

# The Australian Tsunami Warning System

**The Australian Tsunami Warning System (ATWS) is a national effort involving the Australian Bureau of Meteorology (Bureau), Geoscience Australia (GA) and Emergency Management Australia (EMA) to provide a comprehensive tsunami warning system capable of delivering timely and effective tsunami warnings to the Australian population by 2009. The project also supports international efforts to establish an Indian Ocean tsunami warning system, and contributes to the facilitation of tsunami warnings for the South West Pacific.**

'Tsunami' is a Japanese word, which translates as 'harbour wave', now used internationally to refer to a series of waves travelling across the ocean with extremely long wavelengths (up to hundreds of kilometres between wave crests in the deep ocean). Tsunami are usually the result of a sudden rise or fall of a section of the earth's crust under or near the ocean. A seismic disturbance can displace the water column, creating a rise or fall in the level of the ocean above. This rise or fall in sea level is the initial impulse generating a tsunami wave.

On 26 December 2004 the fourth largest earthquake to be recorded since 1900, with a Moment magnitude (Mw) of 9.2, occurred off the west coast of Northern Sumatra in Indonesia. It led to one of the largest losses of life from a natural phenomenon to be

recorded in modern times. A tsunami generated from the displacement of the sea floor of up to 10 m over a length of 1200 km hit the coastline of 11 countries in and around the Indian Ocean, taking the lives of more than 280,000 people.

## Australia's vulnerability to tsunami

Australia is bounded on the northwest, northeast and east by some 8,000 km of active tectonic plate boundary capable of generating tsunami, which could reach our coastline within two to four hours. One-third of all earthquakes worldwide occur along these boundaries. The impact of a tsunami hitting vulnerable low-lying areas of the Australian coast could be significant.

As a direct result of the tsunami generated off the coast of Indonesia on 26 December 2004, the Australian Government identified the need to be able to warn the Australian population of such phenomena, with the aim

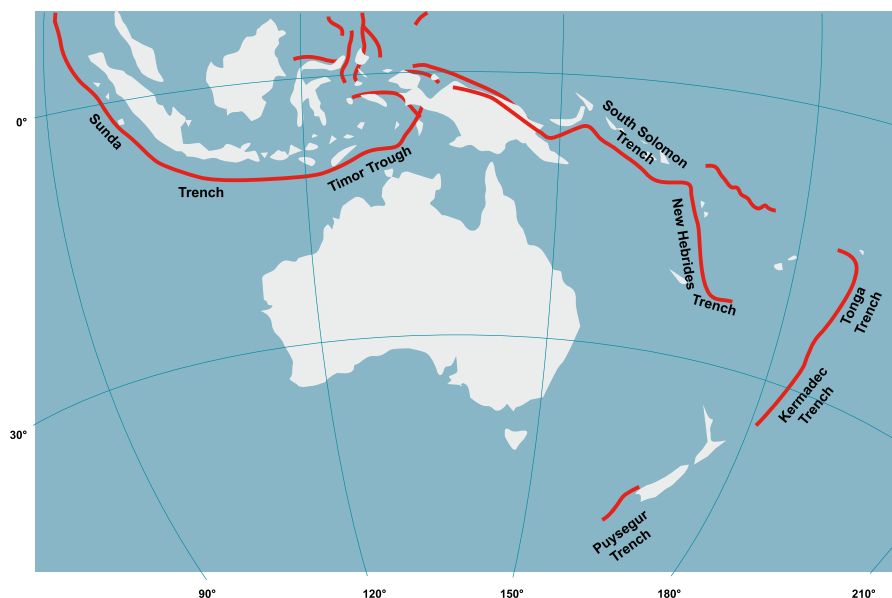
of minimising the loss of life and the economic impact on its population. At that time an informal Australian Tsunami Alert System (ATAS) was operated jointly by the Bureau, GA and EMA. The ATAS system had limited capabilities in tsunami monitoring and warning.

## Enhancing Australia's capabilities

The Australian Government has committed \$68.9M over four years to establish an ATWS by 2009.

This includes:

- Establishment of the Joint Australian Tsunami Warning Centre (JATWC) with 24/7 monitoring and analysis capacity for Australia;
- The upgrade and expansion of sea-level and seismic monitoring networks around Australia and in the Indian and South West Pacific Oceans;
- Implementation of national education and training programmes about tsunami;



Subduction zones along tectonic plate boundaries (shown in red) around Australia that have the potential to generate a tsunami that may impact on Australia's coast (source: Geoscience Australia).



