HENRI F. DRAKE

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EDUCATION

MIT/WHOI Joint Program in Oceanography *2016 - Present*
PhD Candidate in Physical Oceanography

Haverford College *2011 - 2015*
B.S. in Mathematics, Magna Cum Laude

EMPLOYMENT

Graduate Research Assistant, MIT/WHOI Joint Program in Oceanography *2016 - Present*
Research Specialist in Physical Oceanography, Princeton University *2015 - 2016*
Summer Research Assistant in Topology, Haverford College *2014*
Summer Research Assistant in Quantum Computing, University of Southern California *2013*
Summer Research Assistant in Environmental Engineering, Clarkson University *2012*

AWARDS

National Science Foundation Graduate Research Fellowship *2017 - Present*
MIT Rosenblith Presidential Fellowship *2016 - 2017*

RESEARCH PUBLICATIONS

In preparation

Drake, H. F., Rivest, R. L., Deutch, J., Edelman, A. **A multi-control climate policy process for a trusted decision maker**. (under review). [Preprint].

Drake, H. F., Lickley, M., Abbott, T., Brady, R. X. **Assessing climate model projections of anthropogenic warming patterns** (in preparation) [Preprint] [doi].

2020

5. Drake, H. F., Ferrari, R., Callies, J. **Abyssal circulation driven by near-boundary mixing: water mass transformations and interior stratification**. *Journal of Physical Oceanography*. [doi].

4. Hausfather, Z., Drake, H. F., Abbott, T., Schmidt, G. A. **Evaluating the performance of past climate model projections**. *Geophysical Research Letters*, **46**. [doi]

2018

3. Drake, H. F., Morrison, A. K., Griffies, S. M., Sarmiento, J. L., Weijer, W., Gray, A. R. (2018). **Lagrangian timescales of Southern Ocean upwelling in a hierarchy of model resolutions**. *Geophysical Research Letters*, **45**. [doi] [Read online]

2. van Sebille, E., Griffies, S. M., Abernathey, R., Adams, T. P., Berloff, P., Biastoch, A., Blanke, B., Chassignet, E. P., Yu Cheng, Y., Cotter, C. J., Deleersnijder, E., Döös, K., Drake, H. F., Drijfhout, S., Gary, S. F., Heemink, A. W., Kjellsson, J., Koszalka, I. M., Lange, M., Lique, C., MacGilchrist, G. A., Marsh, R., Adame, C. G. M., McAdam, R., Nencioli, F., Paris, C. B., Piggott, M. D., Polton, J. A., Rühs, S., Shah, S. H. A. M., Thomas, M. D., Wang, J., Wolfram, P. J., Zanna, L., Zika, J. D. (2018).

Lagrangian ocean analysis: fundamentals and practices. *Ocean Modelling*, **121**, 49-75. [doi] [Download PDF]

2017

1. Tamsitt, V., Drake, H. F., Morrison, A. K., Talley, L. D., Dufour, C. A., Gray, A. R., Griffies, S. M., Mazloff, M. R., Sarmiento, J. L., Wang, J., Weijer, W. (2017). **Spiraling up: pathways of global deep water to the surface of the Southern Ocean.** *Nature Communications*, **8**, 172. [doi] [Download PDF]

OTHER PUBLICATIONS

Freilich, M., Wilka, C., Shivamoggi, R., Freese, L., Heiderich, J., Drake, H. F., Cantine, M. (2019). **Young Climate Scientists Speak Out**. *Special Climate Crisis Issue of DigBoston* [url]

Drake, H. F. (2019). **Eight ways to support women in science**. *EOS* [doi] [Download PDF]

SELECTED PRESENTATIONS

Drake, H. F., Hausfather, Z., Abbott, T., Schmidt, G. (2019). **How accurate have climate models been so far?** *Graduate Climate Conference*, Woods Hole, MA. [POSTER]

Drake, H. F., Callies, J., Ferrari, R. (2019). **Circulation and stratification of an abyssal ocean controlled by bottom boundary mixing**. *Atmospheric and Oceanic Fluid Dynamics (AOFD) Conference*, Portland, ME. [POSTER]

Drake, H. F., Callies, J., Ferrari, R. (2018). **Impact of Mixing Layer Flows on the Abyssal Circulation and Stratification**. *Workshop on Bottom Boundary Layer Turbulence and the Ocean Overturning Circulation*, Massachusetts Institute of Technology, MA. [TALK]

Drake, H. F., Callies, J., Ferrari, R. (2018). **Boundary Mixing Forcing Abyssal Overturning**. *Gordon Research Conference on Ocean Mixing*, Hannover, NH. [POSTER]

Drake, H. F., Callies, J., Ferrari, R. (2018). **Testing a New Paradigm for the Abyssal Ocean Circulation**. *Ocean Sciences Meeting*, Portland, OR. [TALK]

