



Oklahoma Experimental Program to Stimulate Competitive Research

2012 NSF EPSCoR Research Infrastructure Improvement (RII) Competitions: Tracks 1 & 2

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NSF VISION, MISSION, & "OUTCOME" GOALS

NSF VISION: Advancing discovery, innovation, and education beyond the frontiers of current knowledge, and empowering future generations in science and engineering

MISSION: To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense (NSF Act of 1950)



WHAT IS EPSCoR?

*Experimental Program to Stimulate Competitive
Research*

EPSCoR is a merit based science and technology (S&T) initiative to improve the research capacity capability and competitiveness in states that historically have not received significant federal research and development (R&D) funding.

EPSCoR Mission

To assist NSF 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.

EPSCoR Goals

- To provide strategic programs and opportunities for EPSCoR participants that stimulate sustainable improvements in their R&D capacity and competitiveness.
- To advance science and engineering capabilities in EPSCoR jurisdictions for discovery, innovation and overall knowledge-based prosperity.



NSF EPSCoR Jurisdictions

1980

Arkansas
Maine
Montana
South Carolina
West Virginia

2001

Hawaii
New Mexico

2002

U.S. Virgin Islands

1985

Alabama
Kentucky
Nevada
North Dakota
Oklahoma
Puerto Rico
Vermont
Wyoming

2003

Delaware

2004

New Hampshire
Rhode Island
Tennessee

2009

Iowa
Utah

1987

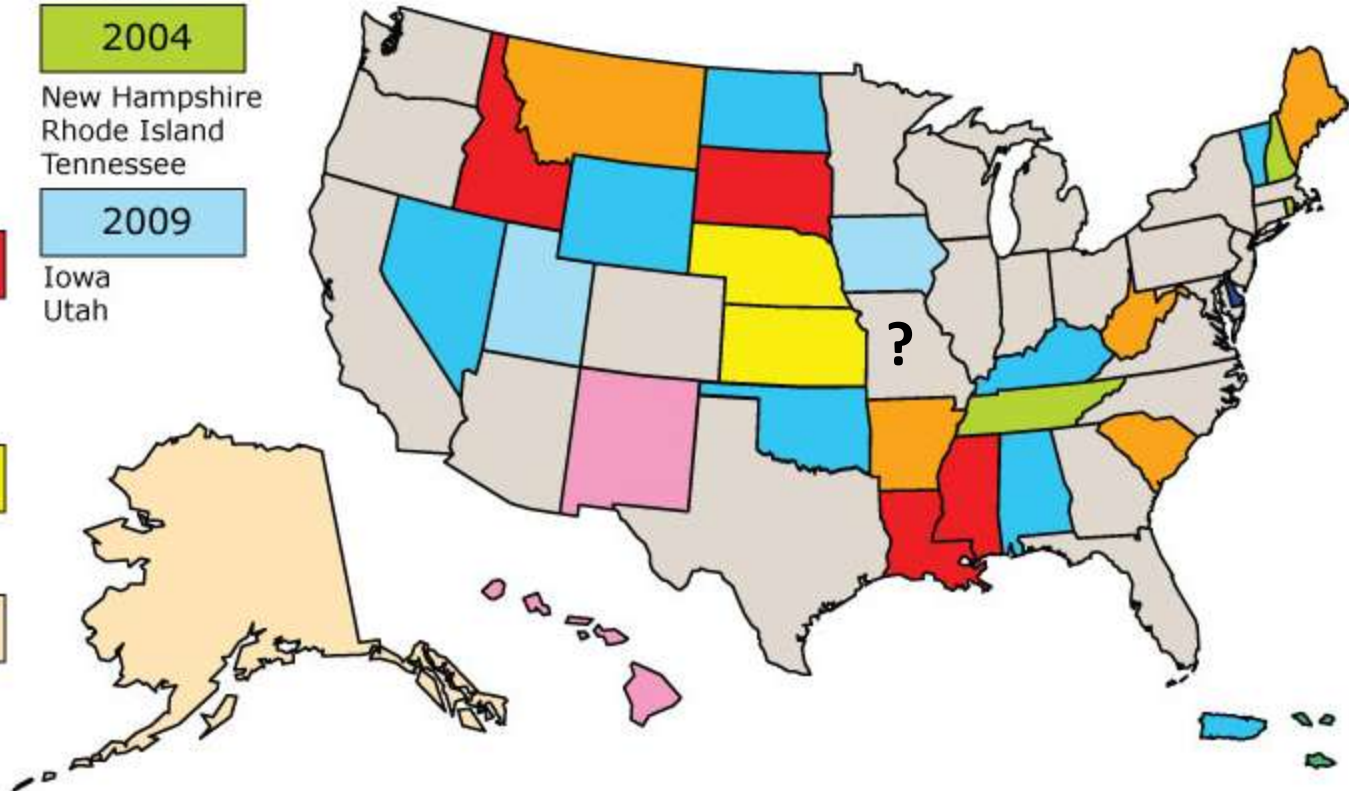
Idaho
Louisiana
Mississippi
South Dakota

