

SEPTEMBER 16, 2015 CENTRAL CHILE EARTHQUAKE AND TSUNAMI

Updated: September, 2015

The September 16, 2015 magnitude 8.3 Mw Central Chile earthquake, located 46 km west of Illapel (31.570 S, 71.654 W depth=25.0 km) generated a tsunami that was observed all over the Pacific region and caused damage locally. According to news reports, there were at least 13 dead and 14 injured due to the earthquake ground shaking and more than one million people were evacuated from coastal regions of Chile to escape the tsunami. The tsunami waves flooded and caused damage in areas of Coquimbo, La Serena, Tongoy, Concon, and Illapel.

According to the USGS, the September 16, 2015 earthquake occurred as a result of thrust faulting on the interface between the Nazca and South America plates in Central Chile. In the region of the earthquake, the Nazca plate subducts eastward beneath the South American plate at a rate of 65 mm/yr.

SEPTEMBER 16, 2015 EYEWITNESS AND INSTRUMENTAL RECORDINGS

A 4.75 m high tsunami wave was measured on the Coquimbo, Chile sea level gauge. Elsewhere in Chile, 1-2 m high waves were measured on sea level gauges located 600 km north and south of the epicenter, from Chanaral to Talcahuano. Outside of Chile, the highest amplitude of 1.4 m was measured on the Nuku Hiva Island sea level gauge in the Marquesas Islands of French Polynesia.

HISTORICAL EARTHQUAKES AND TSUNAMIS IN CHILE

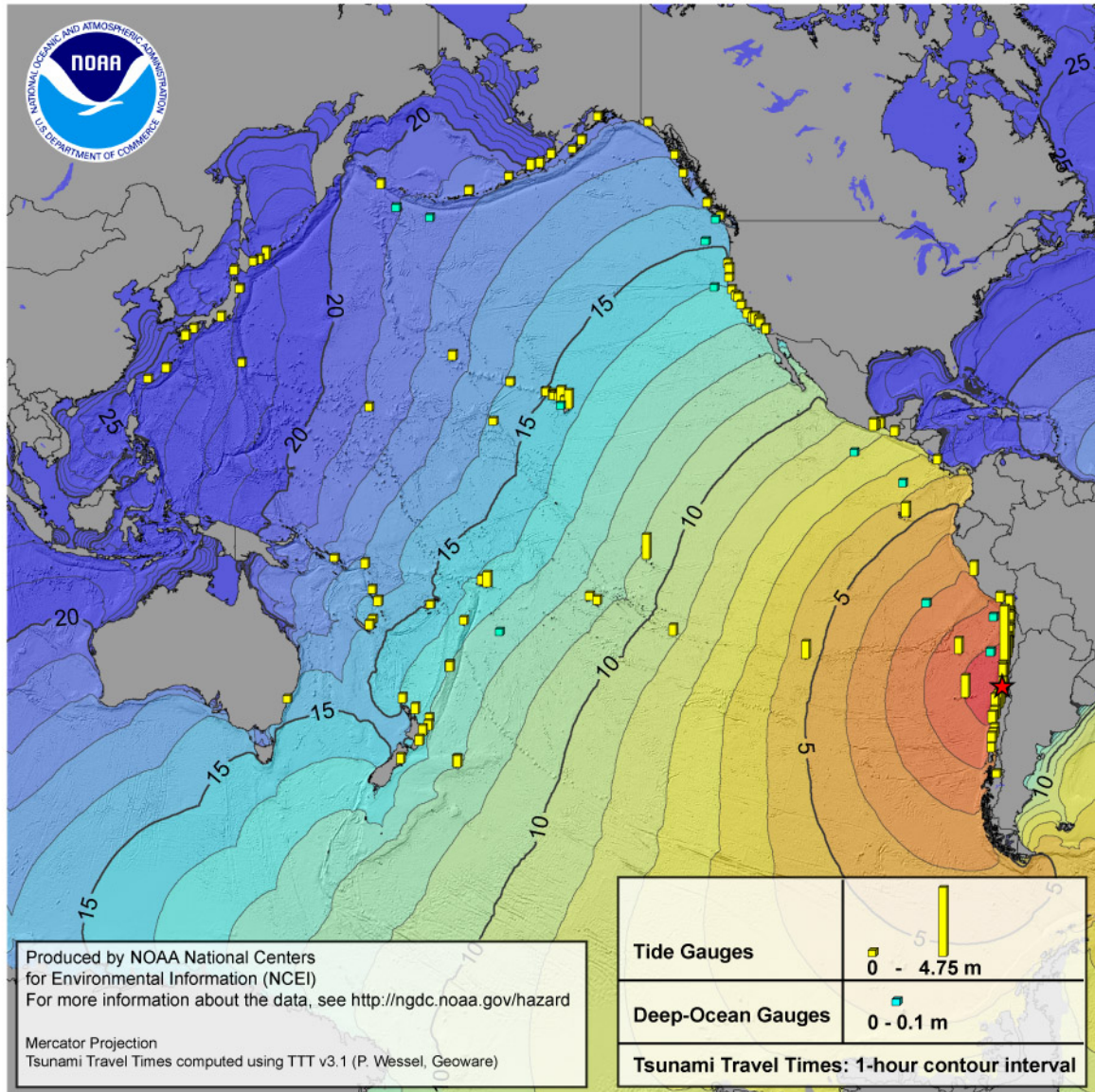
Listed below are significant Chilean earthquakes and tsunamis:

- 1570 Concepcion, Chile earthquake generated a tsunami that caused over **2,000 deaths**
- 1575 Valdivia, Chile earthquake caused **1,200 deaths** and generated a tsunami that caused **100 deaths**
- 1647 Santiago, Chile earthquake caused over **1,000 deaths**
- 1868 Arica, Chile earthquake and tsunami caused **25,000 deaths** in Peru and Chile and additional deaths due to the tsunami in New Zealand and Samoa
- 1877 Iquique, Chile earthquake caused **64 deaths** and generated a tsunami that over **2,400 deaths** in Chile, Peru, USA (Hawaii), Fiji, and Japan
- 1906 Valparaiso, Chile earthquake caused **4,000 deaths** and generated a non-fatal tsunami
- 1922 Vallenar, Chile earthquake and tsunami caused over **700 deaths**
- 1939 Chillan, Chile earthquake caused over **30,000 deaths** and generated a small tsunami
- 1960 Southern Chile earthquake and tsunami caused over **2,000 deaths** in Chile and additional deaths due to the tsunami in USA (Hawaii, California), Philippines, and Japan
- 2010 Central Chile earthquake and tsunami caused over **550 deaths** in Chile

* Data are collected from the US NOAA National Weather Service Tsunami Warning Centers, the US Geological Survey National Earthquake Information Center, the US NOAA National Data Buoy Center, IOC/UNESCO, International Tsunami Survey Teams, and news organizations. Refer to the NCEI event page for data and their sources (http://ngdc.noaa.gov/hazard/tsu_db.shtml). For more information on this event please see <http://www.ngdc.noaa.gov/hazard/16sep2015.html>.

† A validity score or confidence designation is assigned to each tsunami event ranging from -1 for erroneous entries to 4 for definite or confirmed tsunamis.

Sep. 16, 2015 Tsunami Event: Observed Water Heights and Computed Tsunami Travel Times



September 16, 2015 tsunami water heights tide gauges, and DARTs; and estimated tsunami travel times plotted at 1-hour intervals (black lines) using the earthquake epicenter (star) as a point source. The maximum amplitude was 4.75 meters at Coquimbo, Chile. (Credit: J. Varner, NCEI)

Image showing tsunami damage in Coquimbo, Chile (Image credit: SHOA)