

Brandi R. Kamermans (Cron)
International Arctic Research Center
University of Alaska Fairbanks
Fairbanks, AK 99775
Email: brkamermans@alaska.edu

Professional Interests

Aquatic geochemistry; mineralogy; quantitative polymerase chain reaction; food security; data sovereignty; tribal governance; tracking and quantifying endangered and invasive species; outreach and teaching; co-production of tribally-led research; genetics for natural resource management.

Education

Ph.D., University of Minnesota- Twin Cities, Department of Earth Sciences, 2017, Biogeology, Advisor: Dr. Brandy Toner

Dissertation: "Utilization of synchrotron radiation X-ray microscopy, micro-probe, and spectroscopy to characterize the carbon, sulfur, and iron speciation of particles from buoyant, deep-sea hydrothermal plumes in the Mid-Cayman Rise"

M.S., University of New Mexico, Department of Earth and Planetary Sciences, 2011, Biogeochemistry, Advisor: Dr. Laura Crossey

Thesis title: "Geochemical characteristics and microbial diversity of CO₂-rich mound springs of Tierra Amarilla anticline, New Mexico"

B.S., University of New Mexico, Department of Biology, 2008, Biology (*cum laude*)

Senior thesis title: "Microbial diversity, geochemistry, and diel fluctuations in travertine mounds at the Tierra Amarilla Anticline, New Mexico"

Research Experience

Postdoctoral researcher, November 2023-present (working 40 hours / week during 2023-24). I have worked at the International Arctic Research Center, University of Alaska Fairbanks with funding from the Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative. I updated the Kuskokwim River Intertribal Fish Commission and the Alaska Department of Fish & Game about the progress of the project. I developed teaching materials that will effectively communicate outcomes of the research project. I correlated fluorescence measurements with both environmental factors and fish catch rate data. I trained laboratory technicians, undergraduate, and graduate students how to prepare quantitative polymerase chain reaction experiments and data.

Senior Researcher, 2022-2023 at the Salish Sea Research Center at Northwest Indian college. Lead-PI on grants for the Salish Sea Research Center and I spearheaded data collection and data analysis for quantitative polymerase chain reaction experiments for harmful algae, European Green Crab, and Longfin Smelt. I advised several interns at the Salish Sea Research Center. I facilitated meetings to bring tribal leadership and scientists together to discuss research results and implications for tribal communities.

Postdoctoral Fellow, 2020-2022 at Salish Sea Research Center at Northwest Indian College I designed and improved laboratory protocols for environmental DNA research for Lummi Nation. Designed quantitative polymerase chain reaction assay for declining forage fish, Longfin Smelt, and harmful algae.

Postdoctoral fellow, 2017-2019, at the Pennsylvania State University College of Earth and Mineral Sciences I used microscopy, spectroscopy, and electron microscopy techniques to describe the chemical and structural composition of elemental sulfur and organic compounds produced by microbe-mineral interactions in a subsurface system. I applied for instrument time and funding to use the Canadian Light Source, Canada's national synchrotron light source facility, located on the grounds of the University of Saskatchewan in Saskatoon.

Research Assistant (Doctoral), 2011-2017, at the University of Minnesota I investigated the speciation and distribution of carbon, iron, and sulfur in minerals and particles collected from deep-sea hydrothermal vents using x-ray absorption near-edge spectroscopy (XANES) and Scanning Transmission X-ray Microscopy (STXM). I applied for instrument time and funding to use the storage-ring-based high-energy X-ray light source facilities at the Lawrence Berkeley National Laboratory Advanced Light Source and the Advanced Photon Source at Argonne National Laboratory.

Research Assistant (Masters), 2008-2010, at the University of New Mexico I prepared carbonate samples for uranium series analyses, conducted scanning electron microscopy (SEM), and prepared environmental DNA samples for 454-pyrosequencing.

Alliance for Minority Participation/Undergraduate Research Experience and Ronald E. McNair Scholar Researcher, 2000-2003, I prepared water samples for LC/MS/MS analyses at the University of New Mexico.

