PACIFIC DISASTER CENTER

Fostering disaster-resistant communities through information, science and technology

2004-05

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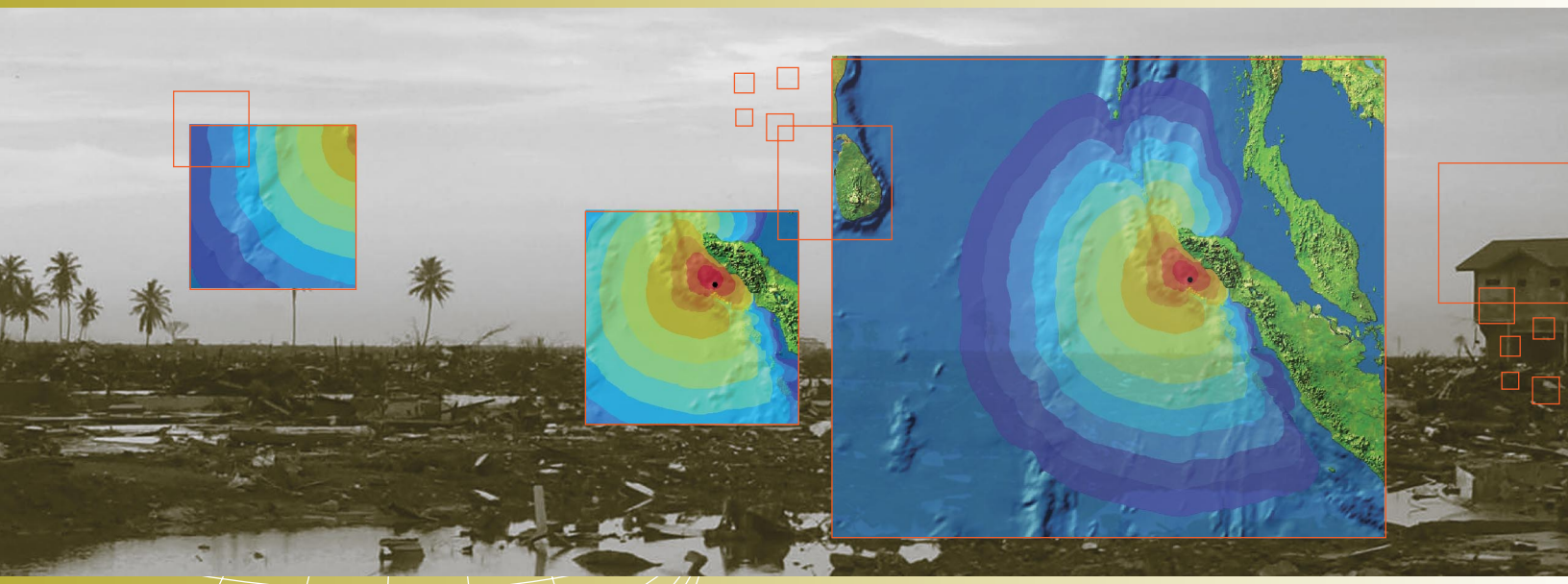


On December 26, 2004, the Great Sumatra-Andaman Islands Earthquake and Indian Ocean Tsunami struck with little warning and devastating force. It claimed nearly 300,000 lives across eight countries including Sri Lanka, India, Indonesia, Thailand, Myanmar, Malaysia, the Maldives and Somalia.

The overwhelming loss of lives and property highlights the critical need for early warning, situational awareness, and decision support in a complex and fast-changing environment impacted by disaster events.

The ability of the Pacific Disaster Center (PDC) to quickly respond to emergency management requests for strategic maps, mitigation tools, online data and information is a prime example of how our effective knowledge sharing, applied information research and analysis capabilities help support today's diverse global community.

Asia Pacific Natural Hazards Information Network (APNHIN)

PDC formally launched APNHIN, a disaster management resource providing access to a wealth of geospatial data to support risk reduction and vulnerability assessment applications in the Asia Pacific region. By building collaborations with partner organizations, this network will continue to grow over time to form a working community of information sharers. PDC constitutes APNHIN's first "node." In the fall of 2004, the U.S. Geological Survey became its second node.

