

# Sarah Purkey

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## Education

- Ph.D. Oceanography, University of Washington, Aug. 2014. Dissertation Title: The Abyssal Ocean's Contributions to the Global Energy and Sea Level Budgets Between the 1990s and 2000s. Thesis committee: Drs. Gregory Johnson (Chair), Susan Hautala and Mark Warner.
- Graduate Certificate in Climate Science, Program on Climate Change, University of Washington, Jan. 2013.
- M.S. Oceanography, University of Washington, May 2010.
- B.A. Mathematics-Physics, Whitman Collage, May 2005.

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## Research and Teaching Positions

- Assistant Professor, Climate, Atmospheric Science & Physical Oceanography (CASPO), Scripps Institution of Oceanography (SIO), University of California, San Diego, Mar. 2017- present.
- Postdoctoral Research Scientist, Ocean and Climate Physics, Lamont-Doherty Earth Observatory of Columbia University, Nov. 2014-Feb. 2017.
- Lecturer, Columbia University Department of Earth and Environmental Sciences, Climate Systems, co-taught with Mingfang Ting and Gisela Winckler, Spring 2015.
- Graduate Research Assistant, School of Oceanography, University of Washington, Advisor: Gregory C. Johnson, Jun. 2008-Aug. 2014.
- Graduate Research Assistant, NASA funded University of Washington High School Climate Science Project, University of Washington, Prof.: LuAnne Thompson, Mar.-Jun. 2011.
- Graduate Teaching Assistant, Physical Processes in the Ocean, University of Washington, Prof.: Mitsuhiro Kawase, Jan.-Mar. 2010.  
Research Scientist, JISAO, University of Washington, Advisor: Gregory C. Johnson, Aug. 2007-Jun. 2008.
- High School Teacher, Educational Advancement Academy, Seattle, WA, Mar. - Jun. 2007.

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## Fellowships and Awards

- GO-SHIP Postdoctoral Fellowship, 2016-2017.
- Lamont-Doherty Earth Observatory Postdoctoral Fellowship, 2014-present.
- University of Washington Graduate School, Distinguished Dissertation Award in Physical Science & Engineering, 2015.
- NASA Earth and Space Science Fellowship (NESSF), 2011-2014.

- NASA MPOWIR Speaker Series, 2013
- NOAA/PMEL Outstanding Scientific Papers, 2011

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## **Publications**

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- Desbruyères, D. G., S. G. Purkey, E. L. McDonagh, G. C. Johnson, B. A. King, 2016. Deep and Abyssal Ocean Warming from 35 years of Repeat Hydrography. *Geophysical Research Letters*, 43:10356-10365.
- Johnson, G. C., J. M. Lyman, and S. G. Purkey. 2015. Informing Deep Argo array design using Argo and full-depth hydrographic section data. *Journal of Atmospheric and Oceanic Technology*, **32**, 2178-2198, doi:10.1175/JTECH-D-15-0139.1.
- Purkey, S. G., G. C. Johnson, and D. P. Chambers, 2014. Relative contributions of ocean mass and deep steric changes to sea level rise between 1993 and 2013. *Journal of Geophysical Research: Oceans*, 119, 7509-7522, doi:10.1002/2014JC010180.
- Purkey, S. G. and G. C. Johnson. 2013. Antarctic Bottom Water warming and freshening: Contributions to sea level rise, ocean freshwater budgets and global heat gain. *Journal of Climate*, 26, 6105-6122. doi: 10.1175/JCLI-D-12-00834.1.
- Purkey, S. G. and G. C. Johnson. 2011. Global contraction of Antarctic Bottom Water between the 1980s and 2000s. *Journal of Climate*, 25, 5830-5844, doi:10.1175/JCLI-D-11-00612.1.
- Purkey, S. G., and G. C. Johnson. 2010. Warming of global abyssal and deep Southern Ocean waters between the 1990s and 2000s: Contributions to global heat and sea level rise budgets. *Journal of Climate*, 23, 6336-6351, doi:10.1175/2010JCLI3682.1.
- Johnson, G. C., and S. G. Purkey. 2009. Deep Caribbean Sea warming. *Deep-Sea Research I*, 56, 827-843, doi:10.1016/j.dsr.2008.12.011.
- Johnson, G. C., S. G. Purkey, and J. M. Toole. 2008. Reduced Antarctic meridional overturning circulation reaches the North Atlantic Ocean. *Geophysical Research Letters*, 35, L22601, doi:10.1029/2008GL035619.
- Johnson, G. C., S. G. Purkey, and J. L. Bullister. 2008. Warming and freshening in the abyssal southeastern Indian Ocean. *Journal of Climate*, 21, 5351-5363, doi:10.1175/2008JCLI2384.1.

