Google Earth Engine in 10

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Github: dcarver1
https://code.earthengine.google.com/915fe2784a09fa68ac2cdc4a9c2afab4

From Noel Gorelick

Data analysis and visualization platform

Inherently parallel system (fast)

Designed for scientists, not software engineers

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Goals

Make it easy

Scalable and shareable workflows

Enable non-traditional users

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Inherently parallel system (fast)

Designed for scientists, not software engineers

Goals

Make it Easy, Scalable and Shareable

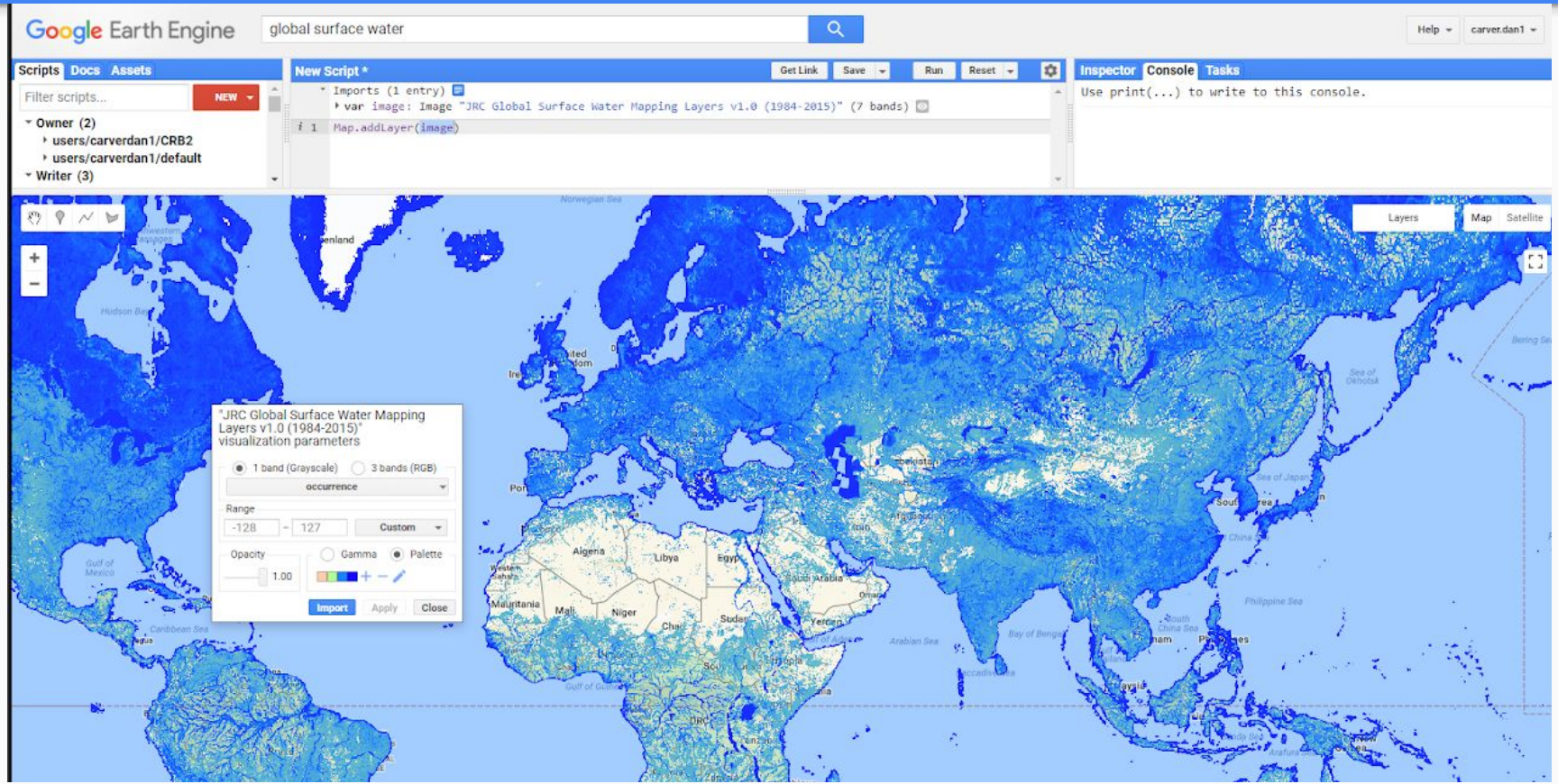
Enable non-traditional users

Focused on society's biggest challenges

Deforestation - Disaster - Climate Change

Drought - Disease - Sustainability

Global Surface Water: https://global-surface-water.appspot.com/



Basics

Built on JavaScript
but that doesn't really matter

02_javascript.js

```
1  /*
2   All the javascript you need to know (almost)
3   */
4
5  var variable = 1;
6
7  var str = 'Hello, World!';
8
9  var list = [1.23, 8, -3];
10 print(list[2])
11
12 var dictionary = {
13   'a': 'Hello',
14   'b': 10,
15   'c': 0.1343,
16   'd': list
17 };
18 print(dictionary['b'])
19
20 print(n1, str, list, dictionary)
```

