MAINE EPSCoR

Experimental Program to Stimulate Competitive Research at the University of Maine

THE UNIVERSITY OF MAINE

Maine EPSCoR's Sustainability Science Initiative

NSF EPSCoR RII Track 1 Strategic Plan for 2009-2014

Revised as of 4/9/2012

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Maine's Sustainability Science Initiative

(EPS-0904155)

Strategic Plan for 2009-2014

(Revised as of 4/9/2012)

Maine EPSCoR RII Management Team:

- Project Director & PI: Michael Eckardt, Vice President of Research, University of Maine
- Associate Project Director & co-PI: Vicki Nemeth, Director, Maine EPSCoR at the University of Maine
- Research Project Director & co-PI: David Hart, Director, Senator George J. Mitchell Center for Environmental and Watershed Research, University of Maine

Maine's Sustainability Science Initiative

Maine EPSCoR at the University of Maine

EXECUTIVE SUMMARY

Maine EPSCoR Introduction

In July 2009, Maine EPSCoR at the University of Maine received a $20M National Science Foundation EPSCoR Research Infrastructure Improvement (RII) Track 1 award for "Maine's Sustainability Science Initiative" project (EPS-0904155) for the time period of July 1, 2009 to June 30, 2014.

Maine EPSCoR perhaps operates somewhat differently from other EPSCoR jurisdictions in that it strategically utilizes each NSF EPSCoR RII Track 1 opportunity to build infrastructure that creates a single specialized research center (rather than a focus on multiple project areas). Previous NSF EPSCoR RII awards have successfully led to the creation of research centers at the University of Maine that have gone on to become national and international leaders of excellence in advanced composites and structures, forest bioproducts (alternative energy), climate change, marine science, and surface science.

This NSF EPSCoR RII project was developed to have a major impact throughout the state by establishing a strong research and education infrastructure for Maine in this sustainability science area. Therefore the main goal for this RII project is to put the infrastructure into place that will lead to the creation of a statewide Center for Sustainability Solutions at the University of Maine.

While the Maine EPSCoR Sustainability Science Initiative (SSI) is based at the University of Maine, which is the state's flagship research and Ph.D. education institution, it also includes the participation of 10 other primarily undergraduate institutions in the sustainability science research, education, and workforce development efforts. These include five private institutions: Bates College, Bowdoin College, Colby College, Unity College, and University of New England. It also includes five other campuses of the University of Maine System: University of Maine Augusta, University of Maine Farmington, University of Maine Fort Kent, University of Maine Presque Isle, and University of Southern Maine. Colleges in Maine's Community College System also participate in related workforce development activities.

Organizational Structure & State Alignment

Maine EPSCoR at the University of Maine was formally established under a Memorandum of Understanding with the State of Maine Office of Innovation, and is responsible for the implementation, administration, and evaluation of NSF EPSCoR projects.

Maine EPSCoR fully recognizes that a successful project of this magnitude and complexity depends on a strong management team as well as sufficient staff and expertise to develop, implement, and oversee it. This RII project utilizes a multi-level, parallel organizational structure that provides effective programmatic and administrative oversight and contributes to successful implementation. The Maine EPSCoR office Director (Vicki Nemeth) is responsible for day-to-day program oversight, administration, and the implementation of the non-research components. She works in tandem with the SSI Research Project Director (David Hart) and his office. Both report to NSF EPSCoR RII Project Director Michael Eckardt (UMaine Vice

President for Research), and both have supporting program and administrative staff in their respective offices.

Eckardt, Hart, and Nemeth act as the Maine EPSCoR Management Team, which is responsible for addressing on-going issues such as the SSI organizational structure, policies, and procedures; strengthening the research focus and integration; addressing research team progress and funding allocations; monitoring the new hire processes; reviewing evaluation and assessment recommendations; revising the SSI Strategic Plan; and overall risk management.

The SSI Stewardship Council and SSI Research Council also assist in overseeing the integrated research portfolio, which is organized and managed in a holistic, comprehensive matrix system that allows SSI to respond effectively to changing needs, opportunities, and challenges. This also requires a strong commitment to on-going organizational assessment and innovation, which is a central component of SSI's management systems.

The Maine Innovation Economy Advisory Board (MIEAB) serves as the Maine EPSCoR state committee and is responsible for oversight and coordination of the state's EPSCoR portfolio to ensure synergy with the Maine 2010 Science & Technology Action Plan. This revised S&T Action Plan for the state 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 to the plan for the first time.

Strategic Planning Process

In September 2009, Maine EPSCoR convened its first state conference under this RII award. During the first day, presentations showcased the various SSI project components and participants took part in training workshops and discussion sessions. Two program officers from NSF EPSCoR were also in attendance, as well as the project's two external evaluators.

The following two days were dedicated to bringing together a core group of SSI members to begin the strategic planning process. The working sessions were led by the Maine EPSCoR external evaluators, with input from the NSF EPSCoR program officers. This strategy allowed for the effective co-development of the strategic plan as well as the project's final 5-year external evaluation plan, and helped to ensure that they were in alignment.

With the diversity of institutions partnering on this project, and given their predominantly teaching focus, strategies needed to be crafted that allowed for a progression in their involvement. For most of these institutions, this was the first time they had collaborated in research with the University of Maine, and for some it was their first foray into having research opportunities at their institution.

This strategic plan was subsequently developed to provide a framework around which this Maine EPSCoR RII project operates and measures progress and performance. Its purpose is to ensure that significant progress is made throughout the RII award period in establishing a strong research and education infrastructure for Maine in this sustainability science area. Goals, objectives, and strategies were carefully crafted to continually solidify and strengthen the enterprise and ensure that the desired outcomes and impacts are reached.

Maine's Sustainability Solutions Initiative Research Focus

The project's Sustainability Solutions Initiative (SSI) research group seeks to connect knowledge with action in ways that promote strong economies, vibrant communities, and healthy

ecosystems. A strong research and education foundation will be combined with workforce development, external engagement, and cyberinfrastructure components to increase capacity, competitiveness, and development in a focus area that is vital to Maine's future.

Producing knowledge and linking it to actions that meet human needs while preserving the planet's life-support systems is emerging as one of the most fundamental and difficult challenges for science in the 21st century. There is growing consensus that traditional methods of generating and using knowledge must be fundamentally restructured to confront the breadth, magnitude, and urgency of many problems now facing society. Solving sustainability problems requires unprecedented levels of program integration characterized by a deep commitment to interdisciplinary teamwork, robust university-stakeholder partnerships, and an innovative institutional culture.

Successful sustainability science research requires three integrative components: evaluating the dynamics of social-ecological systems (SES); understanding & strengthening links between knowledge and action (K↔A); overcoming barriers to organizational innovation & interdisciplinary integration (OI) (Figure 1).We employ two major strategies to advance the theory and practice of sustainability science. First, our research teams include experts in the ecological, social, and economic dimensions of sustainability, researchers skilled in understanding and strengthening connections between knowledge and action, and authorities in organizational sciences. Second, these interdisciplinary teams work in close partnership with diverse stakeholders to maximize the relevance and potential value of research for decision-making.

Fig. 1: Components of Sustainability Science Research

The Sustainability Solutions Initiative (SSI) group working on this RII project uses Maine as a laboratory to study the emerging field of sustainability science. Landscape change is an important nexus for sustainability science research, including the development of multi-scale complex systems models of urban, semi-urban, and rural regions. SSI's progress in understanding the causes and consequences of landscape change is also contributing to broad-based efforts in Maine to chart a more sustainable path for economic and community development. SSI's approach to landscape change research has two novel components. First, it focuses on interactions among three pressing drivers of landscape change (i.e. urbanization, forest ecosystem management, and climate/energy concerns), rather than examining each in isolation. By identifying the differing spatial, temporal, and institutional scales at which these drivers operate, we are developing a more coherent and integrative process for testing SES models. Second, information needs of individuals and institutions that transform and use scientific information shape our research. This integrative strategy facilitates the development of models to improve decision-making processes of individuals and institutions that vary in function, geography, and authority.

SSI is designed as a portfolio of research projects, where each project constitutes a place-based, multi-scale investigation of SES and K↔A processes, patterns, and interactions. While each project offers important learning opportunities in its own right, one of SSI's central goals is to create a quasi-experimental design in which particular groups of projects can be used to compare and contrast the influence of different processes shaping SES and K↔A. This

integrative strategy also increases the potential for drawing inferences about the role of contextual factors (e.g. biophysical, socioeconomic, and decision-making characteristics) and scale on system behavior.

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

Maine EPSCoR SSI Project Goals

The following are the overarching goals that are being addressed in this Sustainability Science Initiative project. Detailed outcomes, objectives, strategies, benchmarks, and timeframes can be found in the following sections of this Strategic Plan.

Goal #:	Description:
Goal 1:	Create a world-class, solutions-driven sustainability science research center recognized for its innovative approaches to interdisciplinary research and deep commitment to collaboration with diverse stakeholders.
Goal 2:	Investigate the dynamics of social-ecological systems, with particular emphasis on SES resilience.
Goal 3:	Examine the connections between scientific knowledge regarding SES dynamics and stakeholder actions that potentially affect SES resilience.
Goal 4:	Test models of organizational science to understand and improve interdisciplinary collaboration and university – stakeholder partnerships.
Goal 5:	Engage all aspects of the state's human and institutional resources in the achievement of the RII project goals and objectives.
Goal 6:	Foster the next generation of sustainability science professionals through efforts that are linked to the diverse challenges and opportunities in this emerging field.
Goal 7:	Prepare Maine's current and future STEM workforce through coordinated programs, opportunities, training, and knowledge dissemination.
Goal 8:	Utilize cyberinfrastructure to improve communication, collaboration, visualization, and data management capabilities that enable innovation and competitiveness in the sustainability science focus area.
Goal 9:	Create and maintain an effective outreach & communication network through strategies that encompass all participants, stakeholders, and the general public.
Goal 10:	Employe multiple qualitative and quantitative evaluation processes to improve project effectiveness and assess achievement towards goals.
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 12:	Implement an effective management plan that will support and ensure the overall success of the Maine EPSCoR RII project.

