

Building Remote Sensing Workflows with Google Earth Engine

North Central Texas COG Regional GIS Meeting
December 6, 2023

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Sanborn History



1866
1881
1896

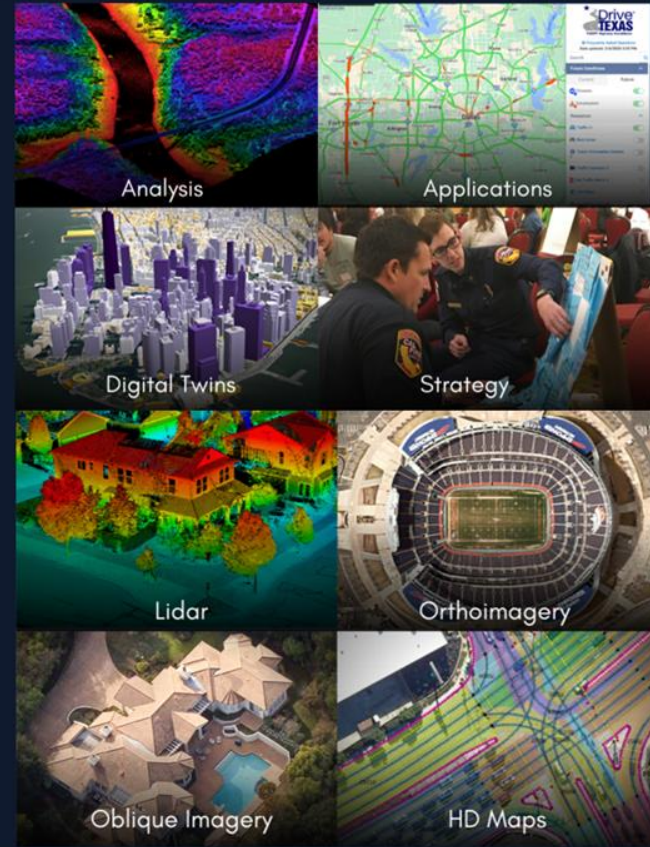
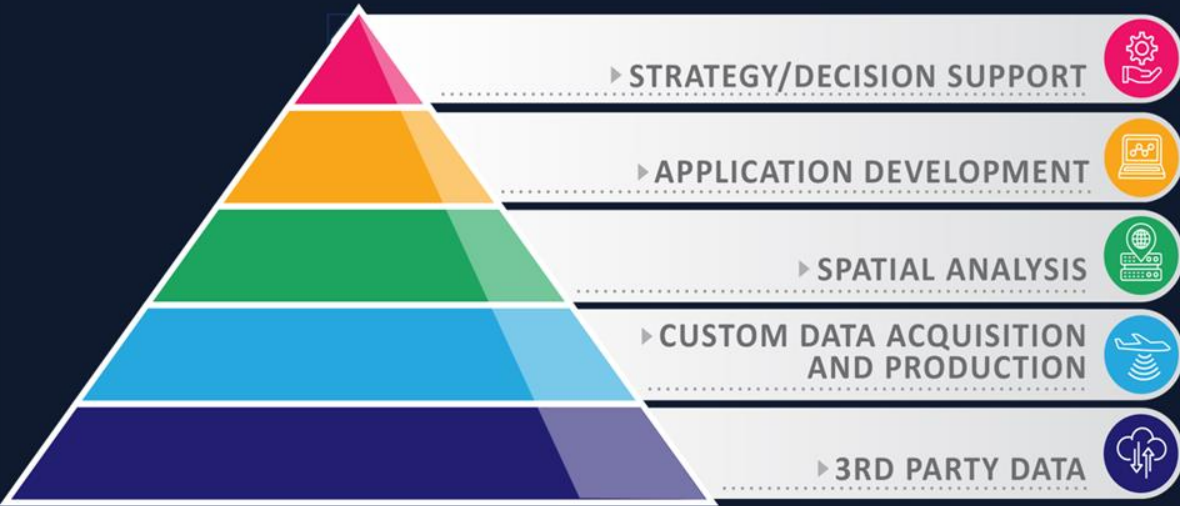
2023



