

Isabela Le Bras

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RESEARCH INTERESTS

EDUCATION

Ph.D. in Physical Oceanography 2011–2017

Massachusetts Institute of Technology – Woods Hole Oceanographic Institution Joint Program

“Dynamics of North Atlantic Western Boundary Currents”

Thesis adviser: John M. Toole

B.A. in Physics, Minor in Mathematics 2006–2010

University of California, Berkeley

Highest honors in physics and general scholarship

APPOINTMENTS

Assistant Scientist 2020–present

Woods Hole Oceanographic Institution

tenure-track position

Postdoctoral Scholar 2017–2020

Scripps Institution of Oceanography

Postdoctoral adviser: Fiamma Straneo

Postdoctoral Investigator Jan-Aug 2017

Woods Hole Oceanographic Institution

Postdoctoral adviser: John M. Toole

Graduate Research Assistant 2011–2017

Woods Hole Oceanographic Institution

Graduate supervisor: John M. Toole

PUBLICATIONS

24. **I. A. Le Bras**, “Labrador Sea Water spreading and the Atlantic Meridional Overturning Circulation”, *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* doi:10.1098/rsta.2022.0189, (2023).
23. D. G. Evans, N. P. Holliday, S. Bacon, **I. A. Le Bras**, “Mixing and air-sea buoyancy fluxes set the time-mean overturning circulation in the subpolar North Atlantic”, *Ocean Sciences* doi:10.5194/os-19-745-2023, 19 (3) (2023).
Role: Contributed to the interpretation of results and manuscript editing.

22. **I. A. Le Bras**, I. Fenty, J. Willis, “The Atlantic meridional overturning circulation at 35N from deep moorings, floats, and satellite altimeter”, *Geophysical Research Letters* **doi:10.1029/2022GL101931**, 50, e2022GL101931 (2023).
21. H. Palevsky, S. Clayton and coauthors (including **I. A. Le Bras**), “OOI Biogeochemical Sensor Data Best Practices and User Guide. Version 1.0.0.”, *Ocean Best Practices Repository* **DOI: 10.25607/OBP-1865**, (2022).
Role: Contributed to the formulation of the oxygen section.
20. A. Arroyo, M. L. Timmermans, **I. A. Le Bras**, A. Proshutinsky, W. Williams, S. Zimmerman, “Declining O₂ in the Canada Basin halocline consistent with physical and biogeochemical effects of Pacific Summer Water warming”, *submitted to Journal of Geophysical Research: Oceans* **doi:10.1029/2022JC019418**, 128 (4) (2022).
Role: Contributed to the interpretation of results and manuscript editing.
19. **I. A. Le Bras**, J. Callies, T.C. Biló, F. Straneo, J. Holte, H. L. Johnson, “Slantwise Convection in the Irminger Sea”, *Journal of Geophysical Research: Oceans*, editor highlight in *EOS magazine* **https://doi.org/10.1029/2022JC019071**, 127 (2022).
18. T.C. Biló, F. Straneo, J. Holte, **I. A. Le Bras**, “Arrival of New Great Salinity Anomaly Weakens Convection in the Irminger Sea”, *Geophysical Research Letters* **doi.org/10.1029/2022GL098857**, (2022).
Role: Contributed to the interpretation of results and manuscript editing.
17. D. Atamanchuk, J. Palter, H. Palevsky, **I. A. Le Bras**, J. Koelling, and D. Nicholson., “Linking Oxygen and Carbon Uptake with the Meridional Overturning Circulation Using a Transport Mooring Array”, *Oceanography* **doi.org/10.5670/oceanog.2021.supplement.02-03**, (2021).
Role: Participated in the project and contributed to manuscript editing.
16. B. Berx, and coauthors (including **I. A. Le Bras**), “Climate-Relevant Ocean Transport Measurements in the Atlantic and Arctic Oceans”, *Oceanography* **doi.org:10.5670/oceanog.2021.supplement.02-04**, (2021).
Role: Participated in the project and contributed to manuscript editing.
15. F. Li, M. S. Lozier, N. P. Holliday, W. Johns, **I. A. Le Bras**, B. Moat, S. Cunningham, M. F. de Jong, “Observation-based estimates of heat and freshwater exchanges from the subtropical North Atlantic to the Arctic”, *Progress in Oceanography* **doi:10.1016/J.POCEAN.2021.102640**, (2021).
Role: Contributed to the interpretation of results and manuscript editing.
14. A. Pacini, R. S. Pickart, **I. A. Le Bras**, F. Straneo, and N. P. Holliday, “Cyclonic eddies in the West Greenland Boundary Current System”, *Journal of Physical Oceanography* **doi:10.1175/JPO-D-20-0255.1**, 2087–2102 (2021).
Role: Provided a calibrated moored dataset and contributed to the interpretation of results and manuscript editing.
13. F. Li, and coauthors (including **I. A. Le Bras**), “Subpolar North Atlantic western boundary density anomalies and the Meridional Overturning Circulation”, *Nature Communications* **doi:10.1038/s41467-021-23350-2**, (2021).
Role: Provided a calibrated moored dataset and contributed to manuscript editing.

