

UNESCO IOC TSUNAMI READY



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Flash drive Tsunami Decision Support Tools TsuCAT



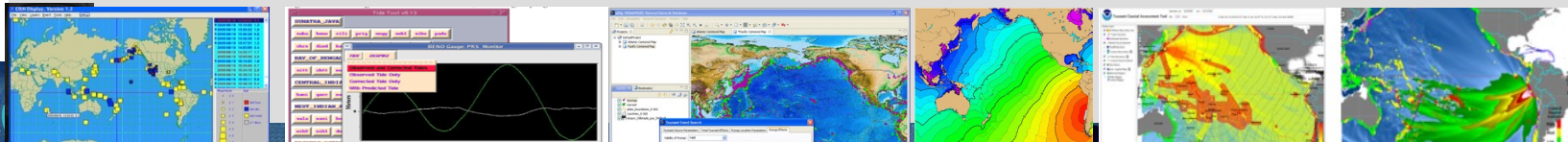
Tsunami Warning Decision Support Tools



ITIC-distributed, supported



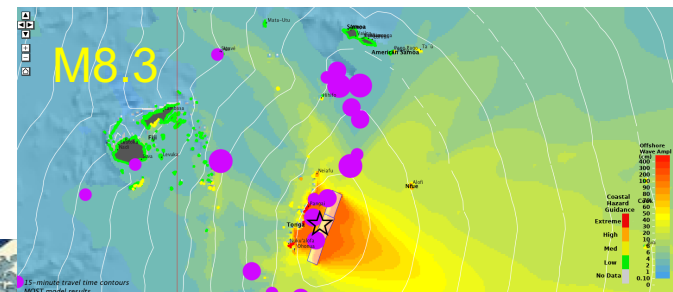
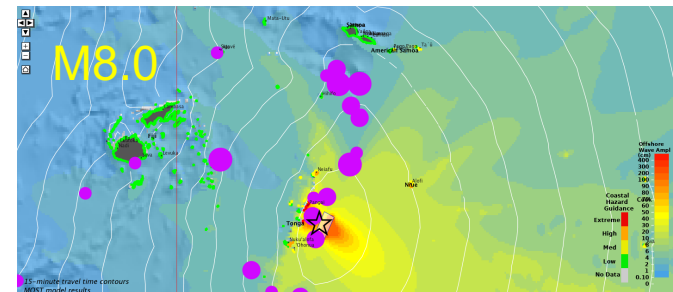
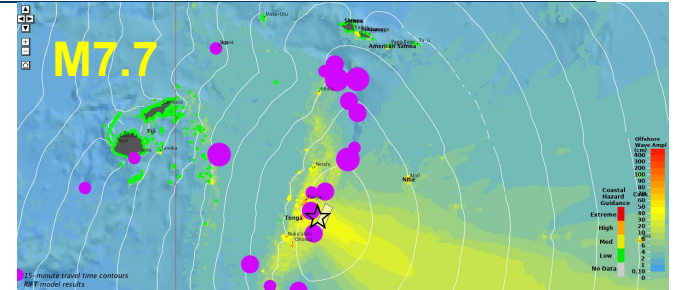
- ❑ **Tsunami Bull Board** (ITIC, 1995) 507 science/tsu/govt (Sep 2021)
- ❑ **Real time EQ Display** (CISN, USGS / NTHMP, 2005), ~250 **v2.0.238**
- ❑ **Real-time Sea Level monitoring**
 - Tide Tool – TWC operations monitoring (PTWC, 2005) **v10.69**
 - IOC Sea Level Monitoring web site (IOC, 2008)
- ❑ **Tsunami Travel Time Software** (ITIC, NGDC, 2007) – **SDK4.0.1**
- ❑ **Tsunami Historical Database** Online (WDS-NCEI), Offline (TsuDig, NCEI, ITIC, 2009)
- ❑ **Tsunami Hazard Assessment Tools** (2017)
 - ❑ **ComMIT/MOST - TEMPP** => planned as **OTGA hybrid 2022-2023**
 - ❑ **Tsu Coastal Assessment Tool (TsuCAT v4.2)** => [2022 TR Community Exercises](#)



