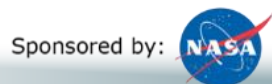


GLOBE

Visualize and Retrieve Your Data

Three steps to Visualization
Data Counts
Advanced Vis Features
Advanced Data Access Tool (ADAT)
GLOBE API



Introduction

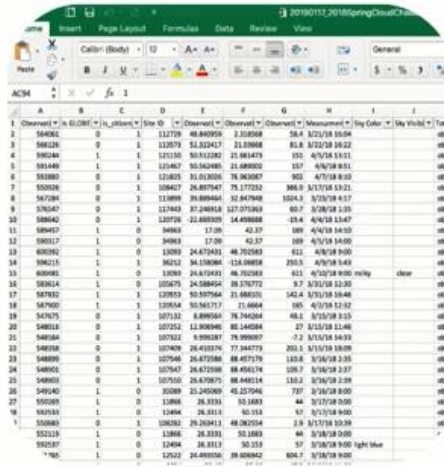
- You should have completed Part 1 for Teachers – Creating a Data Entry Site and Part 2 for Teachers – Entering Measurement Data
- The visualization system uses Production Data only. You will not see any data entered into the training system
- This presentation is available online as well as a video which walks you through the steps
- There is a section for you to try things for yourself after the demonstration and a section to test your knowledge at the end.
- Questions – contact help@nasaglobe.org

Three Ways to Access GLOBE Data on the website

Map It



Spreadsheet



Observer ID	Date	Time	Measurement	Station Name
1	11/27/08	11:00:00	58.4	1/2/18 10:04
2	11/27/08	11:00:00	58.4	1/2/18 10:04
3	11/27/08	11:00:00	58.4	1/2/18 10:04
4	11/27/08	11:00:00	58.4	1/2/18 10:04
5	11/27/08	11:00:00	58.4	1/2/18 10:04
6	11/27/08	11:00:00	58.4	1/2/18 10:04
7	11/27/08	11:00:00	58.4	1/2/18 10:04
8	11/27/08	11:00:00	58.4	1/2/18 10:04
9	11/27/08	11:00:00	58.4	1/2/18 10:04
10	11/27/08	11:00:00	58.4	1/2/18 10:04
11	11/27/08	11:00:00	58.4	1/2/18 10:04
12	11/27/08	11:00:00	58.4	1/2/18 10:04
13	11/27/08	11:00:00	58.4	1/2/18 10:04
14	11/27/08	11:00:00	58.4	1/2/18 10:04
15	11/27/08	11:00:00	58.4	1/2/18 10:04
16	11/27/08	11:00:00	58.4	1/2/18 10:04
17	11/27/08	11:00:00	58.4	1/2/18 10:04
18	11/27/08	11:00:00	58.4	1/2/18 10:04
19	11/27/08	11:00:00	58.4	1/2/18 10:04
20	11/27/08	11:00:00	58.4	1/2/18 10:04
21	11/27/08	11:00:00	58.4	1/2/18 10:04
22	11/27/08	11:00:00	58.4	1/2/18 10:04
23	11/27/08	11:00:00	58.4	1/2/18 10:04
24	11/27/08	11:00:00	58.4	1/2/18 10:04
25	11/27/08	11:00:00	58.4	1/2/18 10:04
26	11/27/08	11:00:00	58.4	1/2/18 10:04
27	11/27/08	11:00:00	58.4	1/2/18 10:04
28	11/27/08	11:00:00	58.4	1/2/18 10:04
29	11/27/08	11:00:00	58.4	1/2/18 10:04
30	11/27/08	11:00:00	58.4	1/2/18 10:04

API

```
curl -X GET "https://api.globe.gov/search/v1/measurement/protocol/protocoltree_height&..."
```

Request URL
https://api.globe.gov/search/v1/measurement/protocol/protocoltree_height&json=FALSE

Server response

Code 200

Response body

```
{
  "protocol": "tree_height",
  "measurement": "2018-03-20",
  "created": "2018-03-20T18:20:00",
  "modified": "2018-03-20T18:20:00",
  "multi": true,
  "organization": "2018-04-18T17:30:00",
  "organization": "College of Earth, Ocean, Atmospheric Sciences (CEAS)",
  "id": "140007",
  "latitude": "27.8321133",
  "country": "United States",
  "countryCode": "USA",
  "longitude": "81.38074",
  "longitude": "-121.65588",
  "elevation": 0,
  "type": "20180320",
  "data": {
    "treeHeightSource": "GLOBE Observer App",
    "treeHeight": "2180.0",
    "treeHeight": "2020.0",
    "treeHeight": "1750.0"
  }
}
```

Visualization System

ADAT

GLOBE API

Visualize and Retrieve your Data

- Now that you've input your data, how can you find it?

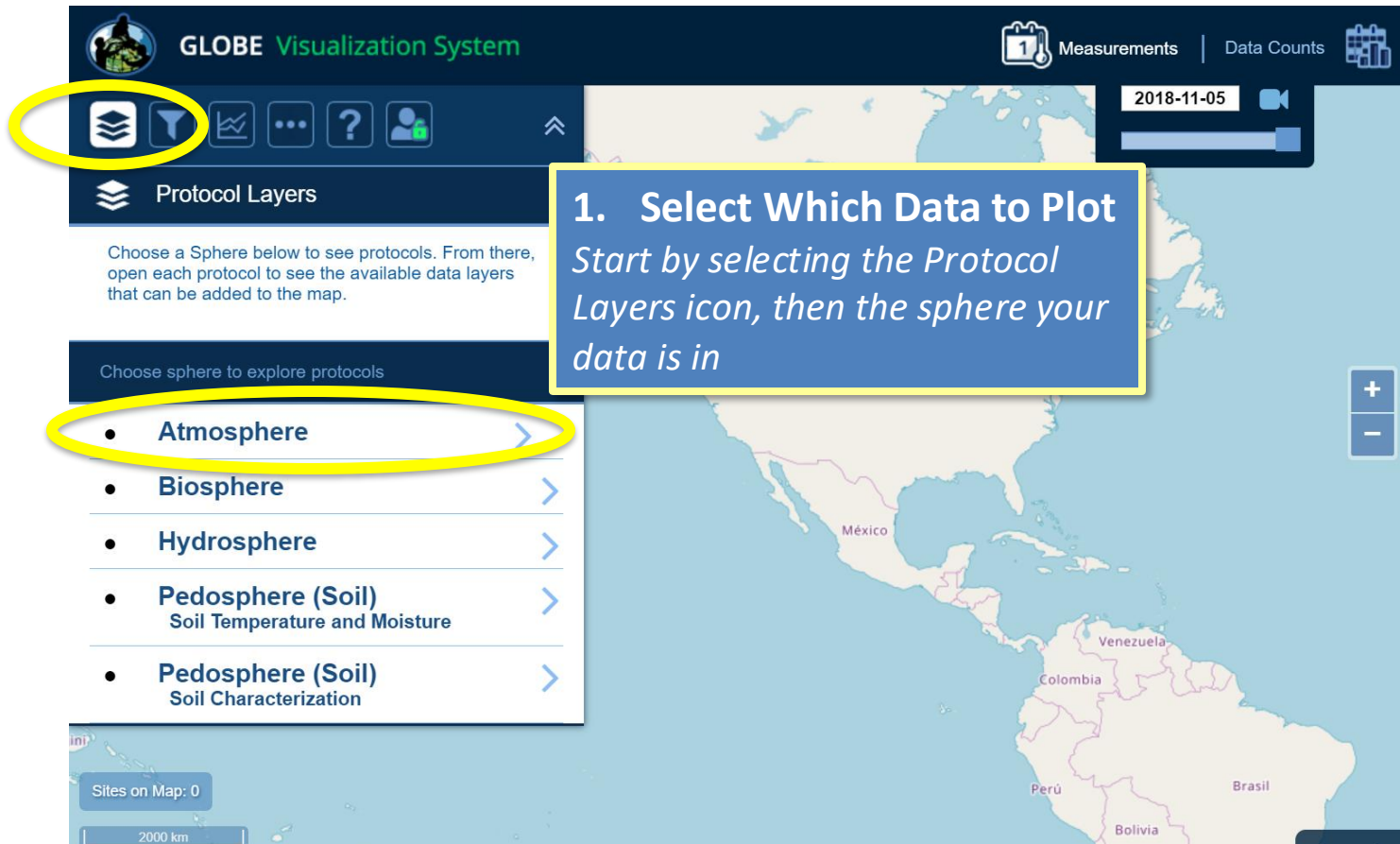
Topics - Visualization

- Navigate to the visualization system
- The pieces of the visualization system
 - Layers, Dates, Filters, Legend, Graphs
- How to view data from a specific protocol on the map
- How to graph and retrieve data for a specific protocol
- Advanced Features
- How to use data counts to find schools that are active in a given protocol

The Basics of the Visualization System

- Select Goto-> from the top and “Visualize Data”
 - Or Go to the homepage and select “Visualize Data”
 - Or <http://vis.globe.gov>
- Three Steps to Visualize your Data:
 1. Select the protocol data you want to see (Add Layers)
 2. Select the Date you want to see the data for
 3. Click on a data point on the map to receive table and graph information

Step 1 – Add Data Layers



GLOBE Visualization System

Measurements | Data Counts

2018-11-05

Protocol Layers

Choose a Sphere below to see protocols. From there, open each protocol to see the available data layers that can be added to the map.

Choose sphere to explore protocols

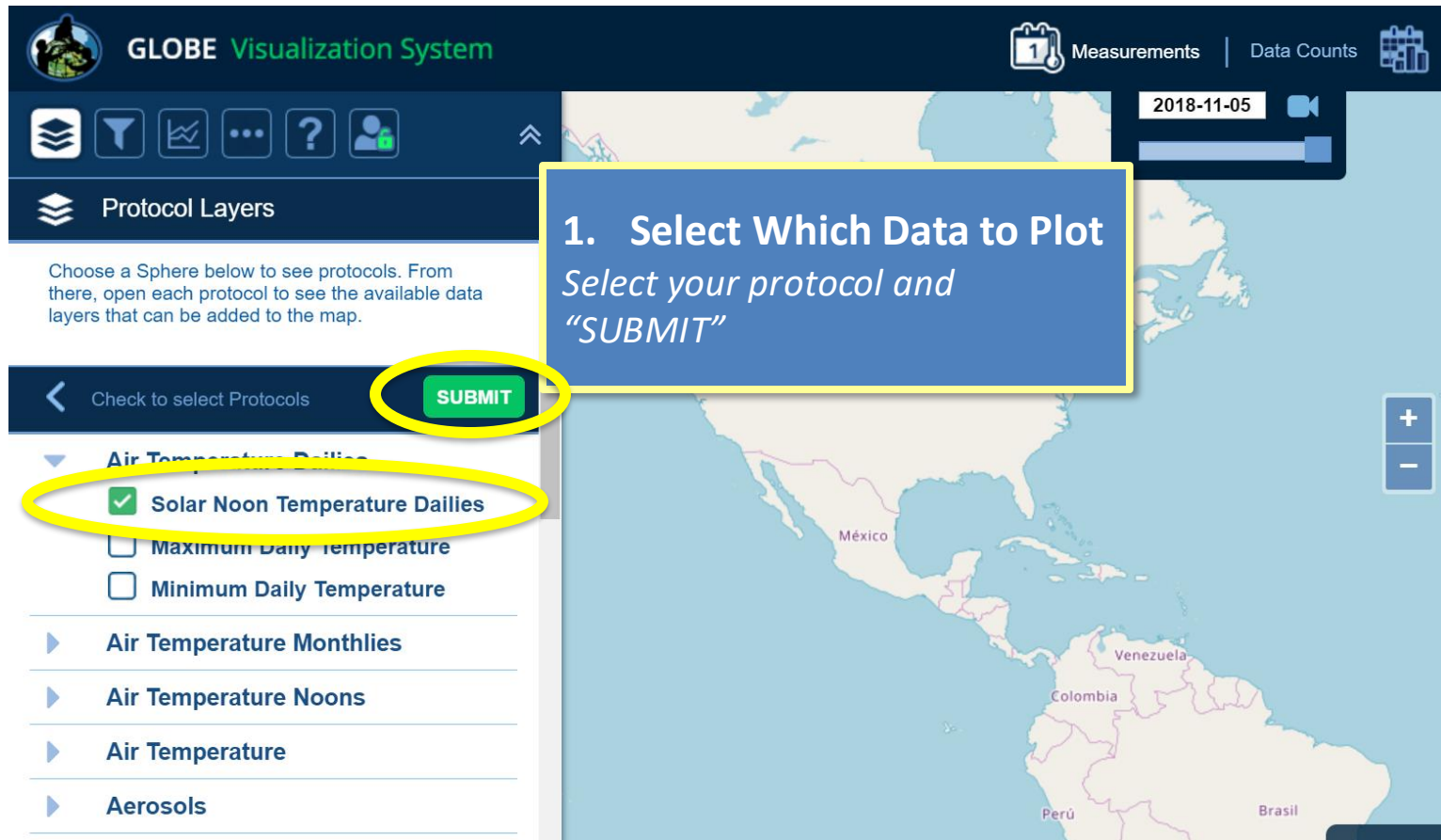
- **Atmosphere**
- Biosphere
- Hydrosphere
- Pedosphere (Soil)
Soil Temperature and Moisture
- Pedosphere (Soil)
Soil Characterization

