ND EPSCoR
Established Program to Stimulate Competitive Research

News & Notes

September 2018

Mark your calendar! ND EPSCoR's annual state conference is March 27, 2019

Although it's hard to think spring before we've even truly started fall, mark your calendar for our next annual **ND EPSCoR Conference**! Please plan to join us in Fargo at the FARGODOME for this important annual event, with great presentations by students and faculty, wrapping up Year 5 of our current NSF EPSCoR Track-1. Hear about research done throughout the state, the impact on the STEM disciplines and the amazing results that have come from five years of hard work.

Detailed information about the event will be posted on the ND EPSCoR website beginning November 1.

Welcome!

With this first edition, we've tried to bring you up to date on many of the things ND EPSCoR is doing across the state of ND.

The mission of ND EPSCoR is to increase the competitiveness of North Dakota for merit-based, federal grants and contracts in support of research in the disciplines of science, technology, engineering and mathematics (STEM). In that mission, ND EPSCoR seeks to provide leadership and teamwork that enhance and broaden the K-12 STEM pathway, by supporting efforts for workforce development.

To be eligible for NSF's EPSCoR Research Infrastructure and Improvement (RII) program, a jurisdiction (state, territory or commonwealth) receives 0.75% or less of NSF's funding over the prior three years. Twenty-four states, including North Dakota, plus Puerto Rico, Guam and the Virgin Islands are currently EPSCoR-eligible.

Established at NSF in 1978, EPSCoR's mission is to enhance the research competitiveness of jurisdictions like ND, by strengthening STEM capacity and capability, which encompasses these goals:

- Catalyze research capability across and among jurisdictions;
- Establish STEM professional development pathways;
- Broaden participation of diverse groups/institutions in STEM;
- Effect engagement in STEM at national and global levels; and
- Impact jurisdictional economic development.

Many federal agencies have EPSCoR programs: NSF DoE, USDA, NASA and DoD. NIH manages a sister program, the Institutional Development Award (IDeA).

The ND EPSCoR State Office was established and staffed to provide coordination, programming and assistance to ND institutions of higher education and tribal colleges to achieve greater research capacity and competiveness and broaden the STEM pipeline, beginning in K-12. The NSF RII Track-1 is the major program, and ND EPSCoR currently collaborates with 11 institutions: three PUIs (primarily undergraduate institutions) - Dickinson State (DSU), Mayville State (Mayville) and Valley City State (VCSU); one MCU (master's college/university) - Minot State University (Minot State); five TCs (tribal colleges) - Cankdeska Cikana Community College (CCCC), Nueta Hidatsa Sahnish College (NHSC), Sitting Bull College (SBC), Turtle Mountain Community College (TMCC) and United Tribes Technical College (UTTC); plus two RUs (research universities) - North Dakota State University (NDSU) and University of North Dakota (UND). (Map on page 4.) The state office staff ensures that all the required programmatic components of the NSF Track-1 cooperative agreement are fully implemented: research with undergraduate and graduate education, diversity, K-12 education and workforce development, collaborations and partnerships and communication.

Please don't hesitate to reach out to me, or my staff, should you have any questions:

- Jean Ostrom-Blonigen, Project Administrator
- Joyce Eisenbraun, Communication Manager
- Scott Hanson, Tribal Colleges Liaison Manager
- Paul Keidel, STEM Manager
- Janelle Smith, Business Manager
- Kathleen Wahlberg, Senior Project Assistant

Regards,
Kelly A. Rusch, ND EPSCoR Executive Director

Accomplishments

Hot off the press

Several publications related to ND EPSCoR research were published recently. Congratulations to the faculty and students who shared information for the benefit of the state, region and nation. Each month will spotlight recent publications.

Center for Regional Climate Studies (CRCS)-related publications:

Soil ecosystem services and human health, by **Eric Brevik** and **Joshua Steffan** (DSU), along with Lily Pereg and Lynn Burgess, in Current Opinion in Environmental Science & Health, Vol 5, p. 87-92. DOI: 10.1016/j.coesh.2018.07.003.

