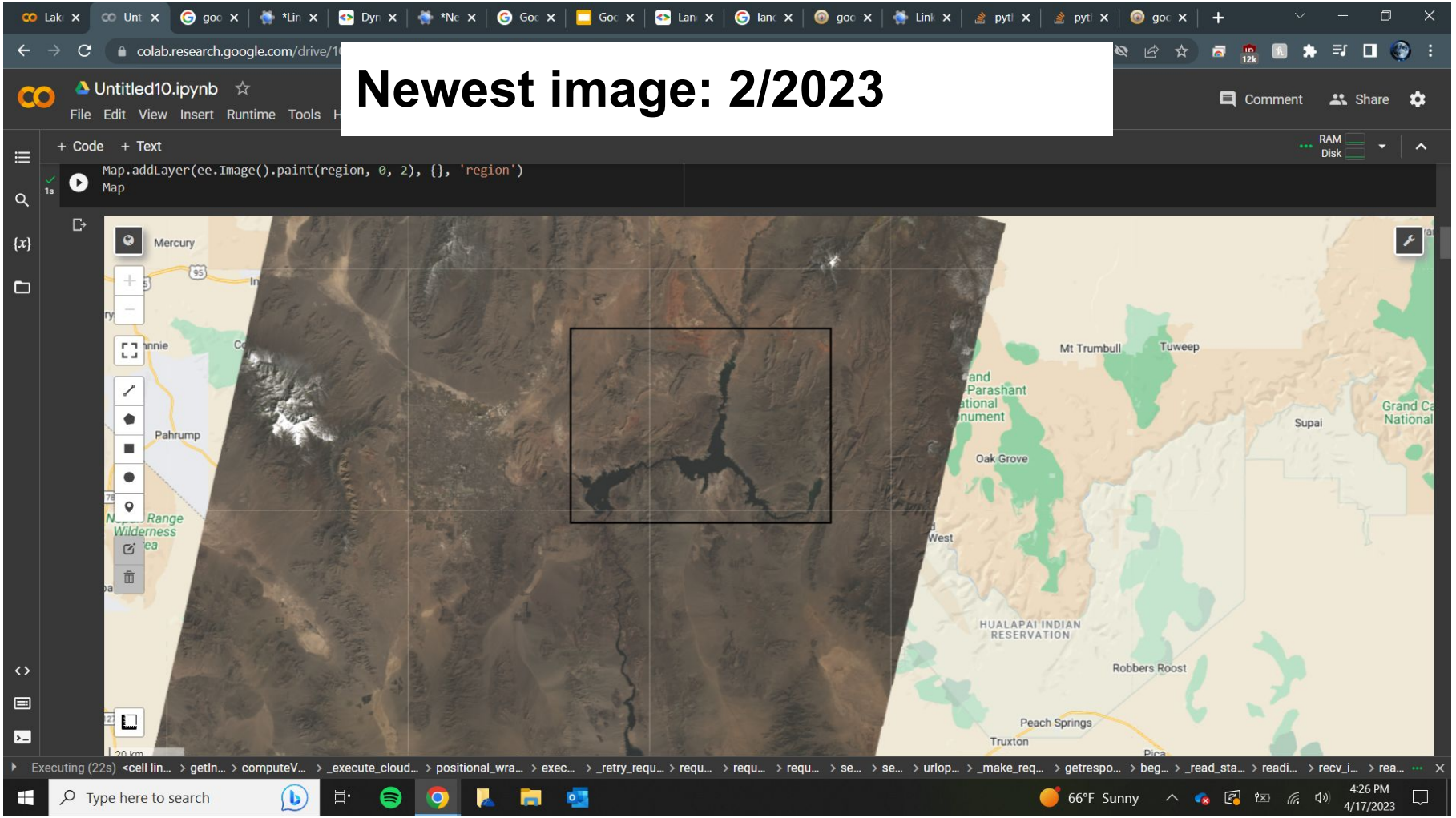
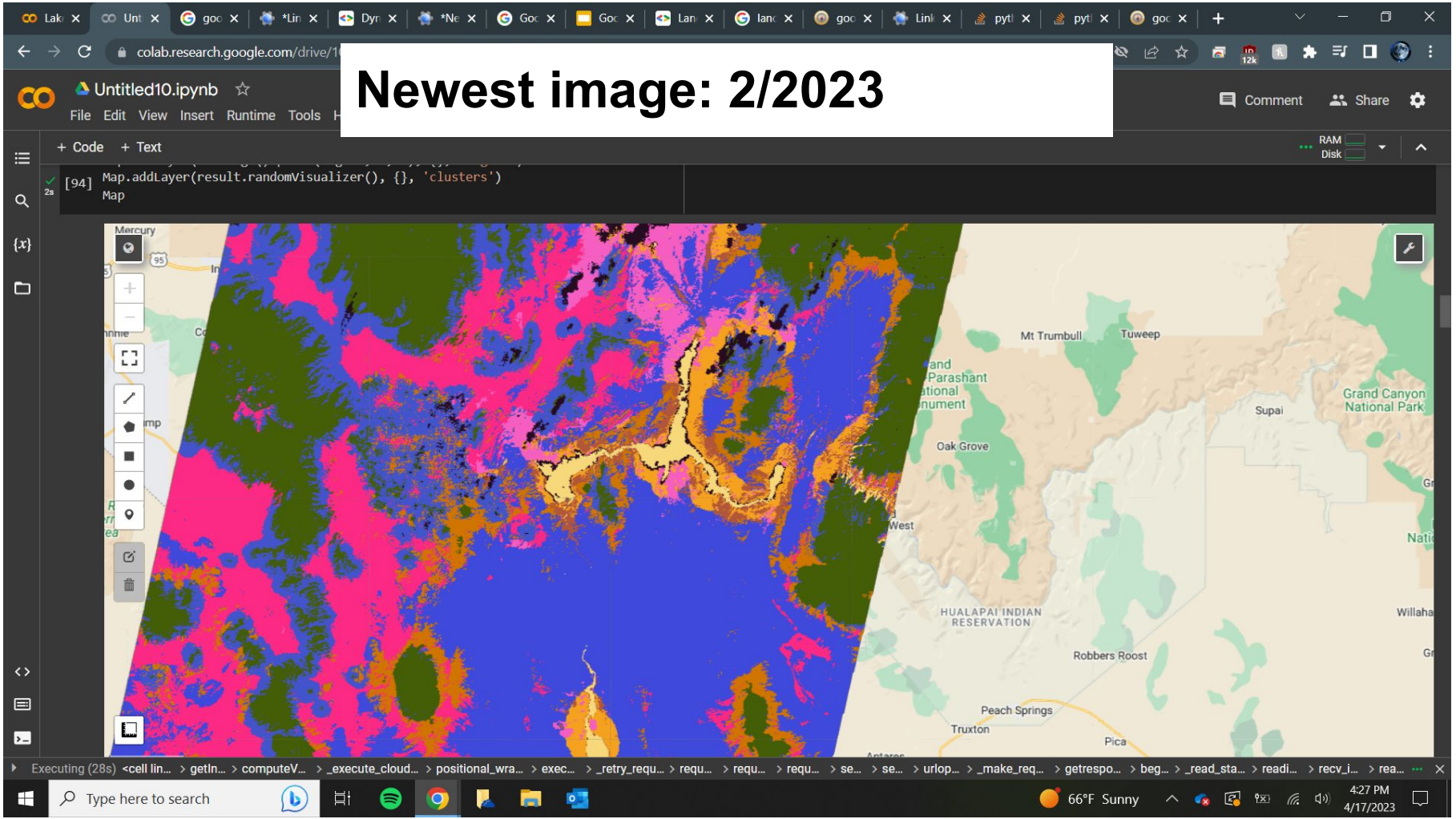
Google earth engine built-in clustering methods

- K-means in this case
- Specify the number of clusters you want
- Can apply the clusters to various uses
- Don’t have to worry about downloading the bands, etc.
- Downside: very specific to the area it is trained on, and if the area is too large, it overgeneralizes the regions

