

Big surf flips boulders across road in Port Fairy

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Port Fairy received a [United Nations-endorsed award](#) in 2012 for being the world's most liveable town with a population under 20,000. It has recently been subject to a [major coastal storm event](#) with one image from the April 2021 storm shown in Figure 1. A similar event in 2009 shown in Figure 2 produced a similar scene of large boulders strewn across the coastal road by storm waves.

Port Fairy and its surrounds have a long history of coastal erosion, coastal recession and coastal inundation. The region is home to possibly the oldest surviving catchment-to-coast water engineering system in the world - the World Heritage listed [Budj Bim](#). In response to ongoing coastal hazards and the need to improve maritime safety, numerous coastal structures have been constructed since the 1800s, including harbour breakwaters ('moles'), river training walls, groynes, seawalls and revetments.

The boulders on the road in from the April 2021 storm and a similar event in 2009 may be a combination of natural boulders, human placed boulders, and there may be remnant indigenous fish traps given its proximity to Budj Bim.



Figure 1: Boulders across road, April 2021 (Source: ABC)



Figure 2: Boulders across road, May 2009 (Source: James Phillips)

Coastal Hazards Assessment for Port Fairy 2011-2013

The Water Research Laboratory (WRL) undertook a [major coastal study](#) for Port Fairy in 2011-2013. Moyne Shire Council considered the findings of this study for [managing present and future coastal hazards](#), and planning future town expansion and subdivisions. There have been legal cases regarding the impacts of flooding, coastal hazards and climate change on proposed subdivisions in 2008 and 2014.

The WRL 2011 study is one of the few places where dynamic inundation modelling has been used – a reverse flood model was set up which was fed with wave overtopping, because the SW facing coast can be hit by ~11 m Hs, 20 s Tp waves (Figure 3), which can overtop parts of the frontal foreshore (Figure 4) and fill the basin behind. The notches marked “Wave Runup Affected Zone” in Figure 5 and Figure 6 show where extreme wave runup is estimated to cross the beachfront road, potentially inundating the area behind. The boulders-across-road scenario was estimated to occur at about a 5 year average recurrence interval under present sea level.



Figure 3: Large waves moving towards South Beach, May 2009 (Source: James Phillips)



Figure 4: Overnight wave runup South Beach, May 2009 (Source: David Sharpe)

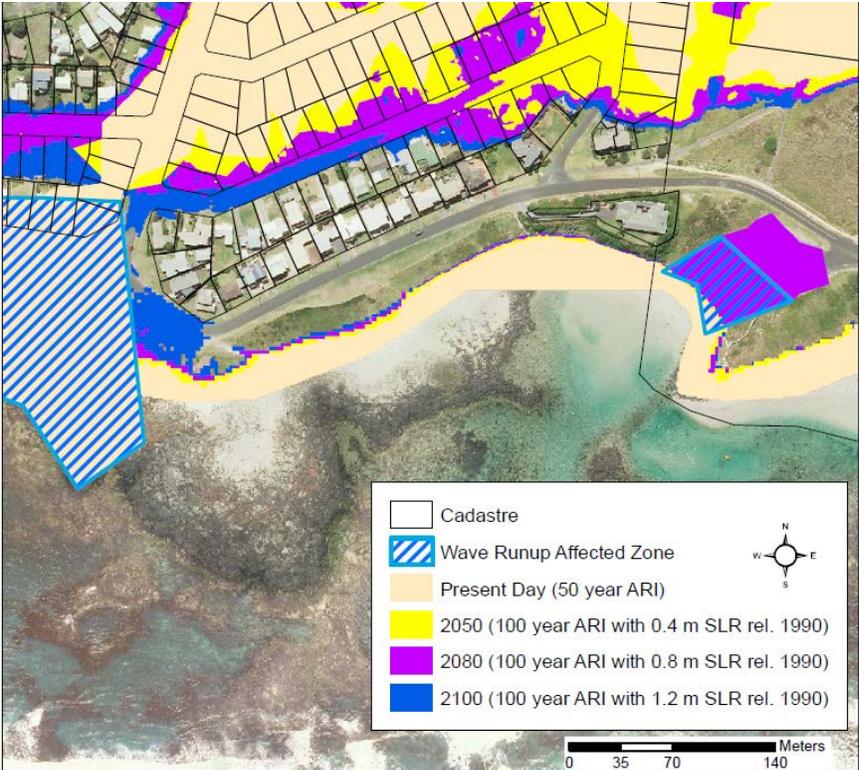


Figure 5: Wave runup and inundation modelling (WRL, 2012)

