Brandi Nicole Revels

Chemical oceanography and isotope geochemistry | bnrevels@gmail.com | ORCID 0000-0001-5842-7726

I study how weathering, particle transport, and mixing change the metals that rivers and glaciers deliver to the ocean. I use isotope measurements to trace those processes and lead expeditions that bring geochemists, oceanographers, and robotics teams into the field together.

Scientific appointments

OceanX | Program Manager and Chief Scientist of OceanXplorer · 2026–present

Coordinate shipboard and shoreside science, working with partner investigators to bring sampling, submersible operations, and ocean observation into a shared expedition plan.

Cornell University | Research Scientist · 2026–present

Previously Research Scientist / Program Manager, 2025–2026. Coordinated field operations, budgets, and research partners across a multi-institutional polar science and robotics portfolio valued at more than $10 million.

Viking Expeditions | Chief Scientist, Viking Polaris · 2023–2025

Led shipboard research in Antarctica, the Canadian Arctic, and the Great Lakes. Established a shipboard clean laboratory, led microplastics and atmospheric monitoring, and developed Expedition Central to give guests access to the measurements collected during their voyage.

Viking Expeditions | Earth and Space Science Specialist and Scientific Advisor · 2021–2023

Supported laboratory outfitting and instrument commissioning aboard Viking Octantis and Viking Polaris, from the shipyard to the first field operations.

Woods Hole Oceanographic Institution | Guest Investigator · 2022–2024

Revels Scientific, Zürich | Founder · 2019–2021

ETH Zürich | Postdoctoral Researcher, Earth Sciences · 2018–2019

Developed and troubleshot mass spectrometric methods and mentored junior laboratory members.

Coral Cay Conservation, Tobago | Science Education and Outreach Officer · 2009–2012

University of South Carolina School of Medicine | Research Specialist · 2008–2009

Combined molecular assays and behavioral observations in neuroscience studies.

Education

ETH Zürich | Doctor of Science, Isotope Geochemistry · Awarded 2019 (defended 2018)

Riverine delivery of Mo, Ni, Fe, and Zn in the Amazon Basin. Advisor: Derek Vance.

University of South Carolina | M.S., Marine Science · 2013

Chemical leaching methods for marine particulate iron and its isotopes. Advisor: Seth John.

College of Charleston Honors College | B.S., Psychology and Chemistry · 2007

Cum laude. Minor in Japanese.

Field and analytical research

Northwest Greenland | Icefin under-ice surveys · 2026

Paired discrete water sampling with profiles of temperature, salinity, dissolved oxygen, and turbidity near Moltke, Chamberlain, and Rasmussen glaciers in Wolstenholme Fjord. The winter and early-spring surveys examined where subglacial freshwater entered the fjord.

Amazon Basin and Kalix River | Trace-metal transport

Collected water and suspended sediment under trace-metal-clean conditions. In the Amazon, used cross-flow filtration to resolve colloids within the conventionally dissolved fraction and assessed how metal partitioning influenced riverine export.

North Atlantic | U.S. GEOTRACES transect

Measured iron isotopes in suspended particles and selective leaches, including samples from the TAG hydrothermal plume. Tested how leach chemistry altered the isotope composition recovered from natural particles.

Isotope and particle analysis

Double-spike Fe, Ni, Zn, and Mo isotope measurements by MC-ICP-MS, Cu isotope analysis by sample–standard bracketing, and column separations for Mo and Ni. Complementary methods include SEM elemental mapping, X-ray diffraction, and synchrotron X-ray absorption spectroscopy.

Tobago | Coastal ecosystem mapping

Led dive survey teams mapping marine habitats. Coauthored a presentation of the project to the Tobago House of Assembly in 2009.

Marine and remote-field training

PADI Divemaster, RYA Powerboat Level 2, STCW safety training, and Wilderness First Responder training.

Fellowships and research support

Viking Fellowship · 2023

Project support of $350,000 to investigate metal controls on global and polar carbon flux.

Swiss National Science Foundation Postdoc.Mobility Fellowship · 2021

Organic carbon and transition-metal isotopes during sediment deposition. Award P500PN_206704, declined.

Graduate Research Assistant Fellowship · 2011–2013

University of South Carolina, Marine Science.

Peer-reviewed publications

Revels, B. N., Rickli, J., Moura, C. A. V., and Vance, D. (2021). The riverine flux of molybdenum and its isotopes to the ocean: Weathering processes and dissolved-particulate partitioning in the Amazon basin. Earth and Planetary Science Letters 559, 116773. doi: 10.1016/j.epsl.2021.116773

Revels, B. N., Rickli, J., Moura, C. A. V., and Vance, D. (2021). Nickel and its isotopes in the Amazon Basin: The impact of the weathering regime and delivery to the oceans. Geochimica et Cosmochimica Acta 293, 344–364. doi: 10.1016/j.gca.2020.11.005

Coppola, A. I., Seidel, M., Ward, N. D., Viviroli, D., Nascimento, G. S., Haghipour, N., Revels, B. N., Abiven, S., Jones, M. W., Richey, J. E., Eglinton, T. I., Dittmar, T., and Schmidt, M. W. I. (2019). Marked isotopic variability within and between the Amazon River and marine dissolved black carbon pools. Nature Communications 10, 4018. doi: 10.1038/s41467-019-11543-9

Revels, B. N., Zhang, R., Adkins, J. F., and John, S. G. (2015). Fractionation of iron isotopes during leaching of natural particles by acidic and circumneutral leaches and development of an optimal leach for marine particulate iron isotopes. Geochimica et Cosmochimica Acta 166, 92–104. doi: 10.1016/j.gca.2015.05.034

Revels, B. N., Ohnemus, D. C., Lam, P. J., Conway, T. M., and John, S. G. (2015). The isotopic signature and distribution of particulate iron in the North Atlantic Ocean. Deep-Sea Research Part II 116, 321–331. doi: 10.1016/j.dsr2.2014.12.004

Teaching and research mentoring

University of South Carolina | Marine Chemistry laboratory

Taught undergraduate laboratory sections and assessed reports and exams. Supervised F. Harman’s summer research on iron isotopes in North Atlantic GEOTRACES particles (2013).

