

# Alice S. Ren

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**Email:** aliceren@.edu      **Address:** 266 Woods Hole Rd, Woods Hole, MA 02543      **Office:** Clark 350A  
**Phone:** (978) 495-1477      **Web:** <https://www.whoi.edu/profile/alice.ren/>      **Citizenship:** USA

**Appointments**  
01/2026–present: Assistant professor at Arizona State University  
01/2025–12/2025: Assistant scientist at Bermuda Institute of Ocean Sciences  
01/2024–12/2025: Postdoc at Woods Hole Oceanographic Institution (WHOI)  
06/2022–01/2024: Postdoctoral Scholar at WHOI

**Research Interests**      Ocean observations, ocean variability and turbulent processes, gas exchange, geophysical fluid dynamics

**Education**  
**Scripps Institution of Oceanography (SIO)**      La Jolla, CA  
Ph.D. in Physical Oceanography      Sep. 2017 – Jun. 2022  
Advisor: Dr. Daniel Rudnick.  
Thesis: *Mesoscale to large-scale variability in the California Current System from high-resolution observations*  
**The University of Maine, Orono**      Orono, ME  
M.S. in Oceanography      Sep. 2013 – Dec. 2016  
Advisors: Dr. Fei Chai and Dr. Huijie Xue.  
**Duke University**      Durham, NC  
B.S. in Environmental Sciences      Sep. 2007 – Sep. 2010  
GPA: 3.88.

**Honors and Awards**  
WHOI Postdoctoral Scholar, funded by the Doherty Foundation      2022-2023  
National Defense Science and Engineering Graduate Fellowship      2019-2022  
Wyer Fellowship from SIO      2019-2020  
Regents Fellowship from SIO      2018  
Scripps Fellowship from SIO      2018  
Graduate Student Excellence Travel Award from SIO      2018  
NSF Interdisciplinary Graduate Education Research Traineeship      2013-2015  
Alice M. Baldwin Scholarship from Duke University      2010

**Current Projects**  
- Interaction of the Gulf Stream with the New England Seamount Chain: *DOD ONR TFO New England Seamounts Acoustics (NESMA) Experiment*  
- Monitoring, reporting, and verification (MRV) of an ocean alkalinity enhancement field trial: *NOAA NOPP*  
- Glider observations in support of BIOS-SCOPE: *Simons Foundation International*

## Publications

[9] **Ren, A.S.**, Rudnick, D.L. and Nicholson, D.P. (2025). **Seasonal Dissolved Oxygen Gas Exchange in the California Current Upwelling System.** *Progress in Oceanography*. 236, 103473. DOI: 10.1016/j.pocean.2025.103473

[8] Alford, M.H., Le Boyer, A.L., **Ren, A.S.**, Voet, G., Bellerjeau, C., Whalen, C., Cuoto, N. (2025). **Observations of turbulence generated by a near-inertial wave propagating downward in an anticyclonic eddy.** *Geophysical Research Letters*. 52, e2024GL114070. DOI: 10.1029/2024GL114070

[7] **Ren, A.S.** and Todd, R.E. (2025). **Springtime warming by ocean advection in the Gulf Stream.** *Geophysical Research Letters*. 52, e2024GL111000. DOI: 10.1029/2024GL111000

[6] **Ren, A.S.**, Rudnick, D.L. and Twombly, A. (2023). **Drift characteristics of Sea-Bird dissolved oxygen optode sensors.** *Journal of Atmospheric and Oceanic Technology*. 40(12), 1457-1468. DOI: 10.1175/JTECH-D-22-0103.1

[5] Todd, R.E. and **Ren, A.S.** (2023). **Warming and lateral shift of the Gulf Stream from in situ observations since 2001.** *Nature Climate Change*. 13, 1348–1352. DOI: 10.1038/s41558-023-01835-w

[4] **Ren, A.S.** and Rudnick, D.L. (2022). **Across-shore propagation of sub-thermocline eddies in the California Current System.** *Journal of Physical Oceanography*, 52(1). DOI: 10.1175/JPO-D-21-0137.1

