

Benjamin Harden

Assistant Professor of Oceanography
Sea Education Association, PO Box 6
Woods Hole, MA, 02543

(508)-540-3954 x545
bharden@sea.edu

Education

- Ph.D., Meteorology and Oceanography, University of East Anglia, UK, 2012.
- M.Sci., Natural Sciences (physics), Cambridge University, UK, 2007.
- B.A, Natural Sciences (physics), Cambridge University, UK, 2006.

Work

- Assistant Professor of Oceanography, Sea Education Association, 2015 – present
- Postdoctoral Investigator, Woods Hole Oceanographic Institution, 2014 – 2018.
- Postdoctoral Scholar, Woods Hole Oceanographic Institution, 2012–14.

Publications

- **Harden, B. E.**, I. A. Renfrew, and G. N. Petersen, 2011: A Climatology of Winter-time Barrier Winds off Southeast Greenland. *Journal of Climate*, 24, 4701–4717, doi:10.1175/2011JCLI4113.1.
- **Harden, B. E.** and I. A. Renfrew, 2012: On the spatial distribution of high winds off southeast Greenland. *Geophys. Res. Lett.*, doi:10.1029/2012GL052245.
- **Harden, B. E.**, R. S. Pickart, I. A. Renfrew, 2014: Offshore Transport of Dense Water from the East Greenland Shelf. *J. Phys. Oceanogr.*, 44, 229–245. doi:10.1175/JPO-D-12-0218.1.
- Andresen C. S., K. K. Kjeldsen, **B. E. Harden**, N. Nørgaard-Pedersen, K. H. Kjær, 2014: Observations of outlet glacier dynamics and bathymetry from Upernavik Isstrøm and Upernavik Isfjord. *Bulletin of Geological Survey of Denmark and Greenland*.
- Sutherland D. A., F. Straneo, **B. E. Harden**, 2014: Atlantic water variability on the southeast Greenland shelf. *US CLIVAR Variations*, 12, 20–25.
- **Harden, B. E.**, F. Straneo, D. Sutherland, 2015: Moored observations of synoptic and seasonal variability in the East Greenland Coastal Current. *JGR-Oceans*, 119, 8838–8857, doi: 10.1002/2014JC010134.
- **Harden, B. E.**, I. A. Renfrew, G. N. Petersen, 2015: Meteorological buoy observations from the central Iceland Sea. *J. Geophys. Res. Atmos.*, 120, 3199–3208. doi: 10.1002/2014JD022584.
- Moore, G. W. K., I. A. Renfrew, **B. E. Harden**, S. H. Mernild, 2015: The impact of resolution on the representation of southeast Greenland barrier winds and katabatic flows. *Geophys. Res. Lett.*, 42, 3011–3018, doi:10.1002/2015GL063550.
- **Harden, B. E.**, R. S. Pickart, H. Valdimarsson, Kjetil Våge, Laura de Steur, Clark Richards, Frank Bahr, Dan Torres, Eli Børve, Steingrímur Jónsson, Andreas Macran-der, Svein Østerhus, Lisbeth Håvik, Tore Hattermann, 2016: Upstream Sources of the Denmark Strait Overflow: Observations from a High-Resolution Mooring Array. *Deep Sea Research: Part 1*, 112, 94–112, doi:10.1016/j.dsr.2016.02.007.

- de Steur, L. , R. S. Pickart, A. Macrander, Våge, **B. Harden**, S. Jónsson, S. Østerhus, H. Valdimarsson, 2017: Liquid freshwater transport estimates from the East Greenland Current based on continuous measurements north of Denmark Strait. *Journal of Geophysical Research (Oceans)*, 122, 93–109, doi:10.1002/2016JC012106.
- Behrens, E., K. Våge, **B. Harden**, A. Biastoch, C. W. Böning, 2017: Composition and variability of the Denmark Strait Overflow Water in a high-resolution numerical model hindcast simulation. *J. Geophys. Res. Oceans*, 122, doi:10.1002/2016JC012158.
- Håvik, L., K. Våge, R. S. Pickart, **B. Harden**, W.-J. von Appen, S. Jónsson, S. Østerhus, 2017: Structure and variability of the shelfbreak East Greenland Current north of Denmark Strait. *Journal of Physical Oceanography*, 47, 2631–2646, doi: 10.1175/JPO-D-17-0062.1
- Rossby, T., C. Flagg, L. Chafik, **B. Harden**, H. Soiland (submitted). A direct estimate of volume, heat and fresh water exchange across the Greenland-Iceland-Faroe-Scotland Ridge. *Journal of Geophysical Research: Oceans*.
- **Harden, B. E.**, R. S. Pickart (in prep). High-frequency variability in the North Icelandic Jet.
- **Harden, B. E.**, G. Gawarkeiwicz, M. Infante (in prep). Trends in physical properties at the Southern New England shelfbreak.

