Introduction to Google Earth Engine (GEE)

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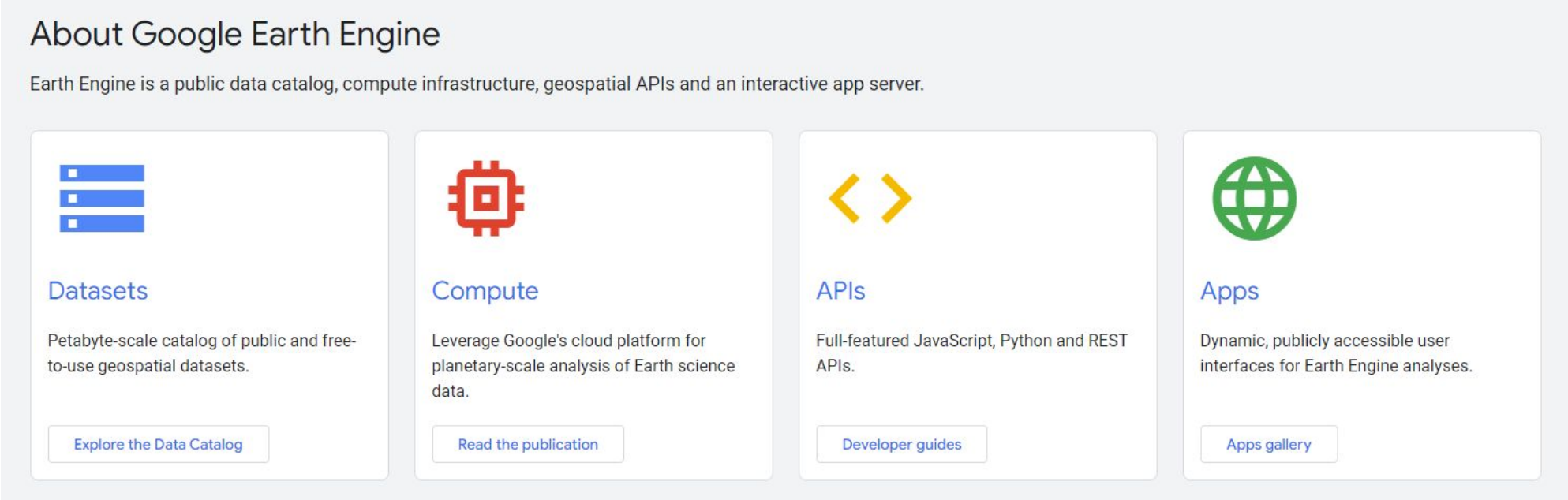
What is GEE?

- **Google Earth Engine = geospatial processing service**
  - Multi-petabyte analysis-ready data catalog
  - High-performance parallel computation
  - Internet-accessible application programming interface (API) & web-based interactive development environment (IDE) rapid prototyping & visualization
  - https://earthengine.google.com/

