

NOAA/NWS Pacific Tsunami Warning Center

**User's Guide:  
PTWC Tsunami Warning  
Products  
for  
Guam and CNMI**

Version 1.02  
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## CHANGE LOG

<b>DATE</b>	<b>DESCRIPTION OF CHANGE</b>	<b>VER</b>	<b>WHO</b>
07/31/14	Changed all time zone references that were SST to CHST	1.01	CSM
09/03/14	Changed CMNI to CNMI on Cover Page	1.02	CSM



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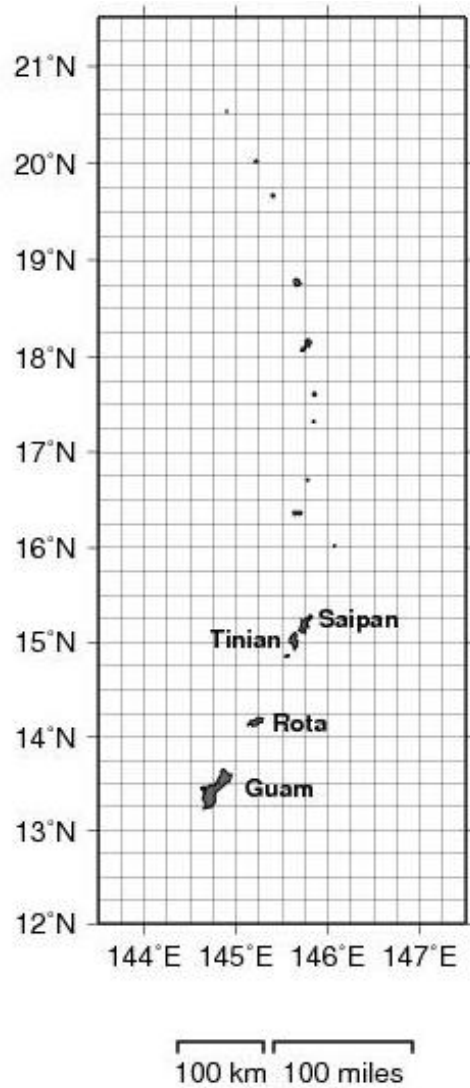
## Introduction

Guam and the Commonwealth of the Northern Mariana Islands (CNMI) are two territories of the United States that make up the Marianas island chain in western Pacific Ocean. Guam is the southernmost island. It has an area of about 210 square miles and a population of around 160,000. CNMI consists of fifteen islands stretching in an arc 480 miles to the north of Guam and with a land area totaling about 180 square miles. Only the three largest islands at the southern end of CNMI - Rota, Tinian, and Saipan – are populated with a total population of about 54,000. Guam and CNMI are situated just to the west of the seismic zone where the Pacific Plate is subducting beneath the Philippine plate. As a consequence, the islands frequently experience earthquakes and are vulnerable not only to impacts from local tsunamis generated by large earthquakes nearby but also from distant tsunamis generated by great earthquakes around the Pacific Rim.

Tsunami warning services are provided to Guam and CNMI by the NOAA/NWS Pacific Tsunami Warning Center (PTWC) located in Hawaii. For the past several decades they have been included in PTWC's international products issued for the UNESCO/IOC Pacific Tsunami Warning and Mitigation System. Those products inform about large, potentially-tsunamiogenic Pacific earthquakes and assign a warning, watch, or informational status to places around the Pacific, including Guam and CNMI, based upon their respective tsunami threat.

A separate set of domestic products is now being implemented by PTWC to cover Guam, Rota, Tinian, and Saipan to give more customized information than is possible with the international product. These new products have been prompted by an upcoming change to PTWC's international products that will eliminate the use of alerting terms such as watch and warning, but instead provide only a general forecast of expected tsunami impacts.

This User's Guide describes the new PTWC products for Guam and CNMI including the levels of alert that may be issued, the information that will be contained in the products, when products can be expected, and how they will be disseminated.



## **PRODUCTS AND ASSOCIATED THREATS**

### ***Tsunami Seismic Information Statement***

For earthquakes located within 311 miles (500 km) of Guam, Rota, Tinian, or Saipan that have magnitudes above about 5.5 but pose no tsunami threat, PTWC will issue a Tsunami Seismic Information Statement. Such earthquakes may be felt on those islands and potentially cause a tsunami concern. This product will quickly inform about the earthquake and that there is no tsunami threat.

### ***Tsunami Information Statement – No Threat***

For an earthquake located more than 311 miles (500 km) from Guam, Rota, Tinian, and Saipan with a magnitude of 6.5 or above that clearly poses no tsunami threat to those islands because it is on land, is too deep within the earth, is too small, or is too far away, a Tsunami Information Statement will be issued indicating there is no tsunami threat.

### ***Tsunami Information Statement – Potential Threat***

If a distant earthquake poses a potential tsunami threat to Guam, Rota, Tinian, and Saipan but the earliest expected initial wave arrival time is more than 6 hours away and the tsunami is still under evaluation by PTWC, then a Tsunami Information Statement (TIS) will be issued indicating there is a potential tsunami threat. Additional TISs will be issued at least once an hour until either:

- 1) it is determined that there is no tsunami threat to Guam, Rota, Tinian, and Saipan and a final TIS is issued;
- 2) the tsunami is still under evaluation but the expected initial wave arrival time becomes less than 6 hours away from Guam, Rota, Tinian, and Saipan and the TIS is upgraded to a Tsunami Watch;
- 3) the evaluation indicates only a potential marine tsunami threat to Guam, Rota, Tinian, and Saipan and the TIS is upgraded to a Tsunami Advisory; or
- 4) the evaluation indicates a potential land inundation threat to Guam, Rota, Tinian, and Saipan and the TIS is upgraded to a Tsunami Warning.

When a TIS is issued for a potential tsunami threat then government officials, emergency managers, and the public should stay alert for further information and be prepared to respond in case the situation is upgraded to a Watch, Advisory, or Warning.

### ***Tsunami Watch***

If a distant earthquake poses a potential tsunami threat to Guam, Rota, Tinian, and Saipan; the earliest expected initial wave arrival time is between 6 and 3 hours away; and the threat is still under evaluation, then a Tsunami Watch will be issued indicating there is a potential tsunami threat. Additional Tsunami Watch messages will be issued at least once an hour until either:

- 1) it is determined that there is no tsunami threat to Guam, Rota, Tinian, and Saipan, and the Tsunami Watch is cancelled;
- 2) the tsunami is still under evaluation but the expected initial wave arrival time is now less than 3 hours away from Guam, Rota, Tinian, and Saipan so the Tsunami Watch is upgraded to a Tsunami Warning;
- 3) the evaluation indicates only a potential marine tsunami threat to Guam, Rota, Tinian, and Saipan and the Tsunami Watch is upgraded to a Tsunami Advisory; or
- 4) the evaluation indicates a potential land inundation threat to Guam, Rota, Tinian, and Saipan and the Tsunami Watch is upgraded to a Tsunami Warning.

When a Tsunami Watch is issued for a potential tsunami threat then government officials, emergency managers, and the public should stay alert for further information and begin taking steps to respond quickly in case the situation is upgraded to an Advisory or Warning.

### ***Tsunami Advisory***

If an earthquake poses only a potential marine tsunami threat to Guam, Rota, Tinian, and Saipan, then a Tsunami Advisory will be issued. The determination of this level of threat may be made in one of two ways:

- 1) when the earliest expected arrival time of the initial tsunami wave is more than 3 hours away, then all available data and information will be used to forecast this level of tsunami threat to Guam, Rota, Tinian, and Saipan; or
- 2) when the earliest expected arrival time of the initial tsunami wave is less than 3 hours away, then this level of tsunami threat will be based primarily upon the earthquake's location, depth, and magnitude using pre-determined criteria.

