RIN

DataHarvest 2025

BEYOND THE PIXELS: THE POWER OF RASTER DATA IN QGIS

Pulitzer Center

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The Pulitzer Center champions the power of stories to make complex issues relevant and inspire action.

Rainforest Investigations Network

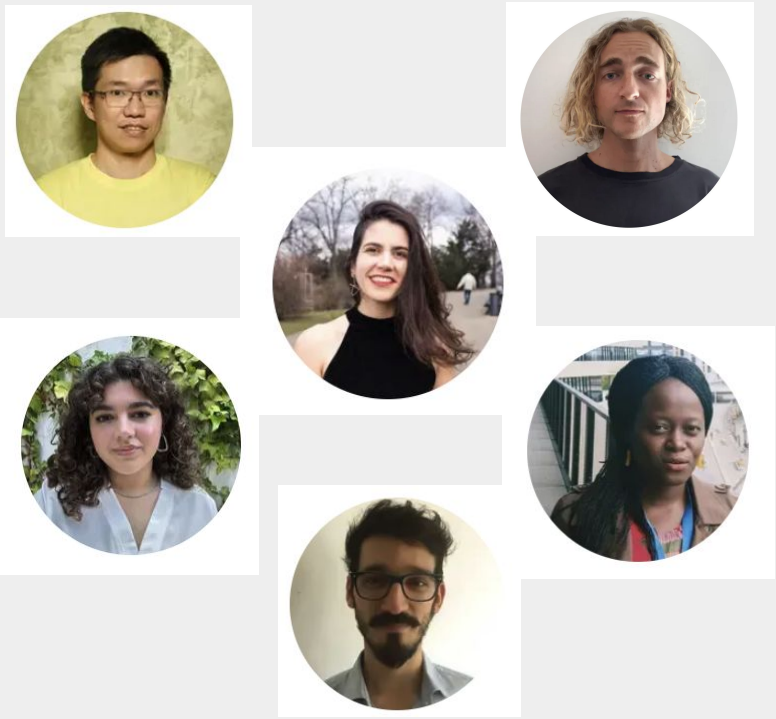
Ocean Reporting Network

The AI Accountability Network

We provide fellowships & grants to journalists for in-depth, high-impact reporting projects

Our **Data and Research Team** assists journalists with their investigation, research, analysis and visualizations.

