

**SABINE MECKING
CURRICULUM VITAE**

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EDUCATION

Ph.D., Oceanography, University of Washington, Seattle, 2001
M.S., Oceanography, University of Washington, Seattle, 1997
Vordiplom (“Intermediate Diploma”), Oceanography, Universität Hamburg, Germany, 1993

EMPLOYMENT

2012-present: Principal Oceanographer, Applied Physics Laboratory, University of Washington, Seattle
2010-present: Affiliate Assistant Professor, School of Oceanography, University of Washington, Seattle
2006-2012: Oceanographer IV/Senior Oceanographer, Applied Physics Laboratory, University of Washington, Seattle
2004-2006: Visiting Scholar, School of Oceanography, University of Washington, Seattle
2004-2006: Research Associate III, Woods Hole Oceanographic Institution, Woods Hole
2003-2004: Postdoctoral Investigator, Woods Hole Oceanographic Institution, Woods Hole
2002-2003: Postdoctoral Scholar, Woods Hole Oceanographic Institution, Woods Hole
1994-2001: Graduate Student Research Assistant, School of Oceanography, University of Washington, Seattle
1998, 1999: Teaching Assistant, School of Oceanography, University of Washington, Seattle
1992-1993: Student Research Assistant, Department of Meteorology, Universität Hamburg, Hamburg, Germany
1990-1991: Software Engineer, Deutsche Lufthansa AG, Hamburg, Germany
1987-1990: Apprentice “Mathematico-technical Assistant”, Deutsche Lufthansa AG, Frankfurt, Germany

PROFESSIONAL SOCIETIES

American Geophysical Union

AWARDS

Best presentation by young scientist at POC topic session, PICES Meeting, October 2004
Postdoctoral scholarship, Woods Hole Oceanographic Institution, 2002-2003

PROFESSIONAL SERVICES

Panel member for NSF Fall 2013 Chemical Oceanography proposal review

Working group on changes to NOAA Climate Program Office's grant program (ACC/GCC), June 2012

Session co-organizer at 2012 Ocean Sciences Meeting: "Oceanic Oxygen Content: Observed Physical and Chemical Processes and Climate Related Changes in the Past, Present and Future"

Panel member for NASA 2007 ROSES Carbon Cycle Science proposal call

Proposal reviews for NSF, NOAA, and NASA

Journal article reviews for *Journal of Physical Oceanography*, *Journal of Geophysical Research*, *Geophysical Research Letters*, *Journal of Marine Research*, *Deep-Sea Research*, *Global Biogeochemical Cycles*, *Biogeosciences*, and *Nature*

OUTREACH

NSF science fair for Congress (invited)

Co-chair 5th grade science fair committee at John Stanford International School (Seattle)

Presentations on physical oceanography, climate change, and ocean acidification in K-12 schools
ORCA bowl judge

High-school science fair judge

CRUISE AND FIELD WORK

R/V Melville, Pacific Ocean hydrographic cruise, CLIVAR P2E (Chief scientist), 25 days, 2013
(cruise blog at www.clivarp2e.blogspot.com)

R/V Revelle, Indian Ocean hydrographic cruise, CLIVAR I9N (Co-chief scientist), 41 days, 2007

R/V Thompson, Pacific Ocean hydrographic cruise, CLIVAR P16N (Co-chief scientist), 21 days, 2006

Guiana Abyssal Gyre Experiment (GAGE)/Vex Fracture Zone Exploratory (VEX) Measurement Program, Tropical Atlantic hydrography and mooring survey (preparation of CFC/CCl₄ sampling on *R/V Knorr*, onshore analysis of samples), 2002

R/V Thompson, Univ. Wash. North Pacific student cruise, GS2000 (CFC sampling and analysis, cruise and station planning), 10 days, 2000

R/V Thompson, Univ. Wash. North Pacific student cruise, STUD97 (CFC sampling and analysis, cruise and station planning), 21 days, 1997

R/V Thompson and *R/V Barnes*, short Puget Sound and coastal cruises (CFC sampling and analysis, O₂ sampling, CTD operations), ~10 days total, 1995-1999

R/V Knorr, Indian Ocean hydrographic cruise, WOCE I1 (CFC sampling and analysis), 31 days, 1995

F/S Heincke, North Atlantic hydrography and biological sampling (CTD deployment, microplankton sampling, sieving and preservation), 14 days, 1994

F/S Valdivia, Greenland Sea hydrography (CTD watch, oxygen sampling), 21 days, 1994

PUBLICATIONS

Peer-reviewed

*Trossman, D. S., L. Thompson, **S. Mecking**, M. J. Warner, F. Bryan, and S. Peacock, 2014. Evaluation Of Oceanic Transport Parameters Using Transient Tracers From Observations and Model Output. *Ocean Modelling*, **74**, 1-21, doi:10.1016/j.ocemod.2013.11.001.

