

Curriculum Vitae

Paul B Goddard

pgoddard@iu.edu

Bloomington, IN 47401

+1 937-654-0537

Current Affiliations:

Indiana University, Bloomington IN

EDUCATION

University of Arizona | Tucson, Arizona

Ph.D. 2018 **Department of Geosciences** (with a Ph.D. Minor in Global Change)

Advisor: Jianjun Yin

Committee: Jianjun Yin, Joellen Russell, Julia Cole, Michael Crimmins

University of Cincinnati | Cincinnati, Ohio

B.S. 2011 **Environmental Studies**

B.S. 2011 **Mathematics**

B.A. 2007 **Secondary Education**

PROFESSIONAL EXPERIENCE

2023 – Pres. **Assistant Research Scientist** | Earth and Atmospheric Sciences, Indiana University

2020 – '23 **Postdoctoral Research Associate** | Earth and Atmospheric Sciences, Indiana University

2019 **Adjunct Faculty** | Rowan University Department of Geology, Glassboro, NJ

2018 – '19 **Postdoctoral Research Associate** | Center for Integrative Geosciences, UCONN

2012 – '18 **Graduate Research Associate** | UA Department of Geosciences, Tucson, AZ

2007 – '12 **Secondary Math and Science Student Teacher, Substitute, & Tutor** | Cincinnati, OH

PUBLICATIONS

Paul B. Goddard, B. Kravitz, D. G. MacMartin, E. M. Bednarz, D. Vioni, W. R. Lee: The impacts of Stratospheric Aerosol Injections on Antarctic ice loss depend on injection location. *Journal of Geophysical Research-Atmospheres* (in review).

Daniele Vioni, E. M. Bednarz, D. G. MaMartin, B. Kravitz, **P. B. Goddard**: Exploring linearities in the climate response to stratospheric aerosol injection under different magnitudes of global cooling. *Earth's Future* (in review).

Doug G. MacMartin, B. Kravitz, **P. B. Goddard**: Transboundary effects of idealized regional geoengineering. *Environmental Research Communications*, (in review).

Paul B. Goddard, B. Kravitz, D. G. MacMartin, H. Wang: The shortwave radiative flux response to an injection of sea salt aerosols in the Gulf of Mexico. *Journal of Geophysical Research-Atmospheres*, **127** (21), doi:10.1029/2022JD037067, (2022).

Paul B. Goddard, C. R. Tabor, T. R. Jones: Utilizing ice core and climate model data to understand seasonal West Antarctic Variability. *Journal of Climate*, **34** (24), 10007-10026, doi:10.1175/JCLI-D-20-0822.1, (2021).

Paul B. Goddard, C. O. Dufour, J. Yin, S. M. Griffies, M. Winton: CO₂-induced ocean warming of the Antarctic continental shelf in an eddying global climate model. *Journal of Geophysical Research-Oceans*, doi:10.1002/2017JC012849, (2017).

Stephen M. Griffies, M. Winton, W. G. Anderson, R. Benson, T. L. Delworth, C. O. Dufour, J. P. Dunne, **P. Goddard**, and coauthors: Impacts on heat in the climate system from the ocean's time mean and

transient mesoscale eddies in a hierarchy of climate models. *Journal of Climate*, **28** (3), 952-977, doi:10.1175/JCLI-D-14-00353.1, (2015).

Paul B. Goddard, J. Yin, S. M. Griffies, S. Zhang: An extreme event of sea-level rise along the northeast coast of North America in 2009-2010. *Nature Communications*, **6**, 6346-6354, doi:10.1038/ncomms7346, (2015).

Stephen M. Griffies, J. Yin, P. J. Durack, **P. Goddard**, and coauthors: An assessment of global and regional sea level for years 1993-2007 in a suite of interannual CORE-II simulations. *Ocean Modeling*, **78**, 35-89, doi:10.1016/j.ocemod.2014.03.004, (2014).

Jianjun Yin and **Paul B. Goddard**: Oceanic control of sea level rise patterns along the east coast of the United States. *Geophysical Research Letters*, **40** (20), 5514-5220, (2013).

