

damage and loss of life, but because of greater affluence the Japanese may be better prepared, better able to respond quickly and efficiently and able to bear the financial losses better because of insurance and government help. (See Figure 1.6)

Of course any loss of life is personally disastrous so comparisons are only useful statistically.

It is not only tsunamis, droughts and frosts which have brought disastrous consequences to PNG over many years, so also have cyclones, earthquakes, floods, landslides, mudslides, volcanoes, wars, mining operations and general human interference with the biophysical environment.

Activity 2.1

The earlier sections of this chapter deal with some of the background and events of the PNG tsunami. This activity will help you to know where places are and some of the characteristics of this disaster.

- a Using Figure 2.1 as a guide, and an atlas, draw an outline map of this region of the world. Locate, draw and name the following information on your map.
 - Papua New Guinea
 - Australia
 - The Pacific Ocean
 - Three other Pacific Ocean nations that are neighbours to PNG
 - Three other south-east Asian nations that are neighbours to PNG
 - Port Moresby
 - All of Australia's capital cities
- b Include on your map the approximate latitude and longitude of the location where the tsunami occurred. (See Figure 2.1)
- c Use your atlas to measure the straight-line distance from the capital city of the state or territory in which you live to the location where the tsunami occurred. Add this information to your map.
- d Read the two descriptions given by Mr. Romme and Dr. Sairere of the PNG disaster.
 - Choose any five points of these descriptions that identify the same aspects of the disaster.
 - Those aspects that mainly describe the **event** mark with a 'E' and those that mainly describe the **impact on people** mark with a 'P'. For example one description of the *event* mentions "an enormous wave higher than the tallest trees" (**E**) while one description of the *impact on people* says "the children and the elderly ... suffered very badly" (**P**).
 - If you have not used either the 'E' or 'P' symbol find one other aspect of the disaster that can be marked with a 'E' or 'P'.
- e Using any of the other text in this unit or any of the other resources listed at the end of the booklet, find two other aspects of the disaster that can each be marked with a 'E' and a 'P'.

A tsunami as a disaster, hazard and an emergency

It can be seen from the information about the PNG tsunami that it could be described at various stages as a *hazard*, *disaster* and *emergency*. (See the section labelled 'What is the difference between hazards and disasters?' in Chapter 1) It is the interaction between people and their environment as they exploit the local resources that leads people to take calculated *risks* from known hazards like the very infrequent tsunamis on the coasts of PNG. (See Box 1.2 'The actions of people') Coasts in active earthquakes zones, such as that of PNG, are more *vulnerable* to tsunami than most of the coasts of Australia. However tsunami can travel very long distances under certain conditions so that, for example, the eastern coast of Australia could be affected by tsunami originating on the other side of the Pacific or Southern Ocean. (See Box 2.2)

Box 2.2 Tsunami threat passes after massive earthquake

The east coast of Australia was on tsunami alert last night after a big earthquake near Antarctica.

The (tsunami) warning was issued from the Pacific Tsunami Warning Center (PTWC) in Hawaii.

The quake struck early yesterday afternoon in the Bellany Islands region, south west of Christchurch. It measured 8.1 on the Richter scale.

Seismologists say it is the biggest earthquake in the world this year.

The Tsunami Warning Centre in Honolulu alerted Australia's Search and Rescue Coordination Centre in Canberra, resulting in official (tsunami) warnings for Tasmania, Victoria and New South Wales.

Police, ambulance, fire, SES, port authorities - in fact all emergency services up and down the east coast - were on standby, prepared for the worst.

By 9.00 p.m., however, the emergency had passed.

The Australian Geological Survey Organisation monitoring tidal gauges said there was a slight chance of a wavelet hitting Tasmania, predicted to be at the most, 10 millimetres.