1992

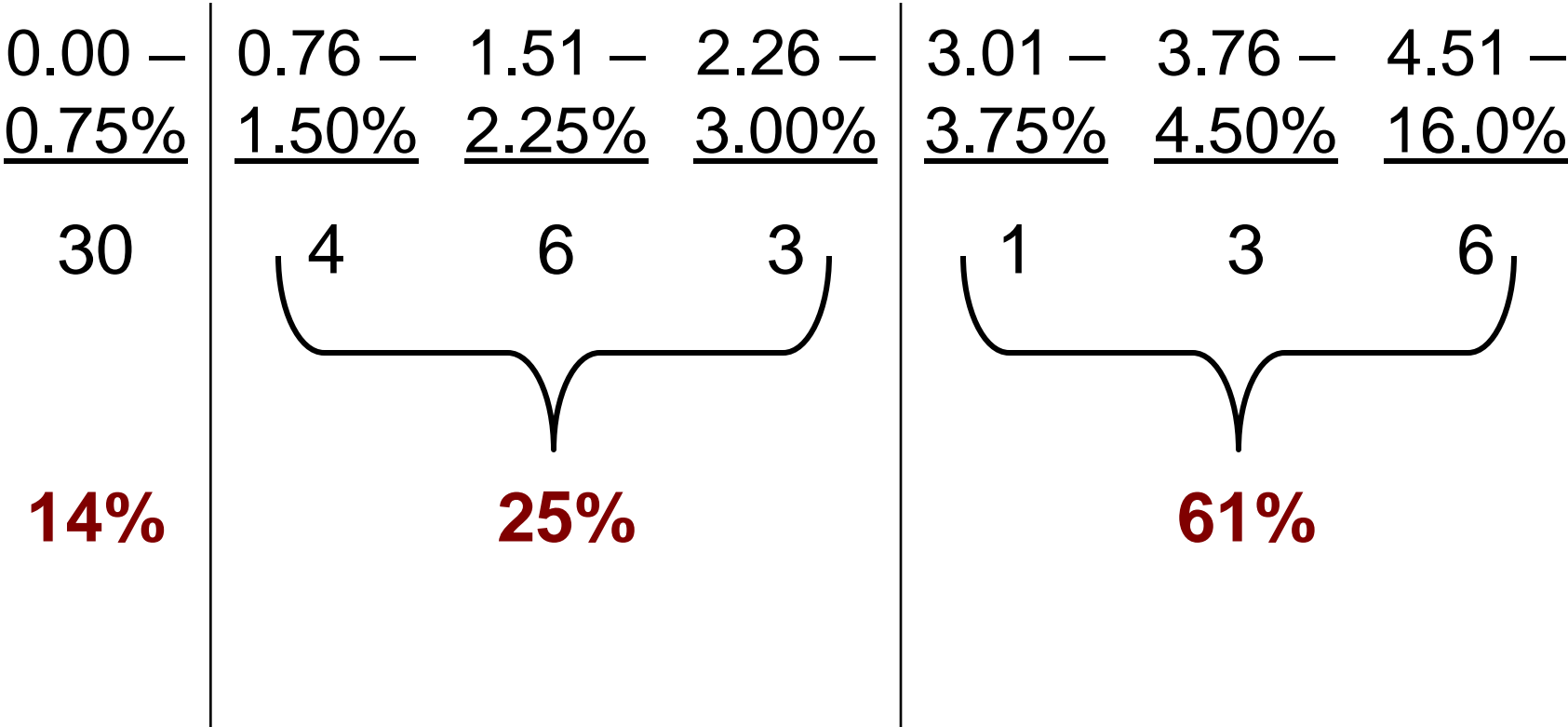
Kansas
Nebraska

2000

Alaska



DISTRIBUTION OF NSF RESEARCH FUNDING AMONG 53 U.S. JURISDICTIONS (FY 2008-2010)



