

HILLARY A. SCANNELL

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Lamont-Doherty Earth Observatory • Columbia University
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EDUCATION

University of Washington Ph.D. in Oceanography	Seattle, WA <i>2020</i>
University of Maine M.S. in Oceanography B.S. in Marine Science	Orono, ME <i>2014</i> <i>2013</i>

RESEARCH APPOINTMENTS

Lamont-Doherty Earth Observatory at Columbia University Postdoctoral Research Scientist, Climate Data Science Lab	Palisades, NY <i>2020 – Present</i>
University of Washington Graduate Research Assistant, School of Oceanography	Seattle, WA <i>2015 – 2020</i>
National Center for Atmospheric Research Graduate Research Assistant, Computational and Information Systems Lab	Boulder, CO <i>Spring 2020</i>
Tableau Software Research Intern	Seattle, WA <i>Summer 2018</i>
NOAA Pacific Marine Environmental Laboratory Graduate Research Assistant, Global Tropical Moored Buoy Array Lab	Seattle, WA <i>2015 – 2017</i>
University of New South Wales Visiting Research Fellow, Climate Change Research Center	Sydney, NSW <i>Summer 2014</i>
Gulf of Maine Research Institute Graduate Research Assistant, Ecosystem Modeling Lab Research Intern, Ecosystem Modeling Lab	Portland, ME <i>2013 – 2015</i> <i>Summer 2013</i>

FUNDED PROPOSALS

- Scannell, H. A.**, 2020: National Center for Atmospheric Research Advanced Study Program Graduate Fellowship, \$6,000.
- Thompson, L. and **Scannell, H. A.**, 2020: Following the heat towards large marine ecosystems: AI tools for tracking dangerous marine heatwaves. Leonardo DiCaprio Foundation & Microsoft AI for Earth Innovation Grant, \$99,889. [[Press Release](#)], [[UW eScience Institute Highlight](#)]
- Scannell, H. A.**, 2018–2019: Microsoft AI for Earth Azure Compute Grant, over \$15,000 in cloud compute credits.
- Scannell, H. A.**, 2018: Integral Consulting Inc. Environmental Big Data Research Award, \$3,764.
- Scannell, H. A.**, 2018: Impacts of El Niño-Southern Oscillation on Indian Ocean heatwaves, National Science Foundation EAPSI/ EPSCoR Co-Funding, \$5,070.

PUBLICATIONS

Peer-reviewed:

