ND EPSCoR State Office
FY22 Annual Report

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Executive Summary (ES)

The North Dakota Established Program to Stimulate Competitive Research (ND EPSCoR) State Office (SO) operations and programming activities are funded by state appropriated dollars (via the North Dakota University System [NDUS]). Reporting to the NDUS Chancellor, the SO develops, implements, funds, and manages several statewide programs and activities and administers several federal awards in support of its mission to broaden and diversify ND's STEM workforce pathways, support and grow statewide STEM research capacity and competitiveness, and inform and communicate science to ND stakeholders (see Section I for the structure of the SO, Section II for FY22 SO programs and activities, and Section III for FY22 SO budget and expenditure details).

During FY22, the ND EPSCoR SO budgeted the $2,842,875 it received from the NDUS into 26 projects across three broad activity pools (Table ES-1):

1. **Programmatic -** funds education, outreach, broadening participation, research, communicating science to the public, workforce development programs, and other activities (see Sections II and III for additional details);
2. **Administrative Services** - costs associated with operating the SO, overseeing programmatic programs and activities, and administering competitive federal awards (see Section II for additional details); and
3. **Leveraged** - provides STEM capacity-building investments at the two research universities (RUs – NDSU and UND [see Appendices A and B, respectively, for additional details]).

Table ES-1. FY22 ND EPSCoR State Office Budgets, Expenditures, Encumbrances, and Rollover (Remaining) Funds.

Activity Pool	Budget	%	Expenditures	Encumbrances	Rollover
Programmatic	$1,806,242	63.5%	$664,546	$761,143	$380,523
Administrative Services	$406,633	14.3%	$250,729	$0	$155,904
Leveraged	$630,000	22.2%	$299,238	$330,762	$$0
TOTAL	**$2,842,875**	**100.0%**	**$1,214,514**	**$1,091,905**	**$536,457**

The FY22 programmatic budget (the SO's largest activity pool) contained six budget categories of STEM support. Those categories are identified further detailed in Section II of this annual report.

See Appendix C for a full list of acronyms present in this document.

At the end of each fiscal year (June 30), the combined rollover dollars (programmatic and administrative services pools) are used to fund a next fiscal year competitive statewide request for proposals (RFPs) program designed to build STEM research capacity, education (both formal and informal), and outreach. The rollover ($536,457) from FY 22 is the smallest dollar amount since the SO was established. This is to be expected as the SO builds to a fully-staffed office with full programming.

Personnel at all 11 ND EPSCoR participating institutions (two research universities - RUs [North Dakota State University and the University of North Dakota]; one master's college/university - MCU [Minot State University]; three primarily undergraduate institutions - PUIs [Dickinson State University, Mayville State University, and Valley City State University]; and five tribal colleges/universities - TCUs [Cankdeska Cikana Community College, Nueta Hidatsa Sahnish College, Sitting Bull College, Turtle Mountain Community College, and United Tribes Technical College]) are eligible to compete for these funds. The

ND EPSCoR State Office's mission is to support efforts of participating institutions of higher education across the state that result in increased STEM capacity and competitiveness

With the exception of two TCUs, where the same faculty member submitted multiple proposals in a single year, 100% of the proposals from the MCU, PUIs, and TCUs have been funded since this program began in Fall 2019. The distribution of funds in FY22 was: NDSU – 35.41%, UND – 36.64%, TCUs – 10.86%, MCU – 9.41%, and PUIs – 7.67%. Appendix D contains fact sheets for each participating campus and in total since 2019. The years indicated in the fact sheets correlate to the fiscal year of the budgeted funds and not the fiscal year of RFP awards made. Year 2021 was an exception. In addition to the $672,988 of rollover dollars from fiscal year 2021 (awards made in fiscal year 2022), the SO invested reserve funds from past fiscal years to aid institutions in engaging in research, education, and outreach activities during COVID. The reserve funds came mainly from fiscal years 2018/2019 during which time the SO was brand new and still coming up to full staffing and programming.

Section I: FY22 ND EPSCoR State Office (SO) Structure

The SO reports to the NDUS Chancellor and is located at, and administered by, NDSU via a memorandum of understanding (MOU) between the NDUS and NDSU. Thus, NDSU is the prime campus for competitive external proposals written, and awards administered, by the SO.

ND EPSCoR's structure allows for partnerships and programming across ND's STEM research, education, outreach, and workforce ecosystem. The SO is a key partner in STEM research capacity building and other integrated activities (education, outreach, workforce development, broadening participation, and communicating science) at 11 participating institutions (two RUs, three PUIs, one MCU, and five TCUs) and several non-profit entities (the number and nature of these relationships changes each fiscal year). State office partnerships with statewide STEM stakeholders help to build a high-quality, higher education-based research effort that serves as the backbone of the state's scientific and technological enterprise, ensuring a strong and stable economic base for the future.

The SO develops, implements, funds, administers, and assesses programs focused on broadening and diversifying ND's STEM workforce pathways, supporting and growing statewide STEM research capacity and competitiveness, and communicating science to ND stakeholders. ND EPSCoR also administers several federal awards/cooperative agreements on behalf of the state. A summary of these activities is contained in Table I-1 and discussed in detail in Section II.

Table I-1. FY22 SO Programming, Administrative Services, and External Award Administration.

SO Program and Activity Categories	Budget Structure	FY22 Programs and Activities (further described in Section II)
SO Activity – Programmatic (*SO dollars)		
Education, Outreach, and Broadening Participation		
*K-21+ STEM	Programmatic (see Section III)	Activities to build the STEM workforce in ND, including: 1) STEM workforce needs paper, 2) K-12 programming (e.g., Lesson Plan development and dissemination, 3) STEM at HOME video series, 4) Undergraduate and graduate student research, training, programming, and professional development, and 5) Digital badging

*Broadening Participation	Programmatic (see Section III)	1) Nurturing American Tribal Undergraduate Research and Education (NATURE) programming and 2) STEM capacity paper
Competitiveness and Sustainability		
*Support for Federal Agency and EPSCoR-like Programs Proposals	Programmatic (Section III)	1) NSF EPSCoR Track-2 proposals, 2) NSF CAREER proposals, and 3) other EPSCoR-like programs. This may include programming support and/or cash match
*Proposal Development Support	Programmatic (Section III)	Internal and external proposal reviews
*Participating Institution STEM RFP Program	Programmatic/ Administrative (Section III)	Competitive STEM research capacity building, education, outreach, and workforce development opportunities that are competitively available to all 11 participating campuses
*External Partnerships	Programmatic (see Section III)	STEM programming partnerships with ND-based entities and organizations
Communication		
*Communicating Science to the Public	Programmatic (see Section III)	1) Website, 2) Social media, 3) Monthly newsletter, 4) Communication workshops, and 5) ND EPSCoR Annual State Conference
Workforce Development		
*Innovation and Entrepreneurship	Programmatic (see Section III)	Students in Technology Transfer And Research (STTAR) student internships with ND-based companies
Track-1 Match		
*RII Track-1 match	Programmatic (see Section III)	The National Science Foundation (NSF) requires a 20% state match on each of its 5-year $20M Track-1 cooperative agreements. ND EPSCoR provides the required 20% as a cash match.
SO Activity - Administrative Services (*SO dollars)		
*Financial, Administrative, and Logistical Services	Administrative (Section III)	1) Oversite of financial obligations covered by the State Office; including administrative support, trainings, and guidance to all 11 ND EPSCoR participating campuses, 2) office and program logistics, and 3) campus visits and outreach to ND EPSCoR participating campuses
*ND EPSCoR State Steering Committee	Administrative (Section III)	Logistical and administrative support
SO Activity – Leveraged (*SO dollars; ** NASA EPSCoR dollars from UND)		
*STEM Capacity Building at the RUs	Leveraged (Section III)	Investments at NDSU (Appendix A) and UND (Appendix B)
**NASA EPSCoR	Leveraged	NASA investments on the NDSU campus. ND EPSCoR manages and administers the NDSU NASA EPSCoR program

SO Administration of Externally Funded Awards (***external dollars; ND EPSCoR staff serve in both administrative and programmatic/research roles on externally funded awards)		
***NSF EPSCoR Research Infrastructure Improvement (RII) Track-1 Cooperative Agreement	NSF	New Discoveries in the Advanced Interface of Computation, Engineering, and Science (ND-ACES, 2020-2025)
***NSF Collaborative Research Grant (2020-2022)	NSF	Cultivating Indigenous Research Communities for Leadership in Education and STEM (CIRCLES) Alliance is a collaboration between six EPSCoR jurisdictions
***NSF Collaborative Research Proposal	NSF	INCLUDES proposal submitted in January 2022

Each SO staff position (with the exception of the Executive Director [who is part-time]) is fully funded by the SO (Figure I-1). Staff members are responsible for building STEM capacity and implementing programs necessary to enhance the ND STEM research, education, and outreach ecosystem. The staff also provides many administrative services to all ND EPSCoR participating institutions. These services are particularly important for the PUIs, MCU, and TCUs, which have significantly smaller research administration support structures that may not cover all of the areas needed for complete award oversight. Finally, staff time is bought-out via competitive external dollars, leveraged state funds (provided by ND EPSCoR SO to both UND and NDSU), and NASA EPSCoR dollars. Charging time to other awards and sources of funds allows the staff to participate in STEM ecosystem endeavors beyond the SO programming, thus continuing to grow the statewide impact of ND EPSCoR. At the end of each fiscal year (June 30), the combined rollover dollars (programmatic and administrative services pools) are used to fund a next fiscal year competitive statewide request for proposals (RFPs) program designed to build STEM research capacity, education (both formal and informal), and outreach.

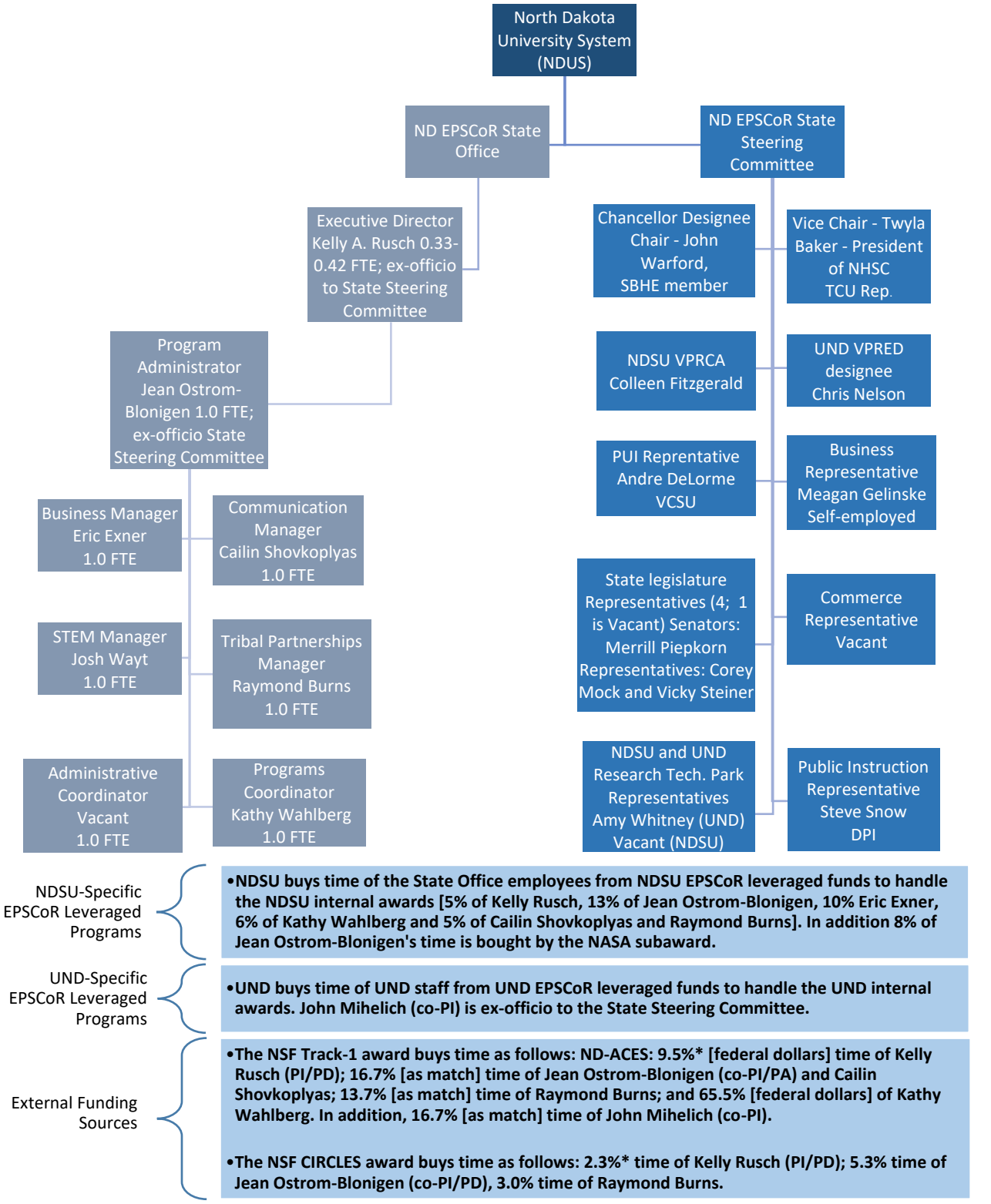


Figure I-1. Organizational structure of ND EPSCoR State Office and ND EPSCoR State Steering Committee. FTE percentages are based on a 12-month appointment.