How EPSCoR Works

Federal Agencies Identify Areas of Research Needs



Federal Agencies Request Research Proposals from EPSCoR States



State EPSCoR Committee Solicits State Proposals



Universities Collaborate to Submit Proposal(s)



Developed Proposals Submitted to Oklahoma EPSCoR Committee

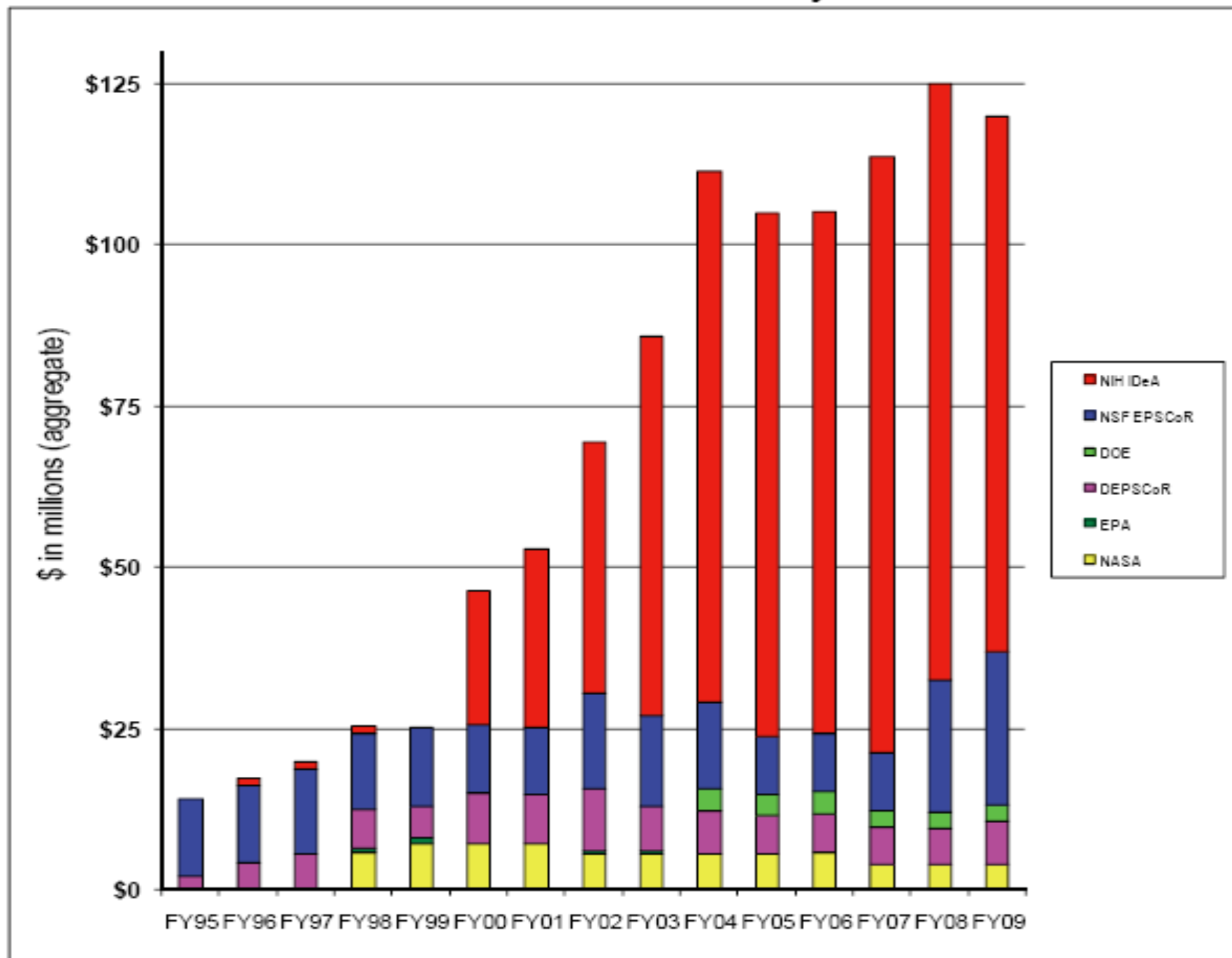


Selected Proposals are Submitted to the Federal Agency



Federal Agency Selects Proposals from EPSCoR States for Funding

Active Oklahoma Awards by Year





NSF EPSCoR

Research Infrastructure Improvement (RII)