*Shao, A. E., **S. Mecking**, L. Thompson, and R. E. Sonnerup, 2013. Mixed Layer Saturations of CFC-11, CFC-12, and SF₆ in a Global Isopycnal Model. *Journal of Geophysical Research*, **118**, 4978–4988, doi:10.1002/jgrc.20370.

Sonnerup, R.E., **S. Mecking**, and J. L. Bullister, 2013. Transit Time Distributions and Oxygen Utilization Rates in the Northeast Pacific Ocean from Chlorofluorocarbons and Sulfur Hexafluoride. *Deep-Sea Research Part I*, **72**, 61-71, doi:10.1016/j.dsr.2012.10.013.

*Trossman, D. S., L. Thompson, **S. Mecking**, and M. J. Warner, 2012. On the formation, ventilation, and erosion of mode waters in the North Atlantic and Southern Oceans. *Journal of Geophysical Research*, **117**, C09026, doi: 10.1029/2012JC008090.

Byrne, R. H., **S. Mecking**, R. A. Feely, and X. Liu, 2010. Direct observations of basin-wide acidification of the North Pacific Ocean. *Geophysical Research Letters*, **37**, L02601, doi:10.1029/2009GL040999. (Editor's highlight and cover page)

Macdonald, A. M., **S. Mecking**, P. E. Robbins, J. M. Toole, G. C. Johnson, L. Talley, M. Cook, and S. E. Wijffels, 2009. The WOCE-era 3-D Pacific Ocean circulation and heat budget. *Progress in Oceanography*. **82**, 281-325, doi:10.1016/j.pocean.2009.08.002.

Mecking S., C. Langdon, R. A. Feely, C. L. Sabine, C. A. Deutsch, and D.-H. Min, 2008. Climate variability in the North Pacific thermocline diagnosed from oxygen measurements: An update based on the U.S. CLIVAR/CO₂ repeat hydrography cruises. *Global Biogeochemical Cycles*, **22**, GB3015, doi:10.1029/2007GB003101.

Sabine, C. L., R. A. Feely, F. J. Millero, A. G. Dickson, C. Langdon, **S. Mecking**, and D. Greeley, 2008. Decadal Changes in Pacific Carbon. *Journal of Geophysical Research*, **113**, C07021, doi: 10.1029/2007JC004577.

Johnson, G. C., **S. Mecking**, B. M. Sloyan, S. E. Wijffels, 2007. Recent bottom water warming in the Pacific Ocean. *Journal of Climate*, **20**, 5365-5375.

Sonnerup, R. E., J. L. Bullister, and **S. Mecking**, 2007. Circulation rate changes in the eastern subtropical North Pacific based on chlorofluorocarbon ages. *Geophysical Research Letters*, **34**, L08605, DOI: 10.1029/2006GL028813.

Mecking, S., M. J. Warner, and J. L. Bullister. 2006. Temporal changes in pCFC-12 ages and AOU along two hydrographic sections in the eastern subtropical North Pacific. *Deep-Sea Research*, **53(1)**, 169-187, doi: 10.1016/j.dsr.2005.06.018.

Mecking, S., M. J. Warner, C. E. Greene, S. L. Hautala, and R. E. Sonnerup. 2004. The effects of mixing on CFC concentrations and CFC-derived age distributions in the North Pacific thermocline. *Journal of Geophysical Research*, **109**, C07014, doi: 10.1029/2003JC001988.

Emerson, S., Y. W. Watanabe, T. Ono, and **S. Mecking**, 2004. Temporal trends in apparent oxygen utilization in the upper pycnocline of the North Pacific: 1980–2000. *Journal of Oceanography*, **60(1)**, 139-147.

Feely, R. A., C. L. Sabine, R. Schlitzer, J. L. Bullister, **S. Mecking**, and D. Greeley. 2004. Oxygen utilization and organic carbon remineralization in the Pacific Ocean. *Journal of Oceanography*, **60(1)**, 45-52.

