NATIONAL REPORT
Submitted by Japan

BASIC INFORMATION

1. ICG/PTWS Tsunami National Contact (TNC)

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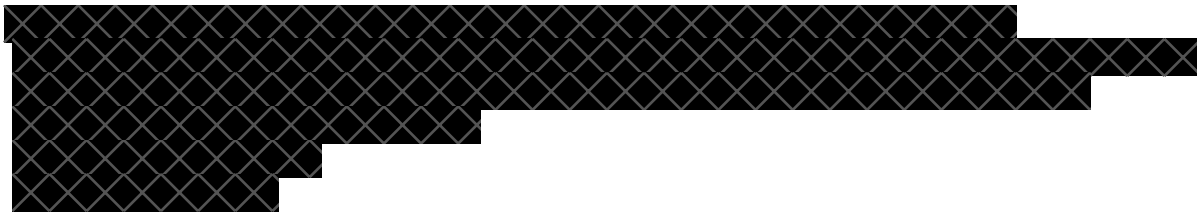
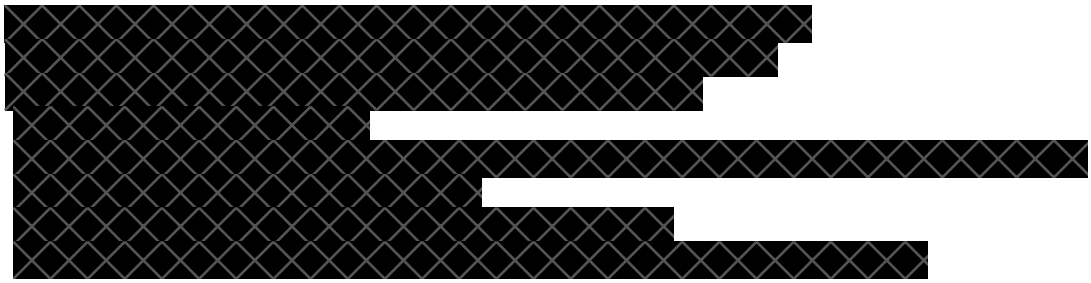
2. ICG/PTWS Tsunami Warning Focal Point (TWFP)

TWFP Agency name: Japan Meteorological Agency (JMA)





3. Tsunami Advisor(s), if applicable

N/A

4. Tsunami Standard Operating Procedures for a Local Tsunami

(when a local tsunami hazard exists)

Japan Meteorological Agency (JMA) is the national authority for issuing tsunami warnings/advisories in Japan. JMA continuously monitors seismic activities in and around Japan. When an earthquake hits, JMA immediately determines the hypocenter and magnitude of the quake. If the earthquake occurs in an ocean area with tsunamigenic potential, JMA conducts tsunami forecast operations using a local tsunami database containing tsunami amplitude and travel time calculated in advance by numerical simulation. Tsunami warnings/advisories are classified into three categories as shown in Table 1: "Major Tsunami Warning," “Tsunami Warning” and "Tsunami Advisory". JMA issues warnings and/or advisories for 66 coastal regions which cover all the coastal areas of the country. Such warning and advisory messages consist of expected maximum tsunami heights and arrival times. However, it takes time to determine the exact scale of earthquakes with a magnitude of 8.0 or more; therefore, in such cases, JMA issues an initial tsunami warning based on the predefined maximum magnitude to avoid underestimation, with qualitative terms such as “Huge” and “High” for estimated maximum tsunami heights instead of quantitative expressions.

JMA provides tsunami warning/advisory messages, via dedicated land line, for the national and local authorities and broadcasting stations for disaster prevention and/or mitigation. Mayors of municipalities are responsible for issuing evacuation order to the residents. In addition, those

messages are directly communicated to the public via JMA's website and emergency mail service for mobile phones.

Real time sea level data are gathered in JMA to monitor tsunami arrivals at coasts. When detecting tsunami waves at tide gauges, JMA announces observed tsunami height and arrival time at each station.

Tsunami warnings and/or advisories are cleared when JMA concludes that the dangerous situation has been over, namely, when the tsunami attenuates and the observed height becomes adequately lower.

Category	Classification of forecast Tsunami Height	Tsunami Height to be Issued	
		Quantitative expression	For huge earthquakes
Major Tsunami Warning	10 m < Height	over 10 m	Huge
	5 m < Height ≤ 10 m	10 m	
	3 m < Height ≤ 5 m	5 m	
Tsunami Warning	1 m < Height ≤ 3 m	3 m	High
Tsunami Advisory	0.2 m ≤ Height ≤ 1 m	1 m	(N/A)

* Tsunami Height is defined as the height of wave crest on the coast relative to normal sea level.

Table 1: Tsunami Warnings/Advisories

5. Tsunami Standard Operating Procedures for a Distant Tsunami

When a large earthquake with a magnitude 7.0 or more occurs in an area distant from Japan, JMA determines the hypocenter and magnitude using seismic waveform data from global seismological observation network. At the same time, JMA exchanges earthquake information with the Pacific Tsunami Warning Center (PTWC), and uses focal parameters provided by PTWC for tsunami forecast where appropriate.

If there is a possibility of tsunami generation that might affect the coasts of Japan, JMA immediately conducts tsunami forecast operations in the same manner and criteria as the local tsunami procedures using a distant tsunami database. In addition, JMA also runs a real-time simulation based on CMT analysis outcomes for more detailed evaluation of tsunami impact. Tsunami Warning/Advisory are issued based on the real-time simulation, with modifications by historical records and/or a comparison between simulated and observed tsunami height at overseas monitoring stations, when available.

To address the uncertainty risk of tsunami caused by volcanic eruption, JMA announces the possibility of a tsunami when a major eruption with a plume height of more than about 15,000 m occurs. The JMA updates information and holds a press conference to explain the situation in detail, if the possibility of a tsunami increases, for example when a clear change is observed in the image analysis of the JMA's meteorological satellite Himawari. When sea level changes are observed in Japan, the JMA issues a tsunami warning/advisory in principle when the observed sea level exceeds the criteria for a tsunami warning/advisory. However, if an obvious pressure change is observed and an obvious sea level change is observed at a time consistent with the observed pressure change, a tsunami advisory is issued even if the observed sea level does not exceed the criteria. (A tsunami warning is issued when the observed sea level exceeds the criteria for a warning). For areas past the expected arrival time of atmospheric Lamb waves, the JMA informs the public that they should continue to prepare for sea level changes, even if no sea level changes have been observed. If no sea level changes were obserbed after estimated arrival time of internal gravity waves, JMA issues information to let people know there is no risk of tsunami *.

* The possibility of sea level changes due to landslides etc. is considered separately.

6. National Sea Level Network

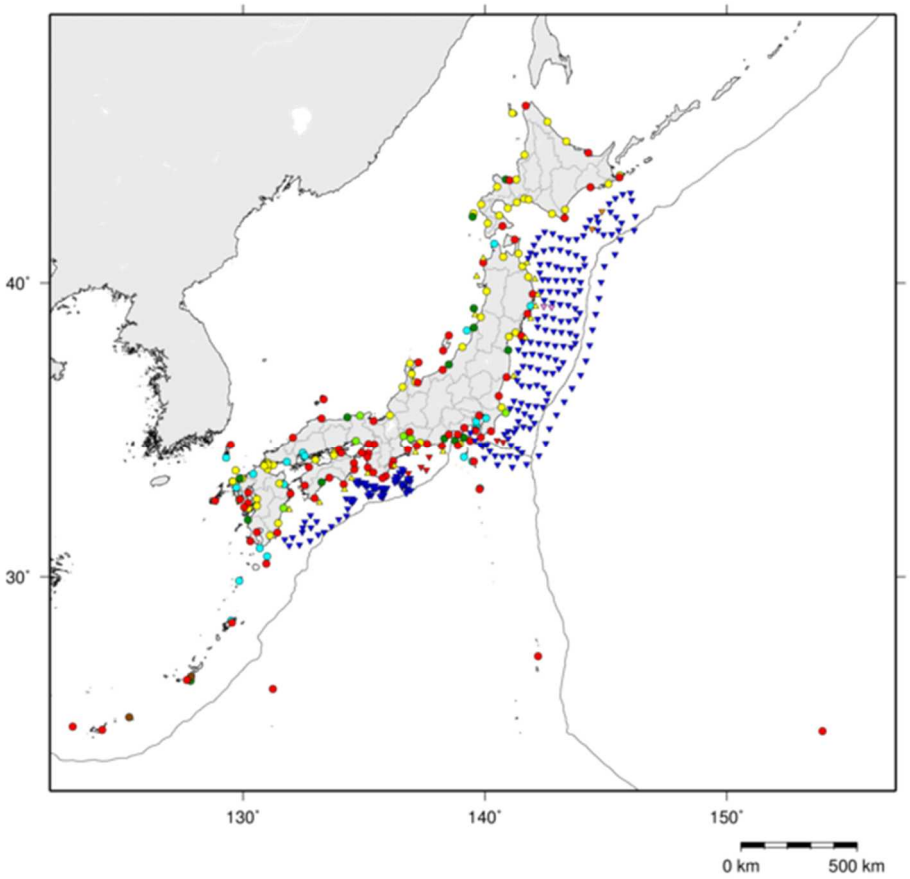
JMA collects tsunami data from various kinds of sea level observation stations all over Japan, such as microwave gauges, float-type gauges, acoustic sensors, huge tsunami gauges, offshore GPS buoys and offshore water pressure gauges installed on the sea floor. These stations are operated by JMA, the Ports and Harbours Bureau (PHB) of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), the Geospatial Information Authority of Japan (GSI), the Japan Coast Guard (JCG), the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), the National Research Institute for Earth Science and Disaster Prevention (NIED), and the Earthquake Research Institute (ERI) of the University of Tokyo and other institutions.