RII Track-1: Up to 5 years and \$20M to jurisdictions to improve physical and human infrastructure critical to R&D competitiveness in priority research areas: **Nanotechnology, Functional Genomics, Plant Virus Diversity & Ecology**

RII Track-2: Up to 3 years and \$6M to consortia of jurisdictions to support innovation-enabling cyberinfrastructure of regional, thematic, or technological importance: **A cyberCommons for Ecological Forecasting**

RII Cyber Connectivity (C2): Up to 2 years and \$1M to support the enhancement of inter-campus and intra-campus cyber connectivity and broadband access within an EPSCoR jurisdiction: **Oklahoma Optical Initiative**

Co-Funding of Disciplinary/Multidisciplinary Research: Joint support of research proposals submitted by EPSCoR researchers to non-EPSCoR NSF programs that 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 and Offices.

Current OK RII Track-1 Award: 2008-2013

BUILDING OKLAHOMA'S LEADERSHIP ROLE IN CELLULOSIC BIOENERGY

Objective 1. Discover molecular mechanisms and tools for biomass development

Objective 2. Effective conversion of biomass to liquid fuels



Instead of looking solely at corn, researchers at OSU, OU and Noble Foundation will study all types of perennial grasses, including switchgrass.

RII Grant Program-Track 1

- The purpose of an RII grant is to provide support for lasting improvements in a jurisdiction's academic research infrastructure and increased national competitiveness.
- EPSCoR support is intended to add specific value to the jurisdiction's academic infrastructure not generally available through other funding sources.
- 2011 RII solicitation:
<http://www.nsf.gov/pubs/2011/nsf11565/nsf11565.htm>

Plan for 2012 RII Competition: Track-1

<http://www.okepscor.org/public-outreach/news/nsf-epscor-call-pre-proposals-2012-rii-track-1-award-competition>

- Project Director regional meetings with scientific community (September 2011 - TU, SWOSU, OU, OSU)
- Plenary meeting: 5 minute presentations – Thursday, Nov. 17
- Project teams submit white papers – Friday, Jan. 6, 2012
- Oral presentations to OK EPSCoR Comm. – February 2012
- Projects selected by OK EPSCoR Comm. – February 2012
- NSF Releases RFA – Summer 2012
- Oklahoma proposal submitted – October/November 2012

Keys to Success

- Successful infrastructure improvement plans are likely to be those that enhance academic R&D competitiveness among a jurisdiction's colleges and universities, including pragmatic plans for the generation of sustained non-EPSCoR support.
- With EPSCoR support, it is expected that the improvement strategies will enable targeted research areas to become nationally competitive.

RII Track-1 Examples

Examples of research infrastructure improvement Track-1 activities that are consistent with NSF EPSCoR program objectives include, but are not limited to:

- Support for competitive levels of start-up funding for new faculty including "seed funding" of faculty research leading to the submission of competitive grant proposals; faculty exchange programs with major centers of research activity; acquisition of state-of-the-art research instrumentation;
- Developing meaningful partnerships, including regional collaborations, among EPSCoR colleges and universities; partnerships between EPSCoR colleges, universities and nationally recognized centers of R&D activity (e.g. federal and industrial R&D laboratories, NSF-sponsored research centers, and academic institutions with nationally-recognized research capabilities).
- Productive partnerships between the state's research universities and the private sector, especially those that increase linkages between EPSCoR researchers and their counterparts in research and/or technology based small businesses and increase the competitiveness of the jurisdiction's/region's S&T entrepreneurial talent in competitions for federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grant funding.

RII Track-1 Examples

- Competitive support for the acquisition of equipment for research experiences and individual instruction by predominately undergraduate research institutions and minority serving institutions;
- Creation of graduate research training groups, or similar appropriate mechanisms that: integrate education and research; encourage multidisciplinary educational experiences; establish links with the private sector, industry and national laboratories
- Implementation of novel concepts for discovery-based STEM education and human resource development along with the identification of best practices to develop leadership; build faculty and student teams that are diverse in members of underrepresented groups within the state (i.e. minorities, women and persons with disabilities) and that will result in a strong, quantifiable impact on the STEM workforce.
- Support for competitive levels of strategic funding to attract and/or retain established faculty who are active researchers in areas aligned with the jurisdiction S&T Plan
- Development of nationally competitive, high-performance computing, networking and data capabilities, to strengthen and enrich the cyberinfrastructure environment to enable more robust science and engineering research and education

What Not To Do

- RII funds should not duplicate or replace existing institutional, state, federal or private sector funding to maintain existing activities, however excellent they may be.
- EPSCoR funding should not be used as an alternative to research support available through NSF's regular grant programs and special competitions (i.e., the RII Grant is NOT the appropriate mechanism to support individual faculty research projects).

