

Savannah Weather Guide

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Overview

The data from Weather Underground are made through personal weather stations as well as monitors, sensors, radars, and satellites to provide rich data. Those weather stations can be set up in either public space or personal households. Those stations are located all over the world since this is a multilayer global data community that strives to make this integrated world weather map. This specific weather map was generated on Sept 15, 2019, 15:44:13, and it consists of a temperature layer, a storm report layer generated from radars, a windstream layer, and a hurricane layer. They also have a historical archive where all the real-time data are stored and allows the user to search for certain months in a year to look at. We also generated a historic data set using data from the Savannah International Airport weather station (KSAV) from September 2019 to look back into the temperature trends.

Access

To view the data sets, please visit the following links:

Historic data gathered through the Savannah International Airport weather station (KSAV) from September 2019:

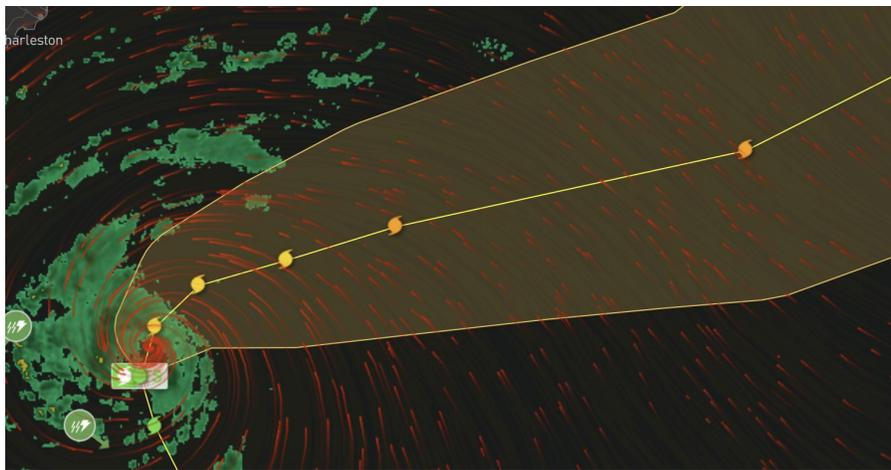
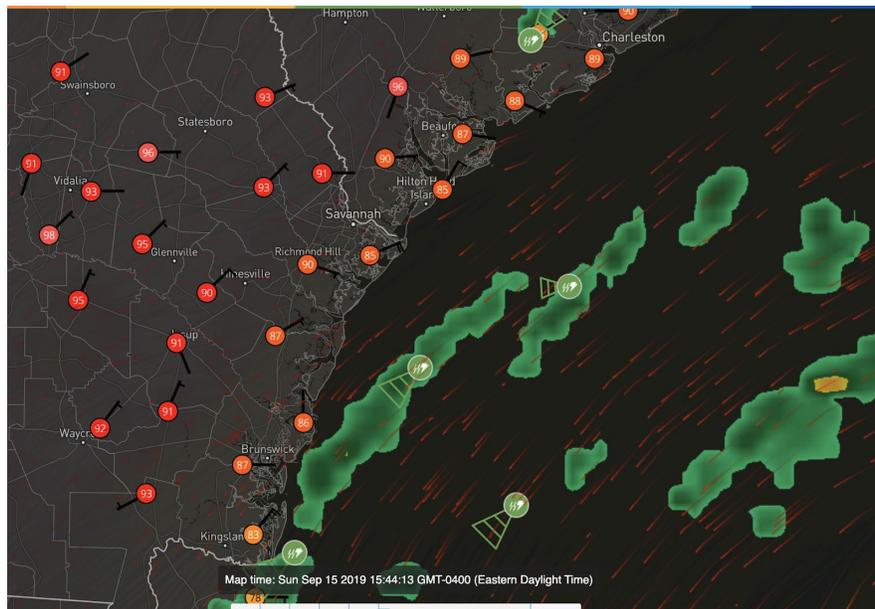
<https://www.wunderground.com/history/monthly/us/ga/savannah/KSAV/date/2019-9>.

