

Hartwell, Anne Marie

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EDUCATION

Ph.D. Oceanography *August 2018-present*
University of New Hampshire (UNH) GPA: 4.00/4.00
Center for Coastal and Ocean Mapping/Joint Hydrographic Center (CCOM/JHC)

M.S. Oceanography *September 2010-July 2013*
University of Rhode Island Graduate School of Oceanography (URI-GSO) GPA: 3.48/4.00

Thesis Title: *A reconstruction of $\delta^{15}N$ of deep ocean nitrate in the past using pore fluid*

B.S. Geology *September 2006- May 2010*
University of New Hampshire (UNH) Magna Cum Laude (3.67/4.00)

Undergraduate Honors Thesis: *Further investigation of metamorphism and mineralogy of South Central Maine in the Penobscot Formation.*

EXPERIENCE

Research Assistant (UNH CCOM/JHC)	<i>August 2018-present</i>
Science Communication (http://oceanbites.org)	<i>November 2013-present</i>
Technical Research Staff (University of Alaska Fairbanks; remote position)	<i>September 2016-January 2019</i>
Research Associate (Bigelow Laboratory for Ocean Sciences)	<i>September 2017-January 2018</i>
Visiting Scholar (University of Akron)	<i>September 2016-August 2017</i>
Adjunct Faculty (Cuyahoga Community College)	<i>September 2016-May 2017</i>
Research Associate (University of Akron)	<i>January 2014- August 2016</i>
Graduate Teaching Assistant (URI-GSO)	<i>Spring 2012, 2013</i>
Graduate Research Assistant (URI-GSO)	<i>September 2010- August 2011</i>
Undergraduate Researcher (UNH)	<i>June 2007-May 2010</i>
Summer Intern (Raytheon Company)	<i>Summer 2007</i>

KEY QUALITIES

- Detail oriented and organized
- Efficient and motivated
- Dedicated and enthusiastic
- Adaptable and trainable
- Good communication skills
- Ability to work independently
- Enjoys problem solving and new challenges

PUBLICATIONS

Wheat, C. G., **Hartwell, A.M.**, McManus, J., Fisher, A., Orcutt, B., Schlicht, L., Niedenzu, S., Bach, W., (accepted January 9, 2019). Geology and Fluid Discharge at Dorado Outcrop, a Low Temperature Ridge-Flank Hydrothermal System. *Geochemistry, Geophysics, Geosystems*.

Hartwell, A. M., Voight, J. R., & Wheat, C. G. (2018). Clusters of deep-sea egg-brooding octopods associated with warm fluid discharge: an ill-fated fragment of a larger, discrete population?. *Deep Sea Research Part I: Oceanographic Research Papers*. DOI: 10.1016/j.dsr.2018.03.011

Murray, N.A., Muratli, J., **Hartwell, A.M.**, Manners, H., Megowan, M., Goni, M., Palmer, M., McManus, J. (2016) Data report: dissolved minor element compositions, sediment major and minor element concentrations, and reactive iron and manganese data from the Lesser Antilles volcanic arc region, IODP Expedition 340 Sites U1394, U1395, U1396, U1399, and U1400. *Proceedings of the Integrated Drilling Program*, 340, DOI: 10.2204/iodp.proc.340.207.2016.

McManus, J., Severmann, S., Cohen, A.S., McKay, J.L., Montanye, B.R., **Hartwell, A.M.**, Brucker, R.L.P., and Wheatcroft, R. (2015) The sedimentary response to a rapid change in lake level in Lake Tanganyika. *Paleogeography, Paleoclimatology, Paleoecology*, 440, 647-658. DOI: 10.1016/j.palaeo.2015.09.035

PUBLISHED ABSTRACTS

Wheat, C.G. and **Hartwell, A.M.**, Capitalizing on existing IODP infrastructure to further our understanding of the crustal aquifer's role in biogeochemical cycling. *C-DEBI Annual Meeting, 2018*.

Hartwell, A.M., Voight, J., and Wheat, C.G. Clusters of deep-sea egg-brooding octopods: only a fragment of the population?. *C-DEBI Annual Meeting, 2017*.

Hartwell, A.M., Wheat, C.G., McManus, J., Orcutt, B., and Fisher, A. Geological constraints and consequences of fluid discharge on Dorado Outcrop: A Ridge Flank Hydrothermal System. *C-DEBI Annual Meeting, 2017*.

Bole, T., McManus, J., Severmann, S., **Hartwell, A.M.** Mercury Increases in Lake Tanganyika since ~1800. Geological Society of America, *Abstracts with Programs*. Vol. 48, No. 5. doi: 10.1130/abs/2016NC-275345

Montanye, B., **Hartwell, A.M.**, Cohen, A., McKay, J., Severmann, S., and McManus, J. Changes in Biological Production and Lake Chemistry in Lake Tanganyika over the Past 400 years. *AGU Fall Meeting, 2015*.