[3] **Ren, A.S.** and Rudnick, D.L. (2021). **Temperature and salinity extremes from 2014-2019 in the California Current System and its source waters.** *Communications Earth and Environment*, 2(62). DOI: 10.1038/s43247-021-00131-9

[2] **Ren, A.S.**, Chai, F., Xue, H., Anderson, D.M., Chavez, F.P. (2018). **A sixteen-year decline in dissolved oxygen in the Central California Current.** *Scientific Reports*, 8(1). DOI: 10.1038/s41598-018-25341-8

[1] Chavez, F.P., Pennington, J.T., Michisaki, R.P., Blum, M., Chavez, G.M., Friederich, J., Jones, B., Herlien, R., Kieft, B., Hobson, B., **Ren, A.S.**, Ryan, J., Sevadjian, J.C., Wahl, C., Walz, K.R., Yamahara, K., Friederich, G.E., Messie, M. (2017). **Climate variability and change: Response of a coastal ocean ecosystem.** *Oceanography*, 30(4). DOI: 10.5670/oceanog.2017.429

## Datasets and Data Products

[2] Todd, R.E., and **Ren, A.S.** (2023). Gulf Stream mean and annual cycle from Spray underwater glider measurements [Data set]. Scripps Institution of Oceanography, Instrument Development Group. DOI: 10.21238/S8TC9W

[1] **Ren, A.S.**, and Rudnick, D.L. (2023). Data to determine drift characteristics of Sea-Bird dissolved oxygen optode sensors [Data set]. SEANOE. DOI: 10.17882/93431

### Research Funding

**Glider Observations in the Gulf Stream: Operations and analyses in support of NESMA.** R.E. Todd, A.S. Ren. ONR Task Force Ocean / New England Seamount Acoustics DRI, \$399,966. November 2024–October 2026.

**Enhancing the BIOS-SCOPE Program with Detailed Biogeochemical Observations in the Sargasso Sea Summer to Fall Transition.** A.S. Ren. Simons Foundation International, \$100,026. November 2025 - October 2026.

### Selected Talks

[Feb. 24, 2026] Ren, A.S., Todd, R.E., Lin Y.T., and Harris, W. **Gulf Stream Acoustic Ducts near the New England Seamounts and their Effects on Acoustic Propagation.** *Ocean Sciences Meeting*, Glasgow, Scotland.

\*presenter

[Feb. 26, 2026] Pinson, A.\* et al. **Evaluating pH and rhodamine sensor data quality during an ocean alkalinity enhancement field trial.** *Ocean Sciences Meeting*, Glasgow, Scotland. Poster.

[Feb. 26, 2026] Nicholson, D.P.\* et al. **Characterizing Ecological Fingerprints and Biogeochemical State with a Fleet of Underwater Vehicles during an Ocean Alkalinity Dispersal in the Gulf of Maine.** *Ocean Sciences Meeting*, Glasgow, Scotland. Poster.

[Feb. 27, 2026] Traylor, S.\* et al. **Autonomous assessment of CO<sub>2</sub> uptake during an ocean alkalinity enhancement field trial.** *Ocean Sciences Meeting*, Glasgow, Scotland.

[May 20, 2025] Todd, R.E.\* and A.S. Ren. **Inferring subsurface sound speed near the Gulf Stream by combining satellite altimetry with a climatology from underwater glider observations.** *Acoustical Society of America Spring Meeting*, New Orleans, LA, USA.

[May 19, 2025] Ren, A.S. and Todd, R.E. **Subsurface acoustic ducts near the Gulf Stream.** *Acoustical Society of America Spring Meeting*, New Orleans, LA, USA.

[Jun. 11, 2024] Todd, R.E.\* and A.S. Ren. **Warming and lateral shift of the Gulf Stream from in situ observations since 2001.** *International Underwater Glider Conference*, Goteborg, Sweden.

