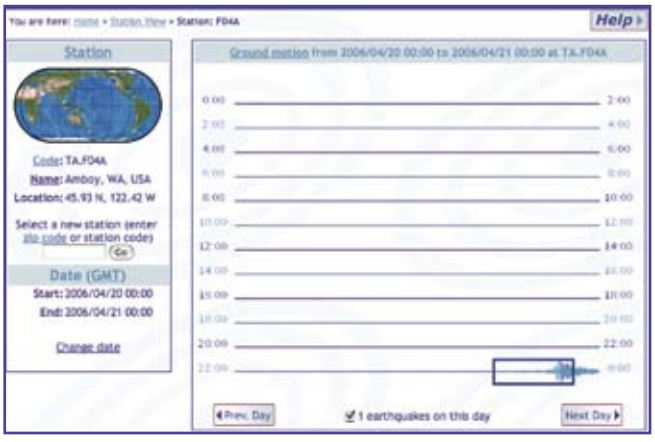
rev rapid earthquake viewer

Did the Earth shake near where you live?

On April 20, 2006 a major earthquake occurred in a remote section of Russia, called Siberia. It had a magnitude of 7.7 and destroyed 3 villages. I bet you didn't know that the ground you were standing on moved from an earthquake that far away! *Be a seismologist and investigate the ground motion near where you live for this earthquake.*

When an earthquake occurs, waves of energy spread out in all directions and travel through the Earth. These waves can be recorded by seismometers (devices that record ground movement) all over the world. By looking at a seismogram (recording from the seismometer) you can see how much the ground moved at the seismometer nearest you, even though you might not have felt it move. Seismometers are more sensitive than humans and can detect ground motion to the hundredths of a millimeter.

Rapid Earthquake Viewer (REV) home page. Click on "Earthquake View" to see a map of recent earthquakes or click on "Station View" to enter your zip code to find a station near you. A list of recent earthquakes is on the left side.



24-hours of recorded ground motion at a selected station. An earthquake is noted in the boxed area.

Step 1: To see how the ground in your area moved during this earthquake, go to the Rapid Earthquake Viewer (REV) at ***rev.seis.sc.edu*** and click on "***Station View***". If you want to look up what a word means in REV, either click on an underlined word or click on the glossary link.

Step 2: On the bottom of the Station View page enter your zip code into the box and click "***Go***", or else click on the station (triangle) that you want to view on the map. Seismic stations are located throughout the U.S. and all over the world.

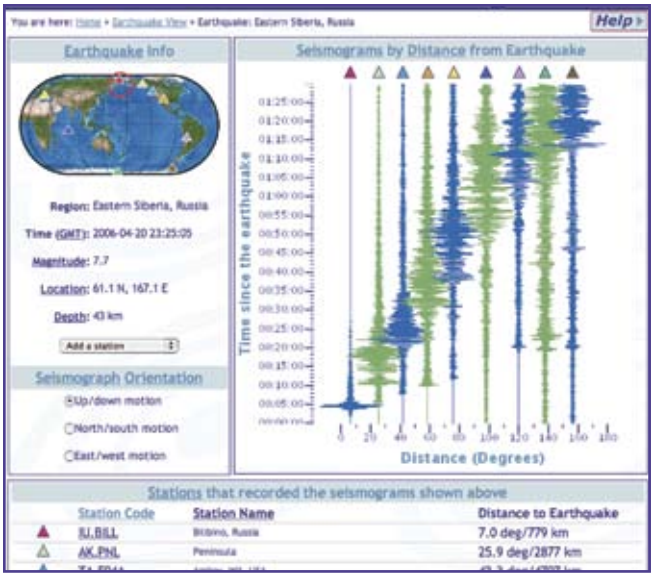
Step 3: You will get a screen that shows the past 24 hours of ground motion recorded at the seismic station closest to your zip code. If you live in an active area or if a large event has occurred somewhere in the world, you might see some earthquakes. If you live in a seismically quiet area you might only see a few bumps in a mostly flat or fuzzy line. You will need to write down the code of your seismic station for later. Most stations are coded according to where they are and what seismic network they belong to. The first two letters before the period are the network abbreviation. The last four letters are the station code and are usually selected as an abbreviation of the place the station is located.

Step 4: To look at the recording from the Siberia earthquake, you need view the recording from the date of the earthquake. Click the "***Change date***" link on the left side of the page.

