



Experimental Program to Stimulate Competitive Research

Highlights: Necessary Ingredients

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OD/OIIA/EPSCoR**

January 23, 2013

Where Do Highlights End Up?

- Research.gov
 - Science, Engineering & Education (SEE) Innovation
- for public viewing

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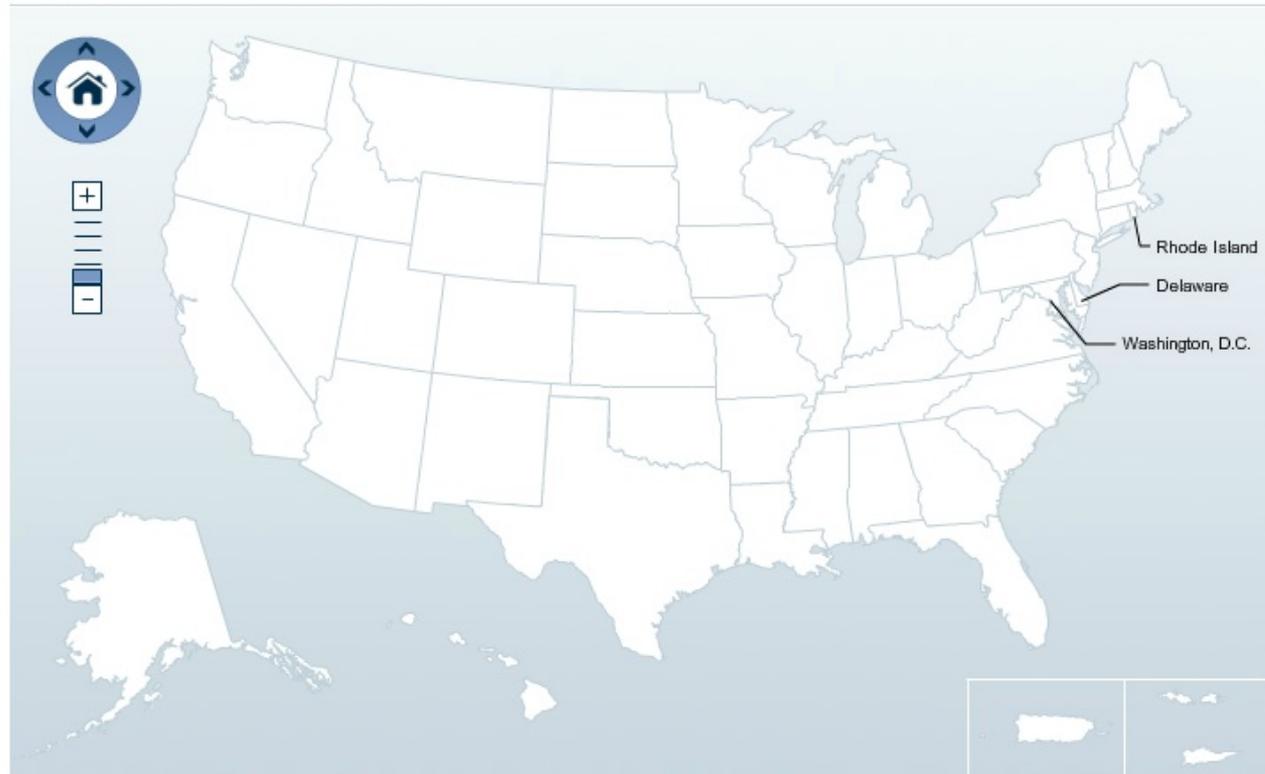
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ND EPSCoR Highlight

North Dakota

Go to: North Dakota ▾



NSF Award Highlights



[Defensive Genes Ward Off Pests](#)

Genetic screening identifies insect-resistant genes in poplar trees...

Research Areas: [Biology](#)



[Training Business STTARs](#)

North Dakota tech transfer program enhances workforce pipeline...

Research Areas: [Education](#)



[Powering the Next Generation of Energy With Electrospinning Nanowires](#)

Innovation could find application in manufacture of lithium ion batteries and next-generation solar cells...

