



**Thirtieth Session of the Intergovernmental coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-XXX) ,
Nuku'alofa, Kingdom of Tonga, 11-15 September 2023**

Report on the South China Sea Tsunami Advisory Center (SCSTAC)

Peitao Wang
South China Sea Tsunami Advisory Center, UNESCO/IOC

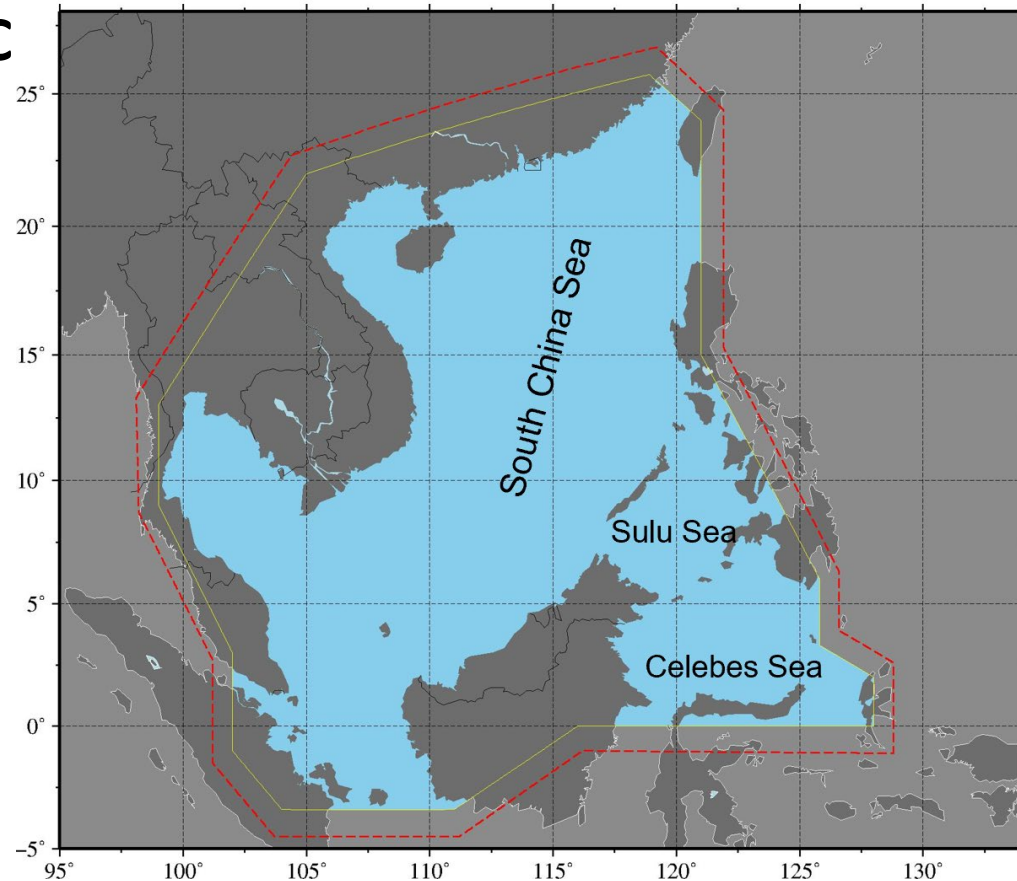
Outline

- 1. Tsunami Warning System**
- 2. Full Operation of SCSTAC**
- 3. Tsunami Warning Capacity Enhancement**
- 4. Communication Test and Exercise**
- 5. Other Activities and Plans**

1. Tsunami Warning System

1.1 The Area of Service for SCSTAC

The Area of Service (AoS) for the South China Sea Tsunami Warning and Mitigation System (SCSTWS) specified by ICG/PTWS embraces all coasts of the South China Sea, and the adjacent Sulu Sea and Celebes Sea, separated by Palawan and Sulu Archipelago from north to south respectively. A total of nine nations bordering the SCS region include Brunei, Cambodia, China, Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam (in alphabetic order).



The South China Sea Tsunami Advisory Center has been in full operation since November 5th, 2019.

