



Major earthquake in Eastern Turkey.
Epicenter near Van with population of 372,000.

Impact

- 138 reported dead
- Dozens of buildings collapsed
- Frequent aftershocks hampering rescue efforts

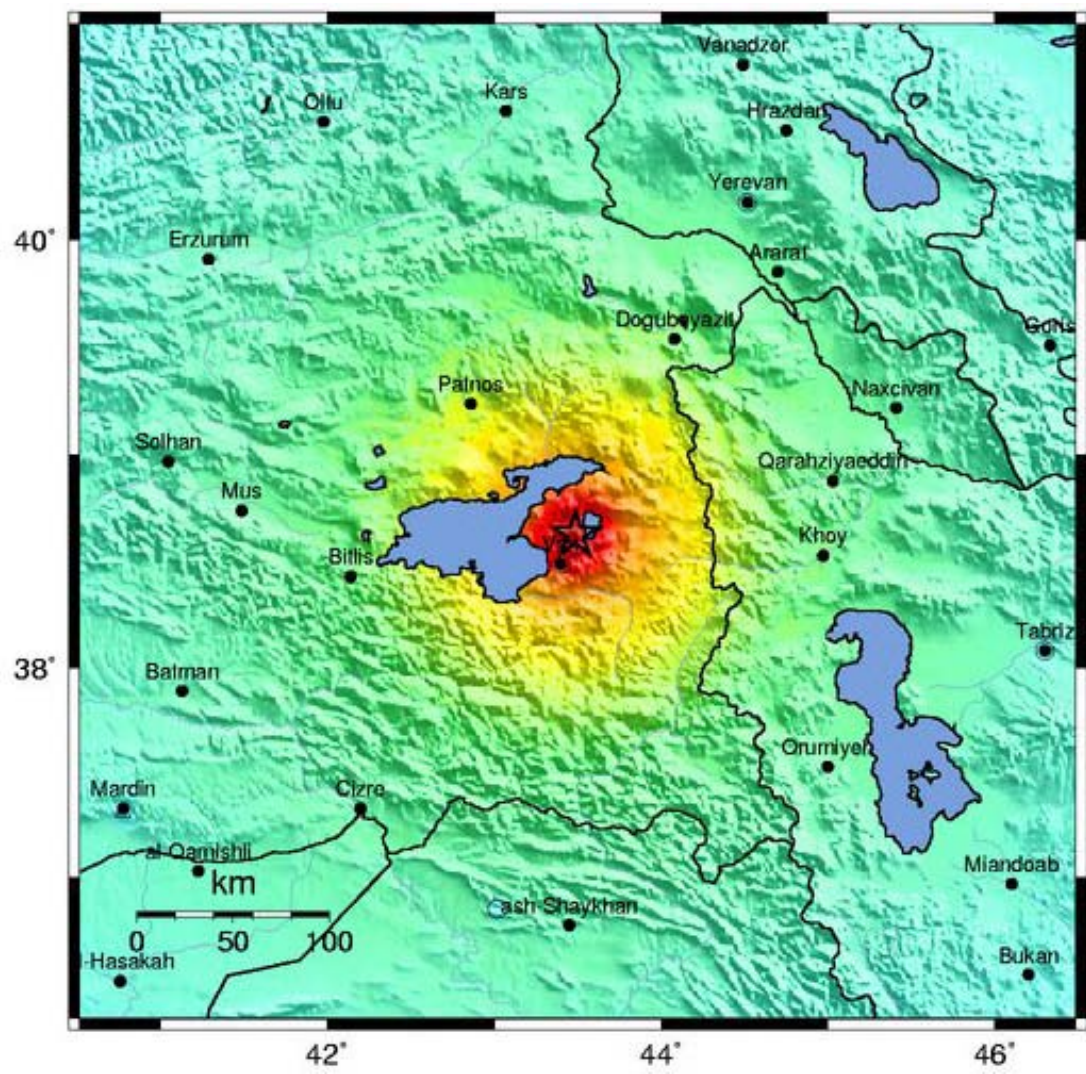
Local Time 1:41 PM
Latitude 38.628° N
Longitude 43.486° E
Depth 20 km

Images courtesy of the US Geological Survey



USGS Estimated Shaking Intensity:
The Modified-Mercalli Intensity scale is a twelve-stage scale, numbered from I to XII.

