BASIC INFORMATION

1. **ICG/PTWS Tsunami National Contact (TNC)**

   Name: Dr. Dmitry Kamaev  
   Position: Head, Laboratory of Mathematical Methods  
   Organization: Federal Environmental Emergency Response Centre of Roshydromet Research and Production Association «Typhoon»  
   Postal Address: 4 Pobeda Street, Obninsk, Kaluga Region 249038, Russian Federation  
   E-mail Address: kda@feerc.ru  
   Telephone Number: +7 (484) 397 16 55  
   Fax Number: +7 (484) 394 07 04  
   Cellular Telephone Number: +7 910529 4289

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

   TWFP Agency name: Sakhalin Tsunami Warning Center  
   TWFP Agency Contact or Officer in Charge:  
      Name:  
      Position: Head of Sakhalin Tsunami Warning Center  
      Telephone Number:  
      Email Address:  
      Postal Address: 78, Zapadnaya St., Yuzhno-Sakhalinsk, 693000, Russian Federation  
      Cellular Telephone Number:  

   **TWFP 24x7 point of contact**

   Name of operational unit: Sakhalin Tsunami Warning Center  
   Email Address:  
   Telephone Number:  
   Fax:  
   Postal Address: 78, Zapadnaya St., Yuzhno-Sakhalinsk, 693000, Russian Federation

**National Tsunami Warning Centre (if different from the above)**

   NTWC Agency Name: Federal Tsunami Warning Center  
   Organization: Federal Environmental Emergency Response Centre of Roshydromet Research and Production Association «Typhoon»  
   NTWC Agency Contact or Officer in Charge (person):  
      Name:  
      Position: Head, Laboratory of Mathematical Methods
3. Tsunami Advisor(s), if applicable

Name: Alexander V. Frolov
Title: Head of Russian Federal Service for Hydrometeorology and Environmental Monitoring
Postal Address: 12, Novovagan’kovsky St., Moscow, 123995, Russian Federation
E-mail Address:
Emergency Telephone Number:
Emergency Fax Number:
Emergency Cellular Telephone Number:

Name: Valery A. Martyschenko
Title: Russian Federal Service for Hydrometeorology and Environmental Monitoring
Postal Address: 12, Novovagan’kovsky St., Moscow, 123995, Russian Federation
E-mail Address:
Emergency Telephone Number:
Emergency Fax Number:
Emergency Cellular Telephone Number:

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: $Ms = 7.0$;
- For areas along the coasts of the Komandor Islands and Hokkaido Island: Ms = 7.5;
- For areas along the coasts of the Andreanof Islands and Honshu Island: Ms = 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 XXVI (2015) and XXVIII (2017) 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. Some of these stations have digital systems (tide gauges) for monitoring sea level variations (Table 1 and Figure 1).
Table 1 Sea level observation network

<table>
<thead>
<tr>
<th>N</th>
<th>Station</th>
<th>Latitude (Degrees)</th>
<th>Longitude (Degrees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>DART 21402</td>
<td>46.488</td>
<td>158.343</td>
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<td>2.</td>
<td>DART 21401</td>
<td>42.617</td>
<td>152.583</td>
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<tr>
<td>3.</td>
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<td>60.43</td>
<td>166.075</td>
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<tr>
<td>4.</td>
<td>Ossora (Kamchatka)</td>
<td>59.3</td>
<td>163.167</td>
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<td>5.</td>
<td>Nikol’skoe (Bering Isl.)</td>
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<td>6.</td>
<td>Semyachik (Kamchatka)</td>
<td>54.117</td>
<td>159.983</td>
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<tr>
<td>7.</td>
<td>Petropavlovsk-Kamchatsky, (Kamchatka)</td>
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<td>158.650</td>
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<tr>
<td>8.</td>
<td>Ozernaya (Kamchatka)</td>
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<td>156.496</td>
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<td>9.</td>
<td>Vodopadnaja (Kamchatka)</td>
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<td>10.</td>
<td>Poronaisk (Sakhalin Isl)</td>
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<td>143.100</td>
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<tr>
<td>11.</td>
<td>Uglegorsk (Sakhalin Isl)</td>
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<td>142.074</td>
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<td>12.</td>
<td>Sovetskaya Gavan’ (Primorje)</td>
<td>48.970</td>
<td>140.291</td>
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<td>13.</td>
<td>Starodubskoye (Sakhalin Isl)</td>
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<td>142.850</td>
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<td>14.</td>
<td>Kholmsk (Sakhalin Isl)</td>
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<td>142.050</td>
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<td>16.</td>
<td>Korsakov (Sakhalin Isl)</td>
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<td>142.767</td>
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<td>17.</td>
<td>Sosunovo (Primorje)</td>
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<td>18.</td>
<td>Cril’ion (Sakhalin Isl)</td>
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<td>19.</td>
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<td>23.</td>
<td>Rudnaya Pristan’ (Primorje)</td>
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</tr>
</tbody>
</table>
7. **Information on Tsunami occurrences**

**Events of 2015**

In 2015, 59 earthquakes with a threshold magnitude (greater than 6 on the Richter scale) occurred in the Pacific Ocean:

1) in the near zone: the Kuril-Kamchatka trench – 2, Izu-Bonin trench – 5, Japan trench – 6, Taiwan – 1;

2) in the far zone: the coast of Chile – 13, Solomon Islands – 9, Kermadec Islands – 4, Papua New Guinea – 4, the Aleutian trench – 2, the New Hebrides Islands – 2, Tonga – 2, Santa Cruz Island - 1, California Bay – 1, Fiji Islands – 1, Indonesia – 1, the East China Sea – 1, South of Panama – 1, coast of Canada – 1, South Pacific – 1.