TsuCAT – Tool Applications



- ❑ **Hazard Assessment** - worst case, or likely impact
- ❑ **Exercise development** – scenario development, PTWC exercise messages
- ❑ **Response Planning** – use scenarios to develop tsunami response plans, procedures (SOPs)
- ❑ **Warning decision making** – estimate tsunami impact with nearest similar scenario (early assessment prior to receiving PTWC forecast)
- ❑ **Features:**
 - Database: ~5400 earthquake scenarios from active subduction zones - Pacific, Caribbean, Indian Ocean (M6.5-9.5)
 - NOAA models (MOST/SIFT (M8+), RIFT (M6.5-7.9))



Exercises – GUI to generate PTWC Messages – 1957 Kamchatka M9.0



1957 Kamchatka M9.0

TEST...TSUNAMI MESSAGE NUMBER 31...TEST
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
0500 UTC WED APR 3 2019

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...
...TEST PTWC FINAL TSUNAMI THREAT MESSAGE TEST...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE ****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
UNESCO/IOC PACIFIC TSUNAMI WARNING AND MITIGATION SYSTEM AND IS
MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE ****

THE TSUNAMI FORECAST IS UNCHANGED IN THIS MESSAGE.

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

- * MAGNITUDE 9.0
- * ORIGIN TIME 0000 UTC TUE APR 2 2019
- * COORDINATES 52.8 NORTH 160.1 EAST
- * DEPTH 22 / 14 MILES
- * LOCATION OFF THE EAST COAST OF THE KAMCHATKA PENINSULA, RUSSIA

TEST... EVALUATION ...TEST

- * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 9.0 OCCURRED
OFF THE EAST COAST OF THE KAMCHATKA PENINSULA, RUSSIA AT 0000 UTC TUESDAY
APRIL 2 2019

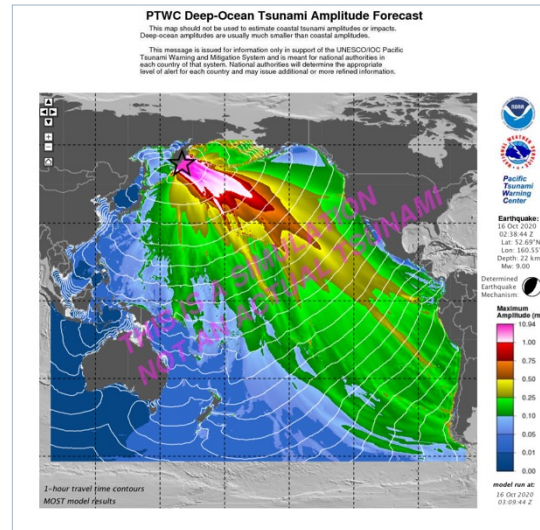
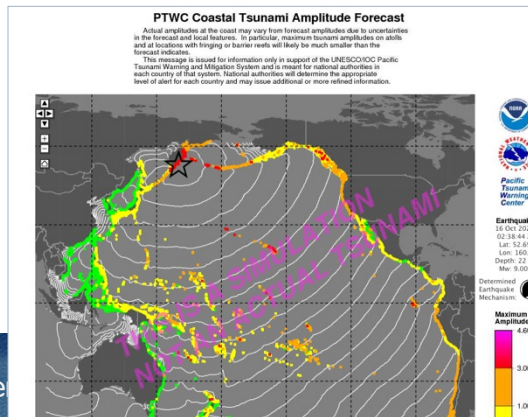
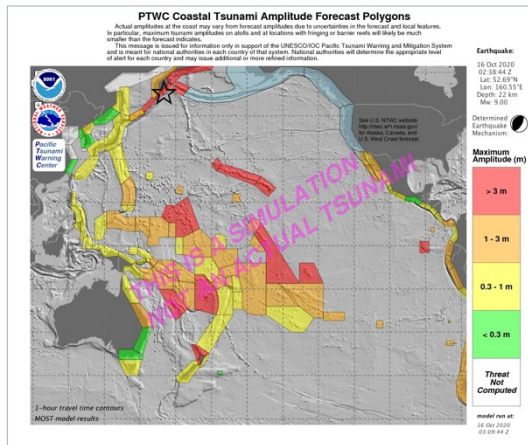
- * THIS IS A TEST MESSAGE.
- * BASED ON ALL AVAILABLE DATA... THE TSUNAMI THREAT FROM
THIS EARTHQUAKE HAS NOW PASSED.

