Using GLOBE's Advanced Data Access Tool - ADAT - https://datasearch.globe.gov/

Hurricane Weather

Recently, 2 hurricanes hit the state of Florida in the United States - one after the other. There were 3 GLOBE schools with weather stations reporting data in Florida during this time. We're going to use ADAT to retrieve Barometric pressure and Winds data from these 3 schools to see what we can learn about hurricanes from GLOBE data.

The process is similar to vis - select your protocols, select your date range, filter and get data….The difference is that ADAT can be used to get much more data across many schools, sites and protocols.

Hurricane Milton from the International Space Station 10/8/24

1) Which protocols?
    a) Select Barometric Pressures and Winds

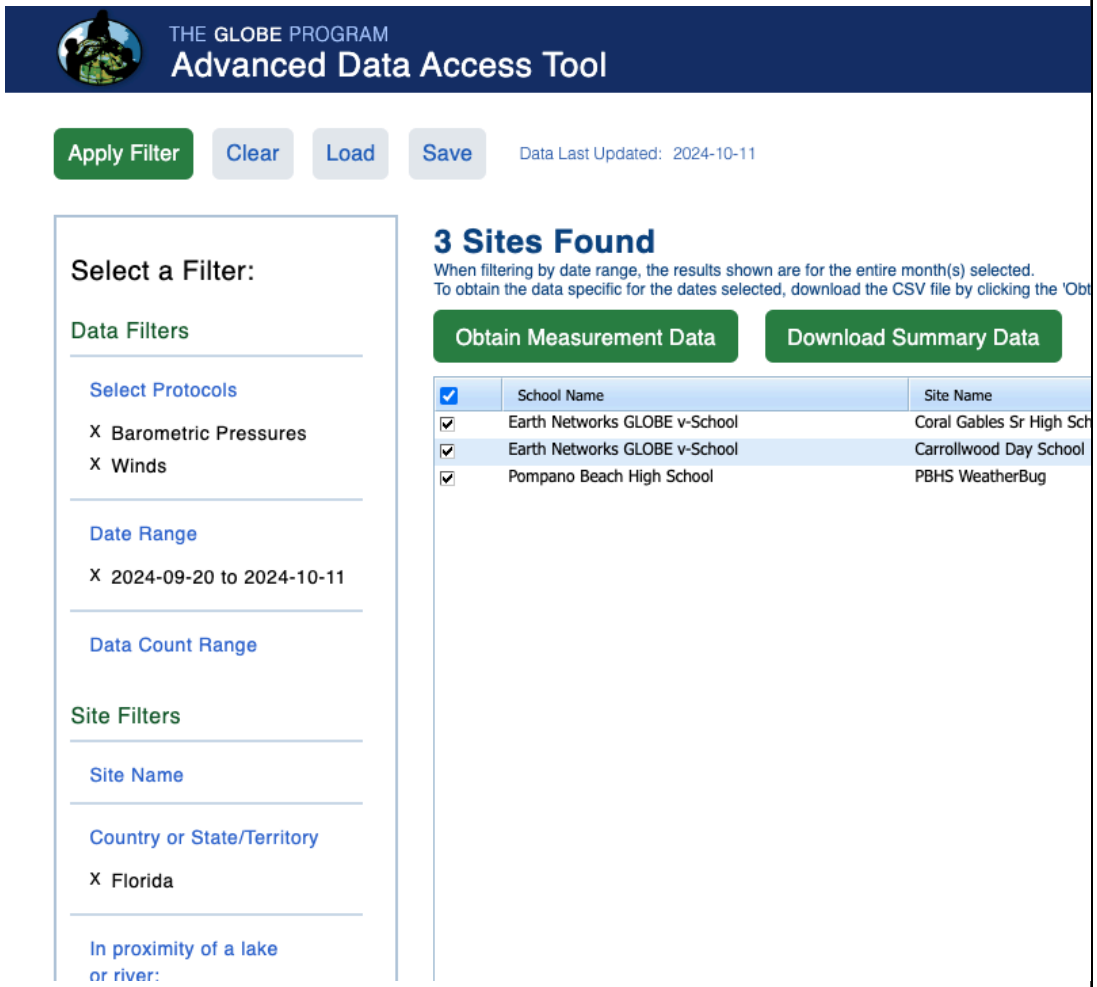
2) Select the Date range
    a) Choose 2024-09-20 to 2024-10-11