- 
1866
 FOUNDED & BEGAN GROUND SURVEYS
- 
1966
 BEGAN AERIAL SURVEYS
- 
1979
 BEGAN DIGITAL PHOTO-GRAMMETRIC MAPPING
- 
1984
 PIONEERED DIGITAL TERRAIN MODELING
- 
1988
 FIRST DIGITAL ORTHO PRODUCTION
- 
1998
 LIDAR COLLECTION & PRODUCTION
- 
2004
 DIGITAL AERIAL IMAGERY & WEB SERVICES
- 
2010
 MOBILE & GROUND LIDAR
- 
2012
 OBLIQUE IMAGERY
- 
2013
 DRONE BASED IMAGERY
- 
2014
 BUILDING INFORMATION MAPPING (BIM)
- 
2016
 HD MAPS
- 
2018
 CLOUD SERVICES
- 
2022
 ACQUIRED APPGEO

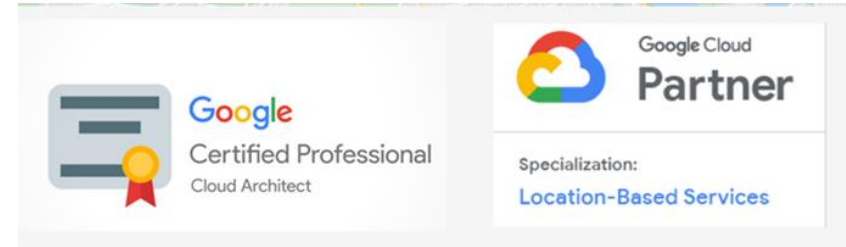
A Next Generation Geospatial Company

Today's complex challenges are best met with a full range of geospatial solutions.



Google Partnership

- A Premier Partner Since 2014
- Partner Specialization in Location-Based Services
- Partner Specialization in Google Earth Engine
- Certified Cloud Architects on Staff



DriveTexas™
Public Traveler Information
New Flooding Likely Layer
New Workzone Data
Exchange

Construction on IH35 (IH 35) ✕

Expected to end on **11/17/2023, 5:00 AM**

Affected Direction: **Northbound**

- Right lane closed.
- Motorists should expect delays.
- Use alternate route

NBML single right lane closure, night time.

< 1 of 1 >



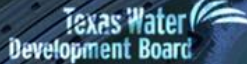
[Frequently Asked Questions](#)
Data Updated: 11/14/2023, 6:40 AM

Search...

Current Conditions ^
CURRENT FUTURE

- Accidents
- Closures
- Construction
- Damage

Texas Imagery Service



Easy Access to Consistent, Quality Imagery Across Texas

Many of us use aerial imagery in our daily lives, whether looking up directions or exploring our neighborhood from above. The State of Texas has collaborated with [Hexagon](#) and [AppGeo](#) to provide a cost-efficient and widely accessible mapping tool that meets the needs of government agencies - the Texas Imagery Service

To get started, visit the [Link Request Form](#) using the button below

We highly recommend reading through the [FAQ](#) below before requesting a unique link for your organization.

The image shows a perspective view of a server room with rows of server racks on both sides. The racks are filled with equipment, and blue cables are visible. The floor is light-colored. The Google logo is centered in the upper half of the image, overlaid on the server racks. The logo consists of the word "Google" in its characteristic multi-colored font: blue 'G', red 'o', yellow 'o', blue 'g', green 'l', and red 'e'.

Google

A white search bar with a microphone icon on the right side, positioned horizontally across the middle of the image.

Google Search

I'm Feeling Lucky

Google was born as a data company...

