

**International Post-Tsunami Survey for the
Tsunami Palu-Donggala, Sulawesi Tengah – Indonesia, 28 September 2018
International Tsunami Survey Team – Palu
ITST-Palu 2018**

GUIDANCE

BACKGROUND, as of 18 October 2018

The 7.5 magnitude earthquake and subsequent tsunami that hit Palu and Donggala in Central Sulawesi Indonesia, Friday 28 September 2018, has killed at least 2,100 people (as on 15 October 2018). Some 680 people are missing, 4,612 injured and 78,994 are displaced in over three most affected areas, Donggala, Palu City, and Sigi. These events are characteristic of a catastrophic and complex disaster where major earthquakes triggered catastrophic liquefaction, landslides, and near-field tsunami which resulted in direct damage, impact, economic loss, and loss of life.

Preliminary US Geological Survey (USGS) analysis showed shallow left-lateral, strike-slip faulting, presumably along the Palu-Koro Fault that trends generally north-south from the North Sulawesi subduction zone in the Sulawesi Sea into the Makassar Strait just west of Sulawesi and into Palu Bay. The USGS Finite Fault solution shows the greatest slip (6-7 m) concentrated north of the epicenter, and a rupture time of about 25-30 sec. Normally, such type of faulting does not generate a significant tsunami in the regional and far field. IRISDES (Tohoku University) preliminary modeling using various source configurations, including uniform slip and finite fault solutions, predict local inundation heights up to 3.9 m.

Five minutes after the earthquake, the Indonesian Agency for Meteorology, Climatology and Geophysics (Badan Meteorologi Klimatologi dan Geofisika - BMKG) issued a tsunami warning for a local tsunami. Recently retrieved marigram from the Pantoloan - Sulteng tide gauge shows a 3.8 m trough-to-peak tsunami that arrived six (6) minutes after the earthquake's origin. There are no other nearby instrumental observations. Several analyses based on pictures, post disaster information, and video clips suggest the first tsunami wave hit the Palu beach area 7-12 minutes after the earthquake. Preliminary field surveys conducted by the BMKG and IRIDeS/Indonesia Ministry of Environment and Forestry/Chuo Univ report an eyewitness height of up to 11.3 m in Palu and 3-10 m on the west and east sides of the bay.

The last significant tsunami that occurred in this region was due to a M7.6 earthquake on 14 August 1968 in the region of Manimbaja Bay north of the 28 September 2018 epicenter. According to the Indonesian Hydrographic Service, the tsunami measured 9-10 m and inundated 500 m inland in the Donggala region; 160 people died and 40 remain missing; 800 coastal homes were destroyed and coconut plantations were flooded. Tambu and Mapaga villages were most affected. This earthquake was determined to have a normal faulting mechanism (strike 119 deg, dip 71 deg., Fitch, JGR, 1972).

ITST-PALU SUMMARY

UNESCO's Intergovernmental Oceanographic Commission and the Indonesian Institute of Sciences (LIPI) through the National Commission of Indonesia for IOC, the Coordinating Ministry for Maritime Affairs (CMAA), and the Ministry for Research, Technology and Higher Education (MORTHE) are coordinating post-tsunami by International Tsunami Survey Teams (ITST-Palu). The surveys will contribute to understanding the characteristics and impacts of the tsunami, and provide information to Government of Indonesia to enable enhancement of tsunami disaster risk management practices

For the purpose of coordination, the Coordinating Ministry for Maritime Affairs (CMAA) established an Indonesian National Tsunami Survey Team (NTST-Palu) consisting of researchers from BPPT, LIPI, BMKG and Universities.

The coordination effort by the International Tsunami Survey Team-Palu (ITST-Palu) and NTST-Palu is to ensure that the scientific surveys are well organized, effective, and productive. The coordination efforts will be centered in Jakarta. The goals include:

- Promote exchange of data among field teams
- Minimize logistical problems for visitors and hosts
- Link visitors to Indonesian collaborators
- Provide the Government of Indonesia (GoI) with a summary of the ITST-Palu findings

