WAVE DATA COLLECTION

Wave data are collected by the NSW Public Works’ Manly Hydraulics Laboratory (MHL) for the Office of Environment and Heritage to provide essential input to design, construction and performance monitoring of coastal zone projects undertaken by the NSW Government. Uses of the wave data include:

- design, repair and performance monitoring of coastal structures
- assessment of coastal processes such as beach erosion and sediment transport
- baseline data for monitoring the impact of climate change
- operational assistance for coastal construction projects
- monitoring severe weather conditions
- oceanographic research.

Since the establishment of the first Waverider buoy station by MHL off Port Kembla in 1974, wave data have been collected at over 40 locations along the NSW coast using a variety of wave motion sensors. In 1986 wave data collection was rationalised with the development of a formal deepwater wave data collection program for the NSW coast. The NSW Wave Climate Program now utilises a network of seven Waverider stations along the NSW coast. The buoys are located off Byron Bay, Coffs Harbour, Crowdy Head, Sydney, Port Kembla, Batemans Bay and Eden. To provide deepwater wave data, the buoys are typically moored in water depths between 60 and 100 metres, between 6 and 12 kilometres from the shoreline.

All deepwater stations are based on the Waverider system developed by the Dutch company, Datawell. The Waverider system uses an accelerometer mounted in a loose tethered buoy (0.7 or 0.9 m in diameter) to measure the vertical accelerations of the buoy as it moves with the water surface. The accelerations are integrated twice within the buoy and the displacement signal so obtained is then transmitted to a nearby shore station. Data received at the shore station is processed by a PC to provide wave data statistics and the raw and analysed wave data is then emailed every hour to MHL’s central computer. Wave data collected by the Waverider buoy network and by other project specific stations has been incorporated into an extensive long-term database maintained at MHL.

In March 1992 the Waverider buoy network was enhanced with the deployment of a buoy off Sydney that also measures wave direction. The Directional Waverider buoy was also developed by Datawell and utilises three accelerometers and a compass to provide wave direction information. In October 1999 the Byron Bay station was upgraded with a Directional Waverider buoy and in February 2001 a directional buoy was deployed at Batemans Bay. Directional Waverider buoys are now deployed at all NSW offshore wave monitoring stations.

Further information on the NSW Wave Climate Program, including details of wave data collection stations, wave data analysis and presentation is presented in a data summary report published each year.