

Northwestern University study is focused on helping tribes be more resilient

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Staff Reporter

One of the many interesting presentations at the Seven Generations Inter-Tribal Leadership Summit Innovation in Education seminar from Wednesday-Friday, Oct. 11-13, at Lac Courte Oreilles Ojibwe University (LCOOU) was from a group from Northwestern University outside of Chicago: "Strengthening Resilience of Ojibwe Nations across Generations."

Presenting were Dr. Kim Marion Suiseeya, Ph.D., and doctoral candidate Jordan Gurneau, a St. Croix member studying civil and environmental engineering, and Maggie O'Connell, a graduate student from Chicago studying chemical engineering.

Also presenting was Raj Sankaran, a computer expert from Argonne National Laboratory.

The team is working under a grant from the National Science Foundation (NSF) for a multi-year study addressing threats to resilience.

The study began by attending a listening session held by the Great Lakes Indians Fish and Wildlife Commission (GLIFWC) asking if there were research questions that Northwestern University could address.

On concern raised was over the future wild rice or "manoomin."

"They wanted to know more about how climate change will affect manoomin," she said.

Another concern raised is the "threats to sovereignty."

"And we learned a lot more about treaty rights and the extent to which different treaty rights are affirmed or eroded," she said. "We started looking at the fact then that climate change, even if treaty rights were fully upheld, climate change is going to impact how those treaty rights can be asserted, can be exercised. And so if you notice, climate threats in the Great Lakes have, which I think many folks might be aware of, but it's increased frequency of extreme rainfall events. Like we heard this morning, the forest composition is changing. There's an increased heat wave intensity, degraded air quality and the first time a red-air quality day was noted by Bad River with the Canadian fires last summer."

Another threat concerned industrial developments, such as pipelines, mining and concentrated animal feeding operations (CAFOs).



PHOTO BY FRANK ZUFALL

Dr. Kim Marion Suiseeya, Ph.D. of Northwestern University (right) begins the presentation. Jordan Gurneau (front) is a St. Croix tribal member and Ph.D candidate who is part of the research team. In the back is Dr. Deb Anderson, Ph.D. a professor of biology at Lac Courte Oreilles Ojibwe University who is also working with the study.

Suiseeya said the tribes told the Northwestern team that they know what's happening in the environment but they lack the data to go into courts to assert treaty rights.

"They were saying that some people have data, but we don't have data," she said.

After the questions and objectives for the study had been established, she said, the focused then turned to creating relationships that is not typically a concern of academia, but the relationships create the strong, trusting bonds for ongoing work and cooperation.

"When we talk about sovereignty and threats this is part of it, but what our tribal partners said is, it's really about these everyday relationships, being able to make decisions, to live your cultural practices, to protect the land, to have relationships with the land, with your kin, with your language, with your history, and with ceremony, and that this was what so important for protecting resilience."

She added, "And so along with my computer science friends, my civil engineering friends and chemical engineering friends, we came together to think, okay, how can we help the tribes answer these questions and address these threats to sovereignty, in a way, in the right way, in a way that's respectful and can actually deliver data that's useful for tribes to use to answer that question."

"So this traditional framework, emerged out of conversations with Edith Leoso of

the Bad River Band and Marvin Defoe from Red Cliff who shared a lot of stories with us over the year that we met with them," she said.

The Ojibwe elders shared a teaching on the relationship between the physical, plant, animal and human worlds.

"And so we started to think about how do we actually use this to guide the kind of research we do?" she said, "and how we ask questions, how we collect the data and how we work with tribes to make the data usable for them to answer their research questions."

Gurneau pointed out that even though he is a St. Croix Tribal member he was raised in Chicago and currently lives in Skokie, Illinois

Gurneau said of the "many solutions and methods" used in the study one includes the deployment of the "cyber infrastructure network," that is "essentially the use of tools and sensor to understand processes that are happening in the natural spaces."

Sankaran said for the last 10 years he has focused on getting sensors and systems out in the environment to understand natural processing. He has created sensors in the plateaus of Colorado and the mountains of California that monitor and collect data

"So we build these kinds of systems, which kind of bring computing from inside the laboratory out into the field, and the whole idea here is if you kind of pair computing with sensing, there's a lot more you can do than what we have done in the past," he said.

Multiple data gathering sensors with computers, he said, create a stream of information.

Suiseeya noted one system recorded sounds for over a year and those sounds were screened for birdcalls.

