

ND EPSCoR

FY26 ANNUAL REPORT

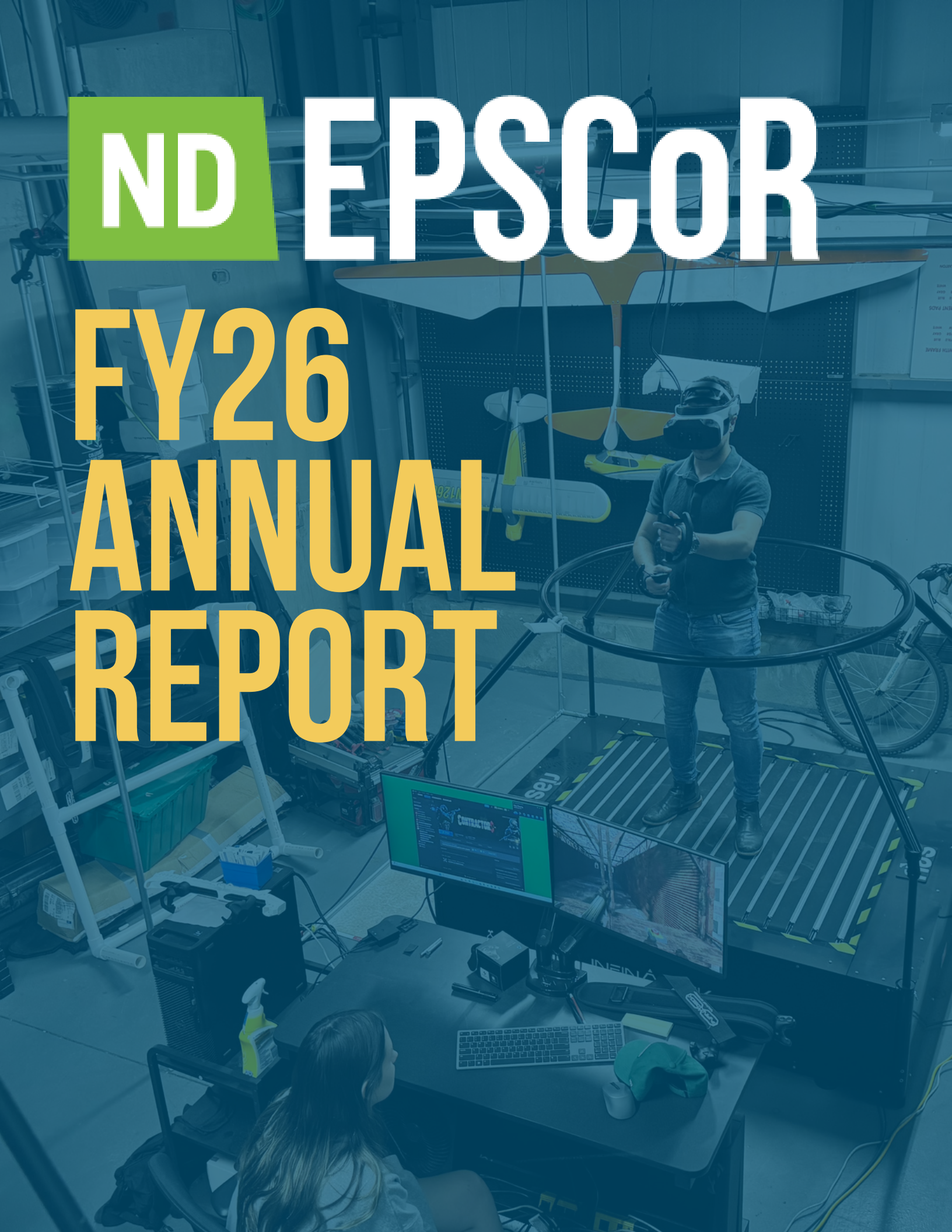


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On the cover: University Summer Camp participant Langston Poitra at UND's Research Institute for Autonomous Systems

PARTNERING INSTITUTIONS

- Bismarck State College (BSC)
- Cankdeska Cikana Community College (CCCC)
- Dickinson State University (DSU)
- Mayville State University (MaSU)
- Minot State University (MiSU)
- North Dakota State University (NDSU)
- Nueta Hidatsa Sahnish College (NHSC)
- Sitting Bull College (SBC)
- Turtle Mountain College (TMC)
- United Tribes Technical College (UTTC)
- University of North Dakota (UND)
- Valley City State University (VCSU)

INTRODUCTION

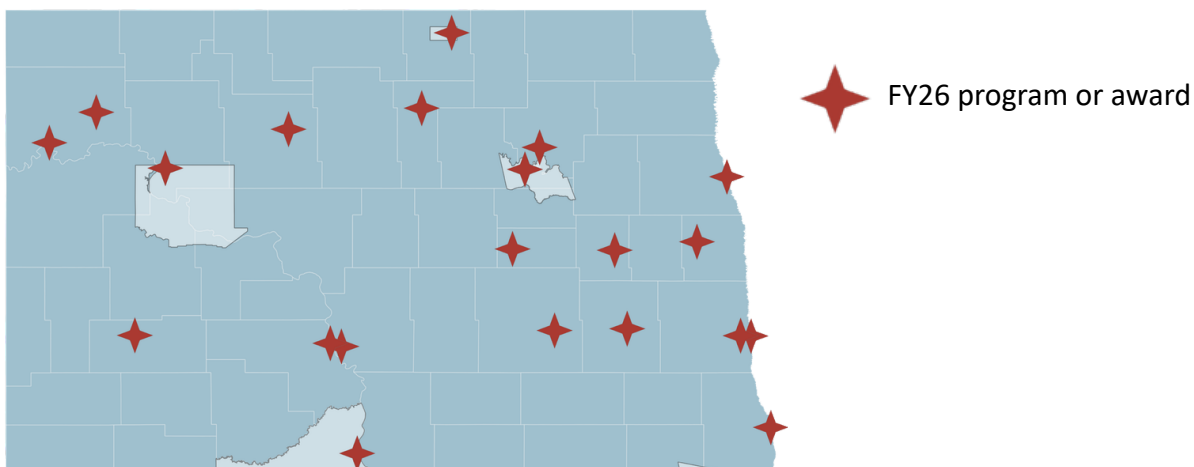
ND EPSCoR has a three-part mission to:

- provide leadership and coordination to broaden and diversify North Dakota's science, technology, engineering, and mathematics (STEM) workforce pathway from elementary through graduate school.
- support and grow statewide STEM research efforts and competitiveness.
- convey the impact of STEM research, outreach, and workforce efforts to North Dakota stakeholders.

