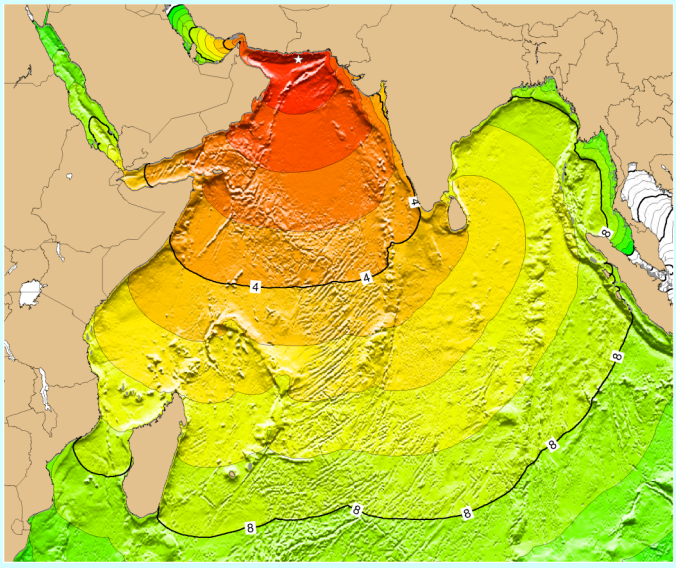
Mauritius Training Program in Seismology and Tsunami Warnings

14-18 January 2008



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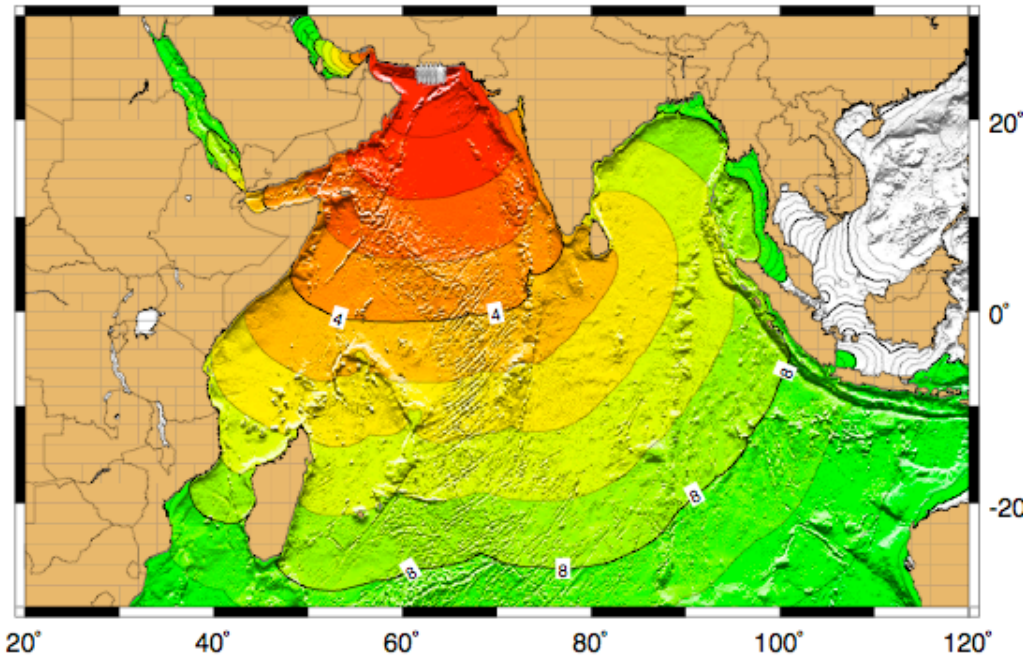
Mauritius Meteorological Services
Vacaos, Mauritius, January 14-18, 2008



Sponsored by:

U.S. Department of State, Bureau of Oceans and International Environmental and Scientific Affairs

UNESCO Intergovernmental Oceanographic Commission (IOC)

U.S. Geological Survey (USGS)

Introduction

The December 26, 2004, Indian Ocean tsunami highlighted the need to increase capacity building of countries throughout the Indian Ocean. In response to this need, the Indian Ocean Tsunami Warning and Mitigation System (IOTWS), under the framework of the IOC, was developed in order to create "tsunami resilient" communities in the Indian Ocean region. An Intergovernmental Co-ordination Group (ICG/IOTWS) is helping to provide overarching guidance and facilitate the development of the regional system. It has met regularly since August 2005 to discuss the tsunami technical monitoring and warning disseminations, coordinate tsunami risk assessment and preparedness activities, and to share national experiences in building tsunami awareness through education and outreach in their countries.

