

Google Earth Engine Service Account Setup

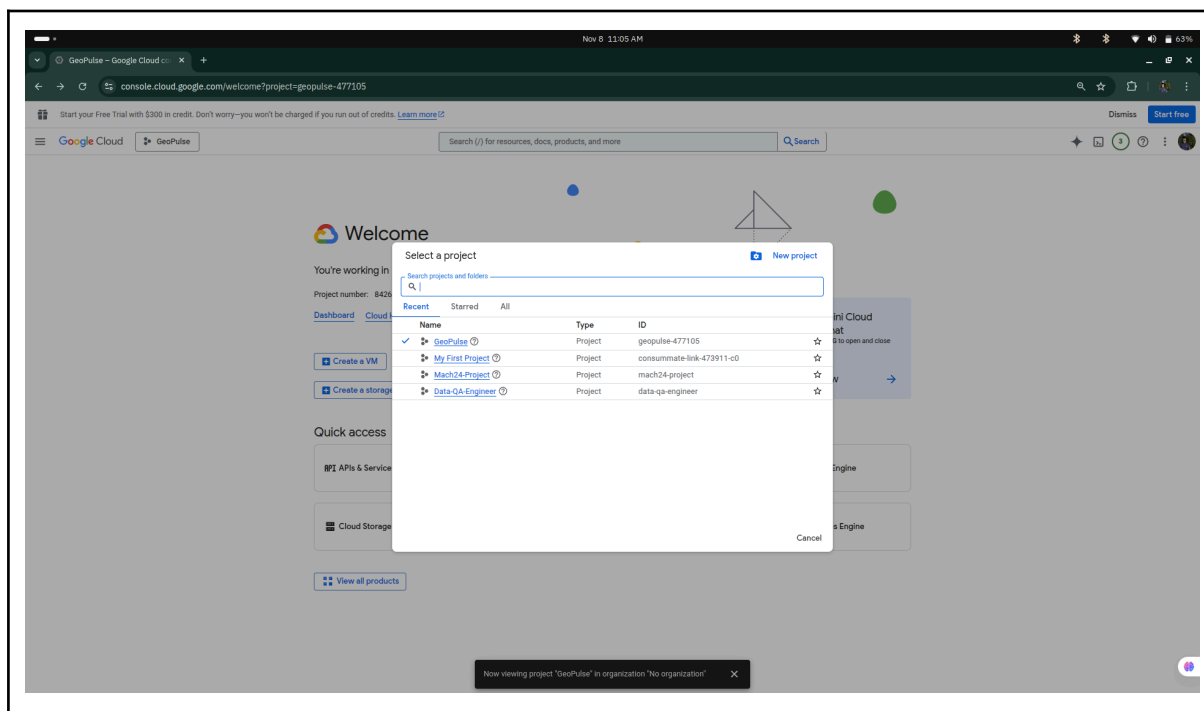
This guide explains how to create a Google Cloud project, set up a service account, and generate the credentials key (key.json) to use with Python scripts for Google Earth Engine (GEE) access.

✓ 1. Create a Google Cloud Project

- Go to **Google Cloud Console**.