[Jun. 9-14, 2024] **Low-frequency Contributions to Eddy Covariances.** *Gordon Mixing Conference*, Mt. Holyoke College, South Hadley, MA. Poster.

[Jun. 5, 2024] **Observing the Oceans with Sustained Underwater Glider Networks.** *Bermuda Institute of Ocean Sciences* (invited), St. Georges, Bermuda. 1-hr seminar.

[Apr. 25, 2024] **Observing the Oceans with Sustained Underwater Glider Networks.** *Arizona State University* (invited), Tempe, AZ, USA. 1-hr seminar.

[Mar. 16, 2024] **Observing the Oceans with Sustained Underwater Glider Networks.** *Florida State University* (invited), Tallahassee, FL, USA. 1-hr seminar.

[Feb. 22, 2024] **The Annual Cycle and Eddy Variability of Upper Ocean Heat Content in the Gulf Stream.** *Ocean Sciences Meeting*, New Orleans, LA, USA.

[Feb. 16, 2024] **Observing the Oceans with Sustained Underwater Glider Networks.** *University of Maine* (invited), Orono, ME, USA. 1-hr seminar.

[Dec. 14, 2023] **Advection Drives Springtime Warming in the Gulf Stream.** *AGU Fall Meeting*, San Francisco, CA, USA.

[Aug. 14, 2023] **Observing the Oceans with Sustained Glider Networks.** *MIT Lincoln Laboratories Seminar*, Lexington, MA, USA. 1-hr seminar.

[Jan. 10, 2023] **Seasonal Dissolved Oxygen Dynamics in the Central and Southern California Current System: High-resolution Observations from a Sustained Glider Network.** *WHOI PO Seminar*, Woods Hole, MA, USA. 1-hr seminar.

[Dec. 6, 2022] **Seasonal Dissolved Oxygen Dynamics in the Central and Southern California Current System: High-resolution Observations from a Sustained Glider Network.** *California Cooperative Fisheries Investigations (CalCOFI) Conference*, remote. Poster.

[Sep. 20-22, 2022] **The Annual Cycle of Dissolved Oxygen in the California Current System from Glider Observations.** *Underwater Glider User Group (UG2) Workshop*, Seattle, WA, USA.

[Jun. 6, 2022] **Mesoscale to Large-scale Variability in the California Current System from High-resolution Observations.** *SIO PhD Dissertation Defense Talk*, San Diego, CA, USA. 1-hr seminar.

[Feb. 24-Mar. 4, 2022] **The Mean Annual Cycle in the California Current System: The Balance of Mixing, Stratification, and Net Community Production from High-Resolution Glider Observations.** *Ocean Sciences Meeting*, remote.

[Dec. 2, 2021] **Temperature and Salinity Extremes from 2014-2019 in the California Current System.** *California Cooperative Fisheries Investigations (CalCOFI) Conference*, remote.

[Oct. 25, 2021] **Temperature and Salinity Extremes from 2014-2019 in the California Current System.** *NOAA Ocean and Atmospheric Research (OAR) Oceans Portfolio Meeting*, remote.

[Sep. 28, 2021] **Across-shore Propagation of Subthermocline Eddies and Other Insights from Long-term Glider Measurements.** *WHOI PO Seminar*, remote. 1-hr seminar.

[Feb. 16-21, 2020] **Cross-shore Advection by Subthermocline Eddies.** *Ocean Sciences Meeting*, San Diego, CA, USA.

[Feb. 11-16, 2018] **A Sixteen-year Decline in Dissolved Oxygen in the Central California Current.** *Ocean Sciences Meeting*, Portland, OR, USA.

## Cruise Experience

### **ONR TFO New England SeaMount Acoustics Experiment (NESMA)**

PI: Matthew Alford Aug. 8-Sep. 5, 2024

Role: watch leader for 5-person team on daily 12-hour shift

Cruise planning and communication. Recovery of Spray gliders. Deployment of fast CTD and epsilon profilers. R/V *Roger Revelle*. 28 days at sea.