Past role and future outlook of the Conservation Reserve Program for supporting honey bees in the Great Plains, by **Haochi Zheng** (UND), Clint Otto, Alisa Gallant, Rich Iovanna, Benjamin Carlson, Matthew Smart and Skip Hyberg, in PNAS, Vol 115 (29) p. 7629-7634. DOI: org/10.1073/pnas.1800057115

Modeling of spatio-temporal variation in runoff contribution areas and analysis of hydrologic connectivity, by **Xuefeng Chu** and **Kendall Grimm** (NDSU), in Land Degradation and Development, Vol 29 (8) p. 1-15. DOI:10.1002/ldr.3076.

Center for Sustainable Material Science (CSMS)-related publications

Renewable isohexides-based, hydrolytically degradable poly(silylether)s with high thermal stability, by **Guodong Du, Srikanth Vijjamarri** and **Marianne Hull** (UND), in ChemSusChem, Vol 11. DOI: 10.1002/cssc.201801123.

Highly functional methacrylated bio-based resins for UV-curable coatings, by **Dean Webster, Arvin Yu** and **Jonas Sahouani** (NDSU), in Progress in Organic Coatings, Vol 122, p. 219-228. DOI: 10.1016/j.porgcoat.2018.05.035

Furfural-derived diacid prepared by photoreaction for sustainable materials synthesis, by **Zijun Wang, Quintin Elliott, Zhijun Wang, Jenna Puttkammer, Joseph Lee, Qianli Chu**, (UND), **Raul Setien** and **Dean Webster**, (NDSU), in ACS Sustainable Chemical Engineering, Vol 6, p. 8136-8141. DOI: 10.1021/acssuschemeng.8b02415.

ND EPSCoR Seed Grant-related publications

Mechanical techniques for enhanced dispersion of cellulose nanocrystals in polymer matrices (book chapter), by **Jamileh Shojaeiarani, Dilpreet Bajwa** (NDSU) and **Kerry Hartman** (NHSC), in Sustainable Polymer Composites and Nanocomposites, 2018. Springer, New Delhi.

Activities and recognition

Faculty and students around the state have been going above and beyond in their efforts, and the results have been recognized across the country. North Dakota, uses its EPSCoR funds to support critical faculty research in 11 institutions across the state, impacting hundreds of undergraduate and graduate students, plus hundreds more in K-12. Here's a quick peek at just a few of the amazing activities around the state:

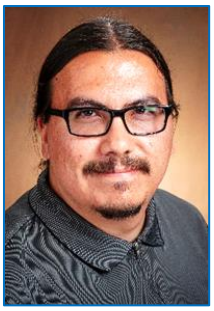
- One of the DSU Natural Science undergraduates, **Billi-Jean Petermann**, (shown right) presented a poster titled "Effects of Land Management Changes on Soil Microbial Communities" at the Soil Science Society of America's annual meeting in Tampa, Florida. (She's now in graduate school at Texas Tech University.)

- **Bakhtiyor Rasulev**, hired under the current Track-1 funding for the CSMS project, joined with other NDSU researchers to propose an efficient and cost-effective method of developing optical materials for various applications, such as night-vision-readable displays, electronics, telecommunication, optical sensing and bioimaging. The $468,000 research grant was awarded by **NSF (Chemistry division)**. Title: Integrated Studies on Designing Organometallic Complexes with Nonlinear Absorption and Near-Infrared Emission, NSF Award Number: 1800476
- **NHSC is starting a sustainable energy degree program**. A two-year Associate Degree will be offered with options for transfer to a four-year school or to begin working. Students will also be doing research projects about sustainable energies.
- **Aaron Kennedy** was the kickoff presenter in August at UND's monthly STEM Café, "Beer's Law: An exploration of light transmission through the atmosphere and beer." In a lighthearted approach, he discussed how light interacts with fluids such as

the atmosphere (or beer) to describe properties such as color (e.g. blue sky/brown beer) and opacity. It turns out that 'Beer's law' aptly describes many of these aspects.

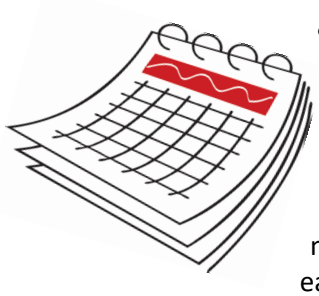
- **New lesson plans for fifth and eighth grade students** are available on both the CRCS and CSMS websites, providing useful and interesting information about weather and sustainable materials. It's an opportunity for teachers and parents to encourage curiosity and build the STEM pathway! See https://www.ndepscor.ndus.edu/resources/.

