

Deep-Water and Coastal Tsunami Detection

Improving tsunami warning forecasts and hazard mitigation.

What are water level data?

Water-level data describe the height of the sea surface. As tsunami waves travel away from their point of generation, they disperse across the ocean, appearing as a large moving “bump” of water. The height of this “bump” continues to increase as the waves enter shallower water until they eventually reach the shore, where they release their energy and flood low-lying coastal areas.

Where do the data come from?

• Deep-ocean Assessment and Reporting of Tsunamis (DART)

- The DART system is an array of 43 offshore sea-bed bottom pressure recorders which detect the passage of a tsunami by increased pressure from the wave passing over. The data are then transmitted to an attached surface buoy, which relays the information to tsunami warning centers via satellite with a message that a tsunami is on the way. DART stations confirm the existence or absence of a tsunami far from the coast.

• Coastal tide gauges

- Although traditionally used to measure tide levels, coastal tide gauges are now also capable of detecting the size and arrival time of tsunami events. In 2004, all 188 U.S. tide gauge stations received upgraded instrumentation to sample every minute and transmit real-time water levels to tsunami warning centers via satellite. Tide gauges confirm the arrival, size and direction of travel along the coast.

How are the data used?

NOAA’s National Geophysical Data Center processes these data to isolate the wave due to the tsunamis. These high-resolution water-level data are then used by national warning centers and researchers in an ongoing effort to increase our understanding and ability to forecast the magnitude, direction and speed of future tsunami events. Preserving and sharing these data improve the forecasts and models necessary for sound management and planning of coastal communities.

For more information:

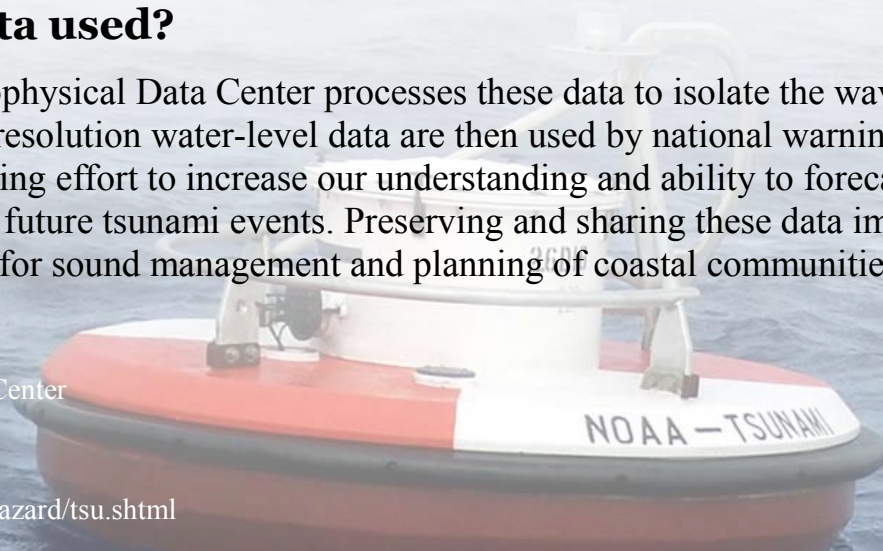
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