The parameters of all earthquakes show that these earthquakes posed no threat to the coast of the Russian Federation. During 2015, only drill tsunami was declared by the Russian TWS. Operational information is always posted on the website of the Russian TWS.

**Events of 2016**

In the year 2016 52 earthquakes with a threshold magnitude (greater than 6 on the Richter scale) occurred in the Pacific Ocean.

The earthquakes that led to the announcement of alarm of a tsunami by the Pacific tsunami warning center are:
1) Vanuatu Islands: 03.04.2016, magnitude 6.9, depth 45 km, the coordinates 14.4 S., 166.6 E.;
29.04.2016, magnitude 6.7, depth 23 km, the coordinates 16.0 S., 167.8 E.
2) the Ecuador coast 17.04.2016, magnitude 7.4, depth 29 km, the coordinates 0.4 N., 74.7 W.;
3) Sea Fiji, Loyalty Islands 12.08.2016, magnitude 7.2, depth 19, the coordinates 22.7 S.,
172.9 E.;
4) coast of Nicaragua 25.11.2016, magnitude of 6.6, depth of 67 km, the coordinates 12.0 N.,
88.6 W;
5) Solomon Islands: 09.12.2016, magnitude 8.3, depth 10 km, the coordinates of 0.7 S, 161.3
E.; 10.12.2016, magnitude 7.1, depth 10 km, the coordinates of 10.9 S., 160.9 E.
6) Papua New Guinea 17.12.2016, magnitude 7.1, depth of 109 km, the coordinates 4.3 S, 153.4
E.

The parameters of all earthquakes show that these earthquakes posed no threat to the coast of
the Russian Federation. For 2016, only drill tsunami was declared by the Russian TWS.

Since IOC of UNESCO has designated 5 November as world day of disseminating information
about tsunami, the Russian TWS organized and conducted various activities among the population of
the far Eastern region of Russia to mark this day.

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

http://www.rtws.ru

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

Future improvements of tsunami warning system include modernization of program products
used in tsunami warning centers.

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 2015». During the inter-sessional period of 2013-2015 the new
version of software system was installed in tsunami warning centers.

The ultimate result of the works under the Federal Program is a general increase of the
performance and stability of the Russian Tsunami Warning System and the practical implication -
improvement of public safety
during

tsunami
emergencies in the Russian Far East.

Exercise Pacific Wave 2017(15-17 February)

16 February 2017 Russia joined the seventh international doctrine of a warning System for
tsunamis in the Pacific ocean «Pacific wave 2017» (Exercise Pacific Wave 2017) according to the
recommendations of the intergovernmental Coordination group for the Pacific warning system and
reduce the risks of tsunami at the 26th session in April 2015 (26th Session (Honolulu, 2015).

The main aim of the exercise: testing experimental products in the Northwest Pacific Tsunami
Advisory Center (NWPTAC) to ensure more rapid and accurate tsunami forecast and improve
operational response to the tsunami threat in the Pacific. Verification of the decision-making procedure with the use of new experimental products NWPTAC (bulletins, predictive distribution maps of the tsunami, distribution of the amplitude of tsunamis in the open ocean and on coast) will allow us to better assess the tsunami threat for the protected coast.

For the Russian TWS training tsunamigenic earthquake with a magnitude of 9.0 occurred on 16 February at 01:00 UTC in the Solomon Islands area. It was supposed that a catastrophic tsunami will strike the coast of the Kuril Islands and Kamchatka. Training a tsunami alert was issued for the of the Kuril Islands and Kamchatka coast. Conducted training, evaluation of decision-making and the quality of communication during the fire drill tsunami until the alert level of the population. Practical activities were carried out in Severo–Kuril'sk, Kuril and southern-Kuril areas of the Sakhalin region. Regular international Exercises (Exercise Pacific Wave) is important to maintain readiness in the event of a real event.

Tests of experimental products NWPTAC allowed us to obtain a quick estimate of the degree of threat a particular event for the countries Pacific pool before registering the tsunami, i.e. only by the parameters of the earthquake and lookup the forecast of development of events after the first registration of a tsunami. Training staff centers of the Russian TWS, is an essential element in the Program of the Pacific warning System and reduce the risks of tsunami.

Exercises of the Russian TWS went harmoniously and without fail. Significant comments not been detected. Interaction during exercises with local authorities and emergency departments was carried out without any fails or remarks. The willingness of all elements of the SPC are satisfactory. This event were widely covered in the media and local television.

February 2017

Vjacheslav Shershakov, Dmitry Kamaev, Danila Chebrov, Tatyana Ivelskaya.