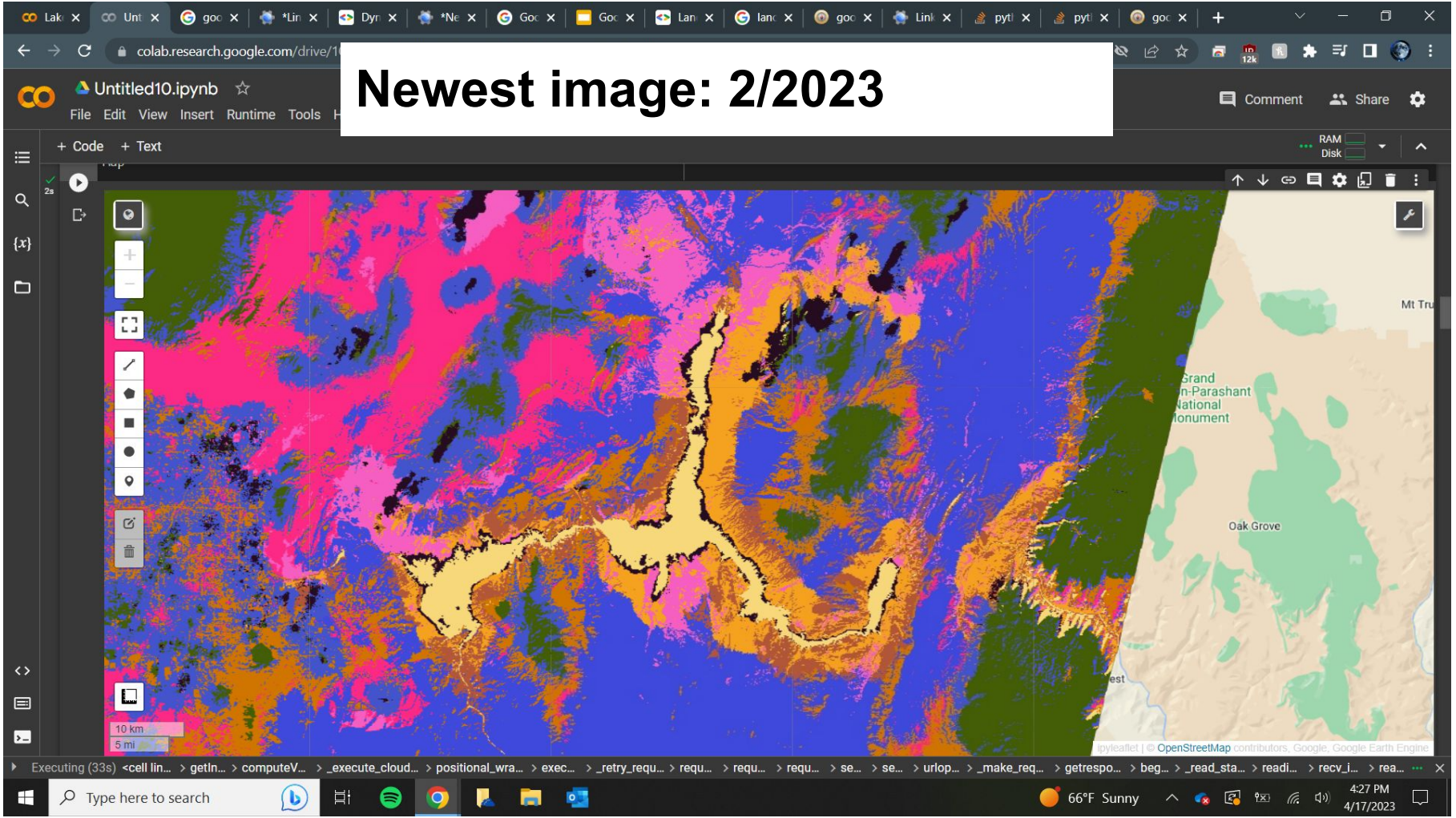
Newest image: 2/2023



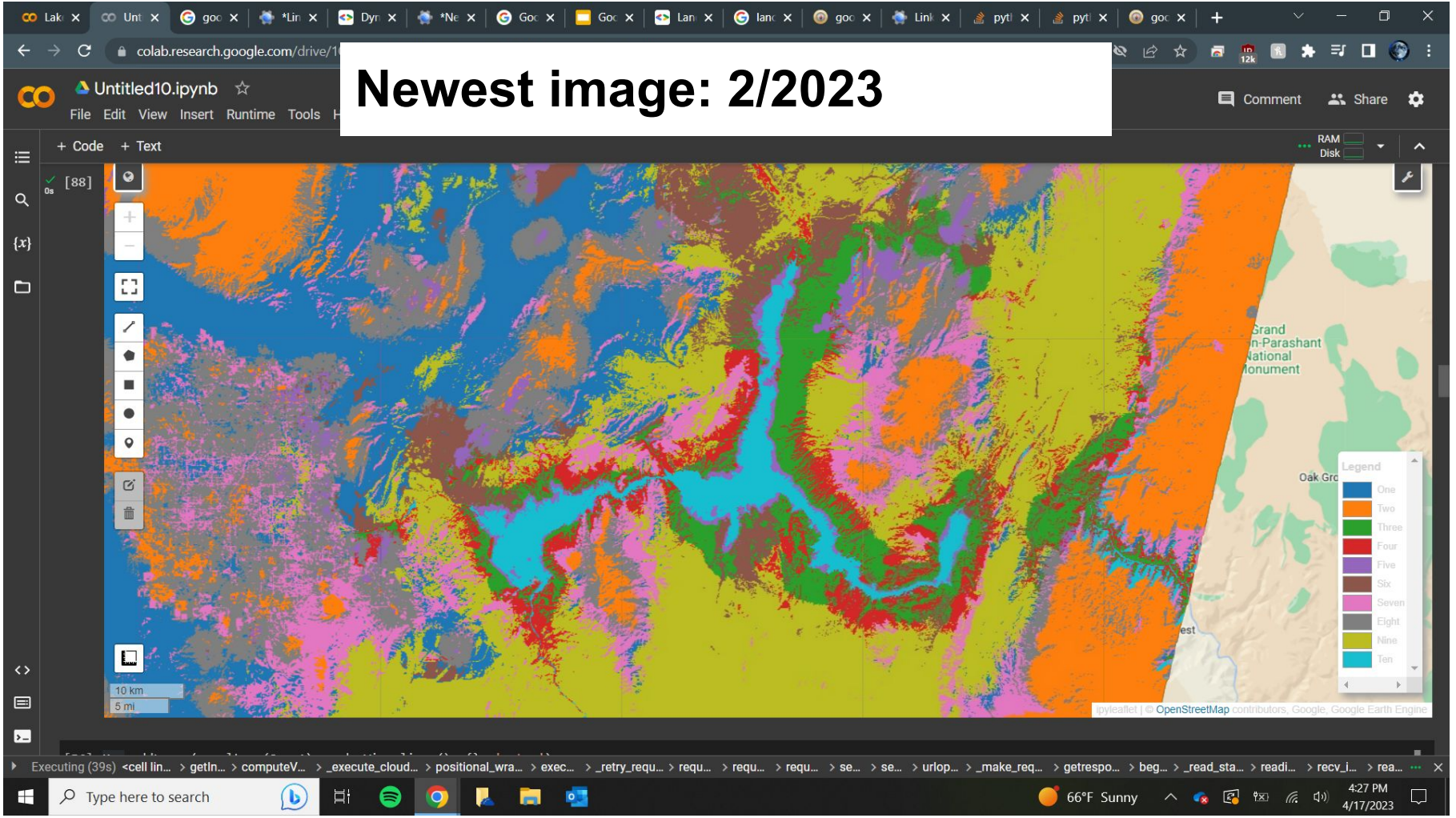
Newest image: 2/2023



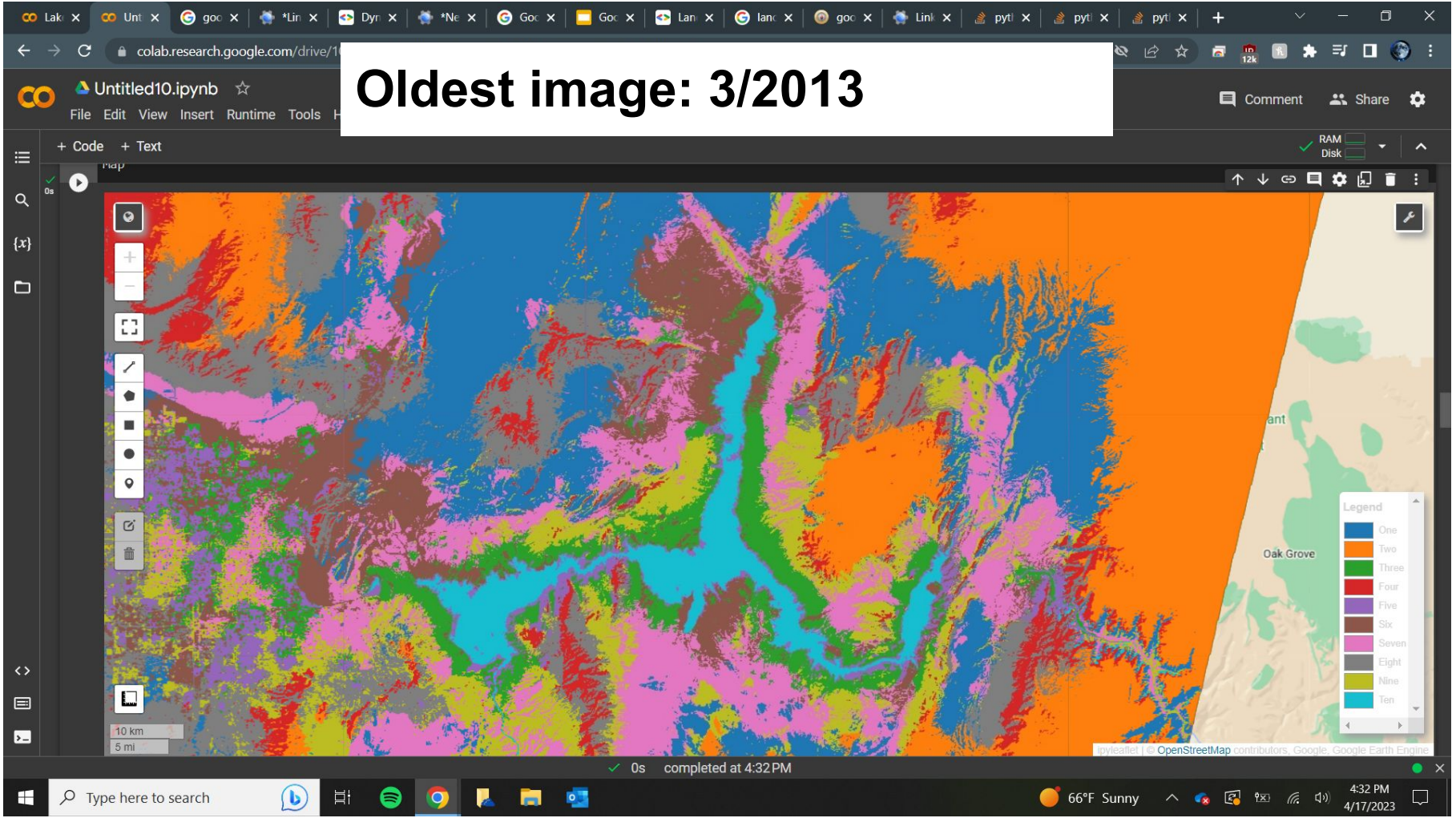
Newest image: 2/2023

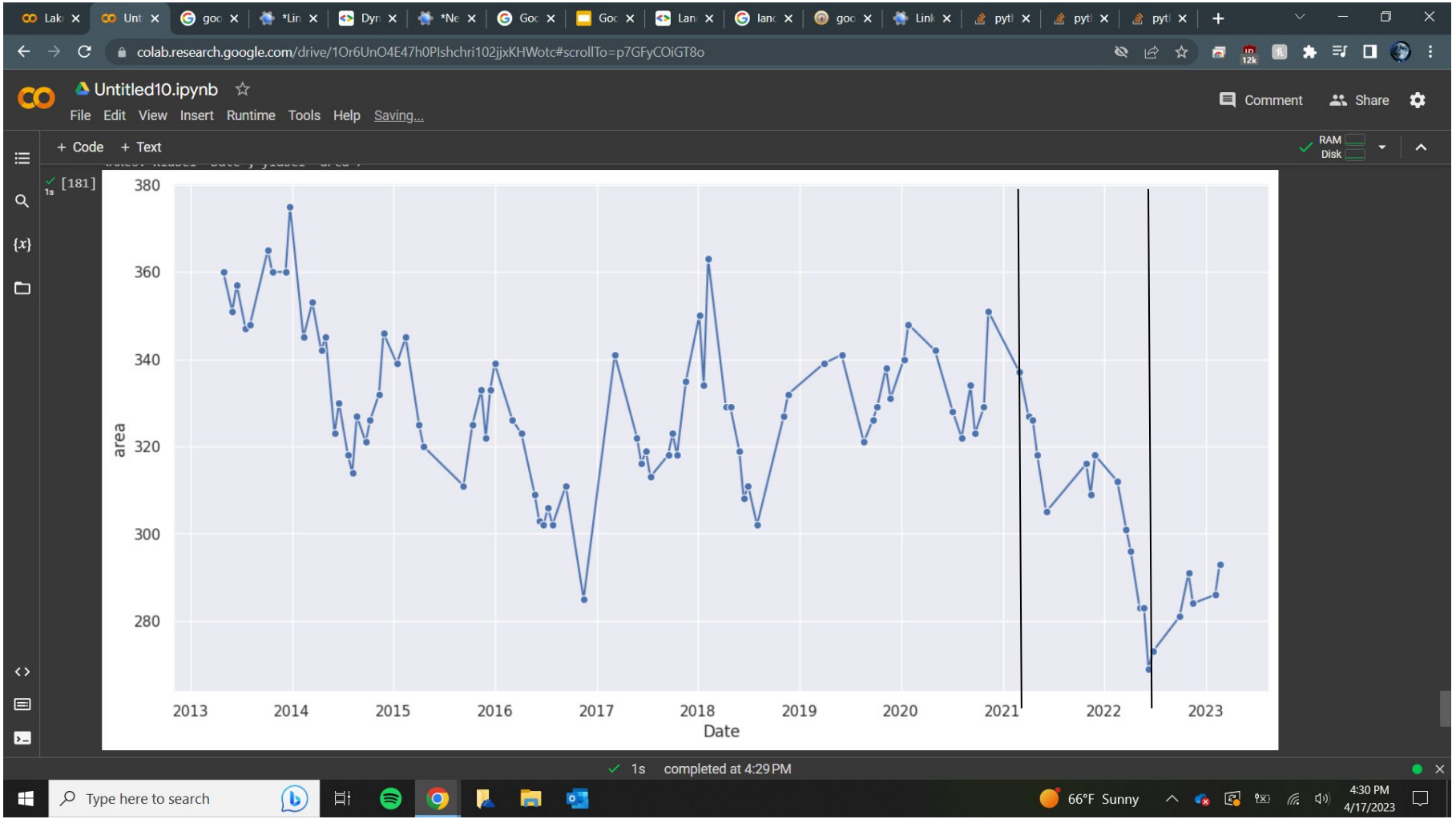


Newest image: 2/2023



Oldest image: 3/2013

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File Edit View Insert Runtime Tools Help Saving...
