

William C. Daniels

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EDUCATION

- 2017 Ph.D., Brown University**, Department of Earth, Environmental and Planetary Sciences (Providence, RI) and **Marine Biological Laboratory**, Ecosystems Center (Woods Hole, MA). Drs. James M. Russell and Anne E. Giblin, advisors.
Climatic and ecological change in Arctic Alaska over the last 32,000 years inferred from lacustrine records and experiments
- 2013 M.Sc., Brown University**, Department of Earth, Environmental and Planetary Sciences (Providence, RI) and **Marine Biological Laboratory**, Ecosystems Center (Woods Hole, MA). Drs. James M. Russell and Anne E. Giblin, advisors.
Benthic community metabolism in deep and shallow arctic lakes during 13 years of whole-lake fertilization
- 2007 B.A., Lawrence University**, Appleton, WI. Magna cum laude in biology. Dr. Bart T. De Stasio, advisor.
Dreissena polymorpha and suspended sediment effects on the lower food web in Green Bay, Lake Michigan and Lake Winnebago, Wisconsin: A modeling approach

TEACHING AND RESEARCH INTERESTS

Paleoclimate, paleolimnology, limnology, organic geochemistry, stable isotope geochemistry, water isotopes, biogeochemical cycles, invasive species, aquatic ecology, Arctic and Antarctic systems, Quaternary geology, human impacts in ecology

PROFESSIONAL EXPERIENCE

- 2017-2018 Post-doctoral Scholar**, University of Massachusetts Amherst, Department of Geological Sciences. Drs. Isla S. Castañeda and Julie Brigham-Grette, supervisors.
Reconstructing Arctic climate change with biomarkers during and since the mid-Pliocene Warm Period
- 2018 Mission Commander**, HERA Mission XVII, NASA-Johnson Space Center. I was one of four crewmembers in a 45-day space flight analog in the Human Exploration Research Analog program.
- 2011-2017 Research and Teaching Assistant**, Brown University and MBL.
- 2009-2011 Research Assistant**, MBL. Research duties included monitoring NitrexTM nitrate removal barriers, maintaining and sampling lab incubations, Antarctic research cruise with Palmer Long-Term Ecological Research Station (measuring bacterial productivity, dissolved oxygen, nutrients, etc.), Arctic limnology at the Toolik Lake LTER Station (nutrient lab manager, field sampling for a wide array of sample types).

- 2009–2010 **Teaching Assistant**, Semester in Environmental Science, MBL, Woods Hole, MA. Teaching duties included lab and field preparations for aquatic components of the course (estuary and lake biogeochemistry), instruction on analytical techniques, undergraduate project guidance and development, field trip leader
- 2008–2009 **Lab Technician II**, St. Croix Watershed Research Station, Marine on St. Croix, MN. Duties included field sampling (sediment coring and stream/lake/bog sampling), maintenance of field and lab equipment, laboratory analyses of sediments including loss-on-ignition, trace metals, gamma spectrometry sample preparation for radiogenic isotopes, grain size analysis, and sample archiving.
- 2007–2008 **Naturalist and Dogsled Musher**, YMCA Camp Menogyn, Grand Marais, MN
- 2005–2007 **Research and Classroom Assistant**, Lawrence University, Appleton, WI. Research duties included maintaining a bi-weekly lake monitoring program in Lake Winnebago and Green Bay, performing routine limnological analyses (chlorophyll a, phosphorus, nitrate), zooplankton identification and enumeration, data management.

