



Australian Government

Bureau of Meteorology

Tasmanian Marine Weather Services Newsletter

July 2009

Wave Data for East Coast

Most people are familiar with the Bureau of Meteorology's waverider buoy on the west coast. The CSIRO have a buoy that records wave height off the east coast near Maria Island. These data are currently experimental and you need to cross check with the forecast.

The observation platform is located approximately five nautical miles east of Cape Boulanger.

To access the data go to <http://imos.aodn.org.au>

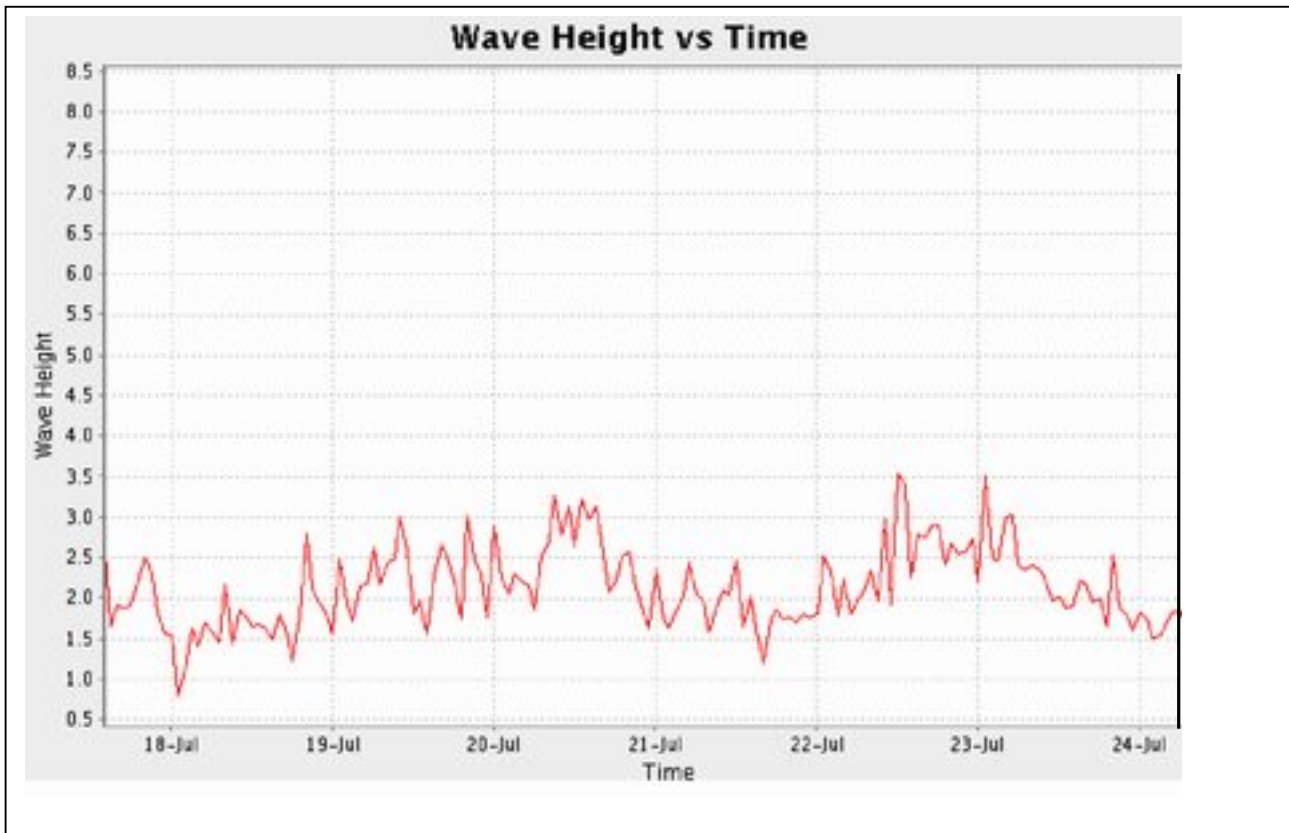
Select the **Realtime** tab

Select **ANMN Moorings**

Untick the box **Argo Floats**

Click on the red triangle on **Tasmania's east coast**

Select **Wave height** from the list and a diagram like below appears.



