Name That Precipitation Type Lab Exercise

Objective:

In this lab exercise we will investigate Mesonet maps, radar, and Skew-T diagrams from different winter storm events to practice assessing possible precipitation type occurring at the surface.

Instructions:

Please read each question carefully and answer them as best you can in the space provided. You are welcome to work on your own or in a group.

Region of Focus for this Exercise:

Each question will focus on a different area. Follow the directions closely!

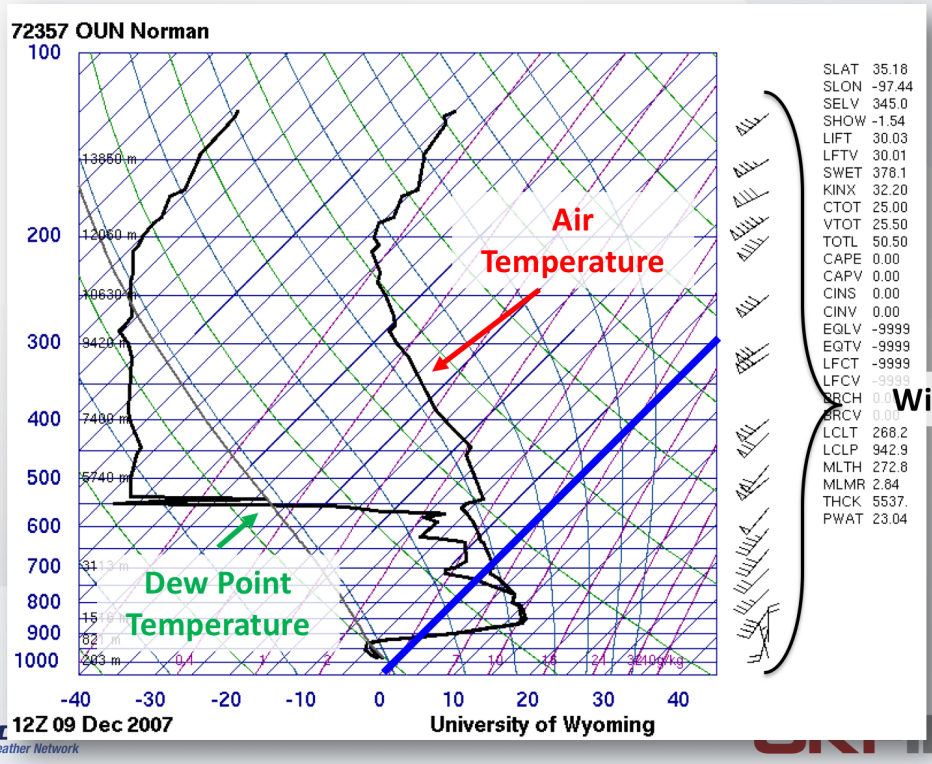
Terminology:

The following are definitions of several meteorological terms that may be useful for this exercise:

- **Base Reflectivity (BREF)** – Return signal to the radar that indicates the location and intensity of particles in the atmosphere such as rain, hail, snow, or other targets (such as bugs, buildings, trees, and other non-weather items).
- **Freezing Rain** – A form of wintry precipitation that arrives as a liquid and later freezes. Freezing rain can coat any surface it comes into contact with – power lines, cars, bridges, etc. – in ice.
- **Skew-T Diagram** – A way to plot information from a weather balloon that shows how temperatures, dew point temperatures, and winds change going upward in the atmosphere. Temperature lines are "skewed" diagonally – giving this chart its funny name. Conditions at the ground are at the bottom of the chart, while conditions higher in the atmosphere are found by moving up the chart.
- **Sleet** – A form of wintry precipitation that can be described as frozen ice pellets. Sleet is the result of snow that has melted and refrozen.
- **Snow –** A form of wintry precipitation that is made up of many frozen ice crystals.

Cheat Sheets:

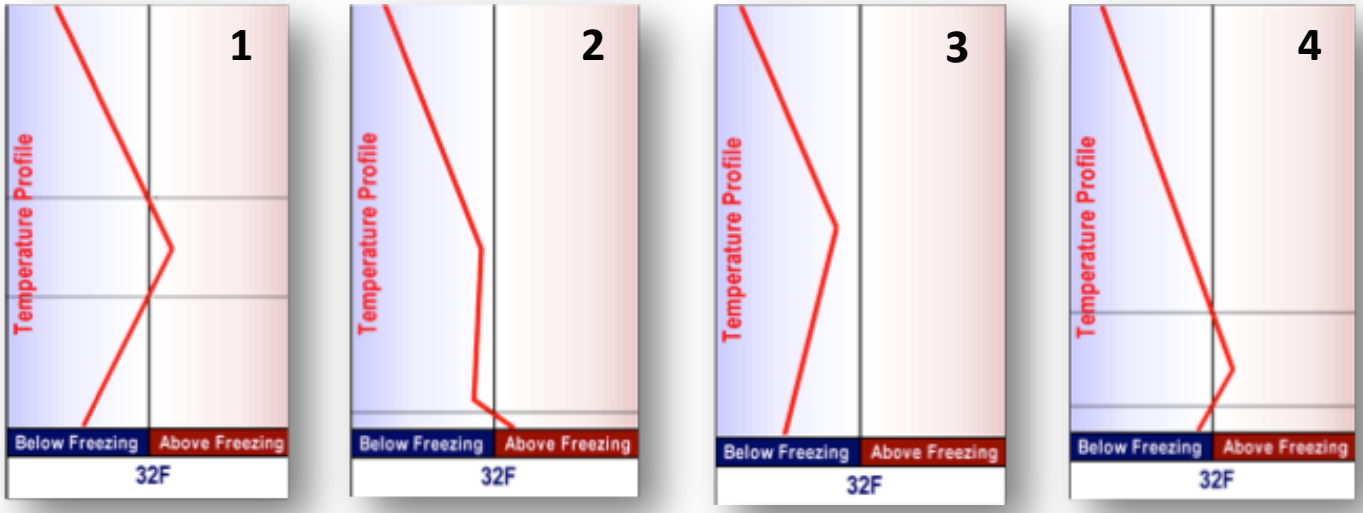
Skew-T Diagrams



Wintry Precipitation on Radar

- **Radar reflectivity provides hints on precipitation type**
  - When viewed with Mesonet data, can better diagnose possible precipitation type
- **Non-snow (rain, sleet, or freezing rain)**
  - Sharp edges
  - Larger reflectivity values
  - Look like storms
- **Snow**
  - Softer edges
  - Much lower reflectivity values
  - Smoother/brushed appearance

Question 1. For each atmospheric temperature profile shown below, what precipitation type (rain, freezing rain, sleet, or snow) is most likely at the ground?

