

Tsunami Warnings

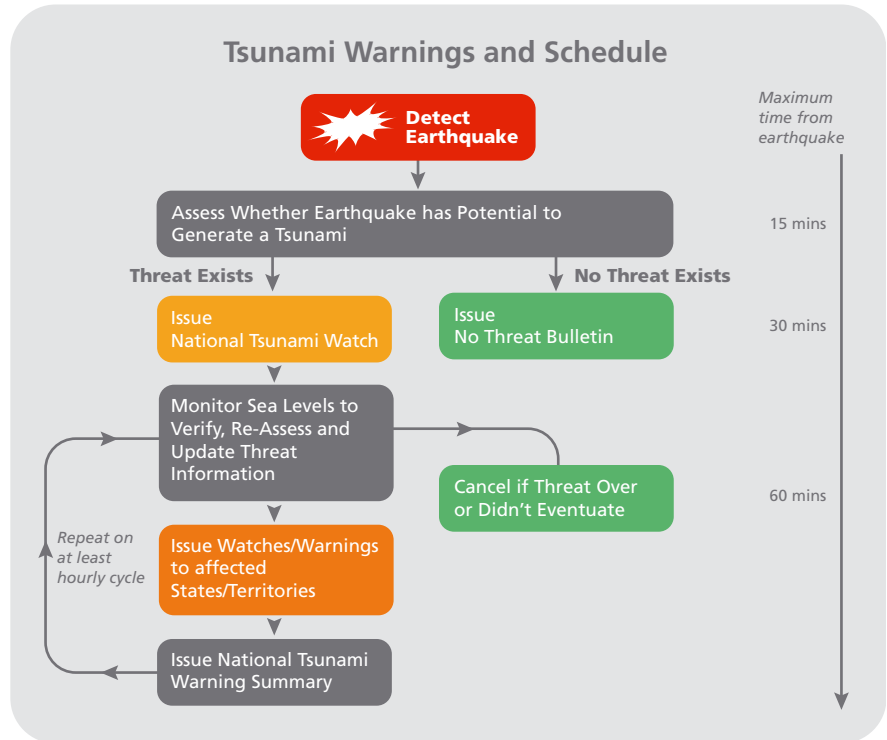
Tsunami in Australia

Tsunami are recorded in Australia about once every two years, and most are small and present little threat of land inundation to our coastal communities. However the abnormal waves, tides and currents caused by even relatively small tsunami can be dangerous to swimmers and mariners.

As a result of the Australian Tsunami Warning System (ATWS) Project, jointly undertaken by the Bureau of Meteorology (Bureau), Geoscience Australia (GA) and Emergency Management Australia (EMA) and funded by the Australian Government, Australia now has a comprehensive, independent tsunami warning service to advise the media, public and emergency authorities of any tsunami threat to Australia and its offshore territories.



Australian Government
Bureau of Meteorology
Geoscience Australia



Tsunami Watches and Warnings for Australia

The Joint Australian Tsunami Warning Centre (JATWC), jointly operated 24 hours a day by the Bureau and GA detects, monitors, verifies and warns of any tsunami threat to the coastline of Australia and its offshore territories.

The first stage of the tsunami warning process is a 'tsunami watch' phase, where seismologists have determined that there is the potential for an identified undersea earthquake to cause a tsunami threat to Australia. If there is a threat, the Bureau would issue a *National Tsunami Watch*. If there is no threat, a *National Tsunami No Threat Bulletin* would be issued.

The *National Tsunami Watch* may be reissued if a tsunami remains

unconfirmed by sea level observations and any potential first point of impact on Australia is more than 90 minutes away (the minimum time criteria for warning).

If sea level observations and further data confirm the tsunami threat, or if any potential first point of impact is less than 90 minutes away, the Bureau, on behalf of the JATWC, will use its severe weather communication infrastructure to issue *Tsunami Warnings* for the States and Territories under threat. The Bureau's Regional Forecasting Centres (RFCs) in capital cities are the main liaison point for Emergency Services during tsunami events.

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Tsunami Watches & Warnings for Australia

Tsunami Warning Messages Summary

Messages: Types & Purpose



National No Threat Bulletin

To advise people that the earthquake has been assessed and that **no tsunami threat** exists



National or State/Territory Watch

To advise people that a tsunami threat **may exist** and that they should look out for further updates



State/Territory Warning

To advise people that a tsunami threat **does exist** and to advise them of the level of threat (marine = blue, land = red) and action they should take



National Warning Summary

To provide the public, media and emergency authorities with the status of tsunami warnings nationally

Event Summary

To provide the public, media, emergency authorities and government with summary information that can be used in post-event analysis

Messages: Layout & Content

Product Identifier

Identify type product/auto notifier

Media Instructions

How urgently message/s should be broadcast. Use of Standard Emergency Warning Signal (SEWS) or not

Message Title and Issue Time

Type, date/time and number sequence of message

Headline Message

Key message; eg. No Threat, Potential Threat, Threat

Summary

What, where and when the threat is

Threat Information

Level of threat, coastal areas affected, time of Arrival

Community Response Advice

What action people should take

Next Update Time

When the next update will be issued

Where the Public can get Further Information

Web and telephone details for further/latest information

Categories of Threat Levels within Tsunami Warnings

In order to assist the community, tsunami threat levels in Regional Tsunami warnings are categorised into three levels with required community responses; these have been determined in consultation with emergency management authorities. These Threat Levels will be specified for the same coastal areas that are used for routine *Bureau Coastal Waters Forecasts*, already known to marine users.

