
ALYSSA R. ATWOOD

Postdoctoral Researcher

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EDUCATION

- 2015 Ph.D. School of Oceanography, University of Washington, Seattle, WA. Thesis: *Mechanisms of Tropical Pacific Climate Change During the Holocene*. Advisors: Julian Sachs and David Battisti.
- 2010 M.S. University of Washington, Oceanography.
- 2010 Certificate in Climate Sciences, University of Washington, Program on Climate Change.
- 2006 B.A. University of California, Berkeley, Atmospheric Science.
- 2006 B.A. University of California, Berkeley, Physics.

PRIMARY APPOINTMENTS

- 2015–present Postdoctoral Researcher, UC Berkeley, Geography Dept. & Georgia Institute of Technology, School of Earth and Atm. Sciences. Hosts: *John Chiang* and *Kim Cobb*.
- 2007–2015 Graduate Research Assistant. University of Washington, School of Oceanography. Research Advisors: *Julian Sachs* and *David Battisti*.
- 2006–2007 Postgraduate Research Assistant. University of California Berkeley, Geography Department. Research Advisor: *Robert Rhew*.

FELLOWSHIPS AND AWARDS

- 2018 Finalist for University of California President's Postdoctoral Fellowship
- 2015–2017 NOAA Climate and Global Change Postdoctoral Fellow
- 2009–2014 NSF Graduate Research Fellow
- 2010–2012 DOE Graduate Research Environmental Fellow
- 2008–2009 Egtvedt Endowment in the School of Oceanography Recipient
- 2007–2008 University of Washington Program on Climate Change Fellow
- 2007–2008 UW Graduate School Fund for Excellence and Innovation recipient
- 2006–2007 Charles H. Ramsden Endowed Fund Research Fellow

RESEARCH INTERESTS: Paleoclimatology, stable isotope and trace element geochemistry, tropical climate change and variability, ocean-atmosphere interactions, climate model-data intercomparison

PUBLICATIONS

Submitted or in press:

1. H. Zhang, M. L. Griffiths, J. C.H. Chiang, W. Kong, Sh. Wu, **A. R. Atwood**, J. Huang, H. Cheng, Y. Ning, S. Xie (subm. to *Science*). “East Asian hydroclimate modulated by the position of the westerlies during Termination I.”
2. Donohoe, A., **A. R. Atwood**, M. P. Byrne (in rev. at *Nature Geoscience*). “Controls on the width of tropical precipitation and its contraction under global warming.”
3. **Atwood, A. R.**, D. S. Battisti, C. M. Bitz, J. P. Sachs (in rev. at *Nature Geoscience*). “Response of the tropical Pacific to abrupt climate change 8,200 years ago.”

Published:

1. *Hydro2k Consortium*: J. E. Smerdon, J. Luterbacher, S. J. Phipps, K. J. Anchukaitis, T. Ault, S. Coats, K. M. Cobb, B. I. Cook, C. Colose, T. Felis, A. Gallant, J. H. Jungclaus, B. Konecky, A. LeGrande, S. Lewis, A. S. Lopatka, W. Man, J. S. Mankin, J. T. Maxwell, B. L. Otto-Bliesner, J. W. Partin, D. Singh, N. Steiger, S. Stevenson, J. E. Tierney, D. Zanchettin, H. Zhang, **A. R. Atwood**, L. Andreu-Hayles, S. H. Baek, B. Buckley, E. R. Cook, R. D'Arrigo, S. Dee, M. Griffiths, C. Kulkarni, Y. Kushnir, F. Lehner, C. Leland, H. W. Linderholm, A. Okazaki, J. Palmer, E. Piovano, C. C. Raible, M. P. Rao, J. Scheff, G. Schmidt, R. Seager, M. Widmann, A. P. Williams, E. Xoplaki (2017). “Comparing proxy and model estimates of hydroclimate variability and change over the Common Era.” *Climate of the Past* 13, 1851-1900. doi: 10.5194/cp-13-1851-2017
2. **Atwood, A. R.**, D. S. Battisti, A. T. Wittenberg, W. H. G. Roberts, D. J. Vimont (2017). “Characterizing unforced multi-decadal variability of ENSO: A case study with the GFDL CM2.1 coupled GCM.” *Climate Dynamics* 49, 2845-2862, doi: 10.1007/s00382-016-3477-9
3. **Atwood, A. R.**, E. Wu, D. M. W. Frierson, J. P. Sachs, D. S. Battisti (2016). “Quantifying climate forcings and feedbacks over the last millennium in CMIP5-PMIP3 models.” *Journal of Climate* 29, 1161-1178, doi: 10.1175/JCLI-D-15-0063.1
4. **Atwood, A. R.** and J. P. Sachs (2014). “Separating ITCZ- and ENSO-related rainfall changes in the Galápagos over the last 3 kyr using D/H ratios of multiple lipid biomarkers.” *Earth and Planetary Science Letters* 404, 408-419, doi: 10.1016/j.epsl.2014.07.038
5. **Atwood, A. R.**, J. K. Volkman, J. P. Sachs (2014). “Characterization of unusual sterols and long chain diols, triols, keto-ols and *n*-alkenols in El Junco Lake, Galápagos.” *Organic Geochemistry* 66, 80-89, doi: 10.1016/j.orggeochem.2013.11.004
6. Myhrvold, C. L., F. Janny, D. Nelson, S. N. Ladd, **A. R. Atwood**, J. P. Sachs (2014). “Holocene Closure of Lib Pond, Marshall Islands.” *PLoS ONE* 9, e90939, doi: 10.1371/journal.pone.0090939
7. **Atwood, A. R.** and J. P. Sachs (2012). “Purification of dinosterol from complex mixtures of sedimentary lipids for hydrogen isotope analysis.” *Organic Geochemistry* 48, 37-46, doi: 10.1016/j.orggeochem.2012.04.006
8. Teh, Y. A., O. Mazeas, **A. R. Atwood**, T. Abel, R. C. Rhew (2009). “Hydrologic regulation of gross methyl chloride and methyl bromide uptake from Alaskan Arctic tundra.” *Global Change Biology* 15, 330-345, doi: 10.1111/j.1365-2486.2008.01749.x
9. Teh, Y. A., R. C. Rhew, **A. Atwood**, T. Abel (2008). “Water, temperature, and vegetation

