



Tsunami Forecast Progress Five Years After Indonesian Disaster

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Almost five years after the 26 December 2004 Indian Ocean tragedy, tsunami warnings are finally benefiting from decades of research toward effective model-based forecasts. Since the 2004 tsunami, two seminal advances have been (i) deep-ocean tsunami measurements with tsunameters and (ii) their use in accurately forecasting tsunamis after the tsunami has been generated. Using direct measurements of deep-ocean tsunami heights, assimilated into numerical models for specific locations, greatly improves the real-time forecast accuracy over earthquake-derived magnitude estimates of tsunami impact. Since 2003, this method has been used to forecast tsunamis at specific harbors for different events in the Pacific and Indian Oceans.

Recent tsunamis illustrated how this technology is being adopted in global tsunami warning operations. The U.S. forecasting system was used by both research and operations to evaluate the tsunami hazard. Tests demonstrated the effectiveness of operational tsunami forecasting using real-time deep-ocean data assimilated into forecast models.

Several examples also showed potential of distributed forecast tools. With IOC and USAID funding, NOAA researchers at PMEL developed the Community Model Interface for Tsunami (ComMIT) tool and distributed it through extensive capacity-building sessions in the Indian Ocean. Over hundred scientists have been trained in tsunami inundation mapping, leading to the first generation of inundation models for many Indian Ocean shorelines. These same inundation models can also be used for real-time tsunami forecasts as was demonstrated during several events.

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