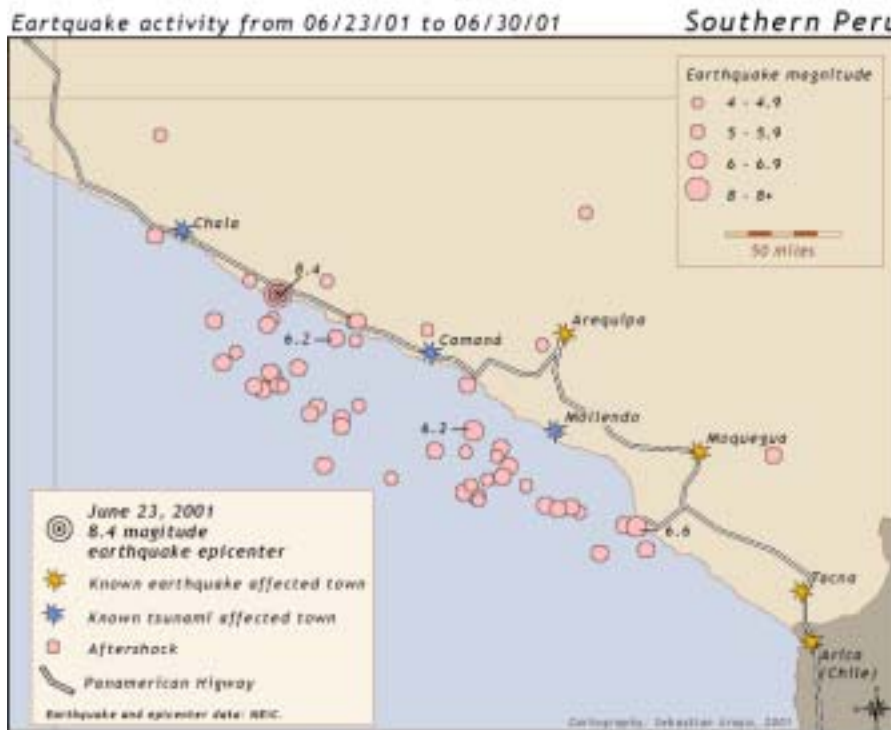


Pre-Trip Report: International Tsunami Survey Team – June 23, 2001 Arequipa earthquake

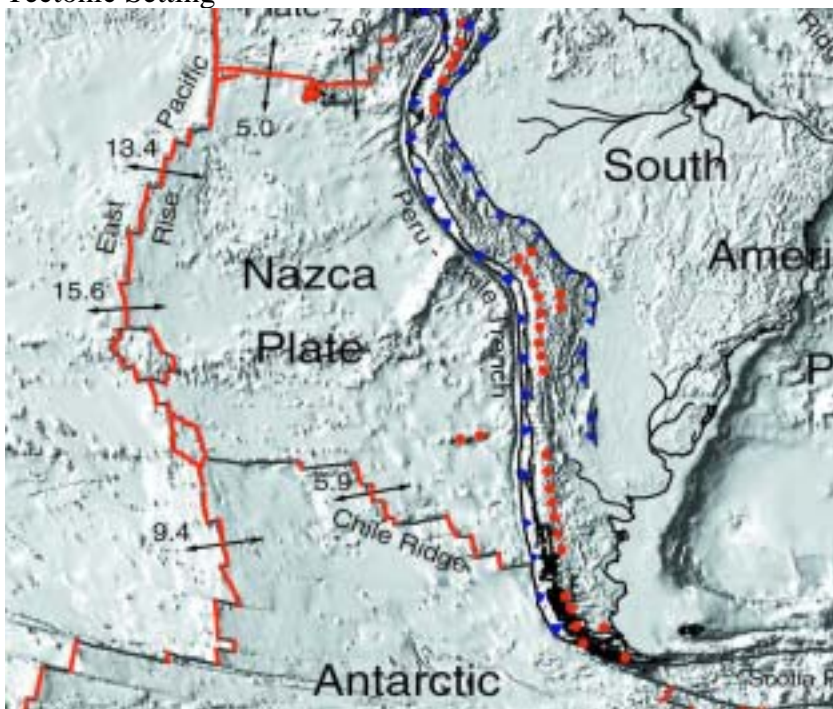
note: This information is preliminary and has been compiled from the web sites listed at the end

