

Stanford



Eliza Dawson

Ph.D. Student in Geophysics, admitted Summer 2018

Bio

BIO

I am interested in processes that impact the evolution of the Antarctic ice sheet and could ultimately lead to wide spread mass loss and unstable retreat. Ice flow is modulated by conditions at the ice-bed interface however the basal environment is very challenging to directly measure due to the remote location, vast size, and extreme thickness of the ice sheet. As a result, it's unknown how the ice sheet could evolve to changes in basal forcing. I am particularly interested in the basal thermal regime and the ability of basal thawing to drive changes in ice flow and stability. The integration of radar analysis and numerical modeling is a powerful way to investigate this problem. With these techniques, I am investigating the ice sheet's response to changes in the extent of thawed basal regions in order to project possible mass loss and contribution to sea level rise.

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I am investigating how changes in the thermal regime at the ice-bed interface could force the Antarctic ice sheet to evolve. My approach combines large scale ice sheet modeling, regional airborne ice-penetrating radar sounding analysis, and the synthesis of the two. Currently, I am using the Ice-sheet and Sea-level system model (ISSM) to learn about basal thaw processes that could drive mass loss and ultimately contribute to sea level rise.

LAB AFFILIATIONS

- Dustin Schroeder, Radio Glaciology (8/1/2018)

Publications

PUBLICATIONS

- **Ice mass loss sensitivity to the Antarctic ice sheet basal thermal state.** *Nature communications*
Dawson, E. J., Schroeder, D. M., Chu, W., Mantelli, E., Seroussi, H.
2022; 13 (1): 4957
- **Post-Processing Synchronized Bistatic Radar for Long Offset Glacier Sounding** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*
Bienert, N. L., Schroeder, D. M., Peters, S. T., MacKie, E. J., Dawson, E. J., Siegfried, M. R., Sanda, R., Christoffersen, P.
2022; 60
- **Rapid and accurate polarimetric radar measurements of ice crystal fabric orientation at the Western Antarctic Ice Sheet (WAIS) Divide ice core site** *CRYOSPHERE*
Young, T., Martin, C., Christoffersen, P., Schroeder, D. M., Tulaczyk, S. M., Dawson, E. J.
2021; 15 (8): 4117-4133
- **Linear Relation Between Shifting ITCZ and Dust Hemispheric Asymmetry** *GEOPHYSICAL RESEARCH LETTERS*
Evans, S., Dawson, E., Ginoux, P.

2020; 47 (22)

- **Seasonal Asymmetries in the Lag between Insolation and Surface Temperature** *JOURNAL OF CLIMATE*

Donohoe, A., Dawson, E., McMurdie, L., Battisti, D. S., Rhines, A.

2020; 33 (10): 3921–45

- **Evaporative Resistance is of Equal Importance as Surface Albedo in High-Latitude Surface Temperatures Due to Cloud Feedbacks** *GEOPHYSICAL RESEARCH LETTERS*

Kim, J. E., Lague, M. M., Pennypacker, S., Dawson, E., Swann, A. S.

2020; 47 (4)

- **Southern African orography impacts on low clouds and the Atlantic ITCZ in a coupled model** *GEOPHYSICAL RESEARCH LETTERS*

Potter, S. F., Dawson, E. J., Frierson, D. W.

2017; 44 (7): 3283–89