Sites on Map: 0

2000 km

1. Select Which Data to Plot
Start by selecting the Protocol Layers icon, then the sphere your data is in

Step 1 – Add Data Layers



1. Select Which Data to Plot
Select your protocol and "SUBMIT"

Check to select Protocols **SUBMIT**

- Solar Noon Temperature Dailies
- Maximum Daily temperature
- Minimum Daily Temperature

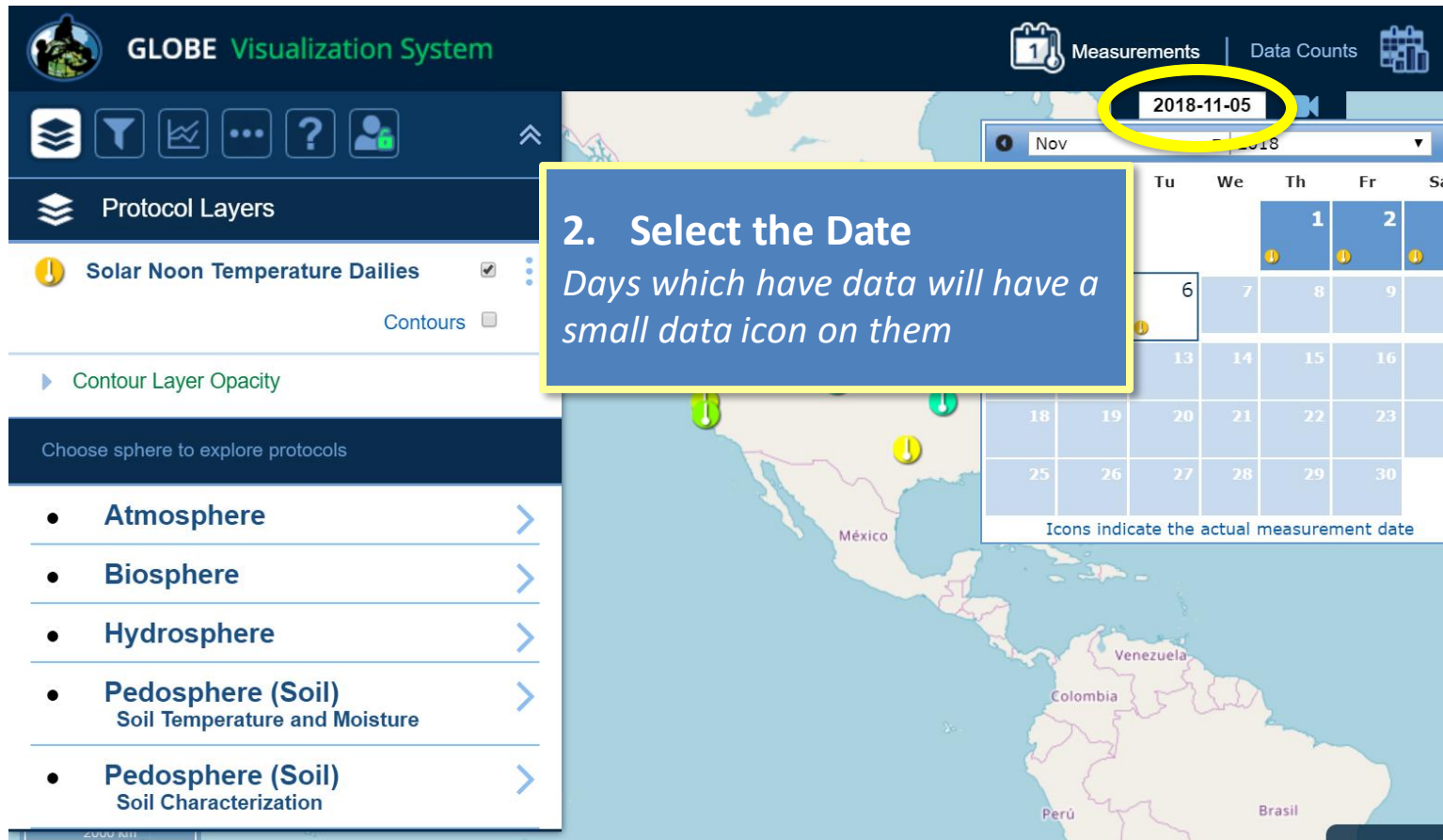
▶ Air Temperature Monthlies

▶ Air Temperature Noons

▶ Air Temperature

▶ Aerosols

Step 2 – Select the Date



GLOBE Visualization System

Measurements | Data Counts

2018-11-05

Nov 2018

2. Select the Date
Days which have data will have a small data icon on them

Icons indicate the actual measurement date

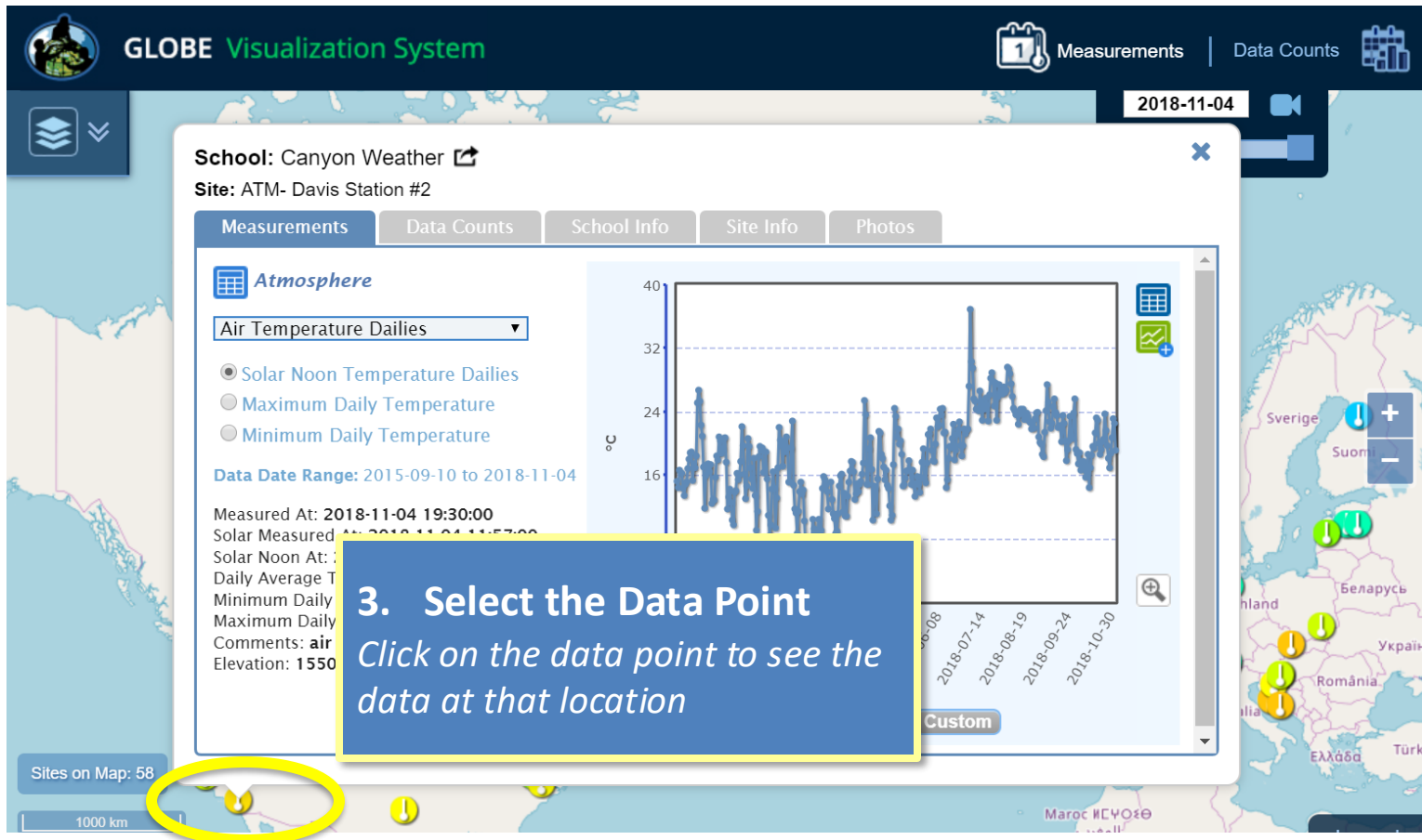
Protocol Layers

- Solar Noon Temperature Dailies Contours
- Contour Layer Opacity

Choose sphere to explore protocols

- Atmosphere >
- Biosphere >
- Hydrosphere >
- Pedosphere (Soil) Soil Temperature and Moisture >
- Pedosphere (Soil) Soil Characterization >

Step 3 – Select the Data Point



The screenshot displays the GLOBE Visualization System interface. At the top, the header includes the GLOBE logo, the text "GLOBE Visualization System", and navigation links for "Measurements" and "Data Counts". A date selector shows "2018-11-04". The main content area is a modal window for "School: Canyon Weather" and "Site: ATM- Davis Station #2". It features tabs for "Measurements", "Data Counts", "School Info", "Site Info", and "Photos". Under the "Measurements" tab, the "Atmosphere" section is active, with a dropdown menu set to "Air Temperature Dailies". Below this, there are radio buttons for "Solar Noon Temperature Dailies", "Maximum Daily Temperature", and "Minimum Daily Temperature". A "Data Date Range" is specified as "2015-09-10 to 2018-11-04". A line graph shows temperature data in degrees Celsius (°C) over time, with a specific data point highlighted. A blue callout box with a yellow border contains the text: "3. Select the Data Point" and "Click on the data point to see the data at that location". In the bottom left corner, a map shows "Sites on Map: 58" with a yellow circle highlighting a specific site marker.

Vis system popup window

See All Atmosphere Data

Go to this School's Page

See Plot Data in a Table

Add this Data to a Multi-site Plot

Change the X-axis Timeline

Visualization System

School: Canyon Weather

Site: ATM- Davis Station #2

Measurements | Data Counts | School Info | Site Info | Photos

Atmosphere

Air Temperature Dailies

- Solar Noon Temperature Dailies
- Maximum Daily Temperature
- Minimum Daily Temperature

Data Date Range: 2015-09-10 to 2018-11-04

Measured At: 2018-11-04 19:30:00
 Solar Measured At: 2018-11-04 11:57:00
 Solar Noon At: 2018-11-04 19:34:00
 Daily Average Temperature: 19.1 °C
 Minimum Daily Temperature: 19.1 °C
 Maximum Daily Temperature: 19.1 °C

Comments: a

Elevation: 159

30 Days | 1 Year | Custom

Advanced Features

- Use Filters - Location/Site/Elevation to find specific locations – school, country, city etc.
- Create an animation
- Use the graph with the + icon to select multiple data sets to graph
 - Allows you to overlay data from multiple sites
- Export layers to KMZ format for using with Google Earth and other similar tools

Filter your results



Select Filter Icon
Filter by teacher, school, country, lat/long or other options

Filters

- Find a Site: None Selected
- Find Multiple Sites: None Selected
- Elevation: -3492 - 7051m
- Observer: (For Clouds data only) All Observations

Filters

- Find a Site:
 - Choose Site
 - Choose Site by School
 - Choose Site by Teacher
- Find Multiple Sites: None Selected
- Elevation: -3492 - 7051m
- Observer: (For Clouds data only) All Observations

Filters

- Find a Site: None Selected
- Find Multiple Sites:
 - By Partner
 - By School or Schools
 - By Place
 - By Lat/Lon Range
 - By Drawing on Map
- Elevation: -3492 - 7051m
- Observer: (For Clouds data only) All Observations