Organize the **world's information** —● Data

and make it universally

accessible and useful —● Intelligence

...and is a **world leader** in applying Machine Learning to real-world situations



Search

Search ranking
Speech recognition



Translate

Text, graphic and
speech translations



Photos

Photos search



Gmail

Smart reply
Spam classification



Self Driving Car

1.5MM miles driven



Data Center Power Usage

Reduced cooling
energy 40%



AlphaGo

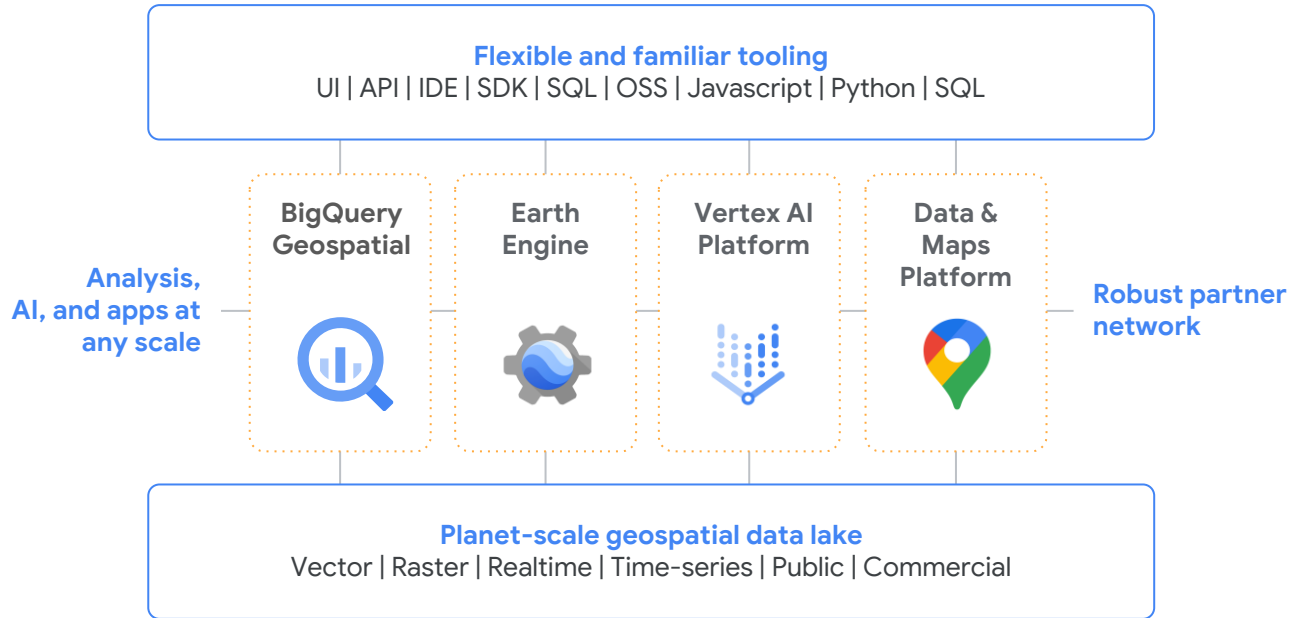
First AI to beat a world
Go champion (2016)



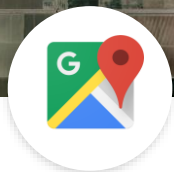
YouTube

Video
recommendations
Better thumbnails

Geospatial Analytics on Google Cloud



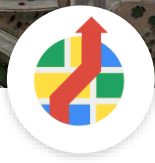
Google Maps Platform



Maps

Brings the real world to your users with customized maps and Street View imagery.

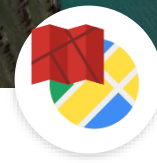
Build customized, agile dashboards with static or dynamic maps for Predictive Maintenance in fleet management



Routes

Helps your users find the best way to get from A to Z with comprehensive data and real-time traffic.

Help customers manage fraud detection by calculating distances & time with real-time traffic info



Places

Helps users discover the world with rich location data for over 100 million places, and enables them to find specific places using phone numbers, addresses and real-time signals.

Help fleet managers track assets globally, or geo-fence at preferred locations

Google Earth Engine

is a cloud-based geospatial processing platform for executing large-scale geospatial data analysis.