### **Gulf Stream Glider Deployment**

PI: Robert Todd Apr. 8 - 10, 2024

PI: Robert Todd Jun. 12 - 14, 2023

PI: Robert Todd Apr. 11 - 14, 2023

PI: Robert Todd Nov. 14 - 16, 2022

PI: Robert Todd Aug. 22 - 24, 2022

Role: prepare and deploy Spray underwater glider

Gliders in the Gulf Stream project. 1 day at sea per deployment. 5 days at sea.

### **Coherent Lagrangian Pathways from the Surface Ocean to Interior (CALYPSO)**

PI: Shaun Johnston Mar. 28 - Apr. 10, 2019

Role: continuous underway CTD (UCTD) operator.

Navy DRI looking at surface processes in the Mediterranean. Sailed on the French ship *Pourquoi Pas?*. 14 days at sea.

### **Point Sal Coastal Circulation Experiment (SCoNE)**

PI: Andre Palocz, Jen MacKinnon, Amy Waterhouse. Sep. 10-20, 2017

Role: watch leader. Continuous towed CTD, thermistor bow chain.

Scripps graduate student led cruise on the *Gordon Sproul*, in coordination with the Inner Shelf DRI. 10 days at sea.

### **Monterey Bay Aquarium Research Institute (MBARI)**

Role: observer. Jun. 11, 17 and Aug. 6, 2015

Small boat deployment of wave-glider in Monterey Bay, mooring recovery by ROV from on board the *Rachel Carson*, and mesopelagic jellyfish sampling by ROV from the *Rachel Carson*.

### **National Oceanic and Atmospheric Administration (NOAA)**

Role: volunteer. Apr. 1-20, 2012

Northeast Fisheries Science Center, Bi-annual Groundfish Survey on the *Henry B. Bigelow* from Woods Hole, MA. Sort, identify, clean, and dissect trawl catch from Gulf of Maine. 19 days at sea.

### **National Oceanic and Atmospheric Administration (NOAA)**

PI: Phoebe Woodworth, Reka Domokos. Mar. 9-26, 2011

Role: Launch CTD rosette, capture water samples at select depths from 1000 m up, filter water samples for chl, determine chl concentrations using fluorometer. Pacific Islands Fisheries Science Center, Cruise to TZCF on the *Oscar Elton Sette* from Honolulu, HI. 17 days at sea.

Teaching Experience

**Participant, Teaching and Learning Commons (UCSD)** Fall 2020  
 Introduction to College Teaching  
 Training course for teaching assistants and instructors.

**Guest lecturer, SIO (UCSD)** Fall 2019  
 Introduction to Physical Oceanography  
 Lecturer for class on eastern boundary currents and upwelling systems.

**Teaching assistant, SIO (UCSD)** Fall 2018  
 Introduction to Physical Oceanography  
 Introduction to descriptive and dynamic physical oceanography for upper level undergraduates.

**Teaching assistant, SIO (UCSD)** Fall 2018  
 Analysis of Oceanographic/Atmospheric Data  
 Introduction to statistical methods and programming commonly used in analysis of ocean and atmosphere datasets (with Matlab) for upper level undergraduates.

**Teaching assistant, School of Marine Sciences (UMaine)** Spring 2016  
 Climate Change and the Oceans  
 The ocean's role in climate as well as impacts of climate change on the oceans. Upper level undergraduate class. Lecturer for class on decadal climate variability.

**Teaching assistant, School of Marine Sciences (UMaine)** Fall 2015  
 Integrated Marine Sciences III  
 A core course for the undergraduate marine science major, introduces students to fieldwork in the first half and numerical models in the second half.

Govt / Industry

**Monterey Bay Aquarium Research Institute (MBARI)**  
 Moss Landing, CA  
 Intern Summer 2015  
 Looked at observations of dissolved oxygen in the Central California Current region with CeNCOOS and Dr. Francisco Chavez.