NSF Review Criteria

What is the *intellectual merit* of the proposed activity?

- How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
- How well qualified is the proposer (individual or team) to conduct the project?
- To what extent does the proposed activity suggest and explore creative and original concepts?
- How well conceived and organized is the proposed activity?
- Is there sufficient access to resources?

NSF Review Criteria

*What are the **broader impacts** of the proposed activity?*

- How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?
- To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
- Will the results be disseminated broadly to enhance scientific and technological understanding?
- What may be the benefits of the proposed activity to society?

Integration

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integration

Integrating Diversity into NSF Programs, Projects, Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering.

Additional Review Criteria

- ***Strategic Fidelity and Impact*** - How are the proposed infrastructure, education, external engagement, and technology transfer plans aligned with the central research themes and with the jurisdiction's S&T Plan? How clearly is the proposed research positioned in the context of other efforts in the field? What meaningful impact on capacity and capability in the jurisdiction is expected as a result of this proposed project? Is there ample evidence that the project will build strength that can be used to address scientific issues of regional relevance, and national importance? How does each proposed component contribute to an identifiable strategy for intensifying competitiveness in research and innovation?

Additional Review Criteria

- ***Value Added*** - Do the proposed activities add value at the institutional, jurisdictional and regional levels in research, education and innovation? How will this be measured? Are the scope and depth of the proposed activities appropriate to achieve the greatest project impacts? Does the project advance the jurisdiction's innovation and economic development plans through greater emphasis on creativity, inventiveness, technology transfer and potential commercialization via organized connections and linkages within and between campuses, schools, private and public sector?

Additional Review Criteria

Diversity Plan - How will the diversity plans broaden participation (e.g., institutions, including minority serving institutions, women and underrepresented groups in STEM, persons with disabilities, and economically disadvantaged, rural, and/or first generation college students) in the research and education activities of the proposed project? How will the proposed activities achieve a significant and sustained impact in the targeted research and education populations within the consortium? What novel and effective ways are proposed to reach non-traditional populations and underrepresented groups in STEM?

Additional Review Criteria

Workforce Development Plan - jurisdiction-wide and fully inclusive of all demographic sectors of the jurisdiction's population, as appropriate. It must engage all elements along the workforce development pathway with particular focus on minority-serving and two-year and four-year institutions. The vital role of private sector partners must be made clear.

Additional Review Criteria

- ***Cyberinfrastructure Plan*** - How well does the cyberinfrastructure plan support and integrate with the jurisdiction's science and technology plan? To what extent is the cyberinfrastructure plan likely to enhance capacity for discovery, innovation, and education in science and engineering? How well does the plan as presented position the proposing jurisdiction for future cyberinfrastructure development?

Additional Review Criteria

- ***External Engagement Plan*** – Includes outreach, communication and dissemination activities that will expand institutional participation, student career options, and facilitate the entry of women and members of underrepresented groups into STEM fields. This plan may include engagement of the private sector to develop partnerships that promote research and workforce development. Communicating the results, benefits, and processes of science to all citizens at all educational levels builds scientific literacy and strengthens educational and research capacity throughout jurisdictions. Plans for the development of substantive technology that enables and facilitates communication within and among jurisdictions and between jurisdictions and the NSF EPSCoR Office must be described

Additional Review Criteria

Evaluation and Assessment Plan

- Is a suitable evaluation plan included with appropriate milestones and metrics in order to determine how effectively the project will achieve its goals?
- Does the plan include a diverse group of independent, external experts to review and evaluate project activities?
- How do the formative and summative evaluation components of the plan assess current status, major impacts, and future directions?

Additional Review Criteria

- ***Sustainability*** - Are the plans to obtain non-EPSCoR funding clear, reasonable and viable? Is there a strategy, with milestones, for sustaining the impacts and achievements of the research and research-based education subsequent to NSF EPSCoR support?

Additional Review Criteria

Management Plan - How well described is the management structure and how will the management structure impact the potential effectiveness of the leadership team? Do the Project Directors and the management team demonstrate the vision, experience and capacity to manage a complex, multi-faceted research, education and knowledge transfer enterprise? Are the membership and roles of the state EPSCoR governing committee and external advisors clearly identified, and is their involvement in the project apparent, logical, and free of conflicts of interest? Are plans for technical assistance appropriate and are the anticipated providers of such assistance appropriately qualified?