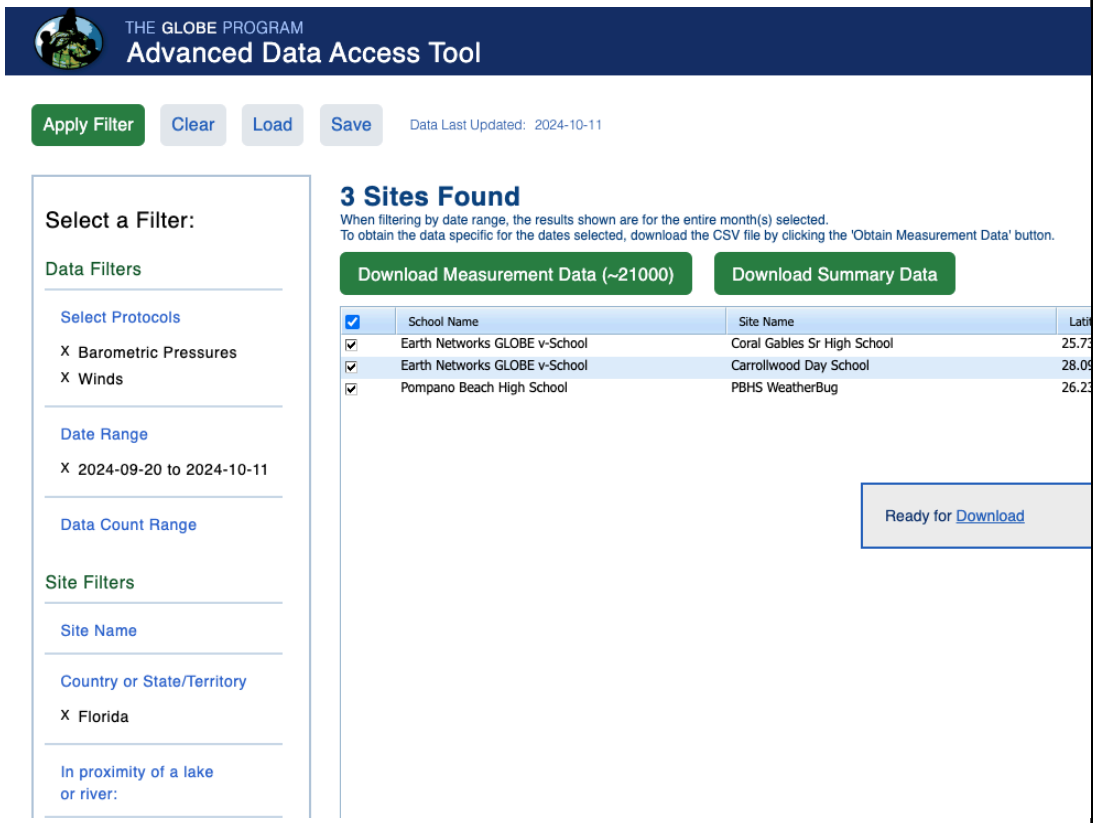
3) Add filters
    a) Under “Site Filters” – “Country or State/Territory” begin typing Florida. Select the bold text “Florida” from the type-ahead field. (It won’t work if you don’t cick on the type ahead text!)