Comment
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RAM
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1s
area
380
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2013
2014
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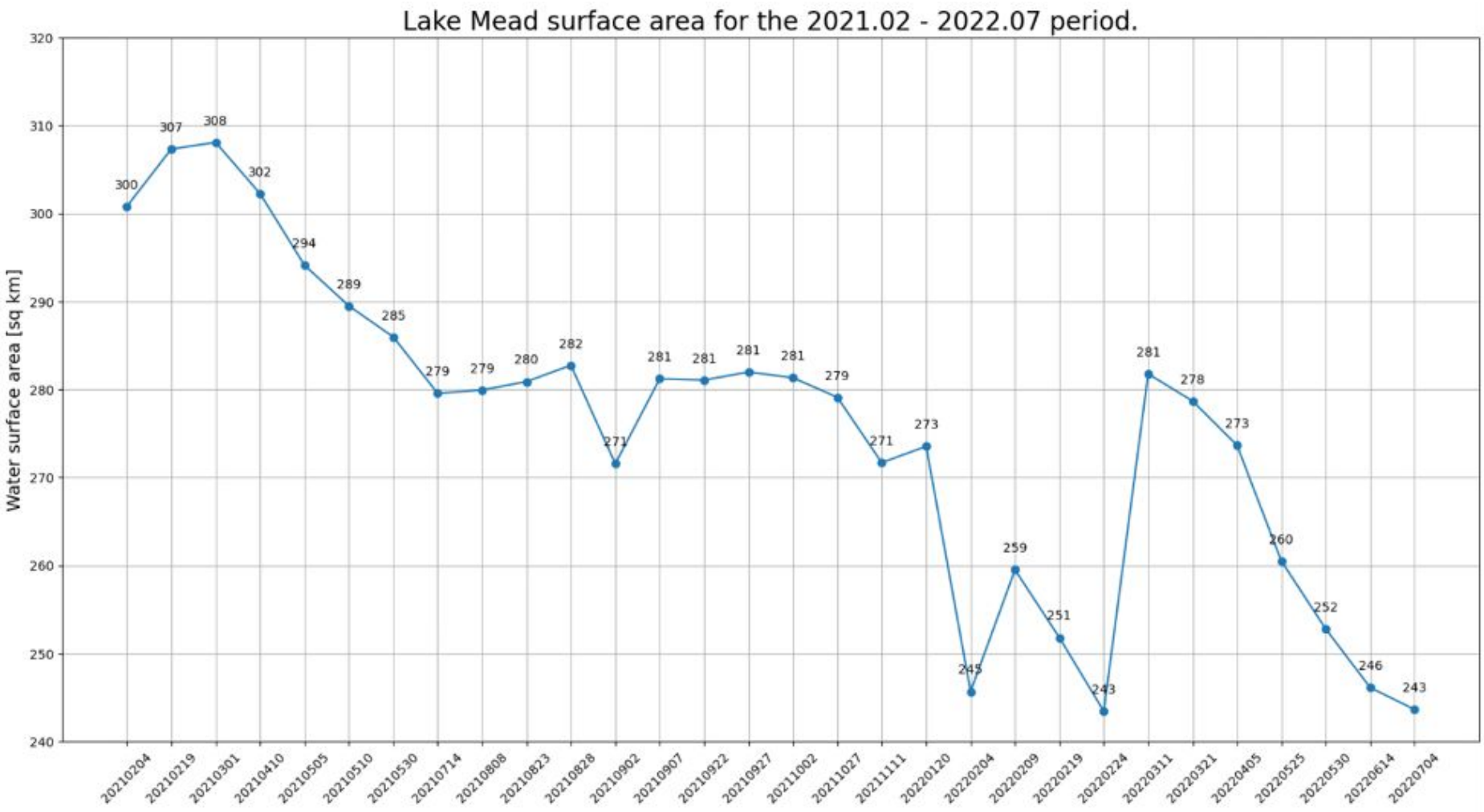
66°F Sunny
4:30 PM
4/17/2023