As of 1 February 2025, JMA receives real time sea level data from 426 stations as shown in Figure 1 and uses the data for monitoring tsunamis and issuing tsunami information to the public.

Observed sea level data from the 22 sites listed in Table 2 are available via GTS with the heading of SWJP40. The sampling rate is one minute and the transmission interval is 10 minutes.

Station Name	Latitude	Longitude	Sensor Type
Wakkanai	45°24′ N	141°41′ E	Microwave-type
Abashiri	44°01′ N	144°17′ E	Microwave-type
Hanasaki	43°17′ N	145°34′ E	Microwave-type
Kushiro	42°59′ N	144°22′ E	Microwave-type
Hakodate	41°47′ N	140°43′ E	Microwave-type
Ofunato	39°01′ N	141°45′ E	Microwave-type
Mera	34°55′ N	139°50′ E	Microwave-type
Chichijima	27°06′ N	142°12′ E	Microwave-type
Minamitorishima	24°17′ N	153°59′ E	Pressure-type
Omaezaki	34°37′ N	138°13′ E	Microwave-type
Kushimoto	33°29′ N	135°46′ E	Microwave-type
Tosashimizu	32°47′ N	132°58′ E	Microwave-type
Aburatsu	31°35′ N	131°25′ E	Microwave-type
Naha	26°13′ N	127°40′ E	Microwave-type
Ishigakijima	24°20′ N	124°10′ E	Microwave-type
Nagasaki	32°44′ N	129°52′ E	Microwave-type
Hamada	34°54′ N	132°04′ E	Microwave-type
Saigo	36°12′ N	133°20′ E	Microwave-type
Toyama	36°46′ N	137°13′ E	Microwave-type
Noto	37°30′ N	137°09′ E	Microwave-type
Sado	38°19′ N	138°31′ E	Microwave-type
Fukaura	40°39′ N	139°56′ E	Microwave-type

Table 2: Sea Level Monitoring Stations available via GTS



Legend (Station Types)

● : Tide gauges / tsunami meters

▲ : GPS buoys

▼ : Offshore-water-pressure gauges (Cable)

Color Legend (Institutions)

- Japan Meteorological Agency (JMA)
- Ports and Harbours Bureau (PHB) of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
- Geospatial Information Authority of Japan (GSI)
- Japan Coast Guard (JCG)
- Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
- National Research Institute for Earth Science and Disaster Resilience (NIED)
- Earthquake Research Institute (ERI), the University of Tokyo
- Other Institutions

Figure 1: Sea Level Monitoring Network in Japan (426 stations in total, as of 1 February 2025)

7. Information on Tsunami occurrences (August 2023 – February 2025)

7.1. Earthquake near Torishima Island, Japan

a) Hypocentral parameters (determined by JMA)

Date	05 October 2023
Time	01:59 UTC
Latitude	29°43′06″ N
Longitude	139°46′18″ E
Depth	17 km
Magnitude	6.5 (Mjma), 6.1 (Mw)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Hachijojima Yaene	33°06'N	139°47'E	02:unclear, 05 Oct	03:17, 05 Oct	0.2m

* Height values described in meter were measured with huge tsunami gauges (resolution: 0.1 m).
* The data contained in this table is provisional and subject to change.

Table 3: Observed Tsunami (Earthquake near Torishima Island, 05 October 2023)

c) Tsunami warning operations

01:59 UTC --- Earthquake occurrence
02:06 UTC --- Tsunami Advisory
03:05 UTC --- Press Conference
04:15 UTC --- Tsunami Advisory (cancellation)

d) Lessons learned

The tsunami prediction results based on the relation between tsunami observation and the previous earthquake occurred around Torishima island were generally consistent with the observed tsunami characteristics.

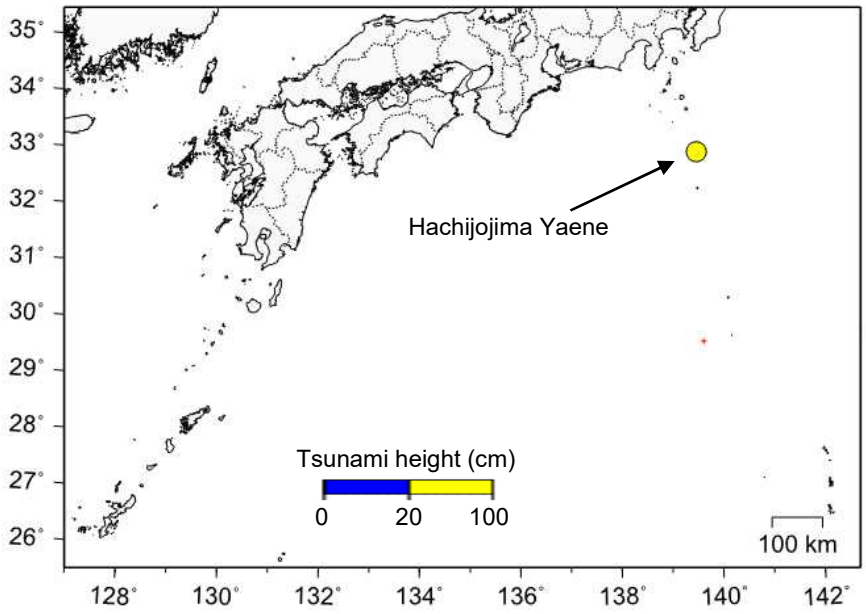


Figure 2: Observed Tsunami (Earthquake near Torishima Island, 05 October 2023)

7.2. Earthquake near Torishima Island, Japan

a) Hypocentral parameters (determined by JMA)

Date	06 October 2023
Time	01:31 UTC
Latitude	29°40′18″ N
Longitude	139°28′24″ E
Depth	19 km
Magnitude	6.0 (Mjma), 6.3 (Mw)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Hachijojima Kaminato	33°08'N	139°48'E	02:unclear, 06 Oct	02:52, 06 Oct	5
Hachijojima Yaene	33°06'N	139°47'E	02:unclear, 06 Oct	02:40, 06 Oct	0.2m
Minami-osumi-cho Odomari	31°01'N	130°41'E	unclear	04:44, 06 Oct	6
Nakanoshima	29°51'N	129°51'E	unclear	03:27, 06 Oct	8

* Height values described in meter were measured with huge tsunami gauges (resolution: 0.1 m), and GPS buoy, ocean-bottom pressure gauges.
* The data contained in this table is provisional and subject to change.

Table 4: Observed Tsunami (Earthquake near Torishima Island, 06 October 2023)

c) Tsunami warning operations

01:31 UTC --- Earthquake occurrence
01:47 UTC --- Tsunami Forecast
04:10 UTC --- Tsunami Forecast (cancellation)

d) Lessons learned

The tsunami prediction results based on the relation between tsunami observation and the previous earthquake occurred around Torishima island were generally consistent with the observed tsunami characteristics.