Section II. ND EPSCoR SO Programs, Services, and External Award Administration

The ND EPSCoR State Office staff has worked to expand its STEM reach within ND since its creation in late 2017. This has been accomplished through increased SO-funded programming and expansion of proposal submissions to federal funding agencies (Table II-1).

Table II-1. FY22 ND EPSCoR State Office funds and administered external awards.

Type of funding	Sponsoring Entity/Agency	Amount
State Appropriated Dollars	NDUS	$2,842,875
State Appropriated Dollars	UND via NDUS (ND NASA EPSCoR)	$85,500
Competitive External Award	NSF EPSCoR RII Track-1	$20M (10 institution cooperative agreement [OIA #1946202]: ND-ACES)
Competitive External Award	NSF	$185,330 (collaborative research award [OIA #2038196]: CIRCLES Alliance – part of a $770,143 collaboration between six EPSCoR states)
Competitive External Proposal*	NSF INCLUDES	$10M INCLUDES proposal submitted by the CIRCLES Alliance. ND component is $2.08M*

**This proposal has been recommended for funding. NSF is expected to make the final decision in late July/August.*

SO ACTIVITY - PROGRAMMATIC

The FY22 SO programs and activities outlined in Section I (see Table I-1) are described in detail below.

Education, Outreach, and Broadening Participation

K-21+ STEM programming. K-21+ STEM programming is a continuum of programs and activities across a student's K-12, undergraduate, and graduate academic career. These programs and activities are designed to stir student interest in STEM, build STEM efficacy, and promote STEM persistence through college and career.

STEM Workforce Paper. The SO concluded its K-12 STEM needs survey, which was open to all ND teachers and received 106 total responses. Survey responses are outlined in the *Partnerships to Build STEM Resources in North Dakota* paper[1]. The paper provides up-to-date demographic information on all 11 ND EPSCoR participating institutions, the current STEM needs of K-12 teachers throughout ND, and background information about the SO's STEM education portal and external STEM partnerships. Initially developed in FY21, the K-12 needs survey and the *Partnerships to Build STEM Resources* paper were not updated in FY22 because of ND EPSCoR personnel changes. However, in FY22, the SO began identifying and recruiting expert educators to join an advisory committee that will provide input on the content and

[1] *Partnerships to Build a STEM Workforce*: https://www.ndepscor.ndus.edu/fileadmin/ndus/ndepscor/STEM/Partnerships_to_Build_STEM_Resources_August_2021.pdf

design of the K-12 needs survey and promote the survey within their professional networks in FY23; at which time, the next version of this paper will be updated.

K-12 Programming. The SO has made progress in partnering with institutions and organizations across the state to support their K-12 programming. For example, the SO financially supported Mayville State University's *Education and Innovation Center* in their efforts to provide classroom experience for STEM teacher candidates. These candidates implemented informal STEM lesson plans to underserved K-8 students at Emerado, Hillsboro, May-Port, Hatton, Hope-Paige, and Northwood public schools (Figure II-1).

Figure II-1. Mayville State University teacher candidate implementing STEM lesson plan with Northwood Elementary students.

The SO also provided financial support for the Great Plains STEM Education Center at Valley City State University, which conducts summer STEM academies for American Indian students. The FY22 INSTEM (Indians into STEM) camps had an enrollment of 40 students, primarily from the New Town (Fort Berthold Reservation) and Trenton areas (Figure II-2).

Figure II-2. High school students from Trenton and New Town at an INSTEM summer camp in June 2022.

K-12 STEM Lesson Plan Development and Dissemination. This initiative, which began in FY20, supports K-12 teachers by providing free STEM lesson plans that are aligned with ND's Next Generation Science Standards. The SO continues to contract with K-12 educators to design innovative lesson plans that are based on ND EPSCoR's Nurturing American Tribal Undergraduate Research and Education (NATURE) Sunday Academy STEM modules or the STEM At Home Video Series. The SO also contracts with cultural experts to create indigenous supplements for each STEM lesson plan. The team has now developed 33 K-12 STEM lesson plans, which are accompanied by both Lakota and Ojibway cultural supplements. The lesson plans are freely available via the SO's STEM Education Portal[2] (Figure II-3). To date, there have been 72 unique lesson plan downloads from the STEM Education Portal. Since September 2020, a total of 4,071 students have been impacted by the Portal lesson plans.

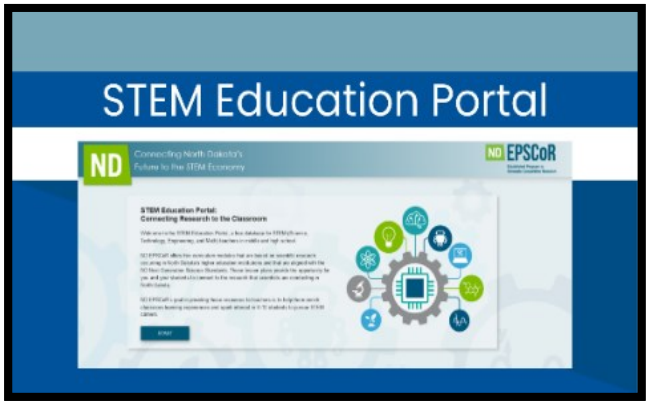


Figure II-3. Click on the thumbnail to view the ND EPSCoR STEM Education Portal.

[2]ND EPSCoR State Office STEM Education Portal: https://www.ndepscor.ndus.edu/stem_education/stem_education_portal/

STEM at Home Activities Series. During FY22, the SO continued bringing fun STEM at Home projects to families via our YouTube channel (Figure II-4). Finding engaging STEM projects for elementary students that families can facilitate is not always easy. The STEM at Home Activities Series is a video-based series that began in FY21 to provide simple and fun STEM projects for young children. Supplies for these projects are normal items found in a home. These projects help to teach important critical thinking skills and potentially spark a lifetime interest in STEM. Some of this year's activities are shown as thumbnails in Figure II-5. View the entire playlist on the ND EPSCoR YouTube Channel or on the ND EPSCoR SO STEM at Home page, both of which are updated monthly with new activities.

Figure II-4. STEM at Home flyer disseminated to the public.

Figure II-5. A selection of videos in the STEM at Home Activities Series. Click on each thumbnail to view the activity.

***Undergraduate and Graduate Student Research, Training, Programming, and Professional Development*.** The SO continues to offer supplemental Responsible Conduct of Research (RCR) training to college students across ND. RCR training is required by most federal agencies and NDUS policy (410.0) for students participating in research. Based on training materials from the Council of Undergraduate Research (CUR) and U.S. Department of Health and Human Services Office of Research Integrity, these materials are available to students at all 11 ND EPSCoR participating institutions. Additionally, the SO offered financial support to undergraduate students to attend academic conferences in FY22; however, COVID pandemic restrictions prevented student travel.

Digital Badging. The ND EPSCoR State Office started a digital credentialing effort in May 2022. Using the Credly™ online platform, both the NSF RII Track-1 ND-ACES cooperative agreement and the programs offered through the State Office will be supported with the development of digital badges that can be issued to participants.

The SO will issue digital badges to participants when they have learned a new skill, completed a program, or achieved an accomplishment. Digital badges are one way that our participants can stand out and effectively communicate their achievements to potential employers. The SO digital badging site on Credly™ will launch during FY23.

Broadening Participation. Broadening participation is a critical activity for the SO. The success of the country's STEM enterprise relies on full access and participation of persons from broad backgrounds and demographics, especially those that are traditionally underrepresented and under resourced. In an increasingly diverse society, the country's STEM enterprise should reflect that diversity. The National Science Board and the National Science Foundation leadership term this the "missing millions" – those who have yet to be engaged in the STEM workforce so it represents the racial, ethnic, and gender representation in the general population[3].

NATURE. The Nurturing American Tribal Undergraduate Research and Education (NATURE) program is a long-standing SO signature program focused on engaging and encouraging American Indian students in STEM activities. American Indian students are significantly underrepresented and underserved within the STEM ecosystem throughout the country. To respond to this, the SO partners with the Tribal Colleges and Universities (TCUs) in ND to provide pathways for American Indian students into the STEM ecosystem (education and career). TCUs, because of their unique institutional nature, represent a vital part of successful outreach into tribal communities.

NATURE, which began in 1998, was initially funded exclusively on federal grant dollars. The success of ≈25-year program has led to the partial institutionalization of the NDSU and UND portions of this program within the ND EPSCoR SO. The TCU-based expenses of the program continue to be funded via NSF EPSCoR Track-1 RII dollars.

NATURE currently consists of four components: 1) TCU Summer Camps (middle and high school students), 2) Sunday Academy (middle and high school students), 3) Bridge Camp high school graduates), and 4) University Summer Camp undergraduate students). With the exception of the Sunday Academy, all of these component activities are held during the summer months; thereby straddling two fiscal years. The TCU summer camps were occurring during the FY22 reporting period; as a result, those numbers were not available at the time of this report. The combined number from 2020-2021 will continue to be a benchmark when, despite the COVID pandemic, there were 1,226 participants (1,155 of whom were AI/AN).

TCU Summer Camps are held from mid-June to late July at each of the participating TCUs. Planned by TCU faculty during the University Summer Camp, these camps expose and engage middle- and high-school tribal students to STEM while also incorporating the heritage and culture of the participating tribes. Due to the large number of participants, Turtle Mountain Community College (Figure II-6)

[3] NSB passes resolutions to address Missing Millions and deliver research benefits across America (National Science Board - News - NSB News Release: NSB passes resolutions to address Missing Millions & deliver research benefits across America (nsf.gov)

typically runs more than one summer camp. The funding for these camps comes from the NSF RII Track-1, while the overall management, planning, and oversight are provided by the SO Tribal Partnership Manager (funded by the SO). Participation continues to be affected by concerns regarding the COVID pandemic in tribal communities.

Figure II-6: Turtle Mountain Community College.

The Summer 2021 virtual camps (June 14 – July 23) had a total of 117 participants (Table II-2). One TCU did not to participate in the 2021 summer virtual camps due to limited bandwidth and other logistical issues. The Summer 2022 camps have not all been completed at the time of this writing so there are no numbers available. Initial numbers look promising with at least one TCU reporting that they've reached their registration goal much earlier than anticipated.

Sunday Academy is a series of hands-on STEM activities held one Sunday each month (at the TCUs) during the academic year (September – March) for 7th-12th grade tribal students. Figure II-7 shows a student working on "The Spectacular Cell" activity at Sitting Bull College. During five of those months, NDSU and UND faculty travel to each of the TCUs on a scheduled monthly Sunday rotation to deliver STEM modules they created during the University Summer Camp. Additionally, faculty from the TCU work together to create a Sunday Academy activity that will be offered simultaneously at all TCUs. Each TCU hires an elder from their community to present a cultural component at the beginning of each Sunday session.

Figure II-7: An SBC Student enjoying the 'The Spectacular Cell' Sunday Academy Activity.

The materials, mileage, lodging, and per diem expenses of NDSU and UND faculty are paid by the SO. The salaries of the TCU faculty and the student participant stipends and meals are paid by the NSF RII Track-1. A total of 221 students from four TCUs participated in these academies during FY22 (Table II-2). During FY22, participation was down as students and tribes adjusted to returning to face-to-face classes while still being mindful of COVID pandemic restrictions. Also, the numbers reflect that United Tribes Technical College chose not to participate in the current NSF EPSCoR RII Track-1 (and therefore the NATURE program) under the 2020-2025 cooperative agreement.

Bridge Camp focuses on students who are between high school graduation and the start of their first university/college fall semester. This camp includes a structure that mimics key skills for post-secondary education; however, each section of the camp is designed to be self-contained to provide important life skills (i.e., resume building).

Four of the seven participants, who matriculated into college in 2019, persisted to the 2020-21 academic year while two have persisted past that point. Twenty students participated in the camp in 2020 (June 22 - July 31), 15 matriculated into college and ten have persisted through 2020-21. Three students participated in the 2021 program (June 22 - July 23; Table II-2). Due to the COVID pandemic, this camp was moved to a virtual platform in both 2020 and 2021. Unfortunately, limited bandwidth and other logistical issues prevented three TCUs from participating in the 2021 summer camp. At the time of this report, the TCUs were uncertain whether the 2022 camp would be held.