Current interactive weather map: <https://www.wunderground.com/wundermap?radar=1>

For the interactive map, please ensure that the following layers are checked: under the layers, please check the temperature/wind layer under Weather Stations, windstream under Atmospheric Conditions, storm reports under Severe, and hurricane/typhoons under Tropical Storms. Once these layers are checked, drag the map over to the Savannah area and observe conditions by clicking on variables within the map.

However, since IBM purchased WeatherUnderground in 2016, users are no longer able to download raw data sources from personal weather stations. We also checked similar websites where people submit their gathered weather data, for example, windy.com, but we are not allowed to acquire any raw data from there as well.

Standards



As mentioned before, there are 4 different layers that are visualized in different ways. For the temperature layer, the website used numbers to represent the temperature and different levels of colors to represent the degree of heat. The key-shaped extension from the temperature circle represents the direction of wind and the wind levels, with the length and position of the horizontal short lines. For the storm report layer, there are green logos representing the origin of the storm and the shapes representing the direction. The green color indicates the affected area. For the windstream layer, the floating lines themselves explain the direction and the color, again, indicates the temperature of the windstream. We can also distinguish the center of a hurricane on the map by identifying where the windstreams whirls into. For the hurricane layer, the circle with two angles indicates that either hurricane or typhoons are currently happening. The user will get detailed information about the type once they click on the icon.

Data Biography



We sat down with Jude Mwenda Ntabathia, a Ph.D. student at Georgia Tech, to learn more about what goes into setting up and maintaining a personal weather station. Jude comes from a computational background but has geared towards applying his technical expertise to social sciences. He currently has a weather station set up on the balcony of his home in Atlanta. This is how he became involved in the community of people who gather weather data. Jude described the people who work and are interested in this field as “citizen scientists.” This term is coined to essentially describe the community collaboration amongst this group and how institutional science

plays into their DIY work. According to Jude, there is an entire community of people who collect weather data through personal stations and contribute these findings back to the public. Some external resources he recommends include the WeatherUnderground forum, WX forum, and Windeep. He also recommends for high school students to tie the weather data to their everyday lives to gain a better understanding of the role of weather data in our lives.

As for Jude, his station is composed of the weather station base, several sensors, like humidity and air quality, and a DIY data visualizer developed using Raspberry Pi. Through this DIY component, he can see the visualized data in real-time and even add alarms for varying weather conditions, such as when the temperature goes over a certain number. People can set up their stations however they wish. The main component that all stations require is the common base which can range anywhere from \$500 to over \$1000. The more expensive the base, the more powerful and accurate the data will be.

Once the data has been gathered, Jude submits them to several platforms, which he noted all vary in what they do with the data and how they validate data submitted to them. Some of the platforms he submits his data to include windy.com, WeatherUnderground, National Weather Service, Personal Weather Station finder, and others. Anyone can send