Research Areas: [Nanoscience](#), [Chemistry & Materials](#), [Engineering](#)

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NSF People of Distinction



[Ryan Bleth](#)

Science
Bismark, North Dakota



[Fredrick Strand](#)

Mathematics
Hatton, North Dakota

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Recent Awards & Abstracts



ND EPSCoR Highlight

Powering the Next Generation of Energy With Electrospinning Nanowires

NSF Award: [Advancing Science Excellence in North Dakota](#) (North Dakota State University Fargo)

State: [North Dakota](#)

Congressional Districts: North Dakota At Large

Research Areas: [Nanoscience](#), [Chemistry & Materials](#), [Engineering](#)

A North Dakota research team has developed a new route to the manufacture of tiny silicon wires, or nanowires.

The innovation could find application in manufacture of lithium ion batteries and next-generation solar cells, and could lead to the sustainable manufacture of useful, flexible, electronic devices with significantly more efficient energy use and longer life-spans.

The method they used, called "electrospinning," can create elongated fibers 1 to 2000 nanometers in size of synthetic and natural polymers, ceramics, carbon and semiconductor materials.

The project is part of the NSF-funded [Experimental Program to Stimulate Competitive Research \(EPSCoR\)](#). Through EPSCoR, NSF establishes partnerships with government, higher education and industry that are designed to effect lasting improvements in a state's or region's research infrastructure, research and development capacity and hence, its national research and development competitiveness.

Images (1 of 2)



Files Needed for a Highlight

- **MSWord file** showing complete concept
- For each image:
 - **JPG file**
 - **NSF Form 1515 MSWord file**

Example from Idaho:



FORM 1515

CONCEPT

JPG

ID concept file (part 1)

TITLE: Distance is no longer a Barrier for Idaho Research Center

OUTCOME: **Outcome:** Scientists in rural Kimberly, Idaho now have computer hardware and internet connections that increase the capacity, efficiency, and security for research data management. Access to data from satellites and sensors enables scientists to make new scientific discoveries related to water resources in a changing climate.

IMPACT: **Impacts/Benefit:** Upgrades have been leveraged to significantly improve the computing performance and capacity available to researchers in remote locations. Research data products used and generated by researchers at the Kimberly Research and Extension Center in Southern Idaho are now automatically replicated for distributed backup and computer hardware is co-managed remotely through the Northwest Knowledge Network. The research community has new reliable high-speed access to important research data products for collaborative, cross-disciplinary research.



Environmental Data Manager, Dr. Luke Sheneman, installs hardware to be jointly managed by the Northwest Knowledge Network based at the University of Idaho and the Idaho National Laboratory. The Network now provides remote service to research stations in rural Idaho.

Idaho concept file (part 2)

EXPLANATION:

Explanation:

Located in rural Southeast Idaho, the Kimberly Research and Extension Center provides joint agricultural research facilities for the University of Idaho and the USDA. Internationally recognized researchers such as Dr. Richard Allen and his students study Idaho water resources in the context of a changing climate. The research requires large amounts of sensor data from satellites and several field instruments. Improved internet access and hardware were provided by leveraging seemingly separate investments by Idaho EPSCoR, the University of Idaho, the Idaho National Laboratory, and the Northwest Knowledge Network (NKN), and the Idaho Regional Optical Network (IRON).

AWARD #s:

CREDIT:

E-MAIL:

Highlight Provided by Luke Sheneman, University of Idaho for EPS-0814387 and EPS-0919514

Photo Provided by Luke Sheneman, University of Idaho, sheneman@uidaho.edu

Idaho form 1515

NSF Form 1515 (Revised 09/09)



National Science Foundation

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Write how you would prefer to identify the copyright holder.

(Examples: "John Smith, Best University" or "John Smith, Biology Department, Best University")

Luke Sheneman, University of Idaho

Related URL(s)

www.northwestknowledge.net

Does This Material Show NSF-Supported Research? Yes No

If yes, please explain and, if possible, provide the NSF grant number.

Grant# 0814387 and 0919514

NSF highlights database

- Program Officer takes files submitted with annual report
- Enters text into online database
 - Copy/Paste from MSWord file
- Uploads images and Forms 1515
 - No spaces in filenames for images and Forms 1515
 - THISISANEXAMPLE.jpg

PO enters award numbers

Administrative

Approving Directorate/Division*:

Program Officer:

First name*:

Last name*:

NSF Award Numbers (list additional numbers in the text)*:

<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

NSF Contract Numbers (for SRS and OPP use only):

<input type="text"/>	<input type="text"/>
<input type="text"/>	

- Multiple awards okay
- Majority EPSCoR support
- May be culmination of many years' work

NSF Press Release Associated with This Highlight (xx-xxx):

Other Directorates/Offices That Supported This Research:

PO enters title, outcome, impact

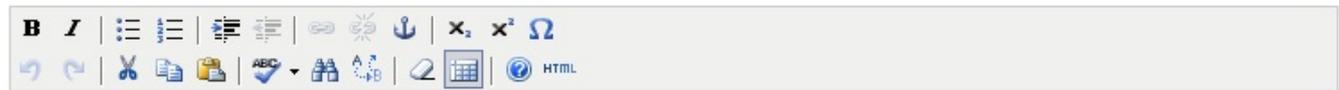
What is your Suggested Title? (20 word max. suggested)*
Example: Rocks Indicate That Antarctica was Connected to North America

TITLE:

What is the outcome or accomplishment? (1-2 short sentences describing it and why it is transformative; 50 word max. suggested)*
Example: A team of scientists has shown that a rock from Antarctica is identical to a band of rocks in western North America, implying that the two continents were once adjacent to one another.

NOTE: Insert only text in the box. Do not try to paste in images. A button for inserting images will appear on the next page.

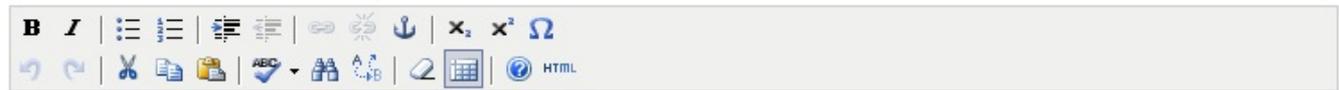
OUTCOME:



Path: //

What is the impact? (1-2 simple sentences describing the benefits for science, industry, society, the economy, national security, etc; 50 word max. suggested)*
Example: Determining the past configuration of the continents can serve many purposes, including modeling past climates, understanding evolution, and helping to locate natural resources.

IMPACT:



Enter image

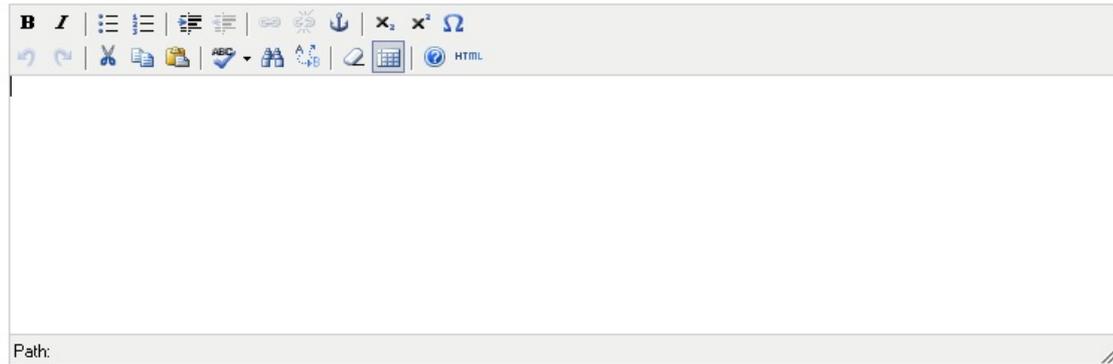
IMAGE FILENAME:

Image File: *

What is your suggested Caption/Description for the image? * (25 word max. suggested per caption; multiple captions can be entered here)

Example: Researchers collect rock samples in the TransAntarctic Mountains.

CAPTION:



A rich text editor interface with a toolbar at the top containing icons for bold, italic, bulleted list, numbered list, link, unlink, image, zoom in, zoom out, and undo. Below the toolbar is a large, empty text area for entering a caption. At the bottom of the editor is a 'Path:' label and a small icon.

CREDIT:

What credit should accompany the image? * (usually the owner or copyright holder; can be individuals and/or their institutions)

Example: John Goodge, University of Minnesota-Duluth; multiple credits can be entered here

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Yes No

Upload the completed and signed Form 1515 or a copy of the email here. * (One form or email can be used for multiple images from the same copyright holder. The form or email can be uploaded at a later time without unsubmitting the highlight.)

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Email address for individual who provided the image: *

EMAIL OF IMAGE PROVIDER:

Finished highlight in NSF highlights database

Submit Text

What is the outcome or accomplishment?

Scientists in rural Kimberly, Idaho now have computer hardware and internet connections that increase the capacity, efficiency, and security for research data management. Access to data from satellites and sensors enables scientists to make new scientific discoveries related to water resources in a changing climate.

What is the impact?