Oklahoma Selection Criteria

Applicants should make a case that their project is:

- Consonant with Oklahoma's Science & Technology Plan:

<http://www.crossroads.odl.state.ok.us/cgi-bin/showfile.exe?CISOROOT=/stgovpub&CISOPTR=4922&filename=5123.pdf>

- Will build infrastructure that creates strategic fidelity and adds value at the institutional, jurisdictional and regional levels in research, education and innovation.
- A multi-disciplinary, multi-campus project that includes compelling outreach components.

Budget Considerations

- NSF budget: \$4 million per year
- Period of support: 60 months
- State match: 20%

Institutional Commitments

In view of the requirement for **sustained** infrastructure improvement, institutions must provide commitments for hiring new tenure-track faculty or an alternative but equally compelling form of commitment. These commitments **must** be included in the white paper.

EPSCoR RII Track-2

- RII Track-2 awards provide 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. These awards facilitate the enhancement of discovery, learning, and economic development of EPSCoR jurisdictions through the use of cyberinfrastructure and other technologies.

EPSCoR Research Infrastructure Improvement Program: Track-2 (RII Track-2)

PROGRAM SOLICITATION
NSF 11-513

REPLACES DOCUMENT(S):
NSF 09-571



National Science Foundation

Office of Integrative Activities

Office of Experimental Program to Stimulate Competitive Research

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

March 14, 2011



RII Track-2 Criteria

- **RII Track-2 proposals may only be submitted by consortia of eligible EPSCoR jurisdictions. No jurisdiction may participate in more than one project (active or proposed). The EPSCoR governing committee of each jurisdiction of the consortium, acting on behalf of that jurisdiction, must submit a separately submitted collaborative proposal.**
- **PI Limit: Principal Investigators/Project Directors of proposed EPSCoR projects must be affiliated with research universities, agencies, or organizations within the participant jurisdiction.**
- **Limit on Number of Proposals per Organization: 1 Eligible jurisdictions can participate in only one consortium, and can submit only one collaborative proposal.**
- **Limit on Number of Proposals per PI: 1 An investigator may serve as PI or Co-PI on only one proposal submitted in response to this solicitation.**

RII Track-2 Criteria

- **Anticipated Type of Award: Cooperative Agreement**
- **Estimated Number of Awards: 2**
- **Duration: Award duration of up to 3 years**
- **Anticipated Funding Amount: Up to \$4 million in FY 2011 (pending quality of proposals and availability of funds)**
- **Limitation of Awards: RII Track-2 award amount not to exceed \$2 million per year. Estimated program budget, number of awards and average award size/duration are subject to the availability of funds.**
- **Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited**
- **Other Budgetary Limitations:**
 - **Funding requests can be for durations of up to 3 years. Annual budgets for NSF support cannot exceed \$2 million.**
 - **Budgets should include sufficient funding for participation in evaluation activities including reverse site visits.**

RII Track-2 Criteria

- NSF recognizes there may be some software development associated with the integration activities in building cyber-enabled environments. Any software development supported by this program is expected to be made available to the community under an open license (<http://www.opensource.org>) with the software engineering process leveraging NSF's "NMI Build and Test" (<http://nmi.cs.wisc.edu>) facility for build and test activities.
- Although researchers in EPSCoR jurisdictions are expected to utilize and benefit from the cyberinfrastructure improvements facilitated by the RII Track-2 awards, these awards are not the appropriate mechanisms to provide support for individual faculty research projects. Requests for support of such projects should be directed to NSF's research grant programs.