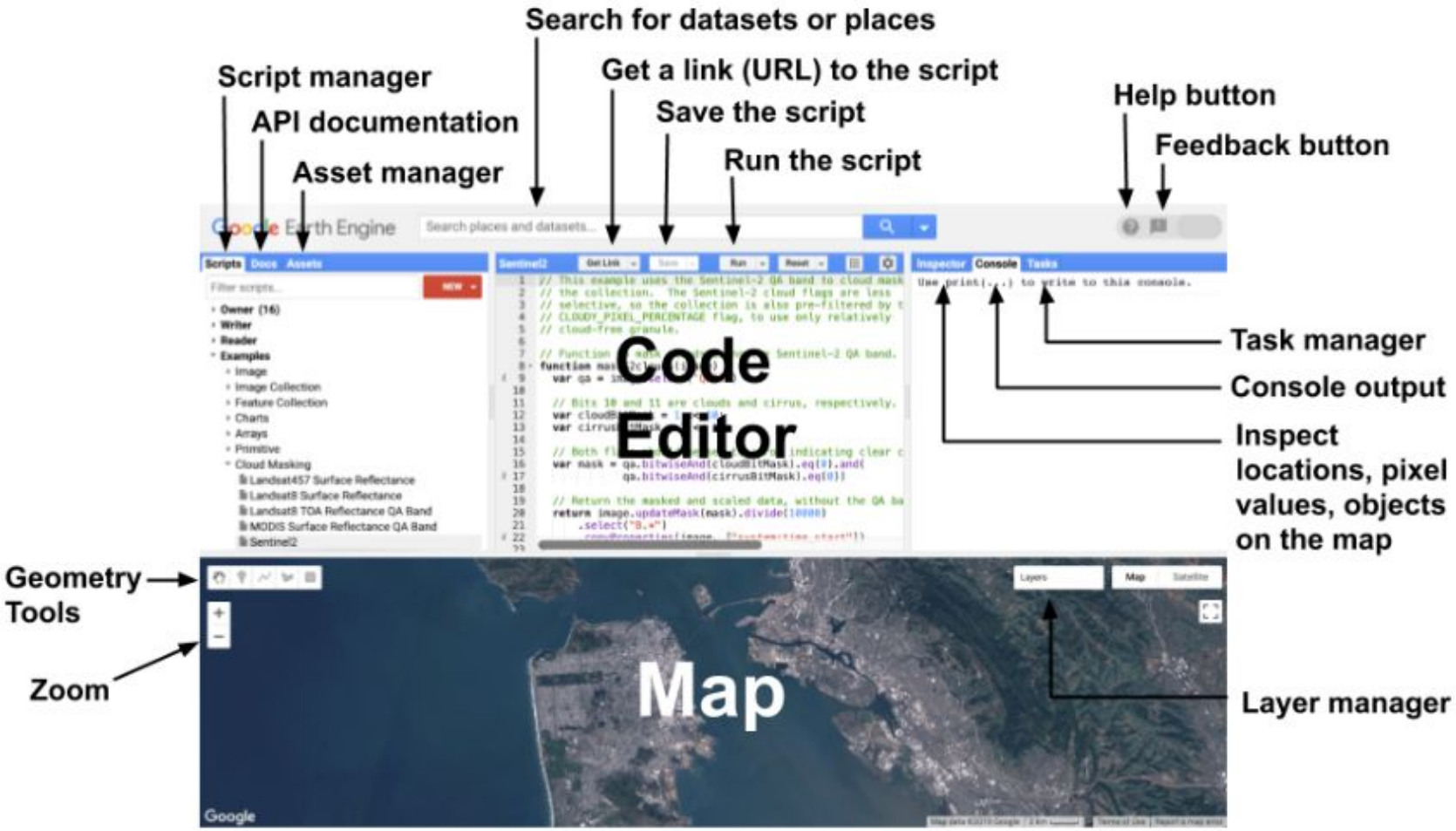


What is GEE?

- **Access to GEE: (1) JavaScript (2) Python**

GEE JavaScript API

- Code Editor: https://code.earthengine.google.com/

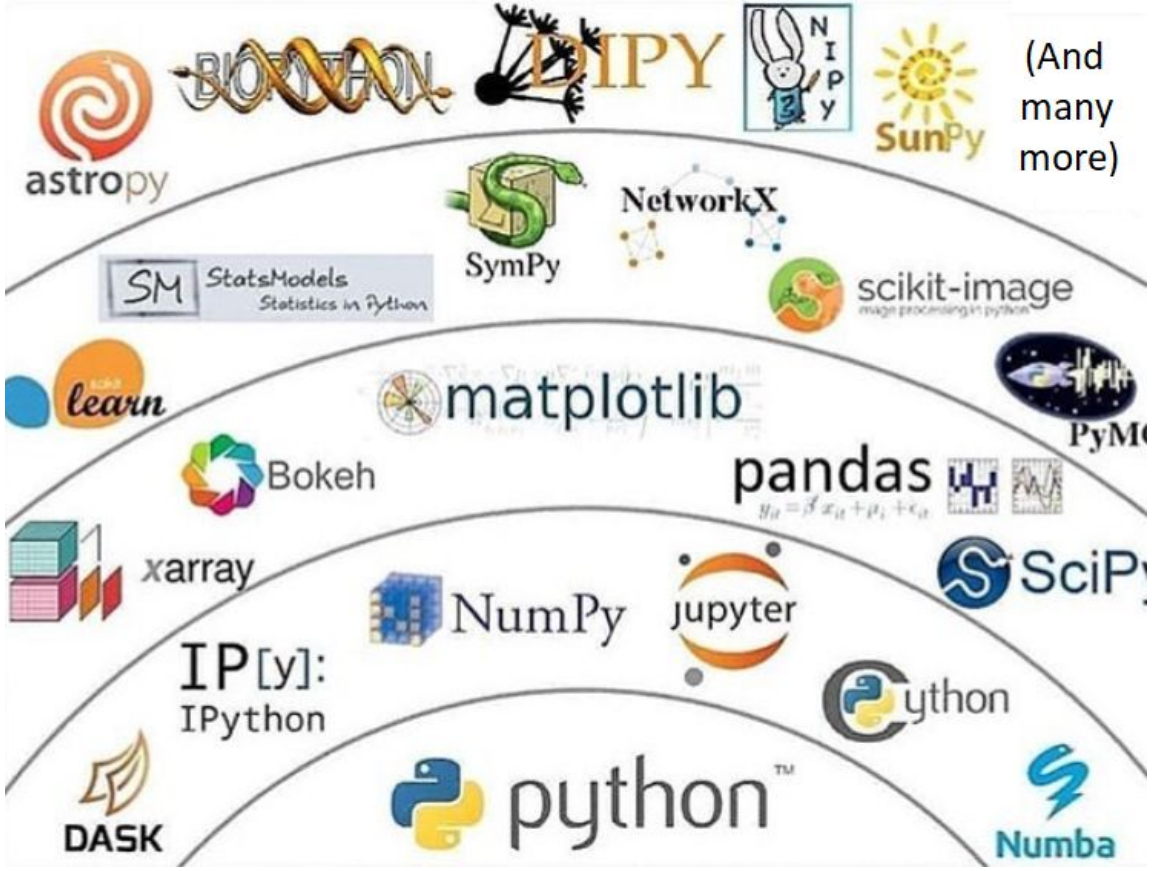


GEE Python API

- **JavaScript: Web-based IDE**
- **Python: Local machine IDE**
  - Python API does not support visual output
  - Require additional process to visualize output

Python

- **Programming language**
  - High level (easy language)
  - Object oriented
- **Advantages of using Python**
  - Simple code layout
  - Easy to learn & implement
  - Massive libraries (modules)
  - Easy debugging
  - Open-source
- **Disadvantages**
  - Low speed
  - Inefficient memory consumption



Google Colab

- **Python interactive Programming environments**
- **Free Jupyter notebook environment that runs entirely in the cloud**
- **Advantages of Google Colab**
  - Pre-installed libraries
  - Save/share scripts on the cloud
  - Free GPU

Tutorials

- **GitHub page**
  - https://github.com/YoungHyunKoo/GEE_Fall2025