To accomplish this mission, ND EPSCoR supports activities that broaden research capabilities and capacity, create STEM learning opportunities, and develop the STEM workforce across the state. By providing offering STEM research opportunities for high school, undergraduate, and graduate students, engaging K12 students in fun and interactive STEM activities, and supporting STEM faculty research activities, we help ensure that the STEM workforce that North Dakota needs for tomorrow is being trained today.

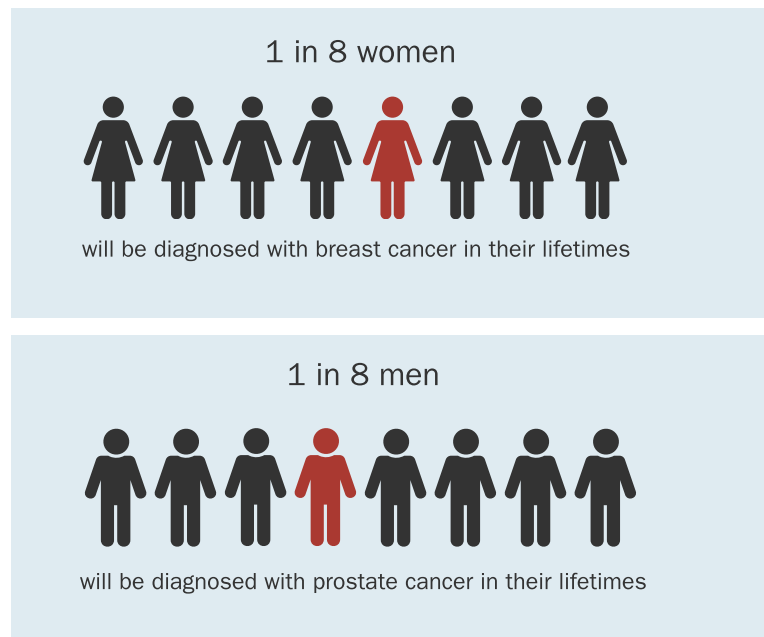
Our FY26 activities ranged from K12 programs to higher education research opportunities, workforce development, and outreach. We continued to support the NSF EPSCoR RII Track-1 project, ND-ACES, through its sixth and final year, and helped launch North Dakota's first NSF E-CORE award, SPARK-ND.

Our motto is “we serve the state.” This report outlines some of the ways in which ND EPSCoR has served North Dakota in fiscal year 2026.



RII TRACK-1 ND-ACES

Breast and prostate cancers account for over 25 percent of all new cancer cases in the United States. According to the American Cancer Society, patients in the US were diagnosed with over 600,000 new cases of breast (319,750) and prostate (313,780) cancer in 2025. Worldwide, one in eight women will be diagnosed with breast cancer and one in eight men will be diagnosed with prostate cancer in their lifetime. Cancer survival rates at five years for breast and prostate cancer are greater than 85 percent if the cancer is diagnosed in the early stages when it is still localized to the original site or region, but five-year survival rates drop to less than 40 percent once the cancer has spread to distant sites.



Sources: <https://seer.cancer.gov/statfacts/html/breast.html>,
<https://seer.cancer.gov/statfacts/html/prost.html>

One of the challenges in treating metastatic cancer is understanding the mechanisms that govern it. Research to date has determined that these mechanisms are highly complex, dynamic, and vary between individuals. Researchers are working to answer questions about how and why tumor cells migrate from the initial tumor site to what causes the latent period between when cancer cells migrate from the original tumor to when a metastatic tumor is detected.

North Dakota's NSF EPSCoR Research Infrastructure and Improvement Track-1 effort [New Discoveries in the Advanced Interface of Computation, Engineering, and Science (ND-ACES)] has addressed this challenge by using an integrated approach bringing together experts in the fields of cellular biology, materials science, and computational research to understand and define the complex mechanisms that govern interactions between individual cells and their environment.

ND-ACES ACHIEVEMENTS AND OUTCOMES

Since its inception in 2020, ND-ACES has established the state as a leader in developing next-generation cancer research tools focused on understanding and treating breast and prostate cancer metastasis. The effort brought together researchers from across the state to combine biomaterials engineering, cell biology, and advanced computational modeling into a unified approach to cancer research.

A central achievement of the project was the creation of highly realistic, human-relevant cancer “testbeds” that mimic how cancers grow and spread within the human body. Researchers developed fully in vitro models of breast and prostate cancer bone metastasis that accurately reproduce the bone microenvironment. These platforms provide a powerful alternative to traditional animal models and can be used for personalized medicine, drug testing, and discovery of new therapies.

To support these testbeds, the team developed multiple enabling technologies. A patented horizontal-flow bioreactor reproduces physiologically relevant blood flow and mechanical forces that influence cancer-cell movement, attachment, and growth. Researchers also created new hydrogel biomaterials and bone-mimicking scaffold systems that support three-dimensional (3D) tumor growth, better reflecting real tissue conditions than conventional laboratory cultures. Additional innovations included a low-cost 3D-printed cell migration device and new methods for studying metabolism in 3D tumor cultures.

