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Upcoming Events

- Tribal Leaders Summit (Bismarck Events Center) September 3-5
- Wed (Sept 4; 3:15pm; Room 104): Extreme Weather and Tribal Resilience in Changing Environmental Conditions: A panel of tribal experts will discuss planning and implementation of climate resilience projects.
 - Thurs (Sept 5; 9:00am to 12:00pm; Prairie Rose 105): Student Research Presentation Competition
 - Thurs (Sept 5; 1:30pm; Room 105): Web-based Climate Adaptation Planning Tools: NASA’s Tribes and Resilience Resources.

UTTC International Powwow: Mobile Solar Trailer Booth
Come see us solar-powering the powwow! Tour the trailer and learn more about the potential of solar energy sustainability. The trailer will be on the west side of the bowery near the food vendors.

- Lunch & Learn
- Emily Biggane will lead a discussion on data representation and visualization. TBA—early October.
 - Jeremy Guinn will lead a discussion on preparing to write a proposal—how to get from a want to an objective statement. TBA—late October.

Science Seminar Series—held every Friday at noon in Science & Technology Center room 231 and sponsored by the Environmental Science Department.



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**An Intertribal
Research and
Resource Center
Newsletter**

Summer, 2019

Mission:

The IRRC provides services and builds capacity for enhancing food, energy, and water sustainability for tribal communities in the Northern Plains.

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**UNITED TRIBES®
TECHNICAL COLLEGE**
INTERTRIBAL RESEARCH
& RESOURCE CENTER

**Tribal
Landscapes**

Research and Resources for Food, Energy, and Water Sustainability



The Intertribal Research & Resource Center (IRRC) was built to bring the good science being done at United Tribes Technical College to the communities we serve. The IRRC works on food, energy, and water sustainability issues for tribal communities. In establishing the IRRC, we are now able to focus on using research to address critical questions in tribal communities and providing resources for training and education for all ages. But, we need your input! What are the most important agriculture, environmental, and natural resource issues? What do you want to know? On what topic do you wish your tribe had reliable data? We are in the process of building community advisory boards and seeking input to drive our programs. Contact us if would like to participate or provide input.

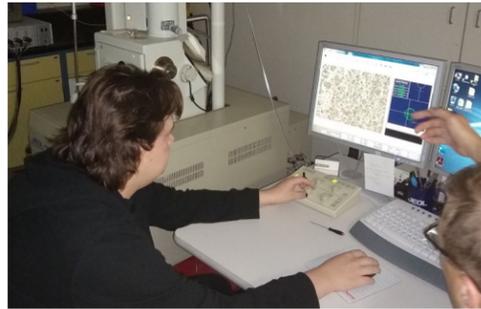
In linking with other UTTC programs such as Tribal Environmental Science, Land Grant Extension, Pre-engineering, Computer Information Technology, Career & Technical Training, and Teacher Education, the IRRC provides a range of expertise in sustainable food systems, ecology, biomaterials engineering, environmental toxins, nutrition, wildlife management, process chemistry, genetics, range management proposal writing, grant management, climate and environmental resilience, and renewable energy.

Look for training announcements in your community - such as *Building Resiliency to Climate and Environmental Change* or *Using Data to Make Land Management Decisions* workshops- and look for community programs with local schools and at community centers. At the Tribal Leaders Summit, the IRRC will host two sessions focusing on climate and environmental resiliency and a student research presentation competition.

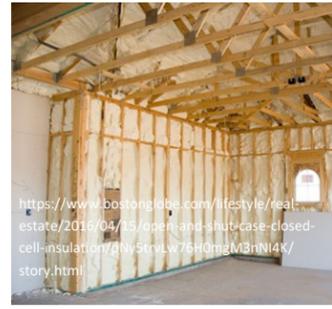
Professional research in renewable energy, toxicology, natural resource use, agricultural biomaterials, wildlife ecology, sustainable food systems, and nutrition provide the foundation of our efforts.



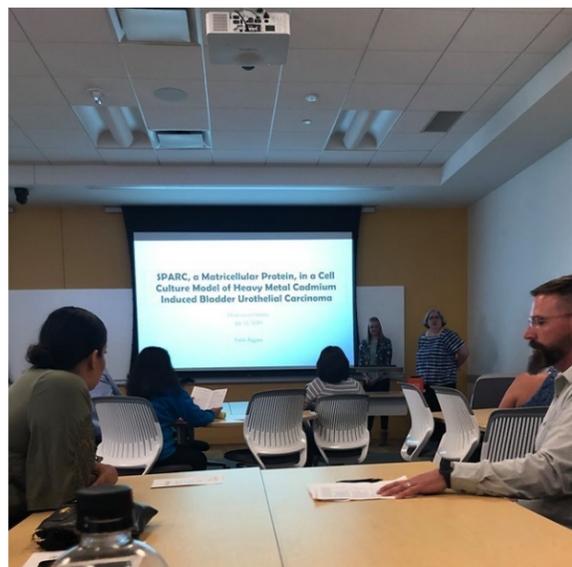
Most spray foam insulations are derived from petroleum based products. Dr. Dhaliwal constructs and researches insulation made from soy based products.



