How to Gather Site Data

From Google Earth Pro and Other Sources

This document was created for our Permaculture Design Certificate courses. The data collected from these sources is not always 100% accurate and requires further verification before implementing a design, but it gives us a general idea of the site conditions and a framework that helps us choose appropriate design strategies based on the unique conditions of the site. We hope that this information enables people to make more informed design decisions, avoid type 1 errors, and make lasting transformations to the places they inhabit.

If you would like further guidance on reading/understanding this data and learning how to create digital design, check out our course offerings at midwestpermaculture.com.

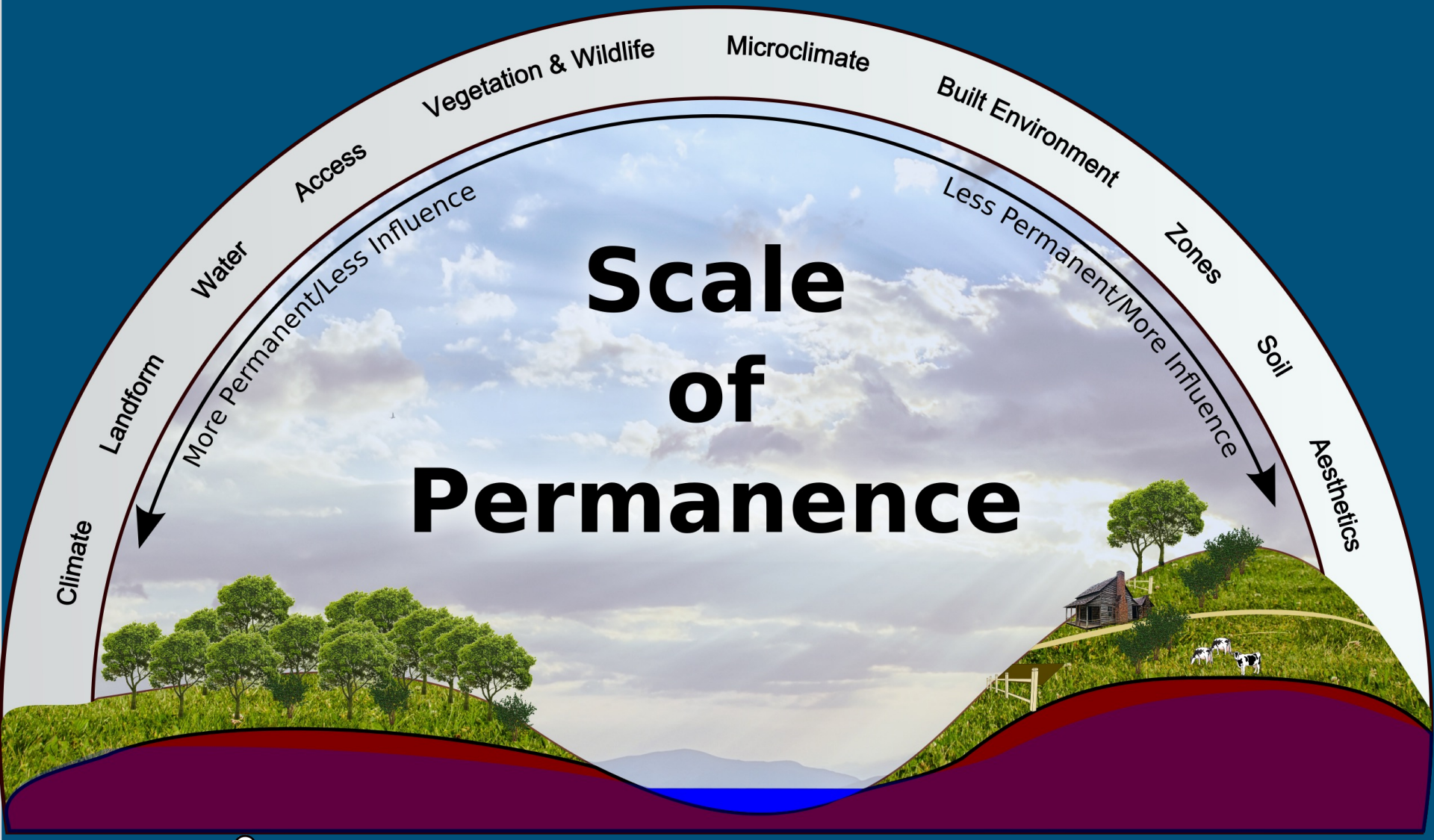
This information represents the current process as we understand it in 2022.

Thank you for downloading!

-Bill, Milton, Megan and the team at Midwest Permaculture

How to Gather Site Data

From Google Earth Pro and Other Sources



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What is the Scale of Permanence

and why is it important to gather site data?

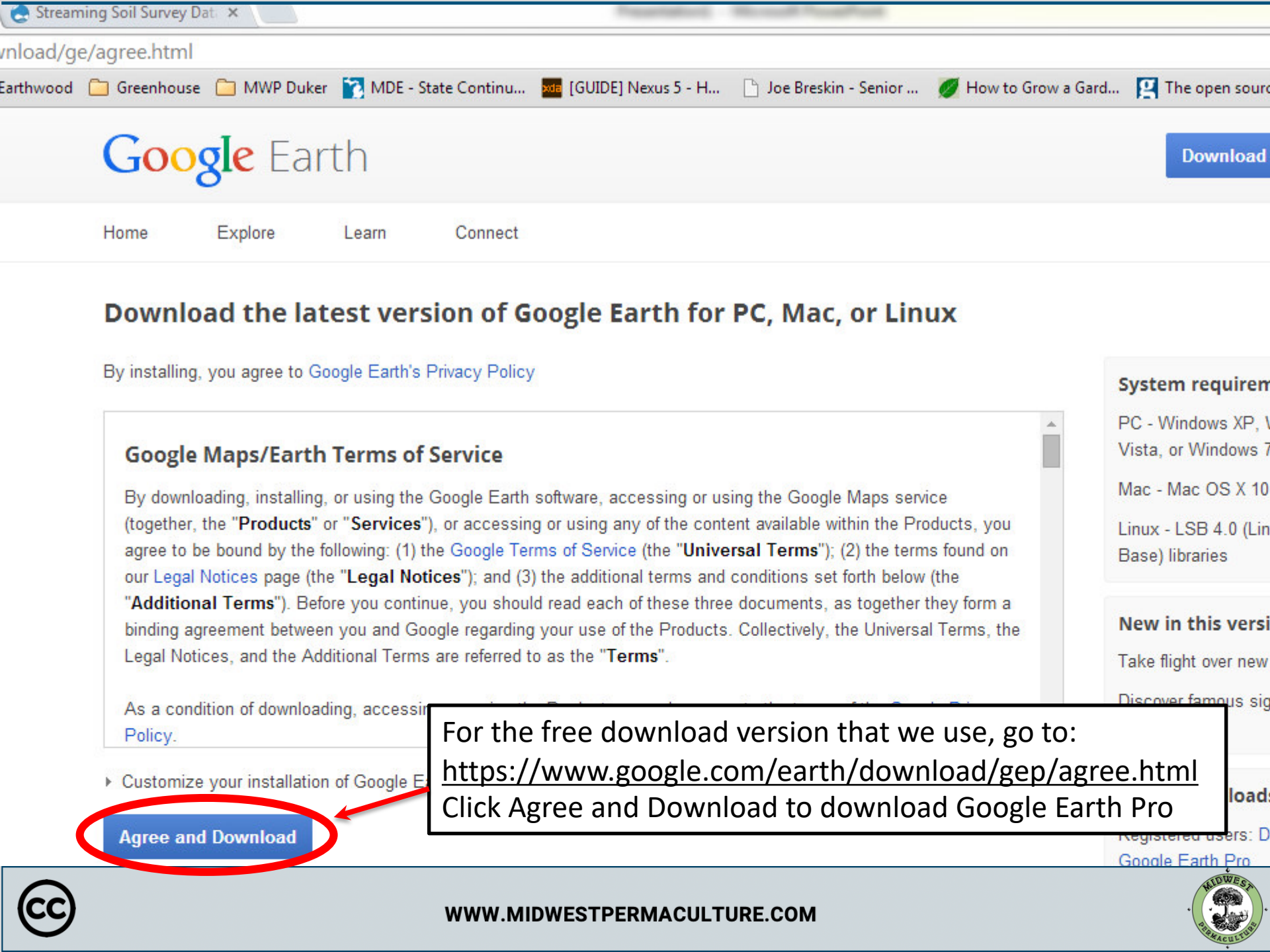
The Scale of Permanence is a strategy that helps order the sequence of design in a way that conserves energy and prevents errors like “putting your house where your pond should have been” by working with preexisting unchangeable circumstances rather than against them.

It encourages us to start by identifying the things we have the least influence over (annual rainfall, wind direction, landform, etc.). We then design around the effects of those things when implementing elements we have more influence over (building placement, zones of use, etc.).

It is helpful to recognize that elements on the lefthand side of the scale influence those to their right. For example, climate affects all the other elements while buildings (the built environment) only influence zones, soils, and aesthetics. We generally start making changes from the left to right of the scale in permaculture as we design.

There is never a blank situation where we can impose a design without dealing with preexisting conditions, and this scale helps us navigate landscape design with greater outer self-awareness.

Downloading Google Earth Pro



For the free download version that we use, go to:
https://www.google.com/earth/download/gep/agree.html
Click Agree and Download to download Google Earth Pro

Install Google Earth Pro

- Find GoogleEarthProSetup.exe where you downloaded it. The default location is your Downloads folder.
- Double click the file to open, and work through the dialogues to install the program.

Downloading the water features to use in Google Earth Pro

Viewing WATERS Data using Google Eart

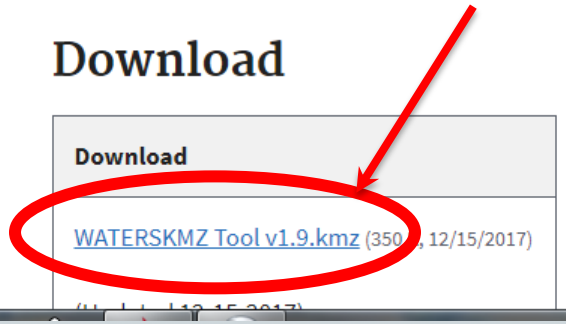
- Description
- Download
- Interface Overview
- Available Data
- Metadata
- Usage Notes
- Terms of Use and Disclaimer
- Changelog

Description

Go to:
https://www.epa.gov/waterdata/viewing-waters-data-using-google-earth

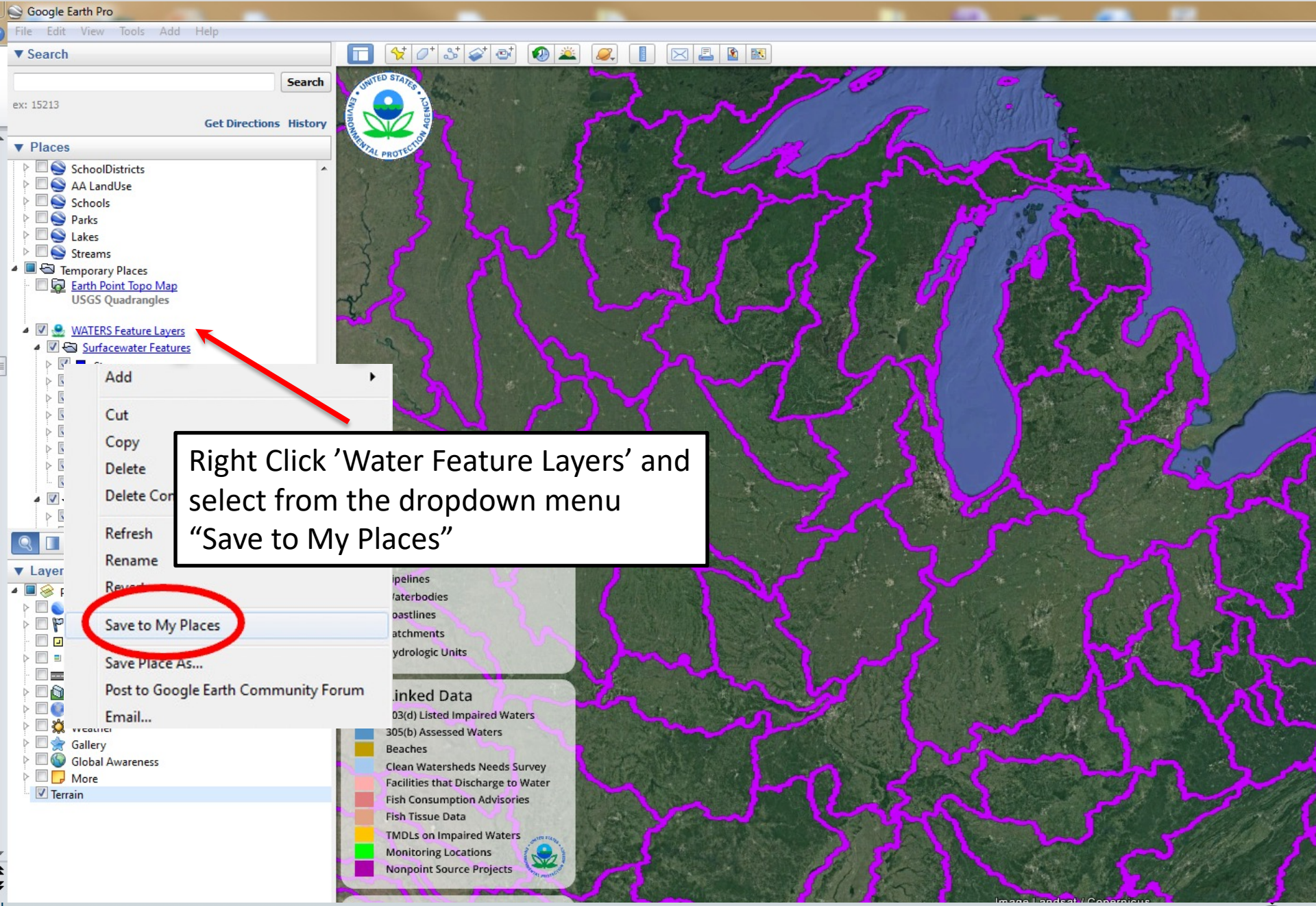
Click the button to download the Watershed Maps

