Sea ice and West Antarctic ice-shelf stability

Kelly M. Brunt, Emile A. Okal, and Douglas R. MacAyeal

NASA Goddard Space Flight Center/GESTAR
Department of Earth & Planetary Sciences, Northwestern University
Department of Geophysical Sciences, University of Chicago

Sea ice plays a critical role in ice-shelf stability. It does so in two ways: 1) sea ice dampens sea swell incident on ice-shelf calving fronts and 2) fast ice can act to buttress an ice shelf, similar to the way an ice shelf buttresses an ice sheet. We examine the sea-ice conditions during two March 2011 calving events, from two different West Antarctic ice shelves. In particular, we examine a calving event on the McMurdo Ice Shelf and a tsunami-triggered calving event on Sulzberger Ice Shelf. We use satellite imagery and aerial photography to assess sea-ice conditions, and long-term ice-shelf stability, prior to these calving events.