Dr. Dhaliwal and his summer pre-engineering research intern, Dione Otten (MHA Nation) tested the chemical and physical properties of each piece of foam. They tested the foam for: insulation value, flame retardancy, moisture absorbance, and mechanical strength.



Home insulations constructed from agriculture based products have the added benefits of replacing petroleum based products as they are less toxic and can provide value to an agricultural producers operations.



IRRC Welcomes New Faculty Member Dr. Emily Biggane

Emily Biggane successfully defended her PhD in Biomedical Sciences at the University of North Dakota July 11th, 2019. Originally from the Minot, North Dakota area, Dr. Biggane researches environmental toxins and tumor growth. Her work supports a better understanding of the health impacts of pollutants for all people.

ENVIRONMENTAL SCIENCE DEPARTMENT STUDENT RESEARCH



UTTC students Berlin West (Cheyenne River), Amy Jackson (Navajo Nation), Kimberly Blevins (MHA Nation), K'Lona Lofton (Cheyenne River), Muriel Friday (Wind River), Abby Decoteau (Turtle Mountain) and Owen C. Smith Sr. (Navajo Nation) stayed busy this summer as student researchers. Berlin's project focused on a less invasive way to identify bats using DNA from guano rather than tissue samples. Amy collected acoustic data in Burleigh, Morton, and Sioux County to monitor bat population declines. Kim used molecular techniques to identify agricultural pollen in bat guano. K'Lona studied different worm composting methods to maximize organic fertilizers. Muriel tested onions for different compounds that may be beneficial in producing natural remedies for people with diabetes. Abby explored tornado severity predictions using debris ball measurements. Owen used microbial fuel cells to measure how much energy is obtained from different sustainable resources. UTTC Environmental Science department faculty Mandy Guinn mentors the students and the summer research program is funded by NSF EPSCoR.

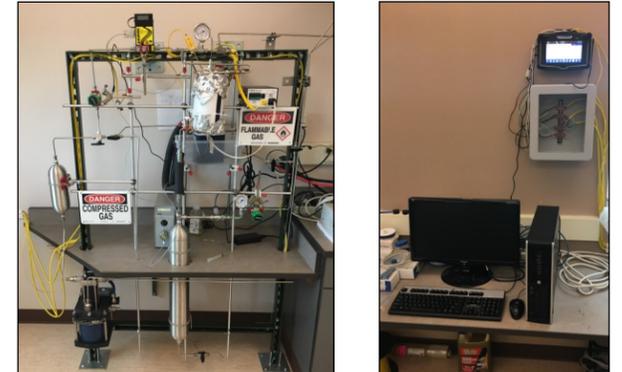


Garrison Dam Sturgeon Collaboration



This summer, UTTC Environmental Science students had the opportunity to work with the Endangered Pallid Sturgeon at the Garrison Dam National Fish Hatchery (GDNFH) in Riverdale, ND. Students worked with the Fishery Biologists Shawn Cole and Rob Holm of the U.S. Fish & Wildlife Service to learn how to care for the sturgeon fry while also collecting data on which types of food ensured the greatest survival. Students that took part in this research will help analyze the data and report their findings back to the hatchery.

Catalysts for Methane Reformation



Dr. Paul Pansegrau (UTTC Environmental Science) spent his summer developing and testing catalysts for reforming biogas using steam-methane and dry (CO₂) reforming processes. To test the catalyst, Paul built a research-scale continuous flow reactor system that is pictured above. This process could one day be used for production of industrial-grade renewable hydrogen (an energy source) and renewable ammonia (a fertilizer product).



Students and faculty from UTTC Teacher education, Pre-Engineering, and an Earth Science course came together to provide a STEM (Science, Technology, Engineering, and Math) Summer Outreach program with a focus on Math for the students at TJES. This collaborative learning opportunity was supported by a grant from the IRRC.



Jessica Shaw and Mara Yborra from UTTC Land Grant teamed up with the IRRC to explore food systems with the TJES summer school kids. Each Tuesday, they worked towards completing their challenge - creating a pizza that was good for their bodies and easy on the planet, all the while comparing their healthy, low-impact creation to a frozen pizza from the grocery store. Sourcing the ingredients locally and comparing them to the high-carbon-footprint ingredients of the store-bought pizza took them on a journey through environmental issues, nutrition, cooking, gardening, the way ecology interacts with our garden, and ultimately how our food choices affect our health and the health of the planet. In the end, they made a delicious and healthy pizza all from local ingredients (except the salt which was from Ohio), starting from milling their own grain to garnishing the finished pie with greens from our UTTC garden and wild plants on campus.