1 No threat

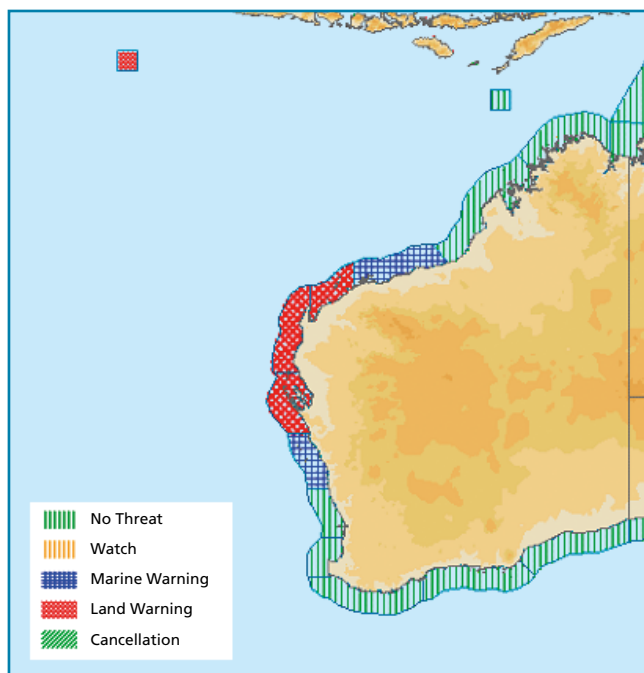
An undersea earthquake has been detected, however it has not generated a tsunami, or the tsunami poses no threat to Australia and its offshore territories.

2 Marine and immediate foreshore threat

Warning of potentially dangerous waves, strong ocean currents in the marine environment and the possibility of only some localised overflow onto the immediate foreshore.

3 Land inundation threat

Warning for low-lying coastal areas of major land inundation, flooding, dangerous waves and strong ocean currents.



Tsunami watches and warnings indicating the level of threat are issued for coastal zones around Australia and its offshore territories.

For further and latest information on tsunami warnings please see

www.bom.gov.au

or call 1300 TSUNAMI (1300 878 6264)

Need emergency advice?

In the event of a tsunami warning for Australia for which you urgently need extra advice, please listen to your local radio and TV announcements for updates on the tsunami threat and emergency services messages or visit the Bureau's website.

Sample - Summary

Tsunami warning for parts of Western Australia

LAND Threat

- For low-lying coastal areas from Kalbarri to Cape Preston, including Denham, Carnarvon, Coral Bay, Exmouth and Onslow, there is a threat of MAJOR LAND INUNDATION, FLOODING, DANGEROUS WAVES AND STRONG OCEAN CURRENTS for several hours from 7:45 PM WST on Sunday
- People in affected areas are strongly advised by FESA to go to higher ground or at least one kilometre inland

MARINE Threat

- For the marine environment from Cape Preston to Wallal, including Dampier and Port Hedland, there is the possibility of DANGEROUS WAVES, STRONG OCEAN CURRENTS, AND SOME LOCALISED OVERFLOW ONTO THE IMMEDIATE FORESHORE for several hours from 8:00 pm WST on Sunday
- For the marine environment from Jurien Bay to Kalbarri, including Geraldton, there is the possibility of DANGEROUS WAVES, STRONG OCEAN CURRENTS, AND SOME LOCALISED OVERFLOW ONTO THE IMMEDIATE FORESHORE for several hours from 8:15 pm WST on Sunday
- For all threatened areas, people are advised to get out of the water and move away from the immediate water's edge
- For latest and further information call 1300 TSUNAMI (1300 878 6264) or visit www.bom.gov.au
- Next update will be issued by 6:45pm WST on Sunday 30 September 2007

Sample - Community Response Advice

COMMUNITY RESPONSE ADVICE FROM EMERGENCY AUTHORITY FOR AREAS UNDER THREAT OF MAJOR LAND INUNDATION AND FLOODING:

