

INTRODUCCIÓN A GOOGLE EARTH ENGINE

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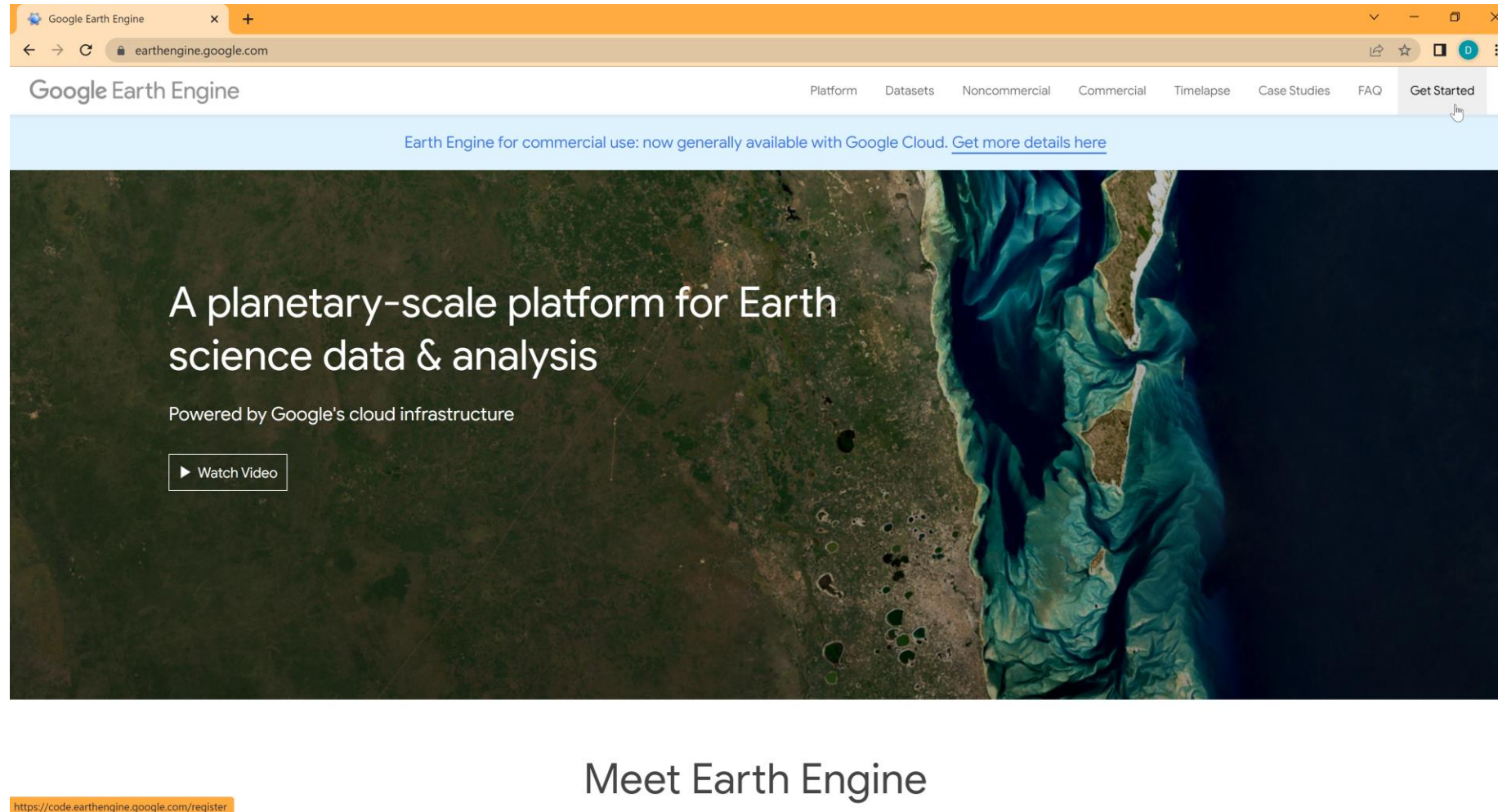
Grupo de Investigación y Sección del Instituto de Desarrollo Regional:

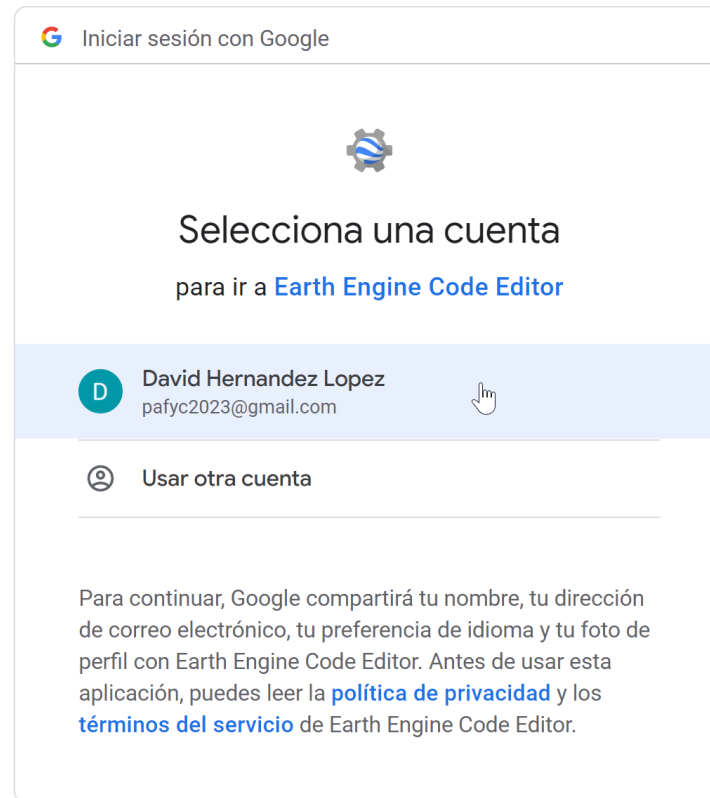
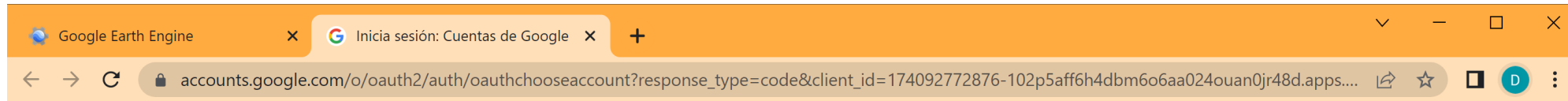
Precisión Agroforestal y Cartográfica, PAFyC

<http://pafyc.uclm.es/>



1. Crear usuario de desarrollo accediendo inscribiéndose en la página, <https://earthengine.google.com/>
Para descargar los resultados de los scripts se puede indicar una carpeta de Google Drive, por lo que conviene crear el usuario empleando el propio usuario de Google