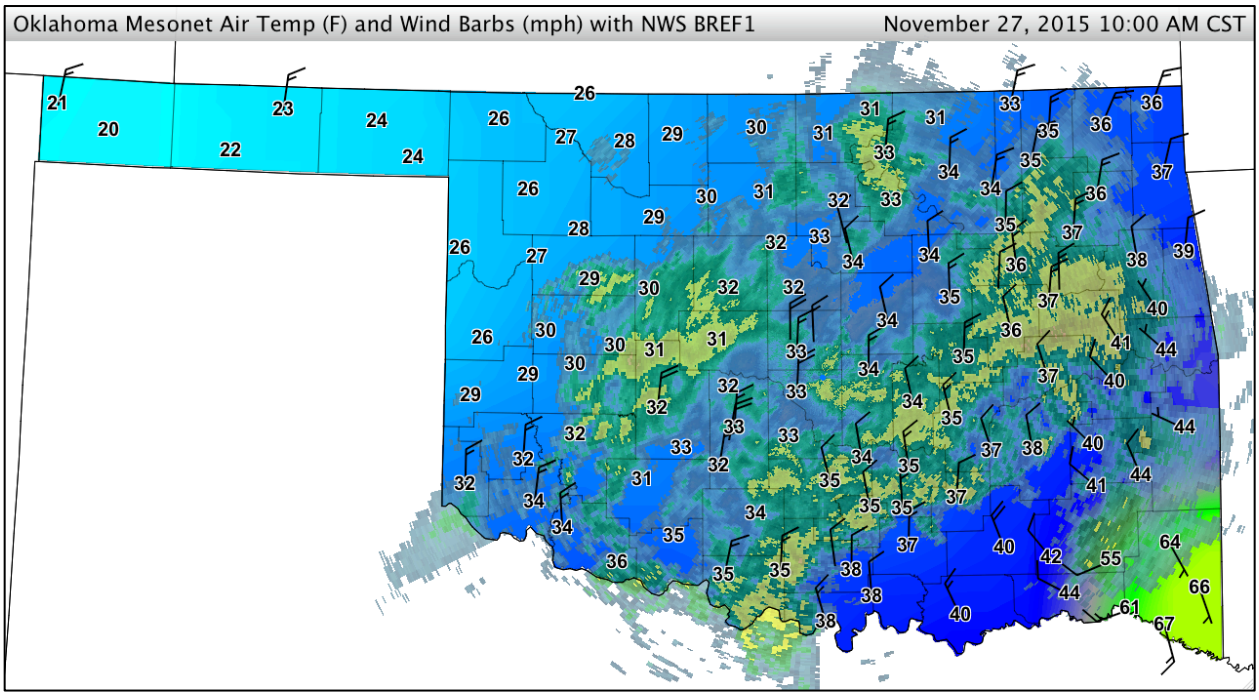


1: _____ 2: _____

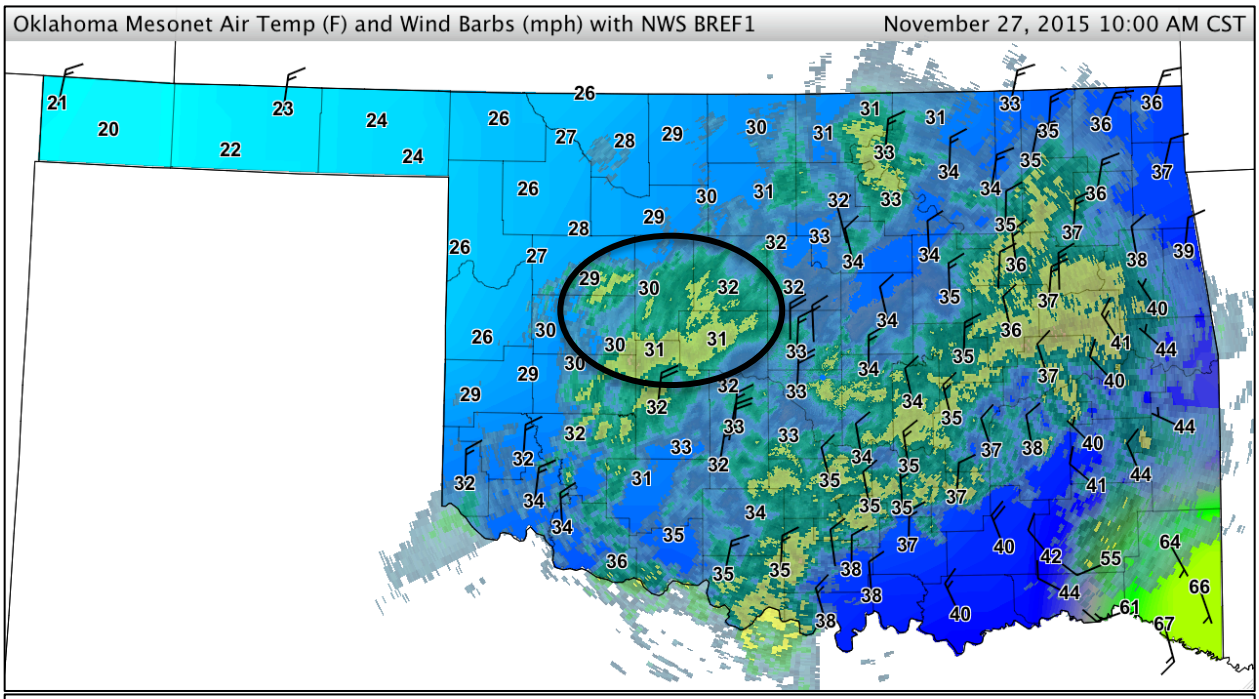
3: _____ 4: _____

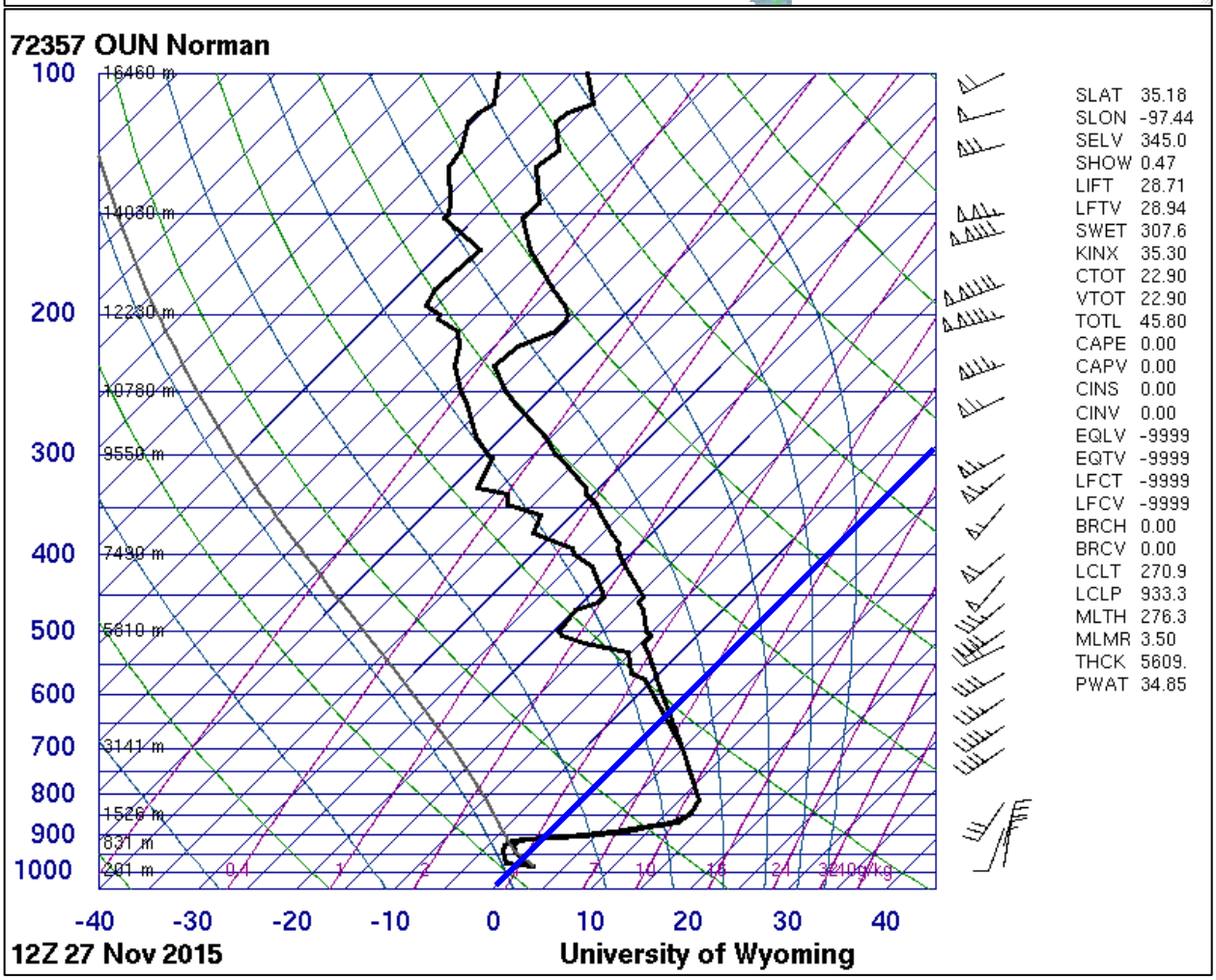
Question 2. Oklahoma Mesonet wind and precipitation sensors are heated to prevent icing during below freezing conditions. (True/False)

Question 3. For the weather map below, draw the 32F line (the "freeze line"). Numbers below 32 should be on one side of the line and numbers above 32 should be on the other side. The goal is to make a nice, smooth line (not dot-to-dot).

