Maine NSF EPSCoR

NSF Reverse Site Visit

September 13, 2010

Maine EPSCoR

Maine EPSCoR 's
Sustainability Science Initiative

EPS-0904155 award
to the University of Maine
July 1, 2010 to June 30, 2014

PI: Mike Eckardt, NSF EPSCoR Project Director
Co-PI: David Hart, SSI Research Project Director
Co-PI: Vicki Nemeth, Maine EPSCoR Director
Sr. Personnel: Kathleen Bell, SSI Stewardship Council

Maine EPSCoR

- Maine became an EPSCoR state in 1980 (first cohort)
- Maine EPSCoR located at the University of Maine

- operates under an MOU with the Maine Office of Innovation to implement and oversee NSF EPSCoR programs
- UMaine is state's flagship research, education (PhD), and land and sea grant university
- ME NSF EPSCoR RII awards provide the infrastructure needed to create new research centers (single focus)
- Historically very successful in this strategy (AEWC, FBRI, Climate Change)

Introduction

- This project seeks to create a **Center for Sustainability Solutions** at UMaine.
- The selection of the research focus for this proposal involved a rigorous statewide process, including AAAS and state EPSCoR Committee review of pre-proposals.
- The sustainability science focus was highest rated and had the potential for greatest impact for the state at this critical time.

Introduction

The selection of this research focus was supported by:

- 2001 Kates and colleagues noted that producing knowledge and linking it to actions that meet human needs while preserving the planet's life-support systems is one of science's most fundamental challenges.

- Fostering research that improves our ability to live sustainably on Earth has been identified as a critical investment priority in NSF's Strategic Plan (NSF 2006).

Introduction

Maine has a long tradition of developing novel solutions to sustainability challenges, such as water pollution, habitat conservation, and forest management (Judd and Beach 2003).

Focus of Sustainability Science

Introduction

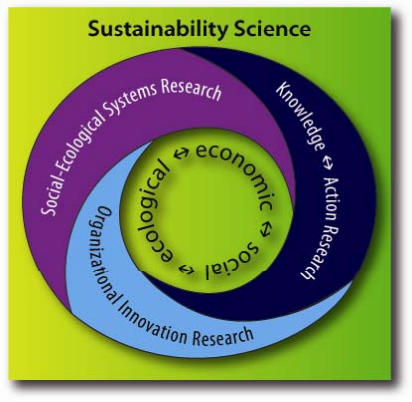
- Natural science & engineering research is necessary but not sufficient alone - expertise existed at UMaine & USM to supplement.
- Ten key faculty members who are now involved in the sustainability project had previously received relevant NSF funding.
- This sustainability research team began functioning 18 months prior to submitting the EPSCoR proposal to lay a preliminary foundation to grow from.
- Group expanded into the Maine EPSCoR Sustainability Solutions Initiative (SSI).

Introduction

Successful sustainability science research requires three components:

- Understanding dynamics of social-ecological systems (SES)
- Understanding & strengthening links between knowledge and action (K-A)
- Overcoming barriers to organizational innovation & interdisciplinary integration (OI)

Central Research Theme



Introduction

SSI Mission: To connect knowledge with action in ways that promote strong economies, vibrant communities, and healthy ecosystems in and beyond Maine.

Vision: Create a Center for Sustainability Solutions that searches for, implements, and evaluates policies and practices that promote economic development while protecting ecosystem health and fostering community well-being.

Overall Research Goal: Create a world-class sustainability science research program focused on the dynamics of social-ecological systems (SES), with an explicit goal of understanding and strengthening connections between knowledge and action (K-A).

Introduction

SSI Core Research Teams:

University of Maine: state's flagship research and education (PhD) institution

University of Southern Maine (PUI & Masters)

Sustainability Solutions Partners (SSP) program:

created to involve undergraduate institutions and community colleges in state:

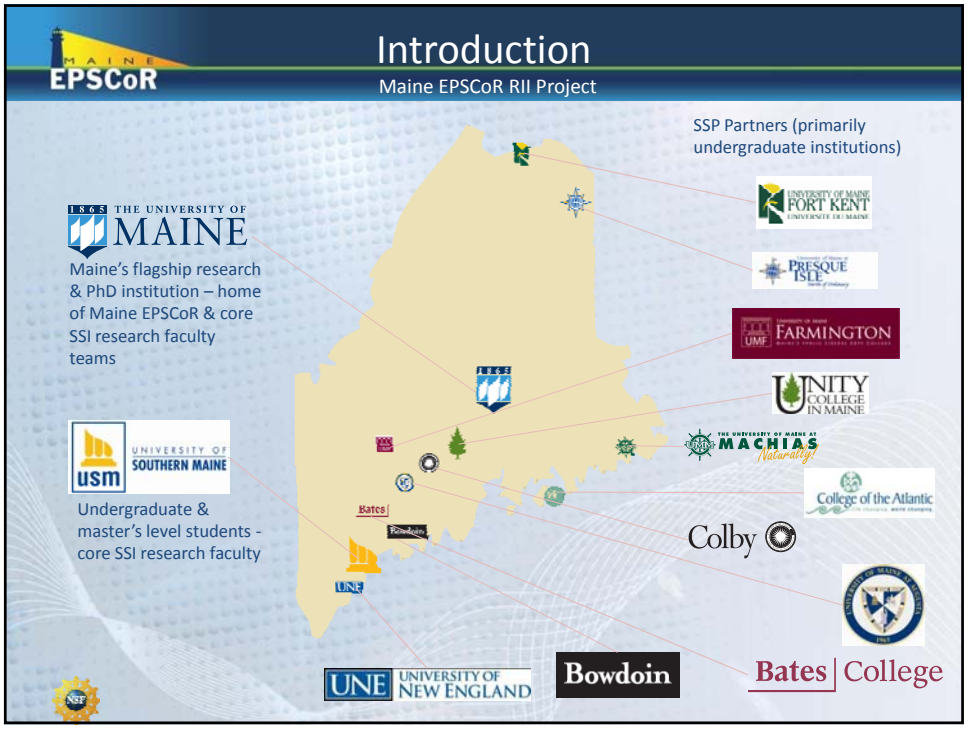
6 private colleges

5 other campuses of University of Maine System

5 community colleges

Introduction

Maine EPSCoR RII Project



Introduction

Presentation Outline

Outline of Presentation

- **Strategic Planning Goals and NSF Criteria**
  - Research and Integrated Education (Goals 1-3)
  - Workforce Development & STEM Education Plan (Goals 4-5)
  - Diversity Plan (Goal 6)
  - Cyberinfrastructure Plan (Goal 7)
  - Outreach and Communication Plan (Goal 8)
  - Management Plan (Goal 9)
  - Evaluation and Assessment Plan (Goals 10-11)
  - Sustainability Plan (Goal 12)
- **Additional NSF Review Criteria**
  - Special Award Conditions
  - Summary of Progress Related to Strategic Plan
  - Significant Challenges & Actions to Address
  - Potential Changes
  - Effectiveness of Project Management & Leadership
  - Strategic Fidelity & Impact
  - Value Added
- **Conclusion**

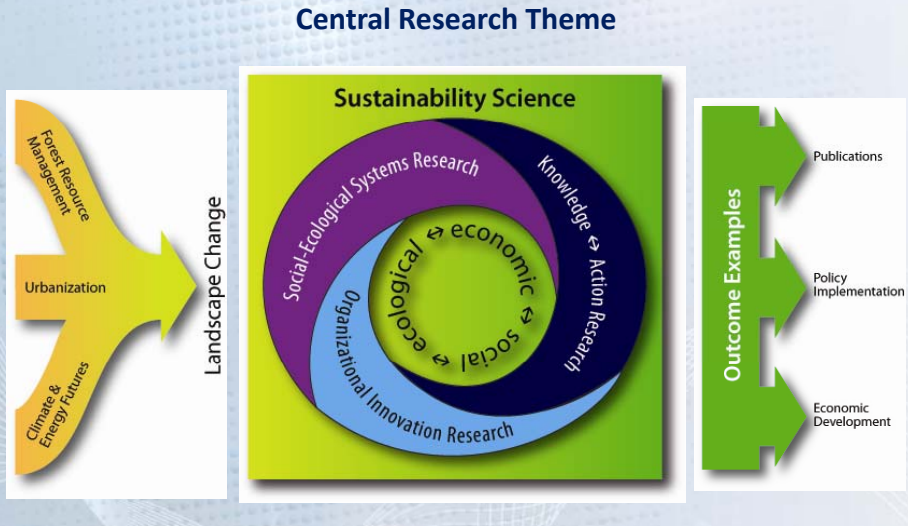
Research and Education

Conceptual Foci

- Dynamics of social-ecological systems (SES)
  - SES thresholds, feedbacks, resilience
  - SES as complex adaptive systems
- Interactions between knowledge and action (K↔A)
  - Salience, credibility, legitimacy
  - Participation, integration, learning, negotiation
- Organizational innovation (OI)
  - Internal and external collaborative processes
  - Harnessing collective intelligence

Research and Education

Conceptual Model



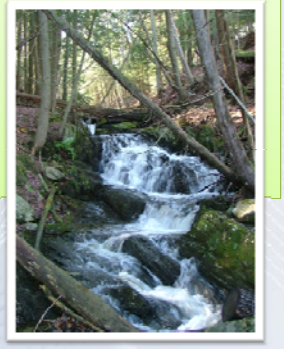
Research and Education

Dynamics of SES

Strategic Plan Goal #1: **Investigate the dynamics of social-ecological systems, with particular emphasis on SES resilience.**

Representative Research Objectives:

- Examine SES feedbacks and thresholds
- Monitor system feedbacks at multiple spatial and temporal scales
- Compare dynamics among landscape arenas



Research and Education

Knowledge and Action

Strategic Plan Goal #2: **Examine connections between scientific knowledge regarding SES dynamics and stakeholder actions that potentially affect SES resilience.**

Representative Research Objectives:

- Assess how SES knowledge affects collective action and governance
- Examine balance between demand for and supply of SES knowledge
- Analyze variations in decision-making processes among landscape contexts

Research and Education

Organizational Innovation

Strategic Plan Goal #3: **Test models from organizational science to understand and improve program effectiveness**

Representative Research Objectives:

- Investigate factors facilitating and hindering interdisciplinary collaboration
- Analyze university-stakeholder engagement processes to increase value of research for decision making

Research and Education

Landscape Change

Strategic Plan Goal #4: **Focus on landscape change as a productive research nexus.**

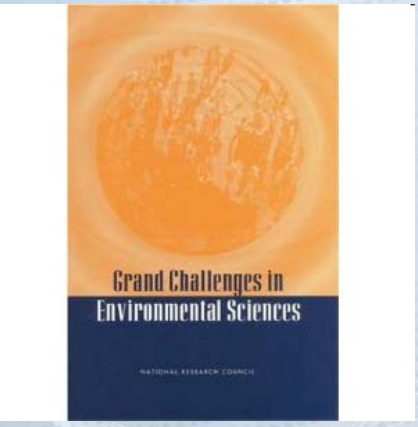
Representative Research Objectives:

- Interactions among three critical drivers of landscape change (i.e., urbanization, forest ecosystem management, climate/energy nexus)
- Develop research portfolio to determine how system context affects potential for generalization and cross-problem integration
- Evaluate intersecting ecological, social, and economic dimensions of landscape dynamics

Research and Education

Landscape Change

Landscape change as a model system:



National Research Council, 2001.