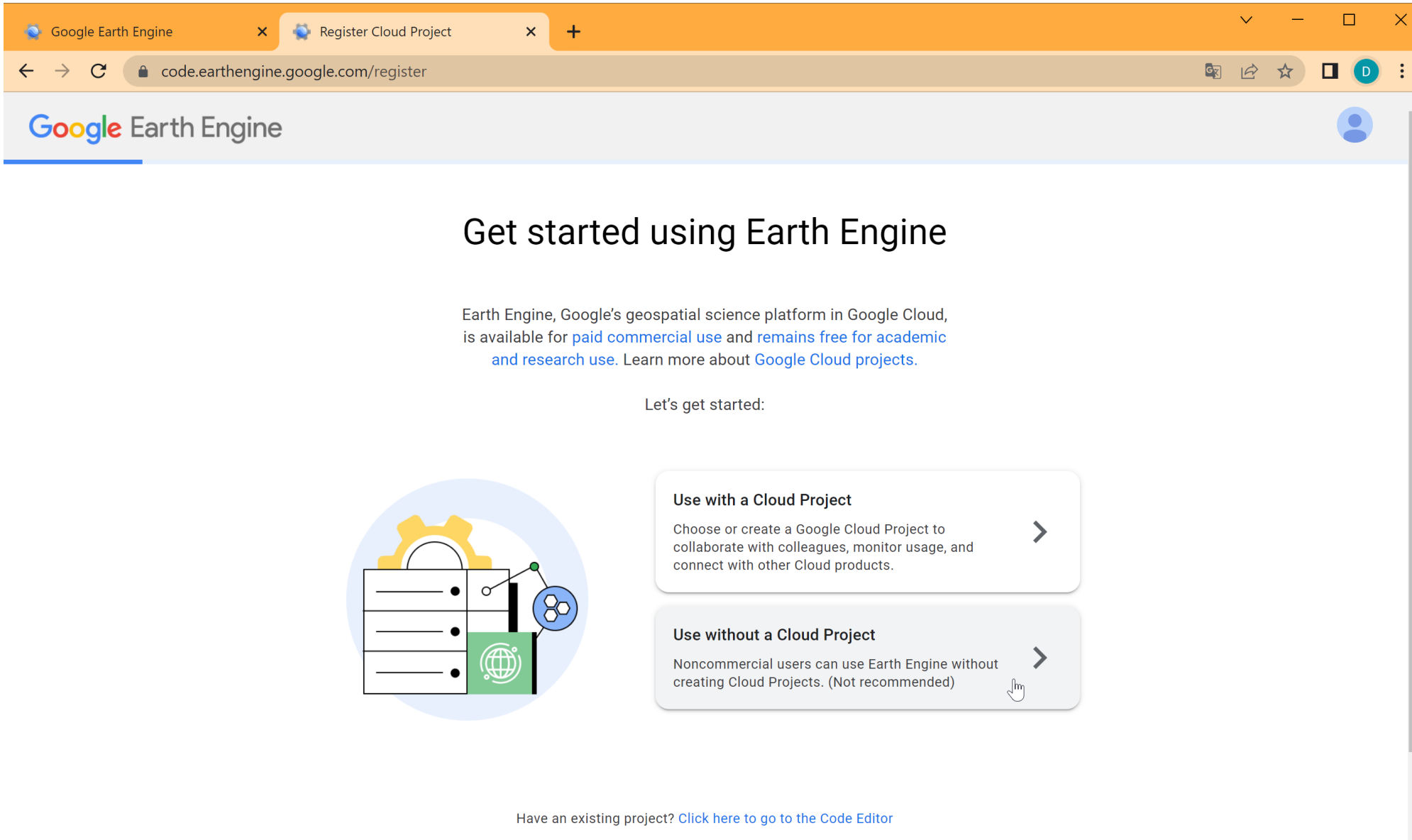
Español (España)



Ayuda

Privacidad


Términos





Google Earth Engine x Earth Engine Signup x +

← → ↻ [signup.earthengine.google.com/#!/](#) 🔍 📄 ☆ 🖨️ D ⋮



SIGN UP

Sign up for Earth Engine

If you'd like to become an Earth Engine developer, please sign up by providing the following information. We can't accept all applications, so please fill out all fields as best you can so we can approve your request for access. If you are accepted, you will receive an email within one week.

If you are interested in commercial use of Earth Engine, you can [find out more](#).

To facilitate the approval process, we suggest that you sign up with an email associated with your organization. Tip: You don't need a Gmail account to create a Google Account. You can [use your non-Gmail email address to create one instead](#).

Email

pafyc2023@gmail.com

Want to use a different account? [Log out](#) or use an Incognito tab.

Full name *

David Hernandez Lopez

Please tell us your first and last name.

Affiliation/Institution *

Institution type *



Google Earth Engine x Earth Engine Signup x Recibidos (1) - pafyc2023@gmail x +

← → ↻ [signup.earthengine.google.com/#!/](#) 🔍 📄 ☆ 🗄️ D ⋮

To facilitate the approval process, we suggest that you sign up with an email associated with your organization. Tip: You don't need a Gmail account to create a Google Account. You can [use your non-Gmail email address to create one instead](#).

Email
pafyc2023@gmail.com
Want to use a different account? [Log out](#) or use an Incognito tab.

Full name *
David Hernandez Lopez
Please tell us your first and last name.

Affiliation/Institution *
Universidad de Castilla-La Mancha
Which organization are you a part of? Give a homepage URL if possible.


Institution type *
Academia
Select the best description for your institution, or choose Other and clarify.

Country/Region *
Spain
Please tell us where you live.

What would you like to accomplish with Earth Engine? *
Uso en pruebas en trabajos de investigación y en docencia
Please describe in a few sentences how you intend to use Earth Engine.

This sign-up page is for [noncommercial and research use](#) of Earth Engine.

☒ I agree that my use of the Earth Engine services and related APIs is subject to my compliance with the applicable [Terms of Service](#). In particular, I acknowledge that creating multiple Earth Engine accounts to circumvent quota restrictions is a violation of the Terms of Service.

☒ No soy un robot  reCAPTCHA
Privacidad - Términos

SUBMIT



Google Earth Engine x | Earth Engine Signup x | Welcome to Google Earth Engine x +

mail.google.com/mail/u/0/?zx=42ijo0sgzf32#inbox/FMfcgzGsmWsMcdCXBpqbntgQFqLqmvbd

Gmail

Buscar correo

Redactar

Recibidos 1

Destacados

Pospuestos

Enviados

Borradores

Más

Etiquetas +

Welcome to Google Earth Engine! Recibidos x

Google Earth Engine <earthengine-noreply@google.com> para mí

19:54 (hace 0 minutos) ☆ ↶ ⋮

🌐 inglés > 🇪🇸 español Traducir mensaje Desactivar para: inglés x

Welcome to Earth Engine!

Greetings, Earth Engine Developer, and welcome! You now have access to:

- The [Earth Engine Code Editor](#) - the primary Earth Engine development environment.
- The [Earth Engine Developer docs](#) - including our [development guides](#), [API reference](#), and [tutorials](#).
- The [Earth Engine Explorer](#) - a graphical user interface. No programming skills needed.

Note that it may take a few days before this change is propagated through the system.

To get started with Earth Engine, we suggest you:

- Read our [Frequently Asked Questions](#).
- Check out our [Get Started](#) guide, [tutorials](#), and complete [documentation](#).
- Visit the Earth Engine [developers list](#).

It's great to have you on board. We look forward to seeing what you can do with Earth Engine!