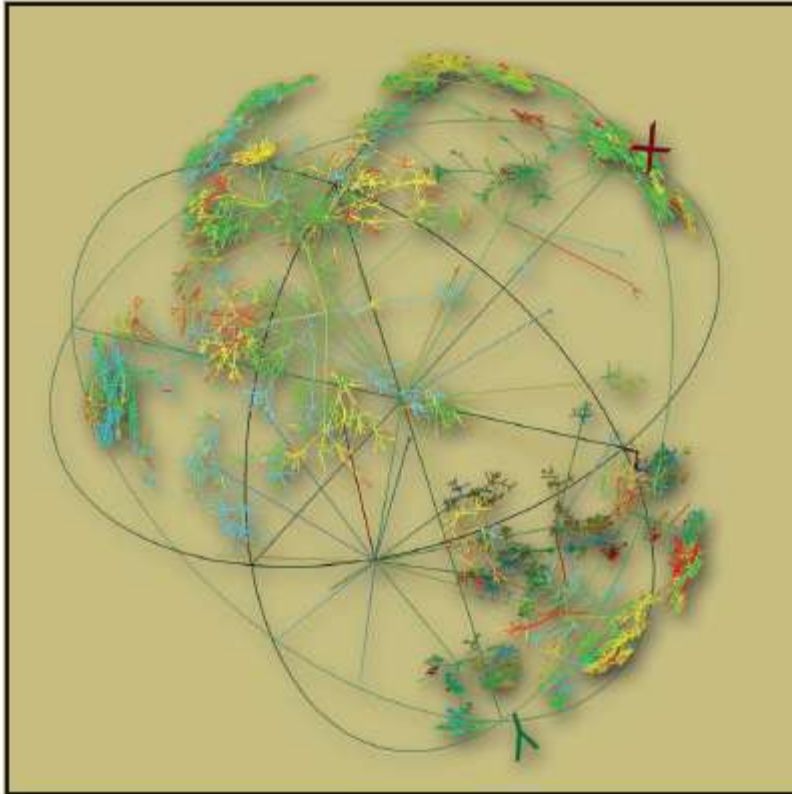
RII Track-2 Goals

- **The RII Track-2 program supports projects that promote, leverage and utilize cyberinfrastructure to address issues of regional, thematic, or technological importance to consortia of EPSCoR jurisdictions.**
- **The consortium-based science and engineering research that will be facilitated by the proposed cyberinfrastructure improvements and the appropriateness of the proposed cyberinfrastructure to the consortium's research efforts will be the primary drivers for RII Track-2 investments.**
- **The project description must include a strong rationale for the establishment of the consortium and must describe how the cyberinfrastructure-enabled activities will advance the research and education goals of the consortium.**

RII Track-2 Goals

- **The project should be of sufficient scope and complexity that the combined resources of the consortium are required to facilitate discovery and innovation, and enable the development of a diverse science and engineering workforce that has the knowledge and skills necessary to design and deploy as well as to adopt and apply cyber-based tools and services.**
- **Over the long term, RII Track-2 investments are expected to result in lasting improvements in the jurisdictions' abilities to more successfully pursue significant jurisdictional and regional opportunities in science and engineering having national and international importance.**
- **The RII Track-2 award is expected to add specific value to the consortium's academic cyberinfrastructure not generally available through other funding.**

CYBERINFRASTRUCTURE VISION FOR 21ST CENTURY DISCOVERY



The importance of cyberinfrastructure to the research and education activities of NSF is reflected in the Foundation's cyberinfrastructure strategic plan, NSF's Cyberinfrastructure Vision for 21st Century Discovery

(<http://www.nsf.gov/pubs/2007/nsf0728/nsf0728.pdf>)



National Science Foundation
Cyberinfrastructure Council
March 2007

RII Track-2 Examples

Examples of research cyberinfrastructure improvement activities that are consistent with NSF EPSCoR program objectives include, but are not limited to:

- **Improvement and enhancement of regional high speed network infrastructure and service connecting multiple institutions to the national and international networking research and education fabrics;**
- **Acquisition and support of new and distributed scientific computing resources and data storage services;**
- **Integration of existing cyberinfrastructure components delivered as a cohesive collaboration, research and learning environment;**
- **Integration, validation, and support of software tools, applications, and services needed to enable research and learning across science and engineering disciplines;**
- **Deployment of nationally competitive high-performance computing and networking capabilities that strengthen and enrich the cyberinfrastructure environment to enable more robust science and engineering research and education, and facilitate broader collaborative interactions with researchers at minority serving institutions within the consortium;**

RII Track-2 Examples

Examples of research cyberinfrastructure improvement activities that are consistent with NSF EPSCoR program objectives include, but are not limited to:

- **Development of computing professionals, interdisciplinary teams, and enabling policies and procedures that are needed to achieve scientific breakthroughs made possible by cyberinfrastructure, paying particular attention to opportunities to broaden participation of underrepresented groups in STEM;**
- **Development of technical expertise to install-, and maintain sophisticated cyberinfrastructure, including managing software versions and monitoring the content for its up-to-date use;**
- **Deployment and support of collaboration tools for large, spatially distributed research groups;**
- **Integration of collaboration techniques and tools to support virtual organizations (e.g., distance learning activities);**
- **Establishment of a repository of validated and verified modeling and simulation tools and components for given research areas (e.g., climate change); and**
- **Enhancement and support of data storage facilities, software tools, and technical expertise to extend data management and sharing with the broader community.**