Download



Adding the Water features application to Google Earth Pro

- Find EWATERS Data v1.6.kmz where you downloaded it. The default location is your Downloads folder.
- Double click the file, and it will open in Google Earth Pro



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Downloading US soil data to use in Google Earth Pro

CALIFORNIA SOIL RESOURCE LAB

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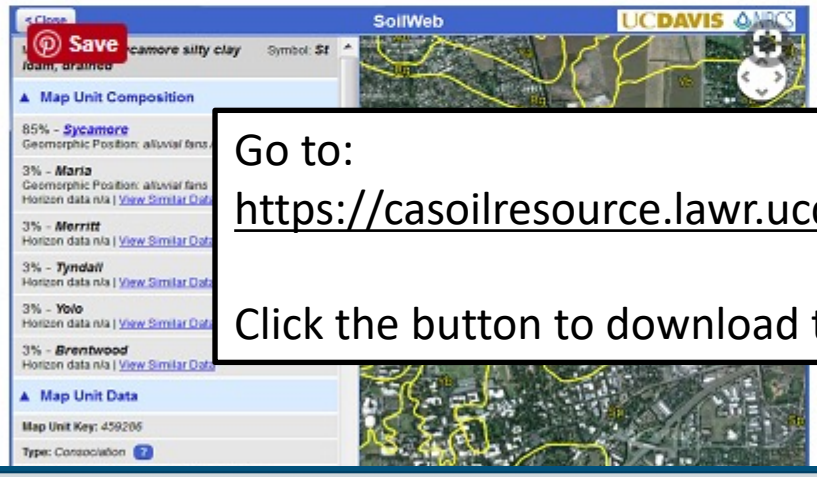
HOME » SOILWEB APPS

SoilWeb Apps

SoilWeb products can be used to access USDA-NCSS detailed soil survey data (SSURGO) for most of the United States. Please choose an interface to SoilWeb:

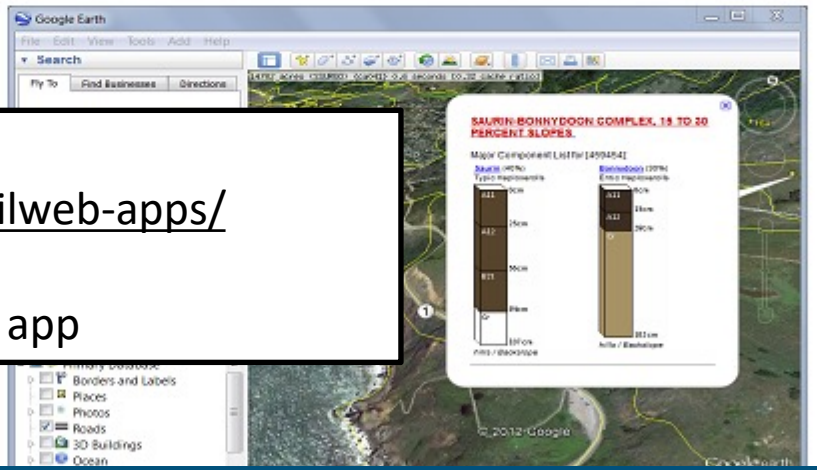
SoilWeb

Explore soil survey areas using an interactive Google map. View detailed information about map units and their components. This app runs in your web browser and is compatible with desktop computers, tablets, and smartphones.



SoilWeb Earth

Soil survey data are delivered dynamically in a KML file, allowing you to in a 3-D display. You must have Google Earth or some other means of v installed on your desktop computer, tablet, or smartphone.

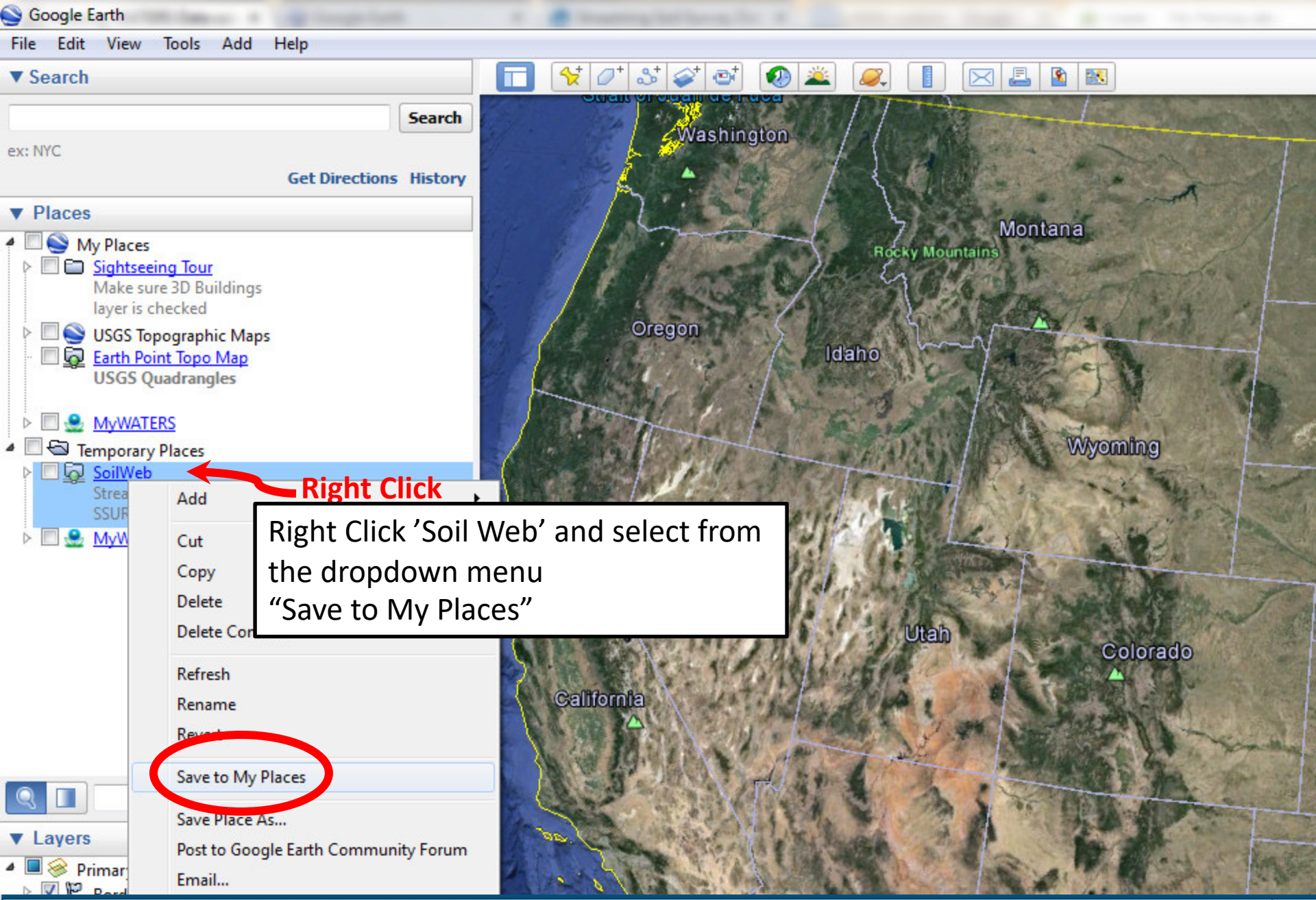


Go to:
https://casoilresource.lawr.ucdavis.edu/soilweb-apps/

Click the button to download the Soil Data app

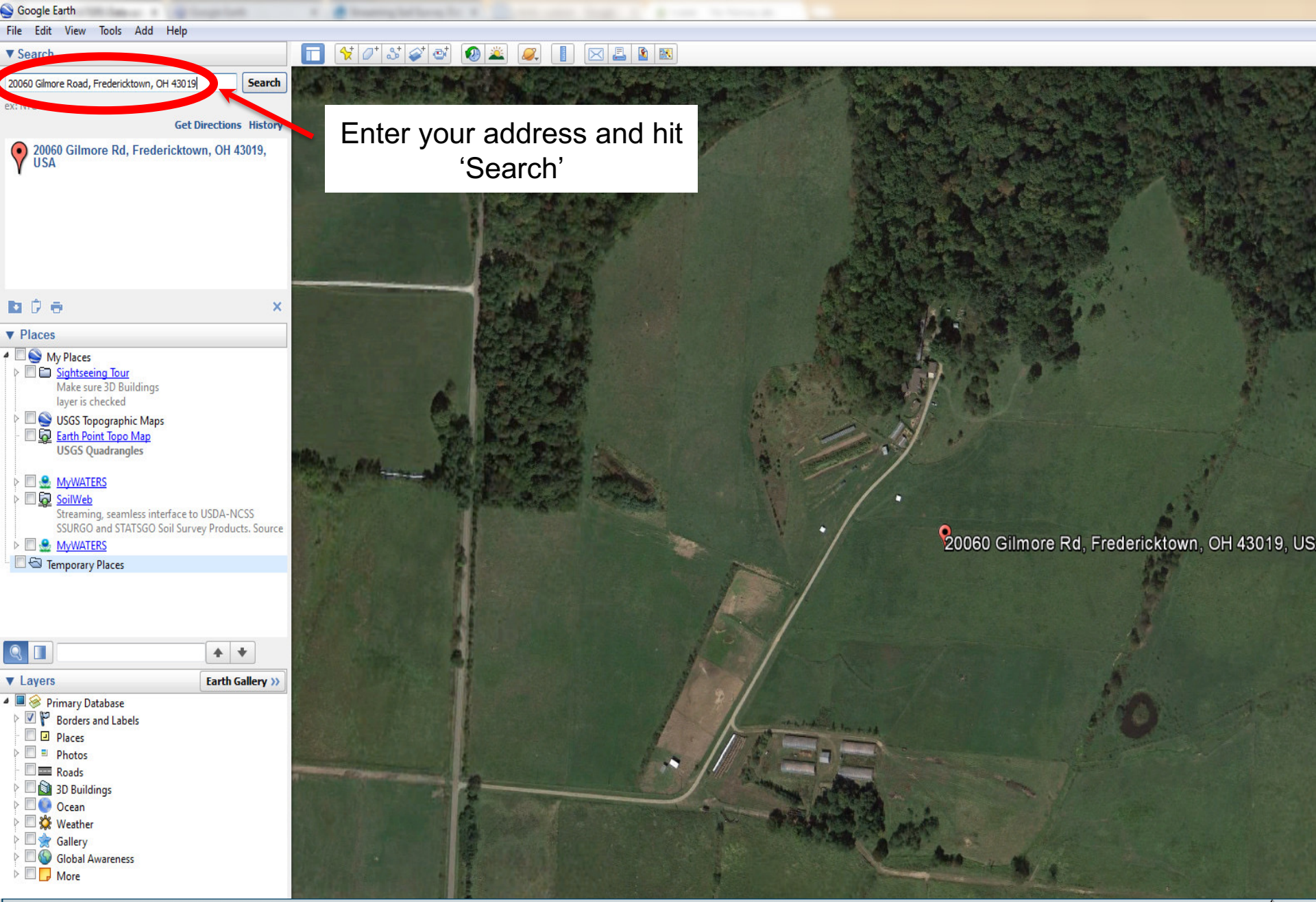
Adding the US Soil Data Feature to Google Earth Pro

- Find SoilWeb.kmz where you downloaded it. The default location is your Downloads folder.
- Double click the file, and it will open in Google Earth Pro.