DATA RE

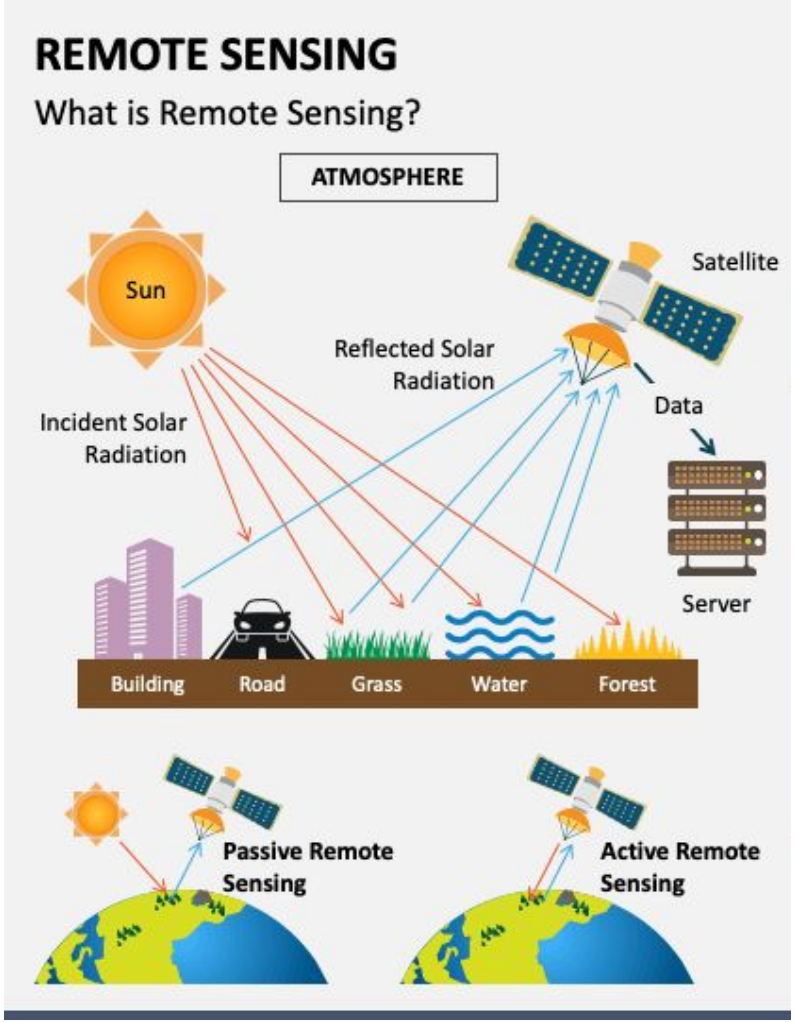


Our **International Education and Outreach Team** connect teachers, students, youth, influencers, and professionals with our reporting.

How does remote sensing work?

What?
Remote sensing is the acquiring of information of an area from a distance.

How?
By measuring its reflected and emitted radiation using devices like satellite and aircraft.

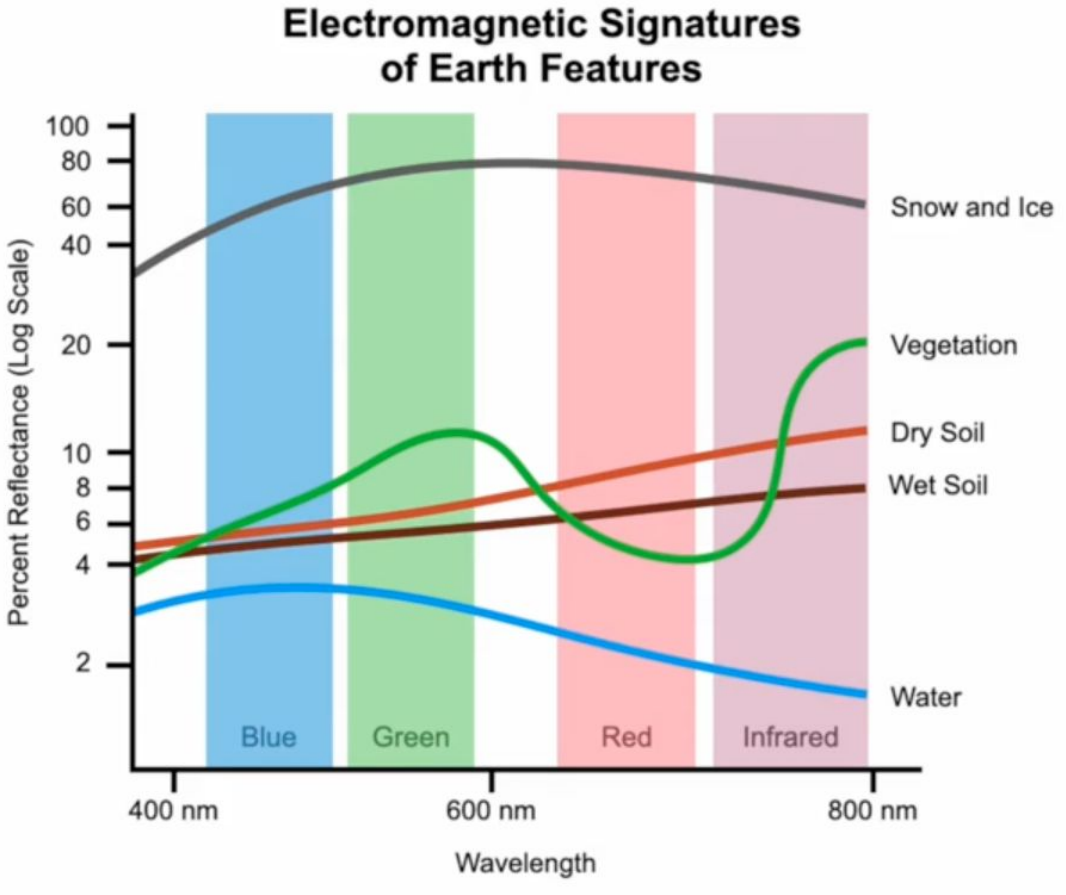


How does remote sensing work?