ND-ACES BY THE NUMBERS

ND-ACES supported

- 177 graduate students
- 170 undergraduate students
- 149 STTAR interns
- 74 faculty researchers
- 6 post-docs

And to date has yielded

- 96 refereed journal articles
- 80 proposal submissions
- 7 patent applications
- 1 patent issued

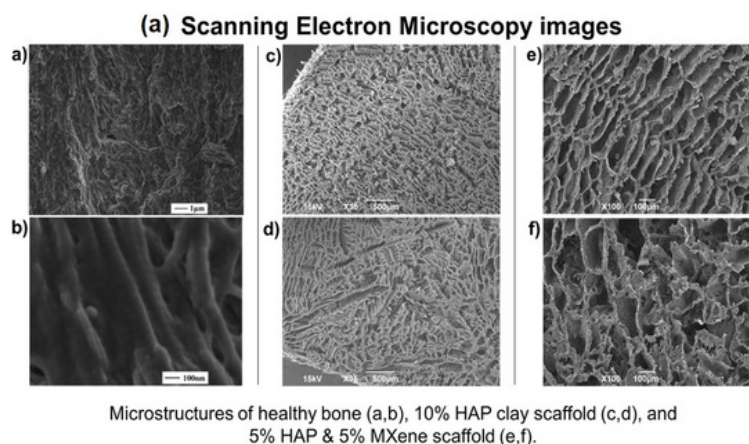
Plus 26 awards, for a total of \$20.6M additional research dollars.



ND-ACES ACHIEVEMENTS AND OUTCOMES

Computational science played a transformative role throughout the project. Researchers developed advanced molecular modeling, computational fluid dynamics, machine learning, and multiscale simulation tools to predict how cells respond to biomaterials, model cancer progression, and accelerate therapeutic discovery. These efforts helped establish a foundation for what investigators describe as “in silico oncology,” where computer models complement and reduce the need for costly laboratory experimentation.

The project produced several important discoveries. Studies confirmed that cancer cells grown in realistic 3D environments behave significantly differently—and more like real tumors—than cells grown in traditional 2D cultures. Researchers showed that tumor behavior is strongly influenced by surrounding tissue properties, including stiffness and bone-like conditions. New findings also revealed how cancer metabolism changes depending on the type of 3D culture system used, highlighting the importance of model selection in cancer research.



Beyond scientific advances, ND-ACES made a substantial impact on workforce development and statewide research capacity. Students from research universities, undergraduate institutions, and Tribal colleges gained hands-on experience in cutting-edge cancer research. Dozens of students participated in paid research, presented at conferences, contributed to publications, and pursued graduate, medical, and research careers, including 27 students at VCSU alone.

NSF EPSCOR

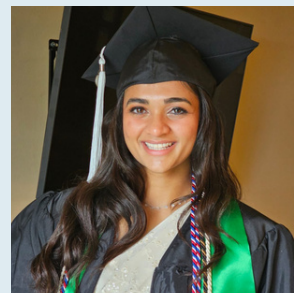
ND-ACES ACHIEVEMENTS AND OUTCOMES

ND-ACES also pioneered the creation of a TCU pillar, which was unique among NSF's Track-1 awards. The TCU pillar became the home of NATURE activities, including Sunday Academy, TCU Summer Camps, and University Summer Camp. Sunday Academy had 2,358 student participations over the six years of the project. Sunday Academy lessons spanned a wide range of STEM topics, including math, engineering, robotics, chemistry, biology, neurobiology, medicine, microbiology, alternative energy, agriculture, and hydrology. A continuation of the TCU pillar later became a part of the successful SPARK-ND award.

ND-ACES successfully created a statewide ecosystem that integrates advanced biomaterials, computational modeling, patient-derived cancer models, and workforce development to accelerate cancer research. The program has positioned North Dakota at the forefront of cancer modeling, personalized medicine, and computational oncology while creating technologies and expertise with long-term benefits for science, healthcare, and economic development. ND-ACES has built durable scientific infrastructure, intellectual property, and expertise that will continue advancing cancer research and attracting investment to North Dakota well beyond the original grant period.

STUDENT SPOTLIGHT: ANJALI NAYAR

UND graduate and ND-ACES undergraduate student researcher Anjali Nayar was accepted to the UND School of Medicine and Health Sciences. The school receives approximately 1,800 applications per year and admits 78 students per cohort, which is an estimated acceptance rate of around 4 to 5 percent.



As a pre-med student, her college experience was enriched by joining Amanda Haage's lab during her sophomore year to work on ND-ACES research. Nayar says that her research experience was invaluable in preparing her to apply for medical school. "Having my name on multiple posters has been great, and has taught me a lot about presenting, communication, learning the basic sciences. I think every undergrad student pursuing medicine should get into research."

NSF EPSCOR

RII E-CORE SPARK-ND

In August 2025, ten of ND EPSCoR's partnering institutions were approved for an NSF E-CORE award for their Sustainable Programs Advancing Research and Knowledge across North Dakota (SPARK-ND) proposal. NSF has awarded the project for an anticipated total amount of \$7,963,804 over four years.

SPARK-ND, funded by NSF under their EPSCoR Collaborations for Optimizing Research Ecosystems Research Infrastructure Improvement (E-CORE RII) program, aims continue the work of building a sustainable STEM research and education ecosystem in North Dakota. Led by NDSU, the collaborating colleges and universities will expand STEM research capacity, connect research communities, build STEM research literacy in rural populations, and strengthen the STEM community at the five TCUs (Tribal Colleges and Universities).

Planned activities for SPARK-ND include:

- outreach to rural schools, including opportunities for high school and undergraduate students to participate in scientific research.
- engagement with primarily undergraduate institutions (PUIs) and TCUs to recruit and retain STEM students.
- development of multi-institutional research teams across the state using networking events, workshops, and funding opportunities.

Colleges and universities participating in SPARK-ND are:

- Cankdeska Cikana Community College
- Mayville State University
- Minot State University
- Nueta Hidatsa Sahnish College
- North Dakota State University
- Sitting Bull College
- Turtle Mountain College
- United Tribes Technical College
- University of North Dakota
- Valley City State University



NSF EPSCOR

SPARK-ND ACTIVITIES

STRATEGIC PLANNING

In October 2025, NDSU, ND EPSCoR, and partner institutions came together for a key strategic planning meeting for SPARK-ND. The session highlighted the importance of teamwork and relationship building among universities and Tribal colleges in North Dakota. Participants engaged in meaningful discussions to define a shared vision and mission, identify primary objectives, and develop strategies to overcome potential challenges.

