

Samuel D. Brenner

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Summary

My research uses a combination of *in situ* measurements and idealized modelling to understand the dynamic and thermodynamic processes linking sea ice and the upper ocean, and how those links impact—and are impacted by—the changing Arctic climate.

Research experience

Brown University, Department of Earth, Environmental, and Planetary Sciences	<i>Providence, RI, USA</i>
Postdoctoral Research Associate	Jul. 2022–Present
• Advisor: Christopher Horvat	
University of Washington, Applied Physics Laboratory	<i>Seattle, WA, USA</i>
Graduate Research Assistant	Sep. 2017–Jun. 2022
• Advisors: Luc Rainville and Jim Thomson	
• Dissertation: <i>The role of sea ice in mediating atmosphere-ice-ocean momentum transfer.</i>	
http://hdl.handle.net/1773/49108	
University of British Columbia, Environmental Fluid Mechanics	<i>Vancouver, BC, Canada</i>
Graduate Research Assistant	Sep. 2015–Aug. 2017
• Advisor: Bernard Laval	
• Thesis: <i>The free oscillatory response of fjord-type multi-armed lakes.</i>	
doi:10.14288/1.0353196	
Undergraduate Research Assistant	Jun. 2013–Jun. 2014

Education

University of Washington	<i>Seattle, WA, USA</i>
PhD in Oceanography	Jun. 2022
Masters of Science in Oceanography	Jun. 2019
University of British Columbia	<i>Vancouver, BC, Canada</i>
Masters of Applied Science in Civil Engineering	Aug. 2017
Bachelors of Applied Science in Civil Engineering	Jun. 2015
Camosun College	<i>Victoria, BC, Canada</i>
Advanced Diploma in Civil Engineering Technology Bridge	Jun. 2013
Diploma in Civil Engineering Technology	Jun. 2010

Teaching experience

University of Washington	
Guest Lecturer	
• Field Measurements (CEWA590): “Measuring sea ice”	May., 2022
• Hydrodynamics (CEWA570): “Wind-driven flow in a lake”	Feb., 2022
Teaching Assistant	
• Coastal Engineering (CEE473/CEWA573)	Spring 2021
• Foundations of Ocean Sensors (OCEAN351)	Winter 2019
University of British Columbia	
Teaching Assistant	
• Fluid Mechanics I (CIVL215)	Spring 2016
• Environmental Hydraulics (CIVL416)	Fall 2016
• Fluid Mechanics II (CIVL315)	Fall 2015 & Fall 2016

Scientific contributions

Publications

Brenner, S., Rainville, L., Thomson, J., Crews, L., and Lee, C., *in review*. Wind-driven motions of sea ice and the ocean surface mixed layer in the Western Arctic.

Brenner, S., Thomson, J., Rainville, L., Torres, D., Doble, M., Wilkinson, J., and Lee, C., *accepted*. Acoustic sensing of ocean mixed layer depth and temperature from uplooking ADCPs. *J. Atmos. Oceanic Technol.*

Cooper, V., Roach, L., Thomson, J., **Brenner S.**, Smith, M., Meylan, M., Bitz, C., 2022. Wind waves in sea ice of the western Arctic and a global coupled wave-ice model. *Phil. Trans. Roy. Soc. A.*, 380(2235), p. 19. [doi:10.1098/rsta.2021.0258](https://doi.org/10.1098/rsta.2021.0258)

MacKinnon, J., et. al, [including **Brenner, S.**], 2021. A warm jet in a cold ocean. *Nat. Comm.*, 12(1) p. 12 [doi:10.1038/s41467-021-22505-5](https://doi.org/10.1038/s41467-021-22505-5)

Brenner, S., Rainville, L., Thomson, J., Cole, S. and Lee, C., 2021. Comparing observations and parameterizations of ice-ocean drag through an annual cycle across the Beaufort Sea. *J. Geophys. Res. Oceans.* 126(4), p. 29. [doi:10.1029/2020JC016977](https://doi.org/10.1029/2020JC016977)

Brenner, S., Rainville, L., Thomson, J., and Lee, C., 2020. The evolution of a shallow front in the Arctic marginal ice zone. *Elem. Sci. Anth.*, 8(1), p. 17. [doi:10.1525/elementa.413/](https://doi.org/10.1525/elementa.413/)

Brenner, S., and Laval, B. 2018. Seiche modes in multi-armed lakes. *Limnol. Oceanogr.*, 63: 2717-2726 [doi:10.1002/lno.11001](https://doi.org/10.1002/lno.11001)

Conference presentations

Thomson J., S. Wahlgren, V. Cooper, **S. Brenner**, M. Smith, S. Swart, L. Biddle, C. Bitz. Waves observed far (>100 km) within sea ice. Poster presented at: Wind waves In the Earth System (WISE) Workshop; 2022 Apr. 25–29; Brest, France.

Sanchez-Rios A., A. Savage, **S. Brenner**, L. Crews, A. Ruiz-Angulo, J. Mackinnon, L. Rainville. Understanding T-S Structure Evolution Across Ocean Fronts: Observations of the Norwegian Atlantic Front Current Along the Mohn Ridge. Presented at: Ocean Sciences Meeting; 2022 Feb. 27-Mar. 04; virtual.

