



PRECISION MONITORING WITH THE CONTINUOUS GLOBAL POSITIONING SYSTEM (CGPS)

NEW INITIATIVE

A significant new component of the project in Phase III, which began in 2001, is a Continuous Global Positioning System (CGPS) network.

CGPS receivers will be established near sea level monitoring stations in partner Pacific Island countries (PIC's) by mid-2003. A minimum of three years of data will have been collected and analysed by the end of this phase in 2005 and this will begin the contribution to ultimately achieving the certainly required to determine absolute sea level.

The South Pacific Sea Level and Climate Monitoring Project is an Australian response to concerns raised about the potential impacts of human-induced global warming on South Pacific climate variability and sea level changes.

Phases I and II of the project ran from July 1991 to December 2000. They established 11 Seaframe (Sea Level Fine Resolution Acoustic Measuring Equipment) stations in the South Pacific to measure sea levels and meteorological data; a data-transmitting system; and databases for archiving and accessing this information. Another station is being installed and feasibility studies will soon be underway in two other partner countries.

This new CGPS network linked to Seaframe gauges will measure vertical and horizontal land movements on the islands to determine absolute sea level changes.

PRECISION AND ACCURACY

The new CGPS network will monitor movements in the earth's crust at the Seaframe tide gauges. If movements such as subsidence or tectonic shifts do happen, the system will allow sea level monitoring to be adjusted to the earth's movement to within a millimetre.

This level of accuracy is needed because sea levels around the world are recording changes between 1 and 2mm a year, according to the Inter-governmental Panel on Climate Change (IPCC).

HIGH-END SCIENCE

Achieving this high level of accuracy takes at least a decade of continuous monitoring, expert supervision and between 15 and 16 hours a day of processing on a powerful Unix computer at Australia's national mapping agency, AUSLIG (Australian Surveying and Land Information Group).

AUSLIG is the only organisation in the Southern Hemisphere capable of undertaking such a task.

The data from each CGPS will be downloaded daily by counterpart staff in each of the partner countries and transmitted electronically to AUSLIG. It will then be analysed daily to adjust readings from the Seaframe stations. Accurate measurements of absolute sea levels and climate change will be the ultimate result.

Seaframe stations measure sea levels relative to the land. But land movement can cause data uncertainty.

The CGPS network will measure vertical and horizontal earth movements that account for land movement and be used to calculate absolute sea levels.

BENEFITS AND APPLICATIONS

CGPS data from the project will be stored at both AUSLIG in Canberra and at the South Pacific Applied Geosciences Commission (SOPAC) in Suva. This will allow the region's scientists and decision-makers to independently access, analyse

and apply this data. Applications are numerous and include mapping, coastal-zone management, and uses in geographic information systems (GIS) and in land surveys.

Another important focus of Phase III will be to facilitate technology transfer, training and capacity building in the region. Local counterpart personnel will be trained and called upon by the Australian project partners to help with observations, project management and maintenance.

FURTHER INFORMATION

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CGPS AND SEAFRAME SITES