TEACHING EXPERIENCE

- 2018 **Guest lecturer, Honors Oceanography, University of Massachusetts.** Lectured for two classes, covering ocean salinity, sediments, and seasonality.
- 2017 **Teaching assistant, Oceanography, Brown University.** Responsible for review sessions, office hours, grading, and co-leading field trips.
- 2011–2017 **Elementary school science volunteer.** I designed and taught hands-on science lessons for grades 2-4 on a bi-monthly basis at the Vartan Gregorian Elementary School (Providence, RI) and The Common School (Amherst, MA).
- 2014–2017 **Climate change guest teacher.** I taught an interactive lesson on climate change to 6 8th grade classes per year at the Marshfield Middle School in MA, and co-taught a week-long middle school SPARK program on meteorology at Brown University.
- 2016 **Teaching assistant, Limnology, Brown University.** Responsible for laboratory sections each of which included a 10-15 minute introductory lecture, leading field trips, delivering 2 class lectures, and grading lab reports.
- 2015–2016 **Instructor, Kaktovik Oceanography Program.** I helped coordinate and teach a week-long science camp for Inupiat children in Kaktovik, AK, and was the lead instructor for the geology lessons which included hypothesis-driven mapping of coastal erosion and sediment coring of Kaktovik Lagoon.
- 2013/2016 **Teaching Certificates I (Reflective pedagogy) and II (Course and syllabus Design),** Brown University Sheridan Center for Teaching and Learning.
- 2013 **Teaching assistant, Climate and Climate Change, Brown University.** Held office hours and review sessions, administered and graded assignments and exams.
- 2012 **Teaching assistant, Environmental Science in a Changing World, Brown University.** Held review sessions and office hours, and was responsible for the two lab sections of the course including developing two lectures on biogeochemical cycling, leading field excursions, overseeing laboratory measurements, and coordinating group work.
- 2009–2010 **Teaching assistant and undergraduate project co-advisor;** Semester of Environmental Science, Ecosystems Center, MBL, Woods Hole, MA.
- 2007–2008 **Naturalist lecturer, dogsled musher, and activities coordinator:** YMCA Camp Menogyn, Minnesota.

UNDERGRADUATE MENTORING

- 2018 Kayley Donze and Kurt Lindberg (University of Massachusetts Amherst). Trained in sedimentary biomarker analysis (GDGTs) and lake water D/H and $^{18}\text{O}/^{16}\text{O}$ analysis.
- 2017 Sophia Rudin (Brown University). Trained in Bolivia coring, XRF analysis, bulk sediment $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ analysis, and trace metal analysis to reconstruct pollution history of urban ponds.
- 2016 Jasmine McAdams (Brown University). Trained in estuarine diatom analysis and identification. Honors thesis: *Paleoecological Analysis of Diatoms as Indicators of Environmental Change in Narragansett Bay, RI*.
- 2106 Rebecca Rose (Brown University): Analyzed C and N content and stable isotope ratios in lacustrine records from Alaska. Honors thesis: *Effects of Holocene Climate Change on the Carbon Cycle in Northern Alaska*.
- 2016 Allison Cluett (Brown University). Analyzed leaf wax hydrogen isotopes in Holocene-length lacustrine records from Alaska. Honors thesis: *High-resolution leaf wax isotope records of Holocene climate in Arctic Alaska*.
- 2015 Patrick Holland-Stergar (Brown University). Analyzed leaf wax hydrogen isotopes in a 32,000 year sediment record from Alaska. Honors thesis: *A leaf wax hydrogen isotopic record of Northern Alaska temperature from the Last Glacial Maximum to the present*.

RESEARCH FUNDING

- 2018 **National Science Foundation Post-doctoral Fellowship (Pending)**. Biomass burning in the terrestrial Arctic during past warm periods: New insights from organic biomarkers in Lake El'gygytgyn (Siberia)
- 2016 **Institute at Brown for Environment and Society outreach grant**. Received travel and supply funds to volunteer with the Kaktovik Oceanography Program in northern Alaska. \$2134. W. C. Daniels.
- 2014 **Geological Society of America Graduate Research Grant**. Calibrating the leaf wax hydrogen isotope proxy in Arctic Alaska using experimental and field studies. Award amount: \$2500. W. C. Daniels.