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.

Maine EPSCoR SSI Mission, Vision, Model System, and Working Definition

Mission

The mission of the Sustainability Solutions Initiative (SSI) is to create a world-class, solutions-driven sustainability science research program focused on the dynamics of coupled social-ecological systems (SES) and connections between knowledge and action (K↔A) that enhance individual and institutional decision-making.

Vision

SSI will lead to the creation of the Center for Sustainability Solutions (CSS), a national and international center of excellence in sustainability science. Widely recognized for its innovative approaches to interdisciplinary research and deep commitment to collaboration with diverse stakeholders, CSS helps search for, implement, and evaluate policies and practices that promote economic development while protecting ecosystem health and fostering community well-being. CSS also works with a variety of partners (e.g., governments, the private sector, native communities, local-to-global NGOs, academic partners) to educate a STEM-ready workforce and create new technologies, services, and businesses in support of a green innovation economy.

Landscape Change as a Model System

Landscape change has been identified as a "grand challenge" for sustainability science and is a central concern in recent reports focusing on Maine's economic, social, and environmental future. SSI will use Maine as a "laboratory" for sustainability science research by evaluating the intersecting ecological, social, and economic dimensions of landscape dynamics. Three critical arenas of landscape change will be examined – urbanization, forest ecosystem management, and climate and energy – with a focus on the interactions among these landscape arenas (Figure 2). By using a portfolio of research projects, SSI will determine how the characteristics of different place-based problems influence the potential for generalization and cross-problem integration. Projects will include contrasting biophysical, socioeconomic, and decision–making contexts, different space, time, and organizational scales, and involvement of distinct stakeholder constituencies.

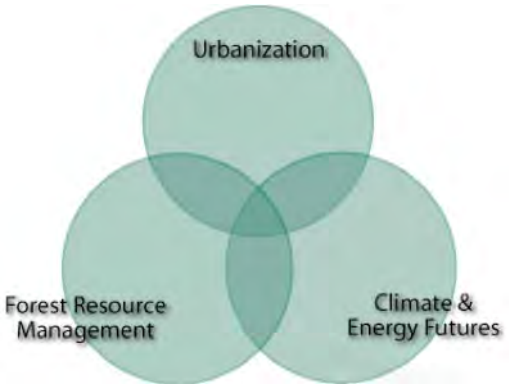


Fig. 2: Interactions of landscape arenas

Sustainability Science: A Working Definition

In 2006, the editorial board of the Proceedings of the National Academy of Sciences created a new section of PNAS dedicated to sustainability science, which they defined 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." SSI has formally adopted this statement as their working definition of sustainability science.

Maine EPSCoR SSI Long-term Outcomes

The overall outcome of this RII project will be that infrastructure will be put into place that will lead to the creation of the Center for Sustainability Solutions at the University of Maine, which will strive to be regarded as a national and international center of excellence in sustainability science. Through the implementation of this RII project, Maine will:

- Have an expanded capacity for sustainability science research, including greater collaboration among participating institutions and statewide stakeholders.
- Have developed solutions-targeted research that promotes economic development while protecting ecosystem health and fostering community well-being.
- Have a STEM workforce that can engage in interdisciplinary research in sustainability science, and who are prepared to create new technologies, services, and businesses in support of a green innovation economy.

Goal #1: Overall SSI Research

Create a world-class, solutions-driven sustainability science research center recognized for its innovative approaches to interdisciplinary research and deep commitment to collaboration with diverse stakeholders.

Context: Establish a research program that builds a statewide capacity to conduct sustainability science research initially focusing on landscape change as a model study system.

Objective 1.1:	Use Maine as a laboratory and incubator for sustainability science research, and grow state capacity to respond to a broad array of sustainability challenges.
Objective 1.2:	Increase Maine's competitiveness and funding in this sustainability area through an interdisciplinary, multi-institutional collaboration.
Objective 1.3:	Develop innovative approaches and models that foster interdisciplinary collaboration and build strong researcher-stakeholder partnerships.
Objective 1.4:	Develop conceptual models for creating and managing a range of sustainability science research initiatives in a multi-dimensional portfolio.
Outcomes and Impacts:	• Expanded capacity for sustainability science research in Maine, including greater collaboration among participating institutions. • Development of a cohesive and well-functioning research team and a robust network of stakeholder partnerships positions SSI to respond to new challenges as they develop. • Establishment of a balanced portfolio of sustainability science research initially focused on landscape dynamics. • Development of solutions-targeted research that promotes economic development while protecting ecosystem health and fostering community well-being. • Education of a STEM-ready workforce and creation of new technologies, services, and businesses in support of a green innovation economy.
Key Milestones:	• Infrastructure is put into place that allows the achievement of formal UMaine research center status for SSI (by December 2013.) • Institutional diversity spans full range, and includes over 25 different disciplines participating in SSI (by June 2012). • Researchers engage in over 100 stakeholder collaborations (by December 2012). • Targeted #s of scholarly outputs such as proposals and publications are submitted annually (on-going).
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council; SSI Research Council

Key Performance Metrics					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Create the Center for Sustainability Solutions at UMaine	Develop organizational structure	Fully integrate participants and institutions	Develop Intent to Plan for formal research center	File for formal research center status	Achieve formal research center status; secure base budget
b) Support statewide PUI & involvement	8 PUI institutions	9 PUI institutions	10 PUI institutions	10 PUI institutions	10 PUI institutions
c) Engage a wide breadth of interdisciplinary expertise	10 disciplines collaborating	15 disciplines collaborating	25 disciplines collaborating	25 disciplines collaborating	25 disciplines collaborating
d) Active collaborations with a wide range of stakeholder groups	30 project-wide	60 project-wide	80 project-wide	90 project-wide	100 project-wide
e) Expand collaborations to include national & international groups	2 project-wide	6 project-wide	10 project-wide	20 project-wide	20 project-wide
f) Foster collaboration & integration between research teams & institutions	Establish teams and frameworks	20 project-wide	36 project-wide	36 project-wide	36 project-wide
g) Support development of new research methods or adoption of best practices	Establish teams and framework	20 project-wide	24 project-wide	24 project-wide	24 project-wide
h) External collaborative proposals submitted	4 proposals @ $400K project-wide	15 proposals @ $1.8M project-wide	25 proposals @ $2.1M project-wide	25 proposals @ $3.75M project-wide	30 proposals @ $4.86M project-wide
i) Peer-reviewed publications published	18 project-wide	35 project-wide	55 project-wide	75 project-wide	105 project-wide
j) Presentations at relevant professional conferences	20 project-wide	30 project-wide	40 project-wide	40 project-wide	40 project-wide
k) Research models/ processes framed & modified by stakeholder input to inform decision-making	Planning & development	20 project-wide	30 project-wide	30 project-wide	30 project-wide
l) Formal related public presentations or public testimony	6 project-wide	12 project-wide	25 project-wide	25 project-wide	25 project-wide

Goal #2: Social-Ecological Systems

Investigate the dynamics of social-ecological systems, with a particular emphasis on SES resilience.

Context: Sustainability science focuses particular attention on the role of thresholds and feedbacks in affecting SES dynamics. One of the central management objectives of sustainability science is to maintain or increase SES resilience (i.e. "the capacity of a system to absorb disturbance and reorganize while undergoing change yet still retain essentially the same function, structure, identity, and feedbacks").

Objective 2.1:	Examine how and why SES feedbacks differ for urbanization, forest management, and climate/energy futures.
Objective 2.2	Determine whether patterns of urbanization, forestry, & climate offer similar or contrasting insights into the existence & strength of SES thresholds & feedbacks.
Objective 2.3	Analyze how the likelihood of encountering and crossing thresholds is affected by interacting, multi-scale system components.
Objective 2.4	Investigate how the ability to understand and predict system thresholds depends on the capacity to monitor system feedbacks at multiple spatial and temporal scales.
Objective 2.5	Define what indicators best measure change and permit detection of proximity to thresholds.
Outcomes and Impacts:	• Improved understanding of SES dynamics and resilience. • Increased capacity by all partners to conduct interdisciplinary research on a wide range of SES problems. • Stakeholder participation in problem definition & research planning processes results in greater support for, and trust of, related expertise and research.
Key Milestones:	• Develop SES models in 12 projects by June 2013.
Responsibility:	SSI Research Proj. Dir. David Hart; SSI Stewardship Cncl; SSI Research Council

Key Performance Metrics

Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Develop models of SES dynamics for specific context	Planning & model development	Develop 3 models project-wide	Develop 12 models project-wide	Develop 15 models project-wide	Develop 15 models project-wide
b) Identify/analyze thresholds/feedback & indicators for specific contexts	Planning & model development	3 project-wide	10 project-wide	12 project-wide	15 project-wide
c) Inform stakeholder mitigation/ adaption strategy	Planning & development	5 project-wide	10 project-wide	15 project-wide	15 project-wide
d) Determine linkages of SES models with K-A	Planning	5 project-wide	10 project-wide	15 project-wide	15 project-wide

Goal #3: Knowledge to Action

Examine the connections between scientific knowledge regarding SES dynamics and stakeholder actions that potentially affect SES resilience.