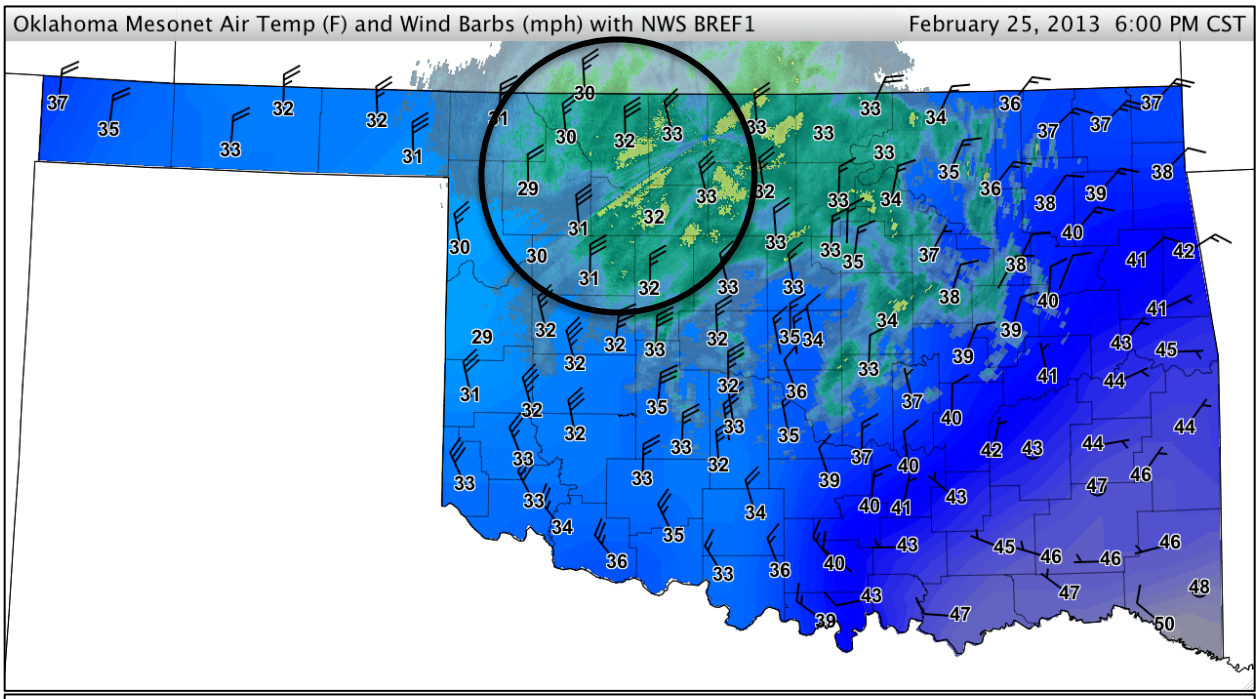


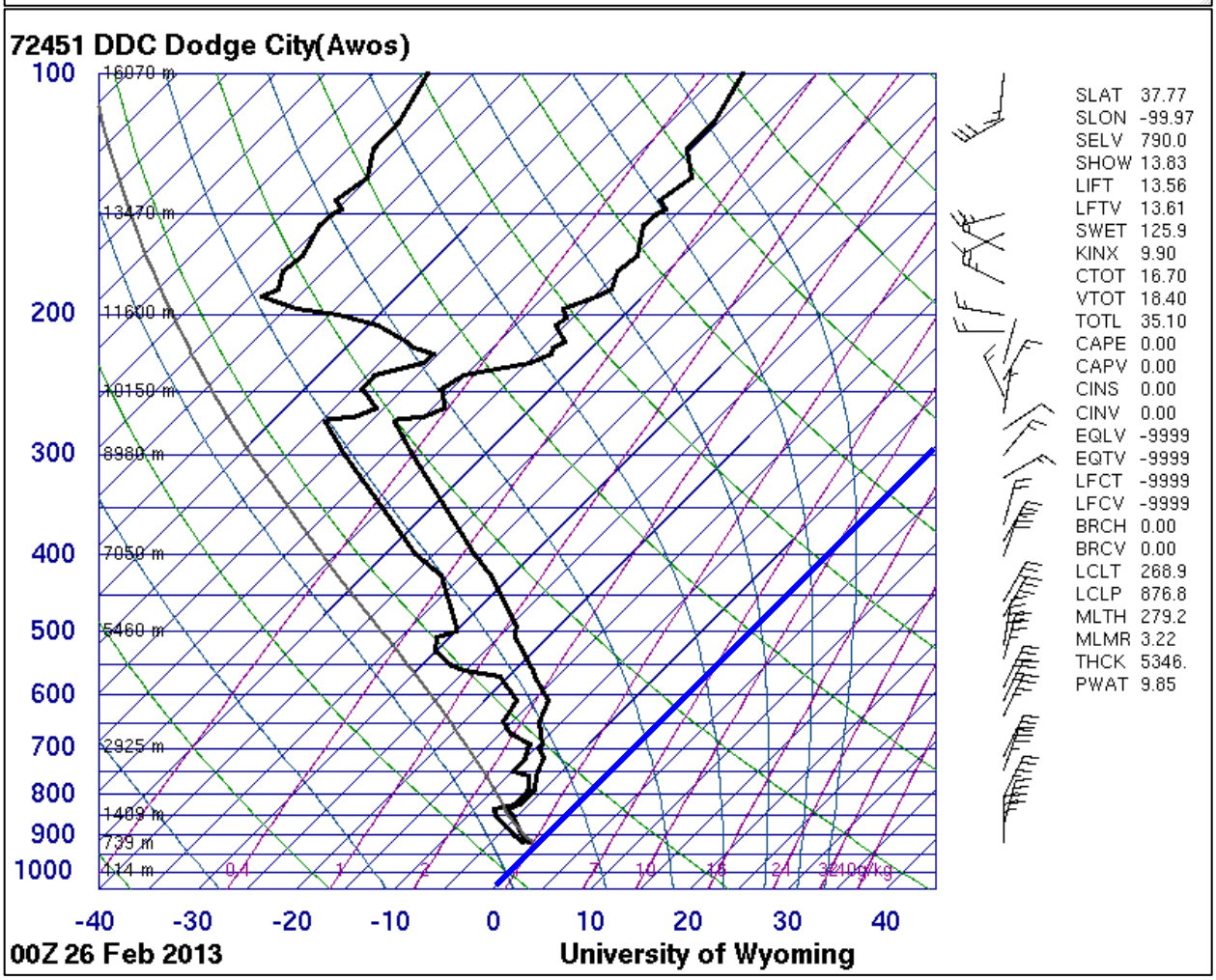
Question 4. Using the below Mesonet and radar map along with the Norman, OK Skew-T from a few hours earlier, what type of precipitation do you think is occurring in the circled area west of Oklahoma City? Why?



