



**International Tsunami Symposium Commemorating  
50<sup>th</sup> Anniversary of the Pacific Tsunami Warning and Mitigation System**

**Making the Pacific Ready for the Tsunami Threat**

**20-21 April 2015**

**NOAA Inouye Regional Center, Ford Island, Oahu, Hawaii**

**Organized by the Intergovernmental Oceanographic Commission (IOC) of UNESCO**

**International Union of Geodesy and Geophysics (IUGG)**

**and the Government of the United States of America**

**FINAL AGENDA (17 April 2015)**

The Symposium will commemorate the 50th anniversary of the International Tsunami Warning System in the Pacific. Established in 1965 under the auspices of the UNESCO Intergovernmental Oceanographic Commission in response to the 1960 Chile tsunami that resulted in casualties across the Pacific, the System provides coordinated tsunami threat information to 46 countries of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS).

The Symposium will recognize the achievements of the last 50 years, review the current state of the System, and identify practical and tangible next steps, desirable partnerships, and necessary commitments needed to sustain and evolve the PTWS for the future. Sessions will cover the PTWS Medium-Term Strategy (MTS) themes of Risk Assessment and Reduction, Event Detection, Warning, and Dissemination, and Awareness and Response. Thematic sessions will consist of invited speakers and panels representing decision-makers, planning and policy, science, warning, and/or emergency operations practitioners. Panels are intended to be discussion conversations that engage both the panelists and the audience in a holistic and interdisciplinary manner. All participants are also invited to contribute posters that will be displayed during the meeting. A Summary Session will capture recommendations to be presented at the Twenty-sixth Session of the ICG/PTWS that immediately follows from 22-24 April 2015. Symposium papers will be published as part of a peer-reviewed Special Volume on the Pacific Tsunami Warning and Mitigation System: Past, Present, and Future.

**DAY 1, APRIL 20, 2105**

**09:00 – 11:00: Opening Session**

Emcee: Brian Yanagi, ITIC

**9:00 – 9:50      1. Opening Ceremony**

UNESCO Intergovernmental Oceanographic Commission (IOC)

Dr. Vladimir Ryabinin, Executive Secretary (by video)

Dr. Yutaka Michida, Japan, IOC Vice President

International Union of Geodesy and Geophysics (IUGG) Tsunami Commission

Dr. Vasily Titov, Chair

Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (UNESCO IOC ICG/PTWS) – Dr. Ken Gledhill, New Zealand, Chair

United States Pacific Command (USPACOM)

Lt General Anthony G. Crutchfield, U.S. Army, Deputy Commander

State of Hawaii - Brigadier General Arthur J. Logan, Adjutant General, Department of Defense and Director, Hawaii Emergency Management Agency (HI-EMA)

## **9:50 – 11:00: 2. PTWS Historical Keynotes**

09:50 – 10:15: Tsunami Warning and Mitigation: USA Experience  
Laura Furgione, NOAA Deputy Assistant Administrator for Weather Services and Deputy Director, National Weather Service

1<sup>st</sup> Showing of PTWS video “Tsunami Warning!”

*Produced by the ITIC, in collaboration with the USA and Chile, the video follows tsunami warning and emergency operations center staff in the PTWC, Chile, Peru, Hawaii, and Samoa, as they respond to a M9.5 earthquake and tsunami off the northern coast of Chile.*

10:15 – 10:30: Tsunami Warning and Mitigation: Chile Experience  
Rear Adm. Patricio Carrasco, Director, Servicio Hidrográfico y Oceanográfico de la Armada de Chile (SHOA)

10:30 – 10:45: Tsunami Warning and Mitigation: Japan Experience  
Yasuo Sekita, Director General, Seismology and Volcanology Department, Japan Meteorological Agency (JMA)

10:45 – 11:00: Tsunami Warning and Mitigation: Pacific Island Experience  
Filomena Nelson, Assistant Chief Executive, Ministry of Natural Resources and Environment, and Director, Disaster Management Office, Samoa

## **11:00 Coffee Break**

## **11:30 – 12:45: 3. History and milestones in the development of the Tsunami Warning System in the Pacific, ITSU to PTWS, 1960 - 2015**

Historical Session Chair: Fred Stephenson, Canada, ITSU Chair 2006-2007

11:35 – 11:50: Historical Keynote: Evolving the PTWS, Dr. Iouri Oliounine, ITSU Technical Secretary, 1982-2002 (by video)