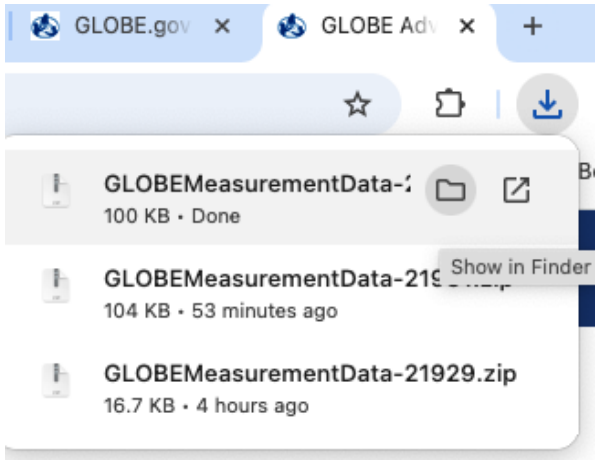
Note the other available filter options such as by site name, by school, teacher, team and elevation or lat/long ranges

4) Click Apply Filter
    a) Response should show “3 Sites Found” and list the sites with all sites pre-selected.

Note the Save and Load buttons. Once you have a filter you like, you can save the filter. You will get a URL that you can share with others (yourself, students or colleagues for example) that will allow them to exactly recreate your filter settings.

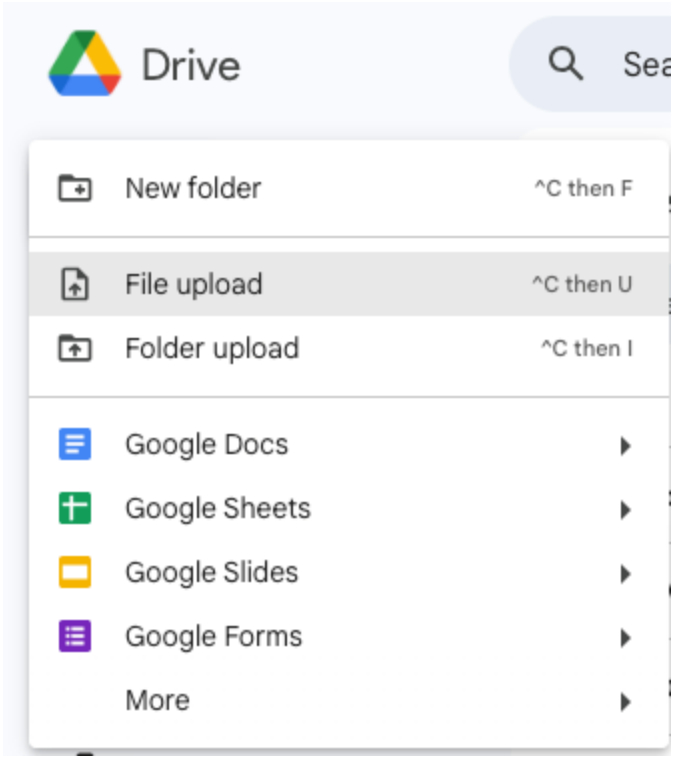


5) Select “Obtain Measurement Data” a) You should see ~21000 records. *Note when using ADAT – be careful, it can rapidly become a lot of data to download. That’s why we show you an estimate before you download the data.* 6) Click “Download Measurement Data” (~21000) a) A timer will estimate time to download and then a link will be provided - “Ready For Download” b) Click to Download the file – noting where it is being saved	

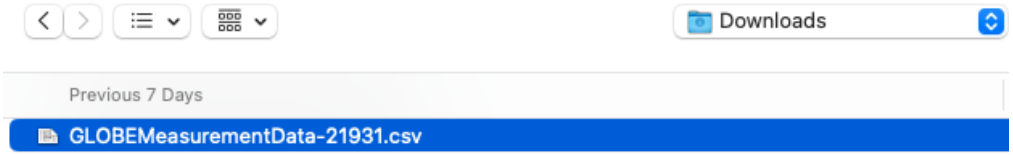
7) Find the .zip file that was downloaded and extract the .csv file (Usually double clicking does it), and remember where the file is for the next steps.	

