

# OCEANOGRAPHIC SERVICES

Oceanographic Services meets the national need for operational oceanographic data, information, prediction and advice, on both short and long time scales, for coastal and open ocean regions around Australia.

Oceanographic Services encompasses a wide range of information, data and products related to the physical state of the ocean and its constituents, including inputs for weather and climate monitoring and prediction, and global and regional seasonal and longer term climate prediction, as well as support for tactical activities of the Australian Defence Force, data and prediction services for resource and environmental management, and information for coastal and open ocean industry operations and activities.

## PLANNED OUTCOME 2007-08

<p><b>Outcome</b></p>	<p>Enhanced community safety and wellbeing through preparation of meteorological and related products and information and the effective use of meteorological and related services by the general public and other major social, environmental and economic sectors.</p>
<p><b>Objective</b></p>	<p>To meet the national need for basic operational oceanographic information, prediction and advice, on both short and long time scales and for both coastal regions and the open ocean.</p>
<p><b>Effectiveness indicators</b></p>	<p>The extent to which:</p> <ul style="list-style-type: none"> <li>• oceanographic services contribute to: <ul style="list-style-type: none"> <li>- minimising loss of life and property and community disruption from tropical cyclones, severe storms and tsunamis;</li> <li>- minimising economic and other costs of disaster preparedness;</li> <li>- the safety, comfort, convenience and general welfare and economic benefit of the public and major community groups;</li> <li>- the safety and efficiency of shipping, small craft and maritime industries;</li> <li>- the efficiency and effectiveness of the Australian Defence Force;</li> <li>- government and community planning;</li> <li>- the management of the environment, including natural resources; and</li> <li>- the economy and efficiency of primary and secondary industry;</li> </ul> </li> <li>• forecasts, warnings, information and advice are accurate and timely;</li> <li>• user needs are identified and, within available resources, are satisfied and new services and products are developed as opportunities arise;</li> <li>• the public and major user groups receive, understand and make optimum use of the services and express satisfaction with the services;</li> <li>• the National Tidal Centre: <ul style="list-style-type: none"> <li>- provides reliable and timely predictions of tides at major and secondary ports; and</li> <li>- contributes to the sea level measurements for climate for Australia and the South West Pacific and for tsunami detection for Australia and the Indian and Pacific Oceans.</li> </ul> </li> </ul>

## OUTPUTS 2007-08

Oceanographic Services is one of the Bureau's eight Major Outputs and contributes towards Output Group 1.3 - Meteorological and Related Services and Products. It generates a range of data, information and products on current and forecast ocean conditions for the Australian region, tailored to meet the sectoral needs of the marine, defence and emergency services communities, and to underpin the development and effective and sustainable operation of ocean observing systems which provide input to weather and climate monitoring and prediction.

This Major Output also encompasses activities carried out by the Bureau as part of Australia's contribution to international collaboration in support of oceanographic observations and services, including those occurring under the aegis of the World Meteorological Organization (WMO). The Bureau's role in such activities provides Australia with a major voice in the development and implementation of international policies and strategic plans, supporting the Government's national plans and projects in the development and provision of oceanographic services to the community, as well as Australia's national and regional disaster mitigation and climate change activities.

### OUTPUT PERFORMANCE 2007-08

Output performance is measured against a number of quality, quantity and price targets. The results achieved for 2007-08 are provided below.

Quality	Target	Actual
Percentage of users surveyed indicating that they are 'satisfied' or 'very satisfied' with oceanographic information, including tide predictions	90%	95%
Percentage of users satisfied with tide prediction services	90%	98%
Percentage of users indicating that oceanographic services support their activities	90%	97%
Percentage of users indicating that oceanographic services meet their needs	90%	94%
Quantity		
Number of oceanographic products issued	3,500	8,680
Number of tide predictions issued	36,500	37,600
Price		
Oceanographic Services	\$5.404m	\$4.026m

### **Comments on output performance**

Public response to the new web-based oceanographic products and services was surveyed for the first time this year. The quality indicators show a high level of public satisfaction with the oceanographic and tide prediction services now available. The number of oceanographic products issued significantly exceeded the target due to the release of online ocean analyses and forecasts from the operational forecast system component of BLUElink.