12:50 – 12:05: 1960-1985 – Fred Stephenson, Canada, ITSU Chair 2006-2007

12:05 – 12:20: 1985-2005 – François Schindele, France, ITSU Chair, 1999-2005

12:20 – 12:35: 2005-2015 – Masahiro Yamamoto, Japan, Senior Tsunami Advisor, UNESCO IOC Tsunami Unit (2005-2012), Director, Earthquake and Tsunami Observations Division, Seismology and Volcanology Department, JMA (2004-2005)

12:35 – 12:40: Announcement of PTWS Commemorative Historical Book, “Pacific Tsunami Warning System, A Half-Century of Protecting the Pacific, 1965-2015”, ITIC and NOAA National Center for Environmental Information (formerly National Geophysical Data Center) / ICSU World Data Service for Geophysics

## **12:45 – 14:00 Group Photo and Lunch, Green Tree Cafe, IRC Atrium**

(Lunch available for purchase)

## **14:00 – 16:45: 4.1 Thematic Session 1**

### **Theme 1: Hazard and Risk – Identification and Risk Reduction**

Understanding tsunami risk has two components: hazard assessment (specifying tsunami sources and their wave height potential along the coast), and risk assessment (estimating likelihood of tsunami effects to coasts in terms of human impacts or physical damages). The aim is to know where the at-risk areas are and how a tsunami could affect those areas. Risk and hazard assessment are conducted utilizing the latest scientific tools and all available tsunami data. Understanding tsunami risk is fundamental for planning effective tsunami warnings. It is also required for disaster risk reduction activities that reduce the impact and community exposure to tsunami and other ocean-related threats.

Session Chair: Dr. Eddie Bernard, Scientist Emeritus, NOAA Pacific Marine Environmental Lab

14:00 – 15:00: Keynote Topics (15 min each)

- 14:05 – 14:20: Gigantic Earthquakes and Tsunamis – When and Where, Dr. Kenji Satake, Earthquake Research Institute, University of Tokyo
- 14:20 – 14:35: Tsunami Hazard Assessment and Risk, Dr. Viacheslav Gusiakov, Novosibirsk Tsunami Laboratory, Russian Academy of Sciences
- 14:35 – 14:50: Practical Risk Reduction: Tsunami Provisions in the International Building Code Gary Y.K. Chock, S.E., F.SEI, F.ASCE, D.CE., Chair, U.S. ASCE -7 Tsunami Loads and Effects Subcommittee; President, Martin and Chock, Inc.
- 14:50 – 15:05: Making Hawaii Ready for the Tsunami Threat – Doug Mayne, Vice Director, Hawaii Emergency Management Agency

**15:15 – 15:45: Coffee Break**

15:45 – 16:45: Discussion Panel (5 min each, followed by discussion)

Keynote Speakers, joined by

Dr. Garry Rogers, Geological Survey of Canada

Prof. Karl Kim, Dept of Urban Planning, University of Hawaii; Director, Disaster Management and Humanitarian Assistance Program; Executive Director, USDHS/FEMA NDPTC

Dr. Hansjürgen Meyer, Director, Corporación OSSO, Colombia

Discussion Questions:

1. How do we responsibly link science, uncertainty, and public policy to ensure simple understanding of risk, and meaningful implementation of programs that make countries safer from the tsunami threat?
2. What are recommended risk reduction approaches that can be adapted to meet varying risk levels and community capacities? How do we measure effective risk reduction?

**16:45 – 17:00:**

Publication of Symposium Special Volume: Pacific Tsunami Warning and Mitigation System: Past, Present, and Future – Dr. Vasily Titov, IUGG Tsunami Commission Chair

**17: 00– 17:15: Introduction to Evening Agenda**

**5. Assessing Risk and Building Preparedness in Communities:**

United States Federal Emergency Management Agency – Timothy W. Manning, Deputy Administrator for Protection and National Preparedness

USDHS/FEMA National Disaster Preparedness Center (NDPTC) of the University of Hawaii – Dr. Karl Kim, Executive Director

**17:15 – 19:30: Poster Session, IRC Tours, and Welcome Reception, IRC Atrium**

Hosted by USDHS/FEMA National Disaster Preparedness Center (NDPTC) of the University of Hawaii  
Poster Displays on History, Hazard and Risk, Science, Country Progress; IRC Tours (PTWC, ITIC), Science on Sphere

## **DAY 2, APRIL 21, 2015**

**09:00 Morning Opening and Day 2 Logistics**

Emcee: Brian Yanagi, ITIC

**09:15– 12:45: 4.2 Thematic Session 2**

**Theme 2: Warning and Forecast: Detection, Warning and Dissemination**

An effective tsunami warning system involves the rapid detection and quantification of the tsunami

source; forecasting and verification of wave propagation and identification of likely threatened areas; and dissemination of information about the threat to enable communities to respond. These topics should be addressed within national, regional, and ocean-wide contexts. National warning systems are the most crucial part in the entire end-to-end system for both local and distant source tsunamis due to the sole national responsibility for alerting communities at risk and urging or ordering immediate evacuation. Local source tsunami warning requires data and techniques that rapidly warn people in minutes, complemented by continuous public education efforts to immediately react to the natural tsunami warning signs.

