying effective policies to manage this invasive species. Specifically, the partnership meeting held in May, 2011 facilitated the ability of Tribes and the State to develop emergency response plans that are inclusive, effective, and in place before the emerald ash borer arrives in Maine.

Climate-Energy Futures

One area in which our K-A research has made major advances is in the climate-energy futures arena (#11, #18, #22, #23, #24, #26). For example, research on tidal energy development has used the results of semi-structured interviews with agency personnel and community members to shape the direction of engineering, physical, and biological research (#18). Most stakeholders interviewed identified public meetings as an appropriate forum for sharing research results, including formal briefings to stakeholders and public officials, face-to-face meetings and community gatherings. Finally, our biological team has been working with state and federal agencies as well as industry in an iterative process of identifying biological information needs for the challenging tidal environments targeted for power development. Initial discussions among researchers, agencies and industry have produced agreement about a data collection framework (#I2, #I3).

Organizational Innovation (OI):

This research is developing and testing models from organizational science to understand and improve interdisciplinary collaboration and university-stakeholder partnerships. Measurable outcomes of progress include analyses of organizational processes that influence interdisciplinary collaboration and university-stakeholder partnerships, a longitudinal study of how interdisciplinary collaborations and stakeholder partnerships change over time, and the development of best practices to promote interdisciplinarity and robust partnerships between universities and stakeholders (#15, #16). Work performed in OI is applicable to all SSI themes and arenas.

During Year 2, OI research has focused on how interdisciplinary teams form and function. Such research also informs our efforts to expand and strengthen SSI's research capacity. Three models of OI have been applied to analyze the behavior of individuals and collaboratives within the context of SSI interdisciplinary research using text analysis of qualitative interviews, survey responses, and social network data. This research has led to the formulation of three new methodological processes or best practices for conducting this type of research and for successful interactions with stakeholders outside the university. Longitudinal research analyzing how collaboration evolves across disciplines and individuals also continued during Year 2. OI

research resulted in six internal presentations, including recommendations (subsequently adopted) for improving interdisciplinary collaboration. This work has also created eight survey instruments to probe and inform stakeholder knowledge of interdisciplinary systems research and outputs.

Significant progress has been made in analyzing the role of social networks within SSI, including how changes in these networks facilitate or impede interdisciplinary success (#12, #16). Continued data collection in Year 2 is expanding our ability to analyze longitudinal change in SSI social networks. Research results have also contributed to SSI organizational changes (e.g., the formation of the Research Council) that emphasize greater researcher participation in policies and procedures. Research has also continued on team dynamics, individual interactions, and how these change over time through meetings of the group, individuals, and via private consultation (#I1, #I2, #I4). The interviews have generated extensive data for analysis (more than 236 single-spaced pages of transcribed data) that are being used to support continued text analysis.

OI research during Year 2 also investigated the factors influencing the characteristics of university-stakeholder partnerships (#14, #17). One study involved 1,000 mail surveys and 19 semi-structured interviews that occurred prior to and following meetings of SSI researchers with stakeholders. One key result was that trust in researchers by stakeholders increased following the engagement process.

SSI Core Integration projects

SSI's integration projects are making progress in linked strategies to increase coordination among different SSI place-based sub-projects and maximize the potential for comparative analyses. Two integration projects are focusing particular attention on data collection and management. The SSI cyber-informatics development project draws on a wide range of faculty with expertise in computer science, electrical engineering, spatial information engineering, earth system science, and informatics. A second project focused on socio-economic data collection has already offered a course that is helping to facilitate consistent data collection in support of coherent hypothesis testing within and among SSI sub-projects. These two projects are also working together to create greater synergy in generating, using, and managing data.

The two other integration projects have made progress in conducting comparative analyses of SSI sub-projects to ensure that the SSI whole is more than the sum of its parts. The Lessons from a Diverse Portfolio project is currently quantifying the evolution of the social network structure of SSI research teams, using experimental games to measure cooperative behavior among researchers and stakeholders, and conducting multivariate analyses to characterize the research teams and the coupled SES on which they are focused. The Growth Scenarios project is extending Bayesian Belief Network models developed by the Alternative Futures team to identify streams and wetlands that are at risk from future development. This integrative approach provides an opportunity to test whether such evidence-based scenarios create opportunities for proactive and cost-effective policy responses that can balance economic development and natural resource protection.

b) Diversity and Broadening Participation:

The SSI Strategic Plan goal for diversity is to "Engage all aspects of the state's human and institutional resources in the achievement of the RII project goals and objectives." The

following narrative details YR2 progress under the two main objectives for this goal. (Also see Appendix 2 Objectives, Strategies, & Benchmarks, Appendix 4 Project Personnel Diversity, and Reporting Templates B & D.)

While Maine traditionally fluctuates between the first or second least diverse state in the nation with minorities now consisting of around 4.8% of the population (2010 U.S. Census), Maine EPSCoR has a demonstrated track record of being committed to programs and activities that will expand the participation of women and underrepresented groups in STEM fields. Maine EPSCoR continues to develop strategies for improvement, including a targeted effort to further engage Native American communities.

b.1 Broadening Participation:

The SSI Strategic Plan Objective #1 for diversity is to broaden overall participation through increased individual diversity. Strategies and actions encompass diversity in new hires, existing personnel, outreach activity participants, and special programs for Native Americans, women and girls, and disabled.

In YR2 of this RII project, of the total number of individuals directly supported, 45% were female and 7% were from underrepresented groups. Of indirectly supported participants, 72% were female and 7% were from underrepresented groups. (See Appendix 4 Diversity, and Template B - RII Participants.) This compares favorably to diversity figures reported in YR1: directly supported - 47% female and 5% underrepresented groups; and indirectly supported - 58% female and 8% underrepresented groups. The YR2 progress also compares favorably with the baseline being used, which is the last year of Maine EPSCoR's Forest Bioproducts Research Initiative RII project (EPS-0554545) which ended September 30, 2009 and had 32% female and 4% underrepresented groups for directly supported participants, and 41% female and 4% diversity for indirectly supported participants.

Maine EPSCoR has formed strong partnerships throughout the years in order to increase the participation of women and underrepresented groups, and these collaborations continued in YR2. With the maturing of the SSI research portfolio, plans are underway for YR3 to integrate SSI researchers and students more into the Maine EPSCoR programs that broaden participation. For example, Maine EPSCoR will support UMaine's Upward Bound 2012 summer program, which will be fully centered around the SSI project and connect diverse students with SSI researchers. All SSI researchers are directly involved in broadening participation through individual recruitment and mentoring activities, as well as institutional collaboration activities.

During YR2, Maine EPSCoR continued collaborations with the following programs and activities:

***National Girls Collaborative Project*:** As part of a match from Maine EPSCoR, the Maine Girls Collaborative Project (MGCP) at UMaine's Women's Resource Center was able to provide full funding to 5 additional mini-grant applicants. This allowed leveraging of their grant from the NSF National Girls Collaborative Project at the Puget Sound Center for Teaching, Learning and Technology (now the EdLab Group), and included:

1) **Hardy Girls Bangor Area Planning Committee and Hardy Girls Healthy Women, "Defying Stereotypes Expanded."** This project was an expansion on a previously funded mini-grant, and allowed for 4 additional events that introduced girls in the greater Bangor area to educational activities and women pursuing careers in STEM fields. Impacts were expanding their STEM horizons, an improved understanding of STEM-

related careers available, increased awareness of the rewards of STEM careers, and a better appreciation for the necessity of STEM-related skills.

2) **Hardy Girls Healthy Women and Girl Scouts of Maine, "Hardy Days of Summer**." This project was a 2-day low-cost alternative summer camp for girls in grades 2-5. Its goals was to highlight STEM careers and opportunities for girls during the summer that are fun, rewarding, and located nearby to girls in the area, as well as to provide the opportunity to meet young women currently in college pursuing STEM majors. The summer camp was able to serve 12 girls, 11 of whom were elementary school students, the remaining girl being a middle school student. This program was considered a success based on informal discussion and surveying, particularly in attaining the following objectives: (1) Participants will perceive STEM career choice as opportunity to make a contribution to society, and (2) Participants will show awareness of rewards of a designated STEM career/discipline.
3) **University of Maine College of Engineering and Girl Scouts of Maine**, "Girl Scouts Transforming Leadership: Engineering." The college hosted an Engineering Awareness Day where girl scouts learned hands-on activities in different engineering labs. The parents and troop leaders who participated were trained on projects that they could duplicate with the troops. These activities were designed to achieve two objectives, to expose girls early to engineering, and to "train the trainers" in engineering activities, and were determined to be successful. This program served 90 middle school-aged girls.
4) **Old Town High School and Challenger Learning Center of Maine, "WISE Club at Old Town High School."** A WISE (Women Interested in Science and Engineering) Club was formed at Old Town High School focused on presenting students with opportunities in STEM fields. Scientists, researchers, and engineers from UMaine and local companies were invited to share their career experiences. In addition, students were given opportunities to participate in scientific research and engineering design challenges throughout the year. Student impacts included increased knowledge of STEM careers and perception of STEM careers as possible/advantageous choice for women or minorities.
5) **Belfast Area High School, Troy Howard Middle School, Maine RISE Center, and Maine Robotics, "Growing STEM outside the classroom**." This collaboration expanded extracurricular opportunities for students to engage in science and engineering activities. Belfast Area High School students were mentored by university professor and community experts throughout the school year to complete specific challenges. Science teachers at their school were also trained to better help the students, as well as implement newly acquired training and resources in their own classrooms. Outcomes were demonstrated understanding of problem-solving steps and increased confidence that participants can be successful during their studies to become a STEM professional. Additionally, teachers will implement the STEM-oriented learning activities into their classes or after school activities.

Expanding Your Horizons: Maine EPSCoR provided its fifth year of support for the Expanding Your Horizons STEM conference on campus for 514 middle school girls in grades 7-8. This conference, sponsored by UMaine's Womens Resource Center, links the girls with women role models who are active in STEM and provides hands-on STEM experiences and career information. This program has provided young women with positive, hands-on, fun experiences in mathematics and science that provides a foundation for them to increase their interest in these

areas. This year's attendees completed pre- and post-surveys to measure their interest in math and science before and after the conference, and their awareness of STEM careers. Examples of the conference impact is that 44% of girls said they were very interested in a future career that uses math and science skills after the conference, compared to 31% before; the percentages interested in careers involving STEM fields and skill areas all went up following the conference; interests involving biology and animals, as well engineering and architecture went up; and 29 girls listed scientist as a career they'd be interested in after the conference, compared to none before. SSI researchers and graduate students normally take an active part in this event, but scheduling difficulties in YR2 meant that only Jennifer Dunham, Maine EPSCoR Program Assistant and Diversity Specialist, was able to participate.

NSF ADVANCE: Maine EPSCoR is a partner in UMaine's recent NSF ADVANCE award, A Rising Tide: Advancing Women and Leadership at the University of Maine. Maine EPSCoR's role is specifically to assist in sponsoring a number of research affinity groups on campus in areas related to the SSI project, to assist and support the proposed annual system-wide networking conference, and to serve in an advisory capacity to the project. SSI faculty member, Susan Gardner, is a Co-PI on the NSF ADVANCE grant, and several other SSI faculty are also key participants in the implementation of the ADVANCE project.

Native American programs: During YR2, Maine EPSCoR's continued collaboration with the Wabanaki Native American Center at UMaine was delayed in initiating activities due to the restructuring of the Center with the Native American Studies program and the loss of the Wabanaki Center Director. During YR2, the former Native Scholar Educational Outreach Program has been redesigned as the Native STEM Scholarship Development Program, under the coordination of Darren Ranco, Director of Native American Programs and an SSI faculty member/team leader. In addition, Native American SSI faculty member John Daigle and the two Native American Collaborative Research Assistants are also key partners in broadening participation efforts. Despite the organizational interruption, some foundation work under the new structure has been done, an event has been conducted, and more are planned to take place for the late spring/early summer. YR2 progress includes:

a) Two Native American graduate students have been hired and oriented as SSI Native Collaborative Research Assistants. They are involved in SSI-related research and will be mentors to Native undergraduate students as the program develops, as well as providing support in coordinating and implementing events and activities.
b) The Coordinator and Research Assistants have met with the University's Native student group, the Native People's Alliance, to begin networking with Native students and developing programming around their feedback. They have planned a panel event to take place in April, in which the Alliance will take part, and the Coordinator with at least one other SSI faculty researcher will serve as panel members. A follow-up event is planned to involve more SSI researchers as an orientation with the project to garner interest among the Native students. At least 17 Native undergraduate students are projected to attend each of these two events.
c) Maine EPSCoR co-sponsored a major Native speaker event in which Sheila Watt-Cloutier, a Nobel Peace Prize nominee and world leader on global climate change and human rights, came to the University for a full day of presentations and discussions with

both graduate and undergraduate students. Approximately 70 people attended the student seminar, over half of which were women and approximately 1% were Native American.

d) Natalie Michelle, one of the SSI Native Collaborative Research Assistants, will conduct a workshop on sweet grass harvesting and protecting coastal grass in early summer. The attendees will be from the elementary and middle schools serving the Passamaquoddy tribe. At least 10 participants are projected.
e) Darren Ranco, SSI faculty member and the Director of Native American Programs, will conduct another workshop on brown ash seed collection during the fall of 2011. As part of these workshops, Ranco shares the results of his team's research on the emerald ash borer with tribal youth. This year's workshop will likely serve the northern tribes of Maine, the Micmacs and the Maliseets of Aroostook County. At least 10 participants are projected.
f) The Emerald Ash Borer research project team is also highly connected with Maine's tribal communities through its research activities, and has been extremely effective in bringing together community stakeholders and building a sense of trust and collaboration. A second workshop in May 2011 brought together university researchers and students, Wabanaki basketmakers, tribal representatives, state and federal foresters, landowners and other stakeholders.
g) One Native American undergraduate student on an internship leverages a Maine Technology Initiative Seed Grant for economic development. The student is working on water detection methods with a focus on a sustainable approach to water quality analysis. This student's involvement in this project has encouraged him to apply to graduate school at UMaine in the fall.

Two SSI researchers from Bowdoin College are also participating in a panel discussion at their institution in April titled "Native American Issues and Academia: Restoring Maine Ecosystmes: Wabanaki and Academics Partnerships". John Lichter and Ted Ames will present on the "Ecological Recovery of Maine's Waterways and Coastal Fisheries". It is projected that approximately 30 individuals will attend this event, the majority of whom will likely be from the Native community.

While an elder-in-residence program was successfully supported by Maine EPSCoR during YR1, this had been coordinated by the Wabanaki Center. With the re-structuring of the Center and the new NSSDP Program, this was not able to be repeated during YR2. However, the Wabanaki Center is currently planning to host this program again, and Maine EPSCoR is positioned to collaborate and support it as part of the NSSDP outreach programming.

Disability programs: Maine EPSCoR has recently begun a partnership with Camp Capella, a year-round recreational and educational program for children and adults with disabilities. During the summer of 2011, Maine EPSCoR is engaged in a pilot program to support SSI-related environmental programs and activities for these participants.

At the end of YR1, Maine EPSCoR had also begun working with UMaine's Center for Community Inclusion and Disability Studies (CCIDS) to develop a specific action plan to foster participation by this population. While planning meetings continued during YR2, the effort was hampered by the temporary re-assignment of its Director, Lu Zeph, to fill a vacant position in the Provost's office. An action plan was finally developed in June 2011, and is ready to be implemented during YR3 under Susan Russell, CCIDS Assistant Director. The Maine EPSCoR Director did also work with the Center during YR2 in project development planning for

proposals that were being submitted by the Center to address barriers to STEM in K-12 for the disabled population.

General: Our partnership with the Institute for Broadening Participation (IBP) also continued. IBP, which is a nonprofit organization located in the state, is committed to supporting future scientists as they make their way through their education and careers, and in particular, focuses on making an education and career in science more accessible to women, people of color, and first generation college students. They are also associated with the NSF IGERT program and the national Alliances for Graduate Education and the Proffessoriate. IBP assists in our recruitment efforts at all levels, and Maine EPSCoR works with IBP as a partner in the Maine STEM Collaborative. UMaine also continues participation with the Northeastern Alliance for Graduate Education and the Professoriate (NEAGEP); takes advantage of strategies that have been developed under the university's past and current NSF IGERT and REU programs; and is planning for various NSF grant solicitations to encourage the participation of women and underrepresented groups (i.e. NSF LSAMP).

b.2 Institutional Collaborations:

This RII project was an important step for Maine EPSCoR, in that it represented the first opportunity to begin to really reach out statewide in a research theme that resonated will all institutions of higher education (the University of Maine is the state's only PhD-granting institution in STEM, and its flagship research institution).

In alignment with the SSI Strategic Plan, Maine EPSCoR created a formalized program called the "Sustainability Solutions Partners" (SSP) program to provide a mechanism for primarily undergraduate institutions in the state to participate in the SSI research and education project.

In YR2, a total of 12 SSP partner institutions are receiving project funding from Maine EPSCoR to be active partners in SSI's research and education activities. These include six private institutions: Bates College, Bowdoin College, Colby College, College of the Atlantic, Unity College, and University of New England; and the six other campuses of the University of Maine System: University of Maine Augusta, University of Maine Farmington, University of Maine Fort Kent, University of Maine Machias, University of Maine Presque Isle, and the University of Southern Maine.

Fall 2010 visits by SSI management team members to these institutions and a survey of SSP faculty conducted by the K-A team helped clarify project issues and immediate needs for these teams. One major need is to continue to provide strategies for integration and communication across the project. YR2 work in these areas is detailed in the Workforce Development and Outreach and Communication sections.

The Maine EPSCoR project as a whole engaged with 258 individual collaborators at 158 institutions during YR2. (Note: Individuals at the 12 SSP institutions involved in research projects are reported as participants on Template B and are not counted here as Collaborators. However, those SSP institutions are counted here if they have individuals collaborating with SSI who are not SSP project participants.)

Since the SSI research focus is strongly dependent on collaborations with stakeholders, SSI researchers engaged with 224 of those individuals at 138 institutions during YR2:

1) ***SSI/SSP Institutions with additional collaborators (5):*** Bowdoin College, University of Maine, University of Maine at Machias, University of Maine at Presque Isle, University of Southern Maine.
2) ***Institutions of higher education (22):*** Arizona State University, Bridgewater College, Duke University, Eastern Maine Community College, Harvard University, Leuphana University Lueneburg, Monash University, San Jose State University, State University of New York, Tufts University, University of California, Berkeley, University of Canterbury, University of Cincinnati, University of Denmark, University of Georgia, University of Minho, University of Missouri, University of New Brunswick, University of North Carolina, University of Washington, West Virginia University, Western Oregon University.
3) ***Industry/business partners (18)***: Bangor International Airport, C.C. Dorion Geological Services, Caswell Forest Producs, CES, Inc., Cianbro Institute, Creative Conservation LLC, E.D. Bessey and Sons, Ed Holt & Associates, Inc., Fred Bailey Trail Design, Kevin Hooper Associates, LandVest, New England Wood Pellet, Ocean Renewable Power Company, Parsons Brinckerhoff Inc., Planning Decisions, Inc., The SOAP Group, Woodard & Curran Inc., Wright-Pierce.
4) ***Governmental partners (46)***: Bangor Area Comprehensive Transportation System, Bangor Chamber of Commerce, City of Bangor, City of Brewer, City of Old Town, City of Portland, City of South Portland, Cumberland County Government, Dorothea Dix Psychiatric Center, Greater Portland Council of Governments, Houlton Band of Maliseets Conservation Department, Maine Air National Guard, Maine Bureau of Parks and Lands, Maine Center for Disease Control, Maine Department of Environmental Protection, Maine Department of Inland Fisheries and Wildlife, Maine Department of Labor, Maine Forest Service, Maine Geological Survey, Maine Institute for Human Genetics and Health, Maine Land Use Regulation Commission, Maine Office of Geographic Information Systems, Maine Public Utilities Commission, Maine State Planning Office, Maine State Senate, Penobscot County Soil & Water Conservation District, Penobscot Nation, Rachel Carson National Wildlife Refuge, Southern California Association of Governments, Southern Maine Regional Planning Council, Town of Brunswick, Town of Cumberland, Town of Hampden, Town of Hermon, Town of Milford, Town of Orono, Town of Topsham, Town of Veazie, Town of Yarmouth, US Army Corps of Engineers, US Fish and Wildlife Service, USDA Forest Service, USDA Natural Resources Conservation Service, USGS Cote Anadromous Fish Lab, USGS Maine Cooperative Fish and Wildlife Research Unit, Vermont Fish and Wildlife Department.
5) ***Non-profit and other organizations (44)***: American Wind Energy Association, Archbold Biological Station, Association of Consulting Foresters, Bangor Land Trust, Belgrade Lakes Regional Conservation Alliance, Brunswick-Topsham Land Trust, Chebeague-Cumberland Land Trust, Chewonki Foundation, Citizens' Task Force on Wind Power – Maine, Cobscook Bay Resource Center, Community Energy Partners, Docks to Doorways, Eastern Maine Development Corporation, Freeport Conservation Trust, Frenchman Bay Conservancy, Friends of Lincoln Lake, GrowSmart Maine, Indian Township Heritage Museum, Island Institute, Jackson Laboratory, Kennebec Estuary Land Trust, Kennebec Homeowners' Association, Maine Audubon Society, Maine Congress of Lakes Association, Maine Office of Energy Independence and Security, Maine Renewable Energy Association, Maine Rural Partners, Maine TREE Foundation, Maine Wilderness Guides Organization, Maine Winter Sports Center, Moosehead Regional Futures, Natural Resources Defense Council of Maine, North Pond Association, Opportunity Maine, Orono Land Trust, Peninsula Power Community Energy Project, Rangeley

Lakes Heritage Trust, Rangeley Snowmobile Assocation, Small Woodland Owners Association of Maine, The Nature Conservancy of Maine, Tidal Energy Device Evaluation Center, Wells National Estuarine Research Reserve, Wind Power for ME Coalition, Woods Hole Oceanographic Institution.
6) ***K-12 institutions (2):*** Messalonskee Middle School, Waterville Junior High School
7) ***Private Landowners (1):*** Jim Reed

In addition, Maine EPSCoR also collaborated with 34 additional partners at 20 institutions in general workforce development & STEM education (see note above concerning SSP institutions):
1) ***SSI/SSP Institutions with additional collaborators (1):*** Colby College
2) ***K-12 institutions (3):*** Belfast Area High School, Troy Howard Middle School, Old Town High School;
3) ***Industry/business partners (1)***: Unum.
4) ***State governmental partners (1)***: Department of Education.
5) ***Non-profit and other organizations (14)***: Maine Mathematics and Science Alliance, Maine Energy Promotional Council, Gulf of Maine Research Institute, Maine International Center for Digital Learning, Mount Desert Island Biological Laboratory (Maine INBRE), Maine Space Grant Consortium (NASA EPSCoR), Institute for Broadening Participation, Girl Scouts of Maine, Hardy Girls Bangor Area Planning Committee, Hardy Girls Healthy Women, Maine Robotics, Maine Pulp & Paper Foundation, Regional Education Laboratory, Education Development Center.

c) **Workforce Development:**

Maine EPSCoR's SSI Strategic Plan outlines a holistic approach to workforce development – education, employment, and economic development are all important components of the process of creating a STEM workforce to ensure Maine's future. Strategies occur at many different levels of the RII project, and encompass: 1) K-12 outreach for students and teachers to develop the "pipeline"; 2) employment opportunities and professional development for faculty, postdocs, graduate and undergraduate students, and professional/technical staff; and 3) entrepreneurial training and support to assist in economic development.

Since Maine ranked 50 out of 52 in 2009 in earned doctorates in science or engineering (http://www.nsf.gov/statistics/nsf11306/appendix/pdf/tab5.pdf), the overall goal for workforce development is to foster the current and next generations of sustainability science professionals. This will be accomplished by: directly linking K-20 programs to the diverse challenges and opportunities in this emerging field; expanding recruitment, retention, training, and other employment-based opportunities at all levels; and expanding capacity for knowledge dissemination for all levels. Specific workforce development strategies as well as corresponding educational outreach and human resource development strategies will be utilized.

Through the end of YR2 of this RII project, a total of 345 individuals were directly supported under this project (received salary/wages). Of that, 177 were existing personnel who had been supported during YR1 and continued in YR2, with the following breakdown: 82 faculty, 1 postdoc (started June 2010), 23 graduate students, 40 undergraduate students, 18 high school students, and 13 professional/technical staff.

An additional 168 personnel were newly supported during YR2. Of that, 29 were existing University positions that were new to the SSI project for YR2 and included 24 faculty and 5 professional/technical staff. An additional 140 were newly hired positions, and included: 3

faculty, 1 postdoc (started August 2010), 26 graduate students, 104 undergraduate students, 2 high school students, and 3 professional/technical staff." (Note: Student research internships are very specifically not fellowships, and are considered employee positions at our universities and colleges, whether at the graduate, undergraduate, or high school level. All student positions include job descriptions specific to the SSI project.)

SSI Workforce Development in the Research component:

The SSI-specific workforce development & STEM education goal for this project is to "Foster the next generation of sustainability science professionals through K-20 programs that are linked to the diverse challenges and opportunities in this emerging field."

Overall Capacity:

SSI Strategic Plan Objective #1 for this goal is to increase Maine's overall capacity for producing sustainability science professionals by directly supporting the involvement of SSI participants at all levels. Three new faculty - Brian McGill, Tim Waring, & Yuseung Kim – formally joined the SSI team during the first three months of YR2 (all went through the hiring process during YR1 but started work for YR2). The fourth new hire, Sean Smith, went through the hiring process in YR2, but will formally start in September 2011 (YR3). Integration of new faculty has been encouraged through funding of pilot projects for new faculty hires, providing SSI graduate student support, providing opportunities for collaboration on integration and core projects, encouraging participation on committees and task forces, and scheduling presentations at integrative discussion groups.

Two SSI postdoctoral fellows also joined the team in summer 2010 (one in June 2010/YR1 and one in August 2010/YR2). Both are co-mentored and have assumed integrative roles working across various research teams. They are also providing mentorship to SSI graduate and undergraduate students. It was decided by the Postdoctoral Recruitment Committee to close the search in late summer 2010 until a further assessment of team needs could be completed. The Research Council will make that assessment after the YR3 proposal review process has concluded. Two teams will be hiring postdoctoral fellows to address specific research needs in May 2011.

A total of 49 graduate research internship positions were supported during YR2. This included support of an incoming cohort of 13 SSI PhD students with research assistant positions in the fall of 2010, which were in addition to three continuing SSI PhD cohort students from YR1 (these students were all admitted specifically as SSI students). An additional 33 graduate students were also supported during YR2: 20 continuing from YR1 and 13 newly hired. (Many departments provided other sources of funding for both graduate and undergraduate students to work on SSI research.) Six additional SSI PhD positions were approved by the Graduate Recruitment Committee in YR2 for a fall 2011 start date (YR3).

During YR2, there were 128 SSI graduate student attendees at 19 SSI-sponsored conferences, workshops and seminars. Highlighted examples include 29 students who presented (oral and poster) at the Maine Water Conference, 27 students who participated in the ME EPSCoR state Conference, 12 students who organized and presented at the World Sustainability Teach-in Day, 4 students who participated in the NSF Communicating Science Workshop, and 14 students who participated in the SSI April 15th Workshop.

For YR2, the team focused on recruiting more undergraduate students to work directly with the research teams. Supplemental funding was provided to encourage teams to hire more undergraduate students to participate in research. SSI graduate students and postdoctoral fellows

are actively involved in mentoring these undergraduate students who are integrally involved in sustainability science research.

Formal Programs in Sustainability Science:

SSI Strategic Plan Objective #2 is to engage in formal graduate and undergraduate programs in sustainability science. The SSI Curriculum and Culture Committee (CCC) is developing a framework for SSI undergraduate and graduate programs that: builds on existing programs, pursues innovative approaches to combining course work across the breadth of sustainability science disciplines, ensures that careful attention is paid to the lessons learned from other institutional efforts to overcome the challenges of creating robust interdisciplinary programs, and attends to the feedback from current SSI undergraduate and graduate students. The CCC is also coordinating with the IGERT Committee as it assesses graduate curriculum needs as during the proposal development process. The committee is currently completing a proposal for submission in the internal UMaine IGERT selection process.

To support the incoming cohort of PhD students, a fall semester introductory "Readings in Sustainability Science" course was established co-taught by core SSI faculty members David Hart, Kathleen Bell and Laura Lindenfeld. This course was designed to 1) introduce students to the growing field of sustainability science and situate SSI within this field and 2) provide an opportunity for SSI doctoral students to learn more about each other's research, disciplinary training, and interests and to establish a sense of cohort and belonging to SSI. A highlight of the class was a group discussion with Nobel Laureate Elinor Ostrom.

During YR2, only the initial readings course was offered. Planning for the second course was delayed due to an on-going institutional assessment of the EES program (Ecology and Environmental Sciences), which is an existing interdisciplinary program based at UMaine. SSI has been investigating the potential of utilizing the EES program structure to design a graduate certificate in sustainability science. In the meantime, several SSI faculty members offered spring courses directly related to SSI graduate student needs…

A two-course sequence has now been approved by the SSI Stewardship Council and is in the process of being implemented for YR3. The first course will be a one-credit "Readings in Sustainability Science" course and will offered in the fall 2011. The second course is under development and will be based on the "Sustainability Science Research" course offered in YR1. Both courses will be co-taught by multiple SSI faculty.

For YR2, SSI-related graduate courses offered included the Readings in Sustainability Science (see above), Advanced Statistics for the Environment (McGill), Seminar in Survey Research (Teisl), Seminar in Game Theory (Teisl), Survey Design and Research (Leahy, Lindenfeld), Introduction to Complex Adaptive Systems (Wilson), Knowledge and Participation in the Fisheries Science Policy Process (Johnson), Sustainable Communities (Merrill), Human Dimensions of Natural Resource Management (Haynes), Climate Change and Culture (Roscoe), Science and the News Media (Schmitt)**,** Sustainable Energy Economics & Policy (Hunt), Sustainable Resource Systems and Public Policy (Smith), Ecological Economics (Anderson).

The "Sustainability Science Research" course from YR1 will be ongoing and will potentially constitute the second course in the 2-course sequence discussed above. Although the course topic will change, the overall strategy for this course is that it will provide unique opportunities for interdisciplinary student teams to work directly with key stakeholders. The YR1 "Environmental Communication" course was opportunistic in its design utilizing the international conference and meeting that was taking place on campus led by SSI faculty

member Laura Lindenfeld. The SSI Stewardship Council has supported providing similar courses as similar opportunities arise. For example, we expect to host an international conference on sustainability science in fall 2012/spring 2013 and would anticipate offering a graduate course to run concurrent with the conference. In addition, Professor Lindenfeld is offering an Environmental Communication course for the fall 2011 semester.

Investigation of the feasibility of establishing an interdisciplinary undergraduate program in sustainability science between the seven University of Maine System institutions and collaborating private colleges has been initiated. Discussions with senior administrators at participating institutions are underway.

The SSI IGERT committee completed a pre-proposal in April for the internal UMaine IGERT selection process. Although the proposal was not selected to go forward, it provided an opportunity for further discussion on curriculum needs specifically tailored to SSI students. This process will continue as the proposal continues to undergo development and refinement in preparation for the next internal IGERT competition in the spring of 2012.

Faculty Mentoring:

SSI Strategic Plan Objective #3 is to support faculty development through a "Mutual Mentoring" program. This program will employ a multi-tiered approach of formal and informal mentoring efforts to ensure that faculty at all career levels receive ongoing support and resources to advance their careers. Stewardship Council has initiated plans to establish a formal peer mentorship network across the project to be implemented in YR3. Many informal faculty partnerships are already occurring and these will be formalized through this process.

Development of strategic partnerships with the UMaine's Center for Excellence in Teaching and Assessment (CETA) and the NSF ADVANCE grant are underway. We will work with these groups in upcoming months to design and offer workshops and seminars for SSI faculty on leadership, communication, interdisciplinary collaboration, and career advancement.

Presentations on coupled SES modeling and linking K-A took place at the ME EPSCoR Conference in fall 2010. These will be followed by introductory workshops to be held on April 15, 2011. A second grantwriting workshop was held on Nov. 10, 2010. Development of "traveling workshops" on grantwriting, coupled SES modeling, and linking K-A is underway. Faculty groups from diverse institutions are collaborating to develop these workshops that will take place multiple times across the state to ensure broad participation of faculty from all partner institutions. An agent-based modeling workshop for faculty was also held during spring semester.

Fostering Collaborative Learning:

SSI Strategic Plan Objective #4 is to provide a team structure that fosters collaborative learning and development between faculty, postdoctoral fellows, and graduate and undergraduate students. Integration is a critical component in sustainability science research. New faculty hires, postdoctoral fellows, and graduate students are playing key roles in facilitating integration across the team. A major goal for YR2 has been establishing mentorship and support structures for students and faculty.

At the beginning of the fall semester, a Graduate Coordinator was engaged to provide support and mentorship for students. The Coordinator's role provides students with a focal point that links their graduate work to SSI and also coordinates activities with other SSI committees. Mentorship includes weekly informal meetings with the students as a group and meetings several

times each semester with individual students. The Graduate Coordinator provides regular feedback to the Stewardship Council on graduate student experiences, issues and problems. Cohort building activities for fall semester included organization of on-campus events for the World Sustainability Development Teach-In Day on December 3, 2010. Students worked in teams to organize a workshop for members of the Senior College to learn about sustainability science and an interactive workshop between Cooperative Extension and SSI. SSI Advisory Board Chair Robert Kates gave the keynote address for the day's events.

In YR2, SSI research teams paired undergraduate research interns with SSI graduate students who provided direct mentorship and research support. Additional supplemental funding to directly support undergraduate students encouraged these partnerships to develop and thrive. For example, graduate students Colleen Budzinski and Bridie McGreavey created the K-A Undergraduate Research Assistant Mentoring Program for students on the Knowledge-Action team. This group meets every week for one hour and provides support for undergraduate research assistants on the K-A team. Support activities include library research training, reflective research practices such as journaling, research proposal development, and career guidance discussions.

Another focus for YR2 has been to establish and continue team activities and events that encourage informal mentoring opportunities and build integration and synergy across the team. In January 2011, a bi-weekly Integration Discussion Group was established. These discussions are open to all team members and focus on conversation rather than presentation. Our goals are to encourage integration, identify opportunities for collaboration, promote interdisciplinarity by building common language, and present research to a friendly and supportive audience. The format for the discussion is a brief presentation on a team member's research interests, followed by a facilitated discussion arranged around a series of guiding questions. This also provides opportunities for new faculty and postdoctoral fellows to present on their research first encouraged integration.

Other continuing team activities include monthly all-team meetings and an annual research retreat (May 2011). All-team meetings for YR2 have focused on presentations on research progress followed by in-depth discussions that help build integration and collaboration. A full-day SSI Workshop is scheduled for April 15th. It will include introductory workshops in SES and K-A, presentations from all research teams, and a poster competition for SSI graduate and undergraduate students. Core faculty also participate in monthly Research Council meetings.

Retreats are held annually. There were two retreats held in YR1, one at the beginning of the project (August 2009) and one towards the end of year 1 (May 2010). There was only one retreat held in year 2 (May 31-June 1, 2011).

The May 2010 retreat (YR1) focused on research progress and integration strategies. Output from the retreat outlined areas of potential collaboration for the team in Year 2 as well as challenges needing to be addressed. Three major areas of action that emerged were integration, team communication/collaboration and SES/K-A focused learning.

The Stewardship Council used the May 2010 retreat report to implement strategies to assist the team in working towards some of these major areas of need. These strategies included: establishment of Research Council; issuance of integration RFP and approval of four integration projects; development of data management plan; initiation of integration discussion group; development of SES and K-A workshops; development of internal team web site; hosting of SSI April 15th Workshop; focused team learning at meetings, workshops and conferences.

The May 2011 (YR2) retreat also focused on long-term planning for SSI including capacity building in and beyond the EPSCoR grant. Action items coming out of the retreat included: long-term planning for the Sustainability Solutions Center; additional focus on cross-team research; building/maintaining long-term collaborative relationships with stakeholders; doing more to incentivize external grant proposals and synthesis papers; and continued strengthening of internal network and integration structure. The Stewardship Council is completing a plan for addressing these items in collaboration with the Management Team and Research Council during the upcoming year.

Community Colleges:

SSI Strategic Plan Objective #5 is to engage community colleges in related workforce development activities. Planning began in the fall of 2010 by researching some of the best practices throughout the nation that are utilized to engage community colleges, and by examining the mission and curriculum of each of the state's community colleges. Eastern Maine Community College was selected to be approached first, as they are located close to UMaine and there are some existing relationships that can be built upon. The project PD and Associate PD held a very positive meeting with EMMC administration in March 2011, with the result that they will be submitting a workforce development proposal to Maine EPSCoR for consideration (by May 2011). A second community college will be approached in April.

General Workforce Development & STEM Education:

The general workforce development & STEM education goal for this project is to "Prepare Maine's current and future STEM workforce through coordinated programs and opportunities, training, and knowledge dissemination."

SSI Strategic Plan Objective #1 for this goal is to implement and support related STEM programs and opportunities that directly engage students and teachers at all levels. During YR2, this has included the following programs, in addition to the efforts detailed in the Broadening Participation section above.

***Maine EPSCoR High School Research Internship Program*:** This program provides research internships to high school students in order to allow them work with UMaine faculty and graduate students in STEM areas. The students are active participants on a research team, working in labs and in the field, assisting researchers and presenting the results of their collaborations in reports and public presentations. Dr. Barbara Cole serves as the Coordinator for this project, and students submit a formal application through their schools and are chosen in a selective process.

In YR2, 21 high school students participated during July and August 2010, including 18 students from Orono High School and 3 students from Bangor High School. In addition, two students from the summer program elected to continue their internships through the academic year. Planning is currently underway for the summer of 2011 (application process will begin in April) and ME EPSCoR is working to expand the Bangor High School involvement.

This program provides high school students with the opportunity to directly participate in cutting-edge research with faculty teams at a time when they are thinking about and formulating their post-high school plans. Through interviews with these participants we have determined that many can develop or solidify an interest in studying a STEM field in college through their experience conducting what they consider relevant and beneficial "real-world" research. 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.

National Girls Collaborative Project: see Diversity & Broadening Participation above

Expanding Your Horizons: see Diversity & Broadening Participation above

Native STEM Scholarship Development Program: see Diversity & Broadening Participation above

Cyberinfrastructure: additional educational activities can be found in the Cyberinfrastructure section.

Teacher Professional Development:

SSI Strategic Plan Objective #2 is to promote educator professional and leadership development in STEM, and foster STEM approaches and activities that value prior learning across subjects. This was addressed through support of the following:

Maine Center for Research in STEM Education (RISE): The RISE Center has been an on-going partner with ME EPSCoR to provide STEM professional development opportunities for K-12 teachers and pre-service teachers. Due to the Center having recently received a $12M NSF MSP grant, their concentration during this year has been on starting up this Maine Physical Sciences Partnership (PSP) program. The Maine EPSCoR Director serves on the PSP Advisory Committee and works to find areas of synergy between the two programs so that supplemental collaborative activities can be implemented in YR3. The RISE Center Director also serves on the ME STEM Collaborative Steering Committee, and presented the PSP project at a general membership meeting in order to generate further collaborative possibilities with the statewide STEM partners. ME EPSCoR is looking at the potential of integrating some of these ideas into its programming during YR3.

Governor's Leadership Academy: In partnership with the Maine Department of Education and the Maine Mathematics and Science Alliance, ME EPSCoR supported the second year of the Governor's Academy for Leadership in Science and Mathematics project for 24 K-12 teachers. This academy engages these highly-skilled mathematics and science teachers in over 100 hours of professional development that will help them become leaders within their own classrooms, schools, and districts. The impact of this program will continue to be studied over the next six months, with interviews that focus on the impact on teachers in terms of their classroom practice as well as changes in STEM leadership roles they have been assuming in their schools and districts. Comparisons of interview results from the fall of 2010 to summer 2011 will also be undertaken, and results will be reported in our YR3 annual report.

STEM Baseline Studies & Strategic Planning: SSI Strategic Plan Objective #3 is to conduct statewide STEM baseline & impact studies and engage in statewide strategic planning that focuses on responding to identified needs.

During YR1, Maine EPSCoR, in alliance with the Maine STEM Collaborative, the Maine Department of Education, and the Maine Mathematics and Science Alliance, began a process to commission a comprehensive STEM landscape study for the state. This was in response to a need identified by the State legislature, which pointed to a lack of meaningful baseline STEM data being available for the state. As indicated in the YR1 annual report, the study was to consist of four components: 1) all K-12 teacher certification and background; 2) student achievement

and aspirations in STEM; 3) statewide study of STEM capacity; and 4) correlation with Maine workforce data.

Early on, it became apparent that different portions of the study would most effectively be performed by different methods, and under various avenues of support (rather than one large study). Therefore, the following study components were implemented:

1) ***K-12 teacher certification and background***: The Maine Mathematics and Science Alliance (with their own funding) completed an initial study of teachers in grades 6-9 to assess the extent of academic preparation in science, and to assess their participation in in-service workshops & courses. In order to provide a more complete picture of K-12, Maine EPSCoR commissioned a similar study of teachers in K-5 and grades 10-12 (NSF-supported) – these teacher surveys were completed by December 2010. The analysis and the resulting report for both pieces were completed June 2011, and is pending release.
2) ***Student achievement and aspirations in STEM:*** The Northeast & Islands Regional Educational Laboratory at EDC was commissioned to look at existing student and teacher data relative to STEM and provide a descriptive summary. (This study was self-funded by REL as part of their mission, and overseen by the Maine Department of Education.) The first part of the report looked at mathematics and science in 5^{th}, 8^{th}, and 11^{th} grades, and the second section looked at K-12 certification endorsements. All data was disaggregated as much as possible by geographic region, school districts, and poverty levels. Preliminary results were presented at the Maine EPSCoR State Conference in November 2010, and raised additional questions that were to be examined prior to issuing a final report. However, REL encountered funding cuts and it was recently determined that they would not be able to do this follow-up. Therefore the initial reports are now being finalized for release.
3) ***Statewide study of STEM capacity***: In July 2010, Maine EPSCoR contracted with the Learning and Teaching Division of the Education Development Center, Inc. in Newton, Massachusetts to conduct this component of the study (NSF-funded). The study was completed November 2010, and the report was released by the Maine STEM Collaborative. Results were also presented at the Maine EPSCoR State Conference in November 2010. Excerpted key points made in this study can be found in Appendix 14: Statewide Study of STEM Capacity.
4) ***Correlation with Maine Workforce Data***: The Maine STEM Collaborative, Maine EPSCoR, and the Maine Department of Education are currently exploring how to most effectively incorporate Workforce Data from the Maine Department of Labor into an Executive Summary report that encompasses all of the above studies. (There has been some delay due to a personnel change-over at DoL.)

As of June 30, 2011, all of the above study components have been completed and reports received as described above. During the first part of YR3, Maine EPSCoR will work with the Maine STEM Collaborative and the Maine Department of Education to create an Executive Summary that summarizes all of the study components in a concise fashion. We are looking at a tentative completion and release timeframe of mid-fall 2011 for this summary.

While only the STEM Capacity study (#3 above) has been officially released, the initial findings from these reports have already been widely used by the Collaborative to inform the new Governor, new Maine Department of Education Commissioner, new legislative members, the state Education Committee, the University of Maine System Chancellor, and other stakeholders of the challenges that the state faces in STEM education. An immediate result has been that in June 2011, a formal Governor's STEM Council was approved and will work with

groups such as the Maine STEM Collaborative, Maine EPSCoR, the RISE Center, MMSA, and businesses/industry to effect change in support of STEM education. The Maine Department of Education has also utilized these results in creating a new STEM Strategic Plan for the state.

The Maine STEM Collaborative is poised to finalize its strategic action plan based on needs and priorities that are identified by the studies, and will now be working to encourage its member organizations to do likewise. In addition, Maine EPSCoR is poised to support key actions in YR3 such as a STEM Partnership program that will help respond to identified needs.

While it can be difficult to draw firm correlations between cause and effect when dealing with long-term issues such as student STEM participation, aspirations, and achievement, by having this baseline data, these studies now put Maine in a much better place to be able to potentially determine whether subsequent STEM efforts are having an impact. In addition, the Maine Department of Labor, in a collaboration with the Maine Department of Education, has begun a longitudinal study of K-12 students that will also assist in the ability to better identify trends and impacts.

All STEM programming supported by Maine EPSCoR will have an evaluation component, and every attempt will be made to seek to correlate change and future impact with the baseline data outlined in these studies.

Maine STEM Collaborative: SSI Strategic Plan Objective #4 is to work with the Maine STEM Collaborative, taking a leadership role in building, integrating, and implementing best practices in STEM across the state.

In order to have a greater effect on statewide STEM workforce development and education, Maine EPSCoR is a key member of the Maine STEM Collaborative, which 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. (See Appendix 1 for Steering Committee membership.) Maine EPSCoR Director Vicki Nemeth is a founding member of the group, and serves on the Collaborative's Executive Committee and Steering Committee. She works closely with the group to assure that the RII workforce development and educational outreach efforts are aligned with the Collaborative's goals, objectives, and strategic plan, and that collaborations are utilized as much as possible to maximize resources and efforts.

In addition to providing programming through the RII project, Maine EPSCoR plays a vital role in the state's overall STEM efforts by being able to provide resources in key areas for the Collaborative. Planning is underway for the Collaborative's third STEM Summit in winter 2012 at Colby College (one of our SSI partner institutions), and Maine EPSCoR will again support this effort. This event brings together stakeholders from diverse sectors to discuss and learn about the status, strengths, and needs of STEM education in Maine.

In addition, the Collaborative has taken a lead role in educating the state's new Governor, Department of Education Commissioner, and legislators regarding the importance of STEM to the state. Maine EPSCoR developed materials to assist in this effort, and has been part of the on-going meetings with these stakeholders.

Maine EPSCoR also took part in the strategic planning activities that lead to an Environmental Literacy Plan and an overall STEM Strategic Plan for the state Department of Education.

d) Cyberinfrastructure:

The cyberinfrastructure goal for this project is to "Utilize cyberinfrastructure to improve communication, collaboration, and visualization capabilities that enable innovation and competitiveness in the sustainability science focus area." The following narrative details YR2 progress under the three main objectives for this goal. (Also see Appendix 2: Objectives, Strategies & Benchmarks for specific metrics, and Appendix 11: SSI Data Management Plan.)

All Maine EPSCoR CI activities continue to be integrated as part of the overall Cyberinfrastructure plan for the state, as well as for the Northeast Cyberinfrastructure Consortium efforts for the New England region, and the Northeast Education and Research Network (NEREN). Maine EPSCoR CI committee members are actively engaged in all.

Videoconferencing & Bandwidth Cyberinfrastructure:

The SSI Strategic Plan Objective #1 for cyberinfrastructure is to expand statewide videoconferencing capabilities and upgrade high bandwidth fiber interconnections. Given the integrated, multi-disciplinary, and multi-institutional nature of this project, state-of-the art communication tools are an absolute necessity, and YR1 strategies included the purchase and installation of equipment in this area.

However, surveys have indicated that the majority of SSI participants are not comfortable using communications technologies. Therefore, YR2 strategies for this objective were designed to focus on videoconferencing and webcam training activities. To that end, a break-out session was part of the 2010 Maine EPSCoR State Conference (12 participants), and included distribution of webcams, training in their use, and training in videoconferencing utilization. An additional 2-3 training sessions will be held May-June 2011 at various locations throughout the state.

UMaine Systems IT personnel also provided training for the Maine EPSCoR and SSI office staff in videoconferencing and in utilizing the statewide Tandberg "movi" system for a wide range of communications purposes. The impact is that this staff is now in a better position to support the SSI participants in their technological learning processes.

Planning is also underway for the creation of an SSI Communications Center at the Mitchell Center at UMaine, which is the "home base" for SSI. This center will feature large-scale videoconferencing capabilities that include large wall projection screens, multiple high-definition cameras and projectors, archiving/streaming capabilities, audio systems, up to 90 videoconference connections at a time, etc. This will provide a much-needed ability for all SSI participants to effectively take part in interactive workshops, meetings, discussion groups, classes, etc. from anywhere in the state. Renovation and installation will take place during YR3.

Communication & Visualization Tools:

The SSI Strategic Plan Objective #2 is to make new communication and visualization tools available. Therefore, the SSI Cyberinfrastructure research team at UMaine (Segee, Zhu, Cousins, Koski, & graduate student King) has a research and development focus on the utilization of tools for collaborating at a distance, which will assist the SSI teams to communicate and collaborate as a virtual organization.

During YR1, this team made significant advances and improvements to the proto-type visualization wall at the Foster Center for Student Innovation at UMaine. During YR2, work has been performed to significantly improve the performance of this and other prototype visualization systems, with enhancements such as frame rates and audio processing that allow for

full motion video as well as videoconferencing. The wall systems can also now use the Windows operating system as well as Linux, and testing of increased monitor and display sizes has been successful.

This has laid the foundation to be able to include a large-scale visualization wall in the planning for the SSI Communications Center at UMaine's Mitchell Center. This, combined with the other Center capabilities, will allow SSI participants throughout the state to collaborate on data analysis and visualization through remote linkages.

In YR1, Maine EPSCoR had purchased twenty Apple laptop computers that the CI research team configured for use in testing dynamic visualization walls for K-12 outreach efforts. This infrastructure leverages the team's NSF ITEST project (Segee, Zhu, Cousins) that focuses on modeling and visualization in climate change using the UMaine supercomputer and the Maine Laptop Initiative (MLTI) laptops in middle schools. Real-world data is compared to model outputs, and teachers and students learn to deal with data, geographic information, and collaborative tools.

During YR2, this prototype was refined, and instrumentation of the server code used in serving tiled displays in the K-12 classroom resulted in identifying a bottleneck that limited performance. By using multi-threaded code, a performance improvement of 200%-300% can be achieved. The code modification is being tested and it is anticipated that this will be made into a permanent change to the production code. Once finalized, this education technology will be used by Maine EPSCoR in YR3 to initiate SSI-specific pilot projects with K-12 schools.

During YR2, Maine EPSCoR purchased a 128 core HP Proliant Cluster having 128 GB of RAM and 20 Gbps Infinaband, to build SSI cloud compute capabilities for SSI, and the CI research team has now deployed cloud computing using Eucalyptus, an open source system based on Amazon cloud services. This deployment includes several server machines, including a development machine and a production machine for SSI. A significant benefit of the cloud is the ability to update and roll back changes with minimum disruption. Furthermore, the development and production machines can be assured to begin as exact duplicates of each other.

The HP cluster is being developed specifically to provide cloud services for the SSI project. This has the added advantage that researchers from around the state can collaborate on a stable platform. Data in the databases can be accessed via the cloud without the need for researchers to have local copies of the data. This greatly improves the quality of the data and virtually eliminates the possibility of data loss. The cloud is serviced by the 100TB NAS disk array, providing ample storage. In particular, a cloud machine has been set up for storage of SSI project related data. The server currently uses D-Space for overall data storage tracking, including metadata libraries, and GeoServer with POST-GIS to manage spatial data. Project management and tracking capabilities have been installed, and all SSI teams have access to the server for data storage and processing.

The HP cluster project above (initiated in spring 2011) represented UMaine's first dedicated approach to utilizing cloud computing, and was very much driven by the complex and virtual organization nature of SSI, which encompasses institutions and participants across the entire state of Maine. In order to continue to support the collaborative nature, integration, growth, and sustainability of SSI, it had become apparent that this was a necessary progression for SSI to pursue. Currently there is a two-fold focus for the cluster: 1) communication and informational purposes (virtual organization); and 2) research purposes (data).

