Maine EPSCoR

NSF EPSCoR

Informational Meeting Presentation

November 1, 2012

About EPSCoR

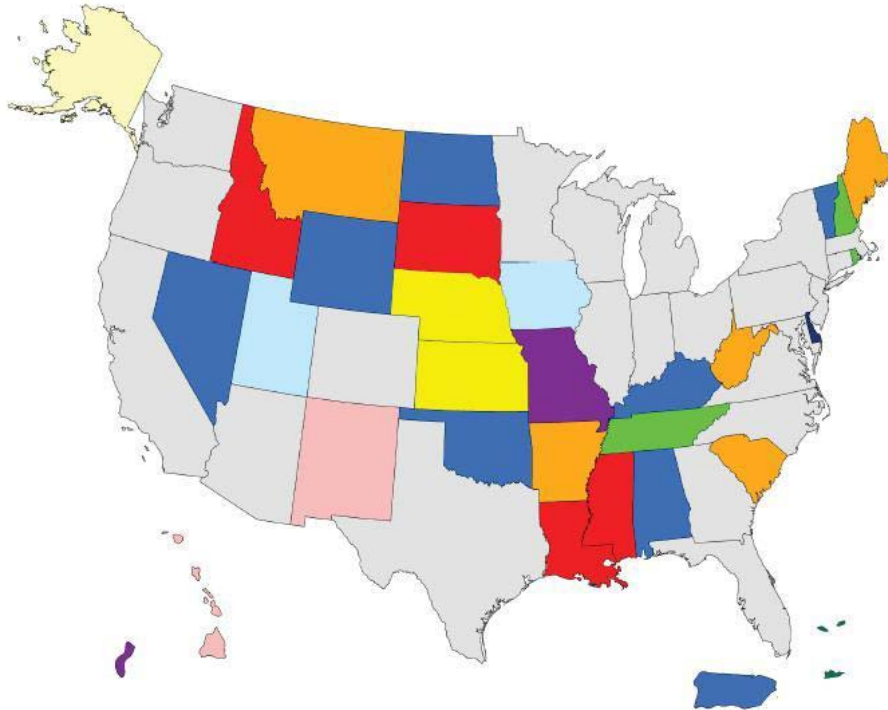### EPSCoR =Experimental Program to Stimulate Competitive Research

➢ Initiated by NSF in 1978

➢ Federal program directed at states that have historically received lesser amounts of federal R&D funding.

➢ Other federal agencies currently also participate: NIH, DOE, NASA, USDA (plus DOD & EPA in the past).

EPSCoR Jurisdictions

1980	1985	1987	2000	2003	2009
Arkansas	Alabama	Idaho	Alaska	Delaware	Iowa
Maine	Kentucky	Louisiana			Utah
Montana	Nevada	Mississippi	**2001**	**2004**	
South Carolina	North Dakota	South Dakota	Hawaii	New Hampshire	**2012**
West Virginia	Oklahoma	**1992**	New Mexico	Rhode Island	Guam
	Puerto Rico	Kansas	**2002**	Tennessee	Missouri
	Vermont	Nebraska	U.S. Virgin Islands		
	Wyoming				

➢ Currently 28 states plus Puerto Rico, the U.S. Virgin Islands, and Guam are eligible to participate.

➢ Maine qualified for the very first cohort (1980).

NSF EPSCoR Program Synopsis

➢ The EPSCoR investment is for multi-institutional and interdisciplinary projects that provide physical, human and cyberinfrastructure aimed at improving research competitiveness in a state.

➢ States develop partnerships between higher education, government, and industry that are designed to effect sustainable improvements in a state's research infrastructure, R&D capacity, and it's national competitiveness.

NSF EPSCoR

➢ NSF EPSCoR is within the NSF Office of Integrative Activities (OIA)

➢ High visibility program.

➢ Highly scrutinized for outcomes and ROI.

➢ Therefore high accountability at all levels.

NSF EPSCoR Mission and Goals

The mission of EPSCoR is to assist the National Science Foundation in its statutory function "to strengthen research and education in science and engineering throughout the United States and to avoid undue concentration of such research and education."

➢ **Goal #1:** provide strategic programs and opportunities that stimulate sustainable improvements in a jurisdiction's R&D capacity and competitiveness.