Mecking, S., and M. J. Warner, 2001. The subsurface CFC maxima in the North Pacific thermocline and their relations to oxygen maxima and mode waters. *Journal of Geophysical Research*, **106(C10)**, 22,179–22,198.

Emerson, S., **S. Mecking**, and J. Abell, 2001. The biological pump in the subtropical North Pacific Ocean: Nutrient sources, Redfield ratios, and recent changes. *Global Biogeochemical Cycles*, **15(3)**, 535–554.

Mecking, S., and M. J. Warner, 1999. Ventilation of Red Sea Water with respect to chlorofluorocarbons. *Journal of Geophysical Research*, **104(C5)**, 11,087–11,097.

(* = graduate student as first author)

Other

Sprintall, J., and **S. Mecking**, 2007. Decadal Changes Evident from CLIVAR Repeat Hydrography Section I9N: More Women Oceanographers at Sea! U.S. CLIVAR *Variations*, **V5N2**.

Mecking, S., 2003. CFC and CCl₄ Measurements on GAGE/VEX Cruise 2002. Data report submitted to Deborah West at WHOI as part of VEX data report required by the French government.

Mecking, S., 2001. Spatial and temporal patterns of chlorofluorocarbons in the North Pacific thermocline: A data and modeling study. Ph.D. thesis, University of Washington, Seattle, WA, 272 pp.

Mecking, S., 1997. Ventilation of Red Sea Water with respect to chlorofluorocarbons. M. Sc. thesis, University of Washington, Seattle, WA, 99 pp.

INVITED MEETINGS AND TALKS

NSF EarthCube End-User Workshop for Ocean Ecosystem Dynamics, Woods Hole, MA, October 7-8, 2013.

Stanford University, EESS Departmental Seminar, March 2013. Seminar Title: “Ocean Decadal Variability and Trends: Observations from the CLIVAR/CO₂ Repeat Hydrography Program”.

CLIDEEP Workshop: Climate Change Consequences on Deep Sea Biota, Friday Harbor, WA, May 11-15, 2012. Presentation on hydrographic data sets and observed trends in temperature, oxygen, and pH.

Coalition for National Science Funding 16th Annual Exhibition and Reception (Science Fair for Congress), Capitol Hill, Washington, D.C., April 14, 2010. Poster Presentation: “Directly Measuring Ocean Acidification” (together with R. H. Byrne from USF).

Understanding North Pacific Carbon-Cycle Changes: A Data Synthesis and Modeling Workshop, Seattle, WA, June 2-4, 2004. Participation in Working Group 2 (“How and why are the North Pacific distribution patterns of carbon, nutrients and oxygen in the water column changing with time?”) and Plenary Sessions.