Virtual machines using Eucalyptus are now being used for the meSSI intranet, which went live in May 2011 and allows both a public and a semi-private area on the web for SSI

management and participants to share project information, updates, resources, videos, calendars, photos, etc. The web presence is based on Wordpress. Having the service on the cloud allows for many important features that would otherwise be difficult or impossible. It is anticipated that future cloud uses will include research meetings and graduate level classes.

The SSI Cyber-Informatics group has also designed the SSI Data Management plan to take advantage of the cloud computing approach for research purposes, as there is a need for data handling and accessibility that spans the entire SSI portfolio. The creation of this SSI Research Cloud service is initially being driven and utilized by some of the following SSI emerging applications/research activities:

a. A suite of coupled climate model simulations for the 20th and 21st century (based on the IPCC A1B scenario), statistically downscaled to produce a high spatial resolution dataset for Maine and the New England region. The tentative timeline for climate model simulations is Fall 2011-Spring 2012; an updated version based on the CMIP5 project climate simulations for the next IPCC assessment will dovetail the World Climate Research Program's 2012-2013 timetable regarding the availability of new simulations. Data standards will be consistent with the Unidata and Earthsystemgrid.
b. We are also exploring the implementation of the generalized tool for the assessment of hydrologic design for culverts in a changing climate. Current work by students in the Computer Science program involves development/programming of the front-end, as well as exploring the extent to which the databases will be used (for example, downscaled climate change scenarios). The design methodology will be coded within the Statistical Computing environment R (already available in meSSI), with a user-friendly front end. The assessment of uncertainty, multimodel combination of scenarios, as well as graphics are some of the foci for this demonstration research project. Detailed work is expected to begin Fall 2011, and involve close collaboration with the UMaine Supercomputing Center personnel.
c. The SSI project is both a consumer and producer of large volumes of diverse and complex data. Recognizing the importance of managing this data well, the data management group within SSI has been working to ensure that all relevant data is gathered, stored, and analyzed in effective, efficient, and reliable ways. That ongoing work will benefit greatly from a few specific and complete examples of the data management tasks. The primary goal of an internship-based summer 2011 project is to develop and document such examples. An important feature of the proposed work is that it emphasizes explication of end-to-end data management (a depth-first approach) in contrast to, and complementary to, the stage-wise (or breadth-first) approach being pursued concurrently. In building this application, a significant challenge is the heterogeneity of computing platforms used by constituents to access the data and results. Using a very simple Web-based format (simple HTML) helps ensure accessibility on diverse platforms but only at the cost of giving up modern Web-based standards (e.g., Javascript libraries). Prior work (in another project) has partly addressed this challenge and provided the RFDE framework for deploying applications in dynamic client environments based on a REST (Representational State Transfer) architectural style that aids robustness. Early work this summer has focused on mapping the needs of this SSI application *(as described in a. and b. above)* to the RFDE framework and writing the necessary tools and writing the necessary tools and Web widgets.
   Currently the CI research team is in discussions with Cisco, Dell, VMware, Intel, AMD, and

others to design the next large and scalable compute platform for use with High performance computing and cloud platforms for UMaine's supercomputer, which will directly benefit the SSI capabilities.

Maine EPSCoR will also be hosting an NSF workshop on "Science: Becoming the Messenger" on April 14-15, 2011, which will also feature training in the use of more technologically-challenging communication tools (50+ SSI participants).

Data Planning:

The SSI Strategic Plan Objective #3 is to develop plans and systems for data handling across research projects and institutions.

To that end, during YR1 the UMaine SSI CI research team forged a good working relationship with SSI researchers at USM in order to evaluate the data needs for the overall SSI project. The team created a dedicated SSI server (messi.target.maine.edu) as the SSI database and linked it to the 100TB disk storage system at the UMaine supercomputer. An authentication system for SSI users was put into place that transcends campus boundaries, and includes an automatic data backup process.

During YR2, a formal SSI Cyberinformatics team was formed to ensure that there was an appropriate high-level focus on data handling for the SSI project. This team includes SSI scientists, engineers, computer hardware specialists and computer software specialists from several participating institutions.

Team members continued working together to form the hardware and software framework for the SSI data management. This includes multiple virtual machines in the computer cloud that serve as database servers as well as a web portal allowing for public access for public data and password-protected access to non-public data. This effort will be completed by June 2011.

The SSI Cyber-Informatics group has developed an overall data sharing and management plan for the SSI project that is designed to support data management and access for: (a) the internal investigations of the SSI project, (b) support of the Sustainability Science Partner teams throughout the state, and (c) sharing data as relevant to related broader national and international scientific investigations including NEON, LTERs, NBII, and CZO, CUAHSI. This plan will continue to be refined during the next year. (See Appendix 11: SSI Data Management Plan.)

SSI CI efforts are coordinated with the activities under the Maine RII Track-2 project to ensure reliable data workloads and broad access to data through on-Campus, multi-Campus, and statewide cyberinfrastructure resources. The SSI Cyber-Informatics group will continue to work to provide open access to project generated data to researchers, educators, students, policymakers and citizens to the extent allowable by law, regulation, and data confidentially requirements as required by Institutional Review Boards.

To achieve a clear understanding of the range of data needs and types of data used within the portfolio of SSI projects, SSI teams were surveyed in January 2011 to identify data sets currently in hand as well as data sets to be developed, and how data are being currently stored and managed. The range in data types is very broad covering imagery, streaming sensor data, time series, geospatial data sets, model results, and results from survey questionnaires among others. The themes cover ecological, climatic, social, economic, and legislative. Many of the data sets of interest are federal or state generated data sets. In some cases, these have been customized or value-added by a team. The heterogeneity assures that there is not a one size fits all data base management or metadata standard solution. The SSI Cyberinformatics team is working to avoid duplication of data sets that are accessible from other sources and will work with the teams to

coordinate data and minimize redundancies. They will follow up this initial inventory with more in-depth discussions with individual teams on access issues and metadata documentation that supports the team needs, as well as ensure consistency with community metadata standards in SSI researcher's sub-discipline.

e) Outreach and Communication:

Outreach and communication are fully integrated throughout all aspects of this project, as it is a key component of the sustainability theme. Therefore, many activities and programs have already been detailed in other sections and will not be repeated here.

The outreach and communication goal for this project is to "Create and maintain an effective outreach & communication network through strategies that encompass all participants, stakeholders, and the general public."

SSI Outreach and Communication in the Research Component:

Internal communications:

The SSI Strategic Plan Objective #1 is to create and maintain an effective internal communication network among SSI team members (including those at participating institutions) that enables information sharing, fosters collaboration, and develops interdisciplinary teamwork. Within the team, monthly team meetings and the annual SSI all team event (April 15) are being expanded to include all team members. The team newsletter doSSIer also continues to be published on a bi-weekly basis and circulation has expanded to include faculty at partner institutions. Plans to develop additional avenues for communication across the teams are underway. Goals for these communication strategies include: 1) increase team knowledge in research areas; 2) provide more opportunities for integration and collaboration between team members; 3) development of interdisciplinary skills. Details on new approaches are outlined below.

- *Integration discussion group:* Every other week, one team member will provide a brief presentation on their area of research followed by Q&A. These will be informal and all team members will be invited to participate. Purpose: Introduce approaches of different disciplines and develop knowledge of project contributions. (Every two weeks, implemented spring semester 2011.)
- *Workshops:* Hands-on workshops are under development that will be open to all team members and will provide opportunities to increase knowledge and share learning experiences in a small group format. Purpose: Enhance knowledge of key research areas of significant value to team learning across the project including SES, K-A and OI. (Introductory workshops on SES and K-A will take place at the SSI team workshop on April 15, 2011.)
- *Visiting scholars:* Invite experts to campus both to provide seminars/workshops in key research areas, and to work with individual teams and team members to enhance specific project learning including knowledge and approaches. Team members from all institutions will be invited to participate. Purpose: Provide different perspectives and learning opportunities for teams and team members. Increase awareness of SSI in the academic community. (Fall 2010: Elinor Ostrom.)
- *Web site (internal*): Create an online space where teams and team members can share information, access important documents, locate resources, retrieve contact information for other team members, and find information on upcoming meetings and events. The site will be

password protected for access by team members only. Purpose: Increase collaboration & integration between project teams. Provide networking and communication opportunities for team members. (Under development. Anticipated to go live mid-April, 2011.)

Stakeholder Networks:

The SSI Strategic Plan Objective #2 is to establish on-going communication networks with stakeholders. Strategies for increasing integration across teams and stakeholder groups require a robust communication plan. SSI describes stakeholders as: Any person or group who has a vested interest in the success of the project. This includes NGOs, government agencies, municipalities, and the private sector. Goals for communication strategies with stakeholders include: 1) update stakeholders on progress of the project; 2) provide opportunities for collaborative input and co-production of knowledge; 3) disseminate information on project research, highlights and news; 4) increase networking opportunities; 5) develop partnerships for evaluating the effectiveness of sustainability-related policies and practices.

Details on new approaches are outlined below.

- *E-newsletter:* Distributed semi-annually to all key stakeholders (stakeholders directly partnering with project teams) and team members, the newsletter will provide updates on progress and successes across the research project. The newsletter will also be made available to other interested stakeholders. Purpose: Provide stakeholders and teams with opportunities to identify cross-project synergies and economic development strategies. (First edition publication date: June 2011.)
- *Annual SSI Conference:* 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. Purpose: Provide a forum for dissemination of research information and project progress. Present opportunities for networking and discussion between SSI teams and a wide range of stakeholders to assist with identification of new synergetic partnerships and economic development strategies across the state. (First conference held in partnership with the Maine Water Conference: March 16, 2011. Over 350 people attended the conference including 250 stakeholder participants.)
- *Writer:* A freelance writer was hired in summer 2010 to assist SSI in producing written materials for a public audience.

On-going communication projects for YR2 include maintenance and expansion of the database, maintenance of the SSI web site (a complete update is scheduled for May 2011), and updates of printed materials for public distribution including faculty profiles. A SSI brochure and profiles of research projects are under development (June 2011). We have also hosted the following events that have been open to the public: four seminars, the Mitchell Lecture on Sustainability, and a two-day workshop on developing communication skills.

Nobel Laureate Elinor Ostrom was the keynote speaker at the 2010 Senator George J. Mitchell Center on Sustainability that took place on October 21, 2010 (see highlight). Over 450 people attended the event with over 25% of attendees coming from off-campus.

Building and maintaining partnerships with stakeholders is a major component of SSI research. As a result, faculty and students have held over 200 formal and informal meetings with potential 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.

Scientific Community:

The SSI Strategic Plan Objective #3 is to disseminate & communicate research progress and results to the scientific community. Information on research publications and technical presentations are included in Appendix 8 and 9. Updates on research projects and progress are available on the SSI web site that will undergo a major update in May 2011. We also hosted Elinor Ostrom for two-days in fall 2010. During her visit, she met to discuss her research with several groups including faculty and students at the School of Economics, Margaret Chase Smith Policy Center, and the School of Marine Sciences. The culmination of her visit was her keynote address at the Mitchell Lecture on Sustainability.

In addition, Maine EPSCoR sent four SSI faculty members to the "Living on the Earth" workshop in Alaska in February 2011, where they presented the SSI model to about 60 participants from other EPSCoR states. Key outcomes from that interaction included:

1) the formation of a nationwide coalition of SES EPSCoR states and elected delegates from each state (Lindenfeld is serving for Maine).

2) Maine EPSCoR will host a "Living on Earth" workshop after the Virgin Islands next year. Lindenfeld is representing Maine to help develop the Virgin Islands' proposal for funding, and Alaska will offer mentorship and guidance.

3) Maine EPSCoR SSI is working together with Alaska to develop a short proposal to NSF EPSCoR to set up an exchange program for SSI faculty and graduate students. The Alaska workshop enabled us to see areas of overlap and difference between Maine and Alaska's projects, and we identified the need and opportunity for learning from each other about interdisciplinary collaboration and sustainability science research.

4) SSI faculty are actively pursuing other NSF funding with colleagues from Alaska as a result of this visit. One of the key initial opportunities is to co-develop an NSF ISE proposal that focuses on visualization as a means for informal science education and communication.

General Outreach and Communication to the Public and K-12:

The SSI Strategic Plan Objective #4 is to build scientific literacy in sustainability science for the general public and K-12 community. Additional information on public events, website maintenance and updates, bi-annual newsletter, and printed materials are included under Objective #2 (above).

As planned, Maine EPSCoR is partnering with the Maine Public Broadcasting Network to produce and air 2-3 documentaries annually that focus on highlighting SSI research. Accompanying activities will include podcasts, materials, and website interactions. Once the first two documentaries are completed (by September 2011), Maine EPSCoR will also utilize its video production capacity to develop related K-12 curriculum that would make use of the Maine Laptop Initiative capacity to involve middle and high school students (YR3). The first documentary has been completed and was screened by Maine EPSCoR during April 2011. The second is currently under development and will be completed by June 2011. Both documentaries will be aired late summer/early fall by MPBN, and offered for regional distribution to the New England states.

In addition, SSI will be podcasting major events to be posted for the general public on the SSI website. These will be available once the website is updated (May 2011). Public presentations play an important role in communicating SSI research to the public, and in YR2, team members carried out 22 presentations to a wide variety of public audiences.

Several websites provide information to stakeholders and the general public regarding SSI

research and education projects. Links to all are provided from the main SSI Web site and include:

- SSI research site: http://www.umaine.edu/sustainabilitysolutions/
- Hancock County Firewood Project: hancockcountywoodshed.wordpress.com
- Belgrade Lakes Watershed Sustainability Project: http://web.colby.edu/epscor
- Hemlock Ecosystem Management Study: http://www.unity.edu/AboutUnity/MeetOurFaculty/FacultyResearch/HEMS/Welcome.aspx
- Saco River Estuary Project: http://www.une.edu/cas/envstudies/sacoriver/index.cfm
- Maine Climate News (SSI-related) - www.extension.umaine.edu/maineclimatenews
- Signs of the Seasons (SSI-related) - http://umaine.edu/signs-of-the-seasons/
- Community Based Conservation: Maine Vernal Pools: http://www.umaine.edu/vernalpools/
- Sustaining Maine's Brown Ash Resource: http://www.umaine.edu/brownash/
- **Interactive** hydrologic analysis and modeling tool for the Sebago Watershed: http://tok.asap.um.maine.edu/sebago/
- Maine EPSCoR: www.umaine.edu/epscor (undergoing major re-development)
- Maine STEM website: www.mainestem.org

In addition to the workforce development and educational programs and activities detailed in other sections, which all involved outreach and communication, Maine EPSCoR has also engaged in the following key activities:

1) Produced a Maine STEM newsletter, and informational materials, exhibits, and presentations on the Collaborative and STEM education in Maine.
2) Produced a fall 2010 Maine EPSCoR newsletter with a spring 2011 issue pending, plus brochures, presentations, posters, exhibits, etc. that have been utilized in numerous venues.

Outreach and communication to the educational and general community included support of multiple strategies to small businesses, K-12 teachers, university and college faculty, pre-service teachers, and students, reaching 1,709 individuals participating in activities and programs that are detailed in other sections.

Maine EPSCoR has invested in equipment and software to set up a communications office with the full capacity to produce its own film, photography, and graphic-design materials. During YR2, one UMaine New Media student and a part-time Maine EPSCoR Production Coordinator were hired to help with expanded communication activities such as film, digital photography, websites, and print media (newsletters, press releases, brochures, posters, etc.).

At the NSF communicating science workshop held in Maine in April 2011, the importance of utilizing video to tell your story was emphasized by the presenters. We had previously begun an effort to create videos that showcase Maine EPSCoR, SSI, and Maine STEM Collaborative programs and activities, and are now in the process of putting this in place on a much more comprehensive scale. Videos are posted on Maine EPSCoR's YouTube site, which is directly linked to the Maine EPSCoR website, and will be on the revised SSI website. While this effort is still in its fledgling state, "hits" on the existing YouTube videos currently range from 60-135 viewers. While SSI stakeholders and other EPSCoR jurisdictions have commented that the videos helped them to find out more about Maine EPSCoR programming, our intent is to eventually create more "buzz" for informing the general public audience as well.

Maine EPSCoR had also created an initial Facebook page with the assistance of one of our New Media students. This student has graduated and we are in the process of recruiting someone new who can fully populate this page with information and keep it updated. As reinforced by the presenters at the April 2011 NSF communicating science workshop, social media needs to be part of an effective communication strategy, and Maine EPSCoR will utilize its Facebook site as another outlet for informing the general public, other EPSCoR jurisdictions, and potential stakeholders. We will also continue to investigate how Twitter could be utilized to assist statewide collaborations and efforts, and also be another informational tool for the general public.

In addition, the media students worked with an independent film-maker to produce a full-length documentary entitled "Pools of Life," which focuses on Maine's vernal pools and SSI's research in that area. This film will be distributed via DVD in the fall 2011, and negotiations are underway to have MPBN air it. Another independent film that will air on MPBN in April 2011 showcases some of the work by SSP researchers at Bowdoin College.

In addition, Maine EPSCoR also collaborated with 24 other partners in workforce development, educational outreach and communication, and human resource development (in addition to the SSI and SSP partner institutions and the SSI research stakeholders). These included:

1) ***K-12 institutions (3):*** Belfast Area High School, Troy Howard Middle School, Old Town High School;

2) ***Industry/business partners (2)***: Unum and Cianbro.

3) ***State governmental partners (2)***: Department of Education and Department of Labor;

4) ***Non-profit and other organizations (14)***: Maine Mathematics and Science Alliance, Maine Energy Promotional Council, Gulf of Maine Research Institute, Maine International Center for Digital Learning, Mount Desert Island Biological Laboratory (Maine INBRE), Maine Space Grant Consortium (NASA EPSCoR), Institute for Broadening Participation, Girl Scouts of Maine, Hardy Girls Bangor Area Planning Committee, Hardy Girls Healthy Women, Maine Robotics, Maine Pulp & Paper Foundation, Regional Education Laboratory, Education Development Center

Other educational outreach activities have been detailed in other sections but include: 1) National Girls Collaborative Project; 2) Expanding Your Horizons; 3) NSF ADVANCE; 4) Native STEM Scholarship Development Program; 5) Cyberinfrastructure activities; 6) High School Research Internship Program; 7) Maine Center for Research in STEM Education programs; and 8) Maine STEM Collaborative activities.

NSF & Other Jurisdictions:

The SSI Strategic Plan Objective #5 is to maintain outreach and communications with the NSF EPSCoR office and other EPSCoR jurisdictions. This is done through newsletters, press releases, highlights, reports, evaluations, site visits, and attendance at national EPSCoR events, as well as on-going e-mail and phone communication with our NSF EPSCoR Program Director.

f) Evaluation and Assessment:

The evaluation and assessment goal for this project is to "Utilize multiple formative and summative evaluation processes to improve the project's effectiveness and assess its impact in relation to its goals."

To achieve this, the Management Team has a five-pronged approach to project evaluation

and assessment. Formative evaluation processes will improve the project's effectiveness, and summative evaluation processes will assess its impact in relation to its goals. All evaluations will determine: 1) the appropriateness of the investment relative to accomplishments; 2) if the investment strategy yields substantial improvement in research and competitiveness; 3) if linkages between the project's research, education, and innovation efforts are effective; 4) if strategies increase participation. Findings will enhance efficacy, identify obstacles, assist in developing corrective action plans as needed, and help plan improvements. In addition, as the project progresses, UMaine's VP for Research (Project PD/PI) will review standardized Return on Investment (ROI) parameters for research centers to ensure that value added aligns with investment.

External Evaluation:

The SSI Strategic Plan Objective #1 is to contract with experienced external evaluators to annually 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. To meet this objective, Maine EPSCoR is working with experienced external evaluators Drs. Eric Welch, U of Illinois Chicago, and Julia Melkers, Georgia Institute of Technology, to annually assess the project's performance. During YR1, they assisted with the co-development of the SSI Strategic Plan as well as the final evaluation plan for the project, conducted interviews, surveys, and social network analysis, and produced the YR1 report in April 2010. Five key recommendations were made (and reported on in the YR1 annual report), which the Maine EPSCoR Management Team and SSI Stewardship Council incorporated into the revised SSI Strategic Plan.

YR2 strategies and activities for this objective included: 1) a November 2010 site visit by the evaluators was made to conduct faculty and student interviews and attend the Maine EPSCoR State Conference; 2) an YR2 on-line survey to all SSI participants (April 2011); 3) follow-up site visits to SSP institutions for interviews and case studies (May 2011); 4) evaluator formal report completed by June 30, 2011; 5) dissemination of report to SSI participants (August 2011); 6) review by Maine EPSCoR Management Team & SSI Stewardship Council, with subsequent recommendations for actions based on feedback (August 2011), and actions integrated into the SSI Strategic Plan.

The results of all YR2 external evaluation activities are part of the formal YR2 evaluation report that is still pending. An initial draft was submitted to Maine EPSCoR by the evaluators on June 30, 2011; the report is currently under review, but will be submitted to NSF EPSCoR upon finalization. Responses to recommendations will be included in the YR3 annual report.

AAAS Assessment:

The SSI Strategic Plan Objective #2 is to utilize the American Association for the Advancement of Science (AAAS) Research Competitiveness Service to provide a scientific peer review to help ensure high quality program delivery. This two-day YR2 review is scheduled for May 23-24, 2011 at the University of Maine. AAAS is currently recruiting a panel of 4-5 experienced professionals with relevant expertise, and the project site review will include one-on-one interactions with the management teams, key administrators, project personnel (faculty, postdocs, graduate & undergraduate students), outreach participants, industry/small business, and stakeholders. The panel will examine focal questions on the project objectives to help ensure continued success, and produce an assessment report by June 30, 2011. The report will be

disseminated to SSI participants (August 2011), and be reviewed by the Maine EPSCoR Management Team & SSI Stewardship Council, with subsequent recommendations made for actions based on feedback (August 2011). These actions will be integrated into the SSI Strategic Plan.

SSI Advisory Board:

The SSI Strategic Plan Objective #3 is that an SSI Advisory Board provides on-going assessment and guidance to the research project team. During YR1, the 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. The first meeting of the SSI Advisory Board took place during YR1 on Dec 15, 2009, when our EPSCoR grant had been underway for less than six months. At that early stage of SSI's development, the Board had three major suggestions for strengthening the project. The following summarizes these suggestions and briefly explains how SSI acted on each suggestion during YR2 (all were incorporated into the YR2 revised SSI Strategic Plan):

1) **YR1 Recommendation:** The team should articulate how individual SSI projects fit within a conceptual framework focused on major issues and needs regarding Maine's future, and consider how SSI projects might be scaled-up and conceptually merged.
   Actions: In YR2, we continued to articulate how SSI projects fit within a Venn diagram reflecting the major drivers of landscape change in Maine, and how these projects can help identify and examine alternative visions for Maine's future. Many SSI projects adopted a multi-scale approach to examine processes and patterns at local, regional, and statewide scales, thereby facilitating efforts to "scale-up". We also used UMaine funds to initiate research that is developing common conceptual frameworks, data management systems and analytical tools for advancing the theory and practice of sustainability science. This emphasis on integration has also led to the merger of several research sub-projects in Year 3, thereby increasing both research capacity and synergy. Plans were also developed in YR2 to issue a seed funding RFP to promote production of collaboratively authored, integrative publications. This RFP was issued on June 14, 2011.
2) **YR1 Recommendation:** The team should increase the level of interaction and integration among research teams and with stakeholders. **Actions:** Among-team interactions in YR2 increased dramatically compared to YR1. All core teams gave interactive presentations at SSI all-team meetings, which promoted among-team discussion and collaboration. Further interactions were stimulated by discussions at Research Council meetings and Integration Discussion Group meetings. Interactions with stakeholders also increased in YR2, including one-to-one meetings, group meetings, and surveys of diverse constituencies from across the state.
3) **YR1 Recommendation:** The team should develop an effective data management system.
   Actions: In YR2, the team created and implemented an SSI Data Management Plan, including a work plan detailing activities and timelines for the January-December 2011 period (see Appendix 11 SSI Data Management Plan).

Members of the SSI Advisory Board met four times in YR2 to assess the various aspects of the program and offer guidance. The meetings included:

a) October 2010 review panel of Board subcommittee to evaluate SSI integration proposals and make funding recommendations (supported by voluntary cost contribution)

b) December 2010 full Board conference call to assess SSI progress to date and offer guidance regarding SSI goals for remainder of YR2 and YR3. (See Appendix 11)
c) February 2011 full Board conference call to develop process for Board review of SSI UM/USM YR2 progress reports and YR3 proposals. (See Appendix 11.)
d) April 2011 full Board review of SSI UM/USM YR2 progress reports and YR3 proposals, including YR3 funding recommendations.

All SSI Advisory Board feedback is reviewed by the ME EPSCoR Management Team and the SSI Stewardship Council, with subsequent recommendations made for actions to be integrated into the SSI Strategic Plan.

During YR2, the major recommendations of the Advisory Board emphasized 1) the need for greater project-wide integration; 2) effective data management; 3) increased project alignment with stakeholder concerns; and 4) a stronger emphasis on solutions. The team has made major progress on all of these throughout YR2, as some were continuations of the YR1 recommendations (see summary response above to the YR1 Advisory Board report). SSI will continue to make these recommendations a priority in YR3.

In YR2 our overall response to this feedback was to continue to provide increased funding to integration and data management initiatives, expanding the scope of stakeholder engagement, and launching a project–wide focus on solutions strategies and tactics. Specific responses are:

1) YR2 Recommendation: Increased integration.

Response: Four research teams are now funded to focus on SSI-wide integration and synthesis. In addition, integration strategies are being developed by the Research Council, and are evident in great collaboration and merging of projects in YR3 compared to YR2.

Other strategies to maximize integration between teams and team members are on-going and will continue into YR3. These include establishing a bi-weekly Integration Discussion Group in spring 2011, focusing on team research at all-team meetings, initiating the Research Council in fall 2010, designing an internal team website, continuing publication of doSSIer (bi-weekly team newsletter), and collaborative team events and workshops.

2) YR2 Recommendation: Effective data management

Response: The SSI Data Management team includes a number of faculty and staff with expertise in this area including: eco-informantics, earth systems science, spatial information science, electrical engineering, and computer science.

In YR2, the team created and implemented an SSI Data Management Plan, including a work plan detailing activities and timelines for the January-December 2011 period (see Appendix 11). Two integration teams (Cyber-Informatics Plan and Integration of Socio-Economic Data Collection) were also funded in YR2. These teams will work collaboratively to ensure that plans for gathering, analyzing, storing and using data are coordinated across the entire research portfolio thereby directly addressing the concerns expressed by the Advisory Board.

3) YR2 Recommendation: Increased project alignment with stakeholder concerns

Response: Interactions with stakeholders also increased in YR2, including one-to-one meetings, group meetings, and surveys of diverse constituencies from across the state. Research collaborations with 138 stakeholder organizations took place during YR2. Participation included over 200 meetings with 5 SSI/SSP institutions, 22 institutions of higher education, 18 private-sector organizations, 46 governmental agencies, 44 non-profit organizations, two K-12 schools and 1 private landowner. Thirty-five stakeholder groups represent national or international interests. SES or K-A models have been used in 22 public presentations and 5 formal presentations of testimony. These activities have resulted in 22 researchers serving on external

boards and scientific advisory committees, demonstrating SSI's long-term commitment to stakeholder engagement.

A major state-wide survey of municipal officials was conducted in YR2 by the K-A team. We anticipate that once analysis of the survey has been completed, results will provide an invaluable resource to the team allowing for reflection on pro ject alignment with the concerns expressed. Other surveys of stakeholder concerns and needs are providing additional insights and these results are being discussed with the SSI team to increase alignment between stakeholders and SSI research.

During the May 2011 retreat, several suggestions emerged regarding formation of a "stakeholder" council. A model for this may be the Cooperative Extension/community volunteer model. We will investigate the feasibility of working with our Extension colleagues to form such a council during the upcoming year.

4) YR2 Recommendation: Stronger Emphasis on Solutions

Response: We recognize that this is a major area of concern of the Advisory Board and we have placed a special emphasis on "solutions" as a priority for YR3. It should be noted that the YR3 RFP incorporated language that strongly encouraged teams to consider and assess how their research process and outputs/outcomes might result in solutions. YR3 plans for All-Team and Integration Discussion Group meetings will also focus on solutions. Our first solutions-focused Integration Discussion Group took place on July 14, at which we established initial goals and guiding questions to help frame these discussions. We also will investigate potential proposals that seek to better define and implement solutions in the context of sustainability science.

NSF EPSCoR Reverse Site Visit and Site Visits:

The SSI Strategic Plan Objective #4 is to participate in NSF EPSCoR reverse site visits, site visits, conferences, and workshops, and to host NSF EPSCoR program officers and directors in visits to the Maine EPSCoR project sites.

YR2 strategies and actions for this objective include:

1) September 2010 NSF EPSCoR Reverse Site Visit: The Maine EPSCoR Project Director, Associate Project Director, SSI Research Project Director, and a member of the SSI Stewardship Council participated in a Reverse Site Visit at NSF. Thirteen recommendations were made by the RSV panel, and ME EPSCoR has been working with our NSF EPSCoR Program Director over the past few months to ensure that we adequately implement actions to address these.
2) October 2010 NSF EPSCoR PA Meeting: the Maine EPSCoR Assoc. PD and the Maine EPSCoR Program Assistant and Diversity Specialist participated in this meeting in Montana to develop "best practices" for Project Administrators and Outreach Coordinators.
3) November 2010 Maine EPSCoR State Conference: NSF Program Officers Tom Baerwald (Coupled Natural & Human Systems) and Amber Story (Behavioral and Cognitive Sciences) gave presentations on opportunities in their Directorates at this event, and consulted with SSI researchers throughout the day.
4) January 2011 NSF EPSCoR PD/PA Meeting: the Maine EPSCoR PD and Assoc. PD participated in this meeting in New Orleans to learn about updates and clarifications in the NSF EPSCoR program.
5) March 2011: NSF EPSCoR Program Director Jennifer Schopf spent a day at Umaine taking part in presentations and activities with the SSI participants. Her guidance,

clarifications, and observations during this site visit were utilized as the SSI Strategic Plan revisions were made.

6) June 2011 Maine Technology Institute SBIR/STTR Workshop: Ben Schrag, NSF SBIR/STTR Program Director will attend.

Internal Project Evaluation and Assessment:

The SSI Strategic Plan Objective #5 is for the Maine EPSCoR Management Team and the SSI Stewardship Council to engage in on-going evaluation and assessment review to ensure that the project achieves its goals, objectives, and benchmarks.

The Maine EPSCoR Management Team (PD/PI Mike Eckardt, Assoc. PD/Co-PI/Maine EPSCoR Director Vicki Nemeth, and Co-PI/SSI Research Project Director David Hart) have met at least monthly in person to plan and oversee activities, address issues, review administrative and programmatic progress, and make decisions on needed changes and solutions. The SSI Stewardship Council meets at least bi-weekly to address research-related issues, recommend changes and solutions, exchange information, and plan and coordinate programs and activities.

All recommendations resulting from evaluation and assessment activities are reviewed and acted upon by these teams, with final decisions on actions being incorporated into the SSI Strategic Plan. Both teams also review the specific progress on the SSI Strategic Plan Strategies and Benchmarks metrics (See Appendix 2).

In September 2010, Maine EPSCoR formally reported on progress to the Maine Innovation Economy Advisory Board (MIEAB), which acts as the state's EPSCoR Committee. The Maine EPSCoR PD, who is a member of the MIEAB, also provides on-going updates throughout the year, and brings Board member feedback to the Maine EPSCoR Management Team for action.

All SSI teams in the Center for Sustainability Solutions 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 Center's integrated portfolio, and all projects are evaluated using a common set of metrics.

SSI research progress is monitored, evaluated, and reported at three levels:

- Overall SSI project progress on the main goals and objectives for the three cross-cutting research themes of SES, K-A, and OI.
- Overall progress on project-wide integration in the model problem set being studied.
- Other individual team project progress as applicable.

All SSI teams in the Center for Sustainability Solutions 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. These have/will include:

1) ***Original portfolio selection (mid-YR1 to mid-YR2):*** 24 prospective UM/USM research teams submitted proposals to SSI in response to an RFP; each proposal was evaluated by 9 members of the SSI team and 11 external reviewers; review criteria was based on SSI goals and objectives (per SSI Strategic Plan); the SSI Stewardship Council approved final funding recommendations, with 18 projects selected to be funded for YR1 (6 not funded). In addition, 6 private colleges were also invited to submit SSP proposals, with all receiving various levels of funding (note: two of them combined on a single project). Even though 23 projects were funded for YR1 (18 at UM/USM, 5 at SSPs), work began immediately to ensure that mechanisms for high levels of communication, collaboration, and integration

between them were in place. For YR2, two projects did not proceed, and an additional 5 projects were submitted, reviewed, and funded as above for the other 5 undergraduate campuses of the UMaine System (broadening participation efforts). Therefore the current project total for YR2 is 16 UM/USM and 10 SSPs.

2) ***Currently (YR2):*** 12 UM/USM teams have just submitted YR3 proposals in response to an RFP, which included full YR2 progress reports; review criteria is based on SSI goals and objectives (per revised SSI Strategic Plan); initial screening will take place shortly by a panel representing the SSI Research Council; the SSI Advisory Board will then engage in a subsequent external review; the ME EPSCoR Management Team will make final funding recommendations. (Note: SSP institutions are on a different funding cycle and will submit YR3 proposals in July.) (Also note: 4 integration SSI projects are being supported through state funds as a voluntary cost contribution; went through proposal review process.)
3) ***On-going evaluation of research progress***: in addition to the above review and evaluation process, research teams are part of a comprehensive, on-going monitoring and evaluation of progress (based on the SSI Strategic Plan goals, objectives, and benchmarks for research). This includes the following, and is summarized in the table below:
    a. Annual full progress reports submitted with continuation proposals (Feb-UM/USM; July-SSPs) are reviewed and acted upon by all proposal review mechanisms including the SSI Research Council, the SSI Stewardship Council, the SSI Advisory Board, and the ME EPSCoR Management Team.
    b. Additional interim updates on progress towards specific benchmarks and timelines (Feb-SSPs; June-UM/USM; November-all): reviewed by SSI Research Council, acted upon by ME EPSCoR Management Team.
    c. Annual site visits/team visits (Fall): members of the SSP Coordination team travel to other institutions for formal site visit review; members of ME EPSCoR Management Team do UM/USM team visit review.
    d. AAAS Assessment (May 2011): progress for the whole SSI project undergoes a comprehensive review every two years by a national panel.
    e. SSI Advisory Board: research progress reviewed during on-site visits or the proposal review process 1-2 times annually; on-going review throughout rest of year via phone/videoconferencing meetings of Board.
    f. SSI Advisory Board Chair: monthly meetings with SSI Research Project Director on overall progress updates.
    g. On-going peer critique & feedback: each team presents at least 2 times annually at SSI All-Team Meetings, SSI Integration Discussion Groups, SSI Research Retreat, SSI Group meetings, special workshops, ME EPSCoR State Conference, etc.
    h. SSI Research Project Director Review: on-going review of progress through in-person meetings, phone calls, e-mail, videoconferences, etc.

SSI research progress review schedule for teams:	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Full progress report		UM/ USM					SSP					
Interim progress reports		SSP				UM/ USM					all	
Site visits/team visits												
AAAS assessment												
SSI Advisory Board review												
SSI Advisory Board Chair updates (on-going)												
Peer critique & feedback (on-going)												
SSI Research Director review (on-going)												

g) Sustainability and Project Outputs:

The goal for sustainability of this project is to "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." The following details YR2 progress under the five main objectives for this goal.

Project Outputs:

YR2 outputs are detailed in other sections as well as Appendix 2 – SSI Objectives, Strategies and Benchmarks, and the NSF EPSCoR Reporting Template E - Outputs. A summary is provided below.

Positions supported*:* Through the end of YR2 of this RII project, a total of 345 individuals were directly supported under this project (received salary/wages). Of that, 177 were existing personnel who had been supported during YR1 and continued in YR2, with the following breakdown: 82 faculty, 1 postdoc, 23 graduate students, 40 undergraduate students, 18 high school students, and 13 professional/technical staff. An additional 168 personnel were newly supported during YR2. Of that, 29 were existing University positions that were new to the SSI project for YR2 and included 24 faculty and 5 professional/technical staff. An additional 140 were newly hired positions, and included: 3 faculty, 1 postdoc, 26 graduate students, 104 undergraduate students, 2 high school students, and 3 professional/technical staff.

***Participants in supported activities*:** an additional 1,709 participants were indirectly supported through various outreach, workforce development, and collaborative activities that were sponsored and supported by Maine EPSCoR. These included: 104 faculty at academic research

institutions, 53 faculty at primarily undergraduate institutions, 93 graduate students, 87 undergraduate students at academic research institutions, 90 undergraduate students at primarily undergraduate institutions, 82 technical/ professional/administrative staff, 103 K-12 teachers/pre-service teachers, 17 high school students, 619 middle school students, 20 elementary school students, 18 business/industry representatives, 320 NGO/government representatives, and 103 members of the general public through conferences and workshops.

Publications: Publications: SSI faculty published 71 total publications; 14 scientific journal articles with primary NSF EPSCoR support/20 with partial NSF EPSCoR support; 2 book chapters with primary NSF EPSCoR support/7 book chapters with partial NSF EPSCoR support; 10 abstracts with primary NSF EPSCoR support/5 abstracts with partial NSF EPSCoR support; 2 books with partial NSF EPSCoR support; 2 proceedings with primary NSF EPSCoR support; 2 technical reports with primary NSF EPSCoR support/1 technical report with partial NSF EPSCoR support; and 4 other publications with primary NSF EPSCoR support/2 other publications with partial NSF EPSCoR support.

***Proposals submitted*:** 49 grant proposals were submitted by SSI resesarchers ($63.5M), 33 awards were received in YR2 ($3.6M), 16 are still pending ($60M), and 6 were rejected ($16.2M). (A complete list of grants submitted/awarded in YR2 can be found in Appendix 6.)

Inter-institutional Synergy:

SSI Strategic Plan Objective #1 for this goal is to use the Center for Sustainability Solutions (CSS) as a catalyst for building inter-institutional synergy in solving sustainability-related problems.

Undergraduate educational institutions from across Maine have become active participants in the SSI project through the SSP program. Site visits in fall 2010 and a survey of SSP participants by the K-A team provided the management team with information on how this program could be refined to maximize participation and integration.

Strategies and activities in YR2 include: SSI Workshop, April 15, 2011 (workshops, team presentations, undergraduate and graduate poster competitions, networking); Maine Water Conference, March 16, 2011 (SSI session, undergraduate and graduate poster competitions); ME EPSCoR Conference, Nov. 3, 2010 (poster presentations, related SSI presentations, networking opportunities); bi-weekly newsletter (on-going); internal web site (under development); "travelling workshops" on SES, K-A and grant writing (under development); and continued support of a graduate assistant to assist with development of K-A and communication needs. Additional information on these strategies is discussed in the Outreach & Communication section.

University-Stakeholder Partnerships:

SSI Strategic Plan Objective #2 is to build an interconnected, state-wide network of university-stakeholder partnerships. All SSI research projects are required to have stakeholder participation. As a result, researchers are collaborating with over 250 individuals in 150 stakeholder groups across the SSI project. Teams have strengthened this network as their research projects have developed with over 200 researcher-stakeholder meetings in YR2. Additional information on strategies being used to support university-stakeholder partnerships is discussed in the Outreach & Communication section. (Also see Appendix #5 Collaborators.)

Government and Private Sector Support:

SSI Strategic Plan Objective #3 is to seek external grants and contracts from government and the private sector. The long-term sustainability of SSI will depend on many sources of funding, and SSI project teams are already working on competitive proposals to other federal agencies, state government, and private entities. In YR2 and beyond, additional emphasis will be placed on the following:

- Support team members seeking funding through thematic federal programs. Grant writing workshop (Nov. 10, 2010). Plans for additional "travelling" grant writing workshops in late spring/early summer.
- Support team members seeking funding through thematic federal programs by conducting grant-writing workshops. An initial workshop was held Nov. 10, 2010 at UMaine, and three more were held in April/May 2011 at UMaine, UMaine Farmington, and UMaine Presque Isle (20 participants).
- Provide financial support for team members seeking external funding to develop SSI collaborative proposals. During June 2011, the Maine EPSCoR Management Team worked with the SSI Stewardship Council to develop an RFP that provides up to $100,000 in financial support for teams to develop collaborative proposals. (RFP released July 2011 – awards pending)
- Provide support for Program Officer meetings, proposal action teams, proposal organizational support, including finding appropriate RFPs (continuous).
- Partner with state agencies as the method to be most successful on a regional scale.
- An inventory of state agencies and contacts is underway and will be completed by June 2011.
- Plans for agency partner scoping meetings will be developed once the inventory is completed.
- Funding awarded for four integration projects. These projects will assist the team in strengthening integrative strategies for its work in sustainability science. This will increase competitiveness for national-level funding in a variety of programs especially those that address transformative and broadly interdisciplinary topics.
- Progress in building relationships with the private sector is outlined under objective #5 below.

Foundation and Private Support:

SSI Strategic Plan Objective #4 is to develop a base of foundation and private support for SSI. Identification of 8-10 foundations with goals closely aligned with SSI projects is under development and will be completed by June 2011. Four foundations will be selected and actively managed for the following year including cultivating relationships.

Two potential donors have been identified and project leaders are working to cultivate relationships with them in collaboration with University Development. Additional potential donors will be identified in upcoming months.

Establishing Maine as a Leader:

SSI Strategic Plan Objective #5 is to establish Maine as a leader in solutions-driven sustainability science, clean technology, and a green economy. Marketing of SSI to various audiences is on-going and details are provided in the Outreach & Communication section. Planning for construction of a new social science research lab is continuing. Architectural plans for complete renovation of an existing on-campus building have been completed and work will

begin in summer 2011. Plans are also underway to refurbish a seminar room at the Mitchell Center to establish a state-of-the-art Communication Center. This will greatly assist in establishing an active communication network to increase research collaboration and improve integration and synergy between institutional partners. Progress to enhance cyberinfrastructure to support research collaboration is outlined in the Cyberinfrastructure section.

The Economic Development Taskforce (EDT) includes four SSI economists, including Charles Colgan, the former Maine State Economist. Initial meetings of the EDT have focused on developing an effective and innovative process for supporting SSI's economic development goals, including supporting partnerships with small businesses. The EDT is developing economic development strategies in which SSI: identifies potential or missing markets for information, knowledge, and new technologies; integrates social science, business, and organizational innovation research and engineering and science research; communicates emerging economic and regulatory trends to audiences from numerous sectors (i.e. private, government, NGO's, etc.); supports and engages with a network of diverse economic development stakeholders; and strives to align curriculum and workforce development needs.

The EDT is focusing on ways that SSI can tap into Maine's existing development infrastructure and private sector networks to facilitate the transfer and exchange of ideas and help form new networks under the umbrella theme of sustainability science. One important step is to encourage SSI teams to consider how their work presents new market opportunities; employs new technologies; identifies market or technology gaps; advances workforce development; and incorporates stakeholders from the private sector. Under the proposed economic development strategies, SSI can be a force that acts to bring together researchers and the private sector.

In addition, in our response to the NSF Reverse Site Visit (Question 10, Objective 2), we had indicated that development of sustainability science internship and exchange programs with private sector partners would be completed by June 2014, and we are on track to pursue this. However, during YR2 and YR3, the EDT is addressing the more immediate goals of establishing robust partnerships with key entities in the private sector and adding private sector members to the Economic Development Task Force.

Development of an SSI stakeholder database is underway and will be completed by June 2011. The taskforce is also researching cooperative extension faculty who have existing private sector contacts and will approach them to potentially serve on the taskforce. Plans are underway to host a "meet and greet" with key entities already engaged in economic development in Maine. It is anticipated that this meeting will take place in summer 2011.

g.1 Seed Funding and Emerging Areas:

Once the initial SSI research projects were underway, it became clear that an emerging area of focus was the need to provide integration and synergy across the project. In June 2010, a YR2 RFP was issued for proposals designed to increase project integration. Eleven pre-proposals were received of which seven moved to the full proposal stage. After external review, four of these proposals were selected to receive funding (through voluntary cost contribution support). These projects are now underway and will be subject to the same review process as regular SSI research projects. Projects address multi-method frameworks for coupled-systems research, cyber-informatics development, integrative decision support tools and spatial modeling, and integration of socio-economic data collection.

Seed funding was also provided to two of the new faculty hires for projects on SES Synergy (Waring) and ECCO: Effects of Climate Change on Organisms (McGill).

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. YR2 travel scholarships are still pending through June.

g.2 Human Resources Development:

Maine EPSCoR SSI's Strategic Plan outlines several goals that address human resource infrastructure, and accordingly, much of the focus for YR2 was to continue putting the human infrastructure in place for this large Maine EPSCoR RII project. With the exception of some of the new hire searches, all other planned objectives and benchmarks for YR1 human resources development have been met or exceeded (see Appendix 2).

YR2 efforts established 23 research teams at 13 institutions, which consisted of faculty, postdocs, graduate, undergraduate, and high school students. A total of 343 individuals throughout the state were directly supported on this project during YR2, and of those there were 115 newly-created positions. The breakdown for all of the positions supported consisted of: 109 faculty, 2 postdocs, 48 graduate students, 144 undergraduate students, 21 high school students, and 20 technicians/professional/ administrative staff on the core project and at collaborating institutions. (See Appendix 4 Project Personnel and Template B. RII Participants)

Human Resources Development in the SSI Research component:

Three new faculty members are now in place on the SSI project, two at UMaine and one at USM. Brian McGill, Assistant Professor of Ecological Modeling, began at UMaine in July 2010. He is jointly appointed in the School of Biology and Ecology. Tim Waring, Assistant Professor of SES Modeling, joined the project at UMaine in August 2010. He is jointly appointed in the School of Economics. Yuseung Kim, Assistant Professor of Community Planning and Development, was appointed at the Muskie School of Public Service at USM in September 2010. The fourth faculty hire has been officially approved and watershed modeler Sean Smith will begin work at UMaine in summer 2011. Integration of new faculty has been encouraged through funding of pilot projects for new faculty hires, providing SSI graduate student support, providing opportunities for collaboration on integration and core projects, encouraging participation on committees and task forces, and scheduling presentations at integrative discussion groups.

Two SSI postdoctoral fellows also joined the team in summer 2010. Both are co-mentored and have assumed integrative roles working across various research teams. They are also providing mentorship to SSI graduate and undergraduate students. It was decided by the Postdoctoral Recruitment Committee to close the search in late summer 2010 until a further assessment of team needs could be completed. The Research Council will make that assessment after the YR3 proposal review process has concluded. Two teams will be hiring postdoctoral fellows to address specific research needs in May 2011.

In fall of 2010, SSI supported an incoming cohort of 15 PhD students in addition to 4 continuing PhD students. An additional 24 graduate students were supported in research internships across the project. Of these 15 students, three are supported with departmental funding. Recruitment for fall 2011 began in October 2010 with six PhD positions available. This process is continuing with some positions filled and others still in the interview stage.

A freelance writer was also hired in summer 2010 to assist SSI with written materials for external stakeholders. The writer has significant experience with translating research materials for public audiences and has been an important addition to the communications team. Her focus

during spring 2011 is on rewriting research summaries and reports for the web site and writing the articles for the first edition of the SSI newsletter.

During YR1, 87 SSI core faculty and graduate students expanded their knowledge base in this research focus by attending/presenting at 437 regional, national, and international workshops, conferences, and symposiums.

Human Resources Development in the Maine EPSCoR component:

Maine EPSCoR supported multiple workforce development and outreach strategies to K-12 teachers, university and college faculty, pre-service teachers, students, researchers, and small businesses, reaching 1,709 individuals. All of these activities assisted in the development of the state's human resource infrastructure in this area. Projects and activities are detailed in section 2.b Diversity and Broadening Participation, 2.c Workforce Development, and 2.e Outreach and Communication. The breakdown of participants includes: 104 faculty at academic research institutions, 53 faculty at primarily undergraduate institutions, 93 graduate students, 87 undergraduate students at academic research institutions, 90 undergraduate students at primarily undergraduate institutions, 82 technical/ professional/administrative staff, 103 K-12 teachers/pre-service teachers, 17 high school students, 619 middle school students, 20 elementary school students, 18 business/industry representatives, 320 NGO/government representatives, and 103 members of the general public through conferences and workshops. (See Appendix 4 and Template D. Outreach)

The Maine EPSCoR office has resumed the search process to hire two new professional staff: an Outreach and Program Coordinator (PA), and a Communications Coordinator, who will complete the planned team for this project.

g.3 Leveraging NSF Programs:

During YR2, Maine EPSCoR also partnered with the following on NSF proposals and funded projects in order to more effectively leverage resources and programs:

NSF CAREER: two proposals were submitted during YR2 by SSI faculty (pending).

NSF TUES: ME EPSCoR was part of a state collaborative planning process that resulted in the submission of a proposal to involve senior-level policymakers in 5 states to better learn how to bring institutional leaders and decision makers together to support effective approaches that improve the outcomes of STEM education at the undergraduate level (pending).

NSF ADVANCE: UMaine recently received an award for the NSF ADVANCE program, which will focus on advancing women and leadership at the university and the other six campuses of the UMaine System. ME EPSCoR serves in an advisory capacity to this project, and will also sponsor special Research Affinity Group activities for women that will focus on SSI-related themes such as climate change, energy, and knowledge-to-action, and allow for increased networking and mentoring opportunities for women in the SSI research area.

NSF MSP: UMaine's Center for Research in STEM Education received a $12M NSF Math Science Partnership proposal for middle school opportunities in physical science. ME EPSCoR serves on the Advisory Committee for this project in order to ensure collaborative efforts with the SSI project.

NSF ITEST and NSF-REU: the SSI Cyberinfrastructure research team has funded projects that focus on supercomputer modeling and visualization in climate change using the UMaine supercomputer and the Maine Laptop Initiative laptops that middle school students have. ME

EPSCoR works with this team to support activities that overlap with SSI objectives, such as improving K-12 visualization walls so that SSI pilot projects can take place next year in K-12.

NSF National Girls Collaborative Project: ME EPSCoR supports additional mini-grants for the Maine Girls Collaborative Project (MGCP) at UMaine's Womens Resource Center, which is funded by a grant at the Puget Sound Center for Teaching, Learning and Technology (now the EdLab Group).

NSF RII Track2: Maine EPSCoR strives to integrate its cyberinfrastructure efforts as part of an overall Cyberinfrastructure plan for the state, in order to ensure that there is an inherent coordination amongst projects that will build on each other. CI activities under this RII Track 1 are therefore also leveraging/being leveraged by projects under an NSF RII Track 2 (NECC Consortium), and NIH INBRE and BTOP projects. The Maine EPSCoR CI Committee members are involved in overseeing all of these projects, which allows for a high degree of ability to build coordinated capacity. The Track 2 is particularly benefitting the SSI project by: 1) providing a network that will allow for improved research collaborations and capabilities amongst the statewide partners; 2) providing greater access to the regional and national backbones; and 3) providing the SSI partner institutions greater access to the UMaine supercomputer.

h) Management Structure:

The Maine EPSCoR Office at UMaine has been formally established under a Memorandum of Understanding with the Maine Office of Innovation, and acts as the fiscal agent/proposing organization for the state's NSF EPSCoR programs; coordinates responses to NSF EPSCoR funding solicitations; is responsible for the implementation, administration, and evaluation of funded projects; and is the liaison to the NSF EPSCoR Office.

There are two goals for management for this project: the overall RII project management, and the SSI research project management.

Overall RII Project Management:

The overall RII project management goal is to "Implement an effective management plan that will support and ensure the overall success of the Maine EPSCoR RII project."

