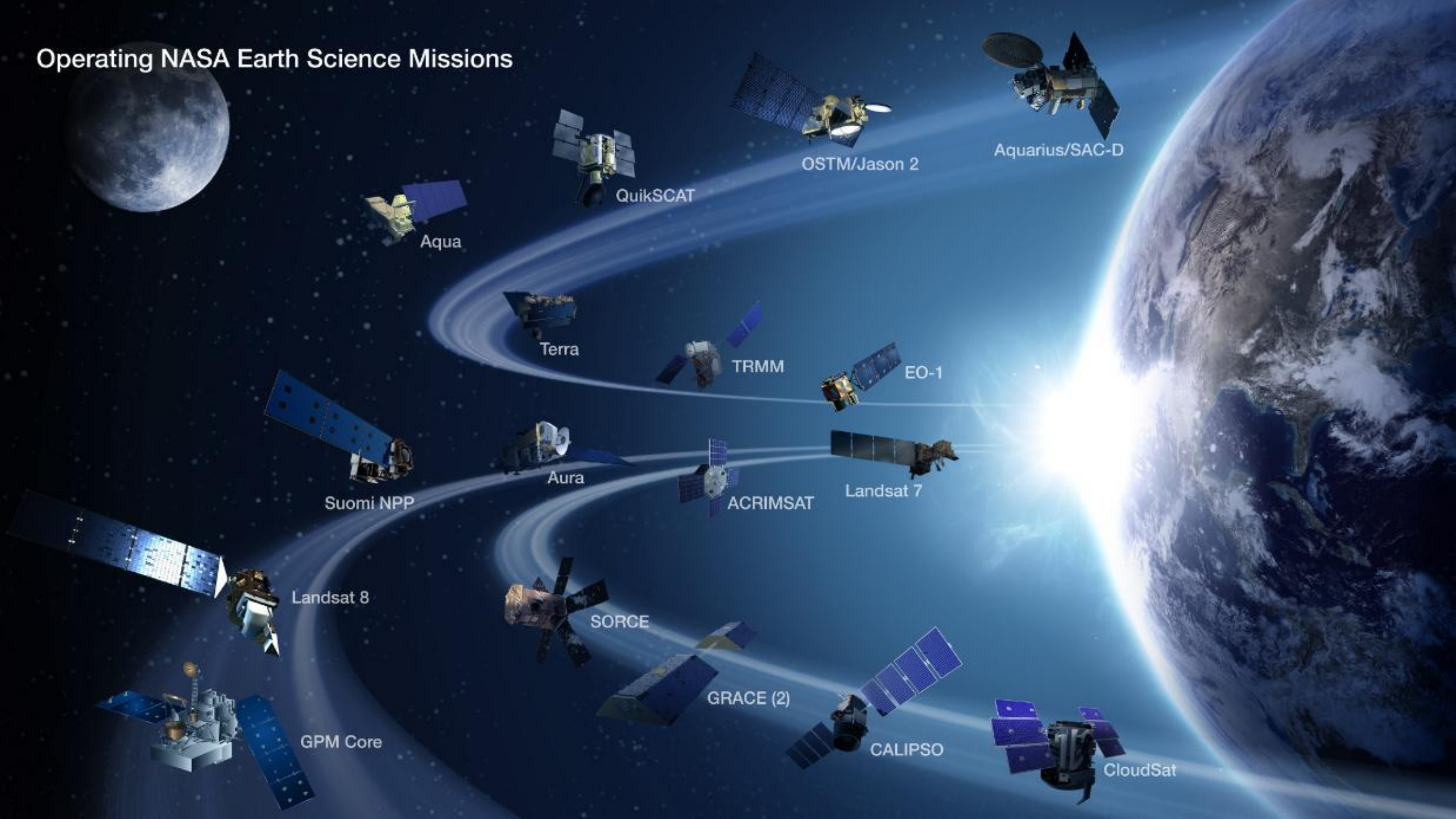
Google Earth Engine

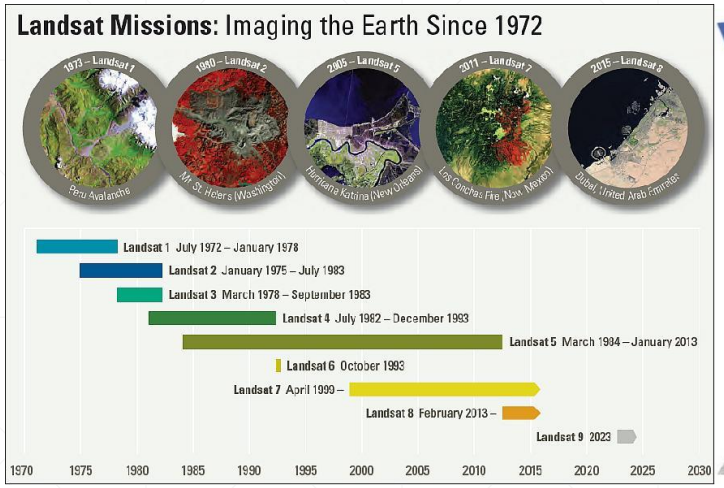
https://www.google.com/earth/

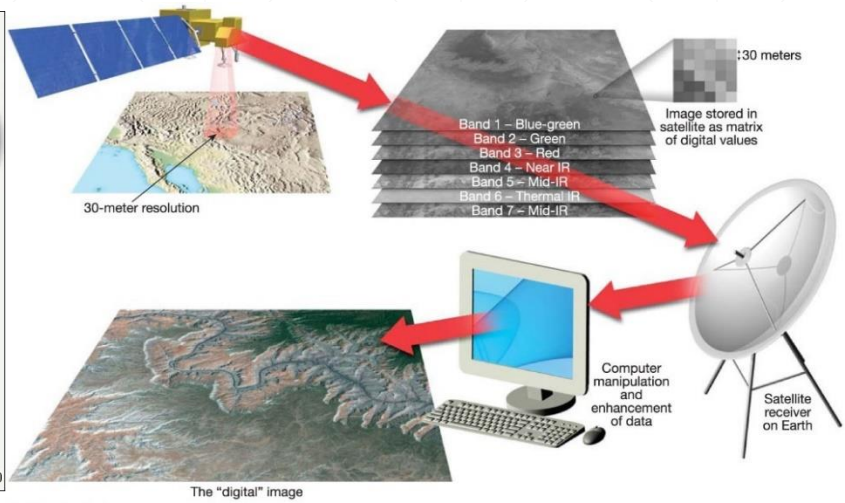
Google Earth Engine

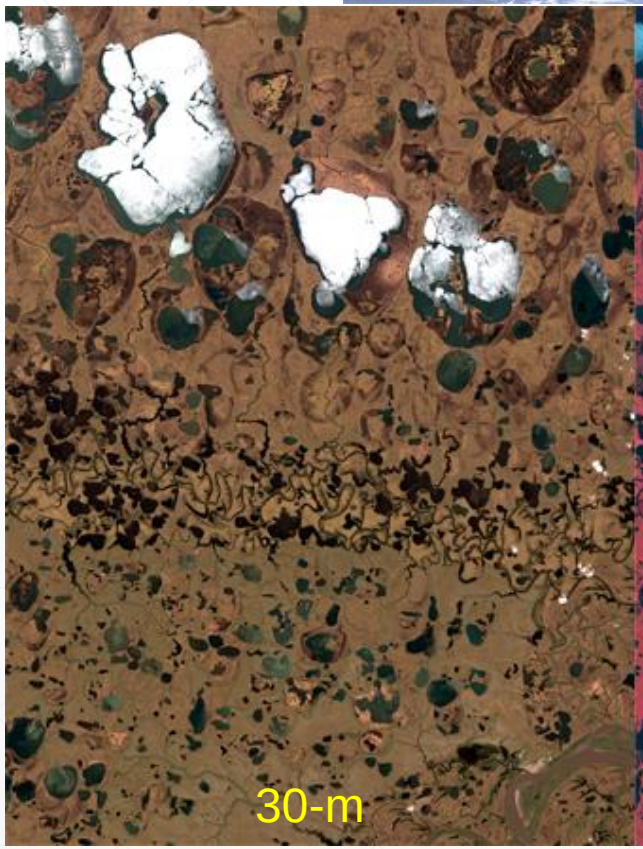
https://earthengine.google.com


Operating NASA Earth Science Missions
OSTM/Jason 2
Aquarius/SAC-D
QuikSCAT
Aqua
Terra
TRMM
EO-1
Suomi NPP
Aura
ACRIMSAT
Landsat 7
Landsat 8
SORCE
GRACE (2)
GPM Core
CALIPSO
CloudSat