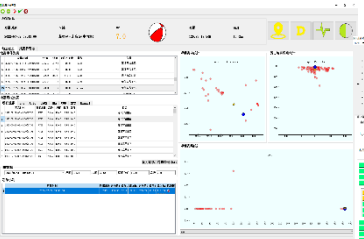
1. Tsunami Warning System

1.2 Tsunami Warning System of SCSTAC

Duty Room of South China Sea Tsunami Advisory Center



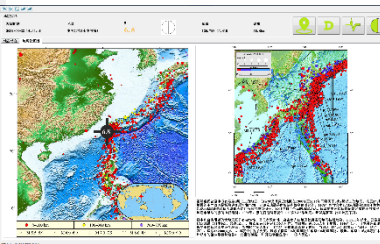
Earthquake information acquisition



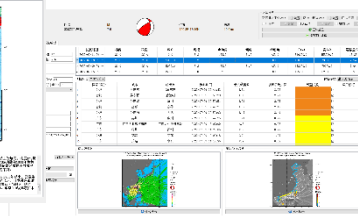
Sea level monitoring



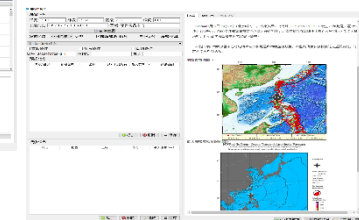
Tsunami scenario database



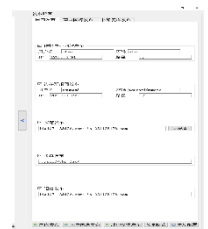
Tsunami parallel model



Tsunami analysis tool



Production & Dissemination

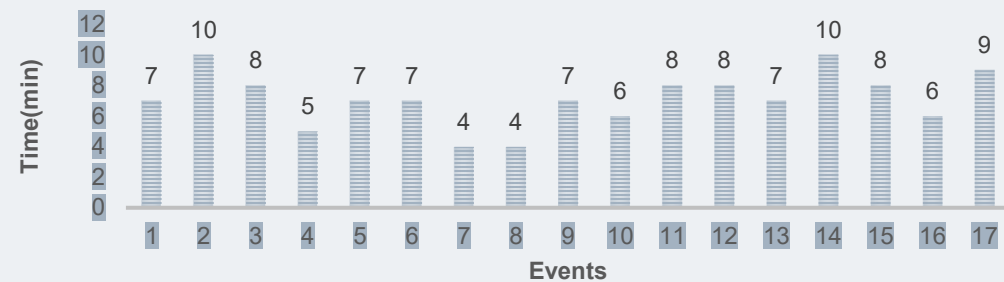
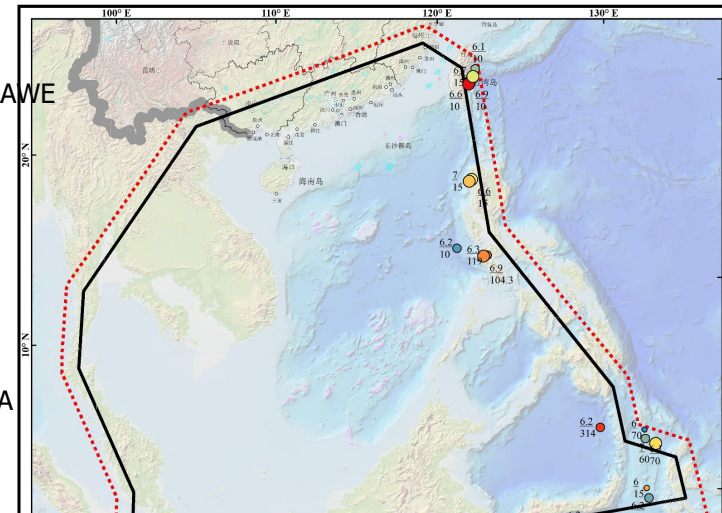


2. Full Operation of SCSTAC

2.1 Issued Tsunami Bulletins (Apr. 2021- Sep. 2023)

- ✓ SCSTAC issued 19 bulletins for 17 earthquake events occurred around the SCS region since Apr. 2021.
- ✓ Most of the first Bulletins were issued in less than 8 minutes from EQ. origin time
- ✓ The tsunami with 8cm amplitude generated by the Mw7.0 occurred in Philippines on 27 July 2022.

