



Stefanie Mack

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Education

Old Dominion University

PhD Candidate, Physical Oceanography, GPA: 3.96/4.0

Norfolk, VA, USA

2010–present

Westminster College

BS Physics, Mathematics minor, magna cum laude

New Wilmington, PA, USA

2010

Notable Projects.....

- **Dissertation Research (Ongoing):** 'Modeling tides and mesoscale eddies in the Ross Sea'

Using a regional ocean model of the Ross Sea and data from a recent cruise, I investigate the importance of tides and eddies, focusing on water mass formation and transport, ice shelf basal melt, and dissolved iron transport.

- **Graduate Project** 'Effect of tides on sea ice concentration from AMSR-E satellite data'

I developed and published a new analysis method to extract tidal variability from satellite swath data and discovered that in the northwest Ross Sea, the spring neap tidal cycle causes the sea ice to open by about 20% in mid-winter.

Publications

S.L. Mack, M.S. Dinniman, D.J. McGillicuddy Jr., P.N. Sedwick, J.M. Klinck, Dissolved iron transport pathways in the Ross Sea: Influence of tides and mesoscale eddies in a regional ocean model, *submitted to Journal of Marine Systems*.

D.J. McGillicuddy, Jr., P.N. Sedwick, M.S. Dinniman, K.R. Arrigo, T.S. Bibby, B.J.W. Greenan, E.E. Hofmann, J.M. Klinck, W.O. Smith, Jr., **S.L. Mack**, C.M. Marsay, B.M. Sohst, G.L. van Dijken (2015), Iron supply and demand in an Antarctic shelf ecosystem, *Geophys. Res. Lett.*, in press.

A. Kustka, J.T. Kohut, A. White, P.J. Lam, A.J. Milligan, M.S. Dinniman, **S.L. Mack**, E. Hunter, M. Hiscock, W.O. Smith, Jr., C.I. Measures (2015), The role of Modified Circumpolar Deep Water as an iron source to productive mid-summer phytoplankton in the Ross Sea, *Deep Sea Res I*, in press.

F.D. Becchetti, **S. Mack**, W.R. Robinson, M. Ojaruega (2015), Colliding nuclei to colliding galaxies: Illustrations using a simple colliding liquid-drop apparatus, *Am. J. Phys.* **83**(10), 846-856.

C.M. Marsay, P.N. Sedwick, M.S. Dinniman, P.M. Barrett, **S.L. Mack**, D.J. McGillicuddy, Jr. (2014), Estimating the benthic efflux of dissolved iron on the Ross Sea continental shelf, *Geophys. Res. Lett.* **41**(21), 7576-7583.

S. Mack, L. Padman, J. Klinck (2013), Extracting tidal variability of sea ice concentration from AMSR-E passive microwave single-swath data: A case study of the Ross Sea, *Geophys. Res. Lett.* **40**(3), 547-552.

Presentations (*Invited)

- S. Mack**, M. Dinniman, J. Klinck, P. Sedwick, D. McGillicuddy, Iron transport pathways in the Ross Sea: Physical processes affecting the supply of dFe in a regional ocean model, oral presentation, Ocean Sciences Meeting, New Orleans, LA, February 21-26, 2016
Dorothy Brown-Smith departmental travel award
- S. Mack**, M. Dinniman, J. Klinck, Effect of tides and eddies on Ross Ice Shelf basal melt from a regional ocean model, poster presentation, 26th IUGG General Assembly, Prague, Czech Republic, June 22-July 2, 2015
ODU SEES Graduate Travel Award; Dorothy Brown-Smith departmental travel award
- S. Mack**, M. Dinniman, B. Greenan, S. Springer, J. Klinck, Role of tidally-induced mixing in the Ross Sea, poster presentation, Ocean Sciences Meeting, Honolulu, HI, February 23-28, 2014
- S. Mack**, Tidally forced mesoscale variability in the Ross Sea, Antarctica, poster presentation, Graduate Climate Conference, Woods Hole, MA, November 1-3, 2013
- *S. Mack**, Tidal effects in the Ross Sea: A look at the mesoscale using satellite data and models, invited presentation, AOCD Seminar Series, Yale, New Haven, CT, October 31, 2013
- S. Mack**, L. Padman, S. Springer, M. Dinniman, J. Klinck, Sea ice variability in the Ross Sea forced by tides: Satellite observations and modeling, poster presentation, AMS Polar Meteorology and Oceanography, Seattle, WA, April 29-May 1, 2013
Best Student Poster award; Dorothy Brown-Smith departmental travel award
- S. Mack**, L. Padman, S. Springer, M. Dinniman, J. Klinck, Sea ice variability in the Ross Sea forced by tides: Satellite observations and modeling, poster presentation, Polar Marine Science Gordon Research Conference & Seminar, Ventura, CA, March 9-15, 2013
Student travel grant provided by the DOE
- *S. Mack**, Tides and sea ice in the Ross Sea: Investigations using satellite data and models, invited presentation, CCPO seminar series, ODU, Norfolk, VA, February 18, 2013
- S. Mack**, S. Springer, M. Dinniman, L. Padman, J. Klinck, Diurnal tidal effects on sea ice concentration in the Ross Sea from AMSR-E satellite data and a regional ocean model, oral presentation, SCAR, Portland, OR, July 16-19, 2012
- S. Mack**, J.M. Klinck, L. Padman, Observing a diurnal tidal effect on sea ice concentration in the Ross Sea using AMSR-E satellite data, poster presentation, Ocean Sciences Meeting, Salt Lake City, UT, February 20-24, 2012

Professional Experience

Graduate Research Assistant

Center for Coastal Physical Oceanography, Advisor: John Klinck

Norfolk, VA, USA

2010-present

Session Co-convenor

IUGG/IACS 2015 Meeting

Prague, Czech Republic

June 2015

Research cruise participant

R/V Hugh R. Sharp

Lewes, DE, USA

August 2014

Summer school participant*ResClim: Sea Ice in the Climate System***UNIS, Svalbard***Summer 2011***Research Experiences for Undergraduates (REU) Student***College of William and Mary, Advisor: Silvina Pagola***Williamsburg, VA, USA***Summer 2009***Research Experiences for Undergraduates (REU) Student***University of Michigan, Advisor: Fred Becchetti***Ann Arbor, MI, USA***Summer 2008*

Technical Skills

Ocean Modelling: : Regional Ocean Modelling System (ROMS); Added tidal forcing (Matlab); modified model bathymetry, resolution, and forcing; modified model code (Fortran90 + MPI); compiled and ran in different parallel cluster environments

Data Analysis: : Matlab; Fortran; time series analysis; Netcdf/Hdf files

General: : Unix/Linux systems; blogging

Extracurricular Activities

Volunteer Official

- *Blue Crab Bowl (National Ocean Sciences Bowl)* 2011, 2013-2016

Volunteer Judge

- *Tidewater Science and Engineering Fair* 2014

Vice President

- *Dept. Ocean, Earth, and Atmospheric Sciences: Graduate Student Organization* 2011-2012

President

- *Society of Physics Students* 2009-2010

Treasurer

- *Society of Physics Students* 2008-2009