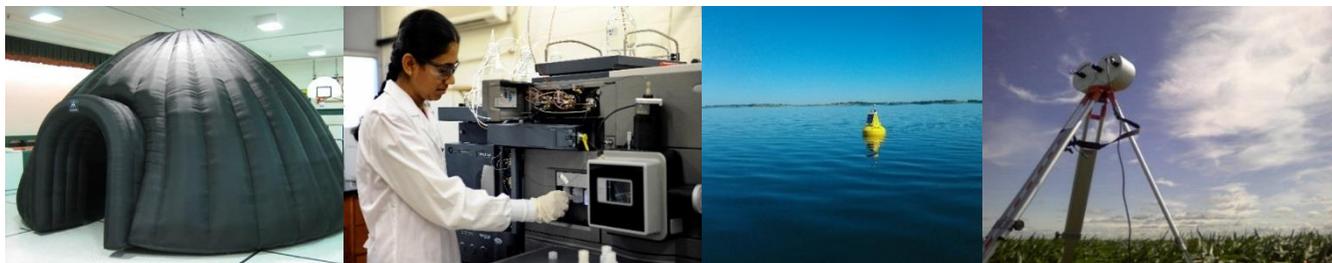


EPSCoR Funding Impact in North Dakota

Science and Engineering

- INSPIRE-ND (Innovative and Strategic Program Initiatives for Research and Education – North Dakota), North Dakota's newest (August 2014) NSF Track-1 award will: 1) Build research infra-structure and strengthen ND's research competitiveness; 2) Provide research and STEM education opportunities for students across the state, including Tribal Colleges (TCs); 3) Enhance research collaborations between universities and colleges; 4) Use agricultural materials to develop sustainable materials; 5) Engage regional climate studies to help predict hydrology and impact on agriculture; and 6) Enhance scientific computing and other infrastructure.
 - EPSCoR INSPIRE-ND researchers seek to continue to advance ND's ranking as a major sustainable supplier of food crops and biofeedstocks through an increased understanding of regional climate patterns by developing a new Center for Regional Climate Studies (CRCS) into a multi-disciplinary collaborative team involving UND and NDSU, as well as tribal colleges and primarily undergraduate universities across the state. The CRCS team is working to develop a comprehensive picture of regional climate variations to better understand and predict patterns of regional flooding and drought, creating a coupled modeling system that links environmental, agricultural, economic, and behavioral models to study the connections between climate variations, crop productivity, and agricultural adaptation, and exploring the feedbacks of climate-induced agricultural land use changes on the environment within the Northern Great Plains (NGP).
 - EPSCoR INSPIRE-ND researchers seek to advance discoveries of new bio-based, sustainable materials that give more consideration to the environment and contribute to ND's economy through their sourcing (low cost, renewable), durable lifetimes (long, high durability), and recyclability (efficient, high value) by working to develop and launch a transformative approach to the development of sustainable materials derived from agricultural materials as a means to replace petrochemical polymeric materials in day-to-day use. Efforts will be built on the continued growth of the Center for Sustainable Materials Science (CSMS), started during the previous Track-1 award, into a high functioning interdisciplinary, sustainable research team that includes new faculty hires, acquisition of state-of-the-art analytical equipment and utilization of cyberinfrastructure to efficiently process data, quickly analyze results, and securely transmit data between groups.



- NASA EPSCoR utilizes two types of awards: Research Infrastructure Development Awards (RID) and Cooperative Agreement research awards (CAN). Ongoing RID projects involve 12 researchers (six from both UND and NDSU). Examples of ND CAN research include: 1) evaluation of simulated global cloud properties, and 2) experimental and computational investigation of low pressure turbine aerodynamics.
- ND is partnered with South Dakota on an NSF EPSCoR Track-2 grant that was awarded in 2013. This award parlays expertise and infrastructure gained from the Sustainable Energy Research Initiative and Supporting Education (SUNRISE) group during the preceding two Track-1 awards. The Track-2 award, named DakotaBioCon (Dakota Bioprocessing Consortium), is focused on developing high-value chemicals from lignin, and in particular on replacements of petrochemical derived ones.

