

Peter Washam, Ph.D.

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Research Interests

- glacier-ocean-atmosphere interactions
- observational coastal oceanography
- underwater robotics

Professional Positions

- 2021 - current **Research Associate**, Cornell University: Department of Astronomy.
Ithaca, NY, USA
- 2019 - 2021 **Research Scientist II**, Georgia Institute of Technology: Earth and Atmospheric Sciences.
Atlanta, GA, USA

Education

- 2014 - 2019 **Ph.D.** University of Delaware: *Physical Ocean Science and Engineering*
Newark, DE, USA
- 2012 - 2014 **M.S.** Florida International University: *Geoscience*
Miami, FL, USA
- 2007 - 2011 **B.S.** University of South Carolina: *Marine Science*
Columbia SC, USA

Peer-Reviewed Publications

- Washam, P.**, Nicholls, K.W., Münchow, A., & Padman, L. (2020). Tidal modulation of buoyant flow and basal melt beneath Petermann Gletscher Ice Shelf, Greenland. *JGR-Oceans*, 125, e2020JC016427, <https://doi.org/10.1029/2020JC016427>
- Washam, P.**, Nicholls, K.W., Münchow, A., & Padman, L. (2019). Summer surface melt thins Petermann Gletscher Ice Shelf by enhancing channelized basal melt. *Journal of Glaciology*, 65(252), 662–674, <https://doi.org/10.1017/jog.2019.43>
- Washam, P.**, Münchow, A., & Nicholls, K.W. (2018). A decade of ocean changes impacting the ice shelf of Petermann Gletscher, Greenland. *J. Phys. Oceanography*, 48:2477–2493, <https://doi.org/10.1175/JPO-D-17-0181.1>
- Münchow, A., Padman, L., **Washam, P.**, & Nicholls K.W. (2016). The ice shelf of Petermann Gletscher, North Greenland, and its connection to the Arctic and Atlantic oceans. *Oceanography*, 29(4):84–95, <https://doi.org/10.5670/oceanog.2016.101>

In Review

- Schmidt, B.E., **Washam, P.**, Davis, P.E., Nicholls, K.W., ... & Makinson, K. (in rev). Heterogeneous melting near the Thwaites Glacier grounding line. *Nature*, submitted May-2022. resubmitted Aug-2022.
- Lawrence, J., **Washam, P.**, ... & Schmidt, B.E. (in rev). Ice, ocean, and seafloor interactions during past Kamb Ice Stream grounding line retreat. *Nature Geoscience*, submitted Jun-2022. resubmitted Sept-2022.
- Davis, P.E., Nicholls, K.W., Holland, D.M., Schmidt, B.E., **Washam, P.**, ... & Basinski-Ferris, A. (in rev). Suppressed basal melting in the eastern Thwaites Glacier grounding zone. *Nature*, submitted May-2022. resubmitted Aug-2022.

Udell, K., Schmidt, B.E., **Washam, P.**, ... & Wood, A.G. (in rev). Dynamic links between summer surface hydrology and terminus change at three major Greenland outlet glaciers revealed with high resolution satellite imagery. *Journal of Glaciology*, submitted Jul-2022.

In Prep

Washam, P., Lawrence, J., Stevens, C., ... & Schmidt, B.E. (in prep). Direct observations of ice melt, refreeze, and ocean circulation in an ice shelf basal crevasse. *Science Advances*, submission imminent, Sep-2022.

Grants

Co-PI **NSF-2053280**, Unravelling the Role of Subglacial Channels in Ice Stream Evolution. [[\\$1,239,283](#)]

PI (pending) **NSF-2235171**, Collaborative Research: NSFGE0-NERC: Melt dynamics at the grounding line of retreating glaciers under the influence of subglacial discharge. [[\\$1,791,804](#)]

Students Advised

Justin Lawrence Advised Ph.D. candidate Lawrence in sub-ice shelf physical oceanographic research. This included but was not limited to: ice-ocean thermodynamic interactions, tidal flows, ocean stratification, turbulent mixing, data fidelity, and publication preparation.