From GEE training by Noel Gorelick https://code.earthengine.google.com/49513818d5bc94076e63107eaef6e7ac

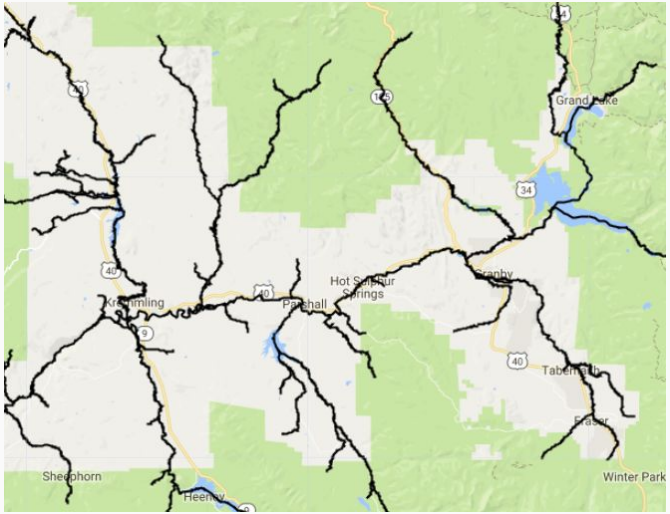
Basics - Data Types

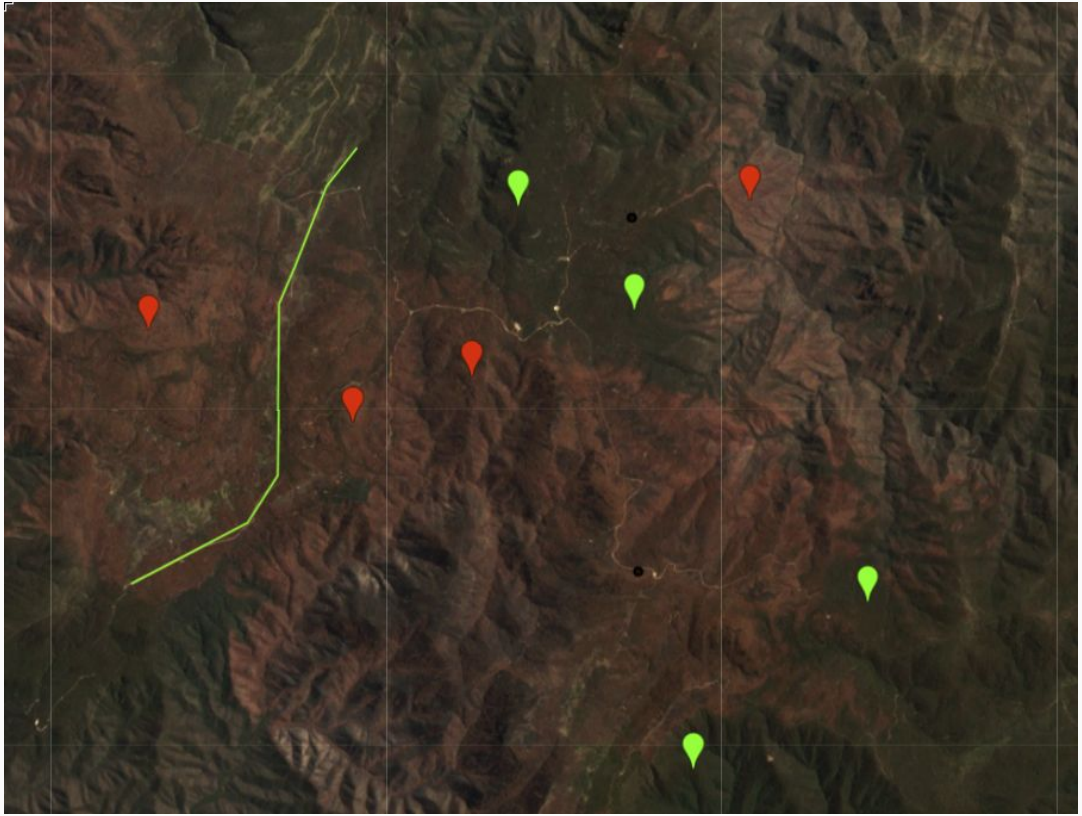
Feature

Point, lines, Polygon

Input your own

Export Results



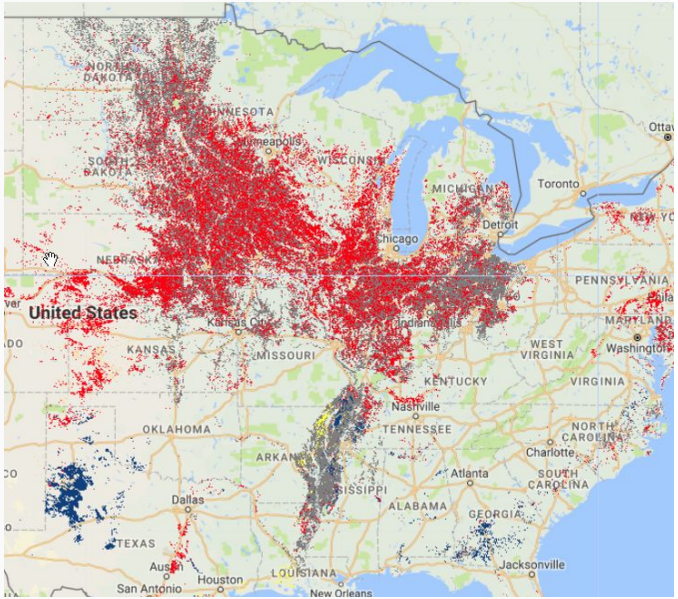


Basics - Data Types

Image

georeferenced

Associated tabular data



SRTM Digital Elevation Data Version 4

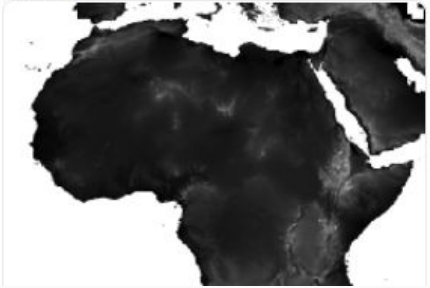
The Shuttle Radar Topography Mission (SRTM, see Farr et al. 2007) digital elevation dataset was originally produced to provide consistent, high-quality elevation data at near global scope. This version of the SRTM digital elevation data has been processed to fill data voids, and to facilitate its ease of use. The SRTM 90m has a resolution of 90m at the equator.

This dataset contains one band, 'elevation' (meters).

For the creation of any reports, publications, new data sets, derived products, or services resulting from the data set, users should cite:

Jarvis, A., H.I. Reuter, A. Nelson, E. Guevara. 2008. Hole-filled SRTM for the globe Version 4, available from the CGIAR-CSI SRTM 90m Database: http://srtm.csi.cgiar.org.