Drake, H. F., Tamsitt, V., Morrison, A. K., Sarmiento, J. L., Griffies, S. M., Weijer, W., Gray, A. R., Talley, L., Wang, J., Mazzlof, M., Dufour, C. (2017). **Spatial and Temporal Structure of Southern Ocean Upwelling**. *Graduate Climate Conference*, Woods Hole, MA. [POSTER]

Drake, H. F., Tamsitt, V., Morrison, A. K., Sarmiento, J. L., Griffies, S. M., Weijer, W., Gray, A. R., Talley, L., Wang, J., Mazzlof, M., Dufour, C. (2016). **Three-Dimensional Pathways of Deep Water Upwelling in the Southern Ocean**. *Southern Ocean Carbon and Climate Observations and Modelling (SOCCOM) Annual Meeting*, Scripps Institution of Oceanography, CA. [TALK]

Drake, H. F., Morrison, A. K., Sarmiento, J. L., Griffies, S. M., Weijer, W., Gray, A. R., Dufour, C. (2016). **Lagrangian Upwelling Pathways of Deep Waters in the Southern Ocean**. *Ocean Sciences Meeting*, New Orleans, LA. [POSTER]

TEACHING

Organizer and Instructor (2020) for a January-term workshop, *Practical Computing Tutorials for Earth Scientists (PraCTES)* [course website] at MIT. Responsibilities included curriculum design, development of code tutorials, assisting other instructors during live hands-one exercises, and presenting two 2 hour lectures.

Teaching Assistant (2019) for MIT 6.S898 [course website], a project-based climate change seminar course cross-listed in the Computer Science and Earth, Atmospheric, and Planetary Sciences departments. Responsibilities included curriculum design, helping students with final projects, leading discussions of assigned readings, and presenting 3 hours of lectures on climate models and data analysis.

Guest lecturer (2019) (one 1.5 hour session) for graduate-level physical oceanography class at University of Rhode Island Graduate School of Oceanography.

Lecturer (2017) (two 1.5 hour sessions) at the Summer Math Review for incoming graduate students in the Massachusetts Institute of Technology / Woods Hole Oceanographic Instutition Joint Program in Oceanography.

Staff tutor (2014-2015) at Haverford College Math Question Center.

SERVICE

Seminar series, conferences, and workshops

Organizer (2020-2021), **MIT PAOC Sack Lunch Seminar**.

Executive Committee Co-Chair (2019), **Graduate Climate Conference**.

Executive Committee Member (2018), **Society for Women in Marine Sciences Annual Symposium**.

Executive Committee Member (2017, 2020), **Graduate Climate Conference** [url].

Department Retreat Committee Chair (2017), **MIT Program for Atmospheres, Oceans, and Climate**.

Leadership and administrative roles

Student Representative for Physical Oceanography (2019-present), **MIT/WHOI Joint Program**.

Web developer [url] (2020-present), **Towards Inclusion and Diversity in EAPS (TIDE)**

DEI Scorecard maintainer [url], **Towards Inclusion and Diversity in EAPS (TIDE)**

Mentorship and advising

Graduate Residential Advisor for MIT undergraduates, Maseeh Hall (2020-present)

"Near-peer" mentor for 1 WHOI Summer Student Fellow (2020)

Peer mentor for 3 MIT-WHOI Joint Program students (2018-present)

Peer review

Reviewer for *Nature* (1), *Ocean Sciences* (1), *Journal of Geophysical Research: Oceans* (1), *Journal of Physical Oceanographer* (1).

OUTREACH

Given my childhood background of online gaming and involvement in various online communities, most of my professional science outreach takes place online. On some media platforms that are *extremely* popular with young people, I am a prominent communicator on climate science and climate change.

- Active climate science communicator on Twitter.com (**@henrifdrake**), 2500+ followers.

- Active on **reddit.com/r/science/**, an online science forum with 20+ million members, where I am an accredited panelist on the topics of Ocean Circulation and Climate Modelling (**/u/aClimateScientist**).

- Founder of **Climate Gamers**, a program that used computer games to communicate climate science.

- Active participant of Skype a Scientist program (15+ virtual classroom visits).

FIELD WORK

Upcoming (2021) **Bottom Layer Turbulence** (30-40 day cruise).
Will investigate the turbulent bottom boundary layer along the continental slope of the Rockall Trough (off the west coast of Ireland), using a combination of ship-based casts, anchored mooring arrays, free-falling profilers, and inert tracer injections to measure turbulence statistics.

2018 **MIT-WHOI Joint Program Orientation** (10 days on *R/V Corwith Cramer*).
Conducted hydrographic and biological surveys of the shelf break jet south of Cape Cod and a warm core eddy on the northern flank of the Gulf Stream.