- **Anna Renner**, (NDSU undergraduate in Chemistry) won the best poster award at the June Green Chemistry conference for her work with CSMS on bio-based sustainable materials. (She's now pursuing graduate studies at Harvard.) (Above, Renner is second from left in the front row. *Photo credits to the American Chemical Society.)*
- **Alena Kubatova** (UND) and **Mukund Sibi** (NDSU) obtained an **NSF-IRES grant** to allow their students to collaborate with scientists in the Czech Republic. According to NSF, the "International Research Experiences for Students (IRES) program supports international research and research-related activities for U.S. science and engineering students. The IRES program contributes to development of a diverse, globally-engaged workforce with world-class skills." Title: Interdisciplinary Environmental and Green Applications in Chemistry (IEGAC). Award Number: 1658615.
- **Stephanie Sundhagen**, (MSU-Minot), presented at the American Chemical Society National Conference, thanks to her efforts as part of **Mikhail Bobylev's** research group.
- **STEM surveys** were sent out to over 800 school administrators in ND to ask about needs/strategies. To help grow interest and capacity in STEM across the continuum, ND EPSCoR is committed to helping support K-12 efforts to better understand K-12 STEM needs, to support systems that equip K-12 teachers with STEM strategies and encourage student engagement and participation in STEM pathways. This will result in a STEM white paper.
- **Julia Bowsher** (NDSU) and colleagues in Wyoming and New Mexico as well as the USDA, collaborated on a research proposal to study bees. The proposal earned them an **NSF EPSCoR RII Track-2 award of $2.8 million** to understand how these important pollinators overcome harsh winter conditions to successfully emerge and reproduce in spring. Title: Insect Cryobiology and Ecophysiology (ICE) Network: Integrating Genomics, Physiology, and Modeling. Award Number: 1826834.
- **Levi Bassett** (DSU) received a Graduate Student Research Assistantships (GSRA) for 2018. Bassett will study Range Science at NDSU. Currently in their second year of GSRA funding at UND are **Alexis Archambault** (NHSC) and **Kelsey Morin** (TMCC), while at NDSU are **Cherokee Durant** (Mayville), **Cheyenne Durant** (Mayville) and **Adam Mortenson** (VCSU).



- **Austin Allard**, (shown left) once a NATURE (Nurturing American Tribal Undergraduate Research and Education) student, went on to college at NDSU, earning bachelors and master's degrees in civil engineering before venturing to Texas A&M. After completing his Ph.D. he returned to North Dakota to help with ND EPSCoR's NASSE (Native American Success in Science and Engineering) program, and was just hired to start teaching pre-engineering at TMCC. For his full story, see: https://www.ndepscor.ndus.edu/fileadmin/ndus/ndepscor/News/2018-09AustinAllardFullCircle.pdf

Upcoming events



- **Chad Ulven**, (NDSU), at NDSU's Science Café September 25, on "Impact of Plastics on Our Environment: What's Next?" This presentation will explore the issues related to over 380 million tons of plastic produced each year as well as concerns related to plastic waste, talk about some potential solutions and start an important conversation about next action steps. Stoker's Basement at the HoDo, Fargo, 7 p.m.

Upcoming events, continued

- **Rachel Navarro**, (UND), at UND's STEM Café on November 14 "Drafting Women and Minorities in Engineering: Broadening Participation." Half Brothers Brewing, Grand Forks, 7 p.m.
- **CRCS and CSMS monthly meetings:** Hosted via IVN to all campuses. Dates will be posted for each on the website**.**
- **CSM**S is hosting a workshop on **Entrepreneurship**, geared for students and faculty. The one-day event will feature lectures on business opportunities, how to write a winning business plan, patents and a keynote lecture. All CSMS students and faculty are invited to the event, October 26, 2018 from 10 a.m. to 5 p.m. Arikara, Memorial Union, NDSU, Fargo.
- **CSMS Translational Summit**, February 25-26, 2019, NDSU Alumni Center, Fargo.
- **ND EPSCoR Annual Conference**, March 27, 2019, Fargo. Setup will be Tuesday, March 26. Details coming in future issues.