Large volume of geospatial data in an Archive Petabytes of data in one location

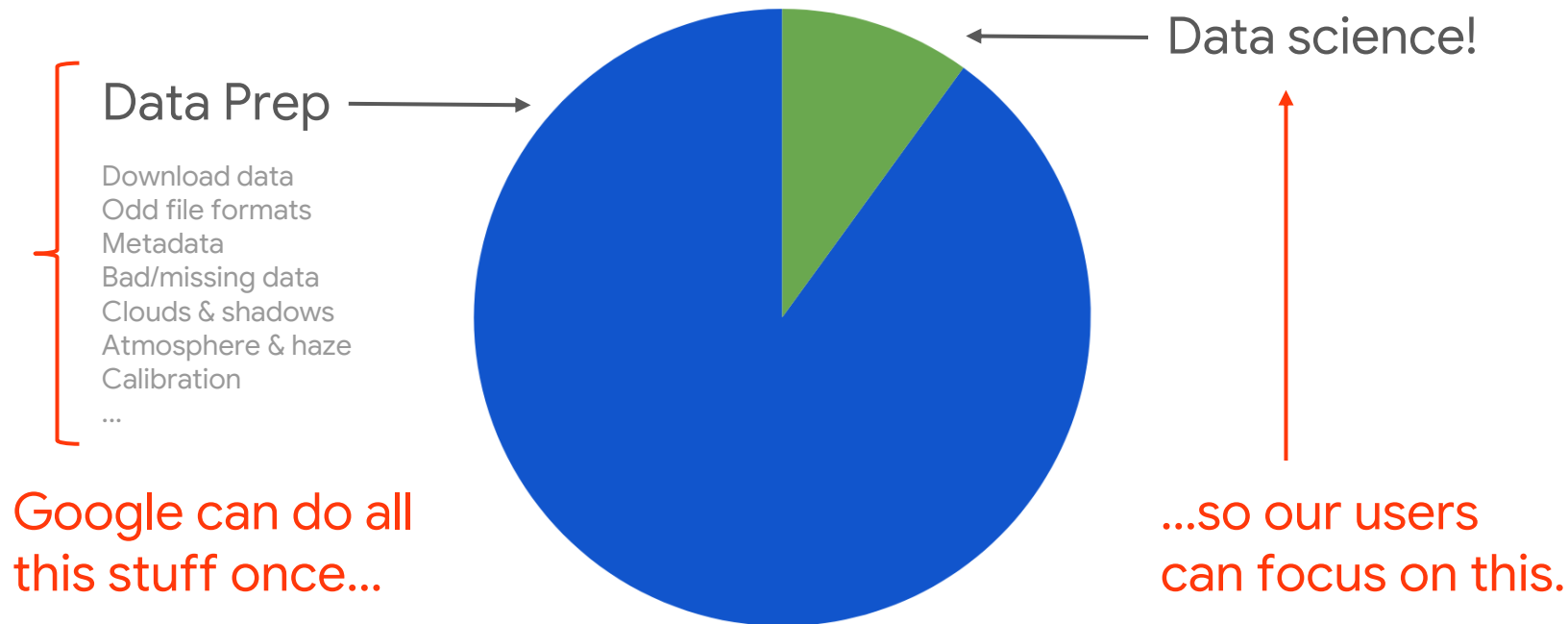


Powerful Image Analysis software



Google Earth Engine

The Classic Remote Sensing Workflow



Earth Engine Public Data Catalog

- Imagery (Landsat, MODIS, Sentinel, NAIP)
- Elevation (Digital terrain)
- Geophysical
- Climate & Weather
- Demographic
- Vector Data
- GEE contains over 80 petabytes of data



Landsat
4, 5, 7, 8, and
9



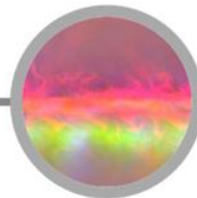
MODIS
Daily, NBAR,
etc.



Terrain
SRTM, NED,
etc.



Land Cover
GlobCover, NLCD,
etc.



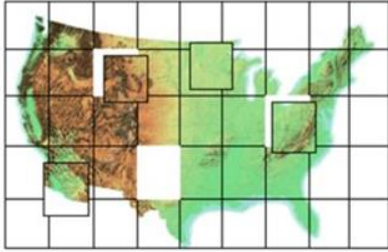
Atmospheric
NOAA NCEP,
etc.