2026 NSF EPSCOR ANNUAL SUMMIT

Nineteen North Dakotans attended the NSF EPSCoR Annual Summit in May in New Orleans, engaging in valuable networking and knowledge exchange with peers from across EPSCoR jurisdictions. Participants connected with NSF program officers and leadership, gaining insight into programmatic direction, upcoming changes, and emerging trends. Several members of the SPARK-ND team facilitated a workshop that highlighted North Dakota's innovative efforts to build sustainable research collaborations among R1 institutions, Tribal colleges and universities, and PUIs—partnerships that remain central to our long-term success.



SPARK-ND team members present at the 2026 NSF EPSCoR Annual Summit

WORKFORCE DEVELOPMENT

STUDENTS IN TECHNOLOGY TRANSFER AND RESEARCH

The Students in Technology Transfer and Research (STTAR) program was established in 1994 in response to recognized state and national needs for increased technology transfer from universities to industry. Since it began, more than 200 North Dakota companies and more than 600 students from across the state have participated in this highly successful program.

The STTAR program provides upper-division students in STEM with an opportunity to use their academic training to address challenging science- and technology-based problems faced by companies in North Dakota. STTAR emphasizes hands-on professional experiences in areas such as research, development, and field work.

ND EPSCoR reimburses participating companies \$10 per hour of a wage of \$18 per hour or more to their interns, up to \$4,800 per intern per year. Benefits of the STTAR program include financial support to offset some of the cost of hiring interns, support for companies in technical areas, practical work experience for students, and a better trained workforce for the state of North Dakota.

Because STTAR students are hired in the summer, the program crosses the fiscal year. In 2025, 23 students worked at 13 different companies. In 2026, 29 students are working at 15 different companies, including four students who have previously participated in the program.



Ackerman-Estvold STTAR intern Nick Sanders in the field near New Town

RESEARCH CAPACITY

NSF PROPOSAL RESUBMISSION PROGRAM

To better support researchers in ND to build capacity and competitiveness through NSF awards, ND EPSCoR offered an NSF Proposal Resubmission Program, which provided principal investigators funds to access resources for improving an already highly-rated proposal for resubmission. The program funds could only be used for an unfunded proposal with reviews received within the past six months. Four applications were submitted, and three awards were made.

PUI AND TCU PRE-PLANNING GRANT PROGRAM

ND EPSCoR offered a pre-planning grant program for researchers at PUI and TCU institutions in ND. These awards are to initiate early-stage team building and project ideation by providing the necessary resources to convene and help catalyze collaborative, interdisciplinary, and interinstitutional conversations. The anticipated outcome of these awards is a preliminary plan identifying a research or research support topic, partnering institutions, and key personnel with expertise/strengths for the proposed project, leading to the submission of a meritorious NSF EPSCoR Planning Grant Application and eventually an E-RISE, E-CORE, or other NSF proposal.

An award was made to Emily Biggane of UTTC for pre-planning for the future E-RISE proposal North Dakota Ecosystem in Mechano-Biology Education and Research (ND-EMBER).

RESEARCH CAPACITY

STEM RESEARCH SEED AWARDS

ND EPSCoR offered STEM research seed awards to research faculty for the specific purpose of generating preliminary data needed to support the preparation of a STEM proposal for submission to a federal agency. Funds may be used for materials and supplies, student support, and operating services. Priority was given to proposals that fit within the current State Science & Technology Plan, and to multi-institutional, collaborative, interdisciplinary teams/research.

Fifty-seven proposals were submitted by North Dakota research faculty, and funding was awarded to the following seven projects.

Deciphering Estrogen receptor alpha - cofactor interactions in distinct cellular environments

Led by Bappaditya Chandra, Chemistry and Biochemistry, NDSU, in collaboration with Archana Dhasarathy, School of Medicine & Health Sciences, UND; Motoki Takaku, School of Medicine & Health Sciences, UND; Emily Biggane, Intertribal Research and Resource Center, UTTC

Decoding How Cells Sense and Respond to Nanoparticles

Led by Maria Morrell, Chemical Engineering, UND, in collaboration with Julia Zhao, Chemistry, UND; Uwe Burghaus, Chemistry and Biochemistry, NDSU; Stefan Vetter, Pharmaceutical Sciences, NDSU; Susan Eliazar, School of Medicine & Health Sciences, UND; Audrey LaVallie, Chemistry, NHSC; Hilde van Gijssel, Science, VCSU

Energy-Aware Coordination of Heterogeneous UAV–UGV Fleets for Persistent Infrastructure-Free Operations

Led by Inbae Jeong, Mechanical Engineering, NDSU, in collaboration with Youjin Jang, Civil, Construction and Environmental Engineering, NDSU

RESEARCH CAPACITY

STEM RESEARCH SEED AWARDS

Engineering Polar Materials for Enhanced Sulfur Electrochemistry in Lithium–Sulfur (Li-S) Batteries

Led by Qifeng Zhang Electrical and Computer Engineering, NDSU, in collaboration with Xiaodong Hou, College of Engineering and Mines, UND

Genomic Drivers of Adaptation and Extinction in North American Megafauna: Implications for Contemporary Conservation Efforts and North Dakota Economy

Led by Igor Ovchinnikov, Biology, UND, in collaboration with Paul Ullmann, Harold Hamm School of Geology & Geological Engineering, UND

Graphene-Intercalated Ultra-Stable 1T-MoS₂ Heterostructures Catalyst for Green Hydrogen Production: Experimental and Simulation Studies

Led by Xiaodong Hou, Center for Process Engineering Research, UND, in collaboration with Deniz Cakir, Physics and Astrophysics, UND; Weixin Huang, Chemistry, UND

PFAS and Microplastics in North Dakota Snowpacks and Their Implications for Agricultural Landscapes

Led by Darshil Patel, Forensic Science, UND, in collaboration with Hannah Correia, Biology, UND; Alena Kubatova, Chemistry, UND

RESEARCH CAPACITY

INTENTIONAL COLLISION

Intentional collisions are structured networking events designed to bring researchers with shared interests together across institutions to catalyze team formation around specific research questions. On April 22, 2026, SPARK-ND hosted an intentional collision at the Heritage Center in Bismarck. The event was offered in a hybrid format. Facilitation was led by consultants Jennifer Janecek-Hartman and Leah Woodke.

This intentional collision convened North Dakota researchers, extension professionals, and other stakeholders to address the intersecting challenges of cover crop adoption and pollinator health, which are topics directly relevant to the state's agricultural economy and conservation landscape.

