



Oklahoma Experimental Program to Stimulate Competitive Research

2012 NSF EPSCoR Research Infrastructure Improvement (RII) Track 1 Competition

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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

1987

Idaho
Louisiana
Mississippi
South Dakota

2009

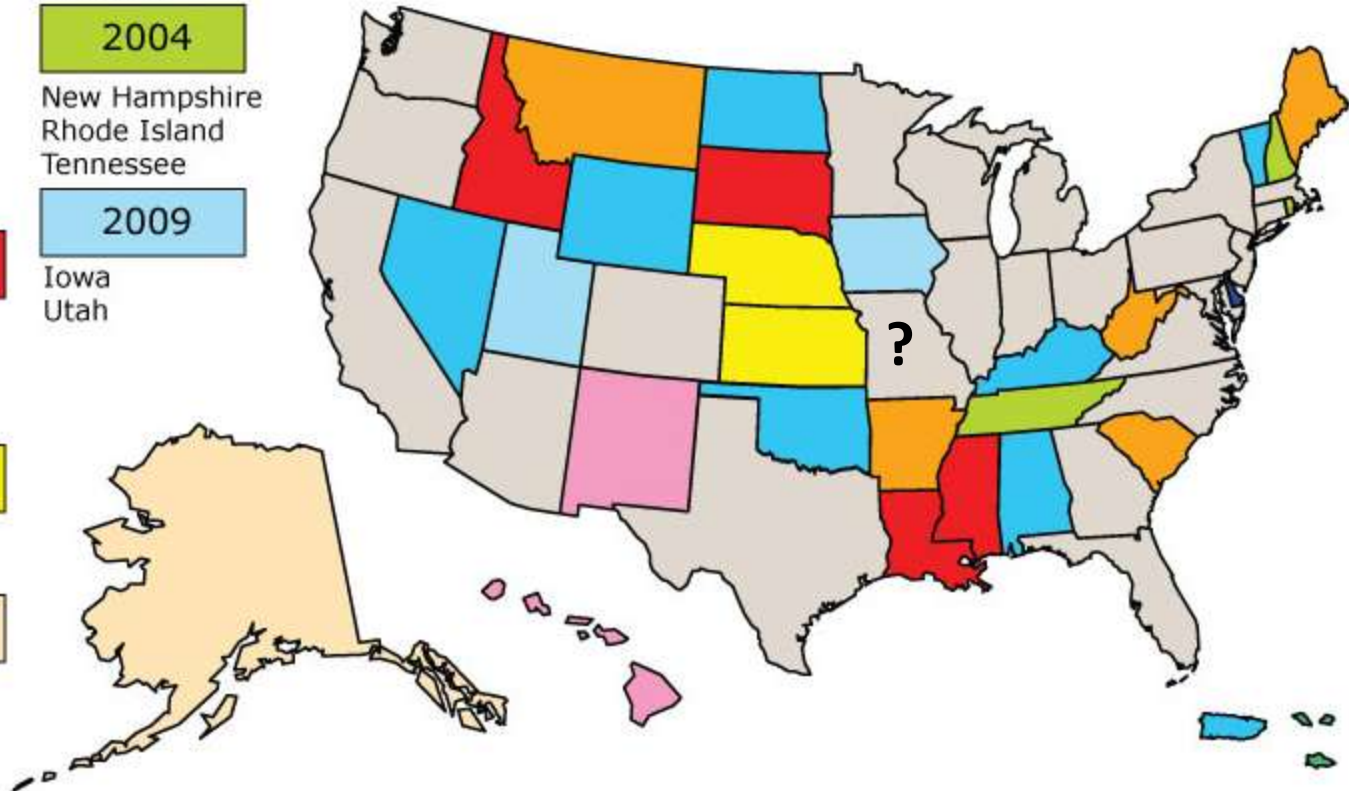