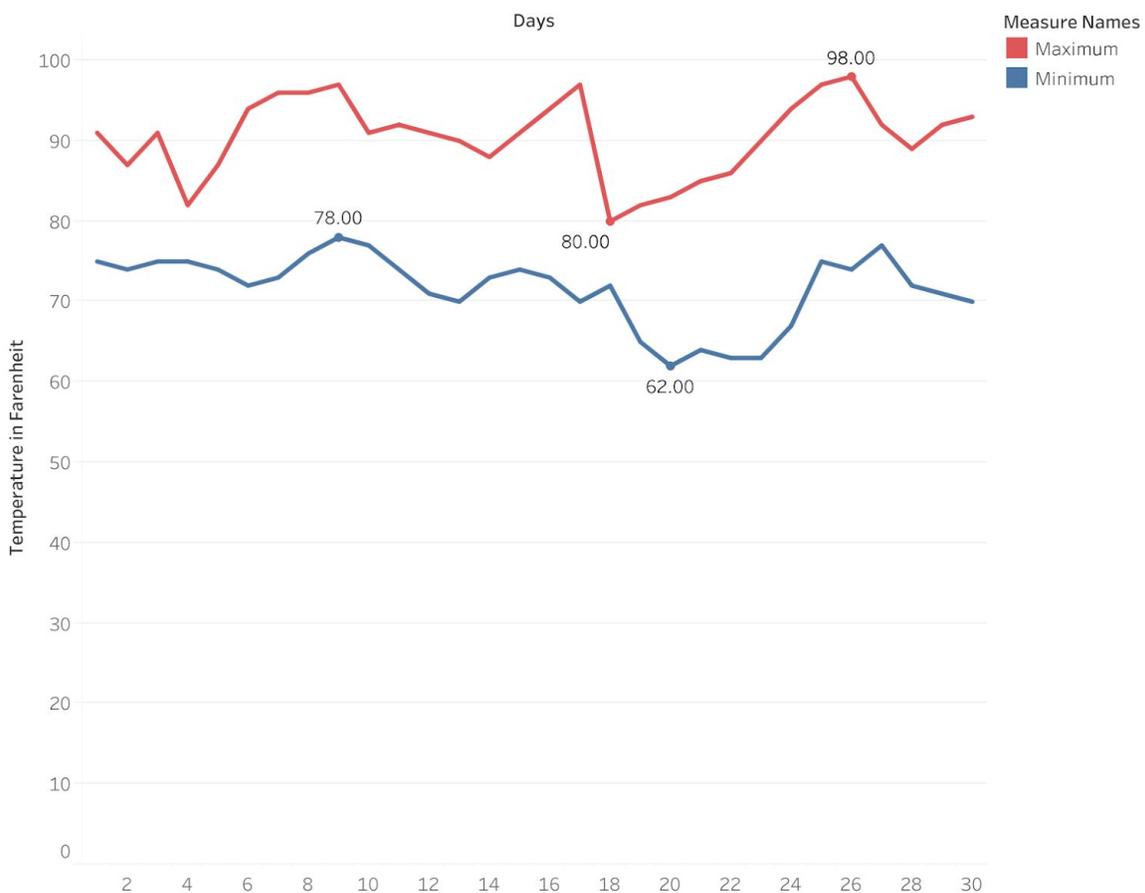


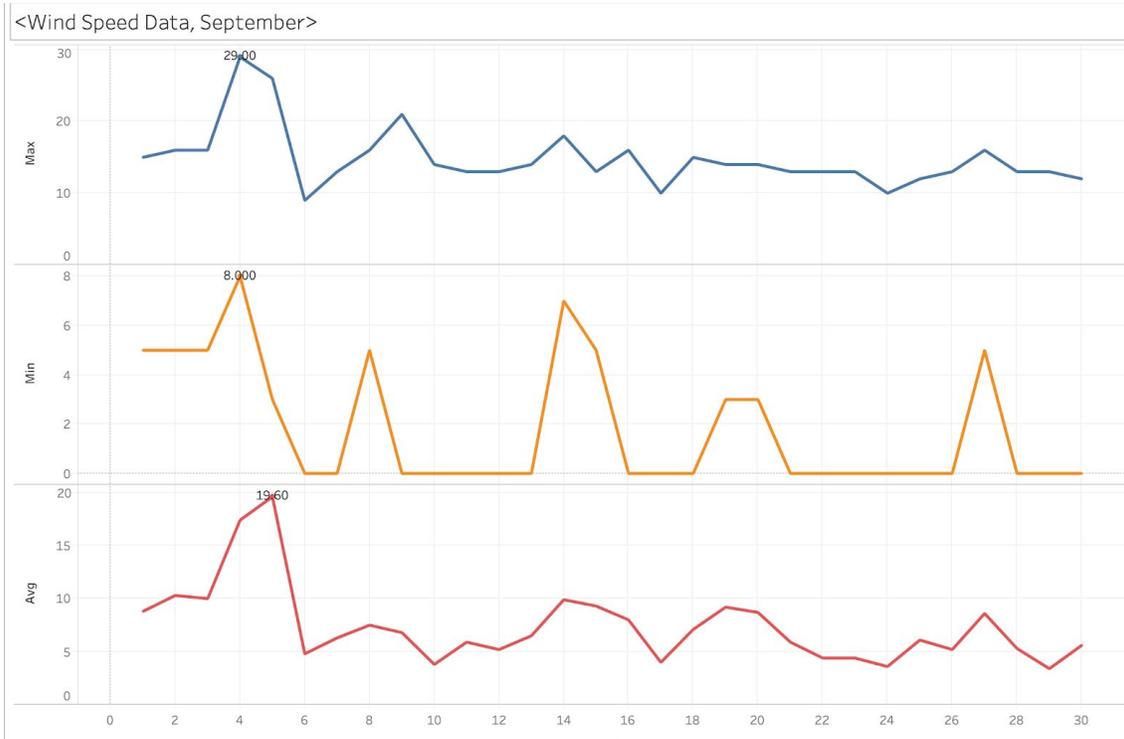
data to these platforms and in turn, the platforms will recalibrate and cross-check the submitted data with one another to ensure accuracy first. If the data is not accurate, the platform will inform the contributor and let them know that something may be off with their station. Once the data is proven to be accurate, these platforms will distribute the data to other agencies, and in some cases, they will sell the data.

Accuracy is the most important aspect of data gathering and according to Jude, there are possibilities of gathering “toxic data,” which refer to readings that are not completely accurate because of external interferences to the weather station. These interferences could range from a tree covering the device and limiting sensor exposure to natural climatic events that limit the sensor’s reading abilities. There are also instances where data from different locations, such as from a high tower building versus a one-floor house, are not always the same.