Gurneau said he has been working the Bad River Tribe on placing a sensor near its fish hatchery that will detect sound, take surface water samples and record rainfall.

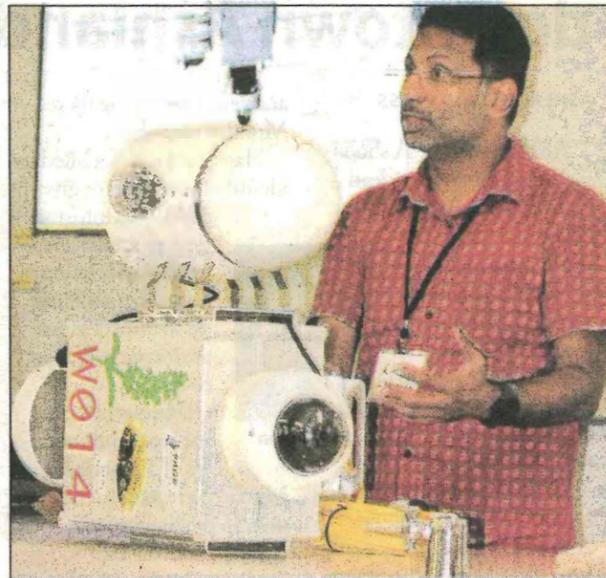
"I was talking with community members trying to explain in very layman's terms that we want to use this to study manoomin, or to help with conservation of manoomin and understand what's happening with our manoomin," he said, "but it can be used for anything; we can use it for any kind of research you're interested in."

He said the sensor could even pick up data on how geese and swan migrations to wild rice beds are impacting the wild rice.

A big concern of the research is to be respectful, and so cameras on the sensors do not take images of people causing privacy concerns.

Gurneau added the goal is adding to traditional knowledge and not supplanting it.

"And so I'm hoping that throughout this process, I'll be able to get an unfettered understanding from traditional knowledge that people have been doing and also create methods or help start using tools like this to develop methods that can be useful in understanding what's happening," he said.



Raj Sankaran, a computer expert from Argonne National Laboratory, with a remote sensor for gathering and processing data.

O'Connell noted she is focused on the threat of industry development and trends, some that seem to be positive but then turn out to have an unanticipated impact. She cited how the passage of the Inflation Reduction Act that creates incentives and tax credits for electrical vehicles in the name of emission reduction also puts importance on mineral extraction needed to create the batteries for the electrical vehicles, but the mining of those minerals puts a strain on indigenous lands.

"Now we're seeing these mining proposals, or these mining companies trying to claim that these mines are in the name of sustainability, which kind of begs the question, what does it mean to be sustainable?" she asked. "How do we define sustainability?"

She talked of using "Lifecycle Analysis" to measure sustainability that looks at several factors. "You would look at what are the materials, the energy, the water that goes into producing this thing, or running this mine," she said. "From its construction to its dismantling, and everything in between. And then you would see what are the emissions the impact on land use on biodiversity and water quality, and from that, trying to choose between technologies, or even between locations or mining techniques and things like that, and try to decide which path is most sustainable."

Emissions, she said, tends to get the most attention because it is easy to measure, but that leaves other "critical aspects of sustainability" out of the equation.

"And from an emissions perspective, electric vehicles do great, have way fewer emission, fewer greenhouse gas emissions than you have

with fossil fuels," she said, "but again, what evidence like this that helps drive these policies neglects is the impact on water quality, on biodiversity and also on the human communities that have to deal with these extractive projects, and all of the things that go along with that."

The study, she noted, is using "lifecycle analysis" through the Ojibwe worldview and values, such as the Seventh Generation perspective, evaluating how actions impact seven generations in the future.

Suiseeya also talked of the goal to share data with tribes in a responsible way that the tribes have access to it and have influence on how the data is used and distributed.

At last year's summit, one of the presenters talked of how the University of Minnesota had conducted wild rice studies on the White Earth Reservation and had been criticized over its unwillingness to share the data with the tribe.

"All the data should be collected for the collective benefit where tribes have the authority to control those data; that those data are handled responsibly and that there are particular ethics that guide all the relationships that are involved in the research, so we as a collective who are doing all the various research are committed to this tribal-driven research approach," she said.

Finally she noted several key research outputs including a sensor network to collect environmental data, online, web-based platform to provide access to data and tool, training on using cyber-infrastructure, research opportunities with tribal colleges and curriculum development with tribal colleges and K-12 schools.