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NOAA's Integrated Tsunami Database: Data for improved forecasts, warnings, research, and risk assessments

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The National Oceanic and Atmospheric Administration (NOAA) has primary responsibility in the United States for tsunami forecast, warning, research, and supports community resiliency. NOAA's National Geophysical Data Center (NGDC) and co-located World Data Service for Geophysics provide a unique collection of data enabling communities to ensure preparedness and resilience to tsunami hazards. Immediately following a damaging or fatal tsunami event there is a need for authoritative data and information. The NGDC Global Historical Tsunami Database (http://www.ngdc.noaa.gov/hazard/) includes all tsunami events, regardless of intensity, as well as earthquakes and volcanic eruptions that caused fatalities, moderate damage, or generated a tsunami. The long-term data from these events, including photographs of damage, provide clues to what might happen in the future. NGDC catalogs the information on global historical tsunamis and uses these data to produce qualitative tsunami hazard assessments at regional levels. In addition to the socioeconomic effects of a tsunami, NGDC also obtains water level data from the coasts and the deep-ocean at stations operated by the NOAA/NOS Center for Operational Oceanographic Products and Services, the NOAA Tsunami Warning Centers, and the National Data Buoy Center (NDBC) and produces research-quality data to isolate seismic waves (in the case of the deep-ocean sites) and the tsunami signal. These water-level data provide evidence of sea-level fluctuation and possible inundation events. NGDC is also building high-resolution digital elevation models (DEMs) to support real-time forecasts, implemented at 75 US coastal communities. After a damaging or fatal event NGDC begins to collect and integrate data and information from many organizations into the hazards databases. Sources of data include our NOAA partners, the U.S. Geological Survey, the UNESCO Intergovernmental Oceanographic Commission (IOC) and International Tsunami Information Center, Smithsonian Institution's Global Volcanism Program, news organizations, etc. NGDC assesses the data and then works to promptly distribute the data and information. For example, when a major tsunami occurs, all of the related tsunami data are combined into one timely resource, posted in an online report, which includes: 1) event summary; 2) eyewitness and instrumental recordings from preliminary field surveys; 3) regional historical observations including similar past events and effects; 4) observed water heights and calculated tsunami travel times; and 5) near-field effects. This report is regularly updated to incorporate the most recent data and observations. Providing timely access to authoritative data and information ultimately benefits researchers, state officials, the media and the public. This paper will demonstrate the extensive collection of data and how it is used.