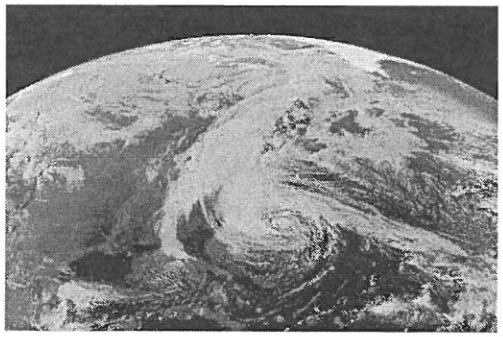
Name:_____ Date:_____

## Tracking Hurricane Sandy

**Purpose:** The purpose of this lab is to use data collected during Hurricane Sandy to track the movement of its low-pressure center. The student will also answer questions using this data and his/her knowledge of weather and the atmosphere.



**Pre-Questions:**

1. What causes wind, or what is necessary for wind to occur?

2. What will cause the greatest wind speed, a high-pressure gradient or a low-pressure gradient?

3. Hurricanes are huge storms with tremendous wind speeds. What must be true about its pressure gradient for it to have such high wind speeds?

**Materials:** Colored Pencils

**Procedure:** Complete the following steps:

1. Using the data from the table on the following page, plot the location of the low-pressure center that formed Hurricane Sandy on the hurricane tracking map on the next page by using the available latitude and longitude coordinates. Next to each point, record the date and time for that position. Once all of the positions have been plotted, connect each data point with a line using a colored pencil.

2. On the hurricane tracking map, use a second color to circle the point where the storm became a hurricane. Using that same color, draw another circle around the point where it changed back to a tropical storm.

| Date | Time | Lat. (°N) | Long. (°W) | Pressure (mb) | Wind Speed (MPH) | Stage |
|---|---|---|---|---|---|---|
| 23-Oct | 1:00 AM | 12.9 | 78.7 | 998 | 45 | Tropical Storm |
| 23-Oct | 1:00 PM | 14.1 | 77.6 | 993 | 50 | Tropical Storm |
| 24-Oct | 1:00 AM | 15.7 | 77.1 | 988 | 65 | Tropical Storm |
| 24-Oct | 1:00 PM | 17.6 | 76.8 | 973 | 80 | Hurricane |
| 25-Oct | 1:00 AM | 20.1 | 75.9 | 957 | 110 | Hurricane |
| 25-Oct | 1:00 PM | 23.5 | 75.4 | 963 | 105 | Hurricane |
| 26-Oct | 1:00 AM | 25.8 | 76.5 | 968 | 85 | Hurricane |
| 26-Oct | 1:00 PM | 27.1 | 77.1 | 971 | 75 | Hurricane |
| 27-Oct | 1:00 AM | 28.1 | 76.9 | 969 | 75 | Hurricane |
| 27-Oct | 1:00 PM | 29.7 | 75.6 | 961 | 75 | Hurricane |
| 28-Oct | 1:00 AM | 31.5 | 73.7 | 960 | 75 | Hurricane |
| 28-Oct | 1:00 PM | 32.8 | 71.9 | 951 | 75 | Hurricane |
| 29-Oct | 1:00 AM | 35.2 | 70.5 | 950 | 75 | Hurricane |
| 29-Oct | 1:00 PM | 38.3 | 73.1 | 940 | 90 | Hurricane |
| 29-Oct | 4:00 PM | 38.8 | 74.4 | 940 | 90 | Hurricane |
| 29-Oct | 10:00 PM | 39.8 | 75.4 | 952 | 75 | Hurricane |
| 30-Oct | 4:00 AM | 40.5 | 77 | 960 | 65 | Tropical Storm |
| 30-Oct | 10:00 AM | 40.2 | 78.4 | 983 | 45 | Tropical Storm |

**Questions:**

1. According to the data, Hurricane Sandy reached wind speeds of 90 mph or greater during two separate periods of time, on October 25th from 1:00AM to 1:00PM and on October 29th from 1:00 PM to 4:00 PM. During these times, was the air pressure greater or less than the air pressure measured at the previous locations?

2. What happened to wind speed when hurricane Sandy passed over Cuba?

3. What happened to barometric pressure when Hurricane Sandy passed over Cuba?

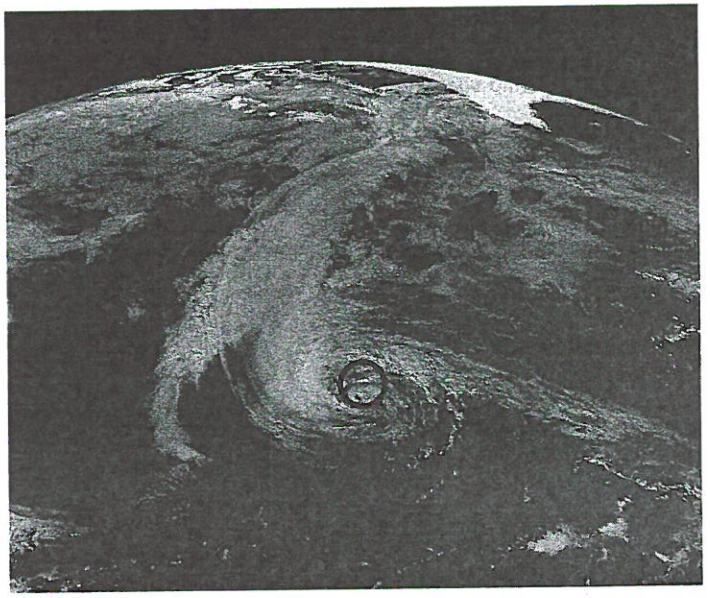
4. What happened to wind speed when Hurricane Sandy made landfall over New Jersey?