IMPACT

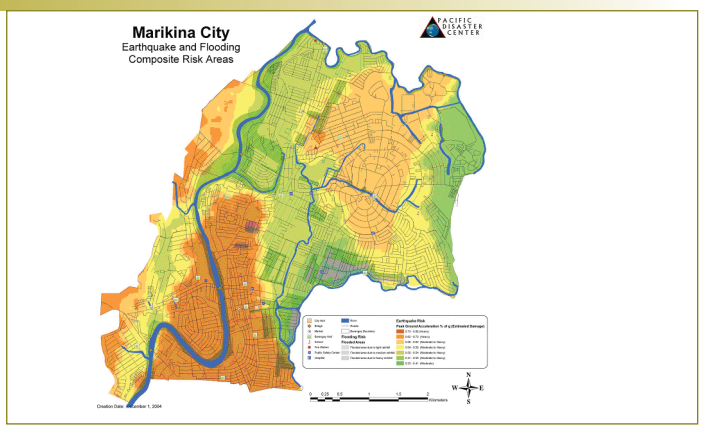
During the Indian Ocean tsunami disaster, APNHIN formed the underlying base for PDC's geospatial response activities. Immediately afterwards, U.S. agencies and international disaster relief communities were able to access unique, value-added information products. More than 8,000 requests were processed on peak days.

Marikina City, Philippines Multi-Hazard Urban Risk Assessment

In 2004, PDC partnered with Marikina City officials to develop an integrated, multi-hazard risk and vulnerability framework for assessing risk and mitigating impacts from urban flooding and earthquakes on critical facilities, businesses and people.

IMPACT

For city officials, PDC was able to visually demonstrate the value of previous mitigation projects to reduce flood risk by more than 50% over the last decade. Acknowledging the progress of City mitigation efforts, Marikina City's mayor has set a strategic goal to foster a disaster-resistant community by eliminating flood risks to city housing by 2015.



Marikina City will showcase its PDC-developed Internet Map Viewer at the new Disaster Mitigation Education Center opening in 2005.

Mekong River Flood Hazard Mapping and Risk Assessments

To better understand the vulnerability to flood hazard within the Mekong River Basin, PDC coordinated with the Mekong River Commission (MRC) to apply two different risk assessments:
1) An innovative geospatial methodology to map and characterize the vulnerability of people and infrastructure;
2) Use of high-resolution satellite imagery and flood modeling to more precisely estimate risks at the community level.

IMPACT

These assessments significantly helped further the knowledge about the patterns and consequences of flooding for disaster management organizations in the Mekong River Basin.

"...it is our fervent hope that the Pacific Disaster Center will continue to share its expertise and resources to countries like the Philippines and promote best practices in disaster management to help build safer communities..."

– Elma C. Aldea, Administrator, Philippines Office of Civil Defense

Disaster Information Sharing and Communications Network (DISCNet)

In collaboration with the Association of South East Asian Nations' (ASEAN) Committee on Disaster Management, PDC developed a comprehensive program known as DISCNet for joint information sharing among the ten ASEAN countries.

IMPACT

PDC played a key role in developing the concept and implementation of DISCNet, the first ever disaster management initiative of its kind for the region. The information-sharing network has since been solidly endorsed by member countries and approved by the Ministers of ASEAN. Phase I implementation has begun in 2005.

Hawaii HAZUS Atlas (HHA)

Since 2003, PDC, Hawaii State Civil Defense and the Hawaii State Earthquake Advisory Committee have been working together to improve the accuracy and timeliness of estimated earthquake damage based on FEMA's earthquake loss estimation model, HAZUS. In 2004, PDC deployed the first phase to train state and county Civil Defense personnel in Maui and Hawaii Counties.

IMPACT

PDC's translation of complex model output for significant earthquake scenarios into an understandable and accessible Internet format has proven to be an invaluable analysis tool for decision makers. The effort has led to a statewide rollout of the Atlas for use by the state's Civil Defense agencies in 2005.