Tsunami Event 15th of July

At 19:22 on the evening of the 15th of July an earthquake of 7.9 on the Richter scale occurred in the ocean off New Zealand.

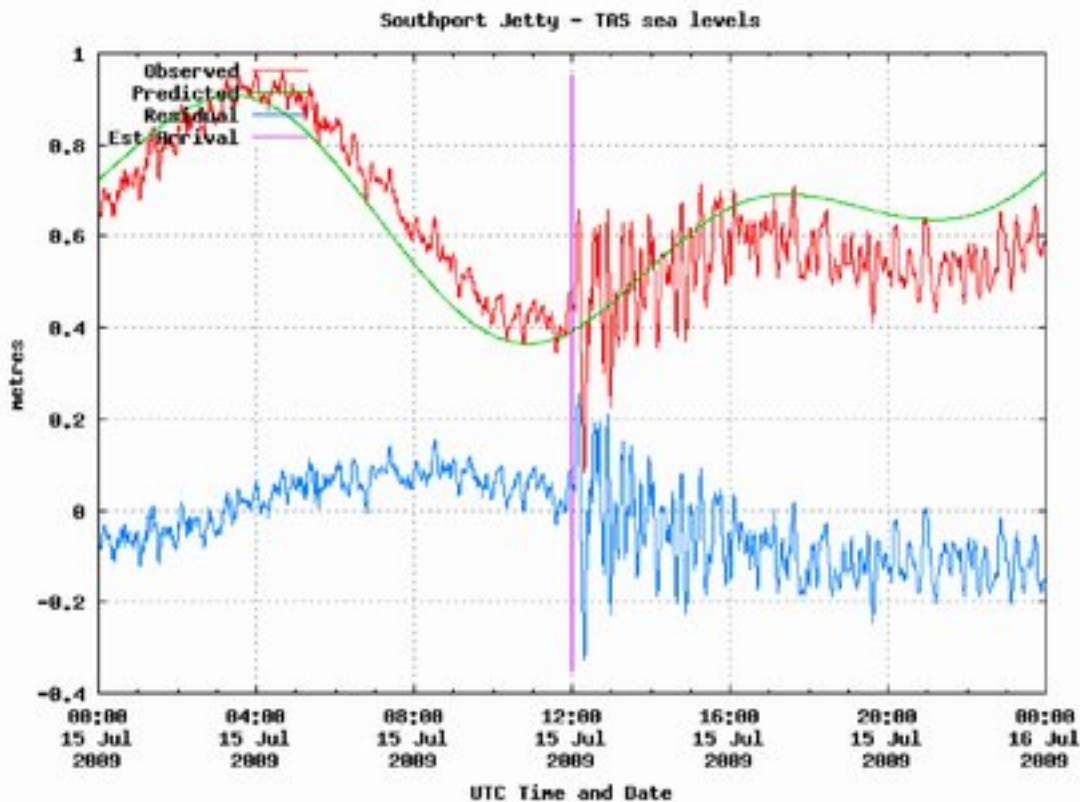
The Joint Australian Tsunami Warning Centre (JATWC) immediately began to coordinate a warning response. The JATWC is the official tsunami warning centre for Australia and is a combined service of Australian Bureau of Meteorology (the Bureau) and Geoscience Australia.

The first advice provided to the Public, Media and Emergency Services was the tsunami watch within 25 minutes of the occurrence of the earthquake. This watch advice gives potential areas that may be affected by a tsunami and when. A tsunami watch is disseminated as an early warning and that more detailed advice will follow shortly.

At 08:17 pm the first tsunami warning was issued giving details of areas that would be affected.