Iowa
Utah

1992

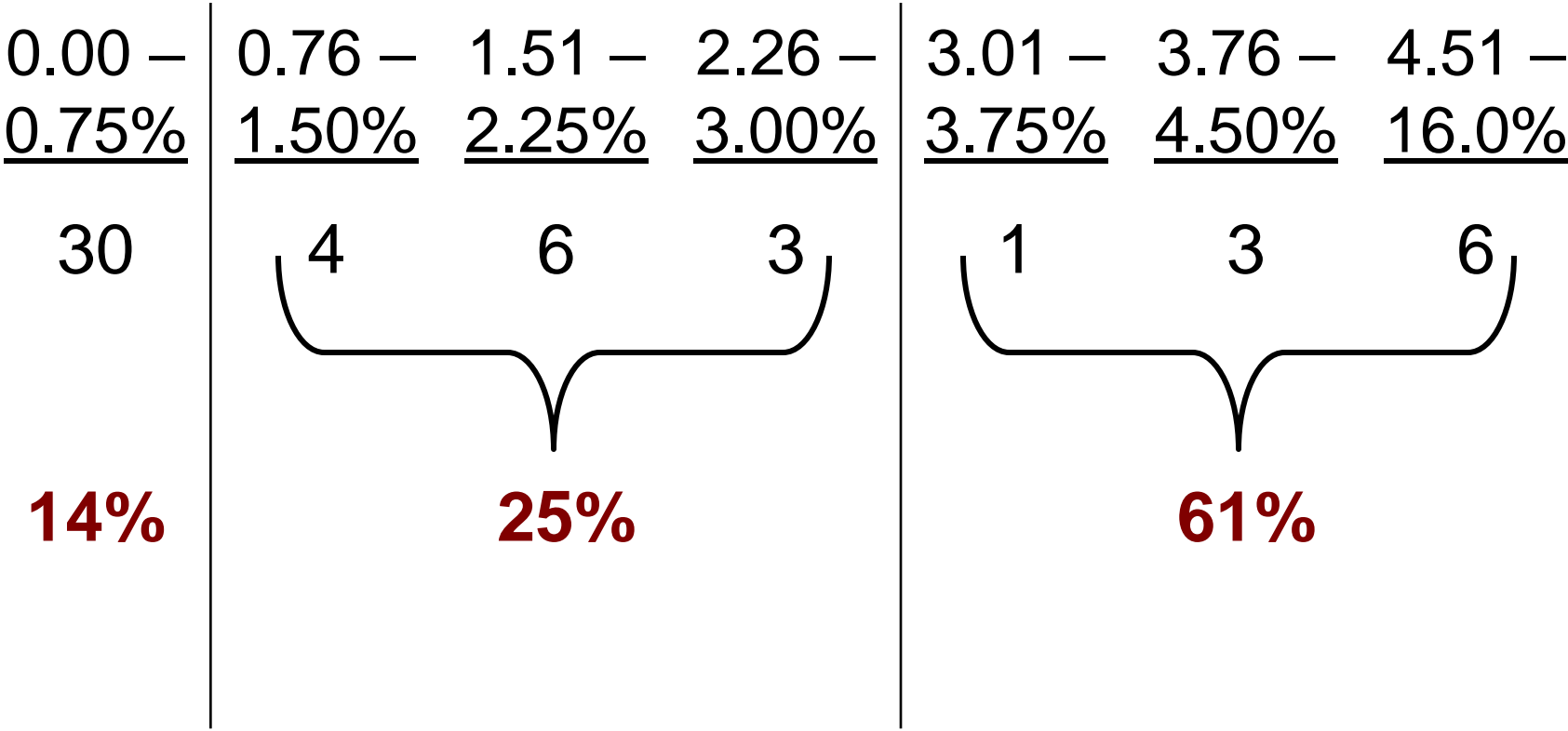
Kansas
Nebraska

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

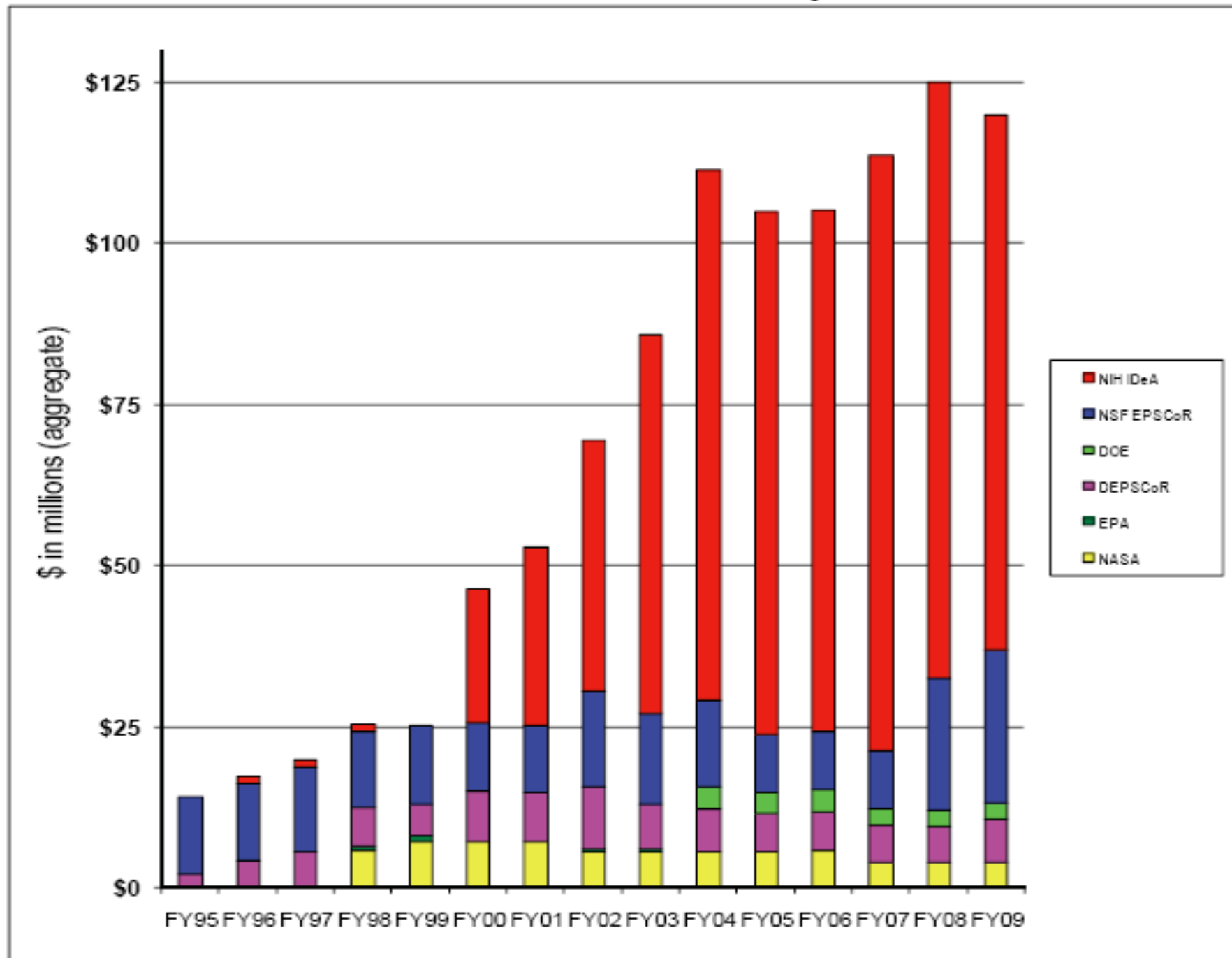


Selected Proposals are Submitted to the Federal Agency



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.

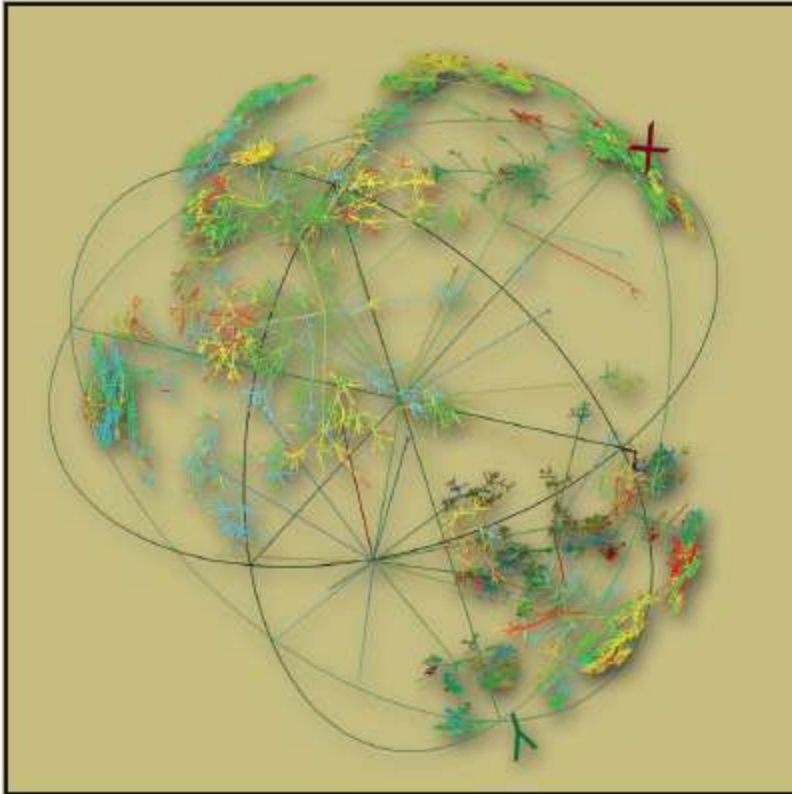
Budget Considerations

- 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.

CYBERINFRASTRUCTURE VISION FOR 21ST CENTURY DISCOVERY



National Science Foundation
Cyberinfrastructure Council
March 2007

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>)

Oklahoma EPSCoR



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