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

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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