Table II-2. ND EPSCoR NATURE Program Summary					
	TCU Summer Camps	Sunday Academy	Bridge Camp	University Summer Camps	Totals
	Summer 2021/2022	FY21/FY22	Summer 2021/2022	Summer 2021/2022	
# of NDSU faculty (# who are AI/AN)	N/A N/A	6/5 0/0	0/~ 0/~	23/14 1/0	29/~ 1/~
# of NDSU/UND graduate students assisting (# who are AI/AN)	N/A N/A	3/3 3/0	0/~ 0/~	3/3 0/0	6/~ 0/~
# of NDSU/UND undergraduate students assisting (# who are AI/AN)	N/A N/A	0/0 0/0	N/A N/A	0/0 0/0	0/0 0/0
# of TC faculty (# who are AI/AN)	6/~ 6/~	5/6 3/3	1/~ 1/~	2/3 2/3	14/~ 12/~
# of TC graduate students assisting (# who are AI/AN)	0/0 0/0	0/0 0/0	N/A N/A	N/A N/A	0/0 0/0
# of TC undergraduate students assisting (# who are AI/AN)	6/~ 6/~	0/0 0/0	N/A N/A	N/A N/A	0/~ 0/~
# of support staff (# who are AI/AN)	6/~ 6/~	4/6 4/6	4/~ 4/~	0/5 0/5	14/~ 14/~
# of participants (# who are AI/AN)	117/~ 110/~	429*/~221* 397*/~205*	3/~ 3/~	13/0 13/0	565*/~* 526*/~*
AI/AN = American Indian / Alaskan Native *Numbers include multiple engagements for single participants ~ Indicates Component in Progress with no final numbers					

University Summer Camp consists of a two-week, residential program for Native American college students. Typically held the first two weeks in June, this year's camp suffered from an almost universal ennui from college students suffering from burnout due to the COVID pandemic. Additionally, other summer camps were in direct competition with the University Summer Camp. The purpose of the camp is to expose and engage Native American TCU students in STEM activities that generate interest in a STEM career beyond the TCU. Bachelors and graduate programs are promoted at NDSU and UND by engaging the students in a research project. Under the program, five students from each participating TCUs are selected and financially supported (by the NSF EPSCoR RII Track-1 via subawards to the TCUs) to attend the camp. Students visit both NDSU and UND to learn about STEM programs and research during the first week of the camp. The SO budget pays the NDSU and UND faculty and student mentor salaries, as well as the housing, meals, travel, and activity costs associated with the program. Each student then selects a faculty researcher with whom they will work during the second week of the camp, performing research in a laboratory setting. The students present their work at the end of the camp.

It is important to note that when the University Summer Camp (indeed all of NATURE programming) was first offered, there were very limited opportunities for Native American students to participate in STEM

research opportunities, especially on TCU and regional campuses. However, in the 20+ years since the start of NATURE, the TCUs (and PUIs near reservations) have expanded their ability to offer students research opportunities. With the adaptations that many institutions have adopted due to the COVID pandemic, the ease of access for geographically isolated communities (such as the tribal communities that the TCUs serve) has also increased dramatically. With this in mind and coupled with low participation numbers, NATURE will be conducting extensive listening sessions to determine how to best move forward to meet the ever-evolving needs of the tribal communities and their youth.

The 2021 virtual University Summer camp, held June 15 – July 10, had 13 students participating from two TCUs. Activities during that camp included an opening ceremony, virtual lab tours, meetings with RU faculty, computer science/HPC, and engineering discussions. One TCU did not to participate in this summer's virtual camp due to limited bandwidth and other logistical issues.

The 2022 University Summer camp, which was to be held June 6 - 17, had initially a lot of interest but eventually wound up with zero students participating from the four TCUs (Table II-1). During those same two weeks, SO staff and coordinating faculty from NDSU and UND worked with the TCU faculty and K-12 instructors from the communities surrounding the TCUs to plan Sunday Academy activities (Figure II-8). In addition, TCU faculty and K-12 instructors use this time to prepare their TCU Summer Camp activities and lesson plans. With this being the first face to face interaction held in two years, the planning camp was a resounding success and allowed ND-EPSCoR to also begin the process of evaluating NATURE and building for the future.

Figure II-8: TCU and K-12 STEM faculty and instructors meet with NDSU/UND Faculty to plan for TCU Summer Camps and for 2022-23 Sunday Academy

STEM Capacity Paper. The SO Tribal Partnerships Manager works to build mutually respectful partnerships between the NDUS institutions and the TCUs located in ND. An example of those efforts is *A Partnership to Build STEM Capacity* paper[4], which was initially developed by the SO in 2016. This document, which is updated each August, is a guide to help build STEM research and education partnerships across the state between the two RUs (NDSU and UND), three PUIs (DSU, Mayville State, and VCSU), one MCU (Minot State), and five TCUs (CCCC, NHSC, SBC, TMCC, and UTTC). The paper provides up-to-date demographic information on all 11 ND EPSCoR participating institutions, along with current STEM capacity and needs. The document is also used by the SO to guide new program development and is a valuable tool for researchers interested in developing statewide partnerships.

Competitiveness and Sustainability

Support for Federal Agency and EPSCoR-like Programs Proposals. The SO provides support/collaboration to faculty proposals (i.e., NSF EPSCoR Track-2 proposals, NSF CAREER proposals, NSF Regional Innovation Hubs, DOE EPSCoR, etc.) in the form of support letters, staff time, facilitating collaborations between institutions, cash match, and the inclusion of SO funded programs (e.g., NATURE) identified by faculty in the Broader Impacts component of his/her proposal, etc. This support is extremely valuable for faculty

[4] *Partnership to Build STEM Research and Education Capacity*: https://www.ndepscor.ndus.edu/serving-our-state/partnershipstobuildstemcapacity/

to provide them access to well-established and staffed outreach programs versus having to create a new program for each proposal (which is not sustainable). This approach also helps streamline the number of outreach activities to allow the focus to remain on the sustainability of key programs that have been successful. During FY22, the SO provided letters of collaboration to 13 faculty who submitted competitive proposals to federal agencies.

Proposal Development Support. The SO supports proposal development at and with all 11 ND EPSCoR participating institutions. Included in this support is funding to send large, multi-disciplinary proposals out for eternal review before their submission to federal funding agencies. There were no faculty requests for this service in FY22.

Participating Institution STEM RFP Program. This program, which began in FY20 (using rollover funds from FY19) uses the SO rollover funding from the prior fiscal year to provide STEM research, education, and outreach capacity and competitiveness building awards to faculty across all 11 ND EPSCoR participating institutions (see Appendix D for individual campus and cumulative totals). Sixty-six projects across seven of the 11 ND EPSCoR participating institutions were funded in FY22 in the following categories: 1) equipment (34 awards), 2) equipment repairs (10 awards), 3) undergraduate research (4 awards), 4) seed awards for faculty to collect preliminary data for the preparation of federal STEM proposals (13 awards), 5) seed awards for faculty and students to engage K-12 in STEM outreach activities (1 award), 6) development of online/virtual modules for STEM courses (2 awards), and 7) seed awards for community-based STEM research (2 awards). No proposals were submitted in the categories of external proposal review for large collaborative and interdisciplinary STEM efforts and electronic STEM data sets.

Figure II-9. Maxiem 1515 Waterjet Machine Center installed at NDSU.

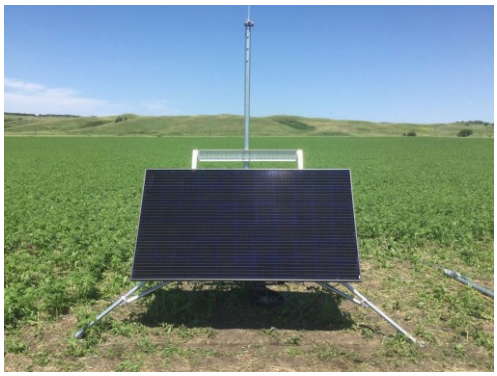


Figure II-10. Power assembly tripod component to carbon flux instrument at Tribal Demonstration Farm, Dunseith, ND.

The funding has been critical for increasing STEM capacity and infrastructure throughout the state. For example, Dr. Chad Ulven (NDSU) was able to purchase a Waterjet Machine Center for research and teaching advancement across several departments (Figure III-9). At full capacity, the Center is anticipated to serve hundreds of students each year over multiple courses and research topics. Similarly, the funding forensic entomological and DNA studies equipment for Dr. Lavinia Iancu within the Forensic Science laboratory at UND makes it possible for over 2,000 students per year to have exposure to this state-of-the-art equipment. Finally, the purchase of a carbon and water flux measurement system by Dr. Robert Monette at TMCC will enhance the development of the science programs on that campus and allow TMCC to assist the Tribal Agriculture and Natural Resources Departments, as well as the USDA

NRCS, with research pertaining to environmental quality and effects of land management on carbon sequestration (Figure II-10).

External Partnerships. The SO continues to actively extend its reach throughout ND by pursuing partnerships with ND-based groups already participating in ND's STEM ecosystem.

North Dakota's Gateway to Science (GTS) STEMzone Activities. Under a Master Agreement first signed in FY21, the SO continues to partner with GTS in providing informal and engaging STEM activities for underrepresented and underserved K-12 students. In FY22, the SO provided funds for materials and equipment purchases that enhanced GTS STEMzones and led to the development of innovative activities on laparoscopy, mechanical physics, structural engineering, and simple machinery. These activities were implemented during GTS STEMzones held across ND (e.g., Tioga, Garrison, Belfield, Hebron, Mandan, Wahpeton, West Fargo) and ultimately reached more than 2,200 underrepresented and underserved K-12 students (Figures II-11 and II-12).

Figure II-11. A St. John's Elementary School (Wahpeton) student at the laparoscopy station during a GTS STEMzone.

The SO also partnered with GTS in providing an in-person STEMzone at Hankinson Public School. This three-hour program reached 125 historically underserved (i.e., rural, Native American) students in grades K-6, who engaged with ten hands-on, informal STEM activities.

Emerging Digital Academy Activities. A 20-week full stack software certification course, developed by Emerging Prairie, is designed to increase the state's coding workforce in this needed programming language. During this past year, the SO funded partial scholarships to two individuals from historically underrepresented groups (e.g., graduates of rural communities). Additional funds were provided to disseminate this opportunity within tribal communities; however, those information sessions were canceled due to concerns surrounding the COVID pandemic.

Figure II-12. St. John's Elementary School students at the marble run station during a GTS STEMzone.

Communication

Communicating Science to the Public. The SO Communication Manager is responsible for the many activities that communicate SO STEM programs and activities to the public.

Communicating Science via Media Outlets. The SO uses numerous outlets to reach ND citizens and stakeholders: 1) SO website allows ND EPSCoR to build relationships with our stakeholder groups (Figure II-13). The website brings stories to public audiences and informs the public about the work of

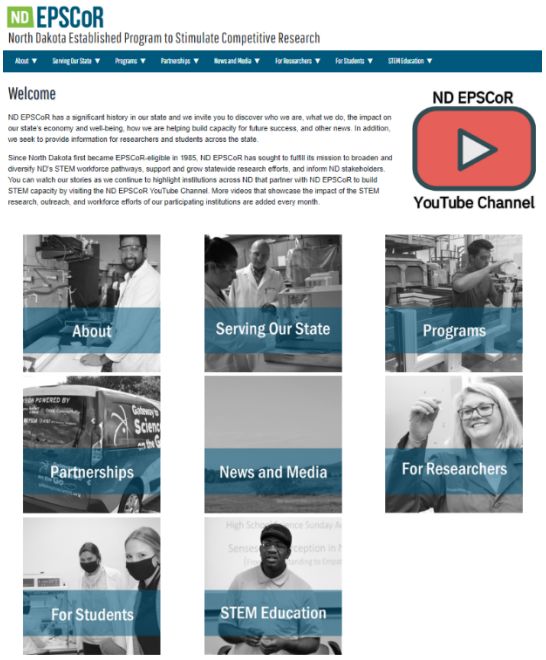


Figure II-13. The landing page of the ND EPSCoR website.

the SO, 2) SO social media platforms including Facebook, Instagram, Twitter, and YouTube build an online presence that broadens the reach of the SO and creates deeper connections with our audiences, 3) Cohesive branding of the SO increases audience recognition and furthers ambient awareness of the mission of the SO, 4) Monthly newsletters cover research, education, and outreach activities occurring across all 11 ND EPSCoR participating institutions[5], 5) Interviews, videos, and written features that share information about our programs and activities, 6) Dissemination of the monthly newsletter to 1,015 individual subscribers plus several listservs, and 7) One-on-one mentoring sessions on communication and presentation skills for faculty and students. The SO mentors faculty and students through the process of building a rapport with them that allows them to share their work and research in ways that are meaningful to general audience stakeholders; and, 8) Creation of the NSF impact statements allows the SO to demonstrate how our work makes a difference in the lives of people across the state of ND and throughout the nation.