SSI Strategic Plan Objective #1 for this goal is that management systems allow for effective coordination, communication, and integration of all program components at all institutions. To that end, Maine EPSCoR fully recognizes that a successful project of this magnitude and scope depends on a strong management team and sufficient staff and expertise to develop, implement, and oversee it. The Maine EPSCoR office and the SSI research office at the Senator George J. Mitchell Center are both based at UMaine and operate under the aegis of the VP for Research (RII PI/PD), which provides a strong, synergistic foundation for success. The addition of a multi-level, parallel organizational structure for this RII project also provides effective programmatic and administrative oversight and successful implementation. (See Appendix 12 Organizational Chart.) The overall RII project management includes:

State EPSCoR Governing Committee: The Maine Innovation Economy Advisory Board (MIEAB) serves as the EPSCoR governing committee for the state (see Appendix 1 for membership), and is under the Maine Office of Innovation, whose Executive Director, Catherine Renault, serves as the state's EPSCoR/IDeA Director. 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 provides updates on the progress of Maine EPSCoR projects.

Maine EPSCoR Management Team: The RII Management Team consists of: 1) Project Director/PI Michael Eckardt (UMaine Vice President for Research), who provides scientific, technical, and administrative leadership; 2) Associate Project Director/Co-PI Vicki Nemeth (UMaine Director of Research Administration & Maine EPSCoR); and 3) Co-PI/SSI Research Project Director David Hart (Director Senator George J. Mitchell Center, UMaine). Eckardt and Nemeth have served in these EPSCoR capacities for over 7 years. This team meets at least monthly, but interacts via phone and e-mail several times a week. Their main actions during YR2 have centered around the further development of the SSI organizational structure, policies, procedures; strengthening SSP integration, and monitoring the new hire processes. They will also be addressing the YR3 funding allocations for the research teams during April.

***Maine EPSCoR Office Team*:** Vicki Nemeth, Director of Maine EPSCoR at UMaine, provides day-to-day oversight of the RII project, and is responsible for the implementation of all non-research programmatic and administrative components of the RII project. Her staff currently consists of a Financial Administrator, a Program Assistant and Diversity Specialist, a Media Production Coordinator (part-time), a graduate student (Media Assistant), and two undergraduate students. Due to special circumstances, the search process was temporarily put on hold to add an Outreach and Program Coordinator (PA) and a Communications Coordinator, but has now resumed. All staff work closely with the SSI research office personnel on a daily basis, as well as other administrative departments at UMaine and the other collaborating institutions to ensure compliance and effective management.

Other Advisory Boards/Committees: In addition to the MIEAB and the SSI Advisory Board (see Appendix 1), two other groups serve in an advisory and implementation capacity for this project. The Maine STEM Collaborative (see Workforce Development above and Appendix 1) 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 serves on the STEM Collaborative's Executive Committee and Steering Committee, and seeks input from the group to assure that the RII educational and workforce development efforts are aligned with the Collaborative's strategic plans. Also, during the proposal-writing process for this SSI project, Maine EPSCoR created a statewide cyberinfrastructure committee that developed a 5-year CI strategy 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 the NSF EPSCoR Track 2 RII and a corresponding NIH IdeA supplement for cyberinfrastructure. (All three projects are administered by the Maine EPSCoR office, which ensures effective coordination and leveraging of efforts.) (See Appendix 1)

SSI Strategic Plan Objective #2 is to ensure administrative, programmatic, and fiscal integrity for all project components and institutions.

The Maine EPSCoR office serves as the administrative liaison with all of the SSP institutions, and the Director has visited each SSP campus and conducted a site visit with all of the research teams, and is usually in e-mail or phone contact at least weekly with each. With many of the SSP institutions having limited experience with federal grants, she has also served as

a mentor and resource to assist them. In addition, training workshops in grantwriting for SSPs are scheduled during April 2011.

An SSP Coordination Team was put into place this year to help address the SSP research aspects, and the project PD (Eckardt), SSI Research Director (Hart), and members of this coordination team conducted additional site visits with each SSP institution during the fall of 2010. These were designed as a follow-up to their YR2 proposals, and included a discussion of review panel comments, strategic planning based on that, and assisting with any special issues that were being faced.

The Maine EPSCoR Director also attends relevant national workshops to keep abreast of changes and clarifications in federal program requirements and policies, is a member of NCURA and SRA International, and works closely with UMaine's Office of Research and Sponsored Programs to ensure adherence to NSF policies and procedures.

Effective communication and coordination, as well as comprehensive technical assistance for workforce development, also are objectives for overall project management that are detailed in those sections.

SSI Research Project Management:

The SSI research project management team is committed to meeting the goal that "Broad coordination of management and decision-making results in a shared vision for SSI research and integration education, effective interdisciplinary outcomes, and participatory project management."

To ensure that there is a common framework of understanding for the SSI project, at the February 17, 2011 SSI Team Meeting, SSI members voted to adopt the following working definition of sustainability science: *An emerging field of research dealing with the interactions between natural and social systems, and with how those interactions affect the challenge of sustainability: meeting the needs of present and future generations while substantially reducing poverty and conserving the planet's life support systems.* This definition originated with the editorial board of the Proceedings of the National Academy of Sciences upon the creation of a new section of PNAS in 2006 dedicated to sustainability science.

SSI Strategic Plan Objective #1 is to establish a new organizational structure and processes that allow for effective communication, coordination, and exchange among SSI research teams and SSI management committees.

The SSI research management team is led by SSI Research Project Director, David Hart, is responsible for all aspects of the research enterprise at the SSI core team level and SSP collaborator level. He is supported by the SSI Stewardship Council, SSI Research Council, various SSI committees, and a staff of four in the SSI office at the Senator George J. Mitchell Center at UMaine.

The SSI **Stewardship Council** was formed in August 2009 and continues to have oversight and responsibility for management of the SSI research project. It consists of six members with SSI Research Director David Hart chairing. The council continues to meet weekly.

An important addition to the research management structure in YR2 has been the **Research Council**. The Council was convened to provide recommendations about important research-related decisions for the SSI project and to ensure 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 research team, committee chairs, two postdoctoral representatives, and one graduate student representative. Brian McGill was voted in as Research Council Chair in February 2011.The council is responsible for providing

focus on guiding research direction, planning and feedback on integration activities, funding allocation processes, and research proposal planning. Recommendations are then provided to the Stewardship Council.

In YR2, **SSI committees** (faculty) continued to provide guidance and recommendations to the Stewardship Council in specific areas. These included: 1) Graduate Recruitment Committee; 2) Curriculum and Culture Committee; 3) Economic Development Task Force; 4) Communication/Web Site Development Committee; and 4) Data Management Committee. In addition, a new faculty search committee was convened in collaboration with appropriate departments to conduct a search for the watershed modeler position (included both SSI and non-SSI faculty members). This committee has now made its recommendation and concluded its work.

The SSI Advisory Board also plays an important role in providing guidance to the SSI management team. Details of YR2 activities are outlined in evaluation section.

SSI Strategic Plan Objective #2 is to establish communication and feedback loops for modifying management systems and practices in ways that lead to more effective organizational processes.

As discussed above, the Research Council and committees all provide feedback to the Stewardship Council. The Research Council Chair meets with the Stewardship Council once a month. Project Director Michael Eckardt and Associate Project Director Vicki Nemeth also participate in council meetings on a monthly basis. Committee chairs can request to join a Stewardship Council meeting or are invited to participate as issues arise.

In YR2 additional avenues have been created to build integration and synergy across the team and provide communication and feedback loops throughout all activities. Team activities and events are discussed in more detail in the Outreach section, as is the internal web site that is currently under development.

SSI Strategic Plan Objective #3 is to engage in activities to advance understanding of challenges and opportunities related to interdisciplinary collaboration and effective teamwork in large-scale projects. 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.

SSI Strategic Plan Objective #4 is to establish a system for managing the interdisciplinary research projects. All SSI teams take part in 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.

In fall 2010, the Research Council appointed a task force to work on producing guidelines for YR2 progress reports and a Request for Proposals to solicit proposals for YR3. These two documents were then finalized by the Research Council and sent to the Stewardship Council for final approval. SSI staff is handling management, dissemination and collection of documents for the review process. Initial screening of YR3 proposals by a nine-member panel representing the SSI Research Council has been concluded. The Research Council task force recommended the make-up of the panel with the Stewardship Council selecting panel members. A subsequent external review by the SSI Advisory Board is now underway and will be completed in mid-April. Recommendations will then be submitted to the ME EPSCoR Management Team who will make final funding recommendations in late April.

In addition to the above review and evaluation process, research teams are also part of a comprehensive, on-going monitoring and evaluation review of their progress. Feedback loops are in place to apply mentoring or mitigation actions where needed. Various management groups are

involved in these review and evaluation processes including the SSP Coordination Team, SSI Advisory Board and Advisory Board Chair, SSI Research Council, SSI Stewardship Council, and the SSI Research Project Director. On-going peer critique and feedback also plays an important role in this process.

i) Jurisdictional and Other Support:

Resources available to the RII project include:
1) Advisory boards/committees: members of the MIEAB, SSI Advisory Board, the Maine STEM Collaborative, and the state's Cyberinfrastructure Committee are all an invaluable resource for providing expertise and guidance to the SSI project.
2) Maine EPSCoR office, Corbett Hall, UMaine: four offices are dedicated for Maine EPSCoR use in Corbett Hall, and staffing is primarily supported as a voluntary cost share. The communications office supports full media services such as film, photography, graphic-design, etc. A large conference room is also available, and is outfitted with a state-of-the-art videoconferencing system.
3) SSI office at the Mitchell Center, Norman Smith Hall, UMaine: all facilities in the building are available for SSI-related use, including a large seminar/workshop room, three conference rooms, and offices and workspaces for faculty, postdoctoral, and student use. All Mitchell Center staff directly support the SSI, primarily as a voluntary cost contribution to the project. The Mitchell Center's database of over 3,000 external constituents is also available for SSI-related use. A portable video-conferencing system is also available.
4) Faculty offices and labs: SSI faculty and students have access to additional state-of-the-art research facilities and equipment at the University of Maine and SSP institutions, including space for students.
5) Collaborations: access to other expertise as needed throughout the state through collaborations with stakeholders, and research, education, and outreach partners.
6) Cyberinfrastructure: Maine's integrated plan for enhancing broadband connectivity will directly benefit the SSI team.

j) Planning Updates:

Maine EPSCoR participated in an NSF Reverse Site Visit in September 2010. The panel made 13 recommendations, which the Maine EPSCoR Management Team and SSI Advisory Board have been working on addressing with our NSF EPSCoR Program Director over the past few months. The resulting actions were incorporated into the revised SSI Strategic Plan that was submitted to NSF EPSCoR in March 2011.

In 2010, the Maine Innovation Economy Advisory Board revised the state's Science and Technology Plan, which can be found at the Maine Office of Innovation website:

http://www.maine.gov/decd/innovation/reports_and_publications/pdfs/2010_S&T_Plan.pdf

The Maine EPSCoR PD and Associate PD were instrumental in providing input in this planning process, and this RII project is fully in alignment with this revised plan. In particular, workforce development is now a specific objective in the state plan.

k) Unobligated Funds:

As of March 31, 2011, $3,367,152 (84%) in YR2 NSF funds have been expensed or contractually obligated. The remaining $632,848 (16%) in YR2 NSF funds has been committed to specific purposes and activities that will occur between now and June 30, 2011, but by NSF's

definition is unobligated. These funds are budgeted to support outreach, travel, conferences and workshops, printing, and new hire advertising costs over the next three months.

ME EPSCoR has met the required YR2 20% cost share of $800,000, and also contributed an additional $822,621 in voluntary cost contributions towards this project.

3) Jurisdiction Specific Terms and Conditions

Specific terms in the RII contract have been met and include:

1) Cost sharing provided at the required amount of $800,000 plus significant voluntary cost contributions (see reporting templates G & H)
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) 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, in the supplementary tables provided, or in Fastlane.

4) Experimental/Computational Facilities

A key goal of SSI is to increase the University of Maine's capacity for conducting experimental social science research (e.g. experimental economics, strategic message testing and design, virtual-reality simulation experiments) by creating an experimental communication laboratory. Designs are now proceeding to create the 320 sq. ft. experimental lab within the planned New Media building on the University of Maine campus. The lab will include observation, experiment and interview rooms. Architectural plans are currently under development for the structure and building is anticipated to begin in the summer of 2011.

Maine's existing and planned cyberinfrastructure is also available to the SSI/SSP teams, from dedicated space on UMaine's supercomputer to the planned statewide broadband connectivity enhancements (see Cyberinfrastructure section) that will allow SSI researchers greater access for collaboration.

5) Publications

During YR2, SSI faculty published 71 related total publications: 14 scientific journal articles with primary NSF EPSCoR support/20 with partial NSF EPSCoR support; 2 book chapters with primary NSF EPSCoR support/7 book chapters with partial NSF EPSCoR support; 10 abstracts with primary NSF EPSCoR support/5 abstracts with partial NSF EPSCoR support; 2 books with partial NSF EPSCoR support; 2 proceedings with primary NSF EPSCoR support; 2 technical reports with primary NSF EPSCoR support/1 technical report with partial NSF EPSCoR support; and 4 other publications with primary NSF EPSCoR support/2 other publications with partial NSF EPSCoR support. (See NSF Fastlane and Appendix 9 for detailed listing.)

6) Honors and Awards

Honors and awards were received by eight faculty, one postdoctoral fellow and two graduate students during Year 2.

SSI Member YR2 Recognitions & Honors	
Calhoun, Aram	Outstanding Associate Editor 2010 for the journal Wetlands
Colgan, Charlie	USM Outstanding Faculty member Award (Muskie School) for AY09-10
Gardner, Susan	Outstanding Contribution to Knowledge Award, ACPA Commission for Graduate and Professional Students
Hall, Damon	New Media Equipment Capacity-Building Award, University of Maine ($5,000)
Judd, Richard W.	Neil W. Allen Jr. Award In Recognition of Outstanding Contributions in Maine History and Genealogy, given by the Maine Historical Society, June 2010
Leahy, Jessica	G. Peirce and Florence Pitts-Webber Outstanding Researcher Award, 2009-2010
Lichter, John	Endowed term chair at Bowdoin College: Samuel S. Butcher Associate Professor of Natural Science
Lichter, John	Charles Bullard Fellowship, Harvard Forest, Harvard University
Lilieholm, Robert	UMaine School of Policy & International Affairs Travel Grant to Kenya (2010)
Lilieholm, Robert	G. Peirce and Florence Pitts-Webber Outstanding Forestry Teacher Award (2010)
Lindenfeld, Laura	Nominated for the Ernest A. Lynton Award for the Scholarship of Engagement for Early Career Faculty
Lindenfeld, Laura	Nominated for the College of Liberal Arts and Sciences Teaching Award (spring 2011)
Danielson, Thomas	Cynthia Loftin's PhD Student received a Presidential Endowment Award from the north American Benthological Society for his dissertation research
Quartuch, Michael	Emerging Engagement Scholar, National Outreach Scholars Conference, 2010

C) HIGHLIGHTS

Three research and education highlights follow.

D) REPORTING TEMPLATE APPENDIXES

The NSF EPSCoR required reporting templates are attached to the end of this report.

Maine NSF EPSCoR Research Infrastructure Award EPS-0904155
Maine's Sustainability Science Initiative

Research and Education Highlight # 1

Maine EPSCoR at University of Maine
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maineepscor@umit.maine.edu
www.umaine.edu/epscor

Alternative futures modeling will help improve land-use decisions

Sustainability Solutions Initiative researchers at the University of Maine are collaborating with diverse colleagues and stakeholders to create computer models that will aid strategic regional land use planning. These tools will help users identify prime land in Maine for different purposes including conservation, human development and protection of working forests and agricultural lands.

Various forces are altering Maine's landscape and communities, including increased parcelization of large tracts of forestland due to recent changes in ownership and growing development pressure in key watersheds. Planners and other decision-makers currently have only limited information to address such challenges, yet their choices will have significant economic, social and environmental impacts in the future.

A recent statewide study revealed the need for a more coordinated and strategic approach to land conservation in Maine that incorporates information from a wide range of stakeholders. Lilieholm and his colleagues are developing alternative futures modeling tools designed to improve this process while also addressing development issues and protection of the working landscape.

Alternative futures modeling synthesizes many kinds of data to create computer-generated maps that depict future landscapes under various land use policies and economic, demographic and biophysical changes. Lilieholm and his colleagues are combining this approach with spatial analysis and expert knowledge from key stakeholder groups to create decision-support systems for use at the state, regional and municipal levels.

The SSI researchers held three workshops in 2010 to gather knowledge and opinion from focus groups of forestry, conservation and agricultural experts on the most important lands to protect. The researchers are planning a fourth workshop with developers to begin identifying the best potential land in the state for development.

Following the completion of data collection and analysis, Lilieholm and his colleagues will test pilot models on the community level in towns in the Lower Penobscot River Watershed. This

watershed is among the most at risk in the nation for the largest increases in housing densities on private forestlands by 2030.

The models will enable users to simulate future scenarios based on current data and projections. Using these shared visual references will allow diverse stakeholders to work together to identify potential land use conflicts and compatibilities and make more informed and strategic decisions about land conservation, development, resource protection and planning.

Research findings also will contribute new insights to the field of sustainability science. Communities around the world will be able to adapt these models to address local challenges and plan for a more sustainable future.

Maine NSF EPSCoR Research Infrastructure Award EPS-0904155
Maine's Sustainability Science Initiative

Research and Education Highlight # 2

Maine EPSCoR at University of Maine
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Vernal Pool Conservation as a Model for Balancing Economic Growth and Natural Resources Protection in Developing Landscapes

Researchers in Maine EPSCoR's Sustainability Science Initiative are collaborating with Maine communities to develop improved strategies for balancing economic development with natural resource protection. Using vernal pools as a model system, they are investigating ways to advance sound economic development while conserving important wetlands in populated areas and working forests.

Vernal pools are small, seasonal wetlands that provide breeding habitat for fairy shrimp, wood frogs and spotted and blue-spotted salamanders, and also help sustain wildlife populations throughout the state. These springtime pools provide food at a critical time of year for wildlife including moose, bear and other mammals, as well as reptiles and migratory waterfowl.

In 2006, Maine passed the strongest vernal pool protection legislation in the nation, based on a decade of research by Dr. Aram Calhoun and other scientists in the eastern U.S. to help the state meet federal mandates. This legislation regulates development within 250 feet of "significant vernal pools," which provide exemplary breeding habitat for indicator species.

Calhoun and Maine Audubon created the Maine Municipal Vernal Pool Mapping and Assessment Project to educate communities about vernal pools. They have so far trained citizen scientists in 13 communities to map and assess significant vernal pools. This project provides landowners with free surveys, enables more informed town planning and encourages conservation of natural resources at the local level.

Now, Calhoun's team is collaborating with stakeholders on research projects that address emerging questions related to the legislation, natural resources conservation on private land and economic development. These include: filling in knowledge gaps in amphibian ecology, identifying stakeholder issues and roadblocks to conservation on private land and understanding the economic impacts of vernal pool and other natural resources conservation on landowners and town economies.

To better understand these questions, Calhoun's team is investigating the human dimensions of

vernal pool and natural resources conservation in projects led by two PhD candidates. They are working with two of the communities that participated in the Vernal Pools Mapping Project to create model town plans that provide flexibility in conserving vernal pools and other natural resources while advancing economic development.

Such proactive planning offers potential benefits including cost savings by avoiding development in inappropriate areas, improved quality of life and effective conservation of important natural resources. Research findings will contribute insights into conserving natural resources on private land and sustaining ecological processes in human-dominated landscapes. Under this scenario, Maine can continue to provide important wildlife habitat in the heavily populated Northeast *and* a vibrant economy for its citizens.

Maine NSF EPSCoR Research Infrastructure Award EPS-0904155
Maine's Sustainability Science Initiative

Research and Education Highlight # 3

Maine EPSCoR at University of Maine
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Surging Ahead: Sustainable Power from the Tides

Maine's Cobscook Bay is a hot spot for tidal power. Following a successful demonstration project here last year, an energy company plans to install the first commercial tidal power system in the U.S. to generate electricity with underwater turbines. Making sure this technology is developed sustainably is the goal of an SSI project led by UMaine researchers Gayle Zydlewski and Teresa Johnson, who are part of the Maine EPSCoR Sustainability Solutions Initiative being supported by an NSF EPSCoR Research Infrastructure Improvement award.

Zydlewski, a fish biologist, and Johnson, a social scientist specializing in fishing communities, are studying the environmental, economic and social issues surrounding tidal power in the communities of Cobscook Bay. They will use their findings to create a model process that any community can use to make informed decisions about the development of tidal power in local waters.

The Cobscook Bay area aims to be the first region in the U.S. powered in part by tidal power from underwater turbines. Portland, Maine-based Ocean Renewable Power Company (ORPC), which generated electricity with prototype turbines in Cobscook Bay last year, is applying for federal permits to install a commercial system.

Community participation is central to the project's sustainability. Johnson and Zydlewski are interested in understanding the human dimensions of tidal power. They want to know what the community's concerns are and what questions they want addressed.

To that end, they have collaborated with area organizations including the Cobscook Bay Resource Center and the Maine Sea Grant Program to design and conduct an in-depth survey of about 40 key stakeholders ranging from fishermen to regulators to scientists.

The researchers found that stakeholders have two main concerns: how tidal power affects marine life and whether this new technology will bring desperately needed jobs to communities on Cobscook Bay.

To address environmental concerns about tidal power, Zydlewski is collaborating with local fishermen to learn more about fish populations and migrations in Cobscook Bay throughout the year. This information will help determine risks of turbine placement on fish and other marine life. They will then work with state and federal regulators, who will analyze these risks to determine a path forward for the industry.

This work is timely as tidal power emerges as a promising source of renewable energy. Although the technology is still in its infancy, more than 45 tidal power projects are being proposed around the world, a five-fold increase since 2009, according to IHS Emerging Energy Research, a consulting firm based in Cambridge, Massachusetts. In Maine, energy developers estimate that tidal power could generate up to 400 megawatts of power in a decade.

Johnson and Zydlewski's research documenting the lessons being learned in the Cobscook Bay area has not only given the local community a voice in this process, but will provide a model for other communities who are also looking at developing tidal power.

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

APPENDIX 1: Governing and Advisory Boards and Committees

Maine Innovation Economy Advisory Board: State EPSCoR Committee (members appointed by Governor)	
Member Name:	**Affiliation:**
Dr. Pam Baker	Bates College
John Burns	Small Enterprise Growth Fund
Dr. Habib Dagher	Advanced Engineered Wood Composites Center
Chris Davis	Pemaquid Oyster Co., Inc.
Dr. Michael Eckardt	University of Maine
John Ferland	Ocean Renewable Power Company
Dr. Tim Ford	University of New England
Karin Gregory	Furman, Gregory, Hahn
Dr. Patricia Hand	Mount Desert Island Biological Laboratory
Rita Heimes, JD	University of Maine School of Law
Dr. Whitney King	Colby College
Dr. Robert Lad	University of Maine
Peter Merrill	WahlcoMetroflex, Inc.
Peter Murray	Quantrix
Captain Robert Peacock	R.J. Peacock Canning Co.
Dr. Hemant Pendse	University of Maine
Dr. Don Perkins	Gulf of Maine Aquarium
Jane Sheehan	Foundation for Blood Research
Dr. Graham Shimmield	Bigelow Laboratory for Ocean Sciences
Dr. Dale Syphers	Bowdoin College
Jill Goldthwait	The Jackson Laboratory
Miles Theeman	Affiliated Healthcare System
Stephen Von Vogt	Maine Marine Composites
Dr. Samantha Langley-Turnbaugh	University of Southern Maine
Andrew Anderson	University of Southern Maine
Dr. Betsy Biemann	*ex officio member, Maine Technology Institute*

SSI Advisory Board	
Board Member:	**Affiliation:**
Robert Kates, Chair	Member American Academy of Arts & Sciences, Presidential Professor of Sustainability Science, University of Maine (Trenton, ME)
Nancy Dickson	Senior Researcher, Kennedy School of Government, Harvard University (Cambridge, MA)
J. Morgan Grove	USDA Forest Service (Baltimore, MD)
Susan Hanson	Research Professor, Clark University (Worchester, MA)
George Jacobson	Professor Emeritus, University of Maine and Maine State Climatologist (Orono, ME)
Ted Koffman	Executive Director, Maine Audubon (Falmouth, ME)
Thomas M. Parris	Vice-President for Sustainability, ISciences, LLC (Burlington, VT)
Pam Person	Climate Change Task Force, League of Women Voters (Orland, ME)

Tarla Rai Peterson	Professor & Boone and Crockett Chair, Dept. of Wildlife and Fisheries Science, Texas A&M University (College Station, TX)
Ken Young	Executive Director, Kennebec Valley Council of Government (Fairfield, ME)

Maine STEM Collaborative	
Executive Committee:	**Affiliation:**
Jan Mokros	Executive Director, Maine Mathematics and Science Alliance
Anita Bernhardt	State Science & Technology Specialist & Regional Representative, Maine Department of Education
Vicki Nemeth	Director of Research Administration & Maine EPSCoR, University of Maine
Steering Committee Members:	**Affiliation:**
Tom Berger	Maine Math & Science Alliance Board & Colby College
John Dorrer	Director, Maine Department of Labor, Center for Workforce Research & Information
Jack Healy	Executive Director, Maine Pulp & Paper Foundation
Marcia Leander	Associate Vice President, Unum
Alan Lishness	Chief Innovation Office, Gulf of Maine Research Institute
Bette Manchester	Executive Director, Maine International Center for Digital Learning
Susan McKay	Professor & Director, UMaine Center for Research in STEM Education
Mike McKernan	Director of Education & Conferences, Mt. Desert Island Biological Lab
Peter Mickelson	Education Chairman, Maine Energy Promotional Council
Steve Pound	Associate Director, Workforce Development, Cianbro Institute
Terry Shehata	Executive Director, Maine Space Grant Consortium
Susie Valaitis	Associate Director, Institute for Broadening Participation
Michael Wing	Director of External Programs, USM Engineering, Health Professions, Nursing, Science, and Technology

Maine EPSCoR Cyberinfrastructure Committee	
Member Name:	**Affiliation:**
Michael Eckardt	Vice President for Research, University of Maine
Vicki Nemeth	Director of Research Administration & EPSCoR, University of Maine
Jeffrey Letourneau	Associate Director, Communications & Network Services, University of Maine System
Bruce Segee	Associate Professor, Electrical & Computer Engineering, University of Maine
John Gregory	Executive Director, Information Technologies, University of Maine
(pending new appointment)	Director, Office of Innovation, DECD

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS-0904155)
Appendix 2: YR2 Objectives, Strategies, Benchmarks, & Progress

Goals 1-4 Objectives:	Strategies:	Year 2 Benchmark	Progress
1) Improved understanding and capacity across all objectives	a) Integration and collaboration between all interdisciplinary members of the team.	On-going (see communication plan)	See benchmarks under goal 6 and goal 9.
	b) Collaboration/ integration with other research teams/institutions.	1 per team; 20 project-wide. (June 2011)	35 across team collaborations.
	c) Development of new research method or adoption of best practice.	1 per team; 20 project-wide. (June 2011)	All teams have either developed new research methods or adopted best practices.
	d) External collaborative proposals and/or support submitted.	1 proposal/$25K per team; 15 proposals/1.8M project-wide. (June 2011)	49 proposals submitted for $63.5M; 33 awards received ($3.6M)
	e) Peer-reviewed publications submitted/accepted/published.	2 per team; 35 project-wide. (June 2011)	36 journal articles published.
	f) Technical publications completed or in process.	2 per team; 40 project-wide. (June 2011)	31 technical publications published.
	g) Technical presentations.	1-2 per team; 30 project-wide. (June 2011)	437 technical presentations
	h) Participation in relevant professional conferences.	1-2 per team; 30 project-wide. (June 2011)	60 professional conferences attended
	i) Participation in relevant training activities or workshops in SES, K↔A, or OI.	2 per team; 40 project-wide. (June 2011)	50 anticipated SSI Workshop, April 15, 2011
	j) Presentations at SSI activities.	1 per team; 30 project-wide. (June 2011)	8 presentations at team meetings. 8 presentations at integrative discussion groups. 29 oral presentations at SSI Workshop (April 15) plus additional student poster presentations. 18 oral presentations at Maine Water Conference 15 poster presentations at Maine Water

Goals 1-4 Objectives:	Strategies:	Year 2 Benchmark	Progress
			Conference 35 poster presentations at ME EPSCoR Conference
	k) Development of media pieces (print, web, multimedia, etc.) for public information dissemination purposes.	1 per team; 15 project-wide. (June 2011)	3 videos, 1 DVD, 9 web sites/pages, 1 brochure, 6 fact sheets.
2) Commitment to stakeholder involvement	a) Active collaborations with stakeholder organizations.	2 per team; 40 project-wide. (June 2011)	60+ active collaborations.
	b) Stakeholder/team meetings	3 per team; 60 project-wide. (June 2011)	238 individuals at 148 collaborating organizations
	c) Breadth of stakeholder collaboration (private sector, government, NGO sector, other research institutions, K-12).	5+ stakeholders per group project-wide. (June 2011)	200+ project-wide. Minimum/team-2. Maximum/team-75.
	d) Primary focus on local/state stakeholder scale, secondary regional/ national/international.	35 local/state; 5 reg/nat/intnl project-wide. (June 2011)	18 private sector, 46 government, 44 NGO, 22 research institutions, 2 K-12
	e) Research models/processes framed and modified by stakeholder input.	1 per team; 20 project-wide. (June 2011)	148 state/regional, 38 national/international.
	f) Stakeholder decision-making process or policy informed/changed through research.	1 per team; 15 project-wide. (June 2011)	All projects had directed stakeholder information exchange. Broader interactions that have been used in decision making have occurred in these 19 projects (listed by project list number): 1, 2, 3, 4, 5, 6, 7, 9, 11, 13, 14, 17, 18, 19, 20, 21, 23, 24, and 25.
	g) Formal related public presentations or public testimony.	12 project-wide. (June 2011)	5 public testimonies, 22 public presentations.
	h) Serving on related external committee, task force, board, etc.	1 per team; 20 project-wide. (June 2011)	22 participants currently serve on external boards/committees.
	i) Collaborative team and stakeholder effort/output (surveys, co-authored publications, grant collaborations, involvement in public media & information dissemination, etc.)	1 per team; 10 project-wide. (June 2011)	11 surveys, 3 co-sponsored workshops, 1 grant, 1 pilot program, 1 pilot study, 2 co-authored published proceedings, 1 co-authored article.

Goal #1 Objectives:	Strategies:	Year 2	Progress
1) Increase research capabilities through an inter-disciplinary, multi-institutional collaborative project	a) Create the Center for Sustainability Solutions	Fully integrate students and institutional partners. (June 2011)	Organizational mechanisms in place to
	b) Funding Opportunities database for grants	5% increase in listings. (June 2011)	9% increase
2) Increase Maine's competitiveness & funding in this focus area	a) Support state PUI involvement	12 collaborations. (June 2011)	In addition to UMaine and USM, 11 PUIs are supported
	b) National & international R&D collaborations.	6 additional collaborations. (June 2011)	32 national/international collaborations.
	d) Faculty collaborators.	75 (June 2011)	108 total faculty project participants and 61 additional collaborators at academic institutions
	e) Breadth of expertise. (disciplines)	15 (June 2011)	26 disciplines represented.

Goal #2 Objectives:	Strategies:	Year 2	Progress
1) Improved understanding and capacity across all objectives:	a) Development of model(s) of SES dynamics for a specific SES context.	3 project-wide. (June 2011)	Under Goal #2 all sub-projects have documented progress. Bayesian Belief-Network Model (Analysis of Alternative Futures, #6). Agent-Based Model (Small-Scale Forest Policy, #4). Urban Simulation Model Framework (Urban Landscape Models, #2).
	b) Identification and analysis of the	3 project-wide. (June 2011)	Protecting Natural Resources (Vernal Pools, #1).

Goal #2 Objectives:	Strategies:	Year 2	Progress
	thresholds, feedbacks, and indicators for a specific SES context.		Decision Support Tools (Lake Management, #3). Restoring Aquatic Systems (Urban Streams, #7).
	c) Informing stakeholder(s) mitigation or adaptation strategy.	1 per team; 5 project-wide. (June 2011)	Lake Level Management (#3). Climate Adaption in Coastal Communities (#11). Tidal Energy Development (#18). Ecological and Economic Recovery of River Systems (#19). Modeling Resilience and Adaptation (#20). Community-Based Ecosystem Management (#21).
	d) Evidence of linkage of SES model with K↔A research.	1 per team; 5 project-wide (June 2011)	Protecting Natural Resources (#1). Decision Support Tools (Lake Management, #3). Small-Scale Forest Management (#4). Spatial Forest Planning (#8). Addressing Invasive Species (#13). Tidal Energy Development (#18).
	e) Participation in OI research.	2 members/ team participate. (June 2011)	Total number of individuals participating was 77 and initial target was 54.

Goal #3 Objectives:	Strategies:	Year 2 Benchmark	Progress
1) Improved understanding and capacity across all objectives:	a) Develop model(s) that assesses reciprocal interactions among biophysical, socioeconomic, and stakeholder contexts in affecting K↔A interactions.	5 project-wide. (June 2011)	Under Goal #3 all sub-projects have documented progress. Urban Simulation Model Framework (Urban Landscape Models, #2). Agent-Based Model (Small-Scale Forest Policy, #4). Bayesian Belief-Network Model (Analysis of Alternative Futures, #6).
	b) Develop methodological framework & best practices for achieving a closer coupling between the societal demand for, and supply of, science products.	10 project-wide. (June 2011)	Urban Landscape Models (#2). Small-Scale Forest Policy (#4). K-A Research (#5). Analysis of Alternative Futures (#6). Fish Consumption Advisories (#9) Climate Adaption in Coastal Communities (#11). Addressing Invasive Species (#13). Ecological and Economic Recovery of River

Goal #3 Objectives:	Strategies:	Year 2 Benchmark	Progress
			Systems (#19). Modeling Resilience and Adaptation (#20). Community-Based Ecosystem Management (#21).
	c) Evidence of linking K↔A research with SES.	10 project-wide. (June 2011)	Urban Landscape Models (#2). Small-Scale Forest Policy (#4). K-A Research (#5). Analysis of Alternative Futures (#6). Fish Consumption Advisories (#9) Climate Adaption in Coastal Communities (#11). Addressing Invasive Species (#13). Ecological and Economic Recovery of River Systems (#19). Modeling Resilience and Adaptation (#20). Community-Based Ecosystem Management (#21).
	d) Participation in OI research.	2 members/team participate. (June 2011)	Total number of individuals participating was 77 and initial target was 54.
	e) Identify best practices for strengthening K↔A interactions in the 3 targeted problem areas.	1 BP per team; 5 project-wide. (June 2011)	Urban Landscape Models (#2). K-A Research (#5). Fish Consumption Advisories (#9). Climate Adaption in Coastal Communities (#11). Addressing Invasive Species (#13). Tidal Energy Development (#18). Modeling Resilience and Adaptation (#20).
	f) Presentation of evidence-based strategy for communicating complex scientific information.	1 per team; 5 project-wide. (June 2011)	Urban Landscape Models (#2). Lake Level Management (#3). Analysis of Alternative Futures (#6). Addressing Invasive Species (#13). Tidal Energy Development (#18). Modeling Resilience and Adaptation (#20). Community-Based Ecosystem Management (#21).
	g) K↔A model that is both internally and externally-oriented for stakeholder and research purposes.	1 per team; 5 project-wide. (June 2011)	Urban Landscape Models (#2). Lake Level Management (#3). K-A Research (#5). Analysis of Alternative Futures (#6). Addressing Invasive Species (#13). Tidal Energy Development (#18). Modeling Resilience and Adaptation (#20). Community-Based Ecosystem Management (#21).

Goal #4 Objectives:	Strategies:	Year 2 Benchmark	Progress
1) Improved understanding and capacity across all objectives:	a) Develop model(s) of OI that examines interdisciplinary collaboration in university-stakeholder partnerships.	2 project-wide. (June 2011)	K-A Research (#5). Modeling Stakeholder Acceptance (#14). The Individual and Disciplinary Systems (#15). Perceptions of the System and Interdisciplinary Success (#16). Linking Values for K-A (#17).
	b) Develop methodological framework & best practices for promoting interdisciplinary collaboration and university-stakeholder partnerships.	2 project-wide. (June 2011)	K-A Research (#5). Modeling Stakeholder Acceptance (#13). The Individual and Disciplinary Systems (#15). Perceptions of the System and Interdisciplinary Success (#16). Linking Values for K-A (#17).
	c) Presentations and technical reports on OI research findings, suggested implementation, and recommendations for improvement.	4 presentations/2 technical reports project-wide. (June 2011)	6 Presentations. Project #5 = 2 Project #15 = 2 Project #16 = 1 Project #17 = 1
	d) Mechanisms developed for external stakeholders to be informed of relevant results of i.e. surveys.	1 per team; 4 project-wide. (June 2011)	Protecting Natural Resources (#1). Urban Landscape Models (#2). K-A Research (#5). Climate Adaption in Coastal Communities (#11). Addressing Invasive Species (#13). Modeling Stakeholder Acceptance (#14). Tidal Energy Development (#18). Community-Based Ecosystem Management (#21).

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

Goal #5 Objectives:	Strategies:	Year 2 Benchmakrs	Progress
5.1 Individual diversity	a) Diversity in new hires (% of total)	Women: 34% Diverse: 6% (June 2011)	Women: 38% Diverse: 13%
	b) Diversity in existing personnel	Women: 34% Diverse: 6% (June 2011)	Women: 47% Diverse: 5%
	c) Diversity in outreach activity participants	Women: 34% Diverse: 6% (June 2011)	Women: 71% Diverse: 7%
	d) Native Scholars Program	45 participants. (June 2011)	101 participants Women: 56% Diverse: 100%
	e) programs for women & girls	450 participants (June 2011)	582 participants Women: 100% Diverse: unknown
	f) STEM Disability program	Finalize pilot programs; 5 participants. (June 2011)	Finalizing plans for summer 2011
5.2 Institutional and partner diversity	a) # collaborating institutions	12 institutions (June 2011)	UMaine plus 12 other institutions participating
	b) # stakeholder collaborators	60 stakeholders (June 2011)	238 individual collaborators at 148 institutions
	c) breadth of stakeholders	5+ stakeholders per group (June 2011)	Of 148 groups: 27 higher education, 19 industry, 47 government, 54 NGO, 5 K-12

Goal #6: Foster the next generation of sustainability science professionals through K-20 programs that are linked to the diverse challenges and opportunities in this emerging field.			
Goal #6 Objectives:	**Strategies:**	**Year 2 Benchmarks**	**Progress**
6.1 Directly support SSI participants	a) New faculty hired	3 UM/1 USM new hires done. (June 2011)	Hiring of 4 faculty completed. Final position to join team in summer 2011.
	b) SSI core faculty supported	35 faculty supported. (June 2011)	49 SSI faculty at UMaine & USM supported
	c) SSP faculty supported	36 faculty supported. (June 2011)	59 faculty at SSP institutions supported
	d) Postdoctoral associates hired (2-3 yr. appointments)	Retained & supported. (June 2011)	Two postdocs supported and retained for YR2. Additional two postdocs to join project in May 2011.
	e) Provide graduate students research assistantships	22 graduate students supported. (June 2011)	48 graduate students supported
	f) Provide undergraduate student research assistantships	90 undergrad. students supported. (June 2011)	144 undergraduate students supported
	g) Provide high school student research assistantships	20 high school students supported. (June 2011)	21 high school students supported July/August 2010 – additional students to start June 2011
	h) Professional/ technical/ administrative staff hired/supported	10 positions supported. (June 2011)	20 positions supported
6.2 Formal graduate & undergraduate programs	a) Graduate research internships on SSI teams	15 cohort/15 additional	23 new graduate students supported on SSI research teams.
	b) Graduate student mentoring	Designate SSI Graduate Coordinator (Sep. 2010); Weekly student meeting with Grad. Coordinator (on-going)	Graduate Coordinator appointed September 2010. Weekly informal meetings with SSI graduate students on-going since September 2010.

Goal #6 Objectives:	Strategies:	Year 2 Benchmarks	Progress
	c) Develop/ implement new graduate & undergraduate courses & curriculum	Development of 2 interdiscip. grad. courses; 1 undergrad. intro. course; planning for modeling courses. (June 2011).	Fall 2010 - Readings in Sustainability Science graduate course. Other SSI graduate courses under development for fall 2011. Multiple SSI-related graduate course offerings in spring 2011, many taught by SSI faculty. Undergraduate intro. course is under development. Planning for modeling course is underway.
	d) Investigate feasibility of establishing UG program in sustainability science between UMS institutions.	Engage senior administration to explore feasibility (August 2011)	PD has begun discussion process with upper administration at UMaine to determine barriers and challenges
	e) Investigate feasibility of offering UG curriculum in sustainability science among partners.	NA for YR2	PD has also begun discussion process with administration at other statewide partners
	f) Student involvement in SSI activities	Students participate in monthly SSI team meetings and events (on-going)	Students actively participate in meetings and events. See Appendix 8.
	g) Travel support	15 graduate, 10 undergraduate students supported. (June 2011)	15 graduate students, 5 undergraduate students travel supported
	h) Undergraduate research internships on SSI teams	20 research internships supported (June 2011)	33 new undergraduate research internships at UMaine & USM are supported
	i) Coordinated graduate curriculum development	IGERT development committee formed (Jan. 2011)	IGERT committee is working on completing draft proposal and will actively compete in UMaine's institutional proposal selection process.
	j) Participation in conferences & activities	ME EPSCoR conf. (Nov. 2010); MWC poster competition (Mar. 2011);	38 students participated in the ME EPSCoR Conf. 15 graduate and undergraduate MWC poster presentations. 15 posters anticipated at SSI Event (April 15, 2011)

Goal #6 Objectives:	Strategies:	Year 2 Benchmarks	Progress
		SSI Event poster competition (Apr. 2011).	
6.3 Support faculty development through "Mutual Mentoring" program	a) Support peer mentorship networks through formal faculty partnerships.	10+ formal mentorship partnerships. (June 2011)	Formal mentorship program currently under development.
	b) Support peer mentorships through informal networking and collaboration.	1 co-taught SSI course, 15 co-mentored graduate students and post-docs, 5 SSI committees and task forces. (June 2011)	1 co-taught course (fall 2010), 14 co-mentored students/postdocs, 6 committees/task forces.
	c) Enhance existing mentorship structures through regular full team meetings, Research Council, and annual retreat.	10+ all team meetings, 10+ Research Council meetings, 1 annual retreat. (June 2011)	8 all team meetings, 7 Research Council meetings, 1 research retreat (May 2011).
	d) Host "traveling workshops" on key topics identified in a 2010 survey.	Develop & offer 1-2 workshops (June 2011)	SES, K-A and grant writing workshops are under development. Introductory workshops in SES/K-A offered at SSI Workshop (April 15, 2011)
	e) Build strategic partnerships with the Center for Excellence in Teaching and Assessment and the NSF ADVANCE grant	Design 1-2 workshops and seminars on leadership, communication, interdisciplinary collaboration, and career advancement. (June 2011)	Initial discussions underway with CETA and NSF ADVANCE team.
	f) Promote interdisciplinary mentorship and conversations.	Develop & implement bi-weekly research Integration Group Discussion Workshops (June 2011)	Implemented in January 2011, a minimum of 7 will be held in YR2 2011.

Goal #6 Objectives:	Strategies:	Year 2 Benchmarks	Progress
6.4 Foster collaborative learning and development	a) Sponsor research-related seminars and workshops	3 seminars/ workshops for 75 participants. (June 2011)	4 seminars (30 participants/seminar), 1 lecture (450 participants), 1 workshop (75 participants)
	b) Sponsor technical assistance workshops	3 workshops for 60 participants. (June 2011)	Introductory workshops in SES and K-A (April 15). Grant writing workshop – 20 participants (Nov. 10)
	c) Sponsor annual statewide EPSCoR conference	Fall 2010 for 150 participants. (June 2011)	Maine EPSCoR State Conference held November 3, 2010 for 184 participants
	d) Provide travel support for core project participants to conferences/workshops	Travel for 30 participants. (June 2011)	85 project participants were provided travel support – 57 faculty, 23 graduate students, 3 staff, 2 undergraduate students
	e) Provide travel scholarships for statewide participants	10 scholarships awarded. (June 2011)	No travel scholarships yet in YR2
	f) Implement team building activities	Monthly all-team meetings, annual research retreat, IDG workshop, other team conferences, workshops and events. (June 2011)	On-going – team meetings, discussion group. Research retreat (May 2011), SSI Workshop (April 2011), MWC (March 16).
	g) New faculty hires enhance project synergies	Integrate new faculty into all aspects of SSI project. (June 2011)	Fund pilot projects for new faculty hires, provide SSI graduate student support, provide opportunities for collaboration on integration and core projects, encourage participation on committees and task forces, schedule presentations at integrative discussion groups.
	h) Develop/ implement service learning opportunities	Develop course with service-learning components; develop summer service-learning internships at partner NGOs.	Intensive Jan. 2011 course "Designing and Managing Conservation Projects" co-taught with staff from Foundations for Success and The Nature Conservancy.

Goal #6 Objectives:	Strategies:	Year 2 Benchmarks	Progress
		(June 2011)	
	i) Provide learning opportunities for stakeholders/partner org.	Develop professional exchange program. (June 2011)	Under development.
	j) Provide professional industry internships for students	(see goal 11 Sustaining Infrastructure)	(see goal 11 Sustaining Infrastructure)
6.5 Community colleges	Engage in sustainability-related workforce development activities	Establish one community college collaboration (June 2011)	Initial meeting with EMMC March 2011; second community college being identified

Goal #7: Prepare Maine's current and future STEM workforce through coordinated programs and opportunities,

Goal #7 Objectives:	Strategies:	Year 2 Benchmarks	Progress
7.1 Related STEM programs for students and teachers	a) Provide related STEM opportunities for K-6 students	50 participants (June 2011)	20 participants to date
	b) Provide related STEM opportunities for middle school students	450 participants (June 2011)	619 participants to date
	c) Provide related STEM opportunities for high school students	30 participants (June 2011)	21 directly supported, 17 indirectly supported to date
	d) undergraduate & graduate opportunities	(Please see Goal # 6 SSI Workforce Development)	48 directly supported graduate students, 93 indirectly supported graduate students; 144 directly supported undergraduate students, 177 indirectly supported undergraduate students
7.2 Teacher professional development and curriculum development	a) Provide related STEM opportunities for K-12 & pre-service teachers	30 participants (June 2011)	103 participants
	b) undergraduate & graduate curriculum	(Please see Goal # 6 SSI	(Please see Goal # 6 SSI Workforce Development)

Goal #7 Objectives:	Strategies:	Year 2 Benchmarks	Progress
	development	Workforce Development)	
7.3 Baseline & impact studies & strategic planning	a) conduct STEM studies	3 completed (June 2011)	1 study completed & published; 2 in final stages of analysis & reporting
	b) work with statewide groups in strategic planning	ME STEM Collaborative plan; ME DOE STEM plan & Env. Literacy plan (June 2011)	Engaged in strategic planning for all
7.4 Maine STEM Collaborative leadership	a) serve on Executive & Steering Committees; lead strategic planning; advocate for STEM	Monthly meetings (on-going)	Assoc PD serves on Exec. Comm. & Steering Committee, leads strategic planning
	b) support & participate in Maine STEM Summit	Planning for next summit (June 2011)	Engaged in planning for winter 2012 STEM Summit
	c) support & participate in STEM best practices	1-2 programs (June 2011)	Pending STEM study completion and recommendations

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

Goal #8 Objectives:	Strategies:	Year 2 Benchmarks:	Progress
8.1 Statewide videoconferencing capabilities	a) Install Media Control Unit (MCU) & videoconferencing equipment at SSI partner locations	Provide webcams, training, & access for 20 SSI faculty (June 2011)	Webcams & training at 2010 ME EPSCoR State Conference (12); 2-3 trainings pending May-June 2011
	b) Install bandwidth switchgears/ modules in CSS researcher buildings	NA YRS	NA YR2
8.2 New communication and visualization tools	Deploy prototype visualization & communication portals	Deploy large-scale portal at UM's Mitchell Center (June 2011)	Visualization wall specs ready for purchase
	Create large audience participation capabilities	Planning for Communications Center (June 2011)	Planning completed – seeking estimates – renovation & installation pending summer 2011
8.3 Data sharing	Create plans & systems for data handling	Create Data Sharing Plan & cloud services (June 2011)	Data plan created Feb. 2011; cloud computing capabilities in development stage for implementation May 2011

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

Goal #9 Objectives:	Strategies:	Year 2 Benchmarks:	Progress
9.1: Internal SSI communication	a) Team events and publications – meetings; workshops; research	Monthly team meetings; 2 workshops; annual SSI	8 team meetings (monthly), 1 grant-writing workshop (Nov), 2 SES/K-A workshops (April), "traveling workshops" under development, 7 bi-weekly discussion

Goal #9 Objectives:	Strategies:	Year 2 Benchmarks:	Progress
	retreats; visiting scholars; seminars; conferences; discussion groups; internal newsletter.	conference; 6 seminars; annual research retreat; bi-weekly discussion group; bi-weekly doSSIer. (June 2011)	groups, SSI 1-day workshop (April), partner in MWC (March), 4 seminars, 1 lecture, bi-weekly newsletter (on-going), annual retreat (May).
	b) videoconferencing, web cams, internal Web site, data sharing networks	10 videoconf. meetings; develop internal SSI Web site; develop data sharing plan; pilot SSI cloud computer (June 2011)	12 team meetings/discussion groups video-conferenced. Internal website under development (live in April). Data sharing plan completed.
	c) Organization - Stewardship Council (SC), Research Council (RC), SSI committees	Monthly EPSCoR team mgt. meeting; weekly SC meetings; SSI committees meet as needed; monthly RC meeting. (on-going)	EPSCoR mgt meetings (monthly, on-going). Stewardship Council meetings (weekly, on-going). Research Council meetings (monthly, on-going). Other committees: Recruitment – 1 meetings, Culture & Curriculum - 4 meetings, Economic Development – 2 meetings.
9.2: SSI Communication with stakeholders	a) SSI Communication tools – mailing list, newsletter, press releases, articles and publications, Web site, presentations	Bi-annual newsletter; maintain/expand mailing list; maintain & update Web site; press releases for major activities; media articles and presentations to the public; print materials completed. (on-going)	Newsletter in development (published June 2011). Mailing list maintained and expanded (on-going). Maintain web site (complete update scheduled for May 2011). 22 public presentations. Printed materials for public distribution include 5 faculty profiles. SSI brochure and profiles of team research are under development (June 2011).
	b) SSI events – conferences, workshops, seminars	3 seminars/ workshops. Annual conference. (June 2011)	4 seminars, 1 lecture, 1 workshop. Conference held in partnership with Maine Water Conference (March 16, 2011). Maine EPSCoR State Conference held for 184 participants (November 3, 2010)

Goal #9 Objectives:	Strategies:	Year 2 Benchmarks:	Progress
	c) Research communication networks to foster improved interactions with stakeholders	(see Goals 1-4, Research)	(see Goals 1-4, Research)
9.3: Communicate with scientific community	Publications, presentations, conferences, Web sites.	3 major publications, 10 technical presentations, 1 award; provide research updates and progress on Web site; 1 visiting scholar. (June 2011)	36 major publications, 437 technical presentations (including national and international), web site maintained (major update scheduled for May 2011), 2-day visit by Elinor Ostrom, 12 awards.
9.4 Build scientific literacy in sustainability science. a) General public b) K-12	a) General public: Web sites, newsletters, articles and publications, printed materials, press releases, podcasts, videocasts, social networking sites.	Update Web site; bi-annual newsletter; video/audio events for podcasting; complete printed materials. (June 2011)	First newsletter in development (published June 2011). Maintain web site (complete update scheduled for May 2011). Printed materials for public distribution include 5 faculty profiles. SSI brochure and profiles of team research are under development (June 2011). Major events are podcasted and will be posted on the updated web site (May 2011)
	b) MPBN collaboration	Produce 2 SSI documentaries and 3 podcasts (June 2011)	One SSI documentary completed, second in development (completion June 2011). Podcasts pending above.
	c) Presentations to NGO's, govt., community orgs, etc.	1-2 formal presentations to (June 2011)	22 presentations to public.
9.5 Outreach and communications with the NSF EPSCoR community	NSF EPSCoR Office program officer & staff communications; other jurisdictions	Newsletters, press releases, highlights, site visits, reports, evaluations, outreach visits, attendance at national EPSCoR events (on-going)	ME EPSCoR 2 newsletters; 3 highlights; 1 site visit March 2011; PD/PA meetings Oct 2010, Jan 2011, May 2011

Goal #10: Utilize multiple formative and summative evaluation processes to improve the project's effectiveness and assess its impact in relation to its goals.			
Goal #10 Objectives:	**Strategies:**	**Year 2 Benchmarks**	**Progress**
10.1 External evaluation by independent reviewers	a) Annually assess overall project performance	Year-round review; Nov. 2010 & May 2011 site visits. (June 2011)	Nov 2010 site visit; May pending
	b) Utilize qualitative investigations	Follow-up survey (April 2011); document analysis; case studies; produce report June 2011	On track for implementation
	c) Utilize quantitative analysis	Report on analysis of attitudinal, network, productivity, and other behavioral data (June 2011)	On track for implementation
	d) Feedback loop	Disseminate report to SSI teams; Management review & recommendations (August 2011)	Pending above
10.2 AAAS assessment	a) AAAS on-site assessment	Two-day site visit of national panel (4-5 members) perform review. (May 2011)	Scheduled for May 23-24, 2011
	b) AAAS report & feedback loop	AAAS panel produces assessment report. (June 2011)	Pending above
10.3 SSI Advisory Board	a) On-going evaluation & assessment	1-3 phone or videoconference meetings; site visit June 2011.	3 full Board meetings via conference call (Dec. 2010, Feb. 2011, April 2011). 1 in-person meeting of Board sub-committee (Oct. 2010).
	b) SSI research project review	12 projects/ proposals	YR3 review by Advisory Board underway. Recommendations to ME EPSCoR Mgt

Goal #10 Objectives:	Strategies:	Year 2 Benchmarks	Progress
		reviewed by SSI Advisory Board. Recommendations to ME EPSCoR Mgt Team for final funding decision. (May 2011)	Team by mid-April 2011
10.4 NSF evaluation & assessment	a) NSF EPSCoR Reverse Site visit	September 2010 RSV; management review & recommendations (March 2011)	4 ME EPSCoR representatives presented to RSV Sept 2010 in DC; incorporated their 13 recommendations in revised SSI Strategic Plan March 2011
	b) NSF program officer visit	March 2011	March 2011 site visit
	C) Attend NSF EPSCoR national conferences & workshops	NSF EPSCoR National Conference, 2-3 PD/PA meetings, 2 special EPSCoR training workshops (on-going)	PD/PA meetings Oct 2010, Jan 2011, May 2011
	d) NSF EPSCoR reporting	Annual report filed on time. (April 2011)	Submitted 2 business days late due to major snowstorm closing University
10.5 Maine EPSCoR management	a) ME EPSCoR & SSI management	(see Goals 12 & 13 Management)	(see Goals 12 & 13 Management)
	b) MIEAB reporting (state committee)	September 2010	PD reported in Sept. 2010; on-going at quarterly meetings

Goal #11: 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 #11 Objectives:	Strategies:	Year 2 Benchmarks	Progress
11.1 Inter-institutional synergy.	Increase networking and communication between collaborating institutions	(see Goal 9 Outreach & Communication)	(see Goal 9 Outreach & Communication)
11.2 Statewide network of university & stakeholder partnerships.	Expand and strengthen university & stakeholder partnerships	(see Goal 9 Outreach & Communication)	(see Goal 9 Outreach & Communication)
11.3 External government grants	a) Provide grant development support for research teams.	1-2 grant-writing workshops; 1-2 Program Officer meetings; SSI proposal action support. (June 2011)	1 grant-writing workshop (Nov. 2010), additional workshops under development.
	b) Build stronger relationships with state and federal agencies.	Develop inventory of state/federal agencies/contacts; plan scoping meetings. (June 2011)	Inventory of contacts under development (completed June 2011).
11.4 Foundation and private support.	a) Develop foundation relationships and support.	Identify foundations with aligned goals. (June 2011)	10 foundations identified (completed June 2011)
	b) Build SSI endowment.	Identify and cultivate relationships with 2 potential donors. (June 2011)	Two potential donors identified. Working with University Development on cultivation efforts (June 2011)
11.5 Establish Maine as leader in sustainability science	a) Market the value of CSS for solving a wide range of sustainability-related problems.	(see Goal 9 Outreach & Communication)	(see Goal 9 Outreach & Communication)
	b) Provide physical infrastructure to support R&D agenda	Continue planning for new social science research lab; begin planning for Mitchell Center Communications Center (June 2011)	Social science lab - architectural plans completed, renovations to begin summer 2011. Communications center – initial plans completed, renovation work to begin 2011.

	c) enhanced cyberinfrastructure to support collaborations	(see Goal 8 CI)	(see Goal 8 CI)
	d) Engage in activities to foster private sector involvement.	Increase EDTF membership; develop stakeholder database; collaborate with Coop. Ext. faculty; host meeting with key entities engaged in economic development. (June 2011)	Discussions underway to increase collaboration and membership on EDTF.

