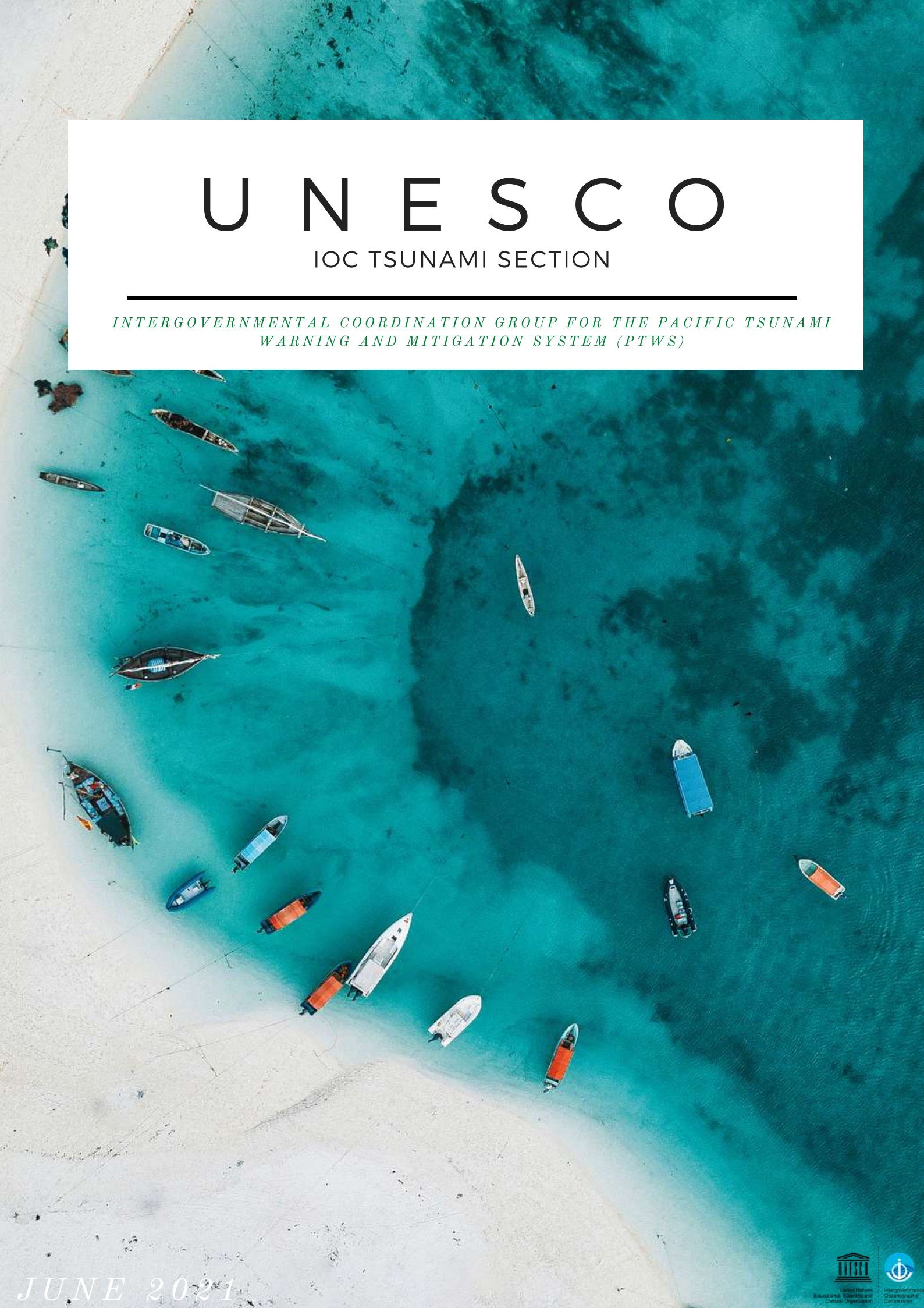


UNESCO

IOC TSUNAMI SECTION

INTERGOVERNMENTAL COORDINATION GROUP FOR THE PACIFIC TSUNAMI WARNING AND MITIGATION SYSTEM (PTWS)

JUNE 2021

SUMMARY

The Snapshots aim to bring the work of the IOC UNESCO REGIONAL Tsunami Early Warning System (TEWS) to a wider audience. This project of the IOC UNESCO Tsunami Section takes place within the framework of the United Nation Decade of Ocean Science for Sustainable Development and its Safe Ocean Outcome. It complements the more specialized fact sheets by highlighting actions, communities, officials, events, tsunami service providers and tsunami information centers.

