

Laura K. Gruenburg

Brooklyn, NY • laura.gruenburg@stonybrook.edu • <https://lagruenburg.github.io>

EDUCATION

Ph.D. in Physical Oceanography <i>Columbia University, New York, NY</i> <i>Dissertation: "Indonesian Throughflow Heat Transport, and Spreading Within the Eastern Tropical Indian Ocean"</i> <i>Advisor: Professor Arnold L. Gordon</i>	February 2021
M.Phil. <i>Columbia University, New York, NY</i>	February 2019
M.A. <i>Columbia University, New York, NY</i>	May 2017
B.A. in Earth Science <i>Vassar College, Poughkeepsie, NY</i>	May 2012

AWARDS AND HONORS

NASA Earth and Space Science Fellowship	2017
Deans Fellow Columbia University	2015
Associate member Sigma Xi	2012

RESEARCH EXPERIENCE

Senior Postdoctoral Research Scientist (full time) <i>School of Marine and Atmospheric Sciences, Stony Brook University</i> <ul style="list-style-type: none">• Developing ocean indicators for the NY Department of Environmental Conservation to understand links between regional physical and biogeochemical processes and human communities within the New York Bight.• Combining data from observations - both publicly available data such as the NEFSC bottom trawls, as well as our own glider, CTD, mooring, and bottle data - as well as reanalysis data for indicator development.• Participating in mooring and glider deployments.• Compiling Indicators annually and writing the publicly available Indicator report to inform managers and other stakeholders.• Conducting original research on changes to regional oceanography – such as the increase in Gulf Stream Ring Impingement on the shelf within the NEUS and implications for larval fish.• Developing a novel approach for understanding the pace of global climate change in coastal oceans and identifying associated species range shifts.• Publishing original research in two academic journals.• Presenting research at international conferences.• Mentoring a masters student as she worked on her own research.	March 2021 – Present
Doctoral Researcher (full time) <i>Department of Earth and Environmental Science, Columbia University</i> Research Advisor: Dr. Arnold Gordon Committee Members: Dr. Ryan Abernathey, Dr. Andreas Thurnherr <ul style="list-style-type: none">• Analyzed contribution of Indonesian Throughflow variability to heat/freshwater in Eastern Indian Ocean with implications for regional climate using in-situ, remote sensing, and reanalysis data.	September 2015 – December 2020
Doctoral Researcher (full time) <i>Research Cruise Aboard the Baruna Jaya VIII, Jakarta, Indonesia</i>	August 2017

PI's Dr. Arnold Gordon and Dr. Anna Kuswardani

- Participated in research cruise with Makassar Strait Mooring recovering, and analysis of ADCP and CTD data.

Masters Researcher (part time)

January 2015 – May 2015

Department of Earth and Atmospheric Sciences, City College

Research Advisor: Dr. Steven Kidder

- Developed titanium-in-quartz thermobarometry for determining pressure-temperature environment of deformation using recrystallized quartz in New Zealand Mylonites.

Undergraduate Researcher (part time)

September 2011 – May 2012

Department of Earth Science and Geography, Vassar College

Research Advisor: Dr. Brain McAdoo

- Established methodologies for flood risk assessment in rural and urban watersheds in upstate New York.

Undergraduate Researcher (full time)

July 2010 – August 2010

Norwegian Geotechnical Institute, Oslo, Norway

Research Advisor: Dr. Carl Harbitz

- Verified methods for tsunami risk assessment using the 2009 tsunami in the Pacific that hit American Samoa.

SCIENCE EDUCATION AND MENTORING

Cofounder of Pyclub-cu (part time)

September 2020 – May 2021

Columbia University

- Cofounder, curriculum developer, and instructor of afterschool oceanography/computer science program ([Pyclub-cu](#)) for high school students.

Science Educator (part time)

October 2016, October 2017, October 2018, October 2020

Lamont Doherty Earth Observatory

- Developed ocean and atmospheric science demonstrations for the general public at three Lamont Doherty Earth Observatory Open House events (October 2020 (virtual), October 2018, October 2017, and October 2016)

Science Educator (part time)

March 2018, February 2019

Intrepid Sea Air and Space Museum

- Demonstrated ocean circulation and ocean acidification to the general public with hands-on experiments during events at Intrepid Kids Week (February 2019) and Intrepid for Girls in Science and Engineering Day (March 2018)

Science Educator (part time)

October 2015, November 2015, November 2016,
November 2017, April 2019, November 2019

Columbia University

- Created engaging participatory science demonstrations for middle school girls during five Girls Science Day at Columbia University events. Science demonstrations: The Energy Budget (November 2019), Earthquake Hazard (April 2019), Ocean Acidification (November 2017), The Nitrogen Cycle (November 2016), Smog City (November 2015).
- Led a sea level rise demonstration for high school students at A Day in the Life of the Hudson River (October 2015)

Science Educator (part time)

March 2016, April 2017, March 2018

American Museum of Natural History

- Led atmospheric chemistry and ocean acidification activities for the general public at three Sun-Earth Day events (March 2018, April 2017, and March 2016).