Modified Mercalli Intensity	Perceived Shaking
X	Extreme
IX	Violent
VIII	Severe
VII	Very Strong
VI	Strong
V	Moderate
IV	Light
II-III	Weak
I	Not Felt



Magnitude 7.2 EASTERN TURKEY

Sunday, October 23, 2011 at 10:41:21 UTC

USGS PAGER

Population Exposed to Earthquake Shaking

Structures are a mix of vulnerable and earthquake resistant construction.

Most vulnerable are

- unreinforced brick masonry
- nonductile reinforced concrete frame construction

Table below shows populations within MMI zones.

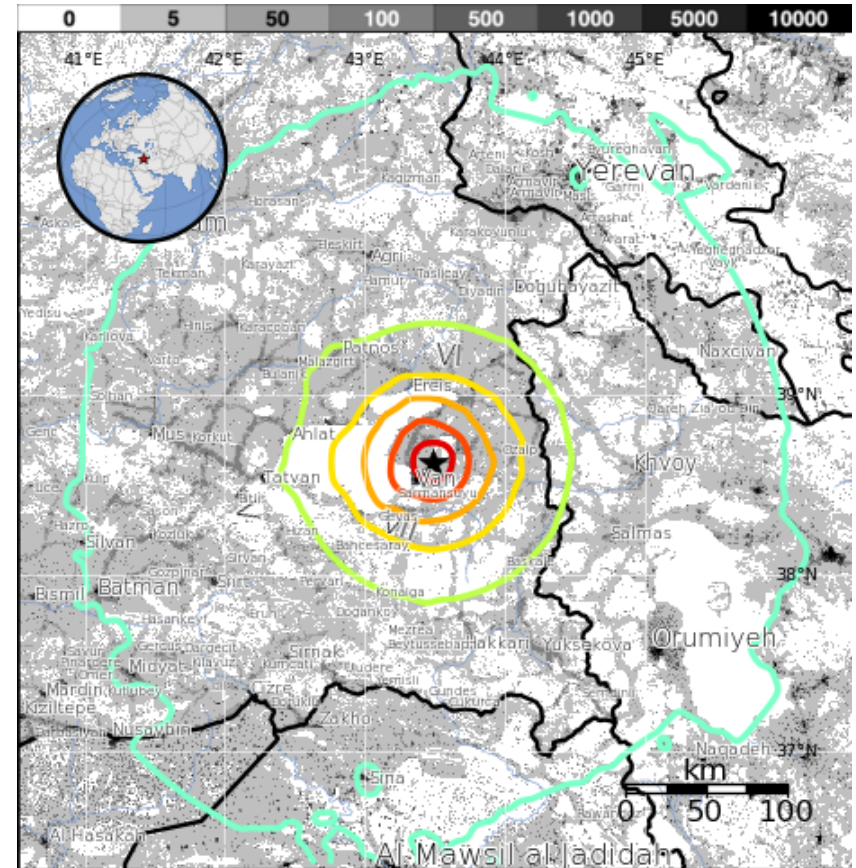


Image courtesy of the US Geological Survey

Estimated <u>Modified</u> <u>Mercalli Intensity</u>	I	II-III	IV	V	VI	VII	VIII	IX	X
Est. Population Exposure	---	357*	8,454k*	9,435k	482k	265k	67k	377k	29k
Perceived Shaking	Not Felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme

Turkey is a tectonically active with frequent destructive earthquakes.

Map shows earthquakes recorded from 1990 to present with October 23 earthquake represented by orange star.