Tsunami Advisories will continue to be issued at least once an hour until:

- 1) further information before impact indicates there is no tsunami threat to Guam, Rota, Tinian, and Saipan, and the Tsunami Advisory is cancelled;
- 2) further information before impact indicates there is a greater tsunami threat to Guam, Rota, Tinian, and Saipan and the Tsunami Advisory is upgraded to a Tsunami Warning;
- 3) the tsunami is impacting Guam, Rota, Tinian, and Saipan at a higher level than expected and the Tsunami Advisory is upgraded to a Tsunami Warning; or
- 4) the tsunami has already impacted Guam, Rota, Tinian, and Saipan and wave action has now diminished to the point where the Tsunami Advisory is cancelled.

A Tsunami Advisory means that that sea level is expected to repeatedly rise and fall by as much as 1 foot (0.3 meters) to 3.3 feet (1 meter) above and below the tide level in cycles that may take from five minutes to an hour. These sea level changes will be accompanied by dangerously strong and unusual near-shore ocean currents and minor flooding of harbors and beaches. This level of tsunami impact is a hazard to swimmers, surfers, divers, and others engaging in coastal ocean recreation or work activities. It is also a hazard to persons and boats in harbors.

Government officials and emergency managers should take appropriate action for a Tsunami Advisory to inform and instruct the public and others at risk to evacuate the water and take other appropriate actions in order to protect lives and property.



### ***Tsunami Warning***

If an earthquake poses a potential tsunami land inundation threat to Guam, Rota, Tinian, and Saipan, then a Tsunami Warning will be issued. The determination of this level of threat may be made in one of two ways:

- 1) when the earliest expected arrival time of the initial tsunami wave is more than 3 hours away, then all available data and information will be used to forecast this level of tsunami threat to Guam, Rota, Tinian, and Saipan; or
- 2) when the earliest expected arrival time of the initial tsunami wave is less than 3 hours away, then this level of tsunami threat will be based primarily upon the earthquake's location, depth, and magnitude using pre-determined criteria.

Tsunami Warnings will continue to be issued at least once an hour until:

- 1) further information before impact indicates there is a reduced tsunami threat to Guam, Rota, Tinian, and Saipan and the Tsunami Warning is downgraded to a Tsunami Advisory;
- 2) further information before impact indicates there is no tsunami threat to Guam, Rota, Tinian, and Saipan and the Tsunami Warning is cancelled;
- 3) the tsunami has already impacted Guam, Rota, Tinian, and Saipan and wave action is only at a lower level or it has diminished to the point where the Tsunami Warning is downgraded to a Tsunami Advisory; or
- 4) the tsunami has already impacted Guam, Rota, Tinian, and Saipan and wave action was minor or non-existent so that the Tsunami Warning is cancelled.

A Tsunami Warning means that that sea level is expected to repeatedly rise and fall above and below the tide level by at 3.3 feet (1 meter) or more in cycles that may take from five minutes to an hour. These sea level changes will be accompanied by repeated flooding and draining of land near the coast accompanied by damage to or destruction of coastal structures. This level of tsunami impact is a hazard to all persons in coastal areas of tsunami inundation zones.

Government officials and emergency managers should take appropriate actions for a Tsunami Warning to inform and instruct the public and others at risk to evacuate the coast and take other appropriate actions in order to protect lives and property.

### **OFFICIAL PRODUCT DEFINITIONS**

The following are the U.S. Tsunami Warning Center official domestic product definitions formulated by and agreed to by the National Tsunami Hazard Mitigation Program.

#### ***Tsunami Warning***

A tsunami warning is issued when a tsunami with the potential to generate widespread inundation is imminent, expected, or occurring. Warnings alert the public that dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after initial arrival. Warnings alert emergency management officials to take action for the entire tsunami hazard zone. Appropriate actions to be taken by local officials may include the evacuation of low-lying coastal areas, and the repositioning of ships to deep waters when there is time to safely do so. Warnings may be updated, adjusted geographically, downgraded, or

canceled. To provide the earliest possible alert, initial warnings are normally based only on seismic information.

***Tsunami Advisory***

A tsunami advisory is issued when a tsunami with the potential to generate strong currents or waves dangerous to those in or very near the water is imminent, expected, or occurring. The threat may continue for several hours after initial arrival, but significant inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbors and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand/contract affected areas, upgrade to a warning, or cancel the advisory.

***Tsunami Watch***

A tsunami watch is issued to alert emergency management officials and the public of an event which may later impact the watch area. The watch area may be upgraded to a warning or advisory - or canceled - based on updated information and analysis. Therefore, emergency management officials and the public should prepare to take action. Watches are normally issued based on seismic information without confirmation that a destructive tsunami is underway.

***Tsunami Information Statement / Tsunami Seismic Information Statement***

A tsunami information statement is issued to inform emergency management officials and the public that an earthquake has occurred, or that a tsunami warning, watch or advisory has been issued for another section of the ocean. In most cases, information statements are issued to indicate there is no threat of a destructive basin wide tsunami and to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. An information statement may, in appropriate situations, caution about the possibility of destructive local tsunamis. Information statements may be re-issued with additional information, though normally these messages are not updated. However, a watch, advisory or warning may be issued for the area, if necessary, after analysis and/or updated information becomes available.

