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## Cook glacier-Ocean Antarctic Past Stability (COLLAPSE) project preliminary results from geophysical and oceanographic data analysis

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The glaciers terminating in the Cook Ice Shelf and the Ninnis Glacier drain most of the Antarctic marine ice sheet covering the Wilkes Subglacial Basin (WSB), whose ice volume is equivalent to 3-4 m of global sea level rise. Long-term climate projections and multiproxy studies of ice records suggest that ice sheet retreat in this area, thought to be colder and more stable, may be triggered by warm ocean water intrusion.

During the 2022 campaign of the Italian Programma Nazionale delle Ricerche in Antartide (PNRA) with the icebreaker L. Bassi, the project COLLAPSE (Cook glacier-Ocean system, sea Level and Antarctic Past Stability) mapped two systems of canyons and hills located at the mouth of suspected glacial valleys off Cook and Ninnis glaciers. The combination of geomorphological, seismic, oceanographic, and sedimentary data (see abstract from Torricella et al.) allowed identification of a variety of processes active on the seafloor today and in the late Quaternary. The geophysical data show evidence of slope instability offshore of the presumed major glacial troughs. Sediment drifts controlled by bottom currents grow on channel-levees and slope terraces. This information will help, albeit indirectly, to reconstruct the dynamics of different glaciers in relation to paleoclimatic changes and ocean circulation, and to estimate their respective contributions to global sea-level rise.

In addition to the co-authors listed in this summary who are involved in the analysis of the geophysical and oceanographic data, the project PNRA COLLAPSE includes a large group of scientists for the analysis of the sediment cores, from the Universities of Trieste, Siena and Milan-Bicocca, CNR-ISP e ISMAR, INGV (I), Univ. Bordeaux, Grenoble and LOCEAN, Paris (F), CSIC (E), Colgate Univ. (USA), Australian National University and Univ. of Tasmania (AUS), Russian FSBI VNIIOkeangeologia, (RU), Alfred Wegener Institute (D), GNS (NZ).