

A. Salehi^{1,2}, C.B. Pattiaratchi^{1,2}, E.M.S. Wijeratne^{1,2}

¹School of Civil, Environmental, and Mining Engineering, The University of Western Australia ² The UWA Oceans Institute

METEOTSUNAMIS INCUR DAMAGES ON COASTS ALL OVER THE WORLD. AS THEY ARE MORE LIKELY TO OCCUR THAN GEOPHYSICAL TSUNAMIS, IT HAS RESULTED IN MANY COASTAL PROBLEMS IN AUSTRALIA IN THE LACK OF PRESENCE OF EFFICIENT PUBLIC AWARENESS SYSTEMS. IDENTIFYING WHERE AND WHEN METEOTSUNAMIS POSE A THREAT WILL AID COASTAL MANAGEMENT AND PLANNING.

The main source of background long waves in the ocean is due to atmospheric processes. Although seismic tsunamis are the main cause of destructive waves observed in the World Oceans, long waves generated by atmospheric forcing can also be responsible for devastating waves. These waves due to their similarity in temporal and spatial scales as seismic tsunami waves and the way they can affect coasts and because of their generation by meteorological disturbances are called "meteotsunamis".

- ▶ **Meteotsunamis**, are similar to tsunami waves (defined as long waves or shallow-water waves, where the wave length, L , is much greater than the water depth, h) that are generated by seismic activity, except they have a **meteorological origin**.
- ▶ While seismic tsunamis are free waves, meteotsunamis can be either **forced or free waves**, yet both have similar periods. More over the latter one is a local event as shelf or basin scale whereas the former type of tsunamis is globally or basin scale.
- ▶ Meteorological **disturbances**, such as squalls, tornadoes, thunderstorms, frontal passages, and atmospheric gravity waves can produce these longer-period surface waves, either locally or remotely.

RESEARCH OBJECTIVES

- ▶ Define the **occurrence** of meteotsunamis and their consequences along the Australian coastline.
- ▶ Identify the **dominant mechanisms** for the generation/propagation of meteotsunamis through idealised simulations.

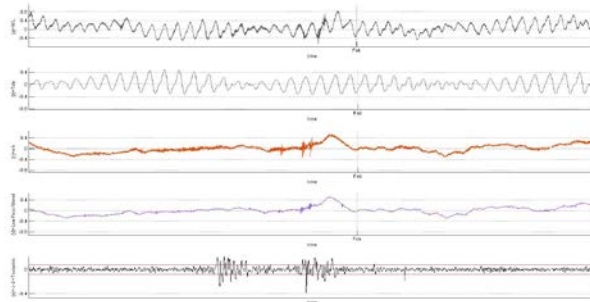


Figure 1. Time series of residual water level (filtered to include periods < 6 hours) recorded at Hillarys, 28th Jan. 2011, 20:57 hrs
Wave height= 48cm

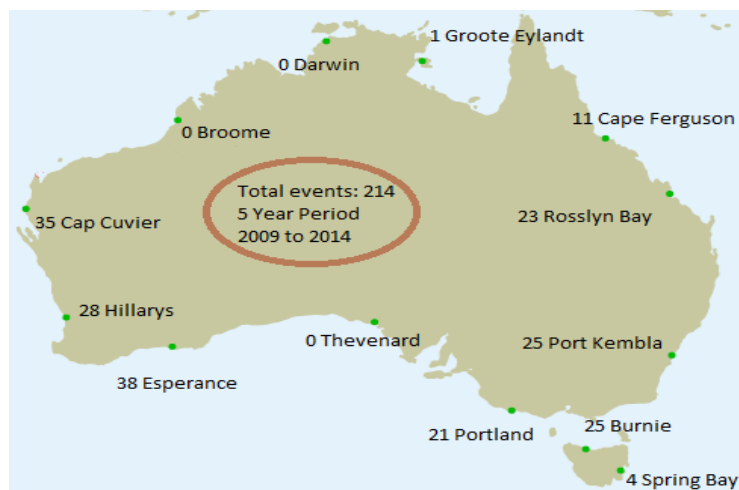


Figure 2. Dispersal of meteotsunami suspicious events at Sea Level Active Stations Monitoring Facility