Peer Mentor (part time)

Columbia University

September 2016 – August 2017

- Mentored an incoming graduate student as part of Lamont Doherty Earth Observatory's first year peer mentoring program.
- Mentored a high school student as part of the Lamont Summer Intern program

PROFESSIONAL DEVELOPMENT

Inclusive Teaching Multi-Day Workshop Participant February 2019

Columbia University

- Developed strategies for leading effective and inclusive classrooms through two workshops:
 - *Blindspots in Inclusive Teaching: Implicit Bias*
 - *Managing our Blindspots: Strategies for Inclusive Teaching*

Oceanhackweek Contributing Scientist

August 2019

University of Washington

- Worked with a team in-person and through GitHub to develop the [isopy python package](#).

Science of Learning Symposium Participant

October 2018

Metacognition: From Research to Classroom

Columbia University

- Learned research-based pedagogy for encouraging effective learning at the point of curiosity.

SKILLS

Python, Matlab, GitHub, R

TEACHING EXPERIENCE

Adjunct Assistant Professor (part time)

January 2021 – May 2021

Drew University

- Taught “Great Challenges in Environmental Science,” an introductory level course, to undergraduates

Teaching Assistant (part time)

January 2019 – May 2019

Columbia University

- Assisted in “Earth's Oceans and Atmosphere,” a small introductory level course for undergraduates.
- Hosted office hours weekly to answer student questions and provide support.

Teaching Assistant (part time)

September 2018 – December 2018

Columbia University

- Assisted in “Dynamics of Climate Variability and Change,” a Masters level course.
- Hosted weekly office hours.
- Prepared and taught a lecture on introductory physical oceanography.

Teaching Assistant (part time)

September 2017 – December 2017

Columbia University

- Assisted in “Intro to Physical Oceanography,” a graduate level course.
- Hosted weekly office hours.

Teaching Assistant (part time)

September 2016 – December 2016

Columbia University

- Assisted in “Oceanography,” a large introductory course for undergraduates.
- Hosted weekly office hours.
- Prepared and taught a lecture on introductory physical oceanography.

Instructor (part time)

January 2015 – May 2015

City College

- Taught the laboratory section of “Earth System Science,” an introductory course for undergraduates.
- Developed lab exercises to effectively demonstrate core concepts.

- Created field trip guides and led students on two educational trips to city parks.

PUBLICATIONS

Gruenburg, L.K., J.A. Nye, K. Lwiza, and L. Thorne. *under review*. Vertical climate velocity adds a new dimension to species shifts. *Nature Climate Change*

Weisberg, S.J., S.M. Roberts, **L.K. Gruenburg**, T.G. Schwemmer, T. Menz, I.F. Fenwick, J.A. Nye, and R.G. Asch. *in press*. Gulf Stream Intrusions Associated with Extreme Seasonal Fluctuations among Larval Fishes. *Marine Ecology Progress Series*

Gruenburg, L.K., A.L. Gordon, and A.M. Thurnherr. 2023. Indonesian Throughflow partitioning between Leeuwin and South Equatorial Currents. *Journal of Physical Oceanography*, <https://doi.org/10.1175/JPO-D-22-0205.1>

Sprintall, J., A. Biastoch, **L.K. Gruenburg**, and H.E. Phillips. 2022. Ocean Basin Connections. In: The Indian Ocean and its role in the global climate system. ed. by C.C. Ummenhofer, and R.R. Hood, Raleigh. Elsevier, Amsterdam, The Netherlands, n.n.. ISBN 978-0-12-822698-8

Li, M., D. Yuan, A.L. Gordon, **L.K. Gruenburg**, X. Li, R. Li, X. Yin, Y. Yang, C. Corvianatie, J. Wei, and S. Yang. 2021. A Strong sub-thermocline intrusion of the North Equatorial Subsurface Current into the Makassar Strait in 2016-2017. *Geophysical Research Letters*, <https://doi.org/10.1029/2021GL092505>.