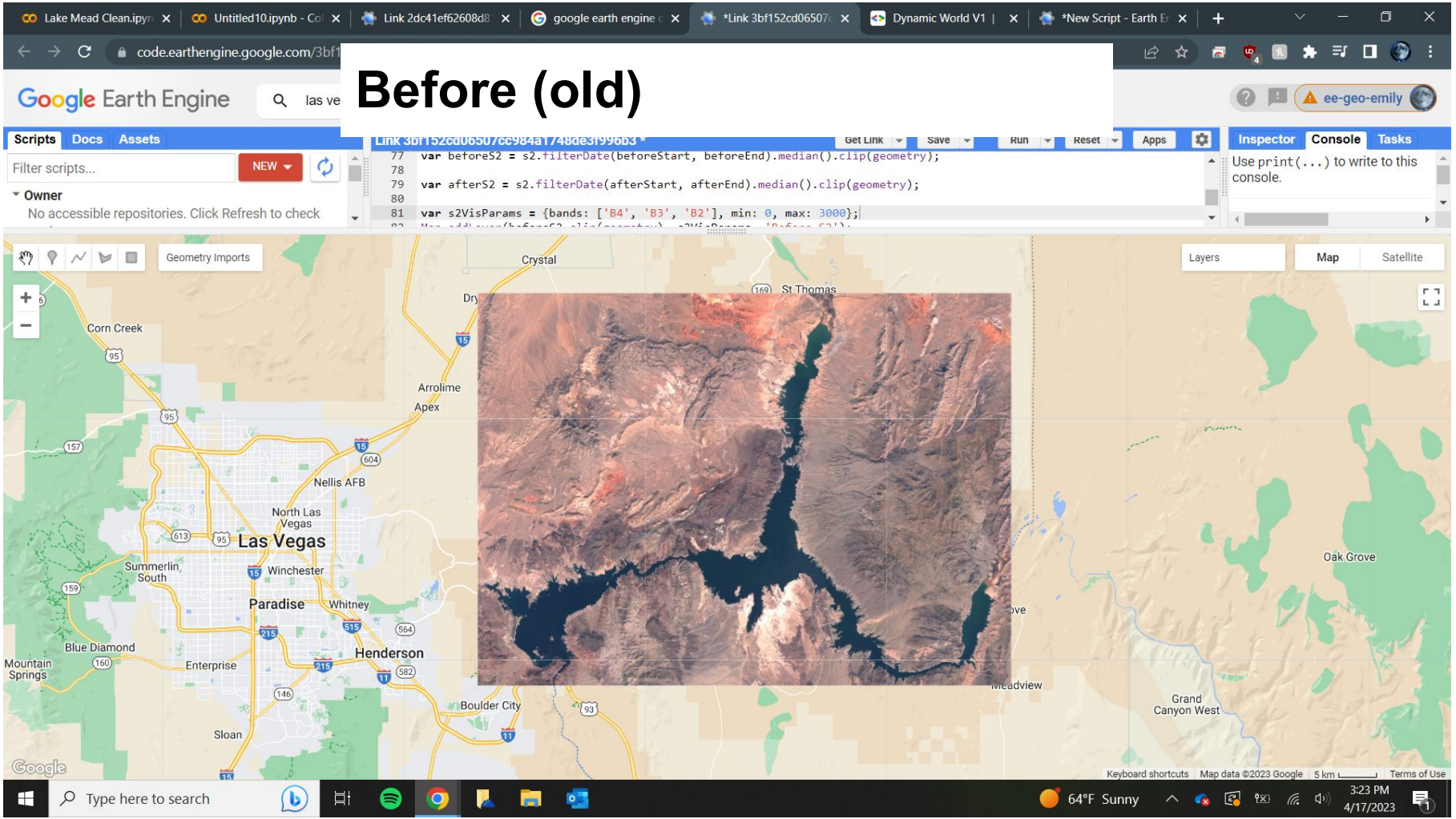

Lake Mead surface area for the 2021.02 - 2022.07 period.
Water surface area [sq km]
320
310
300
290
280
270
260
250
240
300
307
308
302
294
289
285
279
279
280
282
271
281
281
281
281
279
271
273
245
259
251
243
281
278
273
260
252
246
243
20210204
20210219
20210301
20210410
20210505
20210510
20210530
20210714
20210808
20210823
20210828
20210902
20210907
20210922
20210927
20211002
20211027
20211111
20220120
20220204
20220209
20220219
20220224
20220311
20220321
20220405
20220525
20220530
20220614
20220704

Next: The Lake Mead problem is very specific to bodies of water, can we expand the use case to identify change over time over other land types?

Google dynamic world

- https://developers.google.com/earth-engine/datasets/catalog/GOOGLE_DYNAMICWORLD_V1
- 10M resolution
- Built off of sentinel satellite data
- “Near real-time” every ~2 days
- Don’t need to run any models - the output of the data is classes of land cover
- 9 types of land cover + 1 cover category
- Each cover is assigned a probability
  - All 9 sum to 1
  - Highest probability = cover category
- Very fast
- Basically the same interface as the Landsat data - just change the source

Before (old)


Lake Mead Clean.ipyn
Untitled10.ipynb - Co
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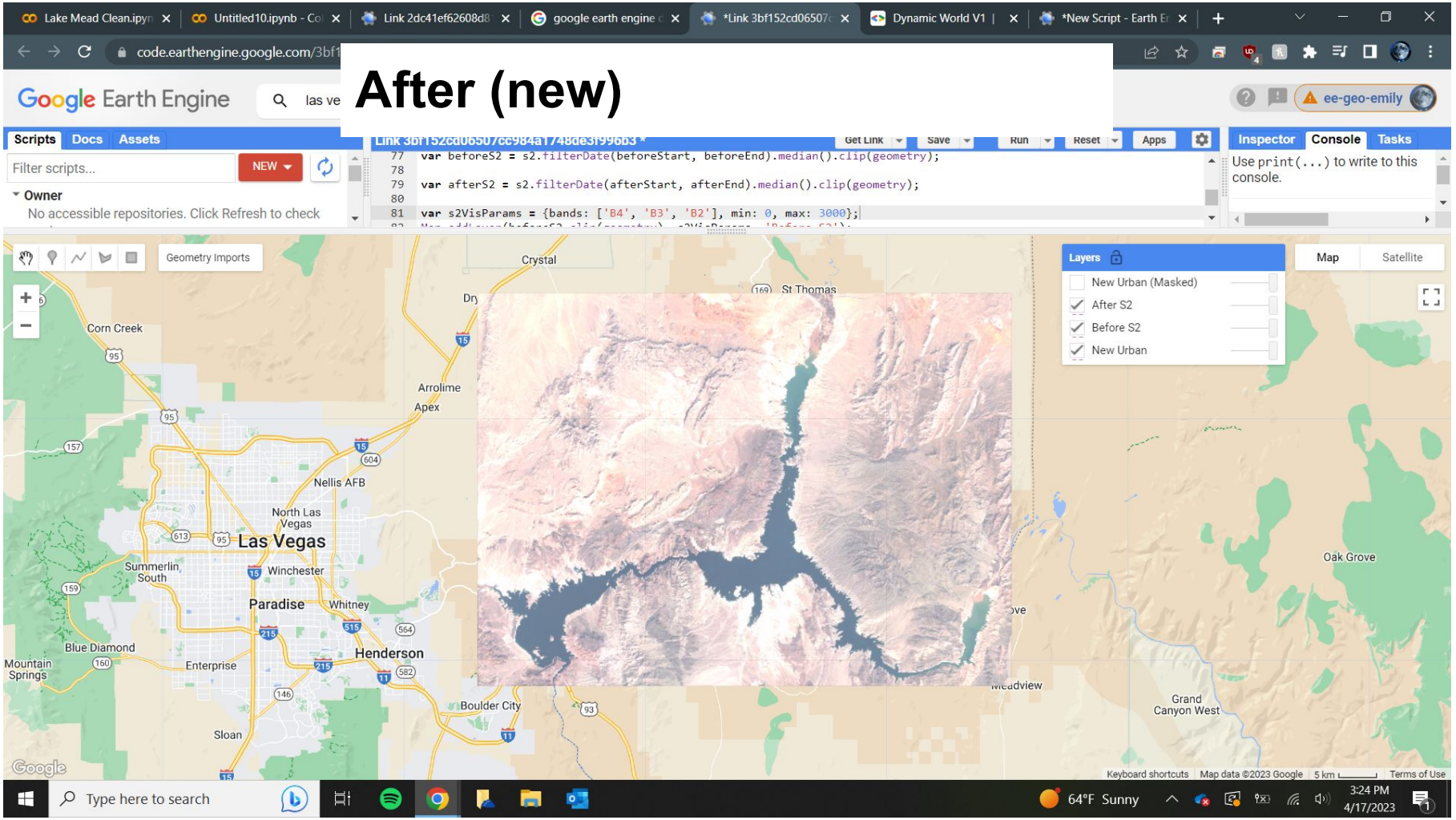
google earth engine
*Link 3bf152cd06507
Dynamic World V1
*New Script - Earth Er
code.earthengine.google.com/3bf1
Google Earth Engine
las ve
ee-geo-emily
Scripts
Docs
Assets
Filter scripts...
NEW
Owner
No accessible repositories. Click Refresh to check
Link 3bf152cd06507cc984a1748de3f996b3 *
Get Link
Save
Run
Reset
Apps
Inspector
Console
Tasks
Use print(...) to write to this console.
77 var beforeS2 = s2.filterDate(beforeStart, beforeEnd).median().clip(geometry);
78
79 var afterS2 = s2.filterDate(afterStart, afterEnd).median().clip(geometry);
80
81 var s2VisParams = {bands: ['B4', 'B3', 'B2'], min: 0, max: 3000};
Geometry Imports
Layers
Map
Satellite
Crystal
St Thomas
Corn Creek
Arrolime
Apex
Nellis AFB
North Las Vegas
Las Vegas
Summerlin South
Winchester
Paradise
Whitney
Henderson
Blue Diamond
Mountain Springs
Enterprise
Boulder City
Sloan
Meadview
Oak Grove
Grand Canyon West
Google
Keyboard shortcuts
Map data ©2023 Google
5 km
Terms of Use
Type here to search
64°F Sunny
3:23 PM
4/17/2023