Sample



Data availability (time)
Feb 11, 2000 - Feb 22, 2000

Provider
NASA / CGIAR

Tags
nasa, cgiar, srtm, elevation, topography, dem, geophysical

Image ID
CGIAR/SRTM90_V4

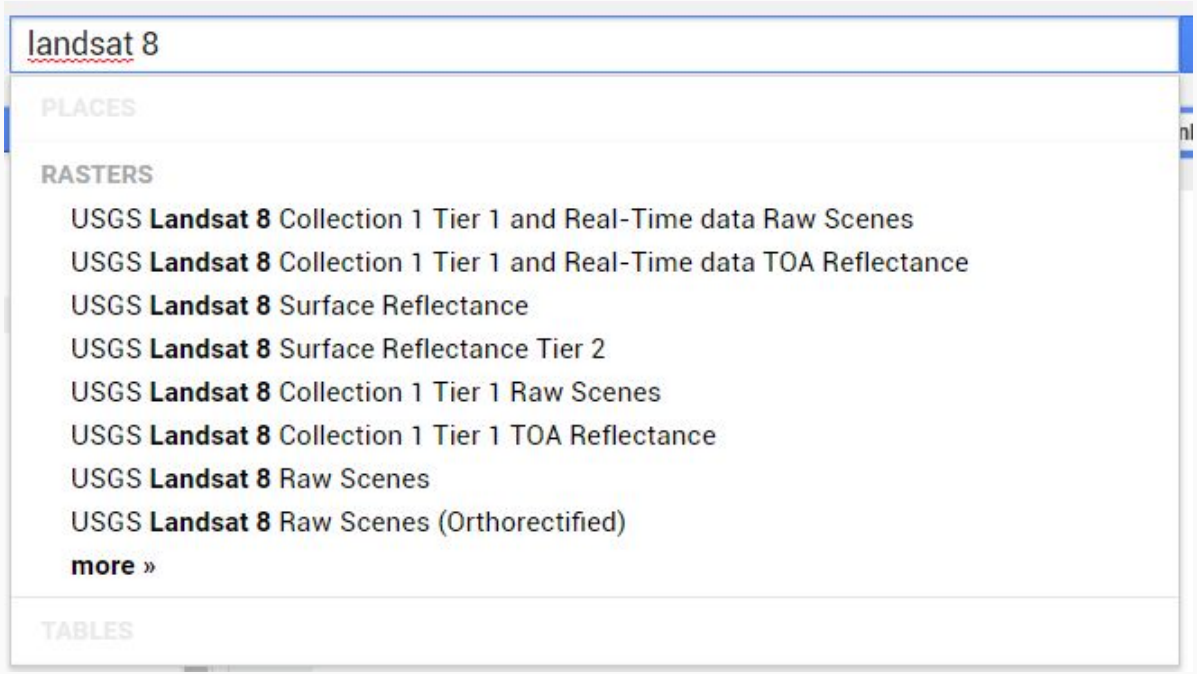
Import

Basics - Data Types

Feature Collections

A bag of elements

- Sort
- Filter
- map
- reduce

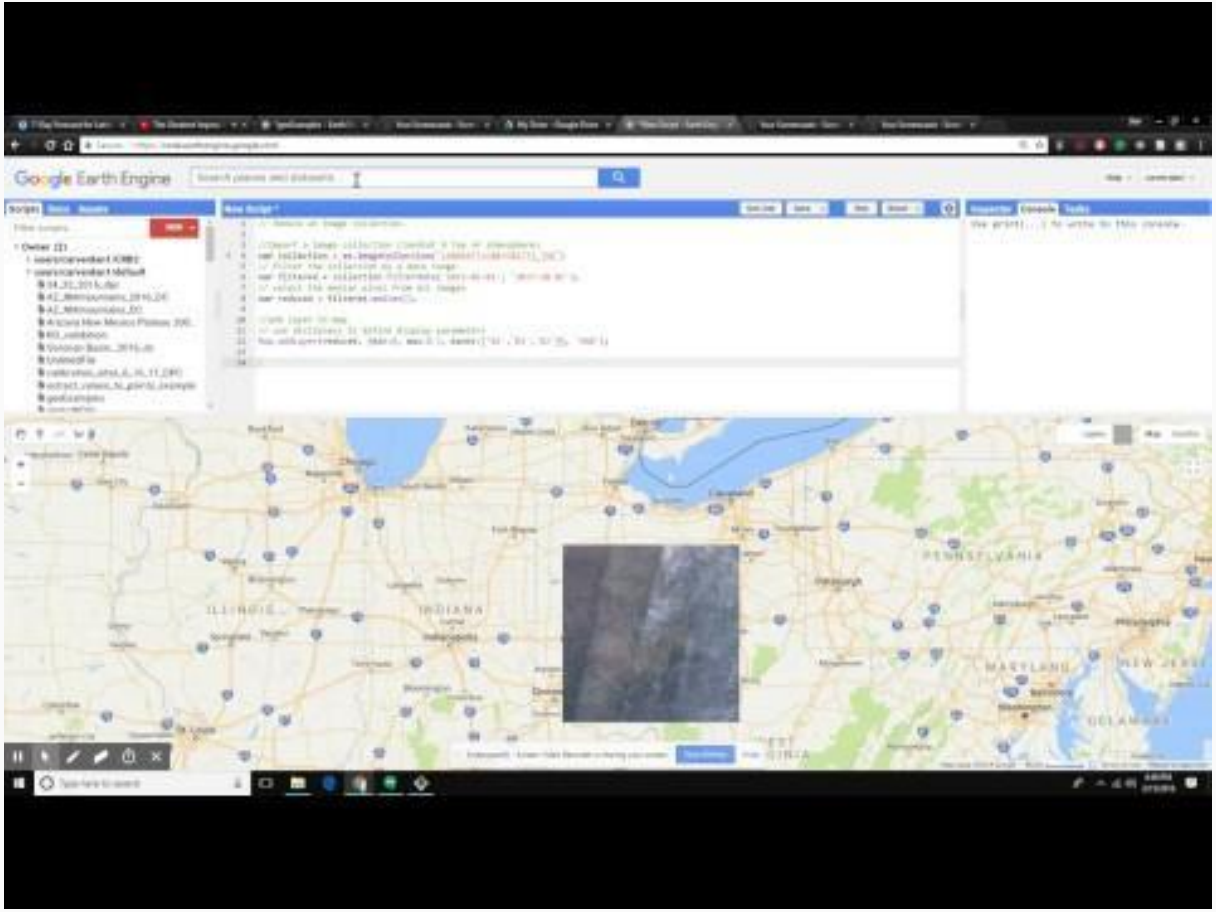


Example workflow

Import and display LS8

```
ew Script *
1  // Reduce an image collection.
2
3  //Import a image collection (landsat 8 top of atmosphere)
4  var collection = ee.ImageCollection("LANDSAT/LC08/C01/T1_TOA")
5  // filter the collection by a date range
6  var filtered = collection.filterDate('2015-05-01', '2017-10-01');
7  // select the median pixel from all images
8  var reduced = filtered.median();
9
10 //add layer to map
11 // use dictionary to define display parameters
12 Map.addLayer(reduced,
13   {min:0, max:0.3, bands:['B4','B3','B2']},
14   'RGB');
15
16 //I can also look like this
17 collection = ee.ImageCollection("LANDSAT/LC08/C01/T1_TOA")
18   .filterDate('2015-05-01', '2017-10-01')
19   .median();
```