ETH Zürich | Bachelor’s thesis supervision · 2017

Supervised Elias Decker’s test of whether SEM imaging could independently verify selective chemical removal of Fe–Mn coatings from suspended river sediment.

ETH Zürich | Doctoral field course, Colombia · 2018

Co-developed a CHF 65,000 field course for 27 doctoral researchers with Colombian hosts, studying climate and biodiversity across volcanic landscapes and coral reefs.

Coral Cay Conservation | Marine science summer school, Tobago

Founded a funded summer program combining classroom science, reef surveys, swimming, and dive instruction.

Additional teaching

Mathematics teacher, Institut Montana Zugerberg, Switzerland. Organic chemistry tutor, College of Charleston (2006–2007).

Conference contributions

2026

Revels, B., Hegelein, V., Schmidt, B., and Sherrell, R. Margins matter: Grounding zone and seasonal controls on subglacial nutrient fluxes. SCAR, Oslo.

Hegelein, V., Revels, B., and Schmidt, B. Subglacial outflow in Greenland informs nutrient delivery and habitability on Earth and other ocean worlds. AbSciCon, Madison.

2024

Revels, B. N., Claes, J., Galvez, K., Goggins, M., Hayden, J., Bates, R., and Stanwell-Smith, D. Leveraging high-resolution videography to estimate elemental biomass in the Southern Ocean. SCAR, Chile. Poster.

Revels, B. N. Empowering discovery: Fostering bilateral engagement and facilitating the “ah-ha” moment. SCAR, Chile. Oral presentation.

2019

Revels, B. N., Rickli, J., Moura, C. A. V., and Vance, D. Ni and δ□□Ni controls by colloidal complexation and secondary oxide precipitation: New insights from the Amazon Basin. Goldschmidt, Barcelona. Oral presentation.

Coppola, A. I., Viviroli, D., Seidel, M., Haghipour, N., Nascimento, G. S., Revels, B. N., Jones, M., Richey, J. E., Ward, N. D., Schmidt, M. W. I., Eglinton, T. H., Dittmar, T., and Abiven, S. Dynamic behaviour of dissolved black carbon in the Amazon River. EGU General Assembly, abstract EGU2019-7507.

2017

Revels, B. N., Rickli, J., Moura, C. A. V., and Vance, D. Phase partitioning of transition metals and their isotopes in the particulate load of the Amazon River. Goldschmidt, Paris. Oral presentation.

2016

Revels, B. N., Rickli, J., Moura, C. A. V., and Vance, D. Distribution of the dissolved load of transition metals and their isotopes in the Amazon River. Goldschmidt, Yokohama. Oral presentation.

2015

Revels, B. N., Rickli, J., and Vance, D. Particulate riverine inputs of metals and their isotopes to the oceans. Goldschmidt, Prague. Poster.

2013

Revels, B. N., and John, S. G. Chemical leaching methods and measurements of marine labile particulate [Fe] and δ□□Fe from the US GEOTRACES North Atlantic transect. GEOTRACES, Norfolk. Oral presentation.

2012

Revels, B. N., and John, S. G. Chemical leaching methods and measurements of marine labile particulate [Fe] and δ□□Fe. AGU, San Francisco. Poster.

Revels, B. N., and John, S. G. Chemical leaches for marine particulate phase [Fe] and δ□□Fe. Geological Society of America, Charlotte. Oral presentation.

Scientific leadership and public engagement

Expedition Central | Viking Expeditions

Designed an onboard platform linking ship position and environmental observations. Developed an interactive iPad application for submarine dives and brought guests into shipboard microplastics research.

Earth Sciences Association of Academic Staff | ETH Zürich · 2015–2018

Represented more than 200 researchers as president. Founded Help!Desk for doctoral student–advisor mediation and created EqualiTea, a workshop series on equity in science.

Doctoral careers and peer exchange | ETH Zürich

Co-created “What’s My PhD Worth?”, securing CHF 17,000 for seminars and workshops attended by more than 100 participants. Secured CHF 25,000 for a three-day scientific retreat attended by more than 70 doctoral researchers.

Discover Cayuga Lake | Board member

Advised on vessel and laboratory design for freshwater research and public education.

Earth Sciences Alumni Association | ETH Zürich · 2019–2023

Board member.

Chemists Without Borders | Bangladesh Arsenic Mapping Project

Contributed data analysis, mapping, and training.

Women++ | Deploy(impact) · 2021

Led a five-person team developing an e-learning platform. The team won first place and received start-up funding.

Selected collaborative proposal development

Project descriptions reflect contributions to proposals. Funding decisions are not recorded here.

FLOWCYCLE | National Science Foundation

Developed the biogeochemistry component for Milne Fiord, Canada, testing how freshwater routing influences retention and export of metals and organic matter.

UNDERCUT | National Science Foundation

Biogeochemical contribution to a proposed study of subglacial discharge, seawater intrusion, and iron delivery at Petermann Glacier, Greenland.

FORTE | NASA Earth Venture Suborbital-4

OceanXplorer contribution to a proposed study of river-influenced waters on the Beaufort Sea shelf.