BASIC INFORMATION

1. ICG/PTWS Tsunami National Contact (TNC)

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

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   Cellular Telephone Number: 

   TWFP 24x7 point of contact

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National Tsunami Warning Centre (if different from the above)

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   Organization: Federal Environmental Emergency Response Centre of Roshydromet Research and Production Association «Typhoon»  
   NTWC Agency Contact or Officer in Charge (person):  
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Emergency Fax Number:  
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4. Tsunami Standard Operating Procedures for a Local Tsunami  
(when a local tsunami hazard exists)

Tsunami monitoring, prediction and warning for the Pacific coasts of Russia now are provided by the centers of the Tsunami Warning System (TWCs) of ROSHYDROMET in Yuzhno-Sakhalinsk, Petropavlovsk-Kamchatsky and Vladivostok working in close cooperation with regional structures of the Ministry for Emergency Situations of the Russian Federation, seismic centers of the Geophysical Service of the Russian Academy of Sciences (GS RAS) and local hydrometeorological stations of ROSHYDROMET. Russian TWCs efficiently cooperate with the TWCs of other Pacific countries.

The divisions involved in the TWS provide twenty-four hours per day, 7 days per week operation, including continuous monitoring of seismicity and sea level variations, situation analysis, declaring and canceling Tsunami Watches and Warnings, preparation and relaying of appropriate signals and messages in accordance with the established procedure.

In cases of local tsunamigenic events, the parameters of earthquakes are estimated by seismic centers (SC) of the GS RAS located in Yuzhno-Sakhalinsk, Petropavlovsk-Kamchatsky and Vladivostok. The initial tsunami warning is provided by the same seismic centers. Criteria for the warning notification are based on the magnitude, Ms, and the location of the tsunamigenic earthquake.

At present time, the GS RAS magnitude criteria (magnitude threshold values for tsunami warning) are as follows:
For areas along the coasts of Kamchatka, the Kuril Islands, the Sea of Okhotsk and the Sea of Japan: \( M_s = 7.0 \);
- For areas along the coasts of the Komandor Islands and Hokkaido Island: \( M_s = 7.5 \);
- For areas along the coasts of the Andreanof Islands and Honshu Island: \( M_s = 8.0 \).

Tsunami warning is cancelled:
- If the tsunami has been recorded, but maximum wave heights are less than 0.5 m
- If the tsunami warning has been declared, but tsunami signatures are absent in the data of coastal tide gauges, the warning is cancelled 0.5-1.0 hour after the latest estimated tsunami arrival time to the settlements on the coast.

The cancellation of tsunami warnings is made by seismic centers and Tsunami Warning Centers (TWCs) in Yuzhno-Sakhalinsk, Petropavlovsk-Kamchatsky and Vladivostok.

5. Tsunami Standard Operating Procedures for a Distant Tsunami (when a distant tsunami hazard exists)

Tsunami warnings for distant tsunamigenic events are provided by TWCs in Yuzhno-Sakhalinsk, Petropavlovsk-Kamchatsky and Vladivostok.

After receiving information and corresponding parameters of a major distant earthquake from the seismic centers of the GS RAS, foreign seismic stations, the Pacific Tsunami Warning Center (PTWC) and JMA NWPTAC, the mentioned above Tsunami Warning Centers carry out:
- The estimation of tsunami threat for the Russian coast based on the magnitude-geographical criterion.
- The calculation of tsunami arrival times to specific coastal sites.
- Sending «Warning and Watch» messages to the coastal hydrometeorological stations; activating tide gauge monitoring and witness observations of sea level changes near the coast.
- Situation analysis based on the entire set of information, including information on actual tsunami tide gauge observations from the Pacific Tsunami Warning Center (PTWC), JMA NWPTAC and other foreign centers.
- Final decision about the actual tsunami threat for the Russian coast, declaring (if necessary) a Tsunami Warning.
- The transmission of tsunami warning emergency messages via communication channels according to the rules of notification to local and central authorities, all sectors of the population at risk and to foreign tsunami warning centers.

More precise definition of tsunami parameters and threat for the Russian coast is based on information about recorded tsunami wave heights at stations located near the source area or between the source area and the Russian coast, as well as on other information arriving from the foreign centers.

During the period between the XXV (2013) and XXVI (2015) ICG/PTWS Sessions, a situation analysis was carried out each time when the PTWC provided a tsunami warning for the Pacific Ocean. These analyses, in particular, included examination of the tide gauge data from Russian and foreign stations.

6. National Sea Level Network
Hydrometeorological stations (HMS) located along the Russian coast of the Pacific Ocean and marginal seas of the Russian Far East carry out sea level observations. Part of these stations have digital systems (tide gauges) for monitoring sea level variations (Table 1 and Figure 1).

<table>
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<th>N</th>
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7. Information on Tsunami occurrences

Events of 2013

Once a tsunami alert was declared:

Based on data from Yuzhno-Sakhalinsk Seismological Station, an earthquake of magnitude Ms = 7.3 was generated at 05:47 24 May 2013. Coordinates: 54.9N, 153.8E. Depth – 620 km.