12. **I. A. Le Bras**, F. Straneo, M. Muilwijk, L. H. Smedsrud, F. Li, M. S. Lozier, and N. P. Holliday, “How much Arctic fresh water participates in the subpolar overturning circulation?”, *Journal of Physical Oceanography* doi:10.1175/JPO-D-20-0240.1, 955–973 (2021).
11. A. Pacini, R. S. Pickart, F. Bahr, D. J. Torres, A. Ramsey, J. Holte, J. Karstensen, M. Oltmanns, F. Straneo, **I. A. Le Bras**, G. W. K. Moore, M. F. de Jong, “Mean Conditions and Seasonality of the West Greenland Boundary Current System near Cape Farewell”, *Journal of Physical Oceanography* doi:10.1175/JPO-D-20-0086.1, 2849–2871 (2020).
Role: Provided a calibrated moored dataset and contributed to the interpretation of results and manuscript editing.
10. **I. A. Le Bras**, F. Straneo, J. Holte, M.F. de Jong, and N. P. Holliday , “Rapid export of waters formed by convection near the Irminger Sea’s western boundary”, *Geophysical Research Letters*, editor highlight in *EOS magazine* doi.org/10.1029/2019GL085989, (2020).
9. **I. A. Le Bras**, M. Sonnewald, and J.M. Toole, “A barotropic vorticity budget for the subtropical North Atlantic based on observations”, *Journal of Physical Oceanography* doi:10.1175/JPO-D-19-0111.1, (2019).
8. E. Frajka-Williams, and coauthors (including **I. A. Le Bras**), “Atlantic Meridional Overturning Circulation: Observed transports and variability”, *Frontiers in Marine Science* **6**, (2019).
Role: Contributed to manuscript writing and editing.
7. J. Hopkins, N. P. Holliday, D. Rayner, L. Houpert, **I. A. Le Bras**, F. Straneo, C. Wilson, and S. Bacon, “Transport variability of the Irminger Sea Deep Western Boundary Current from a mooring array”, *Journal of Geophysical Research: Oceans* **124**, (2019).
Role: Provided a gridded LADCP dataset and contributed to the interpretation of results and manuscript editing.
6. M. S. Lozier, F. Li, and coauthors (including **I. A. Le Bras**), “A sea change in our view of overturning– first results from the Overturning in the Subpolar North Atlantic Program”, *Science* **363**, 516–521 (2019).
Role: Provided a calibrated moored dataset and contributed to manuscript editing.
5. **I. A. Le Bras**, F. Straneo, J. Holte, and N. P. Holliday , “Seasonality of Freshwater in the East Greenland Current System from 2014 to 2016”, *Journal of Geophysical Research: Oceans* **123**, (2018).
4. **I. A. Le Bras**, S. Jayne, and J. M. Toole, “The interaction of recirculation gyres and a deep boundary current”, *Journal of Physical Oceanography* **48**, 573-590 (2018).
3. J. M. Toole, M. Andres, **I. A. Le Bras**, T. Joyce and M. McCartney, “Moored observations of the Deep Western Boundary Current in the NW Atlantic: 2004-2014”, *Journal of Geophysical Research: Oceans* **122**, 7488-7505 (2017).
Role: Contributed to data preparation, figure production, and manuscript editing.
2. **I. A. Le Bras**, I. Yashayaev, and J. M. Toole, “Tracking Labrador Sea Water property signals along the Deep Western Boundary Current”, *Journal of Geophysical Research: Oceans* **122**, 5348-5366 (2017).
1. **I. A. Le Bras** and T. Karin (co-first authors), A. Kehlberger, K. Singer, N. Daniilidis, and H. Haeffner, “Transport of charged particles by adjusting RF voltage amplitudes”, *Applied Physics B* **106**, 117-125 (2012).

