Magnitude 7.8 - OFF WEST COAST OF THE SOUTH ISLAND, N.Z.

2009 July 15 09:22:29 UTC

-- Simulation results and summary --

Tsunami Engineering Laboratory
Disaster Control Research Center
Tohoku University
South Island quake prompts 'potential tsunami' warning

By Stuart Divo

Did you experience the earthquake?
Send us your stories, photos and videos

Civil Defence officials concerned by widely varying measurements of a big quake in Fiordland tonight said they were issuing a "potential tsunami" warning in Southland.

"We've had big differences in the measurements of the quake, ranging from 6.6 by GNS Science, to 6.2 by a tsunami warning centre in Hawaii – we're issuing a precautionary message," said an emergency management spokesman in Wellington, Vince Cholewa.

People ran from restaurants in Queenstown as buildings shook, and lights and phone lines went down.

It was felt across the South Island.

Related links:
- US Geological Survey's earthquake graph
- Quake info at GeoNet

New Zealand Earthquake Report - Jul 15 2009 at 9:22 pm (NZST)

Magnitude 7.8, Wednesday, July 15 2009 at 9:22 pm (NZST). 100 km north-west of Tuatapere.

Quake Details

Information about this earthquake:

Reference Number: 3124785/G
Universal Time: Jul 15 2009 at 9:22
NZ Standard Time: Wednesday, Jul 15 2009 at 9:22 pm
Latitude, Longitude: 45.75S, 166.38E
Focal Depth: 12 km
Moment magnitude: 7.8
Region: Fiordland
Location:
- 100 km north-west of Tuatapere
- 100 km south-west of Te Anau
- 160 km north-west of Invercargill
- 300 km west of Dunedin


http://www.geonet.org.nz/earthquake/quakes/3124785g.html
Fault parameters and calculation condition

<table>
<thead>
<tr>
<th>Depth (km)</th>
<th>Strike (°)</th>
<th>Dip (°)</th>
<th>Slip (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USGS CMT</td>
<td>19.0</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>Harvard CMT</td>
<td>22.2</td>
<td>26</td>
<td>24</td>
</tr>
</tbody>
</table>

Length = 100 km, Width = 50 km, Dislocation = 1.6
(Empirical formula from Papazachos et al, 2004)

Sources:

Bathymetry: GEBCO 1 minute
Equation: Linear shallow-water theory in spherical coordinates
Output time step: 3 seconds
Tsunami propagation snap shots

At $t = 0$ min

At $t = 90$ min

At $t = 36$ min (Jackson Bay)

At $t = 120$ min

At $t = 42$ min (Dart Tasmania)

At $t = 180$ min
Tsunami waveform observation

- Tsunami was observed at 2 locations and reported as **17 cm** at tide gauge station (Jackson Bay, NZ) and **5 cm** at Dart Tasman Sea, NZ.
- Calculation results show **16.1 cm** at Jackson Bay tide gauge station and **4.3 cm** at Dart Tasman Sea.

<table>
<thead>
<tr>
<th>GAUGE LOCATION</th>
<th>LAT</th>
<th>LON</th>
<th>TIME</th>
<th>AMPL</th>
<th>PER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson Bay, NZ</td>
<td>43.975</td>
<td>168.62E</td>
<td>10:18Z</td>
<td>0.17M</td>
<td>10min</td>
</tr>
<tr>
<td>DART Tasman Sea, NZ</td>
<td>-46.92S</td>
<td>160.56E</td>
<td>09:53Z</td>
<td>0.05M</td>
<td>8min</td>
</tr>
</tbody>
</table>

Maximum wave height

Simulated maximum wave height
- At South Island, NZ: 1.50 m
- At Tasmania, AUS: 0.32 m
- At SE. coastline, AUS: 0.24 m