TEST... TSUNAMI THREAT FORECAST...UPDATED ...TEST

- * THE TSUNAMI THREAT HAS NOW LARGELY PASSED.

TEST... RECOMMENDED ACTIONS ...TEST

- * THIS IS A TEST MESSAGE.
- * GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS
SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY LOCAL...



*** THIS IS A SIMULATION, NOT AN ACTUAL TSUNAMI ***
*** THIS IS A SIMULATION, NOT AN ACTUAL TSUNAMI ***

PTWC TABLE OF FORECAST STATISTICS FOR REGIONAL POLYGONS - RUN ID 2020101603944
(for internal use only - not for distribution)

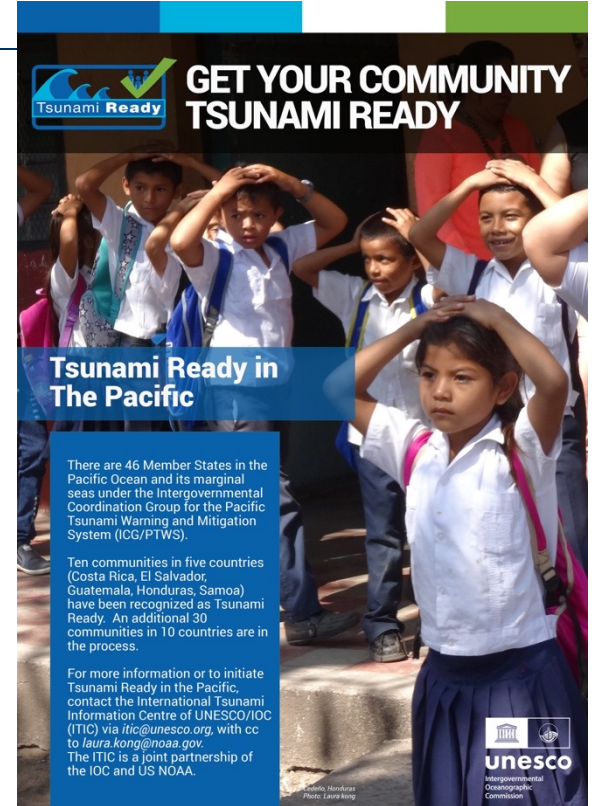
Earthquake - Origin: 10/16/2020 02:38:44 UTC Coordinates: 52.7N 160.5E Depth: 022km Magnitude: 9.0

This table is issued for information only in support of the UNESCO/IOC Pacific Tsunami Warning and Mitigation System and is meant for national authorities in each country of that system. National authorities will determine the appropriate level of alert for each country and may issue additional or more refined information.

Actual amplitudes at the coast may vary from forecast amplitudes due to uncertainties in the forecast and local features. In particular, maximum tsunami amplitudes on atolls will likely be much smaller than the forecast indicates.