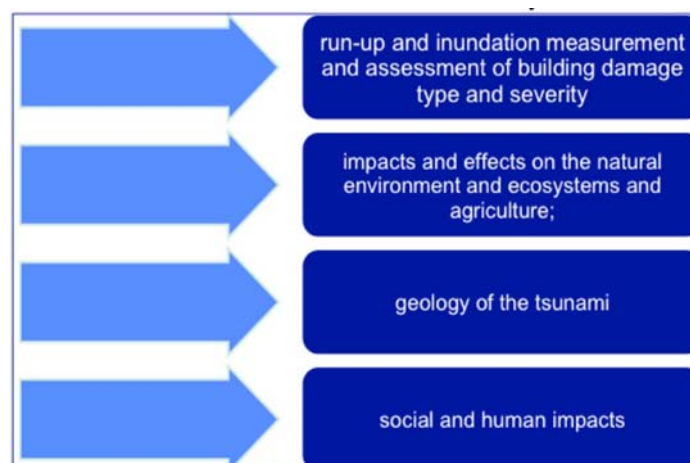
The international coordination for this effort will be handled by ITST-Palu Coordination Team (ICT). ICT members include representatives from the NTST-Palu, the Intergovernmental Oceanographic Commission (IOC/UNESCO), the Indian Ocean Tsunami Information Centre (IOTIC) and the International Tsunami Information Centre (ITIC) of IOC UNESCO.

The ITST-Palu and NTST-Palu encourage all Survey Teams to stay in regular contact with ICT headquarters in IOTIC – BMKG Programme Office in Jakarta.

Tsunami disasters attract a large number of local, national and international professionals to investigate scientific, economic and social impacts. Some of the data are perishable making it essential to collect and document them quickly. Important data may also be desirable from locations that are logistically difficult to access without local assistance. At the same time, Emergency Agencies are focusing on public safety, critical support lifelines and infrastructure, resource mobilization to meet its citizens immediate post-event emergency response needs. To carry out both efforts, coordination and cooperation is critical. If data from science teams are made available, it will immediately contribute to better-informed and ultimately, more practical and efficient response and recovery decision-making. Building from concepts employed in post-earthquake technical clearinghouses, the ITST-Palu will utilize a simplified implementation of a science/technical clearinghouse to provide an efficient framework for central coordination, information sharing and integration of the data collected from the 2018 Palu-Donggala Tsunami.

ITST-Palu will follow a format similar to the previous ITSTs (ITST-Chile 2010, ITST-Samoa 2009), but modified to recognize challenges in survey logistics and to accommodate language, religious, and cultural sensitivities for this geographic area. As such, similar to the ITST-Samoa, international researchers should team with Indonesian researchers to conduct collaborative surveys. To be efficient, the ITST-Palu will use readily-available telecommunication tools to streamline information sharing and coordination through secure electronic mediums hosted by the IOTIC-BMKG programme Office.

ITST-PALU GUIDING PRINCIPLES



1. The Mission of ITST-Palu is

- To understand the characteristics of the tsunami and its impact in both the near-source and distant regions
- Provide information on the impacts to the Government of Indonesia to enable it to enhance their tsunami disaster risk management practice

2. Logistics and Planning

ITST-Palu Coordination Team will consist of representatives from IOC UNESCO-IOTIC-ITIC and NTST-Palu. Their roles are the following:

Dr. Ridwan Djameluddin (Coordinating Minister for Maritime Affairs – CMMA), Dr. Zainal Arifin (Indonesian Institute of Sciences – LIPI), Dr. Muhammad Sadly (The Agency for Meteorology Climatology, and Geophysics – BMKG), and Director and Representatives of UNESCO Office Jakarta for the overall coordination. Ardito M. Kodijat (Indian Ocean Tsunami Information Centre - IOTIC of IOC/UNESCO) and Admiral Musa, Litanya, and Kian Sinki (the IOTIC-BMKG Programme Office) for day-to-day coordination. Dr. Srinivasa K Tummala, Nora Gale (ICG/IOTWMS Secretariat) and Dr. Laura Kong (ITIC IOC/UNESCO) for coordination support.

The ITST-Palu Coordination team will work with the NTST-Palu, international scientists, national scientists, and government officials to enable coordinated surveys and to keep information flowing amongst Survey Teams with the goal of seeking to minimize overlap and duplication.

Concerning transportation and lodging, the Survey Teams are responsible for their own transportation and lodging. IOTIC-IOC/UNESCO and local scientists may be able to assist if needed.

Concerning funding for the field work, IOC/UNESCO, NTST-Palu, and the Government of Indonesia will not be able to provide funding support to Survey Teams.

3. Teams may focus on the collection of one or more data types:

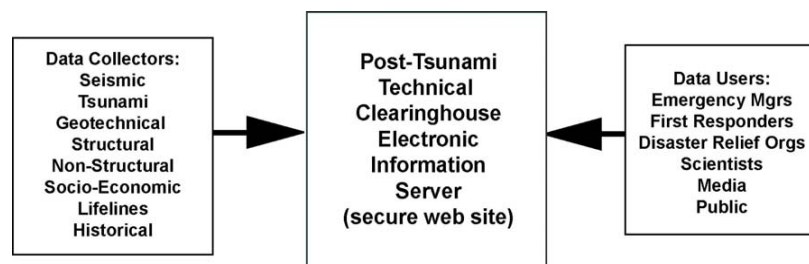
- Measure maximum tsunami inundation, flow depths, and maximum run-up; to the extent possible 'walk the inundation' line in order to collect an exact summary of the inundation of impacted communities.
- Collect geological samples of sediments left by the tsunami;
- Measure the type and severity of damage to different types of buildings and record what factors appeared to control damage levels;
- Collect and measure information about the environmental and biophysical system impacts of the tsunami;
- Collect information about survivor experiences and stories through interviews;
- Explore the human and community vulnerability and resilience factors at work in different places;
- Provide a map of the above information in their summary