No	Mag	Origin Time (UTC)	Dep/km	Lon/°	Lat/°	Location
1	6.3	2023-06-15 02:19:00	119.0	120.68° E	13.82° N	MINDORO, PHILIPPINES
2	7.0	2023-01-18 06:06:00	60.0	127.22° E	2.85° N	NORTHERN MOLUCCA SEA
3	6.2	2023-01-18 00:34:00	140.0	123.32° E	0.10° S	MINAHASSA PENINSULA, SULAWE
4	6.1	2022-12-15 04:03:00	10.0	121.78° E	23.82° N	TAIWAN
5	6.6	2022-10-25 14:59:00	15.0	120.52° E	17.93° N	LUZON, PHILIPPINES
6	6.9	2022-09-18 06:44:00	10.0	121.30° E	23.15° N	TAIWAN
7	6.6	2022-09-17 13:41:00	10.0	121.25° E	23.06° N	TAIWAN
8	7.0	2022-07-27 00:43:00	15.0	120.37° E	17.85° N	LUZON, PHILIPPINES
9	6.7	2022-03-22 17:41:00	15.0	121.57° E	23.43° N	TAIWAN
10	6.2	2022-03-13 21:05:00	10.0	119.15° E	14.42° N	LUZON, PHILIPPINES
11	6.0	2022-01-22 02:26:00	70.0	126.84° E	3.63° N	TALAUD ISLANDS, INDONESIA
12	6.0	2021-10-11 12:34:00	15.0	126.33° E	0.88° N	NORTHERN MOLUCCA SEA
13	6.6	2021-07-26 12:09:00	30.0	122.06° E	0.81° S	SULAWESI, INDONESIA
14	6.9	2021-07-23 20:49:00	104.3	120.50° E	13.80° N	MINDORO, PHILIPPINES
15	6.1	2021-07-10 00:43:00	70.0	126.78° E	3.19° N	TALAUD ISLANDS, INDONESIA
16	6.2	2021-06-03 10:09:00	15.0	126.33° E	0.40° N	NORTHERN MOLUCCA SEA
17	6.2	2021-04-10 09:30:00	314.0	124.77° E	4.19° N	TALAUD ISLANDS, INDONESIA



2. Full Operation of SCSTAC

2.2 SCSTAC and BSCSTAC new website

2023-08-29 07:18:49 (UTC) NTWC Login / Register

South China Sea Tsunami Advisory Center (SCSTAC)

Home

- Recent Events
- Tsunami Service
- Latest News
- Tsunami Education
- SCSTAC
- FAQ
- LINK
- Historical Events

No Current Tsunami Information or Threat in Effect within the SCS Region !

• Latest Event Details

Earthquake: Magnitude: 6.3
Origin Time: 2023-06-15 02:19:00(UTC)
Location: MINDORO, PHILIPPINES

Depth: 119KM
Lat: 13.82°N Lon:120.68°E

• Events List

No	Mag	Origin (UTC)	Depth (km)	Lon (°)	Lat (°)	Location	Message
1	6.3	2023-06-15 02:19:00	119	120.68°E	13.82°N	MINDORO, PHILIPPINES	Detail...
2	7.0	2023-01-18 06:06:00	60.0	127.22°E	2.85°N	NORTHERN MOLUCCA SEA	Detail...
3	6.2	2023-01-18 00:34:00	140.0	123.32°E	0.10°S	MINAHASSA PENINSULA, SULAWESI	Detail...
4	6.1	2022-12-15 04:03:00	10.0	121.78°E	23.82°N	TAIWAN	Detail...
5	6.6	2022-10-26 14:59:00	15.0	120.52°E	17.93°N	LUZON, PHILIPPINES	Detail...
6	6.9	2022-09-18 06:44:00	10.0	121.30°E	23.15°N	TAIWAN	Detail...
7	6.6	2022-09-17 13:41:00	10.0	121.25°E	23.05°N	TAIWAN	Detail...
8	7.0	2022-07-27 00:43:00	15.0	120.37°E	17.85°N	LUZON, PHILIPPINES	Detail...
9	6.7	2022-03-22 17:41:00	15.0	121.57°E	23.43°N	TAIWAN	Detail...
10	6.2	2022-03-13 21:05:00	10.0	119.15°E	14.42°N	LUZON, PHILIPPINES	Detail...

Address: National Marine Environmental Forecasting Center (MNR), Pacific Tsunami Warning Center(NOAA), Northwest Pacific Tsunami Advisory Center (JMA)
Links:
About Us: Disclaimer: The information provided on this
Visitors: 886039

2023-08-29 07:07:59 (UTC)

South China Sea Tsunami Advisory Center (SCSTAC)

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4	6.1	2022-12-15 04:03:00	10.0	121.78°E	23.82°N	TAIWAN	Detail...
5	6.6	2022-10-26 14:59:00	15.0	120.52°E	17.93°N	LUZON, PHILIPPINES	Detail...
6	6.9	2022-09-18 06:44:00	10.0	121.30°E	23.15°N	TAIWAN	Detail...
7	6.6	2022-09-17 13:41:00	10.0	121.25°E	23.05°N	TAIWAN	Detail...
8	7.0	2022-07-27 00:43:00	15.0	120.37°E	17.85°N	LUZON, PHILIPPINES	Detail...
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10	6.2	2022-03-13 21:05:00	10.0	119.15°E	14.42°N	LUZON, PHILIPPINES	Detail...

