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 Google Earth Engine
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Google Earth Engine

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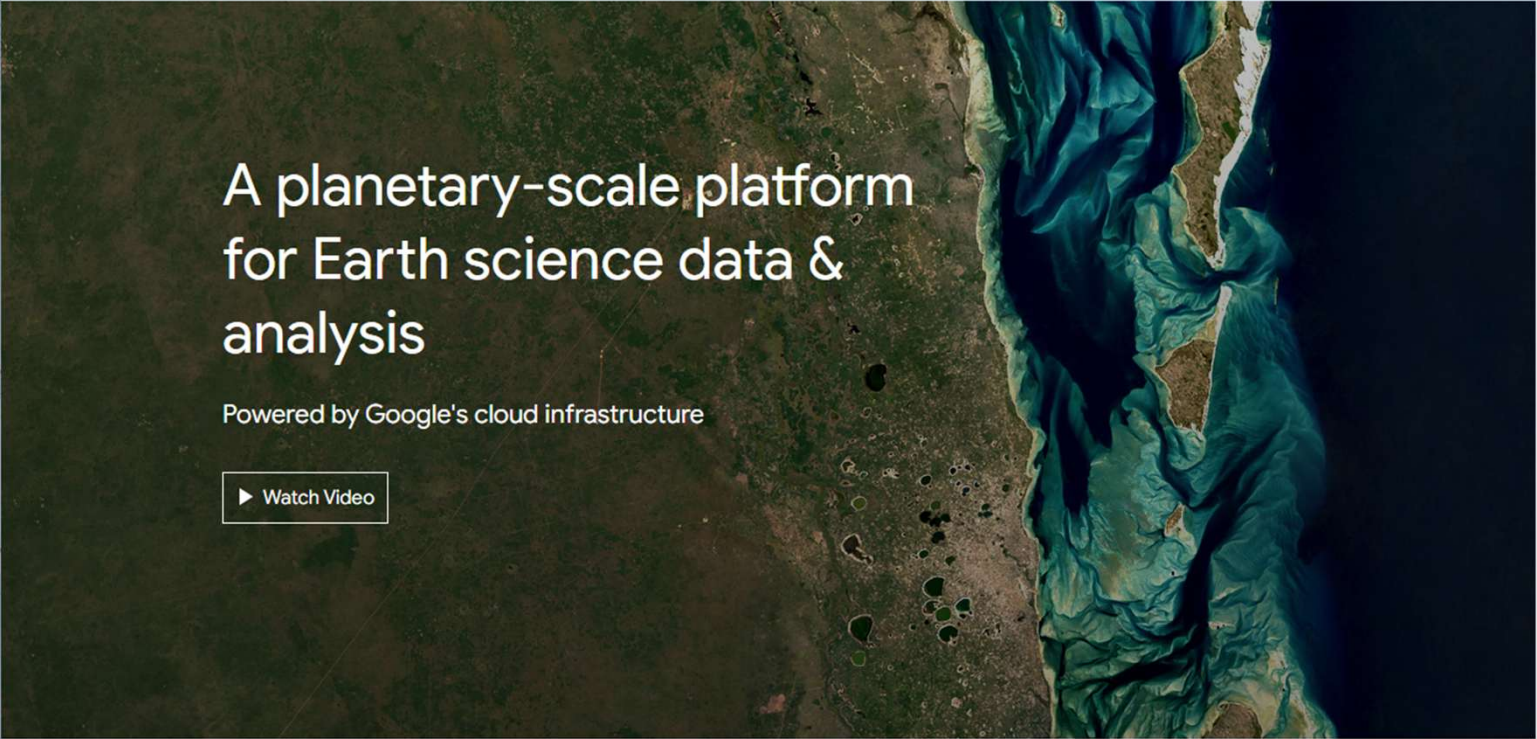
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Google Earth Engine

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Google Earth Engine combines a multi-petabyte catalog of satellite imagery and geospatial datasets with planetary-scale analysis capabilities. Scientists, researchers, and developers use

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 Dr. Tarendra Lakhankar
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Google Earth Engine

Get started using Earth Engine

Earth Engine, Google's geospatial science platform in Google Cloud, is available for [paid commercial use](#) and [remains free for academic and research use](#). Learn more about [Google Cloud projects](#).

Let's get started:



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Noncommercial users can also use Earth Engine without creating Cloud projects. [Click here for the signup form.](#)

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How do you want to use Earth Engine?

Paid usage
Commercial businesses, government operations. [See examples](#)

Unpaid usage
Non-profits, education, government research, training, media. [See examples](#)

Project type*
Academia & Research

Please note: If you will be accessing Earth Engine as a customer of a Google Cloud Platform reseller, please contact your reseller for terms and pricing governing your use of Earth Engine.

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Create or choose a Cloud Project to register

Create a new project in Google Cloud, or choose one you are authorized to access to enable the API:

Create a new Google Cloud Project

Organization

Project-ID*

Choose a unique ID. This cannot be changed later.

Project Name (optional)

Choose a name to help you identify the Cloud Project.

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Google Earth Engine

code.earthengine.google.com/?project=ee-tare0007

Earth Engine Code Editor > Left Panel

The upper left panel contains three tabs: Scripts, Docs, and Assets. The Scripts tab contains example scripts and scripts you save using the Save button in the code editor. The Docs tab contains documentation for the Earth Engine API functions. Toward the top of the Docs tab there's a search box that you can use to search for functions by name. The Assets tab contains the list of assets you've uploaded to Earth Engine. You can use it to upload, view, and manage your assets.

- Repo Manager
- Documentation List
- Assets Manager

Inspector Console Tasks

Use print(...) to write to this console.