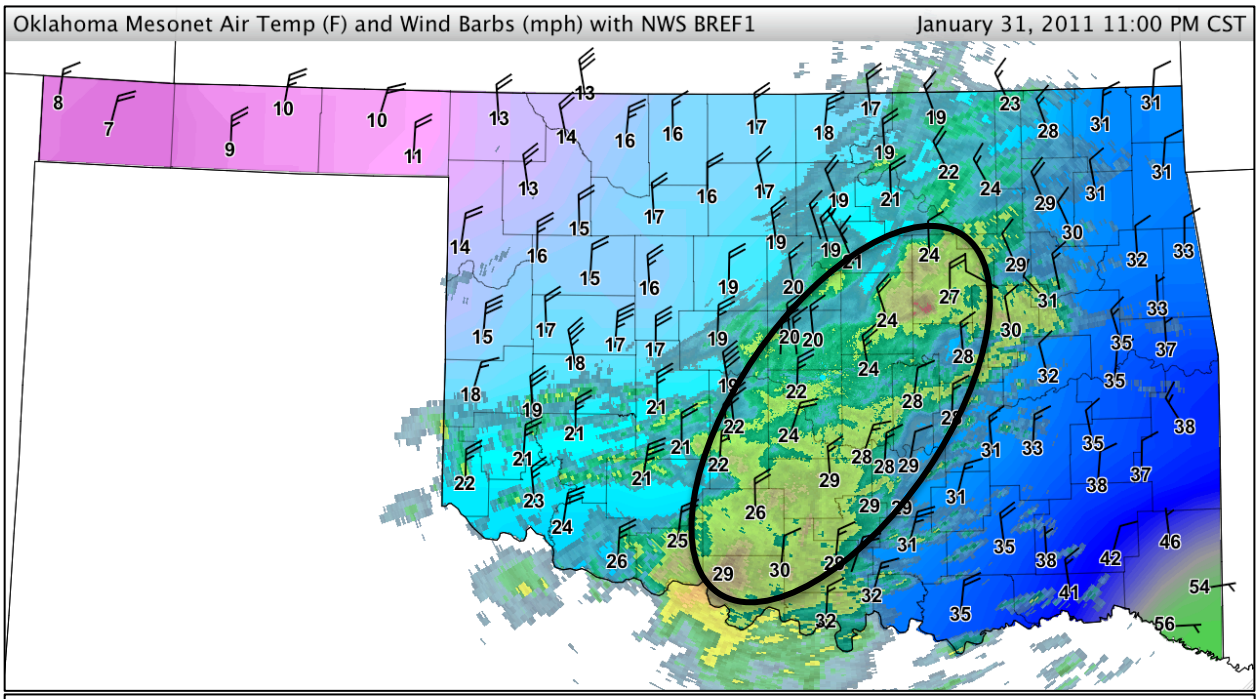


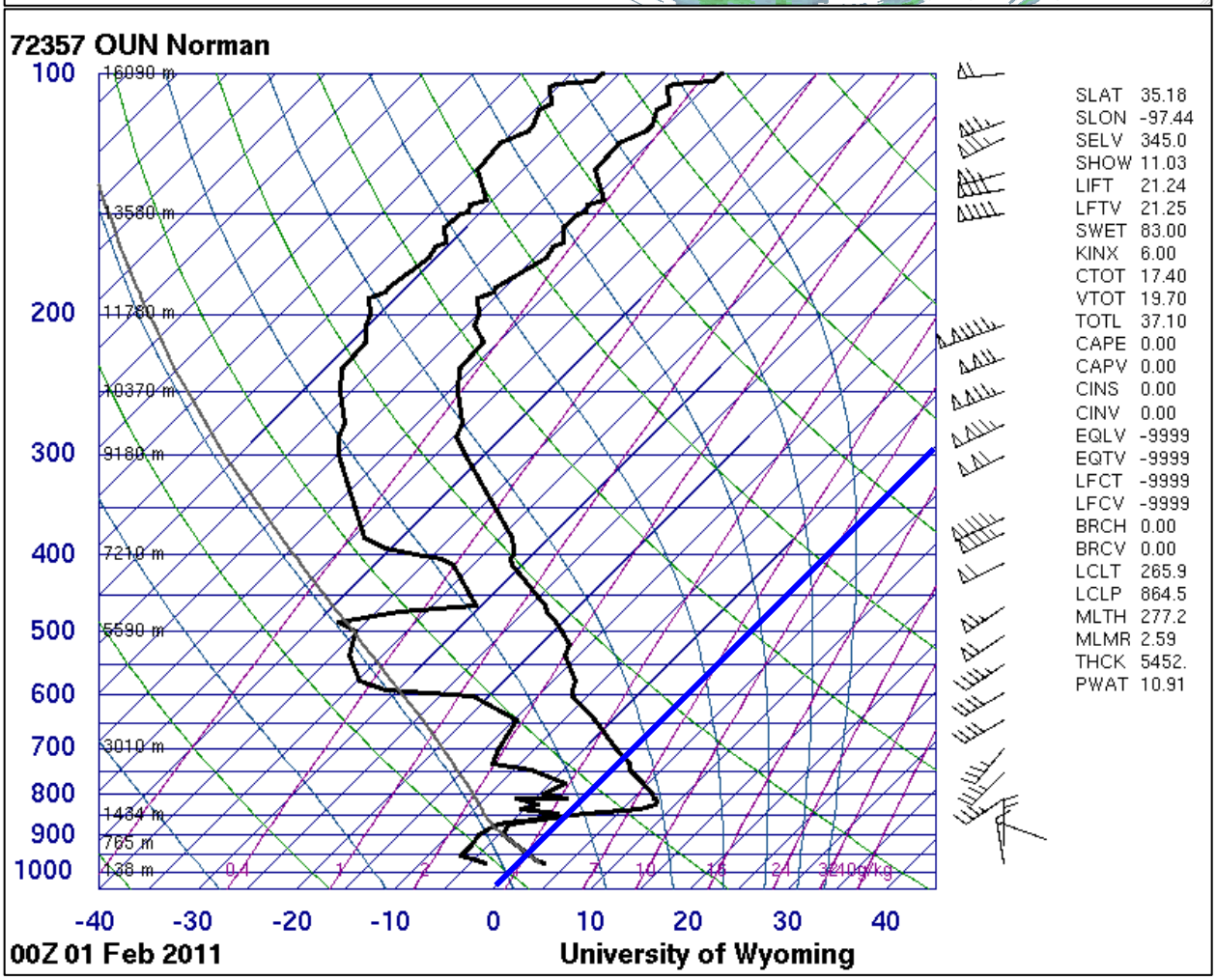
Question 5. Using the below Mesonet and radar map along with the Dodge City, KS Skew-T from the same time, what type of precipitation do you think is occurring in the circled area in northwest Oklahoma? Why?