SERVICE

2020 – Pres. Education for Environmental Change | Indiana University

In coordination with the IU EfEC project, I have created a multi-lesson teaching module designed for secondary science classrooms. This module aims at providing opportunities for students to understand the basic concepts of geoengineering, the social influences involved in the geoengineering process, and the emergency and complexity of addressing climate change issues. I work with educators to help implement the lessons in their classrooms and I supply all the necessary materials to the teachers.

Notable Outcomes:

- 8 Indiana classrooms are completing this unit in Winter/Spring 2023
- Lead biannual workshops to demonstrate the module and receive feedback
- Future plans include co-writing publications with teachers (Summer 2023) and to develop an NSF Education grant proposal to add a digital platform to reach more educators (Fall 2023).

2020 – Pres. Environmental Research Institute | Indiana University

Member of the ERI research community and recipient of the ERI High Impacts Grant

Notable Presentations:

- Humphrey Climate Fellows – Invited Talk (IUPUI, 2022)
- ERI Symposium (IU, 2022)

PRESENTATIONS – selected talks, abstracts, and meetings participant

Paul B. Goddard: Geoengineering Research: Assessing the need for and the potential strategies. IUPUI – Department of Earth Sciences, Spring 2023 – invited talk.

Paul B. Goddard: How can stratospheric aerosol injection slow Antarctic ice loss? Indiana University – Earth and Atmospheric Sciences AS, Spring 2023 – invited talk.

Paul B. Goddard, B. Kravitz, A. Scribner: Climate Engineering Teaching Module. HASTI (Education Conference), Indianapolis, IN, Winter 2023 – talk.

Paul B. Goddard, B. Kravitz, D. G. MacMartin, E. M. Bednarz, D. Vioni, W. R. Lee: The impact of different stratospheric aerosol injection strategies on the Antarctic region. AGU Fall Meeting, 2022

Paul B. Goddard: Introduction to Geoengineering. Humphrey Climate Fellows. IUPUI, 2022.

Paul B. Goddard, Clay R. Tabor, Tyler R. Jones, and Eric J. Steig: The atmospheric drivers of the Amundsen Sea Low variability and the resultant influence on stable water isotopic records in West Antarctica: A study of observation and simulations. AGU Fall Meeting, 2018.

Paul B. Goddard: U.S. northeast coast sea level rise: mechanisms, extreme events, and 21st century projections. University of Connecticut 2018 – talk.

Paul B. Goddard, C. O. Dufour, J. Yin, S. M. Griffies, M. Winton: Role of CO₂-forced Antarctic shelf freshening on local shelf warming in an eddying global climate model. AGU Fall Meeting 2017 - talk.

Paul B. Goddard: Panelist for a session on regional and global sea level change and impacts at the NOAA Ocean Observing and Monitoring Division Community Workshop, Silver Spring MD, 2017.

Paul B. Goddard, J. Yin, S. M. Griffies, C. O. Dufour, M. Winton: Ocean heat transport mechanisms and CO₂-induced ocean climate change around Antarctica in GFDL CM2.6 and CM2.5. CLIVAR Open Science Conference, Qingdao, China, 2016.

Paul B. Goddard, J. Yin, S. M. Griffies, M. Winton: Ocean heat transport mechanisms and CO₂-induced ocean climate change around Antarctica in GFDL CM2.6 and CM2.5. AGU Ocean Sciences Meeting, 2016, AGU Fall Meeting, 2015.

Paul B. Goddard and Jianjun Yin: Ocean dynamics and impacts on U.S. coastal sea level. 43rd Annual GeoDaze Symposium, UA Geosciences, 2015.

Paul B. Goddard, J. Yin, S. M. Griffies, S. Zhang: An extreme event of sea level rise along the northeast coast of North America in 2009-2010. AGU Fall Meeting, 2013-2014.