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## **Reports and Other Publications**

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- Purkey, S. G., Desbruyères D, and N. Zilberman. 2015. Warming the abyss: the deep ocean's contribution to global warming, *US CLIVAR Variations* 13.3: 15-20.
- Johnson, G. C. and S. G. Purkey. 2013. Global oceans: Slow-down of the lower, southern limb of the meridonal overturning circulation in recent decades. In *State of the Climate in 2012*, Blunden, J., and D. S. Arndt, Eds., *Bulletin of the American Meteorological Society*, 94, 8, S68-S69.
- Contributing Author "Chapter 3: Observations: Oceans" for "Climate Change 2013: The Physical Science Basis", Contribution of Working Group I to the Intergovernmental Panel on Climate Change Fifth Assessment Report.

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### **Publications in Preparation**

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- Purkey, S. G., W. M. Smethie Jr., and S. S. Jacob, A declining ventilation rate of Antarctic Bottom Water within the Ross Gyre. *Journal of Geophysical Research: Oceans*, *in prep.*
- D. Roemmich, P. Woodworth, S. Jevrejeva, S. Purkey, M. Lankhorst, U. Send, N. Maximenko, “Chapter 4: *In situ* observations needed to complement, validate, and interpret satellite altimetry”. *Earth Observation of Global Changes*. Ed. CRS press. *in prep.*

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### **Professional Service Activities**

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- Organizer, University of Washington Program on Climate Change Graduate Student Seminar (2012-2014)
- Lead Science Program Organizer, 6th Graduate Climate Conference, Pack Forest, WA, 2012
- Reviewer for *Journal of Climate*, *Journal of Geophysical Research*, *Geophysical Research Letters*, *Nature*, *Science* and *Ocean Modelling*
- Member (2009-present) American Geophysical Union
- Member (2013-2014) American Meteorological Society

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### **Field Work**

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- NOAA Ship Ronald H. Brown, 29 Dec. 2016 – 2 Feb. 2017 (35 days), GO-SHIP section P18, Easter Island-Punta Arenas, Co-chief scientist.
- R/V Fairweather, 3 Aug.-11 Aug. 2013 (8 DAS), North America Carbon Program West Coast Coastal Carbon Survey, Pacific North America Coast, Seattle, WA-Newport, OR, CTD watch-stander/CTD Processing.
- R/V Wecoma, 11 Aug.-3 Sep. 2011 (24 DAS), North America Carbon Program West Coast Coastal Carbon Survey, Pacific North America Coast, Newport, OR, CTD watch-stander/CTD Processing/Salinity Analysts.
- R/V Roger Revelle, 20 Mar.-13 May 2009 (55 DAS), U.S. CLIVAR/CO2 Repeat Hydrography Program Section I05, 32oS, Capetown-Fremantle, CTD watch-stander.
- NOAA Ship Ronald H. Brown, 29 Mar.-12 Apr. 2008 (43 DAS), Southern Ocean Gas Exchange Experiment, South Atlantic, Punta Arenas-Montevideo, CTD watch-stander/CTD Processing/Salinity Analysts.
- NOAA Ship Ronald H. Brown, 21 Jan.-23 Feb. 2008 (34 DAS), U.S. CLIVAR/CO2 Repeat Hydrography Program Section P18, 103oW, Easter Island-Punta Arenas, CTD watch-stander.