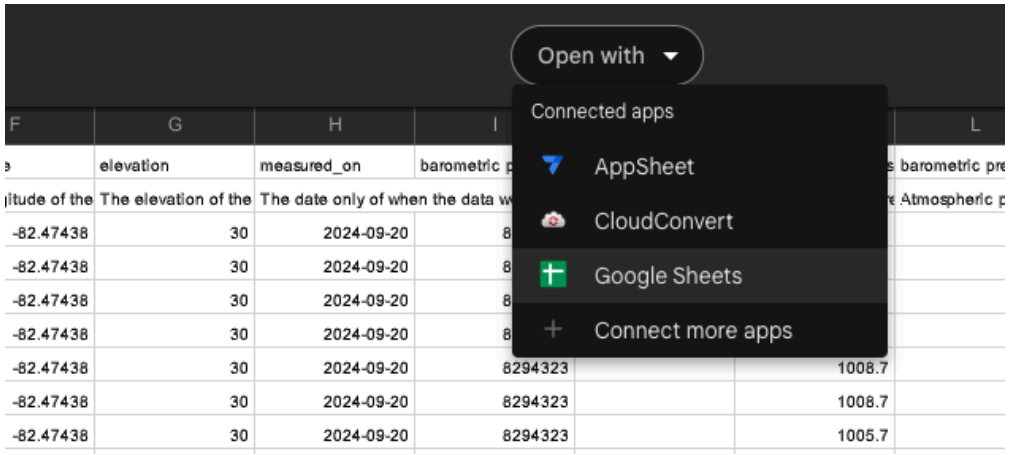
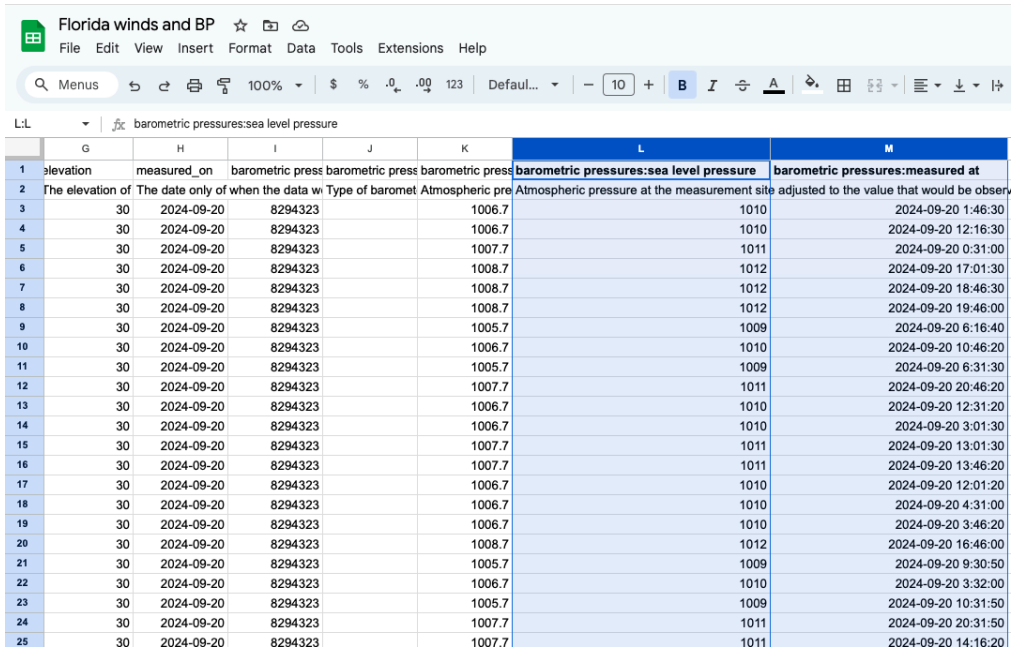
8) Launch a browser and open your google drive. (Excel can work as an option, but it's harder to deal with the time fields in excel)

9) Click New and File Upload to upload your .csv file to Google Drive.