Grant and research awards

- ADAC-ARCTIC Special RFP – Arctic Resilience (**\$1Mil**) “Arctic Biosecurity: Community-Led Early Detection Network”, UAA PI: Amy Bishop and I served as senior personnel and institutional PI for a subaward to UAF (**\$400,613**) with co-PI Jessica Glass
- NOAA Alaska Indigenous Engagement Program Grant (**\$50K**). “Connecting with Regional Partners in Support of Environmental DNA as a Natural Resource Management Tool”. PI: **Brandi Kamermans** with co-PIs Erik Schoen (UAF), Andrés López (UAF), Jessica Glass (UAF), Dan Gillikin (Kuspuk School District), Erich Kuball (Kuspuk School District)
- Alaska Sea Grant (**\$20K**). “Connecting with Regional Partners in Support of Environmental DNA Genetics Curriculum for Workforce Development” PI: **Brandi Kamermans** with co-PIs Erik Schoen (UAF), Andrés López (UAF), Jessica Glass (UAF), Peter Westley (UAF).
- National Science Foundation (**\$20M**). *EPSCoR RII Track-1: IoC: Interface of Change: Building collaborations to assess harvested and farmed marine species prioritized by Gulf of Alaska coastal communities impacted by environmental shifts*. PI: Brenda Konar (UAF). I served as senior personnel and member of the writing team with co-PI Jessica Glass (UAF).

- University of Alaska Fairbanks Center ICE Seed Fund (**\$19,947**) “Sovereign Autonomy for Long-term Monitoring of Non-human genes (SALMONG)” PI: **Brandi Kamermans**
- eDNA Collaborative & miniPCR BIO (\$1,490) “Are teachable units for PCR the key to offering autonomy, Indigenous sovereignty, and governance for salmon eDNA studies in Alaska?” PI: **Brandi Kamermans**
- National Institute for Food and Agriculture Grant (**\$500,000**) “Using molecular methods to determine the role of phytoplankton in West Coast Shellfish die offs”, Northwest Indian College, Salish Sea Research Center, PI: **Brandi Kamermans**
- National Institute for Food and Agriculture Grant (\$250,000) “DNA of Hoolies in the Nooksack River, WA” Northwest Indian College, Salish Sea Research Center, PI: **Brandi Kamermans**
- National Institute of Health Contract (**\$42,310**) Genomics in Tribal Communities, Northwest Indian College, Salish Sea Research Center, PI: **Brandi Kamermans**

Proposals in Review and Development

“Tracking salmon eDNA in the AYK” (**\$350,000**) Arctic Yukon Kuskokwim Sustainable Salmon Initiative, due December 17, 2024, PI: **Brandi Kamermans** with co-PIs Erik Schoen (UAF), Andrés López (UAF), Justin Leon (KRITFC), and Sean Larson (ADF&G)

Teaching Experience

Interns at the Salish Sea Research Center

- Justice Black, Bachelor of Science in Native Environmental Science, Northwest Indian College, 2022-2023 (Research mentor)
- Mickki Garrity, Bachelor of Science in Native Environmental Science, Northwest Indian College, 2020-2022 (Research mentor)
- Sandra James, Bachelor of Science in Native Environmental Science, Northwest Indian College, 2020-2022 (Research mentor)

Undergraduate Student Advising at Penn State University

- Rumya Ravi, Carleton College undergraduate research thesis, July-August 2018

Courses Taught

- Cell Biology, Bachelor of Science in Native Environmental Science, Northwest Indian College, Fall 2022
- Genomics in Tribal Communities (online course), Developed and managed a Massive Open Online Course (MOOC) with introductory genetic material in collaboration with researchers at Turtle Mountain Community College, the University of Alaska Fairbanks, and the University of Colorado Anschutz Medical Campus

Teaching Assistant

- Geology and Cinema (ESCI 1005) Spring 2014, sole-taught a single lesson
- Oceanography (ESCI 1007) Fall 2014, graded papers and sole-taught lab sections
- Soil Chemistry and Mineralogy (LAAS 5311) Fall 2013, graded papers, lead labs, and tutored

Guest Lecturer

- Aquatic Conservation and Management Genomics, College of Fisheries and Ocean Sciences, UAF, 2024