Region Name	Coastal Forecast (meters)					Offshore Forecast (meters)					Total
	Maximum	Mean	Median	STD	STD	Maximum	Mean	Median	STD	STD	
Pacific_Coast_of_Kamchatka_Russia	28.03	17.63	21.21	7.55	4.68	2.93	3.58	1.29	157	157	
Komandorsky_Islands_Russia	11.03	5.96	2.86	4.00	1.91	1.01	0.46	0.69	38	38	
Bering_Sea_Coast_of_Eastern_Russia	29.92	2.27	2.41	1.03	1.44	0.40	0.41	0.17	264	264	
Kuril_Islands_Russia	6.16	1.42	0.87	1.35	1.08	0.25	0.15	0.24	94	94	
Line_Islands_Kiribati	4.86	2.53	2.01	1.14	0.81	0.42	0.34	0.19	147	147	
Marquesas_Islands	4.51	2.18	1.13	1.65	0.74	0.25	0.16	0.28	3	3	
Galapagos_Islands	4.38	1.74	1.66	0.63	0.53	0.27	0.26	0.07	24	24	
Midway_Island	4.32	1.97	1.77	0.71	0.76	0.33	0.28	0.12	94	94	
Northwestern_Hawaiian_Islands	3.79	3.24	3.39	0.41	0.54	0.51	0.54	0.06	13	13	
Society_Islands	3.60	2.52	2.36	0.81	0.63	0.41	0.36	0.13	5	5	
Vanuatu	2.98	0.58	0.52	0.28	0.40	0.10	0.09	0.04	188	188	
Vanuatu:Tafea	2.98	0.51	0.45	0.41	0.40	0.09	0.08	0.05	38	38	
Society_Islands	2.81	0.65	0.62	0.38	0.32	0.13	0.13	0.04	35	35	
South_Central_Chile	2.74	1.53	1.40	0.34	0.46	0.27	0.25	0.06	156	156	
Southern_Chile	2.74	1.48	1.51	0.54	0.46	0.25	0.25	0.09	349	349	
New_Caledonia	2.68	0.41	0.40	0.27	0.39	0.07	0.07	0.04	153	153	
Palmyra_Island	2.63	2.63	2.63	0.00	0.42	0.42	0.42	0.00	1	1	

UNESCO IOC Tsunami Ready Building Community Resiliency (especially for local tsunamis)



Tsunami Ready GET YOUR COMMUNITY
Tsunami Ready **Tsunami Ready**

Tsunami Ready in The Pacific

There are 46 Member States in the Pacific Ocean and its marginal seas under the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS).

Ten communities in five countries (Costa Rica, El Salvador, Guatemala, Honduras, Samoa) have been recognized as Tsunami Ready. An additional 30 communities in 10 countries are in the process.

For more information or to initiate Tsunami Ready in the Pacific, contact the International Tsunami Information Centre of UNESCO/IOC (ITIC) via itic@unesco.org, with cc to laura.kong@noaa.gov. The ITIC is a joint partnership of the IOC and US NOAA.

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Photo: Laura Kong

unesco
Intergovernmental
Oceanographic
Commission

PTWS-XXIX

Adopts and continues to implement the UNESCO-IOC Tsunami Ready Guidelines and Indicators as the international standard for evidence-based community preparedness for tsunamis;

Urges the publication of *IOC MG 74 Standard Guidelines for the Tsunami Ready Recognition Programme* to support implementation of Tsunami Ready;

Urges Member States to use these Guidelines to implement Tsunami Ready in their communities;

Encourages Member States to identify the communities at risk from tsunamis where Tsunami Ready and like initiatives would be targeted,

Noting that some Member States already have similar tsunami hazard mitigation programmes in place, **encourages** Member States that apply other programmes, to confirm alignment with the twelve UNESCO IOC Tsunami Ready Indicators in relevant communities and report outcomes;

Mandates the International Tsunami Information Center (ITIC) to facilitate implementation of and documentation collation for UNESCO IOC Tsunami Ready Programme and other like initiatives in the PTWS:

OCEAN DECADE TSUNAMI PROGRAMME

Seeking Major Advances in SCIENCE and PREPAREDNESS

New
observational and
analysis technologies to
move from a **high-uncertainty**
assumption-based capability
to a **low-uncertainty**
dynamic-based
capability

RESILIENCE!

Communities
respond to tsunami threats
by combining accurate

1. Real-time impact forecasts

with

2. Deep community preparedness.

Tsunami disaster impacts
are minimized, enabling rapid
restoration of critical
infrastructure and services

Comprehensive
institutional & community
preparedness
and capacity building
efforts aimed at achieving
IOC Tsunami Ready
designation across
all socio-economic
categories



