**Tracking Hurricane Katrina - Laboratory Activity Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Hurricane season runs from June 1 to November 30 every year because thunderstorms form over the hot, moist air of the Atlantic Ocean. While hurricanes do not come to Chicago we sometimes experience storms that are the remnants of hurricanes. In this activity you are going to plot the path of hurricane Katrina on a hurricane tracking map. There are also some questions to answer. But first you might like to know…

**How does a hurricane get its name?**

Here is a list of names for Atlantic hurricanes and an explanation of the naming protocol. This explanation is taken from NOAA:

<http://www.nhc.noaa.gov/aboutnames.shtml>

**Atlantic Names**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **2014** | **2015** | **2016** | **2017** | **2018** | **2019** |
| Arthur Bertha Cristobal Dolly Edouard Fay Gonzalo Hanna Isaias Josephine Kyle Laura Marco Nana Omar Paulette Rene Sally Teddy Vicky Wilfred | Ana Bill Claudette Danny Erika Fred Grace Henri Ida Joaquin Kate Larry Mindy Nicholas Odette Peter Rose Sam Teresa Victor Wanda | Alex Bonnie Colin Danielle Earl Fiona Gaston Hermine Ian Julia Karl Lisa Matthew Nicole Otto Paula Richard Shary Tobias Virginie Walter | Arlene Bret Cindy Don Emily Franklin Gert Harvey Irma Jose Katia Lee Maria Nate Ophelia Philippe Rina Sean Tammy Vince Whitney | Alberto Beryl Chris Debby Ernesto Florence Gordon Helene Isaac Joyce Kirk Leslie Michael Nadine Oscar Patty Rafael Sara Tony Valerie William | Andrea Barry Chantal Dorian Erin Fernand Gabrielle Humberto Imelda Jerry Karen Lorenzo Melissa Nestor Olga Pablo Rebekah Sebastien Tanya Van Wendy |

"Since 1953, Atlantic tropical storms had been named from lists originated by the National Hurricane Center. They are now maintained and updated through a strict procedure by an international committee of the [World Meteorological Organization](http://www.nhc.noaa.gov/nhcexit.shtml?http://www.wmo.int/pages/prog/www/tcp/).

The six lists above are used in rotation and re-cycled every six years, i.e., the 2014 list will be used again in 2020. The only time that there is a change in the list is if a storm is so deadly or costly that the future use of its name on a different storm would be inappropriate for reasons of sensitivity. If that occurs, then at an annual meeting by the WMO committee (called primarily to discuss many other issues) the offending name is stricken from the list and another name is selected to replace it. Several names have been retired since the lists were created. "

Retired names since 2000:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2000** Keith | **2001** Allison Iris Michelle | **2002** Isidore Lili | **2003** Fabian Isabel Juan | **2004** Charley Frances Ivan Jeanne | **2005** Dennis Katrina Rita Stan Wilma | **2006** | **2007** Dean Felix Noel | **2008** Gustav Ike Paloma | **2009** |
| **2010** Igor Tomas | **2011** Irene | **2012** Sandy | **2013** Ingrid |  | | | | | |

As you can see Katrina is a retired name and will not be used again. After studying this hurricane I think you will understand why.

**Hurricane Basics**

Weather satellites collect latitude and longitude coordinates to allow people to plot the path of hurricanes and make predictions and advisories as to where they will make landfall. It is the responsibility of the **National Hurricane Center** to provide information to the public about when and where a hurricane will be. Hurricanes begin as tropical depressions. A **tropical depression** is an organized system of clouds and thunderstorms with a defined surface circulation and maximum sustained winds of 38 mph. A **tropical storm** has maximum sustained winds of 39-73 mph. For higher wind speeds and organized circulation the storm is called a hurricane and its strength is divided into five categories with category one being the weakest and category five being the strongest. A **hurricane watch** is established for any place where a hurricane is predicted to make landfall within 24-36 hours. A **hurricane warning** is established for any place where a hurricane is predicted to make landfall within LESS than 24 hours.

The deadliest part of a hurricane is usually the storm surge - a wall of ocean water pushed by the winds of a hurricane. A storm surge comes ashore before the hurricane and can produce waves as high as 25 feet. Take a moment to imagine a wall of water that is as tall as a two story house!