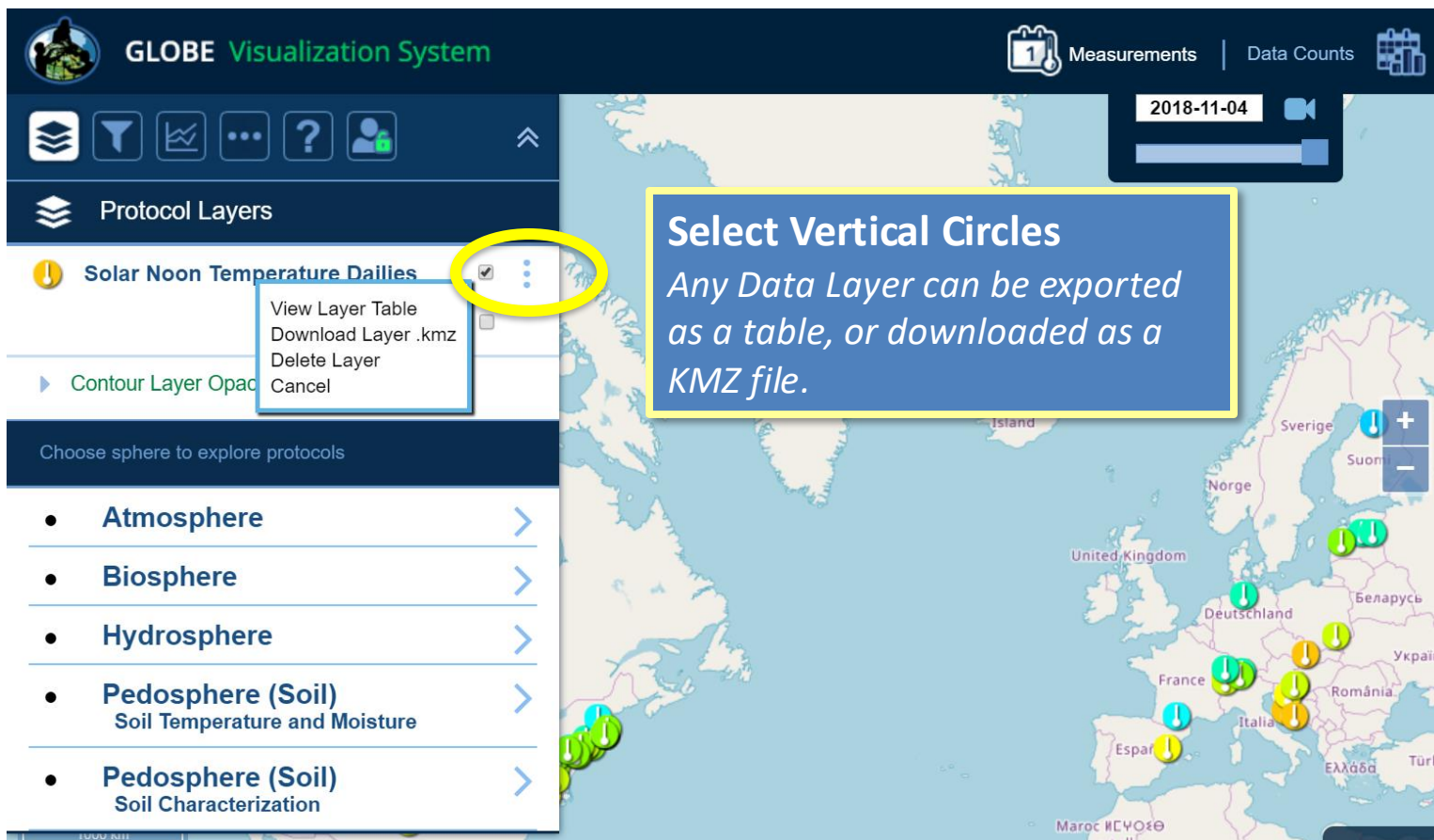
Measurements | Data Counts

2018-11-04

Sites on Map: 58

1000 km

Export Layer



GLOBE Visualization System

Measurements | Data Counts

2018-11-04

Protocol Layers

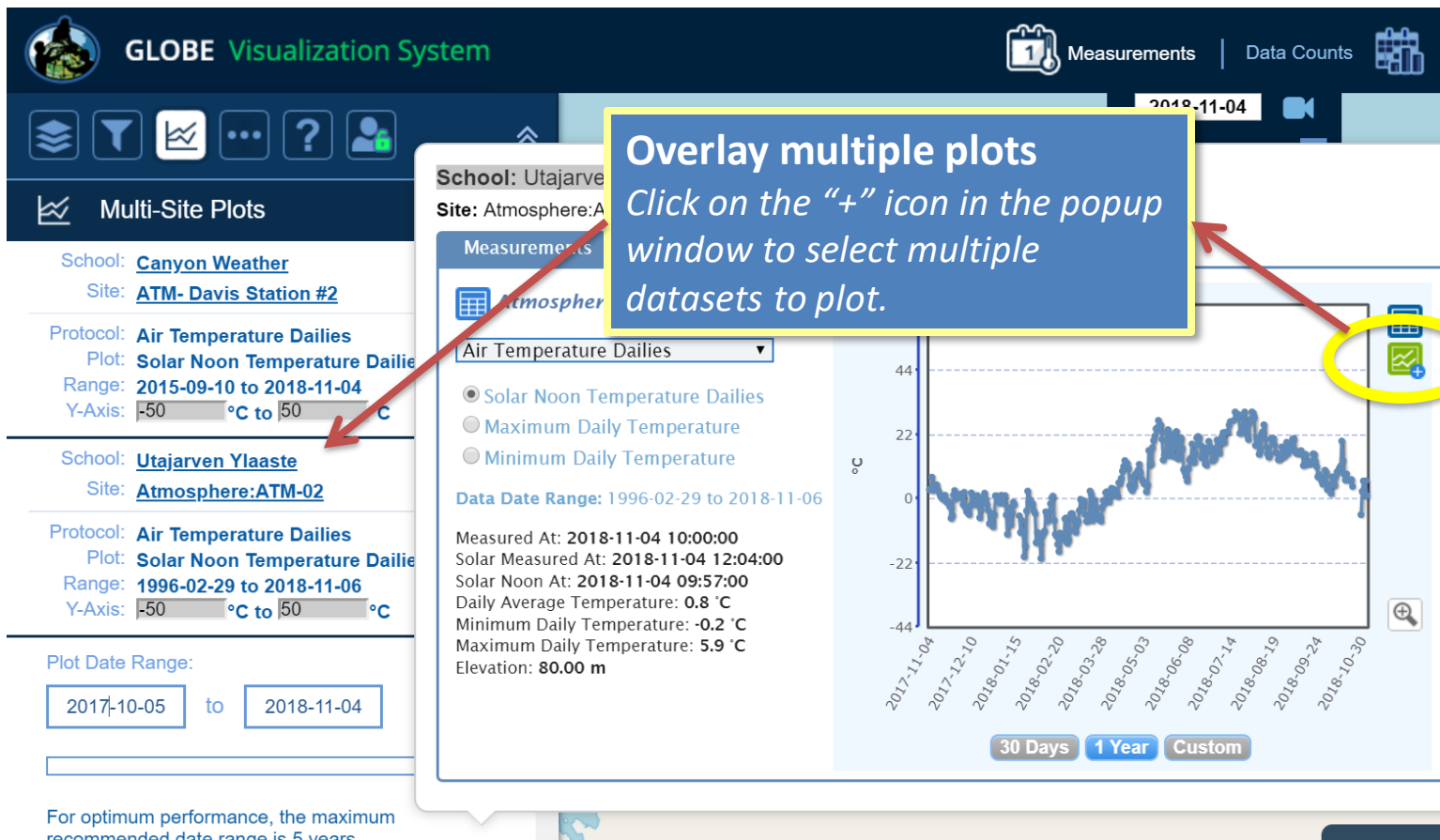
- Solar Noon Temperature Dailies**
 - View Layer Table
 - Download Layer .kmz
 - Delete Layer
 - Cancel
- Contour Layer Opac

Choose sphere to explore protocols

- Atmosphere
- Biosphere
- Hydrosphere
- Pedosphere (Soil)
 - Soil Temperature and Moisture
- Pedosphere (Soil)
 - Soil Characterization

Select Vertical Circles
Any Data Layer can be exported as a table, or downloaded as a KMZ file.

Setup Multi-Site Plot



GLOBE Visualization System

Measurements | Data Counts

2018-11-04

Multi-Site Plots

School: [Canyon Weather](#)
Site: [ATM-Davis Station #2](#)

Protocol: [Air Temperature Dailies](#)
Plot: [Solar Noon Temperature Dailies](#)
Range: [2015-09-10 to 2018-11-04](#)
Y-Axis: [-50 °C to 50 °C](#)

School: [Utajarven Ylaaste](#)
Site: [Atmosphere:ATM-02](#)

Protocol: [Air Temperature Dailies](#)
Plot: [Solar Noon Temperature Dailies](#)
Range: [1996-02-29 to 2018-11-06](#)
Y-Axis: [-50 °C to 50 °C](#)

Plot Date Range:
 to

For optimum performance, the maximum recommended date range is 5 years

Overlay multiple plots
Click on the "+" icon in the popup window to select multiple datasets to plot.

School: [Utajarven Ylaaste](#)
Site: [Atmosphere:ATM-02](#)

Measurements

[Atmosphere](#)

[Air Temperature Dailies](#)

- Solar Noon Temperature Dailies
- Maximum Daily Temperature
- Minimum Daily Temperature

Data Date Range: 1996-02-29 to 2018-11-06

Measured At: 2018-11-04 10:00:00
Solar Measured At: 2018-11-04 12:04:00
Solar Noon At: 2018-11-04 09:57:00
Daily Average Temperature: 0.8 °C
Minimum Daily Temperature: -0.2 °C
Maximum Daily Temperature: 5.9 °C
Elevation: 80.00 m

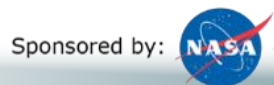
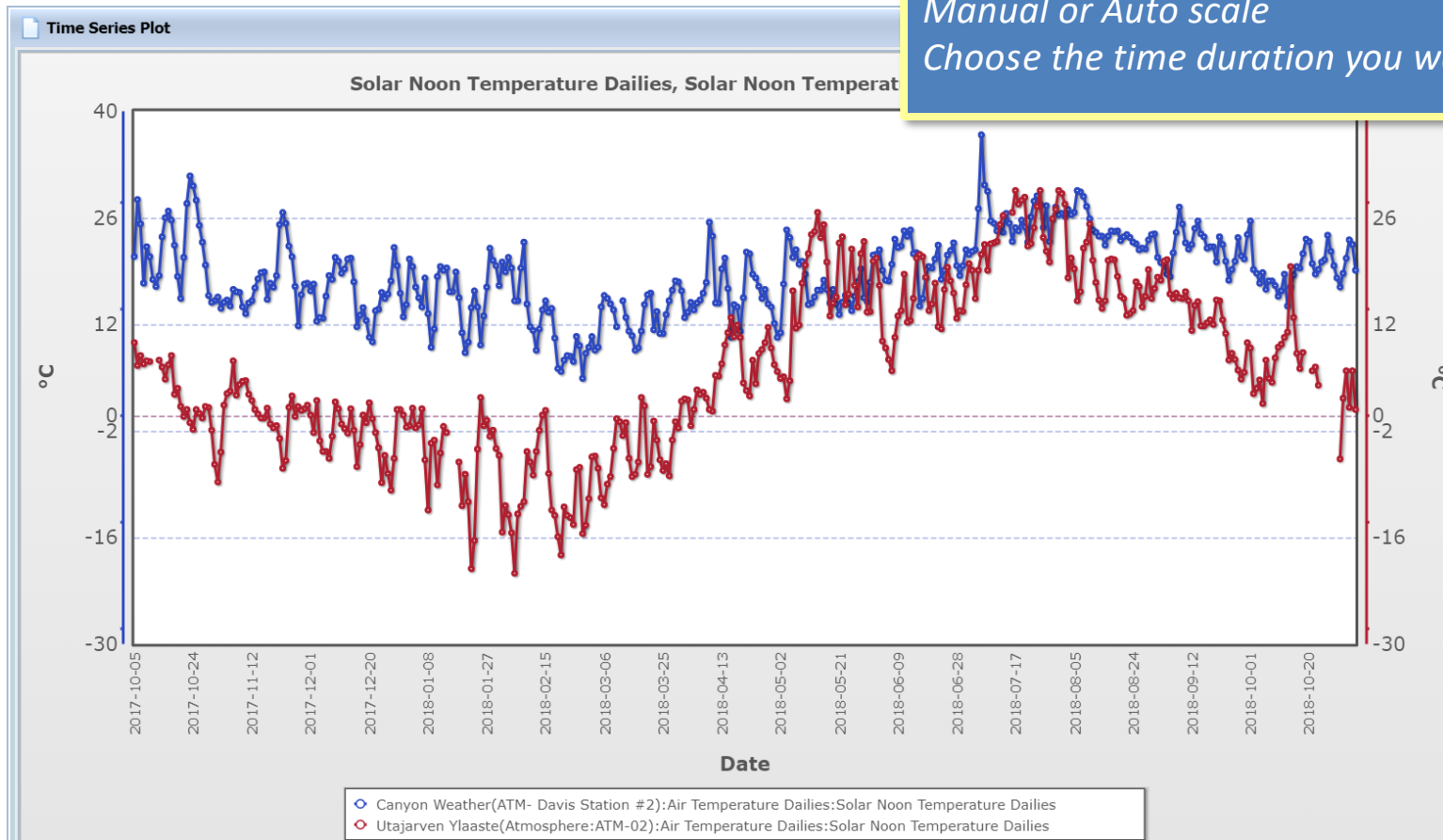
°C