Communicating Science Workshop. In fall of 2022, the SO hosted two Alan Alda Center Communicating Science[6] workshops: *Creating Connections* online workshop and *The Essentials* online workshop (Figure II-14). The Alda Method is a unique approach to science communication training that combines improvisational theatre-based techniques with message design strategies, including analogies and narratives. This immersive method emphasizes two-way communication that builds trust and invites others (especially lay stakeholders) to share in the science conversation. Seventy-eight people, including NDUS faculty, campus communication personnel, and graduate students participated in the workshops.

Figure II-14. Statewide solicitation at all participating institutions for the communicating science workshops.

ND EPSCoR Annual Conference. The SO coordinates and runs the Annual ND EPSCoR State Conference. This annual celebration and showcase of research performed across the entire state draws students, faculty, and other stakeholders. The conference is an important venue to showcase the research efforts of faculty and students from the 11 ND EPSCoR participating institutions and provides a valuable opportunity for faculty and students of various campuses to dialogue in ways that may not normally

[5]Link to ND EPSCoR's monthly newsletter - https://www.ndepscor.ndus.edu/news/news-and-notes-newsletter/
[6] Alan Alda Center Communicating Science: https://www.aldacenter.org/

occur due to distances between the institutions. The 2022 Annual ND EPSCoR State Conference, held in a hybrid format on April 6, 2022 (Figure II-15), was attended by 150 individuals and involved 79 posters and eight sessions. 246 individuals signed up to view the Symposium platform content, visiting the site 1,184 times and spending over 115 hours engaging with the content. A unique feature of the conference available on the Symposium platform was the virtual poster component. Posters could be viewed during the two weeks prior to the conference, giving stakeholders more time to review the research. The posters received 2,201 unique views.

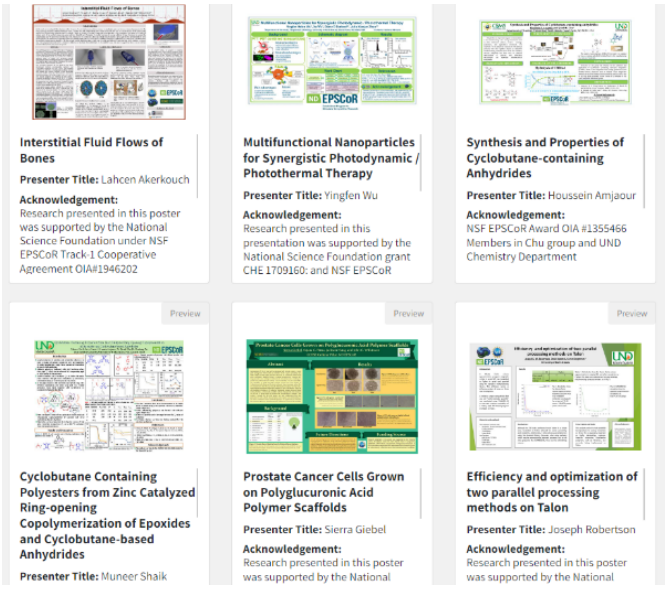


Figure II-15. Click on the thumbnail to view the virtual posters of the 2022 ND EPSCoR Annual Conference.

The hybrid nature of this year's conference allowed for a return to an in-person format (Figure II-16) while also retaining the elements of last year's virtual conference that allowed for broader engagement from throughout the state. The research at this year's hybrid conference was offered virtually on the Symposium™ platform and in person at the Alerus Center in Grand Forks, ND.

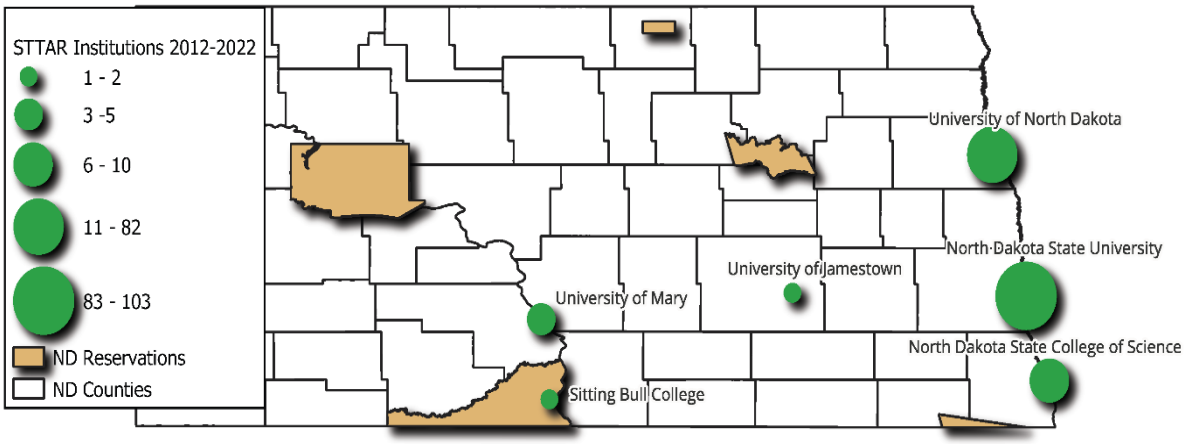
Figure II-16. The hybrid conference allowed for in-person events, such as a poster session.

Innovation and Entrepreneurism. Support for student innovation and entrepreneurism is an important component of a student's STEM pathway.

Workforce Development

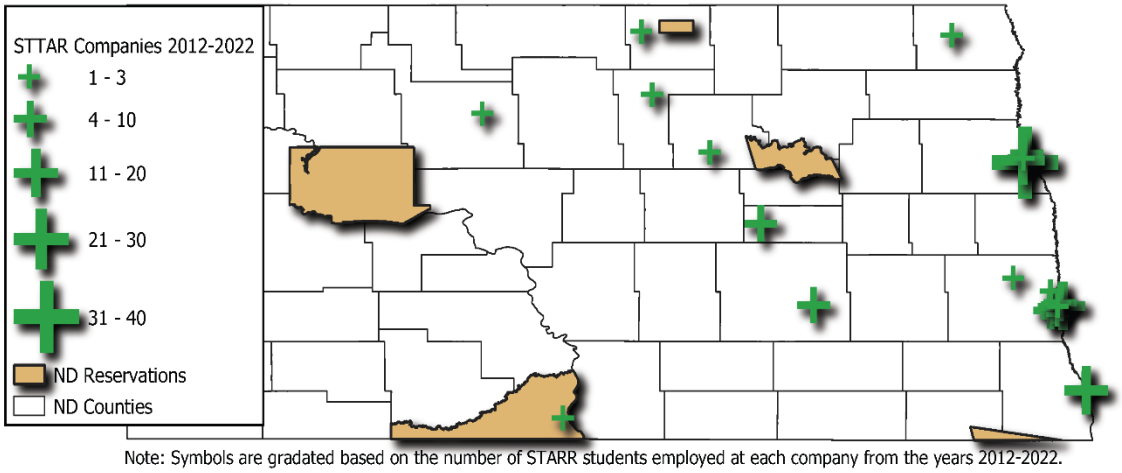
Innovation and Entrepreneurship. ND EPSCoR provides opportunities for North Dakota students to gain practical experience to meet the goal of preparing the state's STEM workforce for the future.

Students in Technology Transfer and Research (STTAR) Program. This program provides upper-division students from ND institutions of higher education (Figure II-17) with an opportunity to apply their academic training to address science and technology-based challenges faced by ND companies (Figure II-18). The STTAR program helps strengthen ND's STEM workforce by providing practical experience to students and technical insight to companies (see Figures II-19 and II-20 for two examples). State office company partners are required to provide a salary of at least $15/hour. The SO currently provides a 1:1 match (up to $7.50/hour) to support student interns.



Note: Symbols are gradated based on the number of STARR students enrolled at each instituion from the years 2012-2022.

Figure II – 17. STTAR Institutions 2012-2022 map.



Note: Symbols are gradated based on the number of STARR students employed at each company from the years 2012-2022.

Figure II – 18. STTAR companies 2012-2022 map.

In FY22, there were 26 STTAR interns at 12 different ND companies. The STTAR program has steadily grown to include companies from the central and western regions of ND. This includes Jamestown (Interstate Engineering), Rugby (Rugby Manufacturing), Carrington (Dakota Growers Pasta Company), and Fort Yates (Sitting Bull College). The Red River Valley is well represented by companies based in Wahpeton (ComDel Innovation, WCCO Belting), Fargo (MBN Engineering Inc, Moore Engineering Inc, Marvin Windows, Renuvix LLC), and Grand Forks (Tau Drones LLC, Nodak Electrical Cooperative).

Figure II-19. Jasmine Kostelecky (NDSU) working in the lab as a Research Science Intern for Renuvix LLC.

Figure II-20. Nadia Mouedden and Anton Skurdal (UND) working in the field as Data Science Interns for Tau Drones LLC.

ND EPSCoR's goal for this program is to grow to have broad representation of companies from all parts of the state and students who represent all institutions of higher education within the state. This program is open to students from all ND higher education institutions.

Track-1 Match

RII Track-1 Match. In FY22, required state match support for the NSF RII Track-1 cooperative agreement (ND-ACES) of 20% ($800K per year) was provided by the SO. This NSF-required match, totaling $4M, has been pledged to this cooperative agreement through the five-year duration of this cooperative agreement (2020-2025).

SO ACTIVITY – ADMINISTRATIVE SERVICES

Financial, Administrative, and Logistical Services. The SO Business Manager provides financial and compliance oversight of all SO dollars. The Administrative Coordinator handles all office logistics as well as the logistics for most of the programs funded by the SO (i.e., Annual Conference, data gathering in ERcore, NATURE planning and events, etc.). The SO also provides administrative support, trainings, and guidance to all 11 ND EPSCoR participating campuses in topic areas such as grant finances, technical training, compliance, etc. In addition, the SO does campus visits and outreach to the ND EPSCoR participating campuses.

Since 2017 (the start of the ND EPSCoR State Office), 618 projects (including 110 subawards to other institutions) associated with these three federal awards have been funded (144 federally funded projects and 474 projects funded from state dollars). The Business Manager's oversight ensures funds are spent within federal and state regulations. The Business Manager also provides guidance to accountants at the other participating institutions.

Additionally, each EPSCoR jurisdiction has several financial and data collection obligations. This includes the annual EPSCoR coalition dues, ERcore (EPSCoR Reporting database) membership fees, ERcore server hosting fees, mandatory travel to NSF and coalition meetings, travel to participating institutions, etc. The costs of these items are covered by the SO on behalf of all participating institutions. The SO also provides training to researchers on grant finances, technical training on ERcore (Track-1 awards), transcription file setup (CIRCLES), etc.

ND EPSCoR State Steering Committee Logistics. The SO provides logistical support for four ND EPSCoR State Steering Committee meetings each year. Additionally, the SO administrative coordinator serves as the secretary for the committee. During FY22, State Board of Higher Education (SBHE) member Casey Ryan, M.D., chaired this committee and Nueta Hidatsa Sahnish College President Twyla Baker, Ph.D., served as committee vice-chair. Per its bylaws, the committee: 1) leads the effort to develop and compile a state Science and Technology Plan that describes and summarizes the research and education strengths of the jurisdiction and provides a set of means and methods to bring the outcomes of NSF EPSCoR Track-1 projects (and other EPSCoR and EPSCoR-like projects) to a commercially viable end, 2) identifies research and development areas, strategies and actions within the higher education system consistent with the state's Science and Technology Plan, 3) assesses and summarizes the strengths, barriers, and opportunities for continuing to build the capacity of the NDUS and the ND Association of Tribal Colleges (NDATC) 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, 4) 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, and, 5) functions as a liaison to state stakeholders in communicating the value proposition of research and economic development from the university systems.

SO ACTIVITY - LEVERAGED

STEM Capacity Building at the Research Universities. The ND EPSCoR SO provides NDSU (via NDSU EPSCoR managed by the SO) and UND (via the Research and Economic Development Office) an award each year that allows these research universities to invest in strategic/priority STEM areas that build capacity and competitiveness (individual annual reports are provided in Appendix A - NDSU and Appendix B - UND).

NASA EPSCoR. During FY22, the NDUS provided $171,000 to UND for ND National Aeronautics and Space Administration (NASA) EPSCoR activities. The SO administers the NDSU NASA EPSCoR activities and received one-half of appropriated dollars ($85,500) via a subaward from UND. These funds are used to provide match funding to NDSU faculty on NASA EPSCoR Cooperative Agreement Notices (CAN, including Rapid Response Research [R3]) and Research Infrastructure Development (RID) awards, which are administered by ND NASA EPSCoR at UND (see Appendix A for the NDSU EPSCoR NASA report).

SO ADMINISTRATION OF EXTERNALLY FUNDED AWARDS

During FY22, SO staff were involved in the administration, management, and implementation (as active researchers) of two federally funded competitive awards. The Executive Director and Project Administrator are responsible for the oversight of these awards. The Business Manager is responsible for the financial/compliance monitoring of the overall NDSU award (parent award) and all of the subawards to ND EPSCoR participating institutions. The majority of the SO staff have a participatory (research, education, and/or outreach) role in these awards as well as an administrative role.