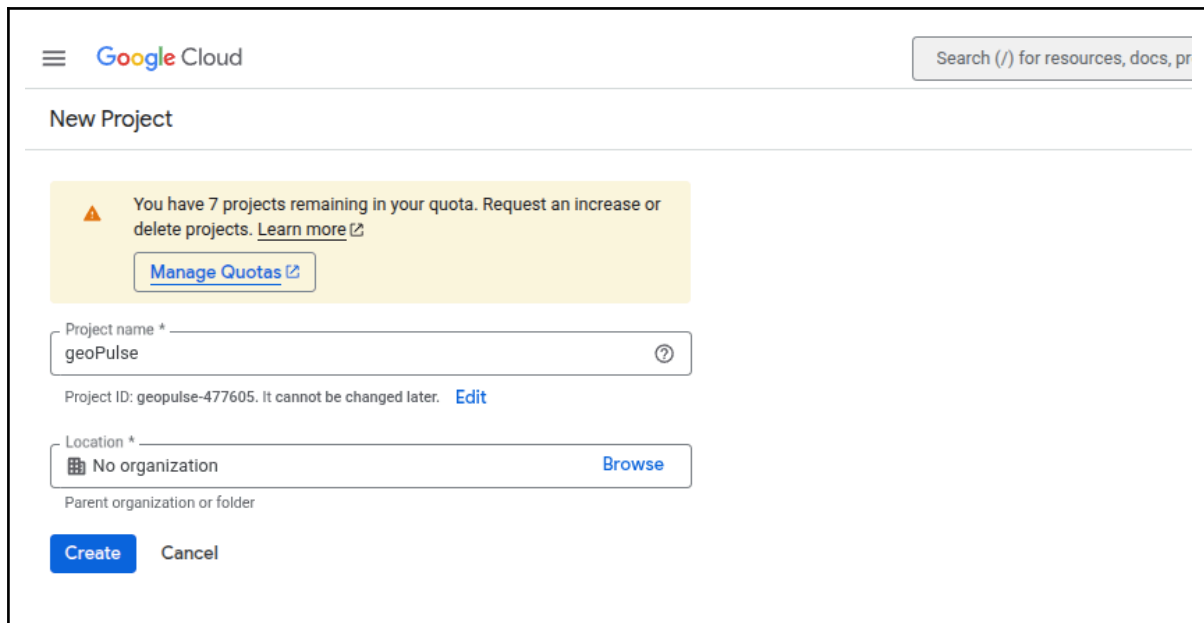
[Google Cloud Console](https://console.cloud.google.com/)

- Click **Ctrl + o** and you will see the pop-up below.



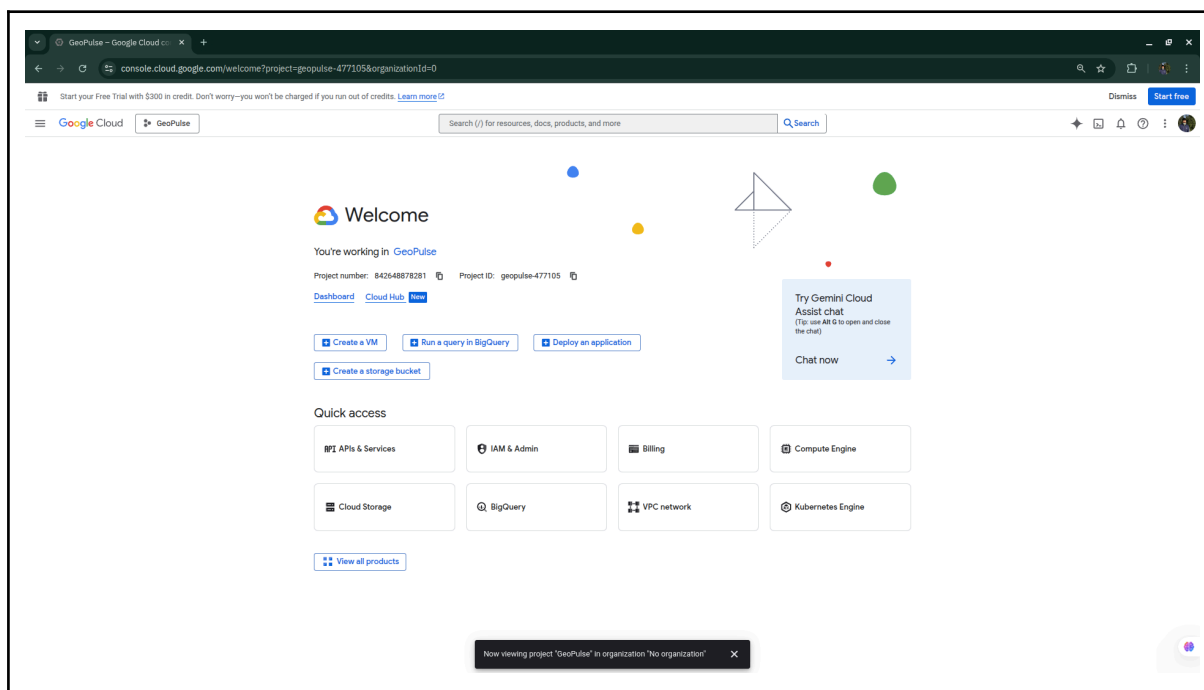
- Click on the **New project**.