Context: Maximizing the relevance of sustainability science and its potential to facilitate change requires greater understanding of how flows of information to and from diverse stakeholders affect individual and institutional decision-making processes. Numerous individual and group decisions impact landscape dynamics. Reciprocally, these decisions are influenced by complex feedbacks and thresholds associated with changing landscapes.

Objective 3.1:	Examine processes by which knowledge derived from SES research affects stakeholder actions and the extent to which stakeholders influence the research process.
Objective 3.2	Develop methods for achieving a closer coupling between the societal demand for and supply of science products.
Objective 3.3	Determine how information affects collective action processes, including the potential for agents to shape SES resilience and the SES characteristics that facilitate effective governance.
Objective 3.4	Create a set of systematic, rigorous, and replicable models to evaluate decision-making processes regarding landscape dynamics, using differences in decision-making environments among the three landscape change arenas as a quasi-experimental system.
Outcomes and Impacts:	• Improved understanding of factors and processes that facilitate and impede K↔A efforts focused on landscape dynamics. • Increased capacity to conduct interdisciplinary research on a wide range of K↔A problems in sustainability science by all partners. • More effective integration of STEM-related knowledge in decision-making processes (e.g., problem definition, options considered, actions taken. • Greater recognition of the utility of STEM-related expertise and research in overcoming K↔A barriers and developing improved solutions.
Key Milestones:	• Targets met for # of models, best practices, & presentations (on-going).
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council; SSI Research Council/ K-A Team members

Key Performance Metrics

Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Models assesses reciprocal interactions among biophysical, socioeconomic, and stakeholder contexts affecting K↔A	Planning & model development	5 project-wide	15 project-wide	20 project-wide	20 project-wide

Key Performance Metrics					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
b) Develop methodological frameworks & best practices	Planning & implement	10 project-wide	15 project-wide	20 project-wide	20 project-wide
c) Find evidence of linking K↔A research with SES	Planning & Implement	10 project-wide	15 project-wide	20 project-wide	20 project-wide
d) Identify best practices (BP) for strengthening K↔A interactions in the 3 targeted problem areas	Planning & implement	5 project-wide	10 project-wide	15 project-wide	20 project-wide
e) Give presentations of evidence-based strategies for communicating complex scientific information	research & development	5 project-wide	10 project-wide	10 project-wide	10 project-wide
f) Create K↔A models that are both internally and externally-oriented for stakeholder and research purposes	planning & development	5 project-wide	10 project-wide	10 project-wide	10 project-wide

Goal #4: Organizational Innovation

Test models of organizational science to understand and improve interdisciplinary collaboration and university-stakeholder partnerships.

Context: Solving sustainability problems requires a high level of interdisciplinary research integration and robust researcher-stakeholder partnerships.

Objective 4.1:	Analyze organizational processes that influence interdisciplinary collaboration and university-stakeholder partnerships.				
Objective 4.2:	Study how interdisciplinary collaborations and stakeholder partnerships change over time.				
Objective 4.3:	Identify best practices for promoting interdisciplinary collaboration and university-stakeholder partnerships.				
Outcomes and Impacts:	• Development of a cohesive and well-functioning team of faculty, postdoctoral fellows, and graduate/undergraduate students across multiple disciplines and institutions. • Awareness of the challenges inherent in interdisciplinary research and provision of resources to assist in overcoming these challenges. • Advancement of a university environment that acknowledges the complexity of interdisciplinary teamwork and provides incentives to facilitate its progression. • Understanding of the process by which individuals comes to engage in interdisciplinary research. • Creation of a statewide, coordinated network that promotes the theory and practice of sustainability science.				
Key Milestones:	4 Models developed by June 2013.				
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council; SSI Research Council; Organizational Innovation team members				
Key Performance Metrics					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Develop models of OI that examine the influences on interdisciplinary collaboration in university-stakeholder partnerships	Research & development	2 project-wide	3 project-wide	4 project-wide	4 project-wide

Key Performance Metrics					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
b) Develop methodological frameworks & best practices for promoting interdisciplinary collaboration and university-stakeholder partnerships	Planning & method development	2 project-wide	3 project-wide	4 project-wide	4 project-wide
c) Produce presentations and technical reports on OI research findings, suggested implementation, and recommendations for improvement	1 presentation project-wide	4 presentations & 1 technical report project-wide	6 presentations & 4 technical reports project-wide	6 presentations & 4 technical reports project-wide	8 presentations & 6 technical reports project-wide
d) Develop mechanisms for informing external stakeholders of relevant results	Planning & implement-ation	4 project-wide	6 project-wide	6 projet-wide	8 projet-wide

Goal #5: Diversity

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

Context: While Maine alternates between the first or second least diverse state in the nation, Maine EPSCoR is committed to meeting the challenges of effecting positive action and change. This RII project utilizes diversity as a cross-cutting goal that spans all project components.

Objective 5.1:	Broaden overall participation through increased individual diversity.
Outcomes and Impacts:	Increased involvement of women and underrepresented groups in STEM research and education programs and activities related to this focus area.
Key Milestones:	• Native American programs fully implemented & on-going (by June 2013). • Special partnerships and programs for women and girls fully implemented and on-going by June 2013 (NSF ADVANCE, Expanding Your Horizons, National Girls Collaborative Project). • Special programs for greater inclusion of persons with disabilities successfully piloted by June 2012.
Responsibility:	Maine EPSCoR Director Vicki Nemeth; Maine EPSCoR Program Assistant & Diversity Specialist Jennifer Dunham

Key Performance Metrics (completed by end of each year)

Strategic Actions:	YR1	YR2	YR3	YR4	YR5
a) Actions increase diversity in directly supported personnel	Women: 33% Diversity: 5% (% of total)	Women: 34% Diversity: 6%	Women: 35% Diversity: 7%	Women: 36% Diversity: 8%	Women: 37% Diversity: 9%
b) Actions increase diversity in outreach participants	Women: 33% Diversity: 5%	Women: 34% Diversity: 6%	Women: 35% Diversity: 7%	Women: 36% Diversity: 8%	Women: 37% Diversity: 9%
c) Expand Native American program involvement	40 participants	45 participants	50 participants	60 participants	70 participants
d) Expand programs involving women & girls	400 participants	450 participants	500 participants	550 participants	600 participants
e) Implement disability programs	Begin planning	Finalize pilot; 5 participants	10 participants	12 participants	15 participants

Objective 5.2:	Expand institutional and partner diversity in this project (type, geographic, disciplinary).
Outcomes and Impacts:	Broadened statewide participation occurs in research, education, and workforce development programs and activities in this focus area.
Key Milestones:	• Establish Sustainability Solutions Initiative Partners (SSP) program for undergraduate & community college participation (by September 2009).

	• Engagement with stakeholders is embedded in all research project aspects (on-going).
Responsibility:	Maine EPSCoR Director Vicki Nemeth; SSI Research Project Director David Hart

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Expand # PUI & community college institutions collaborating	8 institutions	9 institutions	10 institutions	112 institutions	13 institutions
b) Increase # & breadth of stakeholder collaborations	30 stakeholder groups involved	60 stakeholder groups involved	80 stakeholder groups involved	90 stakeholder groups involved	100 stakeholder groups involved

Goal #6: SSI Workforce Development

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

Context: Problems involving the intersecting ecological, social, and economic dimensions of sustainable development offer rich opportunities for relevant, place-based education and hands-on research linked to real-life needs and concerns.

Objective 6.1:	Provide direct research support for SSI participation & engagement at all levels.
Outcomes and Impacts:	Increased statewide capacity to produce and support sustainability science professionals.
Key Milestones:	• Recruit and hire 4 new SSI faculty tenure-track positions by September 2011. • Recruit and hire 4 new postdoctoral associates by June 2012. • Recruit 25 new graduate students specifically to be part of the SSI program (3 cohorts by September 2012). • Provide SSI Research Internships for graduate, undergraduate, and high school students embedded in SSI project teams (on-going).
Responsibility:	SSI Research Project Director David Hart; new hire & graduate committees; SSI Stewardship Council; Maine EPSCoR Director Vicki Nemeth

Key Performance Metrics (completed by end of each year)

Strategic Actions:	YR1	YR2	YR3	YR4	YR5
a) Hire 4 new SSI faculty	Begin search process	3 UM hires/1 USM	Support, mentor, retain	Support, mentor, retain	Support, mentor, retain
b) Directly support SSI faculty at all institutions	60 supported	70 supported	80 supported	90 supported	90 supported
c) Hire 4 new postdoctoral associates	Begin search process	2 UM hires; restart search process	4 new UM hires; orig. 2 completed	Support, mentor, retain	Support, mentor, complete
d) Provide graduate student research assistantships & admit new SSI cohorts	Begin SSI cohort search; support 5	Admit 10 SSI cohort students; support 20 total students	Admit 10 SSI cohort students; support 25 total students	Admit 5 SSI cohort students; support 30 total students	Support 35 total students
e) Provide undergraduate student research assistantships	Begin recruitment; support 15-20 students	90 supported	100 supported	110 supported	110 supported
f) Provide high school student research internships	15 participants	20 participants	25 participants	30 participants	30 participants