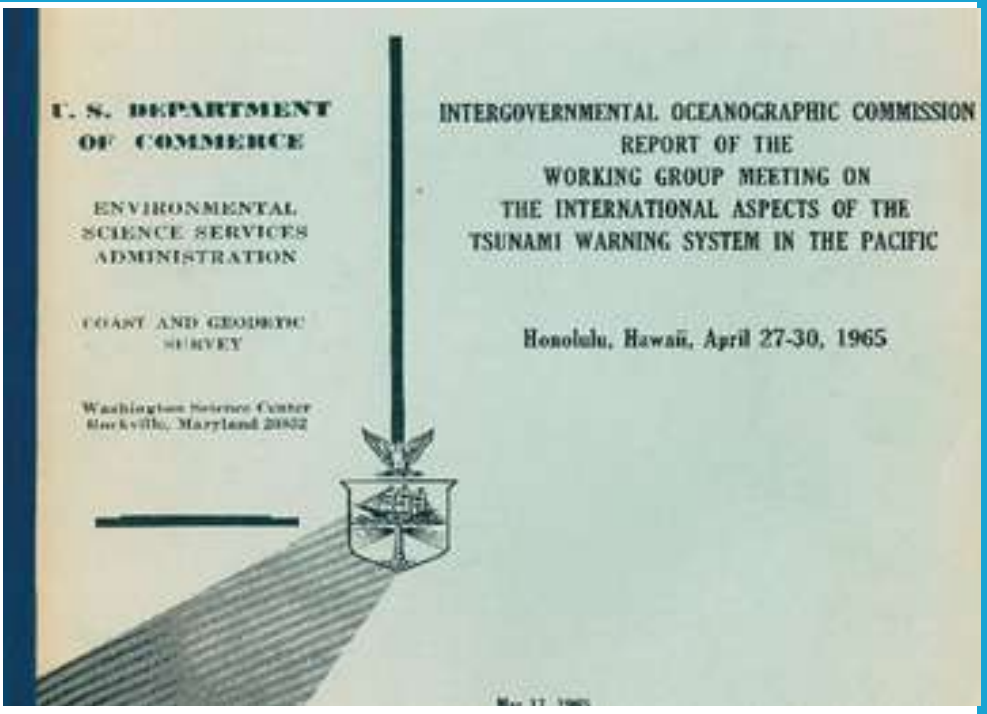
The largest earthquake recorded in the 20th century with a magnitude of 9.5 occurred on the coast of southern Chile on 22 May, 1960, and generated a Pacific-wide tsunami that travelled across the Pacific causing substantial damage and loss of life along the Pacific Coast of Chile, in Hawaii, Japan and the Philippines.

In response to this Pacific-wide catastrophic event, the International Coordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU) was established in 1965 to provide timely and reliable alerts that depended on the free and open sharing of seismic and sea level data to continuously monitor and evaluate tsunamigenic events with the robust international communication systems for timely dissemination of alerts to all countries.

ICG/ITSU was renamed to International Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) in 2005 to focus on commitments of Member States to continually embrace the comprehensive nature of tsunami risk reduction.

ICG/PTWS is a subsidiary body of the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

IOC Report of the Working Group Meeting on the International Aspects of the Tsunami Warning System in the Pacific, Honolulu, Hawaii, April 27-30, 1965


