

## NEWSLETTER

# Prairie Ecosystems Research Center News

The beauty of nature



## WHERE WE STARTED

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### SITTING BULL COLLEGE ESTABLISHES PRAIRIE ECOSYSTEM

Tribal College Journal  
August 18th 2021

Sitting Bull College (SBC) in Ft. Yates, North Dakota, has received a \$3.5 million grant award to assist in its efforts to provide tribal communities in the Great Plains prairie region with pertinent information about their environment. The grant from the National Science Foundation, will expand the college's research capacity, provide funding to hire additional research staff, provide funding for faculty and students to conduct advanced research, and establish a research center on the SBC college campus. The award will be spread out over a period of five years. The grant will develop a solutions platform for using scientific research to address environmental and natural resource issues of importance to tribal communities, while institutionalizing research opportunities for undergraduate students, graduate students, and faculty.

Dr. Mafany Mongoh, instructor in environmental science at SBC, is the principal investigator of the award. Along with co-investigators Dr. Gary Halvorson and Dr. Francis Ndar Onduso, the team of researchers will establish and apply a model for successful conduct of advanced research that will prove beneficial for tribal colleges. A multidisciplinary team will contribute to advancing knowledge in a variety of fields, including soil science, water quality, genetics, wildlife and plant ecology, microbiology, and engineering.

The award funded under NSF-TCUP's TCU Enterprise Advancement Centers (TEA Centers) strand allows TCUP institutions to capitalize on their investments in STEM instructional and research capacity. This project will have a direct impact on tribal communities in areas related to prairie ecosystem services, ecology, and restoration. It is designed to increase the intellectual leadership of SBC to address scientific, engineering needs, or interests, specifically for the tribe or communities in the region.

The grant establishes SBC's Prairie Ecosystems Research Center (PERC), a platform designed to coordinate and improve research efficiency at the college. PERC will leverage diverse research expertise and local Indigenous ecological knowledge to research solutions for community-identified ecosystem problems. PERC will highlight the benefits of local reservation community resources to solve issues that arise in the community using grounded practices that align with cultural traditions. The center will also provide a repository for Indigenous information and knowledge about the plains region and will deliver a database on the ecology of the plains environment for use by both scientists and the community alike.

Science students at SBC are required to complete a research project for their AS, BS, and MS degree programs. PERC will be able to provide advanced training in scientific research to students for their research projects. Students will have access to advanced instrumentation and the right type of resources through the center to facilitate their research experience at SBC. Research students at Sitting Bull College will also be given the opportunity to take part in new studies established through the grant. The center will work with its community partners, tribal entities, and knowledgeable elders to realize its goals and objectives.

By: Tribal College Journal August 2021

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A fog lifts over the campus of Sitting Bull College (SBC) in Fort Yates, North Dakota, as the sun rises over the Missouri River to the east. To the west, a white wind turbine is revealed at the top of the neighboring hill, the first to come in the community. Between the current campus buildings and the hill, architects are finishing drafts of a new state-of-the-art science center.

As wildfires draw attention to air quality and changes in the natural environment, and as COVID-19 provides the general public an awareness of concepts like airborne particulate matter, SBC, already a regional leader in wind energy technology education, has launched an ambitious atmospheric science curriculum and research program. In partnership with NASA, SBC has begun work on its Facility for Innovative Atmospheric Research and Education (FIARE), to be located in the heart of the Standing Rock Indian Reservation. FIARE will provide the reservation and broad geographic region with air quality education, regional data, and research opportunities for students seeking both undergraduate and graduate degrees.

## Taking to the Skies: Atmospheric Research and Environmental Science at Sitting Bull College

by: Cara Dimare with Allen Hastings

Tribal College Journal February 21 2021





Meanwhile, in a virtual classroom at SBC, graduate student Floris White Bull sits and discusses her research with a NASA advisory group. While SBC has graduated several cohorts of environmental science students after debuting its master's degree program in 2014, White Bull and her classmates are in the first cohort to have an atmospheric science focus. A single mother of six, White Bull has raised her children as she has worked towards her educational goals, beginning with an associate's degree in wind energy technology. While SBC currently offers nine undergraduate degree plans, with various certificates and majors, and three graduate degree plans, educational opportunities are amplified multifold for students like White Bull to have interdisciplinary trajectories which create well-rounded hires, including at local businesses.