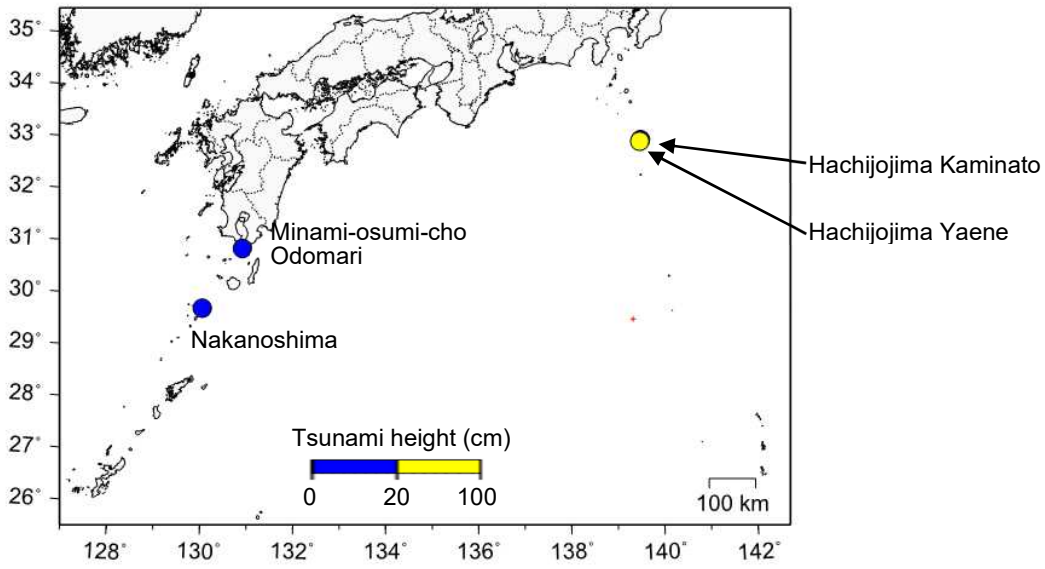


Figure 3: Observed Tsunami (Earthquake near Torishima Island, 06 October 2023)

7.3. Earthquakes near Torishima Island, Japan

a) Hypocentral parameters (determined by JMA)

Date	08 October 2023
Time	Around 19:00 ~ 22:00 UTC
Latitude	unknown
Longitude	unknown
Depth	unknown
Magnitude	unknown (Mjma), unknown (Mw)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Tateyama-shi Mera	34°55'N	139°50'E	unclear	22:43, 08 Oct	17
Izu-oshima Okada	34°47'N	139°23'E	unclear	23:37, 08 Oct	17
Kozushima Kozushima-ko	34°13'N	139°08'E	unclear	23:01, 08 Oct	44
Miyakejima Tsubota	34°03'N	139°33'E	unclear	23:11, 08 Oct	41
Miyakejima Ako	34°04'N	139°29'E	unclear	22:45, 08 Oct	29
Hachijojima Kaminato	33°08'N	139°48'E	unclear	22:12, 08 Oct	23
Hachijojima Yaene	33°06'N	139°47'E	unclear	22:17, 08 Oct	0.7m
Chichijima Futami	27°06'N	142°12'E	unclear	22:24, 08 Oct	16
Miura-shi Misaki-gyoko	35°09'N	139°37'E	unclear	00:01, 09 Oct	0.1m
Minami-izu-cho Teishi-ko	34°38'N	138°53'E	unclear	23:21, 08 Oct	16
Ito	34°54'N	139°08'E	unclear	22:59, 08 Oct	10
Tahara-shi Akabane	34°36'N	137°11'E	unclear	00:01, 09 Oct	12
Kumano-shi Yuki	33°56'N	136°10'E	unclear	22:58, 08 Oct	11
Kushimoto-cho Fukuro-ko	33°29'N	135°46'E	unclear	22:15, 08 Oct	13
Gobo-shi Haraido	33°51'N	135°10'E	unclear	23:42, 08 Oct	15
Tokushima Yuki	33°46'N	134°36'E	unclear	22:11, 08 Oct	8
Uwajima	33°14'N	132°33'E	unclear	02:04, 09 Oct	10
Muroto-shi Muroto-misaki	33°16'N	134°10'E	unclear	23:17, 08 Oct	13
Tosa-shimizu	32°47'N	132°58'E	unclear	23:09, 08 Oct	34
Naka-tosa-cho Kure-ko	33°20'N	133°15'E	unclear	23:15, 08 Oct	18
Saiki-shi Matsuura	32°57'N	131°58'E	unclear	01:20, 09 Oct	6
Nichinan-shi Aburatsu	31°35'N	131°25'E	unclear	23:08, 08 Oct	14
Shibushi-ko	31°29'N	131°07'E	unclear	23:54, 08 Oct	0.2m
Minami-osumi-cho Odomari	31°01'N	130°41'E	unclear	23:18, 08 Oct	26
Tanegashima Nishino-omote	30°44'N	131°00'E	unclear	00:27, 09 Oct	10
Amami-shi Kominato	28°19'N	129°32'E	unclear	23:06, 08 Oct	9
Nakanoshima	29°51'N	129°51'E	unclear	00:46, 09 Oct	31
Nanjo-shi Azama	26°11'N	127°49'E	unclear	23:52, 08 Oct	5

* Height values described in meter were measured with huge tsunami gauges (resolution: 0.1 m).
* The data contained in this table is provisional and subject to change.

Table 5: Observed Tsunami (Earthquakes near Torishima Island, 08 October 2023)

c) Tsunami warning operations

(08 October)
19:00 ~ 22:00 UTC --- Earthquake occurrence
21:40 UTC --- Tsunami Advisory

22:26 UTC --- Tsunami Advisory (revised)
22:44 UTC --- Tsunami Advisory (revised)
22:51 UTC --- Tsunami Advisory (revised)
23:24 UTC --- Tsunami Advisory (revised)
23:40 UTC --- Press Conference
(09 October)
02:00 UTC --- Press Conference
03:00 UTC --- Tsunami Advisory (cancellation)

d) Lessons learned

The observed tsunami might be caused by the multiple earthquakes or by T-phases generated by occurred around Torishima island, as some scientists have proposed.

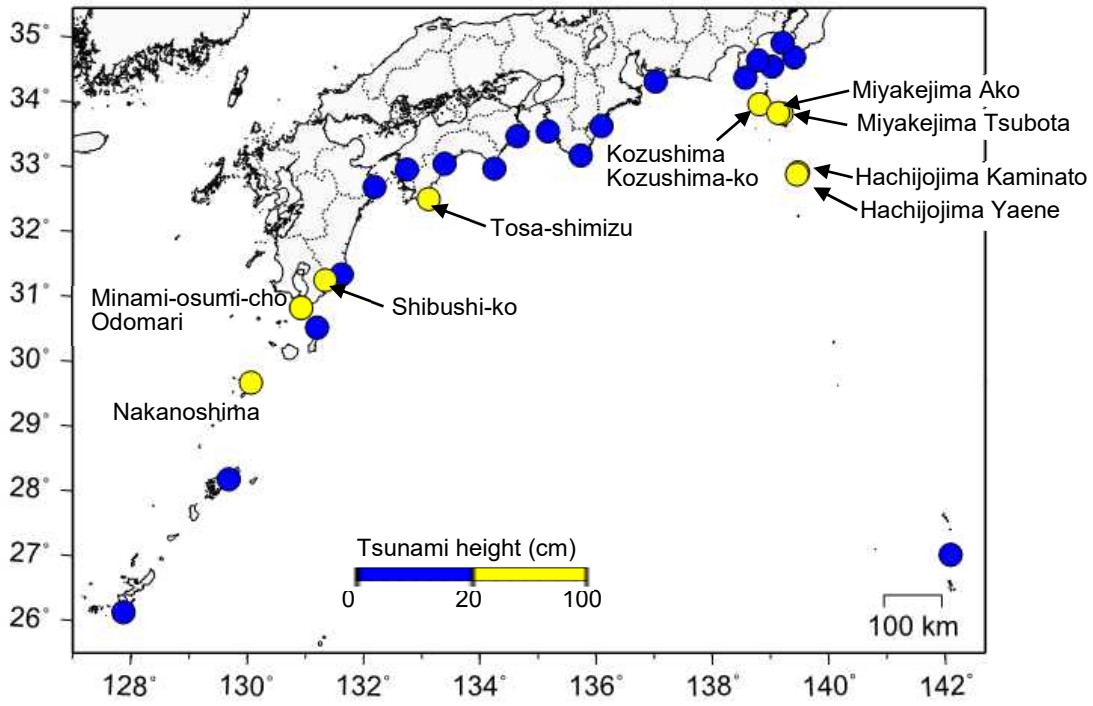


Figure 4: Observed Tsunami (Earthquakes near Torishima Island, 08 October 2023)