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### **Conferences and Presentations**

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- Purkey, S. G., Smethie, W., Jacobs, S., 2016. A declining ventilation rate of Antarctic Bottom Water within the Ross Gyre, Ocean Sciences, New Orleans, LA, 22-26 Feb.
- Purkey, S. G., Desbruyères D., 2016. Recent variability in the heat and carbon inventory of the deep ocean, Ocean Sciences, New Orleans, LA, 22-26 Feb, Invited Poster.

- Purkey, S. G., Desbruyères D., and N. Zilberman, 2015. Warming the abyss: the deep ocean's contribution to global warming, US CLIVAR Summit, Tucson, AZ, 4-6 Aug, Invited.
- Purkey, S. G., 2015. Deep ocean warming, NASA SMART Cable Workshop, Honolulu, HI, 25-27 May, Invited.
- Purkey, S. G., 2015. Deep ocean heat and steric sea level, Deep Argo Workshop, Hobart, Australia, 5-7 May.
- Purkey, S. G., G. C. Johnson, D. P. Chambers, 2014. Regional and global rates of ocean mass addition between 1006-2006 from a full depth sea level rise budget, AGU Fall Meeting, San Francisco, CA, 15–19 Dec., Abstract G31B-08.
- Purkey, S. G. and G. C. Johnson. 2013. Warming, freshening, and contraction of Antarctic Bottom Water between the 1980s and 2000s”, Joint US CLIVAR and OCB workshop: Ocean's Carbon and Heat Uptake, San Francisco, CA, 12–14 Dec.
- Purkey, S. G., and G. C. Johnson. 2014. Warming, freshening, and contraction of Antarctic Bottom Water between the 1980s and 2000s, Ocean Sciences Meeting, Honolulu, HI, 24-28 Feb.
- Johnson, G. C., J. M. Lyman, S. G. Purkey. 2014. A straw plan for deep Argo: Abyssal temperature signals and sampling implications of noise estimates from oceanographic section data, Ocean Sciences Meeting, Honolulu, HI, 24-28 Feb.
- Purkey, S. G. and G. C. Johnson. 2013. Warming, freshening, and contraction of Antarctic Bottom Water between the 1980s and 2000s, NASA MPOWIR invited speaker. Jet Propulsion Laboratory, Pasadena, CA, 10 June 2013.
- Purkey, S. G. and G. C. Johnson. 2013. warming, freshening, and contraction of Antarctic Bottom Water between the 1980s and 2000s”, 12th Conference on Polar Meteorology and Oceanography, Seattle, WA, 30 April- 2 May 2013. Poster.
- Purkey, S. G. and G. C. Johnson, 2013. Antarctic Bottom Water warming and freshening; Contributions to sea level rise, ocean freshwater budgets, and global heat gain, Polar Marine Science Gordon Research Seminar, Ventura, CA, 9-15 March 2013.
- Purkey, S. G. and G. C. Johnson, 2013. Antarctic Bottom Water warming and freshening; Contributions to sea level rise, ocean freshwater budgets, and global heat gain, Polar Marine Science Gordon Research Conference, Ventura, CA, 9-15 March 2013. Poster.
- Johnson, G. C., S. G. Purkey, S. Rintoul, and J. Swift. 2013. Warming, contraction, and freshening of Antarctic Bottom Water since the 1990s, with a potential ice-sheet feedback loop. EGU General Assembly, Vienna, Austria, 3–7 Dec., Abstract EGU2013-1640, invited (Georg Wüst Prize keynote lecture).
- Johnson, G. C., and S. G. Purkey. 2012. Warming and freshening of Antarctic Bottom Water since the 1990s: Implications for heat and freshwater budgets, circulation changes, and sea level rise. AGU Fall Meeting, San Francisco, CA, 3–7 Dec., Abstract OS23C-01, invited.
- Purkey, S. G., and G. C. Johnson. 2012. The contribution of deep Southern Ocean warming and freshening to sea level rise since the 1980s. Graduate Climate Conference, Pack Forest, WA, 26-18 Oct.