➢ **Goal #2:** to advance science and engineering capabilities in EPSCoR jurisdictions for discovery, innovation, and overall knowledge-based prosperity.

NSF EPSCoR Objectives

➢ To catalyze key research themes and related activities within and among EPSCoR jurisdictions that empower knowledge generation, dissemination and application;

➢ To activate effective jurisdictional and regional collaborations among academic, government and private sector stakeholders that advance scientific research, promote innovation and provide multiple societal benefits;

➢ To broaden participation in science and engineering by institutions, organizations and people within and among EPSCoR jurisdictions;

➢ To use EPSCoR for development, implementation and evaluation of future programmatic experiments that motivate positive change and progression.

NSF EPSCoR

NSF EPSCoR Investment Strategies

NSF EPSCoR uses three major investment strategies to achieve its goal of improving the R&D competitiveness of researchers and institutions within EPSCoR jurisdictions:

1) **Research Infrastructure Improvement Program**

2) **Co-Funding of Disciplinary and Multidisciplinary Research**

3) **Workshops and Outreach**

Research Infrastructure Improvement Program

➢ **RII Track-1 Awards:**

- Currently up to $4 million per year for up to five years.

- improve the research competitiveness of jurisdictions by improving their **academic research infrastructure** in areas of science and engineering supported by the National Science Foundation and critical to the particular jurisdiction's science and technology initiative or plan.

- Areas must be identified by the jurisdiction's EPSCoR governing committee as having the best potential to improve the jurisdiction's future R&D competitiveness.

Research Infrastructure Improvement Program

➢ **RII Track-2 Awards:**

- In the past, provided up to $2 million per year for up to three years as collaborative awards to consortia of EPSCoR jurisdictions to support innovation-enabling cyberinfrastructure of regional, thematic, or technological importance.

- Maine EPSCoR just completed a 3-year, 5-state collaborative project that provided Maine's academic institutions with accessibility to over 1,100 miles of high-speed bandwidth.

- New solicitation pending.

➢ **RII C2 Awards:**

- One-time opportunity to provide support for the enhancement of inter-campus and intra-campus cyber connectivity within an EPSCoR jurisdiction. Maine EPSCoR is currently in its 2nd year of this award.

Co-Funding of Disciplinary and Multidisciplinary Research

➢ EPSCoR co-invests with NSF Directorates and Offices in the support of meritorious proposals from individual investigators, groups, and centers in EPSCoR jurisdictions that are submitted to the Foundation's research and education programs, and crosscutting initiatives.

➢ These proposals have been merit reviewed and recommended for award, but could not be funded without the combined, leveraged support of EPSCoR and the Research and Education Directorates.

➢ Co-funding leverages EPSCoR investments and facilitates participation of EPSCoR scientists and engineers in Foundation-wide programs and initiatives.

NSF EPSCoR

Maine EPSCoR Co-Funding

NSF EPSCoR Maine Co-Funding History FY1981-2011

FY	Awards	Institutions	EPSCoR Co-Funding	Total Award Amount
2011	5	2	$630,632	$1,261,277
2010	6	5	$1,123,648	$1,909,557
2009	9	5	$1,775,526	$3,224,586
2008	16	8	$2,186,604	$4,858,230
2007	6	5	$520,953	$1,693,999
2006	11	6	$1,241,835	$3,800,836
2005	7	5	$745,053	$1,929,666
2004	9	6	$992,071	$2,373,146
2003	11	8	$1,010,121	$1,530,078
2002	26	11	$2,617,551	$4,276,603
2001	11	7	$1,786,886	$3,547,568
2000	7	3	$642,802	$1,077,131
1999	10	3	$1,228,352	$3,064,470
1998	3	2	$456,753	$1,550,000
1981-1997	164	64	$20,677,000	$57,460,000
TOTALS:	**164**	**140**	**$37,635,787**	**$93,557,147**

Workshops and Outreach

➢ The EPSCoR Office solicits requests for support of workshops, conferences, and other community-based activities designed to explore opportunities in emerging areas of science and engineering, and to share best practices in planning and implementation in strategic planning, diversity, communication, cyberinfrastructure, evaluation, and other areas of importance to EPSCoR jurisdictions.