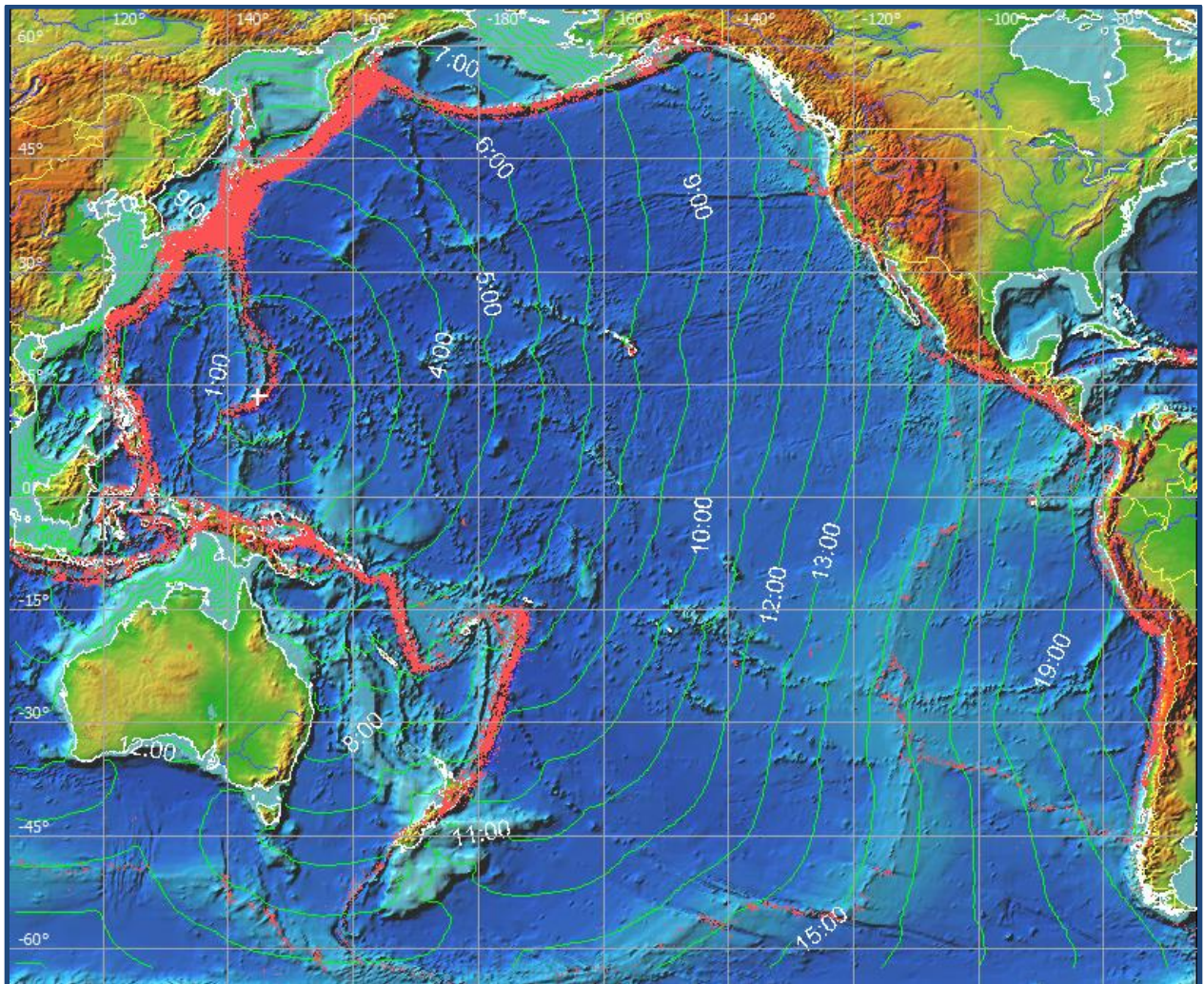
**PRODUCT TYPES AND IDENTIFIERS**

The following table provides the identifying codes of the World Meteorological Organization (WMO) and the U.S. Advanced Weather Information Processing System (AWIPS) for the PTWC product types issued for Guam, Rota, Tinian, and Saipan. This information may be necessary to request to receive these products over some circuits such as the WMO’s Global Telecommunications System (GTS), or to program certain systems such as the Emergency Manager’s Weather Information System (EMWIN) to alert on these products.

<b>Product Type</b>	<b>WMO ID</b>	<b>AWIPS ID</b>
Tsunami Seismic Information Statement	SEGM70 PHEB	EQIGUM
Tsunami Information Statement	WEGM42 PHEB	TIBGUM
Tsunami Watch/Advisory/Warning	WEGM40 PHEB	TSUGUM

## TSUNAMI TRAVEL TIMES

The speed that tsunami waves travel depends upon the depth of the water. In the deep ocean, they can travel at speeds similar to those of a commercial jet – 500 to 600 miles per hour. In shallow water near the coast they travel at speeds similar to common wind waves – 20 to 30 miles per hour. The following map shows tsunami travel times in hours to Guam from the various shallow seismic zones in the Pacific (tiny red dots). For the nearest part of the Marianas Trench seismic zone, the travel time can be only 10 minutes. For more distant seismic zones such as those in Japan the travel time can be 3 to 4 hours, and for South America more than 19 hours.



Tsunami travel time contours across the Pacific to Guam. The green contours are labelled in hours of travel time. Tiny red dots show the location of historical earthquakes having depths less than 50 km. They primarily outline boundaries between tectonic plates that cover the surface of the earth.

## PRE-DETERMINED SEISMIC CRITERIA FOR INITIAL LEVELS OF ALERT

In order to provide the earliest possible information regarding any potential earthquake-generated tsunami, initial products and associated alerts for Guam, Rota, Tinian, and Saipan are based primarily upon the preliminary seismic parameters determined by PTWC within a few minutes of the earthquake and that may evolve over the next few tens of minutes as more seismic data are received and processed.

### *Distant Earthquakes*

For earthquakes located further than three hours tsunami travel time from Guam, Rota, Tinian, and Saipan, the seismic criteria used for initial products are similar to seismic criteria currently used by PTWC elsewhere in the Pacific and are given in the table below.

Earthquake					
Sea	Land	Depth	Magnitude	ETA	Product/Alert Level
Yes	Yes	< 62 mi (100 km)	6.5 - 7.8	> 3 hr	TIS – No Threat
Yes	Yes	≥ 62 mi (100 km)	≥ 6.5	> 3 hr	TIS – No Threat
Yes	Near Sea	< 62 mi (100 km)	≥ 7.9	> 6 hr	TIS – Potential Threat
Yes	Near Sea	< 62 mi (100 km)	≥ 7.9	3 - 6 hr	Tsunami Watch

Some flexibility may be applied by the PTWC duty staff in applying these criteria based upon their assessment of the accuracy of the earthquake parameters, judgments about the tsunamigenic potential of inland events, earthquake slowness indicative of increased tsunamigenic potential, and other considerations such as proximity to the 3- and 6-hour timing boundaries.

### *Nearby Earthquakes*

For earthquakes located within three hours tsunami travel time of Guam, Rota, Tinian, and Saipan, the seismic criteria are somewhat more complicated due to the proximity of the Marianas Trench subduction zone that follows an arc to the east of these islands and comes to within about 80 miles (130 km) of Guam at its closest point. Based on numerical model simulations of tsunami impacts to Guam, Rota, Tinian, and Saipan from earthquakes located in that nearby seismic zone, minimum magnitude thresholds were estimated for Tsunami Advisory and Warning alert levels. A conservative assumption was used in the model simulations that the earthquakes have a depth of 20 km and a shallow thrust mechanism with a strike parallel to the trench.

For any earthquake located within three hours tsunami travel time of Guam, Rota, Tinian, and Saipan and having a preliminary magnitude of 6.5 or greater, the initial level of alert issued by PTWC for Guam, Rota, Tinian, and Saipan will be determined by the following criteria. The three-hour timing boundary for issuing an immediate alert is based on it generally requiring immediate action in that short of a time frame to save lives should the threat materialize.

1. If the earthquake is within 186 miles (300 km) of Guam, Rota, Tinian, and Saipan, has a preliminary depth less than 62 miles (100 km) and has a preliminary magnitude of 7.1 or greater then a **warning** will be issued.
2. If the earthquake is within 186 miles (300 km) of Guam, Rota, Tinian, and Saipan, has a preliminary depth less than 62 miles (100 km) and has a preliminary magnitude of 6.7 or greater but less than 7.1 then an **advisory** will be issued.
3. If the earthquake is between 186 miles (300 km) and 621 miles (1000 km) of Guam, Rota, Tinian, and Saipan, has a preliminary depth less than 62 miles (100 km) and has a preliminary magnitude of 7.6 or greater then a **warning** will be issued.
4. If the earthquake is between 186 miles (300 km) and 621 miles (1000 km) of Guam, Rota, Tinian, and Saipan, has a preliminary depth less than 62 miles (100 km) and has a preliminary magnitude of 7.1 or greater but less than 7.6 then an **advisory** will be issued.
5. If the earthquake is more than 621 miles (1000 km) from Guam, Rota, Tinian, and Saipan, has a preliminary depth less than 62 miles (100 km) and the preliminary magnitude of 7.9 or greater then a **warning** will be issued.
6. If the earthquake is more than 621 miles (1000 km) from Guam, Rota, Tinian, and Saipan, has a preliminary depth less than 62 miles (100 km) and the preliminary magnitude of 7.6 or greater but less than 7.9 then an **advisory** will be issued.
7. If the earthquake has a preliminary depth less than 62 miles (100 km) with preliminary magnitude of 6.5 or greater but does not meet any of the criteria above for an advisory or warning, then only an **information statement** will be issued indicating no tsunami threat.
8. If the preliminary earthquake depth is greater than or equal to 62 miles (100 km) and the preliminary earthquake magnitude is greater than or equal to 6.5, then only an **information statement** will be issued indicating no tsunami threat from a deep earthquake.

These procedures are consistent with current procedures used in PTWC's Pacific and Caribbean international products, with the exception of adding magnitude criteria for tsunami advisories. Some flexibility may be used by the PTWC duty staff in applying these criteria based upon their assessment of the accuracy of the earthquake parameters, earthquake slowness indicative of increased tsunamigenic potential, and other factors such as the proximity to the three-hour timing boundary.