11. **Scannell, H. A.**, L. Thompson, G. C. Johnson, J. M. Lyman, S. Riser, Subsurface evolution of recent marine heatwaves in the Northeast Pacific, *Geophys. Res. Lett.*, 47, e2020GL090548, DOI: [10.1029/2020GL090548](https://doi.org/10.1029/2020GL090548).
10. Sen Gupta, A., M. Thomsen, J. A. Benthuisen, A. J. Hobday, E. Oliver, L. V. Alexander, M. T. Burrows, M. G. Donat, M. Feng, , N. J. Holbrook, S. Perkins-Kirkpatrick, P. J. Moore, R. R. Rodrigues, **H. A. Scannell**, A. S. Taschetto, C. C. Ummenhofer, T. Wernberg, and D. Smale, Drivers and impacts of the most extreme marine heatwaves events, *Sci. Rep.*, 10, 19359, DOI: [10.1038/s41598-020-75445-3](https://doi.org/10.1038/s41598-020-75445-3).
9. Holbrook, N. J., A. Sen Gupta, E. C. J. Oliver, A. J. Hobday, J. A. Benthuisen, **H. A. Scannell**, D. A. Smale, and T. Wernberg (2020), Keeping pace with marine heatwaves as oceans warm, *Nat. Rev. Earth Environ.*, 1, 482–493, DOI: [10.1038/s43017-020-0068-4](https://doi.org/10.1038/s43017-020-0068-4).
8. Holbrook, N. J., **H. A. Scannell**, A. Sen Gupta, J. A. Benthuisen, M. Feng, E. C. J. Oliver, L. V. Alexander, M. T. Burrows, M. G. Donat, A. J. Hobday, P. J. Moore, S. E. Perkins-Kirkpatrick, D. A. Smale, S. C. Straub, and T. Wernberg (2019), A global assessment of marine heatwaves and their drivers, *Nat. Commun.*, 10, 2624, DOI: [10.1038/s41467-019-10206-z](https://doi.org/10.1038/s41467-019-10206-z).
7. Smale, D. A., T. Wernberg, E. C. J. Oliver, M. Thomsen, B. P. Harvey, S. C. Straub, M. T. Burrows, L. V. Alexander, J. A. Benthuisen, M. G. Donat, M. Feng, A. J. Hobday, N. J. Holbrook, S. E. Perkins-Kirkpatrick, **H. A. Scannell** A. Sen Gupta, B. Payne, and P. J. Moore (2019), Marine heatwaves threaten global biodiversity and the provision of ecosystem services, *Nat. Clim. Change*, 9, 306–312, DOI: [10.1038/s41558-019-0412-1](https://doi.org/10.1038/s41558-019-0412-1).
6. **Scannell, H. A.**, and M. J. McPhaden (2018), Seasonal mixed layer temperature balance in the Southeastern Tropical Atlantic, *J. Geophys. Res. Oceans*, 123, 5557–5570, DOI: [10.1029/2018JC014099](https://doi.org/10.1029/2018JC014099).
5. Oliver, E. C. J., M. G. Donat, M. T. Burrows, P. J. Moore, D. A. Smale, L. V. Alexander, J. Benthuisen, M. Feng, A. Sen Gupta, A. J. Hobday, N. J. Holbrook, S. E. Perkins-Kirkpatrick, **H. A. Scannell**, S. C. Straub, and T. Wernberg (2018), Longer and more frequent marine heatwaves over the past century, *Nat. Commun.*, 9, 1324, DOI: [10.1038/s41467-018-03732-9](https://doi.org/10.1038/s41467-018-03732-9).
4. Pershing, A. J., M. A. Alexander, C. M. Hernandez, L. A. Kerr, A. Le Bris, K. E. Mills, J. A. Nye, N. R. Record, **H. A. Scannell**, J. D. Scott, G. D. Sherwood, and A. C. Thomas (2016), Response to Comments on “Slow adaptation in the face of rapid warming leads to collapse of the Gulf of Maine cod fishery”, *Science*, 352(6284), 423, DOI: [10.1126/science.aae0463](https://doi.org/10.1126/science.aae0463).
3. **Scannell, H. A.**, A. J. Pershing, M. A. Alexander, A. C. Thomas, and K. E. Mills (2016), Frequency of marine heatwaves in the North Atlantic and North Pacific since 1950, *Geophys. Res. Lett.*, 43, DOI: [10.1002/2015GL067308](https://doi.org/10.1002/2015GL067308).
2. Hobday, A. J., L. V. Alexander, S. E. Perkins, D. A. Smale, S. C. Straub, J. Benthuisen, M. T. Burrows, M. G. Donat, M. Feng, N. J. Holbrook, P. J. Moore, E. C. J. Oliver, **H. A. Scannell**, A. Sen Gupta and T. Wernberg (2016), A hierarchical approach to defining marine heatwaves, *Prog. Oceanogr.*, 141: 227–238, DOI: [10.1016/j.pocean.2015.12.014](https://doi.org/10.1016/j.pocean.2015.12.014).
1. Pershing, A. J., M. A. Alexander, C. M. Hernandez, L. A. Kerr, A. Le Bris, K. E. Mills, J. A. Nye, N. R. Record, **H. A. Scannell**, J. D. Scott, G. D. Sherwood, and A. C. Thomas (2015), Slow adaptation in the face of rapid warming leads to collapse of the Gulf of Maine cod fishery, *Science*, 350(6262), 809–812, DOI: [10.1126/science.aac9819](https://doi.org/10.1126/science.aac9819).

Conference Proceedings:

1. **Scannell, H. A.**, C. Fraley, N. Mannheimer, S. Battersby, and L. Thompson, Predicting marine heatwaves using global climate models with cluster based long short-term memory, 36th International Conference on Machine Learning (ICML), Climate Change: How Can AI Help, June 14, 2019. [[Abstract](#)]

Reports:

1. Crosman, K., L. Johnson, E. Petrou, and **Scannell, H. A.**, Safeguarding Pacific Northwest Fisheries from a Warming Climate. *The New York Times*, International Edition, August 2, 2017. [[PDF](#)]

HONORS & AWARDS

National Center for Atmospheric Research Advanced Study Program Graduate Fellowship	2020
Integral Consulting Inc. Environmental Big Data Research Award	2018
<i>The New York Times</i> Asia-Pacific Case Competition First Place	2017
University of Washington Program on Climate Change Graduate Fellowship	2015
National Science Foundation East Asia and Pacific Summer Institute Fellowship	2014

SERVICE & OUTREACH

Co-Chair

Program on Climate Change Summer Institute on Climate Extremes, Marine Heatwaves	2020
Ocean Sciences Meeting, Session on Marine Heatwaves & Ocean Biogeochemical Extreme	2020
University of Washington Graduate Climate Conference	2016

