Australian Government
Attorney-General's Department
Emergency Management Australia

# EMA Schools Education




## Tsunami Activity Sheet
## No. 6

## How does a tsunami warning system work?

**6. How does a tsunami warning system work?**
The Pacific Tsunami Warning System was established in 1949. It is made up of a network of seismic-monitoring stations and sea-level gauges. These detect earthquakes and abnormal changes in sea level and help scientists decide whether a tsunami has been triggered by an earthquake. If so, warnings go out to many countries and regions in the Pacific. A warning centre is located in both Hawaii and Alaska.

Look at how **buoys send a message** via satellite to the warning centres. Many buoys are distributed in the Pacific Ocean.
http://www.prh.noaa.gov/itic/tsunami_events/media/graphics/general_maps/tsu_detection_buoy_sys.pdf

There are also many **sea level gauges** distributed in the region
http://www.prh.noaa.gov/itic/tsunami_events/media/graphics/general_maps/tsu_detection_buoy_locations_pac.pdf
http://www.prh.noaa.gov/itic/tsunami_events/media/graphics/general_maps/sea_level_networks_pac.gif

1. Describe how the system of buoys and sea level gauges help scientists to detect and monitor a potential tsunami.

Other warning systems and education needs to be in place along side the buoys and gauges. Read the **storybook** at to learn about how this system works.
http://wcatwc.arh.noaa.gov/book01.htm

2. Use this story to write a step-by-step procedure of how the warning system works.
3. Should people in tsunami-prone areas rely on the tsunami warning system? When might there not be enough time to rely on this system?
4. Look at a map of the Pacific Ocean and the extent of habitable coastline. Is it feasible that all habitable areas can be educated about and ready for a tsunami?
5. The Pacific Tsunami warning system has hundreds of seismic stations worldwide, coastal tide gauges and sophisticated buoys in the Pacific Basin capable of detecting a centimetre's difference in ocean height. But, without similar gauges and buoys in the Indian Ocean, scientists were not able to detect a tsunami there. Describe how a tsunami warning system might have changed the outcome of the Indian Ocean tsunami in 2004?
6. Papua New Guinea is located in the Pacific. Why did the system not work to save lives there in1997? Work with another person to outline what could be done in the future.

**Tsunami modelling**
In September 2004, **Geoscience Australia** published an article that used computer modelling to predict the impact of a large earthquake and resultant tsunami in the Indian Ocean. It is chilling to read how close the modelling was to the actual event.
[http://www.ga.gov.au/image_cache/GA5059.pdf