## TSUNAMI THREAT CRITERIA FOR SUBSEQUENT LEVELS OF ALERT

The tsunami threat to Guam, Rota, Tinian, and Saipan from any earthquake or any potential or observed tsunami will be continuously evaluated by PTWC based upon all available data and information that will typically include the seismic parameters, sea level readings, historical data, tsunami reports, and one or more numerical simulations constrained by some of that information. Taking into account the various uncertainties, and in general leaning towards being conservative, a forecast will be made by PTWC duty personnel for Guam, Rota, Tinian, and Saipan and the appropriate product issued using the following criteria:

<b>Alert Level</b>	<b>Maximum Expected Rise of Sea Level above the Tide in Guam, Rota, Tinian, and Saipan</b>
None	0 to 1 ft (0 to 0.3 m)
Advisory	1 to 3.3 ft (0.3 to 1 m)
Warning	> 3.3 ft (> 1 m)

Alert levels may increase as an event evolves if information is received that justifies such an increase. Alert levels will not be lowered in advance of impact except in the case where an updated evaluation has very high level of confidence and there is a clear benefit to immediately lowering the alert. Alert levels may be lowered after impact as conditions warrant until cancellation.

## EARTHQUAKE LOCATION DESCRIPTION

For earthquakes located further than 186 miles (300 km) from any of islands of Guam or CNMI then the Flynn-Engdahl global region names are used:

[http://earthquake.usgs.gov/learn/topics/flinn\\_engdahl.php](http://earthquake.usgs.gov/learn/topics/flinn_engdahl.php)

For earthquakes located within 186 miles (300 km) of any of the sixteen islands that make up Guam and CNMI, the location name will reference the nearest island by the following scheme:

- 1) If the epicenter is within 6 miles (10 km) of the coast of the nearest island, the name will reference that island as follows: “in the vicinity of Guam” or “in the vicinity of Pagan”.
- 2) If the epicenter is further than 6 miles (10 km) from the nearest island, then the name will reference that island with a distance and direction as follows: “about 91 miles northwest of Agrihan” or “about 48 miles south of Guam”.



## FORECAST POINTS

The following is a list of the forecast points referenced whenever a Watch, Advisory, or Warning is issued. For each of these points, the estimated time of arrival of the first tsunami wave is given in the product.

LOCATION	ISLAND	LATITUDE	LONGITUDE
INARAJAN	GUAM	13.274°N	144.753°E
APRA HARBOR	GUAM	13.454°N	144.620°E
PATI POINT	GUAM	13.603°N	144.962°E
PAGO BAY	GUAM	13.417°N	144.791°E
SONGSONG	ROTA	14.115°N	145.118°E
ARATSU BAY	ROTA	14.144°N	145.243°E
MOCHON BEACH	ROTA	14.202°N	145.257°E
SAN JOSE	TINIAN	14.960°N	145.623°E
LONG BEACH	TINIAN	15.034°N	145.657°E
CHULU BEACH	TINIAN	15.073°N	145.614°E
GARAPAN	SAIPAN	15.214°N	145.699°E
MAGICIENNE BAY	SAIPAN	15.145°N	145.756°E
WING BEACH	SAIPAN	15.273°N	145.791°E
OBYAN	SAIPAN	15.103°N	145.727°E

## PRODUCT TIMING

The initial product for a potentially tsunamigenic earthquake will be issued as soon as the earthquake's location, depth, and magnitude can be determined by PTWC with sufficient accuracy to reasonably estimate its tsunamigenic potential. The speed at which this occurs depends upon a number of factors, the most important of which is the density of real-time-reporting seismic stations in the vicinity of the earthquake. This density varies considerably around the Pacific so that initial products may go out within two to five minutes for an earthquake in Hawaii or California, but could take more than 10 minutes for an earthquake along the East Pacific Rise. The speed of the initial product is most important for coasts located near the earthquake because a tsunami, if generated, may strike those nearby coasts within minutes.

There are only a few real time seismic stations in Guam and CNMI or otherwise nearby. Earthquakes near Guam, Rota, Tinian, and Saipan require data from seismometers located in more than 1000 miles away to analyze. Consequently, the initial product issued for such earthquakes may take 10 minutes or more. For more distant events around the Pacific, the elapsed time is rarely more than 15 minutes.

For a Tsunami Information Statement (TIS) indicating no threat to Guam, Rota, Tinian, and Saipan only one product is usually issued. A supplemental TIS may be issued at a later time, however, if there is something new to report such as a significant change in the earthquake parameters or the observation of small tsunami waves.

For TIS with a potential threat, or for a Watch, Advisory, or Warning, subsequent products will be issued at least once an hour, or more frequently if there is significant new information to report. Products will continue to be issued at least hourly until the threat to Guam, Rota, Tinian, and Saipan has passed, either before impact because the threat was downgraded, or after impact when the threat is over.

A cancellation supplement may also be issued after a significant tsunami to distribute a summary of tsunami observations, some of which may not have been reported during the event.

## **PRODUCT CONTENT**

The products will have content divided into the following lines and sections.

- WMO Product ID Line
- AWIPS Product ID Line
- UGC Code Line <sup>1</sup>
- VTEC Code Line(s) <sup>1</sup>
- Broadcast Instruction Line <sup>1</sup>
- Product Type Line
- Issuing Office Line
- Issuance Date/Time Line
- Product Headline
- Updates Section <sup>2</sup>
- Potential Impacts Section <sup>1</sup>
- Recommended Actions Section
- Estimated Times of Arrival Section <sup>1</sup>
- Tsunami Observations Section <sup>3</sup>
- Preliminary Earthquake Parameters Section
- Next Update and Additional Information Section

<sup>1</sup> Line or Section is only in a Watch, Advisory or Warning.

<sup>2</sup> Updates Section is only present if there is significant new information in the message.

<sup>3</sup> Tsunami Observations Section is only present when there are observations to report.



## SAMPLE PRODUCTS

On the following pages are samples of the various types of PTWC domestic products for Guam, Rota, Tinian, and Saipan to show their general format and the type of information they contain. They are not intended to simulate or otherwise represent the characteristics of any particular actual event or related threat.

### Tsunami Seismic Information Statement

ZCZC  
SEGM70 PHEB 180810  
EQIGUM  
TSUNAMI SEISMIC INFORMATION STATEMENT NUMBER 1  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
610 PM CHST FRI JUL 18 2014  
...NO TSUNAMI THREAT FROM A NEARBY EARTHQUAKE...

#### AUDIENCE

-----  
EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

#### EVALUATION

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 5.9 OCCURRED ABOUT 50 MILES SOUTHEAST OF TINIAN AT 601 PM CHST ON FRIDAY JULY 18 2014.  
\* BASED ON ALL AVAILABLE DATA... THERE IS NO TSUNAMI THREAT TO GUAM... ROTA... TINIAN OR SAIPAN FROM THIS EARTHQUAKE.  
\* SOME AREAS MAY HAVE EXPERIENCED SHAKING.

#### RECOMMENDED ACTIONS

- \* NO ACTION IS REQUIRED.

#### POTENTIAL IMPACTS

- \* NO TSUNAMI IMPACTS ARE EXPECTED.

#### PRELIMINARY EARTHQUAKE PARAMETERS

-----  
\* MAGNITUDE           5.9  
\* ORIGIN TIME        601 PM CHST JUL 18 2014  
\* COORDINATES        14.4 NORTH 146.2 EAST  
\* DEPTH              15 MILES  
\* LOCATION           ABOUT 50 MILES SOUTHEAST OF TINIAN

#### NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT UNLESS ADDITIONAL DATA ARE RECEIVED OR THE SITUATION CHANGES.  
\* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE INTERNET AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.  
\* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL LOWERCASE LETTERS-.  
\$\$

### Tsunami Information Statement – No Threat

ZCZC  
WEGM42 PHEB 180837  
TIBGUM  
TSUNAMI INFORMATION STATEMENT NUMBER 1  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI

637 PM CHST FRI JUL 18 2014  
...NO TSUNAMI THREAT FROM A DISTANT EARTHQUAKE...

AUDIENCE

EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

EVALUATION

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 6.8 OCCURRED IN THE TONGA ISLANDS AT 601 PM CHST ON FRIDAY JULY 18 2014.
- \* BASED ON ALL AVAILABLE DATA... THERE IS NO TSUNAMI THREAT TO GUAM... ROTA... TINIAN OR SAIPAN FROM THIS EARTHQUAKE.

RECOMMENDED ACTIONS

- \* NO ACTION IS REQUIRED.

