



ARTIE.COM

Topic:

TSUNAMIS

- <http://www.youtube.com/watch?v=UzR0Rt3i4kc>



ARTIE.COM

Tsunamis are

large waves caused by the sudden movement
in the sea.

Including -

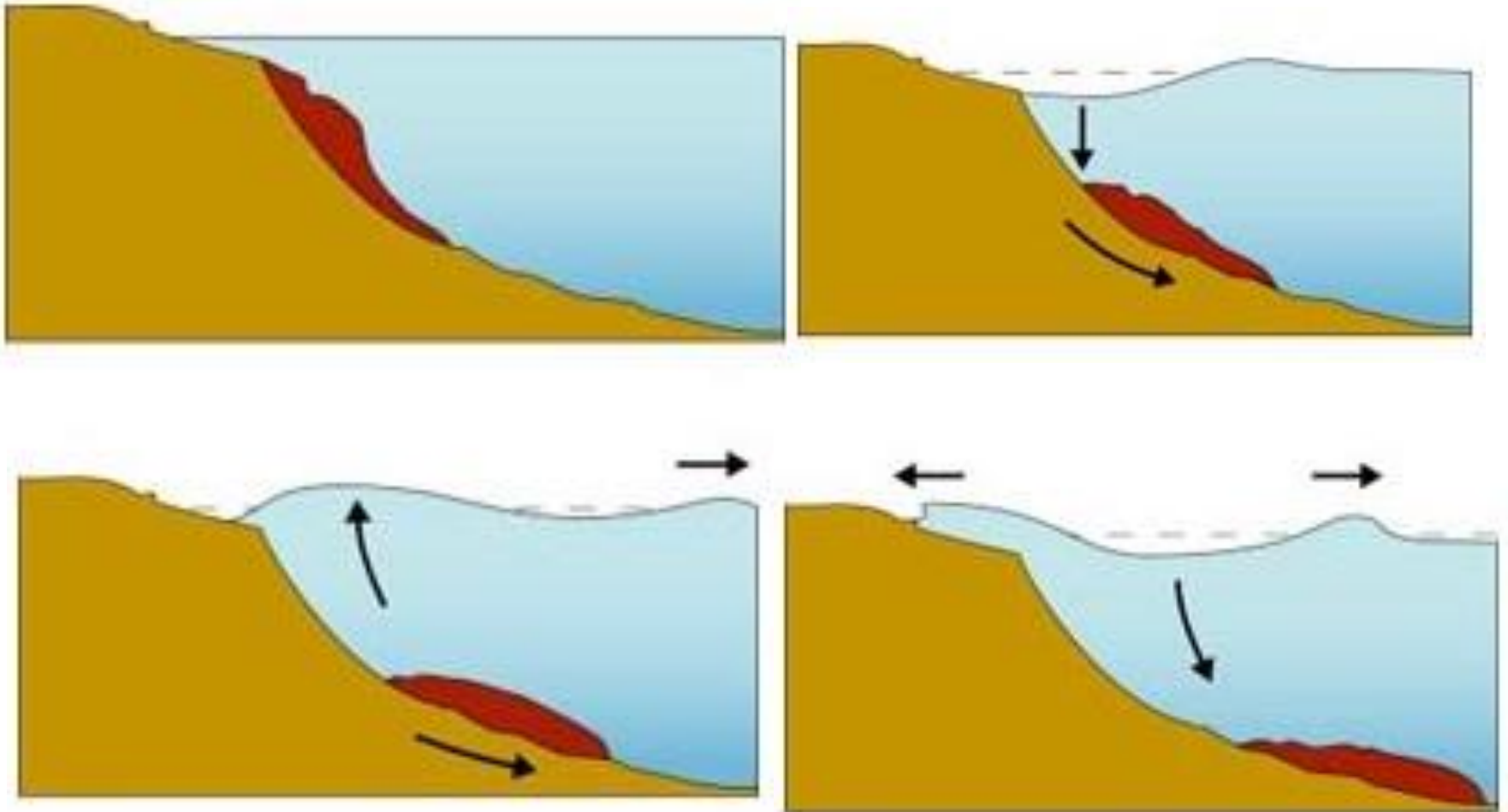
Earthquakes, volcanic eruptions, meteorite
impacts or landslides.