The goal of the event was to plant the seeds for multi-institutional research teams capable of submitting collaborative proposals, with a SPARK-ND Seed Grant program to follow as possible support.

Twenty-five researchers from 17 institutions attended the event. In a post-event survey, two-thirds said they made a new connection and expected a future collaboration to result.



Participants and facilitators at the April 2026 Intentional Collision

RESEARCH CAPACITY

NDSU LEVERAGED FUNDS

With the goal of increasing research capacity and workforce strategies related to emerging priority needs, NDSU's investments of funding have included the following activities.

NDSU used leveraged funding to support research capacity building and workforce development programs through undergraduate research experiences. Forty-three undergraduate student researchers were supported in the Spring 2026 EXPLORE Undergraduate Research Program. This 18-week paid research experience program gave students the opportunity to conduct mentored, hands-on research. Faculty mentors and projects represented 20 distinct departments from across campus.

A research equipment program was implemented to advance research activities at NDSU through the acquisition of shared-use research equipment. The program is designed to strengthen research capacity, foster interdisciplinary collaboration, and position investigators for future external funding. Six applications were funded.

- Yongki Choi, Physics: The acquisition of an atomic force microscopy (AFM) system will provide shared-use, high-resolution imaging and quantitative mapping to strengthen NDSU's research capacity at the intersection of advanced materials, nano/biotechnology, and biomedical/health-related research, directly impacting at least four departments in two colleges.
- Kendra Greenlee, Biological Sciences: The acquisition of a microbalance will replace an inoperable and not-repairable piece of critical equipment in the department of biological sciences, enabling research in pollinator health, cancer cell biology, and stable isotope analysis for biomedical applications.
- Qifeng Zhang, Electrical and Computer Engineering: The acquisition of a high-temperature tube furnace will enable research into a variety of advanced materials by providing precise control and higher temperatures than standard tube furnaces. This equipment will strengthen existing successful research programs and expand capabilities in at least three departments in two colleges.

RESEARCH CAPACITY

NDSU LEVERAGED FUNDS

- Yan Zhang, Mechanical Engineering: The acquisition of a portable high-speed particle image velocimetry system will enable quantification of complex motion and fluid flow, advancing diverse research domains in agriculture, materials, and biomedical science. This equipment will directly impact researchers in five departments across three colleges.
- Samiran Banerjee, Plant Pathology, Microbiology and Biotechnology: The acquisition of an ultra-low temperature (-80°) freezer is critical to maintain sample integrity for genome-level analysis, supporting research in both agricultural and biomedical areas. This shared-use freezer will be used by researchers in five departments from three colleges, plus enable collaborations with USDA researchers.
- Zhikai Liang, Plant Science: The acquisition of a high-end chlorophyll fluorescence imaging platform will expand capabilities in plant science and related fields for field-scale phenotyping and breeding applications. This equipment directly impacts researchers in three departments across two colleges.

Research development support included investments in proposal development assistance for four faculty submitting to the National Science Foundation CAREER program, the implementation of research development services for advancing university-industry-government DoD research partnerships, and travel support for agricultural and biosystems engineering faculty to develop connections for controlled environment agriculture (CEA) operations, greenhouse energy and water management, and data center–greenhouse colocation. The visits provided valuable exposure to advanced greenhouse climate modeling, digital twins, sensors and robotics, geothermal and renewable energy systems, rainwater harvesting and water recycling, and waste-heat recovery from data centers.

RESEARCH CAPACITY

UND LEVERAGED FUNDS

With the goal of increasing research capacity and workforce strategies related to emerging priority needs, UND's investments of funding have included the following activities.

The Early Career Scholars Program supported new faculty to develop multidisciplinary teams, build important network connections, receive mentorship, and conduct research that will lead to external proposal submissions. Participants included:

- Anuradha Akmeemana, Assistant Professor, Criminal Justice
- Darshil Patel, Assistant Professor, Criminal Justice
- Justin Montigne, Assistant Professor, Music
- Markus Allgaier, Assistant Professor, Physics & Astrophysics
- Thanh Phat Vo, Assistant Professor, Mathematics
- Tugba Boz Toguslu, Assistant Professor, Education, Health & Behavior
- Jielun Zhang, Assistant Professor, Electrical Engineering & Computer Science
- Jueming Hu, Assistant Professor, Mechanical Engineering
- Tingjun Lei, Assistant Professor, Electrical Engineering & Computer Science
- Young Jae Choi, Assistant Professor, Economics & Finance

Conference support was provided for the 2025 International Conference: Lyme Borreliosis and Other Tick-Borne Diseases held this past September in Chicago, Illinois.

Support was provided for University investment into Web of Science Intelligence to provide all UND access to an agentic AI-supported tool for monitoring scholarly publications and their impact within UND and abroad. The platform also enables AI-assisted tailored funding opportunity and investigator expertise searches.

STEM PATHWAY

SCIENTIST IN THE CLASSROOM

Rachel Schomaker visited Ray Public School in November 2025 as part of the SPARK-ND Scientist in the Classroom (SitC) program. Ray is approximately 90 miles west of the campus of Minot State University, and is exactly the kind of rural school that this program envisioned partnering with to help support M-12 STEM teachers with both scientific expertise and supplies and equipment.

In collaboration with biology teacher Eric Viall at Ray Public School, Schomaker set up the dates of the classroom visit, decided how to integrate her visit with the classroom curriculum, and ordered the supplies and equipment to support that classroom not only this year, but into the future.

Viall and Schomaker determined that an autoclave and some media would be great additions to his classroom in Ray to help facilitate the microbial labs and experiments that Viall likes to do with his students.

While she was on site in Ray, Schomaker and Viall taught students the general microbiology techniques used to isolate and identify bacteria from the environment, with a focus on gram staining and using selective and differential media to identify bacterial characteristics. Students learned techniques for bacterial isolation, how to identify differences between gram negative and gram positive bacteria in relation to biomedical sciences, and how to select and make their own media using their new autoclave. These skills will be useful for the remainder of their high school education, and will give them a great head start if they go on to study environmental science, ecology, or biomedical science in college.