At 05:57 the seismologist on duty issued a Tsunami Warning over the entire region of the Okhotsk coast of Sakhalin and Okhotsk coast of Kuril Islands.

Based on deep-seated hypocenter, The Sakhalin Tsunami Warning Center cancelled the tsunami alert at 06:17.

MSK scale intensity in Sakhalin-Kuril Region was:

Okha – 2-3
Pil'vo – 2-3
Tymovskoe – 4
Kholmsk – 3
Malokuril'skoe – 3

No tsunami was generated.

Four earthquakes with pre-threshold magnitude were recorded:

1) An earthquake with magnitude Ms=6.6 was registered by Yuzhno- Sakhalinsk Seismological Station at 13:23 1 March at 50.6N, 158.1E, depth – 65 km. Region - Northern Kuril. At 13:23 sea level observations on the Northern Kuril Islands were started, digital tide gauges were
switched to an every 1 minute data transmission mode. MSK scale intensity in Severo- Kuril’sk was 5. Due to lack of significant level changes, the sea level watch was cancelled at 15:16.

2) An earthquake with magnitude Ms=6.7 occurred at 03:07 19 April 2013 at 46.1N, 150.7E, depth – 120 km. Region - Central Kuril Islands. The earthquake was recorded at towns of Sakhalin Region with no casualties and destructions.
   MSK scale intensity in Sakhalin-Kuril Region was:
   Malokuril’skoe – MSK scale intensity 5
   Severo-Kurilsk – 2
   Kuril’sk – 4
   Yuzhno-Kuril’sk – 5.
   Tsunami watch was started at 03:17 and sea level stations were switched to an every 1 minute data transmission mode.
   In Malokuril’skoe visually at 04:22 fast sea level rise and fall were observed in the river entry (max. about 20 cm); there were also changes in the river stream.
   Other sea level oscillations weren’t observed. So at 05:23 Tsunami Watch was cancelled.

3) An earthquake with magnitude Ms=6.2 occurred at 17:10 UTC 26 October 2013 at 37.4N, 145.7E. Region – East coast of Honshu Island. The earthquake was recorded at towns of Kuril Region with no casualties and destructions:
   Yuzhno-Kuril’sk – MSK scale intensity 4.

4) An earthquake with magnitude Ms=6.5 occurred at 18:03 Sakhalin time 12 November 2013 at 54.2N, 162.1E, depth – 59 km. Region – 263 km north-east from Petropavlovsk-Kamchatsky.

Events of 2014
Five earthquakes with with pre-threshold magnitude were recorded:
1) An earthquake with magnitude Ms=6.8 occurred at 21:16 16 March at 19.3S, 70.3W. Region – near Chili coast.

2) An earthquake with magnitude Ms=8.0 occurred at 23:47 2 April at 19.8S, 78.8W, depth – 10 km. Region – near Chili coast.
   Tsunami Warnings were issued by PTWC for Chili, Ecuador, Costa Rica.

3) An earthquake with magnitude Ms=7.6 occurred at 20:15 12 April at 37.4N, 145.7E. Region – Solomon Islands.
   Tsunami Warnings were issued by PTWC for nearest regions of Pacific.

4) Another earthquake with magnitude Ms=7.4 occurred at 12:36 13 April at the same place with magnitude Ms=7.6

5) An earthquake with magnitude Ms=6.8 occurred at 19:21 11 July at 37.0N, 142.8E. Region – Solomon Islands.
No Tsunami Warnings were issued by RTWS for coast regions of Far East of Russian Federation.

8. **Web sites (URLs) of national tsunami-related web sites**
   
   [http://www.rtws.ru](http://www.rtws.ru)

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

   Future tsunami warning system improvements include modernization of program products using in tsunami warning centers. We also plan to include aquatorium of Okhotsk sea into RTWS.

10. **EXECUTIVE SUMMARY**

    The modernization of Russian TWS was carried out under Federal Target Program «Decrease of risks and the mitigation of consequences of emergency situations of natural and technogenic character in the Russian Federation till 2011-2015». During the inter-sessional period 2013-2015 the new version of program complex was established in tsunami warning centers.

    The ultimate result of the works under the Federal Program is general increase of the rapidity and stability of the Russian Tsunami Warning System and as the consequence - the increase in population security in the Russian Far East.

    **Exercise Pacific Wave 2015**

    In Russia Exercise Pacific Wave 2015 was conducted at February 4 as a table-top exercise in a compressed time mode without bulletin issuance. All materials including both message products and maps were available through the PacWave15 website [http://www.pacwave.info](http://www.pacwave.info) and downloaded prior to the exercise date. On the part of Russia Tsunami Warning Centers in Vladivostok, Kamchatka and Sakhalin, as a coordinator, took part in the Exercise.

    Six scenarios were available, and the one of a tsunamigenic earthquake with magnitude 9.0 near the coast of Japan at 01:00 UTC on February 4 was chosen for Russian TWS. It was assumed that a tsunami would be brought down on the coast of the Kuril Islands and Kamchatka, will get to Japanese, Okhotsk and Bering seas.

    Exercise for Russian TWS was held without failures and remarks. It was recommended to conduct seminar for the staff of the Russian Emercom regional Centers for operational management in crisis situations.

February 2015

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