regulation of methyl chloride and methyl bromide fluxes from a shortgrass steppe ecosystem.” *Global Change Biology* 14, 77-91, doi: 10.1111/j.1365-2486.2007.01480.x

10. Rhew, R. C., Y. A. Teh, T. Abel, **A. Atwood**, O. Mazeas (2008). “Chloroform emissions from the Alaskan Arctic tundra.” *Geophysical Research Letters* 35, L21811, doi: 10.1029/2008GL035762

Non-Peer Reviewed:

Atwood, A.R. (2015). “Mechanisms of Tropical Pacific Climate Change During the Holocene.” PhD thesis. University of Washington.

EXTERNAL FUNDING

- 2017-2020 Collaborative Research: The expansion/contraction of the intertropical convergence zone; an emerging mechanism of tropical precipitation changes for reinterpreting paleoclimate records, NSF AGS-GEO/ATM, PI: Aaron Donohoe (University of Washington), co-PI: Alyssa Atwood (\$375,095).
- 2015-2016 RAPID: Galápagos lake chemistry & plankton assemblage during the 2015-16 El Niño, NSF-EAR-1608241, Project Role: Equal participant with PI Julian Sachs in planning, writing, budgeting, and project execution (\$74,986).
- 2015-2017 Tropical Pacific Climate Change Over the Last Millennium: Reconciling Proxy Reconstructions with Driving Mechanisms, NOAA Climate and Global Change Postdoctoral Fellowship.
- 2009-2014 Climate Variability in the Tropical Pacific Over the Last 1,500 Years, NSF Graduate Research Fellowship.
- 2010-2012 Mean State Influences on El Niño/Southern Oscillation Variability: Past, Present, and Future, DOE Global Change Education Program - Graduate Research Environmental Fellowship.

ORAL PRESENTATIONS

- 02/2018 “The Influence of Mean State Changes on ENSO During the Mid-Holocene: Insights from Coral Records and an Isotope-Enabled GCM,” Ocean Sciences Meeting, Portland, OR.
- 09/2017 “A Coral Ensemble Approach to Reconstructing Central Pacific Climate Change During the mid-Holocene,” GeoBremen, Bremen, Germany.
- 08/2017 “High latitude teleconnections to tropical mean climate: paleoclimate data and models,” US CLIVAR Summit, Baltimore, MD. **Invited.**
- 03/2017 “Proxy and modeling evidence of the 8.2 kyr event in the eastern equatorial Pacific”, 28th Pacific Climate Workshop, Pacific Grove, CA.
- 12/2016 “A Coral Ensemble Approach to Reconstructing Central Pacific Climate Change During the Holocene”, 185396, AGU Fall Meeting.
- 06/2016 “Hydroclimate changes in the tropical Pacific over the last millennium: data model comparisons and possible mechanisms”, PAGES2k-PMIP3 Workshop: Comparing Data and Model Estimates of Hydroclimate Variability and Change over the Common