Li, M., D. Yuan, A.L. Gordon, **L.K. Gruenburg**, X. Li, R. Li, X. Yin, Y. Yang, C. Corvianatie, J. Wei, and S. Yang. 2021. A Strong Sub-Thermocline Intrusion of the North Equatorial Subsurface Current into the Makassar Strait in 2016-2017. *Geophysical Research Letters*, <https://doi.org/10.1029/2021GL092505>

Li, M., A.L. Gordon, **L.K. Gruenburg**, J. Wei, and S. Yang. 2020. Interannual to decadal response of the Indonesian Throughflow vertical profile to Indo-Pacific forcing. *Geophysical Research Letters*, <https://doi.org/10.1029/2020GL087679>

Gordon, A.L., A. Napitu, B.A. Huber, **L.K. Gruenburg**, K. Pujiana, T. Agustyadi, A. Kuswardani, N. Mbay, and A. Setiawan. 2019. Makassar Strait Throughflow Seasonal and Interannual Variability, an Overview. *Journal of Geophysical Research Oceans*, <https://doi.org/10.1029/2018JC014502>

Gruenburg, L.K., and A.L. Gordon. 2018. Variability in Makassar Strait heat flux and its effect on the eastern tropical Indian Ocean. *Oceanography* 31(2), <https://doi.org/10.5670/oceanog.2018.220>

Li, M., A.L. Gordon, J. Wei, **L.K. Gruenburg**, and G. Jiang. 2018. Multi-decadal timeseries of the Indonesian Throughflow. *Dynamics of Atmospheres and Oceans* 81(2018) 84-95, <https://doi.org/10.1016/j.dynatmoce.2018.02.001>

INVITED TALKS

Gruenburg, L.K., and A.L. Gordon. (2022) ITF waters in the South Equatorial Current, and their relation to Indian Ocean thermocline variability. Presented at the 4th Open Science Symposium on Western Pacific Ocean Circulation and Climate October 26, 2022. Xiamen, China and virtual.

Gruenburg, L.K. (2020) Indonesian Throughflow in the Indian Ocean: Pathways of Heat. Presented at Gateways to the Ocean Symposium February 13, 2020. Scripps Institution of Oceanography, La Jolla, California.

PRESENTATIONS

Gruenburg L.K., J. Nye, K. Lwiza, and L. Thorne. (2024) Vertical climate velocity adds a new dimension to species shifts. Presented at Ocean Sciences Meeting, New Orleans, Louisiana.

Gruenburg, L.K., J. Nye, and L. Thorne. (2023) Climate velocity in the vertical – slower speeds add a new dimension to species shifts. Presented at 2023 Effects of Climate Change on the World Ocean 5 Meeting, Bergen, Norway.

Gruenburg, L.K., S.A. Murty, C.C. Ummenhofer, P. Wagner, M. Scheinert, J. Durgadoo, A. Biastoch, C.W. Böning (2020) Makassar transport variability over the past century - a synthesis of observations, coral $\delta^{18}\text{O}$ and high-resolution ocean models. Presented at 2020 American Geophysical Union Fall Meeting.

Gruenburg, L.K., A.L. Gordon (2020) Seasonal and Interannual Variability in Cross-Indian ITF Plume Propagation. Presented at Ocean Sciences Meeting, San Diego, California.

Gruenburg, L.K., A.L. Gordon (2019) Variability in Indonesian Throughflow Partitioning Between Leeuwin and South Equatorial Current Pathways. Presented at American Geophysical Union Fall Meeting 2019.

Gruenburg, L.K., A.L. Gordon (2018) The Pathways and Impacts of Indonesian Throughflow Heat Flux on the Eastern Tropical Indian Ocean. Presented at American Geophysical Union Fall Meeting 2018.

Gruenburg, L.K., A.L. Gordon (2017) Indian Ocean Response to Indonesian Throughflow Variability. Presented at 2018 Ocean Sciences Meeting, Portland, Oregon.

Gruenburg, L.K., A.L. Gordon., M. Li (2017) Interannual Variability in ITF Plume Spreading Across the Indian Ocean. Presented at the European Geophysical Union General Assembly 2017.

Gruenburg, L.K. (2015) Titanium-in-Quartz Thermobarometry in New Zealand Mylonites. Presented at the Jeffrey Steiner Memorial Symposium, City College, NY, NY.

Harbitz, C.B., R. Frauenfelder, G. Kaiser, S. Glimsdal, K. Sverdrup-thygeson, F. Lovholt, **L. Gruenburg**, B. McAdoo (2015) Application and Validation of a GIS Model for Local Tsunami Vulnerability and Mortality Risk Analysis. Presented at the 2015 American Geophysical Union Fall Meeting.

PROFESSIONAL SERVICE

Reviewer for Ecological Indicators

Reviewer for Nature Communications

Reviewer for Nature Reviews Earth & Environment

Reviewer for Journal of Geophysical Research - Oceans

Reviewer for Geophysical Research Letters

Reviewer for Climate Research

Reviewer for Marine Geodesy

Co-organizer of LDEO Ocean Climate Physics division weekly seminar series Fall 2018 and Spring 2019