U. S. DEPARTMENT OF COMMERCE

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

COAST AND GEODETIC SURVEY

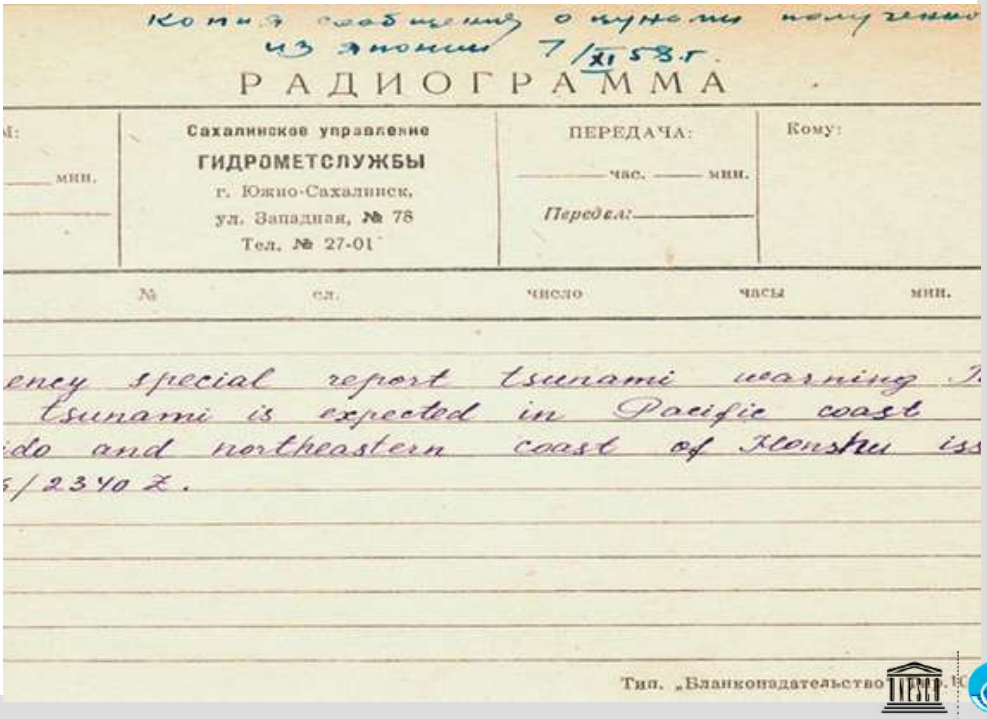
Washington Science Center
Rockville, Maryland 20852

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
REPORT OF THE
WORKING GROUP MEETING ON
THE INTERNATIONAL ASPECTS OF THE
TSUNAMI WARNING SYSTEM IN THE PACIFIC

Honolulu, Hawaii, April 27-30, 1965

"I ran back and climbed up the Tava tree. There was no time to run to the bush because the wave was coming really fast" says Tevita Afa, 16 years-old. Soakimi Maka Finau drew sketches of Tongan survivors' accounts of the September 2009 Samoa Islands Regional tsunami. (Credit: S. M. Finau.)

The first tsunami warning was issued by the YuzhnoSakhalinsk Tsunami Center after a strong earthquake on November 7, 1958, on the basis of a radiogram received from the Japan Meteorological Agency. This earthquake had a higher maximum intensity and was even felt in Sakhalin Island, but the tsunami it generated was weaker. Today, tsunami monitoring, prediction and warning for the Pacific coast of Russia are provided by three 24x7 operation regional centres in Yuzhno-Sakhalinsk, Petropavlovsky-Kamchatsky and Vladivostock. (Credit: YuzhnoSakhalinsk TWC)


Коми з сообщение о цунами получено из Японии 7/XI 58 г.

РАДИОГРАММА

Сахалинское управление
ГИДРОМЕТСЛУЖБЫ
г. Южно-Сахалинск,
ул. Западная, № 78
Тел. № 27-01

ПЕРЕДАЧА: ____ час. ____ мин.
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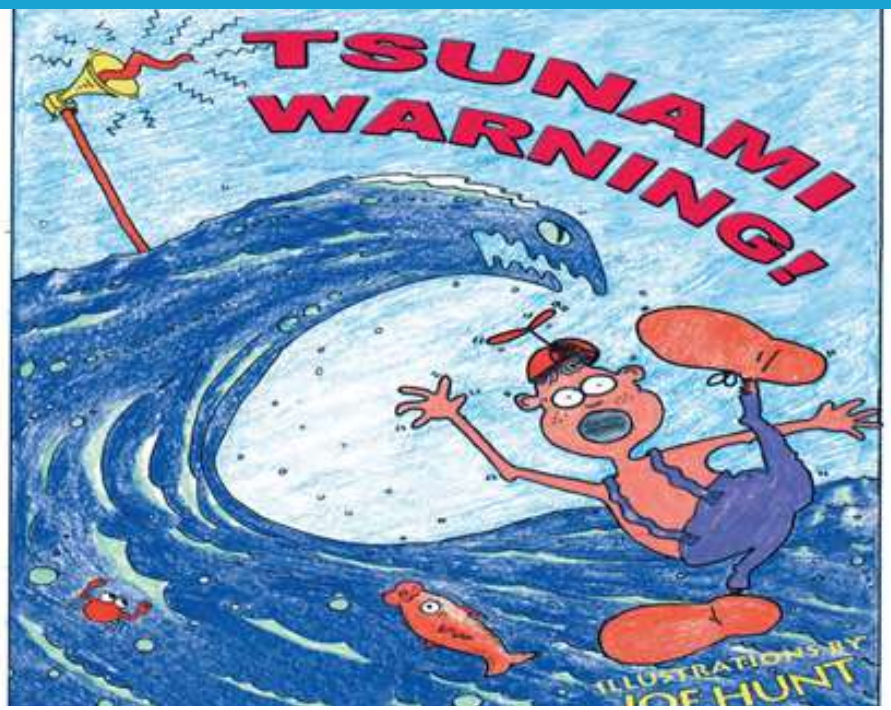
ency special report tsunami warning
tsunami is expected in Pacific coast
ido and northeastern coast of Honshu iss
/2340 Z.