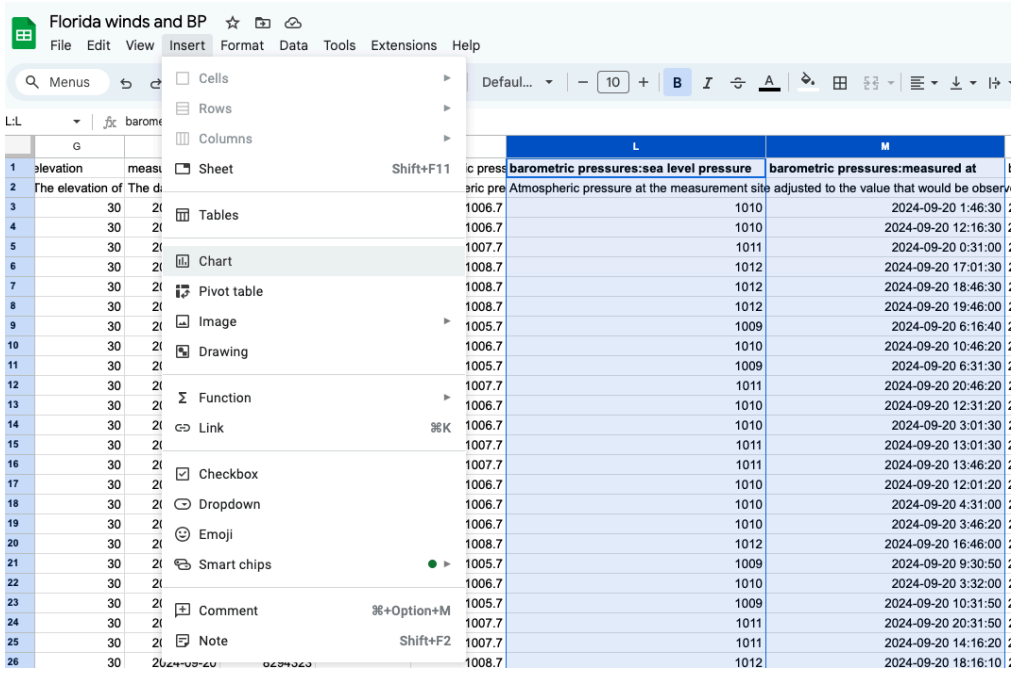
Select your csv:

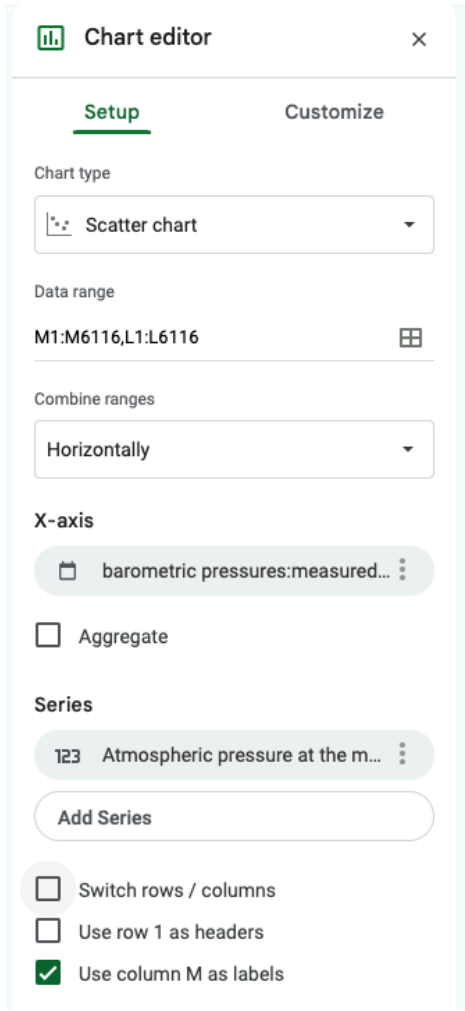


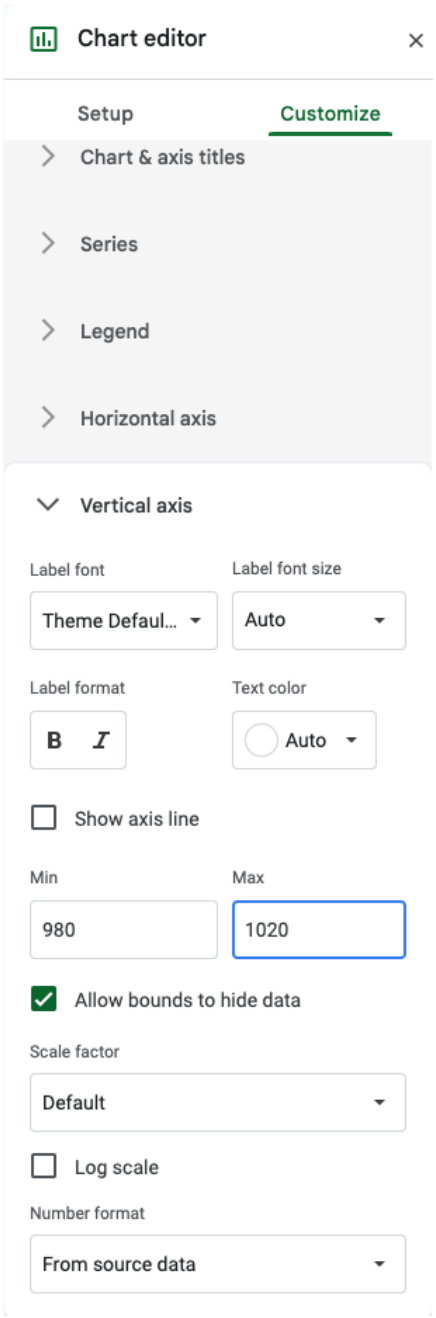
10) Double click on the file in Google Drive to view it. Next - Select the option - “Open With - Google Sheets” from the drop down menu in the middle, to convert it to a “Google Native” file.	
11) Rename your sheet “Florida Winds and BP”	

12) Select Column M (barometric pressures: measured at) followed by Column L (barometric pressures: sea level pressure) and then Insert->Chart

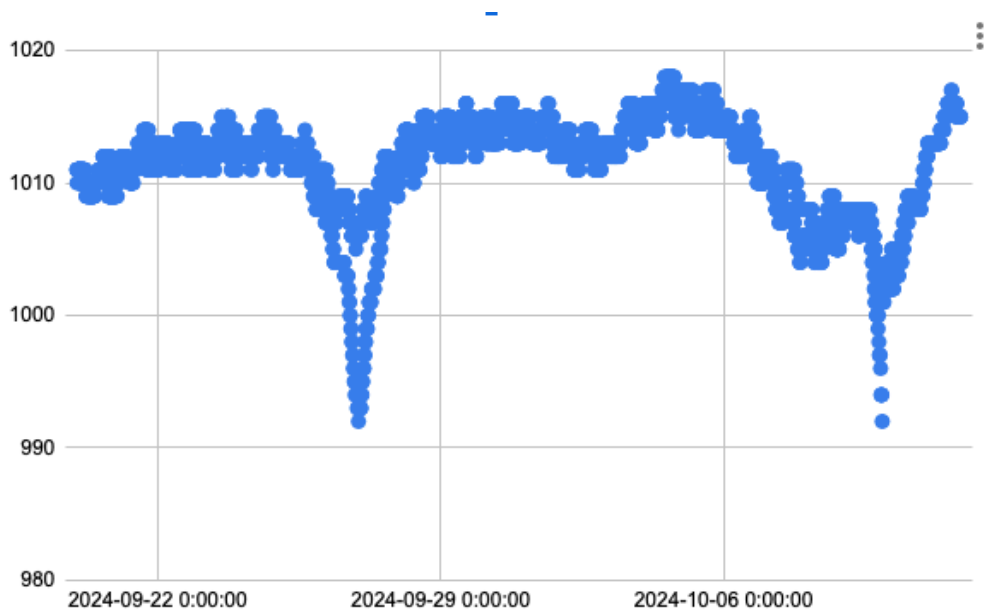
If you select the columns in the wrong order, the chart will put the time axis on the vertical, so be sure to select column M first. Google does provide a switch rows/columns option if needed.