Objective 6.2:	Engage graduate students in SSI mentoring, programs, and opportunities.				
Outcomes and Impacts:	Students have a thorough understanding of the interdisciplinary nature of sustainability science, and are well-prepared for future careers in this area.				
Key Milestones:	• Develop an SSI graduate course series by September 2010. • Establish a Graduate Coordinator position by September 2010.				
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council; SSI Research Council; SSI Graduate Coordinator; SSI Curriculum Development Committee				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Develop SSI graduate courses, certificate, service learning, internships, & programs at UM	Form Curriculum Development Committee	Implement 2 interdiscipl. grad courses	Continue 2 grad course series; submit NSF IGERT; plan SSI grad certificate	Continue 2 grad course series; SSI Certificate program approved; pilot service learning proj.	Continue 2 grad course series; service learning; internships
b) Provide formal & informal graduate student mentoring	Begin planning for mentoring	Appoint SSI Grad Coord.; meet with students	Monthly Coord/student meetings	Monthly Coord/student meetings	Monthly Coord/student meetings
c) Support student involvement in SSI & other professional activities (poster competitions, conferences, etc.)	5 students receive travel support to conferences; all participate in on-going SSI activities	15 travel support; all participate in on-going SSI activities	20 travel support; all participate in on-going SSI activities	20 travel support; all participate in on-going SSI activities	20 travel support; all participate in on-going SSI activities

Objective 6.3:	Engage undergraduate students in SSI mentoring, programs and opportunities.				
Outcomes and Impacts:	Students have a greater understanding of the interdisciplinary nature of sustainability science, and are better prepared to continue their educational or career paths in a sustainability-related area.				
Key Milestones:	• Develop SSI undergraduate courses by September 2010. • Develop an undergraduate concentration in sustainability science by June 2012.				
Responsibility:	SSI Research Project Director David Hart; SSI Research Council; Curriculum Development Committee, NSF Project Director Mike Eckardt				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Develop & implement SSI undergraduate curriculum at UM	Form Curric. Development Team	Develop 1 undergrad intro course; planning continues	Offer 2 undergrad courses; finalize SSI concentration	Offer 2 undergrad courses; SSI concentration curriculum implemented	Offer 2 undergrad courses & SSI concentration

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
b) Explore statewide undergraduate sustainability curriculum	Begin discussions between institutions	On-going	SESYNC grant team examining policies & status	SESYNC team planning process	Supporting policies & curriculum implemented
c) Support student involvement in SSI & other professional activities (poster competitions, conferences, etc.)	all participate in on-going SSI activities; mentoring partnerships with faculty	2 travel support; all participate in on-going SSI activities & mentoring	3 travel support; all participate in on-going SSI activities & mentoring	5 travel support; all participate in on-going SSI activities & mentoring	5 travel support; all participate in on-going SSI activities & mentoring

Objective 6.4:	Support SSI faculty development through mentoring, programs, and opportunities.
Outcomes and Impacts:	• SSI faculty have a greater understanding of, and comfort with, the interdisciplinary nature of sustainability science. • SSI faculty have the ability and knowledge to work with diverse collaborators and stakeholders beyond their field.
Key Milestones:	• Interdisciplinary workshops implemented during YR3 (by June 2012). • Formal faculty mentoring program on-going by September 2012.
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council; Research Council

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Support peer mentoring through formal activities		Plan faculty mentor program	Finalize mentor program; host interdisc. res. workshops	Implement program for 4 mentor pairs; add special workshops	Implement program for 8 mentor pairs; plan for mentor sustainability
b) Support peer mentorships through informal networking activities	Co-taught SSI course; SSI all-team meetings; SSI retreat; task forces	Add: co-mentorship of students; SSI Integration Discussions	Add: co-mentorship of postdocs; SSI part of faculty peer review committees	Build on networks	Build on networks; plan for mentoring sustainability

Objective 6.5:	SSI interdisciplinary project & team structure fosters collaborative learning, development, and solutions approaches.
Outcomes and Impacts:	Enhanced training promotes collaborative, interdisciplinary approaches to problem-solving, fosters innovation, and allows for the successful integration of the production of knowledge with solutions.
Key Milestones:	• SSI Seminar series established by July 2011. • All SSI meetings, discussion groups, workshops, seminars, etc. are fully available virtually to all statewide SSI participants via new SSI Communications Center capabilities (by June 2012).
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council; Research Council

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Sponsor SSI seminars, workshops, conferences, research retreats, etc.	2 workshops (50 particip.); state EPSCoR conference (150); SSI retreat (60)	2 workshops (60); plan SSI seminar series; state EPSCoR conf. (150); retreat (70)	3 workshops (60); 5 seminars (70); state EPSCoR conf.(150); retreat (80)	3 workshops (70); 5 seminars (80); state EPSCoR conf. (150); retreat (80)	3 workshops (80); 5 seminars (90); state EPSCoR conf. (150); retreat (80)
b) Support faculty involvement in SSI & other professional development & team-building activities (conferences, etc.)	travel support for 5 faculty to conf.; all participate in on-going SSI activities; nat. EPSCoR conf.	10 travel support; all participate in on-going SSI activities	15 travel support; all participate in on-going SSI activities; nat. EPSCoR conf.	20 travel support; all participate in on-going SSI activities	20 travel support; all participate in on-going SSI activities; nat. EPSCoR conf.

Objective 6.6:	Engage the state's community colleges in sustainability-related workforce development activities.
Outcomes and Impacts:	• Increased statewide capacity to produce and support Sustainability Science professionals. • Students gain an understanding of the interdisciplinary nature of sustainability science, which can help them to choose to continue their educational or career paths in a sustainability-related area.
Key Milestones:	• Pilot first collaborative project by July 2011.
Responsibility:	Maine EPSCoR Director Vicki Nemeth; NSF Project Director Mike Eckardt

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a)Support workforce development projects at community colleges	Research best practices	Work with one college to develop pilot project	Implement one pilot collaboration	Continue 2 & add one	Continue 2 & add one

Goal #7: General Workforce Development

Prepare Maine's current and future STEM workforce through coordinated programs, opportunities, training, and knowledge dissemination.

Context: Maine's economy increasingly depends on innovation and global competitiveness, which requires that our future workforce has a strong background in science, technology, engineering and mathematics (STEM). With Maine's STEM workforce already 30-40% below the national average, and an overall shrinking pool for the future, it is critical to form partnerships throughout the state to address this in a collaborative manner.

Objective 7.1:	Implement and support related STEM programs and opportunities that directly engage students and teachers at all levels.				
Outcomes and Impacts:	• Increased K-20 student STEM participation. • Improved workforce preparedness in STEM. • Increased K-12 awareness and learning in sustainability-related areas.				
Key Milestones:	• Collaborate with at least 8 STEM partners (by June 2013). • Engage 400-650 students directly in STEM programs and activities (on-going).				
Responsibility:	Maine EPSCoR Director Vicki Nemeth; Program Assistant & Diversity Specialist Jennifer Dunham; Outreach & Program Coordinator				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Work with STEM partners to maximize effectiveness in K-20 activities	3 partners: NCGP; EYH; Native Amer.	Add: Camp Capella	Add: Reach Ctr; Project Reach; CCIDS; SSI partner instit. workforce partners	Add: Upward Bound; 4-H	On-going
b) Support related STEM programs and activities for K-12	400 students participate directly	500 students participate directly	550 students participate directly	600 students participate directly	650 students participate directly
c) High school research internship program	15 participants	20 participants	25 participants	30 participants	30 participants
Objective 7.2:	Promote professional and leadership development for educators in STEM, and foster STEM approaches and activities that value prior learning across subjects.				
Outcomes and Impacts:	• Improved workforce preparedness in STEM. • Increased K-12 awareness and learning in sustainability-related areas.				
Key Milestones:	• 2 teacher workshops supported annually (on-going starting in YR2).				

	• SSI-related curriculum module piloted by June 2012.
Responsibility:	Maine EPSCoR Director Vicki Nemeth; Program Assistant & Diversity Specialist Jennifer Dunham; Outreach & Program Coordinator

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Support STEM opportunities for K-12 & pre-service teachers	Establish partnerships for teacher prof. develop.	Support 2 teacher workshops (30 particip.)	Support 2 teacher workshops (40 particip.)	Support 2 teacher workshops (50 particip.)	Support 2 teacher workshops (60 particip.)
b) Support K-12 curriculum development related to SSI project		Planning	Pilot develop. of 1 curriculum module	Support 2 additional curriculum modules	Support 2 additional curriculum modules

Objective 7.3:	Take a leadership role in working with partners throughout the state to build, integrate, and implement best practices in STEM.
Outcomes and Impacts:	• A strong, coherent, consistent, and integrated statewide STEM education system that uses discovery-based learning activities, partnerships, and innovative programs. • STEM baseline and impact studies allow partners to engage in statewide strategic planning that focuses on responding to identified needs.
Key Milestones:	Four statewide STEM landscape studies completed by September 2011.
Responsibility:	Maine EPSCoR Director Vicki Nemeth; Program Assistant & Diversity Specialist Jennifer Dunham; Outreach & Program Coordinator

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Conduct STEM baseline & impact studies	Contract for 3 baseline studies	4 completed	Develop & distribute executive summary of studies	Expand on key areas from original studies; link to DoL data	Expanded study completed & results distributed
b) Work with statewide groups in strategic planning	Maine STEM Collaborative strategic planning	Add: ME Dept. of Ed. STEM & Environ. Literacy plans	Add: RiSE Center MSP; Reach Center; Governor's STEM Council	On-going	On-going
c) Support statewide STEM programs & activities	Serve as Maine STEM Collaborative leadership; 2010 STEM Summit	On-going	Add: 2012 STEM Summit; STEM Database development	Add: UM Cooperative Extension & 4-H	Add: 2014 STEM Summit

Goal #8: Cyberinfrastructure

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

Context: Maine's remote location and large geographic size makes distance collaboration critical to advancing R&D. Recent investment has connected key research partners in the state and extended connectivity to reach surrounding states and Canada. UMaine's cluster supercomputer provides Maine institutions with a data storage backbone and high-performance computing. A statewide cyberinfrastructure strategy was put in place to support the state's Science & Technology Plan and addresses the needs of its EPSCoR & NIH IDeA community, K-12 and higher education system, libraries, industry, and non-profit research institutions.