Funding

- NSF-OCE Grant: Upstream Sources of the Denmark Strait Overflow, \$297,000, 2014.
- Woods Hole Oceanographic Institution Postdoctoral Scholarship, \$90,000, 2012.
- Visiting Fellowship, University of Bergen, \$3,000.
- Combined travel funding: Inst. of Physics C.R. Barber Trust Fund, Royal Meteorological Society Legacies Fund, University of East Anglia Roberts Fund. \$1,700, 2010.
- Public Radio Exchange STEM Story Project, \$1,350, 2014.

Educator Experience

- Assistant Professor: Sea Education Association, MA.
 - Four semester length programs including course development and delivery on campus and a 135 ft tall ship.
 - Classes Taught: Oceanography, Marine Environmental History, Oceans and Global Change, Directed Oceanographic Research.
- Partnership in Education Program (2015-present)
 - Course Director, 2017-present: Develop four-week program with instructors from across Woods Hole Community
 - Taught courses in Physical Oceanography and Science Communication
 - Mentored students through research projects.
- Assistant Instructor: Communicating Science, Marine Biological Laboratory, MA.
 - Undergraduate course for MBL’s Semester in Environmental Sciences, Fall 2014.
 - Ran seminars on effective communication, taught writing for print and voice, advised independent projects, assessed students’ work, and facilitated in-class discussions.
- Lecturer: Modeling Environmental Processes, University of East Anglia, UK.
 - 3rd year undergraduate and masters level course, Fall 2011.
 - Lectured on computational methods for solving differential equations, held classes

- to teach coding skills, advised students through development of individual research projects, and assessed students' work.
- Teaching Assistant, University of East Anglia, UK.
 - Mathematics for Environmental Sciences, undergraduate course, Spring 2009, 2010.
 - Modeling Environmental Processes, undergraduate and masters course, Fall 2010.
 - Advised groups of students through problem sets and graded coursework and exams.
- Science and Art in the Arctic: 9th Grade residency, Falmouth Academy, MA, Apr 2014 and 2015.
 - Week-long residency with collaborating artist to fuse science and art.
 - Ran two days of classes on the changing ice and biology of the Arctic Ocean.
- Global Weather: Series of workshops about global weather patterns and relating this to climate through art projects, May 2010.
- School Visits: Numerous in-class visits to schools in UK and US to talk about expeditions, environmental sciences and careers, 2008-present
- Physical Oceanography Instructor: Woods Hole Partnership Educational Program (PEP), Jun 2015.
 - Four days of hands-on classes in ocean physics and data analysis.
 - Writing for voice

Science Communication

- *North Atlantic Story Project* (northatlanticstory.org): Outreach website about impact of North Atlantic circulation on our lives. Part of OSNAP project.
- Expedition videographer: Filmed, edited and posted video to websites on numerous expeditions (see Fieldwork Experience)
- Outreach coordinator: Overall outreach coordinator for three cruises including producing websites, recruiting personnel, coordinating activities and schools liaison (see Fieldwork Experience).
- Radio producer:
 - Two month training with public radio organization *Transom.org*, May-Jun 2013.
 - Public Radio Exchange STEM Story Project awardee (\$1,350), June 2014.
 - Pieces aired across US – most recent story aired nationally on *PRI's The World*, Dec 2014.
- *To the Denmark Strait: Oceanographers search for a mysterious current*, 2013, my videos were featured in this book about ocean science in the North Atlantic.
- Videos featured as a teaching aid for the i2 STEM Camp in New York City and Boston, Summer 2014.
- Twice interviewed on local radio WCAI about expeditions to the Arctic.
- AGU Ocean Sciences Conference, Honolulu, HI – Poster presentation: *Communicating oceanography from research vessels*, Feb 2014
- *A Mighty Wind*: Popular science article about Greenland in NERC Magazine *Planet Earth*.
- COSEE Gears Professional Development Workshop attendee, Feb 2014.