Earthquake Tsunamis



Sea level

Landslide Tsunamis



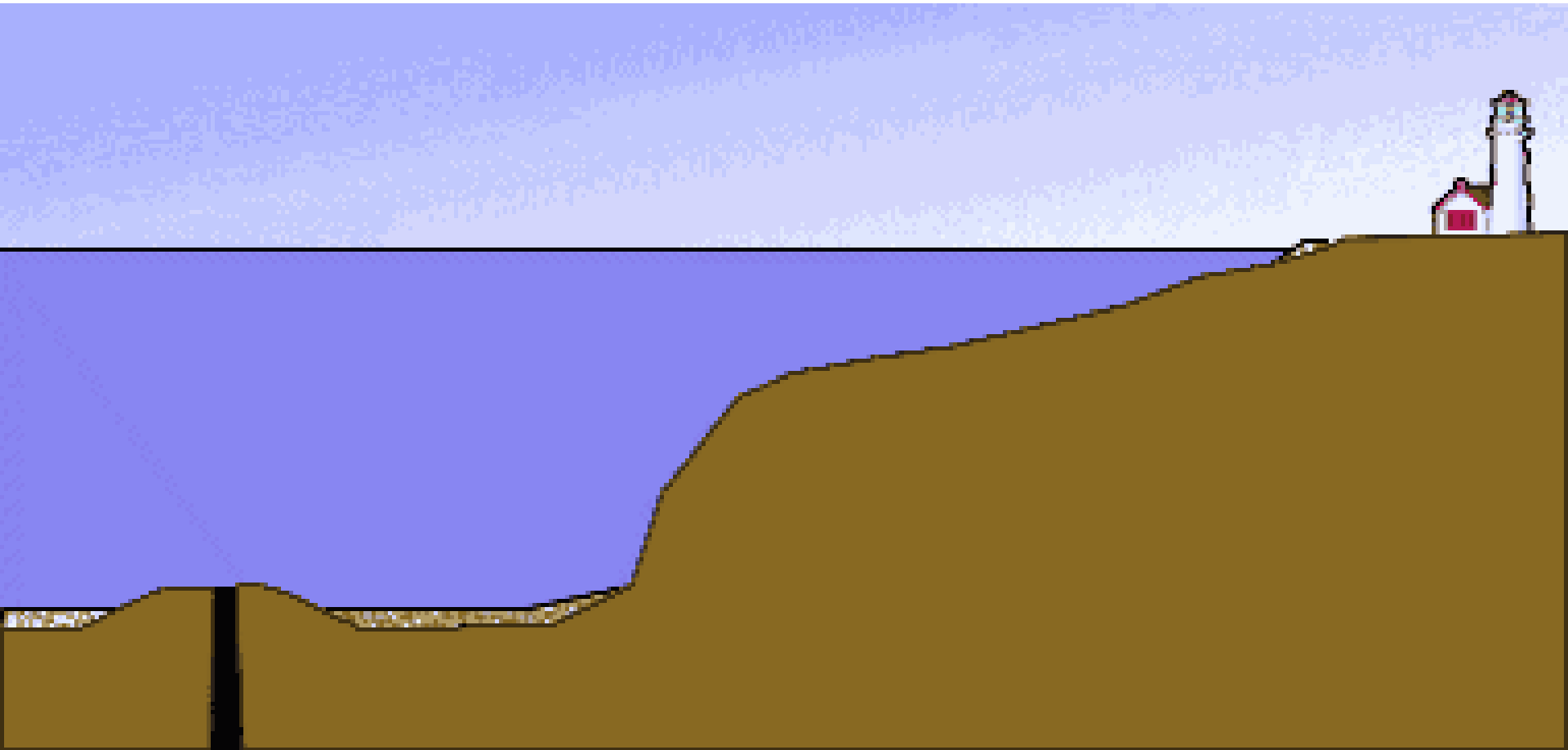
Meteorite Impact



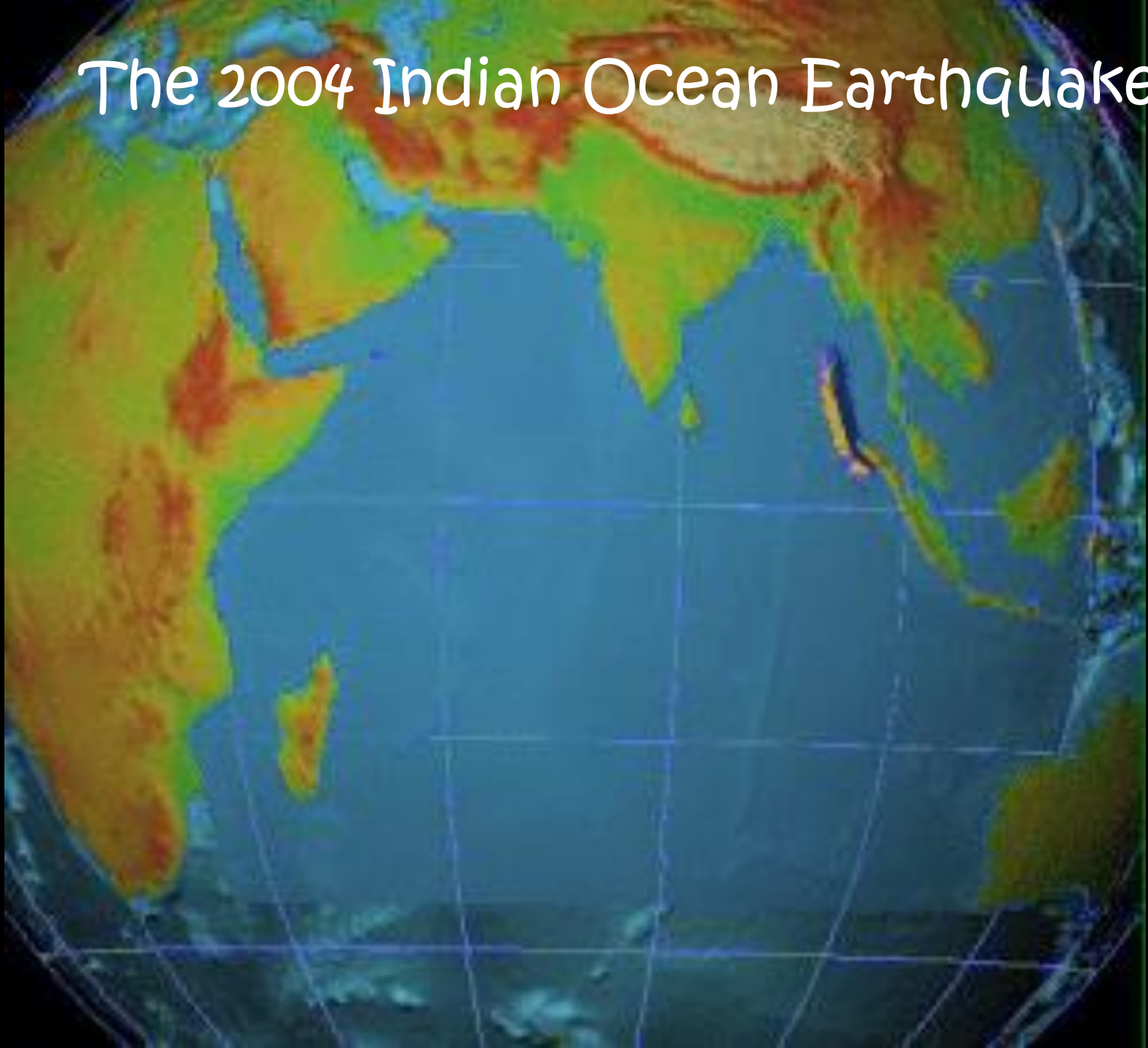
Meteorite/Asteroid Impact

- If an asteroid 0.6 km in diameter or larger struck the Atlantic Ocean 400 miles from NYC:
 - The height of the tsunami would be taller than the Statue of Liberty—93 meters (305 ft 1 in)
 - The height of the tsunami along the African coast would be 20 meters (65 feet) high
- Probability:
 - 1 every 100,000+ years