7.4. Earthquake in Philippine islands region

a) Hypocentral parameters

Date	02 December 2023
Time	14:37 UTC
Latitude	8°31′36″ N
Longitude	126°26′54″ E
Depth	33 km
Magnitude	7.5 (Mw) (determined by JMA)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Ishinomaki-shi Ayukawa	38°18'N	141°30'E	unclear	23:27, 02 Dec	6
Tateyama-shi Mera	34°55'N	139°50'E	19:unclear, 02 Dec	21:10, 02 Dec	12
Izu-oshima Okada	34°47'N	139°23'E	19:unclear, 02 Dec	20:05, 02 Dec	7
Kozushima Kozushima-ko	34°13'N	139°08'E	18:unclear, 02 Dec	21:29, 02 Dec	17
Miyakejima Tsubota	34°03'N	139°33'E	19:unclear, 02 Dec	00:16, 03 Dec	11
Miyakejima Ako	34°04'N	139°29'E	18:unclear, 02 Dec	19:59, 02 Dec	14
Hachijojima Kaminato	33°08'N	139°48'E	18:53, 02 Dec	19:19, 02 Dec	19
Hachijojima Yaene	33°06'N	139°47'E	18:unclear, 02 Dec	19:27, 02 Dec	0.4m
Chichijima Futami	27°06'N	142°12'E	18:unclear, 02 Dec	19:06, 02 Dec	9
Miurashi Aburatsubo	35°10'N	139°37'E	19:57, 02 Dec	22:00, 02 Dec	9
Odawara	35°14'N	139°09'E	19:unclear, 02 Dec	21:15, 02 Dec	3
Miura-shi Misaki-gyoko	35°09'N	139°37'E	19:39, 02 Dec	21:41, 02 Dec	0.1m
Minami-izu-cho Teishi-ko	34°38'N	138°53'E	18:unclear, 02 Dec	21:03, 02 Dec	16
Numazu-shi Uchiura	35°01'N	138°53'E	19:unclear, 02 Dec	23:21, 02 Dec	6
Omaezaki	34°37'N	138°13'E	19:08, 02 Dec	20:44, 02 Dec	8
Maisaka	34°41'N	137°37'E	18:55, 02 Dec	20:44, 02 Dec	3
Shimoda-ko	34°41'N	138°58'E	19:unclear, 02 Dec	20:40, 02 Dec	7
Nishiizu-cho Tago	34°48'N	138°46'E	18:unclear, 02 Dec	21:15, 02 Dec	8
Yaizu	34°52'N	138°20'E	18:52, 02 Dec	21:14, 02 Dec	9
Tahara-shi Akabane	34°36'N	137°11'E	18:56, 02 Dec	01:21, 03 Dec	9
Toba	34°29'N	136°49'E	19:unclear, 02 Dec	21:00, 02 Dec	5
Owase	34°05'N	136°12'E	18:40, 02 Dec	19:39, 02 Dec	8
Kumano-shi Yuki	33°56'N	136°10'E	18:31, 02 Dec	19:55, 02 Dec	8
Misaki-cho Tannowa	34°20'N	135°11'E	18:24, 02 Dec	21:44, 02 Dec	4
Nachi-katsuura-cho Uragami	33°34'N	135°54'E	18:31, 02 Dec	18:37, 02 Dec	6

Kushimoto-cho Fukuro-ko	33°29'N	135°46'E	18:unclear, 02 Dec	19:08, 02 Dec	17
Gobo-shi Haraido	33°51'N	135°10'E	18:59, 02 Dec	19:16, 02 Dec	15
Komatsushima	34°01'N	134°35'E	unclear	23:34, 02 Dec	7
Tokushima Yuki	33°46'N	134°36'E	18:41, 02 Dec	20:36, 02 Dec	12
Muroto-shi Muroto-misaki	33°16'N	134°10'E	18:34, 02 Dec	18:42, 02 Dec	10
Tosa-shimizu	32°47'N	132°58'E	18:31, 02 Dec	18:53, 02 Dec	16
Naka-tosa-cho Kure-ko	33°20'N	133°15'E	18:46, 02 Dec	20:29, 02 Dec	12
Minami-osumi-cho Odomari	31°01'N	130°41'E	18:unclear, 02 Dec	22:22, 02 Dec	16
Tanegashima Kumano	30°28'N	130°58'E	unclear	19:47, 02 Dec	16
Tanegashima Nishino-omote	30°44'N	131°00'E	18:unclear, 02 Dec	22:20, 02 Dec	11
Amami-shi Kominato	28°19'N	129°32'E	17:36, 02 Dec	18:12, 02 Dec	19
Naha	26°13'N	127°40'E	17:20, 02 Dec	19:11, 02 Dec	8
Nanjo-shi Azama	26°11'N	127°49'E	17:unclear, 02 Dec	17:44, 02 Dec	5
Minami-daito-gyoko	25°52'N	131°14'E	17:unclear, 02 Dec	21:53, 02 Dec	4
Miyakojima Hirara	24°49'N	125°17'E	17:unclear, 02 Dec	18:07, 02 Dec	6

* Height values described in meter were measured with huge tsunami gauges (resolution: 0.1 m).
* The data contained in this table is provisional and subject to change.

Table 6: Observed Tsunami (Earthquake around Philippine, 02 December 2023)

c) Tsunami warning operations

14:37 UTC --- Earthquake occurrence
14:56 UTC --- Tsunami Advisory
17:00 UTC --- Press Conference
18:19 UTC --- Tsunami Advisory (revised)
19:30 UTC --- Press Conference
22:00 UTC --- Tsunami Advisory (cancellation in some regions)
22:30 UTC --- Press Conference
(03 December)
00:00 UTC --- Tsunami Advisory (cancellation)

d) Lessons learned

The tsunami prediction results were generally consistent with the observed tsunami characteristics.

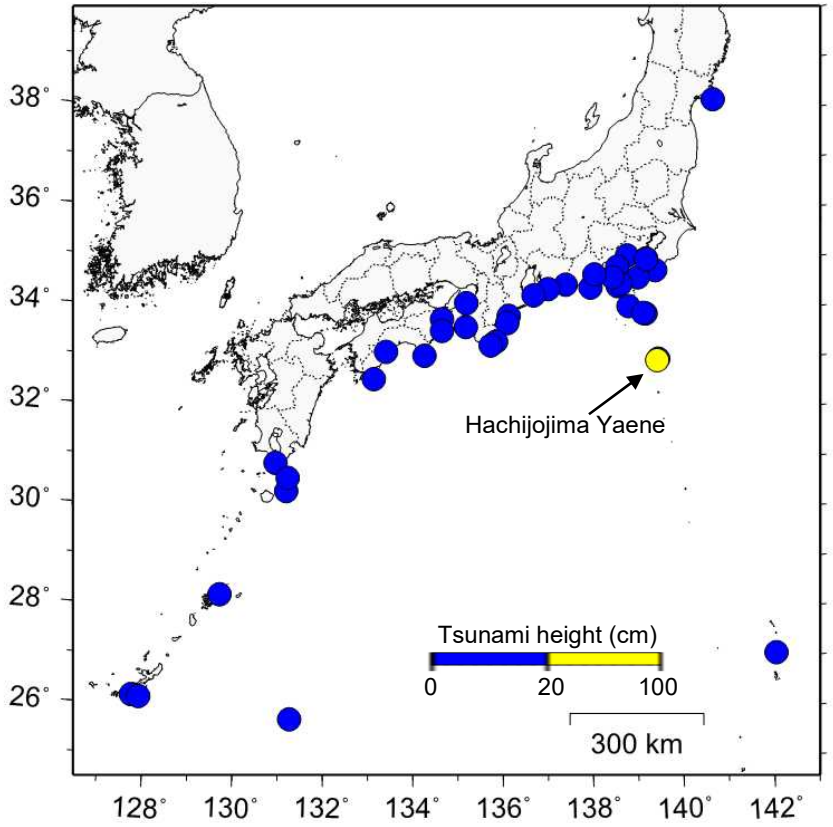


Figure 5: Observed Tsunami (Earthquake around Philippine, 02 December 2023)

7.5. Earthquake in Noto Peninsula region, Japan (The 2024 Noto Peninsula Earthquake)

a) Hypocentral parameters (determined by JMA)