Energy

- While ND currently does not have an active DOE EPSCoR funded project, several new projects have been developed using the expertise and equipment developed under their most recent DOE EPSCoR Infrastructure Improvement Program grant, *Performance Impacts of Impurities in Clean Coal Systems Equipped with Carbon Capture Technologies*. A particularly promising new project evaluated the potential for underground coal gasification of ND lignite. Lignite cores were collected and properties measured.

Workforce Development

- Students from many diverse areas are being provided opportunities to build a brighter future. ND EPSCoR partners with five tribal colleges in *Nurturing American Tribal Undergraduate Research and Education* (NATURE)

to provide an educational pathway for American Indian students in ND to pursue STEM degrees. Through summer camps at the colleges and research universities, a Sunday Academy initiative for middle and high school students, and research mentoring projects, more than 200 participants are involved annually in this program.

- Dereck Stonefish, graduate student in zoology at North Dakota State University, Fargo, received a prestigious NSF Graduate Research Fellowship for research on the migratory ecology of red-winged and yellow-headed blackbirds in the prairie pothole region of ND. A graduate of Sitting Bull College, Fort Yates, ND, he is one of only four tribal college graduates in the U.S. to have received a NSF Graduate Research Fellowship since 2006. Stonefish hopes his achievements will show young people of Standing Rock Reservation, that excelling in higher education is possible. He earlier participated in the ND EPSCoR NATURE program that helped lead him to graduate studies.



- Through the Students in Technology Transfer and Research (STTAR) program, upper division STEM students worked with ND companies to address challenging science, engineering, and technology-based issues, contributing to the state's workforce development needs in science and engineering. Approximately 30-35 STTAR awards are provided annually to companies. The program received statewide media coverage in 2014.
- Important to research infrastructure development and competitiveness is the recruitment and hiring of STEM faculty. ND EPSCoR has impacted more than 70 new faculty positions, with a retention rate averaging 90 percent. During the award period, ND realized results in increasing competitiveness; these efforts translated into Federal R&D Obligations to ND Universities and Colleges.

Commercialization

- EPSCoR researchers addressed applying materials science to sustainability efforts. These initiatives have garnered more than \$40 million in additional funding; have provided research opportunities for more than 200 students; and have promoted industry partnerships with at least 26 commercial organizations.

Cyberinfrastructure

- Cyberconnectivity was improved for research and education, through investments in network infrastructure and high performance computing. The STEM pipeline was enhanced through Graduate Student Assistantships awarded to students from 4-year institutions and tribal colleges in the state to pursue STEM graduate degrees at one of ND's research universities. Receipt of a NSF EPSCoR Cyberinfrastructure grant in 2012 allowed substantial upgrading of connectivity to the TCs.

Outreach

- One business participating in STTAR and in Faculty in Technology Transfer was quoted in a regional newspaper: "The EPSCoR programs, STTAR and FITT (Faculty in Technology Transfer), helped share the risk in a brand new area for us — working with the universities. The students and professor are providing the knowledge and skills we need to reach our project goals. They are contributing so much to our projects, it's hard to imagine doing this without them." - Don Hedger, president, Killdeer Mountain Manufacturing Inc., Killdeer, N.D., quoted in the Bismarck Tribune in 2014

Funding

Current Active North Dakota EPSCoR Awards				
Program	Award	Amount	Type of Award	
NSF	EPSCoR	\$23 million	Research Infrastructure	(2 awards)
DoD	DEPSCoR	\$0	n/a	(0 awards)
DOE	DOE EPSCoR	\$0	n/a	(0 Awards)
NASA	EPSCoR	\$.375 million	Research Infrastructure	(1 award)
Past NSF EPSCoR RII Track-1 Awards			New Funding Generated (Does not include funds from NSF RII awards, State Funds, or pending proposals)	
2005-2008	\$6,783,333		\$31,723,012	
2008-2014	\$16,500,000		\$48,000,016	