

NAME: _____ PERIOD: _____ DATE: _____

LAB PARTNERS: _____ LAB #31

THE BLIZZARD OF 1993 ANATOMY OF A SUPERSTORM

INTRODCUTION

Organized storm systems called mid latitude cyclones or low pressure systems, move across the United States every day. Although many are weak disturbances that draw little attention, some such as the March 1993 system become legendary. This “Blizzard of 1993” brought the eastern United States to a standstill, dumping snow from Mississippi to Maine, halting transportation, and denying electricity to thousands of homes and businesses. The storm also generated tornadoes and record amounts of lightning in the southeastern United States. By some estimates, the death toll related to the storm was over 270.

MATERIALS

Pencil
Colored pencils

APPROXIMATE TIME 1-2 Periods

PROCEDURE

1. The map shows snowfall accumulations at various locations from March 12-14. On the map, draw isolines connecting places where the snowfall was 10, 20, and 30 inches.
2. On the map of snowfall totals, plot the center of the storm by placing an L with the date/time for each position within the period (Use the data table below). The first position has already been located on the map for you (12-7p)

Date	Time	Latitude	Longitude	Pressure (mb)
March 12	7 pm	28.2°N	89.0°W	989
March 12	11 pm	30.0°N	86.2°W	983
March 13	7 am	32.0°N	83.0°W	973
March 13	1 pm	35.5°N	78.5°W	966
March 13	7 pm	38.7°N	75.8°W	960
March 13	11 pm	40.9°N	74.3°W	962
March 14	7 am	45.0°N	68.1°W	965

3. Place an L in the middle of the South Carolina/Georgia border. Put a penny-sized circle around it. Draw a blue cold front extending southward through Florida, and a red warm front from the L to where the X is located to the right of the map. The cold front should be headed eastward, and the warm front headed northward.
4. Make a heavy purple dashed line on the map to indicate the probable location of a squall line (line of severe thunderstorms) based on the position of the fronts that you just drew on the map.

5. Using a blue pencil, shade in the area where there is cold air at the surface, and using a red pencil shade in where air at the surface is warm. (Shade lightly so you can see through it). The entire map should be colored in.
6. Using a green pencil, draw 15 arrows at various locations around the storm center to show wind directions in the region when the storm was centered over the Georgia/South Carolina border. Put some arrows over the water, and one in each state located south of the 45th parallel.
7. A storm surge is caused by strong steady winds pushing water against the coastline. Surges can cause beach erosion, flooding, and damage to boats and docks. Using an orange pencil, highlight the coastal area that would have been experiencing the strongest storm surge as the storm was centered over the Georgia/South Carolina border.

LABORATORY QUESTIONS

1. According to the data table, at what time and date was the pressure in the storm's center lowest?
2. What was happening at the two fronts? (Describe the motion of the warm and cool air)
3. Which front would have forced the air upward more abruptly?
4. How does the upward movement of air contribute to cloud formation?
5. The storm caused numerous tornadoes in Florida, and established new records for lightning strikes, causing 5,100 flashes during one hour on March 13. Which front was responsible for the tornadoes and lightning?
6. Which front was responsible for the snowfall?
7. The death toll related to this storm was over 250. List three ways that a storm system such as this may cause the loss of human life.
8. Use your reference tables to locate the position of the warm ocean current called the Gulf Stream. Would this current have strengthened or weakened the storm system? Explain your answer.

9. Why do low pressure systems near coastal areas typically cause more precipitation than those centered over states such as Montana?

10. Compare your snowfall map to a map of the U.S. What landform is located in the area of heavy snowfall?

11. How would this landform have contributed to the formation of clouds and snow?

12. At the same time the system was centered over the Georgia/South Carolina border, what would have been the wind direction at each of the following locations?

Northern Florida

Northern Alabama

North Carolina

Activity:

"Blizzard of '93"

map provided by the **American Meteorological Society**