During the year the attribution of the Australian Tsunami Warning System project was moved from Oceanographic Services to Weather Services, leading to a difference between the actual and target values for the price.

## **ACHIEVING THE OUTCOME**

Oceanographic Services are delivered through a single output that contributes to the achievement of the desired outcome. The developments relating to this output during 2007-08 and their contributions to the outcome are described below. Development of the Australian Tsunami Warning System, which was reported in this chapter in previous years, is now covered within the Weather Services chapter.

### **OVERVIEW OF 2007-08**

In August, the official launch of the BLUElink ocean analysis and forecast system took place at the Garden Island Naval Base in Sydney, coordinated jointly by the Bureau, CSIRO Marine and Atmospheric Research and the Royal Australian Navy. The launch coincided with the completion of Phase I of BLUElink research, which covered in the development of the OceanMAPS regional ocean forecast system, and the commencement of Phase II research, which will focus on a range of enhancements to the basic forecast model, including increased resolution, and the development of a near-shore wave model and a fully coupled ocean-atmosphere tropical cyclone model. Ocean analyses and forecasts from OceanMAPS (Ocean Model Analysis and Prediction System) were made available online to the community for the first time during 2007-08 in both graphical format (maps) and as digital data-sets to registered users.

Following the public launch of the BLUElink system and its products, an intensive process began to assess the quality of the products being delivered and their value to a wide range of professional and public users. This process involved internal product assessments as well as public surveys and more direct, technical-user consultations through workshops and seminars. Initial feedback from users indicated a very high understanding of the products and acceptance of their value in a range of applications relating to public safety, the environment, industry and recreational activities.

The Bureau continued to play a major role in the management of the Intergovernmental Oceanographic Commission (IOC) and of the Joint IOC/WMO Technical Commission for Oceanography and Marine Meteorology (JCOMM). The IOC and JCOMM play important roles in oceanographic activities in the Indian and the southwest Pacific Oceans, particularly in the intergovernmental coordination of oceanographic and marine meteorological observations, data management and services, and in capacity building in developing nations. As part of the Australian Government's contribution to these international activities, the Bureau held



*Commodore Ray Griggs, Deputy Fleet Commander Australia with the Royal Australian Navy, addressing participants at the formal launch of BLUElink, Garden Island Maritime Heritage Centre, Sydney, 2 August.*

a vice-chairmanship of the IOC and a co-presidency of JCOMM and was involved in a number of related major meetings and events. These included active participation in the annual meeting of the IOC Executive Council, the annual meeting of the IOC Officers, a working group on the future of the IOC, an international symposium on storm surges sponsored by JCOMM, the annual meeting of the JCOMM Management Committee, and the annual meeting of the WMO Executive Council.

#### **Major developments 2007-08**

- The formal launch of the BLUElink system saw the commencement of routine delivery of a suite of oceanographic products from OceanMAPS. The products include both analyses and forecasts extending out to seven days. Core parameters include sea-surface temperature, currents, sea-level anomaly (the difference of the sea level from its climatological mean), and sea-surface salinity.
- The Bureau worked closely with other agencies, particularly the CSIRO, to implement a number of components of the Integrated Marine Observing System (IMOS) under the Commonwealth Government's National Collaborative Research Infrastructure Strategy. The Bureau assisted, for example, with the design and deployment of deep ocean moorings and the implementation of systems to measure and process sea-surface temperatures.
- The Bureau's National Tidal Centre (NTC) renewed a ten-year agreement with Ports Australia (until December known as the Association of Australian Ports and Marine Authori-

ties), the peak body representing the interests of ports and marine authorities in Australia, to provide tidal information services for 80 primary ports around Australia. The tidal predictions are provided directly to port and other authorities, and also made publicly available via the Bureau's website.

- The NTC provided training in support of the Fellowship Program in Sea Level Science offered, through funding contributions from the Government of Norway, under the auspices of the IOC's Indian Ocean Tsunami Warning and Mitigation System (IOTWS). It hosted fellowship holders from the Survey of India and the Malaysian Meteorological Department, and also a visitor from the Singapore Port Authority, who undertook a training attachment. Training was provided in topics including tidal theory and analysis and the quality control of sea level and related information.
- The Bureau, as head contractor and operator of the observing network for the South Pacific Sea Level and Climate Monitoring Project, funded by the Australian Agency for International Development (AusAID), provided a significant contribution to the strategic review of Phase IV of the project. Phase IV involves the maintenance of the network, continued data collection, analysis and dissemination, and measures to increase local participation and capacity (Figure 32). The review made several recommendations on the future of the project, including on the proposed upgrade of the sea-level observing network, which will be the first major upgrade of infrastructure since the project commenced in 1991.