Date	01 January 2024
Time	07:10 UTC
Latitude	37°29′42″ N
Longitude	137°16′12″ E
Depth	16 km
Magnitude	7.6 (Mjma), 7.5 (Mw)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Hakodate	41°47'N	140°43'E	unclear	23:47, 01 Jan	17
Wakkanai	45°24'N	141°41'E	unclear	00:27, 02 Jan	14
Rishiri-to Kutsugata-ko	45°11'N	141°08'E	09: 52, 01 Jan	14:45, 01 Jan	23
Rumoi	43°57'N	141°38'E	unclear	17:47, 01 Jan	25
Otaru	43°12'N	141°00'E	09:unclear, 01 Jan	18:17, 01 Jan	16
Ishikariwan-shinko	43°13'N	141°18'E	10:unclear, 01 Jan	16:35, 01 Jan	35
Otaru-shi Oshoro	43°13' N	140°52' E	09:unclear, 01 Jan	11:40, 01 Jan	14
Iwanai-ko	42°59'N	140°30'E	08:35, 01 Jan	15:26, 01 Jan	49
Setana-ko	42°27'N	139°51'E	08:55, 01 Jan	09:26, 01 Jan	54
Okushiri-to Okushiri-ko	42°10'N	139°31'E	08:16, 01 Jan	09:07, 01 Jan	54
Esashi	41°52'N	140°08'E	08:unclear, 01 Jan	10:45, 01 Jan	31
Okushiri-to Matsue	42°05'N	139°29'E	08:13, 01 Jan	09:01, 01 Jan	12
Esashi-ko	44°56'N	142°35'E	unclear	15:20, 01 Jan	11
Mombetsu-ko	44°21'N	143°22'E	unclear	18:45, 01 Jan	11
Fukaura	40°39'N	139°56'E	08:02, 01 Jan	09:04, 01 Jan	36
Tappi	41°15'N	140°23'E	08:unclear, 01 Jan	13:03, 01 Jan	9
Aomori	40°50'N	140°46'E	unclear	13:44, 01 Jan	10
Akita	39°45'N	140°04'E	08:24, 01 Jan	14:35, 01 Jan	36
Sakata	38°55'N	139°49'E	08:13, 01 Jan	10:08, 01 Jan	0.8m
Tobishima	39°11'N	139°33'E	07:unclear, 01 Jan	08:52, 01 Jan	35
Niigata	37°56'N	139°04'E	07:54, 01 Jan	16:36, 01 Jan	31
Kashiwazaki-shi Kujiranami	37°21'N	138°31'E	07:30, 01 Jan	07:36, 01 Jan	37
Awashima	38°28'N	139°15'E	unclear	10:07, 01 Jan	32
Sado-shi Washizaki	38°19'N	138°31'E	07:32, 01 Jan	10:21, 01 Jan	33
Toyama	36°46'N	137°13'E	07:13, 01 Jan	07:35, 01 Jan	79
Nanao-ko	37°03'N	136°58'E	07:37, 01 Jan	09:59, 01 Jan	54
Kanazawa	36°37'N	136°36'E	07:52, 01 Jan	10:09, 01 Jan	80
Tsuruga-ko	35°40'N	136°04'E	08:34, 01 Jan	11:27, 01 Jan	57
Maizuru	35°29'N	135°23'E	08:42, 01 Jan	15:43, 01 Jan	46
Toyooka-shi Tsuiyama	35°39'N	134°50'E	08:24, 01 Jan	10:20, 01 Jan	35
Sakaiminato-shi Sakai	35°33'N	133°15'E	09:16, 01 Jan	13:29, 01 Jan	60

Iwami-cho Tajiri	35°36'N	134°19'E	08:unclear, 01 Jan	11:16, 01 Jan	20
Hamada	34°54'N	132°04'E	09:33, 01 Jan	12:46, 01 Jan	25
Oki Saigo	36°12'N	133°20'E	08:25, 01 Jan	08:50, 01 Jan	29
Shimonoseki-shi Haedomari-ko	33°57'N	130°53'E	12:unclear, 01 Jan	14:24, 01 Jan	6
Shimonoseki-shi Hikoshima-deshimatsu	33°56'N	130°56'E	unclear	16:25, 01 Jan	9
Shimonoseki-ko Chofu	34°01'N	131°00'E	13:unclear, 01 Jan	13:56, 01 Jan	4
Kanda-ko	33°48'N	131°00'E	14:unclear, 01 Jan	15:36, 01 Jan	5
Kitakyushu-ko Aohama	33°57'N	131°01'E	13:unclear, 01 Jan	19:26, 01 Jan	4
Kitakyushu-shi Moji	33°57'N	130°57'E	12:unclear, 01 Jan	17:05, 01 Jan	10
Kitakyushu-ko Hiagari	33°55'N	130°53'E	12:unclear, 01 Jan	14:36, 01 Jan	8
Karatsu-ko	33°28'N	129°58'E	unclear	15:02, 01 Jan	13
Genkai-cho Kariya	33°28'N	129°51'E	unclear	15:35, 01 Jan	20
Hirado-shi Tabira-ko	33°22'N	129°35'E	unclear	16:05, 01 Jan	7
Tsushima Hitakatsu	34°39'N	129°29'E	09:unclear, 01 Jan	15:01, 01 Jan	32
Tsushima-shi Izuhara	34°12'N	129°18'E	12:unclear, 01 Jan	13:49, 01 Jan	9
Ikinoshima Gonoura-ko	33°45'N	129°41'E	unclear	15:51, 01 Jan	16

* Height values described in meter were measured with huge tsunami gauges (resolution: 0.1 m).
* The data contained in this table is provisional and subject to change.

Table 7: Observed Tsunami (The 2024 Noto Peninsula Earthquake, Japan, 01 January 2024)

c) Tsunami warning operations

07:10 UTC --- Earthquake occurrence
07:12 UTC --- Tsunami Warning
07:22 UTC --- Major Tsunami Warning (upgraded | revised)
09:10 UTC --- Press Conference
11:30 UTC --- Tsunami Warning (downgraded | revised)
12:30 UTC --- Press Conference
16:15 UTC --- Tsunami Advisory (downgraded | revised)
16:45 UTC --- Press Conference
17:30 UTC --- Tsunami Advisory (cancellation in some regions)
22:30 UTC --- Tsunami Advisory (cancellation in some regions)
(02 January)
01:00 UTC --- Tsunami Advisory (cancellation)

d) Lessons learned

As the magnitude was revised by W-phase analysis, the tsunami prediction was updated.

The tsunami prediction results using this revised magnitude were generally consistent with the observed tsunami characteristics. (See Chapter 11)

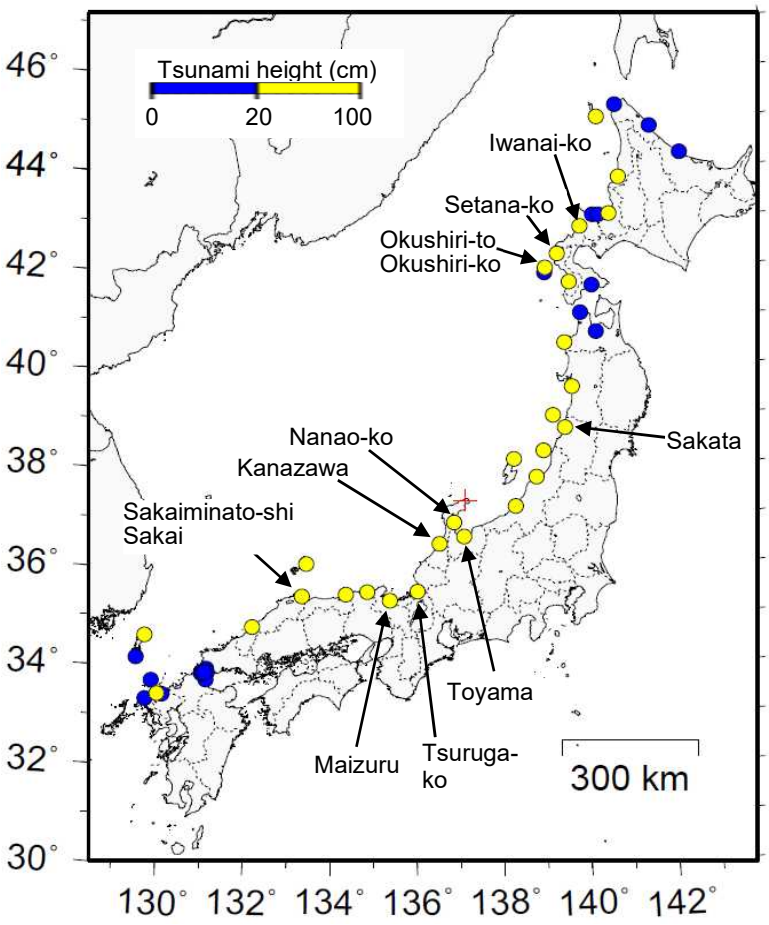


Figure 6: Observed Tsunami (The 2024 Noto Peninsula Earthquake, Japan, 01 January 2024)

7.6. Earthquake in Taiwan region

a) Hypocentral parameters (determined by JMA)

Date	02 April 2024
Time	23:58 UTC
Latitude	23°49′54″ N
Longitude	121°35′54″ E
Depth	23 km
Magnitude	7.7 (Mjma), 7.4 (Mw)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Yonagunijima Kubura	24°27'N	122°57'E	00:14, 03 Apr	00:18, 03 Apr	27
Miyakojima Hirara	24°49'N	125°17'E	01:03, 03 Apr	01:51, 03 Apr	25
Ishigakijima Ishigaki-ko	24°20'N	124°10'E	00:32, 03 Apr	01:42, 03 Apr	17

* The data contained in this table is provisional and subject to change.

Table 8: Observed Tsunami (Earthquake around Taiwan, 02 April 2024)

c) Tsunami warning operations

23:58 UTC --- Earthquake occurrence
(03 April)
00:01 UTC --- Tsunami Warning
01:30 UTC --- Press Conference
01:40 UTC --- Tsunami Advisory (downgraded | revised)
03:00 UTC --- Tsunami Advisory (cancellation)

d) Lessons learned

The tsunami prediction results were generally consistent with the observed tsunami characteristics.