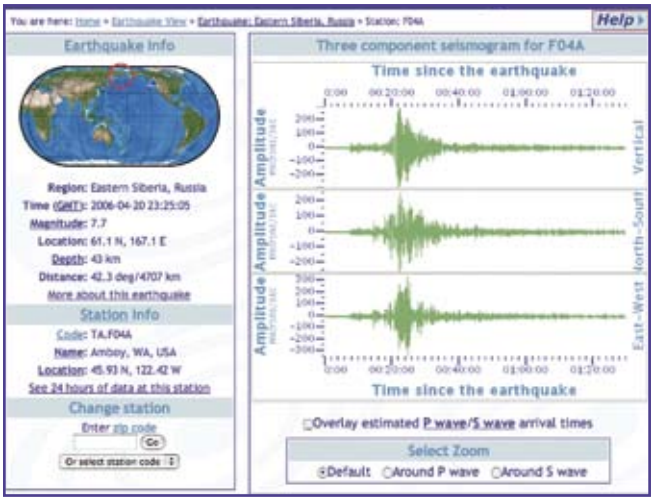
Step 5: A calendar will pop up and you can select the date of the Siberia earthquake, April 20, 2006.

http://rev.seis.sc.edu or www.iris.edu/edu/resources.htm

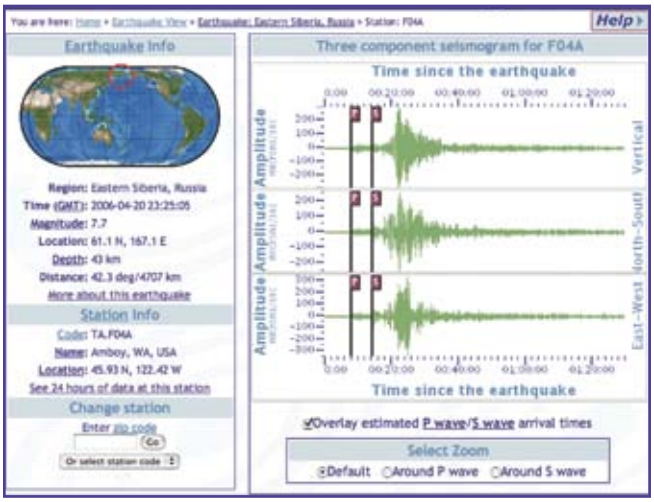
This instruction sheet was produced by the IRIS Education & Outreach Program.



This is a zoomed in recording of the earthquake from seismographs around the world. The seismograms are shown in order of distance away from the earthquake with the closest stations on the left and farther away to the right.



Seismometers record motion in three directions: vertically, east-west and north-south. You can see the seismogram for each orientation.



To see where the P and S waves arrive click the box marked "Overlay estimated P wave/S wave arrival times. REV will flag the arrivals for you.

Step 6: Click the "***Show earthquakes (if any)***" box and if an earthquake was clearly recorded it will be outlined.

Step 7: Click on the earthquake to see a zoomed in recording of the event from other seismographs around the world for the earthquake. The seismograms are shown in order of distance away from the earthquake. The closest stations to the earthquakes are on the left and get farther away to the right. Since the stations are distributed all around the world, the distance is shown in degrees of arc around the Earth's surface. Using this system, the opposite side of the Earth is 180 degrees away. On the Earth's surface, 1 degree equals 111 kilometers, so a station shown as 10 degrees distance is 1110 km away. Viewing the plot helps to get an understanding of how seismic waves travel through the Earth. Note that the energy arrives later at the stations that are farthest away from the epicenter of the earthquake.

Step 8: Add your station to the plot. On the left side of the page there is a pull-down menu that says "***Add a station***". Pull down the list and find your station. It's a long list and the stations are listed in distance (in degrees) away from the earthquake. You can look at the already plotted stations (both the map and the seismograms) and use those distances to gauge roughly how far away your station might be.

Step 9: Once you have your station on the plot, click on the station code in the list under the seismograms. This will let you see the details of your seismogram. Seismometers record motion in three directions: vertically, east-west and north-south. In this view you can see the seismogram for each orientation. Guess where the P (Primary) waves and S (Secondary) waves are on the seismograms. Click the box that says "***Overlay estimated P wave/S wave arrival times***" to see if you're right. This view also lets you see how fast the ground shook at this station. The amplitude is in units of velocity, or distance moved over time. The speed that the seismometer moved up and down or side to side is slow, which is why you didn't feel it. For a distant earthquake the ground motion is far slower than a snail moves.

That's it! Next time there's a big earthquake you can use this exercise to see how much the ground shook where you live.

More and more seismograph stations are being added each year in the US, thanks to a National Science Foundation funded project called EarthScope (***www.earthscope.org***). The seismic recording part of the project started on the West Coast in 2004 and over the next 8 years stations will move across the continental US to the East Coast and then move to Alaska in 2013. At some point in the next 10 years almost every county in the U.S. will have a seismic station near them.