RII Track-2 Success

- **Cyberinfrastructure enhancement strategies that sharply focus available resources on research and research-based education and innovation activities that are consistent with specified long-term objectives of the consortium and its member jurisdictions are most likely to be successful.**
- **In conjunction with this focus, the proposed education and innovation projects should be integrated with identified cyberinfrastructure activities.**
- **EPSCoR strives for improvements that will significantly increase the research capacity of a jurisdiction, consortium, or region to enable stronger competitiveness in large scale and cross-cutting competitions.**
- **EPSCoR support of a proposed research improvement activity should not duplicate other available federal, jurisdictional, or institutional resources and should add significant value to increase competitiveness at the jurisdictional, or larger regional level.**

RII Track-2 Review Criteria

To ensure maximum impact of limited EPSCoR funds, requests for funding must:

- **Contribute to the consortium's strategy for future research and innovation; Add significant and measurable value to research capability in S&T areas of high priority to the consortium as a whole and to member jurisdictions, as appropriate;**
- **Engage the full diversity of the consortium's resources in the STEM enterprise; and**
- **Present a detailed strategy to generate subsequent, sustained non-EPSCoR funding from federal, jurisdictional, or private sector sources.**

RII Track-2 Review Criteria

- What is the intellectual merit of the proposed activity?
- What are the broader impacts of the proposed activity?
 - Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at:
<http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>
- NSF staff also will give careful consideration to the following in making funding decisions:
 - *Integration of Research and Education*
 - *Integrating Diversity into NSF Programs, Projects, and Activities*

RII Track-2 Review Criteria

- **Additional Review Criteria:** Reviewers for the RII Track-2 competition will also consider the following specific aspects of intellectual merit and broader impacts:
 - *Strategic Fidelity and Impact -*
 - *Value Added -*
 - *Cyberinfrastructure-Enabled Science and Engineering*
 - *Diversity -*
 - *Dissemination and Communication -*
 - *Evaluation and Assessment -*
 - *Sustainability -*
 - *Management and Coordination -*

RII Track-2 Oklahoma

- The following process will be used to rank the Oklahoma Track-2 preproposals.
- **White Paper**. Formal application for inclusion in Oklahoma's 2012 Track-2 application will require submission of a White Paper to the Oklahoma EPSCoR Advisory Committee. The deadline for submission of the White Paper is **Monday, October 10, 2011, at 5:00 p.m.** The White Paper should be submitted electronically to Valerie Pogue (vpogue@okepscor.org).
- The White Paper narrative is limited to no more than 5 pages, with one-inch margins (left, right, top, bottom) using 12-point type. Please include a cover page (not counted against the 5-page limit) listing a title for the project, the names and email addresses for all lead Oklahoma scientists, the participating institutions within Oklahoma, and the states participating in the consortium.

RII Track-2 Oklahoma

- **The 5-page narrative should describe the project in language that is generally understandable to the diverse group of scientists and others represented on the EPSCoR Committee (see membership list on the EPSCoR website: <http://okepscor.org>). The narrative should include a description of the project objectives, the methods by which these objectives will be accomplished, how the project fits both NSF and State goals, the qualifications of the project team, any institutional commitments that will enable completion of the project goals, and the facilities and resources that are available as well as those that will be needed to attain project objectives.**
- **In addition to the 5-page narrative, the White Paper should include curriculum vitae in the NSF format for the lead investigator(s). A brief description of the project budget should also be provided. Finally, a letter of collaboration from the lead investigator in the other state(s) forming the proposed consortium should be included.**

RII Track-2 Oklahoma

- **Ranking Meeting.** The White Papers will be distributed to the State EPSCoR Advisory Committee for their consideration. On a date in early November, to be set on a date most convenient to the Committee membership, applicants will be afforded the opportunity to make an oral presentation to the EPSCoR Committee. Each group will be given 20 minutes for their presentation. Following the presentations, the Committee will convene in Executive Session to rank the preproposals.
- If the top-ranked Oklahoma preproposal fails to become a “consortium” by virtue of the fact that none of the proposed consortium members outside of Oklahoma receive approval by their state EPSCoR committee, then the next most highly ranked preproposal will advance to the top Oklahoma ranking. This process will be repeated as necessary until an Oklahoma preproposal in which at least one additional participating consortium member is selected by their relevant state EPSCoR committee is reached.

Oklahoma EPSCoR



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