

NAME: \_\_\_\_\_ PERIOD: \_\_\_\_\_ DATE: \_\_\_\_\_

LAB PARTNERS: \_\_\_\_\_ LAB #33

## HURRICANE SANDY

### INTRODUCTION

Hurricane Sandy was the deadliest and most destructive hurricane of the 2012 Atlantic hurricane season, as well as the second-costliest hurricane in United States history. Classified as the eighteenth named storm, tenth hurricane and second major hurricane of the year, Sandy was a Category 3 storm at its peak intensity when it made landfall in Cuba. While it was a Category 2 storm off the coast of the Northeastern United States, the storm became the largest Atlantic hurricane on record (as measured by diameter, with winds spanning 1,100 miles (1,800 km). Preliminary estimates assess damage at nearly \$75 billion (2012 USD), a total surpassed only by Hurricane Katrina. At least 285 people were killed along the path of the storm in seven countries. The severe and widespread damage the storm caused in the United States, as well as its unusual merge with a frontal system, resulted in the nicknaming of the hurricane by the media and several organizations of the U.S. government “Superstorm Sandy”. Hurricane Sandy was one of the most devastating natural disasters in United State history. In this lab you will use data from Hurricane Sandy to study some weather changes common to all hurricanes. You will also plot a map showing the path of Hurricane Sandy.

### OBJECTIVES

At the conclusion of this lab you should be able to;

1. Interpret basic hurricane data
2. Plot the path of a hurricane

### PROCEDURE

1. Using the data on page 2, plot every position of Hurricane Sandy. Use a pencil and make a dot. Next to each dot place the date/hour (i.e. 22/11 for the first coordinate).
2. Connect the points you have plotted. *Draw an arrow* to show the direction of movement of the hurricane over the time plotted.
3. Answer laboratory questions 1 through 17.

### HURRICANE SANDY DATA

<b>Date</b>	<b>Time (Military)</b>	<b>Latitude °N</b>	<b>Longitude °W</b>	<b>Wind speed (Knots)</b>	<b>Pressure (mb)</b>
Oct. 22	11:00	13.5	78.0	30	1003
Oct. 22	23:00	12.7	78.6	45	998
Oct. 23	11:00	13.8	77.8	50	993
Oct. 23	23:00	15.2	77.2	60	989
Oct. 24	11:00	17.1	76.7	80	973
Oct. 24	23:00	19.4	76.3	90	954
Oct. 25	11:00	22.4	75.5	105	964
Oct. 25	23:00	25.3	76.1	90	968
Oct. 26	11:00	26.7	76.9	80	970
Oct. 26	23:00	27.7	77.1	75	969
Oct. 27	11:00	29.0	76.0	75	958
Oct. 27	23:00	30.9	74.3	75	960
Oct. 28	11:00	32.5	72.6	75	951
Oct. 28	23:00	34.5	70.5	75	950
Oct. 29	5:00	35.9	70.5	85	946
Oct. 29	11:00	37.5	71.5	90	943
Oct. 29	17:00	38.8	74.4	90	940
Oct. 29	23:00	39.8	75.4	75	952
Oct. 30	5:00	40.5	77.0	65	960
Oct. 30	11:00	40.2	78.4	45	983
Oct. 30	22:00	41.3	79.4	40	992
Oct. 31	8:00	42.3	79.5	40	998

# TRACKING CHART

an area subject to hurricane water or wind.

cross the coastline near the area  
 nering effect of breaking waves,  
 an hurricane deaths are caused  
 / come your way.

rom the shore.  
 steps to protect  
 borne in high  
 wa of your home.  
 ork, so it is not  
 1.