OCEAN DECADE TSUNAMI PROGRAMME

A SAFE OCEAN

THE MAIN SOCIETAL OUTCOME

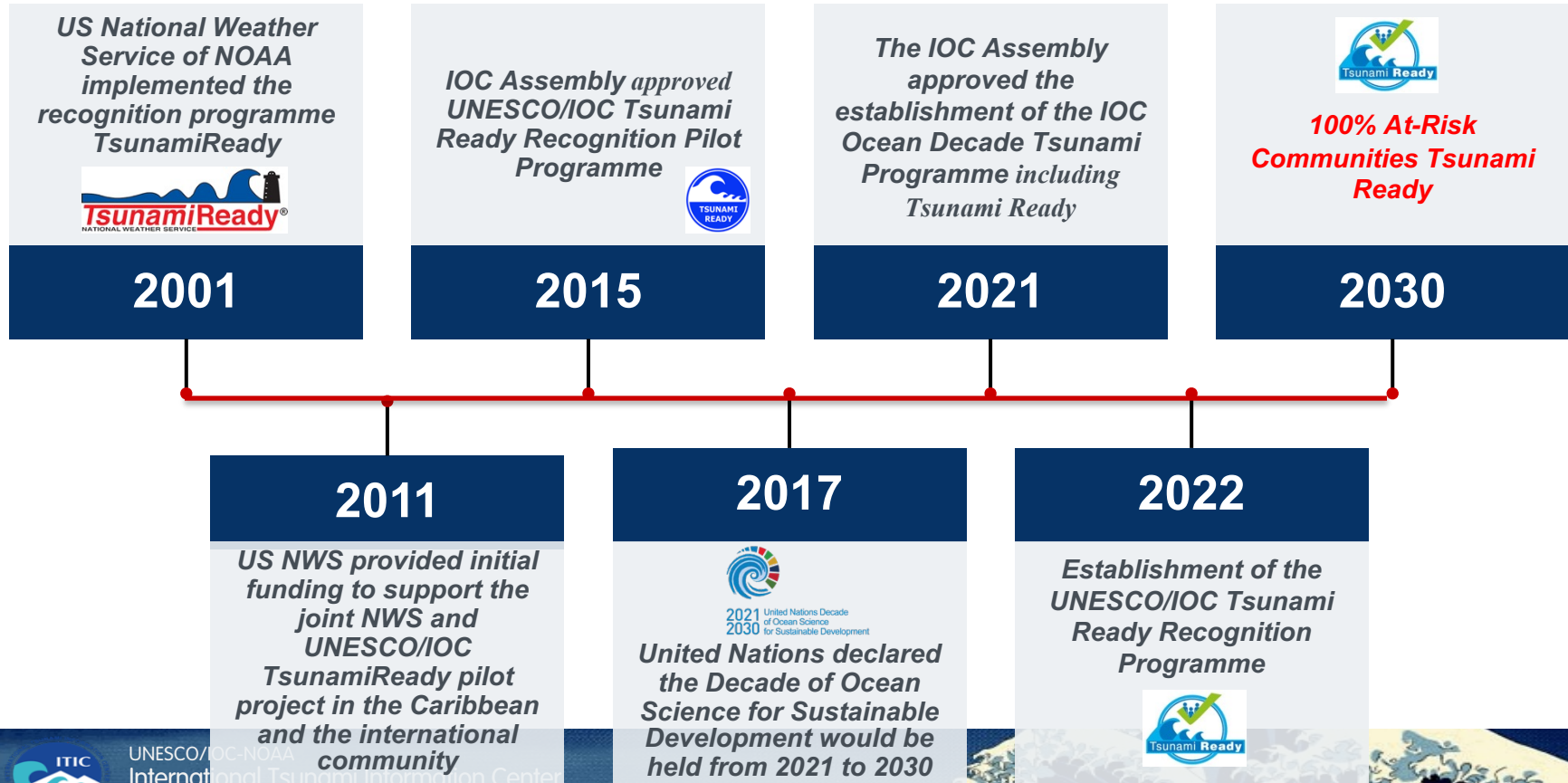
TO MAKE
100%

OF COMMUNITIES AT RISK
OF TSUNAMI PREPARED FOR
AND RESILIENT TO TSUNAMIS

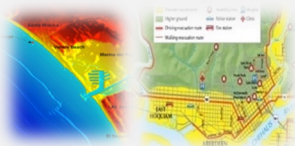
BY
2030

- **Tsunami Coalition:** collaborative with critical UN stakeholders, civil protection, others ==> Raise profile. Facilitate resourcing
- **Capacity Development:** augmented through IOC Ocean Teacher Global Academy (OTGA) ==> Global reach, deep curricula