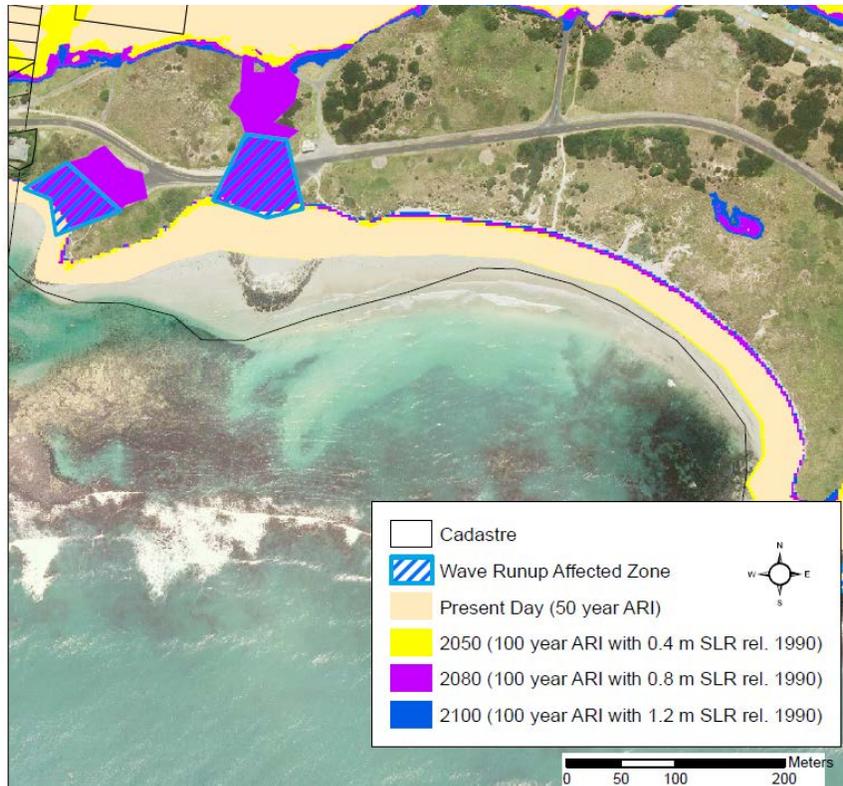


Figure 6: Wave runup and inundation modelling (WRL, 2012)

Figure 7 from May 2009 shows the different wave setup on western vs eastern sides of Griffiths Island – and why people may get trapped there during major storms.



Figure 7: Differential wave setup over access road/breakwater/causeway to Griffiths Island May 2009 (James Phillips)

Observed Wave Heights and Period – April 2021

Wave data from the BoM Cape Sorrell TAS wave buoy (Figure 8) shows a peak Hs of ~9.5 m for the April 2021 storm, which puts the event’s wave height at about a 2 year Annual Return Interval (ARI) (Figure 9), but is well below the event of record of 13.2 m from July 1985. The wave period Tp also nudged 22s in that event, one of the longest observed with a significant wave height (Hs) of over 8 m, and contributing to the high observed runup and damage. Similar values were observed on the recent [Victorian wave buoy network](#) but the buoys are too new to have ARIs available. In the past, Tp wave periods of 15 to 20 s have been used for design in this area. There are also reports of damage to the Warrnambool breakwater (Figure 10).

Significant Wave Height (Hs) & Maximum Wave Height (Hmax)

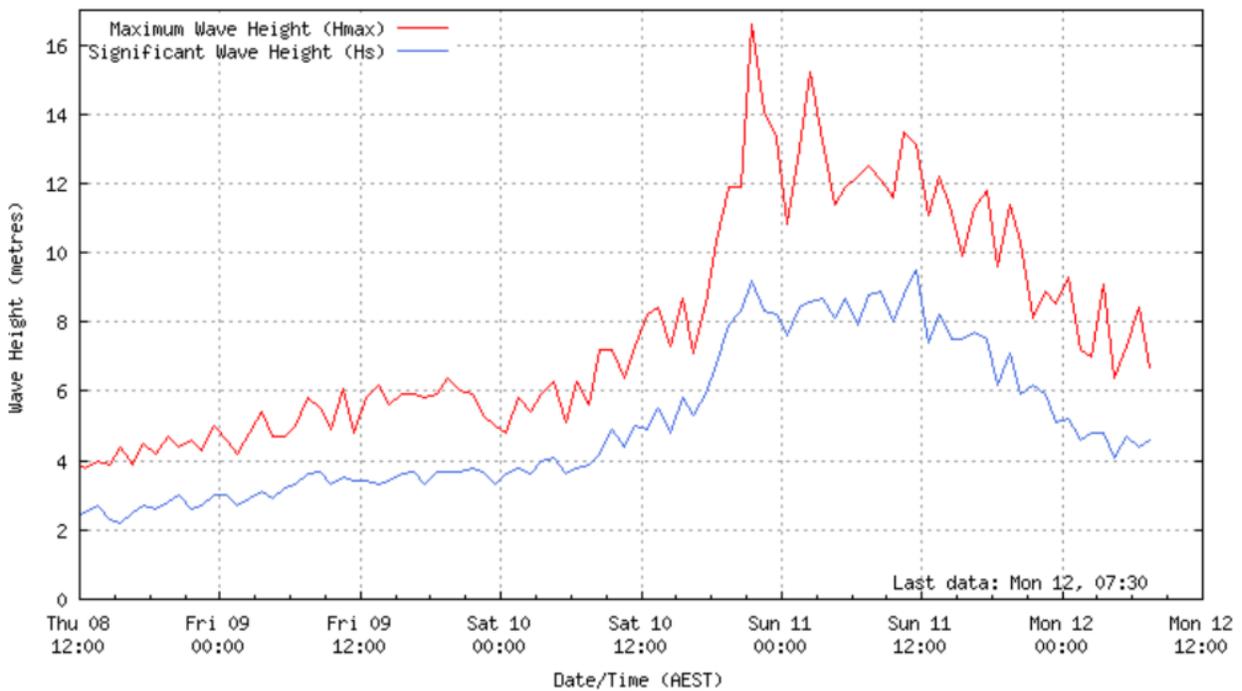


Figure 8: Cape Sorrell wave buoy record (BoM)