Address: National Marine Environmental Forecasting Center (MNR), Pacific Tsunami Warning Center(NOAA), Northwest Pacific Tsunami Advisory Center (JMA)
Links:
About Us: Disclaimer: The information provided on this
Visitors: 70209

• Event Details

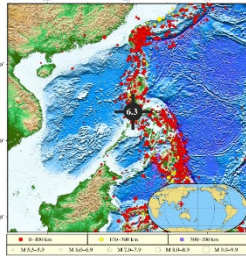
MINDORO, PHILIPPINES Magnitude-6.3

• Home

• Earthquake Information

Origin Time:2023-06-15 02:19:00 (UTC)
Lon:120.68°E **Lat:**13.82°N
Location:MINDORO, PHILIPPINES
Issuing Time:2023-06-15 02:26:00(UTC)

Depth:119km
Magnitude:6.3



• Tsunami Messages

No	Issuing Time	Message Type	Text Message	Graphical Products
1	2023-06-15 02:26:00 (UTC)	Tsunami Information	202306150219_1.txt	Earthquake_Pos.jpg

• Event Details

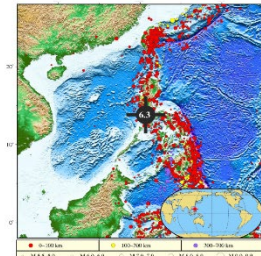
MINDORO, PHILIPPINES Magnitude-6.3

• Home

• Earthquake Information

Origin Time:2023-06-15 02:19:00 (UTC)
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Location:MINDORO, PHILIPPINES
Issuing Time:2023-06-15 02:26:00(UTC)

Depth:119km
Magnitude:6.3



• Tsunami Messages

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1	2023-06-15 02:26:00 (UTC)	Tsunami Information	202306150219_1.txt	Earthquake_Pos.jpg

