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The Antarctic Peninsula ice and cimate system initiative (APICS) - building international science collaboration and logistical teamwork

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Recent events in the Antarctic Peninsula demonstrate that ice and climate systems can change rapidly in a warming world. To date, access to the most active regions has been limited, and little baseline data exist. However, studies based on remote sensing and the available in situ data show that a complex interaction is underway, involving sea ice retreat; surface and basal melting of land and shelf ice; fracturing; melt percolation; seasonal changes in ice flow; and rapid glacial acceleration in the aftermath of shelf break-up. As the shelves disintegrate, they uncover a glacial history preserved on the sea-floor indicating the current retreats are rare to unprecedented in the Holocene. Biological and oceanographic studies are active along the western coast, seeking to understand how ocean currents and ecosystems migrate during climate change.

We propose an international program of logistical cooperation and scientific collaboration to measure, model, and monitor the ongoing climate and glaciological changes in the AP, using the results to forecast future evolution of this and other shelf-glacier systems. Our field science program will aim to install new automated observing stations at selected sites, having a new array of sensors designed to monitor glaciological and geophysical parameters as well as climate. During the installations, we propose to gather baseline data on ice motion, thickness, structure, and internal temperature. We plan to further investigate the sea-floor sedimentary record, promote ongoing west

coast ecosystem research, and initiate a program of biological and oceanographic observation along the eastern coast. Remote-sensing-based studies will continue, using both new and existing tools.

We propose a coordinated logistical plan combining US, UK, Chilean, and Argentine airborne and ground assets in an innovative way, and we plan US and UK research vessel cruises that support both land and sea field work. It is our hope that the logistical paths established as part of the IPY will lead to continuing cooperation in the Peninsula in following years.

We will establish an APICS web forum, and convene APICS workshops (building on recent meetings at Hamilton College and SPRI, that will provide a forum for discussion results, promoting outreach, and planning research activities.

The Antarctic Peninsula may well be a model for a future, warmer Antarctica. What we see there are changes of greater scale, speed, and magnitude than were considered possible before. APICS seeks understand this system and its responses to know what the future may hold.