Objective 8.1:	Expand statewide cyberinfrastructure capabilities through upgraded high bandwidth fiber interconnections and hardware.
Outcomes and Impacts:	• Cyberinfrastructure tools and hardware help overcome the challenges Maine's researchers face in collaborating (rural, remote, distance). • Virtual collaborations for R&D are expanded and easier to engage in.
Key Milestones:	• New hardware allows for high-speed/high bandwidth usages for SSI researchers (by June 2013). • Cloud cluster environment in place for shared data handling and intranet (by June 2013).
Responsibility:	Maine EPSCoR Director Vicki Nemeth; Maine EPSCoR CI Team Jeff Letourneau, Bruce Segee, Eric Damboise; SSI Cyberinformatics Team; NSF Project Director Mike Eckardt

Key Performance Metrics (completed by end of each year)

Strategic Actions:	YR1	YR2	YR3	YR4	YR5
a) Expand SSI researcher CI capabilities through upgraded hardware	Install 30 port multipoint Media Control Unit and 12 switchgear modules		Install 6 additional switchgear modules in SSI researcher buildings	Install 6 switchgear modules in SSI researcher buildings	
a) Create a cloud cluster environment for SSI researcher & student use	Planning for cloud use	Install new SSI core cloud cluster & create D-space & intranet on it	Transfer SSI cloud cluster to new UM super-computer; expand usage	Training to encourage SSI utilization of cloud	Finalize usage of SSI cloud cluster by all SSI teams

Objective 8.2:	Provide new communication and visualization tools.
Outcomes and Impacts:	• An effective virtual organization environment allows for enhanced research, education, and innovation opportunities between statewide partners.

	• Visualization capabilities allow for greater resolution and understanding in research and education.				
Key Milestones:	• New SSI Communications Center completed by June 2012. • All SSI partner institutions have full videoconference capabilities by September 2012. • New SSI visualization capacity available by September 2012.				
Responsibility:	Maine EPSCoR Director Vicki Nemeth; Maine EPSCoR CI Team Jeffrey Letourneau, Bruce Segee, Eric Damboise; SSI Cyberinformatics Team				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Deploy large scale visualization capabilities	Test & refine portal prototypes	Prototype testing; create K-12 laptop wall	Deploy portal in new SSI Commun. Center	Deploy 2nd portal at an SSI partner institution	Deploy 3rd portal at an SSI partner institutions
b) Videoconference and other communication capabilities available at all SSI partners	Add videoconf. capabilities to ME EPSCoR, SSI, & UM conf. center; Provide training	Plan for new SSI Comm. Cntr; install videoconf. at USM; webcam & videoconf. training	Complete SSI Communic. Center; install videoconf. at Colby & Unity; continue training	SSI partner Movi licenses & webcams; add videoconf. capabilities as needed; training	Add videoconf. capabilities as needed; continue training
Objective 8.3:	Develop systems for data handling across the SSI portfolio and institutions.				
Outcomes and Impacts:	• All SSI researchers utilize a common data storage server by June 2014. • Open access to SSI data is provided to researchers and other public stakeholders by June 2014.				
Key Milestones:	• Data needs surveys completed by September 2012. • SSI Data Management Plan finalized by June 2012. • SSI researcher data is catalogued on the SSI D-Space cluster by June 2014.				
Responsibility:	Maine EPSCoR Director Vicki Nemeth; Maine EPSCoR CI Team Jeffrey Letourneau, Bruce Segee, Eric Damboise; SSI Cyberinformatics Team				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Create & implement data management plan	Planning to create initial data management plan	Create SSI cyber-informatics group; finalize data handling systems	Complete data surveys; begin to implement recommend-ations from CI group	Implement data integration strategies (i.e. new hire)	Complete all data integration strategies for SSI project components
b) Utilize common data storage server for all SSI data	Planning and research on best practices and needs	Deploy D-Space server capabilities on UM super-computer	Populate D-Space server with SSI data; refine user privileges & procedures	Continue to populate D-Space server; refine user privileges & procedures	All SSI researcher data is catalogued on D-Space server

Goal #9: External Engagement

Create and maintain an effective outreach and communication network through strategies that engage project participants, stakeholders, and the general public

Context: Due to the nature of the sustainability science focus, external engagement is fully integrated throughout all aspects of this project and may also be addressed in other sections of this Strategic Plan. This goal focuses on strategies for engaging with key partners, the general public and the scientific community.

Objective 9.1:	Establish stakeholder communication networks that allow for two-way sharing, and for information dissemination about the SSI research.				
Outcomes and Impacts:	• Effective communication networks enable successful collaboration and sharing of ideas and information with stakeholders. • SSI is viewed as a valued partner by multiple external organizations.				
Key Milestones:	• SSI project website developed and up by September 2011. • SSI researchers engage in over stakeholder 150 meetings (by June 2012). • SSI project newsletter developed & distribution begun by June 2011.				
Responsibility:	SSI Research Project Director David Hart; SSI Strategic Program Manager Ruth Hallsworth; SSI Stewardship Council; SSI Research Council				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Build & maintain active partnerships between researchers and stakeholders	Planning meetings with stakeholders	Stakeholder participation in SSI seminars/ workshops	Add: over 150 researcher/ stakeholder meetings	Add: SSI researcher participation in stakeholder activities	On-going
b) Develop & implement SSI research communication plan media activities	Develop strategies; hire science writer consultant; develop mailing lists	Bi-annual newsletter; SSI project website; SSI print materials	Add: related websites; special publications; SSI branding; e-mail marketing	Add: SSI exhibit materials	On-going
c) Disseminate research updates through presentations, conferences, etc.	Mitchell Lecture	Add: annual SSI conference	Add: SSI Seminar Series	Add: presentations to civic & community groups	On-going
Objective 9.2:	Disseminate and communicate research results to the scientific community.				
Outcomes and	• SSI is established as a successful model for creating place-based				

Impacts:	collaborations and synergies in sustainability science. • SSI collaborations with state, regional, national, and international partners increase.				
Key Milestones:	• National sustainability science conference sponsored by June 2013. • Two visiting scholars work with SSI researchers and students (on-going).				
Responsibility:	SSI Research Project Director David Hart; SSI Strategic Program Manager Ruth Hallsworth; SSI Stewardship Council; SSI Research Council				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Engage in standard scholarly research outputs	1 major publication; 10 technical presentations	3 major pubs; 40 tech. present.	5 major pubs; 50 tech. present.	7 major pubs; 60 tech. present.	9 major pubs; 70 tech. present.
b) Sponsor & participate in conferences	Sponsor ME EPSCoR State Conf; present at Nat. NSF EPSCoR conf.	Add: present at NSF EPSCoR Living on Earth conf.	Add: SSI Seminar Series; present at Nat. NSF EPSCoR conf.	Add: sponsor nat. sustain. science conf.	Add: present at Nat. NSF EPSCoR conf.
c) Host visiting scholars	Planning	1 visiting scholar	2 visiting scholars	2 visiting scholars	2 visiting scholars
Objective 9.3:	Build scientific literacy for the general public and K-12 community in areas related to the sustainability science research focus.				
Outcomes and Impacts:	Maine's citizenry gain a greater understanding of how sustainability science issues relate to their lives.				
Key Milestones:	• First MPBN documentaries air by fall 2011. • SSI project participants engage in 20 public presentations (by June 2012).				
Responsibility:	SSI Strategic Program Manager Ruth Hallsworth; Maine EPSCoR Director Vicki Nemeth; Maine EPSCoR Communications Coordinator				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Collaborate with MPBN on SSI documentary series	Planning	Produce & air 2 SSI videos	Produce & air 3 SSI videos	Produce & air 3 SSI videos	Produce & air 3 SSI videos
b) Develop and manage project web presence	Update ME EPSCoR website for SSI project	Add: create SSI website; YouTube videocasts; Facebook presence	Add: Maine STEM Collaborative website; other project websites	Add: re-develop ME EPSCoR website; expand social media	On-going
c) Develop & implement other communication strategy activities	Bi-annual ME EPSCoR newsletter; printed materials; project videos	Add: ME STEM Collab. printed materials	Add: 20 public presentations; ME STEM Summit	Add: refine exhibits; develop K-12 materials	On-going

Goal #10: Evaluation & Assessment

Employ multiple qualitative and quantitative evaluation processes to improve project effectiveness and assess achievement toward goals.

Context: Maine EPSCoR utilizes a five-pronged approach to project evaluation and assessment that uses a multi-method approach based on extensive quantitative and qualitative data to develop a rigorous, longitudinal appraisal. All evaluations and assessments are part of a formal feedback loop for Maine EPSCoR management teams.