**G360**  
 Acton, MA and Suzhou, China  
 Product Manager 2012-2013

Guided product development in response to client requirements and use cases for a software release used by large retailers, such as the Home Depot. Worked with local and remote teams.

**Department of Justice** Environment and Natural Resources Division (ENRD)  
Washington, D.C.

Paralegal, Honors Paralegal Program 2010-2012  
Aid attorneys in legal preparation. Examples include filing and privilege review.

**National Oceanic and Atmospheric Administration (NOAA)**

Honolulu, HI

Intern Summer 2010

Mapping project for satellite tagged loggerhead turtles released in the South Pacific with Dr. Don Kobayashi and Dr. Jeffrey Polovina.

Skills

**Programming**

Matlab, Python.

**Languages**

English (native), French (intermediate), Mandarin (beginner)

Service and Outreach

**WHOI Physical Oceanography Seminar** May 2024-June 2025

Invite and host weekly speakers.

**Panelist at 120th anniversary symposium for BIOS** June 7, 2024

Panelist on *Dawn in the age of the Robotic Oceanographer*.

**Panelist at MIT Robotics and Climate Workshop** May 7, 2024

Provided perspectives on measuring ocean warming using autonomous underwater vehicles.

**Presentation to WHOI Summer Student Fellows (SSFs)** July 2023

Talk and panel on graduate school, academia, and career paths.

**WHOI education council representative** April 2023-June 2024

Representative on the WHOI committee in charge of educational programs, including the WHOI-MIT joint program in oceanography.

**WHOI Postdoctoral Association representative** April 2023-June 2024

Represent physical oceanography department on internal WHOI postdoctoral association. Lead mentoring initiatives. Run workshops for professional development. Run annual 1-day WHOI postdoc symposium.

**WHOI Physical Oceanography postdoc representative to the Department (Chair)** April 2023-June 2024

Represent roughly 24 physical oceanography postdocs to the physical oceanography department. Issues include improving the formal mentorship program, housing, moral, and available resources for research. Meet regularly with the department chair, Dr. Young-Oh Kwon.

**Reviewer of Primer on Hypoxia** October 2022

CalCOFI online primer on hypoxia written by science communication fellows.  
**MPOWIR conference honoring Susan Lozier** October 5-12, 2022  
 Participated in mentoring conference for women in physical oceanography as a junior scientist.

**UG2 Standard Operating Procedures** September 2022 - present  
 Writer and reviewer for the community operating procedure for dissolved oxygen sensors on gliders.

**Seminar to WHOI Summer Student Fellows (SSFs)** July 2022  
 Talk and panel on graduate school, academia, and career paths.

**Scripps Heritage Committee** 2021-2022  
 Representative on departmental committee.

**Women and Minorities in Science (WMIS) at Scripps** 2020-2021  
 Outreach and programming especially for gender and Asian issues.

**Peer Mentor** Sep 2019–2021  
 Mentor a first year SIO graduate student through their year 1 classes and the departmental exam at the end of year 1. 2020-2021 Outstanding Mentor.

**Climate, Atmospheric Sciences, and Physical Oceanography Departmental Seminar** 2018–2019  
 Coordinator.

**Birch Aquarium at Scripps Institution of Oceanography** May 12, 2018  
 Lecturer on ocean currents at 1-day workshop for local teachers.

Media and Press

[Oct. 9, 2023] Press Release: New Study Finds that the Gulf Stream is Warming and Shifting Closer to Shore. *WHOI Communications*.  
 [Apr. 26, 2024] Radio Segment: Outside/Inbox: No, the Gulf Stream isn't shutting down. *New Hampshire Public Radio*, segment by Taylor Quimby.

Professional Memberships

**The Oceanography Society, American Geophysical Union**

Reviewer for

Journal of Geophysical Research - Oceans, Journal of Marine Systems, Global Biogeochemical Cycles, Deep-Sea Research Part II, Geophysical Research Letters, Journal of the Acoustical Society of America (JASA), Progress in Oceanography, Nature Communications, Ocean Science