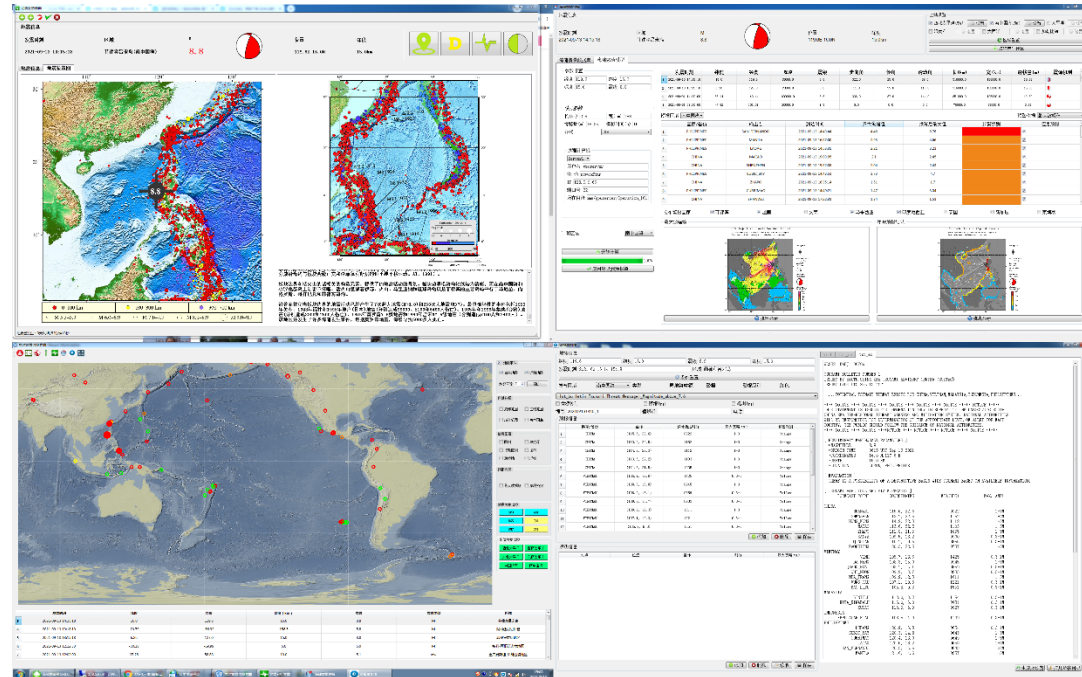
<http://scstac.oceanguide.org.cn>

<https://bscstac.hko.gov.hk/index.htm>

3. Tsunami Warning Capacity Enhancement

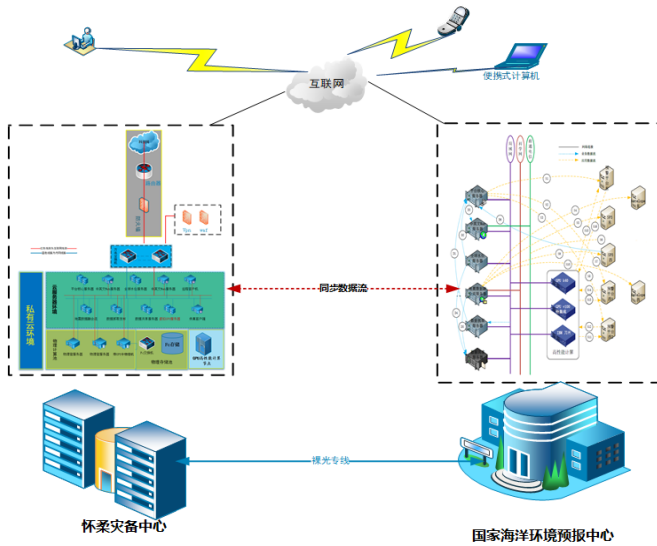
3.1 Smart Tsunami Information Process System (STIPS) at SCSTAC based on Python

- Real-time monitoring, receiving and processing of seismic and sea level data
- Tsunami scenario database
- GPU parallel tsunami numerical simulation
- Automatic generation and release of tsunami warning products
- An integrated decision support system for tsunami warning
- User-friendly, comprehensive, well-maintained and open source software



3. Tsunami Warning Capacity Enhancement

3.2 Backup tsunami warning system in Huairou District Beijing, China



- Implement independent function backup
- The synchronization of data but not dependence

3. Tsunami Warning Capacity Enhancement

3.3 Backup South China Sea Tsunami Advisory Center (Hong Kong)

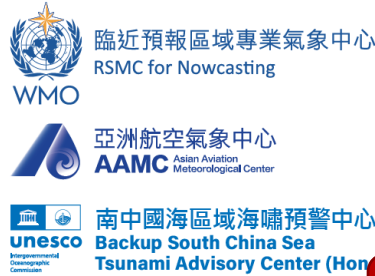
Key performance indicators during the trial operation of BSCSTAC

Event-ID	Time (UTC)	Elas prod	Key Performance Indicators of SCSTAC	Target values of SCSTAC operations	Performance of BSCSTAC at trial operation
1	2022/4/7 23:36		Elapsed time from earthquake to issuance of initial tsunami products with preliminary earthquake parameters	Within 12 minutes	11.5 minutes
2	2022/6/30 18:40		Probability of detection of earthquakes with $M_w \geq 6.0$	100%	100%
3	2022/7/27 0:43		Accuracy of preliminary earthquake parameters on hypocenter location/magnitude/depth	0.3° / 0.3 / 30km	0.23° / 0.21 / 13km
4	2022/9/17 13:41		Accuracy of the Estimated Time of Arrival (ETA) and amplitudes of the tsunamis actually is triggered	Within 10% of travel time	No events occurred for testing
5	2022/9/18 6:44		Percentage of Member States that receive products issued by SCSTAC	100%	Products not issued to Member States
6	2022/10/25 14:59		Percentage of time the SCSTAC is operating and able to respond to a tsunami event	100%	100%
7	2022/12/15 4:03		Regular communication tests	Twice per year	No communication test arranged

3. Tsunami Warning Capacity Enhancement

3.3 Backup South China Sea Tsunami Advisory Center (Hong Kong)

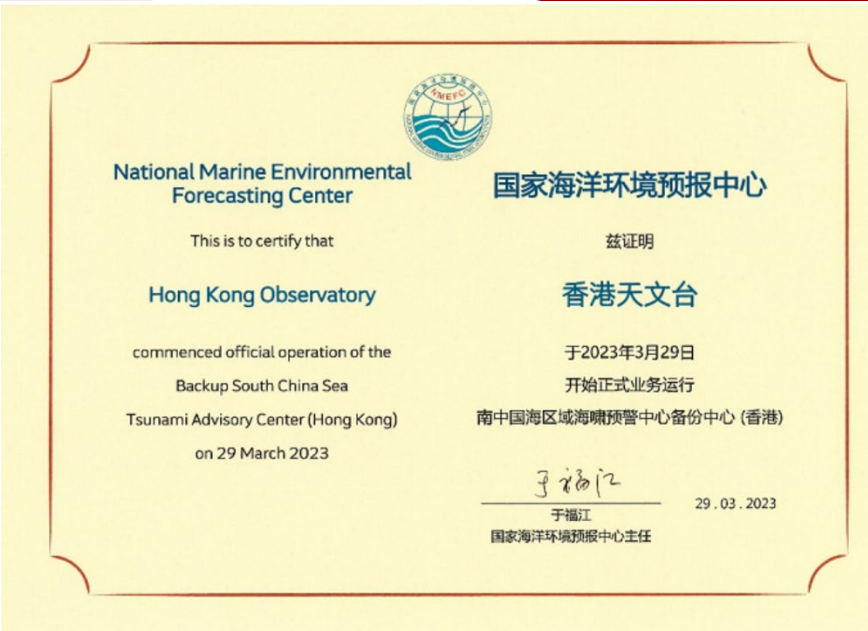
The Backup South China Sea Tsunami Advisory Center has fulfilled its full operation since March 29, 2023.