Tsunami early warning systems must provide timely, understandable warnings within minutes that will then motivate citizens to quickly move out of harm's way. When a warning is issued, the public should already be prepared. In order to accomplish this, progress in three mutually dependent components active at the international or regional, national, and local levels is emphasized:

- First, assessing the tsunami hazard and risk, especially at the local level to identify vulnerable communities;
- Second, preparing the population so they know what action to take in case of a tsunami warning; and
- Third, building an international, national, and local technological framework that can warn coastal communities of an advancing tsunami wave.

For an effective end-to-end tsunami warning response, warning centers need to be vigilant in monitoring the potential hazards and then quickly disseminate consistent and reliable tsunami threat information in an understandable and concise manner. Disaster management organizations or their emergency centers responsible for public safety then need to assess the threat to their populations, disseminate safety instructions, and if needed, initiate public coastal evacuations. These actions comprise the end-to-end tsunami early warning response (monitoring and warning, alert dissemination, emergency response, public action).

The training program in Seismology and Tsunami Warnings emphasizes the technical aspects of end-to-end warning by increasing awareness of modern practices in earthquake and tsunami monitoring, evaluation, warning. The course will be hosted at Mauritius Meteorological Services January 14-18, 2008. With the information gained on this course the participants will, in turn, be expected to educate other members of the community, or be actively engaged in tsunami warning system efforts.

Sponsoring Agencies

The United States Department of State Bureau of Oceans and International Environmental and Scientific Affairs coordinates the bilateral and multilateral engagement of the United States in ocean, environment and health issues such as emerging and infectious diseases, biodiversity conservation, climate change, access to water and energy, oceans affairs, science and technology cooperation, management of toxic chemicals, environmental components of trade agreements, and exploration of space.

The U.S. Geological Survey provides support for seismic and tide station technology transfer, regional and global interoperability through the IOC framework, and capacity building at both the detection/warning formulation and local preparedness levels. This is done at the data analysis and prediction stage, as well as in hazard/vulnerability/risk mapping and modeling standards, protocols, and methods. Training is one of the primary mandates of the USGS effort.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) functions as a laboratory of ideas and a standard-setter to forge universal agreements on emerging issues. The Organization also serves as a clearinghouse for the dissemination and sharing of information and knowledge while helping Member States to build their human and institutional capacities in diverse fields. UNESCO promotes international co-operation among its 191 Member States and six Associate Members in the fields of education, science, culture, and communication.

The Intergovernmental Oceanographic Commission (1OC) is a branch of UNESCO that provides Member States of the United Nations with an essential mechanism for global cooperation in the study of the ocean. The IOC assists governments to address their individual and collective ocean and coastal problems through the sharing of knowledge, information, and technology, and through the coordination of national programs. Starting immediately after the December 2004 Indian Ocean tsunami, the IOC has worked with countries to develop regionally coordinated systems in the Indian Ocean, Caribbean and north Atlantic and Mediterranean.

The International Tsunami Information Center (ITIC) is hosted by the U.S. National Oceanic and Atmospheric Administration for the IOC. Since 1965, the Center's mission has been to mitigate the effects of tsunamis throughout the Pacific. ITIC monitors and evaluates the performance and effectiveness of the Pacific Tsunami Warning and Mitigation System. This effort helps countries to establish or strengthen their national system by building capacities through training and expert consultation for end-to-end tsunami warning and in tsunami preparedness. Since 2004, it has supported the IOC's efforts to develop a global tsunami warning and mitigation.

Acknowledgements

Venue

Mauritius Meteorological Services
Vacaos, Mauritius

Responsible Organizers:

Mr. Yadowsun Boodhoo
Director, Mauritius Meteorological Services, Vacaos, Mauritius

Dr. Laura Kong
Director, IOC International Tsunami Information Center, Hawaii, USA

Dr. Walter Mooney
Senior Seismologist, U.S. Geological Survey, Menlo Park, California, USA

Lecturers:

Dr. Laura Kong
Director, IOC International Tsunami Information Center, Hawaii, USA

Dr. Walter Mooney
Senior Seismologist, U.S. Geological Survey, Menlo Park, California, USA

Mr. Masahiro Yamamoto
Senior Tsunami Advisor, IOC, Paris, France

Mauritius Training Course in Seismology and Tsunami Warnings
Jan 14-18, 2008

Lecturers:
Masahiro Yamamoto, Senior Tsunami Advisor, IOC
Dr. Laura Kong, Director, International Tsunami Information Centre (ITIC), IOC
Dr. Walter Mooney, Senior Seismologist, United States Geological Survey (USGS)