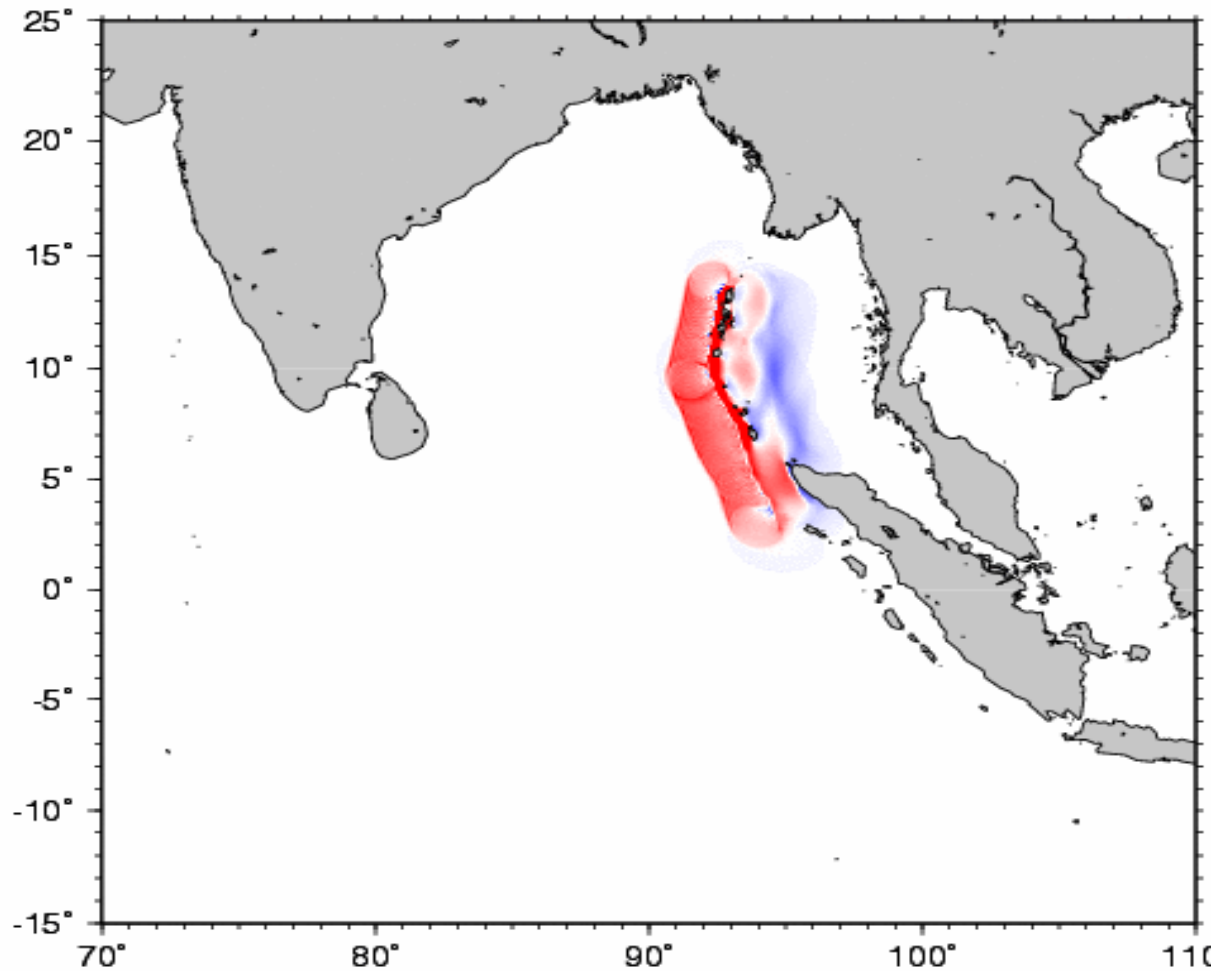
Undersea Volcano



The 2004 Indian Ocean Earthquake



2004 Sumatra Earthquake 010 min



Computer Animation of Tsunami

Animation from:

<http://ioc.unesco.org/itsu/templates/itsu/images/animation.gif?PHPSESSID=01478c6a6f2c87d34904b748ccc71b80>

Approximately 100 minutes after it began, the waves hit the east coast of Sri Lanka.

Quake Waves Hit African Coast



Tsunami

December 26, 2004

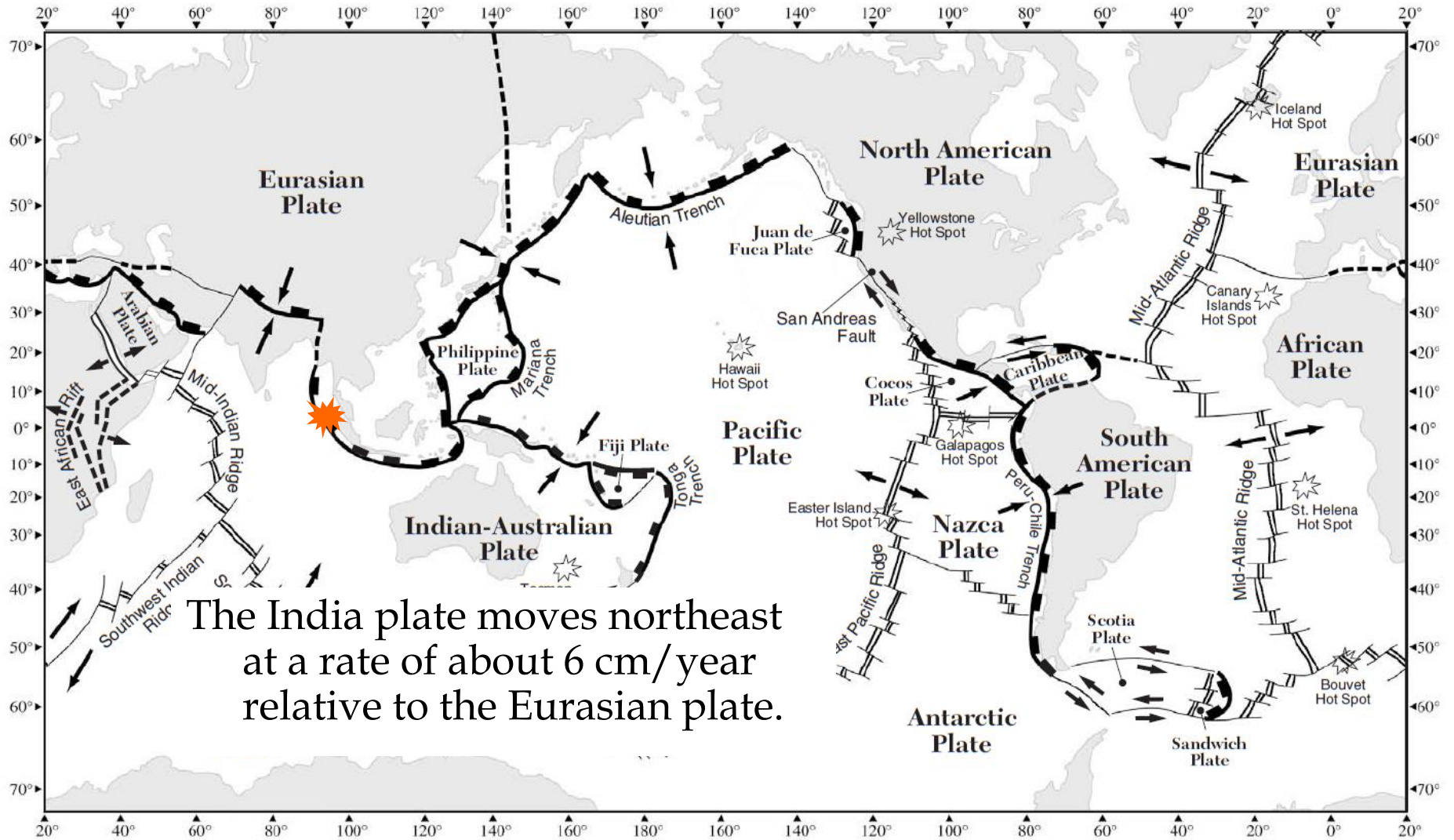
- Waves, as high as 49 feet, traveling 500 mph
- Over 310,000 people killed in a dozen countries
- Over one-third of the dead were children.