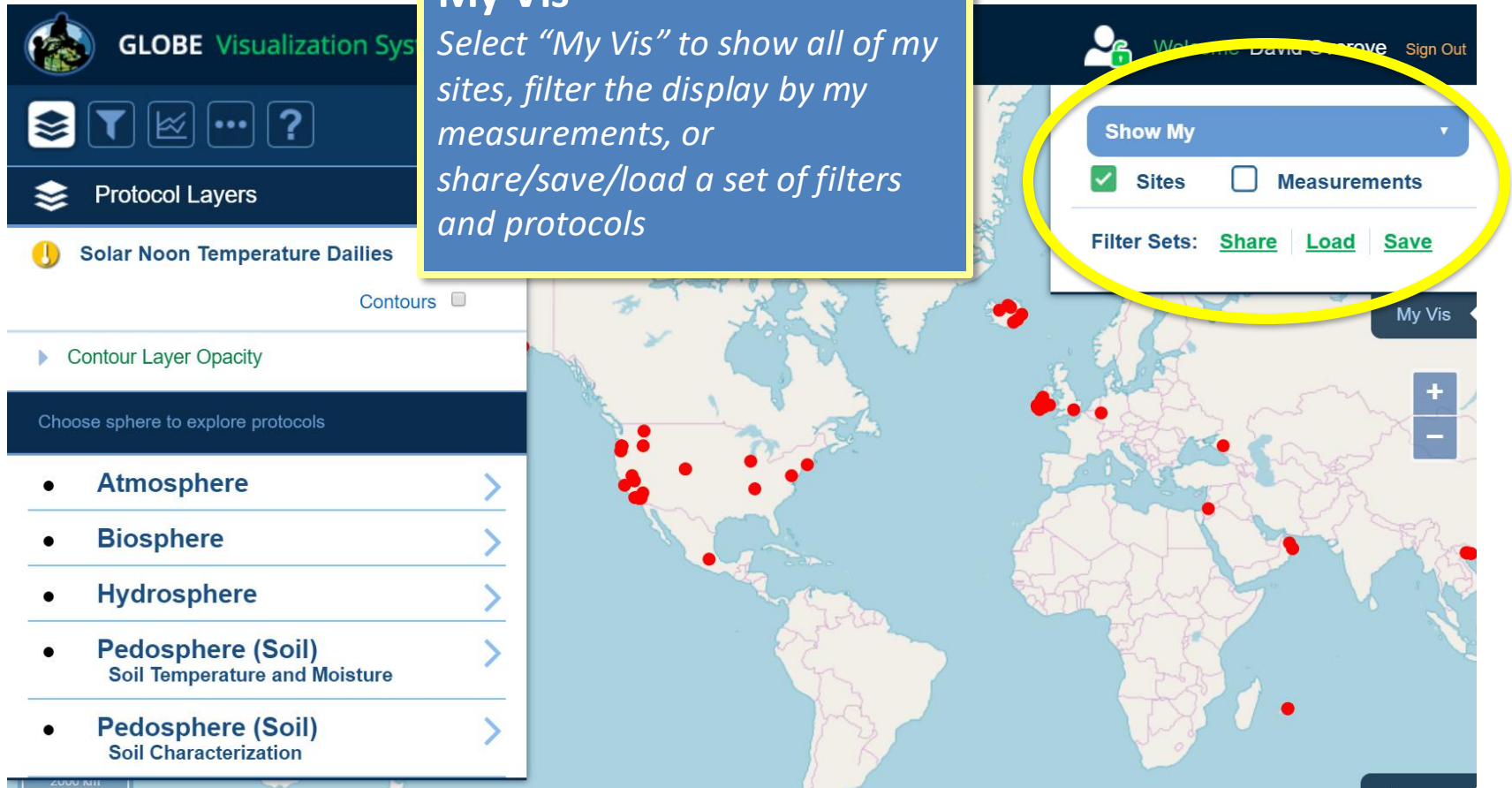
2017-11-04 2017-12-10 2018-01-15 2018-02-20 2018-03-28 2018-05-03 2018-06-08 2018-07-14 2018-08-19 2018-09-24 2018-10-30

30 Days 1 Year Custom

Setup Multi-Site Plot

Multiplot up to 6 data sets
Manual or Auto scale
Choose the time duration you want





My Vis
Select "My Vis" to show all of my sites, filter the display by my measurements, or share/save/load a set of filters and protocols

Contours

Contour Layer Opacity

Choose sphere to explore protocols

- Atmosphere >
- Biosphere >
- Hydrosphere >
- Pedosphere (Soil) >
Soil Temperature and Moisture
- Pedosphere (Soil) >
Soil Characterization

Show My

Sites Measurements

Filter Sets: [Share](#) | [Load](#) | [Save](#)

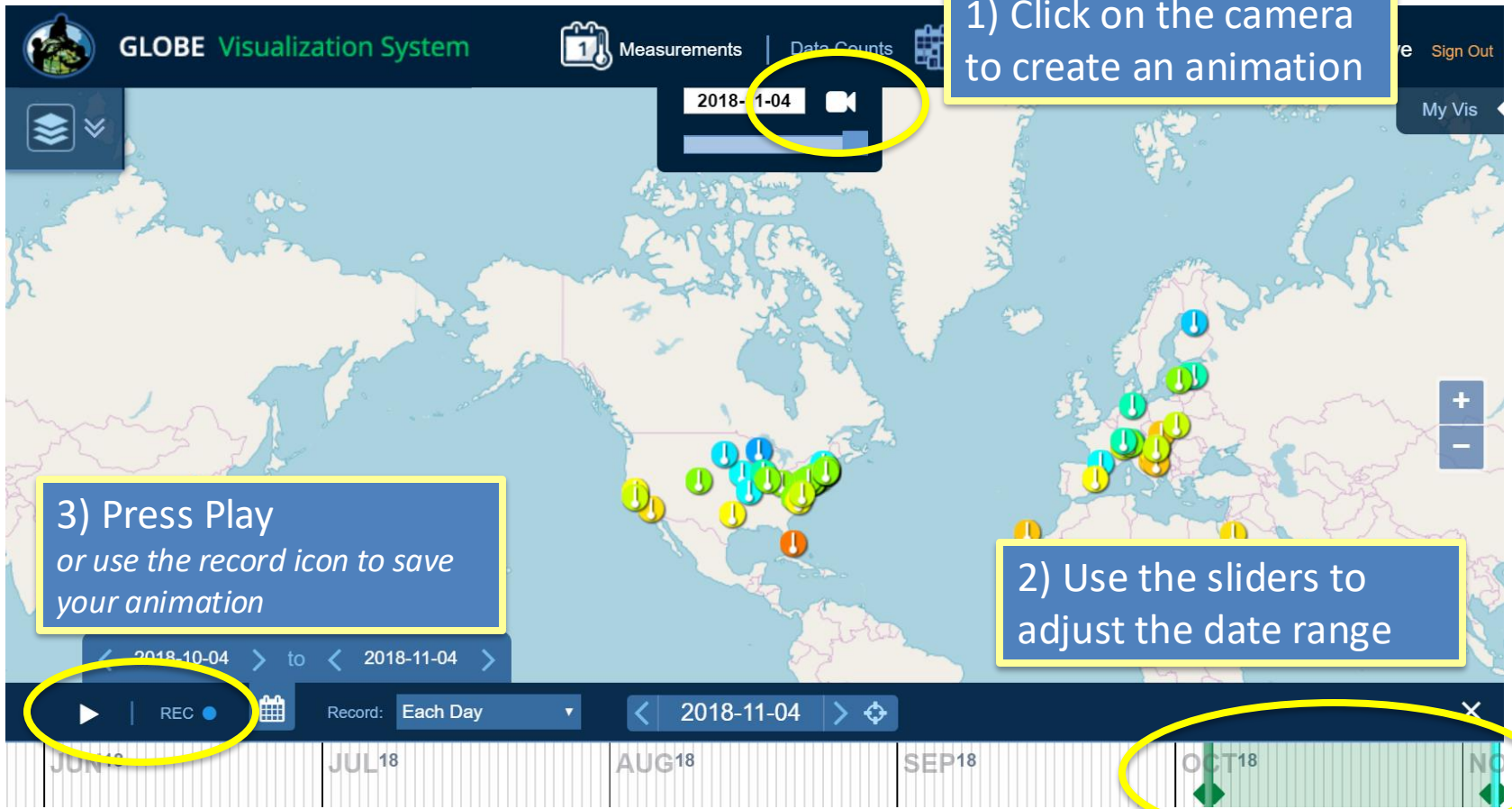
My Vis

Animating Vis

1) Click on the camera to create an animation

2) Use the sliders to adjust the date range

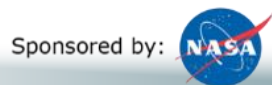
3) Press Play
or use the record icon to save
your animation



The screenshot shows the GLOBE Visualization System interface. At the top, there's a navigation bar with 'GLOBE Visualization System', 'Measurements', and 'Data Counts'. A date range '2018-1-04' is displayed with a camera icon circled in yellow. The main area is a world map with several colored data points (blue, green, yellow, orange) scattered across North America and Europe. On the right side of the map, there are zoom in (+) and zoom out (-) buttons. At the bottom, there's a control panel with a play button circled in yellow, a 'REC' button with a blue dot, and a date range '2018-10-04 to 2018-11-04'. Below this is a timeline showing months from JUN 18 to NOV 18, with 'OCT 18' highlighted in green and a green diamond marker. A yellow oval highlights the 'OCT 18' section of the timeline.

Why use Data Counts?

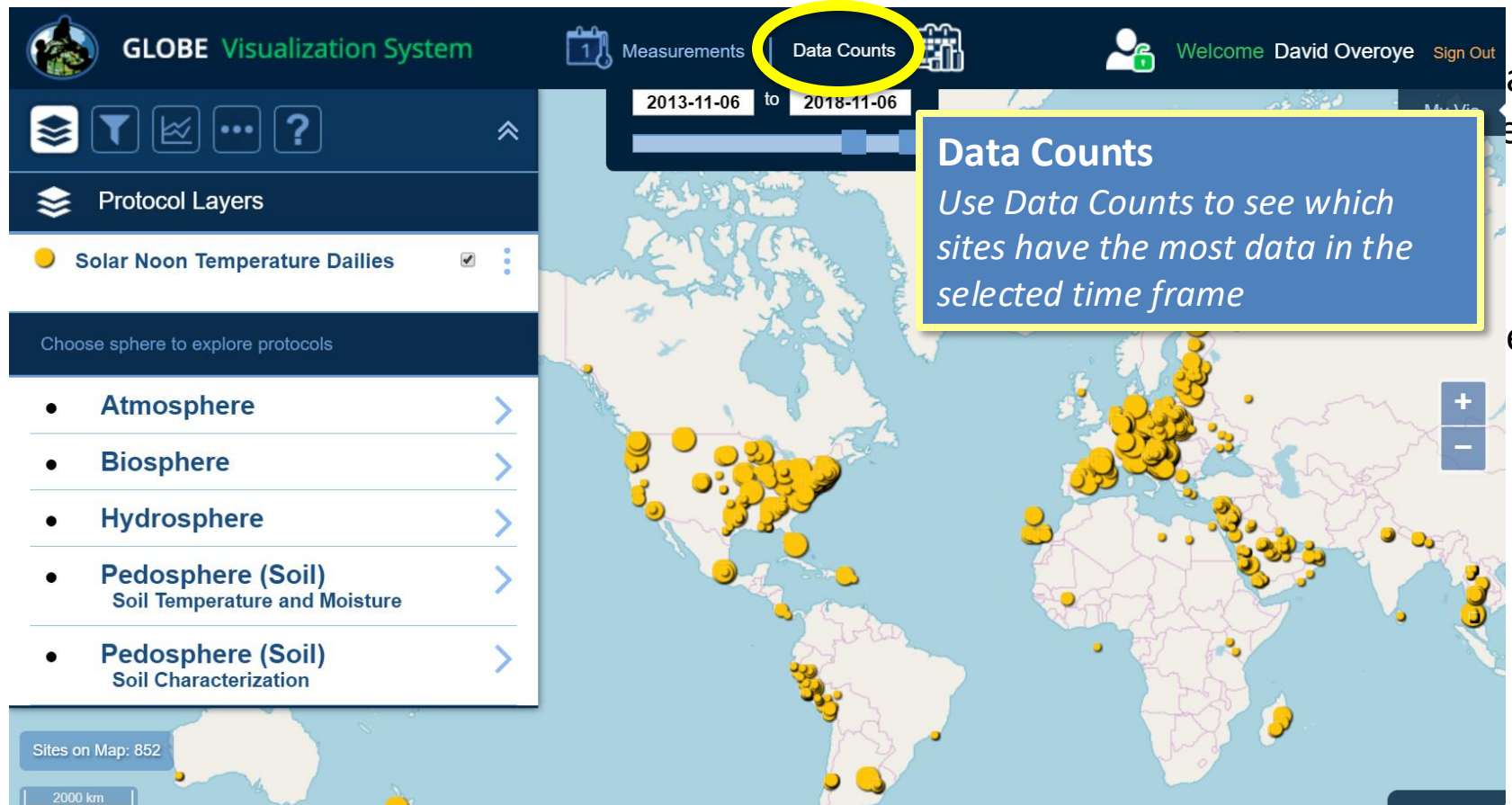
- The Data Counts tab tells you how much data a given location has entered in a particular period of time for a given protocol.
- Looking for someone to collaborate with? Looking for the most current data? Use Data Counts.



How to Use Data Counts

- Select Data Counts on the top menu of the vis system
- Select the protocol(s) you are interested in (ie Solar Noon Temperature Dailies)
- The map will show the total number of measurements which have occurred at any location since the beginning of the GLOBE program.
- Use the Date Range Filter to adjust the date range
- Select a site which has data
 - You can find the school and teacher if you are interested in collaborating.