- Enter a Project Name (e.g., geoPulse) and note the Project ID (e.g., geoPulse-477605).



The screenshot shows the 'New Project' page in the Google Cloud console. At the top, there's a search bar and the Google Cloud logo. Below the header, the title 'New Project' is displayed. A yellow warning box states: 'You have 7 projects remaining in your quota. Request an increase or delete projects. [Learn more](#)'. Below this is a 'Manage Quotas' button. The 'Project name' field contains 'geoPulse' and has a help icon. Below it, the 'Project ID' is shown as 'geopulse-477605' with a note 'It cannot be changed later.' and an 'Edit' link. The 'Location' dropdown is set to 'No organization' with a 'Browse' button. At the bottom, there are 'Create' and 'Cancel' buttons.

- Click **Create**.
- Your new Google Cloud Project will be created.



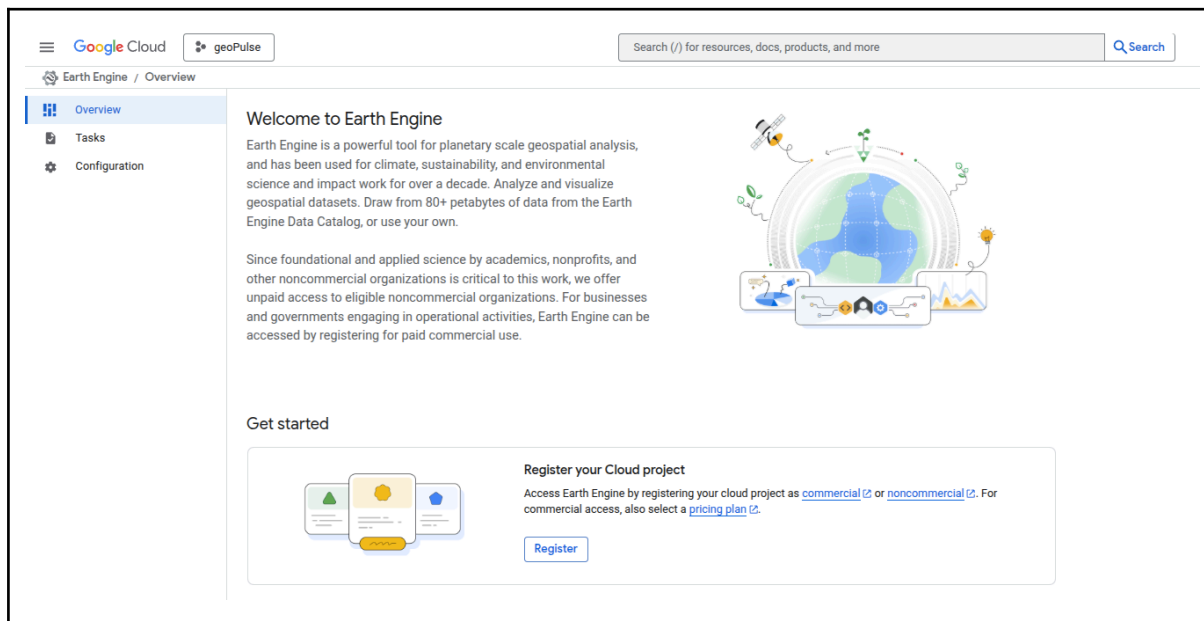
Tip: The project ID is used in our Python code as PROJECT_ID.