Activation of BSCSTAC

Scheduled Activation

Non-scheduled Activation



4. SCSTAC Communications Tests and Exercise

4.1 Communications tests

- SCSTAC conducted communications tests 4 times each year. Member States were required response for dummy information
- Thanks to the coordination of the secretariat and the Member States



SCSTAC COMMUNICATIONS TEST

ISSUED BY SOUTH CHINA SEA TSUNAMI ADVISORY CENTER (SCSTAC)

ISSUED AT 0600Z 28 MAY 2021

THIS IS A TEST BULLETIN

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE

TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL

TSUNAMI ADVICE PRODUCTS FROM THE SOUTH CHINA SEA TSUNAMI ADVISORY

CENTER TO DESIGNATED 24-HOUR TSUNAMI WARNING FOCAL POINTS OF THE SOUTH

CHINA SEA TSUNAMI WARNING SYSTEM.

RECIPIENTS ARE REQUESTED TO PLEASE RESPOND BACK TO THE SOUTH CHINA SEA

TSUNAMI ADVISORY CENTER.

PLEASE RESPOND VIA ONE OF THE FOLLOWING MEANS

*TEL:+86-10-62104561

*EMAIL:TSU@NMEFC.CN

*FAX:+86-10-62173638

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST



Fax



Email



GTS

4. SCSTAC Communications Tests and Exercise

- ❑ IOC issued communications tests Circular Letter one month in advance
- ❑ Updating the contact information of recipients among the member states

Time: 2022-02-11 UTC0600						Time: 2022-05-21 UTC0600					
Agency	Country	GTS	E-mail	Fax	Confirm	Agency	Country	GTS	E-mail	Fax	Confirm
MMD	Malaysia	0600	0606	0603	√	MMD	Malaysia	0600	0600	/	√
NDWC	Thailand	/	0601	0611	√	NDWC	Thailand	/	0600	/	√
IGVAST	Vietnam	/	0600	/	√	IGVAST	Vietnam	/	/	/	×
BDMD	Brunei	0601	0600	0603	√	BDMD	Brunei	0600	0600	0600	√
MSS	Singapore	0600	0600	0600	√	MSS	Singapore	0600	0600	0602	√
MWR	Cambodia	/	/	/	×	MWR	Cambodia	/	/	/	×
PHIVOLCS	Philippines	0601	0600	0600	√	PHIVOLCS	Philippines	0601	0600	/	√
BMKG	Indonesia	0602	0600	/	√	BMKG	Indonesia	0601	0600	/	√
HKO	Hong Kong, China	0602	0601	0601	√	HKO	Hong Kong, China	0604	0600	/	√
NWPTAC	Japan	0600	0600	0603	√	PTWC	USA	/	0600	/	√

Time: 2023-04-24 UTC0600						Time: 2023-08-11 UTC0600					
Agency	Country	GTS	E-mail	Fax	Confirm	Agency	Country	GTS	E-mail	Fax	Confirm
MMD	Malaysia	0600	0600	/	√	MMD	Malaysia	0600	0606	0600	√
NDWC	Thailand	/	0607	/	√	NDWC	Thailand	/	0603	/	√
IGVAST	Vietnam	/	/	/	×	IGVAST	Vietnam	/	/	/	×
BDMD	Brunei	0600	0600	0600	√	BDMD	Brunei	0600	0606	/	√
MSS	Singapore	0600	0600	0601	√	MSS	Singapore	0600	0600	0601	√
MWR	Cambodia	/	/	/	×	MWR	Cambodia	/	/	/	×
PHIVOLCS	Philippines	0609	0600	/	√	PHIVOLCS	Philippines	/	0602	/	√
BMKG	Indonesia	/	/	/	×	BMKG	Indonesia	/	/	/	×
HKO	Hong Kong, China	0601	0600	0601	√	HKO	Hong Kong, China	0601	0607	0605	√
MGB	Macao, China	/	0601	0603	√	MGB	Macao, China	/	0605	0605	√
NWPTAC	Japan	0600	/	0602	√	NWPTAC	Japan	0600	0607	0600	√
PTWC	USA	/	0600	/	√	KMA	Korea	/	0603	/	√