It can be seen from the warning on the next page that this event was predicted to arrive on Tasmania's east coast after 9:30 pm and Hobart after 10:15 on Wednesday evening. The tide gauge at Spring Bay began to pick up tsunami sea level fluctuations at 9:40 pm. The tide gauge at Southport recorded fluctuations of just over 50 centimetres just after 10 pm. The Hobart tide gauge around 10:30 pm. The fluctuations were not large; around 25 centimetres at Spring Bay and 20 centimetres in Hobart.

Some might have thought that tsunami turned out to be a non event. However, while the tsunami was small it was determined to be a marine threat. At 10pm on a cold July night the number of people at risk would have been small. However, a similar event on a warm summer weekend, or public holiday, would see many more Tasmanians in the water and using the foreshore zone, and potentially at risk of unusual currents and waves.



Above: Sea level information at Southport, purple line is the expected arrival time. Green Line = Astronomical tide. Red line = actual sea level, Blue line = non astronomical variation. It can be seen the increase in fluctuation of sea level with the arrival of the tsunami. The times shown are UTC.

Australian Government Bureau of Meteorology TSUNAMI WARNING NUMBER 1 FOR PARTS OF TASMANIA
Issued by the Joint Australian Tsunami Warning Centre [JATWC] at 08:17 PM EST on Wednesday 15 July 2009
TSUNAMI THREAT TO THE MARINE ENVIRONMENT

SUMMARY:

Tsunami warning for the marine environment for parts of TASMANIA.

Threatened areas extend from Northern Tip of Flinders Island to Low Rocky Point including Bicheno, Derwent Estuary, Eddystone Point, Flinders Island, Hobart, Low Rocky Point, Maatsuyker Island, Maria Island, Orford, Scamander, St Helens, Storm Bay and Channel, Swansea, Tasman Island and Wineglass Bay.

Possibility of DANGEROUS WAVES, STRONG OCEAN CURRENTS AND SOME LOCALISED OVERFLOW ONTO THE IMMEDIATE FORESHORE for several hours from 09:30 pm [EST] Wednesday.

Although major evacuations are not required, people are advised to get out of the water and move away from the immediate water's edge.

Next update will be issued by 09:17 PM EST on Wednesday 15 July 2009

For latest and further information call 1300 TSUNAMI [1300 878 6264] or visit www.bom.gov.au

DETAILS: A threat of DANGEROUS WAVES, STRONG OCEAN CURRENTS AND THE POSSIBILITY OF SOME LOCALISED OVERFLOW ONTO THE IMMEDIATE FORESHORE exists for parts of TASMANIA from Northern Tip of Flinders Island to Low Rocky Point including Bicheno, Derwent Estuary, Eddystone Point, Flinders Island, Hobart, Low Rocky Point, Maatsuyker Island, Maria Island, Orford, Scamander, St Helens, Storm Bay and Channel, Swansea, Tasman Island and Wineglass Bay.

Tsunami effects are expected at the following locations from these times:

Babel Island after 10:00 pm [EST] Wednesday St Helens after 09:30 pm [EST] Wednesday

Maria Is after 09:30 pm [EST] Wednesday Hobart after 10:15 pm [EST] Wednesday

Southport Jetty after 10:00 pm [EST] Wednesday

COMMUNITY RESPONSE ADVICE FROM THE TASMANIA POLICE

- While major evacuations in these areas are not required, people are advised to get out of the water and move away from the immediate water's edge of harbours, coastal estuaries, rock platforms and beaches.
- Boats in harbours, estuaries or shallow coastal water should return to shore. Secure your boat and move away from the waterfront.
- Vessels already at sea should stay offshore in deep water until further advised.
- Do not go to the coast to watch the tsunami, as there is the possibility of dangerous, localised flooding of the immediate foreshore. - Check that your neighbours have received this advice.

CAUTION:

Tsunami waves are more powerful than the same size beach waves, with the first wave not necessarily being the largest.

Low-level effects may be observed in neighbouring coastal areas. People are advised to take care.

TSUNAMI SOURCE:

An undersea earthquake of magnitude 7.9 [Latitude 45.960S Longitude 166.470E] occurred at 07:22 PM EST on Wednesday 15 July 2009 off W. COAST OF S. ISLAND, N.Z.