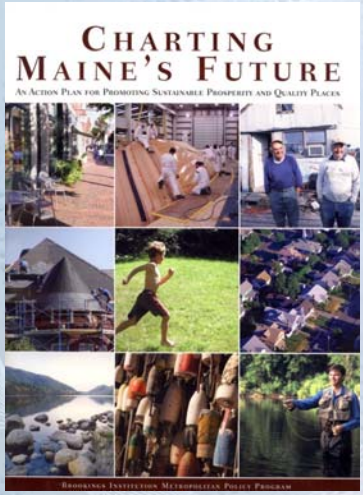
Grand challenges in environmental sciences.

National Academy Press, Washington, D.C.

Research and Education

Landscape Change

Landscape change as a model system:



Brookings Institution, 2006

Charting Maine's future: An action plan for promoting sustainable prosperity and quality places.

Metropolitan Policy Program, Brookings Institution, Washington, D.C.

Research and Education

Progress Goals #1-3

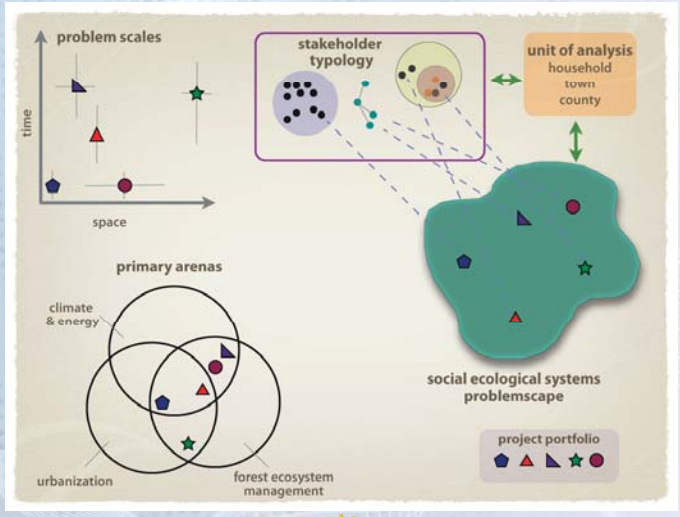
Developed research portfolio strategy for investigating SES, K↔A, and OI

- Compare and contrast
- Evaluate role of context
- Examine scale dependence
- Harness breadth of faculty expertise
- Respond to diverse stakeholders

Research and Education

Progress Goals #1-3

Developed research portfolio strategy for investigating SES, K↔A, and OI



Research and Education

Progress Goals #1-3

Developed research portfolio strategy for investigating SES, K↔A, and OI

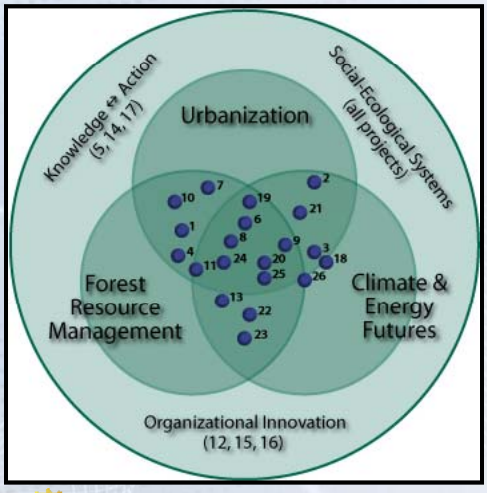
- Designed multiple RFPs and review processes to create and manage research portfolio.
  - YR1 RFP for SSI and SSP teams (Fall 2009)
  - YR2 Integration RFP (Summer 2010)
- Created Science Advisory Board with relevant expertise to guide development and management of research portfolio.
  - Board and Team Research Retreat (December 2009)
- Developed organizational structure to manage portfolio and increase program visibility.
- Recruited faculty and students to fill identified gaps relevant to research and education objectives.
- Provided relevant SES and K-A training and educational experiences for faculty and students.
- Engaged with diverse stakeholders throughout Maine.

Research and Education

Progress Goals #1-3

Implemented research portfolio strategy for investigating SES, K↔A, and OI

Launched 23 integrated research projects in sustainability portfolio



Research and Education

Progress Goals #1-3

Implemented research portfolio strategy for investigating SES, K↔A, and OI

Research and Education

Progress Goals #1-3

Portfolio Example:

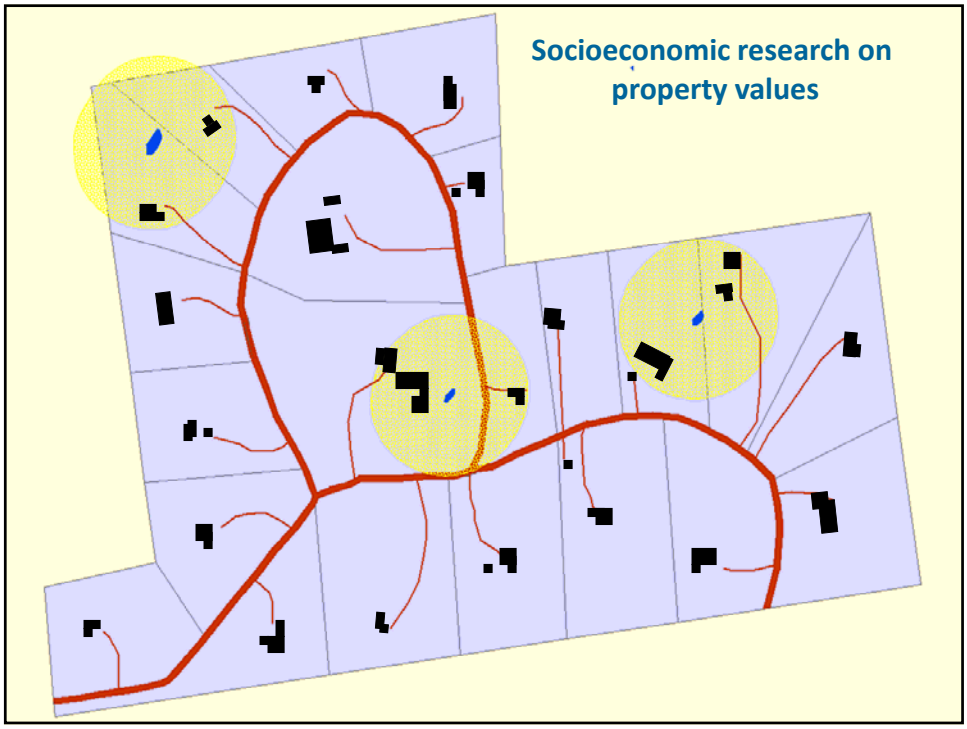
Wetland protection and municipal planning

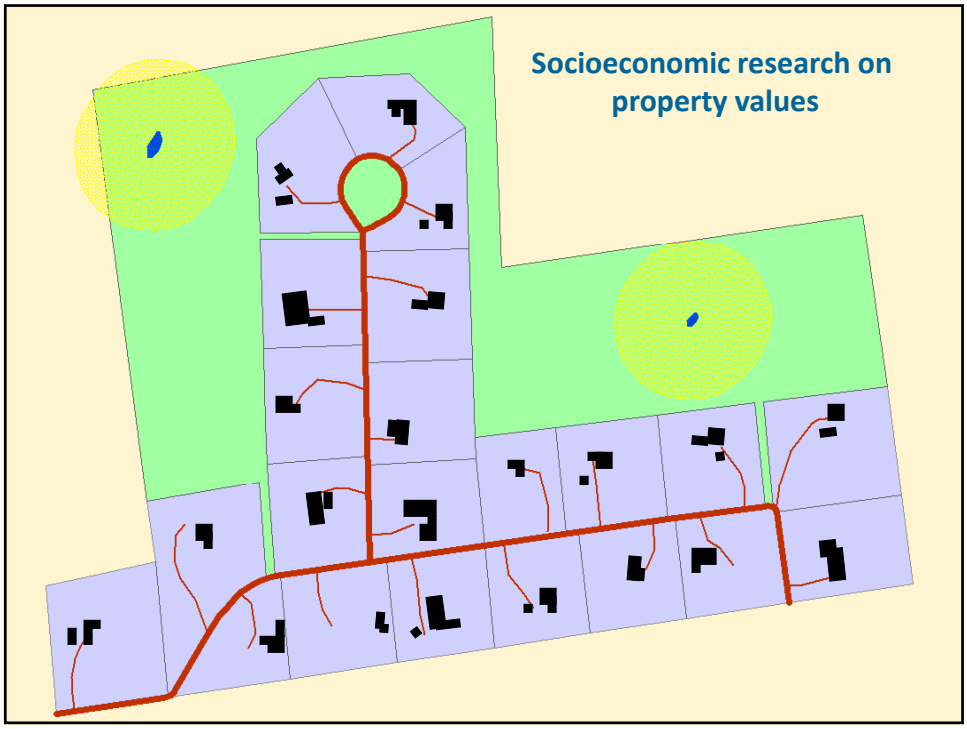
- SES
  - Interactions between landscape permeability and property values
- K↔A
  - Factors affecting willingness to participate in collaborative conservation planning