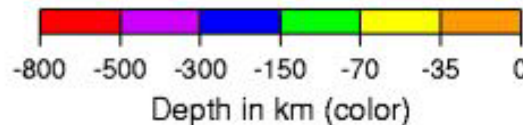
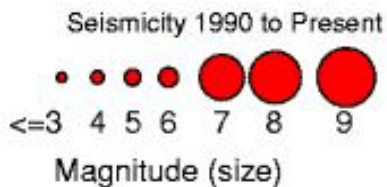
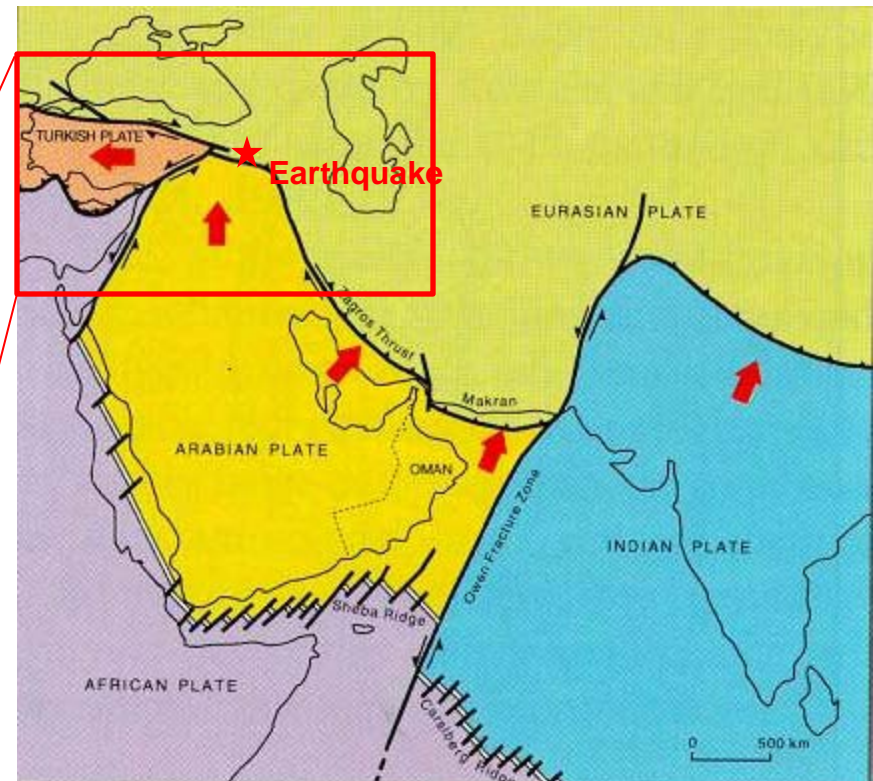
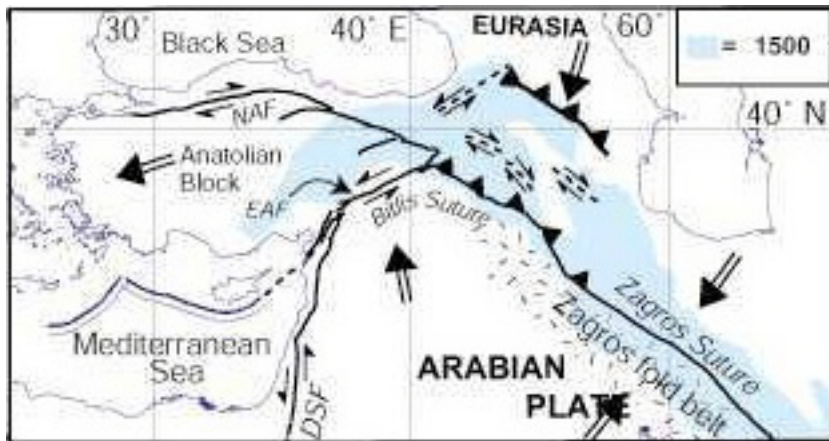


Image courtesy of the US Geological Survey

The Arabian Plate is colliding with Eurasia, and has built a complex mosaic of mountains by thrust and strike-slip faulting.

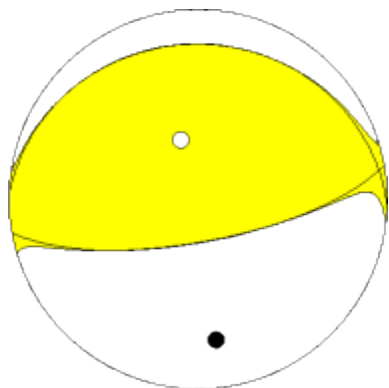
This earthquake occurred in Eastern Turkey on the Bitlis Suture, a large thrust fault.



Summary tectonic map of eastern Turkey. The large arrows are the approximate directions of motion of Turkey, Arabia, and central Iran relative to Eurasia. NAF=North Anatolian Fault; EAF=East Anatolian Fault; DSF=Dead Sea Fault (*Sandvol et al.*)

This earthquake was in a broad region of convergence east of the Anatolian strike-slip faults.

P-wave
first-motion
solution indicates
oblique-thrust
faulting.