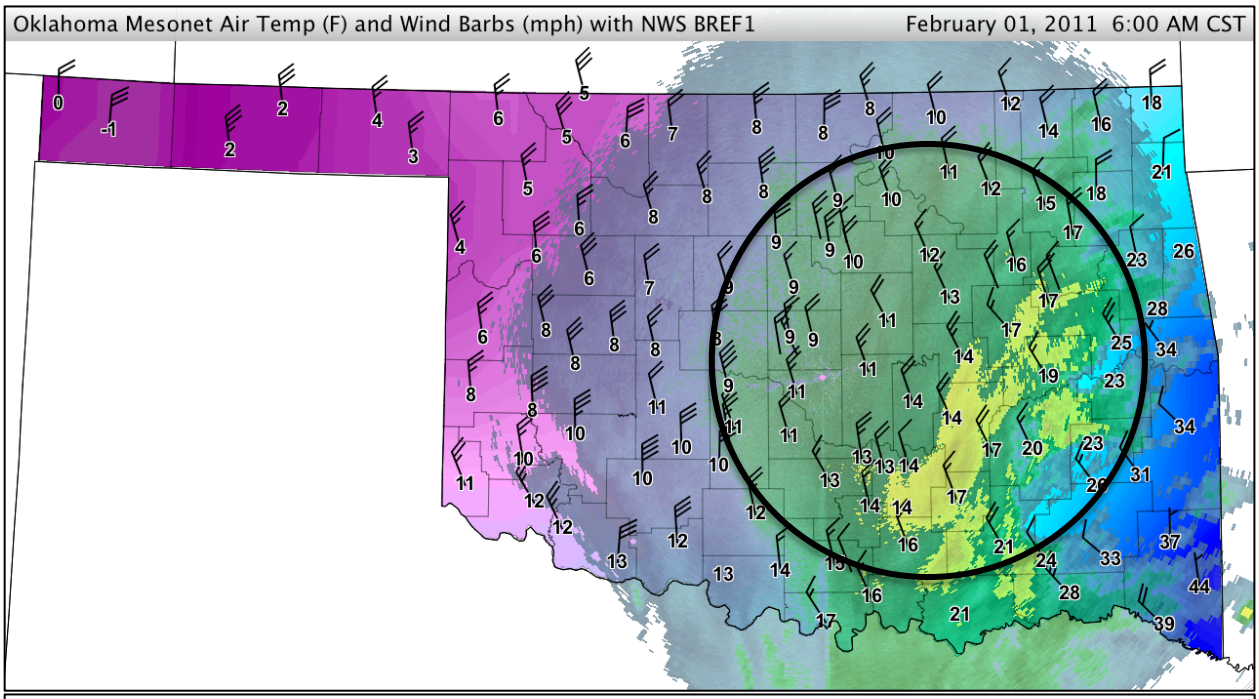


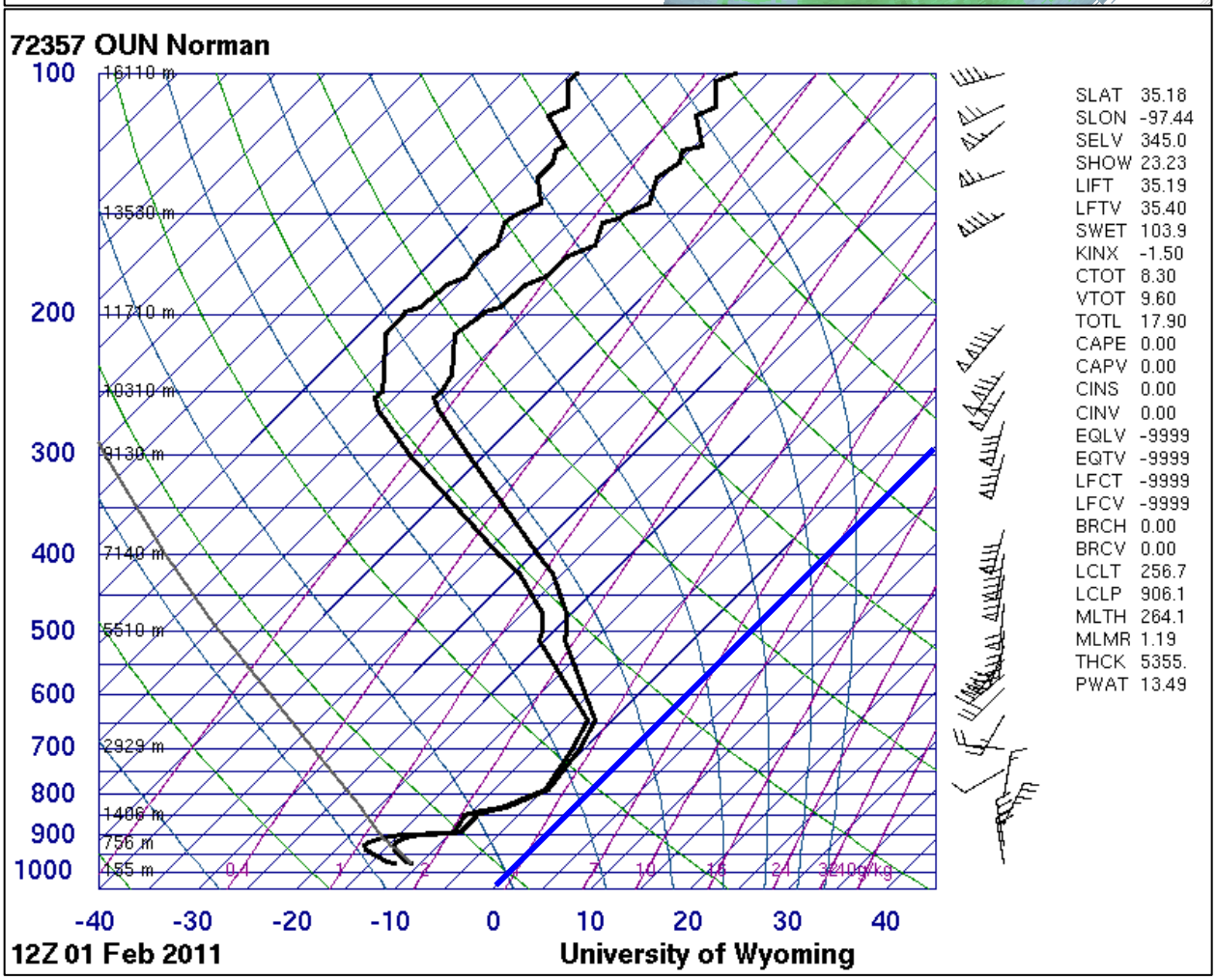
Question 6. Using the below Mesonet and radar map along with the Norman, OK Skew-T from a few hours earlier, what type of precipitation do you think is occurring in the circled area in central Oklahoma? Why?