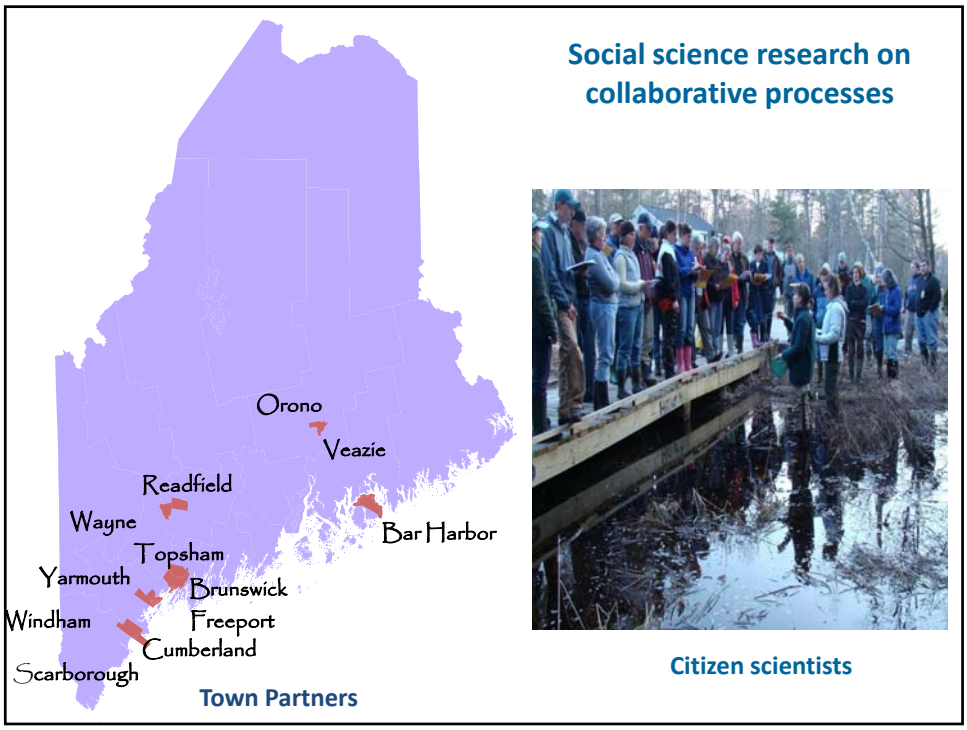
Research and Education

Progress Goals #1-3

Biophysical research on amphibian dispersal in heterogeneous landscapes




Socioeconomic research on property values


Social science research on collaborative processes
Orono
Veazie
Readfield
Wayne
Bar Harbor
Topsham
Yarmouth
Brunswick
Windham
Freeport
Cumberland
Scarborough
Town Partners
Citizen scientists

Research and Education

Progress Goals #1-3

Portfolio Example:
Wetland Protection and Municipal Planning

Project Progress:

- Supported three doctoral students
- Initiated research on dispersal and habitat use in heterogeneous landscapes
- Initiated research on economic barriers to natural resource protection
- Held many meetings with agencies, town planners, tax assessors, citizen scientists, conservation groups, developers, etc.
- Expanded collaborations across UMaine, USM, and University of Maine Law School
- NSF EPSCoR funding helped secure $85K grant from private foundation

Research and Education

Overall Progress

Increased Human Infrastructure

Progress:

- 3 new faculty hired (ecological modeler, social-ecological systems modeler, urban modeler)
- Interviews in progress for 1 additional new faculty position
- 2 postdoctoral fellows hired (2 searches in progress)
- 4 SSI doctoral students began spring 2010
- 11 SSI doctoral students began fall 2010
- 2 SSI Native American students began fall 2010 (M.S.)
- 36 other graduate students supported & involved
- Search underway for YR3 cohort of SSI doctoral students

Research and Education

Overall Progress

Increased recognition and competitiveness:

Progress:

- Published 18 journal articles
- Conducted 113 professional presentations
- Submitted 19 grant proposals ($6.3M)
- Designed social science lab, which will be augmented by $3.6M in funding from state for Innovative Industries Initiative
- Hosted international environmental communication conference
- Created largest interdisciplinary higher education collaboration in Maine's history

Research and Education

Progress Goals #1-3

Progress in Research Collaboration:

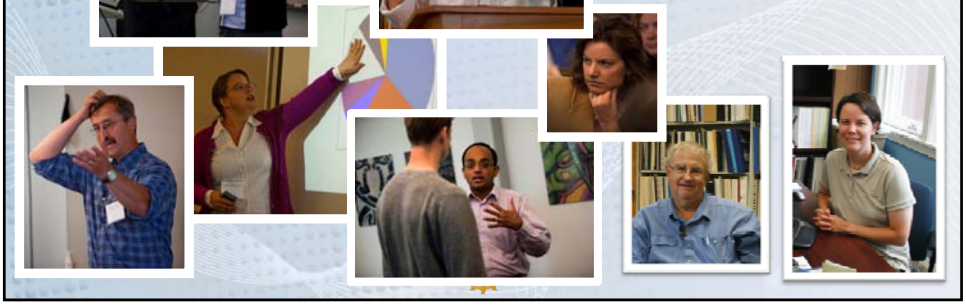
- 87 faculty involved statewide

Research and Education

Progress Goals #1-3

Progress in Research Collaboration:

- 17+ disciplines
- 11 institutions
- 100+ stakeholders



Research and Education

SSI Faculty Video

Research and Education

Broader impacts

Progress:

- Integrated research, teaching, and training activities:
  - Developed interdisciplinary, research-based courses
  - Funded 150+ student research and training opportunities
- Increased participation of under-represented groups:
  - Female faculty & doctoral, undergraduate, & high school students
  - Native American mentoring program
  - Academic institutions throughout Maine
- Disseminated knowledge widely to professional and public audiences
- Enhanced infrastructure for research and education:
  - Designed and leveraged funding for social science research lab
  - Formed extensive research and stakeholder networks

Research and Education

Broader Impacts

Analyzing processes contributing to achievement of Broader Impacts:

- Dissemination to enhance scientific and technological understanding
  - Effectiveness of alternative strategies for communicating complex information
- Benefits to society
  - Influence of information on decision-making

Research and Education

Broader Impacts

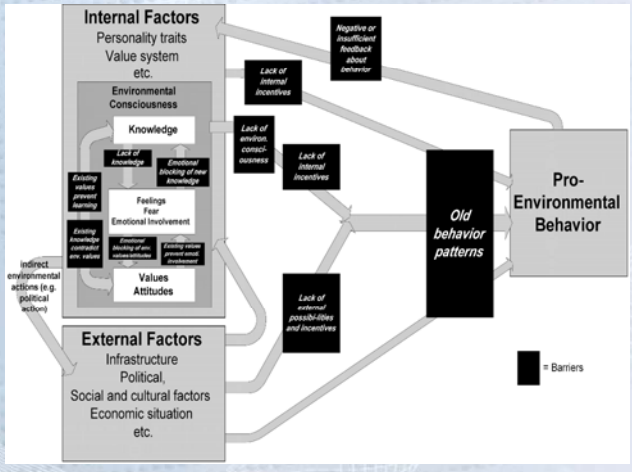
Knowledge deficit model

Kollmuss and Agyeman, 2002. *Environmental Education Research* 8:239-260

Research and Education

Broader Impacts

Alternative, multi-factor model



Kollmuss and Agyeman, 2002. *Environmental Education Research* 8:239-260

Workforce Development Plan

SSI/SSP Students

Strategic Plan Goal #4: **Foster the next generation of sustainability science professionals through programs that are linked to the diverse challenges and opportunities in this emerging field.**

Objective 4.1: Increase Maine's overall capacity for producing sustainability science professionals.

Progress – Graduate Students:

- Supported 40 graduate students in SSI research internships

Workforce Development Plan

SSI/SSP Students

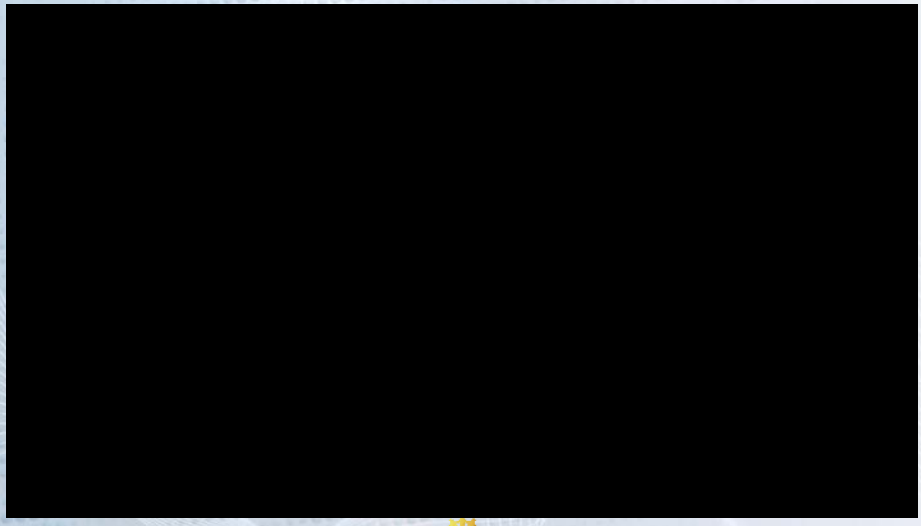
Progress – Graduate Students continued:

- Developing sustainability science curriculum :
  - Offered 2 new UMaine graduate courses (spring & summer 2010 for 27 students)
  - Offering new UMaine graduate course for incoming cohort (fall 2010)
  - Tasked Culture & Curriculum Committee to develop curriculum plan for graduate & undergraduate students & develop NSF IGERT proposal
- Sponsored 15 SSI conferences and seminars (85 students attended)
- Provided travel support to 5 graduate students to participate in national conferences

Workforce Development Plan

SSI/SSP Students

SSI Graduate Student Video:

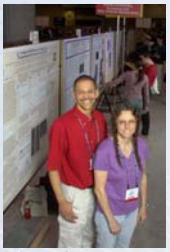


Workforce Development Plan

SSI/SSP Students

Progress – Undergraduate Students:

- 90 undergraduate students supported in SSI/SSP research internships (academic year and summer) at all participating institutions
- Curriculum development:
  (pull from SSP proposals)



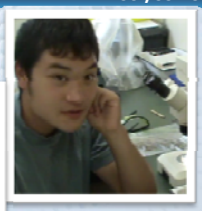
- Quote from the President of an SSP institution about the impact that the SSP program has had on their college already:
  "While it has been challenging for their faculty, they were committed to the program because for the students it has been almost a 'life-changing' opportunity."