Reverse (or Thrust) Fault

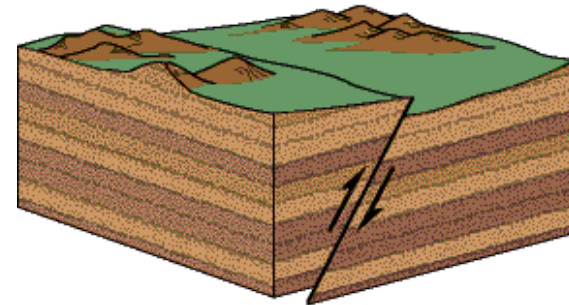
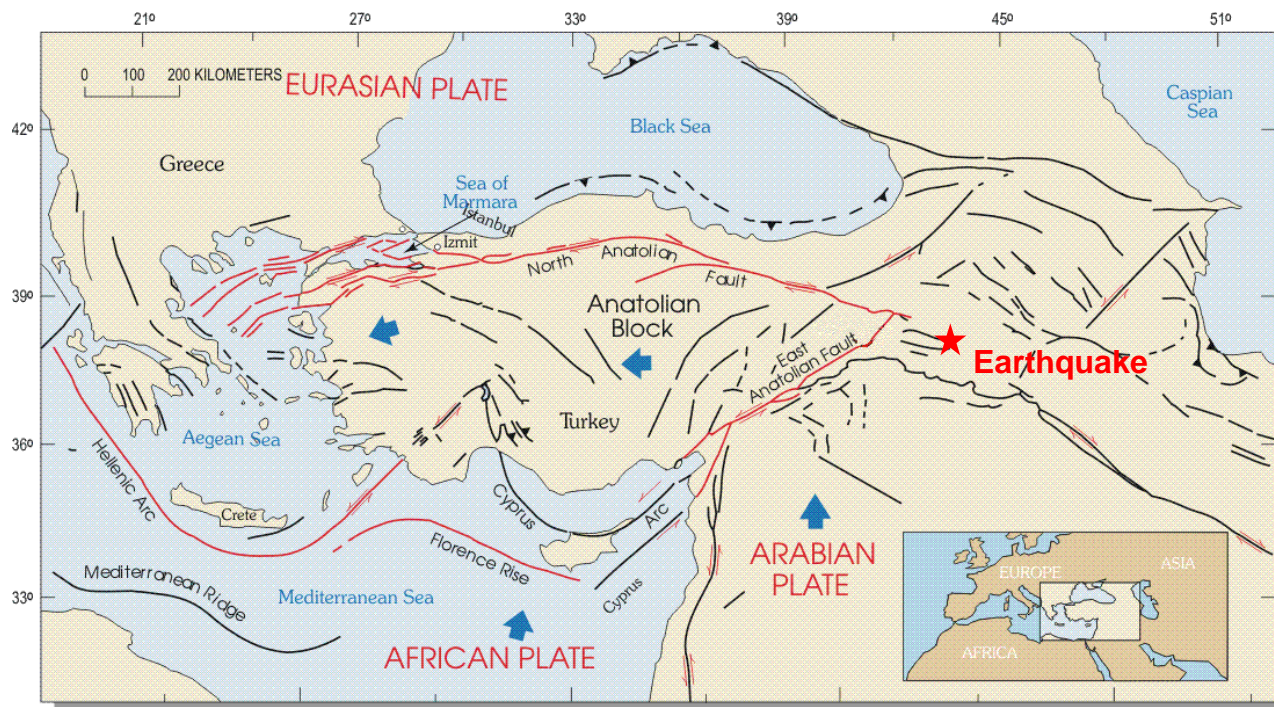
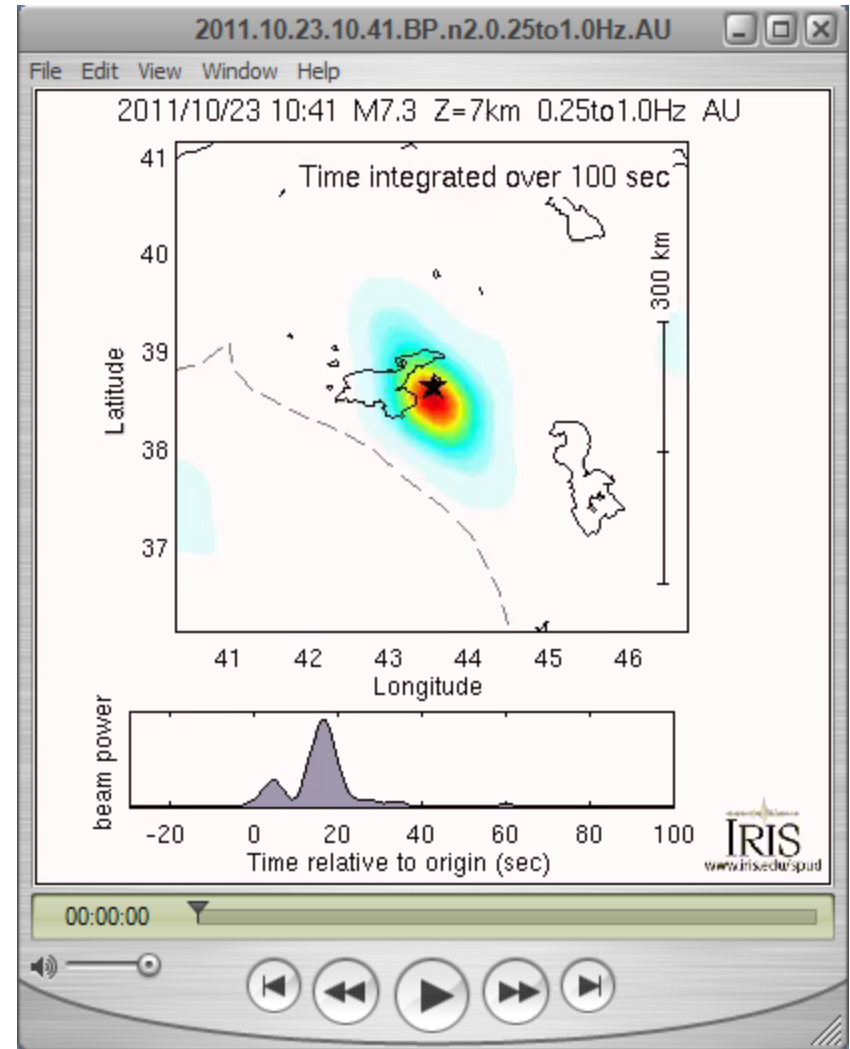