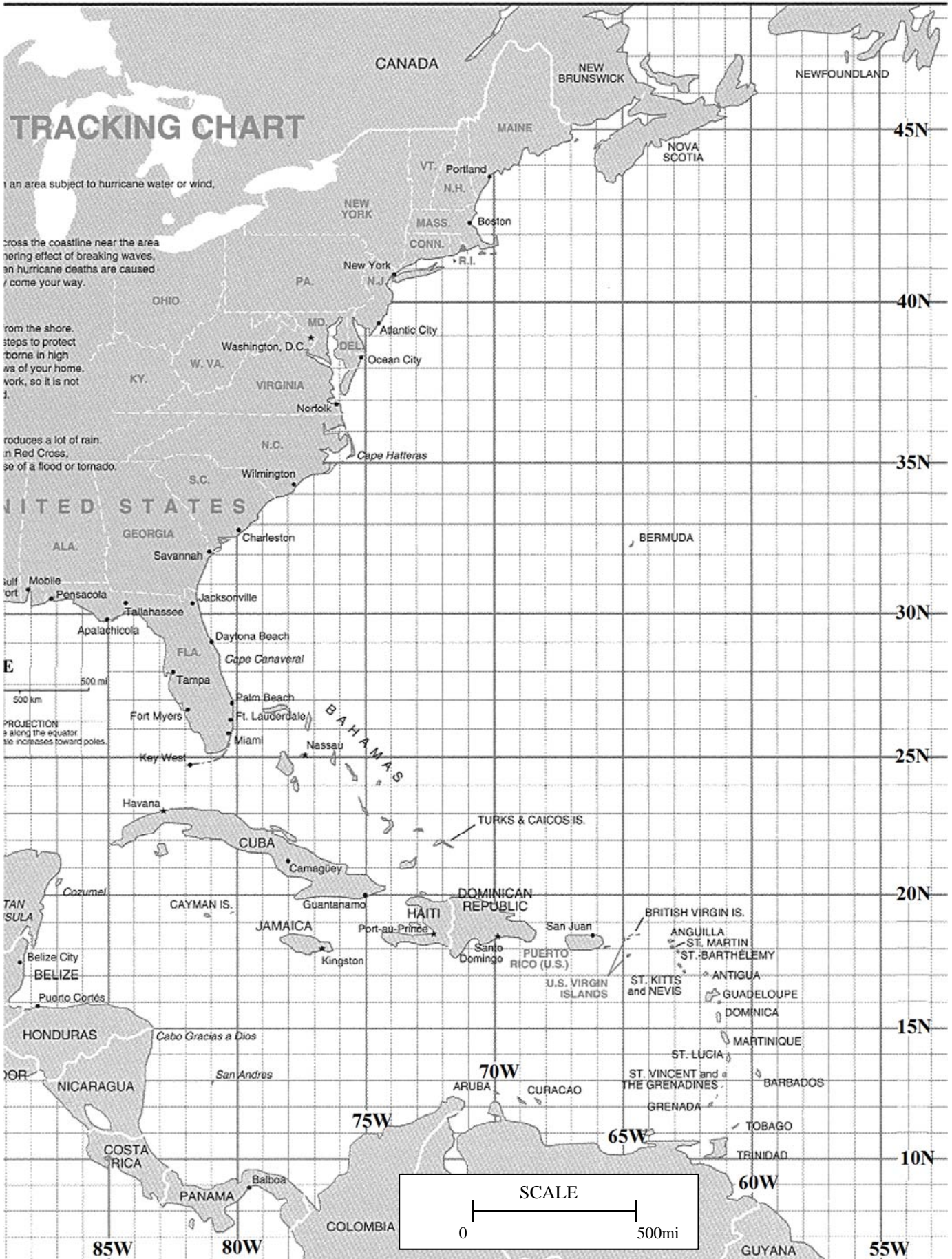
roduces a lot of rain.  
 n Red Cross,  
 se of a flood or tornado.

## UNITED STATES

E

500 mi  
 500 km

PROJECTION  
 along the equator  
 to increases toward poles.



## **LABORATORY QUESTIONS**

1. Between October 22<sup>nd</sup> and October 29<sup>th</sup>, calculate the difference between the highest and lowest air pressures (Show your work)

2. In general, how did the wind speed change from October 22<sup>nd</sup> to October 25<sup>th</sup>?

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For the same period, what change in air pressure occurred?

3. In general, how did the wind speed change from October 28<sup>th</sup> to October 31<sup>st</sup>?

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For the same period, what change in air pressure occurred?

4. Based on your answers to questions 2 & 3 what is the general relationship between air pressure changes and wind speed in a hurricane?

5. According to page 4 in your ESRT, which Ocean Current(s) may have influenced Hurricane Sandy's path?

6. According to the "Planetary Wind and Moisture Belts in the Troposphere" map (ESRT pg. 14), which global wind belt may have influenced Sandy's path?

7. On the data table, note the drop in wind speed from October 29<sup>th</sup> to October 31<sup>st</sup>. Based on your map, what is the most likely cause of this decrease?

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8. Of the cities shown on your map, Atlantic City experienced the most damage. Why?

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9. Describe the overall path of Hurricane Sandy. Start with the first advisory and be very specific in terms of which direction(s) the storm moved.

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10. Using the map scale and your plotted points, calculate the rate of speed in miles/hour that Hurricane Sandy traveled: (Show formula and all work).

$$\text{Formula: rate of speed} = \frac{\text{distance traveled}}{\text{time}}$$

Between October 22<sup>nd</sup> and October 31<sup>st</sup>:

11. Where did Hurricane Sandy most likely originate? \_\_\_\_\_

12. During what part of the year are hurricanes most likely to form? Why? \_\_\_\_\_

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13. On what date and time did Tropical Storm Sandy become a hurricane? \_\_\_\_\_

14. If you were to issue a hurricane warning for New York City, when would you have issued it and why?

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15. Why was Hurricane Sandy given the nickname “Superstorm Sandy”?

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16. Which type of damage is responsible for the highest percentage of hurricane related deaths?

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17. A hurricane has slower wind speeds than a tornado, yet it inflicts more total damage. How might this be explained?

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18. Explain how a hurricane passing over land or a cool ocean waters results in a loss of strength.

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