History of the Implementation of Tsunami Ready



100% AT-RISK COMMUNITIES TSUNAMI READY



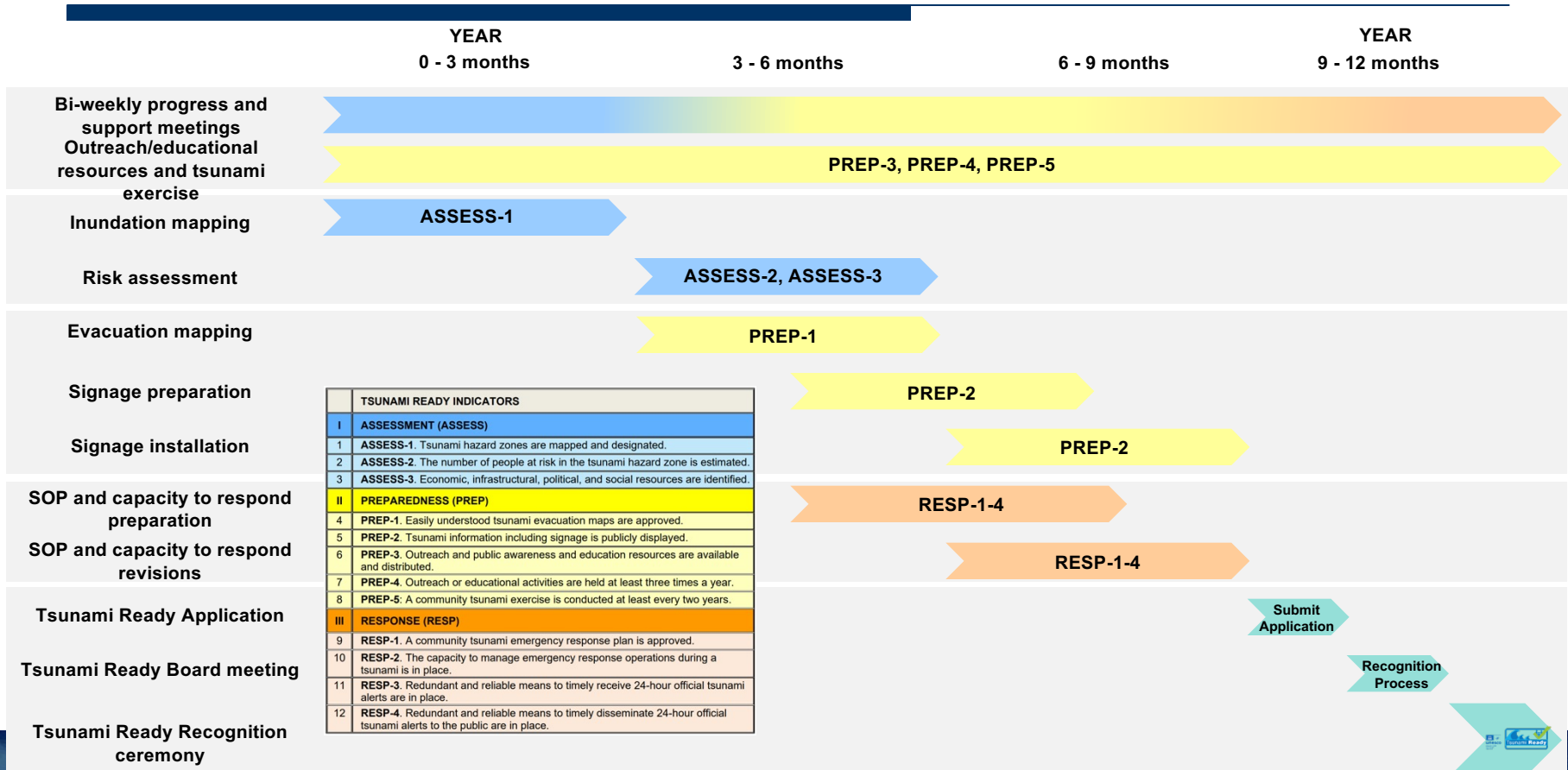
UNESCO IOC TSUNAMI READY INDICATORS

I ASSESSMENT (ASSESS)	
1	ASSESS-1. Tsunami hazard zones are mapped and designated
2	ASSESS-2. The number of people at risk in the tsunami hazard zone is estimated
3	ASSESS-3. Economic, infrastructural, political, and social resources are identified
II PREPAREDNESS (PREP)	
4	PREP-1. Easily understood tsunami evacuation maps are approved
5	PREP-2. Tsunami information is publicly displayed
6	PREP-2. Outreach and public awareness and education resources are available and distributed
7	PREP-3. Outreach or educational activities <u>are held at least three times a year</u>
8	PREP-4. A community tsunami exercise is conducted at least every two years
III RESPONSE (RESP)	
9	RESP-1. A community tsunami emergency response plan (ERP) is approved
10	RESP-2. The capacity to manage emergency response operations during a tsunami is in place
11	RESP-3. Redundant and reliable means to timely receive 24-hour official tsunami alerts are in place
12	RESP-4. Redundant and reliable means to timely disseminate 24-hour official tsunami alerts to the public are in place

- ❑ **STRATEGY:**
Be Aware, Be Prepared
- ❑ **FRAMEWORK:**
 - Harmonized global guidelines UNESCO IOC Tsunami Ready
 - Performance-based Community Recognition
- ❑ **ACTION:**
National programs empower Communities
- ❑ **GLOBAL MEASURE**



Tsunami Ready Recognition – Example 1(2) year timeline



TSUNAMI READY INDICATORS	
I	ASSESSMENT (ASSESS)
1	ASSESS-1. Tsunami hazard zones are mapped and designated.
2	ASSESS-2. The number of people at risk in the tsunami hazard zone is estimated.