- Era, Lamont-Doherty Earth Observatory. **Invited.**
- 07/2016 “Tropical Pacific climate change and ENSO evolution during the Holocene”, NOAA Climate and Global Change Summer Institute, Steamboat Springs, CO.
- 12/2015 “Possible mechanisms of a southward shift in tropical precipitation during the Little Ice Age”, PP44B-06 AGU Fall Meeting. **Invited.**
- 10/2015 “Why was there a Little Ice Age?”, Lawrence Berkeley National Laboratory seminar. **Invited.**
- 09/2015 “Spatial variations of the ITCZ response to North Atlantic freshwater forcing”, Workshop on Monsoons & ITCZ: the annual cycle in the Holocene and the future, Columbia University. **Invited.**
- 09/2015 “Why was there a Little Ice Age?”, U.C. Berkeley Atmospheric Science Center seminar. **Invited.**
- 11/2014 “Possible mechanisms of a southward shifted ITCZ during the Little Ice Age”, Univ. of Washington Chemical Oceanography seminar.
- 09/2014 “The influence of a weakened AMOC on the El Niño-Southern Oscillation”, U.S. AMOC Science Team Meeting, Seattle, WA.
- 12/2013 “Last millennium climate change in CMIP5 models”, PP41B-07 AGU Fall Meeting.
- 09/2013 “The Little Ice Age in CMIP5”, University of Edinburgh School of Geosciences seminar.
- 12/2012 “Holocene climate changes in the eastern equatorial Pacific from hydrogen isotopes of multiple biomarkers from a Galápagos lake”, PP24B-04 AGU Fall Meeting.
- 10/2012 “Initial investigations on the interactions between ENSO and the mean state of the tropical Pacific”, Univ. of Washington Chemical Oceanography seminar.
- 08/2011 “Mean state changes in the tropical Pacific and El Niño-Southern Oscillation Variability: Paleoclimate evidence and climate modeling investigations”, DOE Global Change Education Program Workshop, Knoxville, TN.
- 10/2010 “Holocene rainfall variations from hydrogen isotope ratios of algal biomarkers in a Galápagos Island lake sediment,” Univ. of Washington Graduate Climate Conference.
- 11/2008 “What can Christmas Island tell us about rainfall in the tropical Pacific over the last millennium? Univ. of Washington Chemical Oceanography seminar.

POSTER PRESENTATIONS

- 12/2017 **Atwood, A.R.**, Battisti, D. S., Bitz, C. M., Sachs, J. P. “Response of the tropical Pacific to abrupt climate change 8,200 years ago.” PP33A-1314 AGU Fall Meeting.
- 10/2017 **Atwood, A.R.**, Frierson, D.M.W., Wu, E., Battisti, D.S., Sachs, J.P. “Hydroclimate changes in the tropical Pacific over the last millennium.” Last Millennium Reanalysis Workshop, Boulder, CO.
- 12/2014 **Atwood, A.R.**, Battisti, D.S., Bitz, C.M. (2014). “The influence of a weakened AMOC on the El Niño-Southern Oscillation in CESM,” A33E-3238 AGU Fall Meeting.
- 03/2012 **Atwood, A.R.**, Sachs, J. P. “Holocene rainfall in the eastern equatorial Pacific from hydrogen isotopes in lipid biomarkers from a Galápagos lake,” CLIVAR/PAGES Workshop: Using paleo-climate model/data comparisons to constrain future

projections, University of Hawaii.

- 10/2012 **Atwood, A.R.**, Battisti, D.S. “Interactions between ENSO and the mean state of the tropical Pacific in a GCM,” Univ. of Washington Graduate Climate Conference.
- 10/2011 **Atwood, A.R.**, Sachs, J. “Holocene climate variability in the eastern equatorial Pacific from lake biomarker records,” Graduate Climate Conference, Woods Hole Oceanographic Institution.

ADDITIONAL TRAINING

- 9/2016 Visiting scientist, University of Minnesota Isotope Lab
- 3&6/2016 Visiting scientist, UC Irvine AMS Lab
- 8-9/2015 Advanced Climate Dynamics Course: Climate and Volcanism, Héraðsskólinn, Iceland
- 5-6/2013 NASA Intensive Summer School in Computing for Env. Sciences, Univ. of Virginia, VA
- 9/2013 NCAS Climate Modeling Summer School, Oxford, United Kingdom
- 8/2011 NCAR Community Earth System Model Tutorial, Boulder, CO

TEACHING AND MENTORING

- 2017 – present Postgraduate *Aaron Jones*, laboratory work, Georgia Institute of Tech.
- 2016 – 2017 Undergraduates *Melat Hagos* and *Gemma O’Connor*, laboratory work, Georgia Institute of Tech.
- 2015 – 2016 Undergraduate *Kayla Townsend*, laboratory work, Georgia Institute of Tech.
- 2013 – 2015 Undergraduate *Elynn Wu*, climate modeling, University of Washington
- 2010 Undergraduate *Kyle Thomas*, laboratory work, University of Washington
- 2009 Graduate Teaching Assistant, Field course: Exploration seminar in the Marshall Island, University of Washington
- 2008 – 2009 Washington State University Extension Carbon Masters Program course development: Global climate change. Seattle, WA.