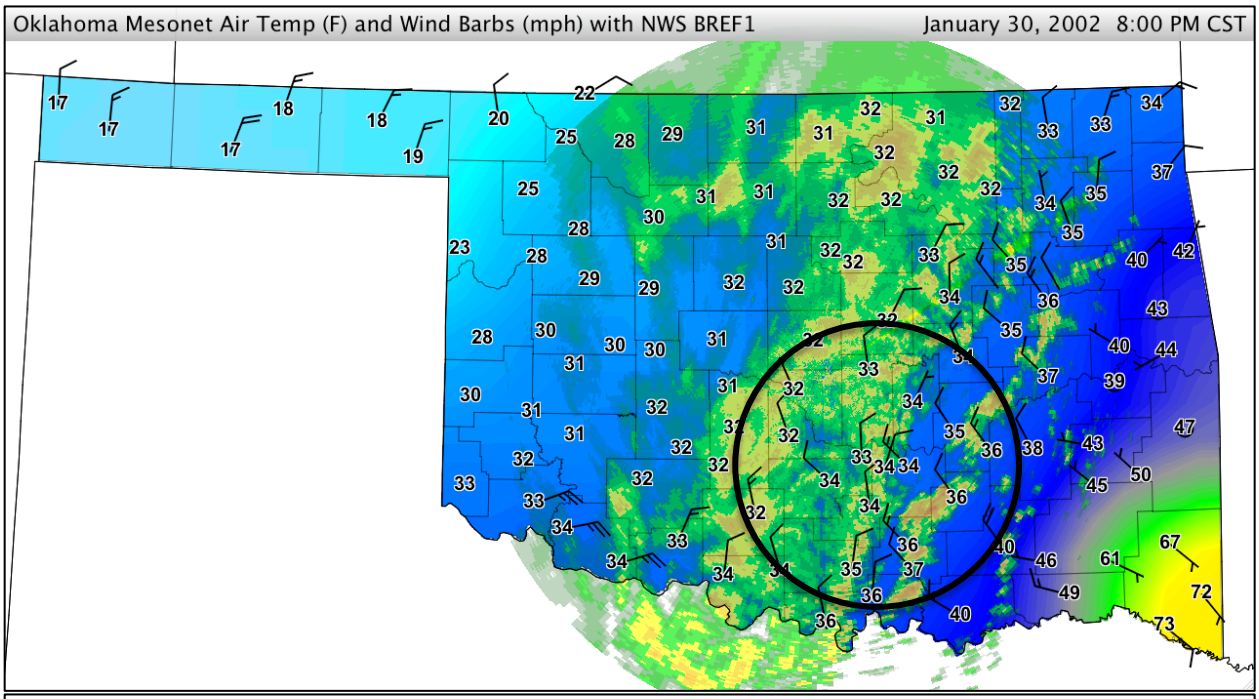


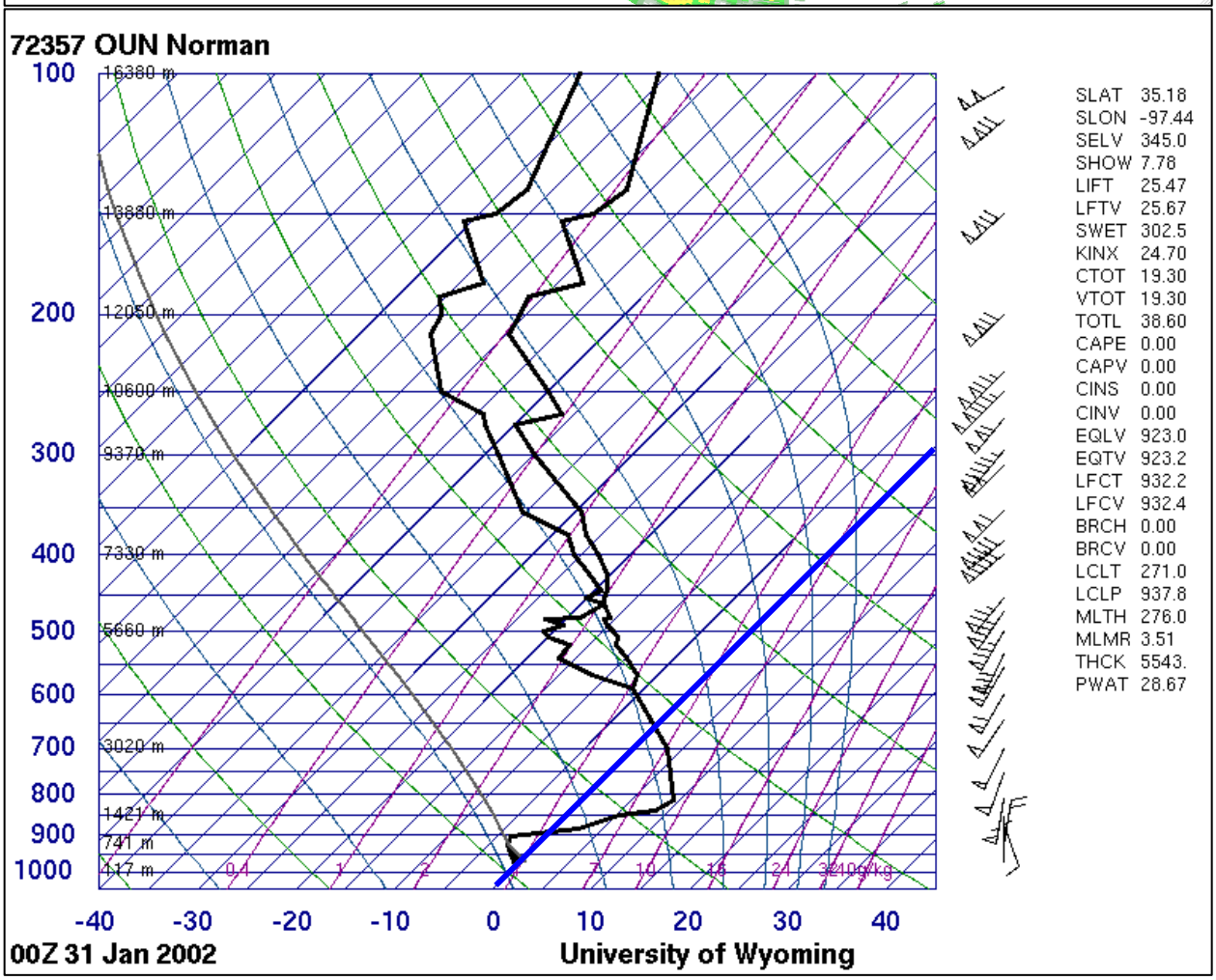
Question 7. Using the below Mesonet and radar map along with the Norman, OK Skew-T from the same time, what type of precipitation do you think is occurring in the circled area in central and eastern Oklahoma? Why?