Advisor

Organizing Committee for the Program on Climate Change Spring Symposium	2017 – 2018
Graduate Student Steering Committee for the Program on Climate Change	2016 – 2018

Referee

SciPy Conference Program Committee (3 subcommittees):	2021
Data Visualization and Image Processing	
Earth, Ocean, Geo, & Atmospheric Science	
Scientific Applications of Machine Learning & Data Science	
NeurIPS Climate Change AI Workshop Program Committee	2019
Academic Journals:	2017 – Present
<i>Geophysical Research Letters</i>	
<i>Journal of Climate</i>	
<i>Journal of Geophysical Research-Oceans</i>	
<i>Nature Communications Earth & Environment</i>	

Volunteer

Contributing Author, oceanbites.org	2014 – 2015
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TECHNICAL STRENGTHS

Computer Languages	python, MATLAB, shell scripting
Data & Databases	CESM, QG-models, NetCDF, NCO, Zarr
Tools	git, L ^A T _E X
Platforms	Azure, AWS, GCP, HPC, Linux
Core Developer	ocetrac

TEACHING

Graduate Teaching Assistant

University of Washington, School of Oceanography

OCEAN 201: Introduction to Oceanography, 2018, 2019

OCEAN 285/286: Physics Across Oceanography: Fluid Mechanics and Waves, 2018

OCEAN 320: Coastal Oceanography, 2018

OCEAN 215: Methods of Oceanographic Data Analysis, 2016

University of Maine, School of Marine Science

SMS 420: Oceans and Climate Change, 2014

SMS 204: Integrative Marine Science II: Physics and Chemistry of Marine Systems, 2013

PRESENTATIONS

Talks:

14. Scannell, H. A., 2020. West Coast Marine Heatwaves, Olympic Coast National Marine Sanctuary's Sanctuary Advisory Council meeting, remote, 25 September.
13. Scannell, H. A., 2020. Defining and Characterizing Marine Heatwaves for Prediction, US CLIVAR Predictability, Predictions, and Applications Interface Panel Summer Meeting, remote, 21 July.
12. Scannell, H. A., S. C. Riser, L. Thompson, and G. Johnson, 2019. The 2019 reappearance of the Northeast Pacific marine heatwave, Ocean Sciences Meeting, San Diego, WA, 21 February.
11. Scannell, H. A., 2019. Integrating machine learning with traditional approaches in ocean science, Gulf of Maine Research Institute, Portland, ME, 25, November.
10. Scannell, H. A., S. C. Riser, L. Thompson, and G. Johnson, 2019. The 2019 reappearance of the Northeast Pacific marine heatwave, Physical Oceanography Seminar, School of Oceanography, University of Washington, Seattle, WA, 13 November.
9. Scannell, H. A., 2019. Rising Toll of Marine Heatwaves, Water & Salmon Committee of the Washington State Sierra Club, Seattle, WA, 15 April.
8. Scannell, H. A., & co-authors, 2019. Marine heatwaves threaten global biodiversity and the provision of ecosystem services, NOAA-Northwest Fisheries Science Center, Seattle, WA, 13 March.
7. Scannell, H. A., 2018. Seasonal mixed layer heat budget in the Southeast Tropical Atlantic, Ocean Sciences Meeting, Portland, Oregon.
6. Scannell, H. A., 2017. Mechanisms controlling the seasonal mixed layer heat budget in the southeast Tropical Atlantic, Program on Climate Change Spring Symposium, University of Washington, Seattle, WA, 8 April.
5. Scannell, H. A., 2017. Taking a holistic view of marine heatwaves globally, NOAA Alaskan Fisheries Science Center, Seattle, WA.
4. Scannell, H. A., 2017. Marine Heatwaves: Emerging climate phenomena, Sound Waters University, Langley, WA.
3. Scannell, H. A., 2016. Marine Heatwaves: Emerging climate phenomena, Program on Climate Change Graduate Student Seminar, University of Washington, Seattle, WA.
2. Scannell, H. A. Climatic influences on extra-tropical marine heatwaves, Commonwealth Scientific and Industrial Research Organization, Oceans and Atmosphere Flagship Seminar Series, Perth, Western Australia. 2015.

1. Scannell, H. A.. The ocean heatwave phenomenon and the climatic mechanisms at play. Climate Change Research Center Seminar, University of New South Wales, Sydney, Australia. August 2014.