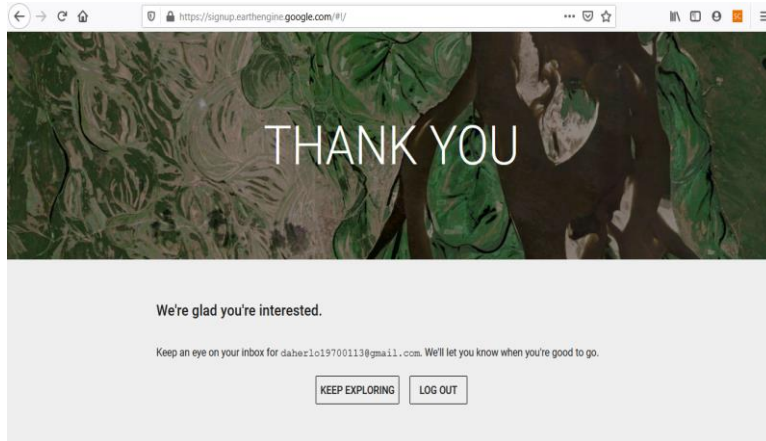
1. Crear usuario de desarrollo accediendo inscribiéndose en la página, <https://earthengine.google.com/>



Google Earth Engine <earthengine-noreply@google.com>

Lun 19/04/2021 10:04

Para: daherlo19700113@gmail.com



Welcome to Earth Engine!

[Earth](#)
[Engine](#)

Greetings, Earth Engine Developer, and welcome! You now have access to:

- The [Earth Engine Code Editor](#) - the primary Earth Engine development environment.
- The [Earth Engine Developer docs](#) - including our [development guides](#), [API reference](#), and [and tutorials](#).
- The [Earth Engine Explorer](#) - a graphical user interface. No programming skills needed.

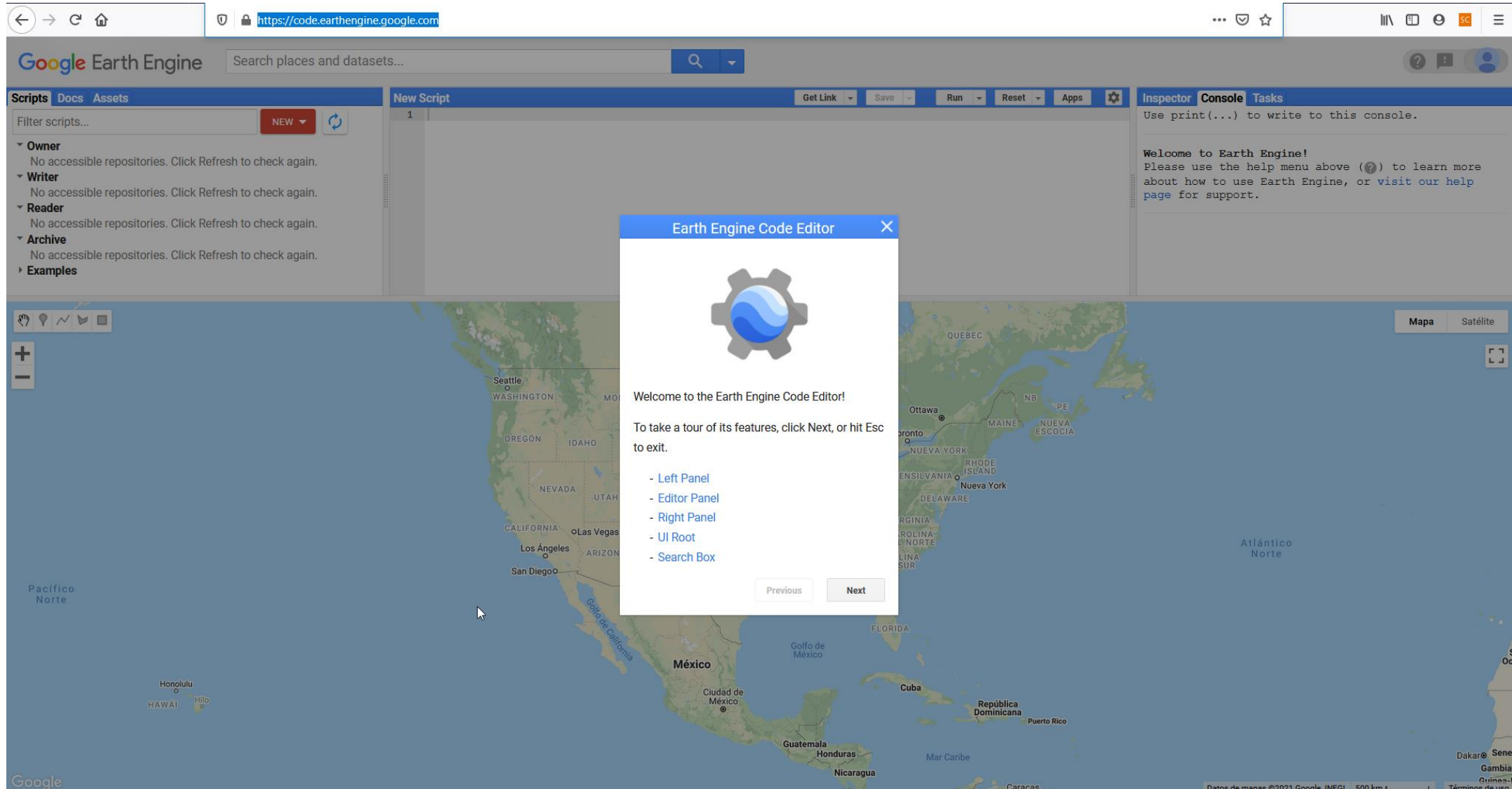
Note that it may take a few days before this change is propagated through the system.

To get started with Earth Engine, we suggest you:

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- Check out our [Get Started](#) guide, [tutorials](#), and complete [documentation](#).
- Visit the Earth Engine [developers list](#).

It's great to have you on board. We look forward to seeing what you can do with Earth Engine!