<http://www.youtube.com/watch?v=FCWfRs1frYE>


Members of the Sri Lankan community in Canada hold a candlelight vigil, for those killed in the Tsunami


Tectonic Plates




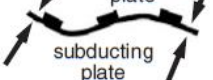
The India plate moves northeast at a rate of about 6 cm/year relative to the Eurasian plate.


Key


- 

Relative motion at plate boundary
- 

Transform plate boundary (transform fault)
- 

Divergent plate boundary (usually broken by transform faults along mid-ocean ridges)
- 

Convergent plate boundary (subduction zone)
- 

Complex or uncertain plate boundary
- 

Mantle hot spot

NOTE: Not all mantle hot spots, plates, and boundaries are shown.

BEFORE the Tsunami

http://www.youtube.com/watch?v=S2eQyj_qbuE&feature=related





(FAMILY PHOTO/AF)



(FAMILY PHOTO/AF)





(FAMILY PHOTO/AP)



BEFORE DECEMBER 26, 2004 EARTHQUAKE-TSUNAMI



10 January 2003

AFTER DECEMBER 26, 2004 EARTHQUAKE-TSUNAMI



29 Dec 2004

8.9 Earthquake & Tsunami in Japan



Japan Tsunami, March 11, 2011

19,000+ died

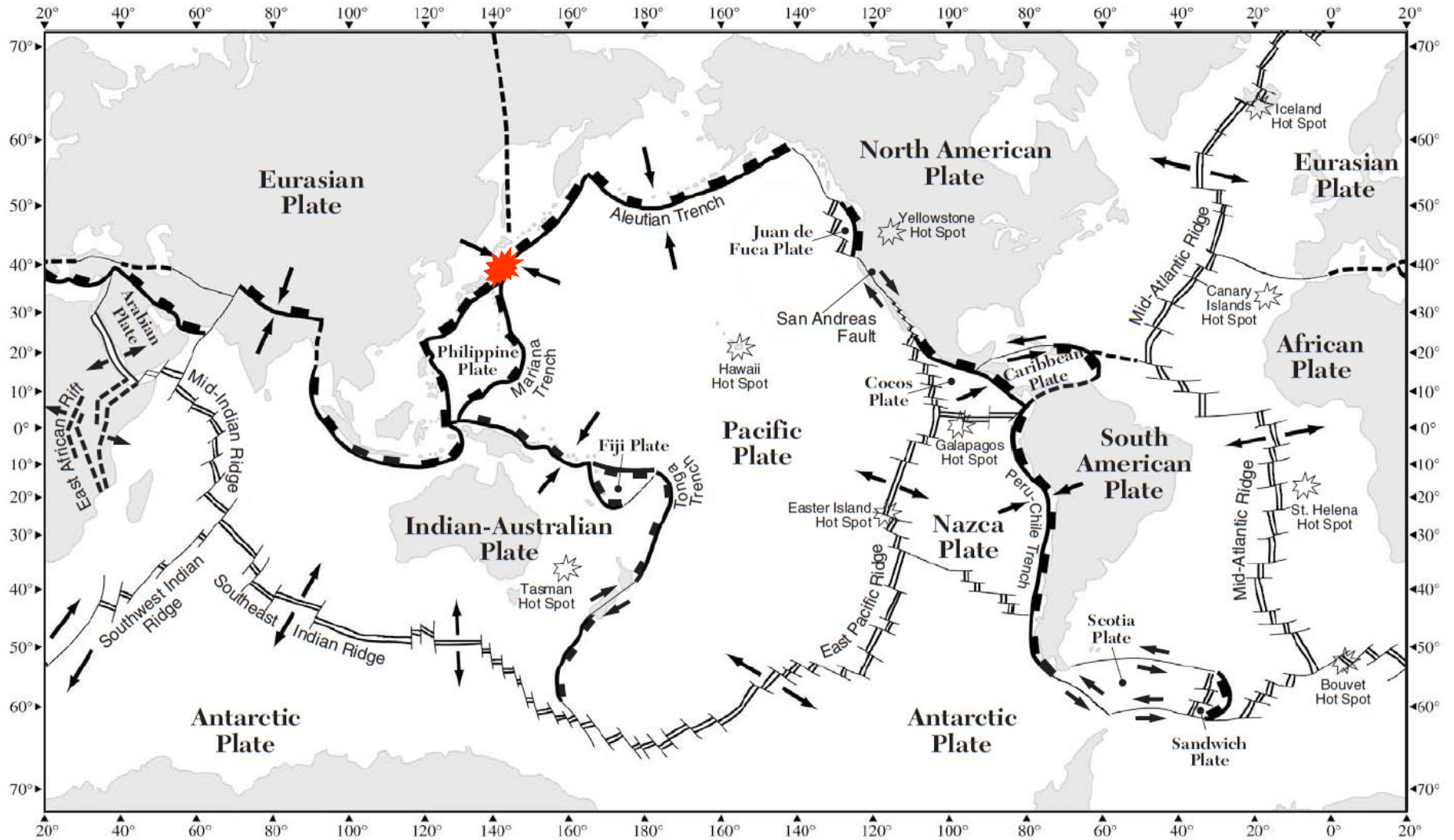
http://www.youtube.com/watch?v=wr8ISvC_Krw

