Activity 5: Make an Intensity Map

Background Information:

This intensity map is based on a real earthquake that occurred on March, 24th in 1976 near Marked Tree, Arkansas. A magnitude 5.5 earthquake occurred and was felt over an area of 174,000 square miles, and was felt in six states. In Arkansas, multiple cities reported an Intensity VI. Power outages, downed telephone lines in Jonesboro, broken windows in Paragould, cracked plaster in Marked Tree, roof damage and fallen ceiling tile occurred as far away as Decatur, Arkansas (Jackson, 1979).

Geologists use the Modified Mercalli Intensity scale, a scale from I to XII, to determine the intensity, or perceived shaking, and damage extent of an earthquake. Intensity values reported after an earthquake can help geologists to understand how the geology of an area responds to seismic energy.

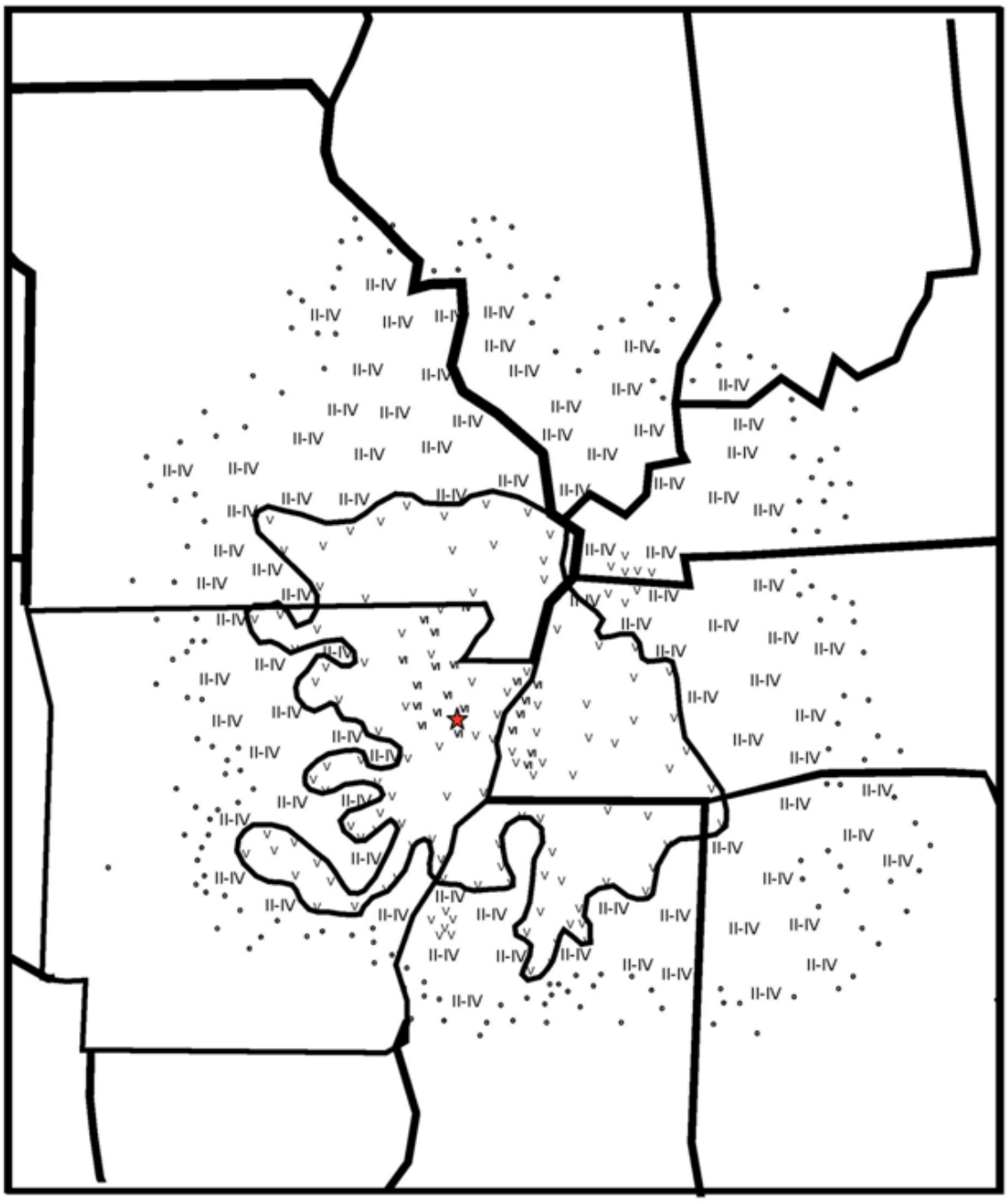
Objective: Complete the Intensity map

Directions: Complete the map by using intensity reports from the 1976 earthquake.

1. Draw the isoseismal lines on the maps based on intensity distribution.

2. Use the Modified Mercalli Scale provided as a color guide and complete the legend below the map. The colors that you choose for the map should match the legend. Use colored pencils to shade the areas with different intensities.

3. How does the area of highest intensity compare with the epicenter you located earlier on the map of the United States?



Map of Marked Tree, Arkansas and surrounding states showing locations for which intensities have been assigned. Small circles represent locations where the earthquake was not felt.

Legend

Earthquake Epicenter

II-IV **V** **VI**

Modified Mercalli Intensity Scale

I.	Not Felt	None	Not felt.
II.	Weak	None	Felt by persons at rest, on upper floors, or favorably placed.
III.	Weak	None	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. May not be recognized as an earthquake.
IV.	Light	None	Hanging objects swing. Vibration like passing of heavy trucks; or sensations of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frame creak.
V.	Moderate	Very Light	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI.	Strong	Light	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry cracked. Trees, bushes shaken (visibly, or heard to rustle).
VII.	Very Strong	Moderate	Difficult to stand. Noticed by drivers of motors cars. Furniture broken. Damage to masonry, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Waves on pond water, turned with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII.	Severe	Moderate/Heavy	Steering of motor cars affected. Damage to masonry. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX.	Violent	Heavy	Some Masonry destroyed, heavily damaged or completely collapsed. General damage to foundations. Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X.	Extreme	Very Heavy	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.