

Oceanography Seminar

Dr. Mark W. Seefeldt

Cooperative Institute for Research in Environmental Sciences
(CIRES)

University of Colorado – Boulder, Boulder, CO

Innovative Studies of Antarctic Precipitation and Atmospheric Circulation Based on Observations and Numerical Modeling

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SEP

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Spanagel Hall, Room 316

Four low-power, autonomous Antarctic Precipitation Systems (APSs) were installed on the Ross Ice Shelf, Antarctica for year-round in situ measurement of precipitation. The APS sites were installed in December 2017 as a part of the United States Antarctic Program (USAP). The precipitation is being measured using an Ott Pluvio² weighing precipitation gauge installed inside a double-alter wind shield. Additional measurements, such as snow height, wind speed, particle counts, and videos, are included in the APS sites to provide supporting observations. The precipitation measurements, and supporting observations, are providing a “ground truth” in understanding precipitation and snow accumulation in Antarctica. The measurements of liquid-water-equivalent (LWE) are compared to the results from numerical weather prediction models and global reanalyses on an event-by-event basis. Additionally, changes in snow height, measured using two different methods, will be compared to occurrences of precipitation in low, medium, and high wind speed cases. The results provide insight on the capability and validity of the precipitation estimates being made with numerical models and the ability to understand snow accumulation at a given location.

Changes in atmospheric circulation over the Amundsen Sea region have been shown to have possible connections to the thinning of the West Antarctic Ice Sheet. An evaluation of 35 years of ERA-Interim reanalysis data using the method of Self-Organizing Maps (SOMs) is presented to identify changes in the atmospheric circulation. A primer on the application of SOMs to atmospheric and climate studies will also be covered.