<http://www.nytimes.com/interactive/2011/03/13/world/asia/satellite-photos-japan-before-and-after-tsunami.html> Before & After Photos from the NY Times




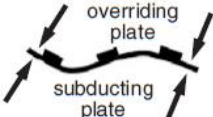


<http://www.usatoday.com/news/world/story/2012-03-11/japan-tsunami-anniversary/53478558/1?csp=34news> Memorials 1 year later



Tectonic Plates

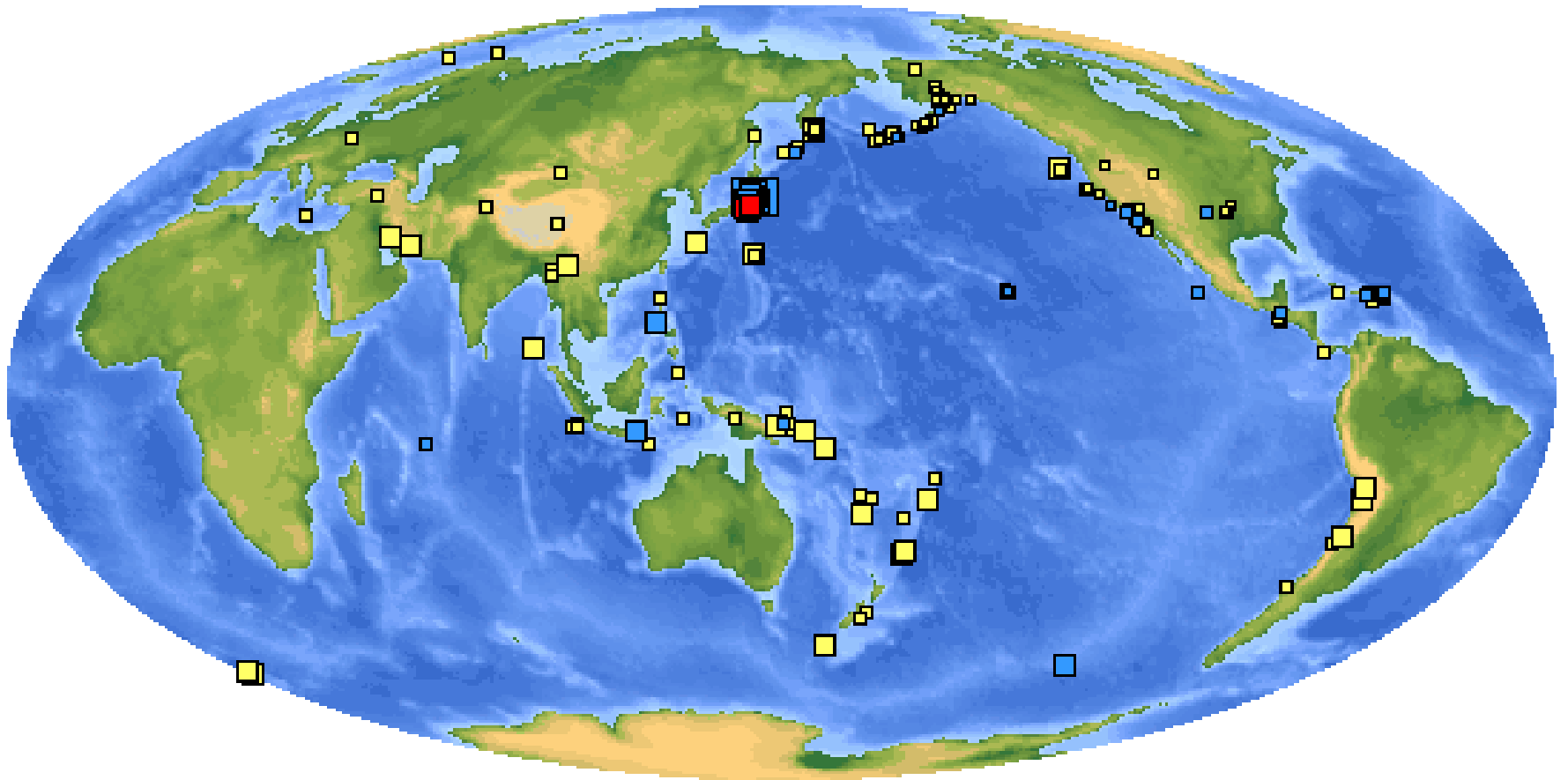


Key

- 
 Relative motion at plate boundary
- 
 Transform plate boundary (transform fault)
- 
 Divergent plate boundary (usually broken by transform faults along mid-ocean ridges)
- 
 Convergent plate boundary (subduction zone)
- 
 Complex or uncertain plate boundary
- 
 Mantle hot spot

NOTE: Not all mantle hot spots, plates, and boundaries are shown.

Fri Mar 11 12:06:38 UTC 2011 288 earthquakes on this map



[Japan Tsunami Video from a Car](#)


How can we prepare for a Tsunami?



Follow the animals!