Rachel Schomaker and Eric Viall prepare for Scientist in the Classroom in Ray

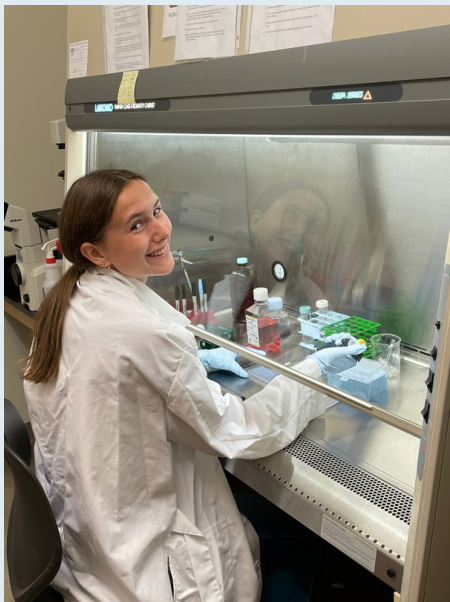
STEM PATHWAY

STUDENT SPOTLIGHT: BROOKLYN BOTZ

Through SPARK-ND, a rural North Dakota high school student gained college-level research experience as a paid student researcher at VCSU. Brooklyn Botz, a senior at Valley City High School, participated in the Research Experience for High School Students (REHSS) program, where she developed laboratory research skills aligned with her interest in genetics.

REHSS expands access to authentic research experiences for rural students, strengthens North Dakota's STEM workforce pipeline, and supports workforce development in biotechnology and health sciences by preparing students early for advanced education and research careers.

Botz said of her experience with REHSS, "I have learned so much about how to do lab research in a college setting, which is something I never would have learned without the grant that allowed me to join. The skills that I have learned will help me not only as I transition into college but also into my future career. I want to do genetic research, and by doing this research project, I have gained insight into what I will be doing in the future."



The STEM Pathway within SPARK-ND is designed to foster early interest in research and support students' transition from high school to undergraduate and graduate education. Many rural North Dakota students have limited exposure to original research, which can reduce awareness of research careers and graduate school pathways. The REHSS program directly addresses this gap by enabling students to engage in mentored research prior to beginning college.

STEM PATHWAY

UNDERGRADUATE STEM RESEARCH AND EDUCATION AWARDS

ND EPSCoR State Office accepted proposals to fund undergraduate STEM research activities at TCUs and PUIs within the state. The following awards were made in FY26.

UNDERGRADUATE RESEARCH AWARDS

Assessing the Correlation between Trexo Robotics Devices and Bowel Movements in Children with Stage (V) and Stage (IV) Cerebral Palsy

Student researcher: Samuel Stillings, DSU, mentored by Sarah Manka

The researchers will collaborate with Trexo Robotics to contact families of children with cerebral palsy (CP) across the United States and Canada who use their products. They plan to assess 50 children under 18 years old who have stage (V) or stage (IV) CP to gain insight into how using Trexo Robotics may increase gut motility.

Documenting Ephemeroptera (Mayflies) Presence in ND Waters

Student researcher: Ezekiel Luchi, VCSU, mentored by Andre DeLorme

The VCSU Macroinvertebrate lab is working to identify mussels and aquatic insect populations for addition to lists of Species of Greatest Conservation Need (SGCN) and Species of Greatest Information Need (SGIN). There are currently five species of Mayfly on the SGCN list and eight species on the SGIN list. Researchers will gather information about these species and identify potential candidates for each list, in conjunction with the North Dakota Game and Fish Department.

Documenting Mussel Populations in North Dakota Rivers

Student researcher: Lorenzo Luchi, VCSU, mentored by Andre DeLorme

Researchers will be collecting mussel habitat data, georeferencing data, and photographing exemplary specimens.

STEM PATHWAY

UNDERGRADUATE STEM RESEARCH AND EDUCATION AWARDS

EQUIPMENT AWARDS

Equipment Grant for Macrophotography

PI: Andre DeLorme, VCSU

This equipment grant will provide the VCSU Macroinvertebrate Lab (VCSU Mac Lab) with a high-quality imaging system for documenting aquatic organisms from North Dakota waters. These photos will be used as part of a digitization process of a large collection of macroinvertebrate organisms (mainly freshwater mussels and aquatic insects) housed in the VCSU Mac Lab.

SwimEx Filtration System Equipment

PI: Heather Golly, MiSU

The SwimEx restoration project will repair and upgrade the water treadmill filtration and sanitation system. The SwimEx system provides an environment that allows participants to perform reduced-weight-bearing movements, supporting rehabilitation, adaptive exercise, and physiological research. Restoration will support 70–100 undergraduate STEM students each year across six programs. The SwimEx system also advances research on aqua therapy outcomes, performance enhancement, and reduced weight gait training models, increasing MiSU's competitiveness for external funding from agencies like NASA, NSF, and NIH.

Under the Dome: Exploring STEM Careers in a Portable Planetarium

PI: Betsy Bannier, Lake Region State College

The PI will present portable planetarium-based immersive learning activities at Lake Region State College, within the greater Devils Lake community, and within an approximate 100-mile radius north and northwest of Devils Lake. The PI will offer no-cost planetarium programming to school principals, community librarians, and civic organizations.

STEM PATHWAY

NATURE

SUNDAY ACADEMY

Once each month during the academic year, CCCC, NHSC, SBC, and TMC host NATURE Sunday Academy. These four-hour STEM lessons are designed by research faculty in North Dakota and are brought to middle and high school students who live in Tribal communities.

Topics for this year's lessons included neuroscience, biology, math, and physics. NATURE Sunday Academy saw 650 student participations in FY26, up from 510 in FY25. Because students may attend more than one lesson, Sunday Academy counts total participations rather than individual student attendance numbers.

TCU SUMMER STEM CAMPS

Each summer, four TCUs host STEM immersion camps for middle and high school students. TCU Summer STEM Camps, which are supported by ND EPSCoR, are planned by TCU faculty and run for one or two weeks, depending on the campus. These camps provide students with hands-on STEM and cultural projects that are facilitated by TCU faculty. The camps are a fun and engaging way for students in Tribal communities to connect with their local colleges and to get a deeper introduction to STEM topics than they might have access to during the school year.