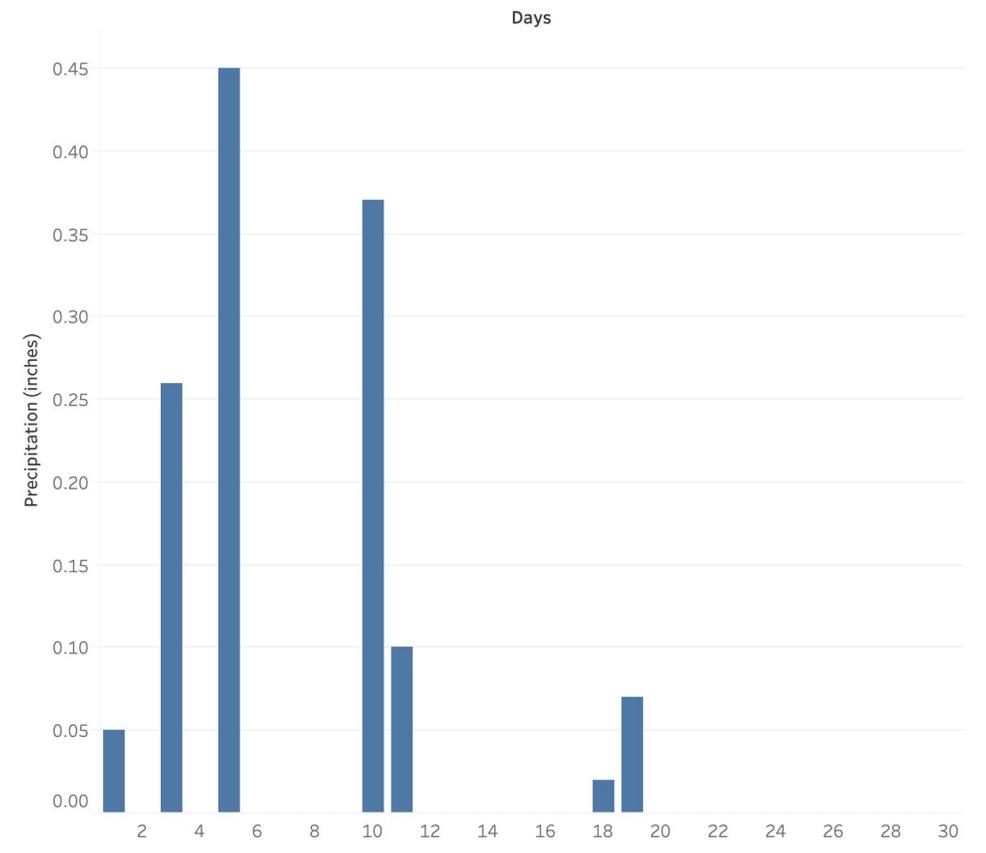
Data Visualization

Minimum & Maximum Temperatures in September 2019





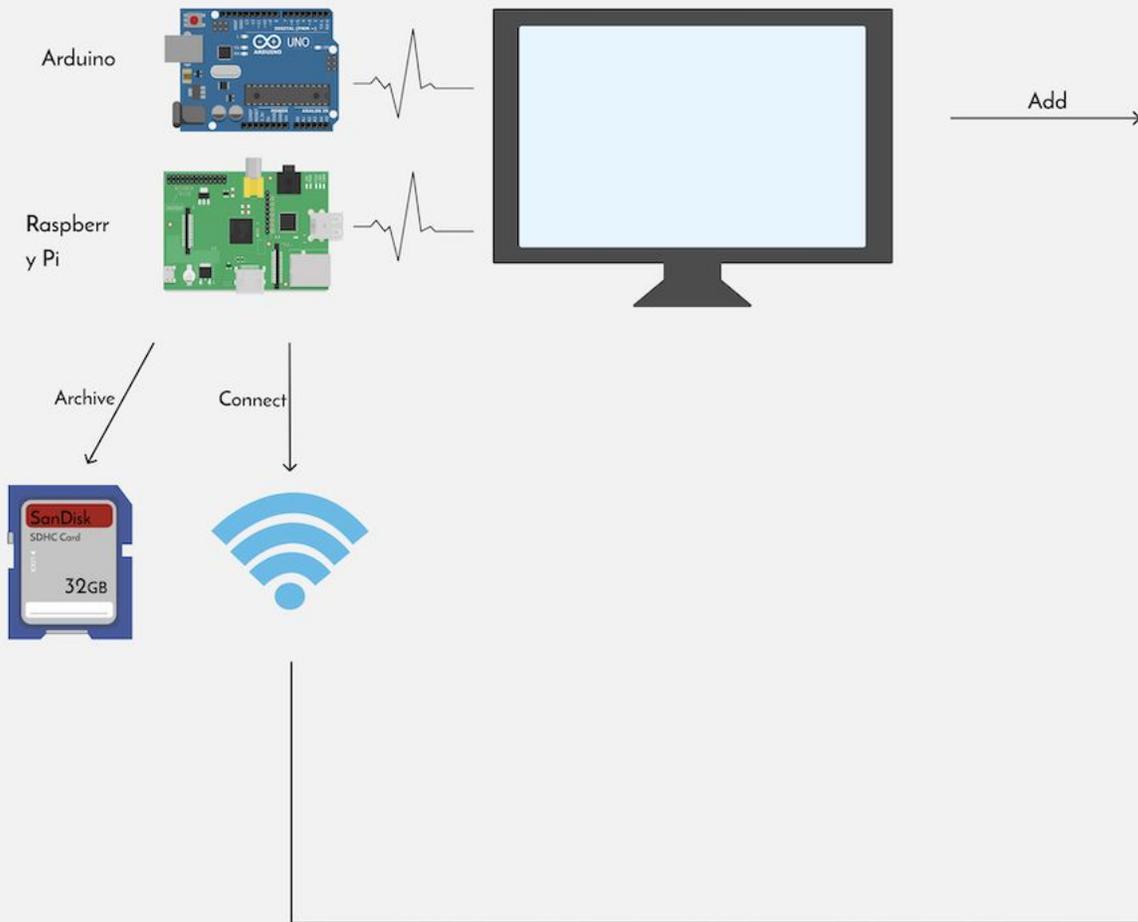
Precipitation during September 2019



Data Life Cycle

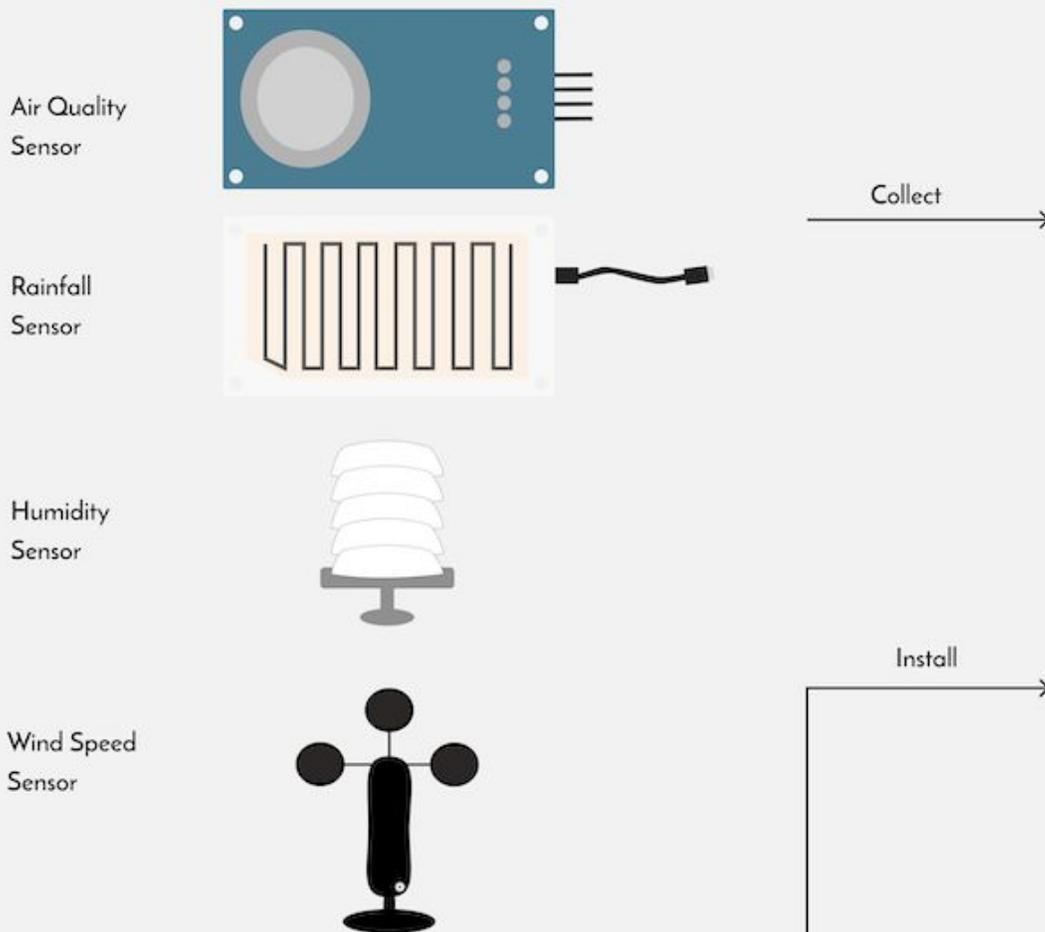
THE BASE

In order to set up a weather station at home, the first step is to get a prototyping board, a computer, and a display port. The hard part here is getting the three of them to communicate with each other efficiently through frequency. After that, people have the base of a weather station.