MENTORING

Postdoctoral scholars

Leo Middleton: 2023-present (co-advised by Tom Farrar)

MIT-WHOI Joint Program Ph.D. students

Hiroki Nagao: 2022-present

Marta Faulkner: 2023-present (co-advised by Mike Spall)

Ph.D. thesis committees

Ashley Arroyo (Yale): 2020-present

Ellen Park (MIT-WHOI Joint Program): 2022-present

Undergraduate students

Megan Knight (WHOI SSF): 2021

Nash Keyes (Yale): 2021 (co-advised by Mary-Louise Timmermans)

SEMINARS

Series of virtual seminars:

NOAA GFDL formal seminar (**invited**)

WHOI physical oceanography seminar Nov 2022
“Slantwise convection in the Irminger Sea”

Series of virtual seminars:

University of Rhode Island, physical oceanography seminar (**invited**)

NASA Goddard Institute for Space Studies, sea level rise seminar (**invited**)

WHOI physical oceanography seminar March 2021
“How much Arctic fresh water participates in the subpolar overturning circulation?”

CLIVAR POS panel webinar Oct 2020
“How much Arctic fresh water participates in the subpolar overturning circulation?”

Caltech oceanography group seminar January 2020
“Freshwater, Convection, and Overturning in the Irminger Sea”

U Mass Dartmouth Oct 2019
“The East Greenland Current System: Seasonality of Freshwater and Boundary Current - Convection Interactions”

Applied Physics Laboratory - University of Washington seminar June 2019
“Seasonality of Freshwater in the East Greenland Current System”

Woods Hole Oceanographic Institution Mar 2019
“Seasonality of Freshwater in the East Greenland Current System”

Scripps Institution of Oceanography, CASPO Seminar Jan 2019

“Seasonality of Freshwater in the East Greenland Current System”	
Lamont Doherty Earth Observatory, Ocean and Climate Physics Seminar “Seasonality of Freshwater in the East Greenland Current System”	Nov 2018
Oregon State University, College of Earth, Ocean and Atmospheric Sciences “Seasonality of Freshwater in the East Greenland Current System”	Oct 2018
Scripps Institution of Oceanography, CASPO Seminar “Advection and Stirring of the Deep Western Boundary Current”	Oct 2017
Bjerknes Center, GFI seminar, Bergen, Norway “Observing and modeling stirring of the Deep Western Boundary Current”	May 2017
Oregon State University, College of Earth, Ocean and Atmospheric Sciences “Stirring in the Deep Western Boundary Current”	Mar 2017
Series of seminars in Germany 1. GEOMAR, Kiel; 2. Marum, Universität Bremen; 3. Universität Hamburg “Observing and Modeling Stirring of the Deep Western Boundary Current”	Jan 2016
University of California, Los Angeles “Observing and Modeling Stirring of the Deep Western Boundary Current”	Dec 2015