**Laboratory Activity Objectives**

* plot latitude and longitude coordinates on a map
* describe the conditions that are necessary for a hurricane to form
* become familiar with tools and websites available on the Internet that provide information about hurricanes

To begin you will need a hurricane tracking map. A map is attached to this lab but additional blank maps are available at: <http://www.nhc.noaa.gov/tracking_charts.shtml>

You will also need to have data about the hurricane you want to track. The data for hurricane Katrina is located at this link: <http://weather.unisys.com/hurricane/atlantic/2005H/KATRINA/track.dat>

However I've selected some of the data for you to plot as the complete data table is very long.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Date/Time  (2005) | Latitude  (oN) | Longitude  (oW) | Wind Speed  (knots) | Pressure  (millibars) | Status |
| 1 | 08/24 00z | 23.30 | -75.80 | 30 | 1007 | Tropical Depression |
| 2 | 08/24 15z | 24.70 | -76.70 | 35 | 1006 | Tropical Storm |
| 3 | 08/25 06z | 26.10 | -78.40 | 45 | 1000 | Tropical Storm |
| 4 | 08/25 17z | 26.20 | -79.50 | 55 | 990 | Tropical Storm |
| 5 | 08/25 19z | 26.20 | -79.60 | 60 | 990 | Tropical Storm |
| 6 | 08/25 21z | 26.10 | -79.90 | 65 | 985 | Hurricane-1 |
| 7 | 08/26 05z | 25.40 | -81.10 | 60 | 990 | Tropical Storm |
| 8 | 08/26 15z | 25.10 | -82.20 | 85 | 971 | Hurricane-2 |
| 9 | 08/27 06z | 24.40 | -84.00 | 95 | 963 | Hurricane-2 |
| 10 | 08/27 18z | 24.50 | -85.40 | 100 | 949 | Hurricane-3 |
| 11 | 08/28 03z | 25.00 | -86.20 | 100 | 939 | Hurricane-3 |
| 12 | 08/28 06z | 25.10 | -86.80 | 125 | 935 | Hurricane-4 |
| 13 | 08/28 12z | 25.70 | -87.70 | 140 | 908 | Hurricane-5 |
| 14 | 08/28 18z | 26.50 | -88.60 | 150 | 906 | Hurricane-5 |
| 15 | 08/29 03z | 27.60 | -89.40 | 140 | 904 | Hurricane-5 |
| 16 | 08/29 09z | 28.80 | -89.60 | 130 | 915 | Hurricane-4 |
| 17 | 08/29 15z | 30.20 | -89.60 | 110 | 927 | Hurricane-3 |
| 18 | 08/29 21z | 31.90 | -89.60 | 65 | 960 | Hurricane-1 |
| 19 | 08/30 03z | 33.50 | -88.50 | 50 | 973 | Tropical Storm |
| 20 | 08/31 09z | 41.10 | -81.60 | 15 | 996 | Tropical Depression |

Plot the position of the storm for each date in the chart above to show the path of the hurricane. Number each position 1, 2, 3… Connect the points with a smooth curve.

***1 knot = 1.15 mph. To convert a wind speed to mph multiply by 1.15. "z" time is an abbreviation for Zulu time - which is GMT time.***

**Answer the following questions:**

1. In what state did Katrina first make landfall?
2. What is the fastest wind speed hurricane Katrina obtained in miles per hour?
3. As wind speed increases the pressure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (increases, decreases).
4. Why did hurricane Katrina slow down at data point 7?
5. What was the status of hurricane Katrina when it passed into New Orleans?
6. What was the local time when hurricane Katrina made landfall? (Use the Internet to help you convert from GMT (Zulu) time to local time.
7. List all the states that the hurricane/storm passed through from August 24th to August 31st.

Visit the National Hurricane Center online: <http://www.nhc.noaa.gov/> Are there any depressions, storms or hurricanes occurring now? If so, describe them.

Watch the following video online: <http://www.theatlantic.com/video/index/244300/nasa-revisits-satellite-images-of-hurricane-katrina/>