Goal #12: Implement an effective management plan that will support and ensure the overall success of the Maine EPSCoR RII project.			
Goal #12 Objectives:	**Strategies:**	**Year 2**	**Progress**
12.1 Systems for effective coordination, communication, integration of all program components	a) Maine EPSCoR Management Team	Monthly meetings; review progress & issues, provide recommendations, strategic planning, etc. (on-going)	All on-going as planned
	b) advisory to SSI office Team	Bi-weekly meetings. (on-going)	On-going as planned
	c) advisory to SSI Stewardship Council	Bi-weekly meetings. (on-going)	PD & Assoc PD alternate attending
	d) advisory to SSI Research Council	Monthly meetings (on-going)	PD & Assoc PD alternate attending
	e) advisory to SSI All-Team meetings	Monthly meetings (on-going)	Assoc PD attends
	f) MIEAB State committee	Provide updates (September 2010)	PD provided formal update Sept 2010; on-going at quarterly meetings
12.2 Ensure	a) SSP program	Communications	Assoc PD communicates at least monthly

Goal #12 Objectives:	Strategies:	Year 2	Progress
administrative, programmatic, and fiscal integrity for all project components and institutions.	institutions have designated leadership and guidelines to follow.	with project leadership; formal training provided 1-2 times. (on-going)	with SSP leaders; SSP Coordinator appointed Jan 2011; training at SSI workshops
	b) outline & clarify project requirements to ensure understanding	Meet with SSI staff monthly & SSP institutions 1-2 times; provide on-going assistance. (June 2011)	On-going as planned; SSP site visits fall 2010 & summer 2011
	c) Maine EPSCoR staff keep abreast of federal & program requirements and policies.	attend 1-2 relevant regional and national conferences and workshops (June 2011)	Assoc PD attended STEM Tech conference Oct 2010
	d) Fiscal responsibility	NSF unobligated funds <20%, with corresponding match met. (June 2011)	YR2 unobligated funds as of March 2011 are 16%; all required match met
12.3 Foster effective communication and coordination.		(See Goal #9, Outreach & Communication)	(See Goal #9, Outreach & Communication)
12.4 Implement a comprehensive technical assistance plan		(See Goal #6, Workforce Development)	(See Goal #6, Workforce Development)

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Goal #13: 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.			
Goal #13 Objectives:	**Strategies:**	**Year 2**	**Progress**
13.1 New SSI organizational structure	a) Integrated matrix management system	Refine integrated mgt. system; map research projects onto matrix. (June 2011)	Mgt system and matrix refined and updated following YR2 project review (May 2011). Mapping completed June 2011.
	b) SSI Stewardship Council	Bi-weekly meetings (on-going)	Weekly meetings.
	c) SSI Research Council	Create Research Council (October 2010); monthly meetings (on-going)	Research Council established (Oct. 10). Monthly meetings (on-going).
	d) SSI committees	Committees meet regularly. Timeframe determined by required tasks. (on-going)	Graduate Recruitment – 1 meeting. Culture & Curriculum – 4 meetings. Economic Dev. – 2 meetings. Data Mgt. – 4 meetings.
	e) SSI Advisory Board	1-3 phone or videoconference meetings; site visit June 2011.	3 Board meetings via conference call (Dec. 2010, Feb. 2011, Apr. 2011). 1 in person meeting of Board subcommittee to review integration proposals (Oct. 2010)
	f) Maine EPSCoR Management Team	Monthly meetings. (June 2011)	Monthly meetings (on-going)
	g) SSI office Team	Bi-weekly meetings. (June 2011)	Weekly to bi-weekly meetings on-going
13.2 Communication & feedback loops	a) SSI all-team meetings	Monthly meetings. (on-going)	Monthly meetings (on-going)
	b) SSI integration discussion groups	Develop group goals (Dec. 2010). Initiate biweekly meetings (Jan. 2011)	Group goals developed (Dec. 2010). 7 bi-weekly meetings held beginning Jan. 2011).
	c) SSI communication tools & website	(see Goal 9 Outreach &	(see Goal 9 Outreach & Communication)

Goal #13 Objectives:	Strategies:	Year 2	Progress
		Communication)	
13.3 OI research	a) OI research	(see Goal 4 Organizational Innovation)	(see Goal 4 Organizational Innovation)
	b) Best practices	(see Goal 4 Organizational Innovation)	(see Goal 4 Organizational Innovation)
13.4 Research project management	a) RFP process - SSI	Create & issue a formal YR3 RFP to solicit UM/USM SSI proposals (Feb. 2011)	Research Council Task Force established to create YR3 RFP (Dec. 2010). YR3 RFP issued Feb. 2011.
	b) RFP process - SSP	Create & issue a formal YR2 RFP to solicit SSP proposals (Aug. 2010)	RFP issued July 2011; review process; 11 SSP institutions supported YR2
	c) Review process - SSI	12 proposals screened by SSI Research Council panel and reviewed by SSI Advisory Board. Final decision by ME EPSCoR Mgt Team. (May 2011)	Initial screening completed by RC panel (March 2010). Advisory Board review underway. To be completed in mid-April. Final decision by ME EPSCoR Mgt team to be completed late April.
	d) Review process - SSP	5 proposals reviewed by SSI team members. Final decision by ME ESPSCoR Mgt. Team. (rolling deadline)	SSI review committee reviewed 9 YR2 proposals August-Sept & made recommendations to Management Team
	e) Project reporting	UM/USM SSI annual reports (Feb. 2011) SSP annual reports (Jul. 2010)	16 UM/USM SSI annual reports received Feb. 21, 2011. Used in YR3 funding process. 7 SSP annual reports received July 2010.
	f) On-going review	UM/USM SSI interim progress reports (Jun. 2011) SSP interim	UM/USM SSI interim progress reporting scheduled for June 2011. 11 SSP interim progress reports received Feb. 2011

Goal #13 Objectives:	Strategies:	Year 2	Progress
		progress reports (Feb. 2011). (See also Goals 1, 2, 3, 4)	

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

APPENDIX 3: SSI Project Personnel

Type	Last Name	First Name	Department	YR1	YR2	Demo*
University of Maine						
Faculty	Amirbahman	Aria	Civil & Environmental Engineering	x	x	
Faculty	Anderson	Mark	School of Engineering	x	x	
Faculty	Beard-Tisdale	Kate	Spatial Information Science & Engineering		x	F
Faculty	Bell	Kathleen	School of Economics	x	x	F
Faculty	Calhoun	Aram	Wildlife Ecology	x	x	F
Faculty	Cole	Barbara	Chemistry	x	x	F
Faculty	Cronan	Christopher	School of Biology & Ecology	x	x	
Faculty	Daigle	John	School of Forest Resources	x	x	O
Faculty	Drummond	Francis	School of Biology & Ecology	x	x	
Faculty	Elliott	Catherine	Cooperative Extension		x	F
Faculty	Fernandez	Ivan	Plant, Soil, & Environmental Science	x	x	H
Faculty	Gallandt	Eric	Plant, Soil, & Environmental Science	x	x	
Faculty	Gardner	Susan	Education	x	x	F
Faculty	Hakola	Judith	English	x		F
Faculty	Halteman	William	Mathematics & Statistics	x		
Faculty	Hart	David	Senator George J. Mitchell Center	x	x	
Faculty	Hiebeler	David	Mathematics & Statistics	x		
Faculty	Hornsby	Stephen	Canadian-American Center	x	x	
Faculty	Hunter	Malcolm	Wildlife Ecology	x	x	
Faculty	Jain	Shaleen	Civil & Environmental Engineering	x	x	D
Faculty	Johnson	Teresa	School of Marine Sciences	x	x	F
Faculty	Judd	Richard	History	x	x	
Faculty	Kuykendall	William	New Media	x	x	
Faculty	Leahy	Jessica	School of Forest Resources	x	x	F
Faculty	Lilieholm	Robert	School of Forest Resources	x	x	
Faculty	Lindenfeld	Laura	Communication & Journalism/Margaret Chase Smith Policy Center	x	x	F

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Faculty	Loftin	Cynthia	Wildlife Ecology	x	x	F
Faculty	Maasch	Kirk	Earth Sciences	x		
Faculty	MacRae	Jean	Civil & Environmental Engineering	x	x	F
Faculty	McCoy	Shannon	Psychology	x	x	F
Faculty	McGill	Brian	Sustainability Solutions Initiative		x	
Faculty	Noblet	Caroline	School of Economics	x	x	F
Faculty	Norton	Steve	Earth Sciences	x	x	
Faculty	Peckenham	John	Senator George J. Mitchell Center	x	x	
Faculty	Peterson	Michael	Mechanical Engineering		x	
Faculty	Porter	Terry	School of Business	x		F
Faculty	Ranco	Darren	Anthropology/Senator George J. Mitchell Center	x	x	O
Faculty	Reeve	Andrew	Earth Sciences	x	x	
Faculty	Sader	Steve	School of Forest Resources	x	x	
Faculty	Saros	Jasmine	School of Biology & Ecology	x		F
Faculty	Scott	Michael	New Media	x	x	B
Faculty	Segee	Bruce	Electrical & Computer Engineering	x	x	
Faculty	Silka	Linda	Margaret Chase Smith Policy Center	x	x	F
Faculty	Simon	Kevin	School of Biology & Ecology	x	x	
Faculty	Stancioff	Esperanza	Cooperative Extension	x	x	F O
Faculty	Teisl	Mario	School of Economics	x	x	
Faculty	Vaux	Peter	Senator George J. Mitchell Center	x	x	
Faculty	Waring	Timothy	Sustainability Solutions Initiative		x	
Faculty	Weiskittel	Aaron	School of Forest Resources	x	x	
Faculty	Wilson	Jeremy	School of Forest Resources	x	x	
Faculty	Wilson	James	School of Marine Sciences	x	x	
Faculty	Zhu	Yifeng	Electrical & Computer Engineering	x	x	
Faculty	Zydlewski	Gayle	School of Marine Sciences	x	x	F
Grad Student	Albee	Emily	Education	x		F
Grad Student	Andrle	Katie	Wildlife Ecology	x		F
Grad Student	Bacon	Linda	School of Biology & Ecology	x	x	F

Type	Last Name	First Name	Department	YR1	YR2	Demo*
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	F
Grad Student	Call	Erynn	Wildlife Ecology	x	x	
Grad Student	Cline	Brittany	Sustainability Solutions Initiative/ Wildlife Ecology	x	x	F
Grad Student	Colby-George	Judy	Ecology & Environmental Sciences		x	F
Grad Student	Cosley	Brandon	School of Business/Psychology	x		
Grad Student	Ditzler	Kristin	Ecology & Environmental Sciences		x	F
Grad Student	Dreyer	Stacia	Economics		x	F
Grad Student	Fisher	Meaghann	Modern Languages & Classics	x		F
Grad Student	Girouard	Maria	Wabanaki Center	x		F
Grad Student	Gorczyca	Erika	School of Forest Resources	x		F
Grad Student	Gray	Alex	Civil & Environmental Engineering	x	x	
Grad Student	Groff	Luke	Wildlife Ecology		x	
Grad Student	Harris	Megan	Biochemistry, Micriobiology, & Molecular Biology		x	F
Grad Student	Hassett	Katherine	Resource Economics & Policy	x		F
Grad Student	Hayden	Anne	School of Marine Sciences	x		F
Grad Student	Hill	Jack	Mathematics & Statistics	x		
Grad Student	Hutchens	Stan	Sustainability Solutions Initiative/ Wildlife Ecology	x	x	
Grad Student	Hutchins	Karen	Sustainability Solutions Initiative/ Communication & Journalism	x	x	F
Grad Student	Jansujwicz	Jessica	Sustainability Solutions Initiative/ Wildlife Ecology/ School of Forest Resources	x	x	F
Grad Student	Johnson	Michelle	School of Forest Resources		x	F
Grad Student	Johnson	Eileen	Economics		x	F

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Grad Student	King	Robert	Electrical & Computer Engineering		x	
Grad Student	Letarte	Danielle	School of Economics	x		F
Grad Student	Levesque	Vanessa	Sustainability Solutions Initiative/School of Economics	x	x	F
Grad Student	Lyons	Patrick	School of Forest Resources	x	x	
Grad Student	Marrinan	Sarah	Economics		x	F
Grad Student	McGreavy	Bridie	Communication & Journalism		x	F
Grad Student	Meyer	Spencer	School of Forest Resources		x	
Grad Student	Michelle	Natalie	Public Administration		x	F O
Grad Student	Morgan	Dawn	Wildlife Ecology		x	F
Grad Student	Mullen	Amanda	Education	x		F
Grad Student	Newell	Ellen	Psychology/Education	x	x	F
Grad Student	Parr	Thomas	Ecology & Environmental Sciences		x	
Grad Student	Pickering	Ryan	School of Economics	x	x	
Grad Student	Plowden	Jennifer	School of Economics	x	x	F
Grad Student	Quartuch	Michael	School of Forest Resources		x	
Grad Student	Quigley	Erin	School of Forest Resources		x	F
Grad Student	Ravis	Charles	Sustainability Solutions Initiative		x	
Grad Student	Ryan	Kevin	Wildlife Ecology	x	x	
Grad Student	Sapiel	Minquansis	Wabanaki Center	x		
Grad Student	Saros	Misa	Civil & Environmental Engineering		x	
Grad Student	Seitz	Eleanor	Communication & Journalism	x		F
Grad Student	Silva	Bernardita	Economics		x	F H
Grad Student	Small	Heather	Intermedia	x	x	F
Grad Student	Smith	Hollie	Communication & Journalism		x	F
Grad Student	Spencer	Erin	Sustainability Solutions Initiative	x	x	F
Grad Student	Springsteen	Anna	Ecology & Environmental Sciences		x	F
Grad Student	Sutton	Anthony	Communication & Journalism		x	O
Grad Student	Trosper	Stacy	Sustainability Solutions Initiative		x	F
Grad Student	Truesdell	Samuel	School of Marine Sciences	x		

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Grad Student	Utley	Lindsay	Communication & Journalism		x	F
Grad Student	Wellman	Joseph	Psychology/Education	x	x	
Grad Student	West	Andrea	Education	x		F
Grad Student	Willett	Sara	Wabanaki Center	x		F
Grad Student	Withee	Jason	Electrical & Computer Engineering	x		
Grad Student	Zimmerman	Jacquelyn	School of Forest Resources	x	x	F
High School Student	Balaban-Garber	Rachel	Orono High School	x	x	F
High School Student	Benoit	Philip	Orono High School	x	x	
High School Student	Bird	Norah	Orono High School	x	x	F
High School Student	Brewer	Addison	Bangor High School		x	F
High School Student	Bulteel	Alex	Orono High School	x	x	
High School Student	Caron	Zachary	Orono High School	x	x	
High School Student	Cole	Avery	Orono High School	x	x	
High School Student	Foster	Andria	Orono High School	x	x	F
High School Student	Guo	Mengting	Orono High School	x	x	F
High School Student	Harrity	Siobhan	Orono High School	x	x	F
High School Student	Koehler	Benjamin	Orono High School	x	x	
High School Student	Koehler	Karl	Orono High School	x	x	
High School Student	Lesser	Daniel	Orono High School	x	x	
High School Student	Ohno	Paul	Orono High School	x	x	
High School Student	Pasquine	Laura	Bangor High School		x	F
High School Student	Richards	Jessica	Orono High School	x	x	F
High School Student	Robinson	John	Orono High School	x	x	
High School Student	Robinson	Paul	Orono High School	x	x	
High School Student	Rowe	Mark	Orono High School	x	x	
High School Student	Walton	Allison	Orono High School	x	x	F

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Postdoc	Hall	Damon	Sustainability Solutions Initiative	x	x	
Postdoc	Kim	Jong-Suk	Sustainability Solutions Initiative/Civil & Environmental Engineering	x		
Postdoc	Lazarus	Eli	Sustainability Solutions Initiative		x	
Staff	Bartlett	Christopher	Sea Grant	x	x	
Staff	Dunham	Jennifer	Maine EPSCoR Office	x	x	F
Staff	Eckardt	Michael	Office of the Vice President for Research	x	x	
Staff	Growe	Cynthia	Maine EPSCoR Office	x	x	F
Staff	Hallsworth	Ruth	Senator George J. Mitchell Center	x	x	F
Staff	Hamel	Carol	Sustainability Solutions Initiative	x	x	F
Staff	Hermann	Michael	Canadian-American Center	x		F
Staff	Homerding	Margaret	School of Marine Sciences	x		F
Staff	Kuykendall	Adam	Maine EPSCoR Office	x	x	
Staff	Mitchell	John	Wabanaki Center	x		O
Staff	Morgan	Dawn	Wildlife Ecology		x	F
Staff	Nemeth	Vicki	Maine EPSCoR Office	x	x	F
Staff	Raymond	Kim	Senator George J. Mitchell Center	x	x	F
Staff	Smith	Hollie	Sustainability Solutions Initiative		x	F
Staff	Zollitsch	Brenda	Sustainability Solutions Initiative	x	x	F
Technician	Finlayson	Christy	Sustainability Solutions Initiative/Anthropology	x		F
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		F
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		

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Technician	Post	Dylan	Sustainability Solutions Initiative		x	
Technician	Simons	Erin	School of Forest Resources	x		F
Technician	Tremblay	Jill	Sustainability Solutions Initiative	x		F
Technician	Yan	Liying	School of Marine Sciences	x		F
Undergrad Student	Armfield	Robert	Wabanaki Center	x	x	O
Undergrad Student	Arsenault	Chad	New Media		x	
Undergrad Student	Baughman	Jessica	School of Economics	x		F
Undergrad Student	Beckwith	Walter	School of Marine Sciences		x	
Undergrad Student	Buckley	Karl	Communication & Journalism/School of Forest Resources	x		
Undergrad Student	Bussell	Mallory	Communication & Journalism/School of Forest Resources	x		F
Undergrad Student	Carle	Brittany	Recreation, Parks, & Tourism		x	F
Undergrad Student	Chavis	Emily	Wabanaki Center	x		F
Undergrad Student	Co	Aileen	Chemical & Biological Engineering		x	F
Undergrad Student	Daigle	Kristyn	Sustainability Solutions Initiative		x	F O
Undergrad Student	Drown	Peter	Sustainability Solutions Initiative		x	
Undergrad Student	Dulin	Nathaniel	Ecology & Environmental Sciences		x	
Undergrad Student	Dunn	Christopher	School of Economics	x	x	
Undergrad Student	Engelmann	Nichole	Ecology & Environmental Sciences		x	F
Undergrad Student	Fitch	Matthew	New Media	x	x	
Undergrad Student	Fournier	Maria	Economics		x	F
Undergrad Student	Grant	Jonathan	Wildlife Ecology	x	x	
Undergrad Student	Han	Chuck	Electrical & Computer Engineering		x	
Undergrad Student	Hecker	Lee	Wildlife Ecology	x	x	

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Undergrad Student	Helmke	Scott	Wildlife Ecology	x	x	
Undergrad Student	Huang	Kang	Electrical & Computer Engineering		x	
Undergrad Student	Hubbard	Malissa	Ecology & Environmental Sciences		x	F
Undergrad Student	Hutchinson	Sean	Communication & Journalism/School of Forest Resources	x		
Undergrad Student	Judd	Lillian	School of Forest Resources		x	F
Undergrad Student	Kacer	Nikita	Academic and Career Exploration		x	F
Undergrad Student	Kennedy	Cody	Wildlife Ecology	x	x	
Undergrad Student	Kent	Sarah	History		x	F
Undergrad Student	Lajoie	Caitlyn	School of Economics	x		F
Undergrad Student	Lankist	Amanda	Chemistry		x	F
Undergrad Student	Ledoux	Haylea	Chemical & Biological Engineering		x	F
Undergrad Student	Legere	Matthew	Earth Sciences	x	x	
Undergrad Student	Li	Bo	Civil & Environmental Engineering		x	
Undergrad Student	Lizotte	Molly	Parks, Recreation, & Tourism		x	F
Undergrad Student	Manning	Joshua	School of Marines Sciences		x	
Undergrad Student	Mattos	Emily	Maine Business School		x	F
Undergrad Student	Mauricette	Eric	School of Forest Resources		x	
Undergrad Student	Melanson	Jesse	New Media	x		
Undergrad Student	Ortiz	Anthony	School of Forest Resources		x	H
Undergrad Student	Peavey	Lauren	Sustainability Solutions Initiative		x	F
Undergrad Student	Pelletier	Kayla	Wildlife Ecology		x	F
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	F

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Undergrad Student	Ross	Brittany	School of Forest Resources		x	F
Undergrad Student	Shank	Elijah	School of Forest Resources		x	
Undergrad Student	Stickney	Matthew	Computer Science		x	
Undergrad Student	Stiles	Benjamin	Sustainability Solutions Initiative		x	
Undergrad Student	Tomes	Andrew	School of Biology & Ecology	x		
Undergrad Student	Tooher	Alexander	Electrical & Computer Engineering		x	
Undergrad Student	Tremblay	Jill	Anthropology	x		F
Undergrad Student	Vo	Giang	Maine Business School	x	x	F
Undergrad Student	Walus	Brandon	Wabanaki Center	x		
Undergrad Student	Wibberly	Megan	School of Economics	x	x	F
University of Maine Other Institution Participants						
Faculty	Maclean	David	Forestry	x	x	
Consultant	Donahue	Charlene	State of Maine Insect & Disease Laboratory	x		F
Consultant	Drummond	Marjorie	GrowSmart Maine	x		F
Consultant	Meadow	Curtis	TreFoil Corporation	x		
Consultant	Neptune	Jennifer	Maine Indian Basketmakers Alliance		x	F O
Consultant	Secord	Theresa	Maine Indian Basketmakers Alliance		x	F O
University of Southern Maine						
Faculty	Briggs	David	Computer Science	x	x	
Faculty	Colgan	Charles	Muskie School of Public Service	x	x	
Faculty	Kartez	Jack	Muskie School of Public Service	x	x	D
Faculty	Kim	Yuseung	SSI/Muskie School of Public Service		x	
Faculty	Owen	David	School of Law	x	x	
Faculty	Pavri	Firooza	Geography & Anthropology	x	x	F
Faculty	Wilson	Karen	Environmental Science & Policy	x	x	F
Grad Student	Bojarski	Slawomir	Muskie School of Public Service	x	x	
Grad Student	Capponi	Randa	School of Law	x	x	F
Grad Student	Dikeman	Barry	Muskie School of Public Service		x	

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Grad Student	Glaser	Peter	School of Law	x		
Grad Student	Goff	Sandra	Muskie School of Public Service	x	x	F
Grad Student	Riley	Jennifer	Muskie School of Public Service		x	F
Grad Student	Youngs	Thea	Muskie School of Public Service	x	x	F
Staff	Ives	Barbara	Muskie School of Public Service		x	F
Staff	Willis	Theodore	Adjunct Faculty	x	x	B
Undergrad Student	Begin	Leonora	Geology		x	F H
Undergrad Student	Carroll	Shannon	School of Law	x		F
Undergrad Student	Dailey	Abraham	Geography & Anthropology	x	x	
Undergrad Student	Ogren	Meghan	School of Law	x		F
Undergrad Student	Pooler	William	Muskie School of Public Service		x	
Undergrad Student	Sanford	Cole	Geography & Anthropology	x		
Undergrad Student	Shuttle	Shannon	Environmental Science	x	x	F
Undergrad Student	Thurston	Scott	Muskie School of Public Service		x	
Undergrad Student	Wood	Richard	School of Law	x	x	
Bates College						
Faculty	Johnson	Beverly	Geology	x	x	F
Faculty	Lewis	Lynne	Economics	x	x	F
Technician	Dostie	Phil	Chemistry	x		
Undergrad Student	Lindelof	Jennifer	Geology	x		F
Undergrad Student	Ross	Zach	Economics	x		
Undergrad Student	Wool	Dava	Geology	x		
Bowdoin College						
Faculty	Camill	Phil	Environmental Studies & Biology	x	x	
Faculty	Herrera	Guillermo	Economics	x	x	H
Faculty	Johnson	Eileen	Environmental Studies	x	x	F
Faculty	Lichter	John	Biology	x	x	
Staff	Ames	Ted	Biology		x	
Undergrad Student	Bell	Andy	Biology	x		

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Undergrad Student	Berghoff	Henry	Biology	x		
Undergrad Student	Elowe	Cory	Biology	x		
Undergrad Student	Hinman	Paul	Economics	x		
Undergrad Student	Jacobson	Holly	Biology	x		F
Undergrad Student	Johnston	Catherine	Biology	x		F
Undergrad Student	Towne	Ben	Biology	x		
Colby College						
Faculty	Bevier	Catherine	Biology	x	x	F
Faculty	Cole	Russell	Biology	x	x	
Faculty	Fleming	James	Science, Technology, and Society	x	x	
Faculty	King	Whitney	Chemistry	x	x	
Faculty	Nyhus	Philip	Environmental Studies	x	x	
Faculty	Rueger	Bruce	Geology		x	
Faculty	Wilson	Herbert	Biology	x	x	
Staff	Elliott	Alice	Goldfarb Center for Public Affairs & Civic Engagement	x		F
Staff	Lessing	Lauren	Museum of Art	x		F
Undergrad Student	Bittler	Kim	Chemistry	x	x	F
Undergrad Student	Bradley	Sharonda	Biology	x		F B
Undergrad Student	Bruno	Jasmine	Biology	x	x	F
Undergrad Student	Chang	Anne	Biology	x		F
Undergrad Student	Hoyt	Eleanor	Biology	x	x	F
Undergrad Student	Kawamura	Malia	Chemistry		x	F
Undergrad Student	Martin	Corey	Biology	x	x	
Undergrad Student	McCullough	Ian	Environmental Studies	x		
Undergrad Student	Murray	Katherine	Chemistry		x	F
Undergrad Student	Schnettler	Erin	Science, Technology, Society	x	x	F
Undergrad Student	Sheppard	Danielle	Science, Technology, Society	x	x	F B
Undergrad Student	Theile	Josie	Chemistry		x	F

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Undergrad Student	Todd	Alexandra	Biology	x	x	F
Undergrad Student	Westhafer	James	Science, Technology, Society	x		
Colby College Other Institution Participants						
Consultant	Baeder	Charles	Belgrade Regional Conservation Alliance		x	
Consultant	Kallin	Peter	Belgrade Regional Conservation Alliance	x	x	
Consultant	Shannon	Maggie	Maine Congress of Lakes Association	x	x	F
University of Maine at Farmington						
Faculty	Barton	Drew	Biology		x	
Faculty	Bennett	Chris	Computer Science		x	
Faculty	Buckley	Daniel	Natural Sciences	x	x	
Faculty	Butler	Ron	Biology		x	
Faculty	Clawson	Mellisa	Education		x	F
Faculty	Daly	Julia	Geology		x	F
Faculty	Harper	Wendy	Economics	x	x	F
Faculty	Heroux	David	Chemistry		x	
Faculty	McAnneny	Cathleen	Geography		x	F
Faculty	McCourt	Matthew	Geography	x	x	
Undergrad Student	Angelides	Michael	English		x	
Undergrad Student	Colbry	Dustin	Environmental Planning & Policy		x	
Undergrad Student	Corson	Hunter	Biology		x	
Undergrad Student	Ferrari	Tom	Biology		x	
Undergrad Student	Scott	Jediah	Environmental Planning & Policy		x	
Undergrad Student	Skoog	Dimitri	Biology		x	
Undergrad Student	Wilson	Tyler	Natural Sciences		x	
College of the Atlantic						
Faculty	Anderson	John	Human Ecology	x	x	
Faculty	Cass	Donald	Human Ecology	x	x	
Faculty	Cline	Kenneth	Human Ecology	x	x	
Faculty	Cox	J. Gray	Human Ecology	x	x	
Faculty	Friedlander	Jay	Human Ecology	x		
Faculty	Taylor	Davis	Human Ecology	x	x	
Staff	Deliso	Elizabeth	Human Ecology	x		F
Staff	Macko	Katherine	Human Ecology	x		F
Staff	Ten Broeck	Craig	Human Ecology	x	x	
Technician	Longsworth	Gordon	Human Ecology		x	
Undergrad	Dickenson	Matthew	Human Ecology	x		

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Student						
Undergrad Student	Doubnerova	Marketa	Human Ecology	x		F
Undergrad Student	Haris	Nick	Human Ecology	x		
Undergrad Student	Maiorana	Matt	Human Ecology	x		
Undergrad Student	Nielsen	Lindsey	Human Ecology	x		F
Undergrad Student	Slabach	Brittany	Human Ecology	x		F
Undergrad Student	Wartell	Jake	Human Ecology	x		
Unity College						
Faculty	Arnett	Amy	Ecology	x	x	F
Faculty	Dunckel	Kathleen	Computers & Geographic Information Systems	x	x	F
Faculty	Latty	Erika	Botany	x	x	F
Faculty	Remsburg	Alysa	Biology	x	x	F
Undergrad Student	Arsenault	Arielle	Biology	x	x	F
Undergrad Student	Barber	Kelly	Sustainability and Global Change	x	x	F
Undergrad Student	Bell	Nils	Biodiversity	x	x	
Undergrad Student	Greer	Jasmine	Biology	x	x	F
Undergrad Student	Lamppa	Thomas	Biology	x	x	
Undergrad Student	Leach	Ari	Resource Management	x	x	F
Undergrad Student	Miller	Andrea	Biodiversity	x	x	F
Undergrad Student	Salvino	Cayce	Biodiversity	x	x	F
Undergrad Student	Zukas	Alison	Resource Management	x	x	F
University of Maine at Presque Isle						
Faculty	Johnston	Jason	Math & Science	x	x	
Faculty	Putnam	David	Math & Science	x	x	
Faculty	Sebold	Kimberly	History		x	F
Faculty	Wang	Chunzeng	Math & Science	x	x	
Faculty	Whittington	Anja	Rec. & Leisure Studies		x	F
Undergrad Student	Crandall	Matthew	Environmental Studies		x	
Undergrad Student	Emery	Robert	Rec. & Leisure Studies		x	

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Undergrad Student	Grivois	Keith	Math & Science	x	x	
Undergrad Student	Paul	Angie	Math & Science	x	x	F O
Undergrad Student	Ryan	Sarah	Math & Science	x	x	F
Undergrad Student	Sirois	Gary	Outdoor Recreation		x	
University of New England						
Faculty	Daley	Michael	Management	x	x	
Faculty	Feurt	Christine	Environmental Studies	x	x	F
Faculty	Morgan	Pamela	Environmental Studies	x	x	F
Faculty	Perlut	Noah	Environmental Studies		x	
Faculty	Sulikowski	James	Marine Science Academic	x	x	
Faculty	Zeeman	Stephan	Marine Sciences	x	x	
Faculty	Zogg	Greg	History & Politics	x	x	
Staff	Davis	Jenna	Office of the Vice President for Research	x		F
Technician	Carlson	Amy	Environmental Studies	x		F
Undergrad Student	Almeida	William	Environmental Studies	x	x	
Undergrad Student	Amaio	Chelsea	Environmental Studies	x		F
Undergrad Student	Bergeron	Jessica	Marine Sciences	x	x	F
Undergrad Student	Carlson	Amy	Chemistry & Physics	x	x	F
Undergrad Student	Crettien	Chloe	Sustainability Solutions Initiative		x	F
Undergrad Student	Hammond	Marissa	Environmental Studies/Marine Sciences	x	x	F
Undergrad Student	Johnson	Samantha	Marine Sciences	x		F
Undergrad Student	Kelly	Lindsay	Environmental Studies	x	x	F
Undergrad Student	Loesher	Gale	Sustainability Solutions Initiative	x	x	F
Undergrad Student	Madore	Justine	Environmental Studies	x		F
Undergrad Student	Ouillette	Amanda	Sustainability Solutions Initiative		x	F
Undergrad Student	Sargent	Deidra	Environmental Studies	x		F
Undergrad Student	Simon	Matt	Sustainability Solutions Initiative		x	

Type	Last Name	First Name	Department	YR1	YR2	Demo*
Undergrad Student	Smith	Kayla	Sustainability Solutions Initiative		x	F
Undergrad Student	Wright	Derek	Sustainability Solutions Initiative	x		
University of New England Other Institution Participants						
Consultant	Dionne	Michele	Wells Nat. Estuarine Research Reserve		x	F
University of Maine at Augusta						
Faculty	Lage	Christopher	Biology		x	
Faculty	Milligan	Peter	Biology		x	
Faculty	Szakas	Joseph	Computer Information Systems		x	
University of Maine at Augusta Other Institution Participants						
Consultant	Fitzgerald	Caragh	UM Cooperative Extension		x	F
University of Maine at Fort Kent						
Faculty	Borges-Therien	Kim	Natural & Behavioral Sciences		x	F
Faculty	Cardenas	Soraya	Natural & Behavioral Sciences		x	F H
Faculty	Hicks	Bruno	Education		x	
Faculty	Hobbins	Dave	Natural & Behavioral Sciences		x	
Staff	Bjerklie	JR	Institutional Research & Assessment		x	
Staff	Kermath	Brian	Center for Rural Sustainable Development		x	
Undergrad Student	Jerkins	Martin	Environmental Studies		x	
Undergrad Student	Ouellette	Greg	Forest Management		x	
University of Maine at Machias						
Faculty	Otto	William	Environmental & Biological Science		x	

*Demographic Abbreviations:
F – Female
B – Black or African American
H – Hispanic
O – Other Ethnic
D – Person with Disability

Maine's Sustainability Science Initiative
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APPENDIX 4: YR2 Project Personnel Diversity

Directly Supported Personnel:	**YR2 Benchmarks**							
	Total	**Males**	**Females**	**Blacks or African Americans**	**Hispanics**	**Other Ethnic**	**Persons with Disabilities**	**Unknown**
Faculty	109	70	39	0	3	6	2	0
Postdocs	2	2	0	0	0	0	0	0
Graduate students	49	17	32	0	1	2	0	0
Undergraduate students	144	80	64	2	2	4	1	0
High school students	20	12	8	0	0	0	0	0
Professional/ Administrative staff	21	10	11	1	0	0	0	0
TOTALS:	**345**	**191**	**154**	**3**	**6**	**12**	**3**	**0**
Direct Overall %:		**55%**	**45%**	**1%**	**2%**	**3%**	**1%**	**0%**
Indirectly Supported Participants:	**YR2 Benchmarks**							
	Total	**Males**	**Females**	**Blacks or African Americans**	**Hispanics**	**Other Ethnic**	**Persons with Disabilities**	**Unknown**
ARI Faculty	104	63	41	0	0	5	4	6
PUI Faculty	53	34	19	0	2	4	1	0
Graduate students	93	30	63	3	0	2	2	4
ARI Undergrad students	87	32	55	0	0	19	0	0
PUI Undergrad students	90	44	46	1	1	3	0	0
K-12 teachers & pre-service teachers	103	23	80	0	0	0	0	0
High school students	17	9	8	0	0	0	0	0
Middle school students	619	6	613	0	1	14	0	0
Elementary school students	20	4	16	0	0	9	0	0
Technical/Professional/ Administrative staff	82	27	55	1	3	0	2	1
Business/Industry	18	1	17	0	0	0	0	0
NGO/Government	320	160	160	3	2	5	1	7
General Public	103	51	52	0	0	24	0	0
TOTALS:	**1709**	**484**	**1225**	**8**	**9**	**85**	**10**	**18**
Indirect Overall %		**28%**	**72%**	**0%**	**1%**	**5%**	**1%**	**1%**

Maine's Sustainability Science Initiative
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APPENDIX 5: YR2 Project Collaborators

SSI Research Collaborations

Institution/Organization	SSI Collaborator	Title/Position
American Wind Energy Association	Christine Real de Azua	Assistant Director of Communications
American Wind Energy Association	Larry Flowers	Technical Director
American Wind Energy Association	Tom Gray	Director of Communications
Archbold Biological Station	Betsie Rothermel	Assistant Research Biologist
Arizona State University	Allen Lee	Lead Programmer, CSID
Arizona State University	Marco Janssen	Director, CSID
Association of Consulting Foresters	Cliff Foster	Forester
Bangor Area Comprehensive Transportation System	Don Cooper	Planner
Bangor Chamber of Commerce	John Porter	President
Bangor International Airport	Amanda Plourde	Environmental Technician
Bangor Land Trust	Lucy Quimby	President
Belgrade Lakes Regional Conservation Alliance	Margaret Pietrak	Education Committee Chair
Belgrade Lakes Regional Conservation Alliance	Mel Croft	President
Bowdoin College	Damon Gannon	Director, Kent Island Research Station
Bridgewater College	Bernardo Motta	Assistant Professor
Brunswick-Topsham Land Trust	Angela Twitchell	Executive Director
C.C. Dorion Geological Services	Chris Dorion	Consulting Geologist
Caswell Forest Products	Richard Latty	Owner
CES, Inc.	Phil Ruck	PE Director of Civil Engineering
Chebeague-Cumberland Land Trust	Penny Asherman	President
Chewonki Foundation	Peter Arnold	Director, Sustainability Inititiative
Cianbro Institute	Parker Hadlock	Project Development Manager
Citizens' Task Force on Wind Power - Maine	Monique Aniel	Co-Chair
City of Bangor	John Murphy	Assistant City Engineer
City of Bangor	Sean Gambrel	Geographic Information Specialist
City of Brewer	Ken Locke	Environmental Services Director
City of Brewer	Tanya Pereira	Economic Development Specialist
City of Brewer	Vicki Proulx	Assessor/Planning Staff
City of Old Town	David Wight	Public Works Director
City of Portland	Alex Jaegerman	Planning Director
City of Portland	Doug Roncarati	Stormwater Program Coordinator
City of South Portland	Charles Haueser	Planning Director
Cobscook Bay Resource Center	Will Hopkins	Director

Institution/Organization	SSI Collaborator	Title/Position
Community Energy Partners	Sue Jones	Maine Wind Working Group Coordinator
Creative Conservation LLC	Jerry Bley	Principal
Cumberland County Government	Aaron Shapiro	Community Development Director
Docks to Doorways	Tom Klingenstein	Chair
Dorothea Dix Psychiatric Center	Paul Ducharme	Director of Facilities
Duke University	Brad Murray	Associate Professor
E.D. Bessey and Sons	Chip Bessey	Owner
Eastern Maine Community College	Dan Belyea	Director, Facilities Management
Eastern Maine Development Corporation	Jennifer Brooks	Director of Community and Economic Development
Ed Holt & Associates, Inc.	Ed Holt	Founder
Fred Bailey Trail Design	Fred Bailey	Owner
Freeport Conservation Trust	Katrina VanDusan	Executive Director
Frenchman Bay Conservancy	Tom Sidar	Executive Director
Friends of Lincoln Lake	Blake Brad	President
Friends of Lincoln Lake	Gary Steinberg	Director
Greater Portland Council of Governments	Neal Allen	Director
Greater Portland Council of Governments	Rebeccah Schaffner	Regional Planner
GrowSmart Maine	Lock Kiermaier	Policy Analyst
Harvard University	David Foster	Professor
Houlton Band of Maliseets Conservation Department	John Walker	Director
Houlton Band of Maliseets Conservation Department	Matt Edberg	Conservation Specialist
Indian Township Heritage Museum	Donald Soctomah	Historical Preservation Officer
Island Institute	George Baker	Renewable Energy Specialist
Island Institute	Heather Deese	Senior Program Director
Jackson Laboratory	Carol Bult	Professor
Kennebec Estuary Land Trust	Alisha Heyburn	Communications Director
Kennebec Estuary Land Trust	Carrie Kinne	Executive Director
Kennebec Homeowners' Association	Dot Kelly	President
Kevin Hooper Associates	Kevin Hooper	President
LandVest	Gary Bahlkow	Director of Northern Timberland Transactions
Leuphana University Lueneburg	Harald Heinrichs	Professor
Maine	Jim Reed	Parcel owner
Maine Air National Guard	Eric Johns	Medical Group Commander
Maine Audubon Society	Jenn Gray	Legal Counsel
Maine Audubon Society	Sally Stockwell	Director, Conservation Department
Maine Bureau of Parks and Lands	Alan Stearns	Deputy Director
Maine Center for Disease Control	Andrew Smith	State Toxicologist
Maine Center for Disease Control	Eric Frohmberg	Toxicologist
Maine Congress of Lakes Association	Phil Mulville	Maine COLA Educator
Maine Department of Environmental Protection	David Ladd	Municipal & Industrial Stormwater Coordinator
Maine Department of Environmental Protection	James Cassida	Director, Division of Land Resource Regulation

Institution/Organization	SSI Collaborator	Title/Position
Maine Department of Environmental Protection	Kathy Hoppe	Environmental Specialist
Maine Department of Environmental Protection	Kristin Feindel	Environmental Specialist
Maine Department of Environmental Protection	Leon Tsomides	Biological Monitoring Program Manager
Maine Department of Environmental Protection	Roy Bouchard	Biologist
Maine Department of Inland Fisheries and Wildlife	Beth Swartz	Wildlife Biologist
Maine Department of Inland Fisheries and Wildlife	John Pratte	Wildlife/Forester
Maine Department of Inland Fisheries and Wildlife	Phillip deMaynadier	Biologist
Maine Department of Inland Fisheries and Wildlife	Rich Hoppe	Regional Wildlife Biologist
Maine Department of Inland Fisheries and Wildlife	Tom Hodgman	Biologist
Maine Department of Labor	John Dorrer	Director
Maine Forest Service	Andrew Shultz	Landownder Outreach Forester
Maine Forest Service	Dave Struble	State Entomologist
Maine Forest Service	Donald Mansius	Director of Forest Policy and Management
Maine Forest Service	Ken Laustsen	Forest Biometrician
Maine Forest Service	Kevin Doran	Natural Science Education
Maine Geological Survey	Peter Slovinsky	Coastal Geologist
Maine Institute for Human Genetics and Health	Janet Hock	Director
Maine Land Use Regulation Commission	Agnieszka Pinette	Senior Planner
Maine Land Use Regulation Commission	Ellen Jackson	Land Use Planner
Maine Land Use Regulation Commission	Samantha Horn Olsen	Planning Division Manager
Maine Land Use Regulation Commission	Sarah Giffen Carr	Senior Planner
Maine Land Use Regulation Commission	Susan Burns	Land Use Planner
Maine Land Use Regulation Commission	Tim Beaucage	Land Use Planner
Maine Office of Energy Independence and Security	Jennifer Puser	Deputy Director of Research and Legislation
Maine Office of Geographic Information Systems	Michael Smith	Director
Maine Public Utilities Commission	John Brautigam	Director, State Energy Program
Maine Renewable Energy Association	Jeremy N. Payne	Executive Director
Maine Rural Partners	Mary Ann Hayes	Executive Director
Maine State Planning Office	Elizabeth Hertz	Planner
Maine State Planning Office	Matthew E. Nixon	Senior Planner
Maine State Planning Office	Michael J. LeVert	State Economist
Maine State Planning Office	Phil Carey	Senior Planner
Maine State Planning Office	Tim Glidden	Director
Maine State Senate	Walter Gooley	State Senator
Maine TREE Foundation	Sherry Huber	Director

Institution/Organization	SSI Collaborator	Title/Position
Maine Wilderness Guides Organization	Greg Shute	Co-President
Maine Winter Sports Center	Mike Chasse	Webmaster
Maine Winter Sports Center	Mike Smith	Program Director
Messalonskee Middle School	Sherry Labbe	Science Teacher
Monash University	Michael Grace	Associate Professor
Moosehead Regional Futures	Sandra Neily	Steering Committee Member
Moosehead Regional Futures	Wendy Weiger	Steering Committee Member
Natural Resource Council of Maine	Dylan Voorhees	Clean Energy Director
New England Wood Pellet	Steve Walker	President & CEO
North Pond Association	Rick Watson	President
Ocean Renewable Power Company	Chris Sauer	President & CEO
Ocean Renewable Power Company	Herb Scribner	Director, Environmental Affairs
Ocean Renewable Power Company	Jarlath McEntee	Vice President of Technology & Engineering
Opportunity Maine	Rob Brown	Executive Director
Orono Land Trust	Wendall Tremblay	Board Member
Parsons Brinkerhoff Inc.	Stephen Rolle	Supervising Transportation Planner
Parsons Brinkerhoff Inc.	Uri Avin	National Leader, Regional Growth
Peninsula Power Community Energy Project	Sandy Cohen	Co-Director
Penobscot County Soil & Water Conservation District	Chris Brewer	District Office Coordinator
Penobscot Nation	John Neptune	Athletic/Cultural Coordinator
Planning Decisions, Inc.	Mark Eyerman	President
Rachel Carson National Wildlife Refuge	Ward Feurt	Refuge Manager
Rangeley Lakes Heritage Trust	Nancy Perlson	Executive Director
Rangeley Lakes Heritage Trust	Rebecca Kurtz	Invasive Plant Program Director
Rangeley Snowmobile Association	Steve Dudley	President
San Jose State University	Anne Marie Todd	Associate Professor
Small Woodland Owners Association of Maine	Mike Dann	Land Trust Coordinator
Small Woodland Owners Association of Maine	Tom Doak	Director
Southern California Association of Governments	Simon Choi	Program Manager
Southern Maine Regional Planning Council	Paul Schumacher	Executive Director
State University of New York	James Gibbs	Professor
State University of New York	Mark Meisner	Assistant Professor
The Nature Conservancy of Maine	Barbara Vickery	Director of Conservation
The Nature Conservancy of Maine	Bruce Kidman	Director of Communications and Government Relations
The Nature Conservancy of Maine	Josh Royte	Conservation Planner
The Nature Conservancy of Maine	Marcia Brown	Senior Program Officer
The Nature Conservancy of Maine	Tom Rumpf	Associate State Director
The Nature Conservancy of Maine	William Brunce	Director of Land Protection
The SOAP Group	John Rooks	Owner
Tidal Energy Device Evaluation Center	Rick Armstrong	Director

Institution/Organization	SSI Collaborator	Title/Position
Town of Brunswick	Anna Breinich	Planning Director
Town of Cumberland	William Shane	Town Manager
Town of Hampden	Gretchen Heldemann	Assessor/Planning Staff
Town of Hampden	Keith Barnhard	Fire Inspector
Town of Hermon	Beth Bowdoin	Assessor/Planning Staff
Town of Milford	Janna Wood	Code Enforcement Officer
Town of Orono	Evan Richert	Town Planner
Town of Orono	William Murphy	Code Enforcement Officer
Town of Topsham	Rod Melanson	Natural Resources Planner
Town of Veazie	Allan Thomas	Code Enforcement Officer
Town of Yarmouth	Kyle Warren	Conservation Planner
Tufts University	Mary D. Davis	Assistant Professor
University of California, Berkeley	Liming Wang	Post Doctoral Researcher
University of Canterbury	Jon Harding	Professor
University of Cincinnati	Steve Depoe	Professor
University of Denmark	John Thogersen	Professor
University of Georgia	Whit Gibbons	Professor
University of Maine	Andre Khalil	Assistant Professor
University of Maine	Andrew Plant	Assistant Professor
University of Maine	Beth Bisson	Assistant Director for Outreach and Education, Maine Sea Grant
University of Maine	Caragh Fitzgerald	Extension Educator
University of Maine	Elizabeth Viselli	Associate Program Manager, AEWC
University of Maine	Fred Servello	Professor
University of Maine	Habib J. Dagher	Director, AEWC
University of Maine	Hemant Pendse	Professor
University of Maine	Huijie Xue	Professor
University of Maine	Jake Ward	Assistant Vice President for Research, Economic Development, and Governmental Relation
University of Maine	James McCleave	Professor Emeritus
University of Maine	Jane Haskell	Facilitator
University of Maine	John Jemison	Extension Professor
University of Maine	John Rebar	Director, Cooperative Extension
University of Maine	Judith Rhymer	Associate Professor
University of Maine	Laura Wilson	Extension Professional
University of Maine	Lisa Phelps	Extension Program Administrator
University of Maine	Mary Cathcart	Coordinator, MCSC
University of Maine	Nathan Stormer	Professor
University of Maine	Nuri Emanetoglu	Professor
University of Maine	Paul Anderson	Director, Marine Extension Program
University of Maine	Paul Grosswiler	Professor
University of Maine	Roger Merchant	Extension Educator
University of Maine	Scott Wilkerson	Sustainability Officer
University of Maine	Stephanie Welcomer	Associate Professor
University of Maine at Machias	Tora Johnson	Director, Geographic Information

Institution/Organization	SSI Collaborator	Title/Position
		Systems
University of Maine at Presque Isle	Don Zillman	President
University of Minho	Anabela Carvalho	Professor
University of Missouri	Ray Semlitsch	Professor
University of New Brunswick	Chris Hennigar	Post Doctoral Researcher
University of New Brunswick	David Maclean	Professor
University of North Carolina	Dylan McNamara	Assistant Professor
University of Southern Maine	Terry Theodose	Associate Professor
University of Washington	Brian Polagye	Research Assistant Professor
University of Washington	John Horne	Research Assistant Professor
US Army Corps of Engineers	Greg Penta	Senior Scientist
US Army Corps of Engineers	Ruth Ladd	Chief, Policy Analysis & Technical Support
US Fish and Wildlife Service	Bob Houston	Biologist/GIS Specialist
US Fish and Wildlife Service	Susan Adamowicz	Land Management Research & Demonstration Biologist
US Fish and Wildlife Service	William Kolodnicki	Refuge Manager
USDA Forest Service	Andrew Lister	Research Forester/GIS Analyst
USDA Forest Service	Brian Sturtevant	Research Ecologist
USDA Natural Resources Conservation Service	Jeff Norment	Biologist
USDA Natural Resources Conservation Service	Sally Butler	State Forester
USGS Conte Anadromous Fish Lab	Adria Elskus	Research Scientist
USGS Maine Cooperative Fish and Wildlife Research Unit	Joseph Zydlewski	Research Biologist
Vermont Fish and Wildlife Department	Eric Sorenson	Community Ecologist
Waterville Junior High School	Deb Strout	Science Teacher
Wells National Estuarine Research Reserve	Jacob Amman	Research Associate
Wells National Estuarine Research Reserve	Jeremy Miller	Research Associate
Wells National Estuarine Research Reserve	Tim Smith	Stewardship Coordinator
West Virginia University	Adam Henry	Assistant Professor
Western Oregon University	Emily Plec	Associate Professor
Wind Power for ME Coalition	Toby Williamson	Community Outreach Consultant
Woodard & Curran Inc.	John Williams	Senior Project Manager
Woodard & Curran Inc.	Zach Henderson	Consultant
Woods Hole Oceanographic Institution	Andrew Ashton	Research Scientist
Wright-Pierce	Jim Brown	Consultant

Maine EPSCoR Office Collaborators
(STEM, Workforce Development, Cyberinfrastructure, etc.)