Right Click 'Soil Web' and select from the dropdown menu "Save to My Places"

Gathering the Data from Google Earth Pro for Your Desired Location



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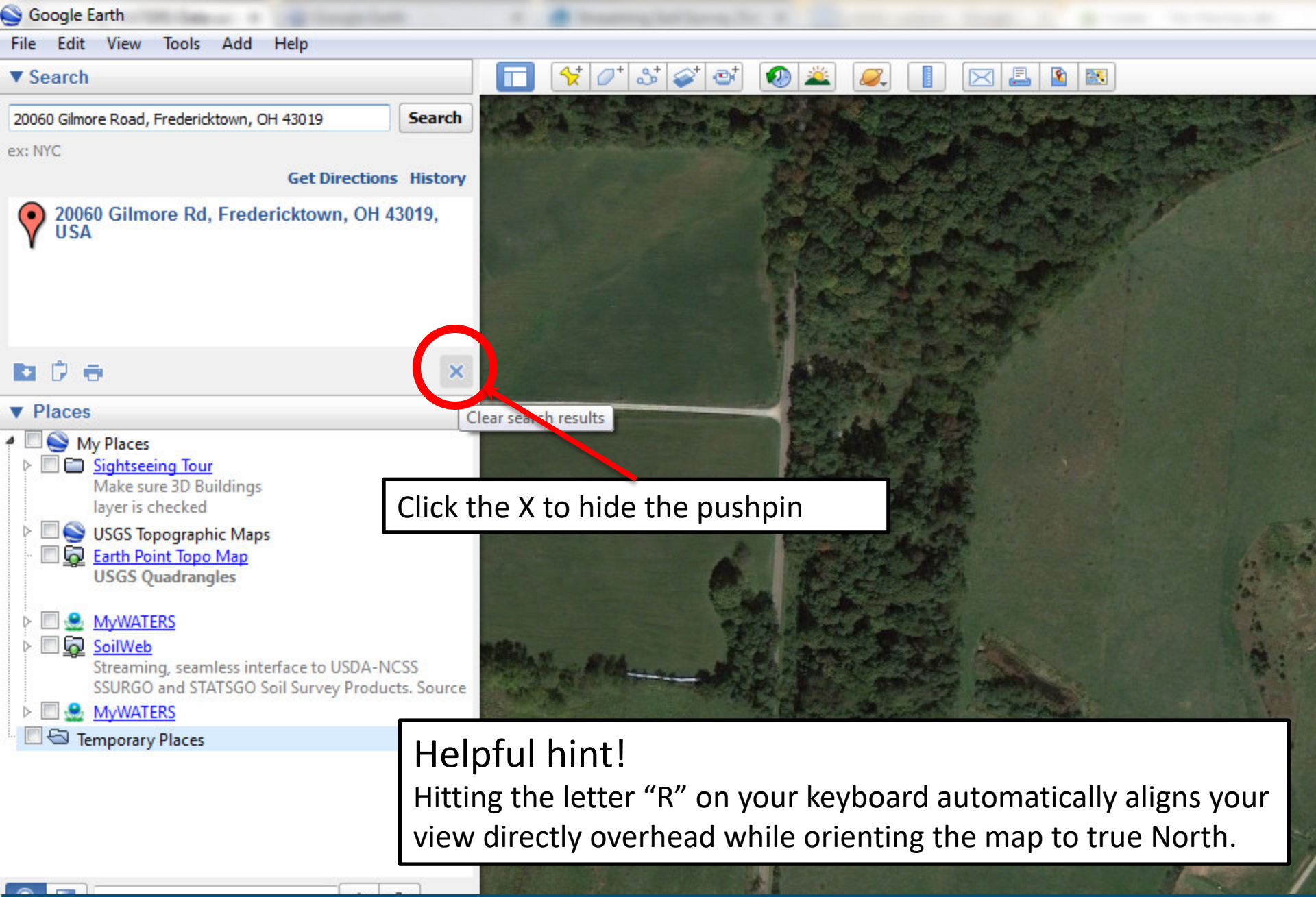

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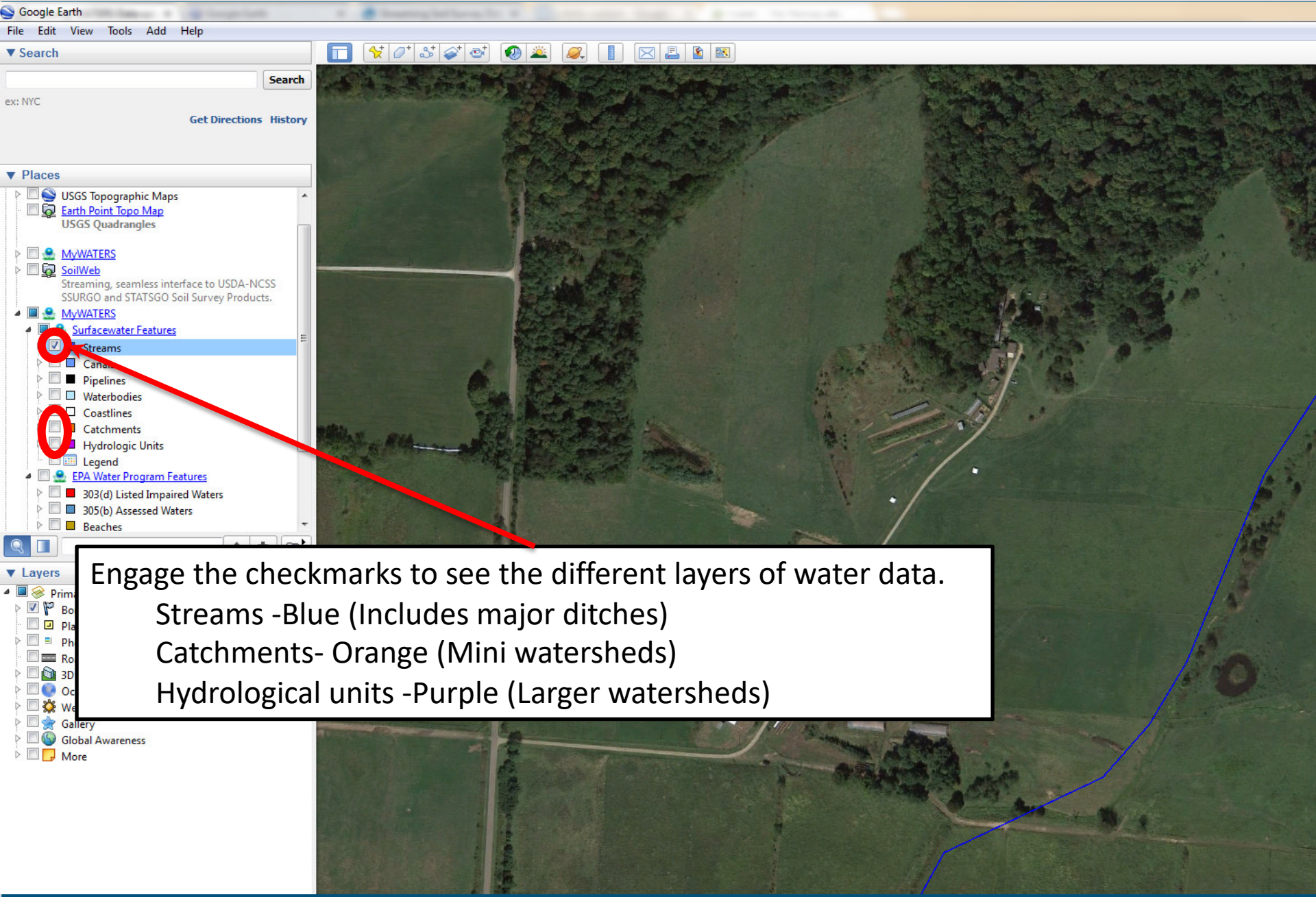
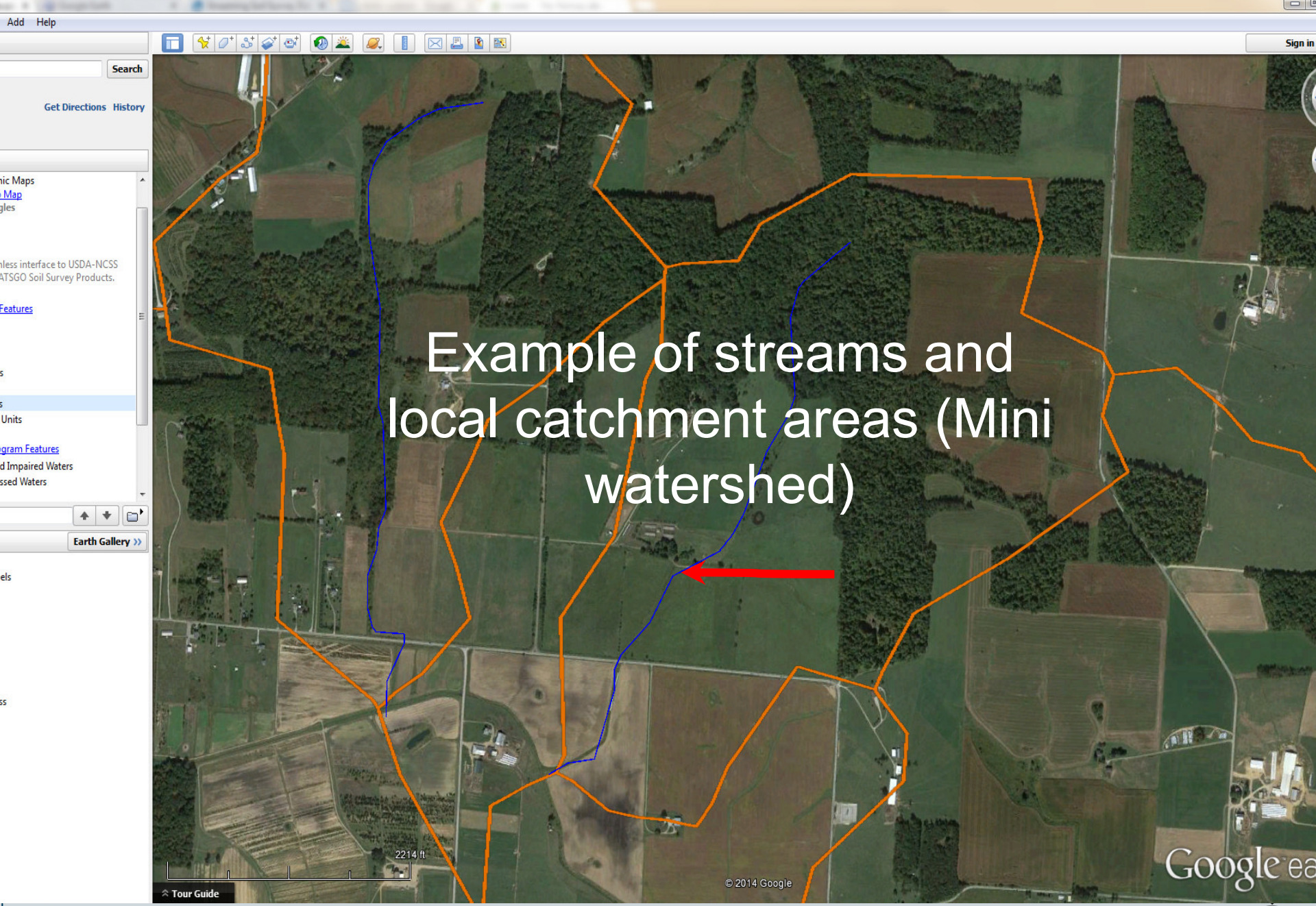


Engage the checkmarks to see the different layers of water data.

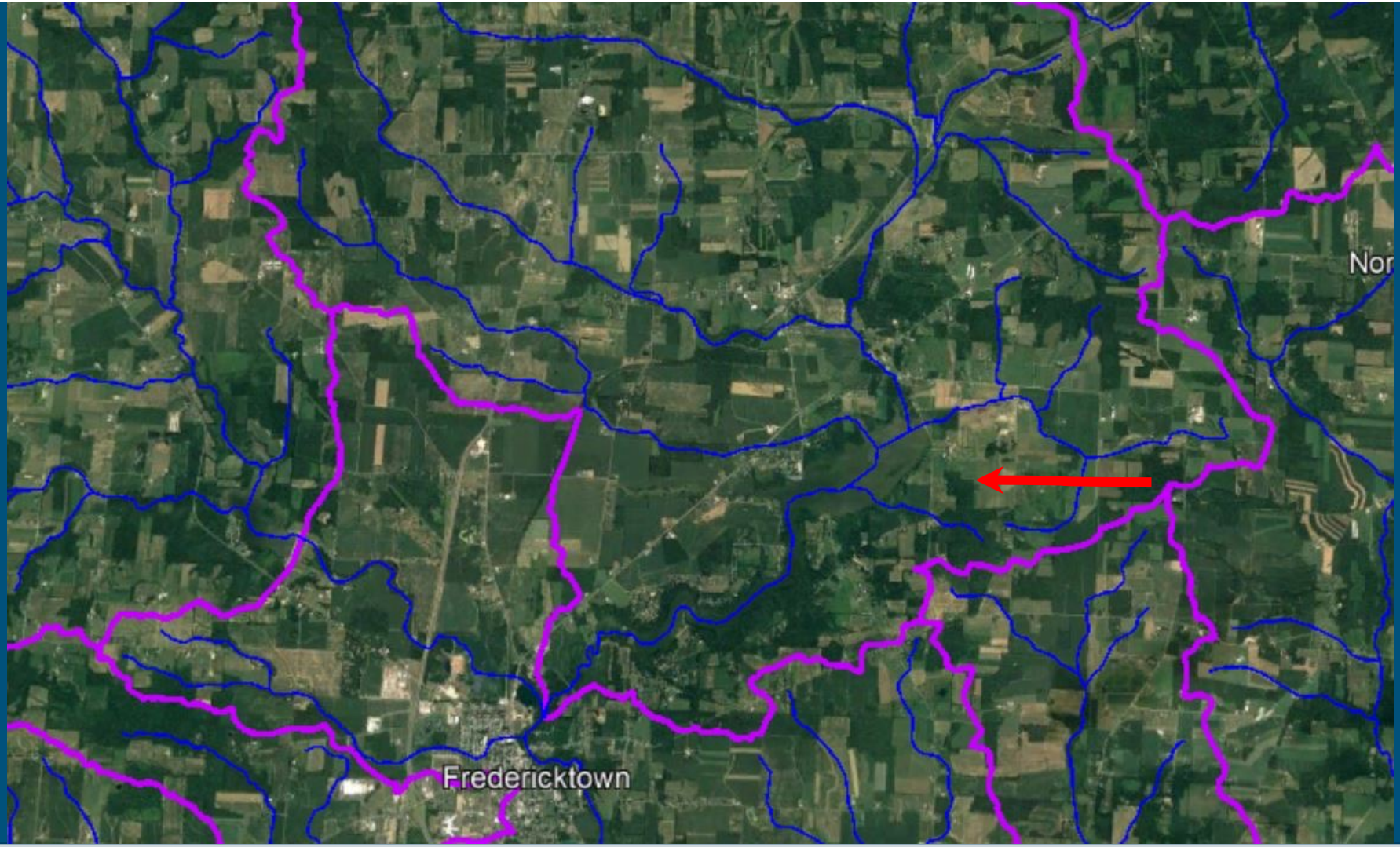
Streams -Blue (Includes major ditches)

Catchments- Orange (Mini watersheds)

Hydrological units -Purple (Larger watersheds)