Image courtesy of the US Geological Survey



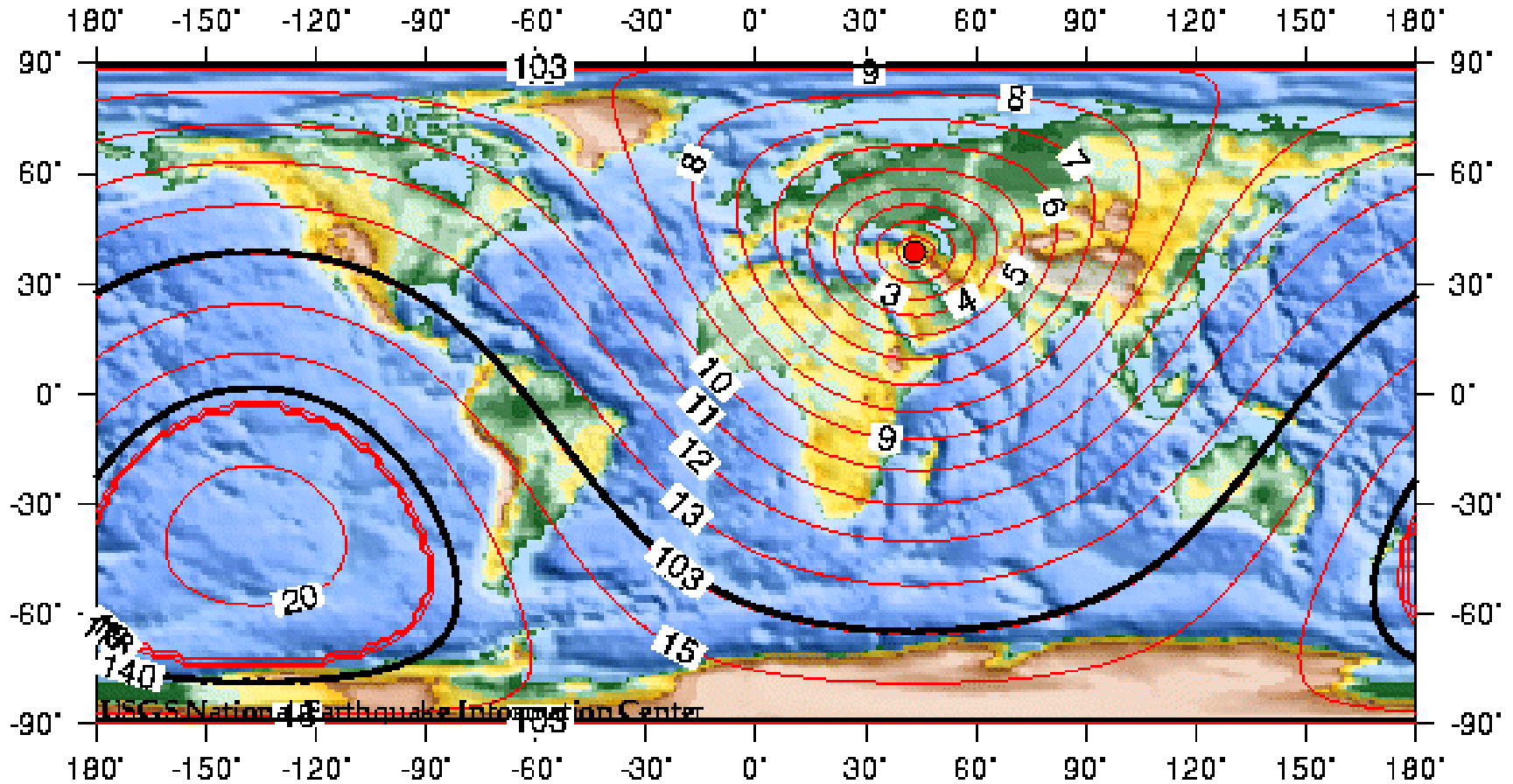
Back Projections are models of the times and amounts of displacement on the fault that produced the earthquake.