Data Counts



Your Turn

- What school reported the coldest solar noon temperature in Poland on 2/16/2014? What was the temperature?
- What was the temperature for the one school which reported data in Argentina on that date?
- Make a chart showing the Solar Noon Temperature Dailies for 1 year with data from the school in Poland and the school in Argentina.
 - What do you see happening?
 - Why does it happen
 - Try checking and un-checking the “Auto Y-Axis” button to see what happens
- Find someone in another country that is doing the clouds protocol this year (or a protocol of your choice) and request to be a friend

Your Turn - Answers

- What school reported the coldest temperature in Poland on 2/16/2014? What was the temperature?
 - If you did solar noon dailies - **Gymnasium No 1, daily average -1C, minimum daily, -5C**
 - If you did minimum - **Gimnazium por. J.Czumy in Celestynów -6C**
- What was the average temperature for the one school which reported data in Argentina on that date?
--- **21.7 C**
- Make a chart showing the Solar Noon Temperature Dailies for 1 year with data from the school in Poland and the school in Argentina.
 - What do you see happening?
 - Why does it happen
 - Try checking and un-checking the “Auto Y-Axis” button to see what happens
--- **The temperature cycles are shifted relative to each other...because they are in the north/south latitudes**
- Find someone in another country that is doing the clouds protocol this year (or a protocol of your choice) and request to be a friend

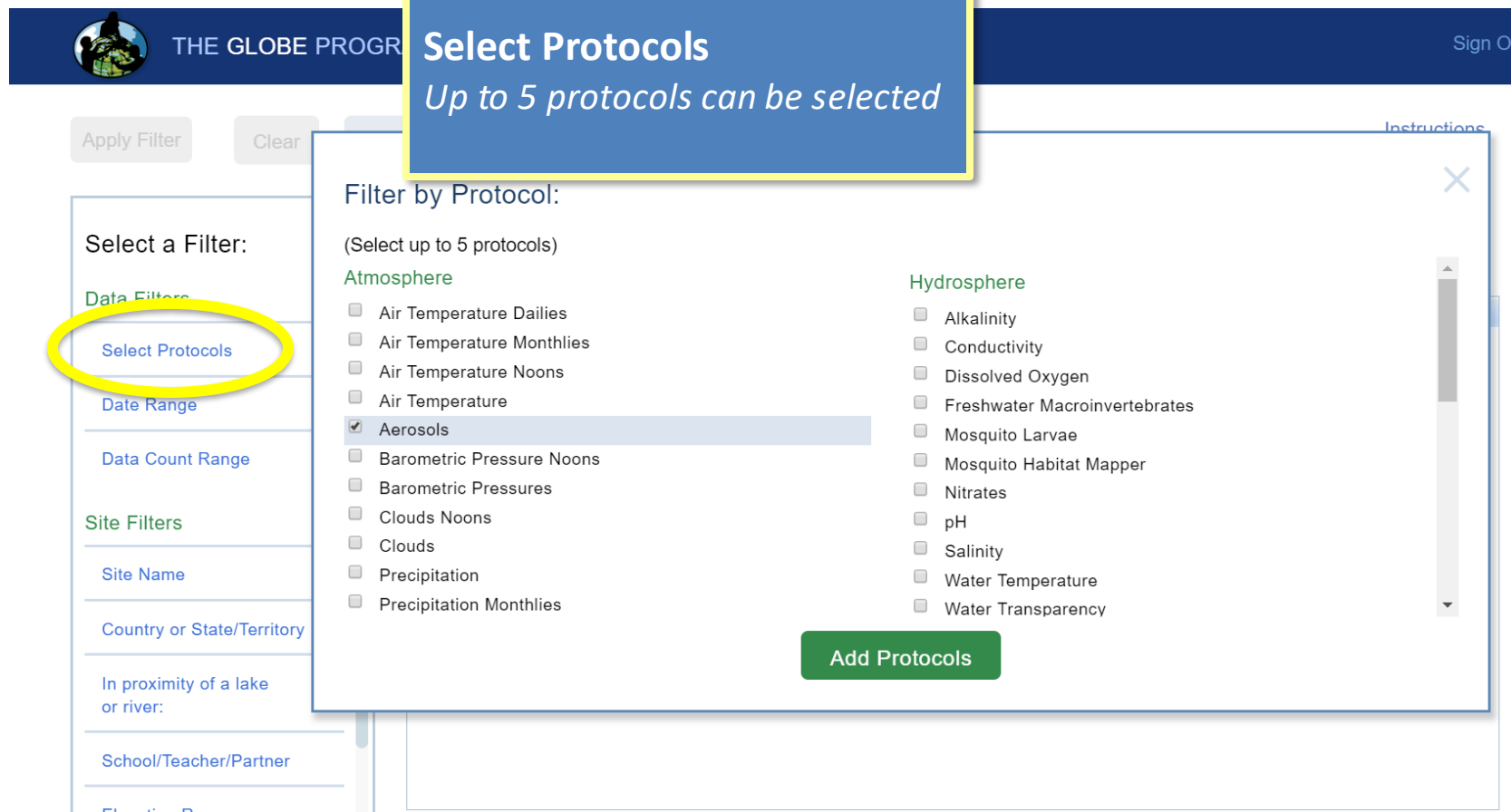


Retrieving Data

Using the Advanced Data Access Tool (ADAT)

- Tool allows you to download GLOBE data from multiple protocols, schools, regions or dates without using the map
 - Used for downloading large quantities of data – multiple protocols and multiple sites
- Select GLOBE Data -> Retrieve GLOBE Data or <http://datasearch.globe.gov/>
- Three Steps –
 1. Select the Protocols you're interested in
 2. Select Filters
 1. Date Range, Country, School or Teacher etc.
 3. Select “Download Measurement Data” (may take a little while!)

Select your protocols



Select Protocols
Up to 5 protocols can be selected

Apply Filter Clear

Select a Filter:

Data Filters

- Select Protocols
- Date Range
- Data Count Range

Site Filters

- Site Name
- Country or State/Territory
- In proximity of a lake or river:
- School/Teacher/Partner
- Elevation Range

Filter by Protocol:

(Select up to 5 protocols)

Atmosphere

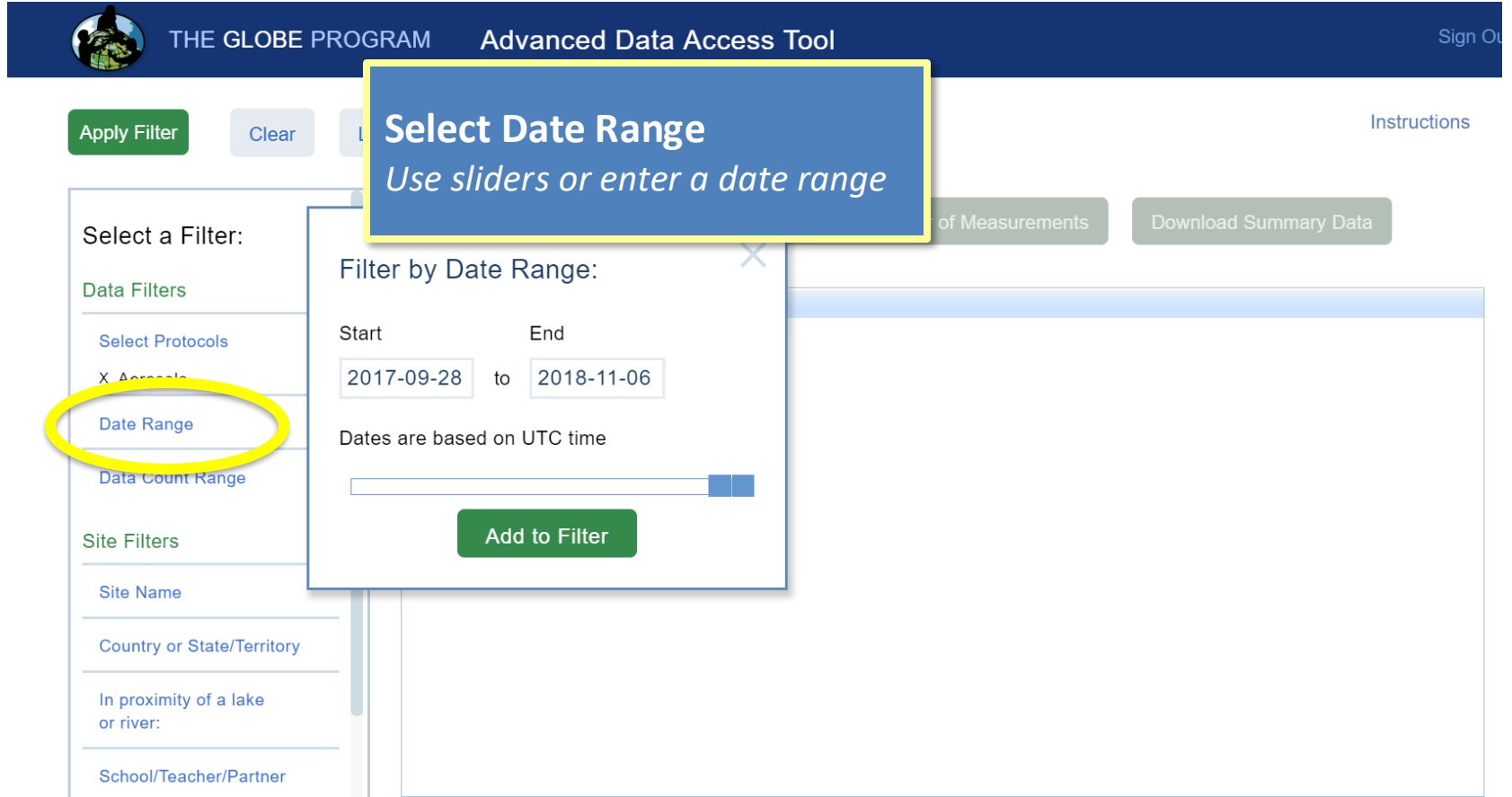
- Air Temperature Dailies
- Air Temperature Monthlies
- Air Temperature Noons
- Air Temperature
- Aerosols
- Barometric Pressure Noons
- Barometric Pressures
- Clouds Noons
- Clouds
- Precipitation
- Precipitation Monthlies

Hydrosphere

- Alkalinity
- Conductivity
- Dissolved Oxygen
- Freshwater Macroinvertebrates
- Mosquito Larvae
- Mosquito Habitat Mapper
- Nitrates
- pH
- Salinity
- Water Temperature
- Water Transparency


Add Protocols

Select the date range



The screenshot displays the 'Advanced Data Access Tool' interface. A blue callout box with a yellow border contains the text: **Select Date Range** and *Use sliders or enter a date range*. The interface includes a top navigation bar with the 'THE GLOBE PROGRAM' logo and the text 'Advanced Data Access Tool'. Below the navigation bar, there are buttons for 'Apply Filter', 'Clear', and 'Instructions'. A 'Filter by Date Range' dialog box is open, showing 'Start' and 'End' date fields with the values '2017-09-28' and '2018-11-06' respectively. Below the date fields, it states 'Dates are based on UTC time' and features a horizontal slider. A green 'Add to Filter' button is positioned at the bottom of the dialog. On the left side of the interface, under 'Select a Filter:', there are sections for 'Data Filters' and 'Site Filters'. The 'Date Range' option under 'Data Filters' is circled in yellow.

Add other filters if needed then "Apply Filter"


Sign Out

Apply Filter
Clear
Load

Apply Filters

Select any additional filtering, then click "Apply Filter" to see how much data is available for download

[Instructions](#)

Select a Filter:

Data Filters

[Select Protocols](#)

Aerosols

[Date Range](#)

2017-01-01 to 2018-11-06

[Data Count Range](#)

Site Filters

[Site Name](#)

[Country or State/Territory](#)


[In proximity of a lake or river:](#)

80 Sites Found




Obtain Measurement Data
Download Summary Data

School Name	Name	Latitude	Longitude	Elevation
Escuela de Enseñanza Media 7 "Nicolas Copernico"	COPERNICO:ATM-01	-34.6427	-58.5405	21.8
SPS Karvina	ATM skola:ATM-01	49.8615	18.5502	255
ZS Manesova Otrokovice	Garden meteorological station:ATM-01	49.2178	17.511	183
IES Los Cristianos	LOS CRISTIANOS-ARONA:ATM-01	28.058	-16.719	25
IES Yaiza	I.E.S.YAIZA:ATM-01	29.5671	-14.1763	104.8
Collège de Barétous	college d'Arette:ATM-01	43.09471	-0.71333	280
Lycée Bernard PALISSY	Grande-Cour:ATM-01	44.1998	0.6243	50.6
II Gimnazija Zagreb	School Location:ATM-01	45.2035	16.0292	125
Tehnicka skola Daruvar	School Location:ATM-01	45.5972	17.2216	145.3
Skola Za Medicinske Sestre Vrapce	Vrapce 01:ATM-01	45.8163	15.8974	138
Skola Za Medicinske Sestre Vrapce	Vrapce 02:ATM-02	45.8162	15.8974	128
Rogozin A- Junior High School	SCHOOL YARD:ATM-01	32.48	35.06	47.2
Helen Parkhurst	Parkwijk Rivier:ATM-01	52.37132	5.24053	-47
Ramey School	School Location:ATM-01	18.49877	-67.13928	125.1
Texas State University	SWT weather station:ATM-01	29.8884	-97.9458	254
Texas State University	Austin:ATM-08	30.25806	-97.75162	159.9
Texas State University	Round Rock High School:ATM-09	30.5091	-97.69755	279.9
Texas State University	San Antonio:ATM-11	29.3097	-98.3779	244.7
Texas State University	South Austin:ATM-13	30.10509	-97.50045	249.8
Texas State University	South Austin - JT:ATM-15	30.24	-97.77	209.9

Sponsored by:



Supported by:

Download the Measurement Data

[Apply Filter](#)
[Clear](#)
[Load](#)
[Save](#)
Data Last Updated: 2018-11-07

[Instructions](#)

80 Sites Found

Download Measurement Data (~4100)

Download Summary Data

Select a Filter:

- Data
- Select
- X Axis
- Date
- X 2
- Data Count Range
- Site Filters
- Site Name
- Country or State/Territory
- In proximity of a lake or river:
- School/Teacher/Partner