- Geomicrobiology (Geosc 409), Penn State University
- Geomicrobiology (ESCI 4801), University of Minnesota

Service

Professional Service

- Organized the Alaska/Washington (AK/WA) environmental DNA virtual monthly meetings, August 2024- June 2025
- Co-organizer eDNA workshop Alaska Marine Science Symposium, January 2024
- Co-organizer Pacific Northwest IndigiData, Northwest Indian College July-August 2023
- Committee for the Penn State 11th Annual Postdoctoral Research Exhibition, May 2019
- President University of Minnesota - American Indian Science Engineering Society, Spring 2014
- Chair “Finding Your Path Among the Stars” American Indian Science Engineering Society Region V Conference, March 2014
- Chair for 1st and 2nd Annual Esci Research Symposium Department of Earth Sciences University of Minnesota- Twin Cities, May 2015 and May 2016

Public Service and Outreach

- Sovereign Autonomy for Long-Term Monitoring of Non-human genes workshop for permafrost DNA extraction and amplification, Kaktovik, AK, July 2025
- Sovereign Autonomy for Long-Term Monitoring of Non-human genes workshop for salmon eDNA extraction and amplification, Glenallen, AK, August 2025
- Sovereign Autonomy for Long-Term Monitoring of Non-human genes taught inclusive environmental DNA research techniques to ~18 high school students at George River Internship, remote AK, July 2024.
- Sovereign Autonomy for Long-Term Monitoring of Non-human genes taught inclusive genetics research techniques to ~40 high school students at Orutsararmut Native Council Science and Culture Camp, Bethel, AK, July 2024.
- Introduction to the field of biogeochemistry to Millennium Scholars, Penn State University, June 2018
- Performed fieldwork with high school students as a member of UMN – AISES, Spring 2013
- Manager and lead science educator at Discovery Space, State College, PA, June -August 2019
- Developed hands-on activities for students at “Ask a Scientist” (August 2017, April 2018, November 2018)

Publications

Google Scholar: <https://scholar.google.com/citations?user=w7WVJr4AAAAJ&hl=en>

- **Cron**, B., Macalady, J. L., & Cosmidis, J. Organic Stabilization of Extracellular Elemental Sulfur in a Sulfurovum-Rich Biofilm: A New Role for Extracellular Polymeric Substances? 2021, *Frontiers in Microbiology*, 12.
- Zhou, Z., Liu, Y., Pan, J., **Cron**, B.R., Toner, B.M., Anantharaman, K., Breier, Gammaproteobacteria mediating utilization of methyl-, sulfur- and petroleum organic compounds in deep ocean hydrothermal plumes, 2020, *The ISME Journal* 14 (12) 3136-3148

- **Cron**, B.R., Cody, S., Kafantaris, F., Druschel, Seewald, J.S., G., Dick, G.J., Breier, J.A., German, C.R., Toner, B.M., Dynamic biogeochemistry of particulate sulfur in a deep-sea buoyant hydrothermal plume, *ACS Earth and Space Chemistry*, 2020, 4; (2), 168-182.
- Nims, C., **Cron**, B., Wetherington, W., Macalady, J., Cosmidis, J., Low frequency Raman spectroscopy from micron-scale and in vivo characterization of elemental sulfur in microbial samples, 2019, *Scientific Reports*, 9 (1), 7971
- **Cron**, B.R., Cosmidis, J., and Macalady, J., Elemental sulfur formation by *Sulfuricurvum kujiense* is mediated by extracellular organic compounds, 2019, *Frontiers in Microbiology*, 2019, doi: 10.3389/fmicb.2019.02710. PMID: 31827465; PMCID: PMC6890823.
- Crossey, L.J., Karlstrom, K.E., Schmandt, B., Crow, R.R., Colman, D.R., **Cron**, B., Continental smokers couple mantle degassing and distinctive microbiology within continents, 2016, *Earth and Planetary Sciences Letters*, 435, 22-30
- Breier, J. A., Gomez-Ibanez, D., Sayre-McCord, R. T., Rauch, C. G., Coleman, M. L., Bennett, S. A., **Cron**, B. R., Sheik, C. S., German, C. R., Toner, B. M., and Dick, G. J., 2014, A large volume particulate and water multi-sampler with in situ preservation for microbial and biogeochemical studies. *Deep-Sea Research Part I*, Vol. 94: 195-206.
- Hall, J., Mitchell, K., Jackson-Weaver, O., Kooser, A., **Cron**, B., Crossey, L., Takacs-Vesbach, C., 2008, Molecular Characterization of the Diversity and Distribution of a Thermal Microbial Community by Using rRNA and Metabolic Genes: *Applied and Environmental Microbiology*, Vol. 74 No. 15: 4910.