Landsat Missions

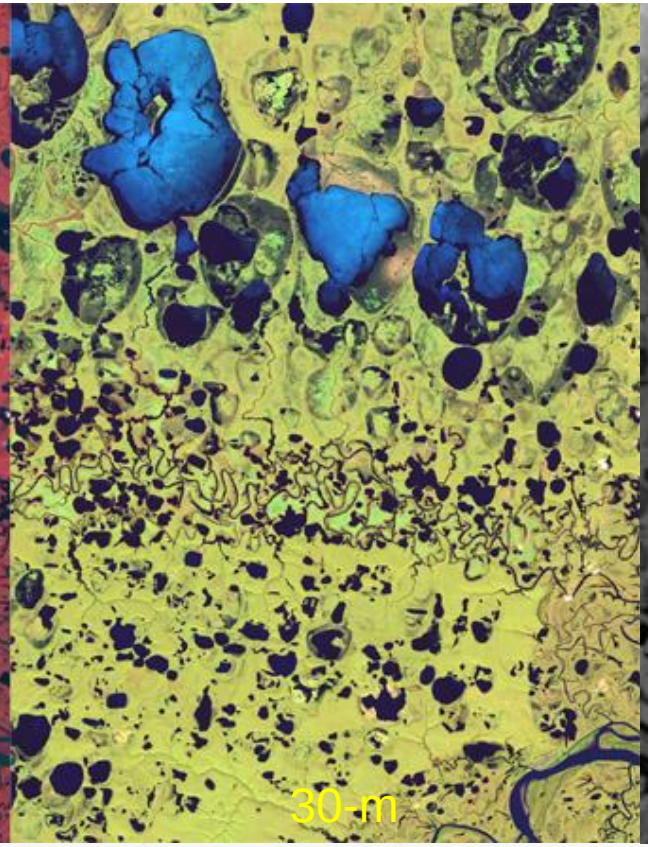




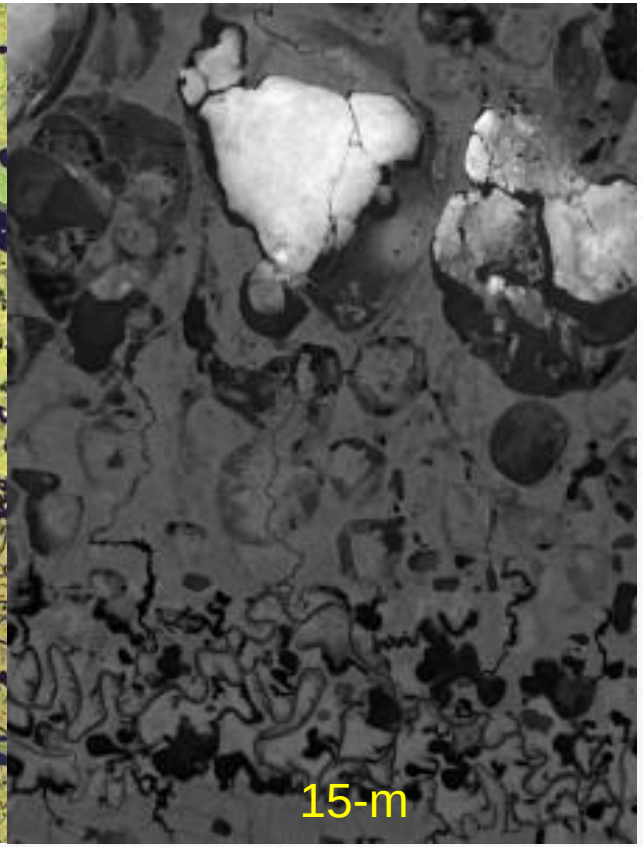


True color composite

Color infrared composite



False color composite



Panchromatic image

Satellite imagery

One Landsat 8 image:

- 64M pixels (30m resolution)
- 10 spectral bands
- 12 bits/band
- 600 images/day

MORE THAN 4M IMAGES FROM 42 YEARS OF LANDSAT.