1. Call in Landsat
2. Filter by date
3. Apply median reducer
4. Add to map


Google Earth Engine
ILLINOIS
INDIANA
PENNSYLVANIA
MARYLAND

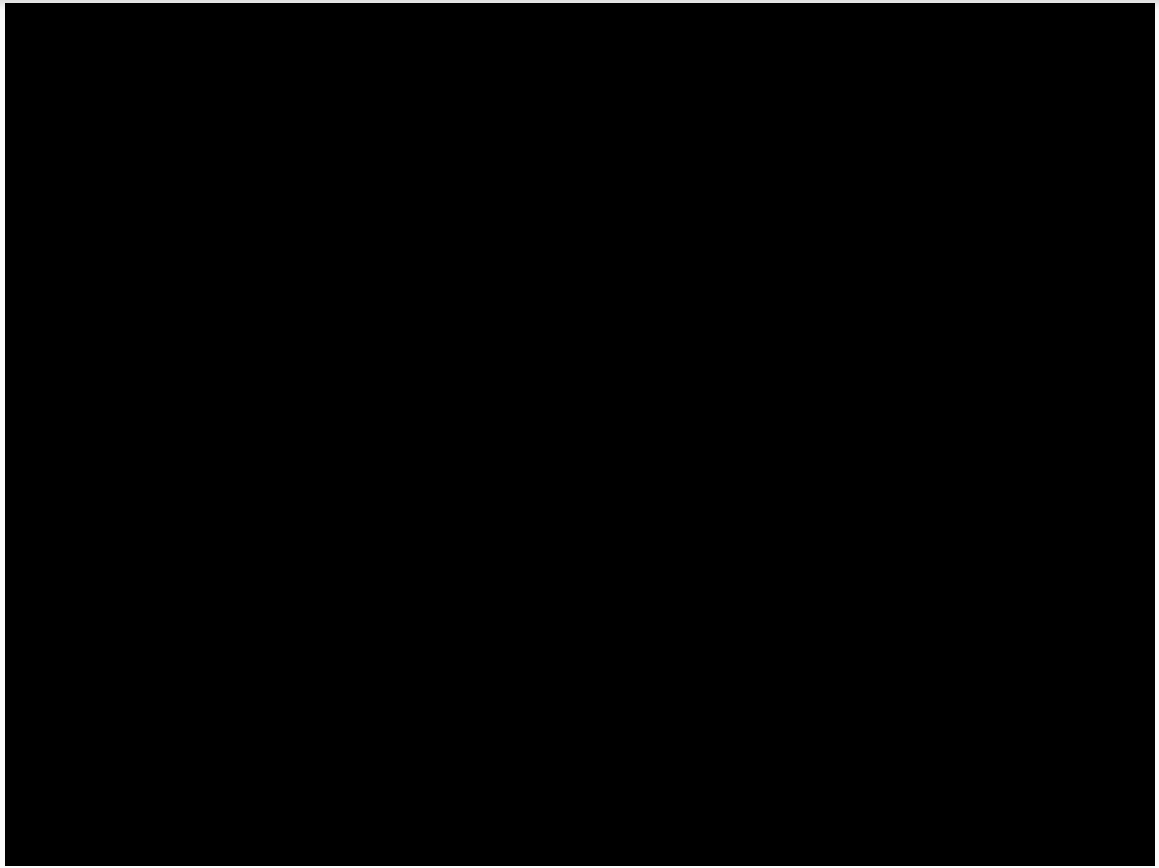
Example workflow

Create an NDVI image

New Script *

```
1  // Reduce an image collection.
2
3  //I can also look like this
4  var collection = ee.ImageCollection("LANDSAT/LC08/C01/T1_TOA")
5    .filterDate('2015-05-01', '2017-10-01')
6    .median();
7
8  // Calculate a Normalized Difference Vegetation Index
9  var ndvi = collection.normalizedDifference(['B5', 'B4']);
10 Map.addLayer(ndvi, {min:0, max:1}, 'NDVI');
11
12
13 //add layer to map
14 // use dictionary to define display parameters
15 Map.addLayer(collection,
16   {min:0, max:0.3, bands:['B4','B3','B2']},
17   'RGB');
18
```