Book Chapters

- Toner, B. M., **Cron**, B. R., Huber, J. A., and McDermott, J. M. (*in review*) Sulfur biogeochemistry of deep-sea hydrothermal vents, *Deep-Sea Microbiology*, Editors Vetriani, C. and Giovannelli, D., Springer International Publishing.
- **Cron**, B. Crossey, L.J., Karlstrom, K.E., Polyak, V.J., Yemane, A., and Chris McGibbon, [eds.] *Geochemistry and microbial diversity of CO₂-rich springs and U-series dating of travertine from the Tierra Amarilla anticline, New Mexico, 2024*, pp. 225-235. <https://doi.org/10.56577/FFC-74.225> *in: Geology of the Nacimiento Mountains and Rio Puerco Valley*, Karlstrom, K.E., Koning, D.J., Lucas, S.G., Iverson, N.A, Crumpler, L.S., Aubele, J.C., Blake, J.M., Goff, F., Kelley, S.A., *New Mexico Geological Society 74 th Annual Fall Field Conference Guidebook*, 334 p.
- **Kamermans**, B. Chapter 15 Na'alkali, in *Voices of Ingenuity*, 2022, Editor Michelle Montgomery, Ph.D. University Press of Colorado.

Articles in review and preparation

- **Cron**, B., Harings, M., Lekanoff, R., Timm, L., López, J.A., Shoen, E., Glass, J., (*in prep*), Navigating barriers in environmental DNA research: researchers in the Arctic take a human-centered research approach
- **Cron**, B., Mallon, R., Peacock, M.B., Lopez, J.A., Rombold, J. (*in prep*) Quantitative polymerase chain reaction (qPCR) assay detects Longfin smelt in Nooksack River, WA
- **Cron**, B., Peacock, M.B., Lopez, J.A. (*in prep*) Subsistence harvesting should consider quantitative PCR for monitoring saxitoxin

Honors

- University of Alaska, Arctic Leadership Initiative Early Career Fellow (2024)
- Pennsylvania State University College of Earth and Mineral Sciences Distinguished Postdoc (2017)
- Gordon Research Conference Carl Storm Underrepresented Minority Fellowship (2017)
- American Indian Science and Engineering Society (AISES) Lighting the Pathway to Faculty Careers for Natives in STEM (LTP) Scholar (2017)
- University of Minnesota Doctoral Dissertation Fellow (2016)
- National Science Foundation (NSF) Graduate Research Fellow (GRFP) (2008)
- Louis Stokes Alliance for Minority Participation Bridge to the Doctorate Fellowship (LS-AMP), NSF undergraduate research fellowship (2006)
- Ronald E. McNair Scholar, undergraduate research experience (2005)

Presentations

Invited Seminars

- **Kamermans**, B.R., The potential and drawbacks of using environmental DNA to quantify species in aquatic environments, IndigiData, June 2024
- **Kamermans**, B.R., Detecting eDNA in Bellingham Bay: studying Hooligans and Alexandrium using eDNA and qPCR, 2021 Banse Seminar Series University of Washington (2020)
- **Kamermans**, B.R., Speciation of Iron and Sulfur in Mineral Aggregates and Organic Complexes from Hydrothermal Vents in the Mid-Cayman Rise (April 2015) Macalester Seminar
- **Kamermans**, B.R., Exploring the geomicrobiology of hydrothermal vents (October 2013) Annual Society for Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference