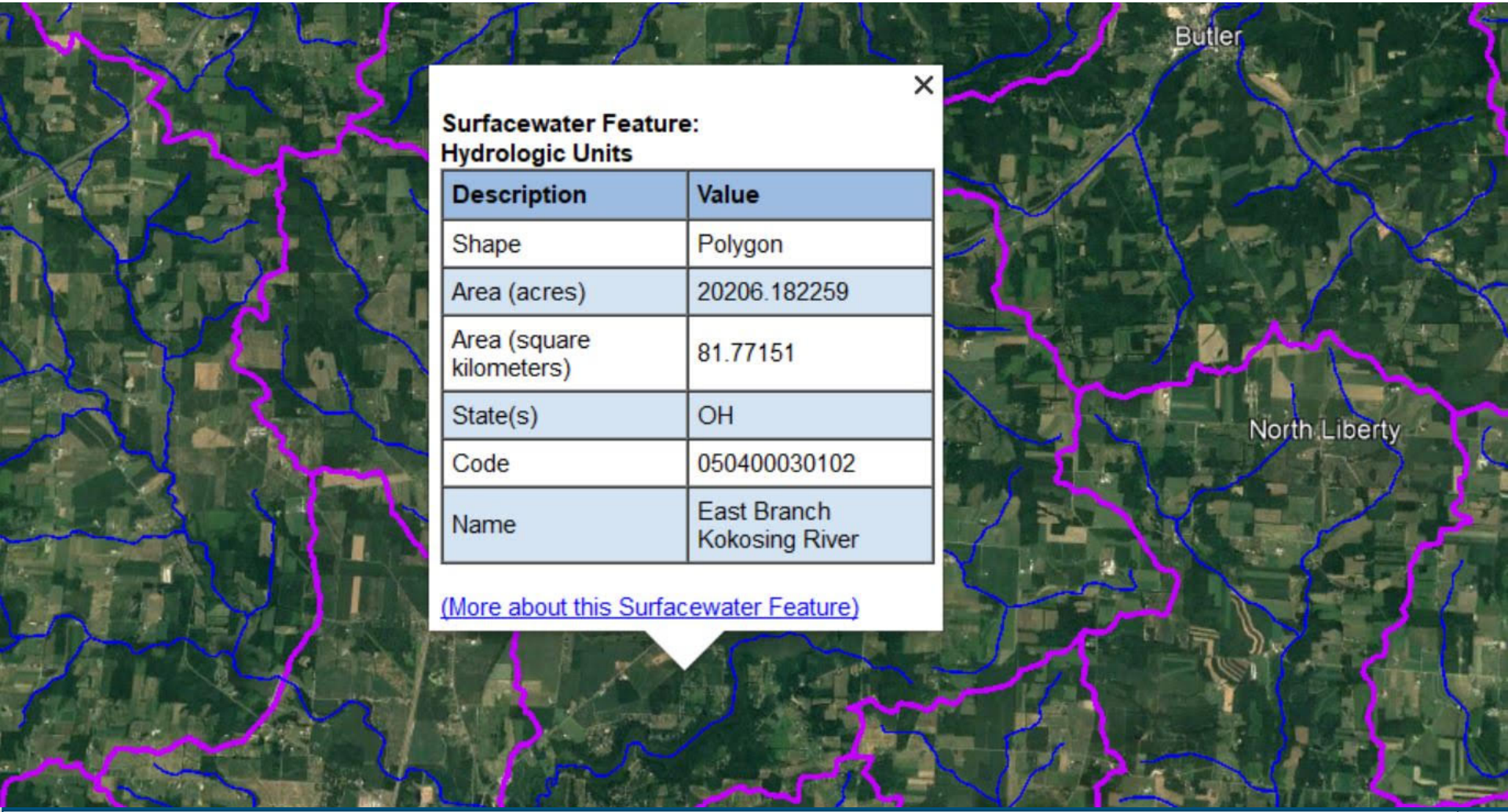

Add
Help
Search
Get Directions
History
Earth Gallery
Sign in
Example of streams and local catchment areas (Mini watershed)
2214 ft
© 2014 Google
Tour Guide

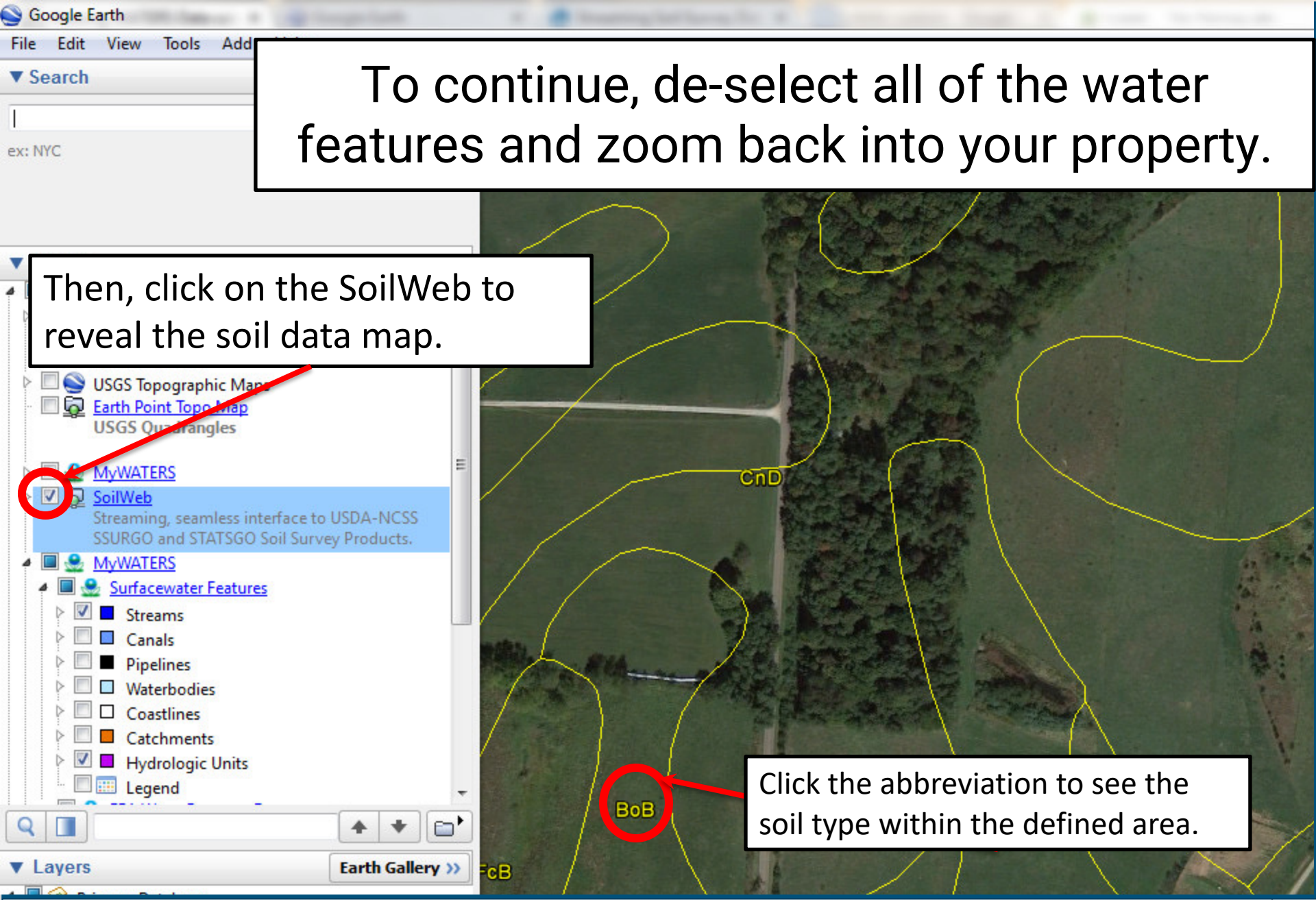
Zoom out to view the Hydrological Units
(Larger watershed areas)
Can you find the point at which all these streams leave the watershed?



CC

Left click within the purple watershed to view its data and name.
This is the “East Branch Kokosing River” watershed.



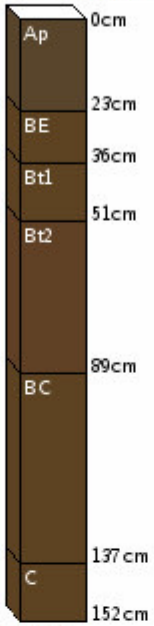

Google Earth
File Edit View Tools Add
Search
ex: NYC
To continue, de-select all of the water features and zoom back into your property.
Then, click on the SoilWeb to reveal the soil data map.
USGS Topographic Maps
Earth Point Topo Map
USGS Quadrangles
MyWATERS
SoilWeb
Streaming, seamless interface to USDA-NCSS SSURGO and STATSGO Soil Survey Products.
MyWATERS
Surfacewater Features
Streams
Canals
Pipelines
Waterbodies
Coastlines
Catchments
Hydrologic Units
Legend
Layers
Earth Gallery
CnD
BoB
FcB
Click the abbreviation to see the soil type within the defined area.

47 seconds [0.53 cache ratio]

Chili-Homewood silt loams, 6 to 12 percent slopes

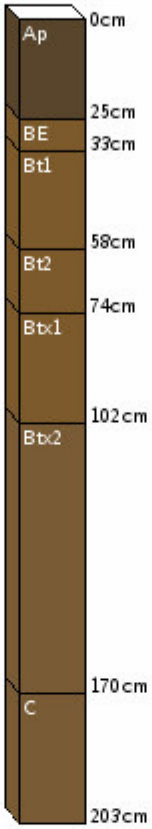
Components within map unit IL12571

Chili (55%)
Typic Hapludalfs



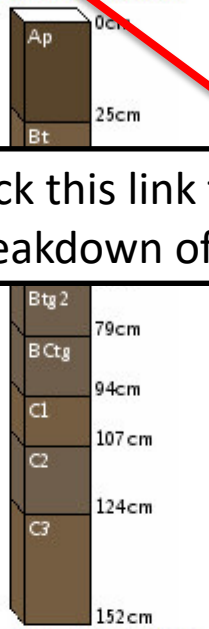
valleys

Homewood (35%)
Typic Fragiudalfs



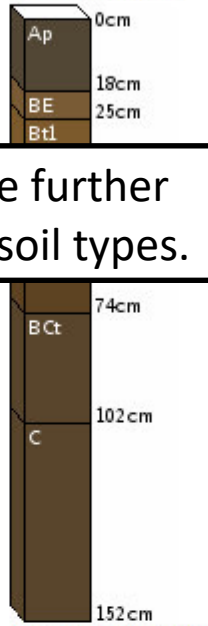
till plains / Shoulder

Jimtown (5%)
Aeric Ochraqualfs



terraces / Footslope

Fitchville (5%)
Aeric Ochraqualfs



lake plains / Footslope

Click this link to see further breakdown of the soil types.

Block Diagrams: c/o NCSS Job Aids
note that these diagrams may be from multiple survey areas

1. OH-2010-09-29-03
2. OH-2010-09-29-10
3. OH-2012-02-16-17

ChE
CnD
CnC
FcB

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Map Unit Composition

Map units consist of 1 or more soil types, commonly referred to as "components".

Component Name	Geomorphic Position
Soil Type 1 Chili	valleys
Soil Type 2 Homewood	till plains / Shoulder
Soil Type 3 Fitchville	lake plains / Footslope
Soil Type 4 Jimtown	terraces / Footslope

*Note: links to horizon data marked with an * are approximate.*

Click this link to see details on the component type. Focus on the primary types.

Map Unit Data *What is a Map Unit?*

Cartographic information about this map unit.

Map Unit Name:	*Chili-Homewood silt*
Map Unit Type:	*Complex*
Map Unit Symbol:	*CnC*
Map Unit Area:	*acres (3159ac. total in survey area)*

Raw Map Unit Data

Raw Component Data (All Components)

Map Unit Aggregated Data

Generalized soils information within this map unit.

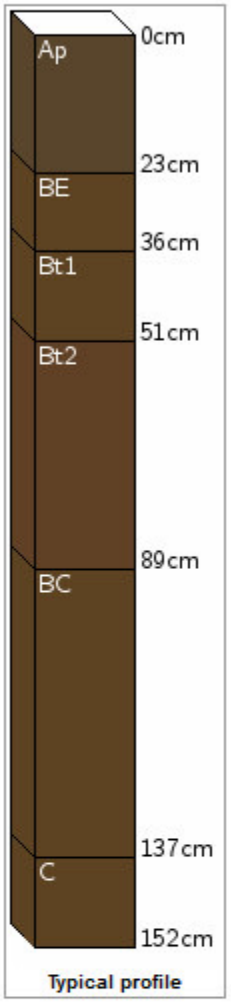
Farmland Class:	*Farmland of local importance*
Available Water Storage (0-100cm):	*14.21 cm*
Max Flood Freq:	*None*
Drainage Class (Dominant Condition):	*Well drained*
Drainage Class (Wettest Component):	*Well drained*
Hydric Conditions:	*0*
[Annual] Min. Water Table Depth:	*99 cm*
[April-June] Min. Water Table Depth:	*99 cm*
Min Bedrock Depth:	*n/a*

Raw Aggregated Map Unit Data

Associated Point Data

Links to any NSSL point data within this map unit.