1. Call in Landsat
2. Filter by date
3. Apply median reducer
4. Calculate NDVI
5. Add to map

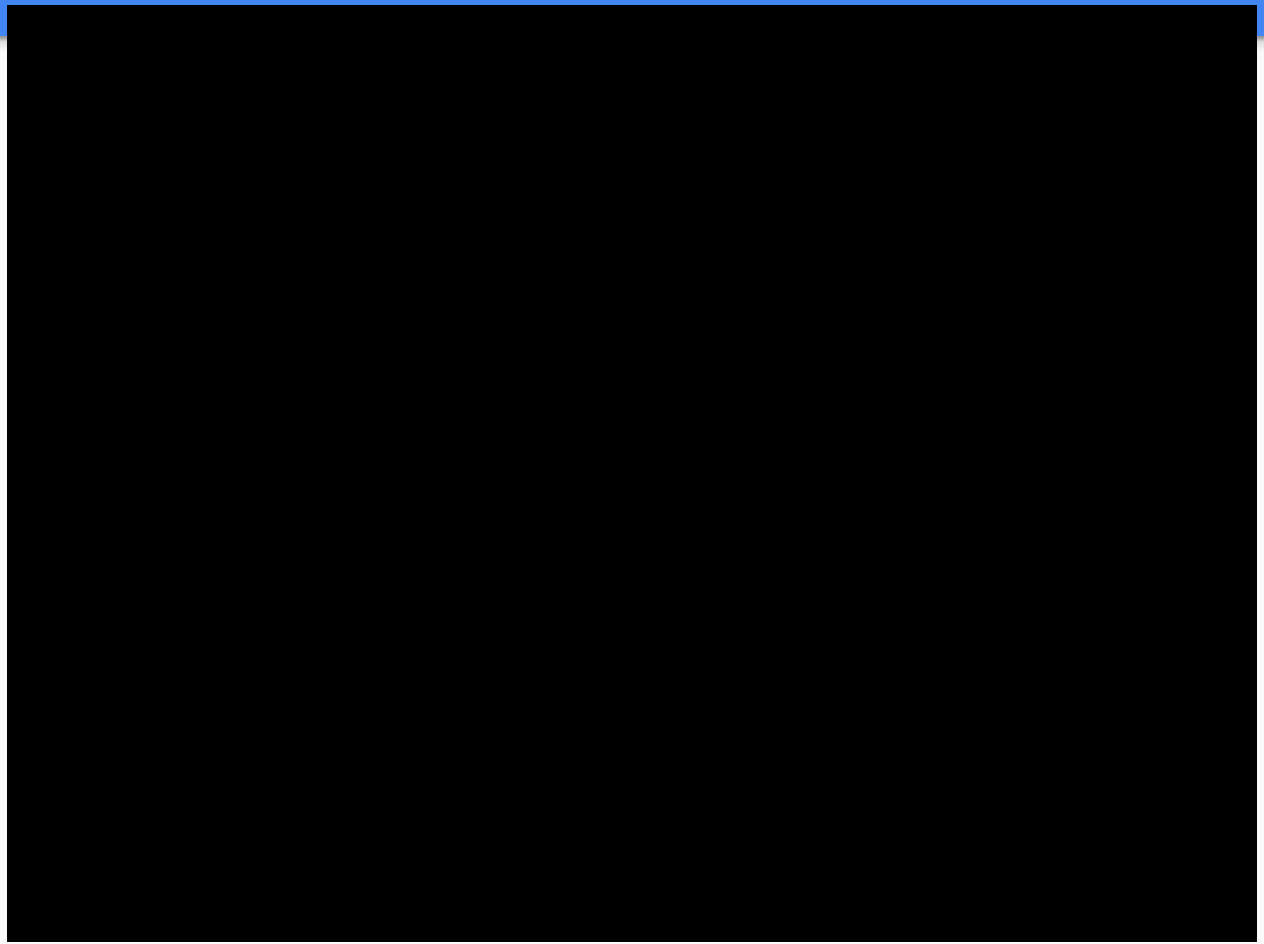


Create an NDVI image

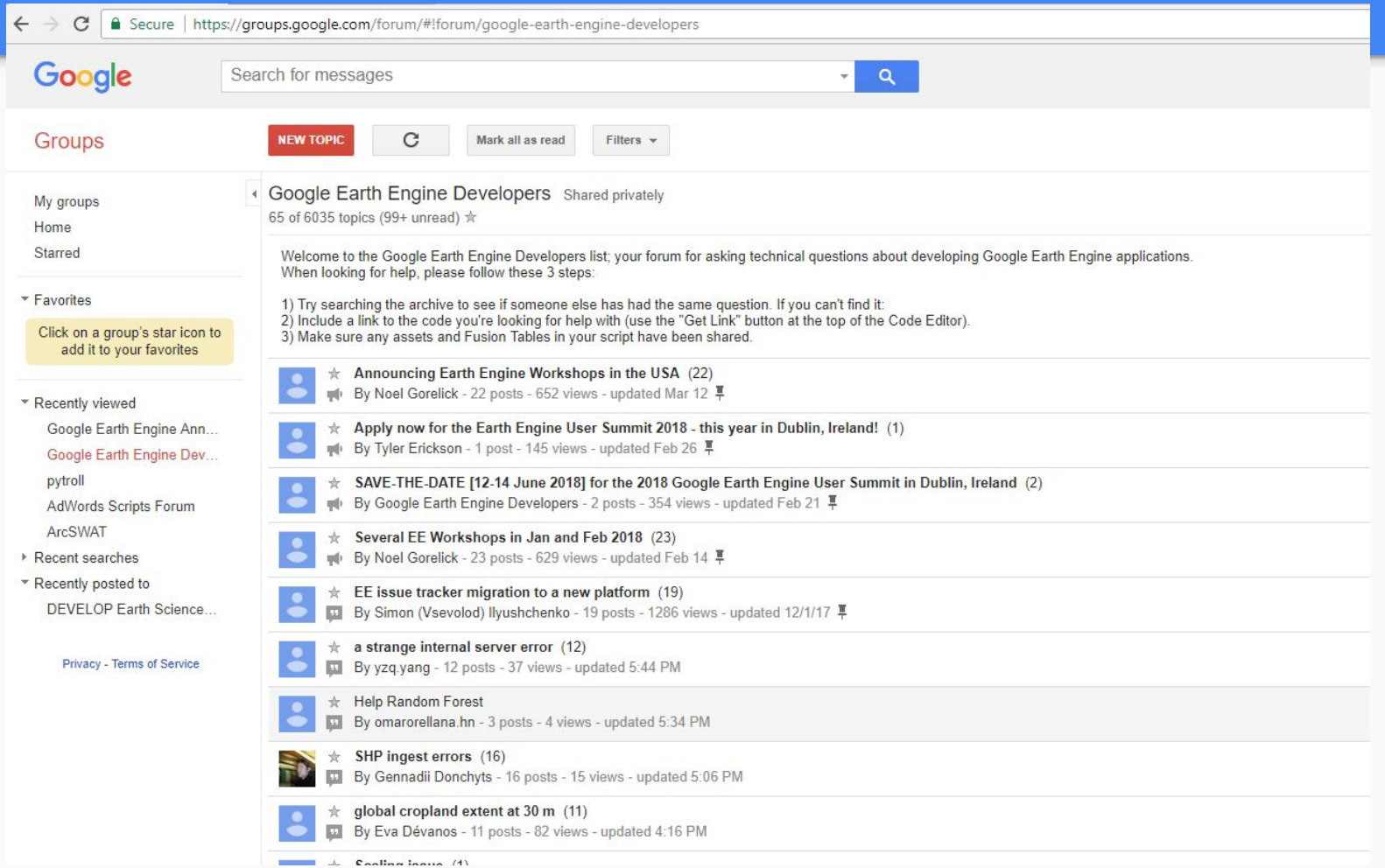
New Script *

```
1
2  //ndvi with naip over a region
3  var naipNDVI = naip
4    .filterBounds(roi)
5    .filterDate('2013-05-01', '2016-09-01')
6    .mosaic()
7  print(naipNDVI)
8
9  Map.addLayer(naipNDVI, {}, 'NAIP Mosaic 2014');
10 //define the vis parameters
11 var visParams1 = {bands:['N', 'G', 'B']}
12 Map.addLayer(naipNDVI, visParams1, 'NAIP Mosaic 2014 False');
13
```