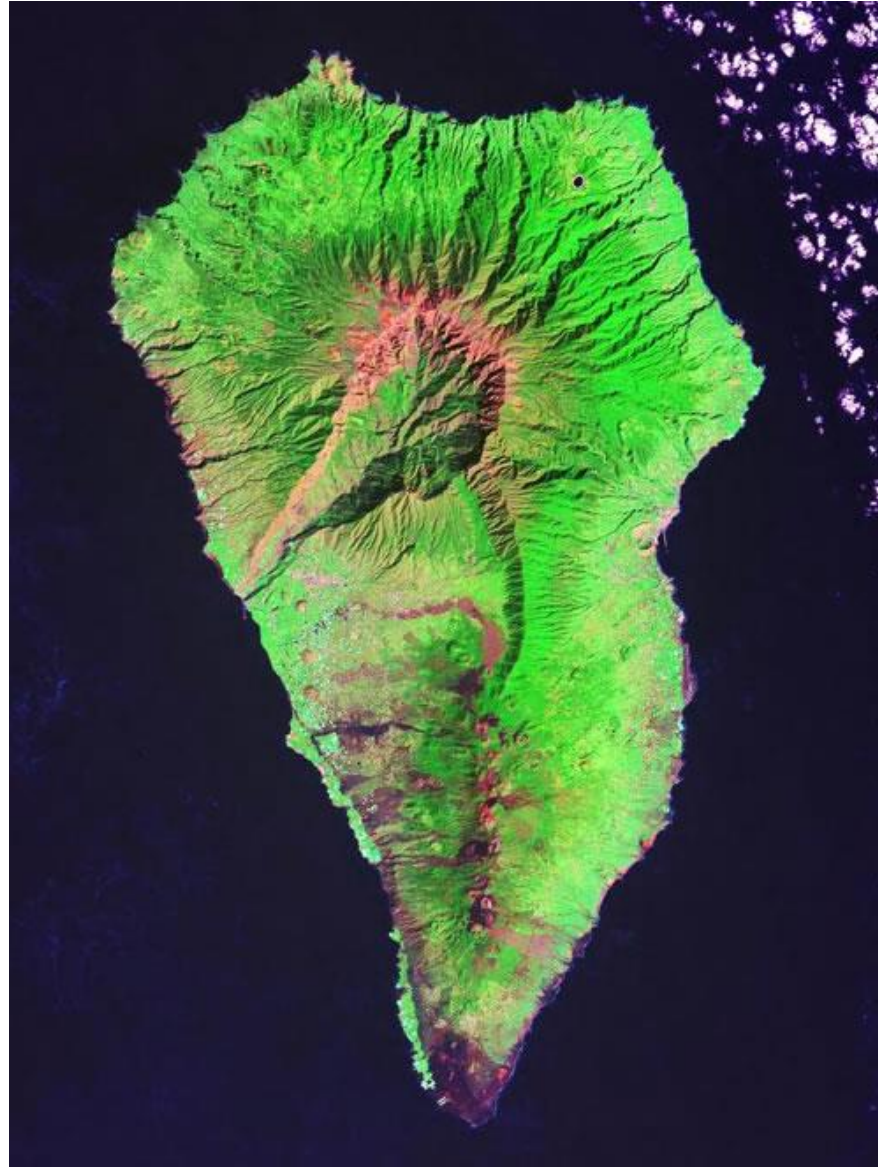


Can Tsunami hit Long Island?

An aerial photograph of Long Island, New York, showing the coastline, water, and some snow patches. The text 'YES!!!' is overlaid in the center of the image.

YES!!!

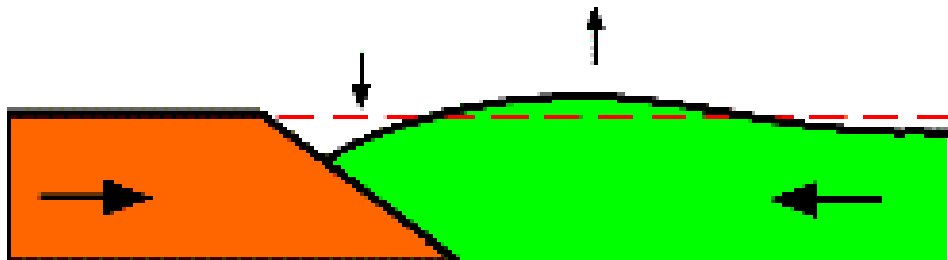
<http://geology.com/news/2005/09/atlantic-ocean-tsunami-threat.html>