Like other things in NATURE, change happens

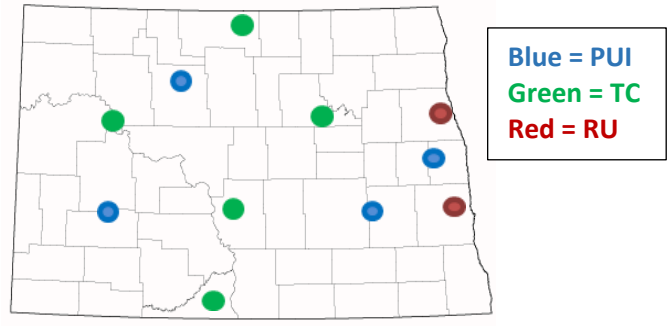
It was another amazing two weeks of investigation, learning, collaboration and enjoying the process of discovery during the annual NATURE camps. NATURE (Nurturing American Tribal Undergraduate Research and Education) summer camp at UND and NDSU is always a highlight for many student scientists as they get introduced to research protocols, get their hands dirty in various experiments on topics in which they are interested, and begin to explore the possibilities to be found in a STEM career.

Funded by ND EPSCoR, NATURE aims to improve STEM education among tribal college and American Indian high school students in the state, and to build a pathway to pursue careers in various STEM disciplines.

A key component of the program was **Dr. Robert Pieri** (left), NATURE coordinator for over 20 years, who announced his retirement this year. Dr. Bob, as he is known affectionately by students, said that as a life-long skier, he knew the best time to quit was when you were tempted to take one more run down the slopes. (*Photos: top, Lawrence Village Center III, a NATURE camp student from SBC, working in the spider silk lab. Middle, at the camp's closing ceremony, as students and faculty gathered around Pieri to wish him well.)*

Year 4 of NSF EPSCoR RII Track-1

Helping researchers and students make an impact is a statewide effort, and often reaches far beyond. The current funding (August 1, 2014 – July 31, 2019) from the NSF EPSCoR RII Track-1 cooperative agreement, combined with matching support from North Dakota, offers a unique opportunity to collaborate around two centers at 11 institutions (listed on page 1) that are studying issues which have a significant impact on our state:



- Learning more about the impact of our changing climate on agriculture. Please see the Center for Regional Climate Studies (CRCS) website for added info at https://und-crcs.org/.
- Creating novel materials from agricultural products is the goal of the scientists in the Center for Sustainable Materials Science (CSMS) team. For added info, please see https://csms-ndsu.org/.

The two research areas for the current NSF EPSCoR Track-1 Cooperative Agreement are found in the **Center for Sustainable Material Science (CSMS)** and the **Center for Regional Climate Studies (CRCS)**. CSMS seeks to advance new discoveries of bio-based, sustainable materials, while CRCS is focused on developing a better understanding of how global climate impacts North Dakota agriculture. Both centers have spent the past four years undertaking collaborative research efforts to build STEM capacity as well as develop novel technologies and systems that are useful to the citizens of North Dakota and beyond. Each of these Centers collaborated with the Education and Workforce Development team to share beyond the research labs, and help students in K-12, undergraduate and graduate levels to take their next steps in the STEM pathway.

Here's highlights from the Year 4 Annual Report:

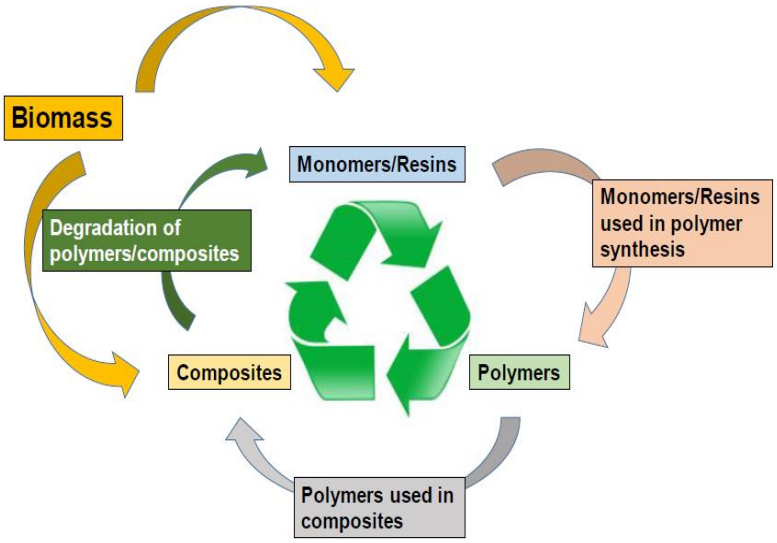
CSMS research:

Year 4 continued to build capacity for interdisciplinary research state-wide with partner institutions Mayville State University, Minot State University, North Dakota State University, Sitting Bull College and the University of North Dakota.