#### **09:15 – 11:00: 4.21 Theme 2, Sub-Theme 1: Tsunami Warning Operations**

Session Chair: Dr. Laura Kong, Director, ITIC

09:15 – 10:15: Keynote Topics (15 min each)

- 09:20 – 09:35: Tsunami Warning – Dr. Charles McCreery, Director, NOAA Pacific Tsunami Warning Center
- 09:35 – 09:50: Real-time Earthquake Source Characterization – Dr. Dominique Reymond, Director, Laboratoire de Géophysique, Centre Polynésien de Prévention des Tsunamis (CPPT)
- 09:50 – 10:05: Tsunami Forecasting – Dr. Vasily Titov, NOAA Pacific Marine Environmental Laboratory
- 10:05 – 10:20: Japan Local Tsunami Warning – Tomoaki Ozaki, Senior Coordinator for International Earthquake and Tsunami Information, JMA

10:20 – 11:00: Discussion Panel (5 min each, followed by discussion)

Keynote Speakers, joined by

Prof. Yuichi Ono, International and Regional Cooperation Office, International Research Institute of Disaster Science (IRIDeS), Tohoku University

Cdr Juan Ramon Sans Aguilar, Director, Mexican Tsunami Warning Center

'Ofa Fa'anunu, Director, Tonga Meteorological Services

Discussion Questions:

1. Are the present core seismic and sea level observing networks, and analysis methodologies adequate for country threat assessment and timely warning? If not, what is additionally needed? What level of commitment—financial or otherwise—are PTWS Member States willing to make to realize this vision?
2. Are instrument-determined local tsunami warnings possible and practical?
3. What level of accuracy is necessary, and how quickly should a forecast be made, to be useful to the different stakeholders (government, non-government, private sector, public, special populations)?

**11:00 – 11:30: Coffee Break**

#### **11:30 – 12:45: 4.22 Theme 2, Sub-Theme 2: Warnings - The Last Mile**

Session Chair: Bernardo Aliaga, IOC PTWS Technical Secretary

11:30 – 12:00: Keynote Topics (15 min each)

- 11:35 – 11:45: Warning Communications and Technologies – Edward Young, Deputy Director, NOAA NWS Pacific Region
- 11:45 – 11:55: Warning the Last Mile - Loti Yates, Director, Solomon Islands National Disaster Management Office

12:00 – 12:45: Discussion Panel (5 min each, followed by discussion)

Keynote Speakers, joined by

Dr. Rene Solidum, Director, Philippines Institute of Volcanology and Seismology (PHIVOLCS)

Lcl Frederic Tournay, Director, Haut-Commissariat de la République en Polynésie Française, French Polynesia

Dr. Ye Yuan, Director, Tsunami Warning Division, China National Marine Environmental Forecasting Center

Discussion Questions:

1. What are the information flow challenges in communicating threat and actionable safety information to the different stakeholders in the warning chain? How can understanding be improved and action made faster?
2. What are the key investments that countries can make to ensure 'Last Mile' warnings are more robust and effective? Are there technological issues that should be raised with the broader telecommunications community? What can the PTWS do to support member states?

**12:45 – 14:00 Lunch, Green Tree Cafe, IRC Atrium** (Lunch available for purchase)

**14:00 – 15:30: 4.3 Thematic Session 3**

**Theme 3: Awareness and Response**

**Preparedness, Emergency Planning and Response, and Post-Disaster Response**

It is essential that tsunami-vulnerable communities are made aware of the effects of and how to respond through simple, cost-effective, and culturally sensitive awareness programs that utilize all-available communication and media mechanisms. Emergency management authorities need plans, standard operating procedures and arrangements to enable effective response management and evacuations. Ensuring the safe action in harbors and ports during tsunamis requires pre-planning. Exercises are essential to maintain operational readiness and test warning systems, and should be conducted on a regular basis. Engagement of non-governmental organizations (NGOs), the private sector, and community representatives as partners is critical component in post-disaster response and for sustaining preparedness and reducing risk throughout the disaster management cycle.