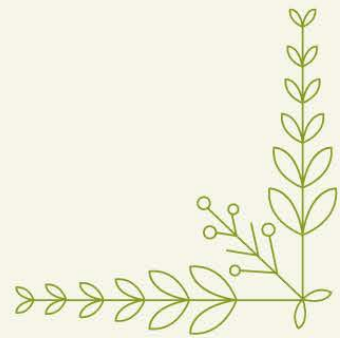
Elsewhere on the reservation, another SBC alumnus, Joe McNeil, looks over blueprints for wind turbine placement. McNeil is the general manager of Strategic, Advancement, Goals, and the Environment (SAGE), a new tribal entity working on Anpetu Wi, a 235-megawatt wind farm to be located north of SBC. On his team are not only notable organizations but also community members like Phyllis Young, a life-long environmentalist who took part in the United Nations' first Conference on Indians in the Americas in Geneva, Switzerland. Together, members of SAGE are working to expand ways of strengthening the economy and protecting the environment on the reservation.

While much has changed over the years, each day on the Standing Rock reservation starts with the sun still rising over the eastern horizon. As time passes, it becomes ever clearer, ensuring a healthy environment protects both people and prosperity. Not long ago, SBC students and trustees teamed up to coin a new college motto: "Build Your Brighter Future." With its partners in FIARE, and graduates in programs like SAGE, Sitting Bull College looks to the skies to do just that.

## THE IMPORTANCE OF AIR

Understandings about the environment and air quality are not new in these parts. For many years, Lakota people have held Indigenous atmospheric science knowledge. There is a word in Lakota to describe the air of early morning, the vapors that are raised by the early sun—anpthániya. There is a word to describe the air when it is in motion, like in the wind—tháté—or when it drafts across—okáluza. Other words to describe air include its various conditions. As hotter and cooler air mix at the horizon, light takes a slightly different path, resulting in waves of heat, a scientific phenomenon long known by its hot, waving air—mašténaptapta.

by: Cara Dimare with Allen Hastings  
Tribal College Journal February 21 2021





Traditionally, care for the environment has always played a role in the Dakota-Lakota way of life, which includes taking care of the air. In one account, as told by storyteller Hokachatka in the early 1900s and preserved in the American Museum of Natural History, three Lakota men were walking, "Soon they came to a man who was throwing dust and sand into the air and blowing on it so that it whirled about. They asked him why he did this and he told them that he was a heyókħa who could control the winds and he did this to cool the earth." Care taken for the environment has not changed. Today, the Standing Rock reservation is situated in southern North Dakota and northern South Dakota. The land area is approximately 2,275,000 acres of which 850,000 acres are under federal and tribal jurisdiction. The primary use of land in the region is intrinsically linked to the natural environment. In an economy driven by ranching and dryland farming, ensuring appropriate care of the environment is fundamental to not only livelihoods but also in the day-to-day lives of most Standing Rock citizens and residents. Many tribal members rely on the natural flora and fauna of the region for foods and medicines.

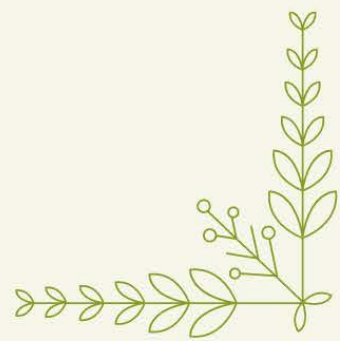
As a tribal college originally chartered by the Standing Rock Sioux Tribe, Sitting Bull College takes seriously its role as an institution guided by Lakota-Dakota culture, values, and language. These guiding principles pulse through the college's commitment to building intellectual capital through academic, career, and technical education, and to promoting economic and social development. Since opening its doors in 1973, the college has grown into its name, secured accreditation, and built a campus which can accommodate the hundreds of members of the SBC community that come through its doors each semester.