*The Bureau provided sea-level science and applications training in support of the Intergovernmental Oceanographic Commission's Indian Ocean Tsunami Warning and Mitigation System program. Bureau senior technical officer Allan Suskin (second from right) shows a model tide gauge to training attachments from India, Malaysia and Singapore.*

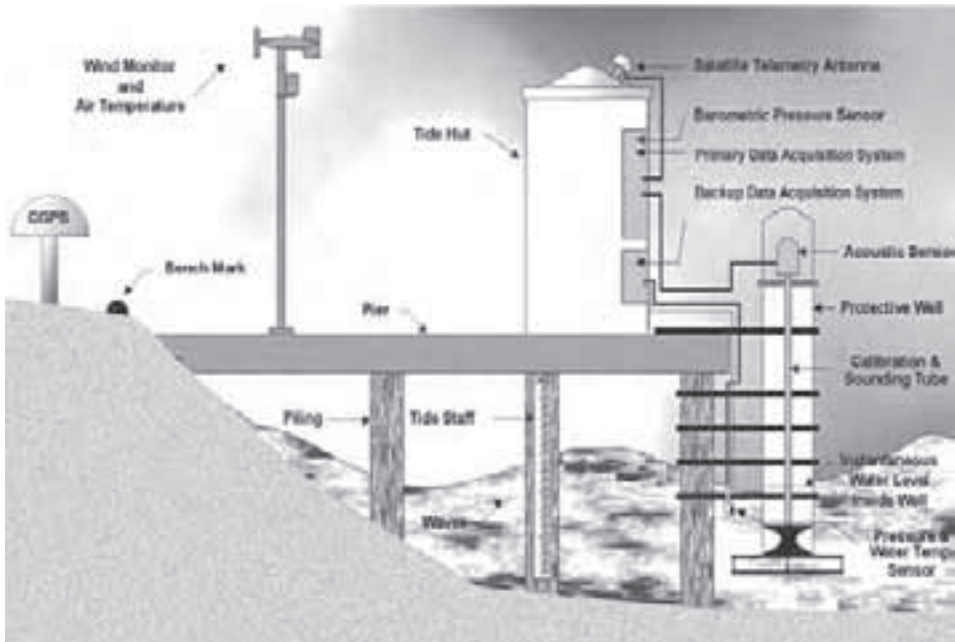


Figure 32. Schematic of a monitoring station installed and operated by the Bureau's National Tidal Centre as part of the South Pacific Sea Level and Climate Monitoring Project.

### Contribution towards outcome

- Forecasts from OceanMAPS, which are used by stakeholders such as the Royal Australian Navy, commercial shipping and recreational boating, represent a significant enhancement of the oceanographic information and prediction services provided by the Bureau. The system provides the maritime community, for the first time, ready access to these new or enhanced products through the Bureau's website.
- IMOS enhances the ability of the nation to capture, maintain and provide essential oceanic environmental information in support of sustainable management practices and will support oceanographic services contributing to the safety and well being of the general community and specific marine sectors. IMOS will provide significant enhancements to ocean observing infrastructure for research over the next five years, and is expected to deliver a blueprint for an eventual operational ocean observing system for Australia.
- Tidal information services are critical for the safe and efficient operation of Australian ports, which remain the gateway for the vast majority of national trade.
- The training provided by the NTC directly enhances the capabilities of regional National Meteorological and Hydrological Services (NMHS) in sea-level measurement, data management and interpretation. Such capabilities have a direct benefit to the Australian community through the contribution of these NMHS to the operation of the Australian Tsunami Warning System by the provision of sea-level data for their areas of responsibility.

- The South Pacific Sea Level and Climate Monitoring Project aims to provide an accurate long-term record of sea levels in the South Pacific region for Australia, partner countries and the international scientific community. These base-line data provide a scientific foundation for informed community response to, and management of, the impacts of climate and sea-level change.