

**Homework #2**

**Due: Thursday, October 19 at the beginning of class.  
 Please show your work.**

1. Using the cloud classification system discussed in class, classify the following clouds. First, for each cloud, determine what shape it has (heap = cumulus, layered = stratus, wispy = cirrus). Secondly, determine the cloud's height (high = cirro, middle = alto, low = no prefix). Thirdly, determine whether the cloud is raining (rain = nimbo). Lastly, put all this information together to assign a name to the cloud. See Ahrens (93-105) for more guidance. See this question on the class web site for color imagery.

A



B



C



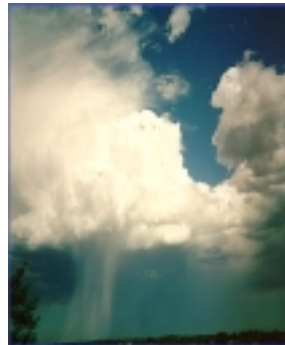
D



E



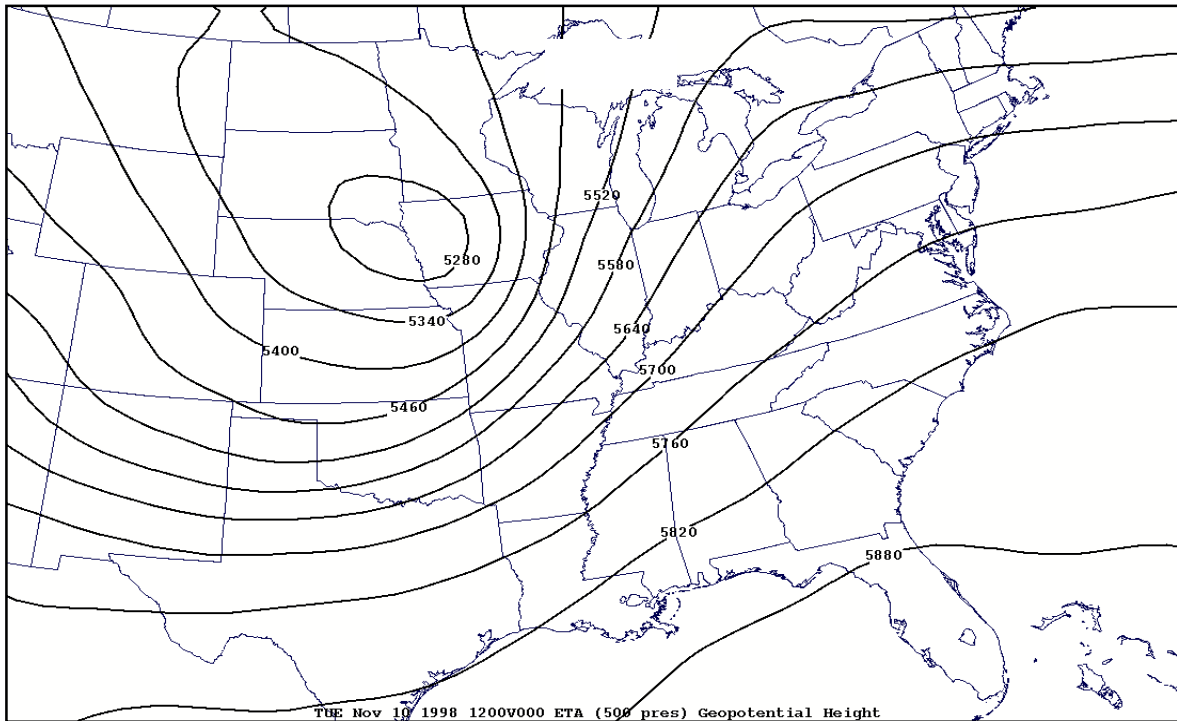
F



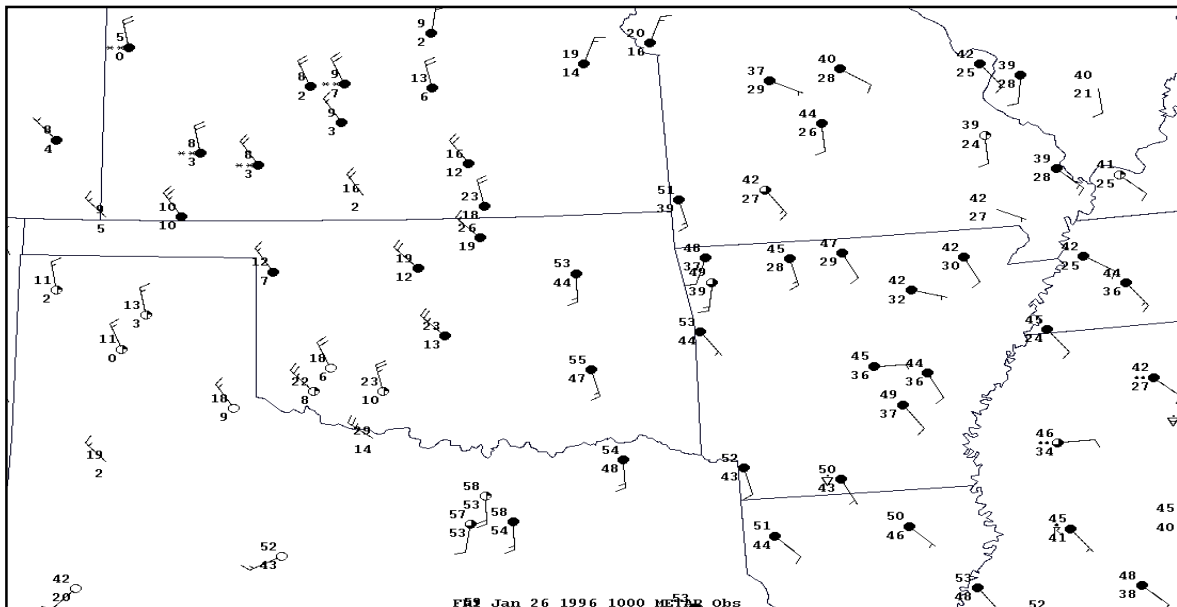
	Shape	Height	Rain (Yes or No)	Cloud name
A				
B				
C				
D				
E				
F				

2. On Tuesday November 10, 1998 an intense low pressure center associated with a variety of weather conditions pounded areas of the Midwest. Blizzard conditions, heavy rain, strong thunderstorms, and very high winds wreaked havoc on a large portion of the country. Below is the 500 mb upper air chart for November 10, 1998. Using the height lines as a guide

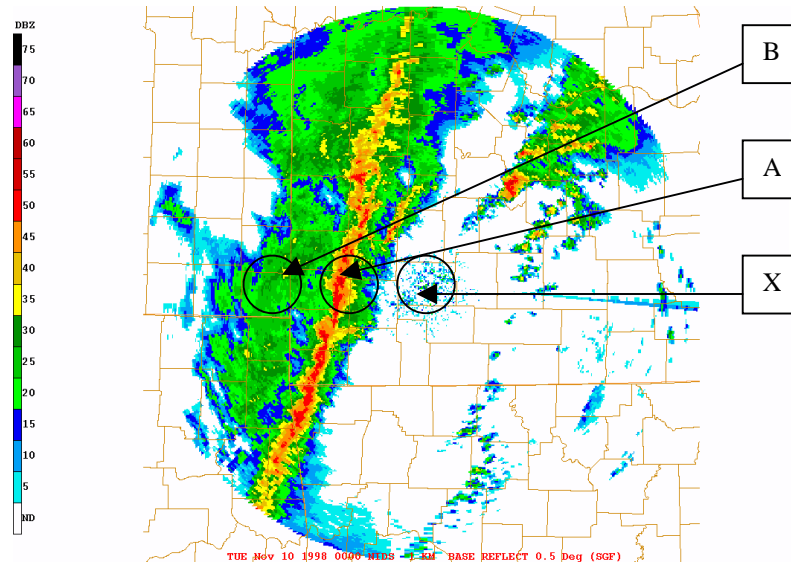
- a) Identify the zone of strongest winds by shading with a pencil. Also indicate wind direction over central Oklahoma.
- b) Indicate area of lowest height by labeling this area with a **L**.
- c) Label main trough with a **T** and main ridge with a **R**.



3. Below is a chart of surface observations for Friday January 6, 1996 at 1000Z. From what you know of frontal systems, label the front, frontal zone, cold and warm air masses in the chart below. Be sure to use wind direction and temperature contrasts when determining where to place the front.



4.



Above is a radar map displaying reflectivity of precipitation in the vicinity of a line of severe thunderstorms. Point X corresponds to the location of the radar instrument itself, while points A and B correspond to locations 60 and 120 miles (respectively) west of point X. See this question on the class web site for color imagery.

- At which point (A, B, or X) is the precipitation the heaviest?
- Noting that the radar beam scans upward at an angle (typically  $\sim 0.5^\circ$ ) to the horizontal, which point (A or B) corresponds to a higher level of the atmosphere?
- Doppler radar indicates that the line of storms is moving east at 50 mph. Approximately how long will it take for the heaviest rain to reach point X?

5. The following is a visible satellite image of the western coast of the United States taken by the GOES-West satellite on January 10, 2001, 2230 UTC. Identify the cold front and the low pressure center for the system off the coast of California.