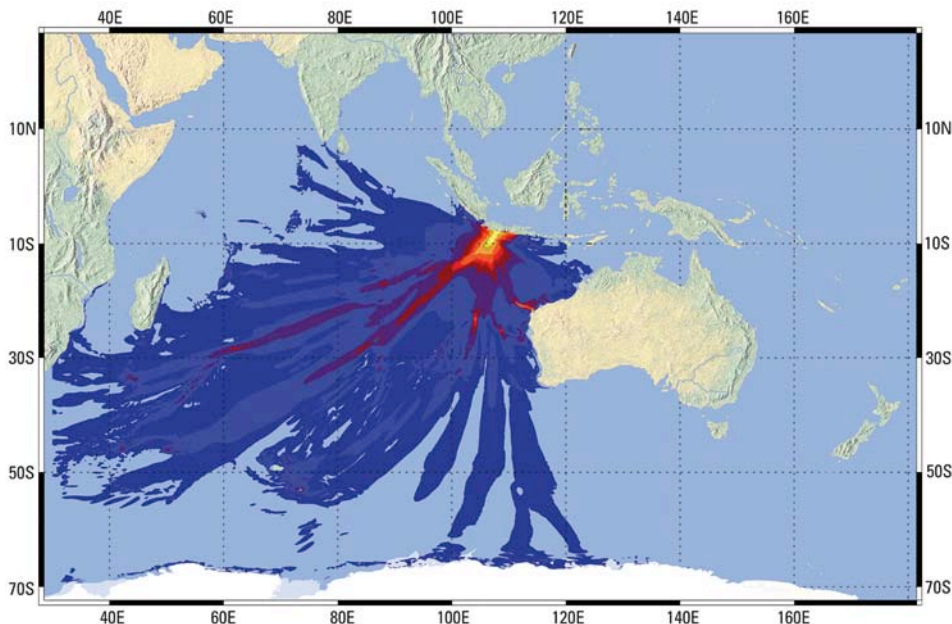
- The local emergency authority has ordered the evacuation of low-lying parts of coastal towns and villages including [insert names]
- People are strongly advised to go to higher ground, at least ten metres above sea level, or if possible move at least one kilometre away from all beaches and the water's edge of harbours and coastal estuaries.
- Take only essential items that you can carry including important papers, family photographs and medical needs.
- It may be in your own interests to walk to safety if possible to avoid traffic jams.
- If you cannot leave the area take shelter in the upper storey of a sturdy brick or concrete multi-storey building.

COMMUNITY RESPONSE ADVICE FOR THREATENED MARINE ENVIRONMENT AREAS:

- The local emergency authority advises people in all threatened areas to get out of the water and move away from the immediate water's edge of harbours, coastal estuaries, rock platforms, and beaches.
- Boats in harbours, estuaries and in shallow coastal water should return to shore. Secure your boat and move away from the waterfront.
- Vessels already at sea should stay offshore in deep water until further advised.
- Do not go to the coast to watch the tsunami, as there is the possibility of dangerous, localised land inundation of the immediate foreshore.
- Check that your neighbours have received this advice.

CAUTION:

- Tsunami waves are more powerful than the same size beach waves, with the first wave not necessarily being the largest.
- Low-level effects may be observed in neighbouring coastal areas. People are advised to take care.



Model forecast of a tsunami generated by an earthquake south of Java (yellow/red indicates highest waves).

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Once separate tsunami watches or warnings are being issued for individual States and Territories, a *National Tsunami Warning Summary* will also be issued listing all the watches, warnings and cancellations that are in effect for the current tsunami event. The JATWC website www.bom.gov.au will provide a complementary coastal threat graphic showing the regions currently under threat. (see previous pages)

Cancellation of a Tsunami Warning

When the main threat has passed or if a tsunami didn't eventuate, the Bureau will issue a *Tsunami Watch Cancellation* or *Tsunami Warning Cancellation*. The

relevant State or Territory Emergency Authority will inform the public when it is safe to return to the affected area. A National Tsunami Event Summary is then issued after the event.

Distribution of Tsunami Bulletins and Warnings to the Media and Public

Tsunami Bulletins, Watches, Warnings, Cancellations and Event Summaries are part of a suite of warnings for severe weather events and hazards issued by the Bureau.

Media organisations across Australia work with the Bureau to also inform the public in the case of a tsunami

GA and Bureau scientists have mapped the fault lines surrounding Australia that have the potential to generate tsunamis. To date, scientists have identified hundreds of off-shore locations within the Australian region that have the potential to generate tsunamis that may impact on our coastlines. Equipped with this information, scientists at the Bureau have been able to run models based on a range of significant earthquake magnitudes, and then validate the models as they matched recent events for which potential threats have been issued for Australia. These models can now be used to more confidently assess the potential threat to the Australian coastline.

event. Tsunami Warning distribution lists are maintained at each of the Bureau's State and Territory RFCs. These distribution lists are used for both National JATWC Bulletins and Regional Warnings. In addition to the media, key agencies such as the State and Territory emergency services, local councils, port authorities, and police are included on these dissemination lists. The bulletin and warning messages are also automatically uploaded to the Bureau's website.