- Purkey, S. G., and C. C. Johnson. 2012. Recent deep Southern Ocean changes in water masses and circulation. University of Washington Program on Climate Change Annual Summer Institute on “Atmosphere-Ocean-Ice Shelf Interactions”, University of Washington Friday Harbor Laboratories, Friday Harbor, WA, 16–18 Sep., invited.
- Purkey, S. G., and G. C. Johnson. 2012. A slow down of Antarctic Bottom Water production and circulation between the 1980s and 2000s. Ocean Sciences Meeting, Salt Lake City, UT, 20-25 Feb., Abstract 9660, invited.
- Johnson, G. C., and S. G. Purkey. 2011. Southern Ocean hydrography and circulation: Warming of global abyssal and deep Southern Ocean waters between the 1990s and 2000s. World Climate Research Program Open Science Conference: Climate Research in Service to Society, Denver, CO, 24–28 Oct.
- Purkey, S. G., and G. C. Johnson. 2010. Contributions of the abyssal global ocean and the deep Southern Ocean to the sea level budget between 1990s-2000s. AGU Fall Meeting, San Francisco, CA, 13-17 Dec., Abstract G51D-08, invited.
- Purkey, S. G., and G. C. Johnson. 2010. Antarctic Bottom Water warming since the 1990s and implications for global heat and sea level budgets. Graduate Climate Conference, Pack Forest, WA, 15-17 Oct.
- Purkey, S. G., and G. C. Johnson. 2010. Antarctic Bottom Water warming since the 1990s and implications for global heat and sea level budgets. International Meeting of Students in Physical Oceanography, Seattle, WA, 22-24 Sep.
- Johnson, G. C., J. M. Lyman, and S. G. Purkey. 2010. Ocean heat uptake. 2010 Program on Climate Change Summer Institute: “Climate Feedbacks”, University of Washington Friday Harbor Laboratories, Friday Harbor, WA, 15–17 Sep., invited.
- Purkey, S. G., and G. C. Johnson. 2010. Antarctic Bottom Water warming since the 1990s and implications for global heat and sea level budgets. Deep Ocean Workshop, Hobart, Australia, 21-23 Jun.
- Johnson, G. C., and S. G. Purkey. 2010. AABW warming between the 1990s and 2000s. Deep Ocean Workshop, Hobart, Australia, 21–23 Jun., invited.
- Purkey, S. G., and G. C. Johnson. 2010. Antarctic Bottom Water warming since the 1990s and implications for global heat and sea level budgets. Ocean Sciences Meeting, Portland, OR, 22-26 Feb., Abstract IT35M-02.
- Wiederwohl, C. L., A. H. Orsi, G. C. Johnson, and S. G. Purkey. 2009. Assessing the effect of Ross Sea source water mass variability on bottom waters offshore. AGU Fall Meeting, San Francisco, CA, 14-18 Dec., Abstract C43C-0517.
- Johnson, G. C., S. G. Purkey, J. L. Bullister, A. H. Orsi, C. S. Wiederwohl, M. J. Warner, S. Mecking, B. M. Sloyan, S. E. Wijffels, and S. C. Doney. 2008. Recent decadal warming and freshening of Antarctic-derived abyssal waters. AGU Fall Meeting, San Francisco, CA, 15-19 Dec., Abstract OS11E-07.
- Purkey, S. G., and K. Hoffman. 2005. Building a tunable dye laser for spectroscopy on Europium doped CaF<sub>2</sub> crystals. Whitman Undergraduate Conference, Walla Walla, WA.