Sea level observations have confirmed a tsunami. The earthquake of magnitude 7.9 [Latitude 45.960S Longitude 166.470E] occurred at 07:22 PM EST on Wednesday 15 July 2009.

The NEXT UPDATE will be issued by 09:17 PM EST on Wednesday 15 July 2009

FOR LATEST AND FURTHER INFORMATION: Call 1300 TSUNAMI [1300 878 6264] or visit www.bom.gov.au

FOR EMERGENCY ASSISTANCE: Call the TASMANIA POLICE on 131 444

Recent High Sea Levels

Over the last few weeks sea levels have been unusual. In most cases they have been quite high with many spring tides. There are several factors that affect the sea level. The first is the phases of the moon. The 7th of July was a full moon so a few days either side of the full moon would see high tides purely by astronomical effects.

However, the sea level is not just made up of the astronomical tides. Three other major factors in determining the sea level are;

Air pressure;
Wind;
Ocean currents.

Air pressure pushes down on the sea; the higher the pressure the greater the weight of air and the more the sea level is pushed down. Conversely low pressure takes weight off the water and allows it to rise. Storm surges in tropical cyclones that have very low pressures can see this effect. Cyclone Nargis in Burma was an extreme example of this phenomenon. In Tasmanian latitudes sea level rises and falls approximately one centimetre per hectopascal of air pressure. In the first few days of July pressures were low, around 990 hectopascals, adding around 20 centimetres to sea levels.

Wind can also raise the sea level. Long periods of onshore wind heap water around the coastline. Conversely offshore wind takes it away.

Ocean currents in adjacent areas also contribute to the sea level. Anticlockwise eddies pile water up and clockwise takes it away. In the early parts of July ocean currents added to the sea level around Tasmania.

July has been a complex mix of the four factors. During the early part of the month the moon was over 400,000 kilometres from the earth. It moves closer on a daily basis to be around 50,000 kilometres closer by the 24th of July. The moon will have a greater gravitational force the closer it comes to the earth. However, this and other astronomical variations are considered in the tide predictions; the wind pressure and ocean currents are not.

Tide information available at <http://www.bom.gov.au/oceanography/tides/>

Sea height and currents information

<http://www.bom.gov.au/oceanography/forecasts/idyoc15.shtml?region=15&forecast=4>

There is a survey from the National Tidal Centre that can be filled out online.

http://www.bom.gov.au/survey/mnb_ntc.shtml

Praise/Complaints/Queries

If you wish to have an explanation of any marine weather matter please email pubmarine.tas@bom.gov.au or call 03 6221 2081 during normal business hours. Use the same email address and phone number if you wish to be put on the address list for this newsletter.