PEER-REVIEWER

Journal of Climate, Geophysical Research Letters, Journal of Geophysical Research-Oceans, Earth System Dynamics

TEACHING

Adjunct Faculty | Rowan University Geology Department

Spring 2019 **Earth in Transition**

Course objective is to inform undergraduates of the causes and impacts of Global Climate Change

Graduate Teaching Associate | University of Arizona Geosciences Department

Spring 2017 **Earth from Birth to Death** | instructor: Randall Richardson

Guided weekly discussions, graded weekly homework and essays

Secondary Math and Science Teacher

2012 – '07 **Teacher, Substitute, Tutor** | Cincinnati, OH

Licensed secondary math teacher in Ohio. Completed several long-term substitute positions at secondary schools, and tutored SAT/ACT preparation for students in Cincinnati, OH.

RESEARCH SCHOLARSHIPS & GRANTS

2020 **ERI High Impact Ideas via the PfEC Grand Challenge Initiative** | Indiana University

Graduate School Supplemental Awards

2017 **ChevronTexaco Geology Fellowship** | UA Geosciences Department \$1,000

2017 **Paul Martin and Sulzer Scholarship** | UA Geosciences Department \$4,750

2017, '15, '14 **Student Travel Grant** | UA Grad. and Professional Student Council \$750 ea.

2015, '14, '13 **Environ. Grad. Student Travel Grant** | UA Institute of the Environ. \$500 ea.

2015 **R. Wilson Thompson Scholarship** | UA Geosciences Department \$500

2014 **Sumner Scholarship** | UA Geosciences Department \$1,500

2014 **Galileo Circle Scholar Award** | UA College of Science \$1,000

- 2013 **Global Change PhD Minor Dissertation Improvement Grant** | UA \$1,000
- 2012 **Carson Scholarship** | UA Carson Scholars Program \$5,000

COLLABORATION

I currently work with a geoengineering research group headed by Ben Kravitz (Indiana University, IN) and Doug G. MacMartin (Cornell University, NY). While at the University of Connecticut, I worked with Clay R. Tabor and his colleagues at the National Center for Atmospheric Research (Boulder, CO). During graduate school, I worked with Jianjun Yin (University of Arizona) and our collaborators in the ocean modeling group at the Geophysical Fluid Dynamics Laboratory (Princeton, NJ) led by Stephen M. Griffies.

TRANSFERABLE SKILLS

- Python
 - NumPy
 - Pandas
 - Xarray
 - Dask
 - Matplotlib
- Linux OS
- Jupyter Notebook
- Github
- Shell Scripting
- Matlab
- Visual Studio Code
- Adobe Illustrator
- NOAA GFDL Climate Models
- NCAR CESM Climate Models
- WRF-Chem Model

HONORS & AWARDS

- 2018 – 2020 **NCAR CISL Allocation Recipient** | NCAR
Supercomputer resources to study precession-length hydroclimate variability of the South American monsoon system using a water isotope-enabled global climate model
- 2012 – '17 **Rachel Carson Scholars Program** | University of Arizona
- 2014 **Best Climate Oral Presentation** | 42nd Annual UA GeoDaze Symposium
- 2003 – '11 **Cum Laude** | University of Cincinnati

PROFESSIONAL DEVELOPMENT

- 2018 **PANGEO Workshop** | Washington DC
Focused on Python packages Xarray and Dask for big data analysis
- 2016 **Software Carpentry Workshop** | Tucson, AZ
Focused on Bash scripting and R-programming for science professionals
- 2014 **CESM Tutorial** | NCAR, Boulder, CO
Focused on the use and components of the Community Earth System Model
- 2012 **Carson Scholarship Climate Communication Workshop** | Biosphere 2, AZ
Focused on improving climate scientists' communication with colleagues, stakeholders, decision makers, and the public

REFERENCES

- | | | |
|--|---|---|
| <p>Dr. Ben Kravitz
Earth and Atmos. Sciences
Indiana University, IN
bkravitz@iu.edu</p> | <p>Dr. Adam Scribner
School of Education
Indiana University, IN
jascrib@iu.edu</p> | <p>Dr. Douglas G. MacMartin
Sibley School of Engineering
Cornell University, NY
dgm224@cornell.edu</p> |
|--|---|---|