POTENTIAL IMPACTS

- \* NO TSUNAMI IMPACTS ARE EXPECTED.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 6.8
- \* ORIGIN TIME 601 PM CHST JUL 18 2014
- \* COORDINATES 19.2 SOUTH 173.2 WEST
- \* DEPTH 15 MILES
- \* LOCATION TONGA

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT UNLESS ADDITIONAL DATA ARE RECEIVED OR THE SITUATION CHANGES.
- \* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE INTERNET AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV) AND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
- \* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV/EARTHQUAKES](http://EARTHQUAKE.USGS.GOV/EARTHQUAKES) -ALL LOWERCASE LETTERS-.

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## Tsunami Information Statement – Potential Threat

ZCZC  
WEGM42 PHEB 180840  
TIBGUM  
TSUNAMI INFORMATION STATEMENT NUMBER 1  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
640 PM CHST FRI JUL 18 2014  
...POSSIBLE TSUNAMI THREAT FROM A DISTANT EARTHQUAKE...

AUDIENCE

EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

EVALUATION

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN THE TONGA ISLANDS AT 611 PM CHST ON FRIDAY JULY 18 2014.
- \* THE TSUNAMI THREAT TO GUAM... ROTA... TINIAN AND SAIPAN FROM THIS EARTHQUAKE IS STILL UNDER INVESTIGATION.

RECOMMENDED ACTIONS

- \* STAY ALERT FOR FURTHER INFORMATION. THERE IS THE POSSIBILITY THAT A TSUNAMI WATCH... ADVISORY... OR WARNING COULD BE ISSUED LATER FOR GUAM... ROTA... TINIAN AND SAIPAN.

POTENTIAL IMPACTS

- \* POTENTIAL TSUNAMI IMPACTS ARE STILL BEING EVALUATED.

\* IF THERE IS A TSUNAMI THREAT TO GUAM... ROTA... TINIAN AND SAIPAN... THE EARLIEST IMPACTS WOULD BE AROUND 201 AM CHST ON SATURDAY JULY 19 2014.

PRELIMINARY EARTHQUAKE PARAMETERS

-----  
\* MAGNITUDE 8.2  
\* ORIGIN TIME 611 PM CHST JUL 18 2014  
\* COORDINATES 19.2 SOUTH 173.2 WEST  
\* DEPTH 15 MILES  
\* LOCATION TONGA

NEXT UPDATE AND ADDITIONAL INFORMATION

-----  
\* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.  
\* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE INTERNET AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.  
\* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL LOWERCASE LETTERS-.

**Tsunami Advisory Message – Nearby Event**

ZCZC  
WEGM40 PHEB 190301  
TSUGUM  
GUZ001>004-190501-  
/O.NEW.PHEB.TS.Y.0001.140719T0301Z-000000T0000Z/  
BULLETIN  
TSUNAMI MESSAGE NUMBER 1  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
101 PM CHST SAT JUL 19 2014  
...A TSUNAMI ADVISORY IS NOW IN EFFECT FOR GUAM AND CNMI...

AUDIENCE

-----  
EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

EVALUATION

-----  
\* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 7.8 OCCURRED IN SHIKOKU, JAPAN AT 1253 PM CHST ON SATURDAY JULY 19 2014.  
\* A HAZARDOUS TSUNAMI MAY HAVE BEEN GENERATED BY THIS NEARBY EARTHQUAKE THAT COULD SOON IMPACT NEARBY COASTS.  
\* MONITORING IS UNDERWAY TO EVALUATE THE TSUNAMI THREAT.  
\* BASED ON ALL AVAILABLE DATA... THERE IS A THREAT TO GUAM... ROTA... TINIAN AND SAIPAN OF SEA LEVEL FLUCTUATIONS AND STRONG OCEAN CURRENTS THAT COULD BE A HAZARD ALONG BEACHES... IN HARBORS... AND IN COASTAL WATERS.  
\* THE EARLIEST ESTIMATED TIME THAT HAZARDOUS SEA LEVEL FLUCTUATIONS AND STRONG OCEAN CURRENTS MAY BEGIN IN GUAM... ROTA... TINIAN OR SAIPAN IS  
357 PM CHST ON SATURDAY JULY 19 2014

RECOMMENDED ACTIONS

-----  
\* PERSONS IN OR NEAR THE OCEAN ALONG THE COASTS OF GUAM... ROTA... TINIAN... AND SAIPAN SHOULD MOVE IMMEDIATELY OUT OF THE WATER AND AWAY FROM BEACHES AND HARBORS.  
\* DO NOT RETURN TO EVACUATED AREAS UNTIL THE ALL CLEAR IS GIVEN BY LOCAL AUTHORITIES.  
\* FOLLOW INSTRUCTIONS AS THEY ARE GIVEN BY GOVERNMENT AGENCIES.

ESTIMATED TIMES OF ARRIVAL

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\* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA (CHST)
CHULU BEACH	TINIAN	15.1N 145.6E	357 PM 07/19
SAN JOSE	TINIAN	15.0N 145.6E	357 PM 07/19
LONG BEACH	TINIAN	15.0N 145.7E	358 PM 07/19
SONGSONG	ROTA	14.1N 145.1E	400 PM 07/19
OBYAN	SAIPAN	15.1N 145.7E	400 PM 07/19
MOCHON BEACH	ROTA	14.2N 145.3E	400 PM 07/19
ARATSU BAY	ROTA	14.1N 145.2E	401 PM 07/19
GARAPAN	SAIPAN	15.2N 145.7E	401 PM 07/19
MAGICIENNE BAY	SAIPAN	15.1N 145.8E	402 PM 07/19
APRA HARBOR	GUAM	13.5N 144.6E	402 PM 07/19
WING BEACH	SAIPAN	15.3N 145.8E	402 PM 07/19
PATI POINT	GUAM	13.6N 145.0E	404 PM 07/19
PAGO BAY	GUAM	13.4N 144.8E	405 PM 07/19
INARAJAN	GUAM	13.3N 144.8E	406 PM 07/19

POTENTIAL IMPACTS

- \* SEA LEVEL FLUCTUATIONS THAT ARE GENERALLY NO MORE THAN 3 FEET ABOVE AND BELOW THE TIDE LEVEL.
- \* MINOR FLOODING OF BEACH AND HARBOR AREAS.
- \* STRONG AND UNUSUAL OCEAN CURRENTS IN HARBORS... BAYS... AND OTHER NEAR SHORE WATERS.
- \* THE HAZARD IS FORECAST TO BEGIN AROUND 357 PM CHST ON SATURDAY JULY 19 AND IT CAN PERSIST FOR MANY HOURS OR LONGER.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 7.8
- \* ORIGIN TIME 1253 PM CHST JUL 19 2014
- \* COORDINATES 32.0 NORTH 133.7 EAST
- \* DEPTH 6 MILES
- \* LOCATION SHIKOKU JAPAN

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THE NEXT MESSAGE WILL BE ISSUED IN THIRTY MINUTES... OR SOONER IF THE SITUATION WARRANTS.
- \* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE INTERNET AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.
- \* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL LOWERCASE LETTERS-.

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**Tsunami Warning Message – Nearby Event**

ZCZC  
WEGM40 PHEB 190518  
TSUGUM  
GUZ001>004-190718-  
/O.NEW.PHEB.TS.W.0001.140719T0518Z-000000T0000Z/  
BULLETIN  
TSUNAMI MESSAGE NUMBER 1  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
318 PM CHST SAT JUL 19 2014  
...A TSUNAMI WARNING IS NOW IN EFFECT FOR GUAM AND CNMI...

AUDIENCE

EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

EVALUATION

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN SHIKOKU, JAPAN AT 308 PM CHST ON SATURDAY JULY 19 2014.
- \* A HAZARDOUS TSUNAMI MAY HAVE BEEN GENERATED BY THIS NEARBY EARTHQUAKE THAT COULD SOON IMPACT NEARBY COASTS.
- \* MONITORING IS UNDERWAY TO EVALUATE THE TSUNAMI THREAT.
- \* BASED ON ALL AVAILABLE DATA... THERE IS THE THREAT OF

HAZARDOUS TSUNAMI WAVES FLOODING LOW-LYING COASTAL AREAS IN  
GUAM... ROTA... TINIAN AND SAIPAN.