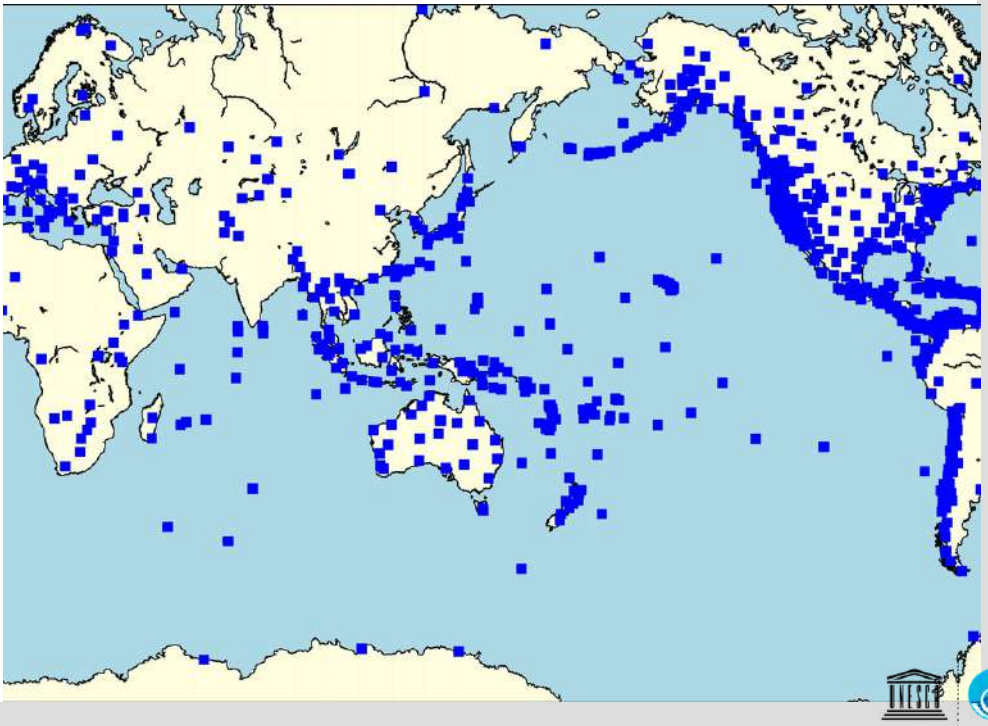
Тип. „Бланкоиздательство"

The ITIC and IOC have created many basic tsunami awareness materials to globally support all countries. Many materials are available in multiple languages. Tsunami Warning! was published in 1993 to describe what happens in Hawaii after a great earthquake generates a tsunami off Alaska. After the 2004 tsunami, the United Nations Office for Disaster Risk Reduction (UNDRR) asked the ITIC to create versions in in Indonesian, Thai, Sri Lankan, and Maldivian. Spanish versions are available for the Caribbean and Central and South America. (Credit: ITIC)



Honolulu Observatory, 1911 : Earthquake monitoring services were carried out initially by the USA's Honolulu Observatory

Core seismic monitoring network used by the Pacific Tsunami Warning Center to monitor earthquakes around the world, January 2015. After the 2004 Indian Ocean Tsunami, the monitoring networks were densified. (Credit: PTWC)



OUR VISION AND MEMBERSHIP

PACIFIC TSUNAMI WARNING AND MITIGATION SYSTEM (PTWS)

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System first convened in 1968 (ICG/PTWS, formerly known as ICG/ITSU). PTWS is an international cooperative effort involving Member States of the Pacific, that meets regularly to review progress and coordinate activities resulting in improvements of the tsunami services for the region.