13) Change the chart type to Scatter chart using the menu option on the right	

14) Select the Customize tab and change the Min/Max range to 980 to 1020	

15) You should see a chart like this



16) Now Select Column S (winds:measured at) followed by Column V (winds:gust mps)

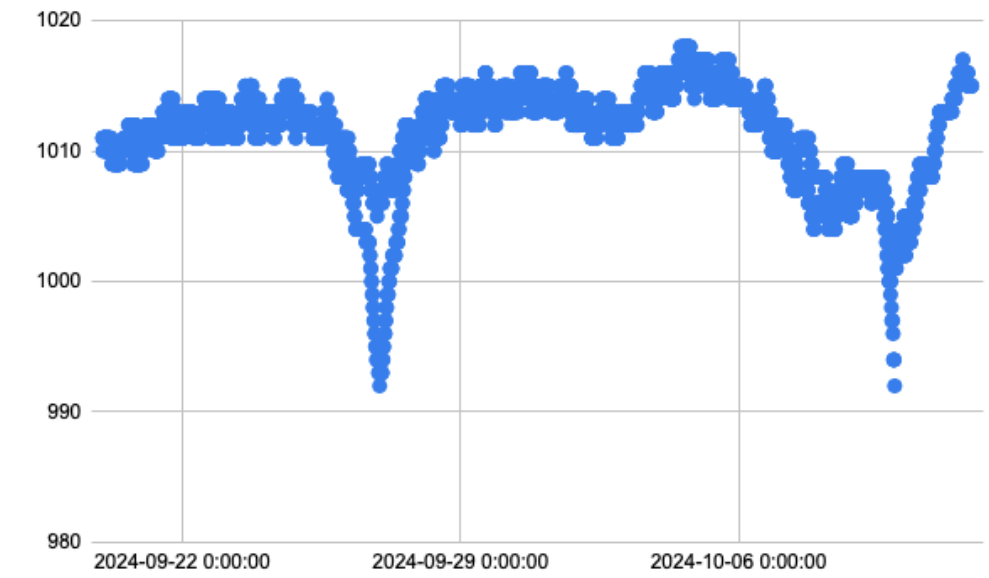
R	S	T	U	V	
ds:userid	**winds:measured at**	winds:speed mp	winds:speed flag	**winds:gust mps**	winc
ıs independent of topography.					
8294323	2024-09-20 1:46:30	0		0	
8294323	2024-09-20 12:16:30	0		0.9	
8294323	2024-09-20 0:31:00	0		0.9	
8294323	2024-09-20 17:01:30	2.2		4.5	
8294323	2024-09-20 18:46:30	0.4		1.8	
8294323	2024-09-20 19:46:00	3.1		6.3	
8294323	2024-09-20 6:16:40	0		0	
8294323	2024-09-20 10:46:20	0		0	