Oral Presentations

- **Kamermans**, B., Schoen, E., Lopez, J.A., Leon, J., Whitworth, K., Dickerson, B., Larson, S., Reece, K., Harings, M., Citizen and community-based monitoring of Chum and Chinook salmon abundance in the Kuskokwim River Basin, 2024 American Fisheries Society National Meeting
- **Kamermans**, B., Reece, K., Sovereign Autonomy for Long-term Monitoring of Non-human genes (SALMONg): the use of eDNA by community, 2024 American Fisheries Society National Meeting
- **Kamermans**, B.R., Mallon, R., Peacock, M.B., Searching for Alexandrium and Hooligans: the Salish Sea Research Center applies molecular methods to inform local communities about microalgae and forage fish, 2022 Whatcom Marine Research Symposium, Bellingham, WA
- **Kamermans**, B.R., Peacock, M.B., Detecting and identifying saxitoxin-producing algae in the Salish Sea, 2021 North Pacific Marine Science Organization (PICES), Session 7: Predictions of extreme events in the North Pacific and their incorporation into management strategies.
- **Kamermans**, B.R., Cosmidis, J., and Macalady, J., Evaluation of S₀ as a biosignature through investigation of bio- and organomineralized S₀ in laboratory and field experiments, 2018 Goldschmidt Conference, Boston, MA
- **Kamermans**, B.R., Ravi, R., Cosmidis, J., Macalady, J., Evaluation of S₀ as a biosignature through investigation of bio- and organomineralized S₀ in laboratory and field experiments, 2017 SACNAS National Conference, Salt Lake City, UT

Poster Presentations

- Harings, M., Lekanoff, R., **Kamermans**, B., Current State of Environmental DNA (eDNA) Research in Alaska, Alaska Marine Science Symposium (2024)
- **Kamermans**, B.R., Hunter, R.H., Kudela, R., Peacock, M.B., Development of three quantitative polymerase chain reaction assays for Yessotoxin producing dinoflagellates, Alaska American Fisheries Society Meeting (2023)
- **Kamermans**, B.R., Peacock, M.B., Hunter, R.H. Supporting safe shellfish harvests by using genetics to detect and quantify toxic Alexandrium in the Salish Sea, Ocean Sciences Meeting (2022)
- **Cron**, B.R., Cody, S., Kafantaris, F., Druschel, G., Dick, G.J., Breier, J.A., German, C.R., Toner, B.M., Sulfur speciation of particles reveals chemical diversity and complexity within the rising plume of the Von Damm hydrothermal plume, Mid-Cayman Rise plume, 1st Geobiology Society Conference, Banff, Canada (2017)
- **Cron**, B., Toner, B.M., Breier, C.A., Dick, G.J., Jian, H., Sheik, C.S., Organic Carbon and Iron-rich Particles in Deep Ocean Hydrothermal Plumes, Von Damm Vent Field, Mid-Cayman Rise. Goldschmidt Conference, Yokohama, Japan (2016)
- **Cron**, B.R., Toner, B.M., Bennett, S.A., German, C.R., Dick, G.J., and Breier, J.A., Jr. The spatial distribution and speciation of iron in buoyant hydrothermal plumes of the Mid-Cayman Rise. American Geophysical Union, Fall Meeting, San Francisco, CA, OS13B-1741 (Fall 2012)
- **Cron**, B.R., Crossey, L.J., Karlstrom, K.E., and Northup, D.E. Microbial diversity and geochemical cycling of unique carbonate springs in northern New Mexico: the geomicrobiology of Tierra Amarilla anticline. Geological Society of America Annual Meeting, Minneapolis, MN, 242-5 (2011)
- **Cron**, B.R., Crossey, L.J., Northup, D.E., Karlstrom, K.E., Microbial richness and diversity in CO₂-rich mound springs of the Tierra Amarilla anticline, New Mexico. New Mexico Geological Society Annual Spring Meetings, Macey Center, New Mexico Tech (2010).

Workshop and skills

- Summer Internship for Indigenous peoples in Genomics (SING) July 2022
- 2nd National Workshop on Marine eDNA, September 2022, Costa Mesa, CA
- U.S. HAB taxonomy Course Bigelow National Center for Marine Algae and Microbiota