Twenty-eighth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-XXVIII), Barceló Montelimar, Nicaragua, from 2 to 5 April 2019

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

OFFICIALS

DR. WILFRIED STRAUCH: CHAIRPERSON

Wilfried Strauch works at the Executive Directorate of INETER (Nicaraguan Geosciences Institute) as an Advisor on Geosciences for the Nicaraguan government and the Director of INETER. Since 2017, he is Chair of the Intergovernmental Coordination Group of the Pacific Tsunami Warning and Mitigation System (ICG/PTWS). Wilfried studied Physics at the Humboldt University in Berlin, Germany, and then worked as a seismologist at the Geophysical Institute in Potsdam, Germany. In 1989, he completed his PhD on the development and application of methods and software for the monitoring of earthquakes and nuclear explosions at the Berlin Academy of Sciences. Since 1989, he has been working in Nicaragua, performing research at INETER in Seismology, Tsunamis, Landslides, Volcanology, Geoinformatics (GIS) and Disaster Mitigation. He coordinated or participated in many scientific and development projects in Nicaragua and in Central and South America together with other national and international groups and is author or co-author of numerous publications on these topics. Wilfried led or participated in the monitoring and investigating of several natural disasters in Nicaragua and Central America. He led the development of the Nicaraguan seismic network, and the volcano and landslide monitoring and early warning system and, in 1996, he was responsible for the establishment of the Nicaraguan tsunami warning system. In 2008-2010, Wilfried worked with the Federal Institute for Geosciences (BGR, Germany) on the establishment of GIS systems for disaster prevention and mitigation in Nicaragua and Central America, including tsunami hazard mapping. In 2010, he studied the performance of the Chilean Early Warning System during the disastrous earthquake and tsunami on 27/03/2010 for the Chilean Civil Protection Agency (ONEMI). From 2011 to 2014, he worked as the scientific director of the Seismological Observatory of Western Panama (OSOP) in the development and application of seismological instrumentation and software in Central America. In 2012-2014, he was the coordinator of the scientific area of the Central American Disaster Prevention and Mitigation Center (CEPREDENAC, Guatemala). Since 2015, he has been the coordinator of the Central American Tsunami Advisory Center (CATAC) established at INETER, Nicaragua, together with the Japanese technical cooperation. Since 2016, Wilfried has coordinated the establishment of the Earthquake Early Warning System in Nicaragua in cooperation with other Central American countries and the Swiss Seismological Service.

DR. LAURA KONG: SECRETARIAT

Dr. Kong has been the Director of the ITIC since 2001. As Director, she oversees a Centre that supports the Intergovernmental Oceanographic Commission in its efforts to deploy tsunami warning and mitigation systems globally, and that works directly with the 46 Member States of the Intergovernmental Co-ordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) to strengthen national tsunami warnings and preparedness. In this capacity, the ITIC works closely with the USA Pacific and National Tsunami Warning Centers, the Japan Meteorological Agency, and other national tsunami warnings centres. The ITIC has been primary provider of information and expertise for technology transfer, awareness, training and capacity building in tsunami warning and mitigation for the IOC. Since the 2004 Indian Ocean tsunami, Dr. Kong has been actively involved in the IOC's coordination and development of systems in the Indian Ocean, Caribbean and adjacent regions, and Mediterranean Seas and north Atlantic Ocean. Within the United Sates, Dr. Kong serves as the Hawaii State Tsunami Advisor and as Chair of the Mitigation and Education Subcommittee of the US National Tsunami Hazard Mitigation Program. She is the former Chair of the Hawaii State Earthquake Advisory Committee, and a member of the Hawaii State Hazard Mitigation Forum. Previously, she was with the Pacific Tsunami Warning Center, the University of Hawaii's Hawaii Institute of Geophysics, the U.S. Geological Survey's Hawaiian Volcano Observatory, and the University of Tokyo's Earthquake Research Institute. She was born and raised in Honolulu, Hawaii, is a graduate of Brown University and received her doctorate in Marine Seismology from the Massachusetts Institute of Technology and Woods Hole Oceanographic Institution in 1990.