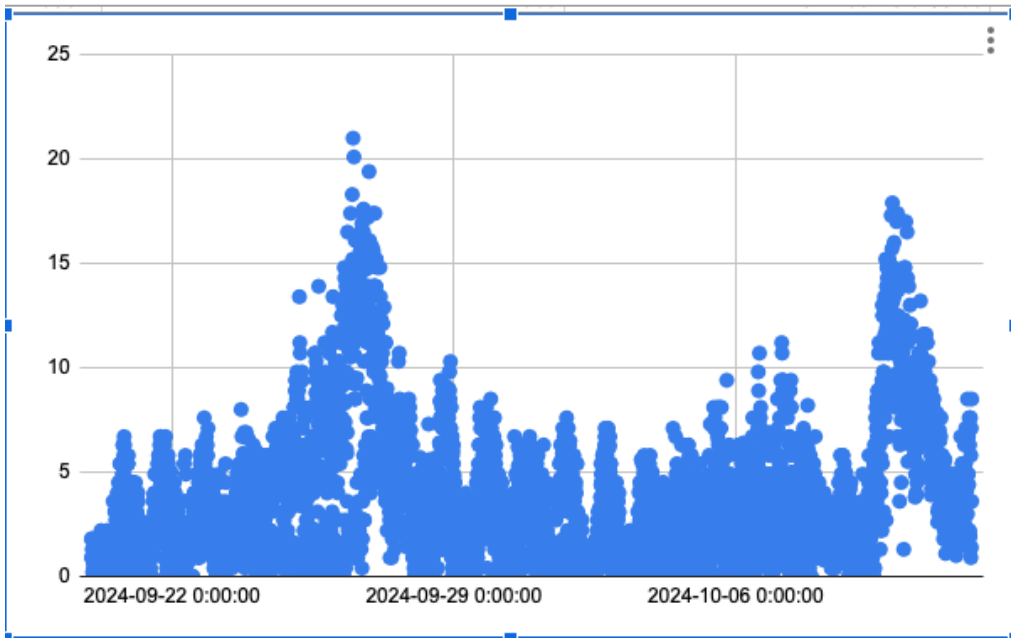
17) Once again, Select Insert->Chart and change the chart type to Scatter

18) Drag the two charts near each other and compare BP with Wind speed

What correlations do you see between barometric pressure and wind speed

Can you tell when the peak of the hurricane was for these schools?





19) How does the information on this nps.gov site compare to what you see on the GLOBE Charts?

What category of hurricane would you say was being observed by these 3 schools?

https://www.nps.gov/articles/saffir-simpson-hurricane-scale.htm

Conversion: 1 meter per second (mps - GLOBE's units) = 2.24 miles per hour (mph used in this chart)

Category	Wind speed	Storm surge (height above normal)	Atmospheric pressure (millibars)	Damage
1	74–95 mph (119–153 kph)	4–5 ft (1.2–1.5 m)	>979	**Minimal**: No real damage to buildings. Damage to unanchored mobile homes. Some damage to poorly constructed signs. Some coastal flooding and minor pier damage.
Examples: Cindy and Ophelia (2005)				
2	96–110 mph (154–177 kph)	6–8 ft (1.8–2.4 m)	965–979	**Moderate**: Some damage to building roofs, doors, and windows. Considerable damage to mobile homes. Damage to piers from flooding. Small craft in unprotected moorings may break their moorings. Some trees blown down. Evacuation of some shoreline residences and low-lying areas required.
Example: The Perfect Storm (1991), Hurricane Isabel (2003)				
3	111–130 mph (178–209 kph)	9–12 ft (3–4 m)	945–964	**Extensive**: Some structural damage to small residences and utility buildings. Large trees blown down. Mobile homes and poorly built signs destroyed. Flooding near the coast destroys smaller structures with larger structures damaged by floating debris. Terrain may be flooded well inland. Evacuation of low-lying residences within several blocks of the shoreline may be required.
Examples: Dennis, Katrina, Rita, and Wilma (2005)				
4	131–155 mph (210–249 kph)	13–18 ft (4–5.5 m)	920–944	**Extreme**: More extensive failure on non-bearing, exterior walls with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland. Massive evacuation of residential areas as far inland as 6 mi (10 km) may be required.
Example: Galveston Hurricane of 1900				
				Catastrophic: Complete roof failure on many residences and industrial buildings. Some complete building failures

Ready for another ADAT Challenge?

Here's a blog about using GLOBE air temperature data to examine Climate change over 20 years of GLOBE history. Try it and see what you get or