**Australian Government**  
**Bureau of Meteorology**  
**Geoscience Australia**

**Attorney-General's Department**  
**Emergency Management Australia**

- Assistance to the Intergovernmental Oceanographic Commission (IOC) in developing the existing Pacific Tsunami Warning & Mitigation System (PTWS) and establishing an Indian Ocean Tsunami Warning & Mitigation System (IOTWS); and
- Technical assistance to help build the capacity of scientists, technicians, and emergency managers in South-West Pacific and Indian Ocean countries.

**How does the new system work?**

GA operates an enhanced network of seismic stations nationally and has access to data from international monitoring networks. It advises the Bureau of the magnitude, location and characteristics of a seismic event which has the potential to generate a tsunami.



Deep-ocean tsunami detection buoys form part of the Bureau's enhanced sea-level monitoring network.

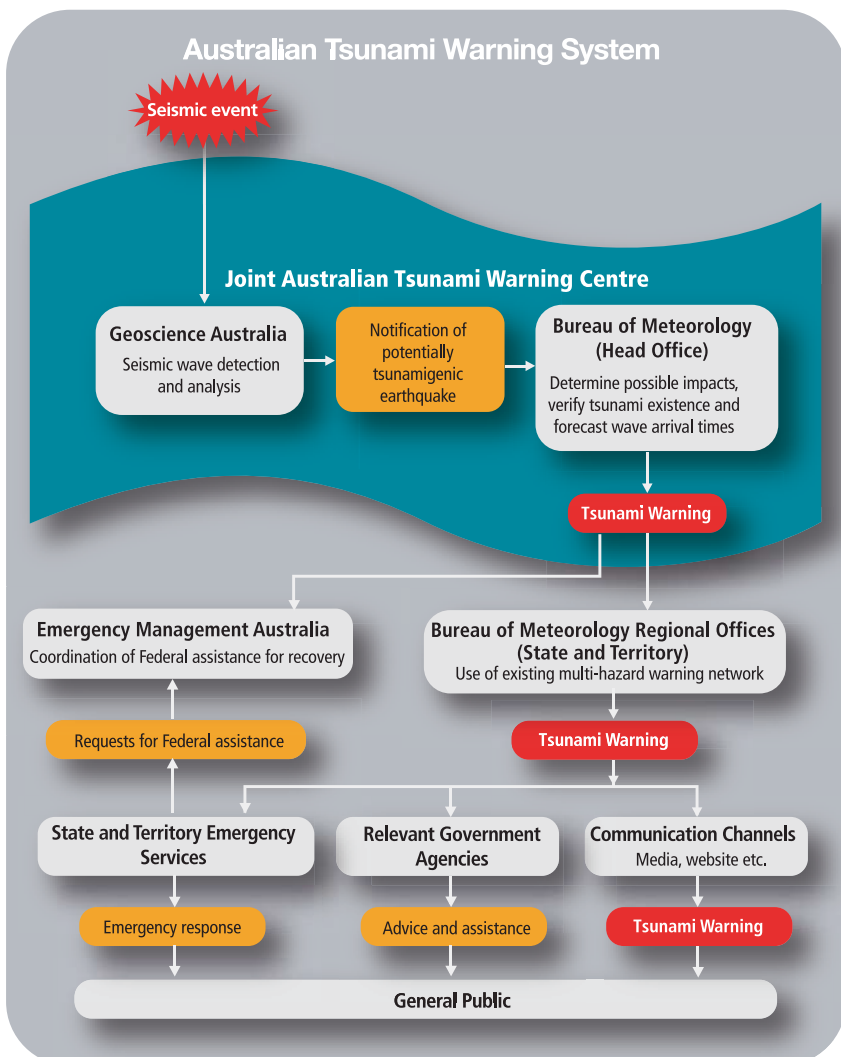
Based on this seismic information from GA, as well as advisories from the Pacific Tsunami Warning Centre (PTWC) in Hawaii and from neighbouring countries with tsunami

detection capacity, the Bureau runs a tsunami model to generate a first estimate of the tsunami size, arrival time and potential impact locations. The Bureau verifies the existence of a tsunami using information from an enhanced sea-level monitoring network.

The Bureau then promulgates advice and warnings on any possible tsunami threat to State emergency management services, media and the public.

EMA liaises with the operations centres of affected State and Territory emergency management organisations and coordinates Federal assistance as required.

EMA also has responsibility for improving public awareness and preparedness for tsunami in Australia.



For further information please see [www.bom.gov.au](http://www.bom.gov.au)  
[www.ga.gov.au](http://www.ga.gov.au)  
[www.ema.gov.au](http://www.ema.gov.au)