Project ENDEAVOR

Under contract, PDC supported the Maui High Performance Computing Center (MHPCC) through development of an interactive, map-based interface for an ocean environmental database. The project leverages PDC's baseline map viewer application, customizing its functions to incorporate model-based statistical outputs.

IMPACT

The ENDEAVOR applications support a variety of ocean transportation planning processes, including hull design and route selection for inter-island navigation in Hawaii. It was also used to assess transportation logistics for Indian Ocean tsunami relief efforts.

> "...the Pacific Disaster Center has set a standard by which mapping information will be shared."
>
> – County of Hawai'i Mayor Harry Kim commending the Hawai'i County Remote Information Services project completed in 2004

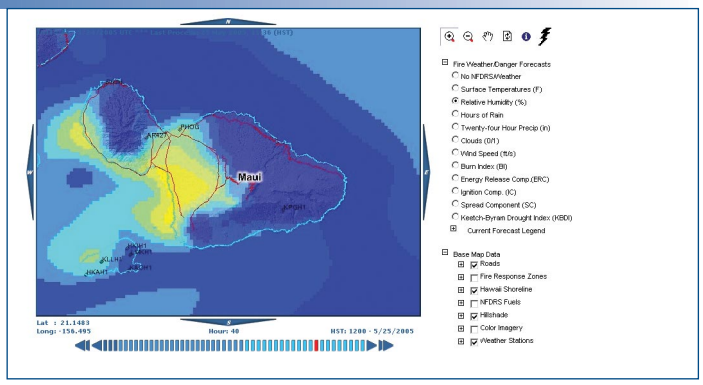
Hawaii Fire Risk Reduction Activities

PDC initiated a number of projects to bring years of fire hazard research into the hands of emergency managers and fire fighters.

- **Fire Danger Rating Systems:** In close collaboration with the U.S. Forest Service, PDC provided Information Technology support for an Internet-accessible application that brings fire danger rating results to end-user communities.
- **Fire Fuels Mapping:** Initially developed for Maui, this mapping project incorporates wildfire hazard assessment into the community planning process.
- **Wildfire Mapping:** PDC provided historical and near real-time fire mapping and characterization products from the University of Hawaii "Hotspot" database.

IMPACT

PDC incorporated advanced modeling and mapping technology into the latest fire hazard and mitigation tools for fire management and emergency personnel. 2005 will see enhancement to existing applications and deployment of methodology and data throughout the state.



The Hawaii Fire Danger Rating system helps disaster managers and planners visualize where a fire may strike within a 48-hour timeframe.

Hawaii State Civil Defense (HSCD) Critical Infrastructure Protection

PDC is assisting HSCD to develop a digital, geospatial database of critical infrastructure within the state. By the end of 2004, many high-priority sites were incorporated into the database. In 2005, PDC will continue to work with HSCD to populate the application and establish a secure network, making this important data accessible to authorized public safety officials throughout Hawaii.

IMPACT

The online database assists civil authorities to better prepare for, respond to, and share information about man-made and natural hazard threats to critical infrastructure.

CONFERENCES

United Nations World Conference on Disaster Reduction

Kobe, Japan, Jan. 18-22, 2005

Held in Japan on the tenth anniversary of the Great Hanshin-Awaji Earthquake, the World Conference on Disaster Reduction (WCDR) was a landmark international event aimed at increasing the profile of disaster risk reduction through mitigation planning and implementation. PDC's strong support started with attending WCDR's Geneva "prep-com" in October 2004 as part of an official U.S. Delegation, and culminated in co-sponsoring a Thematic Session with the Earthquakes and Megacities Initiative (EMI) and UN-HABITAT, as well as a symposium with EMI at the official conference in January 2005.

OUTCOME

The Thematic Session attracted a wide range of policy makers focused on risk and vulnerability issues in large urban environments.