Kathrine Udell Advised undergraduate Udell in remote sensing of glacier surface hydrology and dynamics. This included but was not limited to: atmospherically-forced summer surface melting, glacier velocity maps, data fidelity, and publication preparation.

Recent Conference Proceedings

Washam, P.: Near-ice ocean stratification interacts with ice slope and morphology to drive variable melting. *ITGC Meeting*, Jun-2022.

Washam, P.: Direct observations of ice melt, freeze, and ocean circulation in an ice shelf basal crevasse. *AGU Ocean Sciences Meeting*, **HL01**, Feb-2022.

Washam, P., Schmidt, B.E., Davis, P.E.D., Nicholls, K.W..., & Makinson, K.: Ice loss from asymmetric melting at Thwaites Glacier grounding zone. *AGU Fall Meeting*, **C35A-0867**, Dec-2021.

Washam, P.: Observations of 3-D ocean circulation in an ice shelf crevasse: Implications for melting and freezing rates. *WAIS Workshop 2021*, Sep-2021.

Washam, P., Schmidt, B.E., Lawrence, J., Meister, M., & Holland, D.: A synthesis of ice-ocean boundary observations from the underwater vehicle Icefin. *AGU Fall Meeting*, **C022-0001**, Dec-2020.

Schmidt, B.E., **Washam, P.**, Davis, P.E., Nicholls, K.W., ... & Makinson, K.: Melting at the Grounding Zone of Thwaites Glacier Observed by Icefin. *AGU Fall Meeting*, **C057-04**, Dec-2020.

Lawrence, J., Schmidt, B.E., **Washam, P.**, Hulbe, C.L., ... & Bryson, F.E.: ROV Icefin at Ross Ice Shelf Grounding Zone: 5 km of ice, ocean, seafloor, and crevasse exploration. *AGU Fall Meeting*, **C019-07**, Dec-2020.

Udell, K., Schmidt, B.E., **Washam, P.**, ... & Wood, A.G.: Constraints on the Hydrologic Systems of Three Tidewater Glaciers using High Temporal Spatial Resolution Satellite Imagery. *AGU Fall Meeting*, **C043-08**, Dec-2020.

Meister, M., Spears, A., Dichek, D., ... **Washam, P.**, ... & Schmidt, B.E.: Antarctic Deep Field Deployments and Design of the Icefin ROV. *Global Oceans 2020*. Oct-2020.

Invited Presentations

A synthesis of ice-ocean boundary observations from the underwater vehicle Icefin.

British Antarctic Survey Polar Oceans Seminar, Feb-2021.

Los Alamos National Lab COSIM virtual meeting, Feb-2021.

The Oceanic and Atmospheric Forcing on the ice shelf of Petermann Gletscher, Greenland.

GA Tech Seminar, Atlanta, GA, May-2019.

Subglacial Runoff enhances basal melt beneath Petermann Gletscher's ice shelf, Greenland.

LDEO Seminar, Palisades, New York, Oct-2018,

Univ. South Carolina Seminar, Columbia, SC, Nov-2018.

Data Published in US National Archives

Nicholls K.W. & **Washam, P.** (2020). Autonomous phase-sensitive Radio-Echo Sounder (ApRES)-derived basal and surface melt rates for Petermann Gletscher Ice Shelf, Greenland, 2015 - 2017.

Arctic Data Center. doi:10.18739/A2T14TQ57.

Muenchow, A. & **Washam, P.** (2019). Glacier-ocean interactions at a Greenland ice shelf at tidal to interannual time scales, North Greenland, 2015-17. **Arctic Data Center**.

doi:10.18739/A22J6846K.

Muenchow, A. & **Washam, P.** (2019). Ocean profiles of temperature and salinity below the ice

shelf of Petermann Gletscher, Greenland, 2015. **Arctic Data Center**. doi:10.18739/A2PC2T86B.

Other Works

Washam, P. (2019). The Ocean's Forcing on the Ice Shelf of Petermann Gletscher, Greenland.