Bureau of Meteorology Coastal Weather Observations

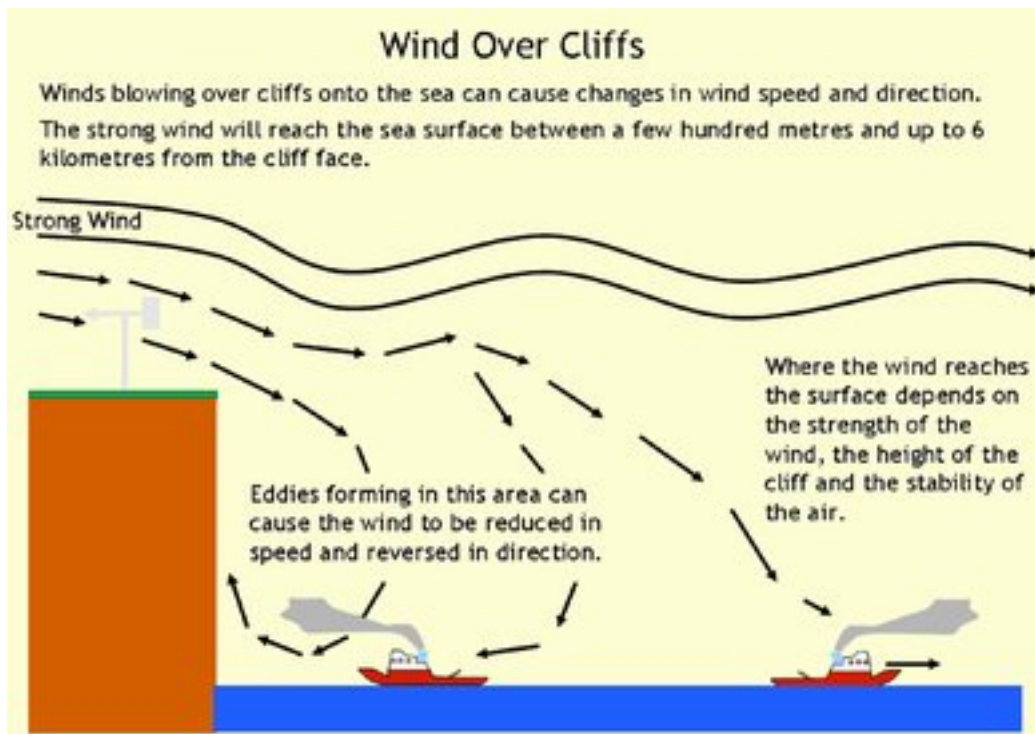
Some mariners have rules of thumb regarding the wind and weather by applying their local knowledge to the readings from the Bureau of Meteorology's coastal wind recording sites. I have often got comments that the coastal winds do not match the conditions at sea.

Wind observations taken at Bureau of Meteorology recording sites are the mean wind speeds recorded on ten metre masts. Most of Tasmania's coastal observations are recorded by automatic weather stations.

These automatic weather stations are recording the wind that is occurring exactly at their location. As they are located on the land there can be a discrepancy between the wind recorded at the site and the adjacent winds over the open water. The discrepancies can be in wind speed or wind direction or both and will depend on the overall wind direction, speed, atmospheric conditions of the day and location of the site.

The wind recorded over the land can be altered by the shape and orientation of the land. The land will compress the air that moves over it making the air speed up; this is the same effect as when you put your finger over the end of a running hose.

The converse of this is when adjacent land shelters the recording instrument from the prevailing wind of the day. At Cape Grim when the wind is from the west through to southwest the speed is enhanced by the nearby cliffs, however, when the wind direction is southeast the wind speed is reduced due to sheltering and frictional effects of the land.



Each coastal wind recording station will have its own peculiarities that will change with the changing wind speeds, directions and atmospheric conditions.

The most obvious of these discrepancies are offshore wind speeds. Offshore wind speeds recorded at a coastal station are often less than the wind further out to sea. Bureau stations on the East Coast will record lower wind speeds than waters further offshore in westerly conditions. A rule of thumb at the Bureau is that in a westerly wind the speeds of the wind gusts at Friendly Beaches are more representative of the mean wind speed offshore than the mean conditions recorded at this site.

The anemometer at Tasman Island is 250 metres above sea level; in southwesterly wind conditions the gust speeds are usually indicative of the mean wind over the sea. Occasionally in a southwesterly wind vertical rotors can form, when they do recordings from this site will have very little in common with the winds occurring in adjacent waters.



(Above: Tasman Island looking southwards. Observation site is located to the right of the building closest to the lighthouse.)

Easterly winds at Maatsuyker Island can flow around the northern and western side of the island and the anemometer located in the southwest of the island will record a light northwesterly.

Maria Island wind recordings are taken at Point Lesueur on the western side of the island. When the wind is either in northerly or southerly direction the wind will funnel through Mercury Passage making the wind on the inside of the island stronger than the wind in more exposed waters to seaward.

At Cape Bruny there is a weather station giving automatic winds at its location. There are also manual observations where during daylight hours the wind can be estimated from the sea state. Basically one reading is over the water and the other over the land and differences will occur.

Latest Coastal Weather observations can be found here.

<http://www.bom.gov.au/products/IDT60700.shtml>