- A CSMS highlight: Developing stable nanoparticles from biobased soybean oil for uses in engineering and medicine. The composites and nanoparticles can now be used for molecular delivery applications, even for encapsulating and transporting hydrophobic (doesn't mix with water) molecules in a biologic environment. The ag-based products ca be used in biomedical, agricultural and nutraceutical settings for controlled-release purposes. These nanotechnology building blocks reduce carbon footprint and energy consumption (**Mohiuddin Quadir, NDSU**).

In addition during Year 4, faculty and student researchers across the state were taking part in multiple efforts:

- Approximately 28 graduate students and 25 undergraduate students have been active with CSMS research during the past year.
- Researcher **Mafany Ndiva Mongoh** (SBC) led an effort to determine natural biodegradation potential of materials created by the project.
- **Mukund Sibi's** group (NDSU) synthesized over 60 new monomers which have performance profiles that are not available in current petrochemical polymers, which may result in increased demand for bio-based polymers.
- **Khwaja Hossain** (Mayville) explored the use of wheat bran to make composites that would be comparable with current petrochemical materials.
- Lignin is a useful and complex organic polymer that is found in the cell walls of many plants, making them rigid and woody. **Alena Kubatova's** group (UND) developed a comprehensive characterization of lignin and its degradation products, creating a potential for future commercialization.
- **Mohiuddin Quadir's** and **Dean Webster's** groups (NDSU) collaborated on developing new nanomaterials that were capable of encapsulating and transporting hydrophobic molecules to biological targets.
- Student researchers at Minot State, led by **Mikhail Bobylev**, successfully created a model for polymerization reaction, leading to a publication.
- The illustration below shows the integration of the research components in CSMS.



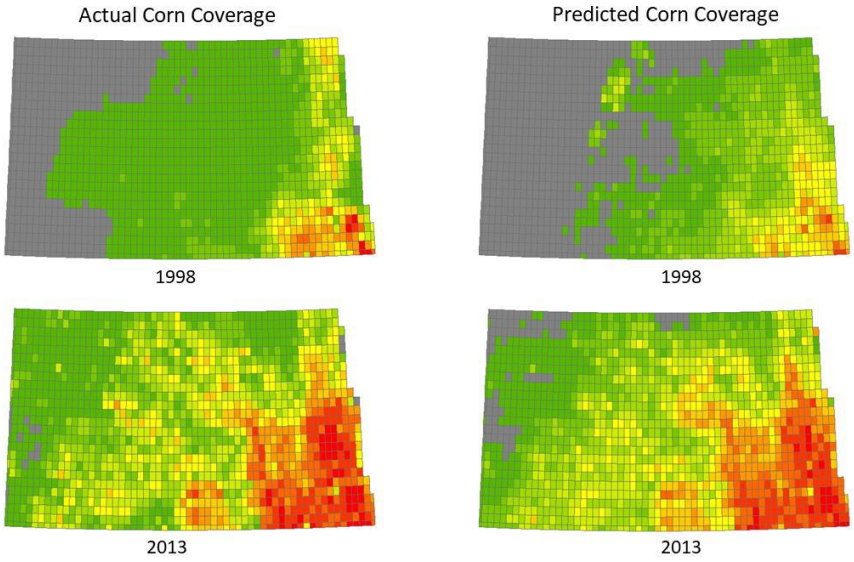
CRCS research:

Year 4 included the efforts of researchers from four tribal colleges—Cankdeska Cikana Community College, Nueta Hidatsa Sahnish College, Turtle Mountain Community College and United Tribes Technical College—plus Dickinson and Valley City State Universities as well as the University of North Dakota and North Dakota State University.

- A CRCS highlight: The results of this study describe how and where acreages of five major land uses have changed throughout North Dakota from 1998 to 2014 in response to both economic and climate factors affecting farmers. The estimated functions and forecasts derived from them will be useful in

planning future infrastructure investments in the agribusiness industrial sector—for example, where new grain storage and loading facilities should be built to accommodate shifting production regions for various crops. Additionally, federal and state-level policy makers should take interest in these results because federal and state agricultural policy will need to respond to changing needs of farmers as they change their production mixes (**David Roberts, NDSU**).

