

ABIGAIL S BODNER

Department of Earth, Environmental and Planetary Sciences, Brown University

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EDUCATION

PhD Earth, Environmental and Planetary Sciences Brown University Advisor: Dr. Baylor Fox-Kemper	<i>Expected May 2021</i>
ScM Applied Mathematics Brown University	<i>2020</i>
MSc (magna cum laude) Geophysics, Atmospheric and Planetary Sciences Tel Aviv University Advisor: Dr. Nili Harnik	<i>2019</i>
BSc (Double Major) - Geophysics, Atmospheric and Planetary Sciences - Mathematics Tel Aviv University	<i>2014</i>

HONORS AND AWARDS

Junior Fellow in the Simons Society of Fellows	<i>AY 2021-2024</i>
Student Oral Presentation Award at the Atmospheric and Oceanic Fluid Dynamics Meeting of the American Meteorological Society	<i>June 2019</i>
Associate of Sigma Xi Scientific Research Honor Society	<i>2019</i>
Gulf of Mexico Research Initiative Scholar	<i>2018</i>
Departmental First Year Fellowship, Brown University	<i>AY 2015-2016</i>
Rana Samuels Ofran MSc Student Excellence Award	<i>AY 2014-2015</i>

PUBLICATIONS

- Bodner, A. S., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P. (2019). A perturbation approach to understanding the effects of turbulence on frontogenesis. *Journal of Fluid Mechanics*, 883.
- Bodner, A. S. & Fox-Kemper, B. (2020). A Breakdown in Potential Vorticity Estimation Delineates the Submesoscale-to-Turbulence Boundary in Large Eddy Simulations. *Journal of Advances in Modeling Earth Systems*, e2020MS002049.

Bodner, A. S., Fox-Kemper, B., Johnson, L., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P. "Modifying the Mixed Layer Eddies Parameterization to Include Frontogenesis and Frontal Arrest by Boundary Layer Turbulence. *In Preparation*.

Bodner, A. S., Harnik, N. & Lachmy, O. Atmospheric Flow Regimes and Vacillation Cycles in the Presence of Topography. *In Preparation*.

INVITED TALKS

Bodner, A. S.: "On the interaction between submesoscales and turbulence: from theory to implementation in global climate models", Physical Oceanography Dissertations Symposium (PODS) XI, Lihue, Kaua'i, October 2021 (Scheduled).

Bodner, A. S.: "Stir and mix: studying upper ocean dynamics from theory to application", Department of Earth and Planetary Sciences, Weizmann Institute of Science, May 2021 (Scheduled).

Bodner, A. S.: "Stir and mix: studying upper ocean dynamics from theory to application", Department of Solar Energy and Environmental Physics (YDSEEP), Ben Gurion University of the Negev, April 2021 (Scheduled).

Bodner, A. S.: "Stir and mix: studying upper ocean dynamics from theory to application", School of Earth Sciences, Tel Aviv University, March 2021 (Scheduled).

Bodner, A. S.: "On the interaction between submesoscales and turbulence: from theory to application", Department of Applied Mathematics and Theoretical Physics Seminar, University of Cambridge February 2021 (Scheduled).

Bodner, A. S.: "Stir and mix: studying upper ocean dynamics from theory to application", Climate, Atmosphere and Oceanography Seminar, The Hebrew University of Jerusalem, January 2021.

Bodner, A. S.: "On the interaction between submesoscales and turbulence: from theory to implementation in global climate models", Physical Oceanography Seminar, Woods Hole Oceanographic Institution, June 2020.

Bodner, A. S.: "On the interaction between submesoscales and turbulence: from theory to implementation in global climate models", The Center for Atmosphere Ocean Science, Courant Institute of Mathematical Sciences, New York University, October 2019.

Bodner, A. S.: "Frontal evolution in the presence of submesoscale instabilities and turbulence", Atmosphere, Ocean, and Climate Dynamics Seminar, Yale University, April 2019.

SELECTED PRESENTATIONS

Bodner, A. S., Fox-Kemper, B., Johnson, L., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: "Modifying the Mixed Layer Eddies Parameterization to Include Frontogenesis and Frontal Arrest by Boundary Layer Turbulence. Ocean Model Working Group winter meeting, February 2021. *Oral*.

Bodner, A. S., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: "Frontal Formation in the Presence of Submesoscale Instabilities and Turbulence", Atmospheric and Oceanic Fluid Dynamics Meeting, AMS, Portland, ME, June 2019. *Oral*.

Bodner, A. S. & Fox-Kemper, B.: "Hidden Dangers in Potential Vorticity", Sources and Sinks of Ocean Mesoscale Eddy Energy Workshop (US CLIVAR), Tallahassee, FL, March 2019. *Oral*.

Bodner, A. S., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: “A Novel Approach to Understanding the Effects of Turbulence and Instabilities on Frontogenesis”, Symposium on Geophysical Fluid Dynamics, Sde Boker, Israel, January 2019. *Oral*.