Since its inception, SBC has risen to fill community needs. One of these needs has been a robust environmental science program. Accredited in its early days to offer an environmental science associate's degree, the college sought and was approved to offer an environmental science bachelor's degree program. And in 2014, SBC was approved to offer a master's degree in environmental science. Alumni of the program have ended up in science careers as far away as Texas and California, but many have remained in the area strengthening community infrastructure such as various agriculture extension programs, natural resource groups, and the tribe's environmental protection agency.

Read more here:

by: Cara Dimare with Allen Hastings  
Tribal College Journal February 21, 2021

**[HTTPS://TRIBALCOLLEGEJOURNAL.ORG/TAKING-TO-THE-SKIES-ATMOSPHERIC-RESEARCH-AND-ENVIRONMENTAL-SCIENCE-AT-SITTING-BULL-COLLEGE/](https://tribalcollegejournal.org/taking-to-the-skies-atmospheric-research-and-environmental-science-at-sitting-bull-college/)**





June 22, 2023

Contact Information

EPA Press Office ([press@epa.gov](mailto:press@epa.gov))

WASHINGTON (June 22, 2023) – Today, the U.S. Environmental Protection Agency (EPA) announced the formal establishment of the agency's first-ever National Environmental Youth Advisory Council (NEYAC). The NEYAC will provide independent advice and recommendations to Administrator Michael S. Regan on how to increase EPA's efforts to address a range of environmental issues as they relate to youth communities. The NEYAC will provide a critical perspective on how the impacts of climate change and other environmental harms affect youth communities. The Administrator announced his intent to launch the youth council last June at the Austrian World Summit.

EPA is soliciting applications for youth to fill 16 vacancies on the NEYAC. Selected applicants will contribute to a balance of perspectives, backgrounds, and experience of the council and will be appointed by the Administrator. As a first-of-its-kind committee, all members of NEYAC will be between the ages of 16 and 29.

As part of the agency's commitment to centering environmental justice communities, at least 50% of the overall membership of NEYAC will come from, reside primarily in, and/or do most of their work in disadvantaged communities as defined by the Climate and Economic Justice Screening Tool (CEJST) as part of Justice40.

"We can't tackle the environmental challenges of our time without input from our younger communities, who've long been at the forefront of social movements," said EPA Administrator Michael S. Regan. "This committee will help ensure that the voices and perspectives of our youth are included and valued in EPA's decision-making as we continue to advance President Biden's commitment to ensuring everyone in this country has access to clean air, safe water and healthy land, now and for generations to come."

Application information:

<https://www.epa.gov/newsreleases/epa-invites-youth-serve-agencys-first-ever-national-environmental-youth-advisory>

## **EPA INVITES YOUTH TO SERVE ON AGENCY'S FIRST-EVER NATIONAL ENVIRONMENTAL YOUTH ADVISORY COUNCIL**

Contact Information

**EPA PRESS OFFICE ([PRESS@EPA.GOV](mailto:PRESS@EPA.GOV))**



# WHO WE ARE



**Samantha Bora**  
**GRADUATE STUDENT**

**READ MORE >>>**

<https://observer.globe.gov/de/news-events-and-people/news/-/obsnewsdetail/19589576/fire-in-the-sky>

## **Fire in the Sky** **NASA GLOBE Blog article by** **Samantha Borah**

"Samantha Borah is a NASA intern and graduate student at Sitting Bull College, earning a master's degree in Environmental Science, with a focus on air quality. Samantha has two years of teaching experience at Standing Rock Community High School and Mobridge-Pollock Middle School. She is also the mother of five daughters. Her experience with monitoring air quality bridges all of those roles, she explains:

I live in a rural area, bordering the Standing Rock Sioux Reservation, home to the Dakota and Lakota nations. As Indigenous people, we live in close relationship with the Earth, which we refer to as Mother/Grandmother Earth, or Unci Maka. Our elders teach us to think seven generations ahead in how we care for the natural environment.