Download Data
Select Obtain Measurement data and download the data

School Name	Name	Latitude	Longitude	Elevation					
ERNICO:ATM-01		-34.6427	-58.5405	21.8					
skola:ATM-01		49.8615	18.5502	255					
den meteorological station:ATM-01		49.2178	17.511	183					
CRISTIANOS-ARONA:ATM-01		28.058	-16.719	25					
S.YAIZA:ATM-01		29.5671	-14.1763	104.8					
age d'Arrette:ATM-01		43.09471	-0.71333	280					
nde-Cour:ATM-01		44.1998	0.6243	50.6					
ool Location:ATM-01		45.2035	16.0292	125					
ool Location:ATM-01		45.5972	17.2216	145.3					
Skola Za Medicinske Sestre Vrapce	Vrapce 01:ATM-01	45.8163	15.8974	138					
Skola Za Medicinske Sestre Vrapce	Vrapce 02:ATM-02	45.8162	15.8974	128					
Rogozin A- Junior High School	SCHOOL YARD:ATM-01	32.48	35.06	47.7					
org_name	site_name	latitude	longitude	elevation	measured_on	aerosols:measured at	aerosols:solar measured	aerosols:solar noon at	
The name assigned to The latitude of The longitude of The elevation of The date only when the data were observed in Coordinated Universal Time (UTC)									
3	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/28/2017	2017-09-28T09:45:00	2017-09-28T12:30:00	2017-09-28T09:12:00
4	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/28/2017	2017-09-28T09:45:00	2017-09-28T12:30:00	2017-09-28T09:12:00
5	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/28/2017	2017-09-28T09:45:00	2017-09-28T12:30:00	2017-09-28T09:12:00
6	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/29/2017	2017-09-29T09:45:00	2017-09-29T12:34:00	2017-09-29T09:12:00
7	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/29/2017	2017-09-29T09:45:00	2017-09-29T12:34:00	2017-09-29T09:12:00
8	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/29/2017	2017-09-29T09:45:00	2017-09-29T12:34:00	2017-09-29T09:12:00
9	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/30/2017	2017-09-30T09:45:00	2017-09-30T12:34:00	2017-09-30T09:12:00
10	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/30/2017	2017-09-30T09:45:00	2017-09-30T12:34:00	2017-09-30T09:12:00
11	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	9/30/2017	2017-09-30T09:45:00	2017-09-30T12:34:00	2017-09-30T09:12:00
12	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/1/2017	2017-10-01T09:45:00	2017-10-01T12:35:00	2017-10-01T09:11:00
13	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/1/2017	2017-10-01T09:45:00	2017-10-01T12:35:00	2017-10-01T09:11:00
14	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/1/2017	2017-10-01T09:45:00	2017-10-01T12:35:00	2017-10-01T09:11:00
15	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/2/2017	2017-10-02T09:45:00	2017-10-02T12:35:00	2017-10-02T09:11:00
16	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/2/2017	2017-10-02T09:45:00	2017-10-02T12:35:00	2017-10-02T09:11:00
17	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/2/2017	2017-10-02T09:45:00	2017-10-02T12:35:00	2017-10-02T09:11:00
18	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/3/2017	2017-10-03T09:45:00	2017-10-03T12:35:00	2017-10-03T09:11:00
19	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/3/2017	2017-10-03T09:45:00	2017-10-03T12:35:00	2017-10-03T09:11:00
20	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/3/2017	2017-10-03T09:45:00	2017-10-03T12:35:00	2017-10-03T09:11:00
21	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/4/2017	2017-10-04T09:45:00	2017-10-04T12:36:00	2017-10-04T09:10:00
22	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/4/2017	2017-10-04T09:45:00	2017-10-04T12:36:00	2017-10-04T09:10:00
23	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/4/2017	2017-10-04T09:45:00	2017-10-04T12:36:00	2017-10-04T09:10:00
24	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/5/2017	2017-10-05T09:45:00	2017-10-05T12:36:00	2017-10-05T09:10:00
25	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/5/2017	2017-10-05T09:45:00	2017-10-05T12:36:00	2017-10-05T09:10:00
26	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/5/2017	2017-10-05T09:45:00	2017-10-05T12:36:00	2017-10-05T09:10:00
27	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/6/2017	2017-10-06T09:45:00	2017-10-06T12:36:00	2017-10-06T09:10:00
28	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/6/2017	2017-10-06T09:45:00	2017-10-06T12:36:00	2017-10-06T09:10:00
29	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/6/2017	2017-10-06T09:45:00	2017-10-06T12:36:00	2017-10-06T09:10:00
30	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/7/2017	2017-10-07T09:45:00	2017-10-07T12:37:00	2017-10-07T09:09:00
31	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/7/2017	2017-10-07T09:45:00	2017-10-07T12:37:00	2017-10-07T09:09:00
32	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/7/2017	2017-10-07T09:45:00	2017-10-07T12:37:00	2017-10-07T09:09:00
33	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/8/2017	2017-10-08T09:45:00	2017-10-08T12:37:00	2017-10-08T09:09:00
34	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/8/2017	2017-10-08T09:45:00	2017-10-08T12:37:00	2017-10-08T09:09:00
35	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/8/2017	2017-10-08T09:45:00	2017-10-08T12:37:00	2017-10-08T09:09:00
36	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/9/2017	2017-10-09T09:45:00	2017-10-09T12:37:00	2017-10-09T09:09:00
37	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/9/2017	2017-10-09T09:45:00	2017-10-09T12:37:00	2017-10-09T09:09:00
38	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/9/2017	2017-10-09T09:45:00	2017-10-09T12:37:00	2017-10-09T09:09:00
39	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/10/2017	2017-10-10T09:45:00	2017-10-10T12:38:00	2017-10-10T09:09:00
40	Al-Hussein Bin Ali Secondary School at Makkah Al-Mukarramah	AL-RAFEY STREET	21.23	39.47	267.7	10/10/2017	2017-10-10T09:45:00	2017-10-10T12:38:00	2017-10-10T09:09:00



Supported by

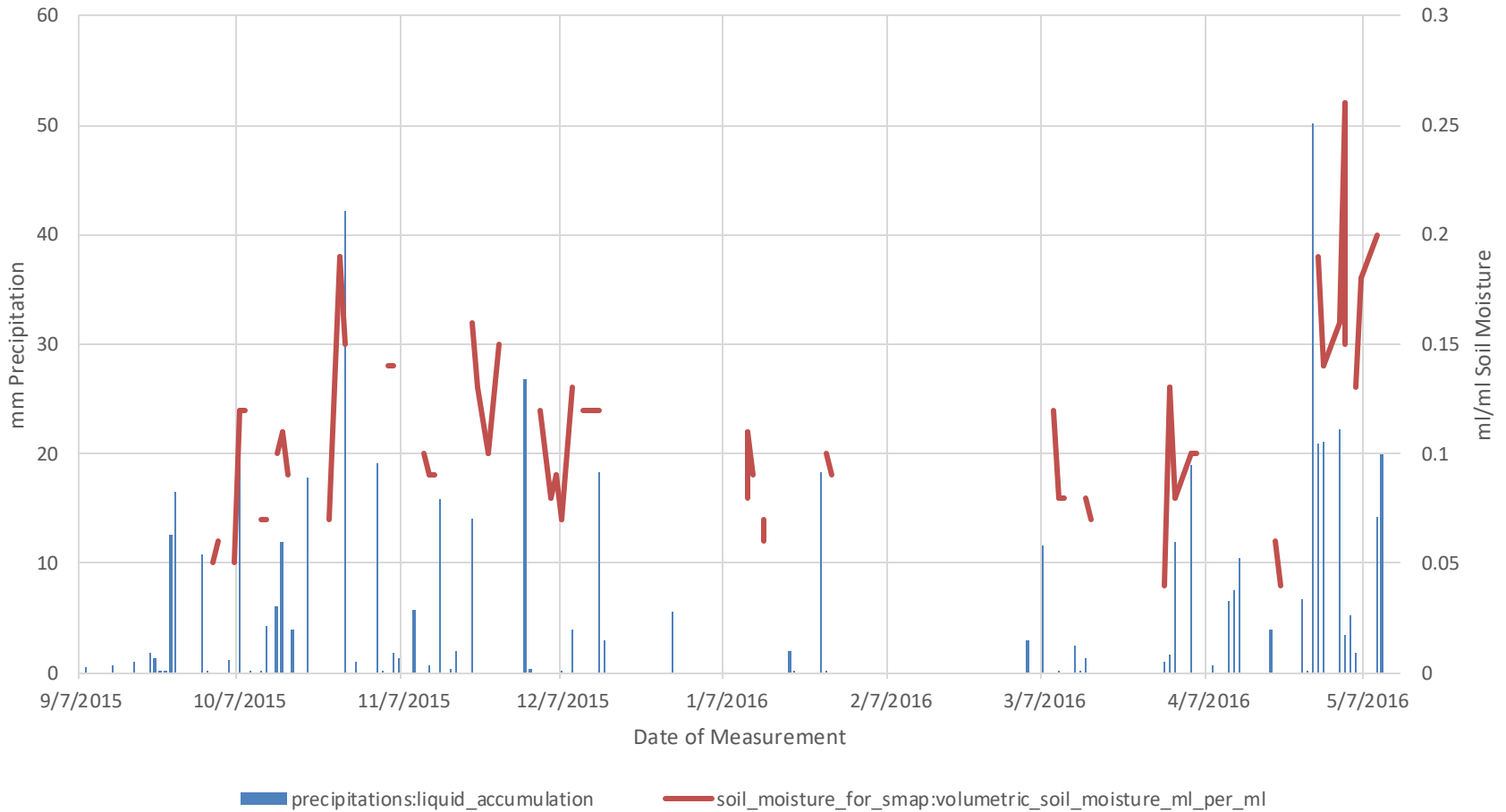
ADAT – Your Turn

- How many sites measured Soil Moisture (SMAP) during the Northern Hemisphere Fall and Winter periods (9/1/2015 – 2/29/2016) – 87 Sites
 - How many data points were taken
 - Which school and site had the highest gravimetric soil moisture (g/g), when was it measured, and what was the value?
- Export all Precipitation and SMAP data from the Ramey School for the period 9/1/2015 through 5/17/2016
 - Plot the data – Is there a correlation between precipitation and Soil Moisture?

Answers - ADAT

- How many sites measured Soil Moisture (SMAP) during the Northern Hemisphere Fall and Winter periods (9/1/2015 – 2/29/2016) – 87 Sites
 - How many data points were taken (1168)
- Which school and site had the highest gravimetric soil moisture (g/g), when was it measured, and what was the value?
 - Srednja skola Vela Luka, 1/15/2016, 0.85 g/g
- Export all Precipitation and SMAP data from the Ramey School for the period 9/1/2015 through 5/17/2016
 - Plot the data – Is there a correlation between precipitation and Soil Moisture? [see next page – what do you think?]

Ramey School Precipitation and Soil Moisture – Do you see a correlation?



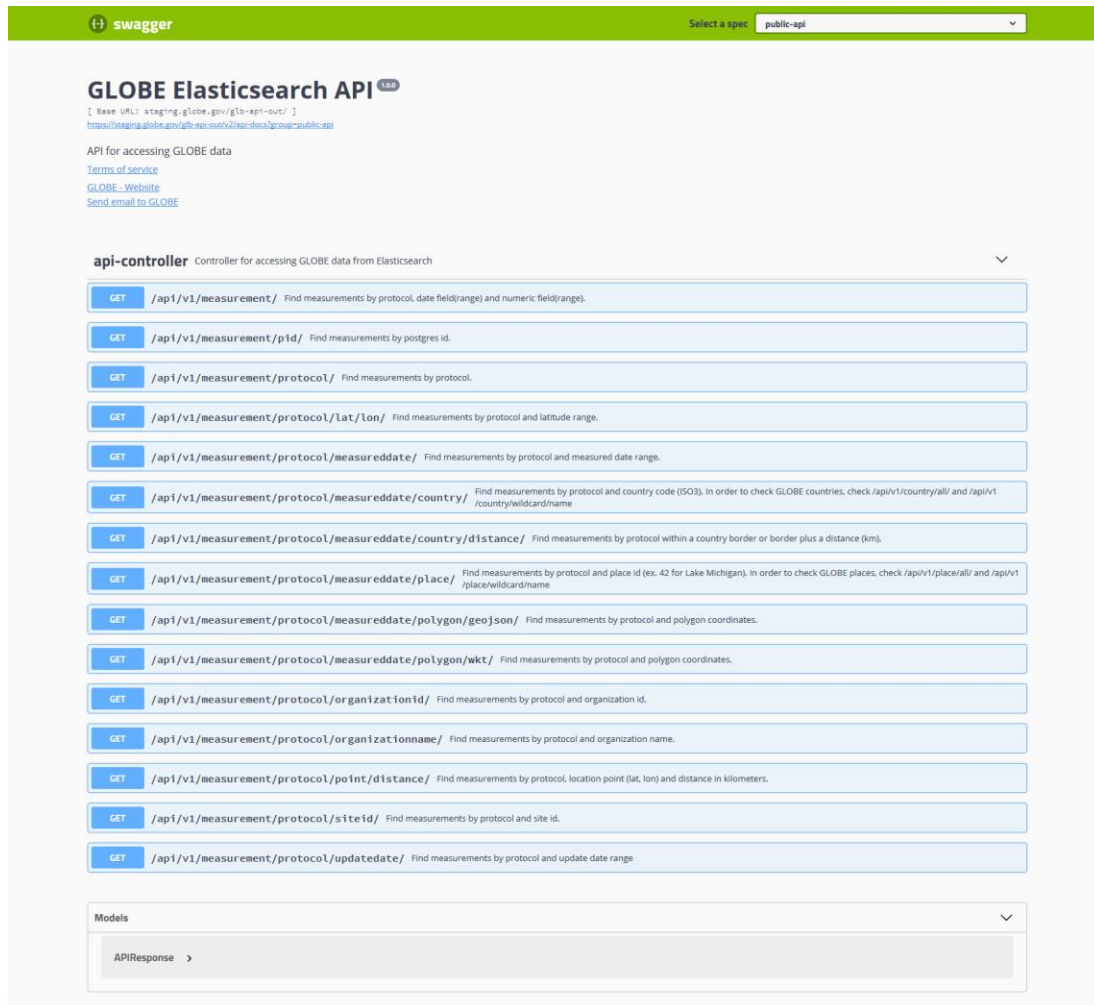
Retrieving Data – the GLOBE API

- API - allows users to pull data from GLOBE programmatically
 - Programmatically = something I can call via a program/script/URL
 - Simple but useful interface
 - Fast
 - Provides support for getting data that is similar to ADAT