« Back to Google Earth



Typical profile

Soil Taxonomy

Order:	*Alfisols*
Suborder:	*Udalfs* [Map of Suborders]
Greatgroup:	*Hapludalfs*
Subgroup:	*Typic Hapludalfs*
Family:	*Fine-loamy, mixed, me*
Soil Series:	*Chili* (Link to OSD)
Data:	[Lab Data]
Raw Data	Component All Horizons

Scroll down to see more info

Land Classification

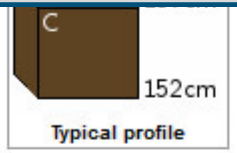
Storie Index	*NOT RATED*
Land Capability Class **[non-irrigated]**	*3-e*
Land Capability Class **[irrigated]**	*-*
Ecological Site Description	*n/a*
Forage Suitability Group	*n/a*

Soil Suitability Ratings

Waste Related	Engineering
Urban/Recreational	Irrigation
Wildlife	Runoff

Hydraulic and Erosion Ratings

Wind Erodibility Group	*5*
Wind Erodibility Index	*56*
T Erosion Factor	*4*
Runoff	*Medium*
Drainage	*Well drained*
Hydric Rating / Hydrologic Group	*No* [Group B]
Parent Material:	*acid loamy outwash derived from sandstone and siltstone*
Total Plant Available Water (cm):	*16.34*



Typical profile

Runoff	Medium
Drainage	Well drained
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Total Plant Available Water (cm):	16.34

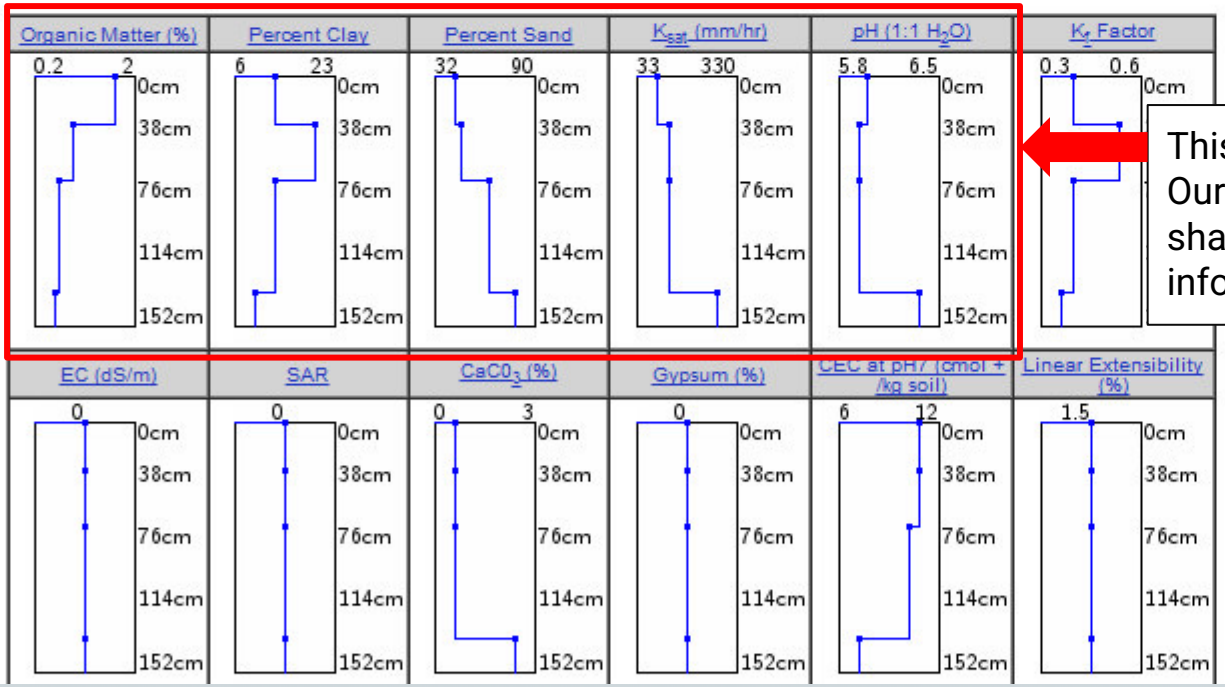
Geomorphology

Landform	outwash plains
Landform	moraines
Landform	kames
Landfor	valleys

If you're lucky, sometimes there will be a list of commonly found plants in these soil types in this area here.

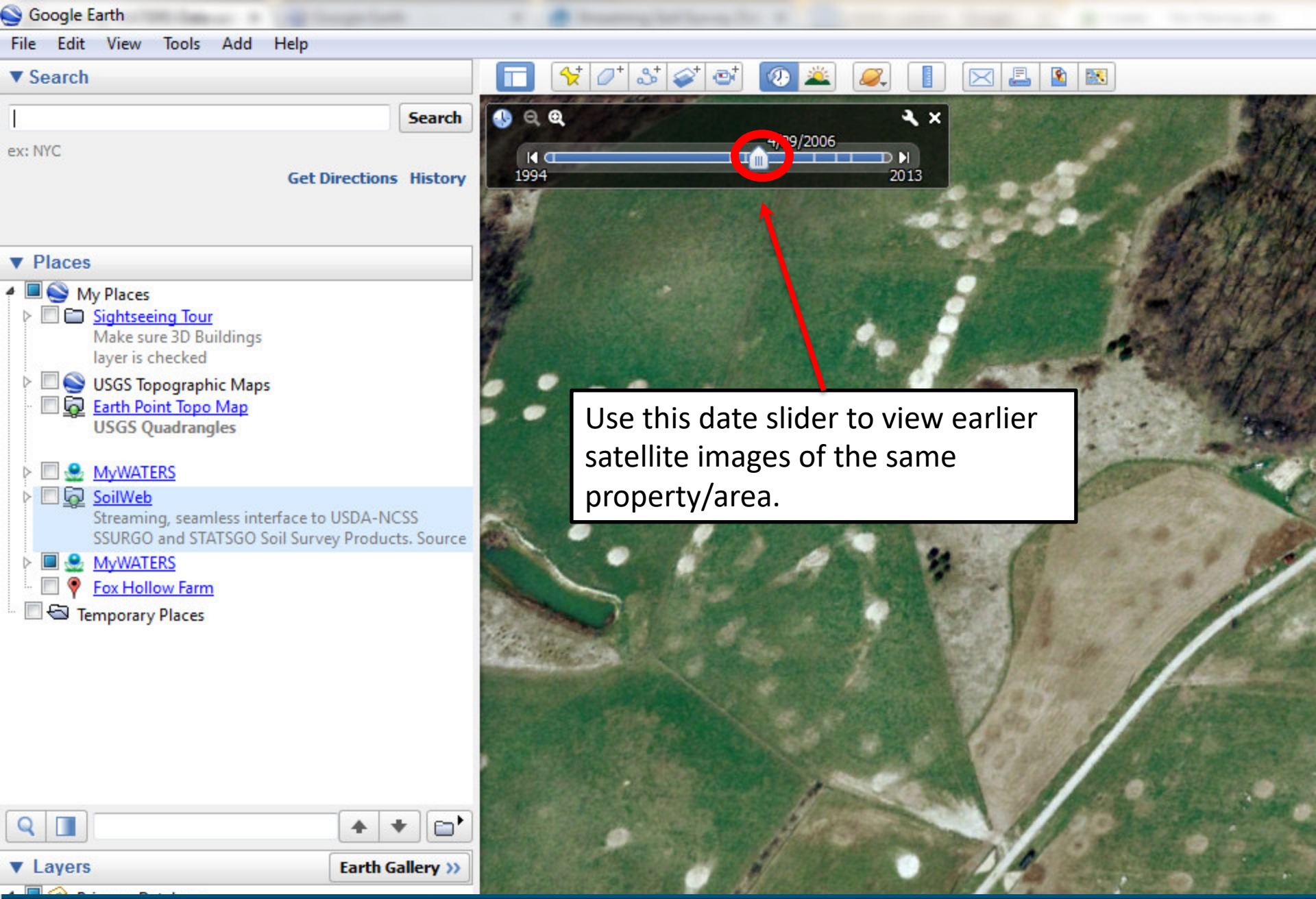
Plants

Symbol	Scientific Name	Common Name	Range Prod.



This is the soil data we use Our instructional video shares how to read this information.

Other features in Google Earth Pro



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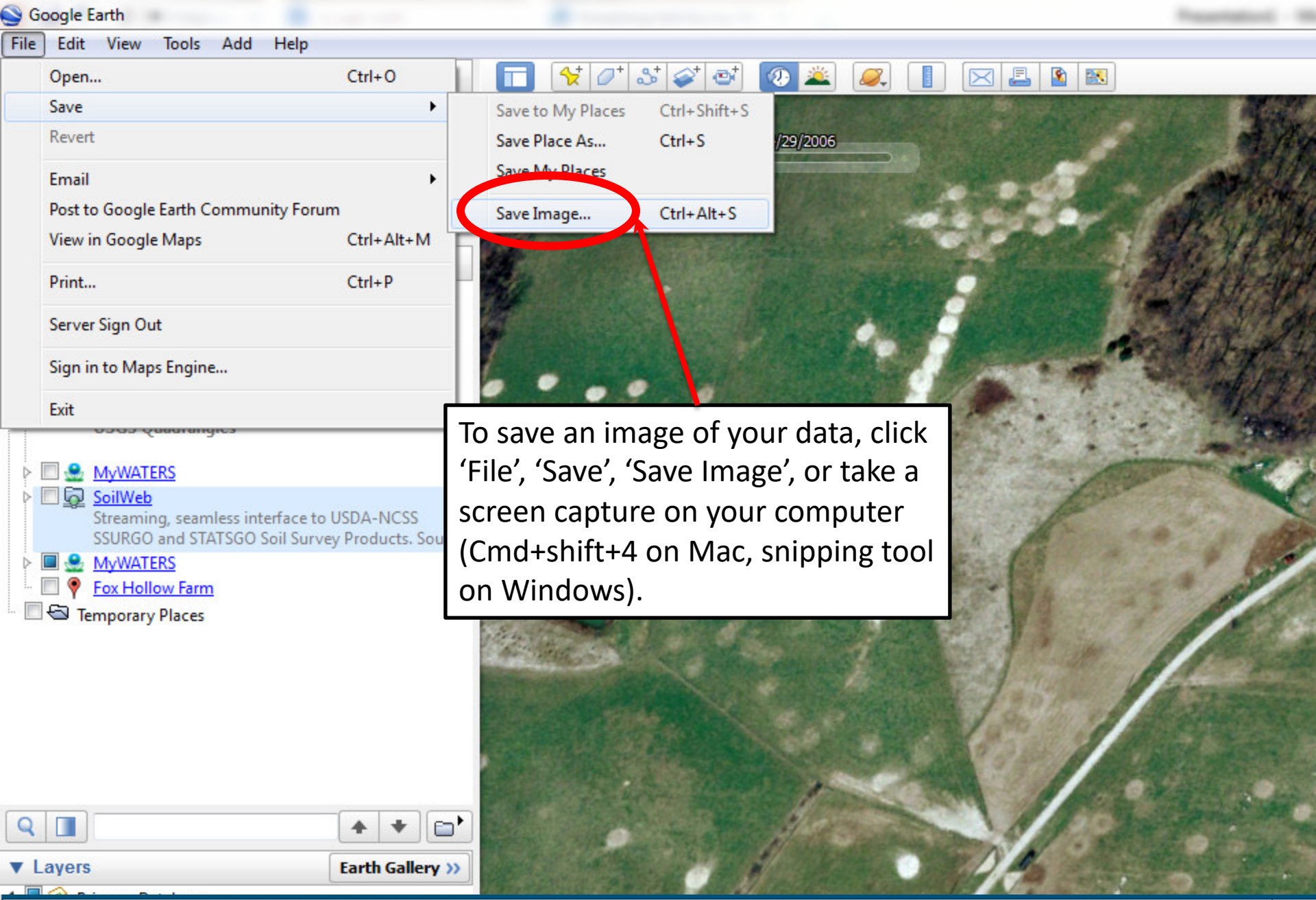
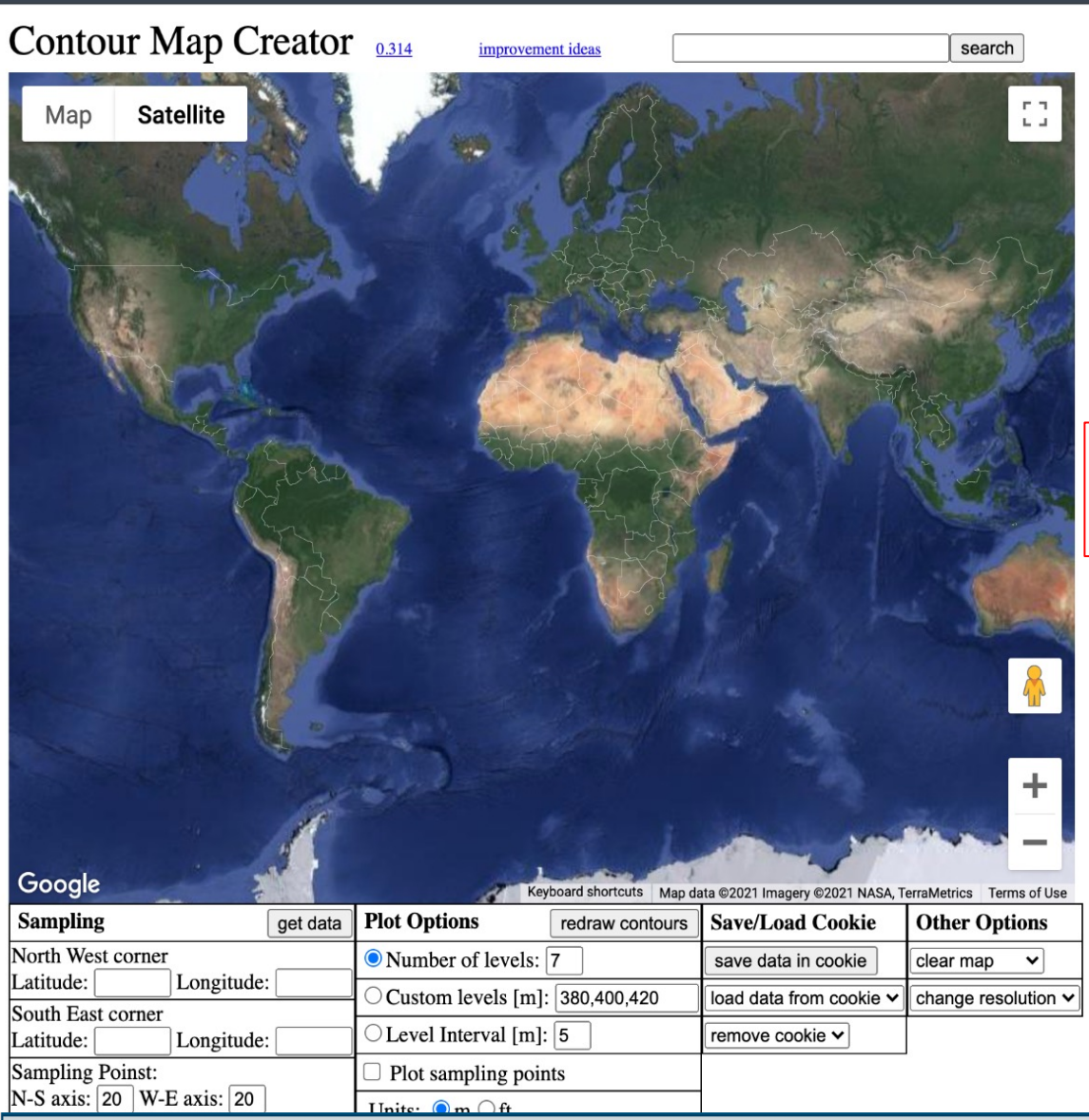