CONFERENCE PRESENTATIONS

AGU OOI-OSNAP special session (virtual presentation) I. A. Le Bras “Boundary Current Ventilation in the Irminger Sea”	Dec 2021
Arctic and Subarctic Ocean Fluxes (virtual presentation) I. A. Le Bras “Revisiting the Arctic freshwater budget from 2004 to 2010”	Oct 2021
Ocean Carbon Biogeochemistry Meeting (virtual presentation) I. A. Le Bras “Boundary Current Ventilation in the Irminger Sea”	June 2021
European Geoscience Union (virtual Pico presentation) I. A. Le Bras , F. Straneo, M. Muilwijk, L.H. Smedsrud, F.Li, M.S. Lozier and N. P. Holliday “How much Arctic fresh water participates in the subpolar overturning circulation?”	April 2021
Arctic and Subarctic Ocean Fluxes (ASOF) (virtual oral presentation) I. A. Le Bras , F. Straneo, M. Muilwijk, L.H. Smedsrud, F.Li, M.S. Lozier and N. P. Holliday “How much Arctic fresh water participates in the subpolar overturning circulation?”	Oct 2020
Ocean Sciences Meeting, San Diego, CA (oral presentation) I. A. Le Bras , F. Straneo, J. Holte, M. F. de Jong and N. P. Holliday “Rapid export of waters formed by convection near the Irminger Sea’s western boundary”	Feb 2020
Ocean Obs’19, Honolulu, HI (poster presentation) I. A. Le Bras , F. Straneo, J. Holte, M. F. de Jong and N. P. Holliday “Observing the link between convection and deep water export”	Sep 2019
EGU Meeting, Vienna, Austria (poster presentation)	Apr 2019

I. A. Le Bras , F. Straneo, J. Holte, and N. P. Holliday “Convection and deep water export in the Irminger Sea”	
AGU Fall Meeting, Washington D.C. (poster presentation) I. A. Le Bras , N. Beaird, and F. Straneo “Freshwater budgets for the ocean east of Greenland”	Dec 2018
Ocean Sciences Meeting, Portland, OR (oral presentation) I. A. Le Bras , F. Straneo, J. Holte and N. P. Holliday “Seasonality of Freshwater in East Greenland Current System”	Feb 2018
Ocean Sciences Meeting, Portland, Oregon “Observing and Modeling the Deep Western Boundary Current”	Feb 2018
Irminger Sea Workshop, Southampton, UK (oral presentation) I. A. Le Bras , F. Straneo, J. Holte and N. P. Holliday “Seasonality of Freshwater in East Greenland Current System”	Nov 2017
USAMOC meeting, Santa Fe, NM (oral presentation) I. A. Le Bras , I. Yashayaev, and J.M. Toole “Labrador Sea Water property changes along the Deep Western Boundary Current”	May 2017
EGU meeting, Vienna, Austria (poster presentation) I. A. Le Bras and J.M. Toole “A vorticity budget for the Gulf Stream”	Apr 2017
Ocean Sciences Meeting, New Orleans, LA (poster presentation) I. A. Le Bras and J.M. Toole “Line W Measurements of the Deep Western Boundary Current reflect changes in Labrador Sea Convection”	Feb 2016
Ocean Sciences Meeting, New Orleans, LA (poster presentation) I. A. Le Bras “Clubes de Ciencia: Intensive science workshops in Mexico provide a unique opportunity for teaching, scientific and cultural exchange”	Feb 2016
RAPID-USAMOC International Science Meeting, Bristol, UK (oral presentation) I. A. Le Bras and J. M. Toole “A decade of Line W observations of the Deep Western Boundary Current”	Jul 2015
Graduate Climate Conference, Pack Forest, WA (poster presentation) I. A. Le Bras and J. M. Toole “Deep western boundary current exchange with the interior”	Oct 2014
Ocean Sciences Meeting, Honolulu, HI (poster presentation) I. A. Le Bras and J. M. Toole “Testing classic theories of western boundary currents in the North Atlantic”	Feb 2014

PROFESSIONAL ACTIVITIES

WHOI commitees: PO website committee (2020-2022), CDEI subcommittee for faculty hiring (2020-2022), Ad hoc hiring committee (2021)

Panel member: CLIVAR POS panel (2020-2022)