NSF EPSCoR Research Infrastructure Improvement (RII) Track-1 Cooperative Agreement. During FY22, the SO administered one NSF EPSCoR RII Track-1 agreement (*New Discoveries in the Advanced Interface of Computation, Engineering, and Science (ND-ACES*, *#1946202, 2020-2025)).*

This $20M award focuses on expanding the state's research capacity by leveraging investments to generate new knowledge and increase North Dakota's competitiveness in biosciences by working

collaboratively within the Center for Cellular Biointerfaces in Science and Engineering (CCBSE)[7]. Specifically, CCBSE builds research capacity to better understand design rules that govern in vitro biointerfaces and influence in vivo decisions surrounding the understanding of biochemistry and the cell biology of cancer cells and tumors (for breast and prostate cancers). The CCBSE has three pillars of scientific inquiry: materials design at biointerfaces, cellular systems at materials interface, and computation, machine learning, and predictive modeling. The CCBSE is also linked to the ND-ACES outreach arm, PROmoting Sustainable Partnerships in Education and Research (PROSPER); especially in the development of STEM pathways for students. This cooperative agreement will be active through June 30, 2025.

In its Year 2 Annual Report filed with NSF on April 1, 2022, ND-ACES included 274 participants (130 students, 87 staff, 56 faculty, and one postdoc). External engagements have been conducted involving 908 event attendees, of which 301 were historically underrepresented K-12 students. There were 10 publications and 18 faculty and student presentations (this number will be augmented in Year 3 reporting period by the 120 posters presented at the annual conference on April 6, 2022. Collaborations within the state totaled 49 at four institutions. Other domestic collaborations totaled 58 at 31 institutions. Five external proposals totaling $6,148,157 had been submitted in Y2. Five new seed awardees were funded for a total of nine, and three emerging areas faculty were moved to Senior Personnel status (with the start of Year 3). Two new faculty have been hired. The UND faculty member began in August 2021 (in the Department of Chemistry), while the NDSU faculty member will begin in August 2022 (Department of Mechanical Engineering). ND-ACES successfully completed its required reverse site visit (RSV) on April 21, 2022. The RSV is a Year 2 required component of all Track-1 cooperative agreements. NSF sent the PI/PD (Kelly A. Rusch) five recommendations. The ND-ACES management team compiled a response to these recommendations and submitted the document to NSF on July 18, 2022.

NSF Collaborative Research Grant. The Cultivating Indigenous Research Communities for Leadership in Education and STEM (CIRCLES [NSF #2038196, 2020-2022]) Alliance is a $770,143 collaboration between six EPSCoR jurisdictions (Idaho [$76,051], Montana [prime institution, $236,250], New Mexico [$87,152], North Dakota [$185,330], South Dakota [$87,850], and Wyoming [$97,510]) to address the underrepresentation of American Indian/Alaskan Native (AI/AN) students in the STEM disciplines and within the STEM workforce. The CIRCLES Alliance (Figure II-21) states are home to 19 tribal colleges/universities (TCUs) and span 49 tribes/nations. The shared vision for the Alliance is to increase the number of AI/AN students who enter and persist in STEM-related fields and to become a leader in advancing AI/AN preparation and success. ND EPSCoR serves as the backbone organization, as well as researchers, for this Alliance.

Figure II-21. CIRCLES Alliance logo.

This grant from NSF was extended through September 30, 2022. ND EPSCoR collected 56 responses (37 surveys and 19 interviews [many of which were virtual]) from TCU faculty and staff; tribal community members; K12 teachers, staff, and administrators within tribal communities; and, parents/guardians). The study was designed to learn and better understand what STEM means to these populations. The

[7] Center for Cellular Biointerfaces in Science and Engineering (CCBSE) website: https://www.ndepscor.ndus.edu/ndepscorprograms/track_1_nd_aces_prime_institution_ndsu_2020_2025/center_for_cellular_biointerfaces_in_science_and_engineering/

responses revealed the indigenous STEM is place-based, holistic, and applied. In addition, several student challenges and community STEM needs were identified. Respondents were also asked about the impact of the COVID pandemic. To date, ND EPSCoR has presented its data at the May 2022 CIRCLES Alliance conference, submitted a manuscript for publication on STEM education and the connections to culture embodied by curriculum and pedagogy at TCUs, and submitted an abstract for presentation at the Association for Science Teacher Education in January 2023.

NSF Collaborative Research Proposal. The CIRLCES Alliance submitted a collaborative NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES [submitted January 2022]) proposal for approximately $10M/five-years ($2.08M to ND EPSCoR, if funded). The proposal focuses on the development of Indigenous STEM K-12 lesson plans and the development of repository for national dissemination. If funded, the SO, together with one faculty member from UND, will participate in a cooperative agreement to develop formal STEM lessons and associated teacher professional development for grades 7-12. Under the INCLUDES proposal, the SO also serves as the backbone organization for the collaborative. Federal funds are included in the budget that would pay a portion of several staff members' time to participate in this award. This award has been recommended for funding.

Section III: FY22 ND EPSCoR SO Budget and Expenditure Details

FY22 SO Budgets

During FY22, SO activities fell into one of three activity pools (see Table ES-1 and Table III-1): 1) Programmatic, 2) Administrative Services, and 3) Leveraged.

Programmatic (63.5%) – Within this budget activity pool, there are six program types (see Section II for a discussion of activities under these program types):

1. Education, Outreach, and Broadening Participation – includes salary for programmatic staff who develop and implement STEM outreach programs that broaden the diversity of the STEM pathway in ND: NATURE, STEM partnership paper implementation, K-12 partnership development, etc.
2. Competitiveness and Sustainability – includes efforts focused on building collaborations and partnerships and proposal preparation.
3. Communication – includes salary for the Communication Manager, travel to participating campuses, supplies, EPSCoR Annual State Conference (held in a hybrid format this year due to the COVID pandemic), branding materials, website maintenance, fees for dissemination services, etc. Of note here is the significantly increased effort in communicating science to the public via increased targeted social media presence, which includes the development of a SO YouTube Channel.
4. Workforce Development – includes STTAR, graduate student research assistantships, undergraduate research funds, etc.
5. Track-1 Match – includes the annual $800,000 cash match to the NSF RII Track-1 cooperative agreement
6. Other EPSCoR Activities – includes one-time use of funds not captured in another category (i.e., conference registration fees, travel, and programmatic allocation for expenses not captured elsewhere).

The majority of the implemented FY22 programs were personnel intensive (i.e., communicating science to the public, K-12 outreach, coordination of workshops, and the annual state conference). Of the $944,118 SO personnel budget, 60.2% was for programmatic personnel who develop, implement, and assess, and disseminate research, education, outreach, and diversity programs. Without these personnel, the SO would be unable to meet its mission of broadening and diversifying ND's STEM workforce pathways, supporting and growing statewide STEM research capacity and competitiveness, and informing and communicating science to ND stakeholders.

The SO has continued to develop additional programs and activities for statewide research, education, and outreach. The majority of these programs/activities are driven by: 1) the need to increase STEM research capacity and competitiveness at all ND institutions of higher education, 2) the needs of the K-21 STEM community, 3) the desire to better communicate the impact of ND EPSCoR programming to ND stakeholders, 4) the SO goal to grow and diversify ND STEM education pathways and workforce readiness, and 5) the desire to meet the STEM programming needs of the entire state despite disparities within the IT infrastructure (especially within tribal and rural communities).

Administrative Services (14.3%) – This activity pool includes costs associated with operating the SO, providing oversight for programmatic programs and activities, and expenditures for servicing competitive federal awards. The FY22 administrative budget included 39.8% of the total SO salary budget. The administrative/service pool was comprised of salaries (13.2% of total FY22 budget) and operating expenses (1.1% of total FY22 budget). The administrative responsibilities included purchasing, billing, managing budgets, financial oversight, scheduling, etc., while the operational expenses included

Table III-1. FY22 ND EPSCoR SO Project Budgets, Expenditures, Encumbrances/Commitments, and Rollover.

Budgets	$	%	Expenditures	Encumbrances/ Commitments	Rollover
Programmatic					
Education, Outreach, and Broadening Participation	$439,453	15.5%	$195,668	$50,864	$192,921
Competitiveness and Sustainability	$158,733	5.6%	$86,919	$0	$71,814
Communication	$172,976	6.1%	$131,407	$0	$41,569
Workforce Development	$131,450	4.6%	$15,000	$97,607	$18,843
Track-1 Match	$800,000	28.1%	$187,328	$612,672	$0
Other Activities	$103,600	3.6%	48,224	$0	$55,376
Total	**$1,806,212**	**63.5%**	**$664,546**	**$761,143**	**$380,523**
Administrative Services					
Other Activities	$406,663	14.3%	$250,729	$0	$155,934
Total	**$406,663**	**14.3%**	**$250,729**	**$0**	**$155,934**
Leveraged					
Other Activities	$630,000	22.2%	$372,411	$257,589	$0
Total	**$630,000**	**22.2%**	**$372,411**	**$257,589**	**$0**
All Activity Pools					
Education, Outreach, and Broadening Participation	$439,453	15.5%	$195,668	$50,864	$192,921
Competitiveness and Sustainability	$158,733	5.6%	$86,919	$0	$71,814
Communication	$172,976	6.1%	$131,407	$0	$41,569
Workforce Development	$131,450	4.6%	$15,000	$97,607	18,843
Track-1 Match	$800,000	28.1%	$187,328	$612,672	$0
Other Activities	$1,140,263	40.1%	$671,364	$257,589	$211,310
Total	**$2,842,875**	**100.0%**	**$1,287,686**	**$1,018,732**	**$536,457**

phone lines, copying, mailing, office furniture/computers, travel to EPSCoR meetings and participating institutions, EPSCoR coalition dues, ERcore fees (the data reporting and tracking tool for the NSF EPSCoR RII Track-1s), ERcore server hosting fees, etc.

Leveraged (22.2%) – This activity pool provides funds for STEM capacity building investments at the two research universities (RUs – NDSU and UND). The FY22 leveraged budget consisted of a subaward to UND (Research and Economic Development Office) and a transfer of funds to a NDSU leveraged project (NDSU EPSCoR [Dept. 4200] administered by ND EPSCoR) of $315,000 per campus. Reports on NDSU's and UND's FY22 use of Leveraged funds are contained in Appendices B and C, respectively.

NOTE: The SO activities (department 4450) and the NDSU EPSCoR-related activities (department 4200) have been intentionally separated for accounting, tracking, and reporting purposes.

The total budget of $2,842,875 was disbursed through 21 projects:

- five ND-ACES match projects (1 parent project, 3 projects at NDSU, and 1 subaward at UND [with 3 sub-projects]
- four Nurturing American Tribal Undergraduate Research and Education (NATURE) University Summer Camp projects (1 parent project, 1 project at NDSU, and 2 UND subawards [1 parent project and 1 project])
- three K-12 outreach (1 SO project and 2 subawards [both to Gateway to Science])
- one subaward to VCSU [1 sub project]
- one project to increase representation in software development with historically underrepresented populations [subaward to Emerging Digital Academy [Emerging Prairie])
- one STTAR project
- one annual conference project
- one professional development (communicating science) project
- one leveraged parent project (from which NDSU established 20 sub-projects [Appendix C])
- one leveraged subaward to UND (from which UND established 7 sub-projects [Appendix D])
- one SO administrative parent project
- one SO administration project.

FY22 SO Expenditures and FY23 Encumbrances

By fiscal year-end (June 30, 2022), $1,214,513 was expended (in charges cleared as of the July 16, 2022 reports; Table III-1). Based on the initial budget, 35.7% of the programming funds, 61.7% of the administrative/service funds, and 47.5% of leveraged funds were expended as of June 30, 2022. Three of these projects remain active/encumbered ($1,070,218) and have been extended through FY23.

The majority of the encumbered funds are within the programmatic pool ($761,143; 71%) with $612,672 of these funds related to ND-ACES state match. The funds in the Workforce Development category will be used to pay the STTAR students during the remainder of Summer 2022. There are currently 26 students working within 12 North Dakota companies. Most of the funds encumbered within the Education, Outreach, and Diversity programs will be used to cover Summer 2022 expenses related to NATURE University Summer Camp and Sunday Academy planning activities, as well as conversion of Sunday Academy modules into lesson plans for K-12 educators.

Rollover

As of July 16, 2022, rollover funds totaled $536,457 (70.9% originated from programmatic funds). Rollover is a combination of salary savings ($368,187), unexpended funds from projects that were completed but had funds remaining ($102,377), and unused operating funds (both programmatic and administrative/service [$65,893]). Salary savings were generated through two means: 1) vacant staff lines and 2) charging ND EPSCOR staff time to other projects (i.e., NSF RII Track-1s) while they performed

work on those projects. As the SO staff continues to gear up to write additional proposals, there is the potential for increased salary savings if new externally competitive awards are funded.