After (new)


Lake Mead Clean.ipyn
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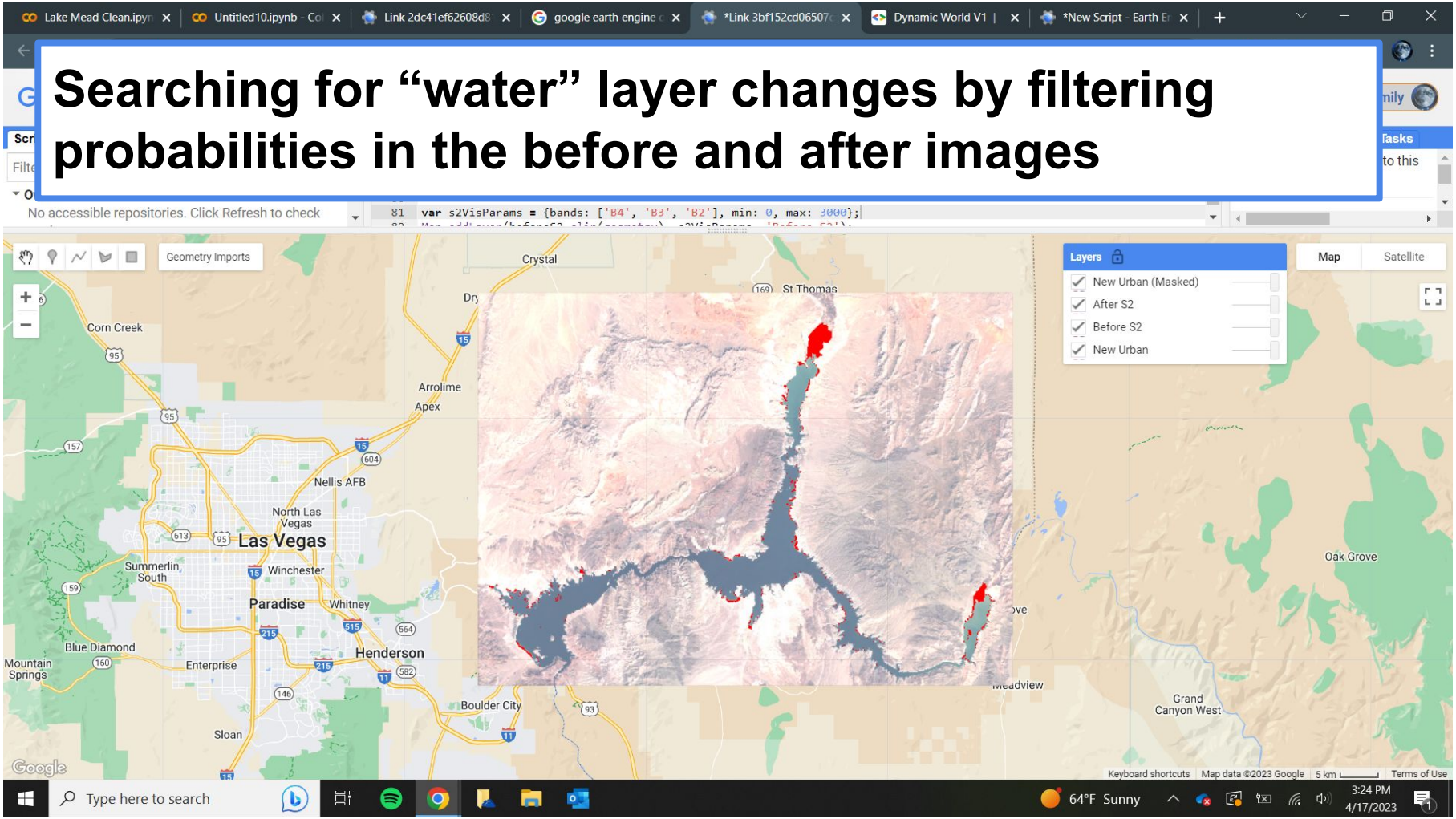
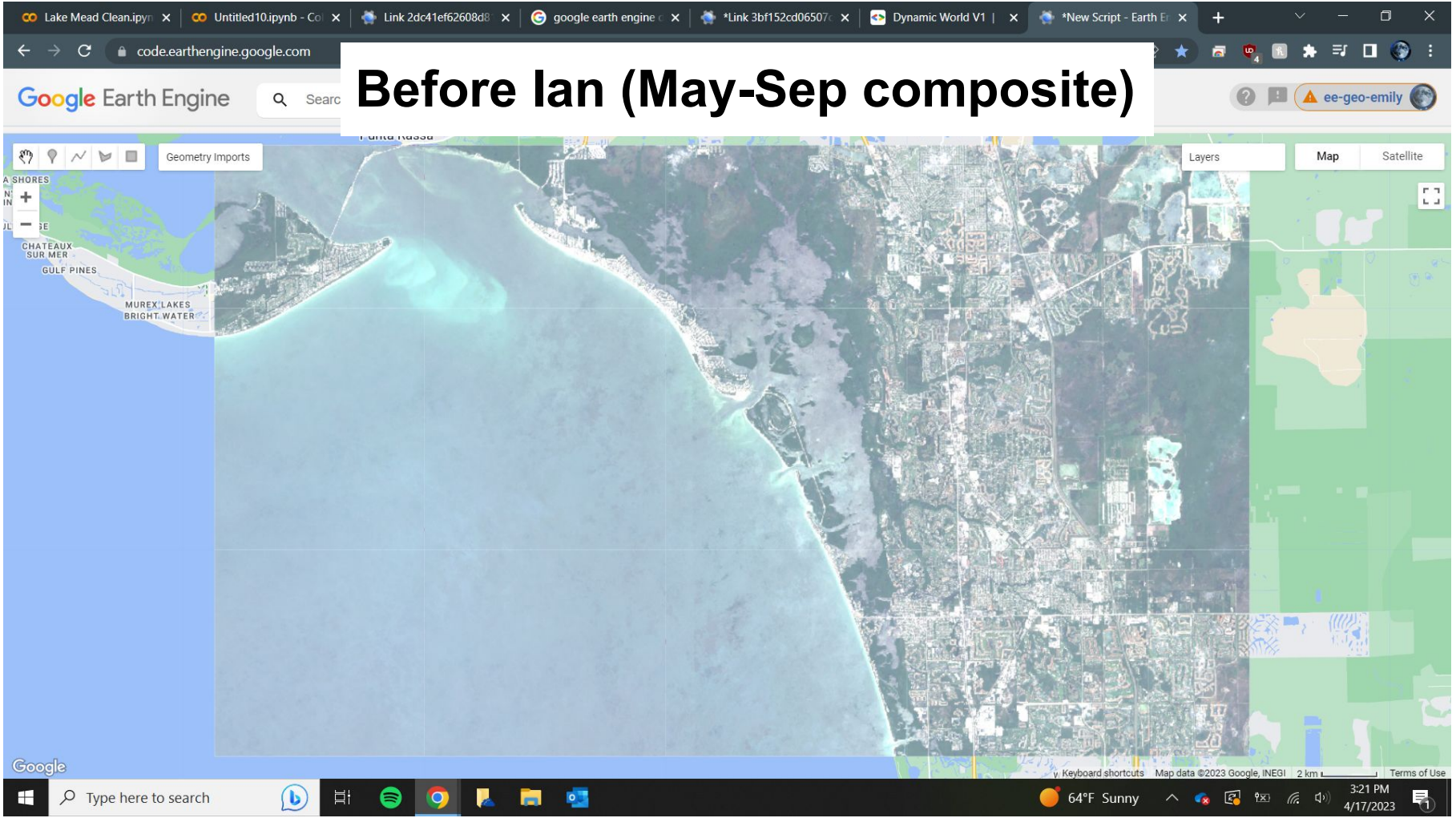
Console
Tasks
Use print(...) to write to this console.
77 var beforeS2 = s2.filterDate(beforeStart, beforeEnd).median().clip(geometry);
78
79 var afterS2 = s2.filterDate(afterStart, afterEnd).median().clip(geometry);
80
81 var s2VisParams = {bands: ['B4', 'B3', 'B2'], min: 0, max: 3000};
Geometry Imports
Layers
New Urban (Masked)
After S2
Before S2
New Urban
Map
Satellite
Crystal
St Thomas
Corn Creek
Arrolime
Apex
Nellis AFB
North Las Vegas
Las Vegas
Summerlin South
Winchester
Paradise
Whitney
Blue Diamond
Mountain Springs
Enterprise
Henderson
Boulder City
Sloan
Oak Grove
Grand Canyon West
Google
Keyboard shortcuts
Map data ©2023 Google
5 km
Terms of Use
Type here to search
64°F Sunny
3:24 PM
4/17/2023

Searching for “water” layer changes by filtering probabilities in the before and after images




