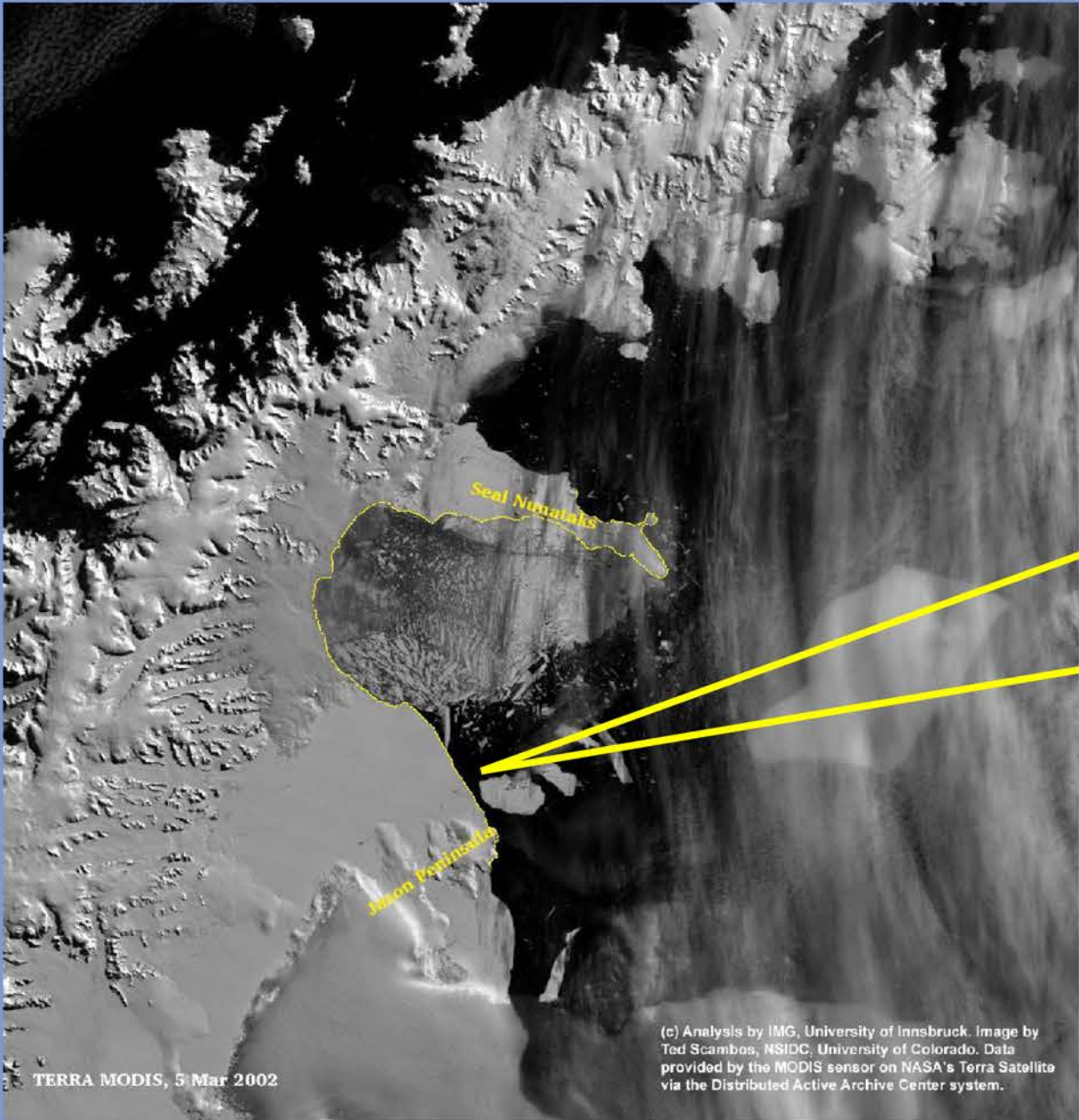


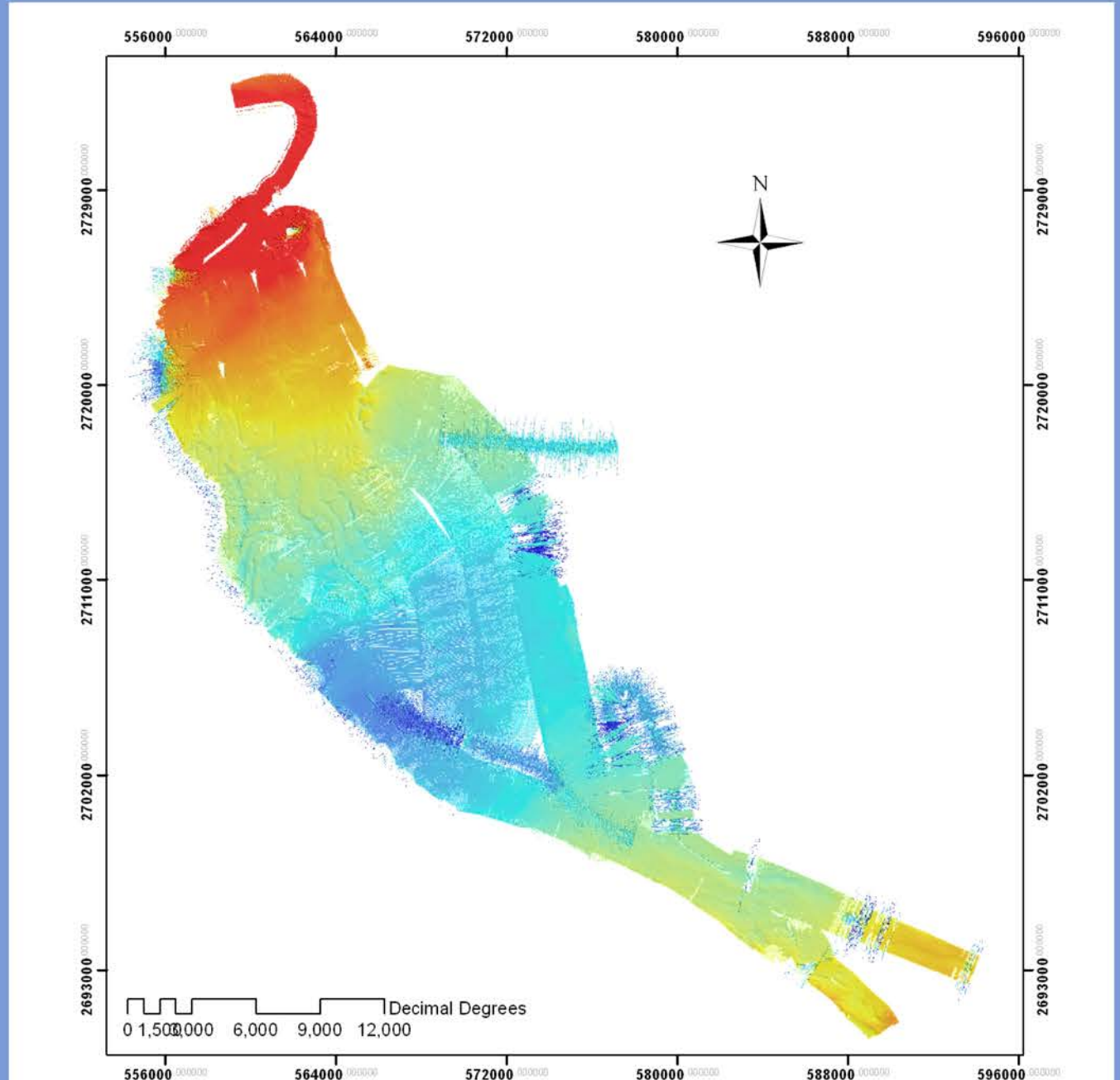
# Multi-beam Bathymetry of Scar Inlet: A Study Using Caris HIPS and SIPS

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**Study Area: The Scar Inlet on the Eastern side of Antarctic Peninsula. Shown in March 2002 after Ice Shelf breakup.**

S-shaped grounding lines are oriented perpendicular to past ice flow. The succession of grounding lines wrap upwards in bathymetry, towards the shallower depths in the Northwest. They represent the extent of past ice fronts. These depositional features are absent over the deeper bathymetry where glacial lineations dominate. They occur again in the shallower depths towards the Southeast portion of the map. The absence of these S-forms in the deepest waters suggests that the grounding lines of the ice front were constrained by depth. The lack of grounding lines over the deep bathymetry represents a more dynamic ice regime over this area. The ice sheet was less stable due to the increased ocean depths and thus had a greater susceptibility to climatic variance such as the inundation of ocean water below the ice front and rising eustatic sea level.



Caris HIPS and SIPS is a software program that allows a user to edit data gathered from bathymetric sensors. In this case, a multibeam system was employed that used an array of emitters and sensors to send out several dozen individual sonar pings at once to measure the depth to the sea floor. This information