Upgrades have been leveraged to significantly improve the computing performance and capacity available to researchers in remote locations. Research data products used and generated by researchers at the Kimberly Research and Extension Center in Southern Idaho are now automatically replicated for distributed backup and computer hardware is co-managed remotely through the Northwest Knowledge Network. The research community has new reliable high-speed access to important research data products for collaborative, cross-disciplinary research.

What explanation/background does the lay reader need to understand the significance of this outcome?

Located in rural Southeast Idaho, the Kimberly Research and Extension Center provides joint agricultural research facilities for the University of Idaho and the USDA. Internationally recognized researchers such as Dr. Richard Allen and his students study Idaho water resources in the context of a changing climate. The research requires large amounts of sensor data from satellites and several field instruments. Improved internet access and hardware were provided by leveraging seemingly separate investments by Idaho EPSCoR, the University of Idaho, the Idaho National Laboratory, and the Northwest Knowledge Network (NKN), and the Idaho Regional Optical Network (IRON).



Environmental Data Manager, Dr. Luke Sheneman, installs hardware to be jointly managed by the Northwest Knowledge Network based at the University of Idaho and the Idaho National Laboratory. The Network now provides remote service to research stations in rural Idaho.

Credit: Luke Sheneman, University of Idaho

Image Provided by: sheneman@uidaho.edu

[NSF Form 1515](#)

Providing an Image*

*or more (up to 5 + video)

- **An image that can be understood by lay-people, with accompanying form NSF 1515**
 - The image should show the highlighted work itself – not a campus building or lab
 - High quality visuals are important!

EPSCoR Guidelines

- **Highlights are expected for RII Track-1, Track-2 and C2 awards**
- **Highlights are required for RII Track-1 projects**
 - **Minimum of three submitted with the annual report**
 - **One science**
 - **One education/outreach**
 - **One open to choice**

Problems encountered

- **Research highlights are often too technical – not understandable by a general audience**
- **Broader impact highlights are often too general – without data that measures the impact of an intervention**
- **Text is sent in PDF form rather than Word, and difficult to copy/paste into NSF's highlights database**

Current status

- **FY12 – 36 highlights entered into NSF highlights database**
- **FY13 – more to be entered**
- **Approved highlights are uploaded to Research.gov SEE Innovation, other NSF documents**

Where Do Highlights (Also) End Up?

- President's Annual Budget Request to Congress
- FY 2013 request released February 9, 2012



FY 2013 Budget Request Highlights

http://www.nsf.gov/about/budget/fy2013/Print%20By%20Tab%20PDFs/01-Overview_fy2013.pdf

- Highlights from:

- Harvard University
- **University of Kansas**
 - CReSIS – a Sci. & Tech. Ctr.
- Case Western Reserve University
 - CLiPS – a Sci. & Tech. Ctr.
- UC Berkeley
 - TRUST– a Sci. & Tech. Ctr.
- **Kansas State University**
- **University of South Dakota**
 - EPSCoR
- **Louisiana State University**
- **University of New Hampshire**
- Howard University
- Boston University
- NCAR - Boulder

FY 2013 Budget Request Highlights



Credit: Andrew Whitehead

Gulf of Mexico Deepwater Horizon Spill Effects on Fish Revealed

DEB-1048206

Despite low concentrations of oil constituents in Gulf of Mexico waters from the Deepwater Horizon spill, fish were dramatically affected by toxic components of the oil. So found a team led by scientists Fernando Galvez and Andrew Whitehead of Louisiana State University (LSU). Galvez, Whitehead and colleagues undertook a combined field and laboratory study. It showed widespread effects of the Deepwater Horizon oil spill on fish in Louisiana marshes. Gene expression in tissues of the fish studied--in this case killifish--was predictive of oil spill responses such as developmental abnormalities and death, say the biologists. "It also indicated impairment of fish reproduction," says Whitehead. The study was funded by a National Science Foundation (NSF) rapid response grant.

Mesoporous Material Transforms Solar Energy Into Fuel

A research team in South Dakota has developed a method to rapidly create a novel material that generates hydrogen in the presence of water and sunlight. This research expands our understanding of how to generate fuel using visible sunlight rather than ultraviolet light. Because the hydrogen generation occurs at room temperature, the process will easily scale up to large production volumes. Applications of the new material range from removal of carbon dioxide from the atmosphere to the mitigation of environmental pollution.



*Credit: Ranjit T. Koodali
University of South Dakota*

EPS-0903804

Thank You