

Next you will compare this theoretical risk ranking to the effects of recent earthquakes in each of these countries.

The following table illustrates the deaths and damage caused by five recent major quakes.

Country	Location	Year	Magn- itude	Deaths	Buildings Destroyed	Damage (billion \$US)
China	Tangshan	1976	7.6	240,000	180,000	5.6
Japan	Kobe	1995	6.8	5,502	100,000	150
Taiwan	Chichi	1999	7.6	2,400	10,000	14
Turkey	Izmit	1999	7.4	17,118	35,000	6.5
United States	Northridge	1994	6.7	57	7,000	44


- How well does the risk factor you calculated in the risk matrix table compare to the actual earthquake damage and casualty figures for each of these countries? Discuss both the number of casualties and the total dollar damage.

Earthquake deaths and wealth

A country's per capita GDP provides a good measure of its wealth. In the risk matrix table, we assumed that affluent countries are better prepared for earthquakes and better equipped to deal with their effects. Now you will use ArcView to test this assumption by looking at deadly earthquakes since 1950. You will examine how death and damage vary depending on whether the earthquake occurred in a wealthy country (GDP \geq \$10,000) or a poor country (GDP $<$ \$10,000).

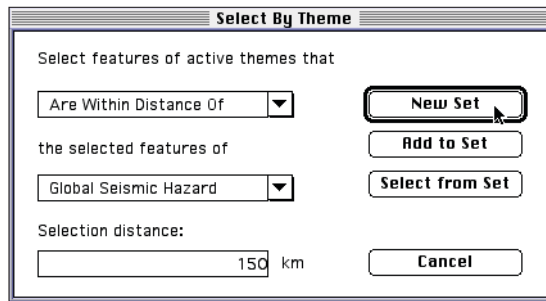
- ▶ Turn on the **Modern Deadly Earthquakes** theme.


This theme is a subset of the **Deadly Earthquakes** theme and shows the deadly earthquakes that have occurred since 1949.

- ▶ Activate the **Seismic Hazard** theme.
- ▶ To display all of the seismic risk zones again choose **Theme ▶ Properties**, click the **Clear** button, then click **OK**.
- ▶ Click the Query Builder button  on the button bar (**NOT the query builder button in the Theme Properties dialog box!**), enter the query statement [GDP] \geq 10000, click **New Set**, then close the Query Builder window.

This query selects countries whose per-capita GDP is at least \$10,000 per year. These countries are considered wealthy, because they are well above the global mean per capita GDP of \$7,500 dollars per year.

- ▶ Activate the **Modern Deadly Earthquakes** theme.
- ▶ Use the Select By Theme operation to select the deadly earthquakes that are within 150 km of any of the wealthy seismic hazard zones.
 - Choose **Theme ▶ Select By Theme**.
 - Configure the Select By Theme dialog box to read “Select features of active themes that **Are Within Distance Of** the selected features of **Seismic Hazard**” and enter **150** for the selection distance. Click the **New Set** button.



- ▶ Open the **Modern Deadly Earthquakes** theme table. Scroll across and select the **Deaths** field and choose **Field ▶ Statistics**.
 - ▶ Read the mean (average) number of deaths per quake.
5. What is the average number of deaths per quake in countries with a high per capita GDP (over \$10,000)?
- ▶ Activate the **Seismic Hazard** theme and open its theme table.
 - ▶ To select the poorer nations, click the Switch Selection button . This will select all the countries whose per-capita GDP is below \$10,000 per year.
 - ▶ Activate the **Modern Deadly Earthquakes** theme.
 - ▶ Perform the select by theme operation again using the same settings you used before.
 - ▶ Open the **Modern Deadly Earthquakes** theme table and get statistics on the deaths field again.
6. What is the average number of deaths per quake in countries with a low per capita GDP (under \$10,000)?
7. Describe how a country’s GDP might affect the number of injured or killed.