PUBLICATIONS

- Vachula, R. S., Huang, Y., Longo, W. M., Dee, S. G., **Daniels, W. C.**, Russell, J. M. Evidence of Ice Age humans in eastern Beringia suggests early migration to North America. Submitted to Quaternary Science Reviews.
- Daniels, W. C.**, Huang, Y., Russell, J. M., Giblin, A. E. 2018. Effect of continuous light on leaf wax isotope ratios in *Betula nana* and *Eriophorum vaginatum*: Implication for Arctic paleoclimate reconstructions. *Organic Geochemistry*. 125: 70-81. DOI 10.1016/j.orggeochem.2018.08.008
- Daniels, W. C.**, Russell, J. M., Giblin, A. E., Welker, J. M., Klein, E. S., Huang, Y. 2017. Hydrogen isotope fractionation in leaf waxes in the Alaskan Arctic tundra. *Geochimica et Cosmochimica Acta*. 213: 216-236. DOI 10.1016/j.gca.2017.06.028.
- Daniels, W. C.**, Novis, P. M., Edlund, M. B. 2016. The valid transfer of *Cyclotella bodanica* var. *intermedia* to *Lindavia* (Bacillariophyceae). *Notulae algarum* 14. ISSN 2009-8987.
- Daniels, W. C.**, Giblin, A. E., Kling, G. W. 2015. Benthic community metabolism in deep and shallow arctic lakes during 13 years of whole-lake fertilization. *Limnology and Oceanography*. 60(5): 1604-1618. DOI 10.1002/lno.10120

- Daniels, W. C.** 2012. *Cyclotella bodanica*. In Diatoms of the United States.
http://westerndiatoms.colorado.edu/taxa/species/cyclotella_bodanica_intermedia
- De Stasio, B. T., Schrimpf, M. B., Beranek, A. E., **Daniels, W. C.**, Hoyer, E. (2010). *Dreissenid* driving tests: going the “wrong” way in Green Bay, Lake Michigan? Verh. Intern. Verein. Limnol. 30(10): 1540-1544. DOI 10.1080/03680770.2009.11902372
- De Stasio, B. T., Schrimpf, M. B., Beranek, A. E., **Daniels, W. C.** 2008. Increased Chlorophyll a, phytoplankton abundance, and cyanobacteria occurrence following invasion of Green Bay, Lake Michigan by *dreissenid* mussels. Aquatic invasions 3(1): 21-27. DOI 10.3391/ai.2008.3.1.5

MANUSCRIPTS IN PREPARATION

- Daniels, W. C.**, Russell, J. M., Morrill, C., Longo, W. M., Giblin, A. E., Holland-Stergar, P., Welker, J., Wen, X., Hu, A., Huang, Y. Continental climate change in the Western Arctic since the Last Glacial Maximum: Insights from a lacustrine record of leaf wax hydrogen isotopes.
- Daniels, W. C.**, Russell, J. M., Giblin, A. E., Longo, W. M., Holland-Stergar, P., Huang, Y. A 32,000 year record of Arctic paleohydrology from Lake E5 in north-central Alaska.
- Daniels, W. C.**, Russell, J. M., Giblin, A. E., Longo, W. M., Huang, Y. Diatom and biomarker records reveal a tradeoff between terrestrial and aquatic carbon burial in Arctic lakes following Holocene climate change.
- Rudin, S., **Daniels, W. C.**, Murray, D. Reconstructed links between urban pond pollution and neighborhood development.
- Longo, W. M., Huang, Y., Russell, J. M., **Daniels, W. C.**, McNichol, A. P., Xu, L., Giblin, A. E. Intensification of a terrestrial organic carbon sink at 18-20 ka in arctic Alaska.