Many other satellites with different combinations of spatial resolution, spectral bands, collection frequency.

https://earthexplorer.usgs.gov

https://libra.developmentseed.org

Google Earth vs. Earth Engine

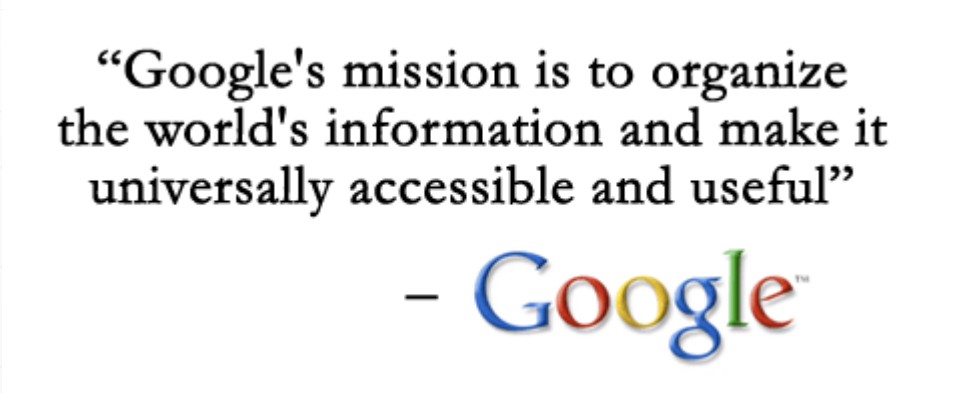
- **Google Earth**
  - Google Earth enables you to travel and learn about the world through a virtual globe. You can view satellite imagery, maps, terrain, 3D buildings and much more.
- **Earth Engine**
  - Earth Engine, on the other hand, is a tool for analyzing geospatial information.
  - Although Earth Engine has a data catalog, not everything available in Google Earth is available for analysis in the Earth Engine catalog. Similarly, much of the data in Earth Engine is not currently available for visualization in Google Earth.

Google Earth Engine

https://earthengine.google.com

Why is Google working on Earth Engine?

Google's mission is to organize the world's information and make it universally accessible and useful. In line with this mission, Earth Engine organizes geospatial information and makes it available for analysis. More generally, Google strives to make the world a better place through the use of technology. Earth Engine's technical infrastructure powers humanitarian, scientific, and environmental initiatives which Google is proud to support.