Info: <https://www.globe.gov/globe-data/globe-api>

Tool: <https://api.globe.gov/search/swagger-ui.html>

Main Interface



The screenshot shows the Swagger UI for the GLOBE Elasticsearch API. At the top, there is a green header with the Swagger logo and a dropdown menu for selecting a specification, currently set to 'public-api'. Below the header, the API title 'GLOBE Elasticsearch API' is displayed, along with its base URL and a link to the Terms of Service. The main content area is titled 'api-controller' and lists 15 different API endpoints, each with a 'GET' method and a brief description of the query parameters. At the bottom, there is a 'Models' section with a dropdown menu showing 'APIResponse'.

Swagger

Select a spec: public-api

GLOBE Elasticsearch API

[Base URL: staging.globe.gov/glob-ep1-out/]
<https://staging.globe.gov/glob-ep1-out/v2/api-docs/group-public-api>

API for accessing GLOBE data
[Terms of Service](#)
[GLOBE - Website](#)
[Send email to GLOBE](#)

api-controller

Controller for accessing GLOBE data from Elasticsearch

- GET /api/v1/measurement/ Find measurements by protocol, date field(range) and numeric field(range).
- GET /api/v1/measurement/pid/ Find measurements by postgres id.
- GET /api/v1/measurement/protocol/ Find measurements by protocol.
- GET /api/v1/measurement/protocol/lat/lon/ Find measurements by protocol and latitude range.
- GET /api/v1/measurement/protocol/measurdate/ Find measurements by protocol and measured date range.
- GET /api/v1/measurement/protocol/measurdate/country/ Find measurements by protocol and country code (ISO3). In order to check GLOBE countries, check /api/v1/country/all/ and /api/v1/country/wildcard/name
- GET /api/v1/measurement/protocol/measurdate/country/distance/ Find measurements by protocol within a country border or border plus a distance (km).
- GET /api/v1/measurement/protocol/measurdate/place/ Find measurements by protocol and place id (ex. 42 for Lake Michigan). In order to check GLOBE places, check /api/v1/place/all/ and /api/v1/place/wildcard/name
- GET /api/v1/measurement/protocol/measurdate/polygon/geojson/ Find measurements by protocol and polygon coordinates.
- GET /api/v1/measurement/protocol/measurdate/polygon/wkt/ Find measurements by protocol and polygon coordinates.
- GET /api/v1/measurement/protocol/organizationid/ Find measurements by protocol and organization id.
- GET /api/v1/measurement/protocol/organizationname/ Find measurements by protocol and organization name.
- GET /api/v1/measurement/protocol/point/distance/ Find measurements by protocol, location point (lat, lon) and distance in kilometers.
- GET /api/v1/measurement/protocol/siteid/ Find measurements by protocol and site id.
- GET /api/v1/measurement/protocol/updatedate/ Find measurements by protocol and update date range

Models

APIResponse >

- Divided into different paths depending on what type of query you want to make



Use the interface to build your query

GET /v1/measurement/protocol/measreddate/ Find measurements by protocol and measured date range.

Parameters Cancel

Name	Description
protocols * required array[string] (query)	Protocols for search <input type="text" value="carbon_cycle"/> <input type="text" value="conductivities"/> <input type="text" value="dissolved_oxygens"/> <input type="text" value="fire_fuel_metadata"/>
startdate * required string (query)	Start date <input type="text" value="2018-01-01"/>
enddate * required string (query)	End date <input type="text" value="2019-01-01"/>
geojson * required string (query)	Return GeoJSON format results if true. Otherwise, return results in custom JSON format. <input type="text" value="FALSE"/>
sample * required string (query)	Return sample number of results (10) if true. Otherwise, return all results. <input type="text" value="TRUE"/>

https://api.globe.gov/search/v1/measurement/protocol/measreddate/?protocols=dissolved_oxygens&startdate=2018-01-01&enddate=2019-01-01&geojson=FALSE&sample=TRUE

API – Tips on inputs

- Use Sample="TRUE" to return 10 records to make sure your query is correct BEFORE trying it "for real" (Sample="FALSE")
- Use GeoJSON=TRUE to return data in GeoJSON format. Use GeoJSON=FALSE to return data in custom JSON format (this response includes the total records which will be returned)
- Currently limited to 1,000,000 records

API – Download your data

- We recommend putting the URL directly into the browser for larger datasets, otherwise use the “Download button” in the response window

Request URL

```
https://api.globe.gov/search/v1/measurement/protocol/measureddate/?protocols=dissolved_oxygens&startdate=2018-01-01&enddate=2019-01-01&geojson=FALSE&sample=TRUE
```

Server response

Code	Details
200	<p>Response body</p> <pre>{ "count": 6969, "message": "success", "results": [{ "protocol": "dissolved_oxygens", "measuredDate": "2018-01-12", "createDate": "2019-03-19T00:00:00", "updateDate": "2019-03-19T00:00:00", "publishDate": "2019-06-25T05:20:58", "organizationId": 102960, "organizationName": "CAG Ceske Budejovice", "siteId": 1901, "siteName": "School Location:SWS-01", "countryName": "czech-republic", "countryCode": "CZE", "latitude": 48.9737, "longitude": 14.5027, "elevation": 395, "pid": 84213954, "data": { "dissolvedoxygensMeasuredAt": "2018-01-12T13:00:00", "dissolvedoxygensWaterBodyState": "normal", "dissolvedoxygensDissolvedOxygenViaKitMgl": "6.0", "dissolvedoxygensUserId": "3806974" } }] }</pre> <p>Download</p>

Response headers

Your Turn

- Which query would you use to find all dissolved oxygen measurements between 1/01/2010 and 1/01/2011
- Which format option would you use to determine how many measurements there are in that time frame?
- Download the dissolved oxygen data using the GeoJSON format, save the file and plot it at geojson.io

Answers

- Which query would you use to find all dissolved oxygen measurements between 1/01/2010 and 1/01/2011
 - Use /measurement/protocol/measureddate
- Which format option would you use to determine how many measurements there are in that time frame?
 - Use GeoJSON="FALSE" and Return sample results="TRUE" to get a count of how many measurements there are in that timeframe:

https://api.globe.gov/search/v1/measurement/protocol/measureddate/?protocols=dissolved_oxygens&startdate=2010-01-01&enddate=2011-01-01&geojson=FALSE&sample=TRUE

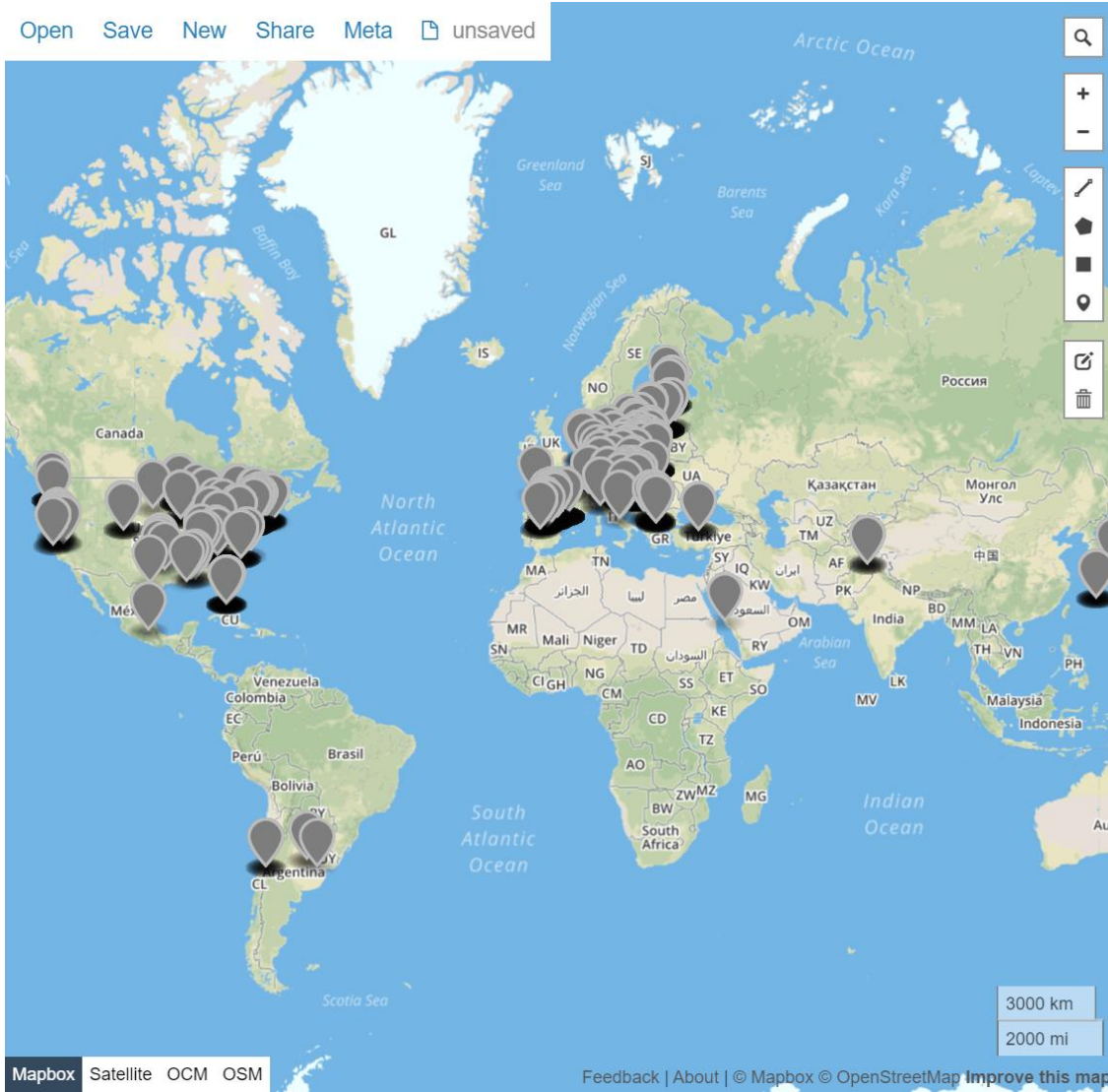
[Answer: count: 3096]

- Download the dissolved oxygen data using the GeoJSON format, save the file and plot it at geojson.io (Note geojson="True" and sample="false")

https://api.globe.gov/search/v1/measurement/protocol/measureddate/?protocols=dissolved_oxygens&startdate=2010-01-01&enddate=2011-01-01&geojson=TRUE&sample=FALSE

Geojson.io plot

Open Save New Share Meta 📄 unsaved



Mapbox Satellite OCM OSM

Feedback | About | © Mapbox © OpenStreetMap Improve this map

</> JSON 📄 Table ? Help anon | log

```

1 {
2   "type": "FeatureCollection",
3   "features": [
4     {
5       "type": "Feature",
6       "properties": {
7         "countryCode": "ARG",
8         "countryName": "Argentina",
9         "dissolvedoxygensComments": "La turbidez se i
10        "dissolvedoxygensDissolvedOxygenViaKitMgl":
11        "dissolvedoxygensMeasuredAt": "2010-09-08T17
12        "dissolvedoxygensOxygenKitMfg": "lamotte",
13        "dissolvedoxygensOxygenKitModel": 7414,
14        "dissolvedoxygensUserId": -1,
15        "dissolvedoxygensWaterBodyState": "normal",
16        "elevation": 64.3,
17        "organizationId": "organizationId",
18        "organizationName": "Escuela de Educación Se
19        "protocol": "dissolved_oxygens",
20        "siteId": "siteId",
21        "siteName": "Subafluente del Ludueña 1:SWS-0
22      },
23      "geometry": {
24        "type": "Point",
25        "coordinates": [
26          -61.00819,
27          -33.01783
28        ]
29      }
30    },
31    {
32      "type": "Feature".

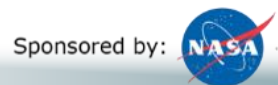
```

Next Steps

- Congratulations – you should:
 - Know how to find your school data
 - Know how to find data from other schools around the world
 - Know how to find schools and teachers who are entering data so you can collaborate with them
- You can now
 - Start creating sites and entering data into the GLOBE system
 - Next Training – 4. Teachers - How to use Setup your GLOBE account

Questions – contact the GLOBE Helpdesk – help@globe.gov

ADAT Case Study



ADAT Case Study - What would be a good filter to setup to see if GLOBE data “saw” El Nino?