- warmer colors indicate greater displacement on the fault.
- graph shows the time distribution of rupture during the earthquake



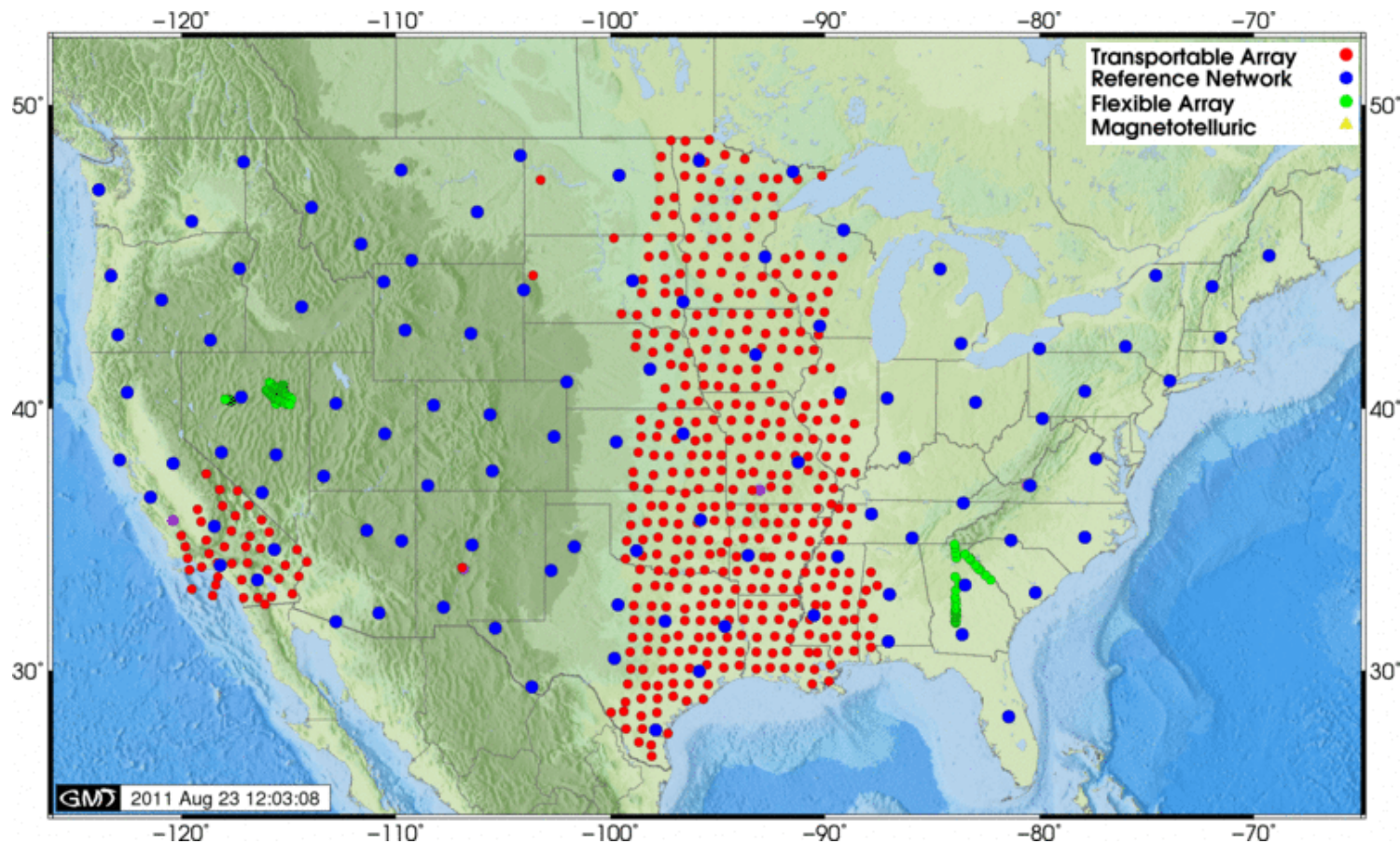
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Predicted travel times, in minutes, of the first P wave arrival