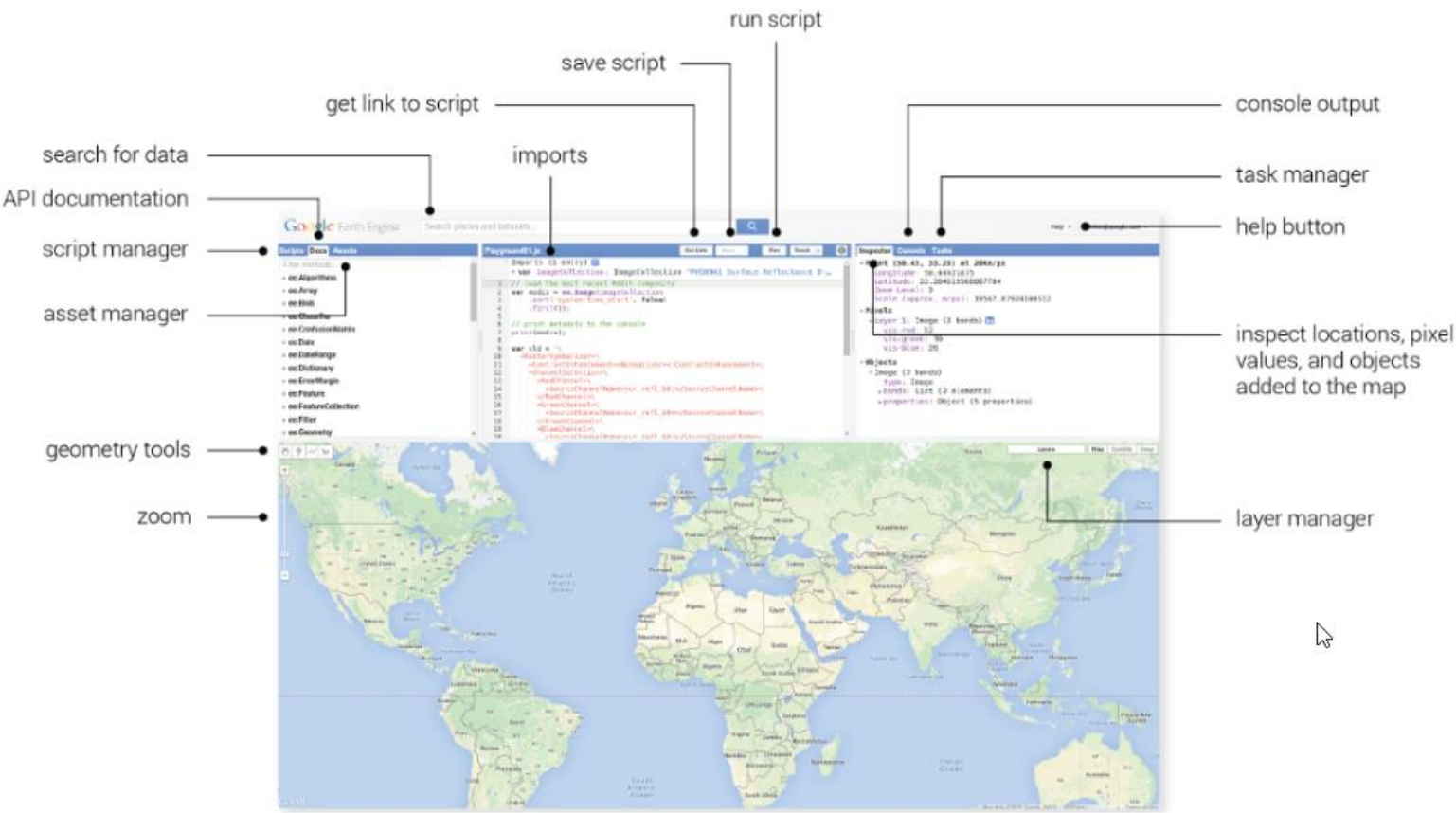
2. Al acceder al editor de código, <https://code.earthengine.google.com/>, se solicita usuario



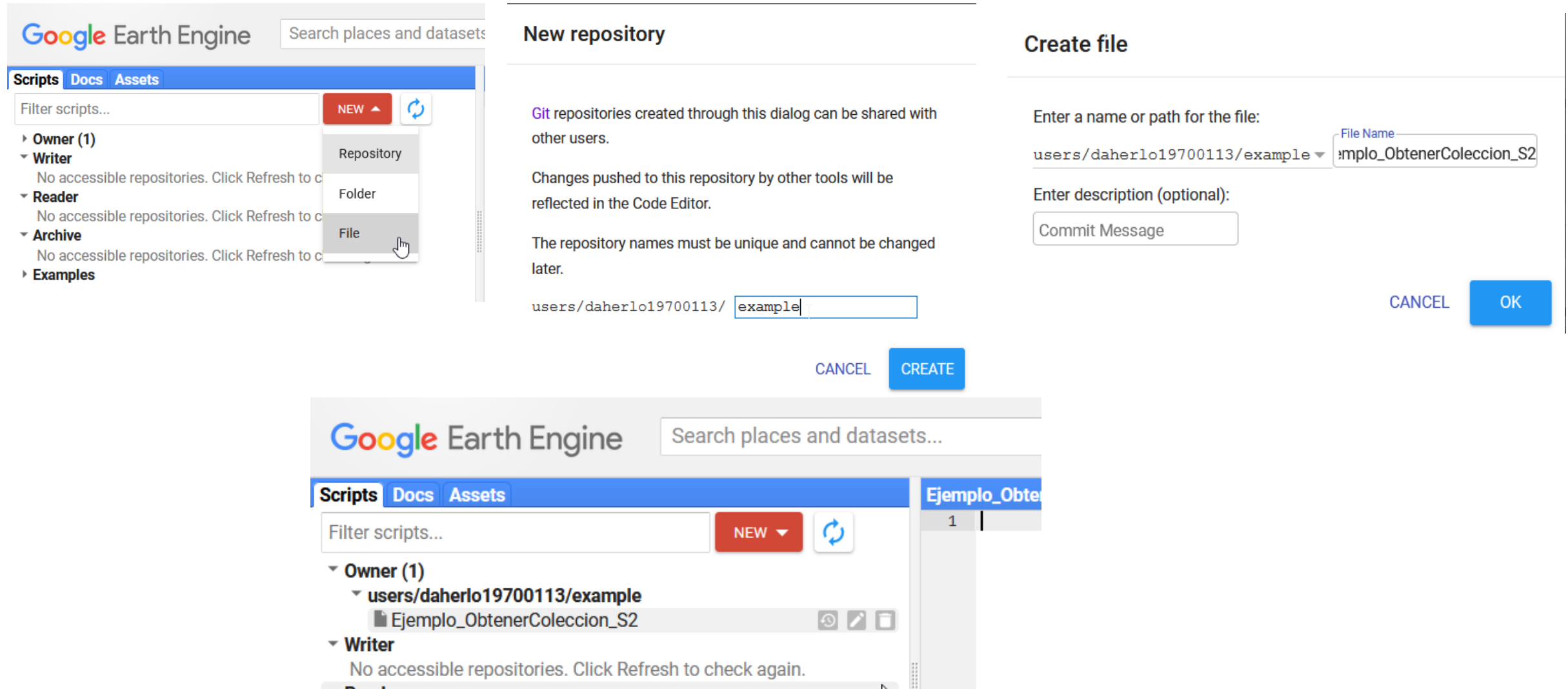


Code Editor

The Earth Engine Code Editor at code.earthengine.google.com is a web-based IDE for the Earth Engine JavaScript API. It requires log in with a Google Account that's been enabled for Earth Engine access. Code Editor features are designed to make developing complex geospatial workflows fast and easy. The Code Editor has the following elements (illustrated in the figure):



2. Crear un fichero (solicita crear repositorio dentro, escribir/copiar código en un fichero, salvar y ejecutar)



The screenshot displays the Google Earth Engine interface. On the left, the 'Scripts' tab is active, showing a list of scripts with columns for Owner, Writer, Reader, Archive, and Examples. A 'NEW' button is visible. In the center, the 'New repository' dialog is open, showing a text input field with 'example' and a 'CREATE' button. On the right, the 'Create file' dialog is open, showing a text input field with 'mplo_ObtenerColeccion_S2' and a 'Commit Message' field. The 'OK' button is visible.

Google Earth Engine Search places and datasets...

