



December 2007

# US IOTWS Program Update

SPECIAL ISSUE: TRANSITION OF PROGRAM ACTIVITIES TO INDIAN OCEAN REGION PARTNERS

**US Indian Ocean Tsunami Warning System (IOTWS) Program**  
*from advanced technologies to resilient communities*

## A SPECIAL FOCUS ON THE US IOTWS TRANSITION WORKSHOP

International cooperation to establish the Indian Ocean Tsunami Warning and Mitigation System (IOTWS) has been under way since shortly after the December 26, 2004 tsunami disaster, including the two-year, \$16.6 million US IOTWS Program funded by the U.S. Agency for International Development (USAID). Over the past three years, the Indian Ocean region has made impressive progress on regional and national tsunami warning systems, as reported through a UN-led assessment of the response to the 8.4-magnitude earthquake and tsunami that occurred on September 12, 2007. Following the US IOTWS Program’s close-out in March 2008, the USG plans targeted support in key areas as international and national partners continue work on a range of ongoing and long-term IOTWS requirements. To help sustain the momentum of U.S. and international efforts, USAID and its partner US Government (USG) agencies conducted a Transition Workshop in collaboration with the Intergovernmental Oceanographic Commission (IOC) at the United Nations Conference Center in Bangkok on December 6-7, 2007.

The Governments of Indonesia, Sri Lanka, Thailand, Maldives, and India together with United Nations and U.S. Government officials joined international, regional, and local partners in the regional forum to define priorities for the continuing development and sustainability of the IOTWS. The workshop had three main objectives: (1) to discuss key U.S. program accomplishments and overall progress of the international IOTWS effort; (2) to ensure continued support for U.S. program contributions; and (3) to identify future priorities and resource needs for the international effort supporting the IOTWS.

Below are highlights from the discussions on topics that included key achievements in the main components of an end-to-end tsunami warning system, experiences from the September 12, 2007 tsunami event, and priorities for sustainability.



## Detection and Forecasting

The National Oceanic and Atmospheric Administration (NOAA) has successfully deployed deep-ocean tsunami detection tsunameters (“DART buoys”) in partnership with Thailand and Indonesia, and upgraded coastal sea-level gauges in Sri Lanka, Indonesia, and the Maldives. NOAA also upgraded Global Telecommunications System (GTS) connections in the Maldives and Sri Lanka, which improved the ability to share and receive critical data. The U.S. Geological Survey (USGS) has supported countries in the region to enhance seismic detection and hazard assessment capability.



USGS

Indonesian researchers and USGS staff during a field trip to examine evidence of recurrent tsunamis and mudslides

Support for maintaining the seismic networks installed in Indonesia under the Program will continue through the Sumatran GPS Array (SuGAR) network. Technical agencies such as NOAA and USGS plan to remain engaged with a number of partners in the region through new and ongoing agreements focused on technology transfer, research and development, and capacity building. NOAA’s Pacific Tsunami Warning Center (PTWC) will continue to provide interim tsunami notification services to the Indian Ocean until a Regional Tsunami Watch Provider is established. To sustain capacity building efforts, technical trainings in seismicity and seismic hazard mapping will be offered both through the Asian Disaster Preparedness Center (ADPC) and the recently established International Tsunami Training Institute (ITTI, described below).

## Warning and Dissemination



Courtesy of Phuket Gazette

Community members in Phuket evacuate as part of the Andaman Wave 2007 drill

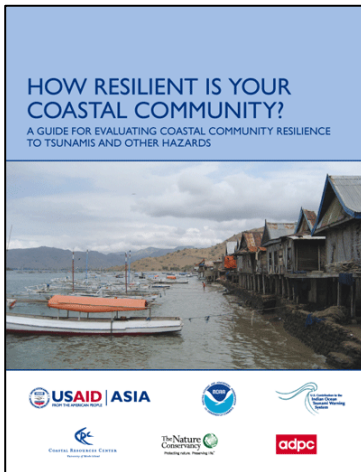
The US Forest Service (USFS) and other partners have conducted intensive training for approximately 600 disaster managers on efficient procedures and dissemination of warning messages. Sri Lanka, Indonesia, and Thailand have incorporated these disaster management systems and practices into their national frameworks and will continue to institutionalize them through training programs at the sub-national levels using materials developed under the US IOTWS Program.