The rollover budget will be used to invest in ND EPSCoR participating institutions in FY23. An RFP released to all ND EPSCoR participating institutions on July 29th requests proposals in the areas of: 1) equipment, 2) equipment repair, 3) undergraduate research, 4) preliminary data seed awards, 5) external proposal review, 6) seed awards for K-12 outreach 7) development of online/virtual modules for STEM laboratory courses, 8) community-based STEM research, 9) student travel to present at national conferences, and 10) digitizing researcher data sets. A total of $536,457 in rollover funding will be allocated to allow individual institutions/faculty to expand capacity and infrastructure in the above listed STEM areas**.**

Summary

The initial proposed budget reflected the projected strategic needs of the SO at the time the budget request was submitted to NDUS; however, events (particularly the COVID pandemic), requests, and opportunities over the course of the year created some deviation from the original budget categories. In each of these cases, the SO worked with NDSU's Grant and Contract Accounting personnel to re-budget funds from one project to another. Future budgets will continue to be refined to ensure funds are being used where they are most needed to support the ND STEM ecosystem. Additionally, as new SO programs are developed and implemented, the programmatic budget will increase as they come online and the administrative/service budget will decrease.

APPENDIX A: FY22 NDSU Leveraged Funds Report

NDSU Leveraged (from ND EPSCoR State Office)

Budget

In FY22, the ND EPSCoR SO provided $315,000 in leveraged funds to invest in STEM capacity building activities on the NDSU campus (Table A-1). The initial budget was allocated to the two base pools: administrative (10%) and programming (90%). The administrative budget covered portions of SO staff salaries for time spent working on "purely" NDSU activities (including associated operating expenses). This budgeting strategy ensures proper allocation of time and resources to the appropriate fund/project.

Most of the funds in the campus programs category were distributed to NDSU researchers via an annual RFP process to fund educational/instructional equipment, equipment repairs, undergraduate student research, seed awards to faculty researchers to gather preliminary data to compete for federal funding, . All disbursed program dollars helped expand the STEM research and education ecosystem on the NDSU campus.

In addition to campus programs, NDSU funds are budgeted for administrative functions through a buy-out of staff time allocated to support ND EPSCoR objectives that are specific to NDSU. These activities include oversight of NDSU Leveraged funds and administrative/operational support of activities aligned with building research capacity on NDSU's campus. Administrative funds were re-budgeted to provide more funds to campus programs. As a result, the Campus Programs allocation increased from 80% to 90%. A total of 21 projects were funded under the categories described above.

Expenditures

Overall, 78% ($246,632) of the leveraged funds were spent during the year (Table A-1). While the COVID pandemic continued to impact spending, the ND EPSCoR staff worked with NDSU faculty to adjust project budgets and timelines to mitigate COVID pandemic impacts to the extent possible. Of the funds spent, 88% ($216,905) were associated with the 21 projects funded under the Campus Program. Expenditures on administrative salaries and operating expenses totaled 12% ($29,727). Administrative time was charged in proportion to the work performed for NDSU STEM-related activities.

Encumbrances and FY23 Commitments

All remaining funds are either encumbered within existing projects (21) that have been extended through FY23 due to the COVID pandemic and supply chain issues ($21,867) or are primarily committed to FY23 projects ($46,681). The funds for FY23 commitments came from finished projects for which funds remained unexpended.

Table A-1. NDSU High level summary of FY 22 budget, funds allocated to projects, expenditures, and encumbrances and FY23 commitments.					
Budgets	**$**	**%**	**Expenditures**	**Encumbrances**	**FY23 Commitments**
Programmatic					
Education, Outreach, and Broadening Participation	$29,475	9.4%	$12,386	$0	$17,089
Competitiveness and Sustainability	$10,624	3.4%	$14,028	$0	$(3,404)
Research and Seed Programs	$243,002	77.1%	$190,491	$21,687	$30,824
Workforce Development	$0	0.0%	$0	$0	$0
Total	**$283,101**	**89.9%**	**$216,905**	**$21,687**	**44,509**
Administrative					
Other Activities	$31,899	10.1%	$29,727	$0	$2,172
Total	**$31,899**	**10.1%**	**$29,727**	**$0**	**$2,172**
All Activity Pools					
Education, Outreach, and Broadening Participation	$29,475	9.4%	$12,386	$0	$17,089
Competitiveness and Sustainability	$10,624	3.4%	$14,028	$0	$(3,404)
Research and Seed Programs	$243,002	77.1	$190,491	$21,687	$30,824
Workforce Development	0	0.0%	$0	$0	$0
Other Activities	$31,899	10.1%	$29,727	$0	$2,172
Total	**$315,000**	**100.0%**	**$246,632**	**$21,687**	**$46,681**

NDSU NASA EPSCoR. During FY22, the NDUS provided $171,000 to UND for ND National Aeronautics and Space Administration (NASA) EPSCoR activities. The SO administers the NDSU NASA EPSCoR activities and received one-half of appropriated dollars ($85,500) via a subaward from UND. These funds are used to provide match funding to NDSU faculty on NASA EPSCoR Cooperative Agreement Notices (CAN, including Rapid Response Research [R3]) and Research Infrastructure Development (RID) awards, which are administered by ND NASA EPSCoR at UND. In the event that these dollars are not used to match NASA EPSCoR CAN or RID awards during a fiscal year, they are made available through supplemental project RFPs to NDSU faculty that provide seed funding for contributing and promoting the development of research infrastructure in support of NASA's mission, improving the state's NASA-related capabilities, developing partnerships with NASA, and contributing to the NASA-related education or economic development of the state. During FY22, the NDSU NASA EPSCoR funds were pledged to NDSU faculty

toward a NASA EPSCoR CAN (~$43,000 per year for three years) and three NASA EPSCoR RID (~$18,000) proposals. The SO recently learned that the CAN proposal was not advanced. As a result, those dollars will either be pledged to FY23 proposals or be awarded via a competitive supplemental request for proposals designed to provide seed funding to NDSU faculty who intend to pursue NASA funding.

APPENDIX B: FY22 UND Leveraged Funds Subaward Report

The EPSCoR office at UND received a subaward from NDSU for leveraged funds in the amount of $315,000 to be expended during the time period of July 1, 2021 – June 30, 2022. Funds were set up for match to a UND Major Research Instrumentation (MRI) award and equipment purchases in alignment with UND's Strategic Goals.

Funds were used for the following equipment: NMR spectrometer, a psychophysiological data acquisition and analysis system, benchtop flow cytometer, VR equipment, combined drone and sensor suite, ultramicrotome, and 3D printer. Funds remaining are due to supply chain issues. -Carryover funds from FY21 were used as planned for salaries and benefits.

Estimated dollars remaining in the current leveraged subaward are: Administration $189,221.

These dollars remaining will be used to complete the equipment purchases as noted above.

Table B-1. UND High level summary of budget, funds allocated to projects, expenditures, and encumbrances and FY23 commitments.

Budgets	$	%	Expenditures	Encumbrances	FY23 Commitments
Programmatic					
Competitiveness and Sustainability	$315,000	100.0%	$125,779	$189,221	$0
Total	**$315,000**	**100.0%**	**$125,779**	**$189,221**	**$0**
Administrative					
Other Activities	$0	0.0%	$0	$0	$0
Total	**$0**	**0.0%**	**$0**	**$0**	**$0**
All Activity Pools					
Competitiveness and Sustainability	$315,000	100.0%	$125,779	$189,221	$0
Other Activities	$0	0.0%	$0	$0	$0
Total	**$315,000**	**100.0%**	**$125,779**	**$189,221**	**$0**

APPENDIX C: List of Acronyms

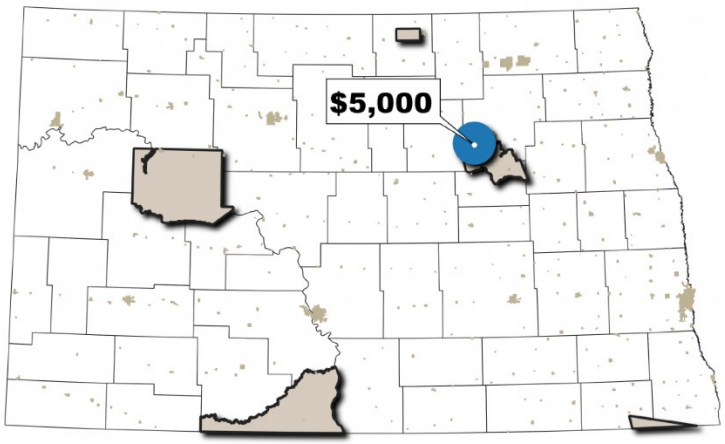
Acronym	Meaning
AI/AN	American Indian/Alaskan Native
CAN	Cooperative Agreement Notice
CAREER	NSF Faculty Early Career Development program
CCBSE	Center for Cellular Biointerfaces in Science and Engineering
CCCC	Cankdeska Cikana Community College, Fort Totten
CIRCLES	Cultivating Indigenous Research Communities for Leadership in Education and STEM
DPI	Department of Public Instruction
DSU	Dickinson State University, Dickinson
EDS	Element **E**nergy **D**ispersive **S**pectroscopy system
EPSCoR	Established Program to Stimulate Competitive Research
ERcore	EPSCoR Reporting Core (Track-1) Database
ES	Executive Summary
FY	Fiscal Year
GTS	Gateway to Science, Bismarck
HPC	High Performance Computing
INCLUDES	Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science
INSPIRE-ND	Innovative and Strategic Program Initiatives for Research and Education-North Dakota
INSTEM	Indians into STEM
MaSU	Mayville State University, Mayville
MCU	Master's College/University. There is 1 participating MCU: MiSU
MiSU	Minot State University, Minot
MOU	Memorandum of Understanding
NASA	National Aeronautics and Space Administration
NATURE	Nurturing American Tribal Undergraduate Research and Education
ND-ACES	New Discoveries in the Advanced Interface of Computation, Engineering, and Science
NDATC	North Dakota Association of Tribal Colleges
ND EPSCoR	North Dakota Established Program to Stimulate Competitive Research
NDSU	North Dakota State University, Fargo
NDUS	North Dakota University System, Bismarck
NHSC	Nueta Hidatsa Sahnish College, New Town
NSF	National Science Foundation
OIA	Office of Integrative Activities
PA	Project Administrator
PD	Project Director
PI	Principal Investigator
PROSPER	PROmoting Sustainable Partnerships in Education and Research
PUI	Primarily Undergraduate Institution. There are 3 participating PUIs: DSU, MaSU, VCSU
R3	Rapid Response Research
RCR	Responsible Conduct of Research
RFP	Request for Proposal
RID	Research Infrastructure Development
RII	Research Infrastructure Improvement
RU	Research University. There are 2 participating RUs: NDSU and UND
RSV	Reverse Site Visit

SBC	Sitting Bull College, Fort Yates
SBHE	State Board of Higher Education
SEM	Scanning Electron Microscope
SO	State Office of ND EPSCoR
STEM	Science, Technology, Engineering, and Mathematics
STTAR	Students in Technology Transfer And Research
TCU	Tribal College/University. There are 5 participating TCUs: CCCC, NHSC, SBC, TMCC, and UTTC
TMCC	Turtle Mountain Community College, Belcourt
UAS	Unmanned Aircraft Systems
UND	University of North Dakota, Grand Forks
UTTC	United Tribes Technical College, Bismarck
VCSU	Valley City State University, Valley City
VPRED	Vice President for Research and Economic Development (UND)
VPRCA	Vice President for Research and Creative Activity (NDSU)

APPENDIX D: At-A-Glance Fact Sheets

Cankdeska Cikana Community College

ND EPSCoR Support of STEM Infrastructure



Institution Details

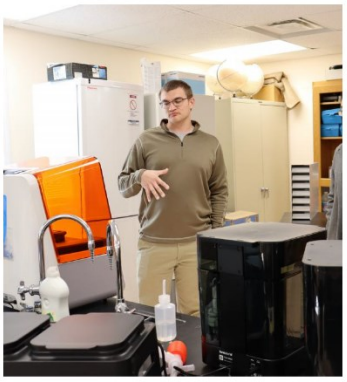
President: Dr. Cynthia Lindquist
Enrollment: 182 (Fall 2020)
Location: Fort Totten, ND
Student to Faculty Ratio: 5 to 1
https://www.littlehoop.edu/

These data were retrieved from the National Center for Education Statistics (NCES).

Investment Category*	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Undergraduate Research	1	$5,000				
Equipment Purchased						

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.

In 2019, Dr. Brent Vœls received an undergraduate research award from the ND EPSCoR State Office.