Scripts Docs Assets

Filter scripts...

NEW ↕

- Owner (1)
- Writer
- Reader
- Archive
- Examples

New repository

Git repositories created through this dialog can be shared with other users.

Changes pushed to this repository by other tools will be reflected in the Code Editor.

The repository names must be unique and cannot be changed later.

users/daherlo19700113/

CANCEL CREATE

Create file

Enter a name or path for the file:

users/daherlo19700113/example

File Name

Enter description (optional):

CANCEL OK

Google Earth Engine Search places and datasets...

Scripts Docs Assets

Filter scripts...

NEW ↕

- Owner (1)
 - users/daherlo19700113/example
 - Ejemplo_ObtenerColeccion_S2
- Writer
- Reader

Ejemplo_Obte

1



2. Crear un fichero (solicita crear repositorio dentro, escribir/copiar código en un fichero, salvar y ejecutar

```
M:\EjemploGEE\agricola\Ejemplo_ObtenerColeccion_S2.js - Notepad++

Archivo  Editar  Buscar  Vista  Codificación  Lenguaje  Configuración  Herramientas  Macro  Ejecutar  Plugins  Ventana  ?

markers.xml  Markers.xml  new 9  parameters_pp_processing_tools.xml  parameters_pp_processing_tools.xml  metadata.py  utils.py  dis.py  image.py  calc_rad2refl.py  micasense_calibration.py

1  // https://developers.google.com/earth-engine/datasets/catalog/sentinel-2?hl=en
2  // https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS\_S2\_SR#description
3
4  var get_dates = function(collection) {
5    return ee.List(collection.toList(collection.size()).map(function(img) {
6      return ee.Image(img).date().format()
7    })))
8  }
9  var geometry = ee.Geometry.Polygon([
10    [[-1.98, 38.96], [-1.98, 39.06], [-1.82, 39.06], [-1.82, 38.96]]
11  ]);
12  // var polygons = ee.FeatureCollection(geometry);
13
14  var collectionS2= ee.ImageCollection ('COPERNICUS/S2_SR') // Selección de la colección de la misión espacial
15    .filterDate ('2019-03-15', '2019-10-15') // Identificación del periodo temporal de análisis
16    .filterBounds (geometry) // Definición de la región de interés
17    .filterMetadata ('CLOUDY_PIXEL_PERCENTAGE', 'Less_Than', 30)
18    .filterMetadata('SENSING_ORBIT_DIRECTION','equals','DESCENDING'); // Identificación de cobertura de nubes mínima
19
20  var dates = get_dates(collectionS2);
21  console.log(dates.getInfo());
22  print(collectionS2)
23  Export.table.toDrive({
24    collection: collectionS2,
25    description:'ColeccionS2',
26    folder: 'gee_giaa',
27    fileFormat: 'GeoJSON'
28  });
29  // editor online de json: https://jsoneditoronline.org
30
```




2. Crear un fichero (solicita crear repositorio dentro, escribir/copiar código en un fichero, salvar y ejecutar)

The screenshot shows the Google Earth Engine web interface. At the top, there's a search bar with the text "Search places and datasets...". Below the search bar, there are tabs for "Scripts", "Docs", and "Assets". The "Scripts" tab is active, showing a list of scripts on the left and a script editor on the right.

On the left, under "Owner (1)", there's a folder "users/daherlo19700113/example" containing a script named "Ejemplo_ObtenerColeccion_S2". Below this, there are sections for "Writer", "Reader", "Archive", and "Examples", each with a message: "No accessible repositories. Click Refresh to check again."

The script editor on the right is titled "Ejemplo_ObtenerColeccion_S2 *". It contains the following JavaScript code:

```
1 // https://developers.google.com/earth-engine/datasets/catalog/sentinel-2?hl=en
2 // https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS_S2
3
4 var get_dates = function(collection) {
5   return ee.List(collection.toList(collection.size()).map(function(img){
6     return ee.Image(img).date().format()
7   })))
8 }
9
10 var geometry = ee.Geometry.Polygon([
11   [[-1.98, 38.96], [-1.98, 39.06], [-1.82, 39.06], [-1.82, 38.96]]
12 ]);
13
14 var collectionS2= ee.ImageCollection ('COPERNICUS/S2_SR') // Selección de la colecc
15   .filterDate ('2019-03-15', '2019-10-15') // Identificación del periodo temporal d
16   .filterBounds (geometry) // Definición de la región de interés
17   .filterMetadata ('CLOUDY_PIXEL_PERCENTAGE', 'Less_Than', 30)
18   .filterMetadata('SENSING_ORBIT_DIRECTION','equals','DESCENDING'); // Identificaci
```

At the top right of the script editor, there are buttons for "Get Link", "Save", and "Run". The "Save" button is highlighted with a mouse cursor, and a small tooltip "Save scrip" is visible.



2. Crear un fichero (solicita crear repositorio dentro, escribir/copiar código en un fichero, salvar y ejecutar

Google Earth Engine

Search places and datasets...

Q

Scripts Docs Assets

Filter scripts...

NEW

Owner (1)

users/daherlo19700113/example

Ejemplo_ObtenerColeccion_S2

Writer

No accessible repositories. Click Refresh to check again.

Reader

No accessible repositories. Click Refresh to check again.

Archive

No accessible repositories. Click Refresh to check again.

Examples

Ejemplo_ObtenerColeccion_S2 *

Get Link

Save

Run

Reset

Apps

Run script (Ctrl+Enter)

```
1 // https://developers.google.com/earth-engine/datasets/catalog/sentinel-2?hl=en
2 // https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS_S2_SR#descri
3
4 var get_dates = function(collection) {
5   return ee.List(collection.toList(collection.size()).map(function(img){
6     return ee.Image(img).date().format()
7   })))
8 }
9
10 var geometry = ee.Geometry.Polygon([
11   [[-1.98, 38.96],[-1.98, 39.06], [-1.82, 39.06], [-1.82, 38.96]]
12 ]]);
13 // var polygons = ee.FeatureCollection(geometry);
14
15 var collectionS2= ee.ImageCollection ('COPERNICUS/S2_SR') // Selección de la colección de la misión espacial
16   .filterDate ('2019-03-15', '2019-10-15') // Identificación del periodo temporal de análisis
17   .filterBounds (geometry) // Definición de la región de interés
18   .filterMetadata ('CLOUDY_PIXEL_PERCENTAGE', 'Less_Than', 30)
19   .filterMetadata('SENSING_ORBIT_DIRECTION','equals','DESCENDING'); // Identificación de cobertura de nubes mínima
20
```

2. Crear un fichero (solicita crear repositorio dentro, escribir/copiar código en un fichero, salvar y ejecutar)

Inspector Console **Tasks**

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

▶ List (131 elements)

▼ ImageCollection COPERNICUS/S2_SR (131 elements)
 type: ImageCollection
 id: COPERNICUS/S2_SR
 version: 1618781845525962
 bands: []
 ▶ features: List (131 elements)
 ▶ properties: Object (20 properties)