Lake Mead Clean.ipyn
Untitled10.ipynb - Co
Link 2dc41ef62608d8
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*Link 3bf152cd06507
Dynamic World V1
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code.earthengine.google.com
Google Earth Engine
Before Ian (May-Sep composite)
ee-geo-emily
Geometry Imports
Layers
Map
Satellite
CHATEAUX SUR MER
GULF PINES
MUREX LAKES
BRIGHT WATER
Google
Keyboard shortcuts
Map data ©2023 Google, INEGI
2 km
Terms of Use
Type here to search
64°F Sunny
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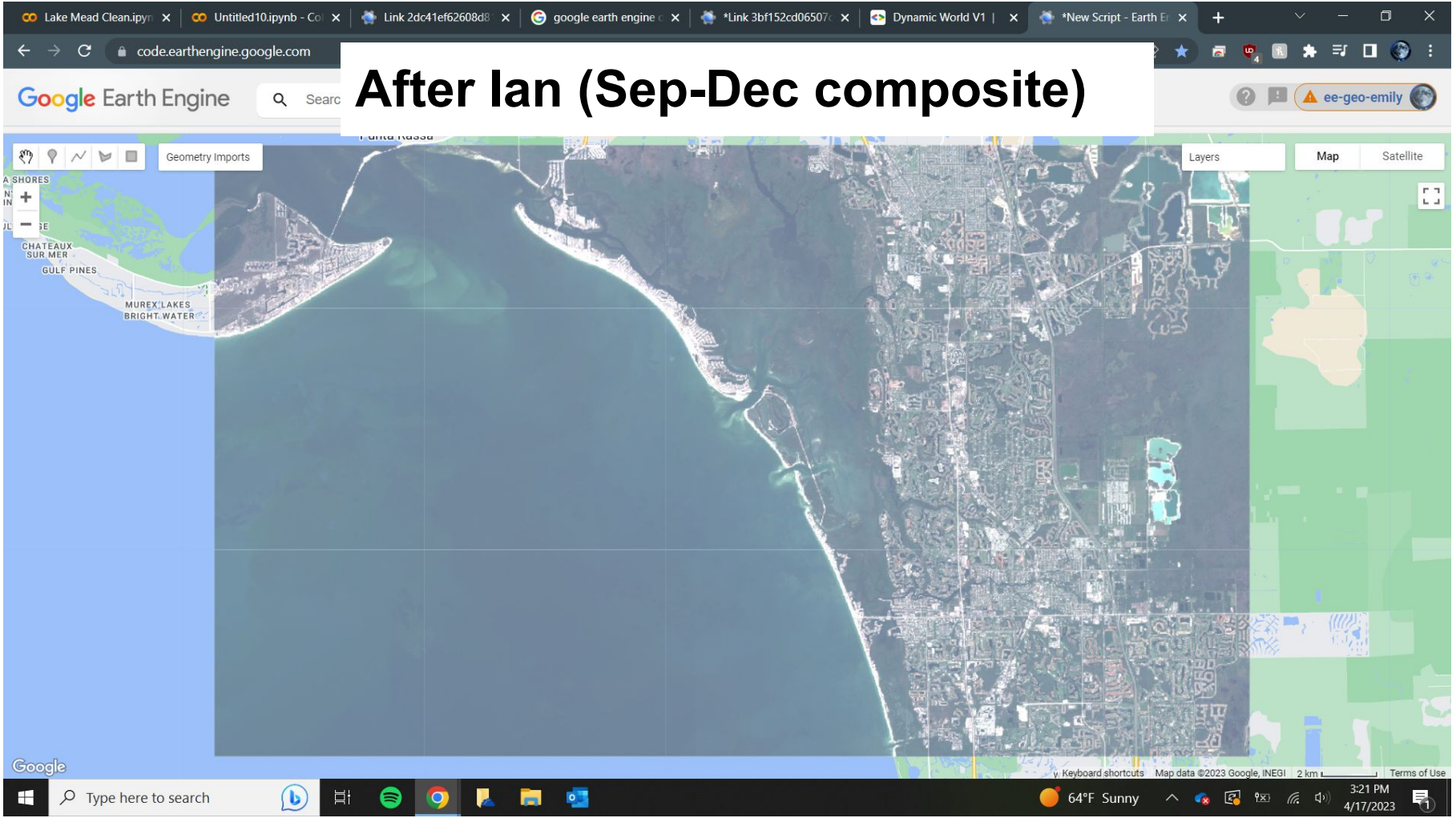
4/17/2023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Untitled10.ipynb - Co
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google earth engine
*Link 3bf152cd06507
Dynamic World V1
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code.earthengine.google.com
Google Earth Engine
Search
ee-geo-emily
After Ian (Sep-Dec composite)
Geometry Imports
Layers
Map
Satellite
CHATEAUX SUR MER
GULF PINES
MUREX LAKES
BRIGHT WATER
Google
Keyboard shortcuts
Map data ©2023 Google, INEGI
2 km
Terms of Use
Type here to search
64°F Sunny
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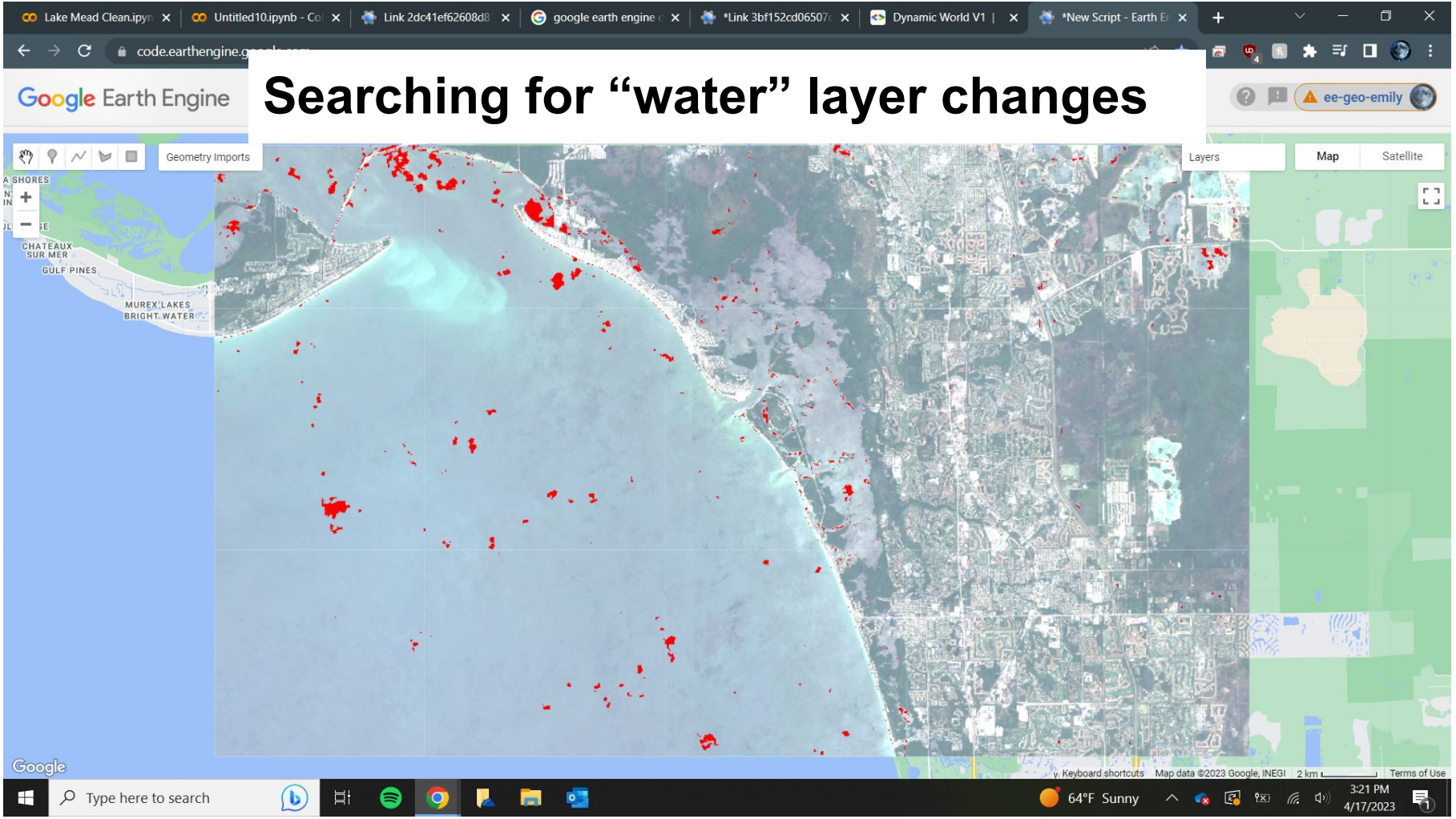
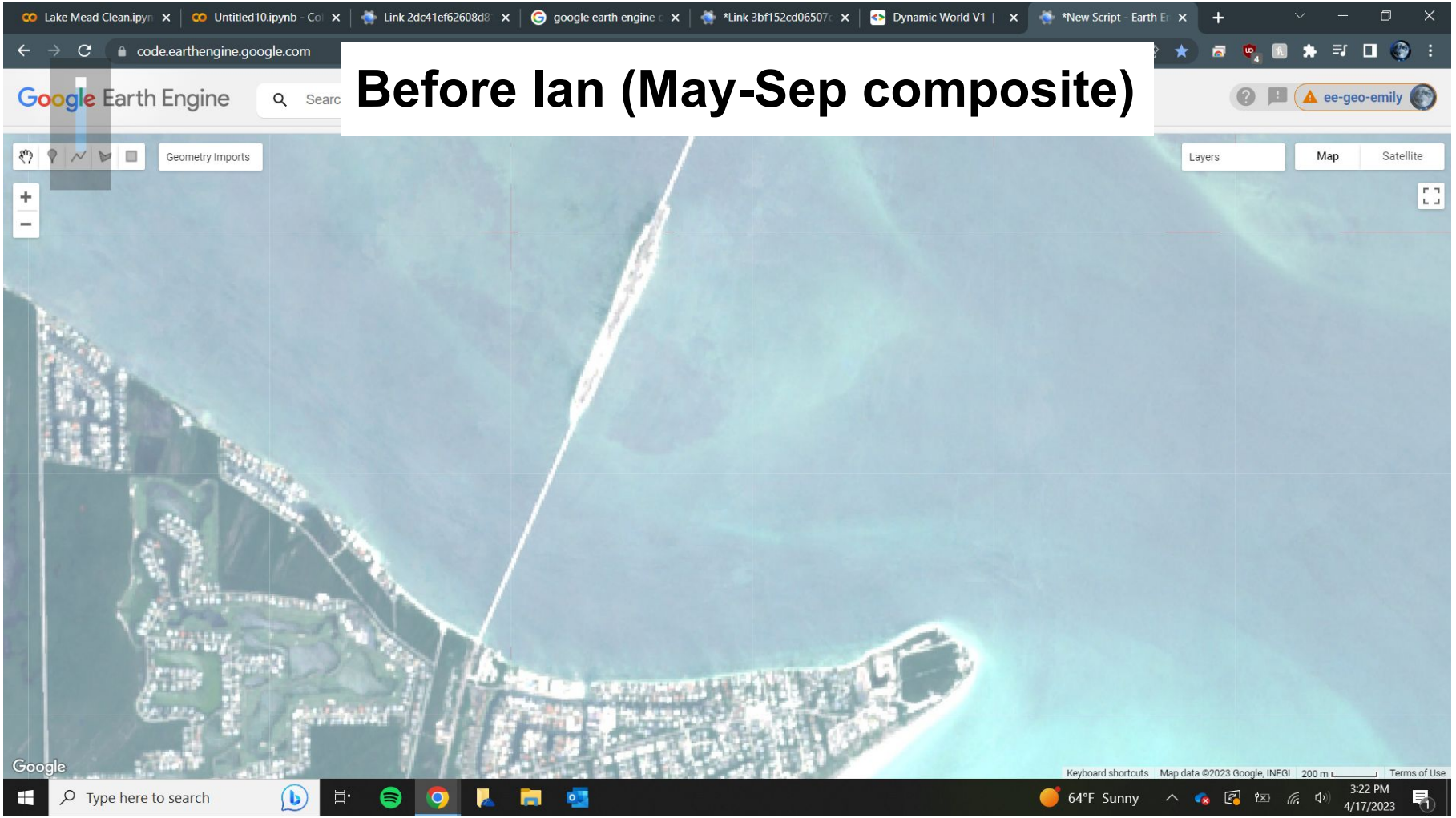
4/17/2023