Institution/Organization	EPSCoR Collaborator	Title/Position
Belfast Area High School	David Thomas	Math & Science Teacher
Cianbro Institute	Steve Pound	Associate Director, Workforce Development
Colby College	Tom Berger	Emeritus Professor
Education Development Center	Barbara Berns	Director, Center for Science Education
Education Development Center	Nancy Richardson	Policy Analyst
Girl Scouts of Maine	Samantha Lott Hale	Director of Program
Gulf of Maine Research Institute	Alan Lishness	Chief Innovation Office, Gulf of Maine Research Institute
Hardy Girls Bangor Area Planning Committee	Trish Hansen	Board Member
Hardy Girls Healthy Women	Jackie Dupont	Director of Programs
Institute for Broadening Participation	Susie Valaitis	Associate Director
Maine Department of Education	Anita Bernhardt	State Science & Technology Specialist & Regional Representative
Maine Department of Labor	John Dorrer	Director, Center for Workforce Research & Information
Maine Energy Promotional Council	Peter Mickelson	Education Chairman
Maine International Center for Digital Learning	Bette Manchester	Executive Director, Maine International Center for Digital Learning
Maine Mathematics & Science Alliance	Jan Mokros	Executive Director
Maine Pulp & Paper Foundation	Jack Healy	Executive Director
Maine Robotics	Tom Bickford	President & Director
Maine Space Grant Consortium	Terry Shehata	Executive Director
Mount Desert Island Biological Laboratory	Mike McKernan	Director of Education & Conferences
Old Town High School	Lisa Schultz	Science Teacher
Regional Education Laboratory	Craig Hoyle	Senior Methodologist
Regional Education Laboratory	Pam Buffington	Senior Project Director
Regional Education Laboratory	Peter Tierney-Fife	Maine State Researcher
Troy Howard Middle School	Beth Haynes	Mathematics Teacher
University of Maine	Ali Abedi	Assistant Professor
University of Maine	Eric Landis	Professor
University of Maine	Hemant Pendse	Professor
University of Maine	John Gregory	Executive Director, Information Technologies
University of Maine	Karen Horton	Associate Professor
University of Maine	Mohsen Shahinpoor	Professor
University of Maine	Molly Schauffler	Assistant Professor
University of Maine	Sheila Pendse	Project Development Associate

University of Maine	Susan McKay	Professor & Director, Center for Research in STEM Education
University of Southern Maine	David Silvernail	Director, Center for Education Policy
University of Southern Maine	Michael Wing	Director of External Programs, Engineering, Health Professions, Nursing, Science, and Technology
Unum	Marcia Leander	Associate Vice President

Maine's Sustainability Science Initiative
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APPENDIX 6: YR2 Grant Proposals Submitted & Awarded

SSI Grant Proposals Submitted in Year 2

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
7/7/10	Noblet, C.	University of Maine	Food Safety, Sustainability in the Seafood Industry	U.S. Dept. of Agriculture	$362,994	rejected
7/9/10	Noblet, C.	University of Maine	Green Innovation Marketplace	U.S. Dept. of Energy	$766,650	pending
7/22/10	Lindenfeld, L.	University of Maine	Full Scale Development. Acting on the Science: Coupled Natural-Human Systems	National Science Foundation	$2,497,278	rejected
8/21/10	Kartez, J.	University of Southern Maine	HUD Sustainable Regional Planning Consortium	U.S. Dept. of Housing & Urban Development	$185,000	$185,000
9/15/10	Lindenfeld, L.	University of Maine	NEWBio: The Northeast Woody Biomass Consortium	U.S. Dept. of Agriculture	$8,680,365	rejected
10/7/10	McGreavy, B.	University of Maine	Graduate Student Government	University of Maine	$850	$850
11/10/10	McGreavy, B.	University of Maine	Robert and Patricia Switzer Foundation Professional Development Grant	Robert and Patricia Switzer Foundation	$560	$560
11/15/10	Hall, D.	University of Maine	Capisic Brook Assessment Plan	City of Portland	$3,580	pending
12/15/10	Hutchins, K.	University of Maine	Stormwater Awareness Intercept Survey	Bangor Area Stormwater Group	$1,200	$1,200
2/11/11	Parr, T.	University of Maine	Analysis of DOM across ecological and sociocultural gradients in Maine, New Zealand, and Australia	University of Maine	$850	pending
2/22/11	Lindenfeld, L.	University of Maine	Promoting Workforce and	Maine Sea Grant	$150,000	pending

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
			Economic Development through Sustainable Seafood			
2/22/11	Hall, D.	University of Maine	Sustainable Coastal Development	Maine Sea Grant	$150,000	pending
2/28/11	Parr, T.	University of Maine	Analysis of DOM across ecological and sociocultural gradients in Maine, New Zealand, and Australia	North American Benthological Society	$900	pending
12/10/10	Leahy, J., Beard-Tisdale, M.K.	University of Maine	Air Quality and Social Science Review of the Literature Relevant to Winter Use	US Dept. of the Interior	$7,579	$7,579
8/1/10	Zydlewski, G	University of Maine	Biological assessment of the OCGen TM Tidal Energy Module Mooring System	US Dept of Energy	$616,977	$61,977
7/14/10	McGill, B.	University of Maine	Integrating Global Species Distribution Data	National Aeronautics & Space Administration	$257,203	pending
7/15/10	Loftin, C	University of Maine	The Role of Marine Derived Nutrients Delivered by Andadromous Fish YR4	US Dept of Commerce	$64,623	$64,623
7/20/10	McGill, B	University of Maine	Steps Towards a Predictive Theory of Species Responses to Climate Change	National Science Foundation	$899,502	rejected
7/22/10	Segee, B., Zhu, Y.	University of Maine	ISE: Full Scale Development: Inquiry-based Learning of Climate Sciences	National Science Foundation	$2,987,803	rejected

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
8/3/10	Segee, B., Zhu, Y.	University of Maine	I-EN: Research/Education Infrastructure for Computation, Visualization	National Science Foundation	$738,015	rejected
8/3/10	Zhu, Y	University of Maine	Low Cost Real Time Monitoring System	US Dept of Energy	$127,065	pending
8/25/10	Segee, B., Zhu, Y	University of Maine	REU Site: Supercomputing Undergraduate Program in Maine (SuperME)	National Science Foundation	$373,618	pending
9/13/10	Lilieholm, R.	University of Maine	Growth of Microalgae on Industrial Cellulosic Residues for Enhanced Bio-Oil	US Dept of Agriculture	$40,051,013	pending
9/24/10	Calhoun, A	University of Maine	The Missing Link: Integrating Social Sciences in Natural Resources Conservation	Society for Conservation Biology	$140,000	pending
11/10/10	Eckardt, M, Nemeth, V, Letourneau, J, Segee, B	University of Maine	Maine EPSCoR: End-to-End Connectivity for Sustainability Science Initiative	National Science Foundation	$1,000,000	pending
11/30/10	Bevier, C	Colby Colege	Social & Physiological Mechanisms Underlying Individual Variation in Behavior in Male Frogs	Andrew W. Mellon Foundation	$13,635	$13,635
12/9/10	Camill, P., Lichter, J	Bowdoin College	Social & Ecological Interdependence of Ecological Recovery in Maine's Rivers & Nearshore Marine Ecosystems	National Science Foundation	$986,832	pending
12/10/10	McGill, B	University of Maine	Geospatial Analyst Position Supplement to	iPlant (National Science	$150,000	$150,000

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
			"Choosing (and making available) the Right Environmental Layers."	Foundation Center)		
12/17/10	Reeve, A	University of Maine	Using Temperature & Flow Profiling to Evaluate Groundwater Interaction With Surface Water in Maine	Maine Agricultural & Experiment Station	$20,000	pending
12/17/10	Zhu, Y	University of Maine	CSR: Small Collaborative Research: SANE: Semantic-Aware Namespace in Exascale	National Science Foundation	$193,649	pending
12/18/10	Ranco, D	University of Maine	Improving Emerald Ash Borer Monitoring & Management Prioritization	Maine Forest Service	$150,000	pending
1/13/11	Norton, S	University of Maine	Identification of the Determinants of Fish Tissue Mercury Concentration in Lake	US Dept of Interior	$23,400	pending
1/13/11	Peckenham, J	University of Maine	FY2011 WRRI Annual Application: Management	US Dept of the Interior	$13,197	pending
1/13/11	Peckenham, J	University of Maine	FY2011 WRRI: Annual Application – Information Transfer	US Dept of the Interior	$37,405	pending
1/14/11	Calhoun, A., Hart, D	University of Maine	Planning for Development &Natural Resources	Elmina B. Sewall Foundation	$98,060	pending
1/28/11	Lilieholm, R	University of Maine	Improving Emerald Ash Borer Monitoring and Management Prioritization	US Dept of Agriculture	$181,902	pending

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
1/30/2011	Ranco, D.	University of Maine	Improving Emerald Ash Borer Monitoring and Management Prioritization	USDA Forest Service	$244,250	pending
1/31/2011	Loftin, C.	University of Maine	Pollination Security for Fruit and Vegetable Crops in the Northeast	U.S. Dept. of Agriculture	$1,480,670	pending
2/22/2011	Teisl, M.	University of Maine	Engaging with Coastal Stakeholders in Maine regarding Energy Alternatives	Maine Sea Grant	$150,000	pending
2/28/2011	Leahy, J.	University of Maine	Peer-to-Peer Learning in Small Woodland Owner Networks	U.S. Dept. of Agriculture	$38,567	pending
3/2/2011	Willis, T.	University of Southern Maine	Exploring methods for measuring sustainability at river herring harvest points	Northeast Consortium	$35,000	pending
4/1/2011	Cline, B.	University of Maine	EArly-concept Grants for Exploratory Research (EAGER) Collaborative and cross-disciplinary research grants Development of harmonic radar direction finding (HDF) technology and remote sensor/mote network to track juvenile amphibian dispersal	National Science Foundation	$35,000	pending
7/30/2010	Bevier, C.	Colby College	Modeling Resience and Adaptation in the Belgrade Lake	National Science Foundation	$99,992	$99,992

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
			Watershed YR II Renewal			
12/9/2010	Camill, P.,	Bowdoin College	NSF Coupled Human & Natural Systems Research Grant.	National Science Foundation	$986,832	pending
7/15/2010	Sader, S	University of Maine	Predictin Response to Climate Change for At-Risk Species	National Aeronautics & Space Administration	$1,239,740	pending
10/8/2010	Hutchins, K.	University of Maine	Travel to National Communication Association Annual Convention	Graduate Student Government, University of Maine	$847	$847
11/1/2010	Hutchins, K.	University of Maine	Travel to National Communication Association Annual Convention	Bailey Funds, University of Maine	$477	$477
11/10/2010	McGreavy, B.	University of Maine	Graduate Student Government	University of Maine	$425	425
TOTALS:		Submitted: 49 Total Awarded: 15		Total $ Amount: $63,565,140 Total $ Award: $473,196		

SSI Grant Proposals Submitted YR1 – Awarded YR2

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
8/27/09	Peterson, Michael	University of Maine	ARRA: Refinement of Cross Flow Turbine Airfoils	U.S. Dept. of Energy	$60,000	$60,000
11/3/09	Peterson, Michael	University of Maine	Microalgae Oil Recovery System Design	U.S. Dept. of the Interior	$15,000	$15,000
2/4/10	Segee, B., Zhu, Y.	University of Maine	CDI-Type I: GPU-Accelerated Interactive Supercomputing for Climate Studies	National Science Foundation	$452,736	$452,736
4/15/10	Johnson, T., Peterson,	University of Maine	Environmental Impact Protocols for Tidal Power	U.S. Dept. of Energy	$1,000,000	$1,000,000

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
	M., Zydlewski, G.					
4/29/10	Simons, E., Wilson, J.	University of Maine	Long-term Outcomes and Tradeoffs of Forest Policy & Management Practices	U.S. Dept of Agriculture	$105,819	$105,819
5/6/10	Wilson, J.	University of Maine	Support for Long-Term Research on the Penobscot Experimental Forest Yr 3	U.S. Dept. of Agriculture	$11,000	$11,000
5/21/10	Calhoun, A., Hart, D.	University of Maine	Improving Planning Processes in Maine Towns to Achieve Environmental Goals	Elmina B. Sewall Foundation	$85,000	$85,000
6/3/10	Zydlewski, G.	University of Maine	UMaine – Tidal Power Environmental Assessments: Fishes	U.S. Dept. of Energy	$846,544	$846,544
6/3/10	Peterson, M.	University of Maine	ARRA: Refinement of Cross Flow Turbine Hydrofoils – Phase II	U.S. Dept. of Energy	$225,000	$225,000
6/4/10	Wilson, J.	University of Maine	Merging Landsat Time-Series and FIA Data to Develop Vulnerability Maps	U.S. Dept. of Agriculture	$33,000	$33,000
4/1/2010	Cox, J. Gray	College of the Atlantic	Sustainable Business Hatchery supplies and innovation fund	WP Carey Foundation	$100,000	$100,000
4/22/10	Leahy, J.	University of Maine	A Long-Term Monitoring Program to	US Dept of Agriculture	$25,000	$25,000

Submit	Name	Institution	Title	Sponsor	Sponsor Request	Award
			Assess the Northern Forest's Logging Industry			
4/23/10	Leahy, J	University of Maine	An Oral History Place Attachment Project - Understanding the Changing Forest Landscape	US Dept. of Agriculture	$37,740	$37,740
2/10/10	Loftin, C	University of Maine	Chemical Analysis of Shrubby Cinquefoil (dasiflora fruticosa)	Nature Conservancy	$4,692	$4692
3/31/10	Daly, J	University of Maine, Farmington	Maine Mountain Ponds Survey	Quimby Family Foundation	$20,000	$20,000
5/1/10	Stancioff, E.	University of Maine	Enhancing Sea Grant's Ability to Help Coastal Communities Adapt to Climate Change	National Sea Grant	$30,000	$30,000
5/10/10	Loftin, C.	University of Maine	Predicting Water Quality in Maine's Lakes by Relating Field Collected	US Environmental Protection Agency	$60,000	$60,000
TOTALS					18	$3,173,508

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APPENDIX 7: YR2 SSI-Sponsored Workshops, Seminars, Presentations

DATE	SSI EVENT	SSI PRESENTER	TITLE	AFFILIATION
6/26/2010	40th Annual Maine Lakes conference (sponsor)	Various		University of Maine; Colby College
9/10/2010	SSI Fall Welcome Event	Hart, David	Welcome to incoming class of SSI doctoral students	University of Maine
10/4/2010	Seminar	Zachary Easton	"Non-point" from Non-point Source Pollution	Cornell University
10/13/2010	Seminar	Kathleen Boomer	Using Multiple Watershed Models to Link Science and Land Management	Smithsonian Environmental Research Center
10/18/2010	Seminar	Adam S. Ward	When Science is Not Enough: Restoring Functions of Streams Beyond the Banks	Penn State University
10/18/2010	SSI Team Meeting	Various		University of Maine
10/20/2010	Seminar	Sean Smith	Closing the Gaps Between Sediment Budgeting, Watershed Modeling, and Stream Rehabilitation	Maryland Dept of Natural Resources Ecosystem Restoration Services
10/21/2010	Senator George J. Mitchell Lecture on Sustainability	Elinor Ostrom	Unconventional Wisdom: Sustaining our Natural Resources in a Rapidly Changing World (co-recipient of the 2009 Nobel Prize in Economic Sciences)	Indiana Univeristy
		David Hart	Introductory remarks	University of Maine
		Johnson, Teresa	Panel Presentation to SSI	University of Maine
11/8/2010	Maine EPSCoR State Conference, University of Maine, Orono, ME	David Hart	Sustainability Project Update	University of Maine
		John ReBar	Reaching Out to Stakeholders	UM Cooperative Extension
		Darren Ranco	Native Research & STEM	University of Maine
		Kathleen Bell, Jim Wilson, Charlie Colgan, Yuseung Kim, Eli Lazarus	Coupled Social-Ecological Systems Research	University of Maine, University of Southern Maine
		Donal Carbaugh	On the Co-production of Knowledge in Sustainability Science	UMASS Amherst
		Jeffrey Letourenau, Bruce Segee, Eric Damboise	Maine's Cyberinfrastructure Plan	University of Maine, University of Maine System
11/22/2010	SSI Team Meeting	Various		University of Maine
11/30/2010	Grant Writing Workshop	Linda Silka		University of Maine

DATE	SSI EVENT	SSI PRESENTER	TITLE	AFFILIATION
12/3/2010	World Sustainability Teach-in Day University of Maine. Orono, Maine	Kates, Robert	*Sustainable Development: Can It Be Done in This or Any Century?*	SSI
		SSI Graduate Students		University of Maine
12/3/2010	Senior College Workshop	SSI Graduate Students		University of Maine
12/3/2010	Cooperative Extension Workshop	SSI Graduate Students		University of Maine
1/13/2011	SSI Team Meeting	Various		University of Maine
1/18/2011	SSI Integration Discussion Group Workshop Series	McGreavy	Attitudes to Vernal Pools	University of Maine
1/27/2011	SSI Team Meeting	Various		University of Maine
2/1/2011	SSI Integration Discussion Group Workshop Series	Waring, Timothy	Evaluating Coupled Socio-Ecological Systems	University of Maine
2/10/2011 – 2/11/2011	Workshop (sponsor)	Eric Eckl	Water Words That Work	Water Words That Work
2/15/2011	SSI Integration Discussion Group Workshop Series	McGill, Brian	Is climate change an example of a coupled natural human system?	University of Maine
3/14/2011	SSI Integration Discussion Group Workshop Series	Lichter, John	Ecological and economic recovery of Maine's waterways and coastal communities	Bowdoin College
3/16/2011	Maine Water Conference	15 SSI presenters		UMaine; UMaine at Machias; USM; College of the Atlantic; Colby; Bates; Bowdoin; Unity
3/22/2011	SSI Integration Discussion Group Workshop Series	Hall, Damon	Strategies and Tactics for Community-based Sustainability Science Research	University of Maine
3/24/2011	SSI Team Meeting	Various		University of Maine
4/12/2011	SSI Integration Discussion Group Workshop Series	Lazarus, Eli	Seeing the forest AND the trees? New approaches to ecological and social dynamics of wooded/working lands and land-use change	University of Maine
4/14/2011	NSF Communicating Science Workshop		Science: Becoming the Messenger	University of Maine
4/15/2011	Maine EPSCoR Sustainability Solutions Initiative Workshop	Various		University of Maine
4/21/2011	SSI Team Meeting	Various		University of Maine
4/26/2011	SSI Integration Discussion Group Workshop Series	Kim, Yuseung		University of Southern Maine
5/31/2011 – 6/1/2011	SSI Retreat (2-day event)			University of Maine

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APPENDIX 8: SSI Technical Presentations Given

Scope	SSI Member	Institution	Description
International	Amirbahman, Aria	University of Maine	Amirbahman A., B.A. Lake, and S.A. Norton, "Seasonal phosphorus dynamics in the surficial sediment of shallow temperate lakes: A combined DET and 31P-NMR study," Paper presented at the American Society of Limnology and Oceanography (ASLO), Aquatic Sciences Meeting, Puerto Rico, February 2011.
International	Bell, Kathleen	University of Maine	Bell, K.P. 2010. Do transdisciplinary fields require transdisciplinary teaching? Global Land Project 2010 Open Science Meeting, Arizona State University, Tempe, AZ, October 19, 2010.
International	Bell, Kathleen	University of Maine	Bell, K.P. 2010. Understanding the market for land-change information: challenges in and opportunities for reconciling supply and demand. Global Land Project 2010 Open Science Meeting, Arizona State University, Tempe, AZ, October 18, 2010.
International	Bell, Kathleen	University of Maine	Hart, D., Bell, K.P., Jain, S., Lindefeld, L., and J. Peckenham, Managing a sustainability science research portfolio: Innovative strategies to maximize social-ecological learning and problem-solving. Resilience 2011 - Resilience, Innovation, and Sustainability: Navigating the Complexities of Global Change, Tempe, AZ, March 15, 2011 (poster presentation).
International	Bell, Kathleen	University of Maine	Leahy, J., Gorcycza, E., Wilson, J., and K.P. Bell. 2011. Oral presentation abstract submitted for consideration to the International Symposium on Society and Resource Management Meeting, Madison, WI, June 4-8, 2011
International	Bell, Kathleen	University of Maine	Plowden, J. and K.P. Bell. 2011. Using stakeholder input to improve community planning research. Oral presentation abstract submitted for consideration to the International Symposium on Society and Resource Management Meeting, Madison, WI, June 4-8, 2011.
International	Bell, Kathleen	University of Maine	Speers, A., Bell, K.P., Teisl, M., and J. Leahy. 2011. Tradeoffs, social norms, status, and pro-environmental behavior. Oral presentation abstract submitted for consideration to the International Symposium on Society and Resource Management Meeting, Madison, WI, June 4-8, 2011
International	Calhoun, Aram	University of Maine	Calhoun, AJK and DE Morgan. Conservation of small wetlands through community based collaboratives. Annual meeting Society for Conservation Biology. New Zealand
International	Calhoun, Aram	University of Maine	Hunter, M.L. Jr. and A.J.K. Calhoun. 2010. Workshop "Advice on attending a professional meeting. Society for Conservation Biology Annual Meeting. Alberta, CA.

Scope	SSI Member	Institution	Description
International	Calhoun, Aram	University of Maine	Jansujwicz, JS, R. Lilieholm, and AJK Calhoun. Spanning Boundaries and Disciplines: Integrating Social Science into Natural Resources Conservation to Enhance Vernal Pool Management on Private Lands. International Association for Society and Natural Resources. Malaysia.
International	Cox, J. Gray	College of the Atlantic	"Developing Our Energy Future: Residential Heating With Wood in Hancock County, Maine" Presentation to the Society for Human Ecology, Las Vegas, Nevada
International	Dreyer, Stacia	University of Maine	Stacia Dreyer, Gene Myers. A comparison of students' conceptions of littering in WA state wilderness areas, state parks and a small city. Invited presentation. The XVIII International Conference of the Society for Human Ecology. Lake Las Vegas, NV.
International	Feurt, Christine	University of New England	"Collaborative Learning and Ecosystem Management" Webinar for Ecosystem Based Management Tools Network incorporating methods used in SSI project
International	Gardner, Susan	University of Maine	Gardner, S. K. (2010, November). Faculty conceptualizations of an interdisciplinary research collaboration. Paper presented at the annual meeting of the Association for the Study of Higher Education, Indianapolis, IN.
International	Gardner, Susan	University of Maine	Gardner, S. K. (2010, November). The challenges of me-search in higher education. Symposium paper presented at the annual meeting of the Association for the Study of Higher Education, Indianapolis, IN.
International	Gardner, Susan	University of Maine	Gardner, S. K. (2011, April). The socialization of part-time doctoral students. Paper to be presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
International	Gorczyca, Erika	University of Maine	An Application of Agent-Based Modeling: Harvest Decisions of Family Forest Landowners in Maine
International	Gorczyca, Erika	University of Maine	Improving SES with SES: Considering the suitability of engaging stakeholders in forest-based socio-ecological systems modeling
International	Hunter, Malcolm	University of Maine	Managing highly dynamic forests for biodiversity. Keynote address to IUFRO (International Union of Forestry Research Organizations) conference in Braganca Portugal.
International	Hunter, Malcolm	University of Maine	Organized and presented a workshop on how to participate in a conference for students, 24th International Congress for Conservation Biology, Edmonton, Canada,
International	Hunter, Malcolm	University of Maine	Popescu, V.D. and M.L. Hunter. Forest succession and amphibian migration: implications for landscape connectivity. 24th International Congress for Conservation Biology, Edmonton, Canada,

Scope	SSI Member	Institution	Description
International	Jain, Shaleen	University of Maine	Gray, A., S. Jain, and E. Stancioff, Adaptation Strategies in a Changing Climate: Building Resiliency in Maine's Coastal Communities and the Statewide Stakeholder Process. Second International Science and Policy Conference/Resilience 2011: Resilience, Innovation, and Sustainability, Arizona State University, Tempe, AZ, 11-16 March, 2011.
International	Jain, Shaleen	University of Maine	Jain, S. Emerging hydroclimatic regimes in a changing climate: Understanding the nature of decadal variability and secular trends for resource management and decision-making. Conference on Decadal Predictability at the International Centre for Theoretical Physics Trieste, Italy, 16 - 20 August 2010
International	Jain, Shaleen	University of Maine	Pearce B. R., S. Jain, and W. Halteman, The nature and impacts of the commingled influence of Sahel precipitation and tropical Pacific sea surface temperature variability on Atlantic hurricane activity. Conference on Decadal Predictability at the International Centre for Theoretical Physics, Trieste, Italy, 16 - 20 August 2010
International	Jansujwicz, Jessica	University of Maine	Cooperation and Natural Resource Management: Community-Based Vernal Pool Conservation Planning in Maine International Symposium for Society and Natural Resource Management
International	Jansujwicz, Jessica	University of Maine	Cooperation and Natural Resource Management: Community-Based Vernal Pool Conservation Planning in Maine International Congress for Conservation Biology
International	Johnson, Teresa	University of Maine	Institutional studies and governance on participatory modelling (and Facilitator). JAKFISH Conference, Brussels, Belgium. March 7-8th, 2011.
International	Johnson, Teresa	University of Maine	Johnson, T.R. and G. Zydlewski. Maine Tidal Power Initiative: Linking Knowledge to action for the Responsible Development of Tidal Power. Presented at the Renewable Ocean Energy and the Marine Environment, Palm Beach, Florida, November 3-5, 2010.
International	Johnson, Teresa	University of Maine	Johnson, T.R., J.A. Wilson, J.A. Acheson. 2010. Competition, cooperation, and learning in the marine commons: Implications for collective action. North American Regional Meeting of the International Association for the Study of the Commons. Arizona. September 2010. (Panel chair)
International	Latty, Erika	Unity College	Invertebrate biodiversity patterns in hemlock-dominated forests: Effects of vegetation, woody debris, and leaf litter
International	Lazarus, Eli	University of Maine	Poster presentation at 2010 American Geophysical Union Fall Meeting (San Francisco, CA): Lazarus, E., and K. P. Bell (2010), Dynamics of land use and common-resource pressures in terrestrial-aquatic environments, Eos Trans. AGU, 91 (55), Fall Meet. Suppl., Abstract NG43B-1420.

Scope	SSI Member	Institution	Description
International	Leahy, Jessica	University of Maine	Gorczyca, E., Leahy, J., Wilson, J., Bell, K., and Mercier, W. "An Application of Agent-Based Modeling: Harvest Decisions of Family Forest Landowners in Maine," for the International Symposium on Society and Resource Management, June 2011. Madison, WI.
International	Leahy, Jessica	University of Maine	Leahy, J., Gorczyca, E., Bell, K., and Wilson, J. "Improving SES with SES: Considering the Suitability of Engaging Stakeholders in Forest-based Socio-ecological Systems Modeling," for the International Symposium on Society and Resource Management, June 2011. Madison, WI.
International	Leahy, Jessica	University of Maine	Lyons, P., Leahy, J., Kittredge, D., and Anderson, M. 2011. "There's No Place like Home: The Role of Place Attachment in Understanding Family Forest Landowner Behavior," for the International Symposium on Society and Resource Management, June 2011. Madison, WI.
International	Leahy, Jessica	University of Maine	Quartuch, M., and Leahy, J. 2011. "The Future of Maine's Changing Family Forests: Preliminary Analysis of Tipping Points in Landowner Attitudes and Behaviors," for the International Symposium on Society and Resource Management, June 2011. Madison, WI.
International	Leahy, Jessica	University of Maine	Straub, C. and Leahy, J. "Do children really influence parent environmental behavior?: An intergenerational knowledge transfer study," for the International Symposium on Society and Resource Management, June 2010. Corpus Christi, TX.
International	Leahy, Jessica	University of Maine	Thornton, T., Leahy, J., and Johnson, T. "Analyzing social networks to determine the benefits of a community based environmental monitoring research project (GET WET!) in natural resource management," for the International Symposium on Society and Resource Management, June 2010. Corpus Christi, TX.
International	Leahy, Jessica	University of Maine	Willand, M., Leahy, J., Ma, Z., and Kilgore, M. "Taking the Behavioral Assumptions Framework to the People: Policy Preferences among Landowners, Interest Groups and Agency Employees toward Recreation Access Incentives," for the International Symposium on Society and Resource Management, June 2010. Corpus Christi, TX.
International	Leahy, Jessica	University of Maine	Zimmerman, J., Leahy, J., Lindenfeld, L., and Doran, K. "Education efforts within the forestry community: Influences of the educator's values and beliefs," for International Symposium on Society and Resource Management, June 2010. Corpus Christi, TX.
International	Lilieholm, Robert	University of Maine	"Pioneers in Landscape-scale Conservation." On-line 1-hour webinar hosted by Jim Levitt of Harvard's Kennedy School of Government. (Lilieholm, Taylor & Nyhaus, presenting) (December 2010) (see http://www.innovations.harvard.edu/xchat-

Scope	SSI Member	Institution	Description
			transcript.html?chid=356)
International	Lilieholm, Robert	University of Maine	A Participatory Approach for Modeling Alternative Future Land Use Scenarios around Nairobi National Park using Bayesian Belief Networks. Ecology and the Environment (in press). (Technical review) (McCloskey, Lilieholm, Boone, Reid, Nkedianye, Sader, Said, and Worden.
International	Lilieholm, Robert	University of Maine	Community-resource Linkages on Alaska's National Forests. Integrated Conservation and Sustainable Living. International Symposium on Society and Resource Management, Madison, Wisconsin. (Tessema presenting, with Blahna & Kruger)
International	Lilieholm, Robert	University of Maine	Silvicultural Rehabilitation of Cutover Mixed-wood Stands. ECANUSA Forest Science Conference, Edmundston, New Brunswick. (Kenefic presenting, with Wilson, Brissette, Nyland & Lilieholm) (October 2010)
International	Lilieholm, Robert	University of Maine	Wildlands and Woodlands A Vision for the New England Landscape. BIOECON Conference, Venice, Italy. (Lilieholm presenting, with Foster & colleagues) (September 2010) (Invited) (International)
International	Lindenfeld, Laura A	University of Maine	Assessing the Needs of Municipalities as a Solutions-Oriented Partnership Strategy. Leuphana University, Lueneburg, Germany
International	Lindenfeld, Laura A	University of Maine	Conference on Communication and the Environment (awaiting acceptance)
International	Lindenfeld, Laura A	University of Maine	Leahy, J., Gorcyzca, E., Mercier, W., Hutchins, K., Lindenfeld, L., Silka, L., and Bell, K. "A Case Study of Combining Coupled Social-Ecological System Modeling with Knowledge-to-Action Research: Agent-Based Modeling of Family Forests," oral presentation for the International Symposium on Society and Resource Management, Corpus Christi, TX.
International	Lindenfeld, Laura A	University of Maine	Technology and Sustainability. Maine's Sustainability Solutions Initiative as a Model
International	Lindenfeld, Laura A	University of Maine	The Sustainability Solutions Initiative. A Model for Interdisciplinary Collaboration. Leuphana University, Lueneburg, Germany
International	Lindenfeld, Laura A	University of Maine	Zimmerman, J., Leahy, J., Lindenfeld, L., and Doran, K. "Education efforts within the forestry community: Influences of the educator's values and beliefs," oral presentation for International Symposium on Society and Resource Management, Corpus Christi, TX.

Scope	SSI Member	Institution	Description
International	Loftin, Cynthia	University of Maine	Parsons, M., C.S. Loftin, and F. Servello. Comparing colony attendance to incubation constancy in the presence of disturbance: methods for remotely monitoring gull activity. 2010 World Seabird Conference, 7-11 September, Victoria, British Columbia, Canada. Parsons presented (poster).
International	Loftin, Cynthia	University of Maine	Wetzel, P., and C.S. Loftin. Characteristics of a large, infrequent disturbance in a wetland ecosystem: Fire in the Okefenokee National Wildlife Refuge, Georgia, USA. 2010 Ecological Society of America Annual Meeting, 1-6 August, Pittsburg, PA. Wetzel presented.
International	Lyons, Patrick	University of Maine	Applying Social Network Analysis to Identify Stakeholders for Engagement in Human Dimensions of Natural Resources Research
International	Lyons, Patrick	University of Maine	Fostering Credibility and Legitimacy among Family Forest Stakeholders and Researchers to Promote Knowledge to Action
International	Lyons, Patrick	University of Maine	There's No Place like Home: The Role of Place Attachment in Understanding Family Forest Landowner Behavior
International	MacRae, Jean	University of Maine	User-driven data exploration of a managed lake system: first steps toward integrated watershed modeling and management tool in support of decision making and community education
International	McCoy, Shannon K	University of Maine	Hassett, K., Noblet, C., Teisl, M., McCoy, S.K. (2010). Take a Hike! The simultaneous relationship between recreation behavior and environmental concern. Paper presented at the Joint Conference of the International Association for research in Economic Psychology and the Society for the Advancement of Behavioral Economics. Cologne, Germany
International	McCoy, Shannon K	University of Maine	Teisl, M. F., McCoy, S. K., Noblet, C. (2010). What's "driving" eco-substitution behaviors? A study in choices related to biofuels. selected Paper. Joint conference of the International Assocation for Research in Economic Psychology and the Society for the Advancement of Behavioral Economics. Cologne, Germany
International	McGill, Brian	University of Maine	"Biological diversity in a changing world" - satellite working group at Kavli Royal Society Center (Oct 2010)
International	McGill, Brian	University of Maine	"Bird populations and communities through time in a changing environment" - Oct 2010 - Royal Society - "Biological diversity in a changing world" symposium
International	Noblet, Caroline	University of Maine	Katherine Hassett, Mario F. Teisl, Caroline Noblet and Shannon McCoy. 2010. What's Attitude got to do with it? Consumer Demand for Biofuels. Selected poster. Joint Conference of the International Association for Research in Economic Psychology and the Society for the Advancement of Behavioral Economics University of

Scope	SSI Member	Institution	Description
			Cologne, Germany.
International	Peterson, Michael	University of Maine	The Characterization and Design of High Solidity Cross-Flow Tidal Turbines
International	Plowden, Jennifer	University of Maine	Plowden, J. and K.P Bell. 2011. Using stakeholder input to improve community planning research. Submitted for consideration to the International Symposium on Society and Resource Management Meeting, Madison, WI, June 4-8 (oral).
International	Quartuch, Mike	University of Maine	"The Future of Maine's Changing Family Forests: Preliminary Analysis of Tipping Points in Landowner Attitudes and Behaviors." Poster Presentation. 16th International Symposium on Society and Resource Management. Madison, Wisconsin, USA.
International	Quartuch, Mike	University of Maine	"Who or What do Small-scale Forest Landowners Consider When Making Forest Management Decisions?: Case evidence From Maine and New Brunswick." Oral Presentation. 16th International Symposium on Society and Resource Management. Madison, Wisconsin, USA.
International	Quartuch, Mike	University of Maine	"Why do You Practice Good Management?": Ethical Motivations for Land Stewardship in Sweden, New Brunswick and Maine." Oral Presentation. 16th International Symposium on Society and Resource Management. Madison, Wisconsin, USA.
International	Sader, Steven	University of Maine	J. McCloskey, R. Lilieholm, R. Boone, R. Reid, J. Worden, S.A. Sader and others. The effects of changing land-use patterns on wildlife migrations and pastoral livelihoods near wildlife reserves in Kenya. NSF-ESPSCoR Conference, University of Maine, Orono, ME
International	Sader, Steven	University of Maine	Wilson J.S., E.M. Simons, K.R. Legaard, S.A. Sader and J. Leahy. Spatial forest planning to meet multiple natural resource goals. Eastern CANUSA Forest Science Conference, Edmunsdston, New Brunswick, Canada
International	Silka, Linda	University of Maine	Silka, L. Climate Change and Other "Wicked Problems": Finding Sustainable Solutions. Annual Meeting of the American Psychological Association. San Diego, CA.
International	Simon, Kevin	University of Maine	Lee M. Demi, Kevin S. Simon, Stephen M. Coghlan, Rory Saunders, Dennis Anderson. TOP-DOWN TROPHIC CASCADES AND THEIR INFLUENCE ON PHYTOPLANKTON BIOMASS IN LAKES ALONG A TROPHIC GRADIENT. Annual Meeting of the North American Benthological Society.
International	Simon, Kevin	University of Maine	Madeleine Mineau, Kevin Simon, Damon Ely, Regina Rancatti, Ivan Fernandez, Steve Norton, Maury Valett. Effects of chronic N enrichment and acidification on coupled N and P cycling in streams: insights from multiple spiraling techniques. Annual Meeting of the North American Benthological Society

Scope	SSI Member	Institution	Description
International	Simon, Kevin	University of Maine	Parr T, C Cronan, T Ohno and K Simon. Patterns of dissolved organic matter composition along an Urbanization Gradient in Maine. Annual Meeting of the North American Benthological Society. May 2011
International	Simon, Kevin	University of Maine	Simon K, C Rigsby, D Ely, M Mineau, T Ohno, I Fernandez, S Norton, HM Valett. MICROBIAL RESPONSE TO ALTERED DISSOLVED ORGANIC MATTER CHEMISTRY ARISING FROM WATERSHED NITROGEN ENRICHMENT AND ACIDIFICATION. Annual Meeting of the North American Benthological Society. Providence, RI, USA
International	Stancioff, Esperanza	University of Maine	National Perspectives on Climate Change Adaptation: A Panel Discussion of Climate Change Adaptation Efforts in Diverse Coastal Regions of the United State The Coastal Societies 22nd International Conference
International	Teisl, Mario F.	University of Maine	Duoadia Bougherara, Sandrine Costa and Mario F. Teisl. 2010. La Compensation Ecologique: Des Indulgences Environnementales? (Ecological Compensation: Are they Environmental Indulgences ?) Research Seminar AgroParisTech, Paris France.
International	Teisl, Mario F.	University of Maine	Mario F. Teisl, Shannon McCoy and Caroline Noblet,. 2010. What's 'Driving' Eco-Substitution Behaviors? A study in choices related to biofuels. Selected Paper. Joint Conference of the International Association for Research in Economic Psychology and the Society for the Advancement of Behavioral Economics University of Cologne, Germany
International	Teisl, Mario F.	University of Maine	Mario F. Teisl, Shannon McCoy and Caroline Noblet. 2010. We are MESSI (MainE Sustainable Solutions Initiative): Using Interdisciplinary Social Science Research to Encourage Sustainability. Invited Paper. The Forum for Social Science Research Concerning the Environment and the Department of Marketing and Statistics. Ã…rhus School of Business, University of Ã…rhus. Ã…rhus, Denmark.
International	Waring, Timothy	University of Maine	Anthropology Cooperating Faculty Seminar Presented research on inter-ethnic cooperative dynamics and social boundaries of environmental cooperation and irrigation management research in Tamil Nadu.
International	Waring, Timothy	University of Maine	School of Economics Seminar Series Presented research on experimental economics measurements of cooperation in irrigation management from case study research in Tamil Nadu.
International	Zhu, Yifeng	University of Maine	Energy Modeling of Wireless Sensor Nodes Based on Petri Nets
International	Zydlewski, Gayle	University of Maine	Erbland, P., G. Zydlewski. 2010. American shad sensitivity to split-beam hydroacoustic monitoring. Oral Presentation at the Annual meeting of the American Fisheries Society, Pittsburg, PA.

Scope	SSI Member	Institution	Description
International	Zydlewski, Gayle	University of Maine	Viehman, H., G. Zydlewski, J. McCleave, 2010. Assessing the Effects of Tidal Power Development on Fishes using Hydroacoustics. Oral Presentation in the Hydrokinetic Electric Generation and Fish Symposium at the Annual meeting of the American Fisheries Society, Pittsburg, PA, 12-16 Sep (presented by Viehman).
International	Zydlewski, Gayle	University of Maine	Zydlewski, G.B., H. Viehman, J. McCleave, K. Harmon. 2010. Assessing Effects of Tidal Power Development on Fish using Hydroacoustics. Renewable Ocean Energy and the Marine Environment. Palm Beach, FL.
International	Zydlewski, Gayle	University of Maine	Zydlewski, G.B., M.T. Kinnison, P. Dionne, M. Wegener, J. Zydlewski, G.S. Wippelhauser. 2010. Understanding Habitat Connectivity For Shortnose Sturgeon: From Ocean To Historic Freshwater Habitat In Maine. The 9th International Congress on the Biology of Fishes. Barcelona, Spain, 5-9 Jul.
Local	Arnett, Amy	Unity College	Presented project information at Unity College. Audience was broader community members, students, faculty and staff.
Local	Beard-Tisdale, Mary Kate	University of Maine	IGERT Sensor Science, Engineering and Informatics. Invited Presentation, University of Arkansas, Little Rock. October 21-22. 2010.
Local	Beard-Tisdale, Mary Kate	University of Maine	Visualizing and Exploring Events from Sensor Networks.
Local	Beard-Tisdale, Mary Kate	University of Maine	Visualizing and Exploring Events from Sensor Networks. SIE- NCGIA Seminar Series, Orono, ME
Local	Bell, Kathleen	University of Maine	Becker, A., Bell, K.P., Budzinski, C., Hall, D.M., Hutchins, K., Kacer, N., Leahy, J., Lindenfeld, L.A., Lyons, P., McGreavy, B., Post, D., Quartuch, M., Richards, M., Silka, L., Smith, H., Sutton, A., Thornbrough, L. Local: Linking Knowledge with Action: Creating Solutions-Oriented Partnerships for a Sustainable Future in Maine presented to the Senior College as part of the World Sustainable Development Teach-In Day, Orono, ME, December 3, 2010.
Local	Bell, Kathleen	University of Maine	Bell, K.P. 2010. Space - A Worthy Frontier ? : Insights from environmental economics. Department of Economics Seminar Series, Bowdoin College, Brunswick, ME
Local	Bell, Kathleen	University of Maine	Silka, L. and K.P. Bell: Maine's Sustainability Solutions Initiative: Linking knowledge with action, oral presentation, American Association of University Women (Maine), University of Maine, Orono, ME, October 13, 2010
Local	Calhoun, Aram	University of Maine	4 spring vernal pool training workshops for Bar Harbor, Wayne, Readfield, Yarmouth

Scope	SSI Member	Institution	Description
Local	Calhoun, Aram	University of Maine	Gallo, S. and A.J.K. Calhoun. 2011. The Maine Amphibian Monitoring Program: Using new technology to engage volunteers. Citizen Science Workshop, Center for research on sustainable forests, UMaine
Local	Calhoun, Aram	University of Maine	Morgan, D. and A.J.K. Calhoun. Community based approach to mapping and conserving vernal pool resources. Citizen Science Symposium, Center for Research on sustainable forests, UMaine.
Local	Calhoun, Aram	University of Maine	Vernal pool mapping and conservation public informational workshop
Local	Cass, Don	College of the Atlantic	Local Heat: The Hancock County Firewood Project Public Forum at the Ellsworth City Hall
Local	Cass, Don	College of the Atlantic	The Hancock County Woodshed: Local Sustainable Energy Present to the Acadia Senior College
Local	Cole, Russell	Colby College	IMPACTS OF LAND USE CHANGES ON WATER QUALITY IN SALMON LAKE AND MCGRATH POND Amy Holmen, Emma Gildesgame, Katherine Orrick, David Firmage, Russell Cole, and Tracey Greenwood.
Local	Cole, Russell	Colby College	NUTRIENT LOADS AND THE PRESENCE OF AN INVASIVE SPECIES THREATEN SALMON LAKE AND MCGRATH POND, KENNEBEC COUNTY, MAINE Ian McCullough ('10), Jessica Balukas ('10), Michael Bienkowski ('10) and Jordan Schoonover ('10), Russell Cole, David Firmage, and Tracey Greenwood.
Local	Colgan, Charlie	University of Southern Maine	Introduction of the Maine Sustainable Urban Regions Project Bangor Advisory Committee
Local	Colgan, Charlie	University of Southern Maine	Introduction of the Maine Sustainable Urban Regions Project Portland Advisory Committee
Local	Cox, J. Gray	College of the Atlantic	Local Heat: The Hancock County Firewood Project Presentation to the Ellsworth Rotary Club
Local	Cox, J. Gray	College of the Atlantic	Local Heat: The Hancock County Firewood Project Presentation to the Downeast RC&D
Local	Cox, J. Gray	College of the Atlantic	Local Heat: The Hancock County Firewood Project Presentation to the Bar Harbor Rotary Club
Local	Cox, J. Gray	College of the Atlantic	Local Heat: The Hancock County Firewood Project Public Forum at the Hancock County shire town's City Hall
Local	Cox, J. Gray	College of the Atlantic	Neighborhood Forests and Local Heat Presentation to Hancock County Soil & Water Conservation District
Local	Cox, J. Gray	College of the Atlantic	The Hancock County Woodshed: Local Sustainable Energy Presentation to the Hancock County Planning Commission
Local	Daly, Julia	University of Maine at Farmington	Paleolimnology group meeting, topical presenter University of Maine

Scope	SSI Member	Institution	Description
Local	Dreyer, Stacia	University of Maine	Mario Teisl, Caroline L. Noblet, Shannon McCoy, Mark Anderson, Megan Wibberly, Brandon Cosley, Joseph Wellman, Stacia Dreyer, Sarah Marrinen, Karen Hutchins and Kevin Price. 2011. Are Mainers 'blown away' by wind? Presentation to the Advanced Engineered Wood Composites Lab, University of Maine. Orono, ME.
Local	Feurt, Christine	University of New England	"Collaboration for Watershed Management" Presentation and Listening Session for Cape Neddick River Association York Maine
Local	Feurt, Christine	University of New England	"Collaborative Learning Strategies Overcome Barriers to Science Communication for Ecosystem Management" UNE Marine Science Graduate Student Seminar, overview of research methods used to engage stakeholders in the SSI project on the Saco Estuary
Local	Feurt, Christine	University of New England	"Sustainable Lawn Care Practices" Kennebunk Conservation Commission Community Forum on Lawn care practices to sustain water quality
Local	Feurt, Christine	University of New England	"Sustaining the Saco - A Day at the Marsh" Field demonstration of research techniques used to monitor wetland vegetation and fish populations of Saco River salt marshes
Local	Feurt, Christine	University of New England	'Protecting Our Children's Water Using Cultural Models and Collaborative Learning to Frame and Implement Ecosystem Management" UNE Undergraduate Research Symposium
Local	Feurt, Christine	University of New England	Taking the Pulse of the Saco Collaborative Learning workshop for stakeholders, students and scientists to develop ideas for indicators of ecosystem health that capture important qualities of place identified by stakeholders in the region
Local	Gallandt, Eric	University of Maine	The Weed Master and Seed Rain Projects. Agriculture Research Updates, USDA NEPSWL Scientists and PSE Faculty, University of Maine, Orono, ME (16 December 2010; 25 attending).
Local	Gallandt, Eric	University of Maine	The Weed Master: Improving physical weed control on small farms. Departmental Seminar, Department of Plant, Soil and Environmental Sciences, University of Maine, Orono, ME (1 October 2010; 20 attending).
Local	Gorczyca, Erika	University of Maine	"A Family Matter: The Use of Agent-Based Modeling and Social Learning to Promote Sustainable Family Forest Management in Maine" A thesis proposal presentation to School of Forest Resources noontime seminar.
Local	Hall, Damon	University of Maine	Communication & Journalism Research Colloquium Series University of Maine, - Orono, ME "USEFUL KNOWLEDGE FOR SUSTAINABILITY SCIENCE: Place-Based Cultural Research on the Yellowstone River"

Scope	SSI Member	Institution	Description
Local	Hall, Damon	University of Maine	University of Maine's Center for Excellence in Teaching and Assessment - Orono, ME "Interdisciplinary Teaching and Learning: Critical Theory in Action"
Local	Hart, David	University of Maine	SSI Overview, Research-Extension Partnerships in Sustainability Science: Bridging Research-Based Knowledge with Client-Based Needs Day-long workshop at UMaine, Orono
Local	Hunter, Malcolm	University of Maine	Call, E.M. and M. Hunter. River restoration in the northeast: what are the implications for avian assemblages? Sedgeunkedunk Symposium and Celebration, Fields Pond Audubon Center, Holden, ME.
Local	Hunter, Malcolm	University of Maine	Call, E.M. The ecology of wading birds in the Everglades. Department of Wildlife Ecology Fall Seminar Series, Orono, ME.
Local	Hunter, Malcolm	University of Maine	Hunter, M.L. A conservation biologist's perspective on climate change. School of Biology and Ecology, University of Maine
Local	Hunter, Malcolm	University of Maine	Maintaining forest biodiversity in a period of uncertain climate change. Warnell School of Forestry and Natural Resources, University of Georgia
Local	Hunter, Malcolm	University of Maine	Managing highly dynamic forests for biodiversity. Dept Wildlife Ecology, University of Maine
Local	Hutchins, Karen	University of Maine	Articulating Community: Debates about Maine's Symbolic North Woods, Guest Speaker, Digital Journalism class, Department of Communication and Journalism, University of Maine
Local	Hutchins, Karen	University of Maine	Constituting Community: Debates about Maine's Symbolic North Woods, co-guest lecture, Land Use Planning class, Economics Department, University of Maine
Local	Jain, Shaleen	University of Maine	Li, B. and S. Jain, Magnitude and Seasonality of Extreme Precipitation in Maine: Recent Changes and Implications for Infrastructure Management and Design. 2011 Undergraduate Research & Academic Showcase, University of Maine Center for Undergraduate Research, April 13, 2011.
Local	Jansujwicz, Jessica	University of Maine	Emerging Trends in Wetlands Conservation: Stakeholder Cooperation in Collaborative Conservation and Community-Based Management
Local	Jansujwicz, Jessica	University of Maine	Institutional Change and Vernal Pool Conservation Planning in Maine
Local	Jansujwicz, Jessica	University of Maine	Landowner Response to Vernal Pool Conservation Planning Undergraduate PRT Course
Local	Johnson, Teresa	University of Maine	Elinor Ostrom: Panel Presentation to the Sustainability Solutions Initiative. University of Mane, Orono, Maine. October 19, 2010.