✓ 2. Register Your Project for Earth Engine

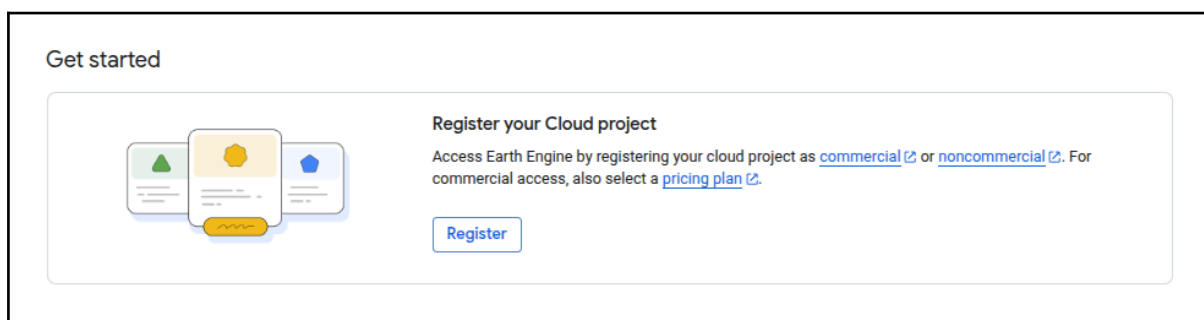
- Go to the **Earth Engine Overview** page.

<https://console.cloud.google.com/earth-engine/welcome>

- Select your previously created project (**Ctrl + o**).

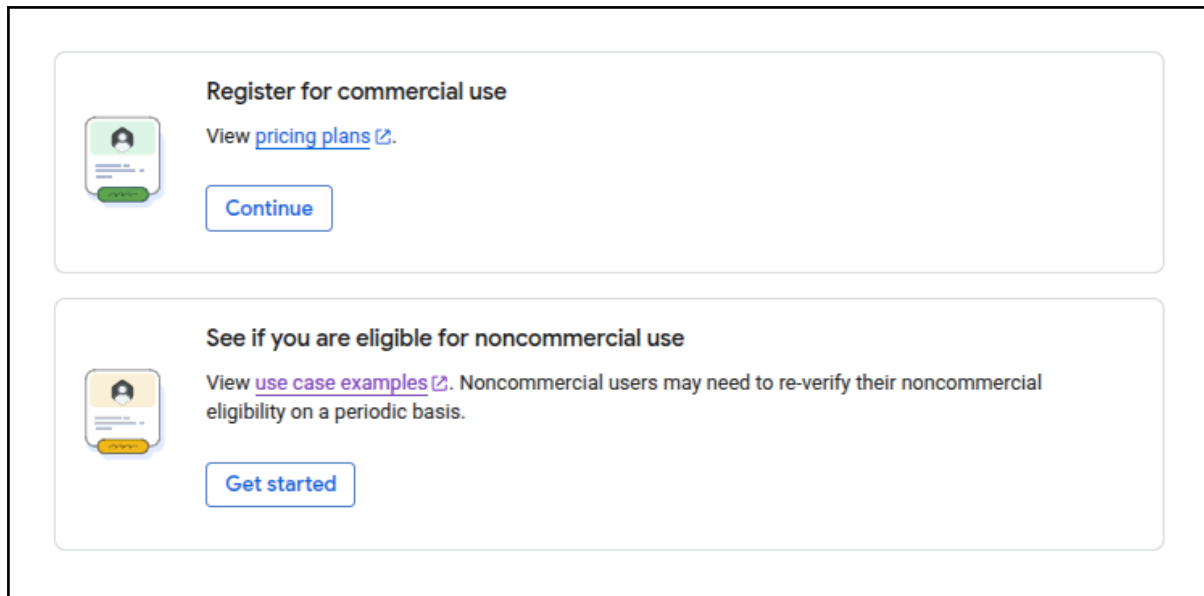


- Register your cloud project by clicking **Register**.



- You will be redirected to the **Earth Engine Configuration** page, where you need to decide to register your cloud project as:
 - Commercial (**pricing plans**) or,
 - Non-commercial (**Unpaid offer based on eligibility**).

- In this guide, we will be registering our cloud project as **non-commercial**.

