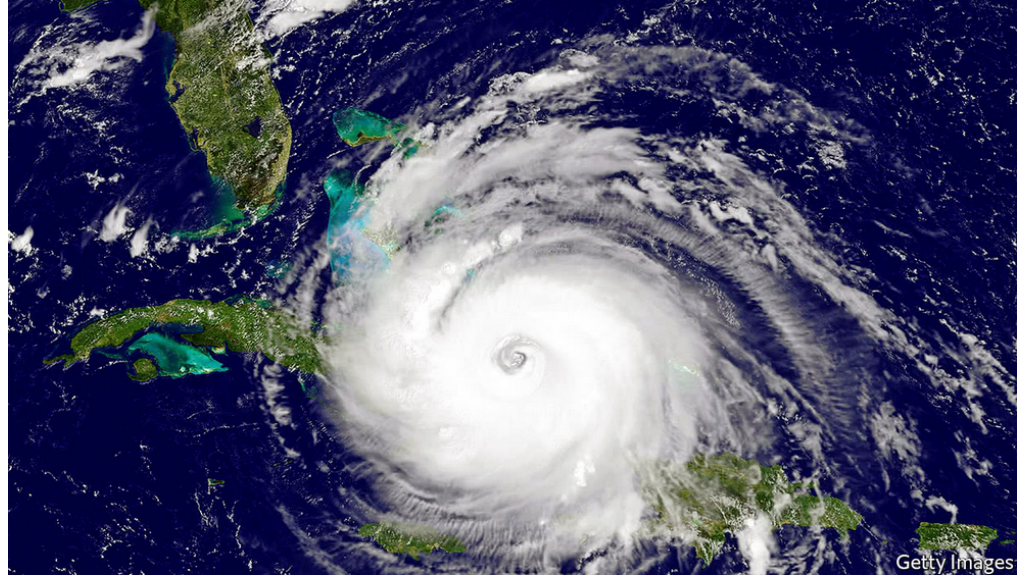


# ATLANTIC HURRICANES – INCIDENCE AND SEVERITY

1851 - 2021

## INTRODUCTION / BACKGROUND






It seems that the past several years have been especially exciting for storm chasers! Between April and November, three Category 3 or larger hurricanes peppered the Atlantic, making it a very active season, one of the most active since 1936. The storms are said to be responsible for over 800 fatalities and have caused an estimated 292 billion dollars of damage.



Hurricanes are, of course, “normal” yearly weather events. Wouldn’t it be interesting to see if their frequency and intensity has changed over recent times? What would drive that sort of change? Would it support or refute what science is saying about climate change?

We will be examining long-term data collected and stored in a hurricane database (HURDAT) maintained by the National Hurricane Center under the direction of the National Oceanic and Atmospheric Administration (NOAA). Data began to be collected by airplane in 1944, so our confidence in these figures are fairly high. Those from earlier years are more subject to error, since some hurricanes don’t make landfall and it is likely that some occurred and we are unable to verify their existence. Also, estimates of severity are subject to interpretation in earlier times when instruments were more primitive. The Saffir-Simpson Scale is used to determine the intensity of a storm and scientists have used this scale to estimate historical data.

### Categories of hurricane

	Category 1	Category 2	Category 3	Category 4	Category 5
Wind	74-95mph	96-110mph	111-130mph	131-155mph	Over 155mph
Storm surge	4-5ft	6-8ft	9-12ft	13-16ft	Over 18ft
					
	Minimal: No real structural damage; some flooding	Moderate: Material damage to buildings; small craft break moorings	Extensive: Structural damage to small houses; inland flooding	Extreme: Major structural damage & heavy flooding; evacuation necessary	Catastrophic: Massive damage to buildings; small structures blown over or away

For purposes of our analysis we will look at two sets of data. For the extended time period, have hurricanes increased in their incidence? Are the number of storms increasing? Are they becoming more intense? In other words, if hurricanes are becoming more numerous, do they represent more danger to those in coastal areas? Should we be mindful of this in urban planning discussions? What might be the ramifications of this federal budget estimates?

## DIRECTIONS

Open the data files and use Excel or Google Sheets to format and analyze the data. You will want to evaluate the information to see how the number and intensity of Atlantic hurricanes has changed over time. You should graph the data, generate a trendline (exponential, linear, other) by determining with your data partners which is most appropriate. Be sure to justify your choice. Include the equation of the trendline and  $r^2$  value. Establish a growth rate (positive or negative) using rolling data approximations. You may choose to add error bars to the data representation if it lends more confidence to your findings.

Be sure to keep track of any “noticings.” What do you notice as you examine the data? What is significant to you? Is the trendline predictive of the future? Why or why not? Are you confident that the data represents what is really happening? Are there data that you would like to see?

Prepare a poster that includes an appropriate title for your data analysis, a representation of your data with its trendline, a claim about the trend that you discover, based in evidence and you and your group should be able to justify the insights from your analysis. You may be asked to share your ideas with the larger KAMSC student group, so do your best!

## REFERENCES:

[https://en.wikipedia.org/wiki/2017\\_Atlantic\\_hurricane\\_season](https://en.wikipedia.org/wiki/2017_Atlantic_hurricane_season)

<http://www.aoml.noaa.gov/hrd/tcfaq/E11.html>

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