3	ASSESS-3. Economic, infrastructural, political, and social resources are identified.
II	PREPAREDNESS (PREP)
4	PREP-1. Easily understood tsunami evacuation maps are approved.
5	PREP-2. Tsunami information including signage is publicly displayed.
6	PREP-3. Outreach and public awareness and education resources are available and distributed.
7	PREP-4. Outreach or educational activities are held at least three times a year.
8	PREP-5. A community tsunami exercise is conducted at least every two years.
III	RESPONSE (RESP)
9	RESP-1. A community tsunami emergency response plan is approved.
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ITIC Training – TEMPP

- ❑ **Tsunami Evacuation Maps, Plans, and Procedures (TEMPP) – IOC MG 82** *Preparing for Community Tsunami Evacuations: from inundation to evacuation maps, response plans and exercises (2020)*
- ❑ Manual (English, Spanish)
- ❑ Supplement 1 (Detail Module Explanations, Guidance) (English)
- ❑ Specialized Documents



http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=2166&Itemid=2640

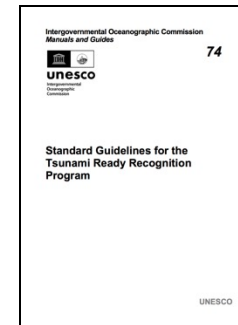


Preparing for Community Tsunami Evacuations
From Inundation to Evacuation Maps, Response Plans, and Exercises ... communities knowing what to do and where to go

HOW TO GET TSUNAMI READY !



- ❑ **Standard Guidelines for the Tsunami Ready Recognition Program**
(IOC Technical Series 74, 2022)
- ❑ **Facilitated by IOC Tsunami Information Centres.**
Contact International Tsunami Information Center
(ITIC, itic.tsunami@noaa.gov)
- ❑ **Training: TEMPP (1-5)**
OTGA - Ocean Teacher Global Academy
ITIC, Indonesia BMKG/IOTIC
- ❑ **Tsunami Ready web site –**
information, resources
<http://www.tsunamiready.org/>



Tsunami Ready – contact ITIC

Thank You

Dr. Laura Kong
Director, ITIC