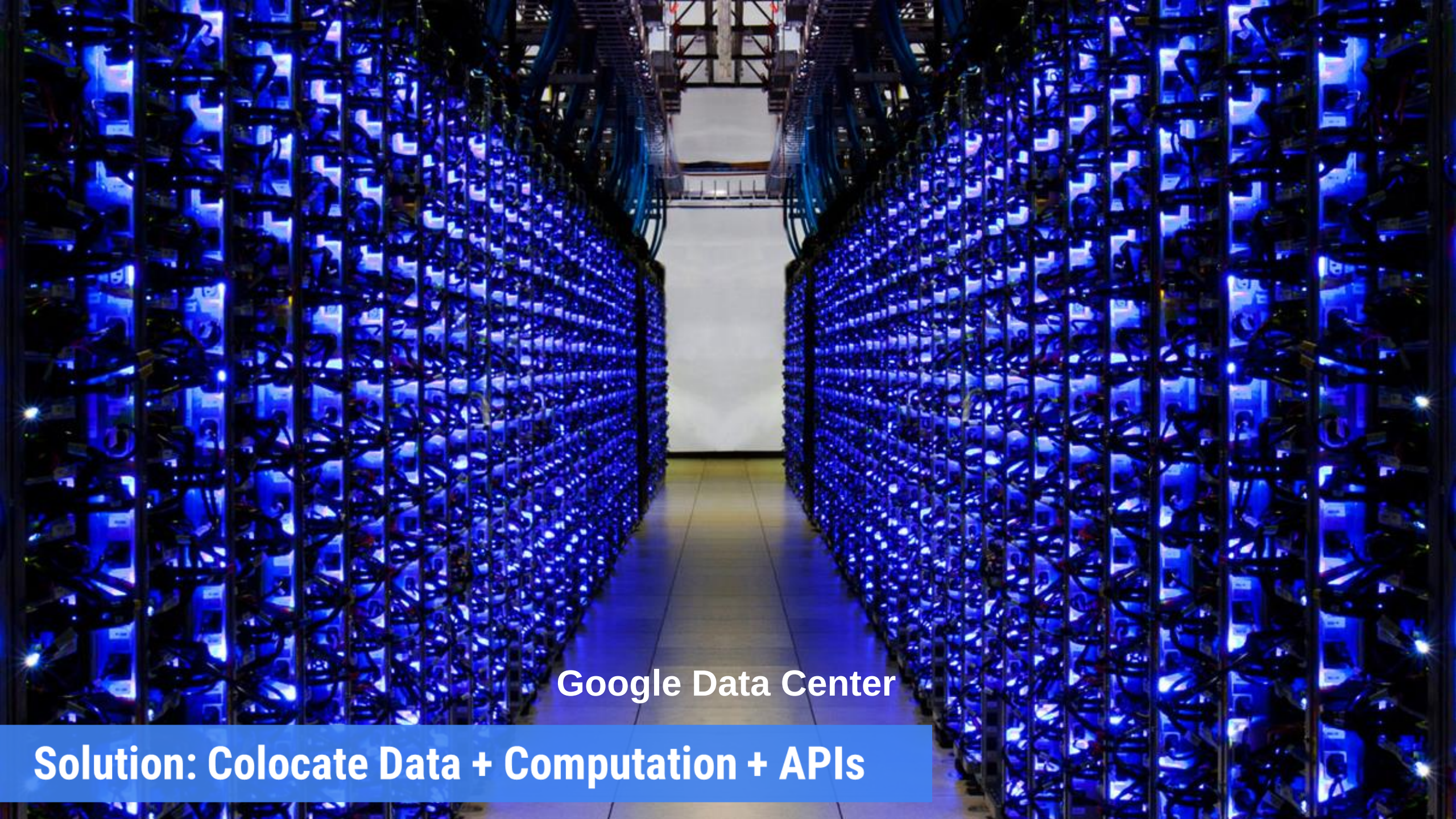


https://earthengine.google.com/faq/

4 Million Landsat images *(1972-2016)*

More than a petabyte stored on tapes at USGS and growing daily