THE SENSORS

People are able to choose what sensors they want to add to their weather stations. Common sensors include air quality sensor, rainfall sensor, humidity sensor and wind speed sensor. These sensors work like USBs and they make your data more accurate. However, the price goes higher when the person choose to add more components to their weather station. The total price ranges from \$500 to more than \$1,000.



THE DATA

The sensors collect raw data on their own and automatically store them in personal computers like Raspberry Pi.

Raw Data

```
0123456 00123458 00 00012345 0  
1 1 13456 2395848 399 293481  
290481849301481 00  
3829014872194 381748 3874  
1827348104 1431 39 1 33  
1345 589038 93 949 39254 49852  
7482549028 4898 42 457897 47  
93874892 749378
```

RAW

Transform



Script



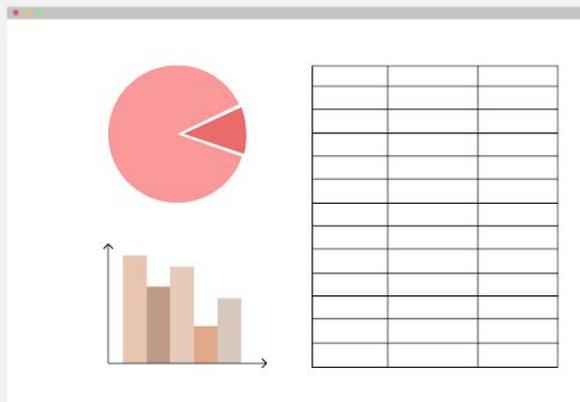
Push



THE TRANSLATION AND VISUALIZATION

By downloading or customizing a script online and install it on Raspberry Pi, it allows Raspberry Pi to run a website and display it on the port if they are connected. The person can customize the script to make the data visualization varies on the website. At the end of day, the script will push all the data that the weather station sensed to specific websites that the user set in advance, for example, Weather Underground. At the same time, the data are archived both online and local in the SD card.

Script and
Website



Weather
Underground



Uses

In the CBS News article “Hurricane Dorian “won’t budge” as it keeps bludgeoning Grand Bahama Island,” we see how weather data is used in a daily context. This article from early September 2019 uses weather data as well as insights from professional meteorologists, including the meteorology director at Weather Underground, to inform the public on Hurricane Dorian and the potential disasters of the storm. While this article focuses on the overall impact of the storm, it does include how parts of Savannah, Georgia will be affected. By using gathered weather data from several outlets, such as the National Oceanic and Atmospheric Administration, CBS News is able to clearly update people on what to expect as the storm moves through the Atlantic ocean. They also utilize data visualization methods to present the storm path. In addition to storm updates, the national news outlet offers insights from professionals on how the catastrophic storm was formed and its climatic impacts. This article is a great example of how weather data is used in daily lives and how it impacts us.

Sources

WeatherUnderground. September 2019.

<https://www.wunderground.com/history/monthly/us/ga/savannah/KSAV/date/2019-9>.

WeatherUnderground. October 2019.

<https://www.wunderground.com/wundermap?radar=1>

Jude Mwenda Ntabathia, September 24, 2019

CBS News. “Hurricane Dorian “won’t budge” as it keeps bludgeoning Grand Bahama Island.”
CBSnews.com.

<https://www.cbsnews.com/live-news/hurricane-dorian-update-category-5-storm-landfall-latest-track-path-models-forecast-2019-09-02/> (accessed October 17, 2019).

Author Details

Nikki Mehrjerdian is a first year Digital Media masters student. She comes from a journalism and video production background and is interested in utilizing virtual and augmented reality to create immersive experiences.

Jade Gao is currently a first year master student in digital media. She is interested in user experience applications and educational content. She came with a background in art direction, with skill sets in graphic design and video production.