Google Earth
File
Edit
View
Tools
Add
Help
Open... Ctrl+O
Save
Revert
Email
Post to Google Earth Community Forum
View in Google Maps Ctrl+Alt+M
Print... Ctrl+P
Server Sign Out
Sign in to Maps Engine...
Exit
Save to My Places Ctrl+Shift+S
Save Place As... Ctrl+S
Save Image... Ctrl+Alt+S
/29/2006
To save an image of your data, click 'File', 'Save', 'Save Image', or take a screen capture on your computer (Cmd+shift+4 on Mac, snipping tool on Windows).
MyWATERS
SoilWeb
Streaming, seamless interface to USDA-NCSS
SSURGO and STATSGO Soil Survey Products. Sou
MyWATERS
Fox Hollow Farm
Temporary Places
Layers
Earth Gallery

Topographical Info



Contour Map Creator

Go to https://contourmapcreator.urgr8.ch/

Folder shared with yo | Session One - Google | Session One - Google | Google Earth Pro Tute | FALL 2021Registratio | Day before email - Gc | MPDC registration sh | Complete Course Res | Contour Map Creato

https://contourmapcreator.urgr8.ch/

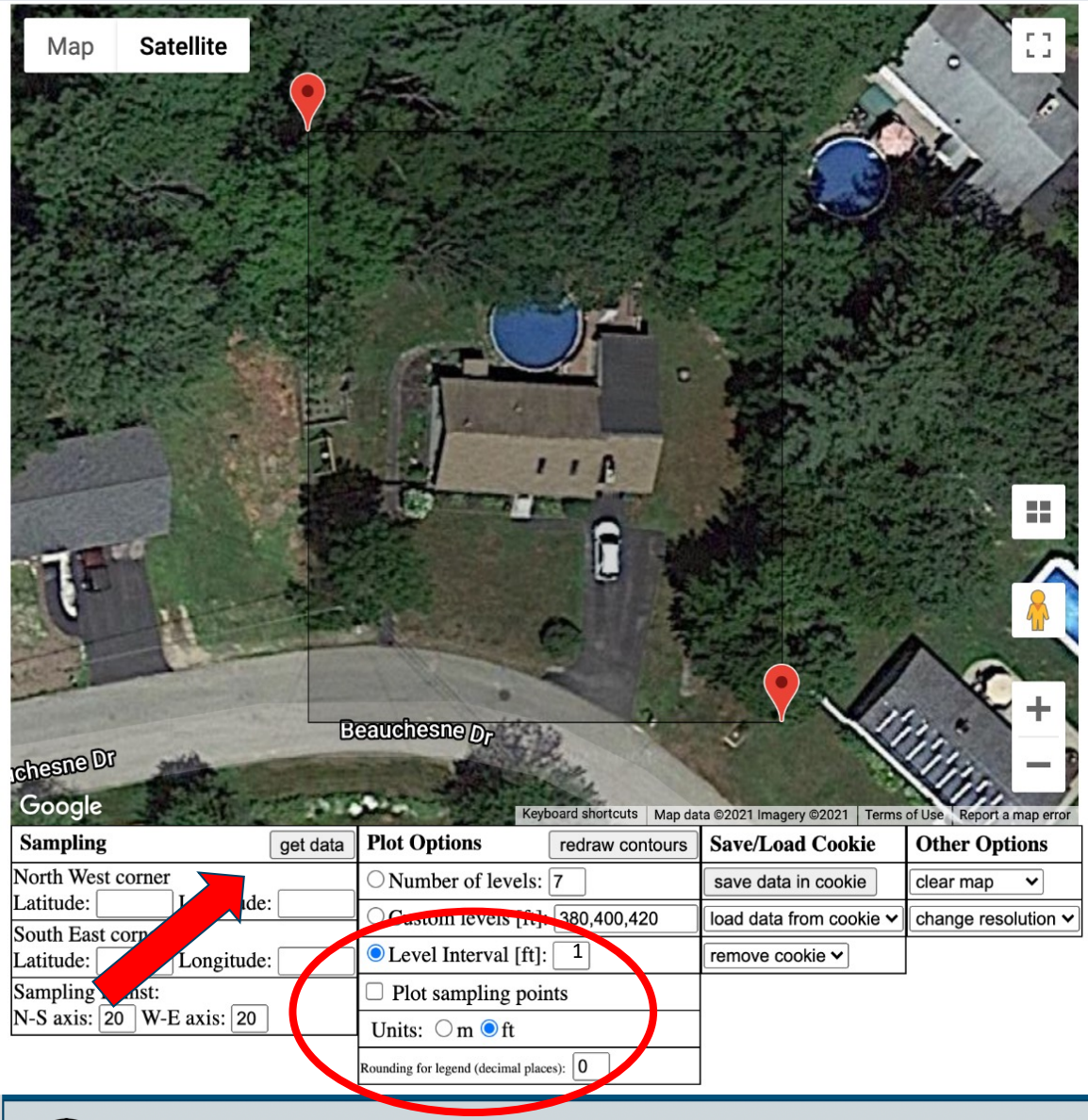
Contour Map Creator

0.314 improvement ideas

2 Beauchesne Drive Hooksett NH search

Enter your address and click search

Sampling	get data	Plot Options	redraw contours	Save/Load Cookie	Other Options
North West corner Latitude: Longitude:		Number of levels: 7		save data in cookie	clear map
South East corner Latitude: Longitude:		Custom levels [m]: 380,400,420		load data from cookie	change resolution
Sampling Poinst: N-S axis: 20 W-E axis: 20		Level Interval [m]: 5		remove cookie	
		Plot sampling points			
		Units: m ft			

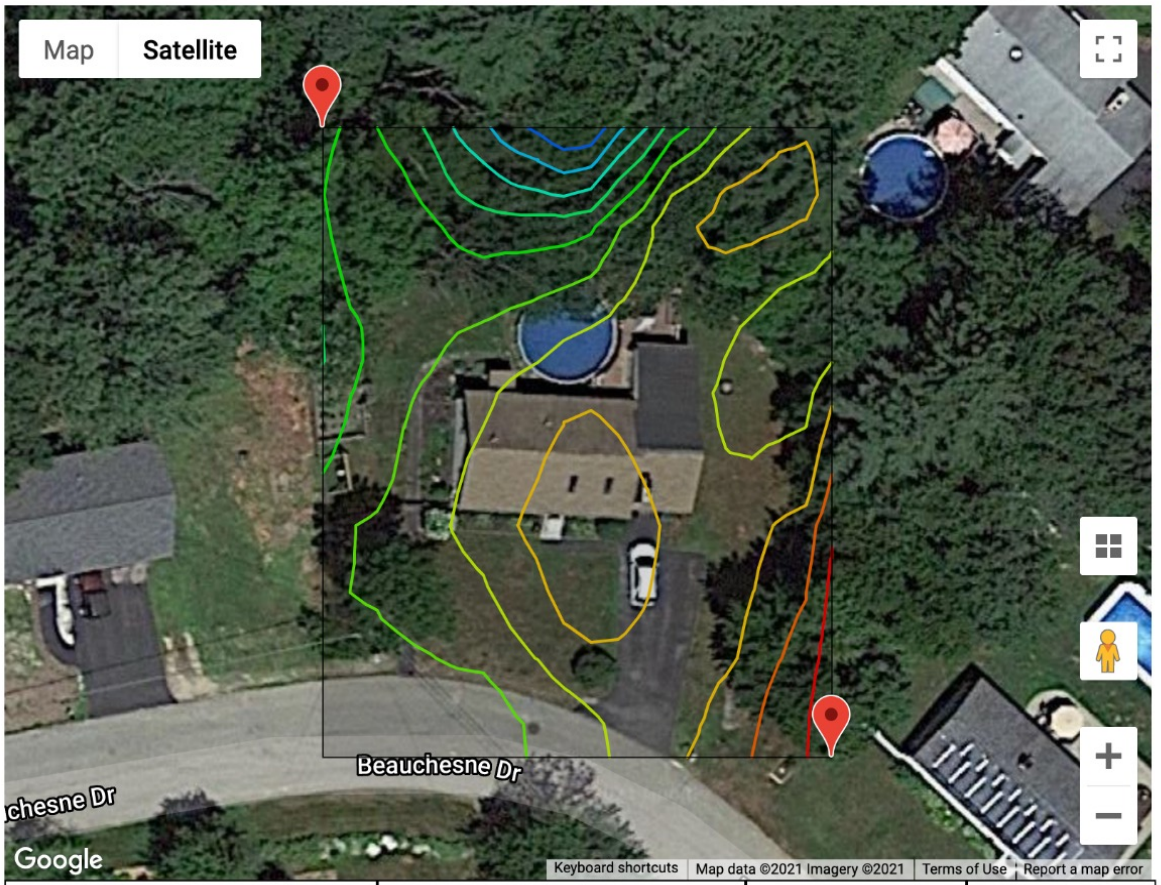


- Click on ‘Level Interval’, and type in the desired number of feet between contour lines
- In Units, select ‘ft’ for elevations calculated by foot, not meters
- To select the area you wish to obtain contour lines for, left click the upper left and lower right corners which will automatically create a box
- Then, click ‘Get Data’ and prepare to be amazed!

Contour Map Creator

0.314 improvement ideas

2 Beauchesne Drive Hooksett NH search



261 ft
262 ft
263 ft
264 ft
265 ft
266 ft
267 ft
268 ft
269 ft
270 ft
271 ft

Sampling	get data	Plot Options	redraw contours	Save/Load Cookie	Other Options
North West corner Latitude: 43.0882 Longitude: -71.4607		○ Number of levels: 7		save data in cookie	clear map
South East corner Latitude: 43.0878 Longitude: -71.4602		○ Custom levels [ft]: 380,400,420		load data from cookie	change resolution
Sampling Poinst: N-S axis: 20 W-E axis: 20		◉ Level Interval [ft]: 1		remove cookie	
		☐ Plot sampling points			
		Units: ○ m ◉ ft			

This is a 1 ft contour map for this property.

The red line in the lower right hand corner is the highest ground, and the blue line at the top is the lowest ground.

This means there is a ten foot difference in elevation on this property.

Notice:

The site https://contourmapcreator.urgr8.ch/ sometimes reaches data limits when usage is high. In this case, you would see an “over query limit” error response, and it would not be capable of pulling data for a selected area. These limits reset daily, so if this does occur you can try again the following day, or visit their backup site https://contourmapcreator.urgr8.ch/srtm. This backup site may have lower quality results, but it still gives a general overview of topography to get you started.

Wind, Climate, and Sun Data

Gathering Wind Data-Wind Roses

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https://mesonet.agron.iastate.edu/sites/locate.php?network=IL_ASOS

iastate.edu Index

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Iowa Environmental Mesonet

Search

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IEM Apps Areas Datasets Info Networks NWS Data Services Webcams

IEM Site Information

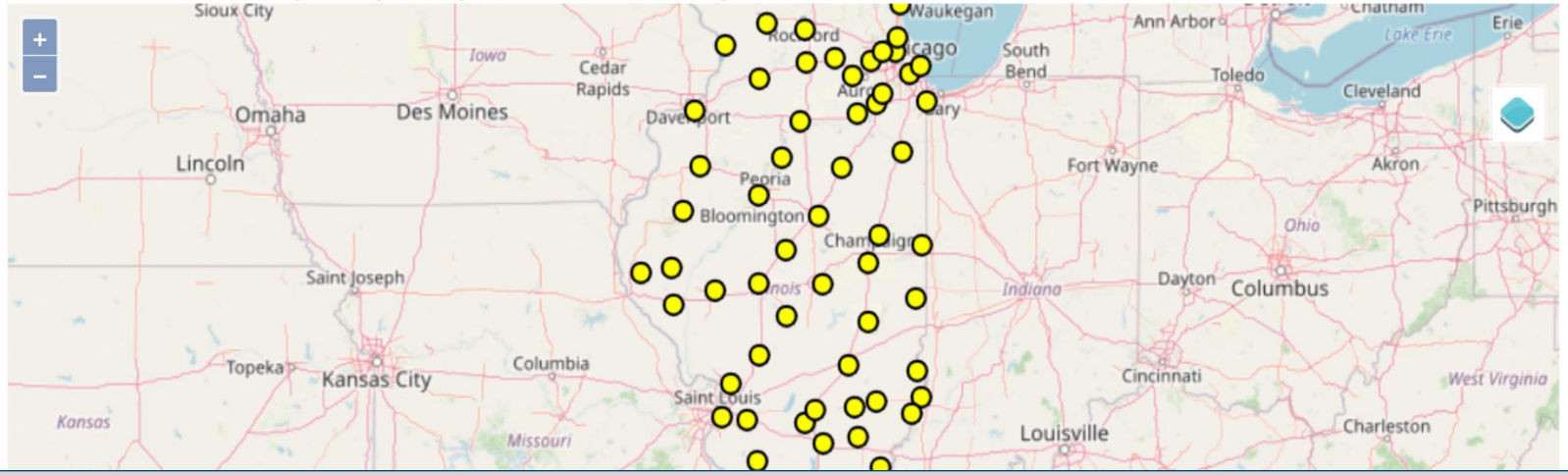
The IEM collects information from many sites. These sites are organized into networks based on their geography and/or the organization who administers the network. This application provides some metadata and

Go to:
https://mesonet.agron.iastate.edu/sites/locate.php?network=IL_ASOS

Select By Network: Illinois ASOS

Select By Station: [ALN] ALTON/ST LOUIS R [1972-] Select Station

Or select site from this map by clicking on the yellow dot and then clicking the 'Select Station' button above.



