

## TSUNAMI ON THE GOLD COAST - January 2005 -

### INTRODUCTION

A tsunami is a series of ocean waves generated by any large-scale disturbance of the ocean water. Earthquakes generate most tsunami, but volcanic eruptions, landslides or meteor impacts may also cause them.

In the deep ocean, a tsunami is barely noticeable and will only cause a small swell of the sea surface as it passes. As the tsunami approaches land and shallow water, the waves slow and become compressed, causing them to grow in height. In the best of cases, the tsunami comes onshore like a quickly rising tide and causes a flooding of low-lying coastal areas. In the worst of cases (See Figure 1) the tsunami results in 40m waves thrusting inland through coastal regions.



Figure 1 - Large tsunami wave impacting coastline.

### BACKGROUND

Tsunami do not have a season and do not occur regularly or frequently, yet pose a major threat to the coastal populations of the Pacific and other oceans and seas. Nothing can be done to prevent tsunami from impacting coastlines, but the adverse impact on the loss of life and property can be reduced with proper planning.

### TSUNAMI ON THE GOLD COAST

A tsunami is recorded on Australia's coastline about once every two years, although most are very small and low risk. In Australia, models

predict that the northwest coast is most susceptible to tsunami impact.

Several large tsunami have hit Australia's northwest coast yet with minimal damage. This area is classified *moderate risk*, due to its close proximity to countries where large earthquakes and eruptions can occur. The Eastern coastline is classed as *low risk*, as a locally formed Tsunami is not likely. This is due to Australia's distance from tectonic plates, as local Tsunami occur in regions of tectonic subduction along plate boundaries (See Figure 2).

The most significant Tsunami recorded on Australia's eastern coastline in the last 40yrs resulted from an earthquake off Peru, causing the arrival of a tsunami only 10cm to 1m in height.

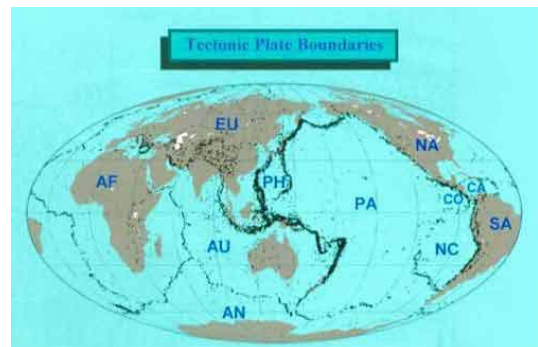


Figure 2 - Earth's Tectonic Plates

### WARNING SYSTEMS

The Pacific Tsunami Warning Centre (PTWC) is the operational centre of the Pacific, composed of 26 international Member States including Australia. Located near Honolulu, Hawaii, PTWC provides tsunami information to national authorities for tsunami that pose a Pacific-wide threat.

If a seismic event meets the known criteria for generation of a tsunami, a warning is issued of an imminent tsunami hazard. The Emergency Managers (EM) Office of each country within the PTWC is quickly notified, with the warning including predicted tsunami arrival times, size of tsunami waves and projected impact at coastal communities.

## THE GEOHAZARDS PROGRAM

Geoscience Australia and its predecessors conduct geophysical monitoring of natural hazards in the Australian region and research into the nature, origin and occurrence of the hazards themselves.

Australia's earthquake monitors are used to detect events that might cause tsunami around Australia's coast. If such an earthquake occurs, Geoscience Australia immediately notify Emergency Management Australia (EMA). The EMA then notifies the Australian authorities and media, who in turn, disseminate the tsunami information to the public via radio and television channels.

## WHAT TO DO IN TSUNAMI ENCOUNTER

- Most importantly, run for high ground, away from the coastline (either hills, high land or tops of buildings).
- Do not stay near the beach and watch - If you can see the wave you are too close to escape it.
- If on a boat, one should never come into shore, shelter behind a headland, or enter a harbour following a tsunami warning.
- Rivers leading from bays are also dangerous, as tsunami can travel up a river enhancing as the river narrows, so do not shelter in rivers.
- Coastal floodplains are a risk, as a tsunami travels through this area as if it was moving through shallow water. A 10m high wave could conceivably travel 8-10 km inland. Hence avoid all floodplains.

## REFERENCE

### NOAA BACKGROUNDER - INTERNATIONAL TSUNAMI INFORMATION CENTRE

[http://www.prh.noaa.gov/pr/itic/library/about\\_tsu/factsheets.html](http://www.prh.noaa.gov/pr/itic/library/about_tsu/factsheets.html)  
[http://www.ngdc.noaa.gov/seg/hazard/tsevsrch\\_idb.shtml](http://www.ngdc.noaa.gov/seg/hazard/tsevsrch_idb.shtml)

### AUSTRALIAN GOVERNMENT - Geoscience Australia, Tsunamis in Australia

<http://www.ga.gov.au/urban/factsheets/tsunami4.jsp>

### TSUNAMI IN AUSTRALIA: THE RISK

<http://www.uow.edu.au/science/eesc/research/Various%20research/tsun.htm>

### THE TSUNAMI WARNING SYSTEM

<http://www.geophys.washington.edu/tsunami/general/warning/warning.htm>

- The back corner of an embayment is a safe place to flee to if a tsunami approaches one of our beaches.
- The public should **NOT RETURN** to low-lying areas until the tsunami threat has passed and the local authorities announce the "all clear".

Gold Coast City Council is currently investigating the implementation of tsunami warning systems on Gold Coast beaches, similar to those used on Hawaii beaches. This would involve clear signage (See Figure 3) and several loud speakers for authorities to notify of arriving tsunami hazard. These systems would alert all persons on the beach and surrounding areas and instruct them on what procedure to follow for the tsunami arrival (similar to that listed above).



Figure 3 - Example of Tsunami sign on the beach