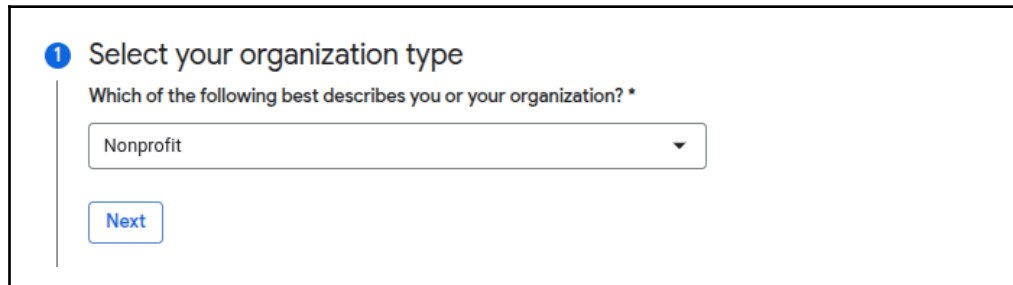


The image shows a registration interface with two main options. The first option, 'Register for commercial use', is highlighted with a green icon and a 'Continue' button. The second option, 'See if you are eligible for noncommercial use', is highlighted with a yellow icon and a 'Get started' button. The 'Get started' button is the one to be clicked according to the instructions.

Register for commercial use
View [pricing plans](#).
[Continue](#)

See if you are eligible for noncommercial use
View [use case examples](#). Noncommercial users may need to re-verify their noncommercial eligibility on a periodic basis.
[Get started](#)

- Click on **Get started**.
- **Fill in:**
 - Select your organization type:



The image shows a form titled '1 Select your organization type'. It asks 'Which of the following best describes you or your organization? *' and has a dropdown menu with 'Nonprofit' selected. A 'Next' button is at the bottom.

1 Select your organization type
Which of the following best describes you or your organization? *
Nonprofit
[Next](#)

- Check noncommercial eligibility:

2

Check noncommercial eligibility

What is the name of your nonprofit? *

Mach24

Will you receive any payment (including fee-for-service) from commercial entities, operational entities, or government organizations for applications or data created using Earth Engine? Note: This does not include research-only grants. *

☐ Yes

☒ No

How would you describe your use of Earth Engine? *

☐ Scientific research
e.g., advancing remote sensing methodologies

☒ Applied science
e.g., analysis of a real-world problem or place

☐ Operational decision making
e.g., analysis to support government actions

Are you conducting research using Earth Engine? *

☒ Yes

☐ No

What is the geographic scope of your study? *

☐ Global

☒ Regional

Please specify the region *

Nepal

Have you previously published work on this topic that used Earth Engine? *

☐ Yes

☒ No

Check eligibility

- Choose your plan.

1

Select your organization type

2

Check noncommercial eligibility

3

Choose your plan

A pricing plan is not required for noncommercial registration.

Next

- Describe your work:

4

Describe your work

Does your work with Earth Engine fall into any of these categories?

☐ Mitigation
e.g., reduction or avoidance of greenhouse gas emissions / CO2 equivalent

☒ Adaptation
e.g., helping people and communities adapt to the impacts of climate change

☐ Protection & conservation
e.g., land and ocean-based interventions to conserve biodiversity and ecosystems

Will you use Earth Engine for any of the following? *

Artificial intelligence and machine learning (AI / ML) ▼

Next


- Click on **Next**, and after reading the Review summary, click on **Register**.

Configuration

You are now registered for noncommercial use


Check out the Overview page to access the Earth Engine API, explore datasets, and start analyzing.

Continue

Control EECU-time

Create, edit, and view the daily limit for usage (EECU-time).

Manage quota

Your Cloud project is registered for noncommercial use

Change your registration details, or update to commercial use if your project no longer meets noncommercial [eligibility requirements](#).