Welcome to Earth Engine!
Please use the help menu above (?) to learn more about how to use Earth Engine, or [visit our help page](#) for support.

The screenshot shows the Google Earth Engine web interface. At the top, there are browser tabs for 'Google Earth Engine' and 'New Script - Earth Engine Code'. The address bar shows the URL 'code.earthengine.google.com/?project=ee-tare0007'. The main interface is divided into several sections. On the left, there is a 'Scripts' panel with tabs for 'Scripts', 'Docs', and 'Assets'. Below these tabs is a search box for scripts and a 'NEW' button. A help popup window titled 'Earth Engine Code Editor > Left Panel' is overlaid on the Scripts panel, providing a detailed description of the tabs and their contents, along with links to 'Repo Manager', 'Documentation List', and 'Assets Manager'. On the right, there is an 'Inspector Console' panel with tabs for 'Inspector', 'Console', and 'Tasks'. The console shows a welcome message and instructions on how to use the print function. The background is a satellite map of North America, showing the United States, Mexico, and parts of Central America. The map includes labels for various cities and states, as well as geographical features like the Gulf of Mexico and the North Atlantic Ocean. The Google logo is visible in the bottom left corner, and the bottom right corner contains copyright information and a scale bar.

Google Earth Engine

code.earthengine.google.com/?project=ee-tare0007

Search places and datasets...

ee-tare0007

Scripts Docs Assets

Filter scripts... NEW

New Script

Get Link Save Run Reset Apps

Inspector Console Tasks

Use print(...) to write to this console.

Welcome to Earth Engine!
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Map Satellite

Google

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Open the data from MODIS Collections in Earth Engine

The screenshot displays the Google Earth Engine web interface. At the top, the browser address bar shows 'code.earthengine.google.com'. The main interface is divided into several sections:

- Scripts:** A sidebar on the left shows a list of scripts under the user 'users/tare0007/Modis-Data'.
- Code Editor:** The central area contains a script with the following code:

```
2 .filter(ee.Filter.date('2022-01-01', '2022-02-01'));
3 var trueColor = dataset.select([
4   'Nadir_Reflectance_Band1', 'Nadir_Reflectance_Band4',
5   'Nadir_Reflectance_Band3'
6 ]);
7 var trueColorVis = {
8   min: 0.0,
9   max: 4000.0,
10  gamma: 1.4,
11 };
12 Map.setCenter(-7.03125, 31.0529339857, 2);
13 Map.addLayer(trueColor, trueColorVis, 'True Color');
14
```
- Inspector/Console:** On the right, the console is empty, with a prompt to use 'print(...)' to write to it.
- Map:** The bottom half of the screen shows a world map in satellite view. The map includes labels for major oceans (North Pacific, North Atlantic, South Atlantic, Indian) and continents (North America, South America, Europe, Africa, Asia, Australia). A scale bar at the bottom right indicates 2000 km.

<https://developers.google.com/earth-engine/datasets/catalog/modis>

Time Series Analysis of NDVI at Central Park

```

var landsat8Sr = ee.ImageCollection('LANDSAT/LC08/C02/T1_L2');
var roi = ee.Geometry.Point([-73.968285, 40.785091]);

// Function to cloud mask from the pixel_qa band of Landsat 8 SR data.
var maskL8sr = function(image) {
  // Bit 0 - Fill
  // Bit 1 - Dilated Cloud
  // Bit 2 - Cirrus
  // Bit 3 - Cloud
  // Bit 4 - Cloud Shadow
  var qaMask = image.select('QA_PIXEL').bitwiseAnd(parseInt('11111', 2)).eq(0);
  var saturationMask = image.select('QA_RADSAT').eq(0);

  // Apply the scaling factors to the appropriate bands.
  var opticalBands = image.select('SR_B.*').multiply(0.0000275).add(-0.2);
  var thermalBands = image.select('ST_B.*').multiply(0.00341802).add(149.0);

  // Replace the original bands with the scaled ones and apply the masks.
  return image.addBands(opticalBands, null, true)
    .addBands(thermalBands, null, true)
    .updateMask(qaMask)
    .updateMask(saturationMask);
};

// Function to add NDVI, time, and constant variables to Landsat 8 imagery.
var addVariables = function(image) {
  // Compute time in fractional years since the epoch.
  var date = image.date();
  var years = date.difference(ee.Date('1970-01-01'), 'year');
  // Return the image with the added bands.
  return image
    // Add an NDVI band.
    .addBands(image.normalizedDifference(['SR_B5', 'SR_B4']).rename('NDVI'))
    // Add a time band.
    .addBands(ee.Image(years).rename('t')).float()
    // Add a constant band.
    .addBands(ee.Image.constant(1));
};

// Remove clouds, add variables and filter to the area of interest.
var filteredLandsat = landsat8Sr
  .filterBounds(roi)
  .filterDate('2013', '2022')
  .map(maskL8sr)
  .map(addVariables);

// Plot a time series of NDVI at a single location.
Map.centerObject(roi, 11);
Map.addLayer(filteredLandsat,
  {bands: 'NDVI', min: 0.1, max: 0.9, palette: ['white', 'green']},
  'NDVI Mosaic');
Map.addLayer(roi, {color: 'yellow', 'ROI'});
var l8Chart = ui.Chart.image.series(filteredLandsat.select('NDVI'), roi)
  .setChartType('ScatterChart')
  .setOptions({
    title: 'Landsat 8 NDVI Time Series at ROI',
    trendlines: {
      0: {color: 'CC0000'}
    },
  });
print(l8Chart);

```

