

Carson Riggs Witte

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Education

Columbia University

Ph.D. in Ocean and Climate Physics

Expected 2023

M.Phil. in Ocean and Climate Physics

2021

M.A. in Ocean and Climate Physics

2020

Pomona College

B.A. in Physics with Engineering Concentration

2016

Publications

Witte, C. R., Zappa, C. J., & Edson, J. B. (2023). The Response of Ocean Skin Temperature to Rain: Observations and Implications for Parameterization of Rain-Induced Fluxes. *Journal of Geophysical Research: Oceans*, 128(1), e2022JC019146. <https://doi.org/10.1029/2022JC019146>

Lindsay, J. M., Hauser, D. D. W., Mahoney, A. R., Laidre, K. L., Goodwin, J., Harris, C., Schaeffer, R. J., Sr, R. S., Whiting, A. V., Boveng, P. L., Laxague, N. J. M., Betcher, S., Subramaniam, A., **Witte, C. R.**, & Zappa, C. J. (2023). Characteristics of ringed seal *Pusa hispida* ('natchiq') denning habitat in Kotzebue Sound, Alaska, during a year of limited sea ice and snow. *Marine Ecology Progress Series*, 705, 1–20. <https://doi.org/10.3354/meps14252>

Witte, C. R., Zappa, C. J., Mahoney, A. R., Goodwin, J., Harris, C., Schaeffer, R. J., Schaeffer Sr, R., Betcher, S., Hauser, D. D. W., Laxague, N. J. M., Lindsay, J. M., Subramaniam, A., Turner, K. E., & Whiting, A. (2021). The Winter Heat Budget of Sea Ice in Kotzebue Sound: Residual Ocean Heat and the Seasonal Roles of River Outflow. *Journal of Geophysical Research: Oceans*, 126(9), e2020JC016784. <https://doi.org/10.1029/2020JC016784>

Hauser, D. D. W., Whiting, A. V., Mahoney, A. R., Goodwin, J., Harris, C., Schaeffer, R. J., Schaeffer, R., Laxague, N. J. M., Subramaniam, A., **Witte, C. R.**, Betcher, S., Lindsay, J. M., & Zappa, C. J. (2021). Co-production of knowledge reveals loss of Indigenous hunting opportunities in the face of accelerating Arctic climate change. 16(9), 095003. <https://doi.org/10.1088/1748-9326/ac1a36>

Mahoney, A. R., Turner, K. E., Hauser, D. D. W., Laxague, N. J. M., Lindsay, J. M., Whiting, A. V., **Witte, C. R.**, Goodwin, J., Harris, C., Schaeffer, R. J., Schaeffer, R., Betcher, S., Subramaniam, A., & Zappa, C. J. (2021). Thin ice, deep snow and surface flooding in Kotzebue Sound: Landfast ice mass balance during two anomalously warm winters and implications for marine mammals and subsistence hunting. *Journal of Glaciology*, 1–15. <https://doi.org/10.1017/jog.2021.49>

Wurl, O., Landing, W. M., Mustaffa, N. I. H., Ribas-Ribas, M., **Witte, C. R.**, & Zappa, C. J. (2018). The Ocean's Skin Layer in the Tropics. *Journal of Geophysical Research: Oceans*, 124. <https://doi.org/10.1029/2018JC014021>

Wurl, O., Bird, K., Cunliffe, M., Landing, W. M., Miller, U., Mustaffa, N. I. H., Ribas-Ribas, M., **Witte, C.**, & Zappa, C. J. (2018). Warming and Inhibition of Salinization at the Ocean's Surface by Cyanobacteria. *Geophysical Research Letters*, 45(9), 4230–4237. <https://doi.org/10.1029/2018GL077946>



Presentations

AMS Annual Meeting (23rd Conference on Air-Sea Interaction) Denver, CO, 8-13 January 2023
TALK: *The Response of Ocean Skin Temperature to Rain: Observations and Implications for Parameterization of Rain-Induced Fluxes*