In FY26, CCCC, NHSC, SBC, and TMC held seven Summer STEM Camps, with a total of 202 participations.

STEM PATHWAY

NATURE

UNIVERSITY SUMMER CAMP

Twelve Tribal college students from across North Dakota attended this year's NATURE University Summer Camp. Designed for current and incoming TCU students with an interest in STEM, the camp paired participating students with researchers from UND and NDSU. The students each chose a research topic and worked with a faculty mentor in labs at NDSU and UND. As camp participants worked on engaging research projects, they also got to experience life on R1 campuses.

Research topics ranged from microbiology in agriculture and image processing methods for soybean disease prevention to engineering a better boot for astronauts exploring the surface of the moon. On the last day of camp, each student or group presented their research findings during the camp's closing ceremony.



University Summer Camp participant Jayden Begay in the lab

OUTREACH

ND EPSCoR hosted its Annual State Conference in Fargo on October 21, which was preceded by a networking session on the evening of October 20.

PRECONFERENCE NETWORKING EVENT

Conference activities began with a No-Stress Networking event on Monday evening. During a round of networking bingo, attendees had to talk to each other to find people who met the criteria of the bingo squares, like being from a PUI or traveling to the conference on I-94. Next, participants volunteered to give three-minute presentations on their research and what kind of collaborations they'd like to get involved in. Twenty researchers and students got up on the open mic to make their pitches.



Researchers and students from across ND at No-Stress Networking

OUTREACH

ANNUAL CONFERENCE

More than 300 researchers, STEM faculty, post docs, and students from across North Dakota registered to attend the 2025 ND EPSCoR Annual State conference. One hundred ninety-five abstracts for presentations were accepted (35 oral presentations and 160 poster presentations).

After opening remarks from ND EPSCoR Director Jim Doolittle, NDSU interim Vice President for Research and Creative Activity Heidi Grunwald, and NDSU President David Cook, NDUS Commissioner Brent Sanford offered a greeting via video. NHSC President Twyla Baker then started the conference in a good way with a prayer song.

A panel of principal investigators discussed their experiences with submitting E-CORE and E-RISE proposals, to offer advice for attendees who were considering submitting their own proposals.

Later, Onnolee Nordstrom and Jennifer Schillinger discussed “The Collaboration Playbook: The Science (and Art) of Working Together.” Nordstrom’s research on Hutterite communities in Canada and the northern plains states shows the power of collaboration and working in teams, as well as the positive impact of having team members with different skillsets.

The noon hour featured a panel discussion among TCU administrators and faculty members entitled Strengthening Collaborations: Key Principles, Practices, and Policies for Engaging with Tribal Partners. The panel was moderated by ND EPSCoR Director of Tribal Partnerships Sheridan McNeil.

Three sessions of concurrent presentations were held in which researchers discussed their current work and research findings. Students, researchers, and faculty also participated in poster presentation sessions.

OUTREACH

ANNUAL CONFERENCE

This year, ND EPSCoR offered awards to student presenters. Faculty from across the state judged students' posters on the scientific merit of their research, the clarity of the design, and their ability to explain their work. Seven students received awards at the conference.

Undergraduate students

- First place: Parker Ehrman, NDSU, *Comparing Slow-Freezing and Vitrification for Cryopreservation of Female Lepidopteran Ovarian Primordial Cells*
- Second place: Tereza Vrbánek, MiSU, *Rapid synthesis of N-methyl-N-[1-(4-pyrimidinyl)ethyl]formamide*
- Third place: Kristie Jo Larson and Thomas Sikorski, UND (co-presenters), *The impact of levocetirizine dihydrochloride on the development cycle of Calliphora vicina Robineau-Desvoidy (Diptera: Calliphoridae)*

Graduate students

- First place: Kiana Mahmoudian, NDSU, *Synthesis and Characterization of Gelatin Methacrylate Hydrogel Microparticles for Biomedical Applications*
- Second place: Christy Finck, NDSU, *Assessing the Degradability of a Soybean Hull-based Baling Twine*
- Third place: Kenneth Mosley, UND, *Continental-Scale, High-Order, High-Spatial-Resolution Ice Flow Modeling Based on Graphics Processing Units (GPUs)*



Parker Ehrman and Jim Doolittle

OUTREACH

STEM OUTREACH ACTIVITIES AWARDS

The ND EPSCoR State Office accepted proposals to fund STEM outreach activities lead by institutions of higher education, STEM science museums, and/or technology parks located in North Dakota. Proposals focused on activities that will build on interest in STEM education and careers. Seven proposals were funded.

College for Kids STEAM Initiative, Lake Region State College

College STEAM for Kids is held annually each summer at Lake Region State College for students who have completed Kindergarten through 5th grade. This award funded the purchase of new materials and activities for this year's camp.

Designing Evidence-based Outreach Activities: A Partnership Between NDSU and the Fargo-Moorhead Science Museum

This project will support the development, implementation, and evaluation of a suite of sensor-based ecology outreach activities designed to build science process skills in students in grades 4–6.

Expanding the UdigND Fossil Expeditions Program, UND

This project will expand UND's Fossil Expeditions Program to engage more North Dakota high school students in the geosciences through a one-week, hands-on paleontology fieldwork expedition. Past participants in the program have gone on to pursue STEM degrees at UND.

INSTEM, VCSU

This award will support VCSU's INSTEM (Indians into STEM) program. INSTEM's mission is to increase awareness and interest in STEM careers among Native American students in North Dakota, while also providing them with the opportunity to live and study on a college campus to increase self-efficacy in STEM academic content and future higher education enrollment.

OUTREACH

STEM OUTREACH ACTIVITIES AWARDS

ND BiotechPathways: Molecular Biology Camp and 4-H Biotechnology Trunks, NDSU

This project will re-establish the Molecular Biology Camp in partnership with the NDSU Microbiological Sciences Department and the Dr. Thomas Glass Biotech Innovation Core and will create a new statewide Molecular Biology Educational Trunk program in partnership with North Dakota 4-H Foundation.

NDeavor Workshop Series: Innovation Studio 101 and Robotics for Educators

NDeavor Innovation Studio will host two workshop series for STEM educators which will train them on digital fabrication and robotics.