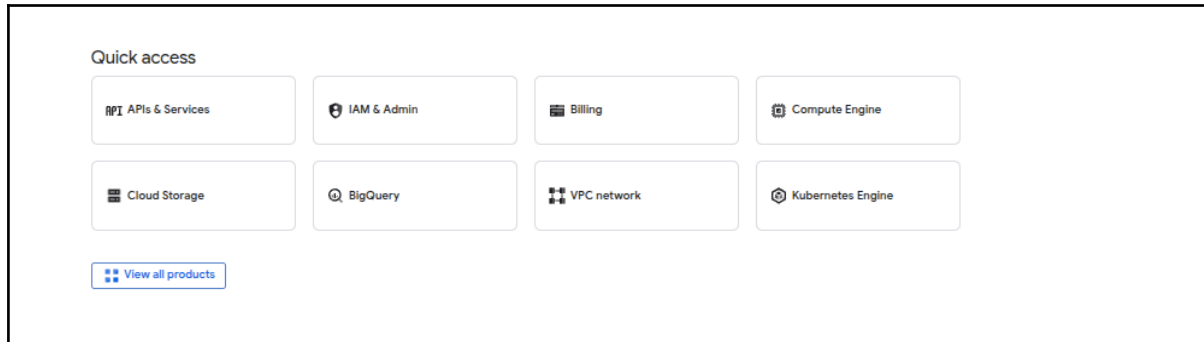
Manage registration

- Your cloud project is now registered for **non-commercial** use.
-

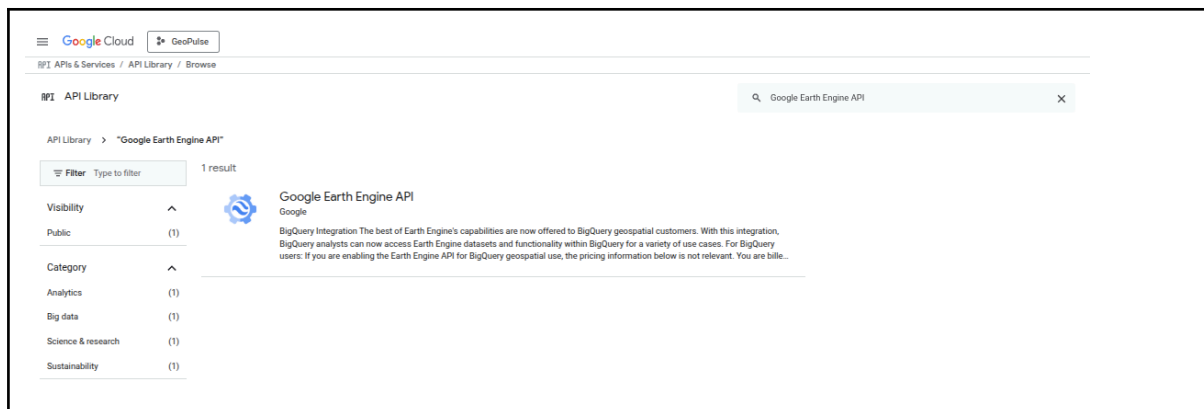
✓ 3. Enable Earth Engine API

- In **Google Cloud Console** under **Quick Access**, go to **APIs & Services** and then the **Library** tab.

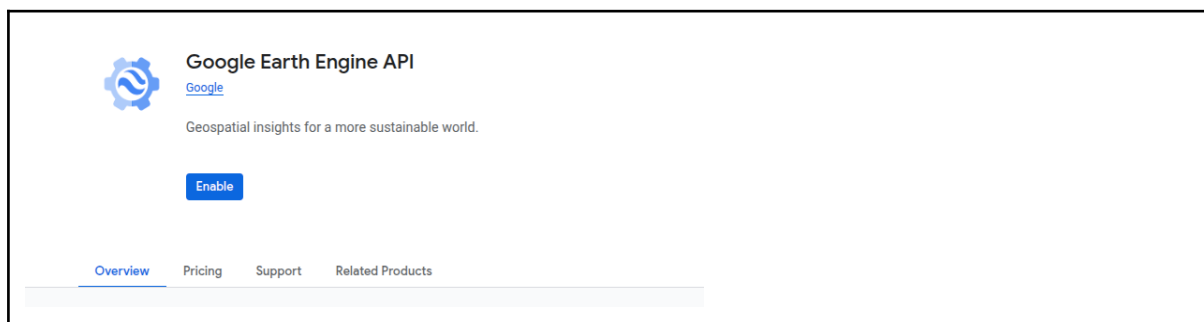
[Google Cloud Console](#)



- Search for **Google Earth Engine API**.