INVITED ACADEMIC LECTURES

- American Geophysical Union Fall Meeting.** “Hydrologic and ecologic change in Arctic Alaska during and since the Last Glacial Maximum. Dec. 13, 2018.
- Greenfield Community College, Massachusetts STEM week.** “Geoscience in extreme environments: Experiences from the Arctic, Antarctic, and a NASA space pod”. Oct. 24, 2018.
- Woods Hole Oceanographic Institute.** “Probing recent Arctic climate changes with 30 years of lake water isotopes” Oct. 16, 2018.
- University of Massachusetts Amherst, Department of Geological Sciences.** “Mashapaug Pond: A Paleolimnological story of people and pollution.” Oct. 20, 2017.
- USGS-Reston.** “Past climate change in Beringia – New insights gained from lacustrine biomarkers.” August 21, 2017
- Marine Biological Laboratory, Arctic LTER Annual Meeting.** “Paleoclimate and Paleolimnology records from Lake E5, Arctic Alaska.” Feb. 2017

ORAL PRESENTATIONS AT CONFERENCES

- Brigham-Grette, J., Castañeda, I. S., DeConto, R., Roychowdhury, R., de Wet, G., Habicht, H., Keisling, B., **Daniels, W. C.** Terrestrial Arctic Climate from Lake El'gygytyn: Normal vs. Super Interglacial Teleconnections. Goldschmidt, Boston, MA. 2018
- Daniels, W. C.** Castañeda, I. S., Salacup, J. M., Brigham-Grette, J. Lacustrine biomarker reconstruction of Arctic climate before, during and after the mid-Pliocene warm period. Northeast GSA, Burlington, VT. 2018.
- Daniels, W. C.**, Russell, J. M., Morrill, C., Longo, W. M., Giblin, A. E., Holland-Stergar, P., Huang, Y. Western Arctic temperature sensitivity varies under different mean states. AGU Fall Meeting, San Francisco, CA. 2017.
- Longo, W. M., Huang, Y., Russell, J. M., Morrill, C., **Daniels, W. C.**, Giblin, A. E., Crowther, J. A high-resolution lacustrine alkenone record demonstrates progressive cold season warming during the Holocene in arctic Alaska. AGU Fall meeting 2017.
- Vachula, R. S., Longo, W. M., Daniels, W. C., Dee, S., Russell, J. M., Huang, Y. Evidence of Ice Age humans in Beringia: new insights on the peopling of the Americas. Invited. AGU Fall Meeting 2017.
- Longo, W. M., Huang, Y., Russell, J. M., Giblin, A. E., McNichol, A. P., Xu, L., **Daniels, W. C.** Differential millennial-scale responses of terrestrial carbon cycling dynamics to warming from two contrasting lake catchments in arctic Alaska. AGU Fall Meeting, 2016.
- Daniels, W. C.**, Russell, J. M. Huang, Y., Giblin, A. E., Longo, W. M., Holland-Stergar, P. Changing primary production in Arctic lakes at seasonal to millennial time scales. **Invited.** ASLO All-Science Meeting, Granada, Spain, 2015

POSTER PRESENTATIONS

- Daniels, W. C.**, Castañeda, I. S., Salacup, J., Brigham-Grette, J. 2018. GDGT distributions in Lake El'gygytyn (Far East Russia) sediments during and since the Pliocene. AGU Fall Meeting.
- Husain, F., Longo, W. M., **Daniels, W. C.**, Russell, J. M., Giblin, A. E., Huang, Y. 2018. High-resolution 10,000-year temperature reconstruction from Lake Fog 2, northern Alaska. AGU Fall Meeting.
- Daniels, W. C.**, Castañeda, I.S., Salacup, J.S., Brigham-Grette, J. 2018. Orbital variability in regular- and H-shaped GDGTs and *n*-alkyl lipids in Arctic lacustrine sediments during the Pliocene. Gordon Research Conference for Organic Geochemistry.
- Castañeda, I. S., Brigham-Grette, J., Habicht, M. H., **Daniels, W. C.**, Patterson, M., de Wet, G., Keisling, B., DeConto, R., Burns, S., Salacup, J. 2018. Plio-Pleistocene Arctic climate variability: Organic geochemical temperature reconstructions from Lake El'gygytyn, Far East Russia. EGU General Assembly Conference.
- Husain, F., Longo, W. M., **Daniels, W. C.**, Russell, J. M., Giblin, A. E., Huang, Y. 2017. A 10,000-year record of Arctic temperature variability during the Holocene inferred from lipid biomarkers in lacustrine sediments from Northern Alaska. Northeast/Northcentral GSA Annual section meeting.
- Daniels, W. C.**, Russell, J. M., Giblin, A. E., Longo, W. M., Morrill, C., Holland-Stergar, P., Rose, R., Huang, Y. 2016. Paleolimnologic and modeling perspectives on the physical and ecological sensitivity of Arctic tundra lakes to temperature change. AGU Fall Meeting.
- Daniels, W. C.**, Russell, J. M., Longo, W. M., Holland-Stergar, P., Giblin, A. E., Morrill, C., Huang, Y. 2015. Deglacial Warming and Wetting of Northern Alaska. AGU Fall Meeting.