Objective 10.1:	Utilize external evaluators to assess the project's performance, with a particular focus on the evolution and outcomes of collaborative relationships, student integration in the research process, and external stakeholder interaction				
Outcomes and Impacts:	• SSI participants achieve greater capacity and competitiveness in this field. • Linkages between the project's research, education, and collaboration efforts are effective.				
Key Milestones:	• SSI Strategic Plan & evaluation design done in tandem by December 2009. • Annual evaluation report completed by June of each year.				
Responsibility:	Maine EPSCoR Management Team (Eckardt, Hart, Nemeth)				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Annual assessment of overall project performance	Initial planning & evaluation development; baseline survey; report	Year-round review; case analysis; surveys; 1-2 site visits; annual report	Year-round review; case analysis; surveys; 1-2 site visits; annual report	Year-round review; case analysis; surveys; 1-2 site visits; annual report	Year-round review; case analysis; surveys; 1-2 site visits; annual report
b) Feedback loops	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action

Objective 10.2:	Utilize AAAS to provide scientific peer review to help ensure high quality program delivery.				
Outcomes and Impacts:	• Findings are used to enhance efficacy, identify obstacles, and assist in developing corrective action plans. • The appropriateness of the investment relative to accomplishments is firmly established.				
Key Milestones:	• Bi-annual site visits occur in YR2 and YR4.				
Responsibility:	Maine EPSCoR Management Team (Eckardt, Hart, Nemeth)				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) AAAS on-site assessment with national panel	Plan	Two-day site visit; 2-year report	Plan	Two-day site visit; 2-year report	

b) Feedback loops	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action
Objective 10.3:	An SSI Advisory Board provides on-going scientific assessment and guidance to the research project team.				
Outcomes and Impacts:	• The investment strategy yields substantial contributions to the field of sustainability science, and increases SSI's capacity and competitiveness. • Findings are used to enhance efficacy, identify obstacles, and assist in developing corrective action plan.				
Key Milestones:	• Initial site visit during YR1 (by June 2010), and every 18-24 months after.				
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council; SSI Research Council; Maine EPSCoR Management Team (Eckardt, Hart, Nemeth)				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) On-going advising by Board Chair; full Board site visit every 18-24 months; phone/videoconf. input as needed	Establish board; initial site visit; follow-up phone meetings; on-going Chair	On-going Chair; 1-2 phone meetings	On-going Chair; 1-2 phone meetings; site visit	On-going Chair; 1-2 phone meetings	On-going Chair; 1-2 phone meetings; site visit
b) Feedback loops	SSI Stewardship & Research Cncl review/ action; Mgt Team review/ action	SSI Stewardship & Research Cncl review/ action; Mgt Team review/ action	SSI Stewardship & Research Cncl review/ action; Mgt Team review/ action	SSI Stewardship & Research Cncl review/ action; Mgt Team review/ action	SSI Stewardship & Research Cncl review/ action; Mgt Team review/ action
Objective 10.4:	Participate in NSF EPSCoR evaluation and other activities to continually refine RII project.				
Outcomes and Impacts:	• New knowledge gained allows for more effective planning, strategic actions, and management.				
Key Milestones:	• Recommendations from NSF EPSCoR Reverse Site Visit are reviewed and actions incorporated into the SSI Strategic Plan (by June 2011 & June 2013).				
Responsibility:	Maine EPSCoR Management Team (Eckardt, Hart, Nemeth)				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) NSF EPSCoR Reverse Site Visit	Plan	RSV fall 2010	Plan	RSV fall 2012	
b) NSF Program Officer site visits	ME EPSCoR State Conf.	ME EPSCoR State Conf.	ME EPSCoR State Conf.	ME EPSCoR State Conf.	ME EPSCoR State Conf.
c) NSF EPSCoR nat. conf.; meetings	2 mtgs; nat conf/1 wkshp	2 mtgs; 1 wkshp	2 mtgs; nat conf/1 wkshp	2 mtgs; 1 wkshp	2 mtgs; nat conf/1 wkshp
b) Feedback loops	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action	Mgt Team review/action

Objective 10.5:	Management teams engage in on-going review to ensure that the project achieves goals, objectives, and benchmarks				
Outcomes and Impacts:	Timely achievement of project milestones and programmatic success.				
Key Milestones:	Management meetings are on-going and address milestones & benchmarks.				
Responsibility:	Maine EPSCoR Management Team (Eckardt, Hart, Nemeth); SSI Stewardship Council; Maine Innovation Economy Advisory Board				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Review by Maine EPSCoR Mgt Team & SSI Steward Cncl	Mgt Team monthly; SC weekly	Mgt Team monthly; SC weekly	Mgt Team monthly; SC weekly	Mgt Team monthly; SC weekly	Mgt Team monthly; SC weekly
b) MIEAB update	Sept. 2009	Sept. 2010	Sept. 2011	Sept. 2012	Sept. 2013

Goal #11: Sustainability Beyond the RII

Sustain the SSI infrastructure, impacts, and achievements through the continued integration of scientific entrepreneurship, institutional and external support, partnerships, education, workforce development, and constituency outreach.

Context: Because most sustainability-related problems do not have simple causes or solutions, the development of durable solutions will necessarily require long-term R&D efforts and partnerships. The ultimate value of sustainability science to society can only be realized through long-lasting collaborations between interdisciplinary researchers, institutions, and stakeholders that are committed to social learning.

Objective 11.1:	Mechanisms for post-RII sustainability are put into place during the RII project.				
Outcomes and Impacts:	SSI has a diverse but targeted portfolio of sustainability science research, with evidence of success that lays the foundation for post-RII continuation.				
Key Milestones:	• Targets for outputs are met on an on-going basis (each year). • SSI leverages 4 other NSF programs by June 2011 & beyond. • Seed funding mechanisms in place & awarded by September 2010.				
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) All targeted outputs are met through supported efforts	Targets met for directly & indirectly supported participants; publications; grants; etc.	Targets met for directly & indirectly supported participants; publications; grants; etc.	Targets met for directly & indirectly supported participants; publications; grants; etc.	Targets met for directly & indirectly supported participants; publications; grants; etc.	Targets met for directly & indirectly supported participants; publications; grants; etc.
b) Provide seed funding for special opportunities	Needs assessment	SSI Integ. proj. funded; new faculty start-ups; travel scholarships	SSI Integ. proj. funded; new faculty start-ups; travel schol.; Mgt. Team awards	SSI new faculty start-ups; travel scholarships; Mgt Team awards; econ. dev. awards	SSI new faculty start-ups; travel scholarships; Mgt. Team awards
c) Focus on SSI human infrastructure development	New hire searches initiated; student recruitment underway	Targeted new hires & students in place; SSI faculty supported	Targeted new hires & students in place; SSI faculty supported	SSI faculty & students supported	SSI faculty & students supported; plans for continuation developed

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
d) Leverage NSF & other programs	NSF EPSCoR Track 2; 2 others	NSF EPSCoR Track 2; ADVANCE; MSP; 2 others	NSF EPSCoR Track 2, C2; ADVANCE; MSP; 2 others	NSF EPSCoR C2; ADVANCE; MSP; 2 others	ADVANCE; MSP; 2 others

Objective 11.2:	Provide post-RII sustainability for SSI efforts through external grants, contracts, and other support.
Outcomes and Impacts:	SSI has a post-RII diverse portfolio of external funding - including grants and contracts from federal and state agencies, private sector contracts, private foundation grants, and philanthropic gifts from individual donors – that allows it to retain a critical mass of expertise for sustainability science research.
Key Milestones:	• 4 grant-writing workshops for SSI researchers offered by June 2011. • Relationships with 4 foundations are established by June 2013 • SSI has obtained post-RII external funding of at least $500K by June 2014.
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Provide grant development support for SSI teams	1 grant-writing workshop; NSF Prog, Officer outreach	3 grant-writing workshops; NSF Prog. Off. outreach	Mgt. Team support for collaborative grantwriting; NSF Prog. Off. outreach	Mgt. Team support for collaborative grantwriting; NSF Prog. Off. outreach	Mgt. Team support for collaborative grantwriting; NSF Prog. Off. outreach
b) Expand state and federal agency relationships	Funding opportunities database	Expand database & inventory of contacts; plan scoping meetings	Add: host 4 scoping meetings; make 2 new agency contacts	Add: host 3 more scoping meetings; make 2 new agency contacts	Add: host 3 more scoping meetings; make 2 new agency contacts
c) Develop a base of foundation and private support; build SSI endowment	Needs assessment	Identify foundations with aligned goals	Expand foundation list; cultivate relationships with 2 foundations	Add 2 more foundation relationships; potential endowment donors	Add 2 more foundation relationships; potential endowment donors

Objective 11.3:	SSI is established as a leader in Maine and beyond in creating synergies to solve place-based sustainability science problems.
Outcomes and Impacts:	• SSI is viewed as a valued partner by federal, state, and local government, tribal communities, business and industry, and NGOs, fostering statewide opportunities for sustainable development. • SSI partner institutions have a stronger research and education base that increases their research competitiveness, supports STEM students, and fosters increased academic and stakeholder partnerships in sustainability science.
Key Milestones:	• National Sustainability Science conference held by June 2013.