We frequently experience hazy skies due to smoke drifting in from wildfires in other areas. The closest EPA monitor is over 100 miles away in any direction, meaning we do not have air quality data being collected and reported for our area. Through my studies I am learning about the health impacts and how important it is to inform the public to assist them in making decisions in regards to their daily activities."

# WHO WE ARE



Congratulations to Elena Rodriguez! Elena placed second in the Scientific Oral Presentation during AIHEC earlier this week. Her research project was "Correlation Between Groundwater Concentrations and Oil Proximity on the Fort Berthold Indian Reservation"

Elena Rodriguez is an environmental science major at Sitting Bull College and is also currently employed as a lab technician at the water quality lab located in the Science & Technology Center.

Elena was funded by Prairie Ecosystems Research Center to travel to AIHEC in Albuquerque, New Mexico in March 2023.

———— Elena Rodriguez  
**LAB TECHNICIAN**

## DR. GARY HALVORSON



**GARY  
HALVORSON,  
PHD, HONORED  
BY MARQUIS  
WHO'S WHO FOR  
PROFESSIONAL  
EXCELLENCE IN  
SOIL SCIENCE**

**On behalf of Sitting Bull College staff, faculty, and students, we wish Dr. Gary Halvorson the best in his retirement from Sitting Bull College. We recognize his twenty-five years of exceptional and faithful service to students and the community. Dr. Halvorson has made several noteworthy contributions to Sitting Bull College and we express our sincere gratitude. Dr. Halvorson will be missed by all his colleagues and students.**

The following article summarizes Dr. Halvorson's professional accomplishments:

"A student of St. Olaf College, Dr. Halvorson graduated with his BA in Chemistry in 1971. Thereafter, Dr. Halvorson continued his studies at Oregon State University, receiving a MS in 1975 and a PhD in Soil Chemistry in 1979. He accepted a ten month fellowship from the International Research & Exchanges Board, Inc. (IREX) in 1978 to the Timeryazov Agricultural Academy in Moscow, USSR.

Subsequent to his graduation, Dr. Halvorson accepted a position as assistant soil scientist at North Dakota State University to conduct research on the reclamation of drastically disturbed land. He was promoted to the position of soil scientist in 1989, interim superintendent of the Land Reclamation Research Center (LRRC) in 1991 and director of the LRRC in 1994. Dr. Halvorson has worked as an agri-business and science instructor at Sitting Bull College (SBC) since 1997. He was SBC Division of Agriculture Director from 1998 to 2014. He has been director of Sitting Bull Laboratories since 2006.

An esteemed soil scientist and educator, Dr. Halvorson has been a member of various professional organizations, including the American Society of Agronomy, Soil Science Society of Agronomy, North Dakota Academy of Sciences, the American Society of Surface Mining & Reclamation (ASSMR), and First Americans Land-Grant Consortium (FALCON). In recognition of his research achievements, ASSMR honored him with the Reclamation Researcher of the Year in 1995. Dr. Halvorson served FALCON as secretary from 2008 to 2012, vice president from 2012 to 2014 and president of FALCON from 2014 to 2016 and continues as a board member.

Additionally, Dr. Halvorson was secretary of the Mandan Lions Club from 1988 to 1993, president of the Mandan Lions Club from 1995-1996 and president of Heart River Lutheran Church from 1991 to 1993 Dr. Halvorson was named SBC Faculty of the Year in 2006. He has written and received numerous grants from USDA, DOD and NSF. Among these are two NSF TCUP grant awards. He also has over seventy professional publications.

Gary Halvorson, PhD, has been included in Marquis Who's Who. As in all Marquis Who's Who biographical volumes, individuals profiled are selected on the basis of current reference value. Factors such as position, noteworthy accomplishments, visibility, and prominence in a field are all taken into account during the selection process."