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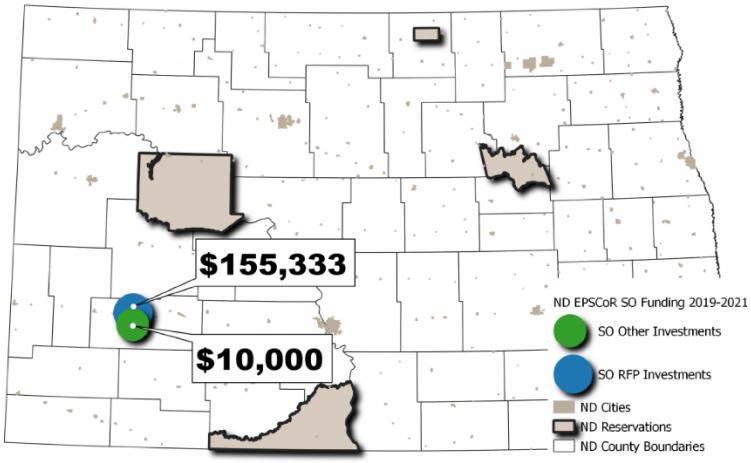
Dickinson State University

ND EPSCoR Support of STEM Infrastructure

Institution Details

President: Stephen D. Easton, J.D.
Fall Enrollment: 1,415 (2021-2022)
Location: Dickinson, ND
Number of Programs: 69
Average Class Size: 13
Student to Faculty Ratio: 12 to 1
https://www.dickinsonstate.edu/



Investment Category*	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment/Equipment Repair	1	$79,689			3	$75,644
Other State Office Investments			1	$10,000		
Equipment Purchased	Giddings Soil Sampling System, Li-Cor Carbon Dioxide Monitoring System, Cryogenic Storage Freezer, and CAE Lucina Birthing Simulator					

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.

Dickinson State University has received several equipment awards from the ND EPSCoR State Office, including a LI-COR Biosciences Carbon Dioxide Soil Flux Monitoring System. Learn more about this equipment in this video: https://youtu.be/UapXOMx7tf4

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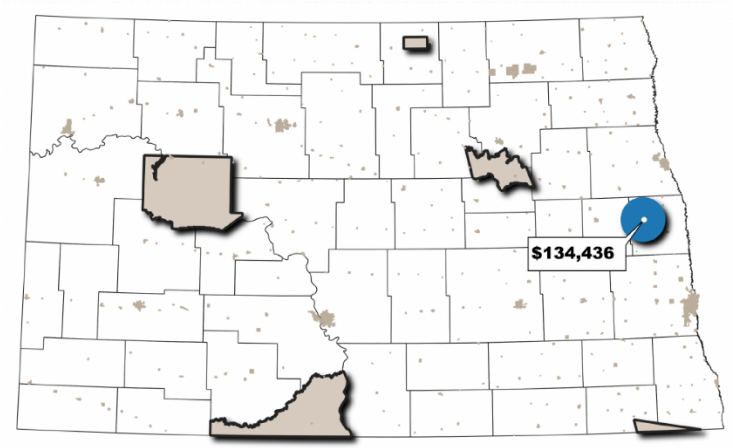
Mayville State University

ND EPSCoR Support of STEM Infrastructure

Institution Details

President: Dr. Brian Van Horn
Fall Enrollment: 1,172 (2021-2022)
Location: Mayville, ND
Number of Programs: 43
Average Class Size: 10
Student to Faculty Ratio: 13 to 1
https://mayvillestate.edu/



Investment Category	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment/Equipment Repair	1	$39,900	1	$25,500	2	$47,036
Preliminary Seed Data	1	$10,000			1	$6,000
K-12 Outreach	1	$6,000				
Equipment Purchased	Inverted Fluorsecence Microscope, Freeze Dryer Vacuum Pump, Quantative PCR equipment, 3-D Bioprinter, Tri-Gas Incubator, Biosafety Cabinet, Autoclave, and Flow Cytometer					

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.

The equipment funded by ND EPSCoR has helped Mayville State University build its cell culture facility.

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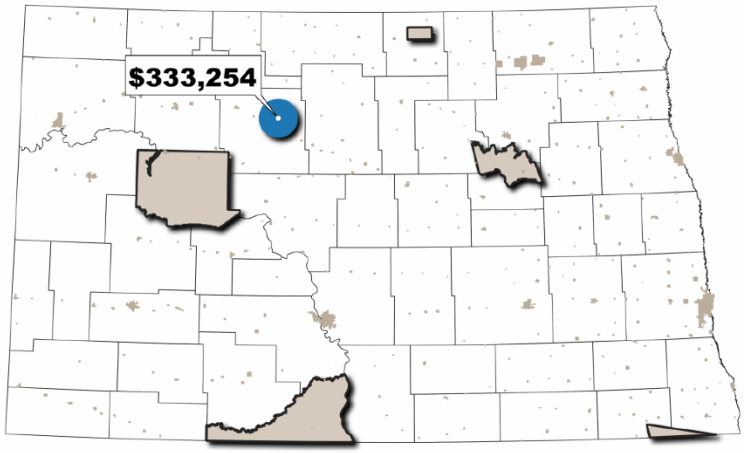
ND EPSCoR

Minot State University

ND EPSCoR Support of STEM Infrastructure



Institution Details

President: Dr. Steven W. Shirley
Fall Enrollment: 2,836 (2021-2022)
Location: Minot, ND
Number of Programs: 80
Average Class Size: 14
Student to Faculty Ratio: 11 to 1
https://www.minotstateu.edu/

Investment Category*	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment/Equipment Repair	1	$40,000	4	$96,044	3	$155,362
Undergraduate Research			1	$4,453	2	$9,934
Preliminary Seed Data	2	$10,741				
K-12 Outreach	3	$16,720				
Equipment Purchased	Agilent 4210 MP-ACES elemental analyzer, Epsilon Eclipse Electrochemical Analzyer, C-3 Cell Stand, Energy Dispersive Spectrometer System, High Resolution UAV-LiDAR, Water Quality Multi-Probe, Tabletop Scanning Electron Microscope, 16 ft USCG Boat, and Trail Camera					

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.

Dr. John Webster, Associate Professor of Geoscience, has received two ND EPSCoR equipment grants and discusses his work in this video: https://youtu.be/oWI2CGMuWs8

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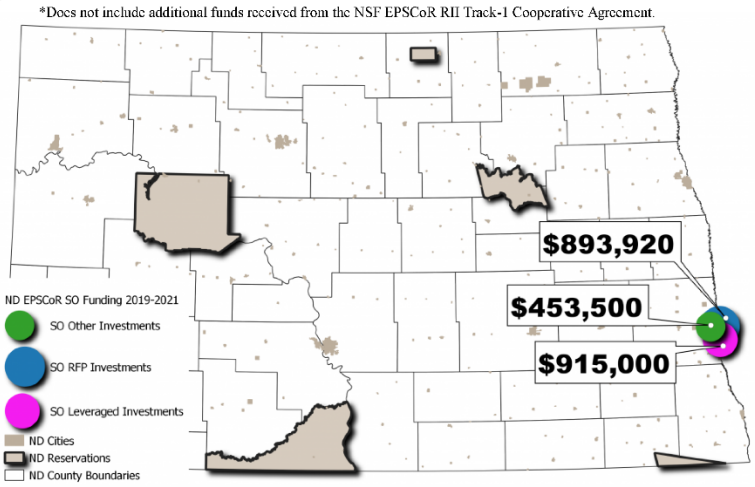
ND EPSCoR

North Dakota State University

ND EPSCoR Support of STEM Infrastructure

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.



Institution Details

Current President: Dr. David J. Cook

Former President: Dr. Dean L. Bresciani

Fall Enrollment: 12,461 (2021-2022)

Location: Fargo, ND

Number of Programs: 207

Average Class Size: 32

Student to Faculty Ratio: 16 to 1

https://www.ndsu.edu/

Investment Category	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment/Equipment Repair	4	$123,654	2	$133,408	21	$537,085
Student Travel	4	$6,845				
Undergraduate Research	5	$9,144				
Preliminary Seed Data	12	$107,132	11	$109,990	5	$63,973
K-12 Outreach	1	$6,000				
Virtual Modules			1	$5,914	1	$5,978
Community					1	$15,000
Electronic Data Sets						
Other State Office Investments				$453,500		
Leveraged Funds		$300,000		$300,000		$315,000
Equipment Purchased	Behavioral Assay System, Optical Extensometer System, Biosensing Equipment, Raman Spectroscopy Device, Centramate 500S, Bi-Directional Cyclic Simple Shear Device, 6-axis 3D bioprinting system, Thermal Conductivity Device, Microphone Array System, Ultracentrifuge, Glove Box Hypoxia Chamber, Three Dimension Handheld Scanner, Three Dimension Tripod Scanner, Organic Carbon Analyzer, Vector Network Analyzer, Waterjet Machine Center, Holomonitor Microscope, Refrigerated Incubating Shakers, Novoclave, four ByteSpeed 2U Servers, Five Asus 2U GPU Servers, Software, and Nanowizard Atomic Force Microscope System					

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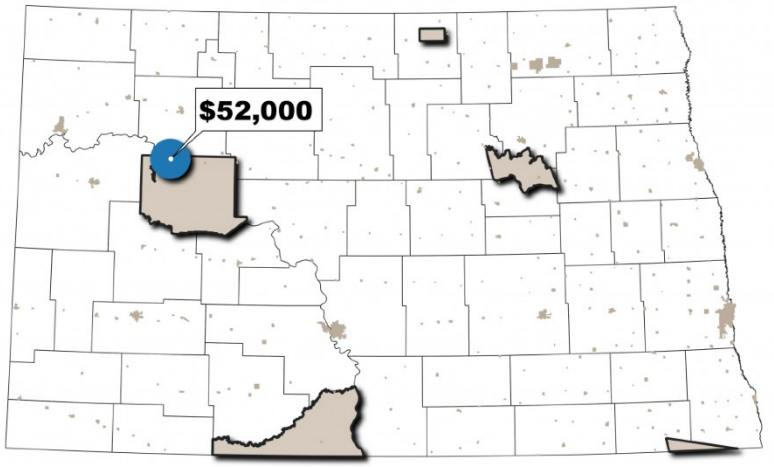
ND EPSCoR

Nueta Hidatsa Sahnish College

ND EPSCoR Support of STEM Infrastructure



Institution Details

President: Dr. Twyla Baker
Enrollment: 179 (Fall 2020)
Location: New Town, ND
Student to Faculty Ratio: 5 to 1
https://nhsc.edu/

These dats were retrieved from the National Center for Education Statistics (NCES).

Investment Category	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment					1	$35,000
Preliminary Seed Data	1	$2,000			1	$15,000
Equipment Purchased	Autoclave, Potentiometer, Ductless Hood, Laboratory Oven, and Muffle Furnace					

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.

In 2021, Dr. Audrey LaVallie received an equipment award. The purchased iems (in table above) form a system to characterize and functionalize oxidized kraft lignin. This system allows NHSC to conduct experiments and analyze samples versus contracting out the service.

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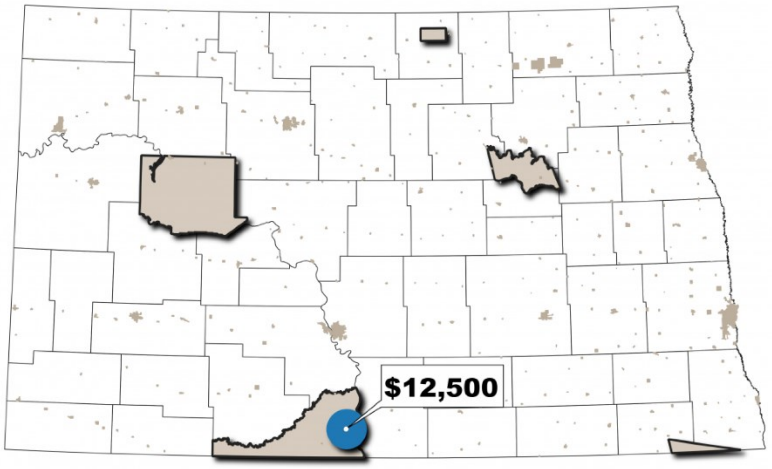
ND EPSCoR

Sitting Bull College

ND EPSCoR Support of STEM Infrastructure



Institution Details

President: Dr. Laurel Vermillion
Enrollment: 229 (Fall 2020)
Location: Fort Yates, ND
Student-to-faculty ratio: 6 to 1
https://sittingbull.edu/

These data were retrieved from the National Center for Education Statistics (NCES).

Investment Category*	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
External Proposal Review	1	$12,500				
Equipment Purchased						

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.

In 2019, Dr. Mafany Ndiva Mongoh received an external proposal review award from the ND EPSCoR State Office to provide external peer reviews for even greater success in receiving federal awards.