MEETING ABSTRACTS

- Macdonald, A. M., and **S. Mecking**, 2013. Towards understanding the role of circulation in the North Atlantic carbon budget. IAHS-IAPSO-IASPEI Joint Assembly, Gothenburg, Sweden. Abstract P10PS.04.
- Macdonald, A. M., X. J. Davis, and **S. Mecking**, 2012. Pacific Heat and Carbon Transports: Preliminary Results. *CLIVAR/GSOP Workshop*, Woods Hole, MA.
- Shao, A. E., **S. Mecking**, L. Thompson, and R. E. Sonnerup, 2012. Modeling the Mixed Layer Saturation of CFC-11, CFC-12, and SF₆. SOLAS Open Science Conference, Cle Elum, WA.
- Mecking, S.**, G. C. Johnson, J. L. Bullister, A. M. Macdonald, 2012. Decadal Changes in Oxygen and Temperature-Salinity Relations Along 32°S in the Indian Ocean Through 2009. *Eos Trans. AGU*, Ocean Sci. Meet. Suppl., Abstract 10467.
- Shao, A. E., **S. Mecking**, L. Thompson, and R. E. Sonnerup, 2012. Modeling the Mixed Layer Saturation of CFC-11, CFC-12, and SF₆. *Eos Trans. AGU*, Ocean Sci. Meet. Suppl., Abstract 10603.
- Trossman, D. S., L. Thompson, **S. Mecking**, M. J. Warner, A. W. Skiba, L. Zeng, and B. K. Arbic, 2012. Towards Parameterizing Along-Isopycnal Diffusivity and Finding Best Estimates of Mode Water Ventilation in the North Atlantic and Southern Oceans. *Eos Trans. AGU*, Ocean Sci. Meet. Suppl., Abstract 9326.
- Mecking, S.**, A. M. Macdonald, D. and S. Trossman, 2010. Biogeochemical Cycling Rates in the Atlantic Ocean. *Eos Trans. AGU*, 91(26), Ocean Sci. Meet. Suppl., Abstract IT15L-07.
- Sonnerup, R., **S. Mecking**, J. L. Bullister, and C. L. Sabine, 2010. Sulfur Hexafluoride in the Eastern North Pacific Ocean. *Eos Trans. AGU*, 91(26), Ocean Sci. Meet. Suppl., Abstract CO11A-03.
- Trossman, D. S., L. Thompson, M. J. Warner, and **S. Mecking**, 2010. Transit Time Distribution Estimation in the North Atlantic and Southern Oceans. *Eos Trans. AGU*, 91(26), Ocean Sci. Meet. Suppl., Abstract PO15F-06.
- 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. *Eos Trans. AGU*, 89(53), Fall Meet. Suppl. Abstract OS11E-07.
- Talley, L. D., J. Sprintall, E. McDonagh, J. S. Swift, **S. Mecking**, and N. Bindoff, 2008. Global-scale Decadal Changes in Salinity and Oxygen Based on Recent Repeat Hydrographic Sections. *Eos Trans. AGU*, Ocean Sci. Meet. Suppl., Abstract 1611.
- Mecking, S.**, C. Langdon, R. A. Feely, C. L. Sabine, C. A. Deutsch, J. H. Swift, P. E. Robbins, and D.-H. Min, 2007. Decadal Variability in the North Pacific Thermocline Diagnosed from Oxygen Measurements: Results from the U.S. CLIVAR/CO₂ Repeat Hydrography Cruises. Ocean Carbon and Biogeochemistry Workshop, Woods Hole, MA.
- Talley, L., N. Bindoff, C. LeQuere, G. C. Johnson, **S. Mecking**, J. Swift, J. Sprintall, I. Yashayev, N. Gruber, and R. Feely, 2007. Large-scale variability in Salinity and Oxygen Based on Recent Repeat Hydrographic Sections. IUGG Perugia, Session JPS001 (invited).
- Sabine, C. L., R. A. Feely, F. J. Millero, A. Dickson, **S. Mecking**, R. Wanninkhof, and D. Greeley, 2006. Decadal Changes in Pacific Ocean Inorganic Carbon Inventory. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract OS33D-05 (invited).
- Mecking, S.**, C. Langdon, R. A. Feely, C. L. Sabine, J. H. Swift, D. Min, and P. E. Robbins, 2006. Climate Variability in the North Pacific Thermocline Diagnosed from Oxygen

