

Session: OS-3 Sea ice extent, properties, volume & ice shelves: modern and paleo records
OS-7 Atmosphere-Ice-Ocean interactions in the Polar Regions

Polar program: None

Title: PIPERS: Air-sea-ice interactions during a very anomalous season in the Ross Sea

Author(s): Sharon Stammerjohn¹ (sharon.stammerjohn@colorado.edu), Stephen Ackley², Ted Maksym³, Peter Guest⁴, John Cassano¹, Peter Sedwick⁵, Brice Loose⁶, Jean-Louis Tison⁷, Bruno Delille⁸, Guy Williams⁹

Institute(s): ¹Univ of Colorado, Boulder, United States, ²Univ of Texas San Antonio, Snow and ice Geophysics Laboratory, San Antonio, United States, ³Woods Hole Oceanographic Institution (WHOI), Woods Hole, United States, ⁴Naval Postgraduate School, Monterey, United States, ⁵Old Dominion Univ, Norfolk, Virginia, United States, ⁶Univ of Rhode Island, Rhode Island, United States, ⁷Université Libre de Bruxelles, Glaciology, Bruxelles, Belgium, ⁸Université de Liège, Chemical oceanography Unit (COU), Liège, Belgium, ⁹Univ Tasmania, Institute of Marine and Antarctic Studies, Hobart, Australia

Text: The PIPERS (Polynyas, Ice Production and seasonal Evolution in the Ross Sea) project conducted a research expedition to the southwestern Ross Sea aboard the RVIB Palmer during April-June 2017. Its main objective was to assess the local/large-scale controls on sea ice production, water mass transformation, and carbon/trace metal inventories during an autumn-winter transition. Between 1979 and 2015 the Ross Sea was notable for showing strong positive sea ice trends in all seasons (strongest in autumn and spring). The PIPERS expedition however took place prior to the lowest austral summer sea ice extent ever observed in the Ross Sea since 1979. This anomalous 2017 summer season followed record-breaking anomalies that first emerged the preceding winter-spring of 2016. Subsequently, during the autumn of 2017, the ice edge was slow to recover during March-April, but by late May, the ice edge east of ~165W finally reached its climatological location, while the ice edge between 165E to 165W remained anomalously south (by ~240km). This ice edge anomaly then shifted eastward during winter-spring 2017. To help explain these anomalous sea ice conditions, air-sea-ice and ice-climate interactions leading up to and during the PIPERS cruise will be described and discussed. These regional analyses will then be compared to the ship-based observations acquired during PIPERS to help validate and distinguish local/large-scale controls on sea ice production and thickness evolution.

Preferred Presentation Type: **Oral Presentation**