- \* THE EARLIEST ESTIMATED TIME THAT TSUNAMI WAVE ACTIVITY MAY  
BEGIN WITHIN GUAM... ROTA... TINIAN OR SAIPAN IS  
612 PM CHST ON SATURDAY JULY 19 2014

RECOMMENDED ACTIONS

- \* PERSONS LOCATED IN LOW-LYING AREAS ALONG COASTS OF GUAM...  
ROTA... TINIAN... AND SAIPAN SHOULD MOVE IMMEDIATELY INLAND OR  
TO HIGH GROUND OR TO THE FOURTH FLOOR AND ABOVE IN A STEEL OR  
CONCRETE BUILDING.
- \* TO AVOID TRAFFIC GRIDLOCK... CONSIDER WALKING OUT OF THE  
EVACUATION ZONE.
- \* PERSONS LOCATED OUTSIDE THE EVACUATION ZONE SHOULD LIMIT  
TRAVEL TO PREVENT CONGESTION OF EVACUATION ROUTES.
- \* LIMIT TELEPHONE AND CELL PHONE USAGE SO THOSE SYSTEMS DO NOT  
BECOME OVERLOADED.
- \* DO NOT RETURN TO EVACUATED AREAS UNTIL THE ALL CLEAR IS GIVEN  
BY LOCAL AUTHORITIES.
- \* FOLLOW INSTRUCTIONS AS THEY ARE GIVEN BY GOVERNMENT AGENCIES.

ESTIMATED TIMES OF ARRIVAL

- \* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE  
ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE  
INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF  
WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE  
HOUR.

LOCATION	REGION	COORDINATES	ETA (CHST)
CHULU BEACH	TINIAN	15.1N 145.6E	612 PM 07/19
SAN JOSE	TINIAN	15.0N 145.6E	612 PM 07/19
LONG BEACH	TINIAN	15.0N 145.7E	613 PM 07/19
SONGSONG	ROTA	14.1N 145.1E	615 PM 07/19
OBYAN	SAIPAN	15.1N 145.7E	615 PM 07/19
MOCHON BEACH	ROTA	14.2N 145.3E	615 PM 07/19
ARATSU BAY	ROTA	14.1N 145.2E	616 PM 07/19
GARAPAN	SAIPAN	15.2N 145.7E	616 PM 07/19
MAGICIENNE BAY	SAIPAN	15.1N 145.8E	617 PM 07/19
APRA HARBOR	GUAM	13.5N 144.6E	617 PM 07/19
WING BEACH	SAIPAN	15.3N 145.8E	617 PM 07/19
PATI POINT	GUAM	13.6N 145.0E	619 PM 07/19
PAGO BAY	GUAM	13.4N 144.8E	620 PM 07/19
INARAJAN	GUAM	13.3N 144.8E	621 PM 07/19

POTENTIAL IMPACTS

- \* SEA LEVEL FLUCTUATIONS THAT ARE 3 FEET OR MORE ABOVE AND  
BELOW THE TIDE LEVEL ALONG SOME OR ALL COASTS.
- \* REPEATED FLOODING AND DRAINING OF LOW-LYING COASTAL AREAS.
- \* DESTRUCTION OF SMALLER COASTAL STRUCTURES.
- \* RAPIDLY FLOWING FLOOD WATER FILLED WITH HAZARDOUS DEBRIS.
- \* SECONDARY HAZARDS THAT MAY INCLUDE DOWNED POWER LINES...  
FIRES... AND HAZARDOUS MATERIAL SPILLS.
- \* THE HAZARD IS FORECAST TO BEGIN AROUND 612 PM CHST ON  
SATURDAY JULY 19 AND IT CAN PERSIST FOR MANY HOURS OR LONGER.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 8.3
- \* ORIGIN TIME 308 PM CHST JUL 19 2014
- \* COORDINATES 32.0 NORTH 133.7 EAST
- \* DEPTH 6 MILES
- \* LOCATION SHIKOKU JAPAN

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THE NEXT MESSAGE WILL BE ISSUED IN THIRTY MINUTES... OR  
SOONER IF THE SITUATION WARRANTS.
- \* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE

INTERNET AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.  
\* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.  
GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT  
EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL LOWERCASE LETTERS-.  
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## Tsunami Warning Cancellation Message – Nearby Event

ZCZC  
WEGM40 PHEB 191244  
TSUGUM  
GUZ001>004-191444-  
/O.CAN.PHEB.TS.W.0000.000000T0000Z-000000T0000Z/  
BULLETIN  
TSUNAMI MESSAGE NUMBER 7  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
1044 PM CHST SAT JUL 19 2014  
...THE TSUNAMI WARNING IS NOW CANCELLED FOR GUAM AND CNMI...  
IN THIS MESSAGE ARE REVISED ALERTS.

### AUDIENCE

EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

### EVALUATION

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.1 OCCURRED IN SHIKOKU, JAPAN AT 208 PM CHST ON SATURDAY JULY 19 2014.
- \* A TSUNAMI WAS GENERATED BY THIS EARTHQUAKE.
- \* ALL AVAILABLE DATA NOW INDICATE THAT THE TSUNAMI THREAT HAS PASSED ALTHOUGH SMALL SEA LEVEL FLUCTUATIONS MAY CONTINUE.
- \* BASED ON ALL AVAILABLE DATA... THERE IS NO FURTHER TSUNAMI THREAT TO GUAM... ROTA... TINIAN OR SAIPAN FROM THIS EARTHQUAKE ALTHOUGH MINOR SEA LEVEL FLUCTUATIONS MAY CONTINUE.

### RECOMMENDED ACTIONS

- \* DO NOT RETURN TO EVACUATED AREAS UNTIL THE ALL CLEAR IS GIVEN BY LOCAL AUTHORITIES.
- \* FOLLOW INSTRUCTIONS AS THEY ARE GIVEN BY GOVERNMENT AGENCIES.

### TSUNAMI OBSERVATIONS

- \* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE TIDE LEVEL.

GAUGE LOCATION	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD
	LAT	LON	(CHST)	HEIGHT	(MIN)
PAGO BAY GUAM US	13.4N	144.8E	609 PM	0.5FT/	0.1M 22
APRA HARBOR GUAM US	13.4N	144.7E	617 PM	1.0FT/	0.3M 18
SAIPAN US	15.2N	145.7E	626 PM	0.6FT/	0.2M 16
CHICHIJIMA JP	27.1N	142.2E	557 PM	0.8FT/	0.2M 28
KUSHIMOTO JP	33.5N	135.8E	614 PM	0.8FT/	0.3M 16

### POTENTIAL IMPACTS

- \* MINOR SEA LEVEL FLUCTUATIONS OF UP TO 1 FOOT ABOVE AND BELOW THE TIDE LEVEL MAY CONTINUE OVER THE NEXT FEW HOURS.

### PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 8.1
- \* ORIGIN TIME 208 PM CHST JUL 19 2014
- \* COORDINATES 32.0 NORTH 133.7 EAST
- \* DEPTH 6 MILES
- \* LOCATION SHIKOKU JAPAN

NEXT UPDATE AND ADDITIONAL INFORMATION

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- \* THIS WILL BE THE FINAL STATEMENT ISSUED FOR THIS EVENT UNLESS NEW INFORMATION IS RECEIVED OR THE SITUATION CHANGES.
- \* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE INTERNET AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.
- \* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL LOWERCASE LETTERS-.

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<b>Tsunami Watch Message – Distant Event</b>
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ZCZC  
WEGM40 PHEB 190549  
TSUGUM  
GUZ001>004-190749-  
/O.NEW.PHEB.TS.A.0001.140719T0549Z-000000T0000Z/  
BULLETIN  
TSUNAMI MESSAGE NUMBER 1  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
349 PM CHST SAT JUL 19 2014  
...A TSUNAMI WATCH IS NOW IN EFFECT FOR GUAM AND CNMI...