Inspector Console **Tasks**

Refresh

CollectionS2

RUN

Task: Initiate table export

Task name (no spaces) *
CollectionS2

☒ Drive ☐ Cloud Storage ☐ EE Asset

Drive folder
gee_giaa

Filename *
CollectionS2

File format *
GEO_JSON

Run Cancel

gee_giaa - Google Drive

drive.google.com/drive/folders/1QtFILKU9eYsMEM_8dXd74seyZ31L27dy?hl=es

Aplicaciones UCLM-On CVN Ininterconecta Safet... DOI Install Docker for W... Hugin console Spatialite tutorial

Drive

Buscar en Drive

Mi unidad > gee_giaa

Nuevo

Mi unidad

Unidades compartidas

Compartido conmigo

Reciente

drive.google.com/drive/folders/1QtFILKU9eYsMEM_8dXd74seyZ31L27dy?hl=es

Aplicaciones UCLM-On CVN Ininterconecta Safet... DOI Install Docker for W... Hugin console Spatialite tutorial

Drive

Buscar en Drive

Mi unidad > gee_giaa

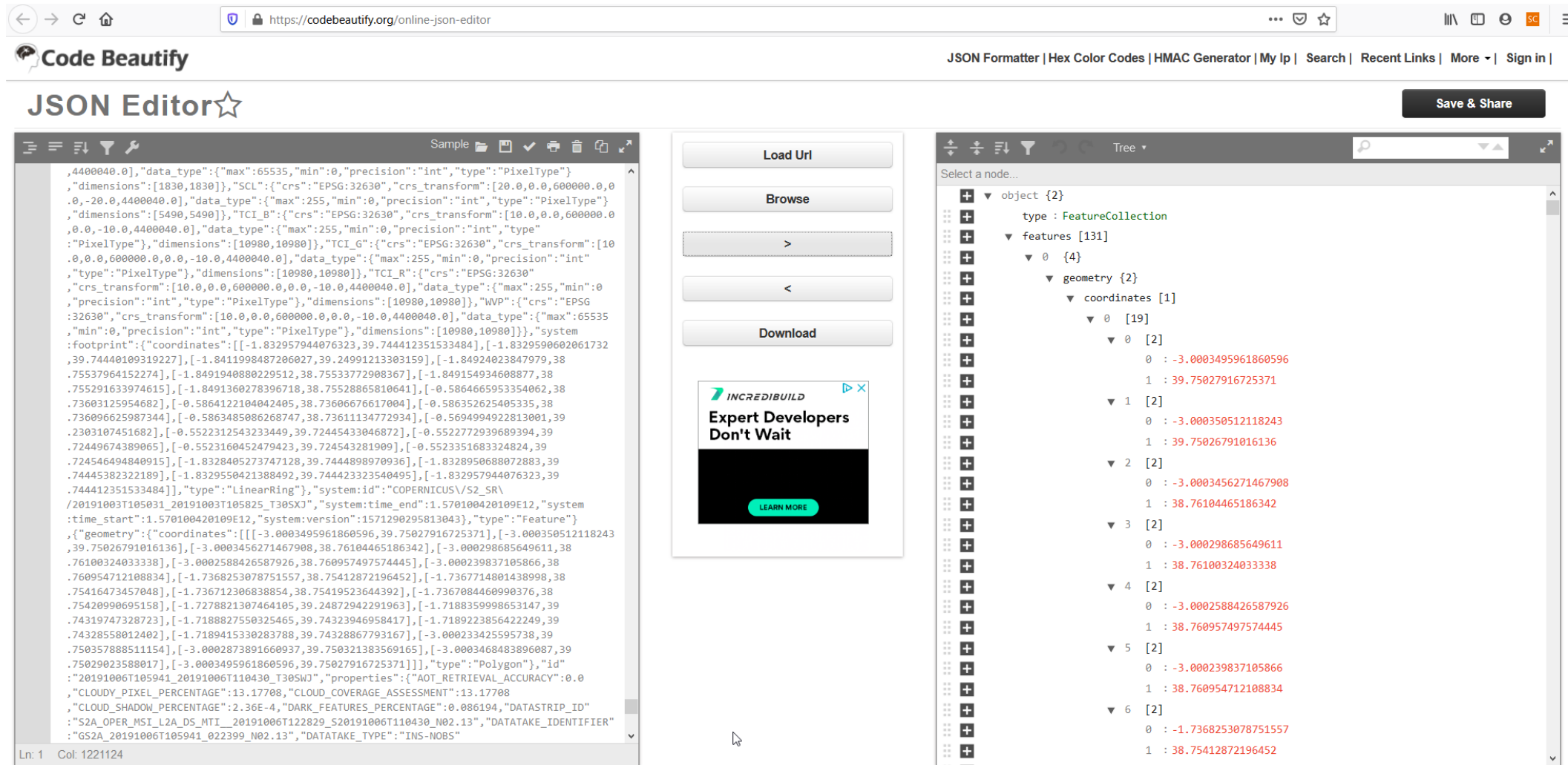
Nuevo

Mi unidad

Unidades compartidas

Nombre ↓	Propietario	Última modificaci...
CollectionS2.geojson	yo	10:35

3. Descarga y utilizar el resultado. Ejemplo fichero JSON que se puede editar con Notepad++, copiar su contenido y consultarlo a través de algún editor de JSON (<https://codebeautify.org/online-json-editor>)



The screenshot displays the Code Beautify JSON Editor interface. The left pane shows a large JSON object with various metadata and a 'features' array. The right pane shows a tree view of the JSON structure, highlighting the 'features' array and its elements. The interface includes a 'Load Url' button, a 'Browse' button, and a 'Download' button. A 'Save & Share' button is also visible.



Ejemplo de severidad de incendios, Ejemplo_IncendioForestal_Lietor_2016_Severidad_S2.js

The screenshot displays the Google Earth Engine web interface. The top navigation bar includes tabs for Google Earth Engine, Earth Engine Signup, Welcome to Google Earth Engine, Ejemplo_IncendioForestal_Lietor, and gee_gifmn - Google Drive. The main interface is divided into three panels: Scripts, Docs, and Assets. The Scripts panel on the left shows a list of scripts, with 'Ejemplo_IncendioForestal_Lietor_2016_Severidad_S2' selected. The central panel displays the script code, which defines a color palette and a legend for fire severity classes. The right panel shows the 'Inspector' tab with a search bar and a list of submitted tasks, including 'myExportImageTask'. Below the script editor, a map view shows the spatial distribution of fire severity classes over a forested area. A legend titled 'dNBR Classes' is visible in the bottom left corner of the map view, listing the severity levels and their corresponding colors: Enhanced Regrowth, High (dark green); Enhanced Regrowth, Low (light green); Unburned (yellow); Low Severity (orange); Moderate-low Severity (light orange); Moderate-high Severity (red); High Severity (dark red); and NA (purple). The map also shows a scale bar and a north arrow.