Searching for “water” layer changes




Lake Mead Clean.ipyn
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64°F Sunny
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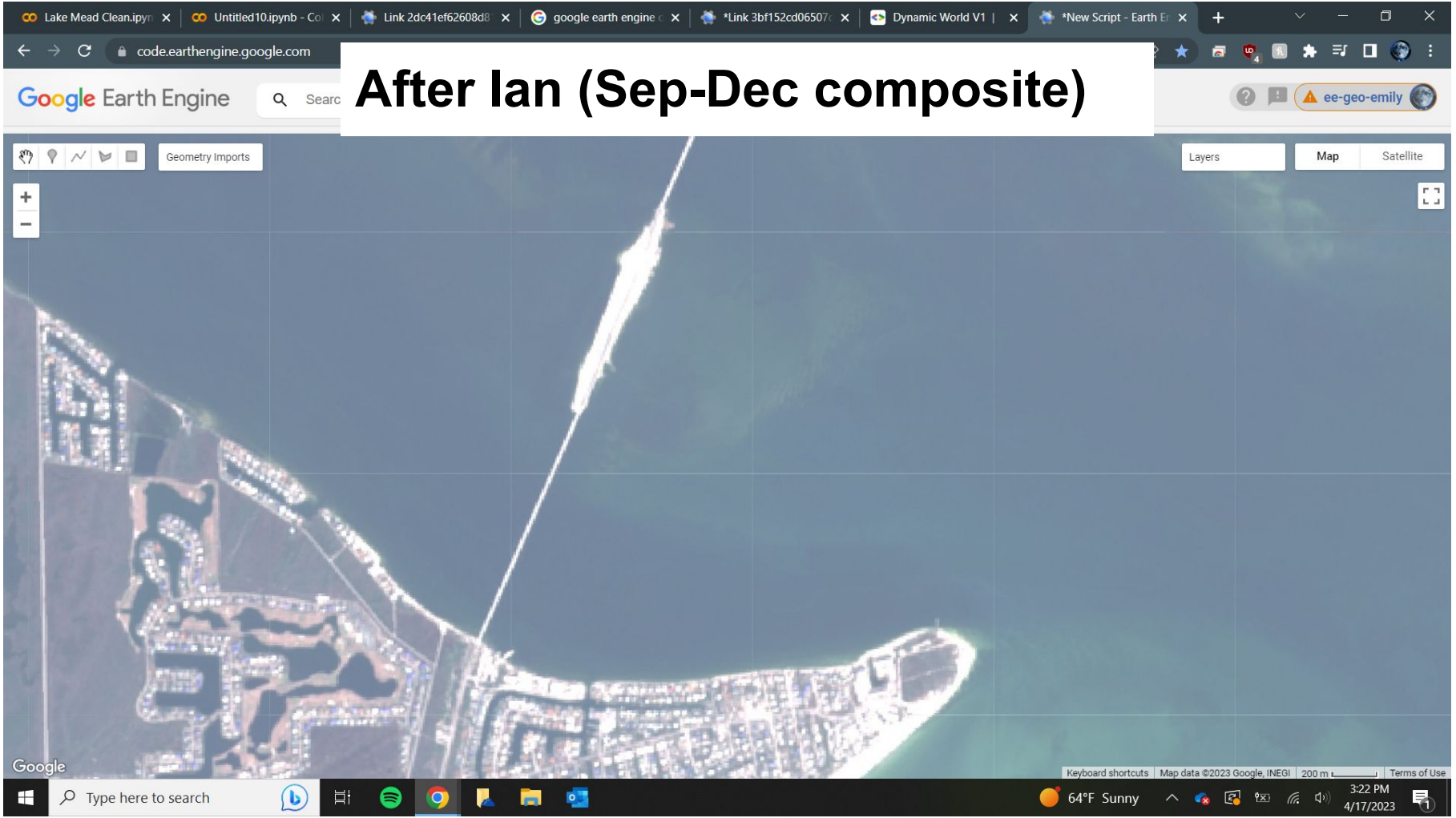
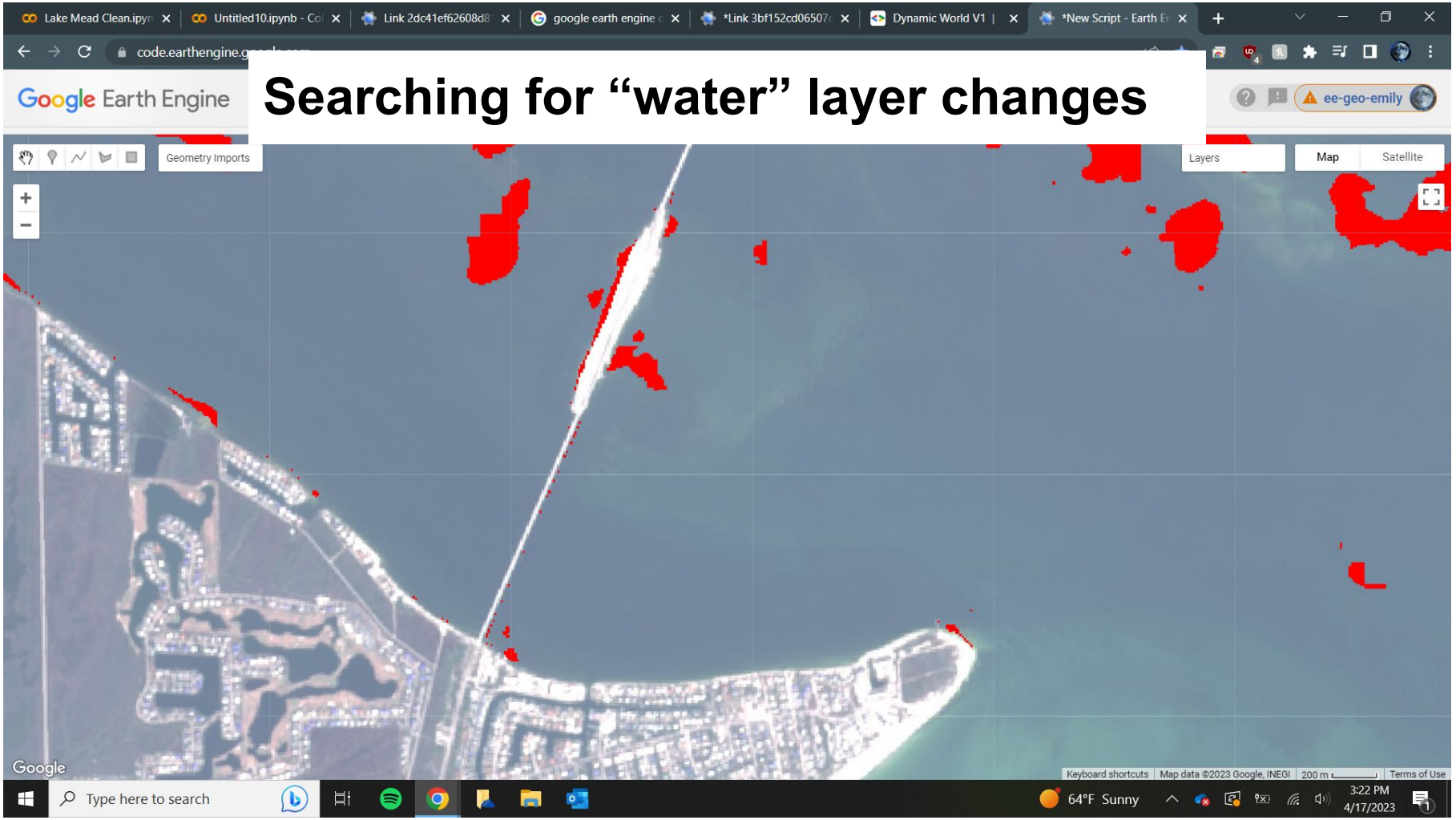
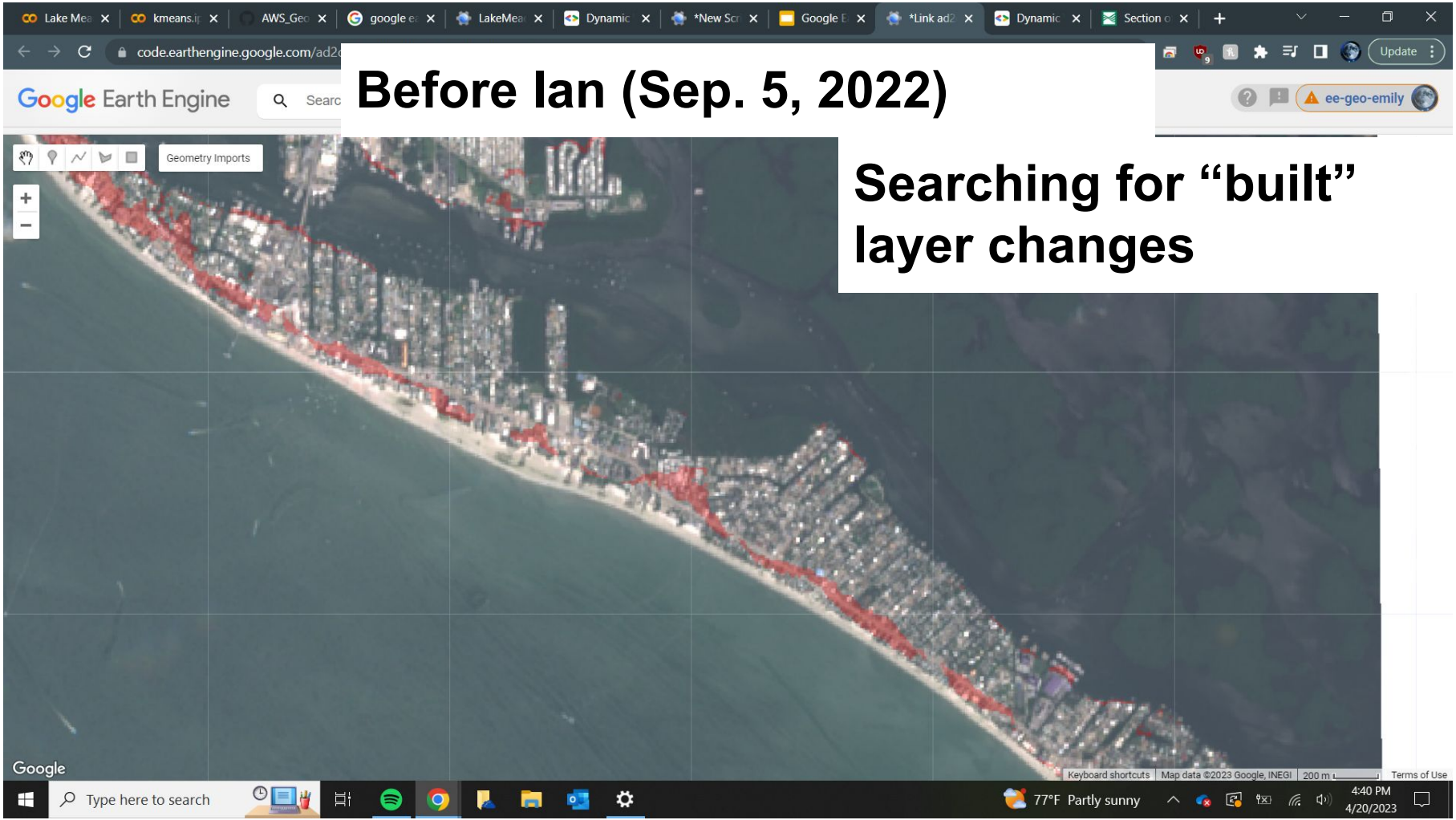
4/17/2023