AUDIENCE

-----  
EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

EVALUATION

- 
- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.4 OCCURRED IN THE NEAR ISLANDS, ALEUTIAN ISLANDS, ALASKA AT 343 PM CHST ON SATURDAY JULY 19 2014.
  - \* THE TSUNAMI THREAT TO GUAM... ROTA... TINIAN AND SAIPAN FROM THIS EARTHQUAKE IS STILL BEING EVALUATED.
  - \* IF A TSUNAMI THREAT EXISTS... THE EARLIEST ESTIMATED ARRIVAL TIME OF TSUNAMI WAVES WITHIN GUAM... ROTA... TINIAN OR SAIPAN WOULD BE  
926 PM CHST ON SATURDAY JULY 19 2014

RECOMMENDED ACTIONS

- 
- \* STAY ALERT FOR FURTHER INFORMATION. THE TSUNAMI WATCH COULD BE ELEVATED TO AN ADVISORY OR WARNING.
  - \* CONSIDER YOUR COURSE OF ACTION IF A TSUNAMI ADVISORY OR WARNING IS ISSUED.

ESTIMATED TIMES OF ARRIVAL

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\* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA (CHST)
CHULU BEACH	TINIAN	15.1N 145.6E	512 PM 07/19
SAN JOSE	TINIAN	15.0N 145.6E	512 PM 07/19
LONG BEACH	TINIAN	15.0N 145.7E	513 PM 07/19
SONGSONG	ROTA	14.1N 145.1E	515 PM 07/19
OBYAN	SAIPAN	15.1N 145.7E	515 PM 07/19
MOCHON BEACH	ROTA	14.2N 145.3E	515 PM 07/19
ARATSU BAY	ROTA	14.1N 145.2E	516 PM 07/19
GARAPAN	SAIPAN	15.2N 145.7E	516 PM 07/19
MAGICIENNE BAY	SAIPAN	15.1N 145.8E	517 PM 07/19
APRA HARBOR	GUAM	13.5N 144.6E	517 PM 07/19
WING BEACH	SAIPAN	15.3N 145.8E	517 PM 07/19
PATI POINT	GUAM	13.6N 145.0E	519 PM 07/19
PAGO BAY	GUAM	13.4N 144.8E	520 PM 07/19
INARAJAN	GUAM	13.3N 144.8E	521 PM 07/19

POTENTIAL IMPACTS

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- \* POTENTIAL TSUNAMI IMPACTS ARE STILL BEING EVALUATED.
- \* IF THERE IS A TSUNAMI THREAT TO GUAM... ROTA... TINIAN AND SAIPAN... THE EARLIEST IMPACTS WOULD BE AROUND 926 PM CHST ON SATURDAY JULY 19 2014.

PRELIMINARY EARTHQUAKE PARAMETERS

-----

- \* MAGNITUDE 8.4
- \* ORIGIN TIME 343 PM CHST JUL 19 2014
- \* COORDINATES 52.5 NORTH 169.9 EAST
- \* DEPTH 6 MILES
- \* LOCATION NEAR ISLANDS ALEUTIAN ISLANDS ALASKA

NEXT UPDATE AND ADDITIONAL INFORMATION

-----

- \* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE INTERNET AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.
- \* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL LOWERCASE LETTERS-.

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<b>Tsunami Advisory Message – Distant Event</b>
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ZCZC

WEGM40 PHEB 190827

TSUGUM

GUZ001>004-191027-

/O.CAN.PHEB.TS.A.0000.000000T0000Z-000000T0000Z/

/O.NEW.PHEB.TS.Y.0001.140719T0827Z-000000T0000Z/

BULLETIN

TSUNAMI MESSAGE NUMBER 2

NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI

627 PM CHST SAT JUL 19 2014

...A TSUNAMI ADVISORY IS NOW IN EFFECT FOR GUAM AND CNMI...

IN THIS MESSAGE ARE REVISED ALERTS.

AUDIENCE

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EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

EVALUATION

-----

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.4 OCCURRED IN THE NEAR ISLANDS, ALEUTIAN ISLANDS, ALASKA AT 343 PM CHST ON SATURDAY JULY 19 2014.
- \* BASED ON ALL AVAILABLE DATA... THERE IS A THREAT TO GUAM... ROTA... TINIAN AND SAIPAN OF SEA LEVEL FLUCTUATIONS AND STRONG OCEAN CURRENTS THAT COULD BE A HAZARD ALONG BEACHES... IN HARBORS... AND IN COASTAL WATERS.
- \* THE EARLIEST ESTIMATED TIME THAT HAZARDOUS SEA LEVEL FLUCTUATIONS AND STRONG OCEAN CURRENTS MAY BEGIN IN GUAM... ROTA... TINIAN OR SAIPAN IS  
926 PM CHST ON SATURDAY JULY 19 2014

RECOMMENDED ACTIONS

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- \* PERSONS IN THE OCEAN SHOULD GET OUT OF THE WATER. PERSONS NEAR THE OCEAN SHOULD MOVE AWAY FROM BEACHES AND HARBORS.
- \* FOLLOW INSTRUCTIONS AS THEY ARE GIVEN BY GOVERNMENT AGENCIES.

ESTIMATED TIMES OF ARRIVAL

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- \* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE



HOUR.	LOCATION	REGION	COORDINATES	ETA (CHST)
	LONG BEACH	TINIAN	15.0N 145.7E	926 PM 07/19
	SAN JOSE	TINIAN	15.0N 145.6E	926 PM 07/19
	OBYAN	SAIPAN	15.1N 145.7E	927 PM 07/19
	CHULU BEACH	TINIAN	15.1N 145.6E	927 PM 07/19
	MAGICIENNE BAY	SAIPAN	15.1N 145.8E	928 PM 07/19
	WING BEACH	SAIPAN	15.3N 145.8E	928 PM 07/19
	GARAPAN	SAIPAN	15.2N 145.7E	930 PM 07/19
	MOCHON BEACH	ROTA	14.2N 145.3E	933 PM 07/19
	ARATSU BAY	ROTA	14.1N 145.2E	934 PM 07/19
	SONGSONG	ROTA	14.1N 145.1E	936 PM 07/19
	PATI POINT	GUAM	13.6N 145.0E	940 PM 07/19
	INARAJAN	GUAM	13.3N 144.8E	943 PM 07/19
	PAGO BAY	GUAM	13.4N 144.8E	944 PM 07/19
	APRA HARBOR	GUAM	13.5N 144.6E	947 PM 07/19

POTENTIAL IMPACTS

- \* SEA LEVEL FLUCTUATIONS THAT ARE GENERALLY NO MORE THAN 3 FEET ABOVE AND BELOW THE TIDE LEVEL.
- \* MINOR FLOODING OF BEACH AND HARBOR AREAS.
- \* STRONG AND UNUSUAL OCEAN CURRENTS IN HARBORS... BAYS... AND OTHER NEAR SHORE WATERS.
- \* THE HAZARD IS FORECAST TO BEGIN AROUND 926 PM CHST ON SATURDAY JULY 19 AND IT CAN PERSIST FOR MANY HOURS OR LONGER.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 8.4
- \* ORIGIN TIME 343 PM CHST JUL 19 2014
- \* COORDINATES 52.5 NORTH 169.9 EAST
- \* DEPTH 6 MILES
- \* LOCATION NEAR ISLANDS ALEUTIAN ISLANDS ALASKA

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE INTERNET AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.
- \* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL LOWERCASE LETTERS-.

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**Tsunami Warning Message – Distant Event**

ZCZC  
WEGM40 PHEB 190927  
TSUGUM  
GUZ001>004-191127-  
/O.CAN.PHEB.TS.Y.0000.000000T0000Z-000000T0000Z/  
/O.NEW.PHEB.TS.W.0001.140719T0927Z-000000T0000Z/  
BULLETIN  
TSUNAMI MESSAGE NUMBER 3  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
727 PM CHST SAT JUL 19 2014  
...A TSUNAMI WARNING IS NOW IN EFFECT FOR GUAM AND CNMI...  
IN THIS MESSAGE ARE REVISED ALERTS.