JIUTA KOROVULAVULA : SECRETARIAT

Mr. Jiuta Korovulavula joined the Intergovernmental Oceanographic Commission (IOC) Tsunami Programme as the National Programme Officer Disaster Risk Reduction (DRR) and Tsunami Warning in 2018 based in Suva, Fiji. He provides technical secretarial support to 19 Member States of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) Pacific Islands Countries and Territories Regional Working Group for Tsunami Warning and Mitigation System (WG-PICT). Mr. Korovulavula works particularly closely with members of the Council of Regional Organizations of the Pacific (CROP), as well as the Pacific Community (SPC) and other development partners to coordinate capacity development, technology transfer and support to tsunami operational exercises, public awareness campaigns, designing of standard operating protocols, evacuation mapping, safe evacuation routes and tsunami evacuation drills for Southwest Pacific Member States at national and sub-national level. Additionally, Mr Korovulavula provides technical support for the Oceania Regional Seismic Network (ORSNET) Member States.
Mr. Korovulavula has more than 10 years of professional experience in sustainable development initiatives at local, national, regional and global levels. As a consultant, he worked closely with the Fiji National Disaster Management Office (NDMO) in the design of tsunami drill exercises using ICT (Information Communication Technologies) and GIS (Geographical Information Systems) capabilities to strengthen national, sub-national and local tsunami preparedness. In 2017, he led a team of IT and GIS experts to design the first Disaster Risk Management mobile application for the Fiji NDMO. In addition, Mr. Korovulavula has more than 10 years of professional experience in civil society, having worked with Pacific Island governments, members of the Council of Regional Organizations of the Pacific (CROP) and communities on strengthening community governance systems. He has a Bachelor of Marine Studies from the University of the South Pacific.

TSUNAMI SERVICE PROVIDERS AND TSUNAMI INFORMATION CENTRE

Dr. Charles S. McCreery, head of the TSP

PTWC
PACIFIC TSUNAMI WARNING CENTER

The U.S began issuing official tsunami warnings in 1949 in response to the 1946 tsunami generated in the Aleutian Islands that devastated Hilo, Hawaii. Following the establishment of the ICG/PTWS in 1968, the US offered the Ewa beach centre as the operational headquarters for the Pacific Tsunami Warning System and the facility was re-named the Pacific Tsunami Warning Centre (PTWC). PTWC works closely with other international, regional, and national centres in monitoring seismic and sea level stations around the Pacific Ocean for large earthquakes and tsunami waves. The PTWC makes use of over 700 high-quality seismic stations around the world to locate and size potentially tsunamigenic earthquakes, and accesses over 700 coastal sea level and 60 deep-ocean pressure systems (DART, tsunameters) globally to verify the generation of and evaluate the severity of a tsunami.

ITIC
INTERNATIONAL TSUNAMI INFORMATION CENTRE

Located in Honolulu, the International Tsunami Information Centre (ITIC) was established under Resolution IV-6 in November 1965 by the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO). It is hosted by the US National Oceanic and Atmospheric Administration (NOAA) National Weather Service, which provides the Director and office staff in Honolulu, Hawaii. Since 1998, Chile's Naval Hydrographic and Oceanographic Service (Servicio Hidrográfico y Oceanográfico de la Armada de Chile) has provided the Associate Director. ITIC's mandate and functions supporting Member States of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS, formerly ITSU) were approved by IOC Resolution X-23 (1977). ITIC maintains and develops relationships with scientific research and academic organizations, civil defense agencies, and the general public in order to carry out its mission to mitigate hazards associated with tsunamis by improving tsunami preparedness for all Pacific Ocean nations. ITIC is also assisting in the development and implementation of tsunami warning and mitigation systems globally (IOC Resolutions XXIII-12, 13, and 14 (Indian, Caribbean, and Mediterranean respectively,2005).

TSUNAMI READY COMMUNITIES

TAMARINDO AND SÁMARA, COSTA RICA, RECOGNIZED TSUNAMI READY

Tamarindo and Sámara were recognized as Tsunami Ready by the UNESCO Intergovernmental Oceanographic Commission in 2021. Tamarindo is subject to tsunami hazard and at the same time is an important area for national and international tourism. That is why the tourist sector, grouped at the Integral Development Association, took a very active role during the process of Tsunami Ready recognition. Tamarindo performed an online tabletop due to the pandemic on September 2020. In Sámara, all neighborhoods participated, created their own warning dissemination system, and supported the deployment of the tsunami evacuation signs donated by the International Migration Organization.