	• University-stakeholder network established by June 2011.				
Responsibility:	SSI Research Project Director David Hart; SSI Stewardship Council				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Maximize inter-institutional collaboration	Establish SSI Partners prog. for PUI institutions	Implement SSI partner integration efforts	Expand integration efforts across institutions	Expand collaboration via virtual organ. capab.	Prepare for post-RII continuation of partnerships
b) Build a network of university-stakeholder partnerships	Require all SSI projects to have stakeholder participation	Develop stakeholder database	Refine collection process for stakeholder collab. info	Explore ways to further the stakeholder network	Plan for post-RII continuation of stakeholder networks
c) Provide physical & other infrastructure to support R&D agenda	Begin planning for new social science research lab	Continue planning for new lab; plan for SSI Comm. Ctr.	Complete SSI Comm. Ctr. renovation	Complete soc. science lab; equip SSI Comm. Ctr.	Add equipment as needed to both
d) Foster private sector involvement, with a focus on clean technology and a green economy	Establish Economic Dev. Task Force (EDTF); regular meetings	Increase EDTF membership; collaborate w/ Coop. Ext. faculty; host meetings w/ key entities in econ. dev.	Host larger meeting of econ. dev. stakeholders; solicit econ. dev. proposals	Support key econ. devel. investments; co-host business conference	Partner for internship & exchange programs
e) Sponsor national Sustainability Science conference			Begin planning; submit white paper to NSF EPSCoR	Submit proposal to NSF EPSCoR; conference May 2013	Follow-up efforts based on conference

Goal #12: Overall RII Project Management

Implement an effective management plan that will support and ensure the overall success of the Maine EPSCoR RII project.

Context: The Maine Innovation Economy Advisory Board (MIEAB) serves as the Maine EPSCoR state committee and is responsible for oversight and coordination of the state's EPSCoR portfolio to ensure synergy with the Science & Technology Action Plan. Maine EPSCoR at the University of Maine was formally established under a Memorandum of Understanding with the Maine Office of Innovation, and is responsible for the implementation, administration, and evaluation of NSF EPSCoR projects. The Maine EPSCoR Director is responsible for day-to-day program oversight and administration, and works in tandem with the SSI Research project Director. Both report to the NSF EPSCoR RII Project Director (the UMaine Vice President for Research), and both have supporting program and office staff.

Objective 12.1:	Use an effective organizational and management hierarchy for administration and oversight of the overall RII project.
Outcomes and Impacts:	• Management and oversight structure provides a solid foundation for the success of the RII project. • Management teams monitor progress and act as feedback loops for all evaluation and assessment mechanisms.
Key Milestones:	• A hierarchy of management teams and advisory groups is in place by September 2009. • Maine EPSCoR Management Team meets at least monthly to review progress & status, and to review evaluation recommendations (on-going). • Management teams revise SSI Strategic Plan at least annually (on-going).
Responsibility:	Project Director Mike Eckardt; Maine EPSCoR Director Vicki Nemeth; SSI Research Project Director David Hart

Key Performance Metrics (completed by end of each year)

Strategic Actions:	YR1	YR2	YR3	YR4	YR5
a) Maine EPSCoR Management Team primary oversight	Establish team & role; meet monthly	Participate in weekly meetings	Participate in weekly meetings	Participate in weekly meetings	Participate in weekly meetings
b) Other advisory boards & committees utilized	Monthly to quarterly input	Monthly to quarterly input	Monthly to quarterly input	Monthly to quarterly input	Monthly to quarterly input
c) State EPSCoR Committee oversight	Annual updates	Annual updates	Annual updates	Annual updates	Final update

Objective 12.2:	Systems ensure administrative, programmatic, and fiscal integrity for all project components and institutions.
Outcomes and Impacts:	• Effective coordination is fostered between all project components and institutions.

	• Formal policies and procedures ensure common understanding and project integrity.
Key Milestones:	• Put a multi-level, parallel organizational structure in place (by August 2009). • Formalize portfolio team leadership at all institutions, and develop formal guidelines and procedures (by June 2010). • Ensure sufficient staffing and expertise at all levels of the project (on-going).
Responsibility:	Project Director Mike Eckardt; Maine EPSCoR Director Vicki Nemeth; SSI Research Project Director David Hart: Maine EPSCoR & SSI Office personnel

Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Maine EPSCoR & SSI Research Office work in tandem	Set up office roles & procedures	On-going collaborative admin.; meet monthly	On-going collaborative admin.; meet monthly	On-going collaborative admin.; meet monthly	On-going collaborative admin.; meet monthly
b) Formalize project leadership structure, policies, procedures	Develop policies & procedures; meet with all instit. leaders	On-going mentoring in policy & procedures; site visits	On-going mentoring in policy & procedures; site visits	On-going mentoring in policy & procedures; site visits	On-going mentoring in policy & procedures; site visits
c) Annual fiscal responsibility	NSF unoblig. funds <20%; match met	NSF unoblig. funds <20%; match met	NSF unoblig. funds <20%; match met	NSF unoblig. funds <20%; match met	All NSF funds spent; match met
d) Keep abreast of federal program compliance updates	Work with Sponsored Research; attend trainings	Work with Sponsored Research; attend trainings	Work with Sponsored Research; attend trainings	Work with Sponsored Research; attend trainings	Work with Sponsored Research; attend trainings

Goal #13: SSI Research Project Management

Broad coordination of management and decision-making results in a shared vision for SSI research and integrated education, effective interdisciplinary outcomes, and participatory project management.

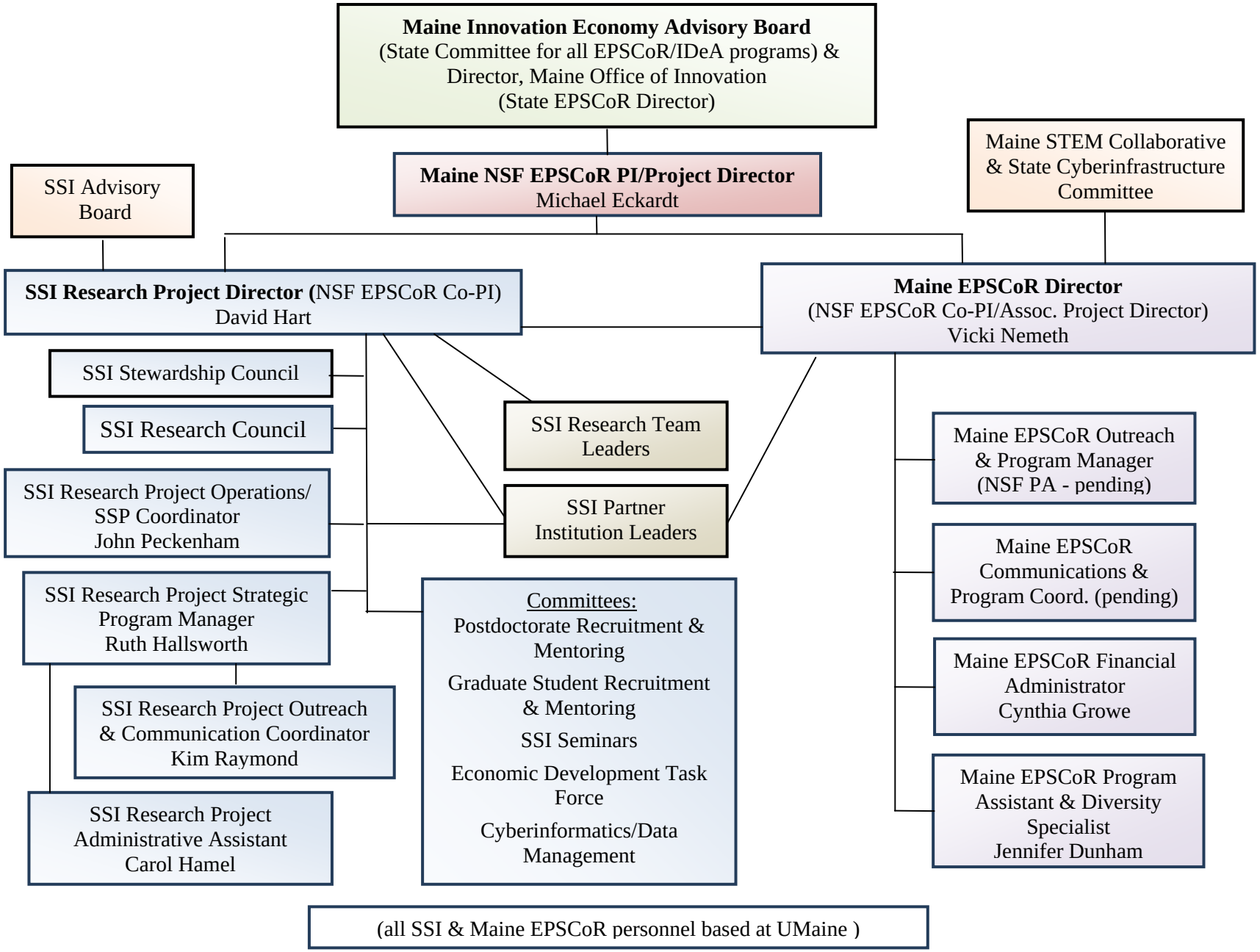
Context: A successful project of this magnitude and complexity depends on a strong management team as well as sufficient staff and expertise to develop, implement, and oversee it. The SSI Research Project Director and his office staff work with the Maine EPSCoR Director and office in a parallel organizational structure that provides effective programmatic and administrative oversight, and contributes to the successful implementation of the research project. Both report to the NSF EPSCoR RII Project Director.