Posters:

8. Scannell, H. A., L. Thompson, W. Cheng, and E. Maroon, 2019. Characterization of marine heatwaves in the CESM Large Ensemble, US CLIVAR Large Ensembles Workshop, NCAR, Boulder, CO.
7. Scannell, H. A., and M. J. McPhaden, 2017. Seasonal mixed layer heat budget in the southeast tropical Atlantic, American Meteorological Society Annual Meeting, Seattle, WA, 25 January, Abstract #308397.
6. Scannell, H. A., and M. J. McPhaden, 2016. Seasonal mixed layer heat budget in the southeast tropical Atlantic, AGU Fall Meeting, San Francisco, CA, 13 December, Abstract #152486.
5. Scannell, H. A., and M. J. McPhaden, 2016. Seasonal mixed layer heat budget in the southeast tropical Atlantic, Graduate Climate Conference, Pack Forest, WA, 29 October.
4. Scannell, H. A., M. H. England, and A. Sen Gupta, 2014. Climatic influences on Indian and Pacific Ocean heatwaves, AGU Fall Meeting, San Francisco, CA, 18 December, Abstract #OS43A-1262.
3. Scannell, H. A., M. H. England, and A. Sen Gupta, 2014. Quasi-decadal variability of ocean heatwaves in the Southern Hemisphere extra-tropics, Graduate Climate Conference, Pack Forest, WA, 1 November.
2. Scannell, H. A., A. J. Pershing, and K. E. Mills, 2014. Frequency of ocean heatwaves occurring in the Atlantic and Pacific Oceans, Ocean Sciences Meeting, Honolulu, HI, 24 February, Abstract #1389.
1. Scannell, H. A., A. J. Pershing, and K. E. Mills, 2013. Likelihood of an ocean heatwave in the northwest Atlantic Ocean, Regional Association for Research on the Gulf of Maine, Portsmouth, NH, 8 October.

MEDIA SPOTLIGHTS AND INTERVIEWS

NPR, Earth's Oceans Are Getting Hotter And Higher, And It's Accelerating, 9/25/19

The Washington Post, The 'Blob' is surging back in the Pacific, leading to fears of mass die-offs of marine life and unusual weather patterns, 9/21/19

InsideClimate News, A Marine Heat Wave Intensifies, with Risks for Wildlife, Hurricanes and California Wildfires, 9/18/19

Forbes, Another 'Warm Blob' Is Forming In The Pacific Ocean, 9/5/19

InsideClimate News, 5 Science Teams Racing Climate Change as the Ecosystems They Study Disappear, 2/6/19

EOS Earth & Space Science News, Why Is the Gulf of Maine Warming Faster Than 99% of the Ocean? 11/12/18

Carbon Brief, Restricting global warming to 1.5°C would 'halve' risk of marine heatwaves, 8/15/18

UW Today, The New York Times recognizes UW student policy recommendations, 6/26/17

The Daily, Understanding the blob and 65 years of hot water, 4/28/16

Weather Underground, The North Atlantic Blob: A Marine Cold Wave That Won't Go Away, 4/8/16

MyNorthwest, Pacific Ocean's 'marine heatwaves' likely to become more frequent, intense, 4/3/16

KING 5 News, Global 'blobs' getting more extreme, 4/1/16

UW Today, Tracking 'marine heatwaves' since 1950 – and how the 'blob' stacks up, 3/30/16

Hakai Magazine, Revenge of the Blob, 3/2/16

German National Public Radio, Heatwaves at Sea, 2/25/16

Tech Times, Climate change blamed for collapse of iconic New England Cod Populations, 10/30/15

NPR, Why is it so hard to save Gulf of Maine Cod? They're in hot water, 10/30/15

The New York Times, Cod's Continuing Decline Linked to Warming Gulf of Maine Waters, 10/29/15

Boston Globe, Climate change hurting N.E. cod population, study says, 10/29/15

Science Magazine, Collapse of New England's iconic cod tied to climate change, 10/29/15

Science Daily, Warming waters a major factor in the collapse of New England cod, 10/29/15

Wired, Climate change is wicked bad for New England's cod, 10/29/15

Smithsonian, Why smarter fishing practices aren't saving Maine cod from collapse, 10/29/15

EurekAlert, New England cod collapse linked to warming waters, 10/29/15

Portland Press Herald, Climate change in Gulf of Maine is responsible for cod's failure to recover, 10/29/15

CBS News, Warmer Atlantic a big factor in cod kill-off, study shows, 10/29/15

The Washington Post, Climate change is doing some very strange things to the waters off New England, 10/29/15

National Geographic, Warm water may spell the end to New England's iconic cod, 10/29/15

Carbon Brief, The contrasting fortunes of Atlantic cod in warming oceans, 10/29/15

AAAS, Warming waters contribute to collapse of Atlantic Cod, 10/28/15