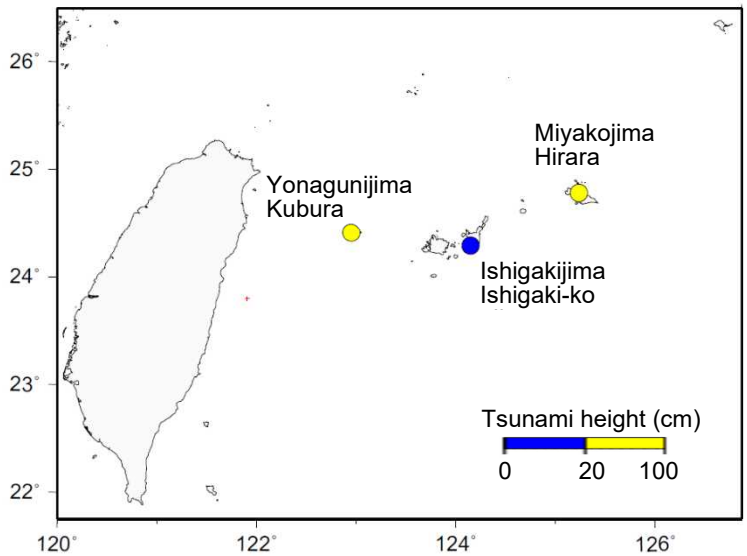


Figure 7: Observed Tsunami (Earthquake around Taiwan, 02 April 2024)

7.7. Earthquake in Hyuganada region, Japan

a) Hypocentral parameters (determined by JMA)

Date	08 August 2024
Time	07:42 UTC
Latitude	31°44′12″ N
Longitude	131°43′18″ E
Depth	31 km
Magnitude	7.1 (Mjma), 7.0 (Mw)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Tateyama-shi Mera	34°55'N	139°50'E	unclear	10:53, 08 Aug	6
Chichijima Futami	27°06'N	142°12'E	09:unclear, 08 Aug	11:10, 08 Aug	6
Nachi-katsuura-cho Uragami	33°34'N	135°54'E	unclear	09:46, 08 Aug	5
Kushimoto-cho Fukuro-ko	33°29'N	135°46'E	08:40, 08 Aug	10:00, 08 Aug	11
Tokushima Yuki	33°46'N	134°36'E	08:43, 08 Aug	09:15, 08 Aug	6
Uwajima	33°14'N	132°33'E	unclear	11:26, 08 Aug	7
Muroto-shi Muroto-misaki	33°16'N	134°10'E	08:27, 08 Aug	08:42, 08 Aug	13
Kochi	33°30'N	133°34'E	08:unclear, 08 Aug	11:28, 08 Aug	7
Tosa-shimizu	32°47'N	132°58'E	08:16, 08 Aug	08:45, 08 Aug	25
Naka-tosa-cho Kure-ko	33°20'N	133°15'E	08:unclear, 08 Aug	10:32, 08 Aug	4
Saiki-shi Matsuura	32°57'N	131°58'E	unclear	10:47, 08 Aug	5
Hyuga-shi Hososhima	32°27'N	131°40'E	08:07, 08 Aug	10:08, 08 Aug	17
Nichinan-shi Aburatsu	31°35'N	131°25'E	07:unclear, 08 Aug	08:23, 08 Aug	40
Miyazaki-ko	31°54'N	131°27'E	08:06, 08 Aug	10:19, 08 Aug	51
Minami-osumi-cho Odomari	31°01'N	130°41'E	08:27, 08 Aug	08:48, 08 Aug	15
Shibushi-ko	31°29'N	131°07'E	08:11, 08 Aug	08:25, 08 Aug	17
Tanegashima Nishino-omote	30°44'N	131°00'E	08:unclear, 08 Aug	09:53, 08 Aug	10
Tanegashima Kumano	30°28'N	130°58'E	08:16, 08 Aug	09:24, 15 Aug	18
Amami-shi Kominato	28°19'N	129°32'E	08:unclear, 08 Aug	10:21, 15 Aug	7
Makurazaki	31°16'N	130°18'E	unclear	10:03, 15 Aug	18

* The data contained in this table is provisional and subject to change.

Table 9: Observed Tsunami (Earthquake in Hyuganada, Japan, 08 August 2024)

c) Tsunami warning operations

07:42 UTC --- Earthquake occurrence
07:44 UTC --- Tsunami Advisory
07:52 UTC --- Tsunami Advisory (updated | revised)
08:00 UTC --- Nankai Trough Earthquake Extra Information (Under Analysis)
08:45 UTC --- Press Conference
10:00 UTC --- Tsunami Advisory (cancellation in some regions)

10:15 UTC --- Nankai Trough Earthquake Extra Information (Megathrust Earthquake Attention)
10:45 UTC --- Press Conference (Nankai Trough Earthquake Extra Information)
13:00 UTC --- Tsunami Advisory (cancellation)

d) Lessons learned

As the magnitude was revised by W-phase analysis, the tsunami prediction was updated. The tsunami prediction results using this revised magnitude were generally consistent with the observed tsunami characteristics. The Nankai Trough Earthquake Extra Information (Megathrust Earthquake Attention) was issued by JMA. (See Chapter 11)

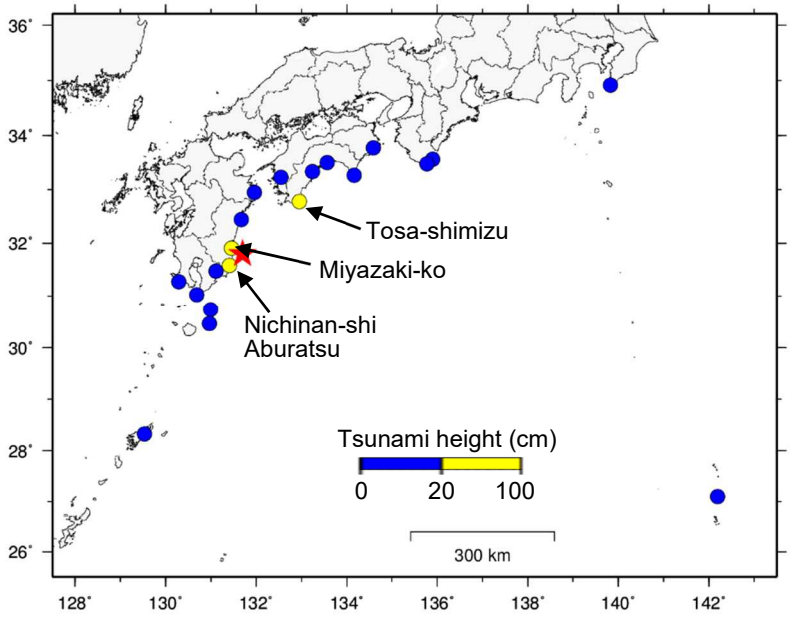


Figure 8: Observed Tsunami (Earthquake in Hyuganada, Japan, 08 August 2024)

7.8. Earthquake near Torishima Island, Japan

a) Hypocentral parameters (determined by JMA)

Date	23 Septemcer 2024
Time	23:14 UTC
Latitude	31°29′00″ N
Longitude	140°07′48″ E
Depth	19 km
Magnitude	5.8 (Mjma), 5.7 (Mw)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Tateyama-shi Mera	34°55'N	139°50'E	00:unclear, 24 Sep	00:57, 24 Sep	9
Izu-oshima Okada	34°47'N	139°23'E	00:11, 24 Sep	01:33, 24 Sep	12
Kozushima Kozushima-ko	34°13'N	139°08'E	unclear	00:54, 24 Sep	20
Miyakejima Tsubota	34°03'N	139°33'E	00:unclear, 24 Sep	00:11, 24 Sep	14
Miyakejima Ako	34°04'N	139°29'E	00:07, 24 Sep	00:11, 24 Sep	15
Hachijojima Kaminato	33°08'N	139°48'E	unclear	01:45, 24 Sep	7
Hachijojima Yaene	33°06'N	139°47'E	23:unclear, 23 Sep	23:58, 23 Sep	0.7m
Minami-izu-cho Teishi-ko	34°38'N	138°53'E	00:unclear, 24 Sep	00:38, 24 Sep	8
Muroto-shi Muroto-misaki	33°16'N	134°10'E	00:unclear, 24 Sep	00:47, 24 Sep	4
Tosa-shimizu	32°47'N	132°58'E	00:unclear, 24 Sep	01:15, 24 Sep	8
Amami-shi Kominato	28°19'N	129°32'E	unclear	01:37, 24 Sep	5
Nakanoshima	29°51'N	129°51'E	01:unclear, 24 Sep	01:44, 24 Sep	13

* Height values described in meter were measured with huge tsunami gauges (resolution: 0.1 m).
* The data contained in this table is provisional and subject to change.