- Longo, W. M., Crowther, J., **Daniels, W. C.**, Russell, J. M., Giblin, A. E., Morrill, C., Zhang, X., Wang, X., Huang, Y. 2015. Seasonally distinct reconstructions of Northern Alaskan temperature variability since the Last Glacial Maximum. AGU Fall Meeting.
- Daniels, W. C.**, Russell, J. M., Huang, Y., Giblin, A. E. 2013. Leaf wax hydrogen isotopes record summer temperature in Arctic lake sediments. AGU annual meeting.
- Daniels, W. C.** and Arctic LTER Lakes Group. 2013. Analyzing plankton communities in Arctic lakes using flow cytometry. Arctic LTER site review.
- Daniels, W. C.**, Giblin, A. E., Kling, G. W., Luecke, C. 2012. Low-level nitrogen and phosphorus addition drives hypolimnetic oxygen drawdown in deep arctic lakes. LTER All Scientist Meeting.
- Moraska Lafrancois, B., Karns, B., Miller, W., Schuetz, B., **Daniels, W. C.**, Peterson, E. 2009. Nitrogen patterns and sources in an upper Mississippi River tributary: a stable isotope approach. North American Benthological Society Meeting.

FIELD EXPERIENCE

- 2018 Paleolimnology field campaign to southern Greenland. Sediment trap recovery and deployment, ekman sampling, soil and vegetation sampling. PIs: Ray Bradley and Isla Castañeda, University of Massachusetts
- 2017 UNOLS Chief Scientist Training Program (R/V Blue Heron). 5-day research cruise on the Laurentian great lakes. Large volume water filtration and ponar sediment sampling for organic geochemical and stable isotope analyses. Large Lakes Observatory. PI: Doug Ricketts
- 2010-2015 Arctic Long-term Ecological Research and Alaska paleoclimate projects. Gravity and livingstone coring, sediment trap deployment, vegetation sampling, and limnologic sampling of remote Arctic lakes, streams, and tundra. MBL and Brown University. PIs: Anne Giblin, Yongsong Huang, James Russell
- 2011 Palmer LTER (R/V Gould). Shipboard volunteer (2 month cruise), Western Antarctic Peninsula. MBL. PI: Hugh Ducklow
- 2010 Nitrex Barrier monitoring, involving groundwater and estuarine sampling and biogeochemical assays in Cape Code, MA. Marine Biological Laboratory. PI: Ken Foreman
- 2008-2009 Sediment coring in Lake Michigan (R/V Laurentian, 3 day cruise) and midwest lakes; monthly stream monitoring; bog water sampling (DOC, mercury, sulfate). St. Croix Watershed Research Station. PIs: Dan Engstrom, Mark Edlund, James Ahlmendinger
- 2005-2006 Weekly limnological sampling of Lake Winnebago and Lake Michigan, WI. Lawrence University. PI: Bart De Stasio