Provisional Agenda

Time	Topic	Lecturer
Day 1	**Tsunami Warning and Mitigation Systems - Science and Hazard Risk Assessment**	
8:30-9:00	**Registration**	
9:00-9:15	**Welcome**	
9:15-9:30	**Lecturer and Participant Introductions**	
9:30-10:15	**Tsunami Warning and Mitigation Systems - Overview**	**Laura Kong**
10:15-10:45	**Coffee**	
10:45-11:30	**Status of the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS)**	**Laura Kong**
11:30-12:30	**Tsunami generation and physics**	**Masahiro Yamamoto**
12:30-1:30	**Lunch**	
1:30-2:15	**Tsunami Hazard and Risk Assessment, Introduction to numerical modeling of tsunamis**	**Laura Kong**
2:15-3:00	**Hands-on Computer learning: TsunamiTeacher**	**All**
3:00-3:30	**Coffee**	
3:30-5:00	**Hands-on exercise: Interactive tsunami historical databases (WDC/NGDC, ITDB)**	**All**
Day 2	**Tsunami Warning and Mitigation Systems – Tsunami Warnings**	
8:30-9:15	**Interim IO Tsunami Advisory Service**	**Masahiro Yamamoto**
9:15-10:15	**Tsunami Warning Center Operations – Seismic monitoring and real-time earthquake source characterization**	**Masahiro Yamamoto**
10:15-10:45	**Coffee**	
10:45-11:45	**Tsunami Warning Center Operations - Sea level monitoring and tsunami confirmation and wave forecast**	**Laura Kong**
11:45-12:30	**Discussion: Indian Ocean Tsunami Warnings**	**All**
12:30-1:30	**Lunch**	
1:30-3:00	**Hands-on exercise: Sea Level Data Tools (Tide Tool, ODINAFRICA Sea Level Monitoring, Station Metadata web service, Anatomy of Tsunami)**	**All**
3:00-3:30	**Coffee**	
3:30-5:00	**Hands-on exercise: Tsunami Travel Times (TTT software, ITDB)**	**All**
Day 3	**Tsunami Warning and Mitigation Systems - Emergency Response, Preparedness and Mitigation**	
8:30-9:30	**Tsunami "End to End" Emergency Response – Overview on Standard Operating Procedures**	**Laura Kong**

9:30-10:15	**Warning Dissemination and Public Alerts – Message Scheduling and Message Content, Communication Tests, Warnings through GTS, RANET, and other existing reliable methods**	**Masahiro Yamamoto, Laura Kong**
10:15-10:45	**Coffee**	
10:45-11:30	**Warning Dissemination and Public Alerts – Potential roles of the Media – Japan example**	**Masahiro Yamamoto**
11:30-12:30	**Practical Aspects – TWC and TWC Training, TER, Coordination, Information Tools / Awareness Products**	**Masahiro Yamamoto, Laura Kong**
12:30-1:30	**Lunch**	
1:30-2:15	**Tsunami Preparedness: Regional and National Exercises and Post-Exercise Evaluations, and other activities**	**Laura Kong**
2:15-3:00	**Tsunami Mitigation - Hard and Soft Countermeasures**	**Masahiro Yamamoto**
3:00-3:30	**Coffee**	
3:30-4:30	**Tsunami Mitigation - Vertical Evacuation, Tourism sector, Preparedness and Resiliency through planning and policy**	**Laura Kong**
4:30-5:00	**Discussion, Q&A, Summary**	**All**
Day 4	**Introduction to Seismology**	
8:30-9:15	**Seismicity and Plate Tectonics of the Indian Ocean Region**	**Walter Mooney**
9:15-10:15	**History of tsunamis in the Indian Ocean and Indian Ocean tsunami modeling scenarios - tsunami hazards and risks in the Indian Ocean**	**Masahiro Yamamoto**
10:15-10:45	**Coffee**	
10:45-11:30	**Introduction to seismic waves**	**Walter Mooney**
11:30-12:30	**Introduction to earthquake sources**	**Walter Mooney**
12:30-1:30	**Lunch**	
1:30-2:15	**Seismic data interpretation - Location**	**Walter Mooney**
2:15-3:00	**Computer exercises (teleseismic data interpretation and location)**	**All**
3:00-3:30	**Coffee**	
3:30-4:00	**Computer exercises (teleseismic data interpretation and location)**	**All**
4:00-5:00	**Computer exercises (local data interpretation and location)**	**All**
Day 5	**Introduction to Seismology**	
8:30-9:15	**Seismic instrumentation and monitoring in the Indian Ocean**	**Masahiro Yamamoto**
9:15-10:15	**Seismic magnitudes**	**Walter Mooney**
10:15-10:45	**Coffee**	
10:45-12:30	**Computer exercises (magnitude calculations)**	**All**
12:30-1:30	**Lunch**	
1:30-2:30	**Seismic data interpretation - Focal mechanisms**	**Walter Mooney**
2:30-3:30	**Seismic hazard mapping**	**Walter Mooney**
3:00-3:30	**Coffee**	
3:30-4:30	**Discussion, Q&A, Summary**	**All**
4:30-5:00	**Closing Ceremony**	