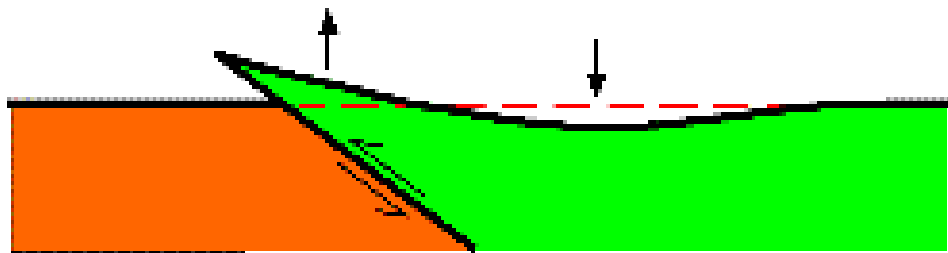
La Palma,
Canary
Islands



Megathrust earthquake – associated with a subduction zone



Strain accumulation

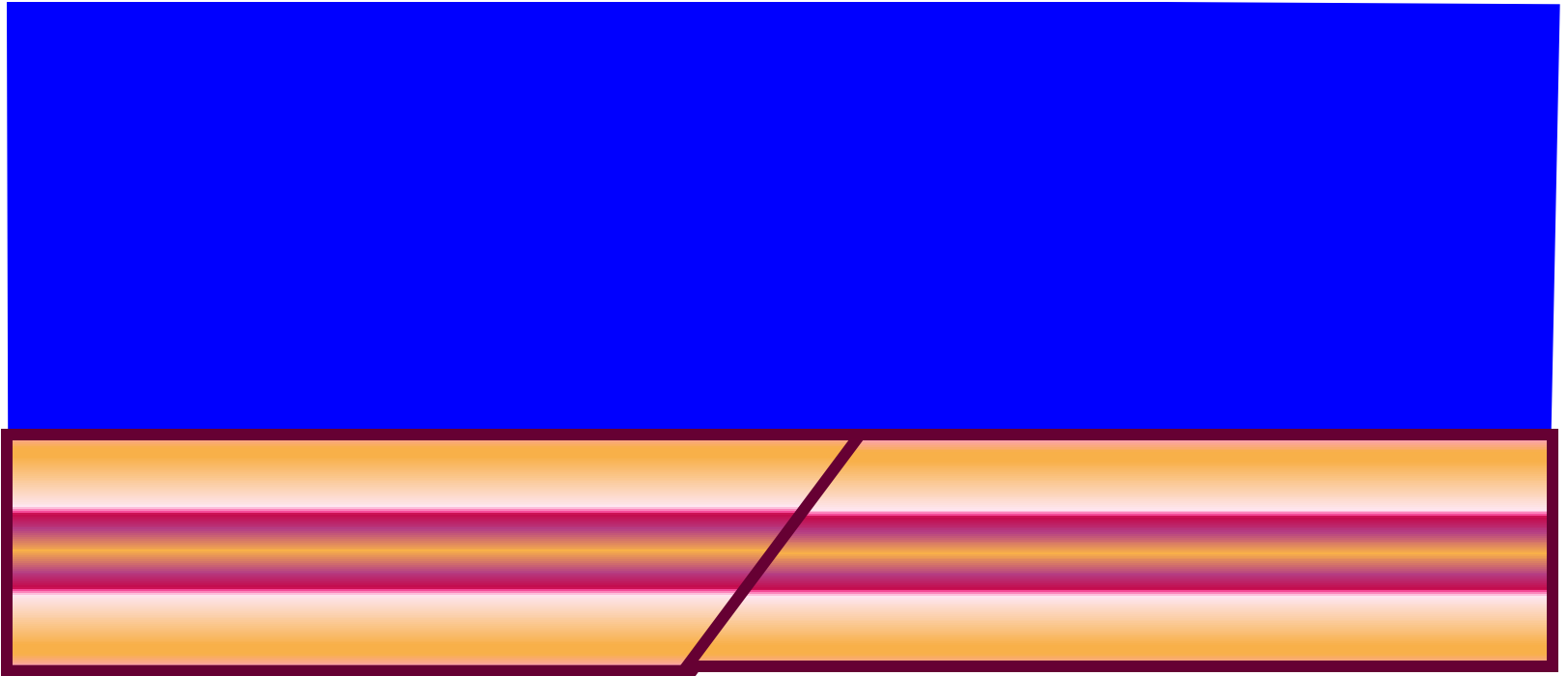


Megathrust rupture



Post-seismic readjustment

Effects of Earthquakes



During

<http://www.youtube.com/watch?v=WhuqKhXZkkY>

EuroNews

05:30 New York

11:30 Bruxelles

13:30 Moscow

BREAKING NEWS





Aftermath of the Tsunami

Aerial Photos of Tsunami damage









Tsunami survivors from Nicobar Island are shown at a tsunami relief camp



Relatives of tsunami victims look at a board where photographs of missing people are displayed at Phuket Town on the Thai holiday island of Phuket.



(AP PHOTO)

Arrival of Help



(AP PHOTO)



(AP PHOTO)

BEFORE AND AFTER THE DISASTER

- **SOURCE OF IMAGES:
SPACE IMAGING/CRISP-
SINGAPORE**
- **NOTE: A TSUNAMI CAN
TRAVEL AT SPEEDS OF 800
KM/HR IN THE DEEP OCEAN**

BEFORE DECEMBER 26, 2004 EARTHQUAKE-TSUNAMI



10 January 2003

AFTER DECEMBER 26, 2004 EARTHQUAKE-TSUNAMI



29 December 2004

BEFORE DECEMBER 26, 2004 EARTHQUAKE-TSUNAMI



10 January 2003

AFTER DECEMBER 26, 2004 EARTHQUAKE-TSUNAMI



29 December 2004

BEFORE DECEMBER 26, 2004 EARTHQUAKE-TSUNAMI



10 January 2003

AFTER DECEMBER 26, 2004 EARTHQUAKE-TSUNAMI



**Strong Coastal
Erosion**

**Torn Away
Vegetation and
Structures**

29 December 2004

8.9 magnitude EQ today

300 mi away from Tokyo, Japan

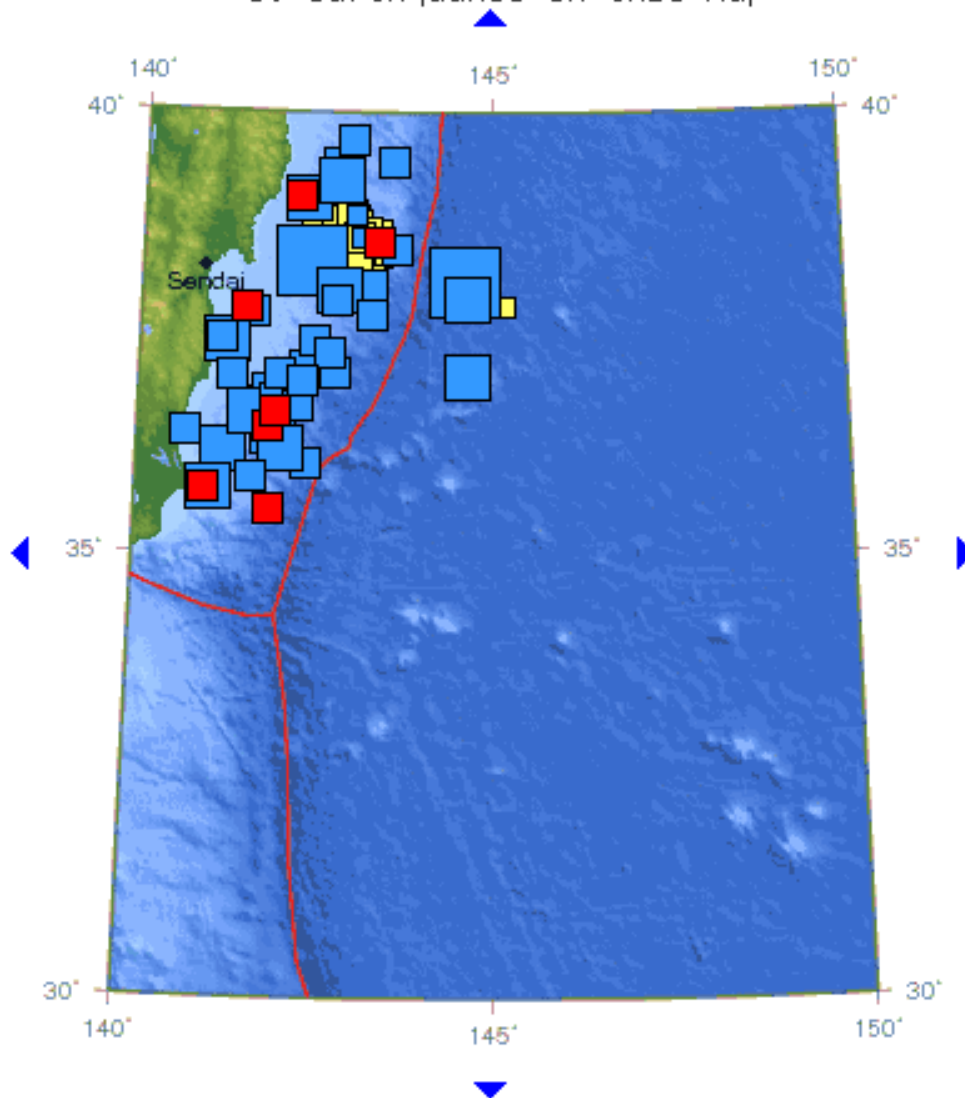
<http://www.bbc.co.uk/news/world-asia-pacific-12709847>

Japanese capital shut down, buildings on fire

TSUNAMI warnings for all of Hawaii, and West Coast of USA, Canada, Mexico, Central America, South America.