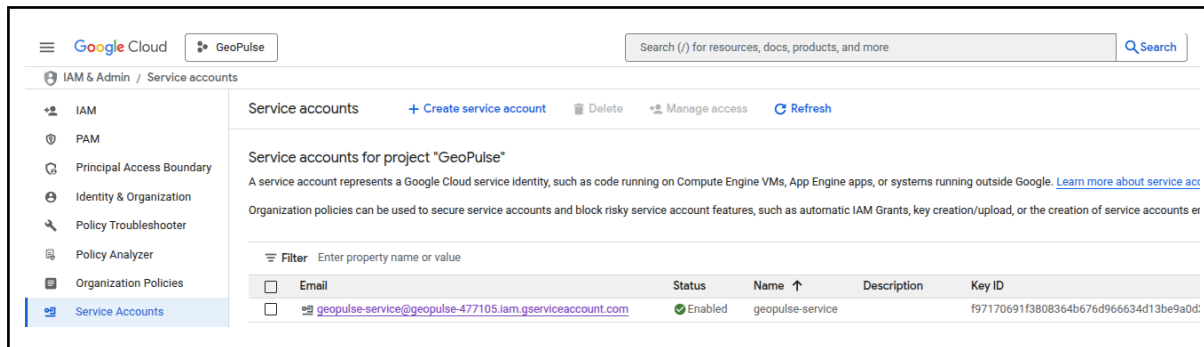
- Click **Enable**.



✓ 4. Create a Service Account

- In **Google Cloud Console**, go to **IAM & Admin** → **Service Accounts**.

[Google Cloud Console](#)



- Click **Create Service Account**.
- Fill in:
 - Service account name: **geopulse-service**
 - Service account ID: **geopulse-service-439** (Auto-generated).
 - This will form the email:
geopulse-service-439@<PROJECT_ID>.iam.gserviceaccount.com
- Click **Create and Continue**.

✓ 5. Assign Roles to the Service Account

- After you fill in the **Service account name** and **ID** and click **Create and Continue**, you'll see **"Grant this service account access to the project"** (Permissions) and optionally **Principals with access**.
- In the **Permissions** section, you can assign roles to the service account.
- Assign the roles required for Earth Engine Access:
 - **Earth Engine Resource Viewer** (minimum)
 - **Earth Engine Admin** (if you need full access)

- To assign the above roles, use the **filter** option (type in **Earth Engine**) from the **role** box of the **Permissions**.

← Create service account

✓ Create service account

2 Permissions (optional)

Grant this service account access to GeoPulse so that it has permission to complete specific actions on the resources in your project. [Learn more](#)

Role IAM condition (optional) ⓘ

Filter Earth Engine X

- Earth Engine Apps Publisher (Beta)
Publisher of Earth Engine Apps
- Earth Engine Resource Admin (Beta)
Full access to all Earth Engine resource features
- Earth Engine Resource Viewer (Beta)
Viewer of all Earth Engine resources
- Earth Engine Resource Writer (Beta)
Writer of all Earth Engine resources

- You'll see roles like:
 - **Earth Engine Resource Viewer.**
 - **Earth Engine Resource Admin.**
- Add **both** roles to the service account, then **press continue.**
- Click **Done.**

✓ Create service account

✓ Permissions (optional)

3 Principals with access (optional)

Grant access to users or groups that need to perform actions as this service account. [Learn more](#)

Service account users role ⓘ
Grant users the permissions to deploy jobs and VMs with this service account

Service account admins role ⓘ
Grant users the permission to administer this service account

Done Cancel

- Check your newly created service account in the **Service Accounts** tab.

The screenshot shows the Google Cloud IAM & Admin console. The left sidebar lists various IAM tools, with 'Service Accounts' selected. The main panel displays 'Service accounts for project "GeoPulse"'. It includes a search bar, a '+ Create service account' button, and a table of existing service accounts.