Robotics Education & Programming for Middle and High School Students in ND, North Dakota's Gateway to Science

North Dakota's Gateway to Science, in partnership with Dakota FIRST Tech Challenge, will expand and improve access to robotics education and programming for middle and high school students in North Dakota.

ND HIGHER EDUCATION STEM ASSET MAPPING PROJECT

In FY26, ND EPSCoR began the process of measuring STEM research capacity at North Dakota institutions of higher education. The goal of our asset mapping project is to identify and analyze the strengths of institutions in the areas of research, education, research administration, and workforce development, so that together we can bring more research grant dollars to North Dakota colleges and universities.

All North Dakota higher education institutions, including private and Tribal colleges and universities, were invited to participate in this project.

The objective of this asset mapping project is to produce a clear, data-driven understanding of the STEM research and education assets within the higher education sector across the state.

The information gathered will be used to:

- identify existing strengths in research capabilities, research administration, and infrastructure.
- identify educational programs, areas of expertise, and interdisciplinary initiatives.
- identify workforce development programs and industry partnerships aimed at skill-building and employment readiness.
- assist in ND EPSCoR efforts to create strategic partnerships.

The initial data set was delivered by the consulting team in May. The State Office is developing a publishing platform for this information and will make the data available to the North Dakota research community later this year.

NORTH DAKOTA STEM RESEARCHERS DATABASE

To facilitate research collaboration across the state, ND EPSCoR has begun compiling a database of North Dakota STEM researchers. The goal of this database is to catalyze collaborations across institutions that are then able to successfully compete for federal research dollars.

Participation in the database is voluntary. Researchers in North Dakota are invited to add their own information. They are asked about their research topics, what kind of collaborators they are looking for, and what experiences and resources they can share with colleagues at other institutions. Participating researchers can then search the submissions to find potential collaboration opportunities.

Thirty-two researchers from seven institutions are currently participating. The ND EPSCoR State Office will continue to promote this effort to expand research collaboration among North Dakota institutions of higher education and research.

ND EPSCOR

FY26 OFFICE BUDGET AND EXPENDITURE DETAILS

CATEGORY	SUB-CATEGORY	BUDGET	EXPENDITURES	OBLIGATED
Administrative		\$929,171	\$590,592	\$338,579
Cost share		\$528,802	\$395,590	\$133,212
Programmatic*				
	Education/STEM pathway	\$525,713	\$173,227	\$352,487
	Competitiveness and sustainability	\$446,187	\$77,038	\$369,149
	Workforce development	\$258,555	\$205,270	\$53,285
	Jurisdictional priorities	\$175,000	\$52,252	\$122,748
Leveraged funds* (Competitiveness and sustainability)				
	NDSU	\$500,000	\$383,755	\$411,028
	UND	\$500,000	\$538,308	\$1,032,221

**Budgets and expenditures include carryover from FY25 and projects set up in FY26*

ND EPSCOR

STATE STEERING COMMITTEE

State Board of Higher Education member Curtis Biller chairs the ND EPSCoR State Steering Committee and Nueta Hidatsa Sahnish College President Twyla Baker serves as its vice-chair.

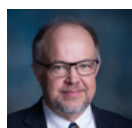
Per its bylaws, the committee:

- leads the effort to develop and compile a state Science and Technology Plan that describes and summarizes the research and education strengths of the state and provides a set of means and methods to bring the outcomes of research projects to a commercially viable end.
- identifies research and development areas, strategies, and actions within the higher education system consistent with the state's Science and Technology Plan.
- assesses and summarizes the strengths, barriers, and opportunities for continuing to build the capacity of the NDUS and the ND Association of Tribal Colleges institutions, identifying long-term strategies for the growth of research and infrastructure capacity that will lead to prosperity and diversification of the state and its competitiveness, and identify key funding and leveraging sources to support research and education proposals from within the state.
- evaluates the potential of ongoing efforts as well as establishes the potential new research directions and their alignment with the STEM research priorities identified in the state's Science and Technology Plan.
- functions as a liaison to state stakeholders in communicating the value proposition of research and economic development from the university systems.

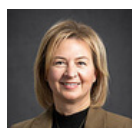
This fiscal year, the committee added seven new members.

ND EPSCOR

FY26 STATE STEERING COMMITTEE MEMBERS



Curtis Biller, Chair
Member, State Board of Higher Education



Sheri Anderson
Associate Vice President for Strategic Research Initiatives, NDSU



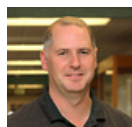
Sen. Josh Boschee
ND State Senate, District 44, Fargo



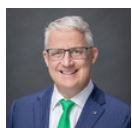
Meagan Gelinske
Investment Advisor, Future Bright LLC



Corby Kemmer
Partner Relations Specialist, ND Department of Commerce



Bryan Schmidt, PhD
Professor and Science Division Chair, MiSU



Scott Snyder, PhD*
Vice President, Research and Economic Development, UND



Kate Waechter
Program Administrator, ND Department of Instruction



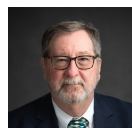
Rep. Christina Wolff
ND State House, District 38, Minot



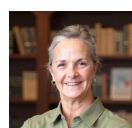
Twyla Baker, PhD, Vice Chair
President, NHSC



Sen. Jeff Barta
ND State Senate, District 43, Grand Forks



James Doolittle, PhD*
Director, ND EPSCoR



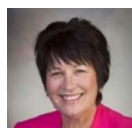
Heidi Grunwald, PhD
Interim Vice President for Research and Creative Activity, NDSU



Rep. David Richter
ND State House, District 1, Williston



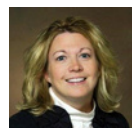
K. Bryant Smalley, PhD, Psy.D.
Associate Vice President for Research and Discovery Development, UND



Rep. Vicky Steiner
ND State House, District 37, Dickinson



Amy Whitney, Ed.D.
Director, Center for Innovation, UND



Brenda Wyland
CEO, NDSU Research & Technology Park

**Non-voting member*

ND EPSCoR



University Summer Camp participant Keanu Begay engineered an improved moon boot in the BiPed Lab at UND

CONTACT US

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