Workforce Development Plan

SSI/SSP Students

SSP Undergraduates:

UMF students



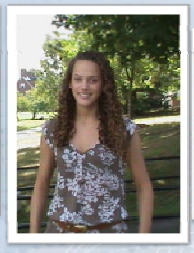
Dimetry Scoot-UMF

Keith Grivois -UMPI

William Almeida and Gale Loescher-UNE

Ben Towne -Bowdoin

Holly Jacobson -Bowdoin



Danielle Sheppard -Colby

Sarah Ryan-UMPI

Ari Leach-Unity

Workforce Development Plan

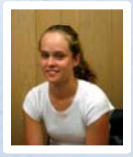
High school program

Progress: High School Research Internship Program:

21 students from Orono and Bangor High Schools participated in summer 2010 internships with UMaine faculty

Orono High School:

Siobhan Harrity



Andria Foster

Avery Cole

Ben Koehler

Daniel Lesser

Jess Richards

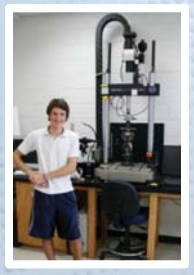
Karl Koehler

Mark Rowe

Workforce Development Plan

High school program

Orono High School:



Alex Bulteel

Paul Ono

Paul Robinson

Zachary Caron

Rachel Balaban-Garber

Bangor High School:

Phil Benoit

Norah Bird

Addison Brewer

Laura Pasquine

Workforce Development Plan

STEM Education

High school student video:

Workforce Development Plan

SSI/SSP Faculty & Staff

Objective 4.2: Support SSI & SSP faculty and postdoctoral associate development and mentoring activities

Progress:

- Research retreats:
  - 50 SSI faculty participated in initial planning retreat (August 2009)
  - 48 SSI faculty, 12 graduate students, 10 staff participated in second two-day retreat to showcase research progress (May 2010)
- xxx SSI/SSP faculty participated in International Environmental Communication Symposium at UMaine (May 2010)
- SSI grant-writing workshop (35 participants)
- SSI Seminar Series – x speakers, x attendees
- Support for travel to xxx conferences

Workforce Development Plan

STEM Education

Strategic Plan Goal #5: **Prepare Maine's current and future STEM workforce through coordinated programs and opportunities, training, and knowledge dissemination.**

Maine STEM Collaborative

Created as a statewide partnership of education, research, business, government, and non-profit sectors.

Governed by Steering Committee of 16 organizations; 300+ general members.

- Maine DOE limited ability to engage in STEM programming
- Large network in state of non-profit or university-based STEM programs
- Integration/collaboration traditionally minimal
- not targeting identified needs with research-based curriculum

Workforce Development Plan

STEM Education

Objective #5.1: Take a leadership role in building, integrating , and coordinating STEM efforts in Maine for greater effectiveness and impact.

Maine EPSCoR Progress:

- seeking to create systemic change for state
- serves on Maine STEM Collaborative Executive Committee
- facilitates strategic planning for Collaborative (May 2010 retreat)
- creating database of existing STEM programs, activities, organizations, etc. in state
- supports statewide STEM programs and activities
- provides seed funding grants for STEM
- coordinates RII STEM with Collaborative efforts
- utilizes Collaborative as part of feedback loop for RII STEM

Workforce Development Plan

STEM Education

Objective #5.2: Promote educator professional and leadership development in STEM, and foster STEM approaches and activities that value prior learning across subjects.

Progress:

- RISE Center workshop June 2010
- Governors Leadership Academy fall 2009
- SSP teacher PD
- NSF MSPs
- STEM Schools grant program
- STEM Partnership grant program

Workforce Development Plan

STEM Education

Objective #5.3: Promote STEM careers and their pathways.

Progress:

- January 2010: Maine STEM Summit
  - 338 participants (K-20 teachers & admin., business, government, non-profits, students, etc.)
  - Highlighted Maine's emerging R&D areas and need for STEM workforce
  - Included several SSI presentations
- Introducing Career Pathways program

Workforce Development Plan

STEM Education

Objective #5.4: Demonstrate the link between investments in STEM and Maine's economic vitality.

Progress:

Maine EPSCoR involved in (through Collaborative):

- **LD-1101:** "Resolve, To Understand and Assist in Efforts To Promote Science, Technology, Engineering and Math Education," sponsored by Sen. Elizabeth Schneider (Orono) July 2009.
- Maine DOE STEM Strategic Plan subsequently required by legislature (pending landscape studies)
- Maine DOE Environmental Literacy plan underway
- Maine DOL longitudinal study award received

Workforce Development Plan

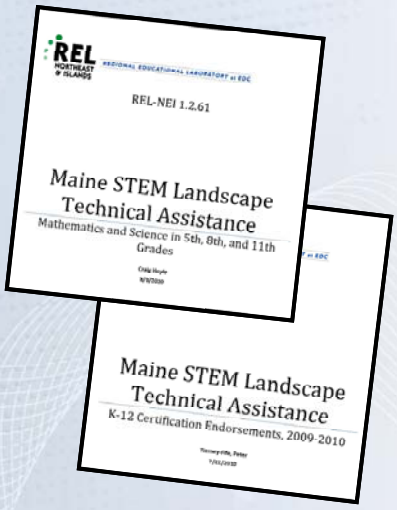
STEM Education

Objective #5.5: Promote measurement systems to monitor and evaluate STEM.

Progress:

Baseline Studies needed:

1) Statewide STEM capacity study (Education Development Center)
2) K-12 student achievement (Regional Educational Laboratory NE at EDC)
3) K-12 certification endorsements (REL)
4) K-12 Teacher survey (MMSA)
5) K-12 student aspirations (MICDL)
6) ME DOL workforce STEM needs
7) ME informal STEM programs and organizations (ME EPSCoR)



Workforce Development Plan

STEM Education

Objective #5.6: Implement and support special STEM programs and opportunities that directly engage students and teachers.

Progress – Student Involvement continued:

- Research assistantships for graduate, undergraduate, and high school students
- Native
- NGCP & EYH

Diversity Plan

Institutional Diversity

Strategic Plan Goal #6: **Engage all aspects of the state's human and institutional resources in the achievement of the RII project goals and objectives.**

Objective 6.1: Expand institutional diversity in this project (academic level, geographic, disciplinary):

Progress:

- Core SSI at UMaine and USM
- Sustainability Solutions Partners (SSP) program created for statewide involvement
- YR1 awards to six private colleges: Bates College, Bowdoin College, Colby College, College of the Atlantic, University of New England, Unity College
- YR1 awards to three UMaine system colleges (planning grants): UM Presque Isle, UM Farmington, and UM Fort Kent
- YR2: two others will be added: UM Augusta & UM Machias
- YR2-5: one community college will be added each year as possible

Diversity Plan

Institutional Diversity

YR1 RII Progress:

- Other collaborators:
  - higher ed (x)
  - industry/business (x)
  - state govt (x)
  - non-profit & other (x)
- (photos)

Diversity Plan

Individual Diversity

Objective 6.2: Broaden participation through increased individual diversity.

While Maine fluctuates between the first or second least diverse state in the nation with minorities consisting of ~3% of the population, Maine EPSCoR has a demonstrated commitment to programs and activities that broaden the participation of women and underrepresented groups in STEM.

Diversity Plan

Individual Diversity

Progress:

- **of 264 individuals directly supported YR1: 47% female and 5% underrepresented**
  (previous RII final year: 32% female, 4 % underrepresented)

Directly Supported Personnel:	YR1 Benchmarks							
	Total	Males	Females	Blacks or African Americans	Hispanics	Other Ethnic	Persons with Disabilities	Unknown
Core faculty	53	35	18	1	0	3	2	0
Collaborative faculty	34	23	11	0	0	0	0	0
Postdocs	2	2	0	0	0	0	0	0
Graduate students	40	14	26	1	0	0	0	0
Undergraduate students	81	38	43	2	0	1	1	0
High school students	21	12	9	0	0	1	0	0
Professional/ Administrative staff	33	16	17	1	0	1	0	0
TOTALS:	264	140	124	5	0	6	3	0
Direct Overall %:		53%	47%	2%	0%	2%	1%	0%

Note: Other ethnic is primarily Native American

Diversity Plan

Individual Diversity

- **of 3,524 indirectly supported participants YR1: (through programming)**
  - **58% female and 8% underrepresented**
  (previous RII final year: 41% female, 4% underrepresented)

Indirectly Supported Participants:	YR1 Benchmarks							
	Total	Males	Females	Blacks or African Americans	Hispanics	Other Ethnic	Persons with Disabilities	Unknown
ARI Faculty	353	207	146	2	4	6	0	0
PUI Faculty	84	39	45	0	0	0	0	0
Graduate students	270	121	149	0	0	0	0	0
ARI Undergrad students	122	38	84	0	1	32	0	0
PUI Undergrad students	310	121	189	0	0	20	0	9
K-12 teachers & pre-service teachers	257	112	145	0	0	0	0	0
High school students	107	55	52	0	0	90	0	0
Middle school students	1025	255	770	0	0	110	0	0
Elementary school students	150	75	75	0	0	0	0	0
Technical/Professional/ Administrative staff	131	45	86	0	0	0	0	0
Business/Industry	94	63	31	0	0	0	0	0
NGO/Government	315	180	135	1	0	31	0	0
General Public	306	153	153	0	0	1	0	0
TOTALS:	3524	1464	2060	3	5	290	0	9
Indirect Overall %		42%	58%	0%	0%	8%	0%	0%