Objective 13.1:	Establish organizational structure and systems that ensure effective communication, coordination and exchange among SSI research teams and SSI management committees.				
Outcomes and Impacts:	• Organizational learning and shared governance foster increased involvement of faculty and a strong commitment to the long-term success of SSI. • SSI has an organizational resilience and capacity to respond to internal and external challenges				
Key Milestones:	• SSI Stewardship Council in place by March 2010. • SSI Research Council in place by June 2011. • SSI Committees involved in respective areas (on-going).				
Responsibility:	SSI Research Director David Hart; SSI Stewardship Council; SSI Research Council; Maine EPSCoR Management Team (Eckardt, Hart, Nemeth)				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Create an SSI organizational/ management structure for research component	Create SSI Stewardship Council; weekly meetings	Add: Create SSI Research Council; monthly meetings; OI feedback refines organ. structure	Add: Res. Council Chair added to Stewardship Council; Mgt. Team joins SC meetings	Add: SSI partner institutions represented on Research Council	On-going
b) Utilize SSI committees	Create committees for graduate, postdoc & faculty recruitment; meet 2-4x	Add: Create curriculum & econ. dev. committees	Add: Create cyber-informatics committee	On-going	On-going

Objective 13.2:	Create internal communication mechanisms, feedback loops, and strategies to ensure the effectiveness of the interdisciplinary SSI research project.				
Outcomes and Impacts:	Participants in the interdisciplinary SSI project are able to collaborate successfully across disciplines, teams, and institutions.				
Key Milestones:	• Internal SSI website developed & in place by June 2011. • Internal SSI newsletter in place by January 2011.				
Responsibility:	SSI Research Director David Hart; SSI Stewardship Council; SSI Research Council; SSI Project Strategic Program Manager Ruth Hallsworth				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Create internal SSI communication networks & networking opportunities	Monthly All-Team meetings; res. retreat; SSI team-building events; conferences; videoconf. meetings	Add: bi-weekly doSSIer internal newsletter; mo nthly SSI discussion groups; MeSSI internal website	Add: interdisciplin. research series of workshops; SSI listserv; SSI Seminar Series	Add: SSI Commun. Ctr. allows for virtual participation by all instit.	On-going
b) Utilize OI to refine systems	On-going	On-going	On-going	On-going	On-going

Objective 13.3:	Establish a system for effectively managing the SSI interdisciplinary research portfolio.				
Outcomes and Impacts:	A matrix organizational approach and a high level of diligence leads to the successful implementation of the SSI portfolio.				
Key Milestones:	• Portfolio matrix system in place by June 2010. • Annual proposal review and evaluation process in place by March 2010.				
Responsibility:	SSI Research Director David Hart; SSI Stewardship Council; SSI Research Council; SSI Project Operations Coordinator John Peckenham; SSI Project Strategic Program Manager Ruth Hallsworth; Maine EPSCoR Management Team				
Key Performance Metrics (completed by end of each year)					
Strategic Actions:	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**
a) Utilize an integrated matrix management system for portfolio of research projects	Planning & development	Map SSI research projects onto matrix	Use OI research to refine	On-going refinement	On-going refinement
b) Create a formal process to annually support & review all projects in portfolio	Create RFP & external review process	Add: refine RFP & review; institute site visits	Add: develop policies for grad student particip. if team dropped	On-going	On-going
c) Develop mechanisms for integration across portfolio		Develop integration projects RFP & review	Support 4 integration projects	Continue integration activities	Continue integration activities

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



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

Acronym	Definition
AAAS	American Association for the Advancement of Science
ADVANCE	An NSF-wide program to increase the participation and advancement of women in academic science and engineering careers
AFRI	Agriculture and Food Research Initiative
AGEP	Alliance for Graduate Education and the Professoriate
AIB	Association of Issuing Bodies
BBN	Bayesian Belief Network
C2	Inter-Campus and Intra-Campus Cyber Connectivity
CAREER	NSF-wide faculty early career development program
CCC	Curriculum and Culture Committee
CCIDS	Center for Community Inclusion & Disability Studies
CETA	Center for Excellence in Teaching and Assessment
CI	Cyber-Informatics
CMIP5	Coupled Model Intercomparison Project Phase 5
CNH	Dynamics of Coupled Natural Human Systems
CSS	Center for Sustainability Solutions
CTE	Career and Technical Education
CUAHSI	Consortium of Universities for the Advancement of Hydrologic Sciences
CZO	Critical Zone Observatories
D-Space	Open source software package that provides the tools for management of digital assets
EAB	Emerald Ash Borer
ECCO	Effects of Climate Change on Organisms
EDC	Education Development Center
EDT	Economic Development Taskforce
EES	Ecology and Environmental Sciences
EHR	Education and Human Resources
EMCC	Eastern Maine Community College
EPA	Environmental Protection Agency
EPSCoR	Experimental Program to Stimulate Competitive Research
FEMA	Federal Emergency Management Agency
FGDC	Federal Geographic Data Committee
FVS	Forest Vegetation Simulator
GB	Gigabyte
Gbps	Gigabit per second
GIS	Geographic Information Systems
HBCU	Historically Black Colleges and Universities
HIS	Hydrologic Information System
HP	Hewlett-Packard
HSI	Hispanic-Serving Institution
HUD	Housing and Urban Development
IBP	Institute for Broadening Participation
IDeA	Institutional Development Award
IDG	Integration Discussion Group

IDR	Interdisciplinary Research
IGERT	Integrative Graduate Education and Research Traineeship Program
IMRC	Innovative Media Research and Commercialization
INBRE	IDeA Networks of Biomedical Research Excellence
IPCC	Intergovernmental Panel on Climate Change
IRB	Institutional Review Board
ISE	Informal Science Education
ISO	International Organization for Standardization
IT	Information Technology
ITEST	Innovative Technology Experience for Students and Teachers
K-12	Kindergarten through 12th grade
K-A	Knowledge-to-Action
LSAMP	Louis Stokes Alliance for Minority Participation
LTER	Long-Term Ecological Research
MaineREN	Maine Research And Education Network
MDIBL	Mount Desert Island Biological Laboratory
ME	Maine
MGCP	Maine Girls Collaborative Project
MIEAB	Maine Innovation Economy Advisory Board
MIT	Massachusetts Institute of Technology
MLTI	Maine Laptop Initiative
MMSA	Maine Mathematics and Science Alliance
MPBN	Maine Public Broadcasting Network
MSP	Math and Science Partnership
MSSM	Maine School of Science and Mathematics
MWC	Maine Water Conference
NAIP	National Aerial Imagery Program
NAS	Network-attached storage
NASA	National Aeronautics and Space Administration
NBII	National Biological Information Infrastructure
NCURA	National Council of University Research Administrators
NEAGEP	Northeastern Alliance for Graduate Education and the Professoriate
NECC	Northeast Cyberinfrastructure Consortium
NED	National Elevation Dataset
NEON	National Ecological Observatory Network
NEREN	Northeast Education and Research Network
NGCP	National Girls Collaborative Project
NGO	Non-Governmental Organization
NHD	National Hydrography Data
NIH	National Institutes of Health
NSEES	Nicholas School of the Environment and Earth Sciences
NSF	National Science Foundation
NWI	National Wetlands Inventory
OI	Organizational Innovation
P-16	Pre-school through undergraduate education
PA	Project Administrator
PD	Project Director
PI	Principal Investigator
PIRE	Partnerships for International Research and Education

POST-GIS	Open source software program that adds support for geographic objects to the PostgreSQL object-relational database
PSP	Physical Sciences Partnership
RAM	Random-access memory
REU	Research Experience for Undergraduates
RFDE	RESTful Framework for Dynamic Client Environments
RFP	Request for Proposals
RII	Research Infrastructure Improvement
RiSE	Research in STEM Education
ROI	Return on Investment
RSV	Reverse Site Visit
RUI	Research in Undergraduate Institutions
S&T	Science and Technology
SBIR	Small Business Innovation Research
SES	Social-Ecological Systems
SESYNC	Socio-Environmental Synthesis Center
SRA International	Society of Research Administrators International
SRN	Sustainability Research Networks
SSI	Sustainability Solutions Initiative
SSP	Sustainability Solutions Initiative Partner institution
SSURGO	Soil Survey Geographic
STEM	Science, Technology, Engineering, and Mathematics
STTR	Small Business Technology Transfer
SURP	Sustainable Urban Regions Project
TB	Terabyte
TCU	Tribal Colleges and Universities
TUES	Transforming Undergraduate Education in Science
UM or UMaine	University of Maine
UMPI	University of Maine at Presque Isle
UNH	University of New Hampshire
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USM	University of Southern Maine
U.S. V.I.	United States Virgin Islands
WaterML	Water Markup Language
WISE	Women Interested in Science and Engineering
YR	Year

Project Participants

MAINE EPSCoR *at* 1865 THE UNIVERSITY OF MAINE

COLLABORATING COLLEGES AND UNIVERSITIES

usm UNIVERSITY OF SOUTHERN MAINE

UNIVERSITY OF MAINE AT AUGUSTA 1965

UMF University of Maine FARMINGTON Maine's Public Liberal Arts College

University of Maine at PRESQUE ISLE North of Ordinary

UNIVERSITY OF MAINE FORT KENT UNIVERSITE DU MAINE

Bates College

Colby

Bowdoin

UNE UNIVERSITY OF NEW ENGLAND

Maine Community College System

UNITY COLLEGE IN MAINE