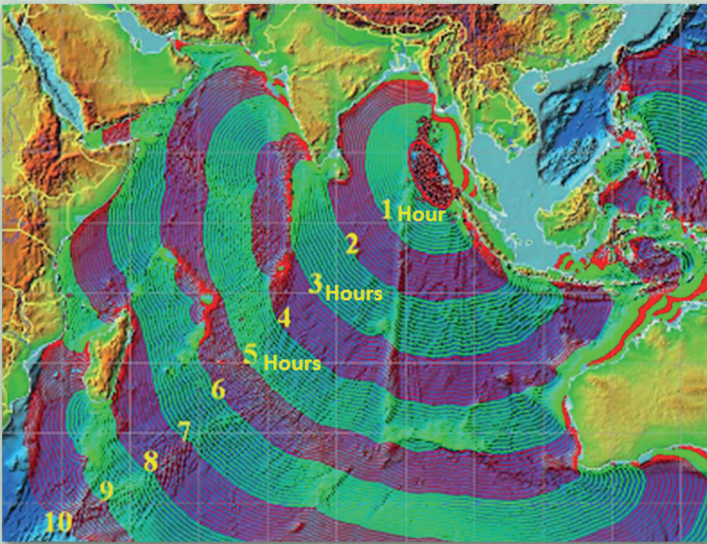# HAZARD CONSEQUENCE
MODELING & VISUALIZATION

This Tsunami Travel Time (TTT) map indicates the time it will take for a tsunami wave to cross the ocean. The tsunami was generated by the magnitude-9.0 earthquake that struck off the coast of Sumatra, Indonesia, on December 26, 2004.

PACIFIC DISASTER CENTER

Modeling Risk. Informing Decisions.

How many hours will it take a tsunami to travel from Chile to the Hawaiian Islands? What areas are likely to flood if a dam or levee breaks? How large might the storm surge be when a tropical cyclone unleashes 150-mile-per-hour winds on the Cook Islands? These are the kinds of questions decision makers must be able to answer quickly and accurately to prepare for and respond to disasters.

PDC uses computer-based models to translate complex hazard information into actionable visualizations of potential disaster impacts. Model results are combined with GIS mapping tools to highlight areas likely to be affected by a specific hazard scenario and to provide information about infrastructure, populations, and critical facilities in at-risk areas.

Fostering disaster-resilient communities through information, science, technology, and exchange

MODELING CAPABILITIES

Tropical Cyclone Modeling

The TAOS™ model, run by Kinetic Analysis Corporation, uses direct input from official advisory forecast sources to simulate the phenomena and impacts associated with tropical cyclones. PDC incorporates the resulting datasets into its analyses and online applications.

Flood Modeling

PDC uses the MIKE hydrological models, developed by DHI, to determine potential inundation resulting from inland flooding along rivers, and downstream inundation resulting from a dam or levee failure. Other flood-related hazards, such as mud flow, are modeled using the FLO-2D model, developed by FLO-2D Software Inc. FEMA's HAZUS Multi-Hazard (HAZUS-MH) Flood Model is used to estimate potential impacts.

Tsunami Travel Time and Inundation Modeling

When a tsunami warning is issued by the Pacific Tsunami Warning Center (PTWC), the Tsunami Travel Time (TTT) model estimates the time it will take for a tsunami wave to cross the ocean. TTT results, including a travel-time map, are automatically incorporated into PDC's online applications.

Earthquake Damage Modeling

PDC supports earthquake mitigation planning by applying the HAZUS-MH Earthquake Model, which estimates community impacts resulting from an earthquake. Currently PDC provides the operational capability for Hawaii disaster managers to produce these estimates in the event of damaging earthquakes.

Plume/Dispersion Modeling

PDC uses the Hazard Prediction and Assessment Capability (HPAC) model, developed by the Defense Threat Reduction Agency, to simulate plume dispersion and generate health risk information related to hazardous agents. These products help provide situational awareness and assist in emergency operations decisions.

In early 2006, a series of record-breaking flood events inundated the Hawaiian Islands and seven people died when a dam failed on the island of Kauai. The Department of Land and Natural Resources (DLNR) Dam Safety Division contracted Pacific Disaster Center (PDC) to model dam failure scenarios for all dams registered in the state of Hawaii and to create flood inundation maps. PDC used the DHI MIKE hydrological models to assess risk in downstream areas and support emergency preparedness and evacuation planning.
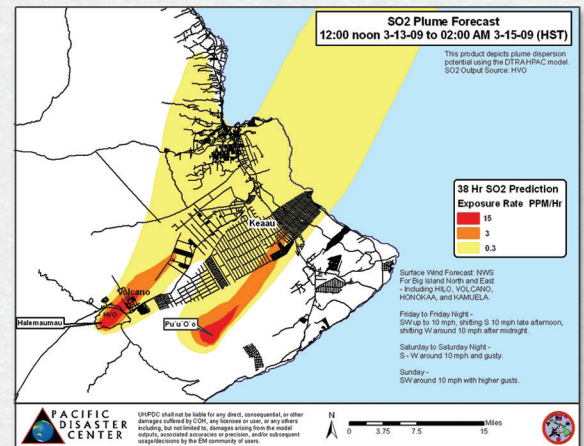
In 2008, PDC used the Hazard Prediction and Assessment Capability (HPAC) software to assist in the modeling of hazardous volcanic sulfur dioxide plumes venting from Kilauea's Halema'uma'u and Pu'u 'O'o craters on the Big Island of Hawaii.

HOW CAN PDC HELP YOU?

PDC will listen to your needs, help identify gaps, and assist in crafting right-sized disaster management solutions.

We Offer:

- Early warning, risk assessment, and modeling and visualization solutions
- Training and strategic advisory services
- Assistance in identifying funding sources or support partners
- Online technologies to efficiently deliver services and support sustainability
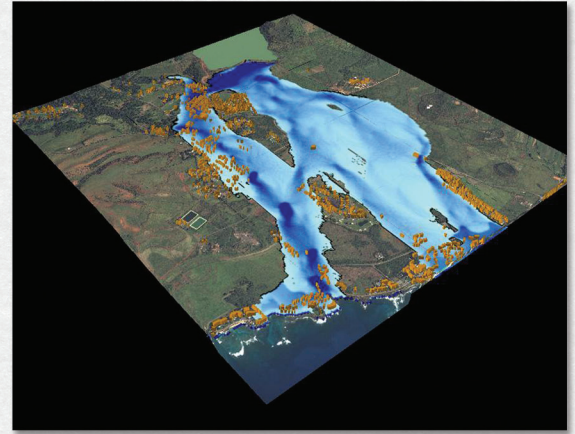
Phone: + 1.808.891.0525
Email: info@pdc.org
Web: www.pdc.org

Follow Us: & /disasteraware

Available on the iPhone App Store

PACIFIC DISASTER CENTER