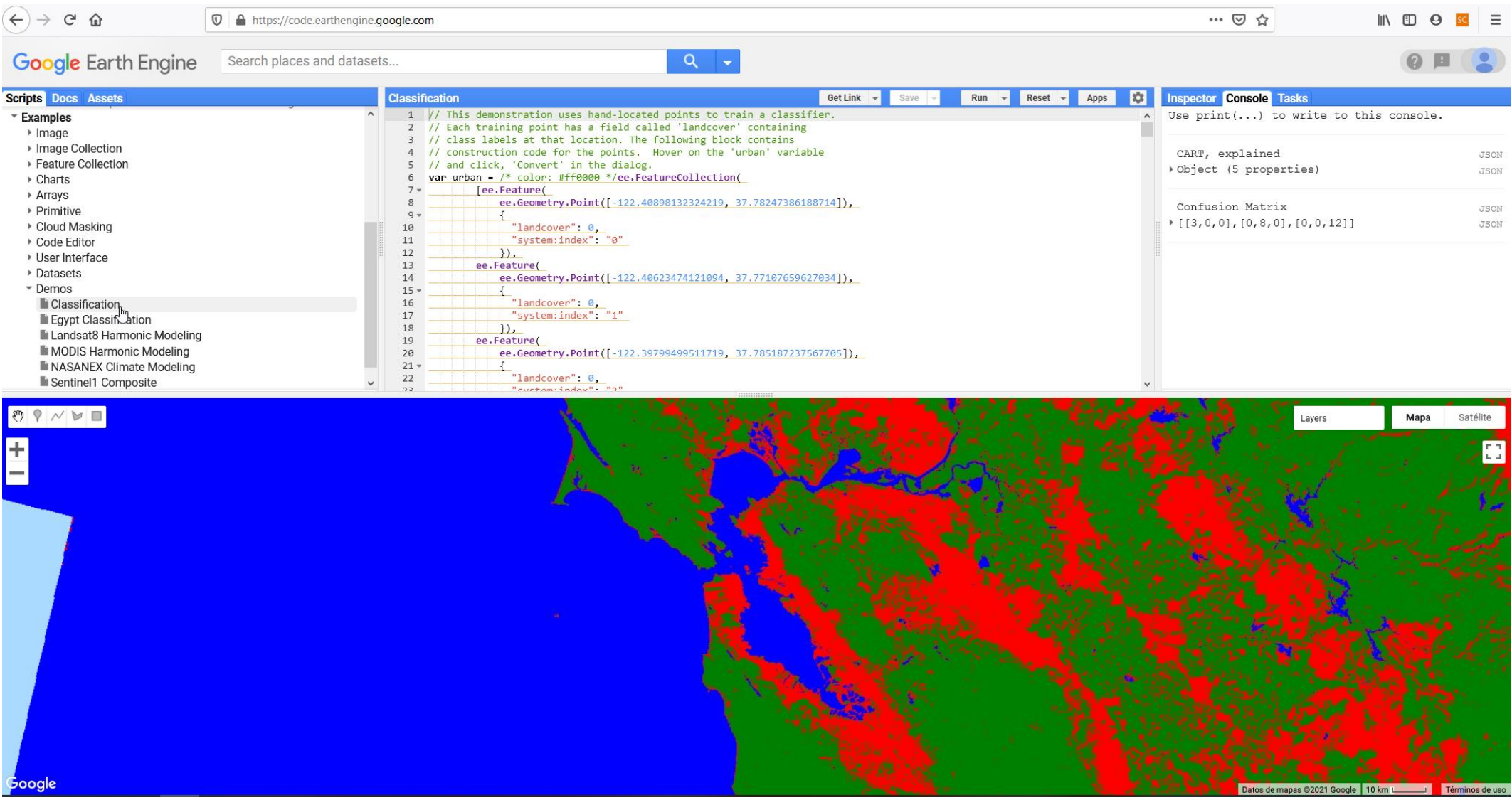
```
344 // Palette with the colors
345 var palette = ['7a8737', 'acbe4d', '0ae042', 'fff70b', 'ffaf38', 'ff641b', 'a41fd6', 'ffffff'];
346
347 // name of the legend
348 var names = ['Enhanced Regrowth, High', 'Enhanced Regrowth, Low', 'Unburned', 'Low Severity',
349 'Moderate-low Severity', 'Moderate-high Severity', 'High Severity', 'NA'];
350
351 // Add color and names
352 for (var i = 0; i < 8; i++) {
353   legend.add(makeRow(palette[i], names[i]));
354 }
355
356 // add legend to map (alternatively you can also print the legend to the console)
357 Map.add(legend);
358
359 //=====
360 // PREPARE FILE EXPORT
361
362
363
```

dNBR Classes

- Enhanced Regrowth, High
- Enhanced Regrowth, Low
- Unburned
- Low Severity
- Moderate-low Severity
- Moderate-high Severity
- High Severity
- NA



Ejecutar ejemplos de GEE



The screenshot displays the Google Earth Engine web interface. On the left, the 'Scripts' panel shows a list of examples, with 'Classification' selected. The main editor area shows a JavaScript script for training a classifier. The script defines three training points with their coordinates and landcover labels (0 for water, 1 for urban). The script then runs a classification on the 'urban' variable. On the right, the 'Inspector' panel shows the output of the script, including the 'CART, explained' object and the 'Confusion Matrix'.

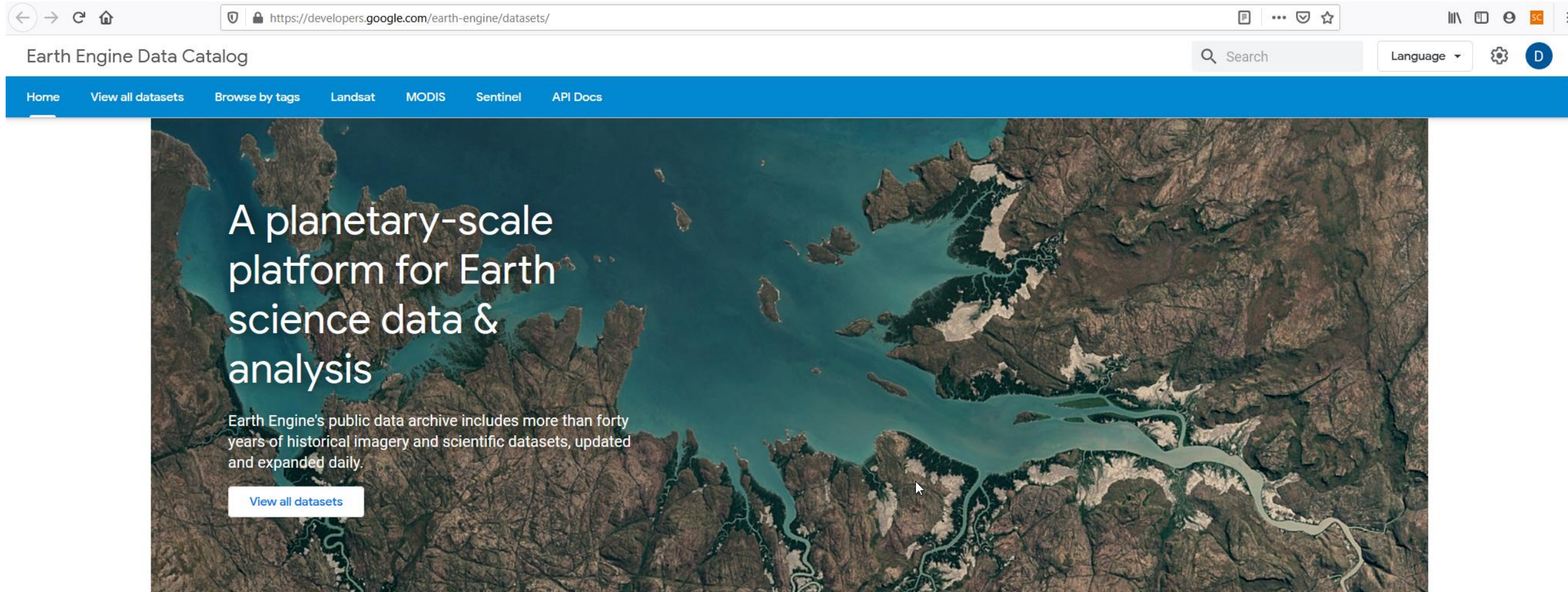
```
1 // This demonstration uses hand-located points to train a classifier.
2 // Each training point has a field called 'landcover' containing
3 // class labels at that location. The following block contains
4 // construction code for the points. Hover on the 'urban' variable
5 // and click, 'Convert' in the dialog.
6 var urban = /* color: #ff0000 */ ee.FeatureCollection([
7   ee.Feature(
8     ee.Geometry.Point([-122.40898132324219, 37.78247386188714]),
9     {
10      "landcover": 0,
11      "system:index": "0"
12    }
13   ),
14   ee.Feature(
15     ee.Geometry.Point([-122.40623474121094, 37.77107659627034]),
16     {
17      "landcover": 0,
18      "system:index": "1"
19     }
20   ),
21   ee.Feature(
22     ee.Geometry.Point([-122.39799499511719, 37.785187237567705]),
23     {
24      "landcover": 0,
25      "system:index": "2"
26     }
27   )
28 ])
```

