Background Information:

TSUNAMI

Tsunami is a Japanese word for "harbour wave". A tsunami is a series of ocean waves with very long wavelengths (typically hundreds of kilometres) caused by large-scale disturbances of the ocean, such as:

- earthquakes
- landslides
- volcanic eruptions
- explosions
- meteorites

These disturbances can either be from below (e.g. underwater earthquakes with large vertical displacements, submarine landslides) or from above (e.g. meteorite impacts).

Tsunami are different from wind swell waves on the ocean. Normal ocean and wind swell waves may cause motion in water to depths of 150 metres. In contrast, the passage of tsunami involve the movement of water all the way to the sea floor. This creates strong and unusual currents and makes it especially dangerous to swim, even if there is no threat to the shore.

In the past, tsunami have been referred to as "tidal waves" or "seismic sea waves". The term "tidal wave" is misleading; even though a tsunami's impact upon a coastline is dependent upon the tidal level at the time a tsunami strikes, tsunamis are unrelated to the tides. The term "seismic sea wave" is also misleading. "Seismic" implies an earthquake-related generation mechanism, but a tsunami can also be caused by a non-seismic event, such as a landslide or meteorite impact.

What happens to a tsunami as it approaches land?

Tsunami waves move outwards away from their source and may go unnoticed by ships, boats or from the air. As tsunami cross the deep ocean, wave heights may be much less than one metre but speeds can reach up to up to 950km/hr. As tsunami leave the deep water of the open-ocean and enter the shallower water near the coast, they change in speed and shape.

A tsunami travels at a speed that is related to the water depth, so as the water depth decreases, the tsunami slows. The tsunami's energy flux, which is dependent on both its wave speed and wave height, remains nearly constant.

Consequently, as the tsunami's speed diminishes, its height grows. This is called shoaling. Because of this shoaling effect, a tsunami that is unnoticeable at sea may grow to be several metres or more in height near the coast. Just like other water waves, tsunami begin to lose energy as they rush onshore. Despite these losses, tsunami still reach the coast with tremendous amounts of energy. It is this energy rather than the movement of water that makes tsunami so dangerous.

This information is derived from
State Emergency Service, Victoria, TsunamiSafe
http://www.ses.vic.gov.au/CA256AEA002F0EC7/page/TsunamiSafe?OpenDocument&1=68-TsunamiSafe~&2=~&3=~
Australian Government: Emergency Management Australia: http://www.ema.gov.au/

How will you be advised of a tsunami warning?

The Joint Australian Tsunami Warning Centre (JATWC), operated by the Bureau of Meteorology and Geoscience Australia, detects and verifies any tsunami threat to the coastline of Australia and its offshore territories.

The Bureau of Meteorology issues two types of tsunami warnings, based upon the level of threat determined by the JATWC.

1. A **marine based tsunami warning** will be issued if the tsunami threat is restricted to the marine environment and immediate foreshore area of the Australian coastline.

2. A **land based tsunami warning** is issued if there is a possibility of more serious inundation of coastal land. This may involve the evacuation of low lying coastal areas.

A tsunami warning may be relayed through Lifeguards, Surf Lifesavers or emergency authorities via official channels (radio, television, sign boards, internet, 1300 TSUNAMI, emergency alert).

What are natural warning signs of tsunami?

The following are natural signs of tsunami that you may, but not always, experience if you are near the coast in Australia or overseas.

You may…

Feel the earth shake
A large undersea earthquake may be felt prior to a tsunami. You may not feel an earthquake if the source is far away.

See the ocean drop
As tsunami approach the shore, the sea level may, but not always, recede or drop dramatically before returning as a fast moving wall of water.

Hear an unusual roaring
A roaring sound from the ocean may precede the arrival of tsunami.

If you notice any of these warning signs take the appropriate action.

What should you do when a tsunami warning is issued?

Marine based tsunami:

- Get out of the water and move away from the immediate water's edge of harbours, coastal estuaries, rock platforms and beaches.
- Return any boats in harbours, estuaries and in shallow coastal water to shore, then secure your boat and move away from the waterfront.

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- Move any vessels already at sea to deep water well offshore and remain there until further advised.
- Don't go to the coast or headlands to watch the tsunami.
- Listen to the media for further information and follow the advice of emergency services.
- Check that your neighbours have received this advice.

Land based tsunami:

- Take only essential items that you can carry including important papers, family photographs and medical needs.
- Go to higher ground or inland. Move away from all beaches and the water's edge of harbours and coastal estuaries.
- Walk to safety if possible to avoid traffic jams.
- Take shelter in the upper storey of a sturdy brick or concrete multi-storey building if you cannot leave the area.

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