Note: Other ethnic is primarily Native American

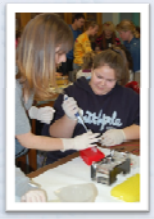
Diversity Plan

Broadening Participation – Women & other groups

Maine EPSCoR program collaborations to broaden participation:

Progress:

- Women and girls:
  - UM Women's Resource Center
    - Expanding Your Horizons (middle school)
    - NSF National Girls Collaborative Project
  - NSF ADVANCE grant (recommended for funding)
- Persons with Disabilities:
  - USM Eastern Alliance in STEM (EAST) program
  - UM Center for Community Inclusion
- First generation/low income:
  - Upward Bound summer program
  - McNair Scholars program proposal (under development)
- Institute for Broadening Participation (recruitment)



Diversity Plan

Broadening Participation – Native Americans

Native STEM Scholarship Development Program

Progress:

- Coordinated by Darren Ranco, UMaine's Coordinator of Native American Research
- Also SSI faculty PI for Emerald Ash Borer invasive species project
- Critically important cultural and economic issue for Maine tribal communities
- Sponsored stakeholder workshop May 2010
- Held brown ash seed collection workshop August 2010 for Jr/Sr high school students & families, with follow-up field trip in October

Diversity Plan

Broadening Participation – Native Americans

Native STEM Scholarship Development Program

Progress:

- Native American Collaborative Research Assistantships for two new SSI graduate students (begin September 2010)
-
- need rest….

Cyberinfrastructure Plan

Introduction

Strategic Plan Goal #7: **Implement new cyberinfrastructure to improve communication, collaboration, and visualization capabilities that enable innovation and competitiveness in the sustainability science focus area.**

Created state CI Committee:

•Jeff Letourneau, Assoc. Dir. Communications & Network Services, UMaine System
•John Gregory, UMaine Director of Information Technologies
•Bruce Segee, Director UMaine Supercomputer
•Cathy Renault, Director Maine Office of Innovation (Science Advisor to the Governor)
•Ad hoc: Mike Eckardt, UMaine Vice President Research (NSF EPSCoR PD)
•Ad hoc: Vicki Nemeth, UMaine Director Research Administration and Maine EPSCoR

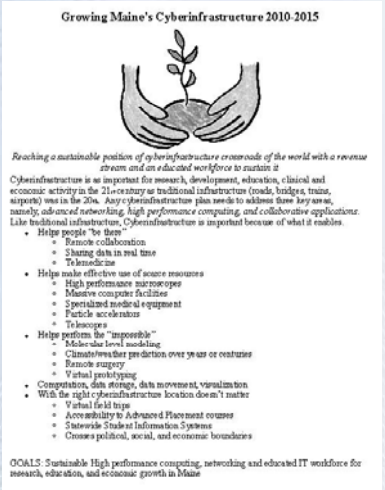
Developed Maine Cyberinfrastructure Plan:

- addresses the R&D needs of the state's EPSCoR/IDeA community, K-12 and higher education systems, libraries, and non-profit institutions
- in alignment with Maine's Science and Technology Plan

Cyberinfrastructure Plan

Introduction

- CI Committee members briefed the Governor, key state legislators, and the Maine EPSCoR Committee (MIEAB) on the development of a Maine CI Plan (Growing Maine's Cyberinfrastructure 2010-2015).
- Resulting plan aligns with a broader Northeast Region plan to address connectivity, high-performance computing, virtual organizations, and scientific collaborations.



Growing Maine's Cyberinfrastructure 2010-2015

Reaching a sustainable position of cyberinfrastructure crossroads of the world with a revenue stream and an educated workforce to sustain it

Cyberinfrastructure is as important for research, development, education, clinical and economic activity in the 21st century as traditional infrastructure (roads, bridges, trains, airports) was in the 20th. Any cyberinfrastructure plan needs to address three key areas, namely, *advanced networking, high performance computing, and collaborative applications.* Like traditional infrastructure, Cyberinfrastructure is important because of what it enables.

- Helps people "be there"
  - Remote collaboration
  - Sharing data in real time
  - Telemedicine
- Helps make effective use of scarce resources
  - High performance microscopes
  - Massive computer facilities
  - Specialized medical equipment
  - Particle accelerators
  - Telescopes
- Helps perform the "impossible"
  - Molecular level modeling
  - Climate/weather prediction over years or centuries
  - Remote surgery
  - Virtual prototyping
- Computation, data storage, data movement, visualization
- With the right cyberinfrastructure location doesn't matter
  - Virtual field trips
  - Accessibility to Advanced Placement courses
  - Statewide Student Information Systems
  - Crosses political, social, and economic boundaries

GOALS: Sustainable High performance computing, networking and educated IT workforce for research, education, and economic growth in Maine

Cyberinfrastructure Plan

Introduction

CI Collaborators include:

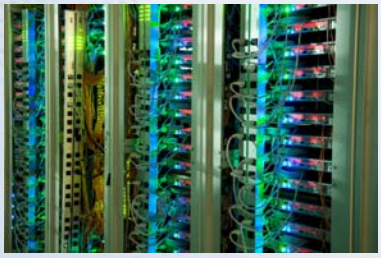
- CIOs from leading regional research institutions
- Northeast Cyberinfrastructure Consortium (NECC) NSF EPSCoR Track 2 RII with VT, NH, RI, DE
- NE Research and Education Networks (NEREN)
- National R&E Networks (CANARIE and Internet2)

Cyberinfrastructure Plan

Introduction

UMaine supercomputer cluster:

- 512 CPUs
- 120 terabyte data storage backbone
- real-time graphic rendering server
- provides state and region with processing and data storage capabilities



Cyberinfrastructure Plan

Introduction

Leveraging of CI efforts enabled accomplishment of Phase I of CI plan:

- BTOP: $25M BTOP broadband infrastructure award
  - CI Committee assisted Maine-based Internet Service Provider in a successful proposal.
  - Provides the new, critically-needed fiber routes for middle mile fiber throughout rural areas of state.
  - Lays foundation for Maine EPSCoR's future CI efforts.
- NSF EPSCoR Track 2 RII (NECC): IRUs (utilizing above) to extend state's research and education fiber optic network
- NIH INBRE CI Supplement: dense wave division multiplexing equipment to "light" the new fiber routes
- NSF EPSCoR Track 1 RII: communication, visualization, and data tools for end-users to take advantage of above increased bandwidth capabilities in state.

Cyberinfrastructure Plan

Videoconferencing & Bandwidth Capabilities

Objective 7.1: Expand statewide videoconferencing capabilities and upgrade high bandwidth fiber interconnections.

Progress:

- Tandberg 30-port High Definition videoconferencing Multipoint Control Unit was installed for statewide use (allows larger #s of participants)
- Tandberg videoconference systems installed at: (adding to existing videoconferencing network)
  - Maine Mathematics & Science Alliance (Maine STEM Collaborative home) in Augusta
  - USM Law School in Portland (pending) (SSI core faculty team)
- High bandwidth Gigabit Ethernet switches installed in 13 buildings at UMaine (facilitate SSI research collaborations)
- Webcams and training provided for 16 researchers throughout Maine – additional training scheduled for upcoming state conference

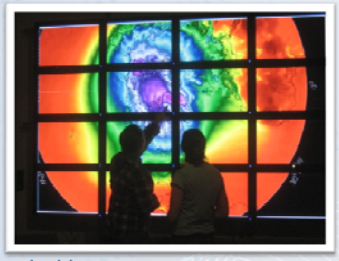
Cyberinfrastructure Plan

Communication & Visualization Tools

Objective 7.2: Make new communication & visualization tools available.

Progress:

- Significant advances and improvement to the proto-type visualization wall, which now permits high-definition video to be displayed in real time.



- Undergraduates funded by a NSF REU project are using this new system.
- Leveraged NSF ITEST project that focuses on modeling and visualization in climate change using UMaine's supercomputer and the Maine Laptop Initiative in middle schools throughout Maine.

Cyberinfrastructure Plan

Data Management

Objective 7.3: Develop plans and systems for data handling across research projects and institutions

Progress:

- Committee created to evaluate the data needs for the overall project.
- Members:
  - Sudarshan Chawathe, Computer Science, UMaine
  - Charles Colgan, Muskie School of Public Service, USM
  - Shaleen Jain, Civil & Environmental Engineering, UMaine
  - Stephen Cousins, Research Assoc., Supercomputer, UMaine
  - John Koskie, Program Manager, Supercomputer, UMaine
  - Bruce Segee, Director of UMaine Supercomputer, Dept. of Electrical and Computer Engineering, UMaine
- A dedicated server (messi.target.maine.edu) established and linked to 120TB disk storage system at UMaine supercomputer.
- Data management plan being developed so that the system can grow over time without data loss or user disruption.

Outreach and Communication Plan

Project Communication Networks

Strategic Plan Goal #8: **Create and maintain an effective outreach & communication network through strategies that encompass all participants, stakeholders, and the general public.**

Objective 8.1: Create and maintain an effective communication network that enables information sharing among participants and partners and fosters effective collaboration.

Progress:

- Regular meetings to maintain network:
  - Weekly SSI Stewardship Council meetings
  - Monthly SSI team meetings (videoconferenced)
- Formed 5 SSI committees to promote communication, outreach, data sharing, and collaboration
- Distributed monthly on-line doSSIer
- Formed SSP leadership network conducted site visits


SUSTAINABILITY SOLUTIONS INITIATIVE

MAINE doSSIer

Outreach and Communication Plan

Science community & Stakeholders

Objective 8.2: Communicate research progress and results to the scientific community and establish communication networks with stakeholders.