Reviewer: National Science Foundation; Nature; Journal of Physical Oceanography; Geophysical Research Letters; Science Advances; Journal of Geophysical Research: Oceans; Journal of Climate; Nature Scientific Reports; Ocean Modelling; Ocean Science Discussions; Earth System Science Data Discussions (ESSDD)

Session chair: EGU meeting 2019, Ocean Circulation and Climate Open Session; Graduate Climate Conference 2013, Physical Oceanography session

Steering committee member: Mentoring Physical Oceanography Women to Increase Retention (2016-2020)

RESEARCH CRUISES

Fall 2021: Beaufort Gyre Observing System aboard CCGS Louis S. St Laurent
Responsible party for WHOI moorings and ice stations.
Chief Scientist: Sarah Zimmerman; Cambridge Bay, Canada. (30 days)

Summer 2020: Overturning in the Subpolar North Atlantic Program (OSNAP) cruise AR45.
Responsible party for cruise dissolved gas component and CTD watchstander.
Chief Scientist: Robert Pickart; Woods Hole, MA. (35 days)

Fall 2018: Overturning in the Subpolar North Atlantic Program (OSNAP) cruise AR30-06.
Cape Farewell mooring specialist and responsible party for CTD χ -pod measurements.
Chief Scientist: Robert Pickart; Reykjavik, Iceland (42 days)

July 2017: Sermilik fjord research expedition. CTD specialist.
Chief Scientist: Fiamma Straneo; Tassilaq, Greenland (14 days)

May 2014: Line W research cruise KN218. CTD watch leader.
Chief Scientist: John M. Toole; Woods Hole, MA (14 days)

Aug 2012: Line W research cruise KN208. CTD watch stander.
Chief Scientist: John M. Toole; Woods Hole, MA (14 days)

May 2012: WOCE/CLIVAR A22 hydrography cruise AT20-1A. CTD watch stander.
Chief Scientist: Ruth Curry; Woods Hole, MA - Bridgetown, Barbados (30 days)

OUTREACH

2021: Panelist for Boston College SACNAS chapter(Society for Advancement of Chicanos/Hispanics and Native Americans in Science) career path discussion

2020: Two presentations to summer undergraduate students from underrepresented backgrounds “Chimneys into the deep ocean: measuring the ocean circulation around Greenland”

2018, 2020: Organized LGBTQ+ networking event at Ocean Sciences Meeting

2019: Talked about science careers and did experiments with groups of underrepresented sixth graders from San Diego on the Scripps Pier in collaboration with Birch Aquarium.

2018: Did experiments with students at Ocean Beach Elementary School for their “Science Night”.

2015-2016: Judge for Falmouth High School Science Fair.

2014: Submerge! New York City marine science festival. Manned booth of hands-on activities for WHOI. Estimated more than 4000 people in attendance.

2014: Article for the general public: “Detours on the oceanic highway” Oceanus Magazine

TEACHING

October 2020: Guest lecture on ocean convection in Boston College Oceanography class (virtual). Professor Hilary Palevsky.

April 2018: Guest lecture on water mass analysis and the overturning circulation for ice-ocean interactions course, Scripps Institution of Oceanography, CA. Professor Fiamma Straneo.

September 2016: Teaching assistant for introductory course on github and python through the Software Carpentry program, Woods Hole, MA.

January 2016: Designed and taught 3 lectures of an undergraduate short-course entitled “Anthropocene”, Woods Hole, MA.

January 2015: Created curriculum and taught a week-long, all-day workshop on ocean physics to college and high school students using lab experiments and numerical simulations (in English and Spanish) at UABC in Ensenada, Mexico through Clubes de Ciencia program.

Spring 2014: Took course through MIT’s Teaching and Learning Laboratory on teaching methods culminating in MIT Teaching Certificate, Cambridge, MA.

Fall 2013: Teaching assistant for introduction to observational physical oceanography, MIT course 12.808 with Dr. Magdalena Andres and Dr. Jake Gebbie. MIT-WHOI Joint Program.

Summer 2013 and 2015: Short Course Instructor for graduate student math refresher. MIT-WHOI Joint Program.