Brenner S., L. Rainville, J. Thomson, L. Crews, C. Lee. Seasonal variations of inertial velocities of sea ice and ocean surface layer in the Beaufort Sea. Presented at: Ocean Sciences Meeting; 2022 Feb. 27-Mar. 04; virtual.

Brenner S., L. Rainville, J. Thomson, C. Lee. In-situ observations to validate (and invalidate) model parameterizations of the ice-ocean drag coefficient. Presented at: 10th IICWG-DA Workshop 2021 Oct. 26-28; virtual.

Cooper, V., L. Roach, C. Bitz, **S. Brenner**, J. Thomson. Towards Validating Wave-Ice Interactions in Climate Models Using In Situ Observations. Poster presented at: AGU Fall Meeting 2020 Dec. 01-17; virtual.

Brenner S., L. Rainville, J. Thomson, C. Lee. Distributed and year-long observations of ice-ocean drag across a range of ice morphologies in the Beaufort Sea. Presented at: AGU Fall Meeting 2020 Dec. 01-17; virtual.

MacKinnon, J., et. al, [including **S. Brenner**]. Subduction of Pacific Summer Water into sub-surface eddies; coordinated observations from late summer Presented at: Ocean Sciences Meeting; 2020 Feb. 17-21; San Diego, CA.

Brenner S., L. Rainville, J. Thomson, J. MacKinnon, C. Lee. Momentum fluxes across the air-ice-ocean interface in the Beaufort Sea. Poster presented at: Ocean Sciences Meeting; 2020 Feb. 17-21; San Diego, CA.

Brenner S., L. Rainville, J. Thomson, C. Lee. The evolution of an Arctic meltwater front. Poster presented at: Liège Colloquium on Ocean Dynamics; 2019 May. 6-9; Liège, Belgium

Brenner S., L. Rainville, J. Thomson, C. Lee. Small scale upper-ocean variability in the Arctic. Poster presented at: Ocean Sciences Meeting; 2018 Feb. 11-16; Portland, OR

Brenner S., B. Laval, J. Shore, S. Vagle. Surface Seiching in Quesnel Lake, British Columbia. Poster presented at: Canadian Meteorological and Oceanographic Society Congress; 2017 June 4-8; Toronto, ON

Service and outreach

School of Oceanography Diversity-Equity-Inclusion subcommittee:

“Graduate Applications Mentorship Program” development

2020–2022

- Assisted in the development, initial roll-out, and post-program assessment of the School of Oceanography Graduate Applications Mentorship Program, which pairs prospective students with current graduate students to help demystify the graduate application process

- https://www.ocean.washington.edu/story/Graduate_Application_Mentorship_Program

Mentor for Graduate Applications Mentorship Program

2021

- Worked with a prospective graduate student to provide advice and help through the graduate school application

Reviewer

- Ocean Modelling (1)
- Journal of Geophysical Research: Oceans (1)
- Ocean Science (1)
- Aquatic Sciences (1)

Pacific Science Center: Climate Change Curiosity Expo

annually, 2018–2020

University of Washington Engineering Discovery Days

annually, 2018–2019

Science World: Meet a Scientist

various dates, 2015–2017

Fieldwork

Research cruises

Norwegian Sea: NORSE pilot/process cruise (R/V Neil Armstrong; 35 days at sea)

Sep.–Oct. 2021

Beaufort Sea: SODA recovery cruise (USCGC Healy; 42 days at sea)

Sep.–Oct. 2019

Beaufort Sea: SODA deployment cruise (USCGC Healy; 36 days at sea)

Sep.–Oct. 2018

Other oceanography/limnology fieldwork

San Juan Channel, WA (mooring deployment/recovery and CTD sections)

Aug. 2019

Cultus Lake, BC (CTD sections)

various dates, 2015–2017

Deeks Lake, BC (mooring deployment and CTD sections)

various dates, 2015–2017

Quesnel Lake, BC (mooring recovery/servicing and CTD sections)

Sep. 26–30, 2016

Resolute Bay, NU (water sample collection and CTDs)

Aug. 2014

Field camps

Milne ice shelf, NU (ice shelf GPR, CTDs, mooring service, glacier ablation stakes)

Jul.–Aug. 2014

Other courses and training

Atmosphere-Ocean-Ice Winter School

Longyearbyen, Svalbard, Norway

May. 2022

Estuarine & Coastal Fluid Dynamics Summer School

Friday Harbor, WA, USA

Jul.–Aug. 2019

Instructional Skills Workshop

Vancouver, BC, Canada

UBC Centre for Teaching, Learning and Technology

Jul.–Aug. 2016

Financial awards

NSERC Canada Graduate Scholarships-Master's (CGS M)

Apr. 2016

NSERC Undergraduate Student Research Award

May 2014

Northern Scientific Training Program (NSTP) Funding

May 2014

Non-academic work experience

AECOM

Civil Engineering Student Intern

Burnaby, BC, Canada

May – Sep. 2015

Canadian Sewage Solutions Inc.

Junior Engineering Technologist

Langford, BC, Canada

Dec. 2011 – Nov. 2012

Kiewit Construction

Purchasing Engineer (co-op student)

Field Engineer (co-op student)

Kearl Lake Oilsands, AB, Canada

Aug. 2010 – Jan. 2011

Aug. – Dec. 2009

District of North Saanich

Drafting Assistant (co-op student)

North Saanich, BC, Canada

Dec. 2008 – Mar. 2009