

Statistics and Atlantic Storms: Is Irma just another hurricane?

This year, 2017, was predicted by several forecasts to be above average for hurricane and tropical storm activity in the Atlantic. How many hurricanes have occurred in the Atlantic basin in the years since 2000?

Here are the numbers of hurricanes for each of the years from 2000 through 2016:

8, 9, 4, 7, 9, 15, 5, 6, 8, 3, 12, 7, 10, 2, 6, 4, 7

There have been four hurricanes in the Atlantic so far in 2017.

Use the Online Statistical Applets link on the AP Stat page of captainmath.net, and click on “One Quantitative Variable.” Name the variable, Hurricanes per Year and enter the numbers above as Raw data. Then click on Begin Analysis and explore the graphs and statistical output.

1. Describe the distribution of the numbers of hurricanes occurring in each year since 2000.
2. Which of the Split stems settings available for stemplots do you think gives you the best look at the shape of this distribution? Why?
3. Interpret the standard deviation of the number of hurricanes during the each of the years from 2000 to the present.
4. How many more hurricanes would need to occur this year in order for 2017 to be declared an “outlier” for the number of hurricanes produced in the Atlantic basin?

Irma's Wind Speed

Hurricane Irma, as of 5pm on 9/6, Irma was packing sustained winds of 185 mph. Does this make Irma unusually powerful among Hurricanes recorded since 1959?

1. Describe the distribution of sustained wind speeds of Atlantic Hurricanes since 1959.
2. Compare the two measures of center given in the chart. What is the best reason you can give for what you observe?
3. Interpret the standard deviation of the wind speeds of the hurricanes.
4. How many mph above average is Irma's sustained wind speed?
5. How many standard deviations above average is Irma's sustained wind speed?

Cat 4-5 Atlantic Hurricanes 1959-present

	Wind_Speed
S1 = mean ()	148.71 mph
S2 = count ()	62
S3 = stdDev ()	15.336 mph
S4 = min ()	130 mph
S5 = Q1 ()	140 mph
S6 = median ()	145 mph
S7 = Q3 ()	155 mph
S8 = max ()	215 mph

Irma's Air Pressure

Hurricanes are also measured by their minimum air pressure: the lower the minimum air pressure, the stronger the hurricane. As of 5pm on 9/6, Irma had a minimum air pressure of 914 mb.

1. How low would a hurricane's pressure need to be to be identified as an outlier?
2. How many millibars below average is Irma's pressure?
3. How many standard deviations is Irma's pressure below average?

Cat 4-5 Atlantic Hurricanes 19...

	Pressure
S1 = mean ()	932.754 mb
S2 = count ()	61
S3 = stdDev ()	14.4045 mb
S4 = min ()	872 mb
S5 = Q1 ()	924 mb
S6 = median ()	935 mb
S7 = Q3 ()	942 mb
S8 = max ()	958 mb

Your Assessment of Irma

Comment on how much Irma compare among all Atlantic hurricanes since 1959, clearly justifying your position using three statistical reasons from the information provided above.