USTDA has supported the Thai National Disaster Warning Center (NDWC) to alleviate communications bottlenecks and improve response time for public notifications. Similarly, USFS and NOAA worked with NDWC and other disaster management agencies to establish a Tsunami Alert Rapid Notification System (TARNS), and Thailand is now seeking funding to continue TARNS implementation.

To reach the “last kilometer”, NOAA introduced a low-cost radio technology called “RANET” that enables disaster communications in vulnerable, remote locations, and provided training on its use. Indonesia has installed 106 RANET emergency radio units, while Sri Lanka has also received RANET units and training. NOAA will continue to maintain broadcast operations until 2015 and provide trainings on this communications technology.

## Mitigation, Response, and Resilience

The Program has provided extensive support for building capacity in communities and linking them to national warning systems. The US IOTWS launched the Coastal Community Resilience (CCR) initiative in partnership with disaster management organizations working in the region to help them adopt common benchmarks and best practices in community resilience. These best practices and other tools have been published in a guidebook titled *How Resilient is Your Community?*, which has been distributed to partners. Numerous international organizations and national non-governmental organizations, including CARE and the International Federation of

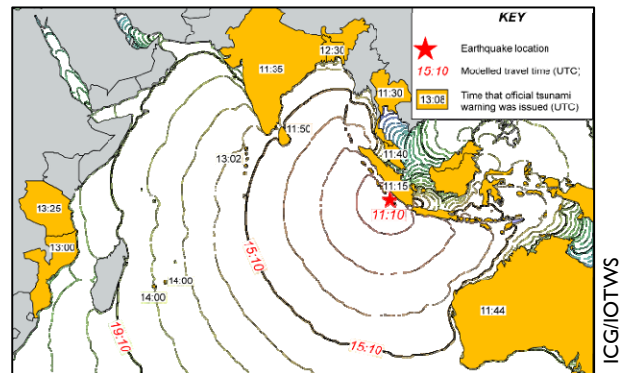


the Red Cross and Red Crescent Societies (IFRC) have adopted CCR for use in their ongoing activities. In addition, ADPC has translated the guide into Vietnamese and incorporated CCR into its training activities.

Having the “upstream” warning components in place is helping local authorities and disaster managers better focus “downstream” efforts by adopting more appropriate standard operating procedures, local response systems, and awareness-building programs. However, just as disaster risk management and preparedness remain significant challenges in general, the “downstream” aspects of the IOTWS will require continued international and host country support over the near and long term. Working Group 6 of the ICG/IOTWS was recently established to help facilitate support to all 28 countries for these downstream issues, including coastal preparedness, education, and resilience. Ideally, efforts to address downstream IOTWS needs should be integrated with broader disaster risk management initiatives.

### Experiences from the September 12, 2007 Earthquake

To best understand overall progress for the region, ICG/IOTWS and national government representatives presented country experiences in reacting to the tsunami event of September 12, 2007 following an 8.4 magnitude earthquake near Sumatra, Indonesia. The responses to this event showed the significant advances made by the five partner countries and across the region in tsunami warning capacity since the tsunami disaster of 2004. According to a recent assessment by the ICG/IOTWS, installation of or upgrades to seismic and sea-level monitoring stations have greatly enhanced hazard detection, disaster management institutions and coordination systems are stronger, warnings are more effectively disseminated, and communities are better prepared. In addition to receiving information from PTWC, in many cases the countries formulated their own warnings based on receipt of available seismic and oceanographic data. Indonesia, for example, was able to issue a national warning to local authorities within 10 minutes of the earthquake, comparable to the speed of issuing tsunami warnings in the U.S. or Japan.



The times at which tsunami warnings were issued on September 12th

### Priorities for Sustainability

In spite of the encouraging progress among national governments and the international community, including USG contributions, important gaps remain. Long-term domestic programs, as well as other donor efforts, such as Germany’s €45 million five-year program with Indonesia, will continue to address ongoing needs in the region. However, additional technology transfer and capacity building are required to ensure the IOTWS becomes and remains fully operational. Tsunamis are the most difficult of all the natural hazards to prepare for, detect, analyze, and warn against. The challenge of building a robust, reliable tsunami warning and mitigation system in a region where no country had the ability to issue a national warning before December 26, 2004 is an undertaking of many years. Countries other than those most affected by the 2004 tsunami have received little or no tsunami reconstruction funding, and continue to require assistance in developing tsunami/multi-hazard warning capabilities.