(24-7 Press Release, 2017)

# SITTING BULL COLLEGE ADMINISTRATION HONORED WITH TREE PLANTING



June 5th 2023 a tree planting was conducted in honor of Dr. Vermillion and Dr. Ressler at Sitting Bull College. Dr. Vermillion has announced her retirement and will be retiring in December 2023. The event started with a prayer by staff Joe Dunn, kind words were shared by Dr. Mongoh, Dr. Onduso, and Dr. Vermillion and Dr. Ressler also shared their experiences and gratitude. Faculty, staff and students also shared a meal afterwards.

The two trees planted in honor of Dr. Vermillion and Dr. Ressler were a Chokecherry tree and Silver Maple Tree. The Lakota name for Chokecherry tree is čhaŋpǎ and the Lakota name for the silver maple tree is ǰahálo. Each tree is known for its cultural uses including their use in lakota/dakota ceremonies and cultural foods.

Trees were sponsored by a grant from the American Indian College Fund secured by Dr. Onduso, who is also the co PI on the TCENTER Grant. Dr. Onduso is also the director of the genomics lab at Sitting Bull College. The following link is a video provided by KLND of the ceremony conducted on campus.

<https://fb.watch/IWybquvKfn/?mibextid=Nif5oz>

# CHOKECHERRY TREE

**Indigenous Names:**  
**čhanphá; dried cherry**  
**patties: čhanphákaški.**

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The plant is Native to North America.

## Plant Characteristics.

Family: Rosaceae (Rose Family)

Perennial, Tree growing to 30 ft. tall, Deciduous, Bloom in Apr, May, Jun, and July with white Flowers, Fruit is a drupe.

## Cultural/Traditional Uses:

- Bundles of branches are tied to Sundance poles as a sacred offering.
  - The leaves are made into tea for Sundancers.
  - Sun dancers suck on small bits of the stem to relieve thirst.
  - Small pieces of the wood are sharpened and used to pierce Sundancer's skin.
  - The fruits are eaten raw or dried for later use.
  - The dried berries are reconstituted with water to make wojapi , which is a kind of pudding.
  - Wojapi is still made using chokecherries, sometimes corn starch and sugar are sometimes added.
  - The stems are sometimes used to make arrows.
  - The fruits of all Prunus species are added to dried meat and mixed together with fat to make wasna (also known as pemmican).
  - Wood is placed in four corners of graves for the protection of the person's spirit.
-

# SILVER MAPLE

## Indigenous Names: ʔhahálo

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Plant # 2

Scientific Name: *Acer saccharinum* L.

Common Names: Silver Maple, Creek Maple, Large Maple, River Maple, Silverleaf Maple, Soft Maple, Swamp Maple, Water Maple, White Maple.

Indigenous Names: ʔhahálo

The plant is Native to North America.

Plant Characteristics.

A large deciduous tree occasionally growing to 100ft (30m), Light grey bark, leaves turn grayish-green to pale yellow during fall, Fruit is a samara, Hybridizes with Red Maple, tolerant to a variety of conditions including flooding.

Cultural/Traditional Uses:

- A decoction of the bark is used to dye hides.
- The sap is sometimes collected and used as a sweetener or refreshing beverage.
- The bark is boiled with the bark of other trees to make a substance that removes rust.
- The wood is curved into decorations
- The wood used in arrows and the roots as bowls in a game called "pugasaing," a dice-like game played by children and adults (Moerman 1998).
- The bark infusion is used as a pain relief for cramps and treatment of diarrhea, menstruation-related issues, and intestinal ailments, and as a diuretic.
- The bark of the roots used for treating gonorrhea
- Used as a dermatological aide, treating hives and measles,
- Concoction made from boiled bark was used to clean sores.
- Infusion of bark used to treat coughs and as a painkiller
- An infusion of the bark is used to treat diarrhea, dysentery, and cramps.
- Sap is boiled into sugar and syrup
- Sap mixed with thimbleberries and water and then fermented into alcohol.
- The dried, processed bark is used as an ingredient in bread and cakes.
- Food: Its seeds comprise protein, starch, and sucrose, and have a "high food value"