Source: ABC News, 26/3/98, at

http://www.abc.net.au/news/98/03/26/980326_22.htm

Box 2.3 Tsunami Alert - Japan

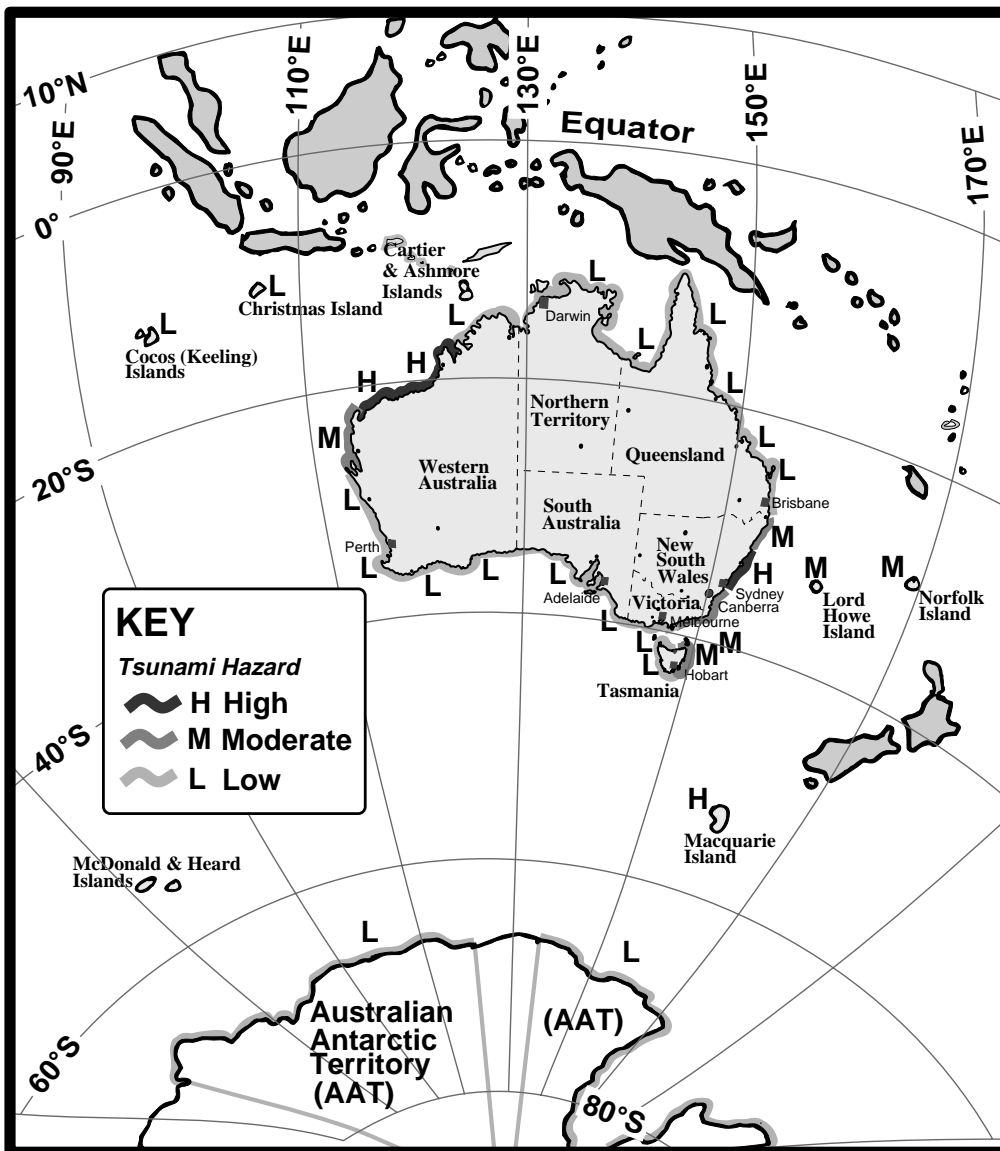
Japan's Meteorological Agency has called off a tsunami alert after minor waves up to 12 centimetres were observed near the southern-most island of Okinawa. The alert was issued after an earthquake measuring 7.7 on the Richter scale hit the region early today. Coastal residents of Okinawa were advised to head inland to avoid forecast tsunamis ... of up to two metres. But officials now say there have been no reports of damage or injury following the earthquakes or the tidal waves. Japan is regularly threatened by tsunamis caused by earthquakes originating under the sea.

Source: ABC News, 4/5/98, at http://www.abc.net.au/news/98/05/04/980504_65.htm

Where else do tsunamis cause disasters other than in PNG?

The location of tsunami vulnerable coastlines are of concern to all countries located around the rim of the Pacific Ocean and as well the many small island-nations dotted throughout this region. The nations at risk include New Zealand and the heavily populated coastal regions of Japan and Indonesia (See Box 2.3 'Tsunami Alert - Japan'). The majority of tsunamis occur in the Pacific Ocean although there is geomorphic and historical evidence that they have occurred in all oceans of the world. (See the *National Geographic* magazine Vol. 194 No.1 of July 1998 which includes an excellent map, 'Natural Hazards of North America', that shows the tsunamis that have impacted on both the west and east coasts of North America over a long period of recorded history.) *The Pacific Tsunami Warning Center (PTWC)* in Hawaii:

- monitors seismological and tidal instruments,
- evaluates the data from these instruments and
- issues warnings for potential tsunami-producing earthquakes to all countries around the Pacific.



Is Australia at risk from tsunamis?

The tsunami threat to Australia according to Emergency Management Australia (EMA) varies from 'low' for most of the states and territories to 'medium' or 'high' for some sections of coastline. (See Figure 2.5) Tsunamis struck the WA coastline in June 1994 and August 1977 (at Cape Leveque). Australia does receive tsunami alerts from the PTWC (See Box 2.2).

Figure 2.5 Tsunami hazard map for Australia and its island territories
 Redrawn from information provided by the *International Decade for Natural Disaster Reduction (IDNDR) 1990-2000 (Australia) 1998*