The 'Inspector' panel shows the following output:

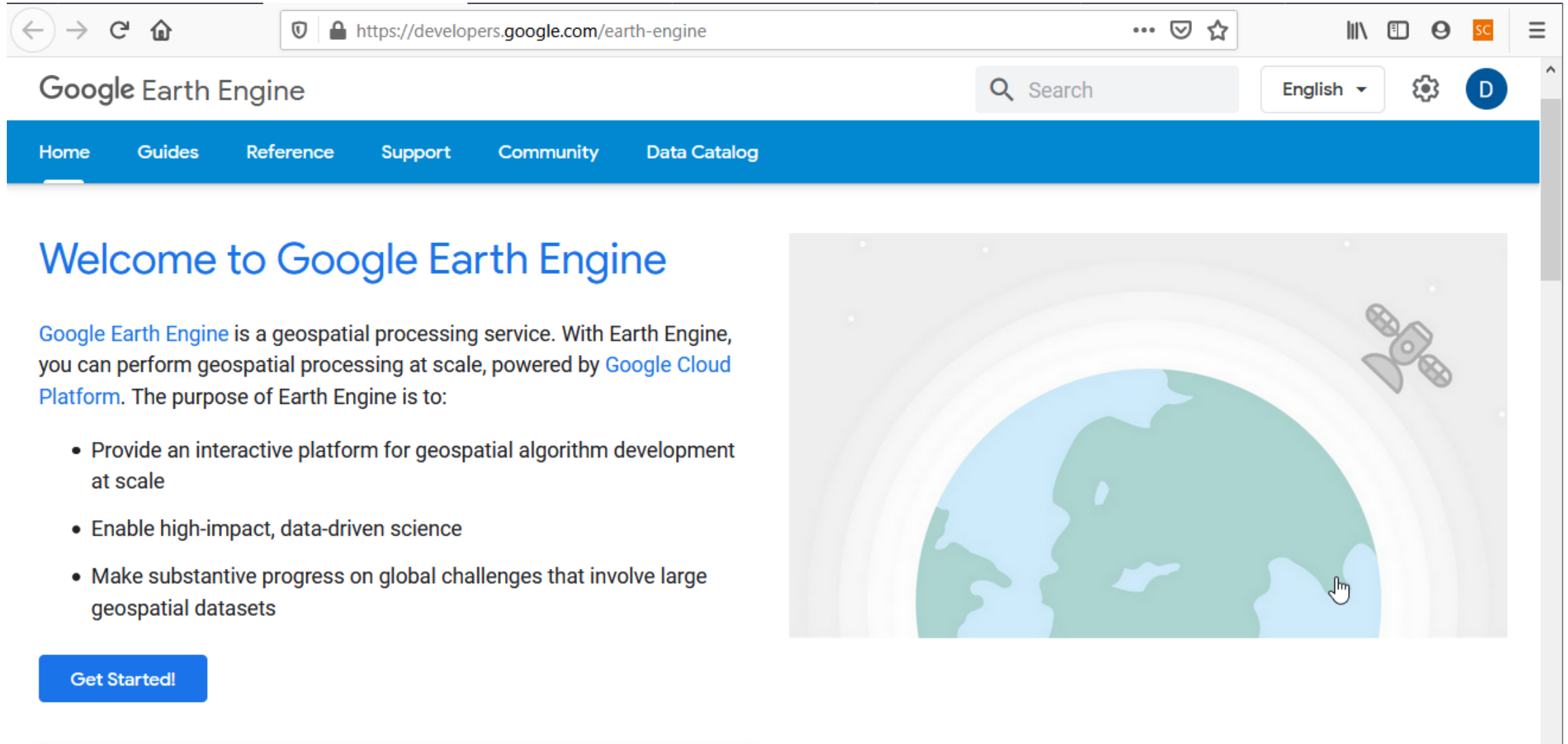
- CART, explained
- Object (5 properties)
- Confusion Matrix
- [[3,0,0],[0,8,0],[0,0,12]]

The map at the bottom shows the results of the classification, with landcover classes represented by different colors (blue for water, red for urban, green for forest, etc.).

Consultar fuentes de datos



Consultar la documentación, cursos, ...



The screenshot shows the Google Earth Engine developer website. The browser address bar displays <https://developers.google.com/earth-engine>. The page header includes the "Google Earth Engine" title, a search bar, a language dropdown set to "English", and a user profile icon labeled "D". A blue navigation bar contains links for "Home", "Guides", "Reference", "Support", "Community", and "Data Catalog". The main content area features a large heading "Welcome to Google Earth Engine" followed by a paragraph: "Google Earth Engine is a geospatial processing service. With Earth Engine, you can perform geospatial processing at scale, powered by Google Cloud Platform. The purpose of Earth Engine is to:". Below this is a bulleted list of three points: "Provide an interactive platform for geospatial algorithm development at scale", "Enable high-impact, data-driven science", and "Make substantive progress on global challenges that involve large geospatial datasets". A blue "Get Started!" button is positioned at the bottom left of the main content. On the right side, there is a large graphic of a stylized Earth with a satellite in orbit and a hand cursor pointing at it.

Google Earth Engine

Search English

Home Guides Reference Support Community Data Catalog

Welcome to Google Earth Engine

Google Earth Engine is a geospatial processing service. With Earth Engine, you can perform geospatial processing at scale, powered by Google Cloud Platform. The purpose of Earth Engine is to:

- Provide an interactive platform for geospatial algorithm development at scale
- Enable high-impact, data-driven science
- Make substantive progress on global challenges that involve large geospatial datasets

Get Started!