Scope	SSI Member	Institution	Description
Local	Johnston, Jason	University of Maine at Presque Isle	How to make a bird specimen (poster and display of student-produced avian specimens) at Aroostook State Park Bird Festival
Local	Judd, Richard W	University of Maine	"Writing Regional Environmental History: Can We Redefine the Field?" University of Maine History Department Symposium Series, Orono, Maine
Local	Kim, Yuseung	University of Southern Maine	Introduction to the Sustainable Urban Regions Project, Portland and Bangor Regional Advisory Committee, Portland ME
Local	Latty, Erika	Unity College	Introduced Pests of Northeastern North America
Local	Leahy, Jessica	University of Maine	Gorczyca, E. "A Family Matter: The Use of Agent-Based Modeling and Social Learning to Promote Sustainable Family Forest Management in Maine," for the School of Forest Resources Noontime Seminar, December 2010. Orono, ME.
Local	Leahy, Jessica	University of Maine	Lyons, P. "There's No Place like Home: The Role of Place Attachment in Predicting Family Forest Landowner Behavior," for the School of Forest Resources Noontime Seminar, December 2010. Orono, ME.
Local	Leahy, Jessica	University of Maine	Shank, E., Lyons, P., and Leahy, J. "The Existence and Creation of Intergenerational Estate Transfer Plans Among Family Forest Owners in Maine" for the University of Maine Center for Undergraduate Research, Annual Undergraduate Research & Academic Showcase, March 2011. Orono, ME.
Local	Levesque, Vanessa	University of Maine	Levesque, V.R. 2010. Potential effects of vernal pool legislation in Orono. World Sustainability Teach-In Day, Penobscot Valley Senior College, Orono, ME, 3 Dec 2010.
Local	Lichter, John	Bowdoin College	Ecological Recovery: From river to estuary to ocean. Kennebec Estuary Land Trust 2010 Environmental Lecture Series.
Local	Lichter, John	Bowdoin College	Ecological Recovery: From river to estuary to ocean. Kennebec Estuary Land Trust Part 3 of Environmental Lecture Series
Local	Lilieholm, Robert	University of Maine	Careers in Nature Conservation. Reeds Brook Middle School presentation to 8th grade science class. (Lilieholm) (Fall 2010)
Local	Lilieholm, Robert	University of Maine	Changes in Maine's Primary Forest Processors: 2000 to 2010. (Ortiz presenting).UMaine Center for Undergraduate Research, Orono.
Local	Lilieholm, Robert	University of Maine	Emerald Ash Borer Research at UMaine. Maine Audubon, Penobscot Valley Chapter, Bangor Public Library, Bangor. (Ranco, Daigle, Quigley & Lilieholm)
Local	Lilieholm, Robert	University of Maine	Research Update from the Conservation Futures Team. SSI All-Team Meeting, University of Maine, Orono. (Lilieholm, Meyer, Johnson & Cronan presenting, with Judd, Wilson, Gallandt, Hornsby, McCloskey &

Scope	SSI Member	Institution	Description
			Tremblay) (January 2011) (Local)
Local	Lindenfeld, Laura A	University of Maine	Panel response to Randy Olson's film "Sizzle"
Local	Lyons, Patrick	University of Maine	The Existence and Creation of Intergenerational Estate Transfer Plans Among Family Forest Owners in Maine
Local	Lyons, Patrick	University of Maine	There's No Place like Home: The Role of Place Attachment in Predicting Family Forest Landowner Behavior
Local	McCoy, Shannon K	University of Maine	McCoy, S. K. (2011). The belief in meritocracy and the psychological justification of inequality. Invited presentation to the Communications and Journalism Colloquium series. University of Maine, Orono
Local	McCoy, Shannon K	University of Maine	McCoy, S.K. (2010). What can you do with a major in Psychology? Seminar presentation. Old Town High School, Old Town, ME
Local	McCoy, Shannon K	University of Maine	Teisl, M., McCoy, S.K., Noblet, C. (2010). What's Economic Psychology? It's MeSSI. Seminar presentation. School of Economics, University of Maine, Orono.
Local	McCoy, Shannon K	University of Maine	Teisl, M., Noblet, C., McCoy, S.K., Anderson, M., Wibberly, M., Cosley, B., Wellman, J., Dreyer, S., Marrinen, S., Hutchins, K., & Price, K. (2011). Are Mainers blown away by wind? Presentation to the advanced engineered wood composites lab (AEWC). University of Maine, Orono, ME
Local	McGill, Brian	University of Maine	"Response of organisms to anthropogenic change: detection and prediction" - Sep 2010 - University of Maine, Wildlife Ecology
Local	McGreavy, Bridie	University of Maine	Participatory Science Communication and Big Night Amphibian Migrations
Local	McGreavy, Bridie	University of Maine	Presentation Design Using Prezi, an Online Presentation Tool
Local	McGreavy, Bridie	University of Maine	Science in Translation: A Mixed Methods Approach to Describe Local Decision Maker Attitudes to Vernal Pools in Maine
Local	Morgan, Dawn	University of Maine	Morgan, Dawn E. Vernal Pool Mapping Project Summary to Orono Town Council, Orono, Maine
Local	Morgan, Dawn	University of Maine	Vernal pool mapping and conservation public informational workshop. Wayne and Readfield, ME.
Local	Morgan, Pam	University of New England	UNE Undergraduate Research Symposium, Summer 2010 Title: Salinity and Plant Diversity in Saco River Estuary Marshes: Art They Related? Authors: William Almeida (Environmental Science major), Pam Morgan

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Local	Morgan, Pam	University of New England	UNE Undergraduate Research Symposium, Summer 2010 Title: Sustaining Quality of Place in the Saco River Estuary through Community-Based Ecosystem Management Authors: Lindsay Kelly (Environmental Science major), Christine Feurt / Pam Morgan
Local	Morgan, Pam	University of New England	UNE Undergraduate Research Symposium, Summer 2010 Title:Assessing the Values of the Saco River through Digital Photography Authors: Chloe Crettien (Environmental Science major), Stephen Burt / Pam Morgan
Local	Parr, Thomas	University of Maine	Introduction to the use of Mendeley for research, reference management, and citation.
Local	Pavri, Firooza	University of Southern Maine	Documenting socio-economic changes within southern Maine's Sebago Lake watershed, 1980-2010
Local	Pavri, Firooza	University of Southern Maine	Documenting socio-economic changes within southern Maine's Sebago Lake watershed, 1980-2010
Local	Peterson, Michael	University of Maine	Experimental Characterization of Cross-Flow Tidal Turbine.
Local	Plowden, Jennifer	University of Maine	Plowden, J. 2010. The relationship between conservation land and development in Maine. Graduate Student Colloquium: University of Maine. November 11, 2010 (oral).
Local	Quigley, Erin	University of Maine	Mobilizing Diverse Interests to Address Invasive Species Threats: The Case of the Emerald Ash Borer in Maine [for the Penobscot Valley Chapter of Maine Audubon, Bangor Public Library, Bangor, ME]
Local	Shank, Elijah	University of Maine	The Existence and Creation of Intergenerational Estate Transfer Plans Among Family Forest Owners in Maine" for the University of Maine Center for Undergraduate Research, Annual Undergraduate Research & Academic Showcase
Local	Silka, Linda	University of Maine	Bell, K. & Silka, L. Sustainability Solutions Initiative. Presentation to local chapter, National Organization of University Women. Orono, ME.
Local	Smith, Hollie	University of Maine	The Colorado Roadless Rule for Communication and Journalism Colloquium Series, University of Maine, Orono, ME
Local	Springsteen, Ann	University of Maine	Sustainability of Lake-Watershed Systems: A look at Sebago Lake This was a presentation as a part of the sustainability Teach-In Day on Dec. 3, 2011. A group of fellow SSI graduate students gave presentations on their SSI projects to the Penobscot Senior College.
Local	Sutton, Anthony	University of Maine	I will defend my research prospectus. This will help shape and guide my research with the Aroostook Band of Micmac into the summer as I continue my thesis work.

Scope	SSI Member	Institution	Description
Local	Taylor, Davis	College of the Atlantic	Presented project findings to date to county first selectmen and code enforcement officers, along with officers of the county planning commission. Also collected information from the audience regarding their heating considerations, information on low-impact logging, and amount of firewood harvesting in their towns.
Local	Taylor, Davis	College of the Atlantic	Presented project findings to date to county residents. Also collected information from the audience regarding their heating considerations.
Local	Teisl, Mario F.	University of Maine	Mario F. Teisl, Shannon McCoy and Caroline Noblet. 2010. What's Economic Psychology? It's MeSSI. Seminar Presentation. School of Economics, University of Maine, Orono.
Local	Teisl, Mario F.	University of Maine	Mark Anderson, Caroline Noblet and Mario Teisl. 2011. World Views and Knowledge to Action. Team presentation. Maine Sustainability Solutions Initiative. University of Maine, Orono.
Local	Willis, Theodore	University of Southern Maine	Influence of alewife on the Kennebec River's recovery
National	Arnett, Amy	Unity College	Invertebrate Biodiversity and Forest Management
National	Arnett, Amy	Unity College	Invertebrate biodiversity patterns in a hemlock-dominated forest: Effects of vegetation, woody debris, and light
National	Bell, Kathleen	University of Maine	Bell. K.P., Levesque, V., Colby-George, J., and C. Colgan. 2011. Measure for measure: What are the linkages between open spaces, private lands, and property values? 2011 W2133 Conference (Benefits and Costs of Natural Resources Policies Affecting Public and Private Lands), Albuquerque, NM, 25 February 2011.
National	Bell, Kathleen	University of Maine	Snell, M., Bell, K.P., and J. Leahy. 2010. Local Institutions and Natural Resource Management. 2010 Annual Meeting of the Agricultural and Applied Economics Association, Denver, CO, July 26, 2010.
National	Calhoun, Aram	University of Maine	Shearin, A.F., A.J.K. Calhoun, and C.S. Loftin. Amphibian Communities in Maine's Fishless Lakes. 2010. The Wildlife Society Annual Conference. Snowbird, UT.
National	Colby-George, Judy	University of Maine	Bell. K.P., Levesque, V., Colby-George, J., and C. Colgan. 2011. Measure for measure: What are the linkages between open spaces, private lands, and property values? 2011 W2133 Conference (Benefits and Costs of Natural Resources Policies Affecting Public and Private Lands), Albuquerque, NM, 25 February 2011.
National	Daigle, John	University of Maine	"Reacting to the Threat of the Emerald Ash Borer (EAB) in Maine," Alaska EPSCoR workshop Living on Earth '11, University of Alaska at Anchorage and Girdwood,

Scope	SSI Member	Institution	Description
			Alaska, February 18-19, 2011 (Daigle and Lilieholm).
National	Daigle, John	University of Maine	Mobilizing Diverse Interests to Address Invasive Species Threats: The Case of the Emerald Ash Borer in Maine. Citizen Science Symposium: Connecting Communities with the Natural World. Orono. Quigley presenting, with Ranco, Lilieholm, Secord, Neptune, Daigle, McCloskey, Livingston & Lizotte) (May 2011)
National	Feurt, Christine	University of New England	"Collaborative Learning and Land Use Tools to Support Community Based Ecosystem Management" Web conference to National Estuarine Research Reserve system
National	Feurt, Christine	University of New England	"Ecosystem Management - a Role for the Coastal Training Program in the National Estuarine Research Reserve System" Presentation to the NERRS Annual Conference
National	Feurt, Christine	University of New England	"Go ahead - Make my day - Coastal Training Program and NEMO friends or foe?" Organized session for NEMO University national conference with case studies in watershed management from northeastern National Estuarine Research Reserves
National	Feurt, Christine	University of New England	"Improving Science Communication Interactive Work Session" Session facilitator for National Estuarine Research Reserve System, Coastal Training Program Winter Conference
National	Feurt, Christine	University of New England	Collaborative Learning, An Expert Practice for Ecosystem Based Management Training led by Dr. Feurt using lessons learned from SSI project. Presented to coastal managers, outreach specialists and academic researchers at the ACE Basin National Estuarine Research Reserve
National	Gallandt, Eric	University of Maine	Cultivation and seedbank management for improved weed control. Illinois Specialty Crop, Agrotourism and Organic Conference, Springfield, IL (7 January 2011).
National	Gardner, Susan	University of Maine	Gardner, S. K. (2010, November). Examining the educational pipeline. Presentation conducted at Keeping Our Faculties of Color Symposium, Minneapolis, MN.
National	Hall, Damon	University of Maine	Agriculture, Food, and Human Values Conference 2011. Missoula, MT: Poster: "The Future of Agriculture in Maine 2025" with John Jemison of Cooperative Extension
National	Hall, Damon	University of Maine	NCA National Communication Association - San Francisco, CA: Environmental Communication Division “Cultural Inventory in Park County, Montana: A Case Study of Public Participation” with Cristi Horton
National	Hart, David	University of Maine	Overview of SSI as part of NSF Reverse Site Visit. 9/13/2010.
National	Hunter, Malcolm	University of Maine	Designing refuges that are resilient to climate change. National Conservation Leadership Forum, National

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			Conservation Training Center, West Virginia.
National	Hunter, Malcolm	University of Maine	Designing refuges to maintain biodiversity in the face of climate change. National Fish, Wildlife and Plants Climate Adaptation Strategy Team, Washington, D.C.
National	Hutchins, Karen	University of Maine	Baker, B., Hutchins, K., Leahy, J., Lindenfeld, L, Quartuch, M.R., and Silka, L. Sustainability Problems and Engaged Solutions: Opportunities for New Interdisciplinary Approaches, 11th Annual National Outreach Scholarship Conference, October, 2010, Raleigh, N.C.
National	Hutchins, Karen	University of Maine	Constituting Community: Debates about Maine's Symbolic North Woods, Environmental Communication Division, National Communication Association conference, San Francisco, CA.
National	Hutchins, Karen	University of Maine	Panel Participant, Media Ecology Association Annual Convention, University of Maine, Orono, Maine
National	Johnson, Michelle	University of Maine	Analysis of Alternative Futures of the Maine Landscape using Stakeholder-Derived Spatial Models - poster presentation at the American Association of Geographers Annual Conference
National	Johnson, Teresa	University of Maine	Jekielek, P. and T.R. Johnson. 2010. Social networks and participation in cooperative fisheries research in the Northeast U.S. American Fisheries Society, Pittsburg, PA. September 2010.
National	Johnson, Teresa	University of Maine	Johnson, T.R. and Henry, A. 2011. Change, Response, and Vulnerability in Eastern Maine Fishing Dependent Communities. Presentation to the Annual Meeting of the Society for Applied Anthropology.
National	Kartez, Jack	University of Southern Maine	Maine EPSCoR Overview Presentation (With L. Lindenfeld, R. Lilieholm, J. Daigle) to the Alaska EPSCoR Living on Earth '11 (LOEII) National EPSCoR Workshop, U. Alaska.
National	Kim, Yuseung	University of Southern Maine	Dynamics of the Amenity City: An Agent-based Simulation of Neighborhood Location Decision, American Collegiate School of Planning Conference, Minneapolis MN
National	Kim, Yuseung	University of Southern Maine	Modeling Coupled Social-Ecological Systems: Sustainable Urban Regions Project in Maine, American Associate of Geographers Annual Meeting, Seattle WA
National	Latty, Erika	Unity College	Invertebrate Biodiversity in Hemlock Forests
National	Leahy, Jessica	University of Maine	Gorczyca, E., Lyons, P., Leahy, J., and Johnson, T. "Applying Social Network Analysis to Identify Stakeholders for Engagement in Human Dimensions of Natural Resources Research," for the International Symposium on Society and Resource Management, June 2010. Corpus Christi, TX.
National	Leahy, Jessica	University of Maine	Leahy, J., Zhao, M., and Kilgore, M. "Family Forest Landowner Policy Preferences for Providing Recreation

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			Access," for the 2009 Society of American Foresters National Convention. September 2009. Orlando, FL.
National	Leahy, Jessica	University of Maine	Lyons, P., and Leahy, J. "Developing a Stakeholder-Driven Family Forest Initiative through Maine's Center for Research on Sustainable Forests," for the Emerging Issues Along Urban/Rural Interfaces Conference: Linking Science and Society, April 2010. Atlanta, GA.
National	Leahy, Jessica	University of Maine	Lyons, P., and Leahy, J. 2010. "Fostering Credibility and Legitimacy among Family Forest Stakeholders and Researchers to Promote Knowledge to Action," for the International Symposium on Society and Resource Management, June 2010. Corpus Christi, TX.
National	Lilieholm, Robert	University of Maine	Lilieholm, R., Sharik, Neuvonen, Wang and Chen. Comparison of Undergraduate Enrollment Trends in Forestry-Related Programs Between the USA and China. Integrating Science and Mathematical Education Research into Teaching. Poster. 2010 National Summer Conference, Maine Center for Research in STEM Education, Wells Conference Center, UMaine, Orono
National	Lilieholm, Robert	University of Maine	Maine's Sustainability Solutions Initiative. Living on Earth II, Anchorage, Alaska. (Lindenfeld, Lilieholm, Kartez & Daigle) (February 2011) (National)
National	Lilieholm, Robert	University of Maine	Undergraduate Enrollment Trends in Forestry and Related Natural Resources Fields, 1980-2009. National Association of University Forest Resource Programs, Albuquerque, New Mexico. (Sharik presenting, with Lilieholm)(October 2010)
National	Lilieholm, Robert	University of Maine	Undergraduate Enrollment Trends in Forestry and Related Natural Resources Fields, 1980-2009. Society of American Foresters' House of Society Delegates Meeting, SAF National Convention, Albuquerque, New Mexico. (Sharik presenting, with Lilieholm) (October 2010)
National	Lilieholm, Robert	University of Maine	Undergraduate Enrollment Trends in Forestry and Related Natural Resources Fields, 1980-2009. USDA Forest Service, Human Resource Management, Albuquerque Service Center, New Mexico. (Sharik presenting, with Lilieholm) (October 2010)
National	Lindenfeld, Laura A	University of Maine	Coupled Social Ecological Systems Approaches on Maine's Sustainability Solutions Initiative. Alaska EPSCoR Living on Earth II Workshop, Ancorage
National	Lindenfeld, Laura A	University of Maine	Environmental Issues in the Digital Sphere. National Communication Association, San Francisco
National	Lindenfeld, Laura A	University of Maine	Integrating communication research in sustainability science. Part of Agrarian Studies Seminar Series. National Communication Association, San Francisco
National	Lyons, Patrick	University of Maine	Developing a Stakeholder-Driven Family Forest Initiative through Maine's Center for Research on Sustainable Forests

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National	McCourt , Matthew	University of Maine at Farmington	“The Rangeley 'Mystique': Tracking regional identity and development through landscape formation” (with Owen Dwyer). Paper presented at the Annual Meeting of the Pioneer America Society/Association for the Preservation of Artifacts and Landscapes, Rutland, VT.
National	McGill, Brian	University of Maine	“New perspectives on species abundance distributions and diversity metrics” - August 2010 - Ecological Society of America
National	McGreavy, Bridie	University of Maine	Panel Participation on Sustainability Solutions Initiative for Media Ecology Association Annual Convention, University of Maine, Orono
National	McGreavy, Bridie	University of Maine	Responsive Research Panel Presentation at the Conference on Communication and the Environment
National	Noblet, Caroline	University of Maine	Mario Teisl, Caroline L. Noblet and Jonathan Rubin. Success and Failure in Eco-Marketing Vehicles. Selected Paper: Behavior, Energy and Climate Change Conference. Sacremento, CA.
National	Owen, Dave	University of Southern Maine	"Urbanization, Water Quality, and the Regulated Landscape" - presented at Vermont Law School colloquium on environmental scholarship
National	Pavri, Firooza	University of Southern Maine	Land use change and water quality monitoring for the Lake Sebago watershed in southern Maine
National	Peckenham, John	University of Maine	Jain, S., J. Peckenham, A. Reeve, and D. Hart (2010) Defining Problems for Sustainable Solutions: Typology of Source Water Protection in Maine, University Council for Water Research Annual Conference, July 17, 2010.
National	Peckenham, John	University of Maine	Peckenham, J. (2010) Changing Climate and Water Resources- Guidance for Drinking Water Utilities. U.S. Environmental Protection Agency SRF/ARRA/GPR Workshop, Kennebunk, ME.
National	Peckenham, John	University of Maine	Peckenham, J., J. Pinto, C. Proctor, Q. Wang, and H. Patterson. (2010) Real-Time Algae Monitoring For Drinking Water Security, North American Lake Management Society Annual Meeting.
National	Pickering, Ryan	University of Maine	"Take a hike, you'll feel like a million bucks: Free leisure activity can make the poor feel richer and have a more positive outlook on life"
National	Quartuch, Mike	University of Maine	“Sustainability Problems and Engaged Solutions: Opportunities for New Interdisciplinary Approaches.” Poster Presentation. 11th Annual National Outreach Scholarship Conference. Raleigh, North Carolina, USA.
National	Ranco, Darren	University of Maine	"Native American Programs in SSI-EPSCoR"
National	Ranco, Darren	University of Maine	"The Clean Air Mercury Rule and Indian Tribes: Sovereignty, Subsistence, and Participation" Bates College

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National	Silka, Linda	University of Maine	Baker, B., Silka, L., Hutchins, K., Leahy, J., Quartuch, M., Lindenfeld, L. Building an Interdisciplinary Approach to Address Statewide Sustainability Problems. Poster presentation at National Outreach Scholarship Conference, Raleigh, NC.
National	Silka, Linda	University of Maine	Peterman, J. N., Bermudez, O. I., Parke, W., Rogers, B., & Silka, L. Characteristics Associated with Household Food Security Status Among Cambodian Refugee Women in Lowell, MA. Experimental Biology Conference, session on Advances in Food Insecurity Research.
National	Smith, Hollie	University of Maine	"Critically Assessing the Discursive Terrain: What Happened to Discursive Closure in the Critical Examinations of Organizations as Discursive?", National Communication Association
National	Smith, Hollie	University of Maine	"Finding a Voice: A Case Study of Source Use in Media Coverage of an Environmental Policy", National Communication Association
National	Smith, Hollie	University of Maine	"The Politics of Public Participation: Discursive Closure in Natural Resource Policy Decisions", National Communication Association
National	Teisl, Mario F.	University of Maine	Stephan Marette, Brian Roe and Mario Teisl 2010. Would Subsidizing a Food Pathogen Vaccine Upset the Food Policy Applecart? Selected Paper. Agricultural & Applied Economics Association. AAEA, CAES, & WAEA Joint Annual Meeting, Denver, Colorado
National	Zogg, Greg	University of New England	Travis, S and G.P. Zogg. 2010. Evidence for the role of plant clonal dynamics in the response of temperate salt marsh communities to sea level rise. Poster presentation at the annual meeting of the Ecological Society of America.
National	Zydlewski, Gayle	University of Maine	Dionne,P., G.B. Zydlewski, G. Wippelhauser, J. Zydlewski, M. Kinnison. 2010. Movement Patterns of Shortnose Sturgeon in Coastal Maine Waters. Oral presentation at the Annual meeting of the North American Chapter of the World Sturgeon Conservation Society, Bozeman, MT.
National	Zydlewski, Gayle	University of Maine	Fernandes, S., G.B. Zydlewski, J. Zydlewski, G.S. Wippelhauser, M.T. Kinnison. 2010. Seasonal Distribution and Movements of Shortnose Sturgeon in the Penobscot River Estuary, Maine. Oral presentation at the Annual meeting of the North American Chapter of the World Sturgeon Conservation Society, Bozeman, MT.
National	Zydlewski, Gayle	University of Maine	Zydlewski, G.B., Viehman, H., McCleave, J.D., Harmon, K. 2010. Report and Fisheries Plan Update & Discussion: Assessing effects of tidal power development on fishes using hydroacoustics. Ocean Renewable Power Company Workshop for Regulatory Agencies

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Other/Special	Chawathe, Sudarshan S	University of Maine	A low-cost, scalable Web mapping service for climate data.
Other/Special	Daigle, John	University of Maine	"Mobilizing Diverse Interests to Address Invasive Species Threats to Coupled Natural/Human Systems: The Case of the Emerald Ash Borer in Maine," Presentation to PRT 225, Prof. Leahy, University of Maine, 16 students, November 29, 2010 (Ranco and Daigle).
Other/Special	Jain, Shaleen	University of Maine	Li, B. and S. Jain, Long-term variability and trends in the seasonality of daily precipitation in Maine. The 19th Annual Harold W. Borns Symposium, Climate Change Institute, University of Maine, Orono, April 7-8, 2011.
Other/Special	Jansujwicz, Jessica	University of Maine	Property Rights, the Policy Process, and Vernal Pool Conservation Planning
Other/Special	Leahy, Jessica	University of Maine	Leahy, J. "Finding Sustainability Solutions through Family Forest Dynamics," for the Forest People Fire Seminar Series at Oregon State University, January 2011. Corvallis, OR.
Other/Special	Loftin, Cynthia	University of Maine	Human perceptions and ecological effects of fire in Okefenokee Swamp; departmental seminar, Wildlife Ecology; Cynthia Loftin and Paul Wetzel; Loftin presented
Other/Special	Waring, Timothy	University of Maine	Complex Adaptive Systems Workshop Series Presented on evaluating NetLogo as a research tool for modeling, testing and studying complex adaptive systems. Placed agent-based models in the research tool-box. NetLogo fits in a central spot between cellular automata, networks, and other agent-based models.
Other/Special	Waring, Timothy	University of Maine	Complex Adaptive Systems Workshop Series Presented on modeling Evolution, Cooperation and social structure with agent based models
Poster	Bevier, Catherine	Colby College	Supple, W.R., and C.R. Bevier. 2010. The Maine Vernal Pool Mapping and Assessment Project. Poster presentation, Colby Undergraduate Summer Research Retreat. July 2010.
Poster	Gorczyca, Erika	University of Maine	"A Family Matter: The Use of Agent-Based Modeling and Social Learning to Promote Sustainable Family Forest Management in Maine." Jan 12, 2011, Small Woodland Owners Association of Maine at the Ag-Trade Show, Augusta Maine
Poster	King, Whitney	Colby College	Josie Thiele, Katherine Murray. 2010. The Impact of Thermal Structure and Mixing on Nutrient Dynamics and Plankton Abundance in Intermediate Depth Lakes in Maine. Presented at the Maine Lake Association Annual Conference, Waterville, Maine. June 2010
Poster	King, Whitney	Colby College	The Impact of Thermal Structure and Mixing on Nutrient Dynamics and Plankton Abundance in Intermediate Depth Lakes in Maine Josie Thiele, Katherine Murray, Malia Kawamura and D. Whitney King Department of Chemistry, Colby College, Waterville, Maine 04901

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Poster	Lilieholm, Robert	University of Maine	Comparison of Undergraduate Enrollment Trends in Forestry-Related Programs Between the USA and China. International Symposium on Forestry Education, Vancouver, B.C. (Sharik presenting, with Neuvonen, Wang and Chen).
Poster	Lilieholm, Robert	University of Maine	Conservation Lands in Maine: A Study of Historic Trends. Maine GIS Education Symposium. Meyer presenting, with Lilieholm and Cronan.
Poster	Lilieholm, Robert	University of Maine	Mobilizing Diverse Interests to Address Invasive Species Threats: The Case of the Emerald Ash Borer in Maine. 2nd Annual Maine Invasive Species Network Meeting, Orono. (Quigley presenting, with Ranco, Secord, Neptune, Daigle, McCloskey, Livingston and Lizotte).
Poster	Lilieholm, Robert	University of Maine	Population Persistence in Complex Landscapes: Vernal Pools as a Model System. 2010. Citizen Science Symposium: Connecting Communities with the Natural World, Orono. (Jansujwicz presenting, with Hunter, Ryan, Cline, Bell, Levesque, Morgan, Popescu, Calhoun and Loftin).
Poster	McCoy, Shannon K	University of Maine	Hassett, K., Noblet, C., Teisl, M., McCoy, S.K. (2010). Take a Hike! The simultaneous relationship between recreation behavior and environmental concern. International Association for research in Economic Psychology and the Society for the Advancement of Behavioral Economics. Cologne, Germany
Poster	Meyer, Spencer	University of Maine	S.R. Meyer, M.L. Johnson, R.J. Lilieholm and C.S. Cronan. 2010. Spatial and Temporal Distribution of Conserved Lands in Maine and the Northeast. Tied for 1st place in poster session at Maine GIS Educators Conference. Augusta, Maine. November 19, 2010.
Poster	Morgan, Dawn	University of Maine	Morgan, Dawn E., and A.J.K. Calhoun. 2010. Conserving Maine Vernal Pools through Collaborative Local Initiatives. Poster at: North East Partners in Amphibian and Reptile Conservation, Schoodic, ME.
Poster	Newell, Ellen	University of Maine	McCoy, S. K., Newell, E. E., Rideout, S., Belknap, C., Paul, C., Brown, J. Dulac, R. (2011). Putting the puzzle together: The role of tolerance for ambiguity in interdisciplinary team success. Association for Psychological Science, Washington, D. C.
Regional	Calhoun, Aram	University of Maine	Calhoun, A.J.K. and D.E. Morgan. 2011. Conserving vernal pool functions through local collaborative initiatives. Annual meeting of the Wisconsin Wetland Association, Madison, WI.
Regional	Calhoun, Aram	University of Maine	Loftin, C., A.J.K. Calhoun, S. Nelson, A. Elskus, and K. Simon. 2010. Does mercury bioaccumulate in amphibians developing in vernal pools. GeoSociety, Northeastern / Southeastern Combined Meeting. Baltimore, MD.

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Regional	Calhoun, Aram	University of Maine	Morgan, D.E. and A.J.K. Calhoun. Aug 2010. Conserving Maine vernal pools through collaborative local initiatives (poster). North East Partners in Amphibian and Reptile Conservation, Schoodic, ME.
Regional	Calhoun, Aram	University of Maine	Shearin, A.F., A.J.K. Calhoun, and C.S. Loftin. Amphibian Communities in Maine's Fishless Lakes (Poster Presentation). 2010. Northeast Partners in Amphibian and Reptile Conservation Annual Meeting. Acadia National Park, Winter Harbor, ME
Regional	Colgan, Charlie	University of Southern Maine	University of New Hampshire and The Concord Coalition The Federal Deficit and Sustainability; Strategies for managing the deficit and achieving a more sustainable economy Manchester, NH
Regional	Cosley, Brandon	University of Maine	Persuaded by the status quo: The role of economic stress in persuasion for environmental messages.
Regional	Daigle, John	University of Maine	"Persuasive Communication Theory Applied to Firewood Movement in the Case of the Emerald Ash Borer," 73nd Annual Northeast Pest Council Meeting, Milford, PA, March 23, 2011 (Daigle and Lizotte).
Regional	Daly, Julia	University of Maine at Farmington	"You're as Cold as Ice: Climate change records from remote mountain ponds" Norwich University, Northfield, VT, department seminar
Regional	Feurt, Christine	University of New England	"Collaborative Learning an Expert Practice for Ecosystem Based Management" UNH Graduate Seminar including Natural Resources faculty and TIDES Graduate Fellows program (Training in Integration of Decision-making and Ecosystem Science)
Regional	Feurt, Christine	University of New England	"Collaborative Research and Stakeholder Engagement at the Wells National Estuarine Research Reserve (NERR)" Presentation to UNH Graduate Fellows in TIDES program (Training in Integration of Decision-making and Ecosystem Science). Orientation to NERRS work in integrated coastal ecosystem science, policy and management.
Regional	Feurt, Christine	University of New England	"From the Headwaters to the Sea, Using Integrated Watershed Planning Approaches in Southern Maine as a Framework for Sustainability" Presentation to the Northern New England Chapter of the American Planning Association (NNECAPA) Conference.
Regional	Feurt, Christine	University of New England	"Sustaining Quality of Place in the Saco River Estuary, Understanding Stakeholder Roles, Values and Concerns" Presentation to the Regional Association for Research in the Gulf of Maine (RARGOM)
Regional	Feurt, Christine	University of New England	"Sustaining the Saco" Saco River Corridor Commission Presentation about stakeholder engagement in Saco Estuary project
Regional	Feurt, Christine	University of New England	"Working Collaboratively to Maintain Ecosystem Services in Southern Maine, a Natural Resource Providers Summit" A Collaborative Learning workshop

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			to engage stakeholders in a parallel project to the SSI project on the Saco Estuary
Regional	Feurt, Christine	University of New England	Beyond Borders - Building the Salmon Falls Watershed Collaborative Moderator for Collaborative Learning process to engage stakeholders in action strategy development for Salmon Falls watershed
Regional	Feurt, Christine	University of New England	Collaborative Learning Training for Salmon Falls Watershed Planning Team
Regional	Feurt, Christine	University of New England	Stakeholder Engagement with Key Pad Poling Training for Salmon Falls Watershed Collaborative members
Regional	Feurt, Christine	University of New England	Sustaining the Saco - Stakeholder Engagement in Indicator Development Indicators of Ecosystem Health Conference, Gulf of Maine Region
Regional	Gallandt, Eric	University of Maine	Crop Rotations Focused on Seedbank Management for Improved Weed Control. Northeast Organic Farming Association of Vermont (NOFA-VT), Integrated Pest Management Series (16 February 2011).
Regional	Gallandt, Eric	University of Maine	Cultivation: Tools and Strategies for Improved Weed Control. Northeast Organic Farming Association of Vermont (NOFA-VT), Integrated Pest Management Series (16 February 2011).
Regional	Gallandt, Eric	University of Maine	Gallandt, E.R. (2010). The Weed Master. Innovative physical weed control tools for the small farm. Northeast Weed Science Society Annual Meeting, Cambridge, MA (6 January 2010).
Regional	Gallandt, Eric	University of Maine	Managing Weed Seed Rain. Northeast Weed Science Society Annual Meeting, Symposium on Weed Seedbanks* (5 January 2010). *Symposium Chair and Coordinator
Regional	Gray, Alex	University of Maine	Adapting to Climate Change in Mid-coast Maine.
Regional	Hart, David	University of Maine	Maine's Sustainability Solutions Initiative: Novel strategies for strengthening connections between knowledge and action. Invited seminar, Dept. of Natural Resources and the Environment, University of New Hampshire.
Regional	Hunter, Malcolm	University of Maine	Meyer, S. et al. Using the Open Standards for the Practice of Conservation to Assess Future Land Use of the Lower Penobscot River Watershed. New England meeting of the Society for American Foresters.
Regional	Jain, Shaleen	University of Maine	Jain, S., Adaptive water allocation and instream flow standards in a changing climate: Maine's Chapter 587. Northeast Climate Change & Bioassessment Workshop, USEPA - New England Regional Lab (NERL), North Chelmsford, MA, September 29-30, 2010

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Regional	Jain, Shaleen	University of Maine	Jain, S., Understanding hydroclimatic variability and change in the context of Maine's instream flow standards. 35th Annual New England Association of Environmental Biologists (NEAEB) Conference, Sturbridge, MA, 16-18 March, 2011.
Regional	Judd, Richard W	University of Maine	"Rethinking Environmental History: The View from New England," Massachusetts Historical Society Environmental History Series, Boston, Massachusetts
Regional	Leahy, Jessica	University of Maine	Shank, E., Lyons, P., and Leahy, J. "Family Ties: Exploring Intergenerational Estate Transfer Among Maine's Family Forest Owners," for the New England Society of American Foresters Annual Winter Meeting, March 2011. Fairlee, VT.
Regional	Leahy, Jessica	University of Maine	Straub, C., Thornton, T., Leahy, J., Peckenham, J., Wilson, L., Jemison, J., and MacRae, J. "A Pilot Study of Groundwater Quality Education Curriculum Using Private Well Water Testing," (poster) for the Northeast Private Well Symposium. November 2009. Portland, ME.
Regional	Leahy, Jessica	University of Maine	Thornton, T., Straub, C., Leahy, J., Peckenham, J., Wilson, L., Jemison, J., and MacRae, J. "Using Public Schools as the Community Center to Promote Private Well Education, Monitoring, and Research," for the Northeast Private Well Symposium. November 2009. Portland, ME.
Regional	Lichter, John	Bowdoin College	Ecological Recovery of Maine's waterways and coastal fisheries. Harvard Forest. Harvard University.
Regional	Lilieholm, Robert	University of Maine	Communicating Sustainability through Citizen Science: Challenges and (Missed) Opportunities. Citizen Science Symposium, University of Maine, Orono. (Jansujwicz presenting, with Calhoun & Lilieholm)
Regional	Lilieholm, Robert	University of Maine	Forging Relationships: Conservation Challenges and Collaboration at the Center for Research on Sustainable Forests. Maine Society of American Foresters Annual Meeting. (Orono, Maine) (October 2010) (Meyer) (Invited) (Regional)
Regional	Lilieholm, Robert	University of Maine	Impacts of State and Federal Rule-making on Forest Management in Maine: Lessons Learned and Future Trends. Fall Meeting of the Maine Division of the Society of American Foresters, University of Maine, Orono. (Lilieholm) (October 2010) (Invited) (Regional)
Regional	Lilieholm, Robert	University of Maine	Public Views toward Forest-based Biomass and Bioenergy. Cooperative Forestry Research Unit Fall Meeting. University of Maine, Orono. (Lilieholm presenting, with Marciano, Leahy & Porter) (October 2010) (Invited) (Regional)
Regional	Lindenfeld, Laura A	University of Maine	Merging Knowledge to Action Theory with Woody Bioenergy Research Development Processes at Woody Biomass Energy Research Symposium for the Northern Forest, Burlington, VT.

Scope	SSI Member	Institution	Description
Regional	Loftin, Cynthia	University of Maine	Shearin, A. C.S. Loftin, A.J.K. Calhoun. Amphibian Communities in Maine's Historically Fishless Lakes: Facultative Breeding Occurrence by Vernal Pool Amphibians 2010 Northeast Partners in Amphibian and Reptile Conservation Conference, 10-11 August, Schoodic Research and Education Center, Acadia National Park, Maine. Shearin presented.
Regional	Lyons, Patrick	University of Maine	Family Ties: Exploring Intergenerational Estate Transfer Among Maine's Family Forest Owners
Regional	Quigley, Erin	University of Maine	Cross-Cultural Emerald Ash Borer Response Planning in Maine [for the Northeastern Forest Pest Council Annual Meeting]
Regional	Ranco, Darren	University of Maine	"Mobilizing Diverse Interests to Address Invasive Species Threats to Coupled Natural/Human Systems: The Case of the Emerald Ash Borer in Maine," National Park Service Headquarters, Acadia National Park, August 4, 2010, Bar Harbor, Maine. Regional in focus, the meeting was attended by 25 Park Service employees who work with the public (Ranco).
Regional	Sader, Steven	University of Maine	Hayashi, R. and S. A. Sader. Finding late successional forests in Piscataquis County, Maine. New England Society of American Foresters Winter Meeting, Lake Morey, Fairlee, Vermont
Regional	Sader, Steven	University of Maine	Looze, B. and S.A. Sader. Analysis of Fragmentation and large-diameter forest in Maine. New England Society of American foresters Winter Meeting, Lake Morey, Fairlee, Vermont
Regional	Sader, Steven	University of Maine	Smith, T. and S.A. Sader. Evaluation of partial harvesting on multiple ownerships in Maine. New England Society of American Foresters Winter Meeting, Lake Morey, Fairlee, Vermont.
Regional	Shank, Elijah	University of Maine	Family Ties: Exploring Intergenerational Estate Transfer Among Maine's Family Forest Owners," for the New England Society of American Foresters Annual Winter Meeting
Regional	Silka, Linda	University of Maine	Silka, L. Engaged Colleges: Making a Difference. Workshop for faculty on campuses throughout New Hampshire and New England. Convened by Campus Compact. Concord, NH.
Regional	Silka, Linda	University of Maine	Silka, L. Partnerships for Research: Opportunities and Challenges. Panel Member, Harvard Catalyst Community-Based Participatory Research Program. Cambridge, MA.
Regional	Stancioff, Esperanza	University of Maine	NOAA and Sea Grant Climate Exchange Training Program
Regional	Stancioff, Esperanza	University of Maine	Northeast Climate Change Adaptation Training for municipal officials and state agencies: Communicating Climate Change and Case Studies on Adaptation

Scope	SSI Member	Institution	Description
Regional	Stancioff, Esperanza	University of Maine	Northeast Regional Sea Grant Conference, New York, Presentation on Climate Change Adaptation and Coastal Resiliency Projects
Regional	Zydlewski, Gayle	University of Maine	Zydlewski, G.B., H. Viehman, J. McCleave, K. Harmon. 2011. Tidal power in Maine and beyond: the fish side of the equation. Presented at Maine Maritime Academy
Regional	Zydlewski, Gayle	University of Maine	Zydlewski, G.B., M.T. Kinnison, M. Altenritter. 2011. Sturgeon of the Gulf of Maine. University of Vermont
State	Amirbahman, Aria	University of Maine	Bacon L.C., A. Amirbahman, and S.A. Norton. "Elucidating complex relationships among factors influencing mercury fish tissue contamination." Maine Water Conference, Augusta, ME. March 16, 2011.
State	Amirbahman, Aria	University of Maine	Lake B.A., J. Hart, and A. Amirbahman, "From landfill to best management practice, a beneficial re-use application of water treatment residuals." Maine Water Conference, Augusta, ME. March 16, 2011.
State	Bell, Kathleen	University of Maine	Becker, A., Bell, K.P., Budzinski, C., Hall, D.M., Hutchins, K., Kacer, N., Leahy, J., Lindenfeld, L.A., Lyons, P., McGreavy, B., Post, D., Quartuch, M., Richards, M., Silka, L., Smith, H., Sutton, A., Thornbrough, L. Regional: Linking Knowledge and Action Systems: Creating Solutions-Oriented Partnerships for a Sustainable Future in Maine, University of Maine EPSCoR Conference, University of Maine, Orono, ME, November 8, 2010 (poster presentation)
State	Bell, Kathleen	University of Maine	Becker, A., Bell, K.P., Budzinski, C., Hall, D.M., Hutchins, K., Kacer, N., Leahy, J., Lindenfeld, L.A., Lyons, P., McGreavy, B., Post, D., Quartuch, M., Richards, M., Silka, L., Smith, H., Sutton, A., Thornbrough, L. Regional: Sustainability Solutions Initiative: Responsive University Research for Improving Maine's Quality of Place, presentation at the Margaret Chase Smith Policy Advisory Board Meeting, Augusta, ME, December 10, 2010
State	Bell, Kathleen	University of Maine	Bell, K.P. and L. Lewis 2011. Who gives a dam? Taking stock of public preferences for river restoration projections. Poster. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Bell, Kathleen	University of Maine	Bell, K.P. Coupled Natural and Human Systems Research Panel Discussion (Organizer and Moderator; Panelists - Charlie Colgan, Yuseung Kim, Eli Lazarus, Teresa Johnson, and Jim Wilson). Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Bell, Kathleen	University of Maine	Bell. K.P. and C. Colgan. 2010. Human dimensions of protecting natural resources on private lands, Maine Revenue Service Tax School, Belfast, ME, 4 August 2010.
State	Bell, Kathleen	University of Maine	Hutchins, K., Bell, K.B., Leahy, J., Lindenfeld, L. and Silka, L. Regional: Problemscaping Maine: Reaching out to Communities to Inform Research. Maine Water Conference, Augusta, ME. March 16, 2011.

Scope	SSI Member	Institution	Description
State	Bell, Kathleen	University of Maine	Plowden, J. and K.P. Bell. 2011. Integrating stakeholder and land use research. (poster presentation). Maine Water Conference, Augusta, ME. March 16, 2011.
State	Bell, Kathleen	University of Maine	Speers, A. and K.P. Bell. Is knowledge linked with action? Evidence from household conservation behavior (poster presentation). Maine Water Conference. March 16, 2011.
State	Bevier, Catherine	Colby College	Belgrade Lakes Watershed Stewardship: Outreach activities with middle school students.
State	Bevier, Catherine	Colby College	The effects of coarse woody debris and shoreline buffers on biodiversity in the Belgrade Lakes
State	Budzinski, Colleen	University of Maine	Lindenfeld, L., Zollitsch, B., and Budzinski, C. Discussion about Sustainability Solution Partners Feedback. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Calhoun, Aram	University of Maine	Calhoun, A.J.K. 2010. Vernal pool regulation and conservation workshop: understanding the law and its implications for landowners (invited workshop organizer and speaker). Annual meeting of Maine tax assessors. Belfast, ME.
State	Calhoun, Aram	University of Maine	Calhoun, A.J.K. 2011 (3 May). Vernal pool conservation in working forests. Kennebec Woodland Partnership. Wayne, ME.
State	Calhoun, Aram	University of Maine	Calhoun, A.J.K. and D.E. Morgan 2011 (29 April). Vernal pool conservation priorities. Annual meeting of the Land Trust Alliance, Topsham, ME.
State	Calhoun, Aram	University of Maine	Jansujwicz, J.S., A.J.K. Calhoun, and R. Lilieholm. Integrating Social Science into Natural Resources Conservation to Enhance Management of Vernal Pools. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Calhoun, Aram	University of Maine	Jansujwicz, JS, AJK Calhoun, and R. Lilieholm. Communicating sustainability through citizen science: challenges and (missed) opportunities. Citizen Science Symposium, Center for Research on sustainable forests, UMaine
State	Calhoun, Aram	University of Maine	Morgan, D.E. and A.J.K. Calhoun. Dec 2010. Research-Extension Partnerships in Sustainability Science: Bridging Research-based Knowledge with Client-based Needs. SSI-UMaine Cooperative Extension Workshop and World Sustainabilty Teach-in Day. Senator George J. Mitchell Center, University of Maine. Orono, Maine
State	Camill, Phil	Bowdoin College	Ecological and economic recovery of the Kennebec and Androscoggin rivers, estuary, and nearshore marine ecosystem.
State	Cole, Russell	Colby College	Ian McCullough '10, Sarah E. Hart ‘10, Dan Homeier ‘12, Philip J. Nyhus, and Russell Cole. Historic and Future Residential Development in the Belgrade Lakes Watershed.
State	Cole, Russell	Colby College	Ian McCullough '10, Sarah E. Hart ‘10, Dan Homeier ‘12, Philip J. Nyhus, and Russell Cole. The Impact of

Scope	SSI Member	Institution	Description
			Land Use Patterns on Phosphorus Loading in the Belgrade Lakes.
State	Cole, Russell	Colby College	Nyhus, Philip J., F. Russell Cole, Sophie Sarkar '11, Brynna Patel '11. Surveying Community Attitudes and Engagement in the Belgrade Lakes.
State	Colgan, Charlie	University of Southern Maine	Economic Growth and Sustainable Urban Regions Presentation to the Annual Meeting of the Nature Conservancy Board of Directors on the Maine Economy and the role of urban regional growth in the development of land conservation strategies.
State	Cox, J. Gray	College of the Atlantic	Developing Our Energy Future: Residential Heating With Wood in Hancock County, Maine. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Cox, J. Gray	College of the Atlantic	Developing Our Energy Future: The Use of Firewood and Pellets for Heating in Hancock County
State	Daigle, John	University of Maine	"Mobilizing Diverse Interests to Address Invasive Species Threats to Coupled Natural/Human Systems: The Case of the Emerald Ash Borer in Maine," Presentation to the PVC Chapter of Maine Audubon, Bangor Public Library, Regional in focus, attended by 15 members of the PVC Chapter of Maine Audubon, February 10, 2011 (Ranco, Daigle, Lilieholm, Quigley, Lizotte).
State	Daigle, John	University of Maine	"The Emerald Ash Borer: Coming to Maine, and what we can do about it," Presentation at the Annual Meeting of the Maine Indian Basketmakers Alliance, July 9, 2010, Bar Harbor, Maine. Regional in focus, the meeting was attended by roughly 35 Wabanaki basketmakers and their families (Ranco and Daigle).
State	Daigle, John	University of Maine	Mobilizing Diverse Interests to Address Invasive Species Threats: The Case of the Emerald Ash Borer in Maine. 2nd Annual Maine Invasive Species Network Meeting, Orono. (Quigley presenting, with Ranco, Lilieholm, Secord, Neptune, Daigle, McCloskey, Livingston & Lizotte) (February 2011)
State	Dreyer, Stacia	University of Maine	Mario Teisl, Caroline L. Noblet, Shannon McCoy, Mark Anderson, Megan Wibberly, Brandon Cosley, Joseph Wellman, Stacia Dreyer, Sarah Marrinen, Karen Hutchins and Kevin Price. 2011. Are Mainers 'blown away' by wind? Invited presentation. Maine Wind Energy Conference. Augusta, ME
State	Lazarus, Eli	University of Maine	Panelist for Coupled Social-Ecological Systems: "A coupled economic and coastline model for beach nourishment." Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Feurt, Christine	University of New England	"The Salmon Falls Watershed Collaborative" New Hampshire Department of Environmental Services Drinking Water Source Protection Workshop

Scope	SSI Member	Institution	Description
State	Feurt, Christine	University of New England	"Sustainable Coastal Land Use - Collaboration in a Changing Climate" A workshop hosted by the Sapelo Island National Estuarine Research Reserve and the Georgia Coastal Management program to develop skills and best practices on the Georgia Coast
State	Feurt, Christine	University of New England	In Defense of Nature: Rachel Carson and the World Around Us Maine Humanities Council Symposium
State	Gallandt, Eric	University of Maine	Managing Weeds with Crop Rotation. Maine Organic Farmers and Gardeners Association Farmer to Farmer Conference (7 November 2010).
State	Gallandt, Eric	University of Maine	Weed Ecology and Management. Guest lecture at Colby College, Waterville, ME (18 January 2011; 40 attending).
State	Hall, Damon	University of Maine	Knowledge to Action Workshop at University of Maine-Orono, ME "Community-engagement"
State	Hall, Damon	University of Maine	Presentation to The Margaret Chase Smith Policy Center Advisory Board Meeting in the Governor's Cabinet Room, Augusta, ME: "Sustainability Solutions Initiative: Responsive University Research for Improving Maine's Quality of Place"
State	Hart, David	University of Maine	Maine's Sustainability Solutions Initiative : Partnerships for Linking Knowledge with Action. 40th Annual Maine Lakes Conference. June 26, 2010.
State	Hart, David	University of Maine	Presentation regarding strategies for gaining research support from private foundations. Session organized by UMaine Office of Research and Sponsored Programs.
State	Hart, David	University of Maine	SSI Overview and Update. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Herrera, Guillermo	Bowdoin College	Human Dimensions of River Restoration: Attitudes, Values and Behavior
State	Hutchins, Karen	University of Maine	Mario Teisl, Caroline L. Noblet, Shannon McCoy, Mark Anderson, Megan Wibberly, Brandon Cosley, Joseph Wellman, Stacia Dreyer, Sarah Marrinen, Karen Hutchins and Kevin Price. 2011. Are Mainers blown away by wind? Invited presentation. Maine Wind Energy Conference. Augusta, ME.
State	Hutchins, Karen	University of Maine	Owen, D., Cronan, C., Lindenfeld, L., Silka, L., Simon, K., Hall, D., Hutchins, K., and Parr, T., 2010. Poster. Sustaining and Restoring Urban Streams in Maine. Maine EPSCoR Conference, University of Maine, Orono, ME, November 8.
State	Jain, Shaleen	University of Maine	Jain,S., Changing Climate and Regional Hydrology. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Jain, Shaleen	University of Maine	Kary, D., K. P. Bell, and S. Jain, Residential land conversion and peak streamflow response. Maine Water Conference, Augusta, ME. March 16, 2011.

