



The West Wind Expedition

A Partnership Between the Climate Change Institute and Pelagic Australis

Impetus. Recent record warming has led to catastrophic disintegration of Antarctic ice shelves and coastal glaciers. Concurrently there has been a strengthening and southward migration of the austral westerly winds that transport heat, moisture and pollutants around the Southern Hemisphere - produced in response to the Antarctic ozone hole and greenhouse gas warming. The effect - much of interior Antarctica is currently isolated from the full force of greenhouse gas warming while the northern fringes and sub-Antarctic islands are starting to disintegrate. Climate models suggest continued poleward retreat of the westerly winds during this century. The impacts of this retreat will yield significant changes in sea level as more Antarctic ice melts, in greenhouse gas uptake by the ocean as deep less saturated water is dragged to the surface, and result in dramatic changes in droughts and floods throughout the Southern Hemisphere.

Background and Purpose. In 1989 Paul Mayewski organized the International Trans Antarctic Expedition (ITASE). As a result twenty-one nations now participate and the results have provided a revolutionary approach to understanding past and modern climate over Antarctica and the Southern Hemisphere. With warming, the ice core records that ITASE used to uncover the last several hundred years of climate change are disappearing. Sub-Antarctic ice core records that could provide unique, highly robust reconstructions of past climate have not yet been recovered and are fast disappearing. South Georgia ice core records could provide a critical view of climate change for much of the South Atlantic and Southern Ocean. Ice core records offer a unique perspective of changes in past temperature, precipitation, atmospheric circulation, air chemistry, sea ice extent, human activity and much more. They offer views at storm event resolution ranging from decades to thousands of years in the past. They offer a framework for assessing future climate and environmental change. Loss of these records through melting is tantamount to losing the “Rosetta Stone” for these regions.



In October 2012 Mayewski and a small team set sail aboard *Pelagic Australis* for an initial reconnaissance to test the suitability of ice core sites on South Georgia. A short window of opportunity and unusually stormy conditions prevented completion of the full reconnaissance. Analysis of the samples recovered did demonstrate, however, the presence of well-preserved annual layers in old ice and notable changes in the chemistry of South Georgia snow and ice related to human activity throughout the Southern Hemisphere. This means that much or all of the South Georgia ice core record is still

preserved, but before mounting a logistics intensive scientific expedition to recover several hundred meters of ice core and potentially thousands of years of record it is essential to fill in more details.

The West Wind Expedition will set sail with Skip Nowak and his *Pelagic Australis* crew to conduct a detailed reconnaissance survey on South Georgia's ice plateau. During the West Wind Expedition we will drill an ~20m ice core capturing several years to decades of climate record, determine ice thickness over the traverse route to the drill site ice,



and recover very old ice from coastal regions to have a snapshot to assess major differences between South Georgia's modern and past climate. The ice samples will be returned to our laboratories at the Climate Change Institute for state-of-the-art analysis and used in climate models

that will allow us to make predictions for future climate in the South Atlantic and the Southern Hemisphere.



The West Wind Expedition is looking for adventurers and climate science supporters.

We will across 1800 nautical miles of open ocean from the Falkland Islands to South Georgia and back, haul sleds through a portion of the route used by Shackleton in his epic 1916 traverse over South Georgia, and ascend into the interior of South Georgia's spectacular glaciers and mountains. Be part of the traverse or tour around South Georgia during the traverse. Be part of the adventure and the science that will help us predict the future of our planet.

[Dr. Paul Andrew Mayewski](#) is director of the Climate Change Institute at the University of Maine. He is an explorer, glaciologist and climate scientist who has led more than 50 major expeditions to Earth's remotest, coldest and highest places (Antarctica, Greenland, Himalayas, Tibetan Plateau, Andes), made numerous first ascents of Antarctic mountains, traversed thousands of miles of Antarctica, and organized several major multi-institutional, multi-disciplinary, multi-year, international research expeditions in the Arctic, Antarctic and Asia. He has published hundreds of peer-reviewed scientific articles, is the recipient of numerous national and international awards and medals including the first-ever internationally awarded Medal for Excellence in Antarctic Research, appears regularly in high profile media (most recently in *The Years of Living Dangerously*, executive producer James Cameron) and is the author of popular books of which the most recent is [Journey Into Climate](#).