USArray: A Continental-Scale Seismic Observatory

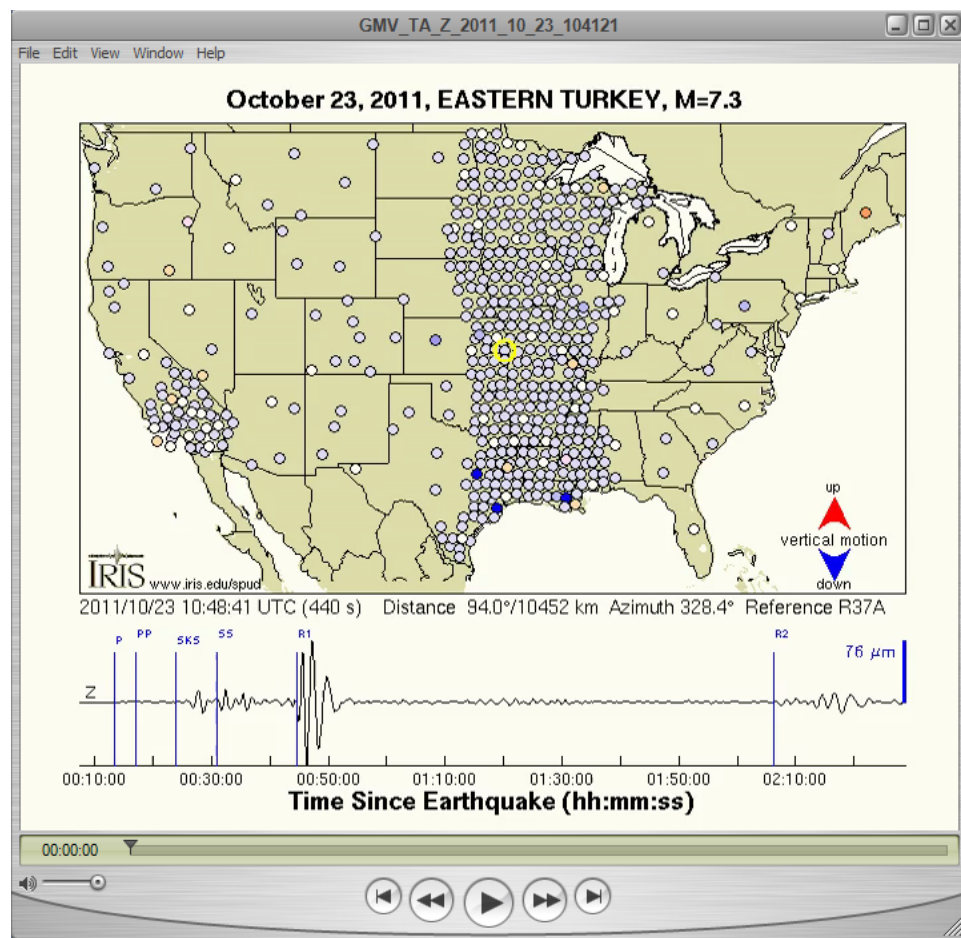


USArray Stations. The 400 active transportable array stations are shown by red dots. Permanent stations are shown in blue.

Animation of ground motion recorded on EarthScope's Transportable Array can provide an effective visual of relative velocities of the fast P, slower S, and slowest surface waves sweeping across the array.