Hartwell, A.M., Spivack, A.J., and Robinson, R.S. Elevated nitrogen isotopic composition of nitrate in the deep North Pacific during the last ice age. *AGU Fall Meeting Abstracts, 2013*

RESEARCH EXPERIENCE

Research Technician, Geochemistry/Biology

September 2016-January 2019

University of Alaska Fairbanks, Fairbanks, AK

Supervisor: Dr. Geoff Wheat. Autonomous and remote position involving data management and analysis, fieldwork, and contribution to peer-reviewed publications. My primary tasks were reviewing and annotating underwater footage from marine submersibles for projects related to geological, hydrological, and biological research questions, and compiling a dataset of Deep Sea Drilling Program, Ocean Drilling Program (ODP), and International Ocean Drilling Program (IODP) holes as preliminary work for a study of crustal hydrology. **Field Work:** R/V Atlantis AT39-01- October-November 2017: North Pond ODP site 395A, IODP sites 1383C and 1382A, Principal investigators: Drs. Geoff Wheat, Beth Orcutt, Kier Becker, Grieg Stewart, Peter Girguis, Julie Huber. Daily fieldwork included collecting pore fluid samples and recovering Circulation Obviation Retrofit Kits via ROV Jason-II. Participated in a ship-to-shore STEM outreach program run by Dr. Orcutt (<http://sites.google.com/site/adoptamicrobe2017>).

Research Associate, Biogeochemistry

September 2017-January 2018

Bigelow Laboratory for Ocean Sciences, East Boothbay, ME

Supervisor: Dr. James McManus. Position entailed manuscript preparation for limnology study focused on shifts in lake chemistry and productivity in Lake Tanganyika over the past 200 years.

Research Associate, Geochemistry:

January 2014-August 2016

University of Akron, Akron, OH

Supervisor: Dr. James McManus. Position responsibilities included purchasing, mentoring students in the use of technically complex laboratory instruments, maintaining laboratory equipment, planning and preparing for fieldwork, analyzing data, and preparing data reports and contributions to peer-reviewed publications. Analytical methods included trace metal extraction and analysis, biogenic silica digestion and analysis, organic content analysis, carbonate analysis, mercury analysis, sediment description, X-ray diffractometer mineralogical analysis, and Environmental Scanning Electron Microscope imaging and elemental analysis. Instruments maintained

included a Perkin Elmer 2400 elemental analyzer, Coulometrics Coulometer, and a HydraC Mercury Analyzer. Travel included fieldwork and visiting other laboratories to do analyses and to collaborate with PI's. **Field Work:** R/V Atlantis AT26-24- December 2014: Geochemical Oceanography cruise related to Center for Dark Energy Biosphere Investigations, Principal investigators Drs. Geoff Wheat, Beth Orcutt, and Andy Fisher. Daily fieldwork included collecting sediment and pore fluid samples recovered via HOV *Alvin*. Participated as the scientific observer on HOV *Alvin* dive 4782 to a depth of 3,024 meters at Dorado Outcrop.

Graduate Student, Paleoceanography/Biogeochimistry: *May 2010-July 2013*
University of Rhode Island GSO, Narragansett, RI

Graduate research analytical methods included molybdenum blue spectrophotometry for phosphorus, and bacterial cultural preparation of *Psuedomonas aureofaciens* and *Psuedomonas chlororaphis* for nitrate reduction. Instrumentation used was a spectrophotometer and an Isotope Ratio Mass Spectrometer. State assistantship in the Marine Geological Samples Laboratory (MGSL) responsibilities included fulfilling sample requests, updating the NOAA MGSL database, and using simple demonstrations to educate visiting groups of grade school students about subsurface basalt flows.

Undergraduate, Geochemistry: *June 2007-May 2010*
University of New Hampshire, Durham, NH
XRD analysis, Bomb Digestion, Thin section preparation

Raytheon- Intern, Material Analysis: *Summer 2007*
Andover, MA
Sample preparation: ESEM. Instrumentation used: Tensile strength tester, ESEM

FIELD EXPERIENCE

R/V Atlantis AT39-01 *October-November 2017*
North Pond ODP site 395A, IODP sites 1383C and 1382A, Principal investigators: Drs. Geoff Wheat, Beth Orcutt, Kier Becker, Grieg Stewart, Peter Girguis, Julie Huber. Daily fieldwork included collecting pore fluid samples and recovering Obviation Circulation Retrofit Kits via ROV *JASON-II*. Participated in a ship-to-shore STEM outreach program with the Girl Scouts of America run by Dr. Orcutt (<http://sites.google.com/site/adoptamicrobe2017>)

R/V Atlantis AT26-24 *December 2014*
Geochemical Oceanography cruise related to Center for Dark Energy Biosphere Investigations (CDEB-I), Principal investigators: Drs. Geoff Wheat, Beth Orcutt, and Andy Fisher. Daily fieldwork included collecting sediment and pore fluid samples recovered via HOV *ALVIN*. Participated as the scientific observer on dive 4782 to a depth of 3100meters at Dorado Outcrop.

R/V Endeavor EN492 *April-May 2011*
Physical Oceanography cruise to conduct high definition hydrographic surveys in the North Atlantic Ocean. Daily fieldwork included CTD, XBTS, and UCTD recovery and deployment. Principle investigator: Dr. David Hebert.