Bodner, A. S., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: “A Novel Approach to Understanding the Effects of Turbulence and Instabilities on Frontogenesis”, CARTHE All Hands Meeting, Miami, FL, November 2018. *Oral*.

Bodner, A. S., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: “A Perturbation Method to Understanding the Effects of Turbulence and Instabilities on Frontogenesis”, Ocean Sciences Meeting, TOS/ASLO/AGU, Portland, OR, February 2018. *Oral*.

Bodner, A. S., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: “Arrest of Frontogenesis by Submesoscales and Turbulence”, Ocean Sciences Meeting, TOS/ASLO/AGU, New Orleans, LA, February 2016. *Poster*.

Bodner, A. S., Harnik, N. & Lachmy, O.: “Global Circulation Regimes in the Presence of Stationary Planetary Wave Forcing”, Geophysical Fluid Dynamics Seminar, Weizmann Institute, Israel, July 2015. *Oral*.

Bodner, A. S., Harnik, N. & Lachmy, O.: “Global Circulation Regimes in the Presence of Stationary Planetary Wave Forcing”, 20th conference on Atmospheric and Oceanic Fluid Dynamics, Minneapolis, MN, June 2015. *Poster*.

Bodner, A. S., Harnik, N. & Lachmy, O.: “Effects of Stationary Forcing on Global Circulation Regimes”, Symposium on Geophysical Fluid Dynamics, Sde Boker, Israel, January 2015. *Poster*.

ADDITIONAL RESEARCH EXPERIENCE AND TRAINING

Community Earth System Model (CESM) Tutorial *Summer 2019*
Run by the National Center for Atmospheric Research (NCAR) in Boulder, CO.

Kavli Institute for Theoretical Physics Graduate Fellow *Spring 2018*
Program for Planetary Boundary Layers in Atmospheres, Oceans, and Ice on Earth and Moons (University of California Santa Barbara).

Fundamental Aspects of Turbulent Flows in Climate Dynamics *Summer 2017*
Summer school program run by Ecole de Physique des Houches (Les Houches, France).

Research Assistant of Dr. Nili Harnik *AY 2013-2014*
Detecting wave disturbances in the stratosphere influenced by the Circumglobal Teleconnection Pattern (Tel Aviv University).

Senior Year Project in Geophysical Fluid Dynamics *Spring 2014*
Under the guidance of Dr. Eyal Heifetz, worked on a revised solution for a Non-Boussinesq stratified shear flow (Tel Aviv University).

TEACHING EXPERIENCE

Studying the Ocean from the Classroom to the Bay *Summer 2018 & 2019*
Course designer and co-instructor in Summer@Brown pre-college program (Brown University).

Principles in Planetary Climate *Fall 2018*
Teaching assistant under Professor Jung-Eun Lee (Brown University).
Guest lecture: “Large Scale Dynamics in the Ocean and Atmosphere”.

Teaching Consultant Program, Brown University Sheridan Center. *Fall 2017*

Climate Change: Fact or Fiction? *Summer 2017*
 Course designer and instructor in Summer@Brown middle school program (Brown University).

Reflective Teaching Program, Brown University Sheridan Center. *Fall 2016*

Continuum Mechanics - Fluids *Spring 2015*
 Teaching assistant under Professor Eyal Heifetz (Tel Aviv University).

Climate Theory *Spring 2015*
 Teaching assistant under Professor Nili Harnik (Tel Aviv University).

Laboratory Experiments in Atmospheric Sciences *Fall 2014*
 Teaching assistant under Professor Nili Harnik (Tel Aviv University).

Earth Sciences Teacher *2012-2013*
 High school senior year research project (Shay Agnon High School, Israel).

Mathematics Teacher *2009-2014*
 Middle school gifted children program (Bar-Ilan University).
 High school and pre-college students (Raz Etgarim Educational Center, Israel).
 At-risk youth (Haklai Boarding school, Israel).

SERVICE

Expert Reviewer for the Intergovernmental Panel on Climate Change (IPCC) *2019*
 Sixth Assessment Report

Expert Reviewer for the Special Report on the Ocean and Cryosphere in a Changing *2018*
 Climate (SROCC)

Reviewer for Journal of Physical Oceanography *2017-Present*

Graduate School Community Fellow *2018-2019*

First Year Graduate Student Mentor *2018-2019*

International Student Representative and Event Organizer *2016-2018*

Leadership Alliance - Graduate Student Panel *2018*

Volunteer at the Division of Fluid Dynamics Meeting (APS DFD) *November 2015*

PROFESSIONAL AFFILIATIONS

Affiliate Graduate Student in the Institute at Brown for Environment & Society (IBES)

Consortium for Advanced Research on Transport of Hydrocarbon in the Environment (CARTHE)

Graduate Fellow of the Rhode Island Consortium for Coastal Ecology Assessment Innovation & Modeling (C-AIM).

American Geophysical Union; American Meteorological Society; American Physical Society

SOFTWARE LANGUAGES

Matlab, Python, Fortran, C, Latex.