PROFESSIONAL SERVICE

- 2018** **Database coordinator and development team member**, Neotoma biomarker database
- 2018** **Session convener**, AGU Fall Meeting 2018, “Biomarkers from Source to Sink: Proxy Development, Mechanistic Theory, and Applications” (PP007)
- 2016** **Session convener**, AGU Fall Meeting 2016, “Water Isotope Systematics: Improving Modern and Paleoclimate Interpretations” (PP22)
- 2015-2018** **Reviewer** (manuscripts and proposals): *Geochimica et Cosmochimica Acta*, *Geophysical Research Letters*, *International Journal of Digital Earth*, *Organic Geochemistry*, *Phytotaxa*, *PlosONE*, and NSF-EAR

UNIVERSITY SERVICE, OUTREACH, LEADERSHIP

- 2018** **Science fair judge**, Westfield High School, Westfield, MA.
- 2016** **Guest science lecturer**, Urban Pond Procession Full Circle Film Series, Providence, RI.
- 2015-2016** **Instructor**, Kaktovik Oceanography Program, Kaktovik, AK.
- 2015-2017** **Guest science lecturer**: Brown University Science Center. “The care and keeping of axolotls”. Keynote presentation to >80 undergraduates each year as part of the science center’s Axolotl Day.
- 2013-2015** **Graduate liaison to the Sheridan Teaching Center**, Brown University. I communicated upcoming teaching/learning events to other graduate students and encouraged participation in teaching certificate courses.
- 2013-2016** **Volunteer coordinator**, RI Watershed Extension. I coordinated a team of 8 people to perform weekly water quality monitoring in an adopt-a-pond program in RI.
- 2012-2017** **Science fair judge**, Lawrence Middle School, Falmouth, MA.
- 2011-2017** **Elementary and middle school science volunteer**, Vartan Gregorian Elem. School, Providence, RI, Marshfield Middle School, MA, The Common School, Amherst, MA
- 2011** **Geosciences graduate field trip director**, Brown University, Providence, RI.
- 2011** **Research volunteer**, Palmer Antarctic LTER.

ONGOING PROJECTS AND COLLABORATIONS

- Reconstructing Arctic climate change with biomarkers during and since the mid-Pliocene Warm Period (Dr. Julie Brigham-Grette, Univ. Massachusetts. Dr. Isla Castañeda, Univ. Massachusetts)
- Alaska paleoclimate and paleoecology (Dr. James Russell, Brown University; Dr. Yongsong Huang, Brown University; Dr. Anne Giblin, MBL; Dr. Will Longo, Macalester College and WHOI)
- Alaska lake water isotopes as a proxy for climate change (Dr. David Boutt, Univ. Massachusetts; Dr. Anne Giblin, MBL)
- Novel applications of spectrometric tools in lacustrine geochemistry (Dr. Aaron Jubb, USGS-Reston).

PROFESSIONAL AFFILIATIONS

Association for the Sciences of Limnology and Oceanography (ASLO), Geological Society of America (GSA), American Geophysical Union (AGU)

AWARDS AND HONORS

- 2014 Graduate fellowship, Institute at Brown for the Study of Environment and Society
- 2014 Graduate research grant, Geologic Society of America
- 2012 Honorable mention, NSF Graduate Research Fellowship Program
- 2012 Antarctic Service Medal, United States Antarctic program and National Science Foundation, given for participation in scientific research in Antarctica
- 2007 Howard and Helen Russell Award for Excellence in Biological Research, Lawrence University

WORKSHOPS AND TRAINING

- 2018 LacCore Training Program in Lake Drilling Coordination and Data Management
- 2017 University-National Oceanographic Laboratory System (UNOLS) Chief Scientist Training
- 2012 Ecology and Systematics of Diatoms, Iowa Lakeside Laboratory
- 2006 Semester in Environmental Science, Marine Biological Laboratory, Woods Hole, MA
- 2006 Recreational SCUBA certification