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mesonet.agron.iastate.edu

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Iowa Environmental Mesonet

Search

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IEM Apps Areas Datasets Info Networks NWS Data Services Webcams

IEM Site Information

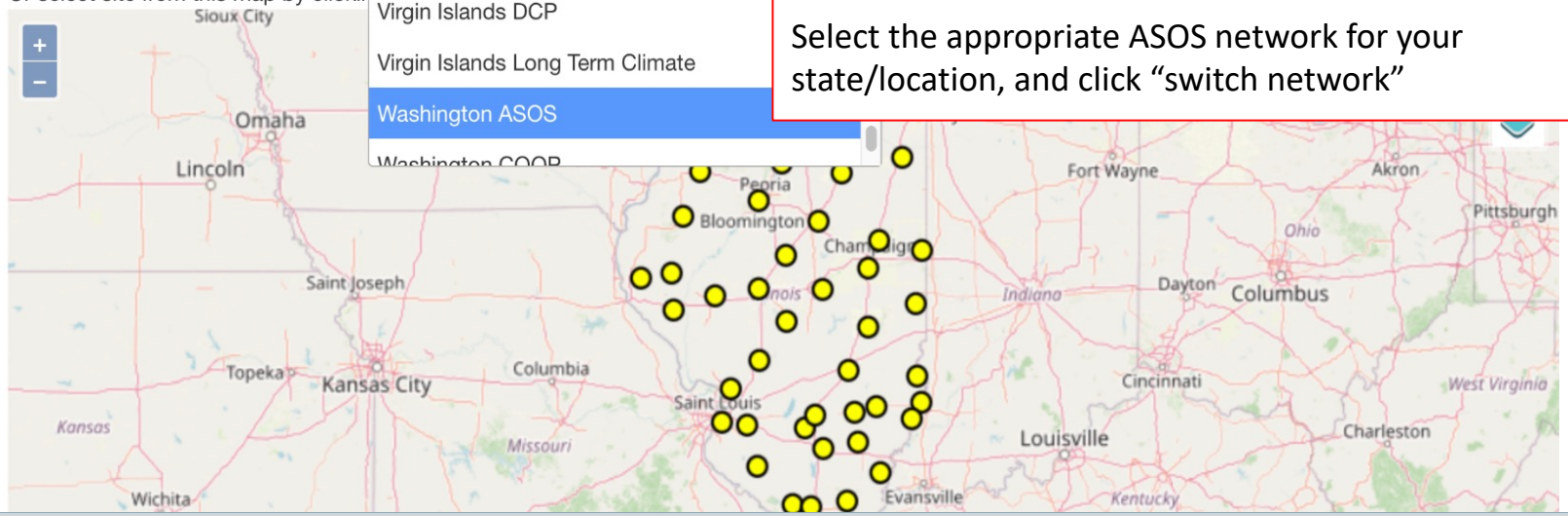
The IEM collects information from many sites. These sites are organized into networks based on their geography and/or the organization who administers the network. This application provides some metadata and site specific applications you may find useful.

Select By Network: Illinois ASOS — Switch Network

Select By Station: Select Station

Or select site from this map by clickin ...tion' button above

- Virginia RWIS
- Virgin Islands ASOS
- Virgin Islands DCP
- Virgin Islands Long Term Climate
- Washington ASOS
- Washington COOP



Select the appropriate ASOS network for your state/location, and click “switch network”

Session One - Google Drive | Session One - Google Drive | Google Earth Pro Tutorial.ppt | Day before email - Google Do | MPDC registration sheet - Go | Complete Course Resources | IEM :: Site Locator

https://mesonet.agron.iastate.edu/sites/locate.php?network=WA_ASOS

IEM | Apps | Areas | Datasets | Info | Networks | NWS Data | Services | Webcams

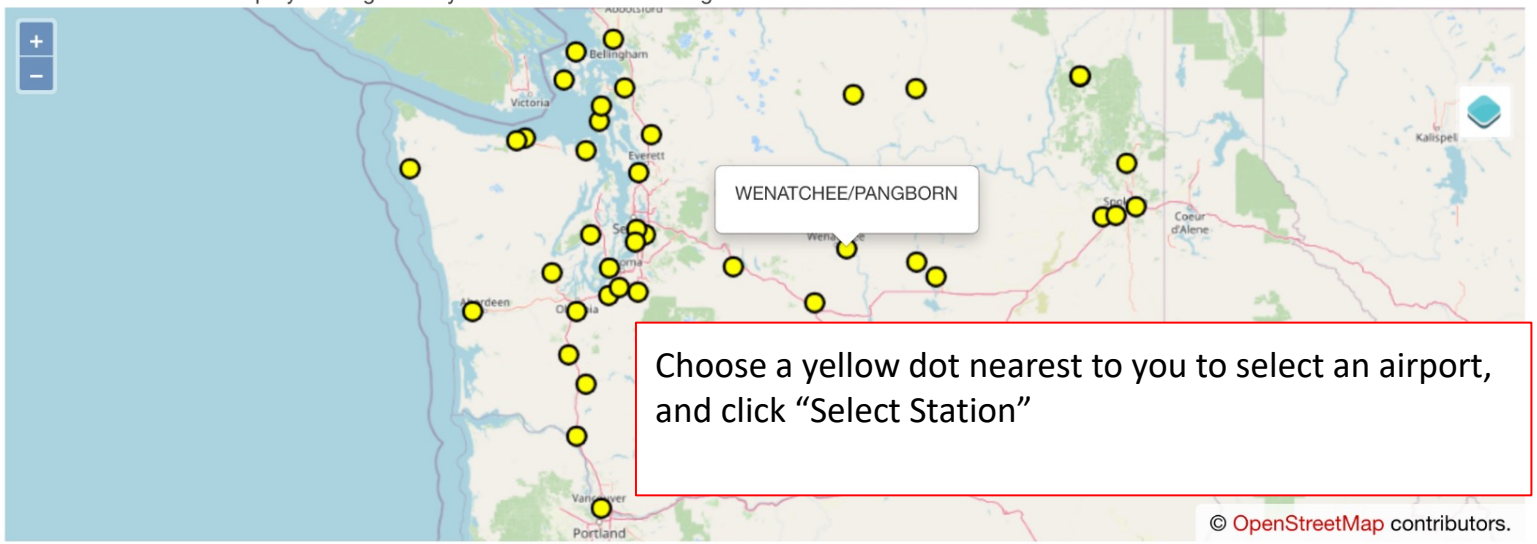
IEM Site Information

The IEM collects information from many sites. These sites are organized into networks based on their geography and/or the organization who administers the network. This application provides some metadata and site specific applications you may find useful.

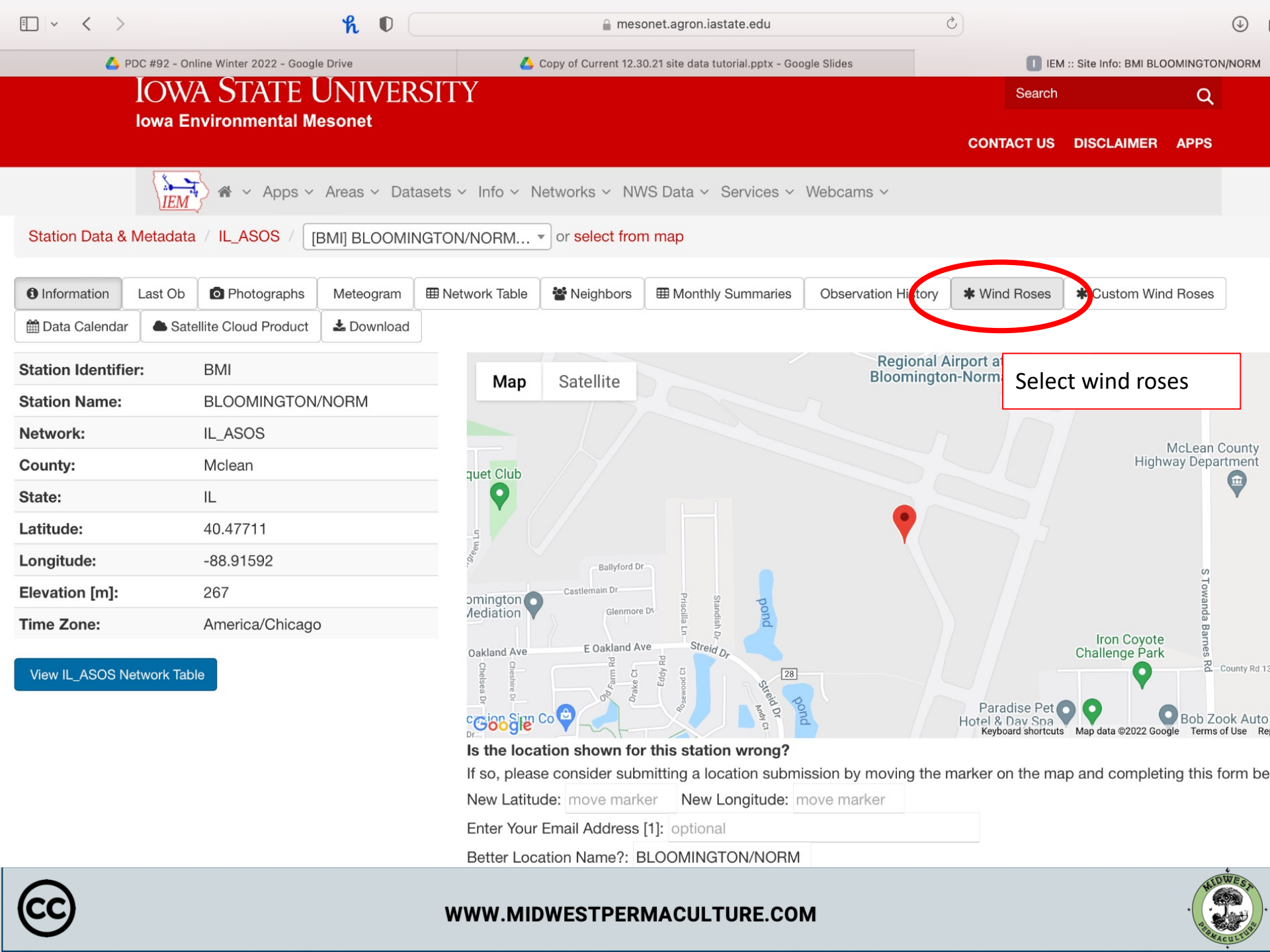
Select By Network: Washington ASOS — Switch Network

Select By Station: [EAT] WENATCHEE/PANGBORN [1972-] — Select Station

Or select site from this map by clicking on the yellow dot and then clicking the 'Select Station' button above.



Choose a yellow dot nearest to you to select an airport, and click “Select Station”



WWW.MIDWESTPERMACULTURE.COM

mesonet.agron.iastate.edu
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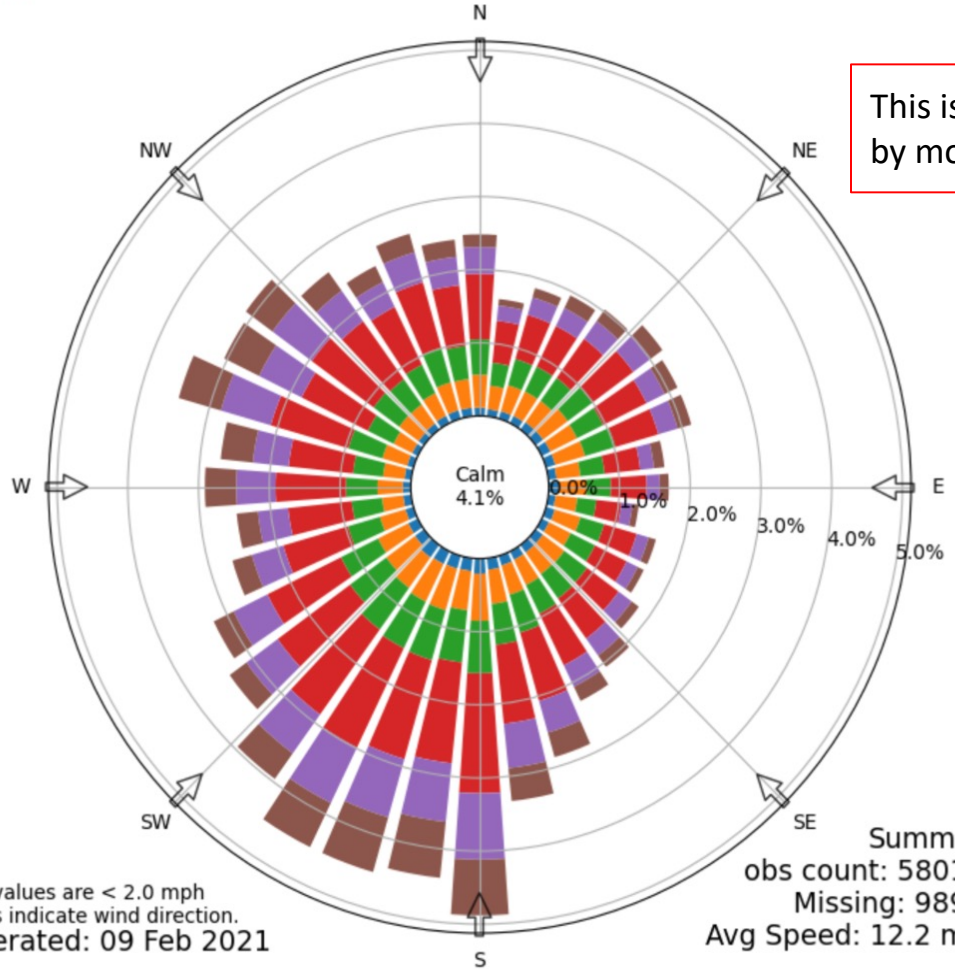
IEM :: Site Wind Roses

[BMI] BLOOMINGTON/NORM
Windrose Plot
Time Bounds: 02 Apr 1976 09:00 AM - 09 Feb 2021 12:56 AM America/Chicago



This is an annual windrose. Scroll down to see windroses by month.