A great earthquake occurred near the coast of southern Peru, about 110 miles (175 km) west of Arequipa or about 370 miles (595 km) southeast of Lima at 4:33 PM EDT on Jun 23, 2001 (3:33 PM local time in Peru). A revised moment magnitude of 8.4 (Harvard) was computed for this earthquake, making this the largest earthquake to occur anywhere in the world in the past 25 years. The focal depth was shallow, with estimates from 9 km (Sipkin, USGS), 26 km (Harvard) to 40 km (Univ of Tokyo). The aftershocks define a 300-km zone striking northwest extending from Chala to south of Motegua .



Epicenter data from NEIC

Tectonic Setting



Digital Tectonic Activity Map of the world

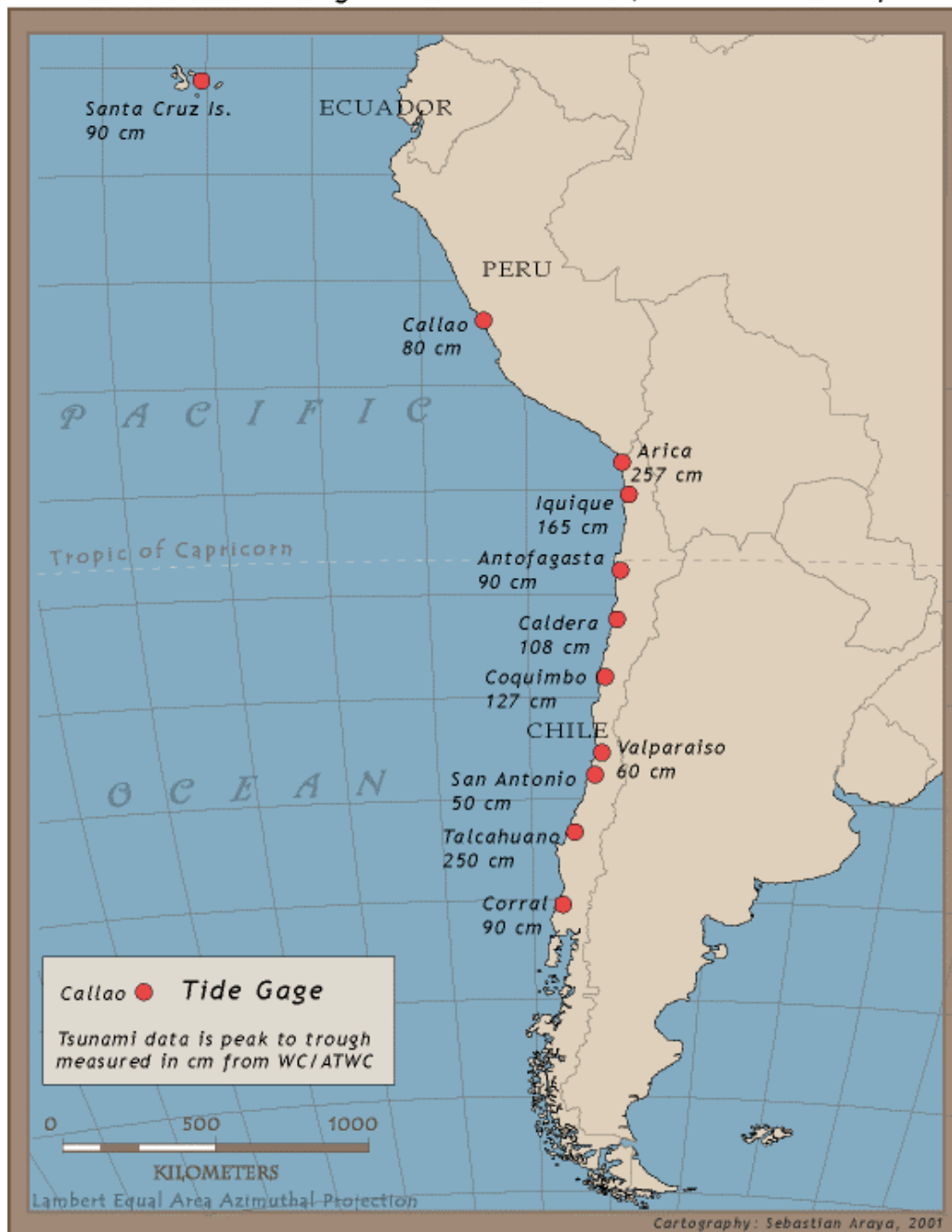
The mainshock hypocenter and aftershock locations are consistent with an inter-plate thrusting event of the Nazca plate beneath the South American plate along a 300 km-long section of the plate