"The WCDR helped focus the international community on disaster-related issues that will comprise a vital part of the global agenda for years to come. We are proud that PDC played an important role in this defining moment..."

- PDC Executive Director
Dr. Allen Clark

First International Conference on Urban Disaster Reduction (ICUDR)

Kobe, Japan, Jan. 2005

OUTCOME

PDC presented two professional research papers addressing multi-hazard risk reduction strategies and research methodologies for assessment of natural hazards.

ASEAN International Conferences

Singapore; Siem Reap, Cambodia; Dhaka, Bangladesh; Bali, Indonesia, Jan.-May 2004

OUTCOME

These four major disaster management meetings paved the way for the implementation of DISCNet in Southeast Asia.

Leadership Seminar for Pacific Island Disaster Managers

Honolulu, Hawaii, Oct 18-29, 2004

In collaboration with the East-West Center, PDC conducted a seminar with Disaster Managers from 17 Pacific Island nations and states. The trainings, which included a tsunami tabletop exercise, helped build the skills of emergency managers in the region and raise their awareness about new risk reduction methodologies and applications.

OUTCOME

The coursework and its applications have proved extremely timely in light of recent disaster events including Cyclone Olaf and the Indian Ocean tsunami.

Asia Pacific Advanced Network

Bangkok, Thailand, Jan 24-28, 2005

PDC organized and co-hosted two sessions with UN ESCAP on disaster warning/response and improved geospatial information dissemination. Additionally, PDC presented at a special Tsunami Response session.

OUTCOME

PDC introduced data sharing and collaborative mechanisms for disaster management applications to hundreds of Information Technology and communications professionals throughout Asia.

GISMAP 2004

Honolulu, Hawaii, June 7-9, 2004

GISMAP plays an important role in fostering the exchange of ideas, technologies, and "best practices" within the GIS community in Hawaii and the Pacific.

OUTCOME

Leveraging this venue, PDC is increasing awareness of risk and vulnerability assessment methodologies, as well as promoting APNHIN for data sharing among disaster managers throughout the region.

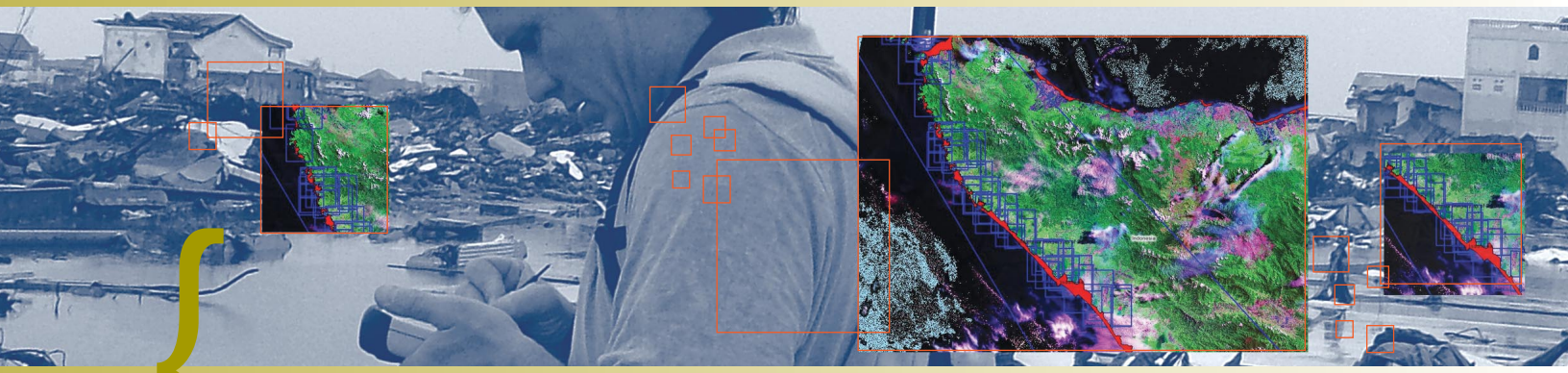
SUPPORT

PDC continues to help emergency managers better prepare for and respond to disaster events by providing information management support to events and intensive training exercises throughout the year.

