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TSUNAMI COASTAL HAZARD ASSESSMENT TOOL (TsuCAT) – SUPPORTING NATIONAL EFFORTS IN DISASTER RISK REDUCTION

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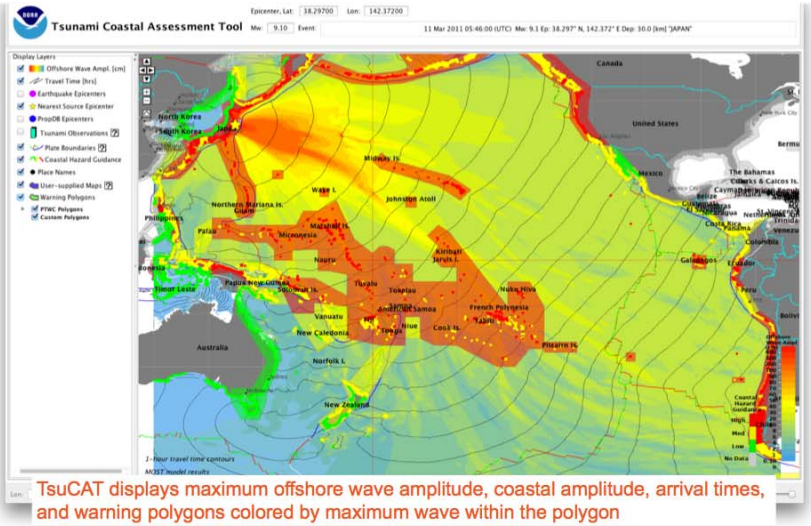
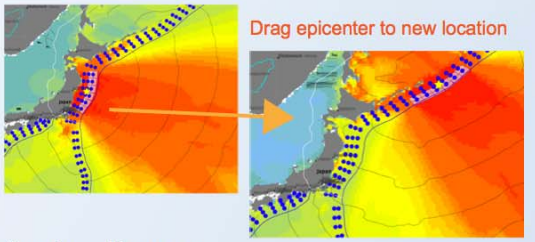
The Tsunami Coastal Assessment Tool (TsuCAT) is a standalone, simple and quick, yet powerful tool for exploring the impact from many different tsunamis. TsuCAT provides access to a Pacific, Caribbean, and Indian Ocean database of tsunami modeling results from NOAA's pre-computed catalog of sources using the MOST (Propagation Database, Gica, et al., 2008) and RIFT models (IOC TS 105, 2014). TsuCAT will assist countries in their tsunami hazard assessment, tsunami exercise and response planning, and warning decision-making.



TsuCAT displays maximum offshore wave amplitude, coastal amplitude, arrival times, and warning polygons colored by maximum wave within the polygon

TsuCAT Workflow

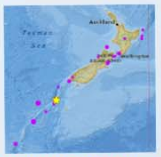
TsuCAT gives offshore wave amplitude, arrival time, and Green's law extrapolated values along the coastline for any epicenter within the global subduction zones, and at any magnitude. To use, the user chooses an epicenter and magnitude (M6.5-9.5): this is done by dragging the yellow epicenter "star" and editing Mw. TsuCAT then chooses the closest epicenter from its database of 5400 runs, and scales it up or down to match the requested magnitude.

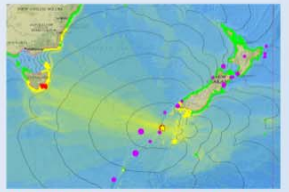


TsuCAT also comes with a catalog of historical tsunamis or earthquakes. Users can choose earthquake epicenter and magnitude from a list: Or select from the map:

Date	Mw	Latitude	Longitude	Country
2017-11-01 02:23	6.6	21.648° S	168.858° E	NEW CALEDONIA
2017-11-19 09:25	6.3	21.638° S	168.673° E	NEW CALEDONIA
2017-11-01 00:09	6.1	21.728° S	168.934° E	NEW CALEDONIA
2003-12-27 04:55	6.1	22.107° S	169.350° E	NEW CALEDONIA
2017-11-20 00:09	6.0	21.485° S	168.809° E	NEW CALEDONIA
2004-12-23 14:59	8.1	49.312° S	161.345° E	NEW ZEALAND
1855-01-23 09:00	8.0	41.250° S	175.000° E	NEW ZEALAND
2016-11-13 11:02	7.8	42.757° S	173.077° E	NEW ZEALAND
2009-07-15 09:22	7.8	45.762° S	166.562° E	NEW ZEALAND
1931-05-25 01:25	7.6	48.786° S	164.357° E	NEW ZEALAND
1868-10-18 12:35	7.6	40.200° S	173.000° E	NEW ZEALAND
2007-09-30 05:23	7.4	49.418° S	163.954° E	NEW ZEALAND
2003-08-21 12:12	7.2	45.104° S	167.144° E	NEW ZEALAND
2016-09-01 16:37	7.1	37.401° S	179.055° E	NEW ZEALAND
2004-11-22 20:26	7.1	46.676° S	164.721° E	NEW ZEALAND

OR





Notice focused impact of 1981 Peysegur event on Tasmania

Databases included

TsuCAT includes the ICSU WDS/ NOAA Centers for Environmental Information (NCEI) Global Historical Tsunami Database and the US Geological Survey (USGS) earthquake catalog. The NCEI database includes event tide gauge, DART buoy, and post-event survey data.

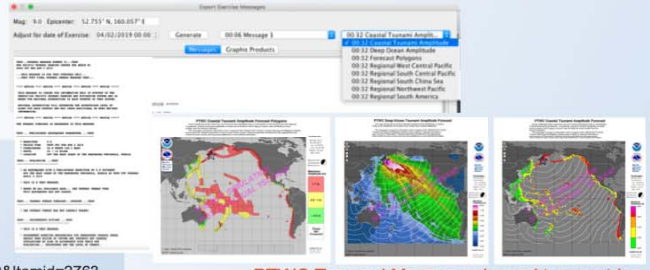
When connected to the Internet, the NCEI and USGS databases update automatically, and Open Street and ESRI World Topo and National Geographic Map databases background maps become available

Example: Conducting Tsunami Exercises

Tsunami exercises and evacuation drills are important activities to prepare for the next tsunami.

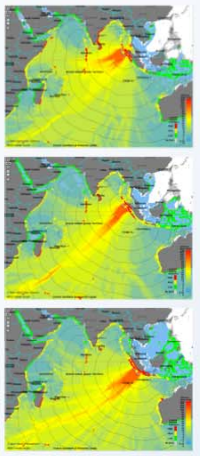
The TsuCAT exercise GUI allows countries to independently develop scenarios and conduct their own exercises triggered by the PTWC tsunami products issued to the Pacific and Caribbean.

TsuCAT uses the earthquake hypocenter and magnitude to generate the corresponding PTWC tsunami forecast products.



PTWC Tsunami Messages issued to countries

Example: Assessing Tsunami Threat



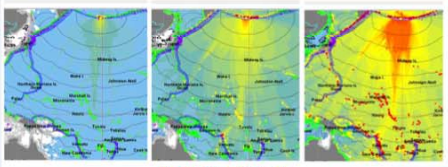
Sunda Trench

TsuCAT can be used to investigate whether an particular earthquake (source, magnitude) will generate a dangerous tsunami, or not.

TsuCAT illustrates how tsunami amplitude and directivity forecasts depend on earthquake magnitude, and on sea floor bathymetry.

Left: Effect of keeping magnitude constant, but moving epicenter just a few hundred km

Bottom: Effect of keeping epicenter same, but varying magnitude (Mw7.8, 8.5, 9.0)



Aleutian Trench

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