RESEARCH EXPERIENCE

Geochemistry

- Stable Isotope Analyses: Hydrogen, oxygen and carbon isotopes in carbonates, waters, lipids and bulk organic material from gas-source isotope ratio mass spectrometry and laser systems (Kiel IV Carbonate Device-, dual inlet-, TCEA- and GC-IRMS, CRDS).
- Radiocarbon Sample Preparation: Sample preparation for rapid-screen ¹⁴C analyses of carbonates.
- U-Series Sample Preparation and Analysis: Sample preparation of carbonate samples for U-series disequilibrium dating. Analysis using Neptune Plus multiple collector inductively coupled plasma mass spectrometry (MC-ICP-MS).
- Organic Geochemistry Analyses: Biomarker analysis using gas chromatography with mass selective detector and flame ionization detector (GC-MS, GC-FID) and high performance liquid chromatography-mass spectrometry (HPLC-MS).

- Chemical Separations: Sample preparation and purification (including method development) using column chromatography and preparative-HPLC on complex sedimentary samples.
- Laboratory Management: General lab upkeep, maintenance and repair of isotope ratio mass spectrometers, Kiel IV Carbonate Device, gas chromatographs, and liquid chromatographs.
- Coral Sampling: Coring and tissue collection of living and fossil coral using Nemo underwater drill and Pomeroy drill.
- Rain and Seawater Sampling: Deployment and recovery of HOBO data loggers, HOBO weather stations and Palmex rainwater collectors.
- Lake Sampling: Experience with Livingstone, Geocore, Aquatic Research and peat coring systems, YSI data sonde, sediment trap design, deployment and recovery, suspended particle sampling, plankton sampling.
- Field Experience: Planning, outfitting, and leading field expeditions in diverse and remote locations, including Kiribati (2015, 2016), Galápagos Islands (2016, 2008), Marshall Islands (2009), Micronesia (2009), Clipperton Atoll (2008), Washington State (2007) and northern Alaska (2007).

Climate Modeling

- Co-developer of the Linearized Ocean Atmosphere Model.
- Simulations and code modifications with the Community Earth System Model (PI on NCAR Large University Computing Allocation of 1.6 M core-hours).
- Inter-model comparisons of CMIP5/PMIP3 paleoclimate simulations.
- Programming Languages: Python, Matlab, NCL, Fortran.

OUTREACH, SERVICE, AND LEADERSHIP ACTIVITIES

- 2016 – present *Co-organizer*, Science Leadership and Management, UC Berkeley; Organize yearly seminar series and end-of-year workshop for graduate students and postdocs to promote leadership development in early career scientists.
- 2013 – present *Peer reviewer* for scientific journals: *Geophysical Research Letters*, *Quaternary Science Reviews*, *Earth and Planetary Science Letters*, *Organic Geochemistry*, *Geology*, *Journal of Geophysical Research–Atmospheres*.
- 2013 – present *Volunteer*, Educurious; Develop teacher-training resources and serve as a science expert for high school science teachers.
- 2010 – 2014 *Co-organizer/co-chair*, Graduate Climate Conference, University of Washington and Massachusetts Institute of Technology.
- 04/2014 *Speaker*, “Climate change impacts in the Pacific Northwest”, Everett Public Library.
- 04/2012 *Speaker*, “Our changing oceans”, Highland Community College Environmental Chemistry class, Des Moines, WA.
- 02/2012 *Speaker*, “Current and future ocean change”, Interlake High School AP Environmental Science class, Bellevue, WA.
- 2009 – 2010 *Volunteer*, Washington State University Extension; Developed pilot program and curricular materials for the community education programs Carbon Masters and Carbon Coaches.

- 01/2010 *Speaker*, “Climate change 101”, WSU Extension Carbon Masters Program, Cascadia Community College, Bothell, WA.
- 10/2009 *Speaker*, “Climate change 101”, WSU Extension Carbon Coaches Program, Cascadia Community College, Bothell, WA.
- 07/2009 *Co-organizer*, Climate Change Symposium, Majuro, Republic of the Marshall Islands
- 2008 *Co-organizer*, US Congressional Delegation-House Science and Technology Committee to the Galápagos Islands.
- 02/2008 *Volunteer*, Technical Advisory Panel member and Science Judge for Washington Regional Ocean Sciences Bowl.