Community Partnership with Gateway to Science



While formal classes were out for summer, our halls were abuzz with youth STEM camps. Gateway to Science STEM campers spent one day a week engaging in the unique science and engineering research occurring on our campus. We loved the excitement each week as campers explored our labs and outdoor spaces. Pictured here campers are trapping bats (origami). Other highlights included practicing radio telemetry to track wildlife, designing solar ovens to cook s'mores and studying the microscopic life in pond water.

The IRRC partnered with Doug Kluck, climatologist with the National Oceanic and Atmospheric Administration (NOAA), and James Rattling Leaf of Rapid City, SD to lead a Basics of Using Climate Data to Make Land Management Decisions workshop at Nueta Hidatsa Sahnish College in New Town, ND. Participants learned the basics of climate change and then used tribal climate resources such as the National Climate Assessment and the US Climate Resilience Toolkit to discuss what their community can do to plan for and adapt to climate change.





United Tribes Technical College Selected By Tribal Solar Accelerator Fund for New Clean Energy Project

United Tribes Technical College has been awarded funding for a new solar energy project from the Tribal Solar Accelerator Fund (TSAF), a tribal led initiative with seed funding from Wells Fargo that aims to catalyze the growth of solar energy and expand solar job opportunities in tribal communities across the United States. This funding builds upon recent solar installer workshops that taught solar technology basics while constructing a solar powered trailer. Look for the ‘Solar Roller’ at this year’s powwow.

UTTC’s Solar for Everyone Initiative will provide a solar demonstration site to symbolize our commitment to a renewable energy future and enhance resiliency of tribal communities in the face of changing environments. Solar power is an untapped resource in many tribal communities that could transport discussions of tribal sovereignty and individual independence, while improving environmental conditions for the next generation. UTTC’s solar demonstration project will be installed near the entrance of UTTC campus in Bismarck, ND and serve to reduce energy expenses on the Skills Center, a primary academic building that houses multiple workforce training departments such as Welding Technology, Automotive Technology, Sustainable Agriculture and Food Systems, Computer Information Technology, and Business Administration. This highly visible location will include educational information and serve as a hub for UTTC’s new initiatives in renewable energies. The project is a collaboration among partners at UTTC, including Career & Technical Education, the IRRC, and industry partners such as Lightspring, LLC, Rock Industries and Sojourn Architect.



Case Studies

The IRRC supports higher education and community education by developing open source case studies and literature reviews. Our pilot case study examines pesticides on the prairie within the Standing Rock Community in North Dakota and will be posted on our website (<https://uttc.edu/irrc/>) once completed.

Planning for and adapting to climate change can be facilitated through case studies. Dr. Jeremy Guinn developed case studies from the National Climate Assessment to help tribes interpret the impacts of climate change now and in the future. Anna Bahnson adapted resources from the US Climate Resiliency Toolkit to assist communities in learning about what other tribes and agencies are doing to build resiliency. Community members from MHA nation worked through the cases at the recent Basics of Using Climate Data to Make Land Management Decisions Workshop.

“The information [from the case studies] is great, now we need to make a plan to utilize.”

-Feedback from Tribal Agency Personnel after working through climate case studies developed by the IRRC

Professional Development

The IRRC supports training for faculty and staff to build capacity for doing good work. By training our own, we will enhance technical skills in people who are already dedicated and committed to the mission of the institution and the communities we serve.

In August, Dr. Carol Davis (Tribal Nations Research Group) provided training for the entire faculty group at UTTC. Dr. Davis discussed the Indigenous Framework of Evaluation and how to incorporate this framework into proposals, grant programs, and even academic programs to integrate community values alongside traditional evaluation measurements.

Mara Yborra (UTTC Land Grant Extension) was supported in participating in research methods training in the area of Public Health at Johns Hopkins School of Public Health. With support from the IRRC, Mara completed two courses: *Collecting, Analyzing and Using Public Health Data in American Indian Communities* and *Introduction to American Indian Health Research Ethics*. The courses will enhance our ability to conduct rigorous research in the area of behavioral science which is critical in evaluating the effectiveness of intervention programs that are developed by the department.

Eric Holmstrom (UTTC Business Faculty) received support for training on Tableau software. Tableau is a powerful software package that allows for research with very large datasets. Eric will implement Tableau into his Business courses, stressing the appropriate methods for asking research questions, analyzing the data, and drawing accurate conclusions supported with data.