Initial result of IODP Expedition 374: Ross Sea West Antarctic Ice Sheet History in the Late Cenozoic

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We collected sediment cores from five sites from the outer continental shelf and rise in the eastern Ross Sea during International Ocean Discovery Program (IODP) Expedition 374, which sailed from January to March 2018. During the expedition, we focused on climate evolution over the past 20 million years to investagate how the climatic/oceanic change affected West Antarctic Ice Sheet (WAIS) evolution since the middle Miocene. This location was selected because most ice sheet models indicate that the Ross Sea ice shelf is highly sensitive to changes in ocean heat flux and sea level. Our aim is to better understand the sensitivity of Antarctic Ice Sheet mass balance during warmer-than-present climates such as the Pliocene warmth and Middle Miocene Climatic Optimum based on data-model integration. The specific objectives are to 1) evaluate the contribution of WAIS to far-field ice volume and sea level estimates; 2) understand mechanism of polar amplification; 3) assess the role of oceanic forcing (e.g., sea level and temperature) on WAIS stability; 4) identify the sensitivity of the WAIS to Milankovitch forcing under different boundary conditions; and 5) examine relationships between seafloor geometry, ice sheet stability, and global climate. In this presentation, we will present an overview of the scientific objectives and the initial scientific results obtained from onboard data collection during IODP Expedition 374.

Keywords: paleoclimate, paleoenvironment, International Ocean Discovery Program (IODP) , Ross Sea

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