DISASTER EVENTS

The Great Sumatra-Andaman Islands Earthquake and Indian Ocean Tsunami, Dec. 26, 2004:

- Collaborated with a wide spectrum of organizations at the non-governmental level including: Mercy Corps International and the Maui High Performance Computing Center; the federal level, including NOAA, USGS, NASA as well as U.S. Pacific Command; the regional level, including the national governments of the ten-country, Association of South East Asian Nations; and the international level, including United Nations agencies such as the World Health Organization.
- Deployed Web-based services to support tsunami relief efforts, including the Indian Ocean Tsunami Response Geospatial Information Service and Map Viewer, ThoughtWeb Relief (in partnership with the Australian-based company ThoughtWeb Inc.) as well as the e-mail based Indian Ocean Earthquake Notification System.



"PDC's imagery will have a profound impact on a return to normalcy for the people in this district..."

– Mercy Corps International on PDC's tsunami response efforts in Sri Lanka.

Tropical Cyclone Heta, Jan. 3-6, 2004: Provided aerial photos of hard-hit villages in American Samoa to help FEMA analysts assess Heta's damage to homes and public facilities, which expedited relief.

Oahu Floods, Oct. 31, 2004: Created imagery products of the Manoa Valley area of Oahu during a Presidentially-declared flood disaster which were widely used by Hawaii State Civil Defense.

Typhoon Muifa, Nov. 14-23, 2004: Produced situational awareness products for the Philippines National Disaster Coordinating Council prior to Muifa's deadly landfall. Analysis accurately predicted cyclone's track past the central Philippine islands.

Cyclone Olaf, Feb. 18, 2005: Coordinated with FEMA, U.S. Pacific Command, and National Geospatial Intelligence Agency to create and disseminate storm maps, data, and modeling and assessment tools to American Samoa's Territorial Emergency Management Coordinating Office ahead of Olaf's landfall.

EXERCISE SUPPORT

- **Earthquake** United Nations International Search and Rescue Advisory Group Exercise, Manila, Philippines
- **Hurricane** Hawaii *Makani Pahili* 2004 Annual Exercise
- **Weapons of Mass Destruction** Guam WMD Exercise
- **Tsunami** Hawaii Statewide Earthquake and Tsunami Exercise
- **Tsunami** Tabletop Exercise for 17 Pacific Island Nations and States
- **Pharmaceutical Stockpile** Strategic National Stockpile Exercise, Oahu/Maui
- **Wildfire** Maui Voluntary Organizations Active in Disaster (VOAD) Tabletop Exercise

PARTNERSHIPS

Renewed energy has been infused into PDC's new and existing partnerships including:

- Association of South East Asian Nations (ASEAN)
- South Pacific Applied Geoscience Commission (SOPAC) and Disaster Managers representing 17 Pacific Island nations and states
- Earthquake and Megacities Initiative (EMI)
- National Defense Coordinating Council and Office of Civil Defense, Philippines (NDCC)
- Asia Disaster Preparedness Center (ADPC)
- Research Center for Urban Safety and Security, Kyoto University, Japan
- Earthquake Disaster Mitigation Research Center, Kobe, Japan
- Philippines National Defense College, Emergency Management Institute, Manila, Philippines
- United Nations International Strategy for Disaster Reduction (ISDR)
- UN-Office of Outer Space Affairs (UN-OOSA)
- UN-Economic and Social Commission for Asia and the Pacific (UN-ESCAP)
- UNOSAT
- U.S. Geological Survey (USGS)
- Federal Emergency Management Agency's Higher Education Project
- U.S. Department of Agriculture Forest Service (USFS)
- Thailand Department of Disaster Prevention and Mitigation
- Pacific Risk Management Ohana (PRiMO)

Pacific Disaster Center's Mission: To provide applied information research and analysis support for the development of more effective policies, institutions, programs and information products for the disaster management and humanitarian assistance communities of the Asia Pacific region and beyond.

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