Sentinel

Computation Engine

A **cloud-based processing infrastructure** that automatically **parallelizes analyses on many CPUs across many computers** in Google's data centers.



Divides data in independent grids



Storage clusters & Computing clusters

Unprecedented speed: reduce processing times.



Merges all grid calculations

Ease of use/lower costs: online platform with easy access

A Powerful Image Analysis Software Enables Collaboration



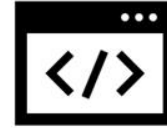
Public data catalog:

Users can access vast amounts of publicly available data.



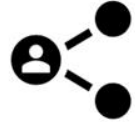
Processing power:

- Distributed computation power
- Cloud processing
- Comprehensive data analysis toolset



Interactive development platforms:

- Explorer
- Code editor



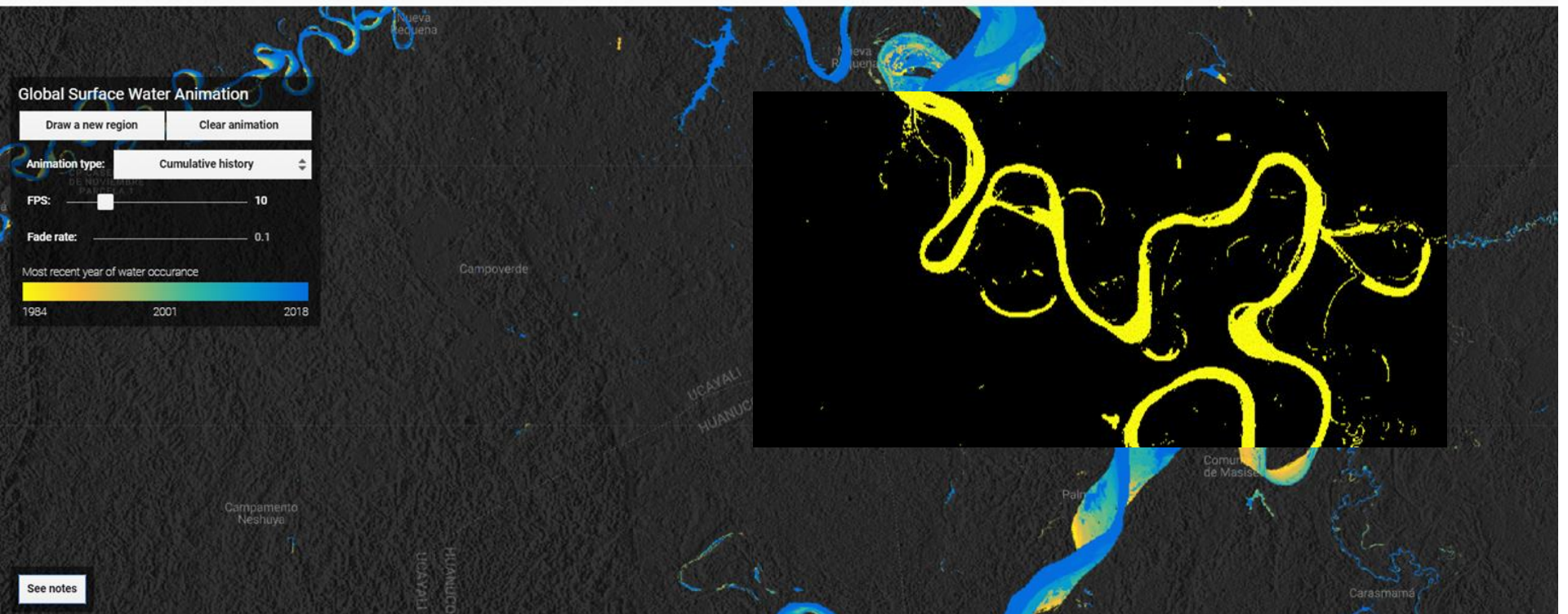
Save & share work routines.



Google
Earth Engine

Earth Engine Apps

Pucallpa, Peru



See notes

Thank You! Questions?

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