AUDIENCE

EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

EVALUATION

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.4 OCCURRED IN THE NEAR ISLANDS, ALEUTIAN ISLANDS, ALASKA AT 343 PM CHST ON SATURDAY JULY 19 2014.

- \* BASED ON ALL AVAILABLE DATA... THERE IS THE THREAT OF HAZARDOUS TSUNAMI WAVES FLOODING LOW-LYING COASTAL AREAS IN GUAM... ROTA... TINIAN AND SAIPAN.
- \* THE EARLIEST ESTIMATED TIME THAT TSUNAMI WAVE ACTIVITY MAY BEGIN WITHIN GUAM... ROTA... TINIAN OR SAIPAN IS 926 PM CHST ON SATURDAY JULY 19 2014

RECOMMENDED ACTIONS

- \* STAY ALERT FOR SIREN SOUNDINGS OR EMERGENCY ALERT SYSTEM BROADCASTS INDICATING THAT A TSUNAMI EVACUATION HAS BEEN ORDERED. EVACUATION INSTRUCTIONS FROM GUAM AND CNMI EMERGENCY MANAGEMENT AGENCIES WILL BE BROADCAST OVER LOCAL RADIO AND TELEVISION STATIONS.
- \* IF AN EVACUATION IS UNDERWAY... MOVE INLAND TO GET OUTSIDE OF THE EVACUATION ZONE OR MOVE TO THE THIRD FLOOR AND ABOVE IN A CONCRETE BUILDING OF SIX STORIES OR MORE. TO AVOID TRAFFIC GRIDLOCK... CONSIDER WALKING OUT OF THE EVACUATION ZONE.
- \* PERSONS LOCATED OUTSIDE THE EVACUATION ZONE SHOULD LIMIT TRAVEL TO PREVENT CONGESTION OF EVACUATION ROUTES.
- \* LIMIT TELEPHONE AND CELL PHONE USAGE SO THOSE SYSTEMS DO NOT BECOME OVERLOADED.

ESTIMATED TIMES OF ARRIVAL

- \* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA (CHST)
LONG BEACH	TINIAN	15.0N 145.7E	926 PM 07/19
SAN JOSE	TINIAN	15.0N 145.6E	926 PM 07/19
OBYAN	SAIPAN	15.1N 145.7E	927 PM 07/19
CHULU BEACH	TINIAN	15.1N 145.6E	927 PM 07/19
MAGICIENNE BAY	SAIPAN	15.1N 145.8E	928 PM 07/19
WING BEACH	SAIPAN	15.3N 145.8E	928 PM 07/19
GARAPAN	SAIPAN	15.2N 145.7E	930 PM 07/19
MOCHON BEACH	ROTA	14.2N 145.3E	933 PM 07/19
ARATSU BAY	ROTA	14.1N 145.2E	934 PM 07/19
SONGSONG	ROTA	14.1N 145.1E	936 PM 07/19
PATI POINT	GUAM	13.6N 145.0E	940 PM 07/19
INARAJAN	GUAM	13.3N 144.8E	943 PM 07/19
PAGO BAY	GUAM	13.4N 144.8E	944 PM 07/19
APRA HARBOR	GUAM	13.5N 144.6E	947 PM 07/19

POTENTIAL IMPACTS

- \* SEA LEVEL FLUCTUATIONS THAT ARE 3 FEET OR MORE ABOVE AND BELOW THE TIDE LEVEL ALONG SOME OR ALL COASTS.
- \* REPEATED FLOODING AND DRAINING OF LOW-LYING COASTAL AREAS.
- \* DESTRUCTION OF SMALLER COASTAL STRUCTURES.
- \* RAPIDLY FLOWING FLOOD WATER FILLED WITH HAZARDOUS DEBRIS.
- \* SECONDARY HAZARDS THAT MAY INCLUDE DOWNED POWER LINES... FIRES... AND HAZARDOUS MATERIAL SPILLS.
- \* THE HAZARD IS FORECAST TO BEGIN AROUND 926 PM CHST ON SATURDAY JULY 19 AND IT CAN PERSIST FOR MANY HOURS OR LONGER.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 8.4
- \* ORIGIN TIME 343 PM CHST JUL 19 2014
- \* COORDINATES 52.5 NORTH 169.9 EAST
- \* DEPTH 6 MILES
- \* LOCATION NEAR ISLANDS ALEUTIAN ISLANDS ALASKA

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

\* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE INTERNET AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.  
\* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL LOWERCASE LETTERS-.

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## Tsunami Cancellation Message – Distant Event

ZCZC  
WEGM40 PHEB 191530  
TSUGUM  
GUZ001>004-191730-

BULLETIN  
TSUNAMI MESSAGE NUMBER 3  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
130 AM CHST SUN JUL 20 2014  
...THE TSUNAMI WARNING IS NOW CANCELLED FOR GUAM AND CNMI...

### AUDIENCE

EMERGENCY MANAGERS... MEDIA... GENERAL PUBLIC

### EVALUATION

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.6 OCCURRED IN THE NEAR ISLANDS, ALEUTIAN ISLANDS, ALASKA AT 143 PM CHST ON SATURDAY JULY 19 2014.
- \* BASED ON ALL AVAILABLE DATA... THERE IS NO FURTHER TSUNAMI THREAT TO GUAM... ROTA... TINIAN OR SAIPAN FROM THIS EARTHQUAKE ALTHOUGH MINOR SEA LEVEL FLUCTUATIONS MAY CONTINUE.

### RECOMMENDED ACTIONS

- \* FOLLOW INSTRUCTIONS AS THEY ARE GIVEN BY GOVERNMENT AGENCIES.
- \* BE OBSERVANT AND EXERCISE NORMAL CAUTION IF YOU ARE NEAR OR IN THE OCEAN.
- \* OTHERWISE... NO FURTHER ACTION IS REQUIRED.

### TSUNAMI OBSERVATIONS

- \* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE TIDE LEVEL.

GAUGE LOCATION	GAUGE COORDINATES		TIME OF MEASURE (CHST)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)	
	LAT	LON				
DART 42414	48.9N	178.3E	657 PM	0.2FT/	0.1M	06
PAGO BAY GUAM US	13.4N	144.8E	609 PM	0.5FT/	0.1M	22
APRA HARBOR GUAM US	13.4N	144.7E	617 PM	1.0FT/	0.3M	18
SAIPAN US	15.2N	145.7E	626 PM	0.6FT/	0.2M	16
CHICHIJIMA JP	27.1N	142.2E	557 PM	0.8FT/	0.2M	28
KUSHIMOTO JP	33.5N	135.8E	614 PM	0.8FT/	0.3M	16

### POTENTIAL IMPACTS

- \* MINOR SEA LEVEL FLUCTUATIONS OF UP TO 1 FOOT ABOVE AND BELOW THE TIDE LEVEL MAY CONTINUE OVER THE NEXT FEW HOURS.

### PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 8.6
- \* ORIGIN TIME 143 PM CHST JUL 19 2014
- \* COORDINATES 52.5 NORTH 169.9 EAST
- \* DEPTH 6 MILES
- \* LOCATION NEAR ISLANDS ALEUTIAN ISLANDS ALASKA

NEXT UPDATE AND ADDITIONAL INFORMATION

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\* THIS WILL BE THE FINAL STATEMENT ISSUED FOR THIS EVENT UNLESS  
NEW INFORMATION IS RECEIVED OR THE SITUATION CHANGES.  
\* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND ON THE  
INTERNET AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV) AND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).  
\* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.  
GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT  
[EARTHQUAKE.USGS.GOV/EARTHQUAKES](http://EARTHQUAKE.USGS.GOV/EARTHQUAKES) -ALL LOWERCASE LETTERS-.

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