Progress:

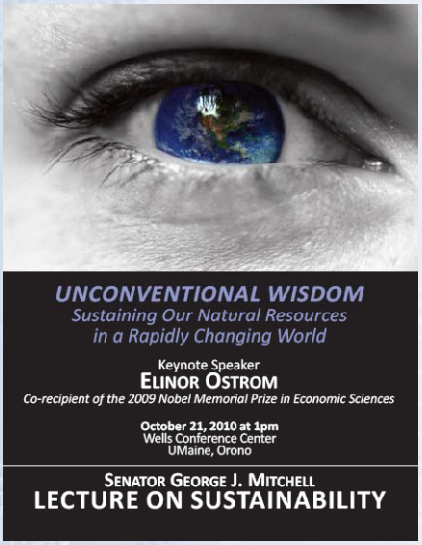
- ***Broader science community:***
  - Published 18 journal articles
  - Delivered 113 posters/research presentations
  - Hosted key researcher visits
  - Sponsored and co-sponsored key seminars:
    - Jon Foley, U Minn
    - Elena Irwin, Ohio State
    - 16 seminars by SSI faculty and postdoctoral candidates
  - Hosted 2010 International Environmental Communication Symposium

Outreach and Communication Plan

Stakeholders

➢***Stakeholders:***

- Researching communication networks
- Integrated 100 + stakeholders directly into research program:
  - •9 industry/business partnerships
  - • 9 State Govt. Agency
  - •41 non-profits and other organizations
  - •20 institutions of higher education
- Hosted events for broad groups of stakeholders:
  - • 28 workshops and seminars
  - • SSI Kick-Off Lecture with Former Governor Angus King (2009)
  - • 2010 Senator George J. Mitchell Lecture on Sustainability (pending)



Outreach and Communication Plan

General public

Objective 8.3: **Build scientific literacy in sustainability science for the general public and K-12 community.**

Progress:

➢Maine EPSCoR newsletter

Outreach and Communication Plan

General public

Progress:

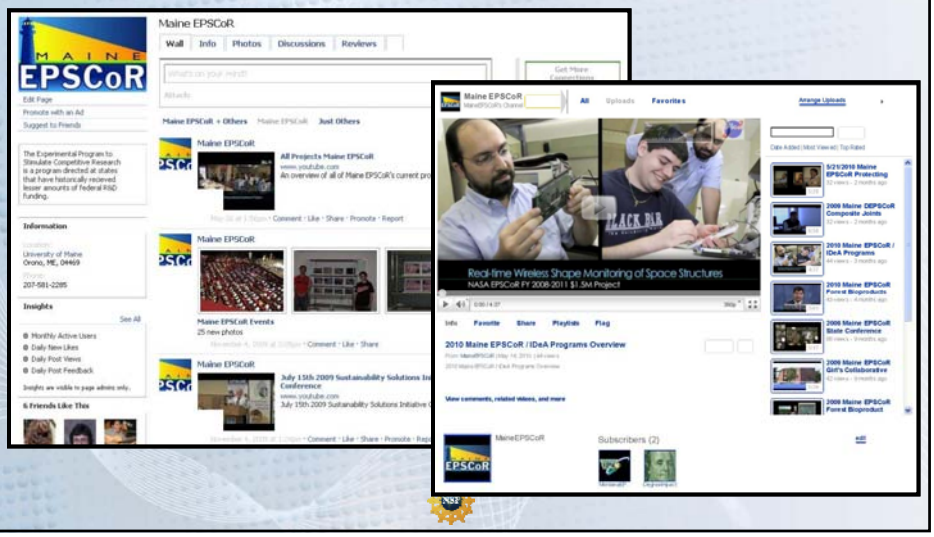
- Exhibits created for events
- Presentations to community organizations and non-profit groups
- Maine Public Broadcasting Network collaboration

Outreach and Communication Plan

General public

Progress:

- Social networking sites: YouTube videos, Facebook page, Twitter (pending)



Outreach and Communication Plan

General public

- **Media Releases/UMaine Articles**

UMaine News, 7/30/10 - Researchers Hope to Stop Emerald Ash Borer Before it Reaches Maine

UMaine Today, Dec. 09 - No Small Threat

UMaine News, 7/15/09 - UMaine Announces $20M NSF Grant for Sustainability Initiative

- **Media Coverage**

8/8/2010 Morning Sentinel - Docks to Doorways: new project calls for public access, green space and a resource center

6/27/2010 Portland Press Herald - Advocates: Neighbors most accountable for lake quality

5/22/2010 Bangor Daily News - UMaine addresses environmental communication

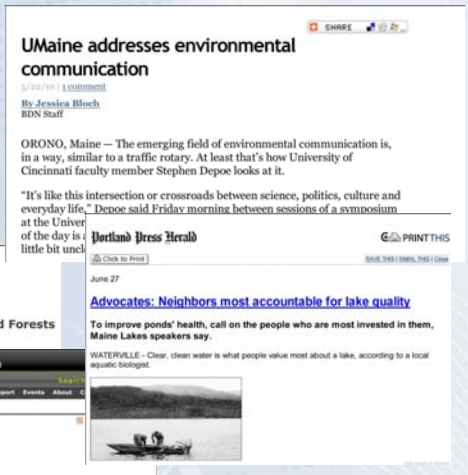
Outreach and Communication Plan

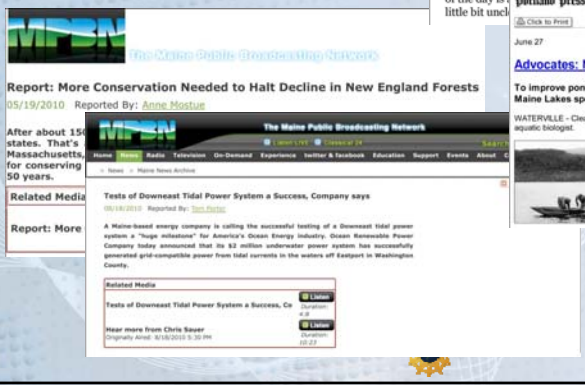
General public

- **Radio Coverage**

8/18/10 MPBN - Report: Tests of Downeast Tidal Power System a Success, Company says

5/19/10 MPBN - Report: More Conservation Needed to Halt Decline in New England Forests



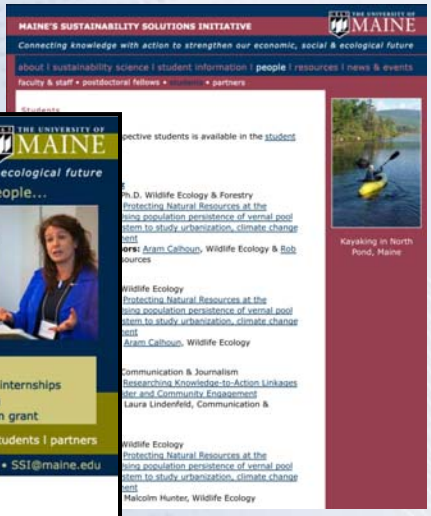


Outreach and Communication Plan

RII Project websites

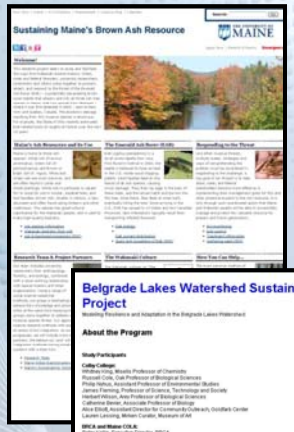
RII Research Project websites:

http://www.umaine.edu/sustainabilitysolutions



Outreach and Communication Plan

General public



Sustaining Maine's Brown Ash Resource

Community based conservation

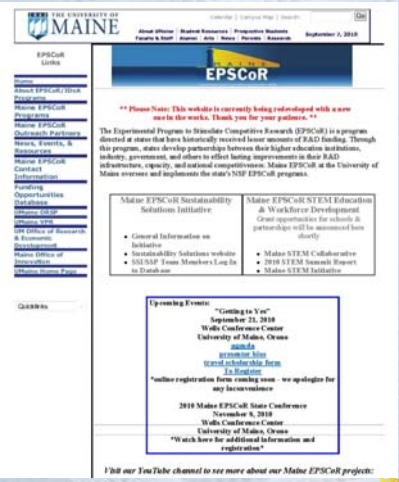
Sebago Watershed modeling tool demo site

www.colby.edu/epscor

Outreach and Communication Plan

RII Project websites

www.umaine.edu/epscor
(being redeveloped)



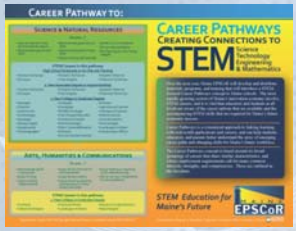
www.mainestem.org
Maine STEM Collaborative

Outreach and Communication Plan

K-12 Community

Progress:

- Maine STEM Collaborative general membership communications & presentations
- Exhibits and presentations at Maine STEM teacher conferences
- 2010 Maine STEM Summit report distributed (1,000 print, 1,000 e-mail)
- Maine STEM Career Pathways brochure introduced



Outreach and Communication Plan

NSF EPSCoR Community

Objective 8.4: Maintain outreach and communication with the NSF EPSCoR office and other EPSCoR jurisdictions.

Progress:

- September 2009: NSF EPSCoR Program Officer site visit for Maine EPSCoR State Conference, and SSI Strategic Planning session with evaluators
- Annual reports, highlights, newsletter, evaluation & advisory board reports to NSF EPSCoR
- Attendance and presentations at NSF EPSCoR conferences and meetings:
  - October 2009 NSF EPSCoR National Conference, DC – Maine's SSI
  - May 2010 NSF EPSCoR PD/PA meeting, DC
  - March 2010 Arkansas STEM workshop – Maine's STEM Collaborative
  - May 2010 PA Best Practices meeting, DC – SSI Project Management
- Informal Project Administrators community networking
- Networking with other EPSCoR jurisdictions on Track 2, NIH INBRE CI supplements, and other grant opportunities to leverage Track 1 infrastructure investment.