Scope	SSI Member	Institution	Description
State	Jain, Shaleen	University of Maine	Reeve, A. S., S. Jain, M. Legere, J. MacRae, F. Pavri, J. Peckenham, M. Saros, M. Scott, A. Springsteen. Using Lumped Parameter Drainage-basin Models to Assess Lake Level in a Managed Lake System. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Jansujwicz, Jessica	University of Maine	Collaboration and Local Natural Resource Planning: Is Theory Running Ahead of Practice? Maine Water Conference, Augusta, ME. March 16, 2011.
State	Jansujwicz, Jessica	University of Maine	Cooperation and Natural Resources Management: Community-Based Vernal Pool Conservation Planning in Maine. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Jansujwicz, Jessica	University of Maine	Spanning boundaries and disciplines: Integrating social and natural sciences for effective water resource management. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Johnson, Eileen	University of Maine	Ames, E., Lichter J, Johnston C, Elowe C, Bell A, Thomson A, Johnson E. A comparison of historical and current substrate types as an indicator of ground fish abundance. Poster. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Johnson, Michelle	University of Maine	Analysis of Alternative Futures of the Maine Landscape using Spatial Models of Coupled Social and Ecological Systems - poster presentation
State	Johnson, Michelle	University of Maine	Using Bayesian Belief Networks to Identify At-Risk Aquatic Resources under Alternative Future Development Scenarios. (Johnson presenting, with Lilieholm, Cronan, Owen, and Meyer). Maine Water Conference, Augusta, ME. March 16, 2011.
State	Johnson, Teresa	University of Maine	J.A. Wilson and T.R. Johnson. Coupled Social-Ecological-Systems Research (SES). Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Johnson, Teresa	University of Maine	Johnson, T.R. 2010. Human Dimensions Research. Presentation to the Maine Tidal Power Initiative Board, Black Bear Inn Conference Center, Orono, Maine, November 12, 2010.
State	Johnson, Teresa	University of Maine	Johnson, T.R. and G. Zydlewski. 2010. Maine Tidal Power Initiative: Linking Knowledge to Action for Responsible Development. Maine EPSCoR State Conference, Wells Conference Center, University of Maine, Orono, Maine. November 8, 2010.
State	Johnson, Teresa	University of Maine	Johnson, T.R. and G. Zydlewski. 2011. Maine Tidal Power Initiative: Social and Ecological Research for the Responsible Development of Tidal Power. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Johnson, Teresa	University of Maine	T.R. Johnson. 2010. Lecture on Human dimensions of marine ecosystems. Lecture to the SOS Wynflette

Scope	SSI Member	Institution	Description
			School, Darling Marine Center, July 14, 2010.
State	Johnson, Teresa	University of Maine	Wilson, J., J. Acheson, T. Johnson, R. Steneck, Y. Chen, P. Hayes, A. Hayden, C. Cleaver, G. Morehead, C.B. Congdon. 2010. Fine-scale Dynamics of Human Adaptation in Coupled Systems: Adaptive Agent-based Modeling of Fisheries. Poster presented at the Maine EPSCoR State Conference, Wells Conference Center, University of Maine, Orono, Maine. November 8, 2010.
State	Johnston, Jason	University of Maine at Presque Isle	Is green energy for the birds?: UMPI's wind turbine and breeding grassland sparrows (UM Wildlife Ecology Seminar)
State	Johnston, Jason	University of Maine at Presque Isle	Modeling evolving ecological, cultural, and economic systems of the Aroostook River watershed of northern Maine for sustainable development (poster presentation). Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Kim, Yuseung	University of Southern Maine	Demographic, Economic, and Land Use/Land Cover Change Projections for Use in Planning and Water Resource Management. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Kim, Yuseung	University of Southern Maine	Kim, Y., C. Colgan. Sustainable Urban Regions Project. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	King, Whitney	Colby College	King, W., P. Nyhus, H. Wilson, R. Cole. "Google Street View" for Maine Lakes: Creating public-domain shoreline images for research, public policy, and education. Maine Water Conference, Augusta, ME. March 16, 2011.
State	King, Whitney	Colby College	Statewide Implications of Change and Resilience in a Central Maine Watershed
State	Leahy, Jessica	University of Maine	Gorczyca E., Leahy, J., and Mercier, W. "A Family Matter: The Use of Agent-Based Modeling and Social Learning to Promote Sustainable Family Forest Management in Maine," for the Small Woodland Owners Association of Maine Annual Meeting, January 2011. Augusta, ME.
State	Leahy, Jessica	University of Maine	Leahy, J. "Evaluating Groundwater Partnerships through a Mixed Method Social Science Approach." Maine Water Conference, Augusta, ME. March 16, 2011.
State	Leahy, Jessica	University of Maine	Leahy, J. "Woodlot Owner Attitudes Toward Risks and Potential of Wood for Energy," for Biofuels for Maine Workshop. October, 2009. Orono, ME.
State	Leahy, Jessica	University of Maine	Lyons, P., and Leahy, J. "There's No Place like Home: The Role of Place Attachment in Understanding Family Forest Landowner Behavior," for the Small Woodland Owners Association of Maine Annual Meeting, January 2011. Augusta, ME.

Scope	SSI Member	Institution	Description
State	Leahy, Jessica	University of Maine	Quartuch, M., and Leahy, J. "Using Mixed Methods to Conduct Stakeholder-driven Research on Maine's Family Forest Owners," for the Small Woodland Owners Association of Maine Annual Meeting, January 2011. Augusta, ME.
State	Leahy, Jessica	University of Maine	Shank, E., Leahy, J., and Shultz, A. "An Analysis of Maine Forest Service WoodsWISE Forest Stewardship Management Plan Evaluations," for the Small Woodland Owners Association of Maine Annual Meeting, January 2011. Augusta, ME.
State	Lilieholm, Robert	University of Maine	Emerald Ash Borer in Maine: Status and Outlook. (Ranco presenting, with Quigley, Lilieholm, and Daigle). Poster. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Lilieholm, Robert	University of Maine	Engaging High School Students in Science-based Study Abroad Programs: Leatherback Sea Turtle Research and Conservation at the Pacuare National Reserve, Costa Rica. 2010 Maine State EPSCoR Conference, University of Maine, Orono. (With Jennifer Lilieholm and Morris).
State	Lilieholm, Robert	University of Maine	Lilieholm, R., C. Cronan, D. Owen, K. Simon, M. Johnson and S. Meyer. Assessing the Impacts of Alternative Future Development Patterns on Urban Streams and Watersheds. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Lilieholm, Robert	University of Maine	Lilieholm, R., C. Cronan, R. Judd, J. Wilson, E. Gallandt, S. Hornsby, J. McCloskey, J. Tremblay, M. Johnson, S. Meyer, E, Mallory and T. Glidden. Analysis of Alternative Futures of the Maine Landscape using Spatial Models of Coupled Social and Ecological Systems. Poster. Maine Water Conference, August, ME. March 16, 2011.
State	Lilieholm, Robert	University of Maine	Lilieholm, R., J. McCloskey, Boone, Reid, Worden and Ogutu. Alternative Futures Modeling in Kenya's National Parks and Reserves. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010
State	Lilieholm, Robert	University of Maine	Lilieholm, R., Sharik, Neuvonen, Wang and Chen. Comparison of Undergraduate Enrollment Trends in Forestry-Related Programs Between the USA and China. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010
State	Lilieholm, Robert	University of Maine	Mobilizing Diverse Interests to Address Invasive Species Threats: The Case of the Emerald Ash Borer in Maine. (with Quigley, Ranco, Secord, Neptune, Daigle, McCloskey, Livingston and Lizotte).Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.

Scope	SSI Member	Institution	Description
State	Lilieholm, Robert	University of Maine	Mobilizing Diverse Interests to Address Invasive Species Threats: The Case of the Emerald Ash Borer in Maine. (Quigley presenting, with Ranco, Secord, Neptune, Daigle, McCloskey, Livingston and Lizotte). Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Lilieholm, Robert	University of Maine	Population Persistence in Complex Landscapes: Vernal Pools as a Model System. (With Jansujwicz, Hunter, Ryan, Cline, Bell, Levesque, Morgan, Popescu, Calhoun and Loftin). Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Lilieholm, Robert	University of Maine	Sustaining Maine's Brown Ash Resource. Presentation to the Maine Indian Basket-makers Alliance, College of the Atlantic, Bar Harbor, Maine. (Ranco presenting, with Lilieholm, Daigle, Secord & Neptune) (July 2010)
State	Lilieholm, Robert	University of Maine	Urban Futures Modeling for Water Quality. Maine Water Conference, Augusta Civic Center. (Colgan presenting, with Kartez, Kim, Bell and Lilieholm).
State	Lyons, Patrick	University of Maine	There's No Place like Home: The Role of Place Attachment in Understanding Family Forest Landowner Behavior
State	McCourt, Matthew	University of Maine at Farmington	Barton, A., C. Bennett, D. Buckley, R. Butler, M. Clawson, J. Daly, W. Harper, D. Heroux, R. Kurtz, C. McAnneny, N. Perlson and S. Rousseau. Sustainability and Landscape Change in the Rangeley Lakes. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME
State	McCoy, Shannon K	University of Maine	McCoy, S.K., Newell, E.E., Wellman, J.D., Cosley, B., & Pickering, R. Research on the research (RoR): Putting the interdisciplinary puzzle together. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	McCoy, Shannon K	University of Maine	Teisl, M., McCoy, S. K., Noblet, C. L. Modeling stakeholder acceptance of environmental problems. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	McCoy, Shannon K	University of Maine	Teisl, M., Noblet, C., McCoy, S.K., Anderson, M., Wibberly, M., Cosley, B., Wellman, J., Dreyer, S., Marrinen, S., Hutchins, K., & Price, K. (2011). Are Mainers blown away by wind? Presntation to the Maine Wind Energy Conference. Augusta, ME
State	McCoy, Shannon K.	University of Maine	Cosley, B., McCoy, S. K., Noblet, C., Teisl, M., & Wellman, J. Persuaded by the status quo: The role of economic stress in persuasion for environmental messages. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.

Scope	SSI Member	Institution	Description
State	McGreavy, Bridie	University of Maine	Science in Translation: A Mixed Methods Approach to Describe Local Decision Maker Attitudes to Vernal Pool Conservation in Maine. Maine Water Conference, Augusta, ME. March 16, 2011.
State	McGreavy, Bridie	University of Maine	Sustainability Solutions Initiative: Responsive University Research for Improving Maine's Quality of Place
State	Meyer, Spencer	University of Maine	Lilieholm, R.J., C.S. Cronan, J. McCloskey, S.R. Meyer, M.L. Johnson, J.Tremblay, R. Judd, J.S. Wilson, E.R. Gallandt, S.J. Hornsby, E. Mallory and T. Glidden. Analysis of Alternative Futures in the Maine Landscape Using Spatial Models of Coupled Social and Ecological Systems. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Meyer, Spencer	University of Maine	Temporal and Spatial Distributions of Conserved Lands in Maine. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Morgan, Dawn	University of Maine	Calhoun, A.J.K. and D.E. Morgan. Vernal pool conservation priorities. Annual meeting of the Land Trust Alliance, Topsham, ME. Direct
State	Morgan, Dawn	University of Maine	Morgan, D.E., and A.J.K. Calhoun. Conserving Maine Vernal Pools through Collaborative Local Initiatives. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Noblet, Caroline	University of Maine	Mario Teisl, Caroline L. Noblet, Shannon McCoy, Mark Anderson, Megan Wibberly, Brandon Cosley, Joseph Wellman, Stacia Dreyer, Sarah Marrinen, Karen Hutchins and Kevin Price. 2011. Are Mainers 'blown away' by wind? Presentation to the Advanced Engineered Wood Composites Lab, University of Maine. Orono, ME.
State	Noblet, Caroline	University of Maine	Mario Teisl, Caroline L. Noblet, Shannon McCoy, Mark Anderson, Megan Wibberly, Brandon Cosley, Joseph Wellman, Stacia Dreyer, Sarah Marrinen, Karen Hutchins and Kevin Price. 2011. Are Mainers 'blown away' by wind? Invited presentation. Maine Wind Energy Conference. Augusta, ME.
State	Noblet, Caroline	University of Maine	Sarah J Marrinan, Kevin Price, Megan Wibberly, Mario F. Teisl, Caroline L. Noblet, Shannon K. McCoy. 2011. Who cares about water? Influences on citizen concern for water quality and quantity. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Nyhus, P.	Colby College	Cole, F. R., P. J. Nyhus, S. Hart, and I. McCullough. "Investigating Resilience and Change in the Belgrade Lakes Watershed." A Delicate Balance: Sustaining Maine Lakes. [included here because not in 2010 report]. 40th Annual Maine Lakes Conference. June 26, 2010.

Scope	SSI Member	Institution	Description
State	Nyhus, P.	Colby College	McCullough, I., S. E. Hart, D. Homeier, P. J. Nyhus, and R. Cole. 2010. "Historic and Future Residential Development in the Belgrade Lakes Watershed." A Delicate Balance: Sustaining Maine Lakes. (Poster). [[Included here because not included in 2011 report]. 40th Annual Maine Lakes Conference. June 26, 2010.
State	Nyhus, P.	Colby College	McCullough, I., S. E. Hart, D. Homeier, P. J. Nyhus, and R. Cole. 2010. "The Impact of Land Use and Land Cover Patterns on Phosphorus Loading in the Belgrade Lakes." A Delicate Balance: Sustaining Maine Lakes. (Poster). [included here because not in 2010 report]. 40th Annual Maine Lakes Conference. June 26, 2010.
State	Owen, Dave	University of Southern Maine	"Urbanization, Water Quality, and the Regulated Landscape" - presentation to the Maine Law School Board of Governors
State	Pavri, Firooza	University of Southern Maine	Historical change in land use for the Sebago Lake watershed
State	Putnam, David	University of Maine at Presque Isle	Climate Change Research and Archaeology in Central Asia: The search for new lost treasures of the Silk Road. Keynote presentation, Maine Archaeological Society Fall meeting, Orono, Maine.
State	Quartuch, Mike	University of Maine	"Using Mixed Methods to Conduct Stakeholder-driven Research on Maine's Family Forest Owners." Poster Presentation. Annual SWOAM conference. Augusta, Maine, USA.
State	Sader, Steven	University of Maine	J. McCloskey, R. Lilieholm, R. Boone, R. Reid, J. Worden, S.A. Sader and others. The effects of changing land-use patterns on wildlife migrations and pastoral livelihoods near wildlife reserves in Kenya.Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Sader, Steven	University of Maine	J. Wilson, S.A. Sader, J. Leahy, K. Legaard and E. Simons. Spatial forest planning to meet multiple natural resource goals. NSF/EPSCoR Maine Sustainable Solutions Initiative Meeting, University of Maine, Orono, ME. November 3, 2010.
State	Sader, Steven	University of Maine	J. Wilson, S.A. Sader, J. Leahy, K. Legaard and E. Simons. Spatial forest planning to met multiple natural resource goals. NSF-EPSCoR Maine Sustainable Solutions Initiative meeting, University of Maine, Orono, ME
State	Sader, Steven	University of Maine	Simons, E.M., D.J. Harrison, K.R. Legaard, S.A. Sader, and J. Hepinstall. The effectiveness of state regulation to protect deer wintering areas in Maine: did the designation of LURC-zoned deer yards achieve desired objectives during the period 1975-2007? Cooperative Forestry Research Unit Advisory Council, University of Maine, Orono ME

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State	Silka, Linda	University of Maine	Silka, L. Building Community-University Research Partnerships. Facilitator of two day workshop for New Hampshire Leaders under the auspices of Community-Campus Partnerships for Health.
State	Simons, Erin	University of Maine	The effectiveness of state regulation to protect deer wintering areas in Maine: did the designation of LURC-zoned deer yards achieve desired objectives during the period 1975-2007?
State	Springsteen, Anna	University of Maine	Springsteen, A., MacRae, J., Kim, J-S., Jain, S. A look at trends in Sebago Lake. Poster. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Stancioff, Esperanza	University of Maine	Adaptation Strategies in a Changing Climate
State	Stancioff, Esperanza	University of Maine	Extension Panel Presentation for Maine Sea Grant National Review on Climate Change Adaptation in Maine
State	Teisl, Mario F.	University of Maine	Mario Teisl, Caroline L. Noblet, Shannon McCoy, Mark Anderson, Megan Wibberly, Brandon Cosley, Joseph Wellman, Stacia Dreyer, Sarah Marrinen, Karen Hutchins and Kevin Price. 2011. Are Mainers 'blown away' by wind? Presentation to the Advanced Engineered Wood Composites Lab, University of Maine. Orono, ME,
State	Teisl, Mario F.	University of Maine	Mario Teisl, Caroline L. Noblet, Shannon McCoy, Mark Anderson, Megan Wibberly, Brandon Cosley, Joseph Wellman, Stacia Dreyer, Sarah Marrinen, Karen Hutchins and Kevin Price. 2011. Are Mainers 'blown away' by wind? Invited presentation. Maine Wind Energy Conference. Augusta, ME, .
State	Teisl, Mario F.	University of Maine	Mark Anderson, Mario Teisl and Caroline Noblet. 2010. World Views and Knowledge to Action in Sustainability Science. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.
State	Whitney King	Colby College	Statewide Implications of Change and Resilience in a Central Maine Watershed. 40th Annual Maine Lakes Conference. June 26, 2010.
State	Wibberly, Megan	University of Maine	Megan Wibberly, Caroline Noblet, Mario Teisl and Shannon McCoy. Mainers' Power-Up: Tradeoffs Between Wind and Water. Maine Water Conference, Augusta, ME. March 16, 2011.
State	Wilson, Jeremy	University of Maine	Wilson, J.S., E.M. Simons, K.R. Legaard, S.A. Sader, and J. E. Leahy. Spatial forest planning to meet multiple natural resource goals. Poster. Maine EPSCoR State Conference, University of Maine, Orono, ME. November 8, 2010.

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APPENDIX 9: YR2 SSI Publications

Institution	Type	Citation	RII Support
Bowdoin College	Journal Article	Holland, D. and **G.E. Herrera**, 2010. The benefits and risks of increased spatial resolution in management of fishery metapopulations under uncertainty. Natural Resource Modeling 23(4):494-502.	Partial
Colby College	Technical Report	d'Hemecourt, L., B. Patel, and S. Sarkar. 2010. The State of Lakes in Maine. In The State of Maine's Environment 2010. [**P. Nyhus** and Colby Environmental Policy Group, editors]	Partial
Colby College	Abstract	**King, D.W.**, **P. Nyhus**, **H. Wilson**, and **R. Cole**. 2011. "Google Street View" for Maine Lakes: Creating public-domain shoreline images for research, public policy, and education. 2011 Maine Water Conference, Augusta, ME.	Primary
Unity College	Other	**Arnett, A.** 2010. Studying the Forest Ecosystem: A Quality Undergraduate Research Experience. Unity: The Magazine of Unity College.	Primary
University of Maine	Journal Article	32. Berteaux, D., S. Blois, J.-F. Angers, J. Bonin, N. Casajus, M. Darveau, F. Fournier, M.M. Humphries, **B. McGill,** J. Larivée, T. Logan, P. Nantel, C. Périé, F. Poisson, D. Rodrigue, S. Rouleau, R. Siron, W. Thuiller, L. Vescovi. "The CC-Bio Project: Studying the Effects of Climate Change on Quebec Biodiversity." (Diversity 2010) 2:1181-1204.	Partial
University of Maine	Other	**Anderson, M.** National Environmental Policy Act (1969) in Berkshire Encyclopedia of Sustainability, Volume 3: The Law and Politics of Sustainability, pp. 393-395.	Partial
University of Maine	Journal Article	**Beard, K.**, J. Emerson, H. Deese, M. Scott, A. Rude, and N.R. Pettigrew. 2011. Use of the EventViewer for visualizing and exploring events extracted from Ocean Observing System Data. Marine Technology Journal. Vol.45. No.1 pp.112-124.	Partial
University of Maine	Other	**Bell, K.P.** 2010. Introduction to Spatial Econometrics by James LeSage and R. Kelly Pace. Journal of Regional Science 50(5): 1014-1015 (Book review).	Partial
University of Maine	Book Chapter	**Bell, K.P.** 2010. Public Preferences for Protecting Working Landscapes, in S. Goetz and F. Brouwer (eds.), New perspectives on agri-environmental policies: a multidisciplinary and transatlantic approach, Routledge Publishing, 199-218 .	Partial
University of Maine	Journal Article	Benjamin, J., **R.J. Lilieholm**, and C. Coup. 2010. Forest Biomass Harvests: A "Special Needs" Operation? Northern Journal of Applied Forestry 27(2):45-49.	Primary

Institution	Type	Citation	RII Support
University of Maine	Journal Article	Blomquist, S.M., and **M.L. Hunter Jr.** 2010. A multi-scale assessment of amphibian habitat selection: wood frog response to timer harvesting. Ecoscience 17:251-264.	Partial
University of Maine	Journal Article	Boyle, K.J., N.V. Kuminoff, C. Zhang, and **K.P.Bell**. 2010. Does a Property-Specific Environmental Health Risk Create a Neighborhood Housing-Price Stigma? Arsenic in Private Well Water. Water Resources Research 1-10.	Partial
University of Maine	Other	**Calhoun, A.J.K.**, and **D.E. Morgan**. 2009. Conservation of Vernal Pools: Lessons from State and Local Action. Case study, discussion questions, and teaching notes. American Museum of Natural History, Network of Conservation Educators and Practitioners. Available at http://ncep.amnh.org.	Primary
University of Maine	Journal Article	**Cronan, C.S.**, **R.J. Lilieholm**, **J. Tremblay** and T. Glidden. 2010. A Retrospective Assessment of Land Conservation Patterns in Maine based on Spatial Analysis of Ecological and Socio-economic Indicators. Environmental Management 45(5):1076-1095.	Primary
University of Maine	Journal Article	Davenport, M., Baker, **Leahy, J.**, and D. Anderson. 2010. "An Exploratory Study of Place Meanings and Significance of an Illinois State Park." Journal of Park and Recreation Administration, 28(1): 52-69.	Primary
University of Maine	Journal Article	Ednie, A., **Daigle, J.** and **J. Leahy**. 2010. "The Development of Recreation Place Attachment on the Maine Coast: User Characteristics and Reasons for Visiting." Journal of Park and Recreation Administration, 28(1): 36-51.	Primary
University of Maine	Journal Article	Fingerut, J., **D. Hart**, and J. Thomson. 2011. Larval settlement in benthic environments: The effects of velocity and bed element geometry. Freshwater Biology	Partial
University of Maine	Other	Foster, D.R., B. Donahue, D. Kittredge, K.F. Lambert, **M. Hunter**, B. Hall, L.C. Irland, **R.J. Lilieholm**, D.A. Orwig, A. D'Amato, E. Colburn, J. Thompson, J. Levitt, A.M. Ellison, J. Aber, C. Cogbill, C. Driscoll, and C. Hart. 2010. Wildlands and Woodlands: A Vision for the New England Landscape. Harvard University Press. 36 pages.	Primary
University of Maine	Journal Article	Gahl, M.K. and **A.J.K. Calhoun**. 2010. The role of multiple stressors in ranavirus-caused amphibian mortalities in Acadia National Park wetlands. Canadian Journal of Zoology 88:108-121.	Partial
University of Maine	Journal Article	**Hart, D.** and **A.J.K. Calhoun.** 2010. Rethinking the role of ecological research in the sustainable management of freshwater ecosystems. Freshwater Biology 55:258-269	Primary
University of Maine	Journal Article	Holmes, T., E. Murphy, **K.P. Bell**, and D. Royle. 2010. Property Value Impacts of Hemlock Woolly Adelgid in	Partial

Institution	Type	Citation	RII Support
		Residential Forests, Forest Science 56(6): 529-540.	
University of Maine	Book	**Hunter, M.L. Jr.** and F. Schmiegelow. 2011. Wildlife, forests, and forestry. Second edition. Prentice Hall, Upper Saddle River, New Jersey.	Partial
University of Maine	Journal Article	**Hunter, M.L., Jr**, E. Dinerstein, J. Hoekstra, and D. Lindenmayer. 2010. Conserving biodiversity in the face of climate change: A call to action. Conservation Biology 24:1169-1171.	Partial
University of Maine	Book Chapter	**Jansujwicz, J.** and **A.J.K. Calhoun**. 2010. Protecting natural resources on private lands: the role of collaboration in land-use planning Pages 205-233 in Trombulak, S. and R. F. Baldwin (eds.). Protecting natural resources on private lands: the role of collaboration in land-use planning. Springer-Verlag, New York, N.Y.	Primary
University of Maine	Book Chapter	**Jansujwicz, J.S.** and **A.J.K. Calhoun**. 2010. Protecting natural resources on private lands: The role of collaboration in land-use planning. Pages 205-235 in Trombulak, S., and R.F. Baldwin (eds.) Multi-scale Conservation Planning. Springer-Verlag, New York, NY.	Partial
University of Maine	Abstract	**Jansujwicz, J.S.**, **A.J.K. Calhoun**, and **R.J. Lilieholm**. 2010. Cooperation and Natural Resource Management: Community-based Vernal Pool Conservation Planning in Maine, USA. Abstract in Proceedings of the 24th Annual Meeting of the Society for Conservation Biology, Edmonton, Alberta, Canada.	Primary
University of Maine	Abstract	**Jansujwicz, J.S.**, **A.J.K. Calhoun**, and **R.J. Lilieholm**. 2010. Cooperation and Natural Resource Management: Community-based Vernal Pool Conservation Planning in Maine, USA. Abstract in the Proceedings of the 16th International Symposium on Society and Resource Management, Corpus Christi, Texas.	Primary
University of Maine	Abstract	**Judd, R.W.** 2010. Review of Twentieth-Century New England Land Conservation: A Heritage of Civic Engagement, edited by Charles H.W. Foster, in Historical New Hampshire 64 (Winter 2010): 130-31.	Partial
University of Maine	Abstract	**Lazarus, E.**, and **K.P. Bell.** 2010. Dynamics of land use and common-resource pressures in terrestrial-aquatic environments. Eos Trans. AGU, 91 (55), Fall Meet. Suppl., Abstract NG43B-1420.	Primary
University of Maine	Journal Article	**Lazarus, E.D.**, and A.B. Murray. 2011. An integrated hypothesis for regional patterns of shoreline change along the northern North Carolina Outer Banks, U.S.A. Marine Geology doi:10.1016/j.margeo.2011.02.002.	Partial
University of Maine	Journal Article	**Leahy, J.** and D. Anderson. 2010. "Cooperation Gets It Done: Social Capital in Natural Resources Management along the Kaskaskia River." Society & Natural Resources, 23(3):224-239.	Primary

Institution	Type	Citation	RII Support
University of Maine	Technical Report	**Leahy, J.** and **L. Lindenfeld**. 2010. "NEWBio Stakeholder Survey and Workshops," Northeast Woody Biomass Consortium, Technical Report. 76 pages.	Primary
University of Maine	Abstract	**Leahy, J.**, **E. Gorczyca**, **W. Mercier**, **K. Hutchins**, **L. Lindenfeld**, **L. Silka**, and **K.P. Bell**. 2010. "A Case Study of Combining Coupled Social-Ecological System Modeling with Knowledge-to-Action Research: Agent-Based Modeling of Family Forests." Oral presentation for the International Symposium on Society and Resource Management. Corpus Christi, Texas.	Primary
University of Maine	Journal Article	**Leahy, J.**, M. Shugrue, **J. Daigle**, and H. Daniel. 2009. "Local and Visitor Physical Activity through Media Messages: A Specialized Benefits-Based Management Application at Acadia National Park." Journal of Park and Recreation Administration, 27(3): 59-77.	Primary
University of Maine	Other	**Lilieholm, R.J. "**Twentieth-Century New England Land Conservation: A Heritage of Civic Engagement," edited by Charles H.W. Foster. Review for The Quarterly Review of Biology 85(4):497-498. (invited)	Primary
University of Maine	Abstract	**Lilieholm, R.J.** 2010. Public Views toward Forest-based Biomass and Bioenergy. Cooperative Forestry Research Unit Fall Meeting. University of Maine, Orono (with Marciano, **Leahy** and Porter).	Primary
University of Maine	Abstract	**Lilieholm, R.J.** 2011. U.S. Undergraduate Enrollment Trends in Natural Resources, 1980-2009. Intermountain Society of American Foresters Meeting, Logan, UT (Sharik presenting).	Primary
University of Maine	Abstract	**Lilieholm, R.J.** 2011. Undergraduate Enrollment Trends in Natural Resources at NAUFRP Institutions: An Update. 8th Biennial Conference on University Education in Natural Resources, Virginia Polytechnic Institute and State University, Blacksburg, VA (Sharik presenting).	Primary
University of Maine	Abstract	**Lilieholm, R.J.** 2011. Wildlands and Woodlands - A Vision for the New England Landscape. BIOECON Conference, Venice, Italy (Lilieholm presenting, with Foster and others).	Primary
University of Maine	Journal Article	**Lilieholm, R.J.**, and W.P. Weatherly. 2010. Kibale Forest Wild Coffee: Challenges to Market-based Conservation in Africa. Conservation Biology 24(4):924-930.	Partial
University of Maine	Abstract	**Lilieholm, R.J.**, D. Foster, L.C. Irland and **M. Hunter**. 2010. Wildlands and Woodlands: A Vision for the New England Landscape. Maine Land Conservation Conference, Topsham, ME.	Primary
University of Maine	Book Chapter	**Lilieholm, R.J.**, L.C. Irland, and J.M. Hagan. 2010. Changing Socio-economic Conditions for Private Woodland Protection. Page 67-98 in S.C. Trombulak and R.F. Baldwin, eds., Landscape-scale Conservation	Primary

Institution	Type	Citation	RII Support
		Planning. Springer, New York, NY. 427 p.	
University of Maine	Journal Article	**Lindenfeld, L.A.** 2010. Can documentary food films like Food Inc. achieve their promise? Environmental Communication. A Journal of Nature and Culture, Vol. 4, Issue 3, 378-386.	Primary
University of Maine	Journal Article	**Lindenfeld, L.A.** 2010. Working Outside the Box: Advertising Campaigns, Downtown Revitalization, and Community Engagement. Journal of Community Engagement and Higher Education. Vol. 1, Issue 2.	Partial
University of Maine	Proceedings	**MacRae*, J.D.**, **J.-S. Kim**, **Shaleen Jain**. 2010. User-driven data exploration of a managed lake system: first steps toward integrated watershed modeling and management tool in support of decision making and community education. The Sixth International Conference on Sustainable Water Environment: Water Infrastructures in Time of Climate Change. University of Delaware, Newark, DE, USA, 29-31 July 2010. (*Invited presentation).	Primary
University of Maine	Book Chapter	Magurran, A. and **B.J. McGill**. "Challenges and opportunities in measuring biodiversity" in Magurran & McGill "Biological diversity: frontiers in measurement and assessment" Oxford University Press	Partial
University of Maine	Book	Magurran, A. and **B.J. McGill.** 2010. Co-editors of "Biological diversity: frontiers in measurement and assessment." Oxford University Press.	Partial
University of Maine	Journal Article	Mann, M. and **J. Leahy**. 2009. "Connections: Meanings of ATV Riding among Club Members in Maine." Leisure Sciences, 31(4): 384-396.	Primary
University of Maine	Journal Article	Mann, M., and **J. Leahy**. 2010. "Social Capital in an Outdoor Recreation Context." Environmental Management, 45(2):363-376.	Primary
University of Maine	Journal Article	**Mario Teisl**, **Mark W. Anderson**, **Caroline L. Noblet**, George Criner, Jonathan Rubin and Timothy Dalton. 2011. Are Environmental Professors Unbalanced? Evidence from the Field. Journal of Environmental Education 42(2): 67-83.	Partial
University of Maine	Book Chapter	Maurer, B.A. and **B.J. McGill**. "Measurement of Diversity" in Magurran & McGill "Biological diversity: frontiers in measurement and assessment" Oxford University Press	Partial
University of Maine	Book Chapter	**McGill, B.J.** "Spatial statistics of biodiversity" in Magurran & McGill "Biological diversity: frontiers in measurement and assessment" Oxford University Press	Partial
University of Maine	Journal Article	**McGill, B.J.** 2011. "Linking biodiversity patterns by autocorrelated random sampling." American Journal of Botany 98(3): 481-502.	Partial
University of Maine	Book Chapter	**McGill, B.J.** and A. Magurran. "The future of measuring biodiversity" in Magurran & McGill	Partial

Institution	Type	Citation	RII Support
		"Biological diversity: frontiers in measurement and assessment" Oxford University Press	
University of Maine	Abstract	McNamara, D., **E. Lazarus**, A. B. Murray, M. Smith, and S. Gopalakrishnan. 2010. Emergent dynamics of sustainability and resource equity in coupled human coastline systems. Eos Trans. AGU, 91 (55), Fall Meet. Suppl., Abstract NG43B-1421.	Partial
University of Maine	Journal Article	Morgan, D.E. 2010. Natural History Notes: Rana Sylvatica (Wood Frog) Egg Mass Surveys. Herpetological Review, 41.	Primary
University of Maine	Technical Report	**Morgan, D.E.**, and **A.J.K. Calhoun**. 2010. The Maine Municipal Guide to Mapping and Conserving Vernal Pools. Maine Audubon Society, Falmouth, ME.	Primary
University of Maine	Journal Article	Petrin, Z., E.G. Schilling, **C.S. Loftin**, F. Johansson. 2010. Predators shape distribution and promote diversification of morphological defenses in Leucorrhinia, Odonata. Evolutionary Ecology 24:1003-1016.	Partial
University of Maine	Proceedings	**Ranco, D.**, **J. Daigle**, **R. Lilieholm**, J. Neptune and T. Secord. 2010. Kolunkayowan Wikpiyik: Protecting the Ash for Future Generations Symposium Report. Orono, ME: George Mitchell Center, University of Maine. 23 pgs.	Primary
University of Maine	Journal Article	Samson, J ; D. Berteaux, **B.J. McGill**, and M. Humphries. 2011. "Geographic disparities and moral hazards in the predicted impacts of climate change on human populations." Global Ecology and Biogeography online-early publication 17 FEB 2011 DOI: 10.1111/j.1466-8238.2010.00632.x.	Partial
University of Maine	Journal Article	Schilling, E.G., **C.S. Loftin**, and A.D. Huryn. 2009. Effects of introduced fish on native macroinvertebrate communities in two physiographic types of historically fishless lakes. Biological Conservation 142:3030-3038.	Partial
University of Maine	Journal Article	**Silka, L.** 2010. Community Research in Other Contexts: Learning from Sustainability Science, Journal of Empirical Research on Human Research Ethics, 5(4), 3-11.	Primary
University of Maine	Journal Article	Strojny, C. A. and **M.L. Hunter, Jr.** 2010. Comparing relative abundance of amphibians in forest canopy gaps of natural origin vs. timber harvest origin. Animal Biodiversity and Conservation 33:1-13.	Partial
University of Maine	Book Chapter	**Teisl, M.F.** 2011. Ecolabeling. In Klaus Bosselmann, Daniel Fogel, and J. B. Ruhl (Eds.), The Encyclopedia of Sustainability, Vol. 3: The Law and Politics of Sustainability, pp. 130-134. Great Barrington, MA: Berkshire Publishing.	Partial
University of Maine	Journal Article	Tessema, M.E., **R.J. Lilieholm**, N. Leader-Williams, and Z.T. Ashenafi. 2010. Community Attitudes toward	Partial

Institution	Type	Citation	RII Support
		Wildlife and Protected Areas in Ethiopia. Society and Natural Resources 23(6):489-506.	
University of Maine	Journal Article	Whitesell, S., **R.J. Lilieholm**, and T.L. Sharik. 2010. A global survey of tropical biological field stations. Pages 5-14 in BioScience Topics in Biological Field Stations, University of California Press (ISBN 978-0-9817130-4-5). 72 pages.	Partial
University of Maine	Journal Article	Whitmer, A., L. Ogden, J. Lawton, P. Sturner, P.M. Groffman, L. Schneider, **D. Hart**, B. Halpern, W. Schlesinger, S. Raciti, N. Bettez, S. Ortega, L. Rustad, S.T.A. Pickett and M. Killelea. 2010. The engaged university: Providing a platform for research that transforms society. Frontiers in Ecology and the Environment 6: 314-321.	Primary
University of Maine at Farmington	Abstract	**Daly, J.**, B. Engel, and J. Hansen. 2010. Characterizing seasonal markers using high-resolution water temperature data from small mountain ponds. American Geophysical Union, Fall Meeting 2010, abstract #GC13C-0710.	Partial
University of Maine at Farmington	Abstract	Engel, B. and **J. Daly**. 2011. Characterizing and predicting Mixing Events in High-Elevation Mountain Ponds in Maine. Geological Society of America Abstracts with Programs, Vol. 43, No. 1, p. 76.	Partial
University of Southern Maine	Abstract	**Kim, Y.** 2010. Dynamics of the Amenity City: An Agent-based Simulation of Neighborhood Location Decision, American Collegiate School of Planning Conference, Minneapolis MN, Oct 6-10, 2010.	Partial
University of Southern Maine	Journal Article	**Owen, D.**, C. Bohlen, P. Glaser, Z. Henderson and C. Kilian. 2010. Collaboration, Clean Water Act Residual Designation Authority, and Collective Permitting: A Case Study of Long Creek, Watershed Science Bulletin 1 :35-41	Primary

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APPENDIX 10: SSI Advisory Group Reports

SSI Advisory Group Conference Call Report – Dec. 16, 2010

Attendance: Dickson, Jacobson, Kates, Koffman, Parris, Person and Hart
(Grove at NSF, Hanson family illness, Peterson, sudden work issue)
Agenda:
1. Update on program and efforts to address last year's Advisory Group concerns**.** (David Hart)
2. Review and selection of new projects on integration (Dickson, Parris).
3. Executive session: Individual concerns, Spring in person meeting

1. David Hart: SSI Progress

- Staffing almost all in place (3 faculty hires, offer to a fourth; 15 doctoral students, room for 5 more, 2 post-docs)
- Research products beginning to come (18 peer reviewed papers, 121 scientific presentations, 19 grant proposals, $2.4 million received).
- Important meetings: NSF Reverse site review, Ostrom lecture, Retreat, State-wide EPSCoR
- Rapid expansion of Partners (all 7 UMaine campuses and 5 other colleges). Various pressures to add community colleges and K-12 system.
- Creation of Research Council (new level of leadership) to develop metrics and assess current and yr.3 proposals
- Research on research found that those "happiest" with SSI are those most comfortable with ambiguity.
- Reviewed considerable efforts to address 2009 Advisory concerns of integration, data management, and stakeholder involvement. Integration: retreat discussions, request for proposals (see below), data management: enlarged committee put together a plan, stakeholder involvement is now considerable and involved in almost all research.
- David's biggest challenges now facing
    - Where to go with education – interdisciplinary graduate program, common undergraduate curriculum, K-12?
    - How to deal with very large number of faculty (over 100)?
    - How to evaluate progress at the project and SSI-scale?
    - How to insure development, implementation and evaluation of solutions?
    - What should SSI look like after 2014 and how will it be supported?

Advisory group had no formal discussion of these questions but a number of points made at various times seem relevant to these questions.

- Ambiguity is not always a virtue.
- Not all participant partners should be encouraged to submit research proposals (e.g. U Me Augusta) but use their strengths and connections with community college relations, undergraduate curriculum, workforce development, K-12 education etc.

- In considering metrics, evaluating projects, assessing solutions etc. relate these to such key reports as the Maine Economic Growth Council benchmarks, Brookings report, Caron envisioning report etc.
- Need for a SSI capstone project other than the aggregate of single portfolio projects.
- The major endpoint should be to develop solutions to real problems in Maine (solution v. research oriented). Evaluation should reflect this.
- Encouraged development of statewide major, minor in sustainability science.
- Successor to ME SSI in 2014 should be as novel as the current program is and not just another new center, program, and institute.

2. Integration – Nancy and Tom

In response to Group concerns, RFP issued in June to fund research teams focused on integrative activities. $350K available for one year projects. 11 pre-proposals received in July requesting $700K. 7 proposals were submitted in September requesting $430K. Dickson, Hanson, and Parris agreed to serve as reviewers.

Awardees:
4 grants ranging from $46K-$100K totaling $292,132
1 outstanding proposal that came in after review conducted.
PIs from a range of disciplines.

Beard (spatial info science & engineering) et al – to provide a cyber-informatics development plan that focuses especially on biophysical data. Has a goal of developing a metadata catalog and data curation tools. $100K

Tiesel (econ) et al – build a social science database that would allow for consistent data collection across separate projects and to provide capacity building workshops on "best practices" in socio-economic data collection. Has the primary goal of helping teams to ask the "right questions" so that resulting data supports the testing of relationships between desired constructs. $100K

Lilieholm (Forest Resources) et al – Combines elements from two SSI projects – Maine Futures and Urban Streams to forecast alternative future urbanization patterns and assess their impact on human and natural systems using Bayesian Belief Network models to combine spatial data, expert K, and stakeholder values to develop decision tools to identify at-risk aquatic resources. $46K

Bell (econ) et al – This project uses Ostrom's socio-ecological systems (SES) framework to characterize variation among projects in the SSI portfolio of projects and to identify integrative strategies. It uses social-network research methods and cooperative experiments to evaluate the SSI research portfolio. $46K

Three rejected proposals -- in general were not funded because we could not understand what kinds of integrative research would result from the proposed study or what the value-added was.

Observations by review group:

Integration: While these proposals are a step forward in integration, overall there is no standard for integrating a large portfolio of projects. Indeed, the integration process itself should be a subject for research. Two of the projects address integrating data but social scientists and natural scientists are still operating independent of one another in data management proposals. An effort to integrate the current portfolio that with partners has about 30 projects might begin with a detailed spreadsheet using a typology of David's that includes three "model systems" (Urbanization, forest resource management, climate and energy futures) with three cross-cutting research themes (K with A, social-ecological systems, organizational innovation) and details of what problems the projects are seeking to solve, what solutions are sought, and who would use the "product"

Data coordination: SSI is addressing our concern that they plan for data set development. The Beard et al "Cyber-Informatics Development Plan" and the Teisl et al "Integration of socio-economic data collection" address challenges related to the process of generating, using, and storing data. We suggested the need for an overarching data committee to coordinate plans for gathering, analyzing, storing, and using data across the entire SSI research portfolio.

Solutions-orientation: There was concern that projects need to more actively identify who the users of their work will be and to solicit the needs of those users so that the work will more likely contribute to solutions. The projects weren't particularly clear as to how they will solicit needs of users of the data/information provided by CI, e.g., data quality, format, and resolution. There was some concern that PIs assumed that they know what the users' needs are or should be.

Methods: Recognizing that sustainability science is a solution-driven field requiring a variety of approaches, the review group wanted to underscore that there is not, and should not be, one dominant research method.

Breadth v depth: The group raised the question of whether projects might be trying to collect too broad a range of data just because it is available and suggested that they consider restricting the focus to the most relevant data relating to the SSI "model systems": urbanization, forest resource management, and climate and energy futures. It will be tempting to collect lots of data.

Partnerships: It wasn't clear what long-term partnerships are being built. We suggested more attention be paid to this aspect, particularly related to future fundraising. One major partner to consider including is the Maine State Library.

Project duration and funding: Concern was expressed that all of the projects are trying to do too much with relatively small budgets that need to be expended in one year. This is a short timeframe for planning and implementation of a project. We suggested that consideration be given to thinking in terms of longer-term funding with the provision that funding is subject to continued NSF funding.

3. Executive session

Concerns and discussions by group members

- **Creating prosperity in Maine.** Elevated and stimulated discussion about what is needed –jobs, quality of place. Hope that will come out of this. SSI needs to map out what they are doing in terms of Brookings Report, Maine Economic Growth Council Report, Envisioning report. Especially important given the political changes taking place in Maine and DC.

- **Education issues:** K-12; university degree programs especially interdisciplinary graduate program; statewide undergraduate major/minor; community colleges and workforce development e.g. windpower; - Advisory Group may be able to help.

- **Research portfolio, solutions, users**. Fear expressed that the "outcomes" will be a series of disconnected research reports from researchers already working in those areas. Need to define commonality across projects (see spreadsheet suggestion above). Clarify who users will be, what constitutes solutions, and how success is defined by products of research and usability. Have projects end with usable projects that don't end on the shelf. Need to identify and group specific solutions. Create a high visibility product that is larger than any single portfolio project (a "capstone").

- **Spring meeting.** Face to face spring meeting likely to be held in May but should be prefaced by 1-2 conference calls before then. Tentative agenda might constitute the three issues described above: economic development in Maine, education, and research portfolio, solutions and users. By then, SSI will have tried to place its work in context with major development proposals for Maine; some interdisciplinary education experience will have been gained; and Year 3 research projects will have been chosen and Advisory Group will have both a brief overview document and comparative data on the portfolio enabling it to address central issues of solutions, users, and metrics of success.

SSI Advisory Group Conference Call Report - Feb 17, 2011

Present: Nancy Dickson, Susan Hanson, David Hart, Robert Kates, Ted Koffman, Thomas Parris, Pamela Person, Tarla Rai Peterson, Ken Young
Absent: George Jacobson, Jr., Morgan Grove (provided input before the meeting)

Agenda:

1) Look at 2nd year reporting documents and 3rd year RFP
2) What, if any, role do we play in evaluation process
3) Give advice about what, in our judgment, constitutes a sustainability solution
4) Private conversation

SSI/EPSCoR Yr 3 Project Grants Request for Proposals

David was asked to provide context:

July 2011 begins the formal third year of the project which is programmed to spend abut $4 million in each of its five years. Currently there are some 16 projects at U. ME/Orono and Southern Maine who have received the 3 year RFP and some 10-15 proposals are expected for a share in $400K 3d year research funding. In addition some projects have departmental or other grant funds, as well as SSI-supported graduate assistants, post-doctoral fellows, and faculty.

Note that there are 30 research projects overall (list just sent to Board members): 16 projects at U. ME/Orono and Southern Maine (2 have been retired), 4 integration projects created in response to our previous concerns, and 10 other projects with Sust Solutions partners in other campuses.. Almost every institution of higher education in the State is now participating with ~ 100 faculty and > 200 undergraduates and graduate students.

SSI now has another layer of governance, a Research Council, of ~ 15 people representing all of the research projects. It has designed a 3-stage process for selecting proposals, linked to ongoing negotiations with NSF, where NSF is raising expectations for accountability. They will pre-screen proposals based on criteria expressed in the RFP. They are then asking the Advisory Board to rank the screened proposals. With this ranking in hand, the VP for Research, David, and Co-Director of EPSCOR Office would make final decision.

There is no quota on the number of proposals desired but NSF is concerned about there being too many grants. A goal is to have a lot fewer teams in the future and discussions are underway on how to create such teams. A subgroup of the Research Council is also thinking about converging on three large collaboratives, but this is not being forced in the timeframe of this RFP.

Comments on the SSI YR2 Project Progress Report

There was considerable concern expressed with the requested 2yr. progress report. Many members of the Board, but especially the non-academic members felt that the progress report would be extremely difficult for stakeholders to read, understand, and most important, use

research findings to solve problems in Maine. For example, how will regional economic development agencies access and use this data to address the sorts of problems that they address? The RFP for the 3rd year, it was noted, has a different tone clearly identifying sustainability solutions as a major output of the Initiative.

A second major concern was how the collection of the various projects will be more than the sum of the 20+ smaller project reports. How will the narratives be blended? Is the whole greater than the sum of the parts? Is a 2 year project report suitable for a diverse audience being planned?

The absence of reporting on data storage and archiving research results, increasingly demanded by agencies, both in year 2 reports and in the RFP was noted and no deliverable to archive material was cited. David reassured the Board that this is being addressed with two integration projects organizing material and making it usable along with two cyber-infrastructure projects from NSF.

Another issue raised was that the scale of place and activity and the salient elements of the biophysical and social context in the study site need to be made clearer in reporting on the research. A map of the many place-based projects would be helpful.

Overall, it was felt that the two year reports were designed to be meaningful to NSF and such reports need to be useful as well to stakeholders and interested citizens. It was recognized that there was a stress between these goals, but they need to be balanced.

Possible Board Participation in Proposal Evaluation

Reasons why we might want to participate in the evaluation of the round 3 proposals?

1) NSF wants an external advisory process.
2) There's a utility of having an independent group who collectively are not on a day to day collegial relationship with the research groups involved in the evaluation.
3) Helping with this evaluation allows us to track the progress of the research which is something we want to do

Discussion followed of whether we should participate in the review and there was unanimous agreement to do so. A lively discussion followed about how to do so and this is what was decided.

We will review some time in mid-March the two-page narrative document from the progress report and the three page narrative from the proposals that survived the pre-screening. We will receive the Research council sub-committee reviews as well as have available the entire proposal and progress reports documents. RK will divide us into 2 groups and will assign half the proposals to each that emerge from the pre-screening.

Each Board member will rank each of the assigned proposals on a set of mutually agreed criteria that might include the following and will write a paragraph of appraisal on each of the proposals.