Calm values are < 2.0 mph
Arrows indicate wind direction.
Generated: 09 Feb 2021

Summary
obs count: 580127
Missing: 98915
Avg Speed: 12.2 mph

Wind Speed [mph]
2 - 5 | 5 - 7 | 7 - 10 | 10 - 15 | 15 - 20 | 20+

https://www.usclimatedata.com/

U.S. Climate Data

Enter a location

Home United States

US Climate Data

You are here: Home

Climate Doylestown - Pennsylvania

	Jan	Feb	Mar	Apr	May	Jun
Average high in °F	38	41	50	62		
Average low in °F	22	24	31	41		
Av. precipitation in inch	3.33	2.80	3.84	4.11		

	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F	85	83	75	64	54	42
Average low in °F	64	62	55	44	36	27
Av. precipitation in inch	6.36	4.07	4.39	4.11	3.68	4.01

Share

- go to https://www.usclimatedata.com/
- Type in the closest city near you. If the prompt window does not appear, you will need to type in a larger nearby city.
- Scroll down to see average temps and rainfall, and access the climate data chart.

Abbreviations

Average precipitation in : Av. precipitation in
Jan: January, Feb: February, ...

Doylestown Climate Graph - Pennsylvania Climate Chart

Precipitation Low High

usclimatedata.com
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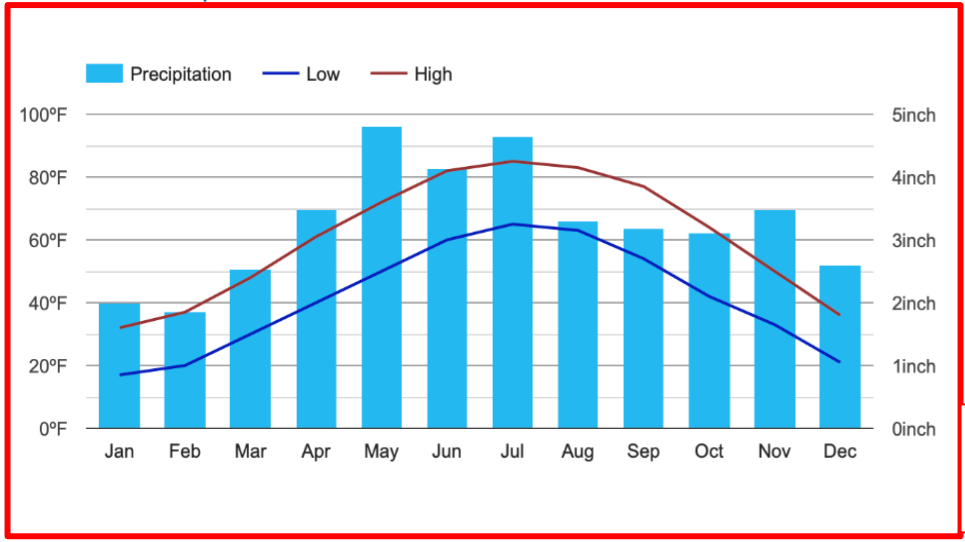
IEM :: Site Wind Roses
Climate Kankakee - Illinois and Weather averages Kank...

	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F	85	83	77	64	50	36
Average low in °F	65	63	54	42	33	21
Av. precipitation in inch	4.65	3.31	3.19	3.11	3.48	2.60
Av. snowfall in inch	0	0	0	0	1	6

Kankakee Climate Graph - Illinois Climate Chart



Annual high temperature	60°F
Annual low temperature	41°F
Average annual precip.	39.16 inch
Av. annual snowfall	24 inch

Here is the annual rainfall. Also note the annual snowfall, as it could be pertinent to designing in your location.

Station Data

Monthly averages Kankakee
Longitude: -87.8463, Latitude: 41.0714
Average weather Kankakee, IL - 60901

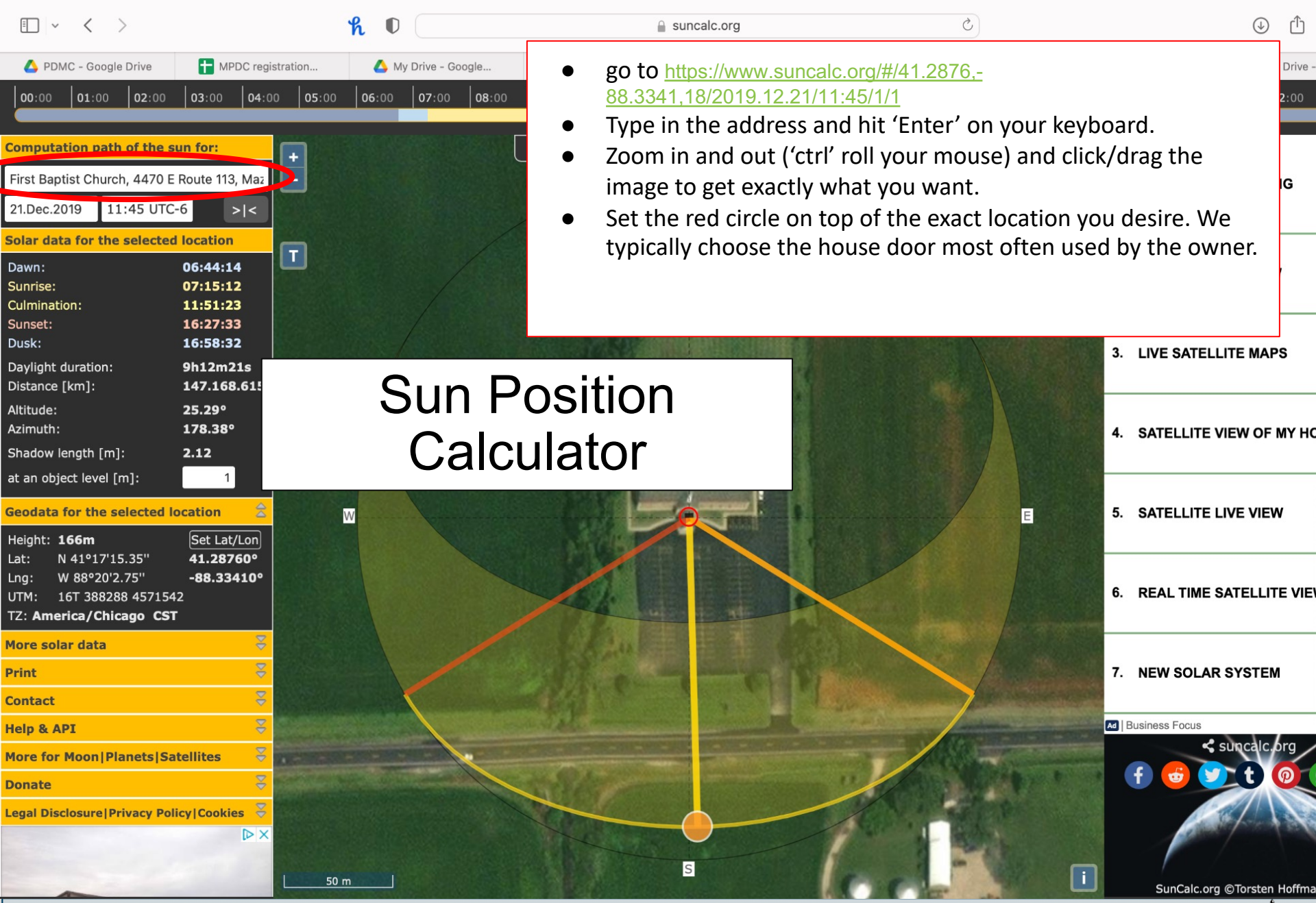
Monthly: 1981-2010 normals
History: 2007-2018

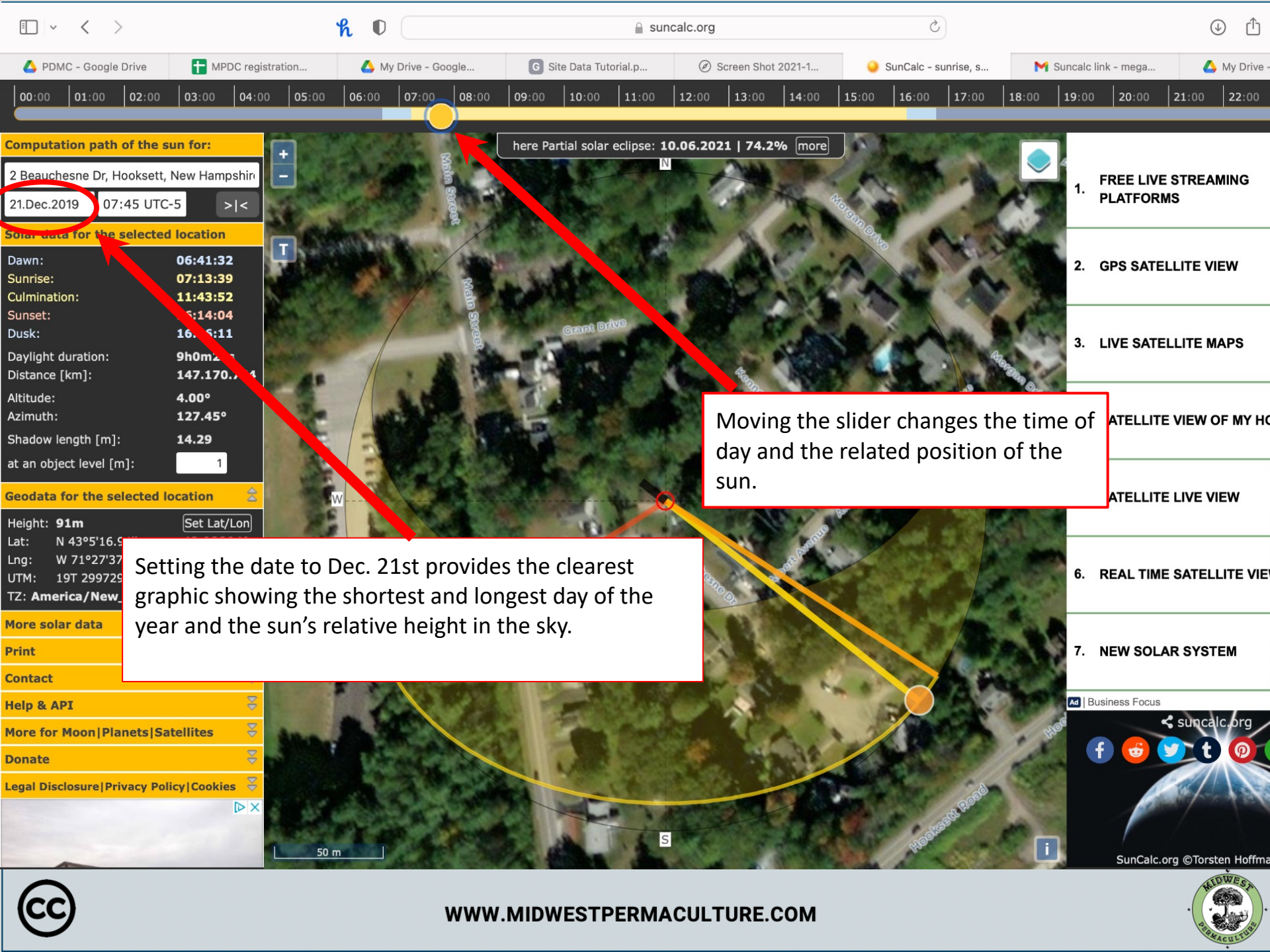
This is the chart we often use.

Average precipitation in : Av. precipitation in
Jan: January, Feb: February, ...

- go to https://www.suncalc.org/#/41.2876,-88.3341,18/2019.12.21/11:45/1/1
- Type in the address and hit 'Enter' on your keyboard.
- Zoom in and out ('ctrl' roll your mouse) and click/drag the image to get exactly what you want.
- Set the red circle on top of the exact location you desire. We typically choose the house door most often used by the owner.

Sun Position Calculator





Moving the slider changes the time of day and the related position of the sun.

Setting the date to Dec. 21st provides the clearest graphic showing the shortest and longest day of the year and the sun's relative height in the sky.

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