- Measurements: An Update Based on the U.S. CLIVAR/CO₂ Repeat Hydrography Cruises. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract OS33D-06.
- Talley, L., N. Bindoff, C. LeQuere, R. Feely, G. C. Johnson, C. Sabine, **S. Mecking**, J. Swift, N. Gruber, and C. Deutsch, 2006. Overview of Decadal Variations in Salinity, Oxygen and Nutrients Based on Recent Repeat Hydrographic Sections. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract OS33D-01 (invited).
- Johnson, G. C., S. C. Doney, **S. Mecking**, B. M. Sloyan, and S. E. Wijffels, 2006. Abyssal Temperature Variability and the Global Ocean Heat Budget. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract OS41D-05 (invited).
- Sonnerup, R., J. Bullister, **S. Mecking**, and C. Deutsch, 2006. Circulation rate changes in the Eastern Subtropical North Pacific based on chlorofluorocarbon ages. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract OS33D-08.
- Byrne, R. H., X. Liu, **S. Mecking**, and R. A. Feely, 2006. Acidification of the North Pacific Ocean: Direct Observations of pH in 1991 and 2006. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., OS21C-1598.
- Cook, M. F., A. M. Macdonald, **S. Mecking**, J. M. Toole, P. E. Robbins, G. C. Johnson, L. D. Talley, and S. E. Wijffels, 2006. The WOCE-Era 3-D Pacific Ocean Circulation, *Eos Trans. AGU*, 87(36), Ocean Sci. Meet. Suppl., Abstract OS45G-15.
- Mecking, S.**, M. S. McCartney, C. Mauritzen, and K. L. Polzin, 2006. Abyssal Transport and Mixing in the Vema Fracture Zone. *Eos Trans. AGU*, 87(36), Ocean Sci. Meet. Suppl., Abstract OS36A-14.
- Emerson, S. R., Y. W. Watanabe, T. Ono, **S. Mecking**, and C. Deutsch, 2004. Temporal Trends In Apparent Oxygen Utilization In The Upper Pycnocline Of The North Pacific. *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract OS24B-03 (invited).
- Mecking, S.**, M. J. Warner, and J. L. Bullister, 2004. Age and AOU Increases at the North Pacific Subtropical-Subpolar Gyre Boundary. PICES 13th Annual Meeting, Honolulu, HI.
- Mecking, S.**, P. Robbins, A. Macdonald, and J. Toole, 2004. Oxygen Utilization and Nutrient Remineralization Rates in the Pacific Ocean. European Geophysical Union General Assembly, Nice, France.
- Macdonald, A. M., P. E. Robbins, **S. Mecking**, J. M. Toole, G. C. Johnson, S. E. Wijffels, and L. D. Talley, 2002. Oceanic heat flux within the Pacific basin: A WOCE synthesis. WOCE Final Conference, San Antonio, TX.
- Bullister, J. L., R. E. Sonnerup, R. A. Fine, D. Min, S. Mecking, W. M. Smethie, Jr., M. J. Warner, and R. F. Weiss, 2002. The WOCE Pacific CFC Survey. WOCE Final Conference, San Antonio, TX.
- Emerson, S. and **S. Mecking**, 2002. Recent Changes in the AOU of the Upper Thermocline in the North Pacific Ocean. *EOS Trans. AGU*, 83(4), Ocean Sci. Meet. Suppl., Abstract OS31J-01 (invited).
- Mecking, S.**, M. J. Warner, S. L. Hautala, C. E. Greene, 2002. The Influence of Mixing on the Ventilation of the North Pacific Thermocline. *EOS Trans. AGU*, 83(4), Ocean Sci. Meet. Suppl., Abstract OS41B-14.
- Mecking, S.**, and M. J. Warner, 2000. Effects of Mixing on Tracer-Derived Ventilation Ages in the North Pacific Thermocline. *Eos Trans. AGU*, 81(48), Fall Meet. Suppl., Abstract OS12E-11.
- Emerson, S., J. Abell, and **S. Mecking**, 2000. Using AOU to constrain decadal changes in the biological pump of the subtropical North Pacific. JGOFS Meeting, Bergen, Norway.

- Mecking, S.**, M. J. Warner, and C. E. Greene, 2000. On the Origin and Structure of the Subsurface CFC and Oxygen Maxima in the Subtropical North Pacific Thermocline. *EOS Trans. AGU*, 80, Ocean Sci. Meet. Suppl., Abstract OS31O-10.
- Greene, C. E., **S. Mecking**, and S. Hautala, 2000. Simulations of Tracer Distributions in the Subtropical North Pacific with an Isopycnal Model of Advection and Diffusion. *EOS Trans. AGU*, 80, Ocean Sci. Meet. Suppl., Abstract OS31O-09.
- Mecking, S.**, M. J. Warner, and J. L. Bullister, 1998. Temporal changes in CFC distributions along 152°W in the North Pacific. WOCE Conference, Halifax, Canada.
- Mecking, S.**, M. J. Warner, and C. E. Greene, 1998. Subduction in the Subtropical North Pacific: Observations and Model Simulations of Subsurface CFC Maxima. WOCE-AIMS Tracer Workshop, Bremen, Germany.
- Mecking, S.**, and M. J. Warner, 1996. Ventilation of Red Sea Water with Respect to Chlorofluorocarbons. *EOS Trans. AGU*, 77, Fall Meet. Suppl., Abstract OS12A-06.

ACADEMIC ADVISORS

Postdoctoral: John M. Toole (WHOI)
Ph.D: Mark J. Warner (UW)
M.Sc.: Mark J. Warner (UW)

STUDENT ADVISING

2010-present: Andrew Shao (chair of committee; co-advised with LuAnne Thompson), M.Sc. completed in August 2012, continuing on to Ph.D.

2008-2011, David Trossman (co-advisor; chair of committee: LuAnne Thompson), Ph.D. in May 2011 (came in with M. Sc.)