4. Survey Team Guidance and Logistics

- Each team (International researcher jointly with National researcher) is required to arrange their research permit in Indonesia by making an online application on the MORTHE website at <https://frp.ristekdikti.go.id/index.php/register>. Requirements for the application are detailed in the accompanying ITST-Palu Visa and Permit Procedures Document. The grant of this research permit is expected to take 2 working days, and is also an important prerequisite for obtaining an appropriate visa for Indonesia (Free Visa or Visa on Arrival or Pre-departure/Calling Visa based on your country of origin). . If needed, the ITST-Palu Coordination Team can assist in processing the research permit working in collaboration with national partners;

- Prior to starting and before proceeding to Palu, Survey teams are requested to check-in with the ITST-Palu Coordination Team (ICT) at the IOTIC – BMKG Programme Office (Jakarta, BMKG) in Jakarta in order to receive their ITST badges and Situational Awareness information. International researchers are required to be accompanied by the national partner during the survey. After completion and before departing back to their country of origin, Survey teams are requested to debrief and share a summary survey outcomes to the ICT at the IOTIC – BMKG Programme Office (Jakarta, BMKG).
- A copy of all survey data and report needs to be submitted to the ICT and shared with the ITST-Palu, NTST-Palu and the Indonesian collaborator. Survey Team members (international and national) will not lose the rights to publish the data they collect. All Papers / Publications resulting from the survey should be made jointly with the Indonesian collaborators and uploaded to the MORTHE portal using the same login and password provided while applying for the research permit. Please refer to section 5 below for further information.
- Each team shall make known its dates of travel and survey plan to ICT which will make every effort to:
 - Compile the main objectives of each Survey;
 - Inform each Survey Team of activities done by other previous Surveys;
 - Inform each Survey Team on the general situation and present conditions;
 - For specific needs, assist to facilitate contacts, information, and other requests;
 - Receive the general outcomes of each Survey in order to facilitate the next Surveys.
- It is requested that local scientists or other local organizations or volunteers be included with your international team wherever possible. This is to bridge any language or cultural sensitivities, as well as to build local science experience and capacity.
- Please review the IOC Post-Tsunami Survey Field Guide (IOC Manual and Guides 37 – see <http://unesdoc.unesco.org/images/0022/002294/229456e.pdf>) and ensure that your surveys are consistent with these guidelines.
- ITST Tsunami Questionnaires (English and Indonesian) and Eyewitness Survey are available to guide your data collection work. These can be downloaded from http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=2081&Itemid=2400 You are encouraged to use them.
As needed, these can be translated into languages other than English.

5. Information Sharing and Reporting



Each Survey Team coordinated through ITST-Palu is requested to submit to ITST-Palu, within 6 weeks of concluding the Field Survey, a one-page summary plus eventual pictures or maps, to be used for further guidance.

The ITST-Palu and NTST-Palu are committed to preserve the data and intellectual property rights of the scientists who collect and interpret these important data. ITST-Palu and NTST-Palu also recognizes the high value of the data to governments for response and recovery planning, as well as for information sharing to enhance science and knowledge about tsunamis and to improve tsunami mitigation. To enable these activities, ITST-Palu and NTST-Palu commits to the following:

- As ITST-Palu members are volunteers from organizations and research centers with related interests, survey participants should not lose the rights to publish data they collect. No data or outcomes from the Summary Report to the Government of Indonesia (GoI) or data provided to other governments, will be released publicly for one year;
- At the conclusion and after quality-control by each Survey Team, the ITST-Palu Coordination Team will compile a Summary Report based on summaries received. The estimated delivery date of the report will be 6 months after the completion of the ITST-Palu surveys. The Report will be shared with the Government of Indonesia only.
- The IOTIC will provide a secure ITST-Palu electronic platform (UNESTEAMS ITST-Palu) for data collectors to upload Survey metadata and data. The site will also contain Survey Team information, briefing reports, and other related information. Simple upload forms or spreadsheets will be provided to facilitate this process. Before and during fieldwork, Teams can upload daily Survey metadata in order to share and to keep track of progress and coverage.

ITST-Palu Coordination Team - Contact Information:

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