The ICG/IOTWS and other workshop participants identified several critical needs for additional donor investment in the IOTWS, including:

- access to observational data, analyses, and other information products for tsunami warning purposes;





Top: Walter Mooney, Curt Barrett, Smith Dharmasaroja, and Ridwan Djamaluddin  
Bottom: Lalani Imbulana, Indira Fernando, Fathmath Fairooza, Patra Dewi, and Jane Cunneen

- region-wide standard operating procedures for warning formulation and dissemination and additional assistance with developing functional and appropriate national standard operating procedures;
- continued support for coastal community resilience (with a multihazards focus) as well as disaster risk management and preparedness; and
- capacity and institution building at all levels to institutionalize the end-to-end tsunami warning and mitigation system nationally and across the region.

To ensure the sustainability of warning systems and the preparedness of coastal communities, government partners committed to maintaining equipment and continuing to build regional, national, and local capacities. Many of the tools and methods introduced through the US IOTWS Program are being incorporated into ongoing capacity building activities of national and regional organizations such as ADPC and the Asian Institute of Technology (AIT). In addition, key publications such as the CCR guide and *Tsunami Warning Center Reference Guide* are available on the US IOTWS Program website (<http://www.us-iotws.gov>).

Through the ITTI framework, the First Certificate Program in Asia on Tsunami Science and Preparedness will be held March 10-26, 2008, at AIT in Thailand. The course will draw on experiences from the first ITTI course held in July 2007 at the University of Washington. It will be an intensive program organized for practitioners actively engaged in end-to-end tsunami warning, mitigation, and preparedness activities. The program offers participants with a wide range of backgrounds the opportunity to work with colleagues and experts from both the U.S. and the Indian Ocean region.

In their closing remarks, ICG/IOTWS representatives underscored their commitment to establishing regional tsunami watch providers by 2008-2009. Ongoing funding, technical, and coordination needs identified at this transition workshop will be addressed at the Fifth ICG/IOTWS meeting in April 2008 in Kuala Lumpur, Malaysia. After close-out of the US IOTWS Program, USG agencies will continue to provide technical support to partners on selected activities in developing and maintaining the end-to-end system. The agencies will continue to participate in ICG working groups on various issues, including the siting of tsunami detection systems, forecasts for national warning centers, and development of tools to better predict geographic areas most at risk. Over the next two months, USG agency partners will outline options for future engagement with the IOC to support long-term needs in the Indian Ocean region.

## UPCOMING US IOTWS PROGRAM AND RELATED ACTIVITIES

### **Training Seminar on the Deep-ocean Assessment and Reporting of Tsunamis (DART) Tsunameter, January 28-30, 2008**

Jakarta, Indonesia. For more information contact David McKinnie at [david.mckinnie@noaa.gov](mailto:david.mckinnie@noaa.gov)

### **Training Seminar on Concepts of Operations (CONOPS), January 31-February 1, 2008**

Jakarta, Indonesia. For more information contact David McKinnie at [david.mckinnie@noaa.gov](mailto:david.mckinnie@noaa.gov)

### **Regional Workshop on Critical Coastal Issues in Post-Tsunami Asia, February 19-21, 2008**

Pathumthani, Thailand. For more information contact Saengroaj Srisawaskraisorn at [ssrisawas@usaid.gov](mailto:ssrisawas@usaid.gov)

### **ITTI Course: First Certificate Program in Asia on Tsunami Science and Preparedness, March 10-26, 2008**

Pathumthani, Thailand. For more information contact Theerachai Haitook at [theerachai@ait.ac.th](mailto:theerachai@ait.ac.th)

Application deadline January 31, 2008

### **About the US Indian Ocean Tsunami Warning System (IOTWS) Program**

The US IOTWS Program is part of the international effort to develop tsunami warning system capabilities in the Indian Ocean following the December 2004 tsunami disaster. The US program adopts an "end-to-end" approach—addressing regional, national, and local aspects of a truly functional warning system—along with multiple other hazards that threaten communities in the region. In partnership with the international community, national governments, and other partners, the US program offers technology transfer, training, and information resources to strengthen the tsunami warning and preparedness capabilities of national and local stakeholders in the region.

For more information please visit [www.us-iotws.gov](http://www.us-iotws.gov).