June 19, 2020

Ignite Open Innovation (OI) Forum

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Indigenous Observation Network (ION): Community-Based Water Quality Monitoring Project

Friday, June 19 at 2:00 - 3:00 PM Eastern

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Indigenous Observation Network (ION)

The hydrology of the Yukon River Basin has changed over the last several decades as evidenced by a variety of discharge, gravimetric, and geochemical analyses. The Indigenous Observation Network (ION), a community-based project, was initiated by the Yukon River Inter-Tribal Watershed Council (YRITWC) and the U.S. Geological Survey (USGS). Capitalizing on existing USGS monitoring and research infrastructure and supplementing USGS collected data, ION investigates changes in surface water geochemistry and active layer dynamics throughout the Yukon River Basin. Over 1600 samples of surface water geochemistry (i.e., major ions, dissolved organic carbon, and 18O and 2H) have been collected at 35 sites throughout the Yukon River and its major tributaries over the past 15 years. Active layer dynamics (maximum thaw depth, soil temperature and moisture) have been collected at 20 sites throughout the Yukon River Basin for the past eight years. Important regional differences in geochemistry and active layer parameters linked to permafrost continuity and tributaries will be highlighted. Additionally, annual trends and seasonal dynamics describing the spatial and temporal heterogeneity of the watershed will be presented in the context of observed hydrological changes. These data assist the global effort to characterize arctic river fluxes and their relationship to the carbon cycle, weathering and permafrost degradation.
Nicole Herman-Mercer
(USGS Scientist Spotlight | AKCA SC Profile)

Nicole is a social scientist at the U.S. Geological Survey in the Decision Support Branch of the Water Resources Mission Area’s Integrated Information Dissemination Division. Nicole began at the USGS in 2008 as a Student Intern in Support of Native American Relations (SISNAR) working on a case study of Indigenous Observations of Climate Change in a rural Alaska Native Village in the Yukon River Basin. Her work explores the interactions between different knowledge systems regarding human dimensions of landscape change and water resources in rural Alaska Native villages. She manages the Indigenous Observation Network and also conducts research on the impacts of climate change on Indigenous communities in Alaska. Currently, her focus is on the co-production of knowledge utilizing community-based and participatory methods in the Arctic and sub-Arctic to form a better understanding of environmental change and impacts on the populations of this region.
Ryan Toohey, hydrologist and Science Applications Coordinator for the U.S. Geological Survey’s Alaska Climate Adaptation Science Center (AKCASC). His interests in water quality led Toohey to pursue an environmental science degree from Huxley College at Western Washington University. He graduated with an environmental science degree in the year 2000, having focused on water quality and Geographic Information Systems. In 2012, Toohey received an interdisciplinary joint Ph.D. in environmental science with a focus in both hydrology and agroforestry from the University of Idaho and the Centro Agronómico Tropical de investigación y Enseñanza (CATIE) in Costa Rica. In addition to his position at the Alaska CASC, Toohey serves as an Affiliate Research Assistant Professor for the International Arctic Research Center at the University of Alaska Fairbanks.

ION Resources and Publications

- USGS Webpage on Yukon River Basin Indigenous Observation Network (ION)
- YRITWC Science Webpage on ION
- 2019 NSF Grant: "Collaborative Research: Indigenous Observation Network 2.0: Impacts of Environmental Change on the Yukon and Kuskokwim Watersheds"
- 2011 NSF Grant: "The Yukon River Basin Indigenous Observation Network: Uniting Traditional Ecological Knowledge and Western Science to Address and Understand Water Resources in the Arctic"

Q&A Questions for Discussion

- How are community-based monitoring projects different and similar to crowdsourcing and citizen science projects? What mutually beneficial outcomes and impacts have emerged from ION and particularly engaging with indigenous communities?
- Typically people assume crowdsourcing and citizen science projects involve volunteers providing free labor. How are contributors of ION different, especially since they are referred to as community technicians? Are they being paid to contribute to ION? Is it voluntary for them to participate? What are their motivations and incentives for participating?
- How can USGS conduct more community-based projects? What are the advantages for taking a more community-based approach to conducting science?
- As we all are still adjusting to working differently in a COVID-19 environment, how has your ION work been affected? Have the indigenous communities you work with been hard hit like the Navajo Nation? How has this participatory, community-based approach been more advantageous or disadvantageous?
USGS Open Innovation (OI) Community Wiki

**Series of talks and open discussions to inform the USGS Open Innovation Strategy**

The USGS Open Innovation (OI) Community welcomes anyone interested in using participatory science and innovation methods like Crowdsourcing, Citizen Science, and Prize Competitions to obtain ideas, data, services, and solutions from the public and organizations in an open way. Ignite Open Innovation (OI) Forum is a series of different talks and panels to inform the development of a USGS Open Innovation Strategy.

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If you have any questions, comments, or suggestions, send an email to: sophialiu@usgs.gov and OpenInnovation@usgs.gov