- The illustration below tracks the difference in actual and predicted corn coverage between 1998 and 2013.



Additional CRCS activities at various institutions across North Dakota included:

- **Andre DeLorme's** group (VCSU) discovered eight species of dragonfly that were not known in North Dakota prior to the research on aquatic habitat quality.

- Dynamic downscaling of models was developed to provide scientists with better information on the impact of crop cover on atmosphere, while another of **Aaron Kennedy's** group (UND) investigated predictive models for blizzards and other severe convective weather.
- Measurements of precipitation, air temp and snow depths from **Xuefeng Chu's** group (NDSU) was shared with stakeholders, while others in the group developed a hydrologic model and runoff index for drought identification in cold climate regions and also worked to develop a new integrated hydrological modeling system.
- **Mike Parker** (CCCC) explored biological remediation of contaminated soil using enzymes from saprophytic fungi, with initial results showing contaminate reduction of 26-34% in just one month.
- **Jianglong Zhang** and **Haochi Zheng** (UND) studied the linkage between farmers' crop choices and an economic land use model to improve the accuracy of crop predictions for maize, soybeans and wheat crops.
- A major breakthrough in understanding soil health was achieved through **Anne Denton's** group (NDSU). Using information from **Xuefeng Chu's** (NDSU) analysis, the team was able to avoid challenges previously posed by vegetation, which often distorted topographic analysis.
- **Eric Brevik, Joshua Steffan** and **Paul Barnhart's** group at DSU collected and analyzed soil samples to assess the impact of farmers' land management changes on soil microbes.
- Students from across the state were an important part in the research with approximately 31 graduate students and 24 undergraduate students active with CRCS research during the past year.
- To gain a better understanding of how North Dakota farmers adjust their crop selection, **David Roberts'** (NDSU) group developed econometric models, using market conditions and location factors.
- **Xiaodong Zhang's** group (UND) conducted a water quality study in the Devils Lake watershed, analyzing the sulfate concentration and investigating the impact of Devils Lake flooding.

Outreach: Education, Workforce Development and Collaborations

The STEM pathway often begins in early childhood, as a young person is encouraged to explore the world of science, technology, engineering and math (STEM). As a part of the NSF EPSCoR Track-1 collaborative agreement, ND EPSCoR offers support for developing tools that can be used by K-12 teachers, and learning how to better understand student choices. In addition, there are collaborations with industry and education across the state.

- An Outreach highlight: Twelve students across the state participated in a distributed Research Experience for Undergraduates (REU), allowing the student to remain at their home institution or travel

to another participating institution while contributing to ground-breaking research. The 2018 students awarded were **Karissa Bohn**, (DSU); **Amy Jackson**, (UTTC); **Creighton Pfau**, (Mayville); **Tess Skinner**, (Minot State); and **Yaritza Vilanueva**, (VCSU). In 2017, **Brittany Decker**, (DSU); **Noah Irby**, (UND); **Anna Renner**, (NDSU); **Hannah Torgerson**, (Mayville); **Kayana Trottier**, (TMCC); **Lee Voigt**, (NHSC); and **Hayden Zander** (VCSU) were the awardees.

- Seven new NATURE Sunday Academy lessons were created and presented at five tribal college locations to encourage **480 middle and high school** students to consider a STEM career.
- To track interests and choices made by students, data was collected from over **300 fifth and eighth grade students** from rural ND schools including Bowman, Circle of Nations, Gackle, Montpelier, Napoleon, Steele – Kidder County, Sterling, Wilton and Wing.
- Outreach also includes supporting **59 graduate students and 49 undergraduates**, who were trained in research methods and learned about regional climate and sustainable bio-materials.
- A **CRCS Stakeholder Advisory Board** was created, with support from agriculture, water management and regional weather/climate groups.
- **CSMS team members** have continued to develop partnerships with industry, including **Mukund Sibi** and **Dean Webster** (NDSU) with AkzoNobel, **Dean Webster** with Zymergen and **Chad Ulven** (NDSU) with Composites Innovation Center.
- **Dickinson State University** hosted K-12 STEM education events over the summer, providing teachers with professional development resources and information.
- A collaborative effort between the University of Georgia and **NDSU** resulted in the third **International Symposium on Materials from Renewables** in July 2018. A distinguished group of speakers from industry and research addressed developments in creating materials from renewable resources, such as natural polymers and plant or vegetable oils. Students, faculty and guests were able to hear from top scientists who are working on emerging research.