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
COMMISSION Océanographique Intergouvernementale
COMISIÓN OCEANOGRÁFICA INTERGUBERNAMENTAL
МЕЖПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ

اللجنة الدولية الحكومية لعلوم المحيطات
政府间海洋学委员会

UNESCO – 7 Place de Fontenay - 75352 Paris Cedex 07 SP, France
http://ioc.unesco.org - contact phone: +33 (0)1 45 68 03 18
E-mail: v.ryabinin@unesco.org

IOC Circular Letter No 2952
(Available in English only)

IOC/VR/BA/ah
17 July 2023

To : Registered SCSTAC focal points and Tsunami Warning Focal Points of the following countries: Brunei Darussalam, Cambodia, China, Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam

C.c. : Corresponding Official National Coordinating Bodies for liaison with the IOC
Corresponding Permanent Delegates/Observer Missions to UNESCO and National Commissions for UNESCO
Chair, Intergovernmental Coordination Group for Pacific Tsunami Warning & Mitigation System
Director, Pacific Tsunami Warning Center
Director, International Tsunami Information Center
IOC Tsunami Resilience Section

Subject: Notification and Instructions regarding the South China Sea Tsunami Advisory Center (SCSTAC) Communications Test for the Registered SCSTAC Focal Points, 11 August 2023 at 0600 UTC

By this letter, I wish to inform you that the South China Sea Tsunami Advisory Center (SCSTAC) will conduct a communications test on 11 August 2023 at 0600 UTC to verify that the communication channels between the Centre and the recipient organizations of its tsunami advisories are operating properly.

The concerned Tsunami Warning Focal Points (TWFPs) should expect to receive the test message within a few minutes of issuance through all their designated communication methods. These may include:

1. Global Telecommunication System (GTS) using the World Meteorological Organization product header WESS31 BABJ, the same product header used by SCSTAC to issue an advisory
2. E-mail – sent by tsu@nmfrc.cn
3. Telefax – sent by SCSTAC.

The concerned national Tsunami Warning Focal Points (TWFP) should verify that the test message is received by all of their designated communication methods. TWFPs are requested to complete and return the acknowledgement form attached hereafter by Telefax to +86 10 6217 3638, and/or

Chairperson	Vice-Chairpersons		
Dr Yutaka MICHIDA Professor Atmosphere and Ocean Research Institute, The University of Tokyo Kashiwanoha 5-1-5 2778564 Kashiwa JAPAN	Dr Marie-Alexandrine SICRE Directrice de Recherche Centre national de la recherche scientifique (CNRS) 3 rue Michel Ange 75016 Paris FRANCE	Mr Juan Camilo FORERO HAUZEUR Colombian Ocean Commission (COO) Avenida Ciudad de Cali No. 51 – 86 Edificio WBC, Oficina 305 111071 Bogotá, D.C. COLOMBIA	Prof. Amr Zakaria HAMOUDA President National Institute of Oceanography and Fisheries (NIOF) Gaitbay, Al-Antara Alexandria EGYPT
Executive Secretary Dr Vladimir RYABININ Intergovernmental Oceanographic Commission – UNESCO 7 Place de Fontenay 75352 Paris Cedex 07 SP FRANCE	Dr Nikolay VALCHEV Director Institute of Oceanology Bulgarian Academy of Sciences 7 Place de Fontenay 9000 Varna BULGARIA	Dr Srinivasa Kumar TUMMALA Director Indian National Centre for Ocean Information Services (INCOIS) Pragathi Nagar (BO), Nizampet (SO) Hyderabad 500090 INDIA	

4. SCSTAC Communications Tests and Exercise

4.2 Exercise PaciWave 2022

- ❑ SCSTAC had conducted tsunami exercise in SCS region on 13 Oct 2022
- ❑ Post-Exercise Evaluation Forms are to be completed by each participating agency and forwarded to the country Exercise PaciWave 2022 National Contact, or the country Tsunami National Contact (TNC)



TEST PACWAVE22 TSUNAMI EXERCISE **TEST**

ISSUED BY SOUTH CHINA SEA TSUNAMI ADVISORY CENTER (SCSTAC)

ISSUED AT 0000Z 13 OCT 2022

THIS IS A COMMUNICATION TEST BULLETIN FOR PACWAVE22 TSUNAMI EXERCISE.