Table 10: Observed Tsunami (Earthquake near Torishima Island, Japan, 23 September 2024)

c) Tsunami warning operations

23:14 UTC --- Earthquake occurrence
23:20 UTC --- Tsunami Advisory
(24 September)
00:11 UTC --- Tsunami Advisory (updated | revised)
01:20 UTC --- Press Conference
02:00 UTC --- Tsunami Advisory (cancellation)

d) Lessons learned

The tsunami prediction results based on the relation between tsunami observation and the previous earthquake occurred around Torishima island were generally consistent with the observed tsunami characteristics.

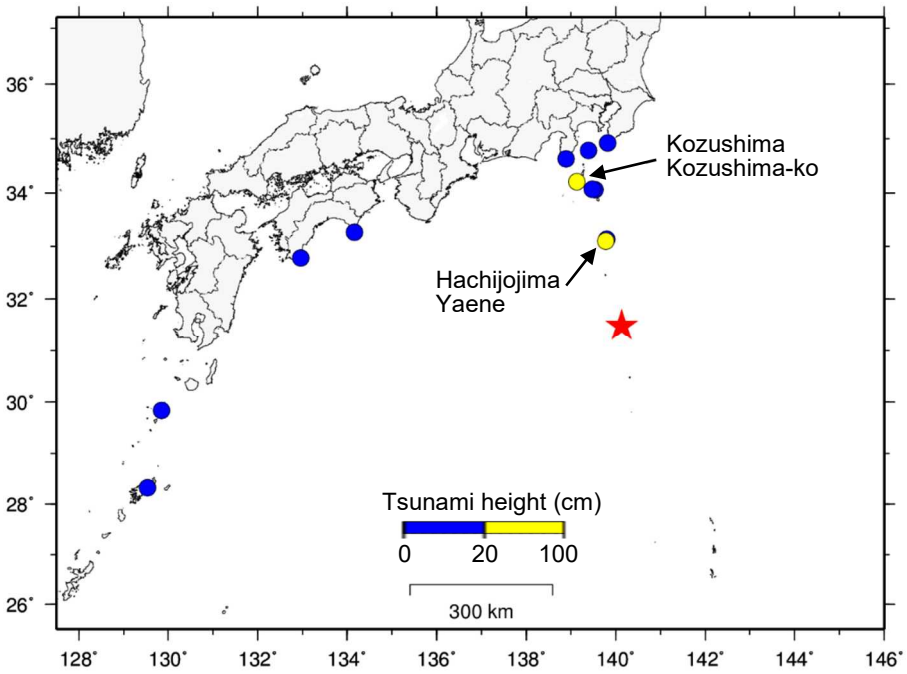


Figure 9: Observed Tsunami (Earthquake near Torishima Island, Japan, 23 September 2024)

7.9. Earthquake in Hyuganada, Japan

a) Hypocentral parameters (determined by JMA)

Date	13 January 2025
Time	12:19 UTC
Latitude	31°49′42″ N
Longitude	131°34′12″ E
Depth	36 km
Magnitude	6.6 (Mjma), 6.7 (Mw)

b) Observed tsunami

Station			Arrival Time [UTC]	Maximum Amplitude	
Name	Latitude	Longitude		Time [UTC]	Height [cm]
Uwajima	33°14'N	132°33'E	unclear	16:06, 13 Jan	8
Muroto-shi Muroto-misaki	33°16'N	134°10'E	13:unclear, 13 Jan	13:17, 13 Jan	10
Tosa-shimizu	32°47'N	132°58'E	12:55, 13 Jan	13:20, 13 Jan	13
Hyuga-shi Hososhima	32°27'N	131°40'E	12:unclear, 13 Jan	15:05, 13 Jan	6
Nichinan-shi Aburatsu	31°35'N	131°25'E	12:40, 13 Jan	13:05, 13 Jan	15
Miyazaki-ko	31°54'N	131°27'E	12:41, 13 Jan	15:00, 13 Jan	23
Shibushi-ko	31°29'N	131°07'E	14:unclear, 13 Jan	15:36, 13 Jan	8
Tanegashima Nishino-omote	30°44'N	131°00'E	unclear	14:31, 13 Jan	8
Tanegashima Kumano	30°28'N	130°58'E	unclear	14:04, 13 Jan	11

* The data contained in this table is provisional and subject to change.

Table 11: Observed Tsunami (Earthquake in Hyuganada, Japan, 13 January 2025)

c) Tsunami warning operations

12:19 UTC --- Earthquake occurrence
12:29 UTC --- Tsunami Advisory
12:55 UTC --- Nankai Trough Earthquake Extra Information (Under Analysis)
14:15 UTC --- Press Conference
14:45 UTC --- Nankai Trough Earthquake Extra Information (Analysis Complete)
14:50 UTC --- Tsunami Advisory (cancellation)
15:15 UTC --- Press Conference (Nankai Trough Earthquake Extra Information)

d) Lessons learned

As the magnitude was revised by W-phase analysis, the tsunami prediction was updated. The tsunami prediction results using this revised magnitude were generally consistent with the observed tsunami characteristics.

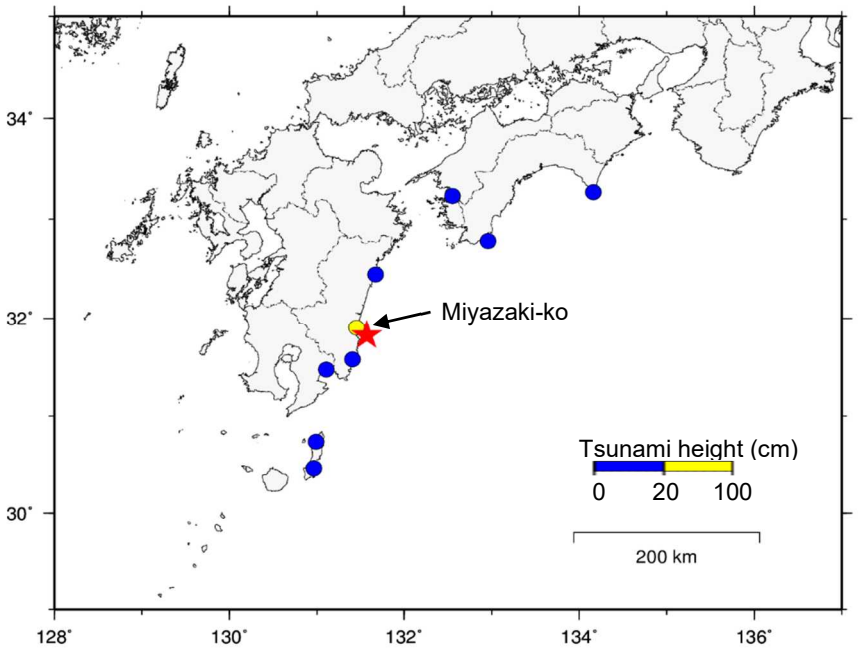


Figure 10: Observed Tsunami (Earthquake in Hyuganada, Japan, 13 Januarv 2025)

8. Web sites (URLs) of national tsunami-related web sites

http://www.jma.go.jp/jma/indexe.html

9. Summary plans of future tsunami warning and mitigation system improvements.

The JMA uses a tsunami database to predict tsunamis and promptly issue tsunami warnings. Real-time simulations are used as one of the reference materials for updating and canceling tsunami warnings. The JMA is considering providing information on tsunami trends using real-time simulations.

10. EXECUTIVE SUMMARY

Since the last meeting, Japan has experienced a number of tsunamis, including the Noto Peninsula Earthquake in January 2024. The Noto Peninsula earthquake caused damage to some coastal tsunami observation equipments, but the JMA quickly restored observation. The JMA has increased the number of offshore tsunami observation points.

We also promote drills and awareness-raising-evetns, as appropriate action upon receipt of information is important to mitigate damage in the event of a tsunami. On August 8, 2024, the Nankai Trough Earthquake Extra Information (Megathrust Earthquake Attention) was issued first time since the current framework was developed in 2019. Through this experience we learned that not many people are familiar with this information and know what they should do, so the government will make more efforts to increase public understanding.

Research on volcanic tsunamis and the Nankai Trough Earthquake has been conducted in cooperation with universities and research institutions in Japan.

The technical cooperation project implemented by the Japan International Cooperation Agency (JICA) with the cooperation of the JMA for Vanuatsu and Indonesia ended in 2023 and 2025, respectively. A new project for the Philippines started in 2024.