➢ The EPSCoR Office also supports outreach travel that enables NSF staff from all Directorates and Offices to work with the EPSCoR research community regarding NSF opportunities, priorities, programs, and policies. Such travel also serves to more fully acquaint NSF staff with the science and engineering accomplishments, ongoing activities, and new directions and opportunities in research and education in the jurisdictions. (Coordinated through Maine EPSCoR office.)

EPSCoR 2030 Report

➢ A panel of nationally recognized scientists and engineers met at the behest of NSF in January 2012 to examine the Experimental Program to Stimulate Competitive Research in terms of its relevance to the national research agenda.

➢ The two-day workshop produced observations about the value of the NSF program and recommended programmatic changes to be made both by NSF and by the EPSCoR states that can enhance EPSCoR's effectiveness.

➢ NSF & NSF EPSCoR are in the process of evaluating these recommendations for potential action with regard to future investment strategies.

http://www.nsf.gov/od/oia/programs/epscor/2030%20Report.pdf

NSF EPSCoR in Maine

➢ NSF EPSCoR requires jurisdictions to establish a state EPSCoR infrastructure in order to fulfill the program requirements.

➢ Maine EPSCoR at the University of Maine was designated to:
  • act as the fiscal agent/proposing organization for NSF EPSCoR programs;
  • to be the designated liaison with the NSF EPSCoR Office;
  • and to be responsible for the administration, implementation and evaluation of Maine NSF EPSCoR programs.

EPSCoR in Maine

EPSCoR activities in Maine are overseen by the
Maine Innovation Economy Advisory Board (MIEAB)

which is a statewide steering committee of individuals from
Maine's education, research, and business
communities, and state government.

The Council is under the auspices of Maine's Office of Innovation.

NSF Strategic Plan

http://www.nsf.gov/news/strategicplan/index.jsp

Dr. Subra Suresh, NSF Director

"It is NSF's mission to support the full breadth of science and engineering research and education. We are constantly alert to emerging ideas with the potential to transform the world, establish new paradigms, and even foster new industries. "

"There is overwhelming consensus worldwide that frontier research and technological innovation, driven by a creative and skilled science and engineering workforce, are the new engines of economic growth. "

Strategic Priorities

FY2013 and beyond…

➢ Fundamental science and engineering research & education: contributes directly to addressing national challenges.

➢ Science, Engineering, and Education for Sustainability (SEES): creating new knowledge for a clean energy economy and a sustainable future.

➢ Research and innovation for manufacturing: boosting U.S. competitiveness in advanced manufacturing.

➢ Cyber-enabled Materials, Manufacturing, and Smart Systems (CEMMSS): creating smart systems that sense, respond, and adapt to the environment.

➢ Promoting multidisciplinary research in new materials, wireless communications, cyberinfrastructure, and robotics.

NSF Strategic Priorities FY2013 and beyond…

➢ Advanced Computing Infrastructure

➢ Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21) : addressing grand challenges in computing, computational modeling and simulation, big data.

➢ Secure and Trustworthy Cyberspace (SaTC): ensuring the reliability and accessibility of cyberinfrastructure.

➢ World-class facilities and equipment: protecting critical infrastructure.

➢ Developing the next generation of scientific leaders through support for graduate fellowships and early career faculty.

➢ Advancing evidence-based reforms in science and mathematics education.

Transform the Frontiers

"Transformative research leads to the emergence of new fields and/or extraordinary shifts in existing fields and, by its nature, has significant impact on the frontiers of S&E, and on improvements in education. And, transformative research leads to important new discoveries."

T-1: *Make investments that lead to emerging new fields of science and engineering and shifts in existing fields.*

T-2: *Prepare and engage a diverse STEM workforce motivated to participate at the frontiers.*

T-3: *Keep the United States globally competitive at the frontiers of knowledge by increasing international partnerships and collaborations.*

T-4: *Enhance research infrastructure and promote data access to support researchers' and educators' capabilities and enable transformation at the frontiers.*

Innovate for Society

"NSF is committed to creating connections between research produced through our investments and the needs of society.

By forging links between fundamental research and society's needs, NSF helps articulate important new areas of S&E, improves quality of life, creates a scientifically literate populace, and empowers future generations.

This goal requires close interaction with NSF stakeholders, a clear recognition of the Foundation's role in the nation's innovation enterprise, and an appreciation of the dynamic global context.

