Introduction to IOTWMS
The Intergovernmental Oceanographic Commission (IOC) Of UNESCO

- The only intergovernmental body of the UN system specializing in ocean science, services, observations, data exchange, and capacity development
- Established 1960, 149 Member States

High-Level Objectives 2014-2021:
- Healthy ocean ecosystems;
- **Early warning systems (e.g. tsunami);**
- Resilience to climate change and variability by science-based services, adaptation and mitigation; and
- Emerging ocean science issues.
Tsunami Warning Systems

- Pacific since 1965
- 2004 tsunami in Indian Ocean (M9.1) illustrated need for more
- In 2005, the IOC was mandated to establish three more TWS
  - ICG IOTWMS
  - ICG CARIBE EWS
  - ICG NEAMTWS
- Java (M7.8) July 17, 2006 ~ 700 Causalities
- Mentawai (M7.7) 25 Oct 2010 ~ 400 Casualities

~230,000 Causalities
Over 1.6 people million displaced
Estimated economic losses of $14 billion
Governance

UNESCO/IOC Assembly/Executive Council

Working Group for Tsunami & Other sea level related Warning & mitigation Systems (TOWS-WG)
[4x ICG Chairs, WMO, UNISDR, UNDP, IMO, IHO]

Task Team Disaster Management & Preparedness

WG1 Tsunami Risk, Community Awareness and Preparedness
Chair: Dr. Harkunti Rahayu (Indonesia)

WG2 Tsunami Detection, Warning & Dissemination
Chair: Mr. Peter Coburn (Australia)

1x Regional WG: NW Indian Ocean
Chair: Dr. Juma Al Maskari (Oman)

Task Team - IOWAVE18
Chair: Dr. Yuelong Miao (Australia)

Task Team - Capacity Assessment of Tsunami Preparedness
Chair: Dr. Harkunti Rahayu (Indonesia)

ICG Caribbean & Adjacent Seas (CARIBE-EWS)

Intergovernmental Coordination Group
Indian Ocean Tsunami Warning & Mitigation System (IOTWMS)
Chair: Dr. Andi Eka Sakya (Indonesia)
Vice Chairs: Dr. Sam Hettiarachchi (Sri Lanka)
Vice Chair: Dr. Juma Al Maskari (Oman)

Steering Group: Officers, WG Chairs/VCs

ICG Pacific Tsunami Warning & Mitigation System (PTWS)

ICG NE Atlantic & Mediterranean Seas (NEAMS-TWS)

IOC Tsunami Unit (Paris)
Head: Thorkild Aarup

ICG/IOTWMS Secretariat (Perth)
Head: Srinivasa Kumar Tummala
Indian Ocean Tsunami Information Centre (Jakarta)
Head: Ardito Kodijat

ICG/IOTWMS Secretariat supported by Australia and hosted by the Bureau of Meteorology in Perth
IOTWMS - The Three Pillars

**Risk Assessment and Reduction**

Systematically collect data and undertake risk assessments

**Detection Warning and Dissemination**

Develop hazard detection, monitoring and early warning services
Communicate threat information and early warnings

**Awareness and Response**

Build national and community response capabilities
Pillar 1: Risk Assessment & Reduction

- **Tools, Methods & Guidelines** for Tsunami Risk Assessment published

- Indian Ocean Probabilistic Regional **Tsunami Hazard Maps** published

- Assessment and Awareness of **Makran Tsunami Hazards**

- Regional **Workshops** on Tsunami Risk Assessment and Modelling

- Enhancing Tsunami Risk Assessment and Management, **Strengthening Policy Support** and Developing Guidelines for Tsunami Exercises in Indian Ocean Countries
Pillar 2: Detection, Warning & Dissemination

- **Service Definition**: AoS, Stations, Products, Thresholds, CFZs, Formats
- **Tsunami Service Framework**
  - 3 inter-operable Tsunami Service Providers (Australia, India, Indonesia)
  - Network of NTWCs, TNCs, TWFPs
- Greatly expanded seismic and sea level monitoring networks
- Harmonised threat information by TSPs
- National warnings Sovereign responsibility of authorized national agencies
- Several Events handled
- Yearly performance assessments against Key Performance Indicators
- 6-monthly communications test to identify and fix any issues
- Interim Service – JMA, PTWC
IOTWMS Detection Networks

Indian Ocean Sea Level Network, 2004
- Sea Level Gauge
  - All data are shared internationally in near real-time.