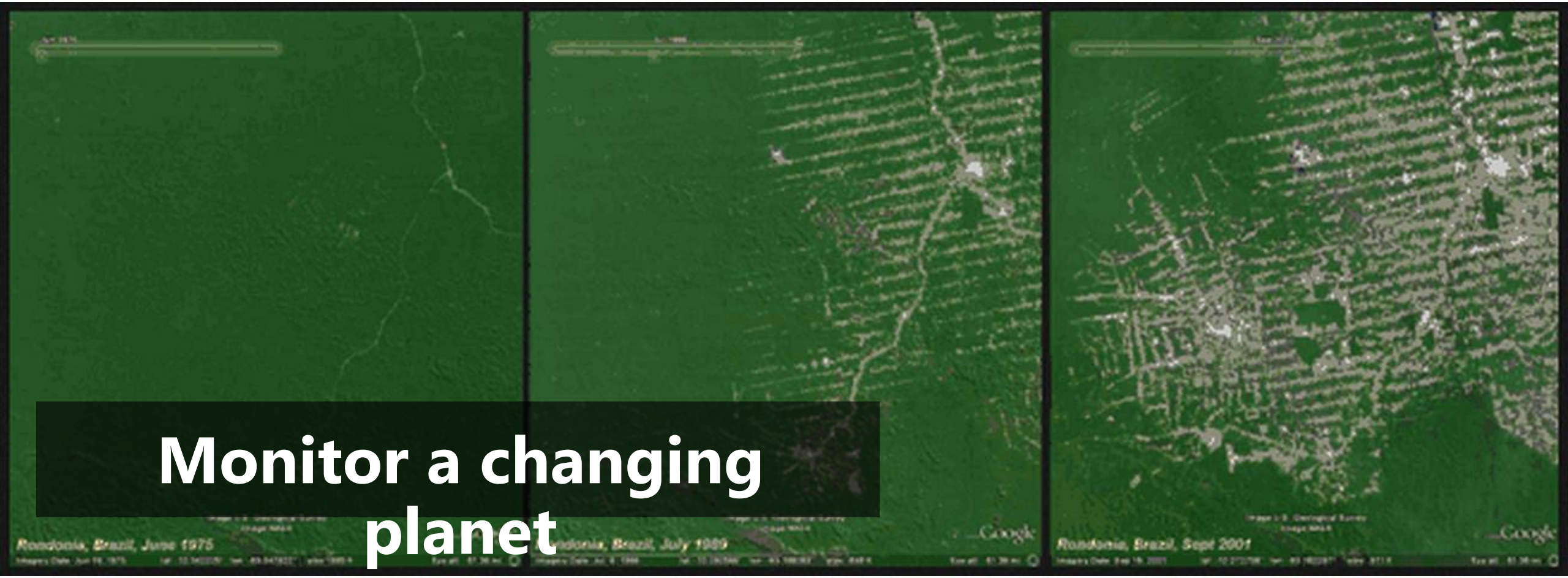
Earth Observation Data Archives



Solution: Colocate Data + Computation + APIs

Google Earth Engine:

Deriving information from earth data at scale



Monitor a changing planet

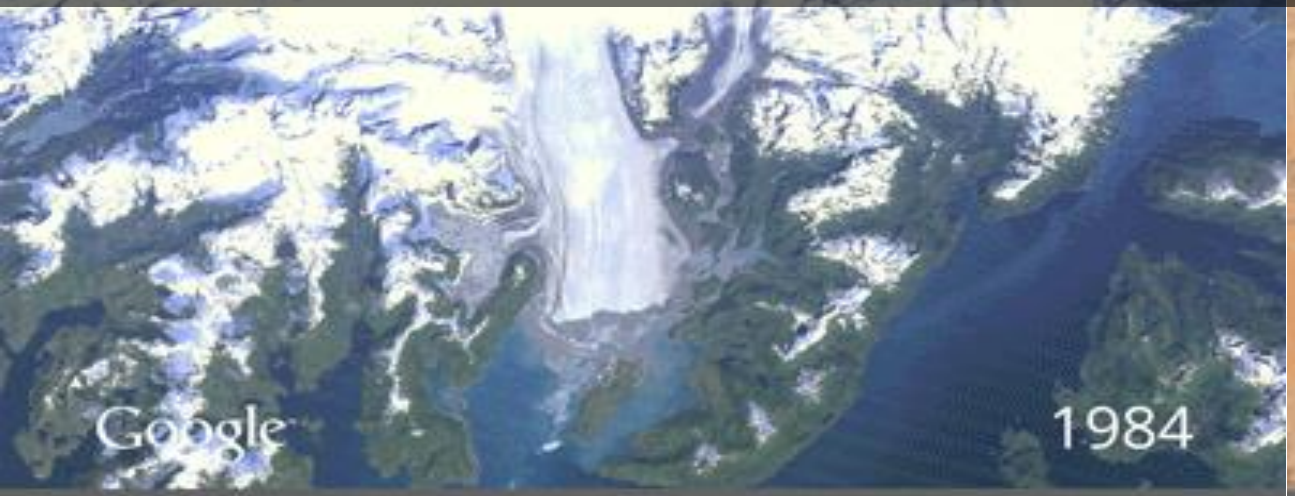

Layers
Map
Satellite


Layers
Map
Satellite

Before Earth Engine

After Earth Engine

Landsat Timelapse Animations

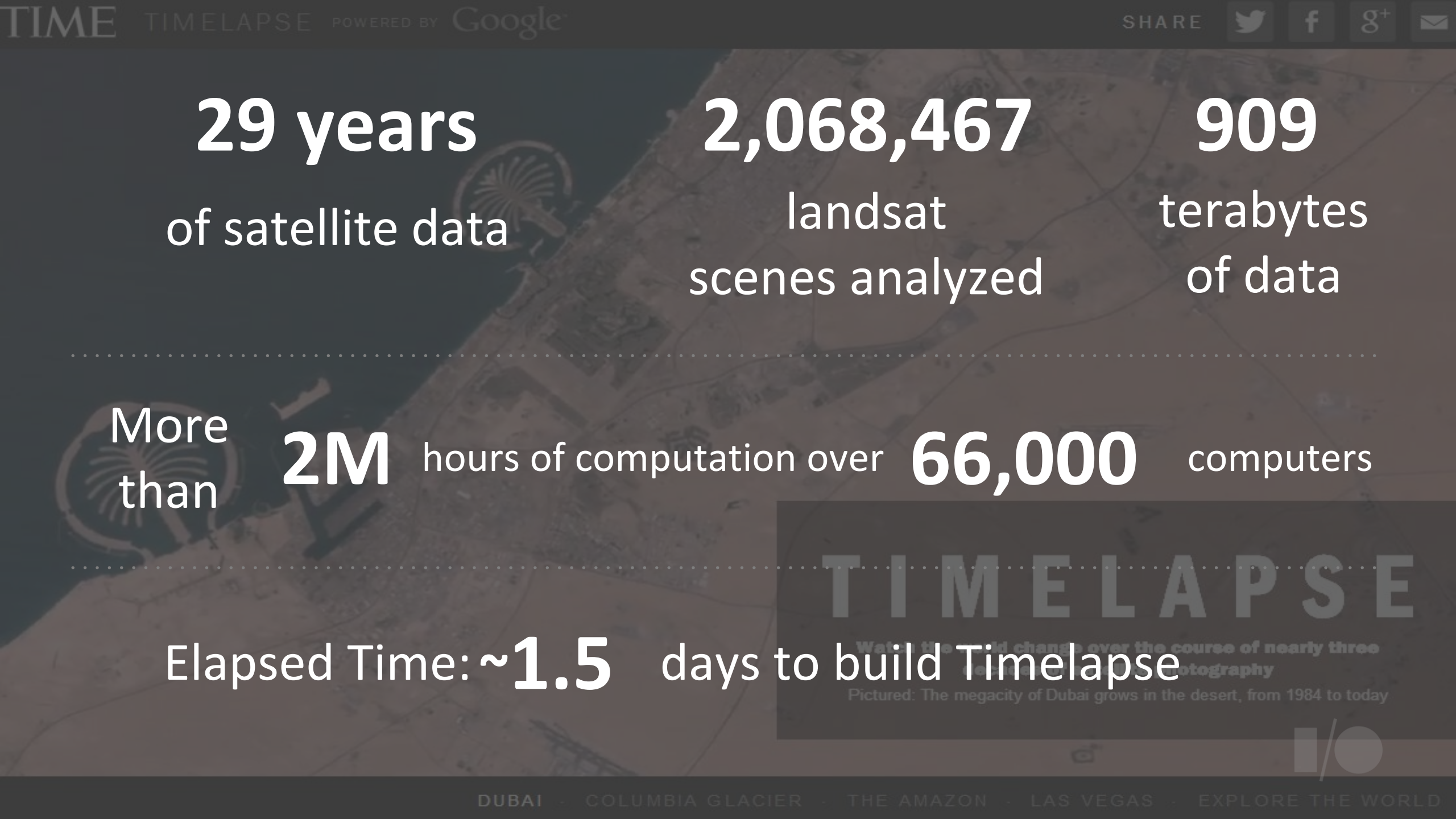


Columbia Glacier Retreat, 1984-2011

Saudi Arabia Irrigation, 1984-2012

Las Vegas Urban Growth, 1986-2012

Brazilian Amazon Deforestation, 1984-2012


TIME TIMELAPSE POWERED BY Google
SHARE
29 years
of satellite data
2,068,467
landsat
scenes analyzed
909
terabytes
of data
More
than
2M
hours of computation over
66,000
computers
TIMELAPSE
Pictured: The megacity of Dubai grows in the desert, from 1984 to today
Elapsed Time: ~1.5 days to build Timelapse
DUBAI · COLUMBIA GLACIER · THE AMAZON · LAS VEGAS · EXPLORE THE WORLD

Earth Engine Code Editor