- Background
 - El Nino is a phenomenon that happens approximately every 7 years that results in increased rain along the western side of the US, Latin and South America. The last El Nino occurred in 2015/2016.
- Which protocol to measure?
 - Precipitation
- Date Range?
 - Compare 2013/2014 to 2015/2016 (El Nino Year)



Clear Filters

Data Last Updated: 2016-05-16

Instructions

Select a Filter:

Data Filters

Select Protocols

X Precipitation

Date Range

X 2015-12-01 to 2016-02-29

Data Count Range

Site Filters

Site Name

Country or State/Territory

In proximity of a lake or river:

School or Teacher

Elevation Range

Lat/Long Range

Proximity to Lat/Long

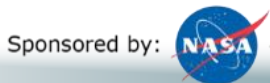
345 Sites Found

Download Measurement Data (13300)

Download Summary Data

School Name	Site Name	Location	Latitude	Longitude	Elevation
2nd Arsaakeio-Tositseio lyceum Ekalis	School Arsaakeio Drosia-CC		38.1198	23.8661	380.6
Abdul Bin Salam Secondary School at Al-Ahsa	مدرسة عبدالله بن سلام دراسة الغلاف الجوي		25.4524	49.59444	150
Agial Junior High School	METEOROLOGICAL SHELTER SCHOOL YARD		32	34.44	27
Ahmad Sameh	GREENHOUSE PATH:ATM-01		31.45	35.13	698.2
Al Afak School -Sur Baher	GARDEN YARD:ATM-01		31.44	35.13	599.6
Alexander von Humboldt Gymnasium	Humboldt Gymnasium Vordereingang:ATM-01	Konstanz, BW, Germany	47.667	9.183	367.4
Alexander von Humboldt Gymnasium	Radolfzell Mogginger Steig:ATM-02	Konstanz, BW, Germany	47.449	8.593	386.8
Al-Fahd Secondary School at Rejal Alma'a	Al-Fahd at Rejal Alma'a		17.79349	41.94154	743
Al-Farouq Intermediate School at Jeddah	ikea:ATM-01		21.5546	39.1844	12.9
Al-Fath Secondary School at Abha	ALfathi:ATM-01		18.1208	42.31	2247
Al-Hayathem Intermediate and Secondary Girls School	AL-Hayathem Intermediate:ATM-01		24.1	47.1427	700
Al-Hussein Bin Ali Secondary School at Makkah Al-Muk:	AL-RAFAY STREET:ATM-01		21.23	39.47	267.7
Aljazeera Intermediate School at Taif	Aljazeera School:ATM-01		21.21266	40.26944	365.2
Al-Khaleej Secondary School at Dammam	ALKalig:ATM-02		26.2589	50.0669	10
Al Majd Junior High School	School almajd		32.6047	35.44457	101
Al-Masaudi Intermediate School at Jeddah	Al-Masaudi Intermediate School at Jeddah		21.56452	39.20419	32
Al Mustakbal Elementary School	METEOROLOGICAL SHELTER ON THE ROOF		32.09	34.57	59
AL MUTANABI JUNIOR HIGH SCHOOL (GLIDUZ3N)	SCHOOL RIGHT MAIN ENTRANCE:ATM-01		32.8507	35.2142	212
Al Mutran	SCHOOL YARD:ATM-01		32.41	35.16	412
AL Salam Elementary School	School Entrance Garden Yard:ATM-01		31.25	34.46	255
Anykscial distr. Troskunai K. Inciura Gymnasium	TROSKUNAI:ATM-01		55.5869	24.8866	50
Apeitio Gymanasio Agrou	atm-1:ATM-01		34.91643	33.0144	993.8
As-Siddiq Secondary School at Rejal Alma'a	Alsedeeq Secondary School Atmosphere:ATM-01		19.26422	46.53181	1245.
Athens Intermediate School	ATIS 2:ATM-02	Athens, AL, United States	34.47649	-86.59782	249.2
AT-Tahawy High School at Al-Hofuf	موقع دراسة الغلاف الجوي		25.21	49.36	173.8
Attour Junior High School For Girls	School Entrance Garden Yard:ATM-01		31.46	35.14	820
aum hany	sumail atm		23	57	394
aum hany	I'm Hani atm2		23	58	366
Bagy Bin Mekhled School at Riyadh	bagy atmosphere		24.81287	46.88946	595
Barta'a Junior High School	School Roof:ATM-01		32.475	35.08	4
Berufskolleg Institut Dr. Flad	School Location:ATM-01	Stuttgart, BW, Germany	48.774	9.1543	271
Brazil Secondary School	BHS Instrument Shelter:ATM-01		10.561	-61.27	25
Brazil Secondary School	BHS Car Park:ATM-02		10.561	-61.27	25
Bundeshandelsakademie und Bundeshandelsschule Brei	School Location:ATM-01		47.49139	9.72331	403
Bunyawat Wittayalai School	Fongsiri		20	99	477
Cabrini High School	Cabrini High Back Yard:ATM-01	New Orleans, LA, United States	29.9815	-90.088	1
Canyon Weather	ATM- Davis Station #2	la verne, CA, United States	34.1248	-117.7493	475
Cedar Grove Elementary	Atmosphere	Germantown, MD, United States	39.24907	-77.23223	130
CEIP Pérez Zamora	huerto de los abuelos:ATM-01		28.3773	-16.5833	334.9

Protocol
Date Range





Clear Filters

Data Last Updated: 2016-05-16

[Instructions](#)

Select a Filter:

Data Filters

Select Protocols

X Precipitation

Date Range

X 2015-12-01 to 2016-02-29

Data Count Range

Site Filters

Site Name

Country or State/Territory

- X Oregon
- X Washington
- X California
- X Uruguay

In proximity of a lake or river:

School or Teacher

Elevation Range

Lat/Long Range

Proximity to Lat/Long

13 Sites Found

Download Measurement Data (321)

Download Summary Data

<input checked="" type="checkbox"/>	School Name	Site Name	Location	Latitude	Longitude
<input checked="" type="checkbox"/>	Canyon Weather	ATM- Davis Station #2	la verne, CA, United States	34.1248	-117.7493
<input checked="" type="checkbox"/>	Escuela No. 10	RINCON METEOROLOGICO:ATM-01		-33.24423	-56.30924
<input checked="" type="checkbox"/>	Escuela No. 81 Enrique Amorin	Agapito		-31	-57
<input checked="" type="checkbox"/>	Escuela No. 88 Alfredo B. Nobel	Las Violetas:ATM-01		-34.56708	-56.29809
<input checked="" type="checkbox"/>	Escuela No. 8 Alemania	Estación escolar Nuevo Berlín		-32.97972	-58.057
<input checked="" type="checkbox"/>	Kingsburg High School	Kingsburg High School Weather Station Site:ATM-02	Kingsburg, CA, United States	36.5197	-119.5463
<input checked="" type="checkbox"/>	Lane Community College	Science Building (NW):ATM-01	Eugene, OR, United States	44.0083	-123.0310
<input checked="" type="checkbox"/>	Liceo No. 1 Brause	Liceo Brause Pando		-34.7	-55.9
<input checked="" type="checkbox"/>	Lourdes Public Charter School	Lyons Fire Hall:ATM-01	Scio, OR, United States	44.7166	-122.6927
<input checked="" type="checkbox"/>	Lourdes Public Charter School	School Site:ATM-02	Scio, OR, United States	44.7225	-122.6898
<input checked="" type="checkbox"/>	McKnight Middle School	AWS and Cloud site:ATM-01	Renton, WA, United States	47.4851	-122.1112
<input checked="" type="checkbox"/>	Monroe Elementary School	James Monroe Elementary - The Outpost:ATM-01	Everett, WA, United States	47.9792	-122.2008
<input type="checkbox"/>	test_mobile school 1		Pasadena, CA, United States	37.63675	-122.1260

Ready for [Download](#)

Locations →

Sponsored by:



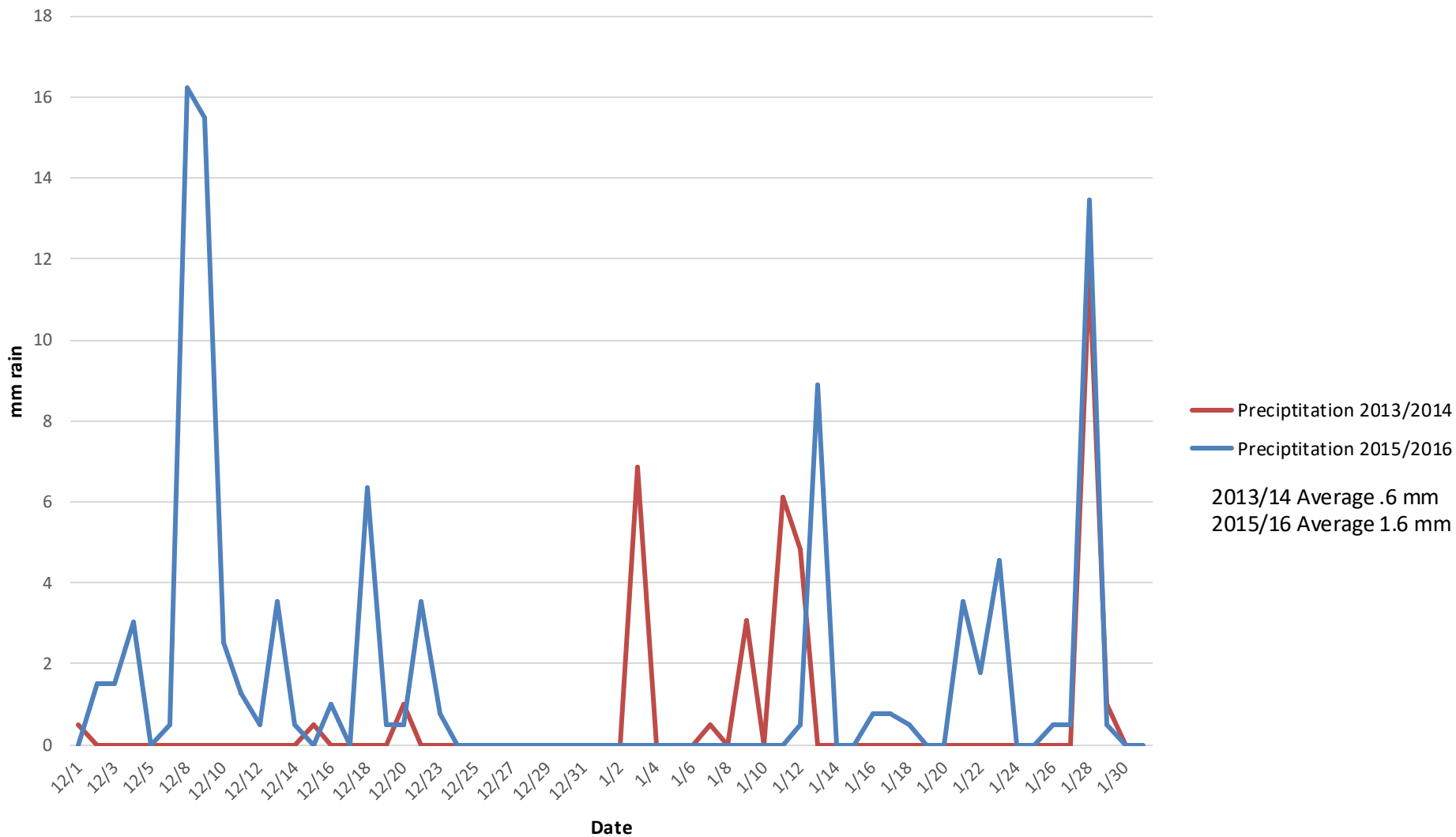
Supported by:



McKnight Middle School – Data from 2013 and 2015 - Download to Excel

	A	B	C	D	E	F	J	K
1	org_name	site_name	latitude	longitude	elevation	measured_on	precipitations	precipitations:0
106	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/1/2015	0	no occurrence
107	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/2/2015	1.52	rain
108	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/3/2015	1.52	rain
109	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/4/2015	3.05	rain
110	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/5/2015	0	no occurrence
111	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/6/2015	0.51	rain
112	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/8/2015	16.25	rain
113	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/9/2015	15.49	rain
114	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/10/2015	2.54	rain
115	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/11/2015	1.27	rain
116	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/12/2015	0.51	rain
117	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/13/2015	3.55	rain
118	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/14/2015	0.51	rain
119	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/15/2015	0	no occurrence
120	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/16/2015	1.02	rain
121	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/17/2015	0	no occurrence
122	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/18/2015	6.35	rain
123	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/19/2015	0.51	rain
124	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/20/2015	0.51	rain
125	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/22/2015	3.56	rain
126	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/23/2015	0.76	rain
127	McKnight Middle S	AWS and Cloud site:ATM	47.4851	-122.111	161	12/24/2015	0	no occurrence

McKnight Middle School – Compare Precipitation 2013/14 to 2015/16



Ramey School Precipitation and Soil Moisture – Do you see a correlation?