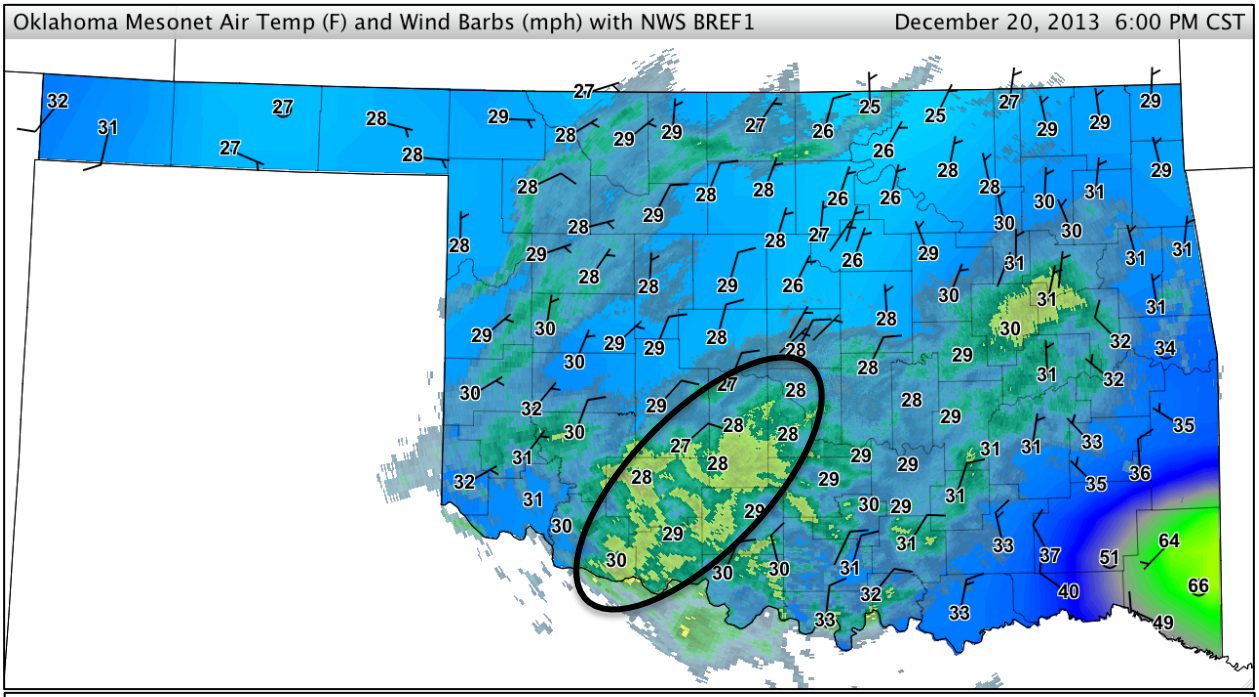


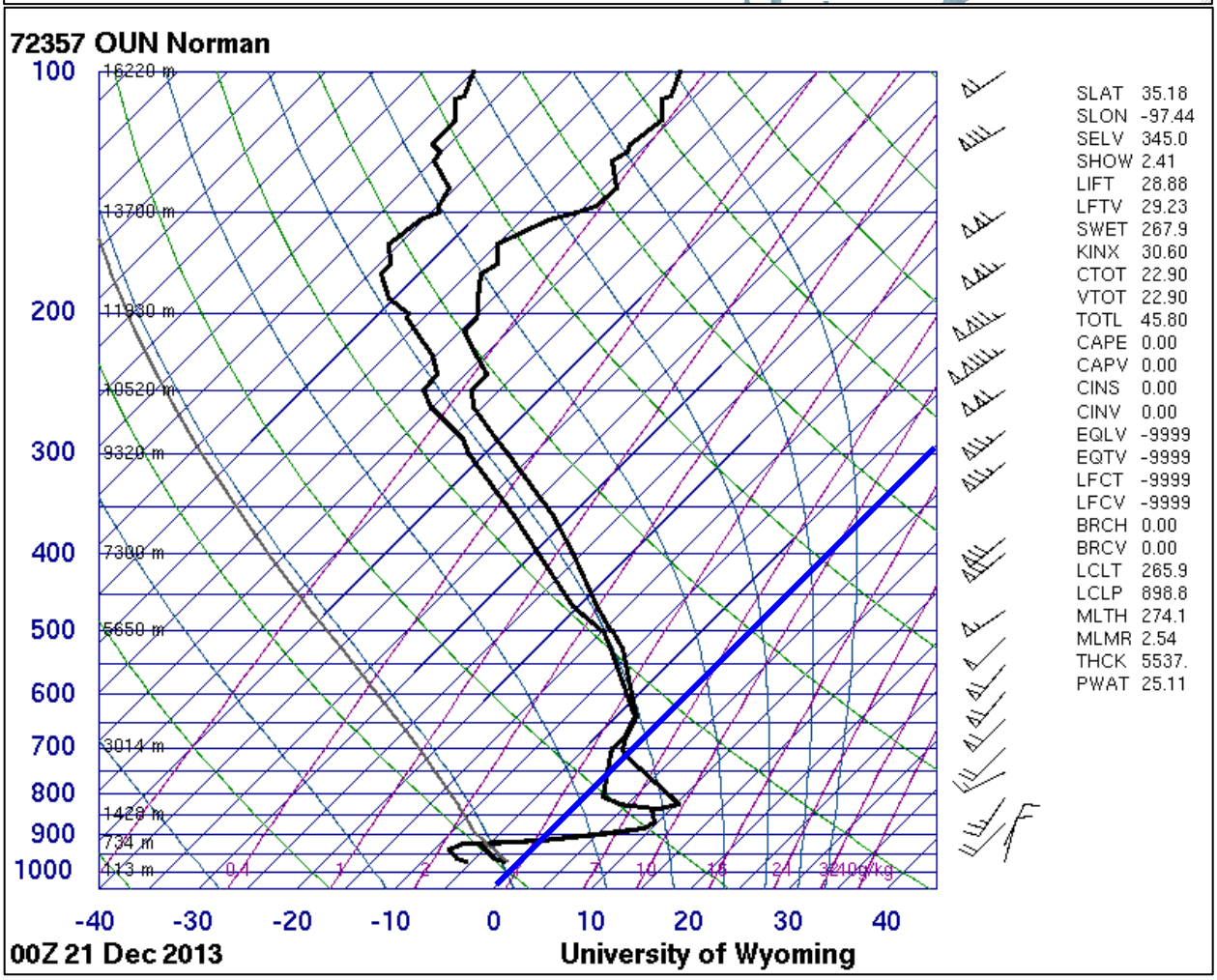
Question 8. Using the below Mesonet and radar map along with the Norman, OK Skew-T from a few hours earlier, what type of precipitation do you think is occurring in the circled area in south central Oklahoma? Why?





Question 9. Using the below Mesonet and radar map along with the Norman, OK Skew-T from the same time, what type of precipitation do you think is occurring in the circled area in southwestern Oklahoma? Why?





Question 10. Using the below Mesonet and radar map along with the Norman, OK Skew-T from a few hours later, what type of precipitation do you think is occurring in the circled area in central Oklahoma? Why?