1. Call in NAIP
2. Filter by area
3. Filter by Date
4. Mosaic
5. Calculate NDVI
6. Add to map



For Help


Secure | https://groups.google.com/forum/#!forum/google-earth-engine-developers
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Mark all as read
Filters
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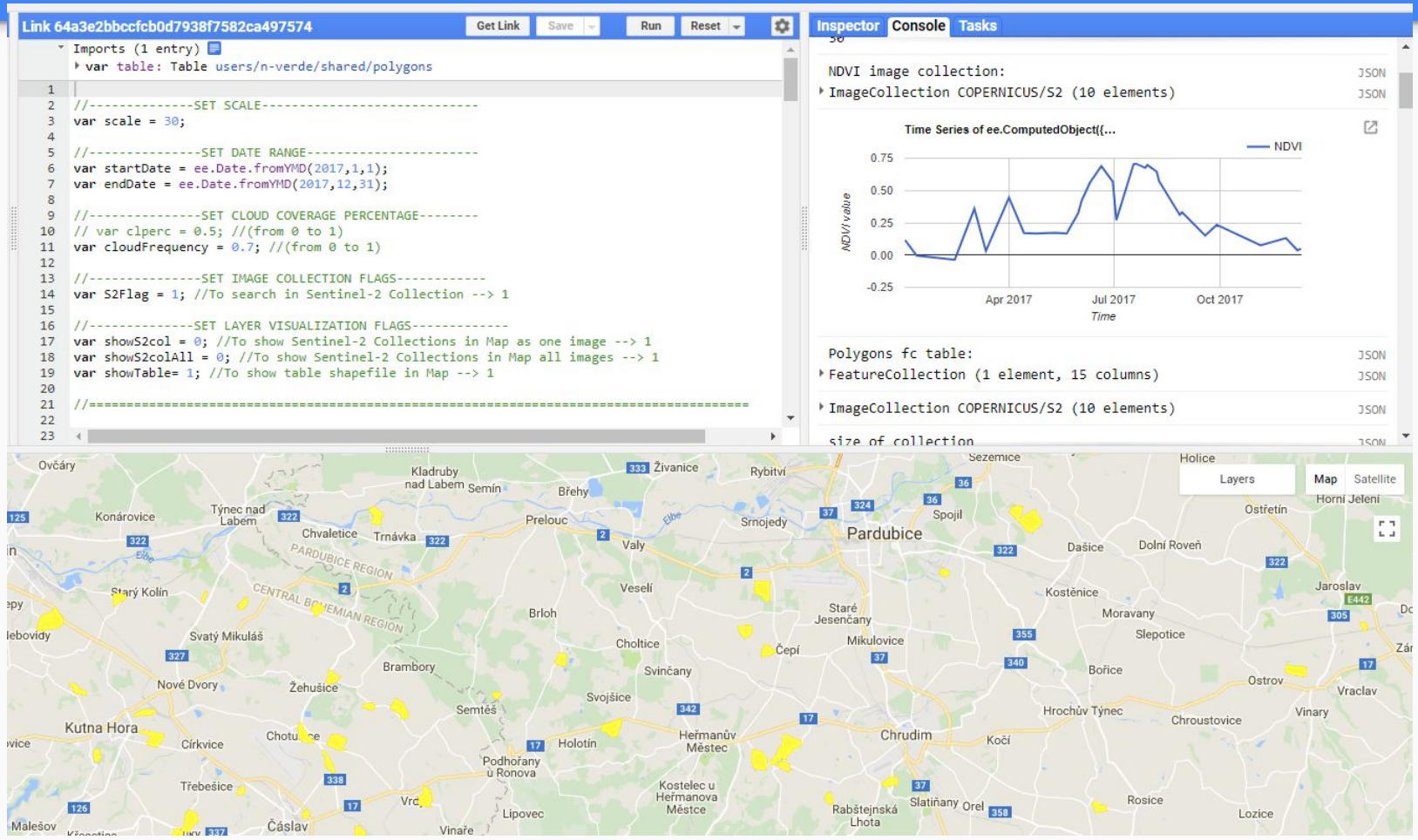
65 of 6035 topics (99+ unread)
Welcome to the Google Earth Engine Developers list; your forum for asking technical questions about developing Google Earth Engine applications.
When looking for help, please follow these 3 steps:
1) Try searching the archive to see if someone else has had the same question. If you can't find it:
2) Include a link to the code you're looking for help with (use the "Get Link" button at the top of the Code Editor).
3) Make sure any assets and Fusion Tables in your script have been shared.
Announcing Earth Engine Workshops in the USA (22)
By Noel Gorelick - 22 posts - 652 views - updated Mar 12
Apply now for the Earth Engine User Summit 2018 - this year in Dublin, Ireland! (1)
By Tyler Erickson - 1 post - 145 views - updated Feb 26
SAVE-THE-DATE [12-14 June 2018] for the 2018 Google Earth Engine User Summit in Dublin, Ireland (2)
By Google Earth Engine Developers - 2 posts - 354 views - updated Feb 21
Several EE Workshops in Jan and Feb 2018 (23)
By Noel Gorelick - 23 posts - 629 views - updated Feb 14
EE issue tracker migration to a new platform (19)
By Simon (Vsevolod) Ilyushchenko - 19 posts - 1286 views - updated 12/1/17
a strange internal server error (12)
By yzq.yang - 12 posts - 37 views - updated 5:44 PM
Help Random Forest
By omarorellana.hn - 3 posts - 4 views - updated 5:34 PM
SHP ingest errors (16)
By Gennadii Donchyts - 16 posts - 15 views - updated 5:06 PM
global cropland extent at 30 m (11)
By Eva Dévanos - 11 posts - 82 views - updated 4:16 PM

Lots and lots of examples to hack from



Signup: earthengine.google.com/signup

EE101 repository: https://goo.gl/VyPqNv

These Slides : github/dcarver1

Thank You; Questions

https://goo.gl/VyPqNv

radarClassification *

Get Link | Save | Run | Reset

```
50
51 var classifier = ee.Classifier.randomForest(30).train(training, 'cropland', composite.bandNames())
52 var result = composite.classify(classifier)
53 Map.addLayer(result, {min:1,max:5, palette:['red','green','blue', 'yellow', 'orange']}, 'classification')
54
55 print(validation.classify(classifier)
56 .errorMatrix("cropland", "classification")
57 .accuracy())
58
```

Inspector | Console | Tasks

- Image (12 bands)
- Object (1 property)
- Feature 3

0.4968078932095183