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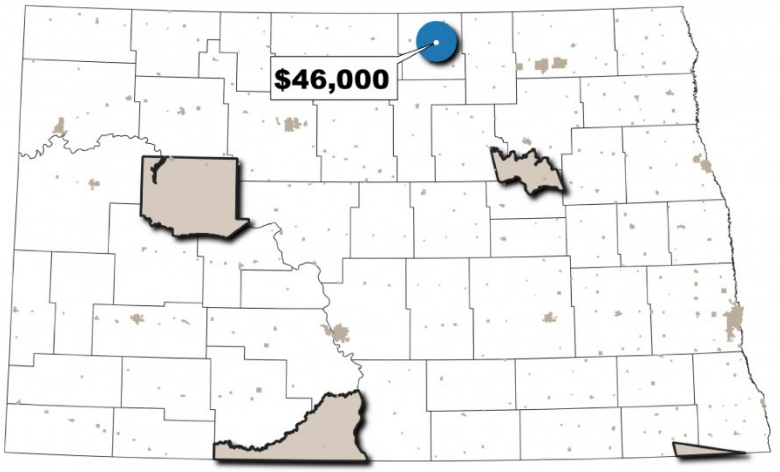
ND EPSCoR

Turtle Mountain Community College

ND EPSCoR Support of STEM Infrastructure



Institution Details

President: Dr. Donna Brown
Enrollment: 586 (Fall 2020)
Location: Belcourt, ND
Student-to-faculty ratio: 9 to 1
https://www.tm.edu/

These data were retrieved from the National Center for Education Statistics (NCES).

Investment Category	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment					1	$40,000
K-12 Outreach	1	$6,000				
Equipment Purchased	Eddy Flux System with an Open-Path Gas Analyzer and 3D Sonic Anemometer					

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.
*Does not include the $40,000 award to NDSU/TMCC/UND/UTTC for an Optical Extensometer System.

In 2021, Dr. Robert Monnette received an equipment award from the ND EPSCoR State Office to purchase an Eddy Flux System.

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ND EPSCoR

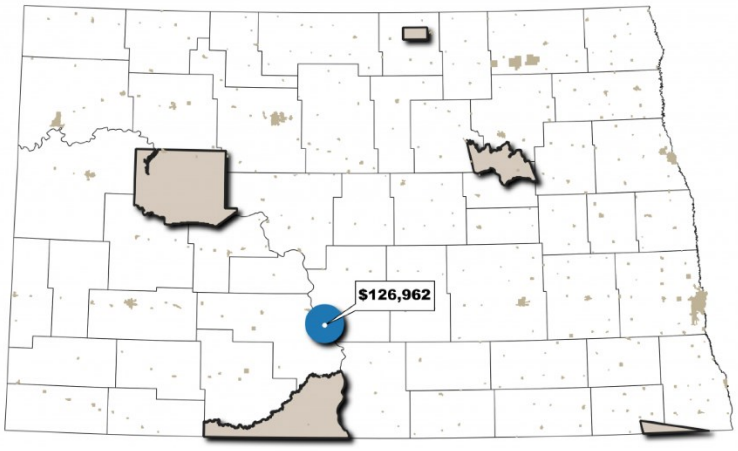
United Tribes Technical College

ND EPSCoR Support of STEM Infrastructure

Institution Details

President: Dr. Leander R. McDonald
Enrollment: 326 (Fall 2020)
Location: Bismarck, ND
Student-to-faculty ratio: 8 to 1
https://uttc.edu/

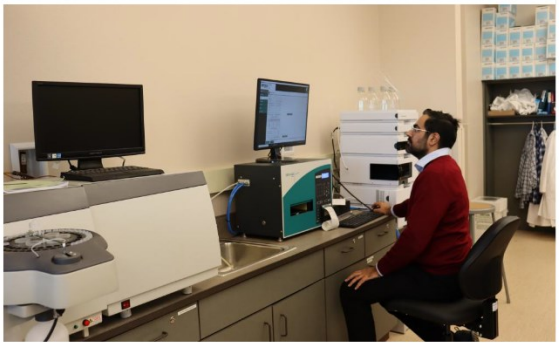
These data were retrieved from the National Center for Education Statistics (NCES).



Investment Category	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment/Equipment Repair			1	$26,130	2	$100,832
Equipment Purchased	Heat Flow Meter, Universal Testing Machine, and X-Ray Diffractometer					

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.
*Does not include the $40,000 award to NDSU/UTTC/TMMC/UND for an Optical Extensometer System.

In 2021, Dr. Gurjot Dhaliwal and Ram Hona received equipment awards from the ND EPSCoR State Office. Learn more about Dr. Hona's work here: https://youtu.be/qPs_3BfrxtY and learn more about Dr. Dhaliwal's work here: https://youtu.be/1AG7Drw6BAA



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ND EPSCoR

University of North Dakota

ND EPSCoR Support of STEM Infrastructure

Institution Details

President: Dr. Andrew Armacost

Fall Enrollment: 13,772 (2021-2022)

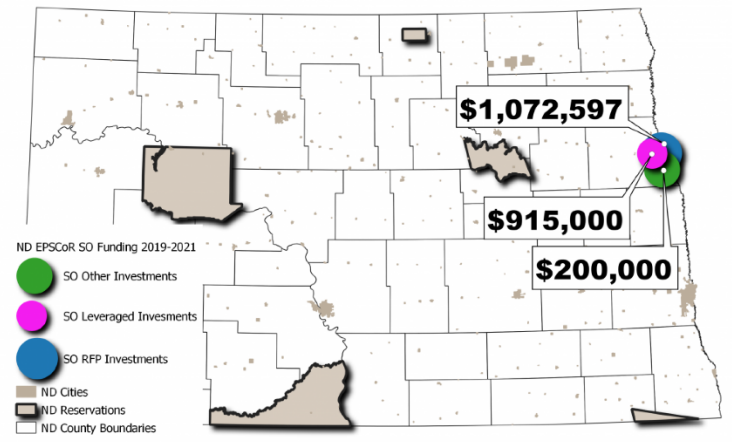
Location: Grand Forks, ND

Number of Programs: 223

Average Class Size: 25

Student to Faculty Ratio: 17 to 1

https://und.edu/



*Does not include additional funds received from the NSF EPSCoR R11 Track-1 Cooperative Agreement.
*Does not include $40,000 award to NDSU/TMCC/UND/UTTC for an Optical Extensometer System.

Investment Category	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment/Equipment Repair	1	$111,256	4	$130,835	11	$524,182
Student Travel	3	$5,292				
Undergraduate Research	2	$10,000	2	$10,000	2	$9,996
Preliminary Seed Data	8	$79,893	7	$63,650	6	$88,500
K-12 Outreach	1	$5,999				
Community					1	$15,000
Virtual Modules			2	$12,000	1	$5,994
Other State Office Investments				$200,000		
Leveraged Funds		$300,000		$300,000		$315,000
Equipment Purchased	Ergometer Bicycle and Respitory Gas Analyzer, Multi-Shot Pyrolyzer EGA, PY-3030D, TELEDYNE ISCO Model 65D, Wet-Gas Meter, Solvent extraction system, computer &software to monitor ISCO pump, Asphlat Mixer Performance Tester, NDAWN Mesonet Tower Station, Non-contact Surface Profilometry, Zeta Potential Analyzer, EMULATE Airway Lung-Chip, Gel Permeation Chromatography System, Two Hyperspectral Cameras, High-Performance Laptop, Motorized Rail, Software & License, Particle Image Velocimetry System, Voluetric Bioimaging System, Genetic Analyzer, Insect Rearing Chamber, Mastercycler, ThermoMixer, Centrifuge, GC with Autosampler, Optical Measurement System, AI Computer Node Hardware and AI/VR Workstation Hardware					

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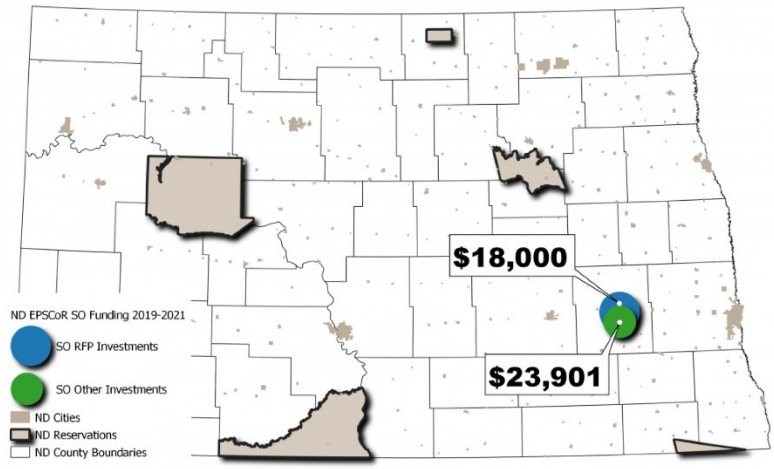
ND EPSCoR

Valley City State University

ND EPSCoR Support of STEM Infrastructure

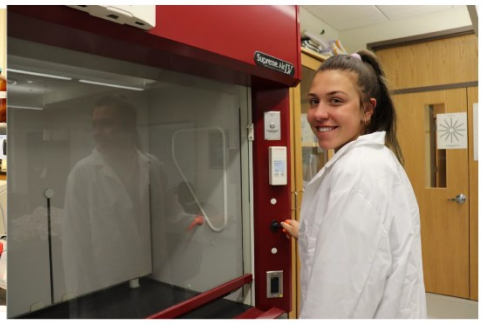
Institution Details

President: Dr. Alan D. LaFave
Fall Enrollment: 1,686 (2021-2022)
Location: Valley City ND
Number of Programs: 66
Average Class Size: 13
Student to Faculty Ratio: 13 to 1
https://www.vcsu.edu/



Investment Category*	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
K-12 Outreach			1	$6,000	1	$6,000
Virtual Modules			1	$6,000		
Other State Office Investments				$23,901		
Equipment Purchased	UVP ChemStudio Imaging System					

*Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.



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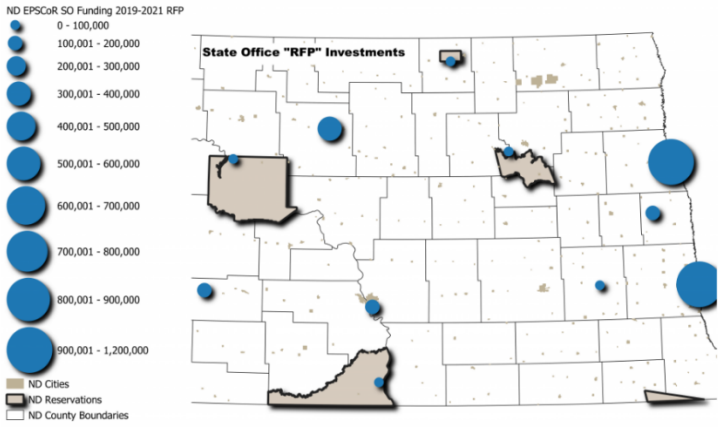
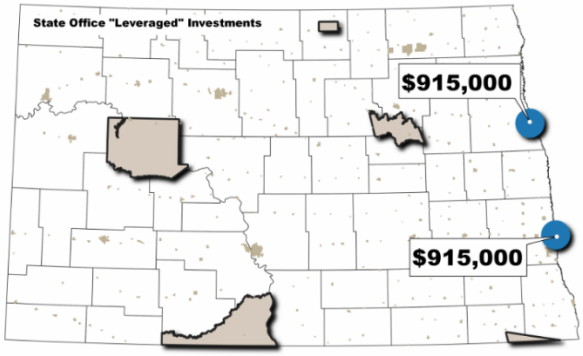
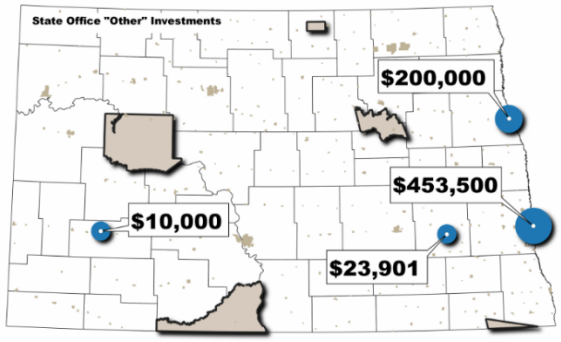
Support of STEM Infrastructure Funding-At-A-Glance







Does not include additional funds received from the NSF EPSCoR RII Track-1 Cooperative Agreement.

Investment Category	2019		2020		2021	
	# of Awards	Value	# of Awards	Value	# of Awards	Value
Annual RFP						
Equipment/Equipment Repair	8	$394,499	12	$411,917	44	$1,515,141
Student Travel	7	$12,137				
Undergraduate Research	8	$24,144	3	$14,453	4	$19,930
Preliminary Seed Data	24	$209,766	18	$179,640	13	$173,473
K-12 Outreach	7	$40,719	1	$6,000	1	$6,000
Virtual Modules			4	$23,914	2	$11,972
Community-based					2	$30,000
External Proposal Review	1	$12,500				
Other State Office Investments				$687,401		
Leveraged Funds		$600,000		$600,000		$630,000

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