11. NARRATIVE

11.1. Tsunami warning system

JMA is the national authority for issuing tsunami warnings/advisories in Japan. JMA continuously monitors seismic activity in and around Japan. When an earthquake occurs, JMA immediately determines the hypocenter and magnitude of the earthquake. If the earthquake occurs in an ocean area with tsunamigenic potential, JMA conducts tsunami forecasting operations. JMA provides tsunami warnings/advisories, via dedicated land line, for the national and local authorities and broadcasting stations for disaster prevention and/or mitigation. JMA collaborates with universities and other research institutions to improve tsunami monitoring and forecasting technology.

a) Utilization of tsunami observation data from the Nankai Trough Seafloor Observation Network for Earthquakes and Tsunamis (N-net)

The JMA is working with other organisations to establish a tsunami monitoring network. For tsunami observation using water pressure gauges on the seafloor offshore, the JMA began using observation data from DONET (Dense Oceanfloor Network system for Earthquakes and Tsunamis) installed in the Nankai Trough in 2012, and also uses observation data from S-net (Seafloor observation network for earthquakes and tsunamis along the Japan Trench) installed on the Pacific side of eastern Japan. Both systems are operated by the National Research Institute for Earth Science and Disaster Resilience(NIED).NIED is currently installing a new cabled seafloor seismic and tsunami observation system, N-net, in the off the coast of Kochi Prefecture to the Hyuganada.The JMA started using its tsunami observation data for tsunami information on November 21, 2024. As a result, it has become possible to detect tsunamis further offshore than before, from Kochi Prefecture to Miyazaki Prefecture. This has made it possible to update the tsunami warnings earlier than before and to improve the accuracy of tsunami information. The

number of offshore tsunami observation points from which observed tsunami values are announced in tsunami information has increased from 232 to 250.

b) Response to the 2024 Noto Peninsula Earthquake

On January 1st 2024, an earthquake with magnitude 7.6 (Mjma) occurred near the Noto Peninsula. Following the earthquake, the JMA issued the tsunami warning, including the major tsunami warning, and tsunamis were indeed observed over a wide area (see Chapter 7.3). The earthquake caused significant ground uplift on the Noto Peninsula. As a result, at some of the tsunami observation points along the coast of the Peninsula, the tsunami observation equipment was exposed above the water, and it was no longer possible to observe tsunamis. The JMA dispatched staff to these points, installed temporary tsunami observation equipment, and promptly resumed tsunami observation. In addition, staff were dispatched to areas where tsunami damage had been confirmed, and field surveys were conducted to investigate the traces of the tsunami. As a result, it was confirmed that there were places where the run-up height exceeded five meters.

11.2. Tsunami mitigation activities

Japan has the Basic Disaster Management Plan, which defines the responsibilities of each entity such as the national and local governments, public corporations and other entities. It consists of various plans for each type of disaster. The Basic Disaster Management Plan describes specific countermeasures to be taken by each entity according to the disaster management phases of prevention and preparedness, emergency response, as well as recovery and reconstruction. Disaster drills and public education programmes are carried out in collaboration with related ministries and agencies and local governments under the leadership of the Cabinet Office.

a) Tsunami drills

In 2023, earthquake and tsunami disaster prevention drills were held in various parts of the country, mainly on World Tsunami Awareness Day (November 5), and were organized by the national government, local governments, and private companies. The Cabinet Office, in cooperation with local governments, held 10 disaster prevention drills with the participation of local residents in various parts of the country, mainly during the above period. These drills included training on how to protect oneself in the event of an earthquake (shakeout training) and how to evacuate in the event of a tsunami after the shaking has stopped (tsunami evacuation training), as well as training on how to check the safety of people, set up and operate evacuation shelters, and so on. In addition, workshops were held before and after the drills, in which local residents were informed about the expected damage in their area, the geographical conditions, etc., and used this as an opportunity to learn appropriate evacuation behavior in the event of a tsunami. In total, about 9,000 people participated in the drills and workshops.

b) Nankai Trough Earthquake Extra Information

Mega earthquakes have historically repeated in the Nankai Trough. If a large earthquake occurs in this region, an intensity of 7 (the maximum on the JMA seismic intensity scale) is expected in some areas, and a large tsunami of more than 10 m is expected to hit a wide area on the Pacific side. On August 8, 2024, an earthquake with a JMA magnitude of 7.1 occurred in the Hyuganada Sea off Miyazaki, Kyushu. Due to this earthquake, the JMA issued a tsunami advisory. And based on the analysis of the Nankai Trough seismic activity, the JMA issued the "Nankai Trough Earthquake Extra Information (Megathrust Earthquake Attention)" (see Chapter 7.7). Fortunately, no mega earthquake has occurred in the Nankai Trough since then.

Although this information is highly uncertain, it is believed that residents who hear the information can reduce the damage by raising awareness. Therefore, this information is a part of the effort to save more lives by calling for necessary disaster prevention measures based on the premise of daily preparedness. The information was issued for the first time since the current framework established in 2019, and there was some confusion among local governments and

businesses when they received the information and had to respond to it. The Central Disaster Management Council-Committee conducted a review by a working group composed of academic experts, local governments, business operators, and others, and compiled measures to improve disaster prevention activities when information is released. Specifically, it was decided to strengthen public relations and information dissemination by the government when information is released. It was also decided that the basic approach to disaster response should be clearly stated in the guidelines so that each recipient of information can respond appropriately to the situation.

c) World Tsunami Awareness Day

In light of Noto Peninsula Earthquake and the issuance of Nankai Trough Earthquake Extra Information, on 5 November, World Tsunami Awareness Day (Tsunami Disaster Prevention Day in Japan), the Cabinet Office hold a special online event on "Preparing for Tsunamis with the Noto Peninsula earthquake and the Nankai Trough Earthquake Extra Information in mind". At this event, people involved in tsunami disaster prevention in their local areas presented their initiatives.

The '2024 World Tsunami Awareness Day High School Summit' was held in Kumamoto with the aim of fostering future leaders in national resilience and further strengthening ties between countries around the world. About 250 people from Japan and overseas participated in the discussions.

11.3. Research projects

a) Study on volcanic tsunamis

A study on the eruption and tsunami of the Hunga Tonga–Hunga Ha‘apai volcano, entitled "Urgent and comprehensive study of 2022 Tonga submarine eruption and associated tsunami ", was conducted from February 2022 to March 2024 with the participation of 18 institutions in Japan.This research project has been supported by Grant-in-Aid for Special Purposes from the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Japan Society for Promotion of Science (JSPS). This research project analyzed atmospheric pressure and tsunami data recorded around the world, and clarified the mechanism of tsunami generation by resonance occurring between the moving air-pressure disturbances and sea surfaces. It also analyzed the damage in the Tonga Islands and along the coast of Japan, as well as the responses of local governments and residents.

b) Study on the Nankai Trough Earthquake

The "Research Project for Disaster Prevention on the great Earthquakes along the Nankai trough" was launched in 2020 as a five-year project. Sponsored by MEXT, the project was conducted by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) as the principal investigator and nine domestic universities and research institutes, including the National Research Institute for Earth Science and Disaster Prevention (NIED), as the research partners. This project has developed a monitoring system to understand and predict the activity of the Nankai Trough earthquake based on scientific and quantitative data, and to disseminate information. The project has also developed systems for simulating earthquake hazards and risks, techniques for deciding evacuation destinations and means of evacuation, technologies for understanding the situation to minimise the suspension of corporate activities, and technologies for simulating measures to maintain urban functions, and researched the ideal approach to disaster prevention measures for residents and companies. Furthermore, in collaboration with local governments, they assessed the disaster prevention issues in each region, worked to improve disaster information literacy so that they could share images of disaster in each region, and examined how to disseminate disaster prevention information.

11.4. International contributions

Japan has supported many countries in capacity building on tsunami warning systems and tsunami mitigation through projects implemented by the Japan International Cooperation Agency (JICA).

From 2022 to 2025, JICA had led a technical cooperation project, "Capacity Development on Operation of Earthquake and Tsunami Analysis and Warning Dissemination" to improve the tsunami warning capacity of the Indonesian Meteorology, Climate and Geophysics Agency (BMKG). Under this project, the JMA had contributed to the capacity building of the BMKG by sending experts to the BMKG, and giving lectures on the standard operating procedures (SOPs) of the tsunami warning system during the training programs for the BMKG officials invited to Japan. In 2024, JICA has launched a technical cooperation project, "The Project for Capacity Development for Monitoring and Information Dissemination of Earthquake, Tsunami and Volcano" for the Philippine Institute of Volcanology and Seismology, Department of Science and Technology （DOST-PHIVOLCS). The JMA will also provide technical support for this project.

The Asian Disaster Reduction Center (ADRC) holds a tsunami seminar every year to share the latest research results, technologies and expertise on tsunami disaster risk reduction with member countries, partner organisations, stakeholders and the general public. As 2024 marks the 20th anniversary of the Indian Ocean Tsunami, in cooperation with Syakura University (USK) in Banda Aceh, Indonesia, the ADRC held an international tsunami disaster prevention seminar on 7 November. In addition to introducing Japan's initiatives for reducing tsunami damage, the ADRC also shared insights into the recovery from the tsunami damage caused by the Great East Japan Earthquake.

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