These will be circulated to the Board that will have one or more conference calls to assemble their final evaluation.

Criteria:
1. Clarity of purpose
2. Significance of research question (science)
3. Quality of research plan
4. Success and significance of problem solving re sustainability
5. Response to those concerned with solutions and applications.
6. How are they dealing with data (i.e. how will the data be archived?)

Sustainability solutions:

The Board acknowledges that identifying solutions and what constitutes progress in creating and implementing them is a challenging. And we have given some thought to this ourselves. Here are our thoughts and they might be shared with all the research teams awarded 3d year funding:

What constitutes sustainability solutions begins with this concept or working definition:

Sustainability solutions are implementable actions that address (solve) well-defined sustainability problems.

This concept implies a three stage criteria for identifying sustainability solutions and from which a rating system to evaluate solutions could be readily devised:

- **Is there a well-defined sustainability problem(s)?** How serious is it? Where did it originate from (researchers, stakeholders, or jointly)?
- **What are the proposed actions to address the problem?** Are these novel solutions or a restatement of existing ones? If they are existing ones, why aren't they being used or what are the barriers to their use? Are the proposed actions available for public discourse?
- **Have any of the actions been implemented?** Have barriers been removed, solutions adopted, or actions implemented? How might they be looked at to judge their effectiveness?

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APPENDIX 11: SSI Data Management Plan

Maine EPSCoR SSI Data Management Plan[Δ]

The SSI Cyber-Informatics group has developed an initial overall data sharing and management plan for the Maine EPSCoR SSI project that is designed to support data management and access for: (a) the internal investigations of the SSI project including its partner teams throughout the state, and (b) sharing data as relevant to related broader national and international scientific investigations including NEON, LTERs, NBII, CZO, and CUAHSI[∀]. SSI efforts are coordinated with activities under the Maine RII Track-2 project to ensure reliable data workloads and broad access to data through on-Campus, multi-Campus, and statewide Cyberinfrastructure resources. The SSI Cyber-Informatics group will work to provide open access to project-generated data to researchers, educators, students, policymakers and citizens to the extent allowable by law and regulation, and data confidentiality as required by the Institutional Review Boards.

Data Inventory:

To achieve a clear understanding of the range of data needs and types of data used within the portfolio of SSI projects, SSI teams were surveyed in January 2011 to identify data sets currently in hand as well as data sets to be developed, and how data are being currently stored and managed. The range in data types is very broad—imagery, streaming sensor data, time series, geospatial data sets, model results, and results from survey questionnaires among others. Taken together, the themes (ecological, climatic, social, economic, and legislative) mirror the range of social science and biophysical research areas being pursued within SSI's research portfolio. Many of the data sets of interest are federal or state generated data sets. In some cases, these have been customized or value-added by a team. The heterogeneity assures that there is not a one size fits all data base management or metadata standard solution. We do not wish to duplicate data sets that are accessible from other sources and will work with the teams to coordinate data and minimize redundancies. We will follow up this initial inventory with in-depth discussions with individual teams on access issues and metadata documentation that supports the team needs, as well as insure consistency with community metadata standards in SSI researcher's sub-discipline.

Data Storage and Management:

The inventory results indicate that project data are currently being stored across many different computers and in different data storage formats that include spreadsheets, various databases, and flat files. To support shared reliable and secure access we will work with the teams to port data to a secure server.

[Δ] A work plan detailing activities and timelines for the January-December 2011 period is included as an addendum.

[∀] National Ecological Observatory Network (NEON), the Long Term Ecological Research Sites (LTERs), National Biological Information Infrastructure (NBII), Critical Zone Observatories (CZO), and Consortium of Universities for the Advancement of Hydrologic Science Inc. (CUAHSI).

A server has been set up at University of Maine's Target Technology Center for storage of SSI project related data. The server is currently accessible only to the SSI research team. The server currently uses D-Space for overall data storage tracking, including metadata libraries, and GeoServer with POST-GIS to manage spatial data. Project management and tracking capabilities have been installed for those projects wishing to use them. All SSI teams will have access to the server for data storage by March 31, 2011.

Data currently resident on the system is socio-economic and related data, including detailed Census data for Maine for 1990, 2000, and 2009, other demographic information, and data sets from municipal governments including cadastral, tax, land use and zoning data. Census 2010 data will be added when it becomes available this year.

We recognize that certain types of data have legal access restrictions, for example, information related to threatened and endangered species. Such data need to have secure and controlled access, or limited access in aggregate or anonimized forms (e.g., statistical summaries).

Data Interoperability:

To be interoperable across teams within the project and with the wider scientific community and the public, we recognize the need for standard formats that can be easily shared across the web and the need for associated metadata that is compliant with some metadata standard. Several metadata standards exist (Z39.50, FGDC, Dublin-Core, Darwin-Core, EML, ISO-19115, DDI) and given the range of data types currently identified, a range of metadata options will be beneficial. The Ecological Metadata Language (EML) used primarily in the ecology community will serve well for some project data sets. Similarly the NBII Biological Data Profile, which has extensions for information on taxonomies, sampling methodology, and analytical tools would serve well for other data sets. ISO 19115 and the North American Profile (NAP) (a profile of the ISO 19115 standard), which will serve as the next version of the FGDC Standard, provides a logical metadata standard for geospatial data sets. The Data Documentation Initiative (DDI[π]) metadata standard supports social science survey data that makes up a sizeable portion of SSI generated data. The State of Maine uses FGDC. Given the need for several metadata standards, we will evaluate different metadata development tools that support the range of SSI data types and supporting access portals. DSpace supports many standard bibliographic data resources and provides community access and as such provides a good general option. Another option under consideration is the Mercury[⊥] portal. Mercury, developed by Oak Ridge National Laboratory (ORNL), manages distributed scientific data and metadata and provides cataloguing services for several metadata standards including FGDC, Dublin-Core, Darwin-Core, EML, and ISO-19115 and retrieval of associated data.

Data sharing requires effective data access and discovery and an ability to search on several dimensions that include spatial, temporal, thematic, project specific, or principal investigator specific. Therefore, we expect access portals to provide intuitive search support on these dimensions. DSpace supports search on Dublin Core elements. Mercury, which supports several metadata standards, supports search on the elements of these various standards including taxonomic, spatial, temporal, sampling parameters, etc. The NBII Clearinghouse and LTER sites, among a range of other participants, currently use Mercury.

[π] http://www.ddialliance.org/

[⊥] http://mercury.ornl.gov/

We will use DSpace and extensions like Geoserver where appropriate, but we expect to continually evaluate additional approaches to managing SSI data and implement those, such as the DDI to maximize the usability and discovery of social, behavioral, and economic data. The suitability of Mercury for SSI datasets will be further investigated through team-wide discussion and a pilot study in the Summer and Fall of 2011.

Interoperability and Sampling Protocols:

SSI projects that are generating data may need to be concerned about sampling protocols and documentation of these such that the collected data has potential for extended use beyond the project needs. Biological sampling protocols and stratification of sampling designs for various landscape factors are potential concerns for scientific data sharing. As noted above, SSI researchers collecting hydrologic data are working to ensure interoperability with CUAHSI HIS[ζ] and access through HydroSeek[ɜ]. CUAHSI's HydroCatalog currently houses 5.1 billion hydrologic data points. The Cyber-Informatics group is committed to working closely with all researchers needing help with interoperability issues, thus ensuring that the data produced by SSI researchers is discoverable through the SSI website and community databases.

Named Data Sets:

Across the SSI project, we can identify some named data sets that will be of general utility, however, the list should be considered as preliminary These include National Aerial Imagery Program (NAIP) imagery, National Land Cover Data, SSURGO soils data, National Hydrography Data (NHD), National Elevation Dataset (NED), National Wetlands Inventory (NWI), FEMA floodplain data, Air Toxics Data, near real time National Weather Service data, National Climatic Data Center climate data, and US Census data.

Among the named data slated for SSI-wide and public release are:

(a) A suite of coupled climate model simulations for the 20th and 21st century (based on the IPCC A1B scenario), statistically downscaled to produce a high spatial resolution dataset for Maine and the New England region. The tentative timeline for climate model simulations is Fall 2011; an updated version based on the CMIP5 project climate simulations for the next IPCC assessment will dovetail the World Climate Research Program's 2012-2013 timetable regarding the availability of new simulations. Data standards will be consistent with the Unidata and Earthsystemgrid[+].

(b) Streamflow data from SSI's streamflow sensors in the Sebago Lake watershed will be updated every three months and made available through SSI Data system in WaterML to ensure web service based transmission and integration with the CUAHSI Hydrologic Information System (CUAHSI-HIS).

(c) Economic and demographic forecasts of Maine regions. The regional economic forecasts will be available in May 2011.

Synergistic Supercomputer Access:

The Maine supercomputer facility is fully available for Maine EPSCoR and SSI usage for all NSF EPSCoR projects. This includes high performance computing, cloud services, data

[ζ] http://his.cuahsi.org/

[ɜ] www.hydroseek.org

[+] www.earthsystemgrid.org

storage, and visualization tools. This data center also serves the Northeast Cyberinfrastructure Consortium (NECC), a five-state collaboration (Maine, New Hampshire, Vermont, Rhode Island and Delaware) made possible by NSF EPSCoR RII Track-2 and NIH INBRE funding. The high performance computer services have been available for approximately ten years, the cloud services have been under development for approximately one year and are now being deployed to a significant degree, largely due to the acquisition of new hardware to support cloud services (as well as HPC services). A significantly larger system is scheduled to go online in the Fall of 2011, funded by the State of Maine, that will serve research, education, and economic development at the state level and be easily expandable, i.e., investments in computer hardware can be added to the resource which is centrally managed and maintained.

Cloud services allow for the creation of virtual computers that can be accessed via the Internet and used in exactly the same way as a desktop machine. Unlike a desktop machine, however, these machines only exist when they are being used, are not dependent on a particular piece of hardware to run, and do not run the risk of major data loss in the event of a disk failure. These machines can be accessed from anywhere with a network connection, and can be used simultaneously by researchers around the state. Furthermore, even after a particular research project is completed, or a student graduates, the machine can be re-instantiated at any time in the future and be in exactly the same configuration.

Currently, the web server used by the SSI team is a virtual machine in the cloud, as is the D-Space server discussed in the previous section. Work is underway to create a virtual machine that will serve as the web portal that will serve as "one stop shopping" for all aspects of the SSI project, internal and external.

Individual cloud machines are currently being created for a handful of *"early adopter"* SSI researchers. A significantly larger push for more users will come when the machine funded by the state of Maine is operational in the Fall of 2011.

SSI Cyber-Informatics Group Tentative Work Plan (January -- December 2011)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Remarks
Data Inventory													
SSI Team Survey													
Interviews and follow-up Questionnaires													
SSP Survey													
Data Storage & Management													
D-Space Testing on Messi Server													http://www.dspace.org/
SSI Team Accounts on Messi and access to D-Space													
Common Datasets ported to D-Space and Messi Server													
Data Management Wiki													
Data Management Webinar/Workshop													Tentative workshop at the Maine EPSCoR Conference
Data Interoperability													
Survey of Team-relevant data standards													
Interoperability discussions and Specialist Visits													Tentative Invitees: NCEAS, Maine GIS, IBM World Community Grid
ORNL Mercury Portal Suitability Discussion & Pilot Study													http://mercury.ornl.gov/
Named Datasets													
Common Named Datasets Inventory													To be updated every six months or upon investigator request
SSI Named Datasets Release													Downscaled Climate Projections for Maine, Streamflow data
Synergistic Supercomputer Access (*activities with Maine's EPSCoR RII Track-2 Project*)													
Messi Server Testing and SSI Team-wide access													http://messiweb.target.maine.edu/
SSI & SSP Cloud Computing Testbed													

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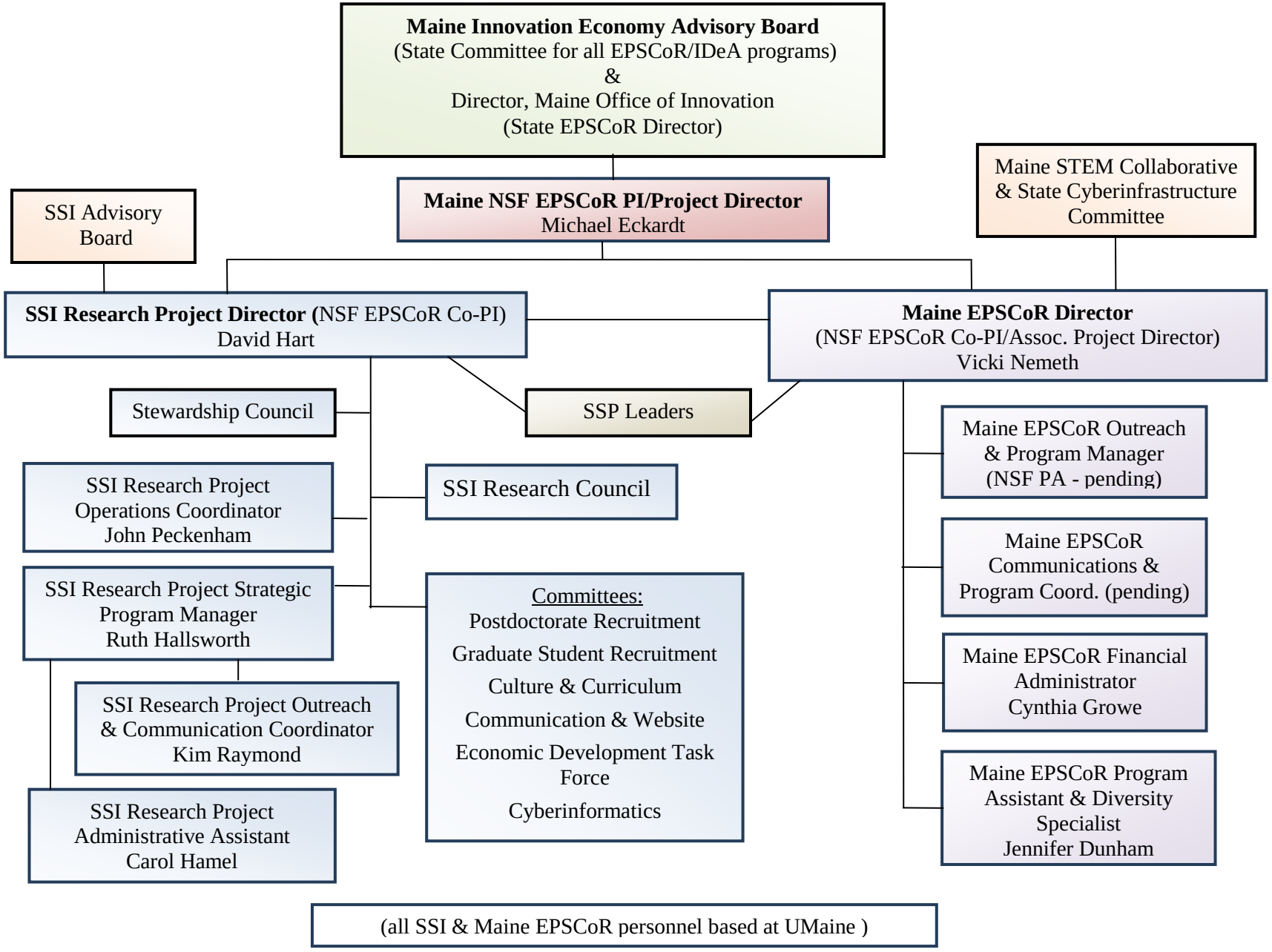
Appendix 12: Organizational Chart



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Appendix 13: Maine EPSCoR SSI RII YR2 Research Project Teams

Maine EPSCoR SSI Core Research Projects at UM/USM					
	STATUS: A=active; NA=not active; C=combined with another project				
Proj	**YR3**	**YR2**	**YR1**	**Project Title**	**Institutions & Principal Team Members**
#1	**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: Aram Calhoun, Kathleen Bell, Mac Hunter, Cyndy Loftin
				A team of biophysical and social science faculty and students at the ***University of Maine*** are conducting research to understand and strengthen efforts to balance potentially competing demands for natural resource management and economic development, using vernal pools within Maine towns as a model system. Research is driven by the needs of regulators and planners identified through stakeholder meetings. Social survey and focus group data informs the work with three model towns chosen from municipalities participating in Maine's Vernal Pool Mapping Program (VPMP). Findings from the three projects will be combined to develop conservation guidelines with stakeholders. Research centers around: 1) studying the effects of different land-use and forest management practices on amphibian dispersal and migration, with the goal of understanding how these movement processes affect population dynamics and persistence; 2) providing science-based information to facilitate the regulation and conservation of amphibians with complex life histories in Maine's diverse geographic landscapes, while allowing for economic growth and development; 3) studying the behavior of municipalities and boundary organizations to elucidate opportunities in decision making for promoting sustainable communities. *Ongoing Progress: Work is progressing on the identification and analysis of SES thresholds, feedbacks in the context of vernal pools. K-A research is being conducted through surveys and focus groups. Stakeholder groups are working with researchers to test the application of spatial pattern analyses.*	
#2	**A**	**A**	**A**	**Sustainable Urban Regions Project (SURP)**	USM: Charles Colgan, Jack Kartez, Yuseung Kim UMaine: Kathleen Bell, Rob Lilieholm, Jim Wilson
				Faculty and students at the ***University of Maine*** and the ***University of Southern Maine*** are investigating urbanization; a highly complex set of forces involving multiple socio-economic, ecological and policy forces interacting with one another at multiple scales over multiple time frames. This team is constructing, testing, and using computer simulation models of coupled socio-ecological systems in urban regions, with a focus on	

				developing such models for the Portland and Bangor metropolitan regions using both existing computer planning models and development of models using the Urban Sim modeling framework. The development of the simulation models and the use of their outputs are coordinated with public and private sector stakeholders in the two regions. Stakeholder involvement helps set research priorities and assists in the assessment of the effectiveness of model outputs. *Ongoing Progress: Work is progressing on predicting how urbanization occurs in coupled human-natural systems using the Urban Simulation Model Framework. Early applications of models are being evaluated with stakeholders to guide the development of decision support models related to changing landscapes (e.g., in the context of transportation planning).*	
#3	**A**	**A**	**A**	**Decision Tools to Support Water Resources Sustainability of Managed Lake Systems**	UMaine: Andrew Reeve, Shaleen Jain, Jean MacRae, John Peckenham, Michael Scott USM: Firooza Pavri
				A team of faculty and students at the ***University of Maine*** and the ***University of Southern Maine*** are focusing on sustaining ecosystems associated with water resources while maintaining the services they provide to humans (i.e. power production, drinking water, recreation, etc.). The team is developing computational tools coupled with statistical and laboratory analysis of available and new field data. The target audience consists of lake managers in federal and state agencies, not-for-profit groups engaged in lake advocacy, and industry. The team is providing new field data, interpretation of available data using new methods, and creating a computational framework to explore current and potential future conditions within the Sebago Lake watershed. The watershed simulation tool that is under development will be made available through an internet interface. These tools will help guide lake management in Maine that must balance competing demands on lake systems while providing a useful and accessible educational resource for Maine citizens. *Ongoing Progress: A model is being developed to start examining how biophysical feedbacks (urbanization) affect thresholds for stream water quality and ecological integrity. The watershed-scale model will be used to explore how socioeconomic thresholds and feedbacks vary with spatial scale. Lake level modeling has demonstrated that the outlet dam has minimal effect on lake levels over short time periods. Early versions are being evaluated with stakeholders to develop decision support models related to changing landscapes and climates.*	
#4	**A**	**A**	**A**	**Ecological and Social Change: Adaptation, Place, and Evaluation (ESCAPE)**	UMaine: Jessica Leahy, Kathleen Bell
				Faculty and students at the ***University of Maine*** are taking an integrated approach to study urban-rural landscape change. Research includes: 1) Investigate and contrast SES dynamics in the context of urban-rural landscape gradients, private landownership, place attachment, and forest health; 2) Identify indicators best measuring relevant ecological and social change and permitting detection of proximity to thresholds among landowners, decision-makers, private businesses, and community residents; 3) Examine connections between scientific knowledge regarding SES dynamics and landowner/decision-maker actions that potentially affect SES resilience,	

				with a particular focus on understanding the potential for landowners, municipal officials, forest managers, and others to conceptualize or operationalize SES concepts; 4) Determine how SES information affects action processes among landowners, decision-makers, private businesses, community residents and the voting public, including the potential for these stakeholders to shape SES resilience and the SES characteristics that facilitate effective landscape governance (e.g., forest management, land use planning, land management); and 5) Analyze processes and methods that influence stakeholder engagement, with particular emphasis on evaluating processes that affect research partnerships between researchers and multi-scale stakeholders (landowners, landowner-based organizations, municipal officials, private businesses, community residents). *Ongoing Progress: An agent-based model is being designed to examine the behaviors of family forest landowners, a group that collectively owns approximately one-third of the forested land in Maine. Model calibration and data generation applied for three scenarios: a baseline model, a social change (increased/reduced property taxes), and a biophysical change (an invasive insect outbreak increasing tree mortality).*	
#5	**A**	**A**	**A**	**The Knowledge-Action Collaborative**	UMaine: Laura Lindenfeld, Linda Silka, Mario Teisl, Shannon McCoy, Mark Anderson, Caroline Noblet
				The K-A collaborative team of faculty and students at the ***University of Maine*** are engaged in studying researchers, the general population, and stakeholders (either at the organizational or individual level) in order to provide an effective body of knowledge-to-action information to the SSI teams. At the core of solutions-driven sustainability science rests the problem of *how research teams overcome roadblocks between knowledge and action and build partnerships for sustainable solutions.* This guides the team's approach to studying how stakeholders interact with the research process and how obstacles to successful K-A processes can be overcome. The team is testing theories on the ways in which individual and institutional processes link stakeholders and community actions, and how the sustainability science research process influences and is influenced by these collaborations. Understanding that different stakeholders have differing knowledge and preferences, and that institutional arrangements channel decision-making and policy alternatives, the team members have undertaken fieldwork and laboratory research to study communication and decision-making processes to increase K-A efficacy. *Ongoing Progress: Social science researchers have been employing a variety of methodologies to investigate the reciprocal processes influencing interactions between knowledge generation and knowledge use, as well as factors influencing stakeholder cooperation and the potential for collective action. Best practices for K-A research and methods for communicating complex scientific information have resulted from work in SSI problem areas and early applications of models developed by different teams are being evaluated with stakeholders.*	
#6	**A**	**A**	**A**	**Analysis of Alternative Futures in the Maine Landscape using Spatial Models of Coupled Social and Ecological Systems**	UMaine: Rob Lilieholm, Chris Cronan, Kevin Simon UMaine School of Law: Dave Owen

				Faculty and students at the ***University of Maine*** and the ***University of Maine School of Law*** are creating capacity to forecast alternative development patterns and assess their impact on coupled human and natural systems. The team is using Bayesian Belief Networks (BBN) to combine spatial data, expert knowledge, and stakeholder values to develop decision tools designed to identify at-risk resources – especially aquatic resources and other significant landscape features. Specific objectives are to: 1) expand our spatial analysis of alternative futures from the 1-million-hectare Lower Penobscot River Watershed (LPRW) to the State of Maine using BBNs to model how key landscape drivers such as population and climate change affect future land use scenarios and resulting tradeoffs; 2) use existing and novel data regarding interactions between land use and ecosystem services to parameterize watershed-scale BBN models that identify aquatic resources at risk of exceeding biophysical and regulatory thresholds; and 3) engage a range of stakeholders to study how spatially explicit risk assessment maps and knowledge can inform public/private actions to protect at-risk resources. *Ongoing Progress: A Bayesian belief network model of spatial land-use is being designed to reflect suitability for development based on current conditions and expert knowledge. Model outputs are intended to help inform new management strategies. Model calibration and data generation used three scenarios: a baseline model, a social change (increased/reduced property taxes) and a biophysical change (an invasive insect outbreak). Stakeholder groups are working with researchers to test the application of spatial change analyses.*	
#7	**C**	**A**	**A**	**(Combined with #6 for YR3)** **Sustaining and Restoring Urban Stream Resources in Maine**	UMaine School of Law: Dave Owen UMaine: Chris Cronan, Laura Lindenfeld, Kevin Simon, Peter Vaux.
				A team of faculty and students at the ***University of Maine*** and the ***University of Maine School of Law*** worked to identify the key legal, social, economic and biophysical linkages that influence stream health in the face of urbanization. The team also engaged in assessing and actively developing methods for translating this understanding into actions that prevent or reverse stream degradation. The overarching goal was to provide knowledge to support more sustainable management of watersheds in present and future urbanized areas. *Ongoing Progress: Models are being employed to examine how biophysical feedbacks at various stages of urbanization affect thresholds for stream water quality and ecological integrity. Early applications of models are being evaluated with stakeholders. Legal research is studying how the laws and regulations affect community actions.*	
#8	**C**	**A**	**A**	**(Combined with #4 for YR3)** **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: Jeremy Wilson, Steven Sader, Jessica Leahy

				Faculty and students at the ***University of Maine*** researched how to address Maine's forest sustainability challenges in the future. Specifically, spatial planning and decision support systems (DSS) are needed to evaluate how the ecological and policy environment of today will shape management options and outcomes in the future, which will ultimately determine the sustainability of Maine's forest resources. By integrating geospatial data with spatial forest planning software and advanced DSS tools, they helped provide a process to evaluate current forest conditions and potential outcomes of future resource management strategies, including effects on wood supply, wildlife habitat, and vulnerability to future spruce budworm outbreaks. *Ongoing Progress: Spatial models are being developed dealing with vulnerability to invasive species, susceptibility to different organisms, and changes in management strategies. Stakeholder groups are closely linked with researchers to test the models for decision support use.*	
#9	**NA**	**A**	**A**	**(YR1 & YR2 project only)** **Linking Knowledge with Action: Refining Maine's Mercury Fish Consumption Advisory**	UMaine: Aria Amirbahman, Kathleen Bell, Linda Bacon, Kevin Simon, Steve Norton, Ivan Fernandez
				Faculty and students at the ***University of Maine*** conducted research using existing data (University, state, and regional resources) to identify relationships among watershed attributes, lake trophic state, and fish Hg burden to build a predictive model. This research aimed to: 1) identify data gaps; 2) determine target lakes for additional data acquisition; and 3) initiate a stakeholder engagement process to inform a rigorous assessment of the current Hg advisory and potential revisions to that advisory. *YR2 Progress: Biophysical scientists and social science researchers are employing a variety of methodologies to investigate the reciprocal processes influencing interactions between knowledge generation and knowledge use, as well as factors influencing stakeholder cooperation and the potential for collective action with respect to public health and fish consumption advisories. This includes working with Maine CDC on communicating knowledge.*	
#10	**NA**	**NA**	**A**	**(YR1 project only)** **Development of a Spatial Landscape Simulation Suite**	UMaine: David Hiebeler, Frank Drummond, Jim Wilson, Charlene Donahue
				Faculty and students at the ***University of Maine*** explored how to improve awareness of SSI-related issues among the general population, primarily by targeting K-12 students and teachers and engaging them in hands-on exploration of these issues via computer simulation models.	
#11	**A**	**A**	**A**	**Adaptation Strategies in a Changing Climate: Maine's Coastal Communities and the Statewide Stakeholder Process**	UMaine: Shaleen Jain, Esperanza Stancioff
				Faculty and students at the ***University of Maine*** are focusing on reducing climate-related impacts in the coastal zone through the use of infrastructure improvements and tailored decision-support tools that promote economic development and secure communities. By seeking to involve the integration of climate information in infrastructure design (for example, culverts) and using hydroclimatic forecasts, this team is working with town	

				managers, planners, and engineers to identify knowledge gaps and characterize attendant uncertainties and unknowns. The research team has also carried out a survey of Maine's coastal communities and obtained survey feedback from researchers in other coastal states, so as to develop a generalizable approach to climate adaptation in the coastal zone. *Ongoing Progress: Research on climate futures is being taken to communities that need new knowledge on how climate changes can affect infrastructure so that disasters can be averted or mitigated.*	
#12	**NA**	**NA**	**A**	**(YR1 project only)** **A Complexity-based Approach to Research-on-Research and Enhanced Systems Outcomes (RoR)**	UMaine: Terry Porter
				Faculty and students at the ***University of Maine*** conducted research on the SSI project itself, as an experimental system. The team performed analysis on survey and social network research that was conducted early in the SSI, thus providing baseline information about attitudes and social structures amongst the core faculty group of SSI researchers at the University of Maine.	
#13	**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: Darren Ranco, John Daigle, Rob Lilieholm MIBA: Jennifer Neptune, Theresa Secord
				An interdisciplinary team of faculty and students at the ***University of Maine*** are studying and facilitating the ways that Wabanaki basketmakers, tribes, state and federal foresters, various university researchers, landowners and others can come together to prevent, detect, and respond to the emerald ash borer (EAB), a potentially devastating invasive threat to all three species of ash trees found in Maine. The team worked with key tribal, state and federal stakeholders to identify and implement four areas of collaborative research: 1) mapping ash resources; 2) developing policy guidance; 3) public education and stakeholder engagement; and 4) seed collection. Research and coordination will be expanded by: 1) Developing a Bayesian Belief Network (BBN) model to identify the location of brown ash resources; 2) Developing EAB policy guidance; 3) Continuing analysis and facilitation of the stakeholder network; and 4) maintaining work as a boundary organization. *Ongoing Progress: This project incorporates spatial models that address vulnerability to invasive species. Specifically, the Wabanaki basketmakers and other stakeholders are working with SSI researchers to prevent, detect, and respond to the emerald ash borer, a potentially devastating invasive threat to ash trees in Maine.*	
#14	**C**	**A**	**A**	**(Combined with #5 for YR3)** **Modeling Stakeholder Acceptance of Solutions to Environmental Problems**	UMaine: Mario Teisl, Shannon McCoy, Caroline Noblet, Laura Lindenfeld, Jessica Leahy, Linda Silka, Mark Anderson
				Faculty and students at the ***University of Maine*** conducted research that provided crucial knowledge about how people evaluate environmental/resource management problems and potential technological approaches to these problems. They also evaluated approaches to measure and change people's environmental values. This knowledge	

				will help design, and test the effectiveness of various information strategies to educate and promote environmental solutions. *Ongoing Progress: K-A research is being conducted through surveys to assess the factors influencing the characteristics of university-stakeholder partnerships.*	
#15	**A**	**A**	**A**	**Systems Analysis of SSI: Navigating Perspectives, Paradigms, and Problemscapes (OI)**	UMaine: Susan Gardner, Shannon McCoy
				Faculty at the ***University of Maine*** are conducting two lines of organizational innovation research that will investigate factors (individual, small group, and large group) that impact the ongoing progress of the Sustainability Solutions Initiative. This project has two primary aims: 1) achieving better understandings of the internal dynamics of SSI, and, in the process, seeking integration amongst multiple research perspectives in pursuit of this objective; 2) supporting communication and interconnections amongst Social-Ecological Systems (SES) and Knowledge-to-Action (K/A) researchers and the Organizational Innovation that can then link the internal activities of SSI with the outputs and outcomes sought in the overall enterprise. *Ongoing Progress: This project is producing an analysis of organizational processes that influence interdisciplinary collaboration and university-stakeholder partnerships, a longitudinal study of how interdisciplinary collaborations and stakeholder partnerships change over time, and the development of best practices to promote interdisciplinarity and robust partnerships between universities and stakeholders.*	
#16	**C**	**A**	**A**	**(Combined with #15 for YR3)** **Perceptions of the System and Interdisciplinary Success (RoR)**	UMaine: Shannon McCoy
				Faculty at the ***University of Maine*** applied key social psychological theories to understand how perceptions of the SSI system impact the success of interdisciplinary work and K/A. Drawing on uncertainty management theory, procedural justice theory, and system justification theory, a primary aim of the work was to identify key components of the SSI system likely to lessen the uncertainty of interdisciplinary work. *Ongoing Progress: Significant progress is being made in analyzing the role of social networks within SSI, including how changes in these networks facilitate or impede interdisciplinary success.*	
#17	**C**	**A**	**A**	**(Combined with #5 for YR3)** **Developing a Framework for Linking Researcher and Stakeholder Values with Knowledge to Action Effectiveness (RoR)**	UMaine: Mark Anderson, Mario Teisl, Caroline Noblet
				Faculty at the ***University of Maine*** explored the development of a comprehensive approach to understanding the effects of differences in environmental world views on the effectiveness of SSI's efforts to understand and strengthen links between Knowledge and Action (K-A). The research sought to develop a comprehensive framework for understanding value or world view differences and changes both within the SSI study team and between the team and stakeholders.	

				Ongoing Progress: K-A research conducted through surveys and focus groups is investigating factors influencing the characteristics of university-stakeholder partnerships, particularly as influenced by viewpoints on the environment.	
#18	**A**	**A**	**A**	**Maine Tidal Power Initiative: Linking Knowledge to Action for Responsible Development of Tidal Power**	UMaine: Teresa Johnson, Gayle Zydlewski
				An interdisciplinary team of faculty and students at the ***University of Maine*** are contributing research towards solving a key sustainability challenge in Maine: the need for renewable energy. This project focuses on tidal power as a part of the solution and seeks to determine how we can support the *sustainable* development of this renewable energy resource through the engagement of stakeholders in an iterative process of research and outreach. While this broad, solution-driven question compels the research, the team's focus is on understanding (and creating) linkages between technical (engineering, biological, and physical resource evaluations) research of tidal power with social science and knowledge to action research necessary for informing decisions about tidal power development. Tidal power development takes place within dynamic social and ecological systems (SES), and involves complex interactions and feedbacks between the social, ecological, and technological components of the system. Understanding the implications of these interactions is necessary for decision-making and moving this technology forward in a responsible manner. *Ongoing Progress: This project crosses numerous SES boundaries. Research on tidal energy development is showing that agency personnel and community members have important contributions to shape the direction of engineering, physical, and biological research. As a result, tidal energy development entities have incorporated semi-structured interviews with agency personnel and community members to shape the direction of engineering, physical, and biological work.*	
SSP Research projects for broadening participation and research capacity at Primarily Undergraduate Institutions					
SSP #19	**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 & Beverly Johnson Bowdoin: John Lichter, Phil Camill, Guillermo Herrera USM: Theodore Willis & Karen Wilson
				Faculty and students from ***Bowdoin*** and ***Bates Colleges*** and the ***University of Southern Maine*** are examining ecological and economic recovery of the Kennebec and Androscoggin rivers and their common estuary and nearshore marine environment with the goal of estimating the potential economic benefits of ecological restoration. Their research is identifying and modeling the ecological and socioeconomic constraints hindering more complete ecosystem recovery, and predict the economic benefits of further recovery under different scenarios of habitat restoration and dam removal. *Ongoing Progress: The focus on a major estuarine system is identifying some of the thresholds, feedbacks, and indicators that are having noticeable effects on stakeholder attitudes and behaviors. The researchers*	

				are employing a variety of methodologies to investigate the reciprocal processes influencing interactions between knowledge generation and knowledge use, as well as factors influencing stakeholder cooperation and the potential for collective action to address change and restoration.	
SSP #20	**A**	**A**	**A**	**Modeling Resilience and Adaptation in the Belgrade Lakes Watershed**	Colby: Whitney King, Russell Cole, Philip Nyhus, James Fleming, Herbert Wilson, Catherine Bevier, Bruce Rueger UMF: Wendy Harper
				Faculty and students at ***Colby College*** are collaborating with the Belgrade Regional Conservation Alliance, the Maine Congress of Lake Associations, faculty from the University of Maine Farmington, and other stakeholders to understand the impact of landscape and lake-ecosystem changes in the development of central Maine. The Belgrade Lakes region is being used as a model because it provides a unique laboratory to understand the complex dynamics between environmental, biogeochemical, and socio-economic systems. *Ongoing Progress: Spatial land-use analysis is being used to assess current conditions and vulnerabilities in lake systems. Social science researchers are employing a variety of methodologies to investigate the historical context of knowledge use, as well as to identify the factors influencing stakeholder cooperation and the potential for collective action. Early applications of model systems are being evaluated with stakeholders to learn how to manage changing landscapes.*	
SSP #21	**A**	**A**	**A**	**Sustaining Quality of Place in the Saco River Estuary through Community Based Ecosystem Management**	UNE: Pamela Morgan & Christine Feurt
				Faculty & students at the ***University of New England*** are looking at how to utilize a framework of community-based ecosystem management to sustain the structure and function of the Saco River estuary by connecting human values and actions with the ecological health of the estuary. To that end, they are developing indicators that connect to and reflect the status of what people value about the estuary with the land use, conservation, and management actions that have both positive and negative effects on the ecosystem services provided by the estuary and its immediate watershed. *Ongoing Progress: This project is addressing the identification and analysis of thresholds, feedbacks, and indicators of a major river/estuary system. Close collaboration between knowledge generation and knowledge use through stakeholder cooperation is being studied as a vehicle for action.*	
SSP #22	**A**	**A**	**A**	**Understanding the Relationships Among Biodiversity, Forest Management, and Invasive Species Disturbance in a Forested New England Landscape**	Unity: Amy Arnett, Erika Latty, Alysa Remsburg, Kathleen Dunckel

				Faculty and students at ***Unity College*** are focusing on the effects of logging and forest management techniques on biodiversity in Hemlock-dominated ecosystems, which provide essential habitat for wildlife and are an important component of northern forests. Through collaborations with small woodlot owners, they are investigating management practices that provide the most robust scenario for ecosystem health and the economic well-being of the landowner. Their research involves: 1) gathering long-term ecological baseline data that will help assess the eventual impact of the invasive hemlock woolly adelgid (HWA); 2) evaluating the impact of current forestry practices on ecosystem health; and 3) addressing the social and economic implications of hemlock logging and HWA. *Ongoing Progress: This project has begun a study of forest sustainability to examine dynamic vulnerability to invasive species, susceptibility to disease organisms, and changes in management strategies.*	
SSP #23	**NA**	**A**	**A**	**(YR1 & YR2 project only)** **Developing our Energy Future: A Community-based Research Project**	CoA: J. Gray Cox, Davis Taylor, Don Cass, John Anderson
				Faculty at the ***College of the Atlantic*** have begun planning and initial data gathering to support a study of three different aspects of sustainable energy for coastal/island areas of Maine: 1) an analysis of the Hancock County Woodshed; 2) demand-side management of residential energy consumption; and 3) determining flight patterns of migratory birds to assist in siting of offshore wind turbines. In addition, faculty will support student ventures that engage the community in developing sustainable energy solutions. These ventures will be independent entities housed in COA's new venture incubator, the Hatchery, and will collaborate with the COA interdisciplinary team to convert knowledge to action. *YR2 Progress: This climate-energy futures project is exploring regional attitudes and practices for alternative heating systems. Surveys have identified trends of increased consumption not previously noted for firewood use. Spatial landscape analyses of the sustainability of firewood supply are being conducted.*		
SSP #24	**A**	**A**	**A**	**Modeling Evolving Ecological, Cultural, and Economic Systems of the Aroostook River Watershed of Northern Maine for Sustainable Development**	UMPI: Jason Johnson, David Putnam, Kimberly Sebold, Chunzeng Wang, Anja Whittington
				Faculty and students at the ***University of Maine Presque Isle*** are gathering data and conducting research on the natural, cultural, and economic resources of the Aroostook River watershed. The data will contribute to a growing GIS database that will be available to local businesses, municipalities, state and federal agencies, and citizens. They are engaging with a variety of stakeholders to develop a better understanding of sustainable resource use, with a particular focus on the utilization of grasslands as a biomass source. Their GIS data will facilitate this biomass effort, and also provide ecological monitoring to mitigate unintended risks to natural systems. *Ongoing Progress: This project is starting a GIS-based analysis of farmland and forest conversion to energy fuels in northern Maine. Stakeholder needs, economic development goals, and ecosystem function are being addressed.*		

SSP #25	**A**	**A**	**A**	**Promoting Watershed-Based Sustainable Development through Ecological and Socio-Economic Research and Educational Initiatives**	UMF: Wendy Harper, Matt McCourt, Dan Buckley, Ron Butler, Julia Daly, Drew Barton, David Heroux, Chris Bennett, Cathleen McAnneny, Mellisa Clawson
				Faculty and students at the ***University of Maine Farmington*** are investigating knowledge-to-action that promotes sustainability in the Rangeley lakes region through the development of baseline data; identification of social, economic, and ecological indicators; and assessment of local knowledge-to-action pathways. Community stakeholders, such as the Rangeley Lakes Heritage Trust (RLHT) and public schools are engaged, and UMF is collaborating with Colby College and the Belgrade Regional Conservation Alliance (BRCA) to explore the regional similarities and differences between the Rangeley and Belgrade lakes regions, with the long-term goal of progressing toward a meta-analysis of watershed-based sustainability projects that promote proactive policy and decision making. *Ongoing Progress: This project is studying the dynamics of how changing climate and land-uses are affecting regional economic productivity in a region dominated by tourism and forestry industries.*	
SSP #26	**A**	**A**	**A**	**Biomass Energy Resources in the St. John Valley, Aroostook County, Maine: Development Potential, Landscape Implications, and Replication Possibilities**	UMFK: Soraya Cardenas, Kim Borges-Therien, Bruno Hicks, Dave Hobbins, JR Bjerklie
				Faculty and students at the ***University of Maine Fort Kent*** are working to bring about a better understanding of the landscape consequences of large-scale biomass energy resource development in the St. John Valley of Aroostook County. They are accomplishing this through: 1) a land-use mapping research project that will translate the biomass volume required by the community into plausible landscape scenarios based on the region's varied land uses and land covers; and 2) gauging the level of community acceptance and the potential to meet real consumer demand. *Ongoing Progress: This project is starting an analysis of the sustainability of forest conversion to energy fuels in northern Maine. Particular focus is being placed on the how knowledge systems affect community acceptance, energy self-sufficiency, and economic development.*	
SSP #27	**A**	**A**	**A**	**Evaluating the Effects of Turkeys on Maine Agriculture**	UMA: Christopher Lage, Peter Milligan, Joseph Szakas
				Faculty and students at the ***University of Maine Augusta*** are collaborating with University of Maine Cooperative Extension and community stakeholders to evaluate the effects of turkeys on Maine agriculture. The team is addressing problems that include the evaluation of land use, feeding habits, gut microbial ecology, and population genetic structuring of turkeys inhabiting agricultural versus non-agricultural areas of Maine. *Ongoing Progress: This new project is based on the re-introduction of wild turkeys and the effects on sustainable agriculture, as well as population dynamics under altered landscapes and climate.*	

SSP #28	**?**	**NA**	**NA**	**Planning for Sustainability of Downeast Natural Resources**	UMM
				Not active to date - pending YR3 proposal	
SSI Core Integration Projects (non-NSF support – leveraging a UMaine voluntary cost contribution)					
#I-1	**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
				Faculty and students at the ***University of Maine*** are examining the SSI research portfolio to explore questions about SES research practice, success, and knowledge exchange. Their three-part study utilizes a general SES classification framework, social-network research methods, and cooperative experiments to evaluate the SSI research portfolio. They are collecting three types of data: 1) attributes of the teams and the systems they study; 2) network structure of interactions between and within teams; and 3) cooperative propensities as a function of "markers" such as discipline and institution as measured by experimental games. Their data analysis will identify major axes of variation among projects, and interrelationships between project, team, and system attributes. Their exploratory work in this novel domain will strengthen knowledge of the linkages across SSI projects, extend the capacity for cross-project comparisons, support hypothesis generation that can inform management of the SSI research portfolio, and elucidate more general principles that can advance the state of the field at large.	
#I-2	**A**	**A**	**NA**	**An SSI Cyber-Informatics Development Plan**	UMaine: Kate Beard, Shaleen Jain, Brian McGill, Bruce Segee USM: Charles Colgan
				A team of faculty and students at the ***University of Maine*** and the ***University of Southern Maine*** are working across the whole SSI portfolio on the generation, use, and management of data, which constitutes both a critical challenge and a unique opportunity for SSI. Data-related challenges stem from diversity, volume, formats, streaming, and versioning, and undergirds efforts that seek to model, diagnose, and predict the trajectory of complex, coupled natural-human systems—a central thrust within SSI. This team is pursuing an integrative research strategy that involves: a) efforts to maximize the efficacy of computational resources for data-related research to enhance and complement the current research portfolio within the SSI, b) proactive coordination and initiation of collaborative efforts across various research projects within SSI and the state of Maine to lower the threshold related to data search, access, processing (format, resolution etc.), and archiving, and c) development, testing, and implementation of a database management backbone using appropriate database software and hardware, d) development of a metadata catalog and data curation tools that will aid metadata generation, e) development of a project-wide ontology that seeks to systematize the relationships between knowledge across various domains and their linkages to data, f) support for scientific workflows that will allow SSI projects to link various data to high performance computational and analytical tools, and g) investigate the potential for web-based	

				modeling, data analysis and visualization tools that allow user interaction, gaming, and shared vision planning.	
#I-3	**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
				Faculty and students from the ***University of Maine*** and the ***University of Maine School of Law*** are expanding SSI's capability to forecast alternative future urbanization patterns and assess their impact on human and natural systems. Their approach uses Bayesian Belief Network (BBN) models to combine spatial data, expert knowledge, and stakeholder values to develop decision tools designed to identify at-risk aquatic resources. Specific objectives are to generate: 1) a BBN development model to identify streams and wetlands likely to experience new residential and commercial development near the major urban centers of Maine; and 2) a pilot municipal-scale BBN model to identify smaller at-risk wetlands. Future development scenarios modeled here will consider zoning and land use policies, and explore varying levels of population growth and housing density. They are also evaluating opportunities for prioritizing policy and regulatory responses within existing legal frameworks and, if applicable, the potential opportunities and pitfalls arising from reforms designed to allow such prioritization.	
#I-4	**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
				Faculty and students at the ***University of Maine*** and the ***University of Southern Maine*** are assisting the current research projects in the SSI portfolio by institutionalizing the collection of socio-economic data across SSI. The team is coordinating the data collection efforts of the social science faculty/graduate students currently on SSI teams, and is providing data collection expertise to assist with conceptualization, research design and instrument design. By assisting teams to ask the right questions, the resulting data can better support the testing of relationships between desired constructs. By creating and supporting synergies across the entire scope of the SSI project, leading to the identification of new hypotheses and the development of a more integrative research framework, the team will build an SSI social science database that will allow for consistent data collection across separate projects, indexed to allow for time, space, topic and population links so that ultimately we can perform a 'meta-analysis' of Maine's sustainability domain.	

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

Maine's Sustainability Science Initiative
NSF EPSCoR RII Track 1 (EPS-0904155)
Appendix 14: Statewide Study of STEM Capacity

Statewide study of STEM capacity: In July 2010, Maine EPSCoR contracted with the Learning and Teaching Division of the Education Development Center, Inc. in Newton, Massachusetts to conduct this component of the study (NSF-funded). The study was completed November 2010, and the report was released by the Maine STEM Collaborative. Results were also presented at the Maine EPSCoR State Conference in November 2010. Excerpted key points made in this study include:

> "Maine is a state with rich natural resources and an abundance of STEM champions working in government, nonprofits, businesses, and education sectors to promote STEM programs. These efforts are occurring without strong, coordinated state leadership and key systems in place to foster improvement of the educational system in general. This coordinated state leadership must occur at the highest levels of state government and must define what students need to know (enhanced rigor) for 21st century jobs, what constitutes college and career readiness, and what teachers will need to know to prepare students for STEM and technological programs. State leadership must also develop intervention systems for schools that are not improving student outcomes. These systems are the basis for any STEM improvement efforts to be successful.
>
> Maine has been trying to improve education from the bottom up, with the participation of local schools, institutes and foundations, and scattered partnerships with the university and community college systems. These are rich resources that, when wedded to state system improvements, will propel the state to a leadership position.
>
> The stakes for Maine are high. Although STEM jobs will be increasing in the years to come, there are doubts about the state's ability to educate students to take those jobs of the future. Only 34 percent of 9th graders complete a college two- or four-year degree—a fact that does not bode well for the economic development and future of the state.
>
> Our interviews and review of documents have identified several issues that may serve as leverage points around which a renewed STEM improvement effort may be successful. The following table illustrates Maine's efforts in key areas that have been identified as critical to school improvement in general and STEM improvement in particular.
>
> Maine has some strategies in the initial stages and a number of assets from which to draw in identifying key leverage points for intervention. The following is a list of key intervention points that we have derived from our study.

State Leadership:

- Institute coordinated state management of the educational improvement system by a cross-agency task force that includes the governor, members of the legislature, non-profit organizations, university and community college executives, and business representatives. A mechanism is in place through the P–16 Leadership Council that was established in 2004 to "create a seamless pre-kindergarten through sixteenth grade educational system."
- Form a statewide coalition of external champions with the P–16 Leadership Council to develop a communication plan for STEM awareness and recruitment and to ensure that improvements in instruction and teacher preparation are implemented.

P–16 Alignment and Coherence

- Implement the Common Core standards and devote resources to increase the capacity of local districts to implement them.
- Define career and college readiness with the university and the community college systems in terms of courses or competencies that must be mastered prior to college admission.
- Establish a system that holds local schools accountable for performance and provides for state intervention if improvement does not take place.
- Invest state resources in increasing the capacity of the Department of Education to do its job, and in investing in a strong state coordinated system that balances local control with state imperatives and programs.
- Build on current dual-enrollment programs and partnerships by defining the role of community colleges in forming partnerships with high schools, businesses, and CTE centers, and encourage the development of early college STEM high schools and academies for grades 9–13.
- Continue efforts to upgrade the rigor of offerings in the Career and Technical Education Centers.

Instructional Quality

- Ensure that the university system becomes a partner in P–16 improvement and that, as a first step, it improves STEM content in preservice teacher preparation programs.
- Introduce incentive programs to attract undergraduate STEM majors to teaching and to entice STEM teachers to teach in hard-to-staff schools. Develop STEM master-teacher-leader programs.
- Develop guidelines and resource banks for professional development and research-based curriculum programs. Use the laptop initiative in a variety of ways to disseminate best practices in curriculum and instruction.

Conclusion

Across the country, STEM education has been singled out as a major national and state priority in reports, funding programs, and most recently, in the Race to the Top grant program. The emphasis on science, technology, engineering, and mathematics education is not new for many states that are in the process of altering their educational systems to respond to the need to prepare their workforce for jobs in the 21st century. That preparation has included efforts to set the stage for improvement by ratcheting up course requirements, improving the quality of teachers, identifying the best curricular programs, and ensuring students are ready for college.

Maine is now trying to set the stage for that improvement to take place, but is missing a number of important systemic elements. Although Maine has several assets described in this report, the state has not established the structures that will enable all students to stay in school, take rigorous coursework, enroll in college, and graduate from college with the skills necessary for entering STEM jobs.

Maine is poised to gather the significant science, technology, engineering and mathematics resources already in place and integrate them into a more focused and state-driven improvement system. But that improvement depends upon a coordinated effort involving the Governor's office, the Department of Education, the University and Community College systems, and business and non-profit groups. That effort must reflect the fact that the future economy of the state depends upon coordinated state action."

Project Participants

MAINE EPSCoR

1865 THE UNIVERSITY OF MAINE

COLLABORATING PARTNERS

usm UNIVERSITY OF SOUTHERN MAINE

UMM THE UNIVERSITY OF MAINE AT MACHIAS *Naturally!*

UNIVERSITY OF MAINE FORT KENT UNIVERSITE DU MAINE

UMF University of Maine FARMINGTON MAINE'S PUBLIC LIBERAL ARTS COLLEGE

University of Maine at PRESQUE ISLE *North of Ordinary*

UNITY COLLEGE IN MAINE

Bates College

Colby

Bowdoin

College of the Atlantic *life changing. world changing*

Maine Community College System

UNE UNIVERSITY OF NEW ENGLAND