<input type="checkbox"/>	Email	Status	Name ↑	Description	Key ID	Key creation date
<input type="checkbox"/>	geopulse-service@geopulse-477105.iam.gserviceaccount.com	Enabled	geopulse-service		f97170691f3808364b676d966634d13be9a0d389	Nov 3, 2025
<input type="checkbox"/>	geopulse-service-439@geopulse-477105.iam.gserviceaccount.com	Enabled	geopulse-service		No keys	

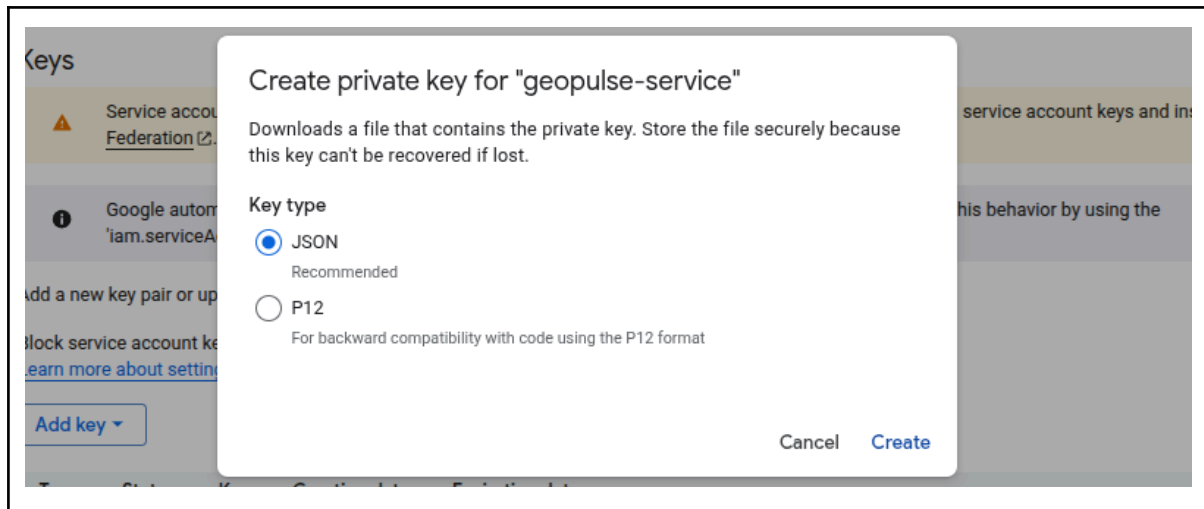
✓ 6. Generate Service Account Key (.json)

- In the **Service Accounts**, select your service account.
- Go to **Keys** → **Add Key** → **Create New Key**.

The screenshot shows the Google Cloud IAM & Admin console, specifically the 'Keys' tab for the 'geopulse-service' account. The left sidebar is the same as the previous screenshot. The main panel shows the 'Keys' section with a warning message about security risks and a button to 'Add key'. A dropdown menu is open under 'Add key', showing options for 'Create new key' and 'Upload existing key'.

Key	Creation date	Expiration date

- Choose **JSON** format.



- Click **Create**.
- Your newly created key will be automatically downloaded into your computer in **JSON** format.
- Save the downloaded key as **geopulse-key.json** in your project directory.

Important Tip: Keep this file secret! Do not commit it to version control (e.g., GitHub).

✓ 7. Initialize Earth Engine in Python

- Create a **.env** file in your project root.

```
PROJECT_ID=" Your Previously Created Project Id "  
SERVICE_ACCOUNT= "Your service account email (.iam.gserviceaccount.com)"
```

In Python, you can load them with:

```
import os
from dotenv import load_dotenv

load_dotenv() # Load environment variables from .env
project_id = os.getenv("PROJECT_ID")
service_account = os.getenv("SERVICE_ACCOUNT")
```

- Initialize Earth Engine in Python using the service account.

```
import ee
import os

credentials = ee.ServiceAccountCredentials(
    os.getenv("SERVICE_ACCOUNT"), "geopulse-key.json"
)
ee.Initialize(credentials, project=os.getenv("PROJECT_ID"))
```

- If the above code does not throw an error, that means:
 - Your **Earth Engine service account** credentials (**geopulse-key.json**) are valid.
 - Your environment variables **SERVICE_ACCOUNT** and **PROJECT_ID** are correctly set.
 - Your **Google Cloud project** is properly linked and has **Earth Engine API** enabled.

In other words, if **ee.Initialize()** runs without raising an exception — your setup is complete and you’re successfully authenticated into **Google Earth Engine**.



Congratulations!