It's been a busy, productive year! You can continue to look for new information and results in the year ahead, as this important research and outreach continues throughout the state. For the latest news, check our website at www.ndepscor.ndus.edu.

Funding and RFPs

ND EPSCoR will showcase EPSCoR-related funding opportunities when they become available. ***Please work with your own campus sponsored program individuals to ensure that you're meeting internal deadlines and crafting appropriate budgets.***

NSF EPSCoR: Research Infrastructure Improvement Program: Track-2 Focused EPSCoR Collaborations (RII Track-2 FEC) - Limited Submission Program

The NSF EPSCoR Research Infrastructure Improvement Program: Track-2 Focused EPSCoR Collaborations (RII Track-2 FEC) program builds interjurisdictional collaborative teams of EPSCoR investigators in scientific focus areas consistent with NSF priorities. For FY 2019, RII Track-2 FEC proposals are invited on a single topic: "Harnessing the Data Revolution to solve problems of national importance." Projects are investigator-driven and must include ***researchers from at least two RII- eligible jurisdictions*** with complementary expertise and resources necessary to tackle those projects, which neither party could address as well or rapidly alone.

The Science, Technology, Engineering and Mathematics (STEM) research and education activities should seek to broaden participation through the strategic inclusion and integration of different types of individuals, institutions and sectors throughout the project. Proposals must describe a comprehensive and integrated vision to drive discovery and build sustainable STEM capacity that exemplifies diversity of all types (individual, institutional, geographic and disciplinary). The development of diverse early-career faculty is a critical component of this sustainable STEM capacity. A single proposal is submitted for a project. Support for non-lead collaborating institutions should be requested as subawards. Separately submitted collaborative proposals are not allowed. Each participating EPSCoR jurisdiction must have at least one co-PI on the project. Proposals that do not comply with these requirements will be considered not responsive, and will be returned without review.

Funding and RFPs con't.

Letter of Intent Deadline: November 26, 2018; Full Proposal Deadline: January 25, 2019

Please note: Limited submission grant programs are those that indicate a limit on the number of proposals that may be submitted **by an institution** for a particular deadline. What does that mean for you? A selection process becomes necessary if more applicants express interest in applying than a single institution is allowed to submit to the grant program. Please contact your campus research office for your campus requirements.

ND NASA EPSCoR CAN FY2019 Announcement RFP

In response to the FY 2019 Cooperative Agreement Notice (CAN) solicitation, the North Dakota NASA Established Program to Stimulate Competitive Research (EPSCoR) is soliciting research proposals from research faculty at Affiliate Institutions specifically designed to promote and expand NASA research in North Dakota. One proposal will be selected by ND NASA EPSCoR for full submission for the CAN. Following preliminary proposal selection by ND NASA EPSCoR, the selected PI must submit an NOI before *October 22, 2018* and a full proposal by *December 7, 2018*.

Details and guidance for pre-proposals can be found on the ND NASA EPSCoR website here: http://ndnasaepscor.und.edu/news/news-article.aspx?newsid=2641

Pre-proposals must be submitted to ND NASA EPSCoR by **Noon, October 8, 2018.**

ND EPSCoR Track-1 team updates

Please welcome new teammates or those with changing roles to the Track-1 effort as of August 31:

- **John Mihelich**, (UND) is the new Co-Principal Investigator for the NSF EPSCoR Track-1 leadership team as of July, 2018. He is the Associate Vice President/Faculty Fellow, Division of Research & Economic Development at the University of North Dakota, and brings a wealth of experience as well as a passion for STEM education.
- **Brent Voels**, (CCCC) is the new Principal Investigator for his campus. He is a science instructor.

Welcome to the state office

Business Office Manager, Janelle Smith, comes with a background in operations and management. When you have questions about your budget, which fund to use, or to submit invoices, she's got the answers. 701-231-1048

STEM Manager, Paul Keidel, brings a lifetime of teaching and working with students and STEM across the state. For practical, tested ideas on successful STEM integration/ outreach for your team or program, give him a call. 701-231-8264

Communication Manager, Joyce Eisenbraun, has extensive experience in marketing/communication. When you'd like to tell the world about your research/students/impact to the state and nation, send the info her way. 701-231-8109

Stay in touch

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