Indian Ocean Seismic Network, 2004
- Broadband Seismometer
  - All data are shared internationally in near real-time.

Sea Level Monitoring Stations
- Australia
- India
- Indonesia
- Malaysia
- Philippines
- Thailand
- Vietnam
- Sri Lanka
- East Timor
- Maldives
- Guam
- United States

Seismic Stations
- Australia
- Indonesia
- Malaysia
- Thailand
- Vietnam
- Guam
- United States

2004

2017
Pillar 3: Awareness & Response

- Education Material for NTWCs, emergency managers, communities, schools, tourism, etc in multiple languages including posters, booklets, videos, comics, stickers, guidebooks and leaflets.
- Over 100 capacity development workshops on Standard Operating Procedures for NTWC, DMO, staff and/or Media
- Indian Ocean Tsunami Information Center (IOTIC) in Jakarta supported by BMKG, Indonesia (2017-2022)
- 70th Anniversary of 1945 Makran tsunami commemorative events held in Iran, Pakistan, India and Oman
- Documenting the impacts of Ambon Tsunami of 08 October, 1950
- Awareness and Education Materials on Distant Tsunami in Indian Ocean
- IOWave16 communication platform [www.iowave16.org](http://www.iowave16.org)
- Indian Ocean-wide (IOWave) exercises held every two years
- World Tsunami Awareness Day (WTAD) – 05 November
• In the Indian Ocean, four IOWave Exercises have been conducted in 2009, 2011, 2014 and 2016.
• All 24 Indian Ocean Member States involved their NTWCs and 12 involved Communities in IOWave16
• 59,000 persons evacuated.
• 92% involved NDMOs, 79% involved Local DMOs and 63% involved Media.
• IOC-UNESCO conducted on online assessment that was co-ordinated in-country by the IOWave16 National Contacts.
• UNISDR deployed international observers and film crews in India and Seychelles.
• UNESCAP helped develop outreach materials and supported a post-IOWave16 workshop (Bandung, December 2016).
• IOWave18 during 04-05 September 2018
IOTWMS Way Forward

• Sustain and Enhance end-to-end system
• Enhance regional cooperation for “Makran Subduction Zone”
• Greater emphasis on community awareness and preparedness → “Last Mile”
• Indian Ocean Wave 2018
• “Indian Ocean Tsunami Ready” Guidelines & Piloting
• Capacity Assessment of Tsunami Preparedness
• Continue Capacity Development Initiatives
• Integrate with international frameworks and multi-hazard warning systems
Calendar of Events

• ICG/IOTWMS XI, 18 – 20 April 2017, Malaysia
• 1st Integrated Meetings, 04 – 17 September 2017, Indonesia
• Training on Tsunami Emergency Maps Plans and Procedures (TEMPP-1), November 2017, Indonesia
• 2nd Integrated Meetings, June 26 – July 14 2018, India
  • Trainings on TEMPP-2, Warning Centre Operations and SOPs
  • Working Group & Task Team Meetings
• Online Capacity Assessment of Tsunami Preparedness, June 2018
• Exercise IOWave 18, 04 – 05 September 2018
• Post-IOWave 18 Workshop, November 2018, Indonesia
• 13th Steering Group Meeting, November 2018, Indonesia
• Training on TEMPP-3, 2018, Indonesia
• TOWS-WG, February 2019, France
• ICG/IOTWMS XII, 3 – 6 March 2019, Iran
Thank you!

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