Management Plan

Overall Maine EPSCoR RII Project

Strategic Plan Goal #9: **Implement an effective management plan that will support and ensure the overall success of the Maine EPSCoR RII project.**

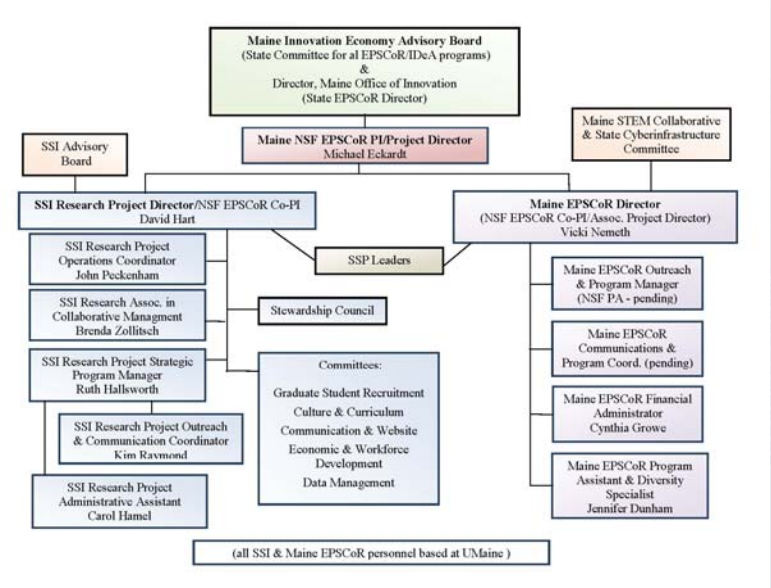
Objective 9.1: Management systems are in place to allow for effective coordination, communication, and integration of all program components at all institutions.

Progress:

- Statewide oversight by Maine EPSCoR State Committee
- Management team has direct oversight over all aspects
- Tandem, but highly integrated, organizational project structure:
  - SSI office: responsible for all research and integrated education components
  - Maine EPSCoR office: responsible for all other components

Management Plan

Overall Maine EPSCoR RII Project



Management Plan

SSI Research Project

Strategic Plan Goal #10: 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.

Progress on objectives:

- Established organizational structure
  - Created SSI Stewardship Council
    - Diverse expertise, experience, and project roles
  - Created 5 SSI Committees to develop and implement policies
  - Hired collaboration expert to facilitate policy and process development
  - Established Science Advisory Board, monthly discussions with Chair
- Established communication and feedback loops
  - Monthly all-team meetings, SSI website, doSSIer newsletter, SSI-SSP meetings

Management Plan

SSI Research Project

Progress continued:

- Employed OI research to study and strengthen interdisciplinary collaboration
  - Quantitative and qualitative research to assess values, attitudes, and behaviors
  - Identification and implementation of "best practices" for collaboration
- Established system for managing interdisciplinary research projects
  - Implemented process for soliciting, reviewing, and funding research proposals
  - Progress reports and presentations by research teams
- SSP Institutions
  - research oversight by SSI, administrative by Maine EPSCoR office
  - YR1 initial site visits; YR2 site visits this fall to assess progress
  - utilize Faculty/Staff Profile Database for on-line reporting
  - K-A team dedicated to SSP training and integration

Evaluation and Assessment Plan

External evaluation

Strategic Plan Goal #11: **Utilize multiple formative and summative evaluation processes to improve the project's effectiveness and assess its impact in relation to its goals.**

Five-pronged approach:

1) External independent evaluators (annual)
2) AAAS Assessment (twice during project)
3) SSI Advisory Board (on-going)
4) NSF EPSCoR office (on-going)
5) Internal project evaluation (on-going)

Evaluation and Assessment Plan

External evaluation

Objective 11.1: Contract with experienced external evaluators to annually assess the project's performance.

External Evaluators:
Dr. Eric Welch, University of Illinois, Chicago
Dr. Julia Melkers, Georgia Institute of Technology

➢**Evaluation design includes:**
- quantitative and qualitative longitudinal study over five year project
- formative evaluation to provide feedback to Maine EPSCoR management
- Summative evaluation to provide outcome measures and analysis for NSF EPSCoR and external stakeholders

➢**Evaluation schedule:**
- Site visits annually around Maine EPSCoR State Conference (as applicable)
- On-line surveys and other data collection activities on-going as needed

Evaluation and Assessment Plan

External evaluation

YR1 Progress:
➢Three day site visit by evaluators September 2009:
- Participated in 2009 Maine EPSCoR State Conference
- Participated in NSF-EPSCoR mandated Strategic Planning session
- allowed for co-development of final evaluation plan for project

➢Baseline survey and social network analysis completed (Dec. 2009-Jan. 2010)

YR2 plans:
➢Evaluator site visit November 2010 to conduct interviews and participate in 2010 Maine EPSCoR State Conference
➢Additional surveys and analysis throughout year
➢YR2 report and recommendations March 2011

Evaluation and Assessment Plan

AAAS Assessment

Objective 11.2: Utilize AAAS to provide a scientific peer review that ensures high quality program delivery.

American Association for Advancement of Science (AAAS)

Two assessments planned during 5-year project:

- 2-3 days with panel of 4-5 national experts
- Interviews with project leadership, research teams, students, outreach participants, stakeholders, industry/business, and university/state/government leaders
- First site visit: scheduled March 2011 (YR2)
- Second site visit: tentative March 2013 (YR4)

Evaluation and Assessment Plan

SSI Advisory Board

Objective 11.3: An SSI Advisory Board will provide on-going assessment and guidance to the research project team.

Progress:

- Established SSI Advisory Board to provide ongoing assessment and guidance
- Members and affiliations:
  - Bob Kates (Chair), Presidential Professor of Sustainability Science, University of Maine
  - Nancy Dickson, Senior Researcher, Kennedy School of Government, Harvard University
  - Morgan Grove, USDA Forest Service
  - Susan Hanson, Research Professor, Clark University
  - George Jacobson, Professor Emeritus, UMaine and Maine State Climatologist
  - Ted Koffman, Executive Director, Maine Audubon
  - Thomas Parris, Vice-President for Sustainability, ISciences, LLC
  - Pam Person, Climate Change Task Force, League of Women Voters
  - Tarla Rai Peterson, Professor & Boone and Crockett Chair, Dept. of Wildlife and Fisheries Science, Texas A&M University
  - Kenneth Young, Executive Director, Kennebec Valley Council of Government

Bob Kates, NAS

Evaluation and Assessment Plan

SSI Advisory Board

Progress:

- First meeting December 15, 2009:
  - Briefings and Q&A with all SSI research teams
- Regular communication (> once per month) with Board Chair
- Continued input from Board:
  - Evaluation of research progress
  - Advice to SSI management re suggested program modifications
  - Enhanced networking (regional, national, international)
- Implementation of Board feedback via SSI Stewardship Council and Organizational Innovation research team

Evaluation and Assessment Plan

SSI Advisory Board & External Evaluators Recommendations

YR1 SSI Advisory Board & External Evaluators Recommendations:

- ***Recommendation #1*: Need for greater development of interdisciplinary capacity.**

Response:

- Increased support for existing interdisciplinary teams
- Training in interdisciplinary "best practices" led by members of SSI Organizational Innovation team
- Recruitment of new faculty, postdoctoral fellows, and doctoral students
- Hiring of expert in collaborative processes

Evaluation and Assessment Plan

SSI Advisory Board & External Evaluators Recommendations

YR1 SSI Advisory Board & External Evaluators Recommendations:

- ***Recommendation #2:*** Need for increased stakeholder engagement.

Response:

- Training in engagement "best practices" led by members of SSI Organizational Innovation team
- Creation of an integrative Knowledge-Action team serving multiple SSI and SSP projects to facilitate and study engagement processes
- Hiring of expert in collaborative processes

Evaluation and Assessment Plan

SSI Advisory Board & External Evaluators Recommendations

YR1 Recommendations continued:

- ***Recommendation #3:*** Need for greater integration across research portfolio.

Response:

- Creation of integration RFP, proposal review underway
- Recruitment of new postdoctoral fellows and faculty to focus on integrative strategies
- Proposed workshop on strategies for research integration

Evaluation and Assessment Plan

SSI Advisory Board & External Evaluators Recommendations

YR1 Recommendations continued:

- ***Recommendation #4***: Address issues raised by low interest in using cybertechnology.
  Response: YR2 includes small-group training workshops using webcams, videoconferencing, social networking, etc. for communication.

- ***Recommendation #5*:** Continue to develop the Faculty/Staff, Student, and Stakeholder databases.
  Response: Faculty/Staff/Student Profile Database customized and expanded May 2010 for all SSI and SSP reporting. Stakeholder database updated by SSI office.

Evaluation and Assessment Plan

NSF EPSCoR

Objective 11.4: Participate in NSF EPSCoR reverse site visits and site visits, and Project Director/Project Administrator meetings and trainings.

NSF EPSCoR Reverse Site Visits:
YR2: September 2010 (current)
YR4: September 2012

NSF EPSCoR Site Visits: (tentative)
YR3: July 2011 to June 2012
YR5: July 2013 to June 2014

Other Maine EPSCoR activities:
YR1: September 2009 Maine EPSCoR State Conference – program officer site visit & participation in strategic planning session

Other NSF EPSCoR activities:
YR1: May 2010 Project Administrator Best Practices workshop

Evaluation and Assessment Plan

Internal

Objective 11.5: Maine EPSCoR management teams engage in on-going evaluation and assessment to ensure that the project achieves goals, objectives, and benchmarks.

Maine EPSCoR Management Team:
Meets monthly to review progress, challenges, and actions needed, using all inputs as feedback loops.