AGU Fall Meeting Chicago, IL, 12-16 December 2022
TALK: *Modulation of Air-Sea Heat Fluxes by Surface Material*

AGU Ocean Sciences Meeting Virtual, 27 February – 4 March 2022
TALK: *Observations and Modeling of the Response of Sea Surface Skin Temperature to Rainfall*

ArcticNet Annual Scientific Meeting Virtual, 6-10 December 2021
TALK: *The Winter Heat Budget of Sea Ice in Kotzebue Sound: Residual Ocean Heat and the Seasonal Roles of River Outflow*

AGU Fall Meeting Virtual, 13-18 December 2020
POSTER: Observations of the heat budget of thinning coastal Arctic sea ice under the influence of a river outflow

AGU Ocean Sciences Meeting San Diego, CA, 16-21 February 2020
TALK: *Observations of the heat budget at the ocean-ice interface during an anomalous Arctic winter*

Alaska Forum on the Environment Anchorage, AK, 9-12 February 2020
TALK: *The heat budget of sea ice in Kotzebue Sound*

Research Experience

Community Science Fellow: AGU Thriving Earth Exchange **2021 – present**
• Working with community leaders in Marion & Horry counties, South Carolina, to provide actionable scientific insight into the causes, consequences, and potential remedies for recent chronic flooding

PhD Student: Columbia University (Advisor: Dr. Christopher J. Zappa) **2018 – present**
• **Research Cruise, RV Falkor, Equatorial Pacific (6 weeks in 2019)** - Multidisciplinary study of the sea surface microlayer to quantify the impact of near-surface material on air-sea fluxes and the surface ocean heat budget. Responsible for shipboard data acquisition (DC fluxes, IR imagery, SST), design and construction of a drifting buoy for upper ocean profiling ('SPIP-2'), and assistance with UAV operations.
• **Ikaagvik Sikukun, Kotzebue, AK (2-4 weeks every season in 2017-19)** - Co-production of Knowledge with Indigenous Elders in Kotzebue, Alaska to study the changing sea ice conditions in Kotzebue Sound and the Bering Strait region. Responsible for deployment and recovery of ocean & ice-tethered moorings, meteorological stations, on-ice sampling, and UAV operations.
• **Air-Sea Interaction Tower, Woods Hole, MA (Deploy 2019, Recover 2020)** - Integration of Visible, Infrared, and Polarimetric imaging systems with fiber-optic connection to the mainland for continuous data acquisition throughout a winter season.

Field Engineer: Christopher J. Zappa Lab, Lamont Doherty Earth Observatory **2016 – 2018**
• **Research Cruises, RVIB Araon, Terra Nova Bay, Antarctica (2 months, Deploy 2017, Recover 2018)** - Year-long deployment of a heavily instrumented oceanographic mooring in the Terra Nova Bay polynya to study high-salinity shelf water formation.
• **Research Cruise, RV Falkor, Timor Sea (6 weeks in 2016)** - Multidisciplinary study of the sea surface microlayer to better understand the interaction between the layer's physical and chemical properties. Responsible for shipboard data acquisition (DC fluxes, Polarimetric & Infrared imagery, SST).



Lab Intern: NASA Jet Propulsion Laboratory

2015 – 2016

- Worked on the design and implementation of a quadrupole ion trap mass spectrometer intended for immediate use onboard the International Space Station, future use on manned missions to Mars, and missions to Europa and Venus

Research Assistant: Pomona College // Leibniz Universität Hannover

2014 – 2015

- Worked predicting, measuring, and analyzing the quantum transitions of diatomic molecules using the Fourier Transform Microwave Spectrometer in Hannover.

Relevant Skills & Experience

Teaching Assistant, Columbia University

Spring & Fall 2020

Earth's Environmental Systems: Climate Systems (Spring & Fall Semesters)

LDEO Ocean & Climate Physics Seminar Coordinator

2020 – 2021

Fluent in Python, MATLAB, QGIS, Arduino, AutoCAD