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE

TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL

TSUNAMI ADVICE PRODUCTS FROM THE SOUTH CHINA SEA TSUNAMI ADVISORY

CENTER TO DESIGNATED 24-HOUR TSUNAMI WARNING FOCAL POINTS OF THE SOUTH CHINA SEA TSUNAMI WARNING SYSTEM.

THIS TEST MESSAGE IS SENT BY GTS, FAX AND EMAIL.

RECIPIENTS ARE REQUESTED TO PLEASE RESPOND BACK TO ICG PTWS TASK TEAM

ON PACWAVE22. GUIDANCE FOR THE EXERCISE CAN BE FOUND IN

THE PACWAVE22 EXERCISE MANUAL LOCATED AT

WWW.PACWAVE.INFO

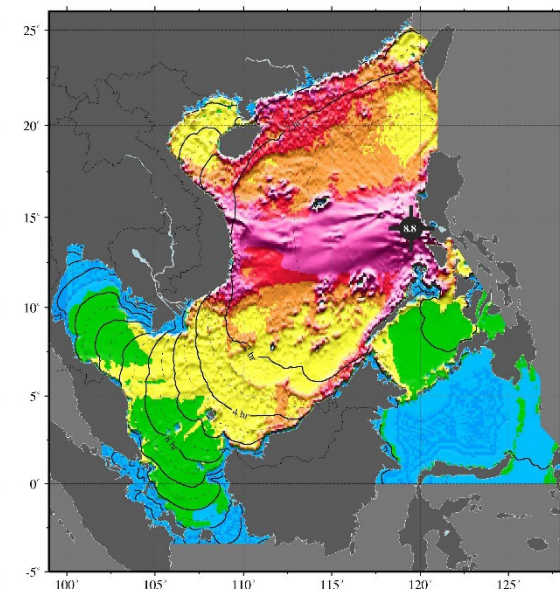
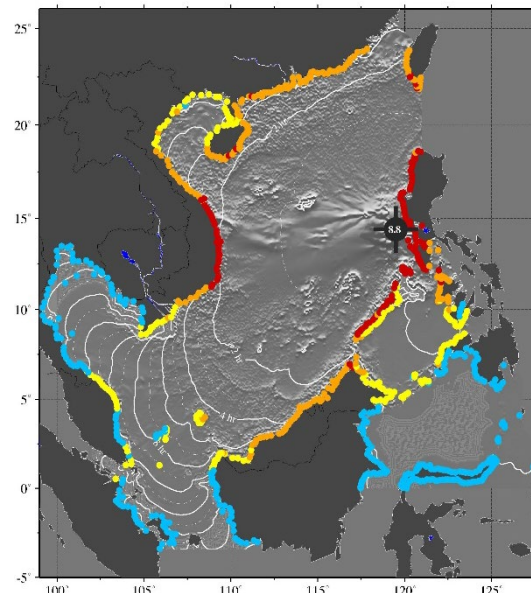
PLEASE RESPOND BEFORE THE DUE DATE SPECIFIED IN THE EXERCISE MANUAL.

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST

PLEASE TAKE NOTE OF THE TIME YOU RECEIVE THIS MESSAGE AND THE METHOD(S)

BY WHICH YOU RECEIVE THIS MESSAGE AND REPORT BACK THROUGH THE EXERCISE

PACWAVE POST-EXERCISE ONLINE EVALUATION SURVEY BY 23 OCTOBER 2022



5. Other Activities and Plans

5.1 Regional Training and Workshop

- ❑ Training for seismic and tsunami warning operators on strengthening standard operating procedures for seismic data and tsunami warning in the South China Sea region, 9-10 December 2021, Online
- ❑ First NMEFC-BMKG Workshop on Non-seismic Tsunamis and Complex Tsunamis, 14 July 2022
- ❑ 2022 International Symposium on Applied Technologies for Earthquake and Tsunami Monitoring, Early Warning and Disaster Mitigation in the South China Sea Region, 20th December 2022



5. Other Activities and Plans

5.2 Plans

- ❑ Conducts 2 online/offline Training Workshop on Tsunami Forecasting and Risk Assessment for Tsunami Warning Operators in the South China Sea region in next two years
- ❑ Continues to provide opportunities for in-person education, outreach and training activities in the region(regional training workshop/short-term international staff)
- ❑ Continues to develop new tsunami warning skills to improve responsiveness to unusual tsunami events(e.g. landslide tsunami, volcanic tsunami and meteotsunami)



Thank You

Peitao Wang
South China Sea Tsunami Advisory Center, UNESCO/IOC