

Weak Underbelly Work: At Sea with IPY in the Amundsen

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Research during the past decade has shown that portions of the WAIS draining into the Amundsen Sea and off the Antarctic Peninsula are moving, melting, thinning and retreating much more rapidly than elsewhere around the continent, and may be contributing to sea level rise. The Amundsen Sea Embayment Project (ASEP; Anandakrishnan et al. 2001) outlined the field work that may be needed to better understand ongoing change in that area. Developments since that time have only increased the general sense that the Amundsen sector of WAIS is more vulnerable to a warming climate than previously assumed. IPY presents a potential opportunity to update and implement ASEP, while taking advantage of international interest in this region. We will report the status of interest in shipboard studies and ocean modeling of the Amundsen Sea's role in the evolution of WAIS ice shelves. In particular, we will seek input and discussion on efficient ways to address a variety of related issues. These could include the following questions: What ocean and sub-ice measurements and models are needed to monitor the temporal and spatial variability in ocean circulation and properties, to refine and validate models of that circulation and its ice/ocean interactions, and to ground-truth remote observations? What meteorological measurements are needed, and where, to monitor regional atmospheric forcing and improve the NCEP/ECMWF Reanalysis products in the sparsely observed SE Pacific sector? What observations and modeling efforts are needed to evaluate the roles of sea ice and icebergs in the regional ocean circulation and ice shelf decay? What bathymetric measurements are needed, and where, to assess the role of bottom topography in channeling seawater from the continental shelf break to glacier grounding zones? What seawater, sediment or other sampling is needed to determine freshwater sources, the timing of ice shelf retreat, possible past ice sheet collapse through the Amundsen, and the relevance to WAIS of life in this cold, dark environment? How broadly/narrowly in geographic extent should shipboard work be focused, over what time frame, and with what types of logistic support?