I-1: Make investments that lead to results and resources that are useful to society

I-2: Build the capacity of the nation's citizenry for addressing societal challenges through science and engineering.

I-3: Support the development of innovative learning systems.

Eligibility

A state is eligible to apply for an RII Track 1 based on:

➤ A statewide demonstrated commitment to develop its research foundation and to improve the quality of STEM research **conducted at its universities and colleges.**

➤ A jurisdiction's most recent three-year history of research funds awarded by NSF is equal to or less than 0.75 percent of the total NSF research budget for that same period.

➤ It is eligible based on the NSF EPSCoR "cohort" that it is in (one RII Track 1 award at any one time).

Maine is eligible to apply in 2013 for the next round of RII Track 1 funding.

Academic Infrastructure

The bottom-line intent of the RII Track-1 program is to
develop, expand, use, and sustain the science
and technology resources that reside in the
jurisdiction's colleges and universities,
by supporting sound platforms and opportunities
for enhanced academic R&D competitiveness.

Infrastructure

The RII Track-1 is intended to add specific value to the jurisdiction's academic infrastructure not generally available through other funding sources.

Infrastructure can include:

➢ Human
➢ Physical (not capital construction)
➢ Cyberinfrastructure

Research Focus

The science and engineering research program for which improved infrastructure is requested is the heart of the RII Track-1 proposal.

➢ The intellectual merit and broader impacts of the proposed activities provide the rationale for the requested infrastructure investments which, in turn, enhance the overall research capacity of the jurisdiction.

➢ These proposals are unique in their jurisdiction-wide scope and complexity; in their integration of individual researchers, institutions, and organizations; and in their role in developing the diverse, well-prepared, STEM-enabled workforce necessary to sustain research competitiveness and catalyze economic development.

Research Focus

A potential RII Track 1 research focus needs to be able to demonstrate that:

1) it is very clearly in NSF-supported research areas;

2) has the potential to be competitive in applying for regular NSF Directorate program support in the future;

3) there is a track record of "fundability" of that focus by NSF.

4) It is in alignment with the Maine S&T plan and MEIF sectors.

Impact/Outcomes

Pursuit of these goals and objectives bolsters the capacity of jurisdictions to:

➢ enhance discovery and learning through utilization of cyberinfrastructure and other evolving technologies;

➢ develop the diverse, well-prepared, internationally competent and globally engaged STEM workforce necessary to sustain the nation's competitive edge;

➢ facilitate knowledge generation leading to economic development;

➢ and expand the scientific literacy of all citizens, and disseminate to them the importance of STEM research and education.

Maine's RII Infrastructure Strategy

➢ Maine has had 8 NSF EPSCoR RII Track 1 awards for a total of $49.6M

➢ Maine's strategy for these NSF EPSCoR RII awards has been to provide the infrastructure needed to create new research centers or major initiatives in areas that are consistent with the State's Science & Technology Action Plan.

➢ Historically been very successful in this strategy, and in recent years have had a single focus, which will continue.

Maine's RII Infrastructure Strategy

Our current award from NSF EPSCoR
for "Maine's Sustainability Science Initiative"
seeks to continue that success by creating a

Center for Sustainability Solutions

at the University of Maine

RII Track 1 Components

Research Project Team:	Maine EPSCoR Office:
Research	
Workforce Development: integrated with research (graduate, undergrad, postdoc, faculty)	Workforce Development: general STEM (K-20 students and teachers; state & regional partnerships, etc.)
	Diversity
Research-specific Cyberinfrastructure	General Cyberinfrastructure
External Engagement: pertaining to the research (scientific community, stakeholders, etc.)	External Engagement: general public, K-12, etc.
	Evaluation & Assessment
Sustainability beyond the RII	
Management of the research	Management overall

Example of Current RII Track 1 Budget
NSF Support: $4M per year
Required cost share: $800,000 per year (20%)

RII Components:	Example Budget per Year: (includes indirects)
Research and integrated Workforce Development (student internships)	$2,700,000 NSF funds $ 600,000 cost share funds
All other components:	$1,300,000 NSF funds $ 200,000 cost share funds
(Note: cost share currently required at 20% of NSF award – each participating institution must provide this relative to their sub-award amount.)	