is initially filled with errors caused by a multitude of factors, including the pitch and roll of the ship over waves, miscommunications between the GPS on the ship and the depths recorded, and interference from ice. Within Caris HIPS and SIPS these errors can be corrected, allowing a clean, accurate bathymetric map to be produced. The map at left shows the original data, which is riddled with errors and artifacts from the data retrieval process. Following extensive editing and careful cleaning of the data, the map at right was produced

Domack, Eugene et al. "Subglacial morphology and glacial evolution of the Palmer deep outlet system, Antarctic Peninsula." *Geomorphology* 75 (2006).  
 Fricker, Helen et al. "An active subglacial water system in West Antarctica mapped from space." *Science* 315 (2007).  
 Lewis, Adam et al. "The age and origin of the Labyrinth, western Dry Valleys, Antarctica: Evidence for the extensive middle Miocene subglacial floods and freshwater discharge to the Southern Ocean" *Geology* 34 (2006).  
 Map from: [http://dude.uibk.ac.at/Projects/Larsen\\_Ice\\_Shelf/images/modis\\_20020305.jpg](http://dude.uibk.ac.at/Projects/Larsen_Ice_Shelf/images/modis_20020305.jpg)

Glacial Flow patterns are parallel to each other as mega-scale glacial lineations. They have a Southwest - Northeast orientation and are elongated. They represent the drainage of a central ice dome on the Peninsula as ice flowed East towards the terminus on the continental shelf.