boundary interface. Rupture was complex with a large portion of the moment release associated with an asperity 150 km SE of the epicenter. The June 23 shock originated just southeast of the source of a magnitude 7.7 earthquake that occurred in November 1996, and it appears to have involved rupture of part of the plate-boundary segment that produced an earthquake of magnitude approximately 9.0 in 1868.

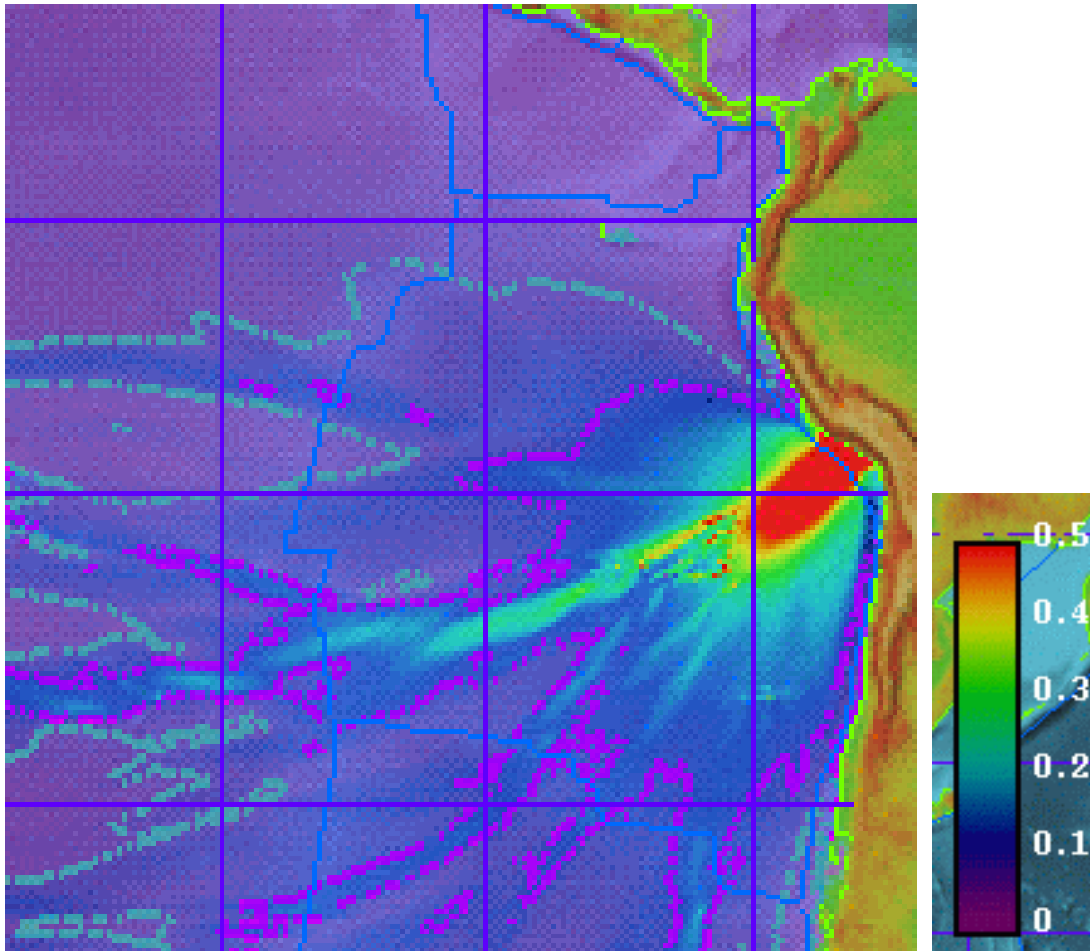
The Tsunami

The earthquake produced a tsunami that was recorded throughout the Pacific basin with maximum wave heights (peak to trough) of 2.5 meters in Arica, northern Chile, the closest tide gage station to the epicenter. South American tide gage readings are shown below:

South American Tide Gage Data June 23, 2001 Peru Earthquake



Preliminary modeling results suggest the tide gage recordings are consistent with the primary thrust source mechanism. The tsunami magnitude based on recorded amplitudes in California, Japan, Hawaii and Alaska averages 8.2.



Impacts

As of July 4, the official death toll was 77, with 2,713 people injured 25,399 homes destroyed and 33,570 homes damaged and 190,000 homeless. 68 persons are still reported missing. The greatest damage was in the Arequipa-Camana-Moquegua-Tacna areas. The table below summarizes data compiled by the Instituto Nacional de Defensa Civil on identified fatalities.

Fatality Demographics

Town	number	%	under 15	16 to 29	30 to 49	50 to 69	over 70
Female							
Camana	20	45	7	0	6	7	0
Tacna	14	43	1	4	2	0	6
Arequipa	7	57	3	0	1	1	2
Moquegua	22	84	3	3	3	0	10
Others	8	63	0	1	1	3	3