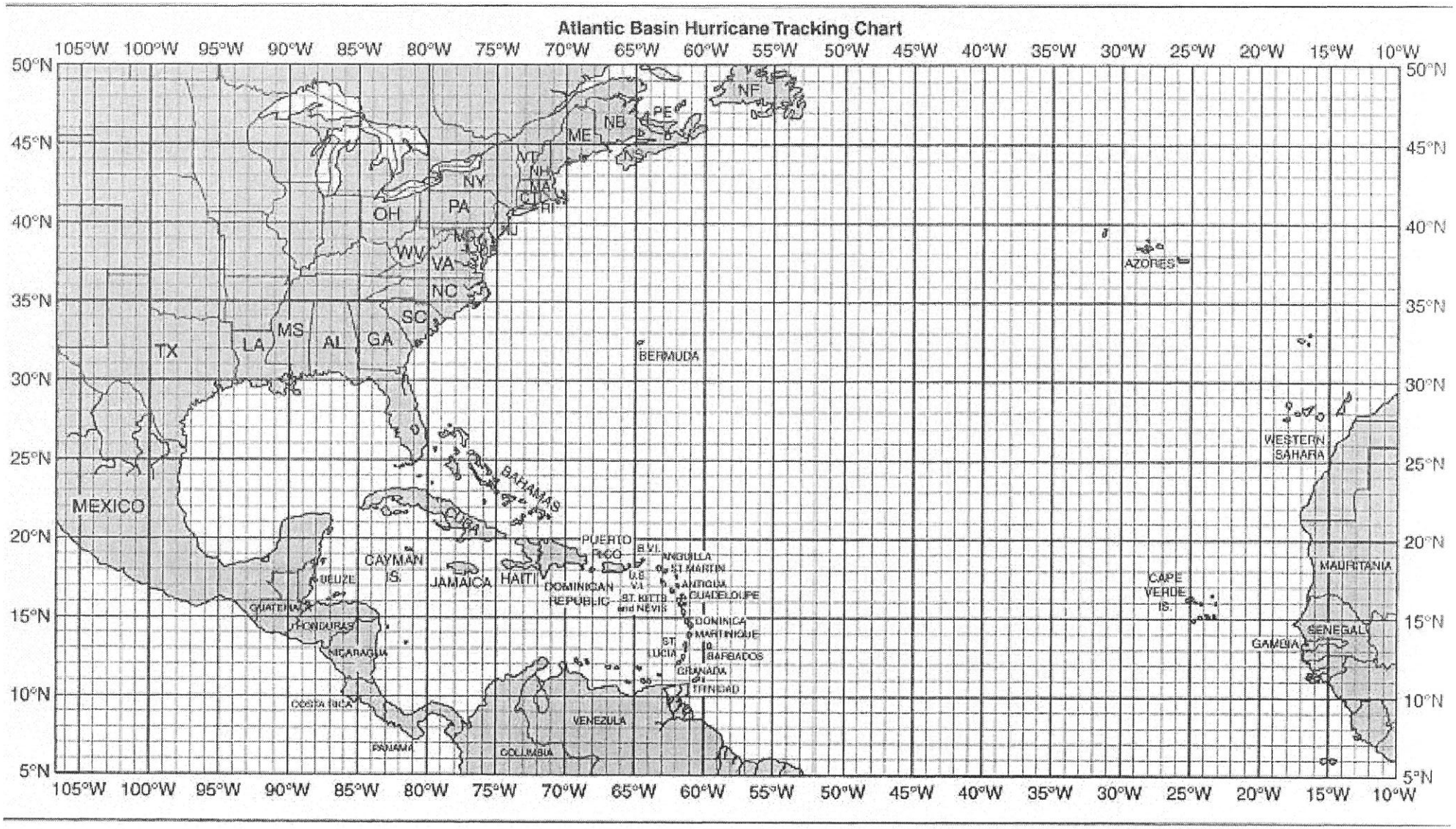
5. What happened to barometric pressure when Hurricane Sandy made landfall over New Jersey?

6. Using your answers to the previous questions, create a hypothesis that describes the relationship between atmospheric pressure of a hurricane and its wind speed.

7. We know that hurricanes form in the tropics, near the equator, where ocean and air temperatures are high. This energy creates an extremely low-pressure center, as air and water vapor are rapidly heated and lifted up at its center. Using this information, explain why hurricanes like Hurricane Sandy lose pressure and gain wind speed when they travel over water, but gain pressure and lose wind speed when they travel over land.

8. All Hurricanes are storms with a low-pressure center. On the photograph of Hurricane Sandy below, draw arrows showing the general direction you would expect air to move in this storm. The center of the storm is outlined in black.






**Hurricane Tracking Map**