Fri Mar 11 11:51:13 UTC 2011

80 earthquakes on this map



last hour

day

week

mag

>7

6

5

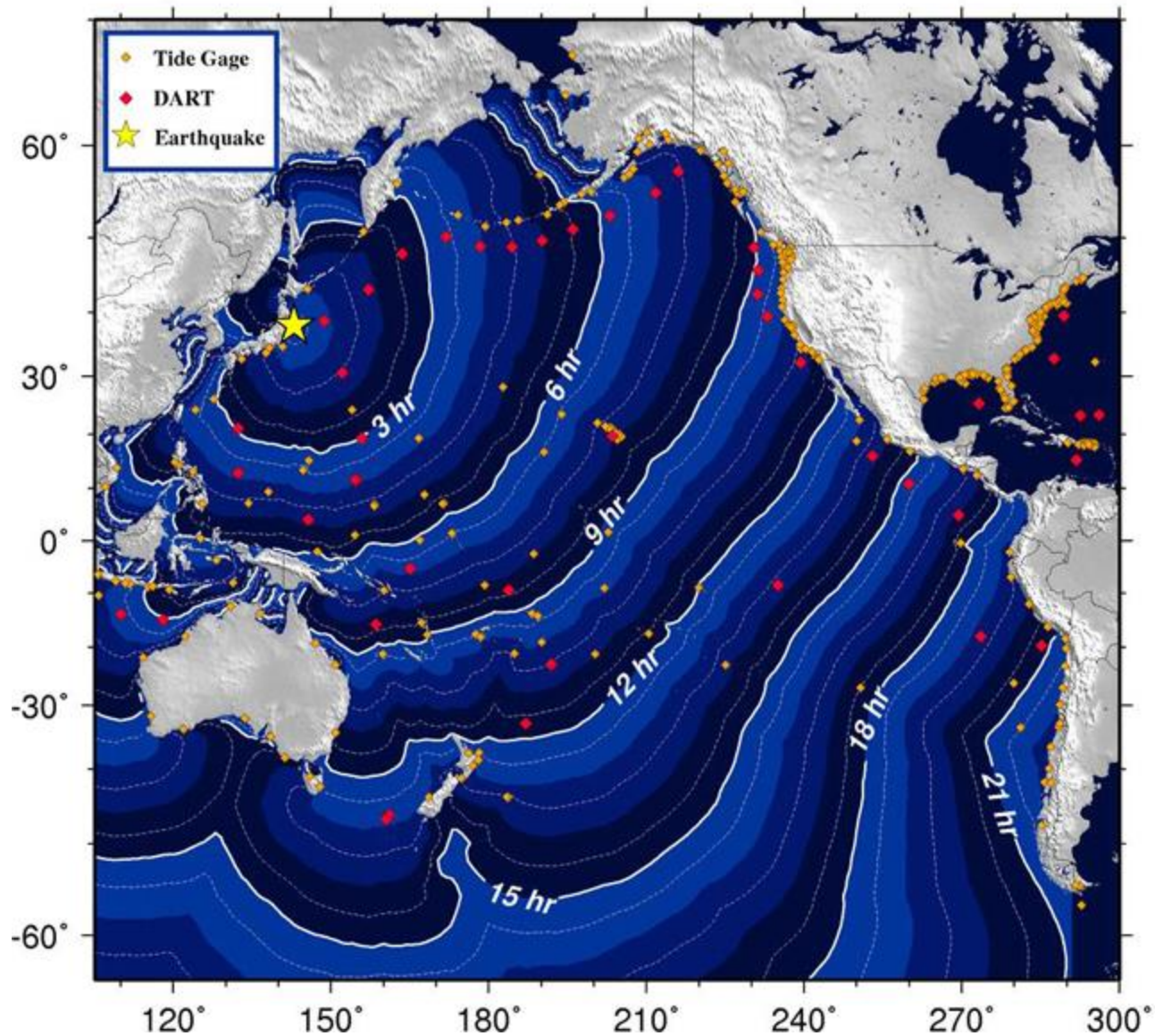
4

2.5

?

Video of Tsunami

- <http://thelede.blogs.nytimes.com/2011/03/11/video-of-the-earthquake-and-tsunami-in-japan/> (video – Burns NYTIMES)
- <http://www.bbc.co.uk/news/world-asia-pacific-12709791> (Pictures)



As you probably know by now, Japan was hit by a 8.9-magnitude earthquake earlier today that sent devastating waves crashing into the island nation and has triggered tsunami warnings in Hawaii and along the Pacific coastline of North and South America.

In anticipation of the waves hitting Hawaii, the state's governor ordered the evacuation of people located in coastal areas. They have been advised to move to areas at least 50 feet above sea level and 100 feet inland.

At least four airports in Hawaii — Hilo, Lihue, Kahului and Honolulu International — have been shut down and workers have moved equipment to higher ground.

In Japan, Narita Airport, which handles a good chunk of international flights in and out of the Tokyo area, was shut down following the quake, forcing planes that were en route to land elsewhere. The U.S. Navy air facility in Atsugi, Japan, granted permission for commercial planes to land.

Some nuclear power plants and oil refineries in Japan were shut down as a result of the earthquake. Millions have been left without power. Japanese Prime Minister Naoto Kan said there have been no reported leaks of radioactive material from the power plants.

This is obviously a developing story, as the waves are expected to make land in Hawaii within the next hour, followed by the west coast in another 2-3 hours

<http://www.reuters.com/article/2011/03/11/uk-japan-quake-tsunami-hawaii-idUSLNE72A00P20110311>

- CNN map of entire Pacific Basin
- <http://www.cnn.com/2011/WORLD/asiapcf/03/11/map.japan.tsunami/index.html?hpt=T1>
- <http://www.cnn.com/2011/WORLD/asiapcf/03/11/japan.quake/index.html?hpt=T1&iref=BN1>

Tsunami to strike Hawaii from 8-8:30 am EST (3-3:30 am Hawaii time)

- <http://www.hawaiinewsnow.com/Global/story.asp?S=14231535>
- Honolulu news, Oahu
- <http://www.kitv.com/index.html>
- Hawaii Evacuation Maps
- <http://www.kitv.com/news/27157605/detail.html>

Tsunami to strike West Coast USA 10 am

- Pacific Tsunami Warning Center
- <http://www.weather.gov/ptwc/>
- Los Angeles, CA news
- <http://www.cbsnews.com/stories/2011/03/10/national/main20041994.shtml>