After Ian (Sep-Dec composite)

Searching for “water” layer changes




Before Ian (Sep. 5, 2022)
Searching for “built” layer changes
Google Earth Engine
Geometry Imports
ee-geo-emily
Update
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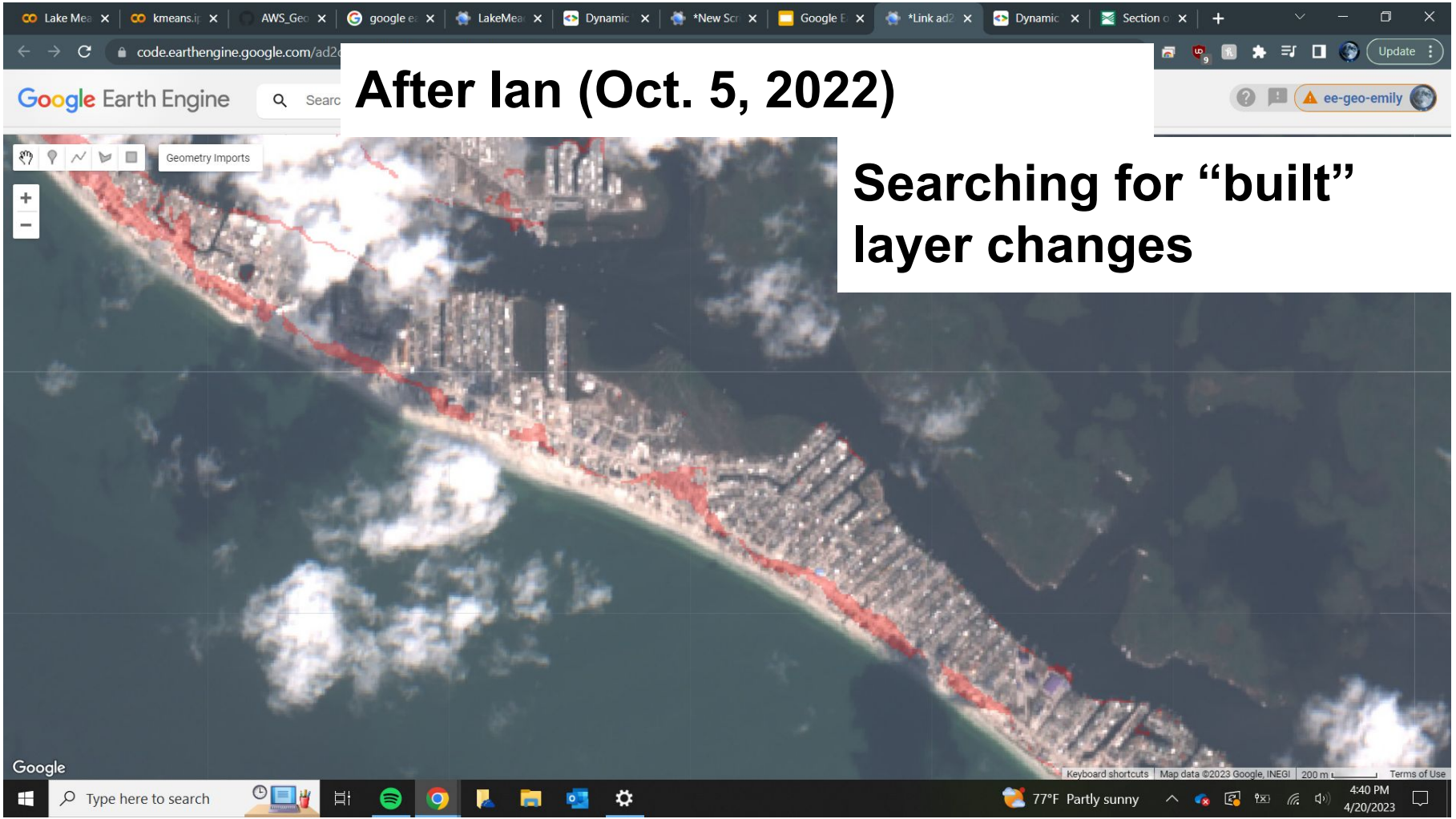
Keyboard shortcuts
Map data ©2023 Google, INEGI
200 m
Terms of Use
Type here to search
77°F Partly sunny
4:40 PM
4/20/2023



After Ian (Oct. 5, 2022)

Searching for “built” layer changes

High resolution comparison

https://www.usgs.gov/media/before-after/section-fort-myers-beach-and-after-hurricane-ian-0