Awards and Appointments

- Appointed member of the US CLIVAR AMOC working group.

- Public radio Exchange STEM Story Project award for radio story on mathematics of sea ice, 2014.
- Winner of Environmental Physics Essay Competition, Institute of Physics, UK, 2012.
- Best Student Poster, 11th Conference on Polar Meteorology and Oceanography, Boston, MA, 2011.
- Best Oral Presentation – runner up at University-wide Postgraduate Showcase, University of East Anglia, 2010.

Fieldwork Experience

- Chief Scientist – four voyages aboard the SSV Robert C. Seamans as part of SEA Semester (Oct 2015, Feb 2016, Oct 2016, Oct 2017).
- Outreach Coordinator for team of seven: SUBICE – investigating under-ice plankton blooms in the Chukchi Sea aboard USCGC Healy. (www.arcticspring.org), May 2014.
- Outreach Coordinator for team of three: Warm water pathways into the Eurasian Arctic aboard Lance (www.whoi.edu/warmingarctic), Sept 2013.
- Lead Physical Oceanographer: Ocean-Ice interactions, Upernavik fjord, Greenland, Aug 2013.
- Data processor: Measurements of the North Icelandic Jet in Denmark Strait aboard Bjarni (MRI, Iceland), Feb 2013.
- Outreach Coordinator for team of four: Mooring recoveries in the East Greenland Current aboard James Clark Ross (www.greenlandsfrozenoast.com), Sept 2012.
- Outreach videographer: Mooring deployments in the Denmark Strait aboard R/V Knorr (www.whoi.edu/denmarkstrait), Aug 2011.
- Science Crew: Shelf-basin exchange in the Beaufort Sea aboard USCGC Healy, Sept 2010.
- Science Crew/Radiosonde Coordinator: Dense water spilling from the Greenland shelf aboard R/V Knorr.

Professional talks and Presentations

- Radcliffe Center for Advanced Study, Harvard, MA, Jun 2016
 - Public Talk: Where does the Gulf Stream go?
- WHOI Seminar, Woods Hole, MA, May 2016
 - Upstream Sources of the Denmark Strait Overflow
- Mass. Marine Educator Conference, Woods Hole, MA, Apr 2016
 - Public Talk: Where does the Gulf Stream go?
- Ocean Sciences Conference, New Orleans, USA, Feb 2016
 - Oral presentation: Upstream sources of the Denmark Strait Overflow.
- International AMOC Conference, Bristol UK, Jul 2015
 - Poster presentation: Upstream sources of the Denmark Strait Overflow.
- AGU Ocean Sciences Conference, Honolulu, HI, Feb 2014
 - Oral presentation: Moored observations of the North Icelandic Jet.
 - Poster presentation: Communicating oceanography from research vessels.
- Guest Seminar, University of Bergen, Norway, Jul 2013.
- U.S. CLIVAR International Workshop, Beverly, MA, Jun 2013
 - Poster presentation: Hydrographic variability at the mouth of Sermilik Fjord and the impact of winds.

- American Meteorological Society 11th Conference on Polar Meteorology and Oceanography, Boston, MA, May 2011.
 - Oral presentation: Cross-slope transport of dense water from the east Greenland shelf and the role of barrier winds.
 - Poster presentation: A climatology of wintertime barrier winds off southeast Greenland.
- Departmental Seminar, Woods Hole Oceanographic Institution, MA, Jan 2011.
- Departmental Seminar, University of East Anglia, UK, Nov 2010.
- International Polar Year Conference, Oslo, Norway, Jun 2010.
 - Oral presentation: East Greenland barrier winds: A climatology and ocean impacts.
- UK Polar Network Workshop, British Antarctic Survey, Cambridge, UK, May 2010.
 - Poster presentation: Orographically enhanced winds near Greenland and their impact on ocean circulation.