UDEL Electronic Theses and Dissertations.

Washam, P. (2014). Recent Changes in Central and Eastern Pacific El Niño. **FIU Electronic**

Theses and Dissertations. 1556. 10.25148/etd.FI14071180.

Service

Proposal Reviewer NASA Cryosphere

Journal Reviewer Nature Communications Earth and Environment, JGR-Oceans, GRL
Elsevier Estuarine, Coastal, and Shelf Sciences, Journal of Glaciology

Memberships American Geophysical Union, European Geophysical Union

Teaching Experience

2022 Ocean Worlds: Earth & Beyond, Cornell University (co-Instructor)

2013 - 2014 Introduction to Oceanography - Lab, Florida International University

Outreach

• **Press Conference: The Threat from Thwaites: The retreat of Antarctica's riskiest glacier.**
AGU 2021. Dec-2021.

• **What happens to ice when it enters the ocean?** Arbor Station Elementary School, Douglasville, GA.
Atlanta Science Festival - Imagining the Future. Mar-2021.

• **Surviving the Polar Regions: Then and Now.** Grady High School, Atlanta, GA. Mar-2021.

• **Conversations with a NASA-funded Scientist.** Laurens Academy, Laurens, SC. Nov-2020.

- *Switching Poles: Atmospheric-Ice-Ocean Interactions beneath one of Greenland's last remaining ice shelves*. McMurdo Science Seminar, McMurdo, Antarctica. Nov-2019.
- *Life on a Glacier*. Eastside Charter School, Wilmington, DE. Nov-2015.

Select Press Coverage

- *How Explosives, a Robot, and a Sled Expose a Doomsday Glacier*. Matt Simon. Wired Magazine. Jan-2022.
- *The ice shelf holding back the 'Doomsday glacier' could shatter within the next five years, scientists warn*. Rachel Ramirez. CNN. Dec-2021.
- *Understanding How Antarctica is Melting*. Eli Kintisch. Newsy. Jan-2021.
- *Ice shelf holding back keystone Antarctic glacier within years of failure*. Paul Voosen. Science Magazine. Dec-2021.

Field Work Experience

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| Winter 2019 | Ross Ice Shelf and Europa Underwater Probe
McMurdo and Ross Ice Shelves, Antarctica
Responsibilities: Under-ice robot vehicle deployment, data processing and analysis, differential GPS programing, deployment, and recovery |
| Fall 2017 | R/V Polarstern , PS109: Greenland ice sheet-ocean interaction
Tromso, Norway - Bremerhaven, Germany
Responsibilities: CTD operations, mooring deployment and recovery, data processing and analysis |
| Spring 2017 | Acoustic Sensor Networks for Ice-Covered Seas
Thule, Greenland
Responsibilities: Sea ice drilling operations, CTD operations, under-ice mooring deployment and recovery, data processing and analysis |
| Fall 2016 | R/V Sikuliaq , Canada Basin Acoustic Propagation Experiment
Nome - Dutch Harbor, Alaska
Responsibilities: CTD operations, instrument preparation, mooring hardware preparation, mooring deployment |
| Summer 2015 | Petermann Gletscher Expedition
Petermann Gletscher, Greenland
Responsibilities: Ice shelf drilling operations, under-ice mooring deployment, sediment core collection, AWS set up, programing, deployment, and recovery of differential GPS units |
| Summer 2015 | I/B Oden , Petermann Gletscher Expedition
Petermann Gletscher, Greenland
Responsibilities: CTD operations, instrument preparation, data processing and analysis |
| Summer 2010 | R/V Point Sur , Summer Freshwater Runoff into the Gulf of Alaska
Dutch Harbor, Alaska
Responsibilities: CTD operations, mooring recovery |

Awards and Skills

- Fluent in MATLAB, QGIS, and shell scripting languages
- Developed original post processing scripts for underwater vehicle CTD and ADCP operations
- Academic Excellence Award for Florida International University M.S. Program in Geosciences
- University of Delaware College of Earth, Ocean, and Environment Travel Award