530

POLENET: THE POLAR EARTH OBSERVING NETWORK FOR IPY AND BEYOND

AM Reading[1], TJ Wilson and the POLENET group[2]

[1]Australian National University, Canberra, ACT, Australia, [2]Ohio State University, Columbus, Ohio, United States

The polar regions have unique geodynamic environment where the solid earth, the cryosphere, the oceans, the atmosphere and the global climate system are intimately linked. The aim of this programme is to investigate systems-scale interactions within the polar earth system and polar geodynamics by deploying autonomous remote observatories, on the continents and possibly offshore. The principal components of these observatories will be continuous GPS and seismometers, with the potential addition of meteorology packages, geomagnetic observatories, tide gauges (at coastal sites), and bottom pressure gauges (at offshore sites). Remoteness and environmental challenges have resulted in a dearth of observational systems in the polar regions of the earth which this programme will overcome.

Geodetic studies, including GPS measurements of crustal motion, tide-gauge measurements of relative sea-level change, and gravity measurements of mass change, constitute essential elements in developing an understanding of the stability and mass balance of the major ice sheets of the world, most importantly the Antarctic and Greenland ice sheets. Seismological data from the observatories will provide the first relatively high-resolution data on the Earth beneath the polar seas and ice-sheets. Advanced techniques to image the Earth's deep interior, such as seismic tomography, will be used to place constraints on the planet's internal processes. The axial vantage points of the poles will allow unprecedented studies of the Earth's core. Enhanced seismic station coverage will vastly improve the detection level for earthquakes and permit evaluation of seismotectonic activity and associated seismic hazard across the remote high latitudes.

Several key locations in the Antarctic still require investigators to assume responsibility for the installation and running of an observatory. Please come to the presentation if you think that you, or a colleague from your Antarctic programme, could be involved.