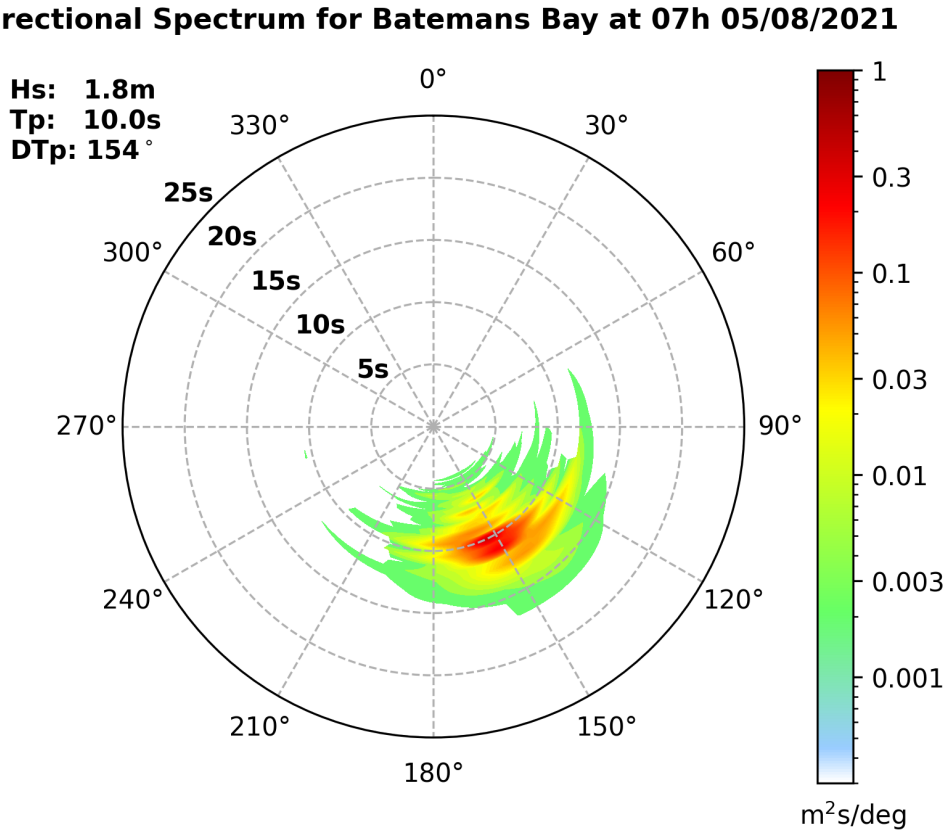
DIRECTIONAL WAVE SPECTRUM

Directional wave spectra plots have been developed by MHL to display the rich directional energy data available from the Department of Planning, Industry and Environment's NSW Waverider buoy network.

Going beyond the conventional reporting usually provided (wave heights, period and direction), directional spectral plots show information about the sea state in an easy to interpret graphical format, providing an overview of the wave conditions at a glance.

The directional spectrum plots are generated hourly in line with the conventional wave height, period and direction graphs provided on the MHL website: www.mhl.nsw.gov.au/Data-Wave



The directional spectra plots show the direction from which the waves are propagating, so for NSW the wave energy will come from the top right (north-east) to the bottom (south) on the plot. Long period waves (swell) are shown towards the outer edge of the plot and short period waves (sea) down to 2 seconds are near the centre of the plot.

Sea states associated with high wind events appear as broad areas of colour near the centre of the plot as these events generate short period waves with wide directional spreading. Swell that is generated a long distance from the Waverider buoy is usually represented by small peaks in the middle of the plot (10 to 15 seconds) as it is typically associated with long period waves from a narrow direction.

One of the key features of the directional spectra plots is the capacity to represent more than one wave direction source, for example a southerly swell with a north-easterly sea can be depicted on one plot, but such information may be lost in the conventional plots of wave height, period and direction parameters.

The analysis takes the raw heave and x, y displacement data collected by the buoys each hour and processes them to remove noise, before transformation into velocity vectors. These velocities are then fed into a custom implementation of the DIrectional WAve SPectrum analysis (DIWASP) software which produces the spectral plots for presentation on MHL's website along with key summary statistics.

The summary parameters included with the directional spectra plot are:

Hs significant wave height in metres = average of the highest one-third waves recorded during the 55 minute sampling period

Tp period in seconds of the highest peak of the energy spectrum

DTp the wave direction at the peak of the energy spectrum (Tp) measured in degrees clockwise from True North.