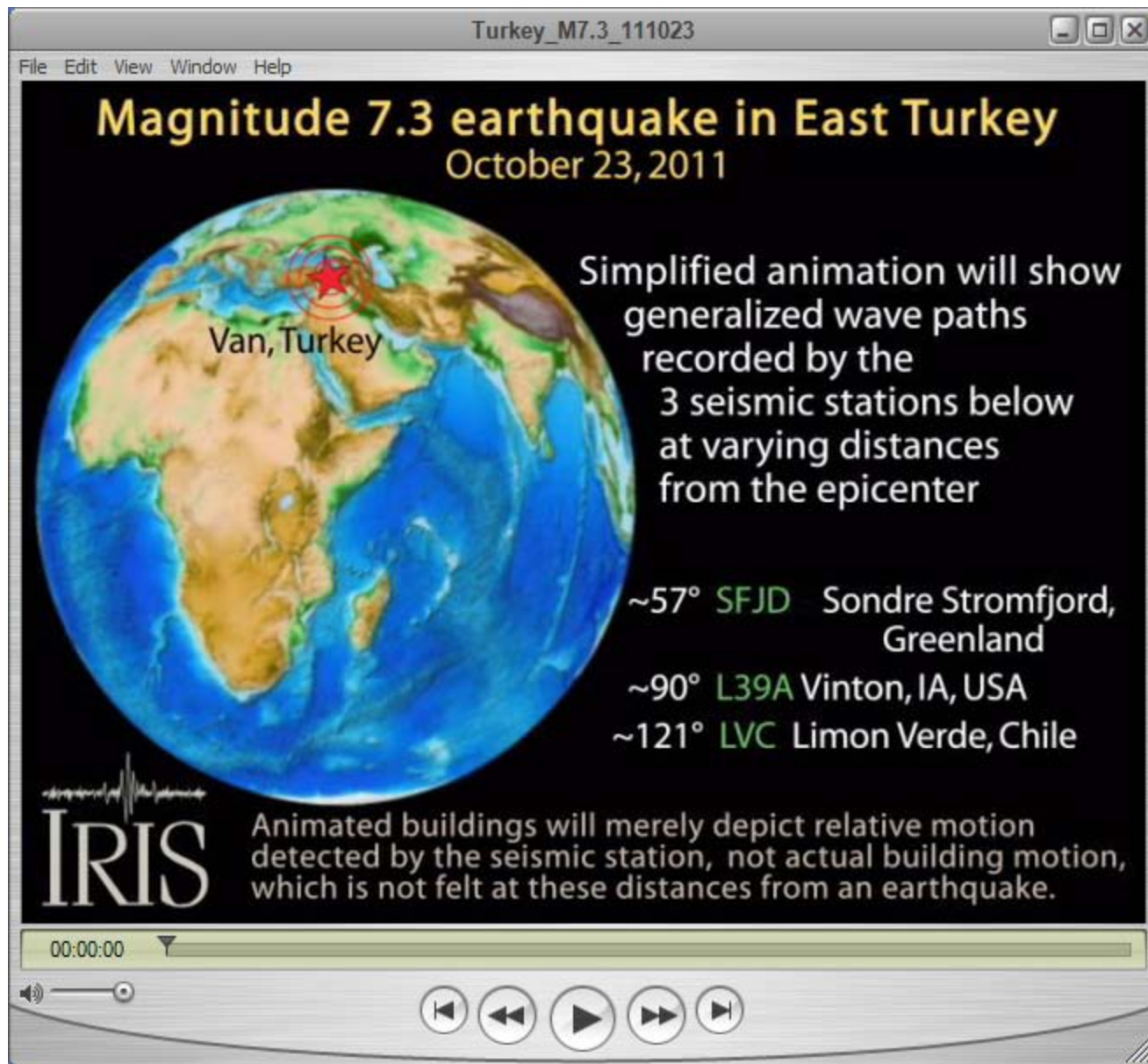
- Red, station moving up
- Blue, station moving down

The seismogram along the bottom is from the station at the yellow circle.



Quick Time Required

Animation of the generalized paths of seismic waves traveling from Turkey to three stations at varied distances around the globe.



Turkey_M7.3_111023

File Edit View Window Help

Magnitude 7.3 earthquake in East Turkey

October 23, 2011

Van, Turkey

Simplified animation will show generalized wave paths recorded by the 3 seismic stations below at varying distances from the epicenter

- ~57° **SFJD** Sondre Stromfjord, Greenland
- ~90° **L39A** Vinton, IA, USA
- ~121° **LVC** Limon Verde, Chile

IRIS Animated buildings will merely depict relative motion detected by the seismic station, not actual building motion, which is not felt at these distances from an earthquake.

00:00:00

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