TOTAL	71	58.4	14	8	13	11	21

source: Actualidad <http://www.peru.com/noticias/index.asp>
 Insituto Nacional de Defensa Civil

At least 20 of the people killed and some of the missing are attributed to the tsunami impact in the Camana-Chala area. Approximately 2,000 hectares of agricultural land were destroyed as the ocean water surged up to 1-km inland. Catholic Relief Services reports that an estimated 80% of the houses in the village of La Punta were destroyed.

The International Tsunami Survey Team

The Arequipa ITIS team will meet in Lima July 5-6 and will depart for the coast on July 6. The primary purpose is to map the tsunami inundation from the Chala to Mollendo. The group will also

collect information from eye witnesses and survivors on the nature of the tsunami and the nature and pattern of damage to structures. The group will return on July 16.

Web links:

IRIS event page <http://www.iris.washington.edu/NEWS/Peru20010623.htm>
USGS event page http://earthquake.usgs.gov/activity/latest/eq_01_06_23/index.html
EIC event page <http://www.eic.eri.u-tokyo.ac.jp/topics/200106232033/>
Instituto Geofisico del Peru http://cns.igp.gob.pe/net_main.htm
Tsunami Magnitude <http://www.eic.eri.u-tokyo.ac.jp/abe/Mt010623.html>
Global tide gage data <http://wcatwc.gov/06-23-01.htm>
Tsunami modeling <http://www.pmel.noaa.gov/tsunami/peru20010623.html>
http://www.pmel.noaa.gov/tsunami/peru_pmel.html
Impacts & damage <http://www.reliefweb.int/w/rwb.nsf>
http://www.peru.com/noticias/especiales/2001/06/28/victimas_terremoto/
Historic Peru Tsunamis <http://www.usc.edu/dept/tsunamis/peru/>