Tamarindo, Costa Rica

Sámara, Costa Rica

TSUNAMI READY IN SAMOA

The Village of Savaia in Lefaga district on the Island of Upolu, Samoa, was recognized as Tsunami Ready on 20th June 2017. Samoa became the first Pacific Island Country in the Southwest Pacific and the second country in the PTWS to pilot the UNESCO–IOC ICG/PTWS Tsunami Ready Guidelines. The Samoa National Tsunami Ready Board (NTRB) conducted a site verification visit from June 14-16 to review, evaluate and approve Savaia village Tsunami Ready Application. The Application included a Savaia village disaster response plan outlining the roles and responsibilities of a village disaster management committee in receiving and disseminating hazard warning information. Under the village disaster management committee is an eight-member warning team with Standard Operation Procedures (SOPs) for before, during and after a disaster. The warning team was the designated focal point for National Warning System. Savaia village customized the tsunami signage to their local language. The village disaster response plan was tested during the Pacific WAVE Exercise in 2017. The NTRB continues to review and evaluate the design of the community-based disaster risk management programme for the development of a Village Disaster and Climate Risk Management plan to include the 10 Tsunami Ready guidelines.

: Savaia Community Disaster Committee

United Nations Educational, Scientific and Cultural Organization
Intergovernmental Oceanographic Commission

TSUNAMI EVENTS

THE 2009 SAMOA TSUNAMI

On 29th September 2009, an 8.1 magnitude submarine outer-rise earthquake occurred at 6:48am local time on the Kermadec-Tonga Subduction Zone. An outer-rise earthquake occurs on the subducting or downgoing plate before it enters the subduction zone. The other tsunamigenic outer-rise earthquake occurred in 1933 in Sanriku, Japan, and in 1977 in Indonesia which resulted in over 3000 deaths and extensive damages.

This atypical tsunamigenic earthquake generated a tsunami with wave height of 22 meters that caused damage and loss of life in Samoa, American Samoa, and Tonga, killing 189 people, the majority in Samoa. The government of Samoa estimated total damage at US$ 147.25 million. A total of 20 villages, including resorts and infrastructures, were destroyed. It was reported that a 6-meter-high tsunami hit Pagopago, American Samoa, killing 32 people, injuring over one hundred people and destroying 200 homes and businesses. In Tonga, which was located closest to the epicenter of the earthquake, nine people were reported dead and 90 percent of homes and local infrastructure were damaged on the northern island Niuatoputapu.