➢ **Project must be self-contained progammatically and financially.**

Eligible Costs

So what can (and should) the RII Track 1 support?

➢ Human infrastructure and corresponding research activity:

➢ Salary: faculty (new and existing); postdocs; graduate, undergraduate, and high school research internships; professionals, technicians, consultants, etc.

➢ Other: travel, supplies, new faculty start-up packages, partnership activities, outreach and communication activities, project evaluation, etc.

➢ Physical infrastructure: small & large equipment, cyberinfrastructure (does not support capital construction.)

➢ Workforce development & STEM education: training & mentoring, workshops, visiting scholars, faculty exchange, K-20 education partnerships & programs, diversity programs, etc.

RII Management

Due to the large-scale nature of these projects, significant management systems need to be in place, including:

Research Project:

➢ 1) Research Project Director: able to allocate 75% of their time to the project.

➢ 2) Near-full-time second in command.

➢ 3) Some form of management team representing the key research themes.

➢ 4)Capacity to have research office staff dedicated to this project.

All will work with the Maine EPSCoR office staff to implement
the full scope of the project.

Administration

➤ All RII participants are required to participate in:

1) On-line database reporting

2) Evaluation surveys, interviews, and other mechanisms

3) Project meetings, workshops, seminars, trainings, etc.

➤ Significant strategic plan required with specific goals, objectives, strategies, and metrics.

➤ Annual and other reporting requirements are significant.

RII Process

The proposal development process is intended to identify a research focus that:

➢ is the most likely to advance the further development of a nationally competitive academic R&D capability for Maine.

➢ has a very high probability of being able to realize goals and objectives.

➢ Leads to innovation, STEM workforce development, and economic development and commercialization.

➢ Is an identified need for Maine and has a sufficient analysis of the strengths, barriers, and opportunities involved.

RII Process: Phase I

Concept Papers - due November 13, 2012

➢ Researchers from Maine's colleges and universities are invited to submit a concept paper that describes a current research problem/need for the state that might be applicable for the next Maine NSF EPSCoR RII Track 1 project research focus (a "grand challenge").

➢ Use template posted on www.umaine.edu/epscor/RII_development.htm

➢ Required to address a comprehensive, integrated, trans-disciplinary statewide focus that creates a substantial academic research infrastructure & involves participants from colleges & universities throughout the state. Not designed for individual, single institution, or small group faculty research.

➢ Deadline for submission: November 13, 2012 to maineepscor@umit.maine.edu

➢ Submitted papers will be posted on Maine EPSCoR website

RII Process: Phase II

Informational & Networking meeting
December 11, 2012, UMaine

This networking meeting will be held to allow interested participants to:

1) participate in additional Q&A on the RII Track 1 program;

2) hear short presentations on submitted research concepts;

3) actively network to meld commonalities between concepts, develop further partnerships, and solidify possible project themes that will proceed for further consideration.

4) Report out on revised concepts.

RII Process: Phase III

Pre-proposals due January 30, 2013

As a result of the above process, a select # of concept groups will be invited to submit pre-proposals for specific research focus areas.

The pre-proposal will be 12-15 pages and will need to address:

1) The science

2) The integrated education and workforce development (graduate & undergraduate research internships, postdocs, faculty)

3) Any cyberinfrastructure needed specifically for the research focus

4) Management of the research project portion

RII Process: Phase IV

AAAS Review February 2013

➤ The approved pre-proposals will undergo a AAAS peer review.

➤ Comments and scores will distributed to the groups so that they can be addressed in the next phase.

RII Process: Phase V

Review Panel Presentations – March 2013

The pre-proposal groups will present their projects to the Maine EPSCoR review panel, which is responsible for making the recommendation on which research focus is the most viable for the state to submit.

RII Process: Phase VI & Beyond

Phase VI – State Approval (March-April 2013)

Phase VII – Proposal Preparation (begins March 2013): Maine EPSCoR works with the research theme group, statewide educational institutions, stakeholders, and other partners to develop a proposal.

Phase VIII – Proposal Submission (June to October 2013): submission of the State's proposal to NSF EPSCoR. (Note that NSF EPSCoR is potentially changing the due date from October.)

Phase IX: **Award notification (Summer 2014)**

Phase X: **Project begins (July 2014)**