➢ ***SSI/SSP research progress, challenges, issues, and actions addressed by:***
- SSI Stewardship Council (weekly)
- SSI Research Council: (pending – monthly)
- SSI Research Teams (monthly)
- SSP Research Teams: (3-4 times a year in person; other on-going)

➢ ***Maine EPSCoR Office:***
- On-going financial review
- On-line reporting databases
- On-going benchmarks assessment

- SSP Site visits (1-2 times/year) to assess progress & address issues

- Maine STEM Collaborative: meets monthly & provides feedback loop on outreach efforts

Sustainability Plan

Research

Strategic Plan Goal #12: **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.**

Progress to meet objectives through:

➢ **Project outputs:**
- Human Resource infrastructure:
  - Positions directly supported: 264
  - New hires: 3 faculty, 2 postdocs, 18 graduate, 90 undergraduate, 21 high school students, 1 administrative
  - Participants: 3,524
- Publications: 18 scientific journal articles; six websites
- Proposals:
  - Submitted: 19/$6.3M
  - Awarded: 9/$2.4M
  - Pending: 8 /$3.7M

Sustainability Plan

Research

Progress to meet objectives through synergies & partnerships:

- Fostered increased commitment to interdisciplinary collaboration
  - Creation of new research teams and partnerships
  - Matching departmental support for SSI graduate students
- Built state-wide network of university-stakeholder partnerships
  - SSI and SSP projects span wide range of Maine's geography, communities, and concerns
  - Increased recognition for role of higher education in serving state's needs
- Exploring new opportunities for jurisdictional, regional, national, and international collaboration\

Sustainability Plan

Research

Progress to meet objectives through increased funding:

- **Leveraging other NSF programs:**
  - Awarded:
    - NSF ADVANCE (recommended for funding)
    - NSF EPSCoR RII Track 2
    - NSF MSP (collaborator with ME Center for Research in STEM Education)
  - Submitted & pending:
    - NSF CAREER (Jain, McGill)
  - Under development:
    - NSF Informal Science Education (Silka, Lindenfeld)
    - NSF IGERT
    - NSF EPSCoR C2
- **Other proposal collaborations:**
  - USDA-AFRI (two proposals)

Sustainability Plan

Research

Progress continued:

- Launched economic development taskforce
  - Identifying and sharing market opportunities with private sector
    - Collaborating with existing economic development and innovation networks (MEIT, E2TECH)
  - Advancing innovation curriculum
    - Training problem-solvers - interdisciplinary, modeling, communication skills
  - Expanding ongoing economic development activities
    - Knowledge transfer alliance
    - Wind and tidal energy

Sustainability Plan

Research

Progress continued:

- External funding from a diverse set of institutions
  - Private foundations:
    - Sewall Foundation grant
    - Environmental Funders Network (Leahy)
  - Cultivating relationships with current and potential future donors:
    - DeAngelis Endowment Fund
    - Flanders Fund for Student Research
- Commitment of on-going, long-term base support for proposed Center for Sustainability Solutions by UMaine VPR

Sustainability Plan

Research

Progress continued:

➢**Increased capacity and competitiveness through:**

- Branding Maine as a leader in sustainability science
  - Mitchell Lecture 2010 (Elinor Ostrom, 2009 Nobel Prize winner)

- Expanded base of interest and experience in solutions-driven, interdisciplinary research involving faculty from throughout Maine

- Wide array of stakeholders value opportunities to collaborate with university researchers due to growing focus on linking knowledge with action

- Expansion of interdisciplinary teamwork and university-community partnerships leads to stronger social networks and greater support for science-based decision-making

Special Conditions Progress

RII Project

NSF EPSCoR Special Terms and Conditions:

➢Meet required cost share of 20%:
- Met required cost share of $800,000
- Plus additional YR1 cost contributions of $645,645

➢Ensure participant support funds not used for other expenses:
- Participant support costs are tracked in a separate account

NSF EPSCoR General Terms and Conditions:

➢ Key Personnel: no changes

➢ Project Governance ensures efficient and effective performance:
- Project organization structured to maximize success
- NSF-mandated strategic planning session Sept. 2009 (within three months of award) and plan submitted within one month

➢ Reporting requirements:
- Annual report submitted with required components
- YR1 unobligated funds: $465,285 (11.6%) not spent but committed

Strategic Plan Progress

Summation

- As detailed in previous slides, the YR1 focus has been on developing the research and education infrastructure to support a large project of this size.
- All strategic plan components were addressed as outlined or at a greater level.
- Achieved or exceeded majority of benchmarks for YR1 in all project component areas.
- Major exceptions are:
  - One faculty new hire in interview process
  - Two postdoctoral fellowship positions in search process
  - Two professional staff positions in search process

Challenges and Actions

SSI Research

- **Challenges identified by evaluators & advisory board**
  - Greater integration across SSI projects
  - Broader focus on major issues regarding Maine's future
  - Increased responsiveness to stakeholder needs
  - More solutions-driven approach
- **Corresponding actions being taken:**
  - Focus on increased research integration via RFP (awards Oct. 15)
  - Multiple discussions with SSI team regarding integrative research strategies and potential benefits (research retreats)
  - New faculty will add greatly to integrative capacity
- **Other challenges & actions:**
  - new hires (in process)
  - data management plan

Challenges and Actions

Maine EPSCoR

- **Challenge of SSP institutions:**
  - Inclusion sometimes difficult (more limited expertise & faculty numbers)
  - For many this is their first large federal award – don't have administrative or programmatic expertise
  - Since primary teaching institutions, difficult to travel for meetings
- **Actions:**
  - working with all to mentor
  - Altered funding year to September-August (assures summer funding)
  - Allowing greater educational focus than research when needed
  - Videoconferencing when possible for meetings & trainings

- **Challenges of Workforce Development plan:**
  - Lack of cohesive, meaningful baseline data for STEM in state
- **Actions:**
  - Engaging in statewide landscape studies to provide

Potential Changes

- No substantial changes to scope of RII project.

- Modification of some strategies in response to challenges and opportunities.

Management/Leadership Effectiveness

Promoting the Specific Infrastructure Investment Areas

Annual briefings of:

- Key state legislative committees, e.g., Business, Research & Economic Development
- Departmental Commissioners, DEP
- MIEAB (done YR1)
- Federal delegation

Media presentations on significant findings

Management/Leadership Effectiveness

Strengthening the Noted Research Focus Area(s)

SSI Stewardship Council

- provides hands-on leadership for all facets of SSI
- has substantial expertise in SES, K-A, and OI, three drivers of landscape change, and project management
- fills many liaison roles between research teams, SSI committees, and Maine EPSCoR management
- played central role in searches for all new SSI modeling faculty and postdoctoral fellows
- is developing leadership capacity to support succession planning for effective long-term leadership

ADD PHOTOS OF SC MEMBERS!

Management/Leadership Effectiveness

Integrating Research With Education and Innovation

- Stewardship Council works with OI researchers to identify and implement best practices for mentoring SSI doctoral students
  - SSI Open House for Graduate Students enhances recruitment success
  - SSI graduate coordinator role expands and facilitates mentoring and conflict resolution
- SSI students trained in interdisciplinary collaboration
- SSI students trained university-stakeholder collaboration

Management/Leadership Effectiveness

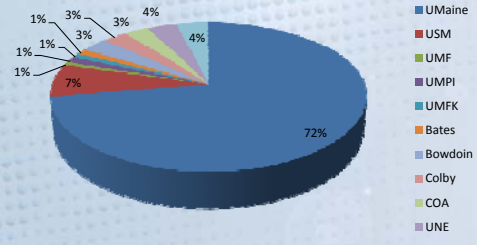
Employing Appropriate Evaluation System for Measuring Project Outputs and Outcomes

Sum up evaluation and assessment plan?
Benchmarks table
Faculty/Staff Profile Database

Management/Leadership Effectiveness

Allocating Financial Resources

Distribution of award by institution:



Strategic Fidelity and Impact

Summation

- Fostered innovative research collaborations and stakeholder partnerships to strengthen competitiveness in sustainability science:
  - Unprecedented state-wide collaboration
  - Increased national and recognition of Maine as leader in sustainability science research
- Coordinated infrastructure, education, external engagement, and technology transfer plans
- Development and measurement of outputs and outcomes for all components of SSI

Strategic Fidelity and Impact

State S&T plan

- Developed research infrastructure plans in response to state-wide strengths, opportunities, and barriers
  - Aligned with 2010 Maine Science and Technology Action Plan to "Create an environment where science, technology, innovation, and entrepreneurship stimulate Maine's economy."
  - Support 4 of Maine's 7 targeted sectors
  - Support goals and objectives to:
    - Increase R&D to public and private sector
    - Increase employment by building innovation capacity
    - Increase per-capita income by increasing the skills of Maine workers

Value Added

Research, Education, and Innovation

- Coordinated research and education to add value across institutions, jurisdiction, and region
- Developed metrics to measure additional value
- Enhancing Infrastructure with Social Science Research Lab
- Launched economic development taskforce
- Adding capacity to state's current & future workforce infrastructure:
  - Hired 3 SES Modeling Faculty
  - Interviews underway for Watershed Modeler
  - Hired 2 SSI Postdoctoral Fellows
  - Supported 40 graduate students, 90 undergraduate students, and 21 high school students
  - Recruited strong SSI Doctoral Cohort of 15
  - Formed new Native American Collaborative Research program (2 M.S. Students Participating)

Value Added

Economic Development

- Launched economic development taskforce
  - Identifying and sharing market opportunities with private sector
    - Collaborating with existing economic development and innovation networks (MEIT, E2TECH)
  - Advancing innovation curriculum
    - Training problem-solvers - interdisciplinary, modeling, communication skills
  - Expanding ongoing economic development activities
    - Knowledge transfer alliance
    - Wind and tidal energy
- Developing plans consistent with Maine Science and Technology Plan

Conclusion

Maine EPSCoR Press Conference Video

Conclusion

- SSI is taking on a leadership role in this integrated type of sustainability science, which has not been undertaken before.
- This is a unique and trans-disciplinary project, which is especially challenging given the statewide participation of non-research oriented institutions.
- For a comprehensive, statewide project of this magnitude and complexity, progress in YR1 has been significant.
- Well-positioned for YR2 implementation and expansion, and to set the stage for impacts and outcomes that will truly benefit Maine's quality of place.

Iterative Strategy

Extra slide