Penobscot Bay, Maine *October 2009*
Two days of field observations and sample collection in Penobscot Bay, Maine, with mentorship from Dr. Jo Laird.

ORAL PRESENTATIONS

Memorial University Department Talk *March 2018*
Title: Clusters of deep-sea egg-brooding octopods associated with warm fluid discharge: an ill-fated fragment of a larger, discrete population?
Author: **Hartwell, A.M.**

The University of Akron Geosciences Colloquium (Akron, OH) *January 2017*

Title: Octopuses brood near fluid discharge zones on a deep-sea outcrop
Author: **Hartwell, A.M.**

The University of Akron Geosciences Colloquium (Akron, OH)

October 2014

Title: A Reconstruction of $\delta^{15}\text{N}_{\text{global}}$ of deep ocean nitrate in the past using pore fluid
Author: **Hartwell, A.M.**

American Geophysical Union (San Francisco, CA)

December 2013

Title: Elevated nitrogen isotopic composition of nitrate in the deep North Pacific during the last ice age
Authors: **Hartwell, A.M.**, Spivack, A.J., and Robinson, R.S.

TEACHING/MENTORSHIP/OUTREACH

Teaching experience:

- **Cuyahoga Community College:** Instructor of Physical Geology Lecture (ESCI 1410) and Lab (ESCI141L), general education courses for undergraduate students. Responsibilities include preparing and presenting lectures, and evaluating homework and laboratory assignments, and preparing exams. *Spring 2017*
- **Cuyahoga Community College:** Instructor of Introduction to Oceanography (ESCI 1812), a general education course for undergraduate students. Responsibilities included preparing and presenting lectures, and designing and evaluating homework assignments and exams. *Fall 2016*
- **URI-GSO:** Teaching assistant in Introduction to Oceanography (OCG123) a general education course for undergraduate student. Responsibilities included designing and evaluating homework assignments that reinforced the learning objectives of the courses, conducting review sessions, working with students individually during weekly office hours, and presenting a lecture. *Spring 2013*
- **URI-GSO:** Teaching assistant for Ocean Sciences (OCG451) designed as an upper level earth science course for non-geology science and engineering majors. Responsibilities included designing and evaluating assignments and tests that reinforced the learning objectives of the course, holding review sessions, and hosting weekly office hours. *Spring 2012*

Undergraduate Honors Research Thesis:

- Troy Bole: Quantifying sedimentary mercury concentrations on the Luiche Platform in Lake Tanganyika *2015-2016*

Outreach:

- Science Blog Leadership Team/ post contributor <https://oceanbites.org> *November 2013- present*
- Ocean Discovery Day volunteer, University of New Hampshire *September, 2018*
- Hurricane Island, Maine- visiting presenter for high school students (7/18/2018) *July 2018*
- Ship-to-shore STEM contributor: <http://sites.google.com/site/adoptamicrobe2017> *October 2017*
- Science Olympiad volunteer, University of Akron *March 2015, 2016*
- Wildcat Youth Mentor *2007-2008*
- UNH Robotics STEM workshops for middle school girls *2006-2007*

WORKSHOPS

- Alan Alda Center for Communicating Science *January 2019*

AWARDS

- UNH Graduate School Travel Award (\$200.00) *August 2018*

PUBLIC RELATIONS

- UK TalkRadio: Paul Ross (Host) *November 2018*
- National Geographic: Carrie Arnold (writer) *April 2018*
<https://news.nationalgeographic.com/2018/04/animals-octopuses-deep-sea-oceans/?beta=true>
- Popular Science: Mary-Beth Griggs (writer) *April 2018*
<https://www.popsci.com/octopus-group-deep-sea-warm-water>
- Science News: Sarah Zielinski (writer) *April 2018*
<https://www.sciencenews.org/blog/wild-things/how-deep-sea-geology-trip-led-researchers-doomed-octopus-nursery?tgt=nr>
- The Field Museum: Kate Golembiewski (PR) *April 2018*
<https://www.fieldmuseum.org/about/press/giant-group-octopus-moms-discovered-deep-sea>
- National Science Foundation: Cheryl Dybas (PR) *April 2018*
https://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=245123&org=NSF&from=news
- Le Petit Quotidien: Pauline Leroy (writer) *April 2018*
- TVN24 Poland: Anita Piqtek (writer) *April 2018*
- Science et vie Decouvertes: Pierre Tessier (writer) *April 2018*

PROFESSIONAL MEMBERSHIPS

- American Geophysical Union *2013-present*
- Society for Women in Marine Sciences *2018-present*

INTERESTS

- Ocean exploration
- The interplay of marine communities and properties of the seafloor.
- Application and conceptual design of ocean engineering and robotics for enhancing marine research
- Geochemical cycling in marine sediment and how is it influenced by ecological factors including sedimentation rate, biology, diffusion, basement material, and pollutants
- The potential to strategically, efficiently, and safely harness renewable energy from the ocean
- Biogeochemistry and the nitrogen cycle
- Outreach