Session Chair: David Coetzee, Manager, Capability & Operations, New Zealand Ministry of Civil Defence and Emergency Management

**14:00 – 15:00: Keynote Topics (15 min each)**

- 14:05 – 14:20: Community Education and Awareness - Mylene Villegas, Chief, Geological Disaster, Awareness, and Preparedness Division, Philippines Institute of Seismology and Volcanology (PHIVOLCS)
- 14:20 – 14:35: Tsunami Emergency Response and Evacuation – Vinnie Atofau, Jr., Manager, Territorial Emergency Management Coordinating Office, American Samoa
- 14:35 – 14:50: Boat Harbors and Shipping Ports during Tsunamis – Kevin Miller, Earthquake and Tsunami Program, California Office of Emergency Management, USA
- 14:50 – 15:05: Post-Event Response, Relief, and Recovery and Humanitarian Assistance – Mandate and Roles of US Pacific Command (PACOM) and USAID/OFDA – Julie Leonard, Regional Advisor, USAID Office of Foreign Disaster Assistance, Latin America and the Caribbean Office

**15:05 – 15:45: Discussion Panel (5 min each, followed by discussion)**

**Keynote Speakers, joined by**

Rick Bailey, Head, Tsunami Warning & Ocean Services Bureau of Meteorology, Australia

Dr. Wilfried Strauch, Advisor, Instituto Nicaraguense de Estudios Territoriales (INETER)

Dr. Sun-Cheon Park, Senior Researcher, Korea Meteorological Administration (KMA)

**Discussion Questions:**

1. What are the common Awareness and Response challenges, or successes, in relation to tsunami and what can the PTWS do to support member states in this regard?



2. What measures can countries take to facilitate effective public awareness and disaster response? What percent of a country's tsunami budget, or tsunami program, should be spent on public awareness and education?
3. How can communities be more involved in tsunami risk mitigation?

**15:45 – 16:15: Coffee Break**

**16:15 – 17:15: 6. Summary Session: Looking to the Future**

The Session is expected to articulate the requirements and commitments needed to sustain and evolve the PTWS to continue to protect the lives and property throughout the Pacific Region. Thematic Session chairs will summarize pertinent issues, challenges, and potential solutions raised in their sessions as key PTWS priorities for the next 5-10 years, and be followed by Remarks by the ICG/PTWS Chair. The Chair will then moderate a 'Pacific Town Hall Meeting.'

Session Chair: Dr. Yutaka Michida, IOC Vice-President and TOWS-WG Chair, Japan

16:15 – 16:45

Session Summaries (5 min each)

History, Hazard and Risk, Warning Operations, Warnings – Last Mile, Awareness and Response

Fred Stephenson, Dr. Eddie Bernard, Dr. Laura Kong, Bernardo Aliaga, David Coetzee

PTWS Priorities – The Next 5-10 Years, Remarks by ICG/PTWS Chair - Dr. Ken Gledhill, New Zealand

**16:45 – 17:30**

**Pacific Town Hall Meeting:**

Representatives of the United Nations, Science, Warning Centers and Disaster Management Offices, Risk Reduction agencies, Post-Disaster Response and Recovery, Regional Organizations, Financing, and Member States are encouraged to dialogue on effective Disaster Risk Reduction drawing on lessons learned from recent tsunami disasters, and other natural hazard disasters, and the importance of adaptation in building greater resiliency. Discussion may further elaborate on Session Summaries. Emphasis will be on actions and activities that engage the PTWS Medium Term Strategy (MTS) foundational elements. These are:

- Interoperability: Free, open and functional exchange of tsunami information
- Research: Enhanced understanding and improved technologies and techniques
- Capacity Building: Training, technology and knowledge transfer
- Funding and Sustainability: Resources to sustain an effective PTWS

**17:30: 7. Closing**

Symposium Committee, Michael Angove, NOAA Tsunami Program Manager

US NOAA, Laura Furgione, NOAA Deputy Assistant Administrator for Weather Services and Deputy Director, National Weather Service

**17:30 – 19:00: Poster Session, IRC Tours, and Reception, IRC Atrium**

Hosted by University of Washington, Joint Institute for the Study of the Atmosphere and Ocean  
Poster Displays on Warning, Awareness and Response, Country Progress; IRC Tours (PTWC, ITIC),  
Science on Sphere

**Symposium Organizing Committee:**

Mike Angove (USA Tsunami National Contact), Rear Adm. Patricio Carrasco (Chile, ICG/PTWS Vice-Chair), David Coetzee (New Zealand, ICG/PTWS Disaster Management and Preparedness Working Group Chair), Dr. Ken Gledhill (New Zealand, ICG/PTWS Chair), Dr. Laura Kong (ITIC Director), Dr. Vasily Titov (USA, IUGG Tsunami Commission Chair, ICG/PTWS Tsunami Hazard Assessment Working Group Chair)