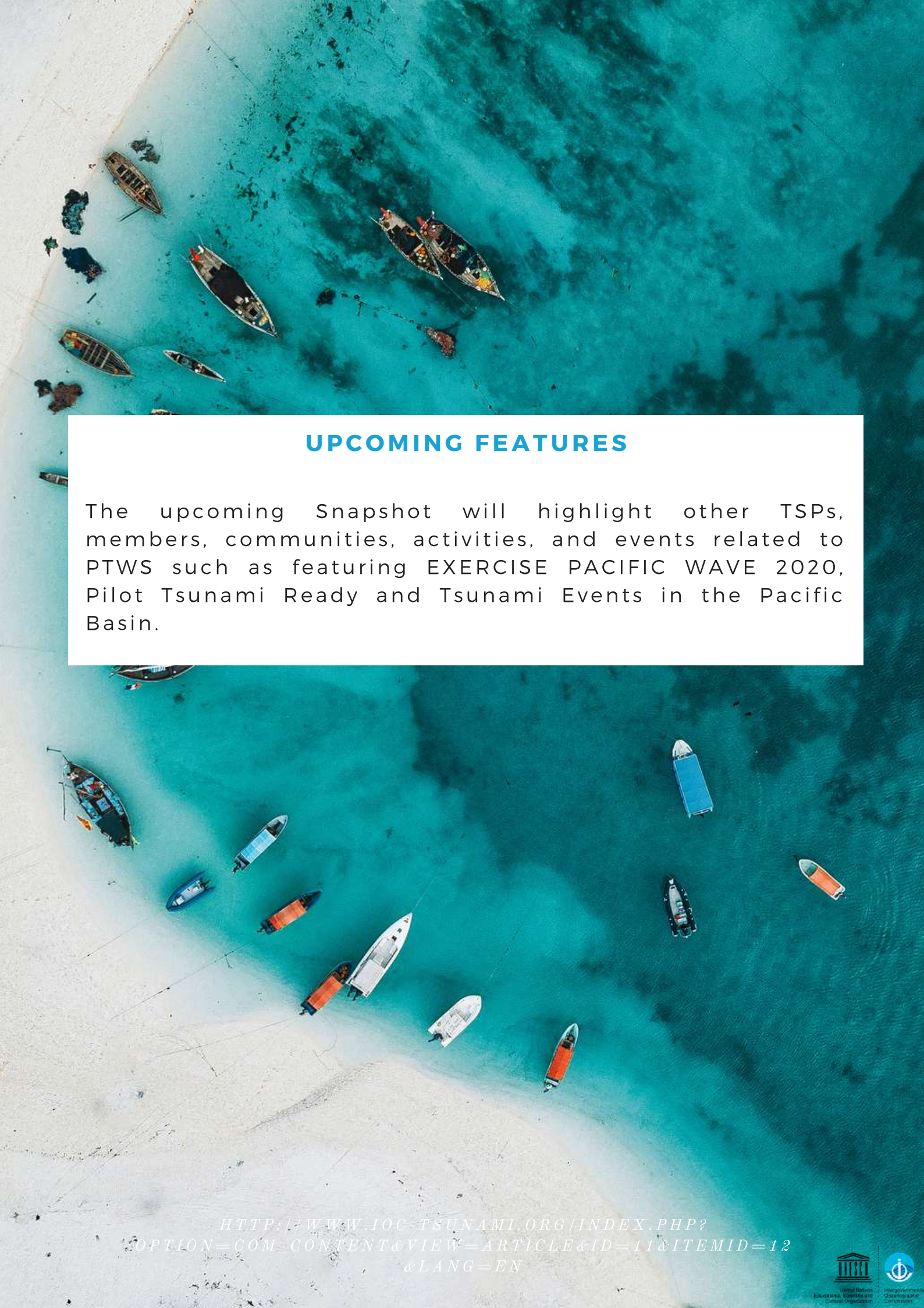
A post tsunami survey on Samoa and American Samoa found the generating earthquake to be different from those that commonly cause tsunamis. The impact of the tsunami on the shoreline varied. The coral reefs effect on inundation seems to be a proof of strong return flow. The survey also showed the effectiveness of tsunami education and awareness in reducing deaths and injuries. Most of the local people in Samoa and American Samoa self-evacuated to higher ground just in time before the tsunami arrived when they felt the early morning earthquake. Some witnessed the withdrawal of the sea from the shore. In an interview, one survivor said, “Thank God it didn’t happen at night.”

THE 1896 SANRIKU TSUNAMI

Before the 2011 Tohoku Tsunami, an 8.5 magnitude earthquake occurred on 15th June 1896, on the west of Japan Trench and off the coast of Sanriku. This earthquake generated the most devastating tsunami event in Japanese history. The earthquake occurred at 19:32 local time causing a tsunami that killed 28, 000 people and caused damages along 170 miles. Waves, which reached the height of 38.2 meters, were said to be generated by the tsunami in combination with the rias shoreline and high tide. Victims were found physically damaged and heavily scarred, and 8891 homes were instantly swept away.

Local villages were celebrating a Shinto holiday and the return of a soldier who served in the Sino-Japanese War. Minor shocks were felt during a family dinner, but no one was concerned because they caused no damage. Interestingly, several strange phenomena were reported in the area; dried up wells, low water level of wells, a large school of sardines off the coast and a large catch of tunas every day. A research report concluded that the high death toll was attributed to the fact that few people noticed the minor shocks of the earthquakes and those who noticed them were not concerned about a tsunami nor knew to evacuate to a higher inland location.

The tsunami was observed across the Pacific. According to the San Francisco Chronical of June 16, 1896, a 9.5 feet wave was observed in California. In Hawaii, waves were demolished, and several houses swept away. Tsunami research in Japan was strengthened following the 1896 Sandriko tsunami.



UPCOMING FEATURES

The upcoming Snapshot will highlight other TSPs, members, communities, activities, and events related to PTWS such as featuring EXERCISE PACIFIC WAVE 2020, Pilot Tsunami Ready and Tsunami Events in the Pacific Basin.

HTTP://WWW.IOC-TSUNAMI.ORG/INDEX.PHP?OPTION=COM_CONTENT&VIEW=ARTICLE&ID=11&ITEMID=12&LANG=EN