Satellite can take pictures of the visible light that human can see.

But it can also detect radiation (or wavelength) that we cannot see.

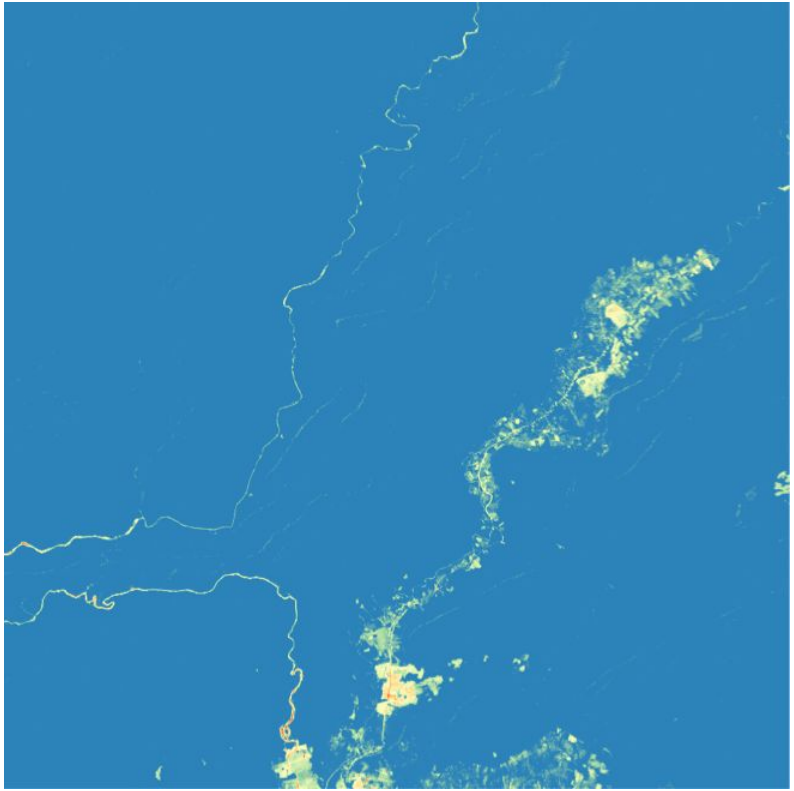
Different earth features and objects emit/reflect radiation differently, allow us to detect them.



[Learn more at Planet University online course (login needed).]

Natural color (RGB)

False color (NDVI)



Geospatial analysis

Resolution

- Local
- Regional
- Ecosystem
- Global

Time Scale

- Frequency
- Duration
- Changes (Before and after)

Dimensions

- Distance
- Area
- Intersection
- Perspective

Spatial resolution

Low resolution: over 60m/pixel

Medium resolution: 10 – 30m/pixel

High resolution: 3m – 5m/pixel

Very high resolution: <1m/pixel

Landsat 8 image of Reykjavik, Iceland, acquired July 7, 2019, illustrating the difference in pixel resolution. Credit: NASA Earth Observatory.


Sentinel 2
10 m/px - medium res


AirBus
50 cm/px - hi-res

AirBus
<1 m/px - hi-res

Earth Observation Satellites

Satellite (provider)	Resolution	Access
Landsat (NASA)	30 m - medium	Open via EO Browser or NASA Catalogs (Earth Observatory or Landsat Viewer) and via Google tools (Earth Engine + Timelapse)
CBERS-4 (INPE-China)	20 m - medium	Open via INPE Imagery Catalog
Sentinel-1 (ESA) - SAR	10 m - medium	Copernicus Browser
Sentinel-2 (ESA)	10 m - medium	Copernicus Browser
Planet satellites	2~3m - high	Via NICFI (ended)
Pléiades (AirBus)	30 cm - high	Purchase (e.g. SkiFi)

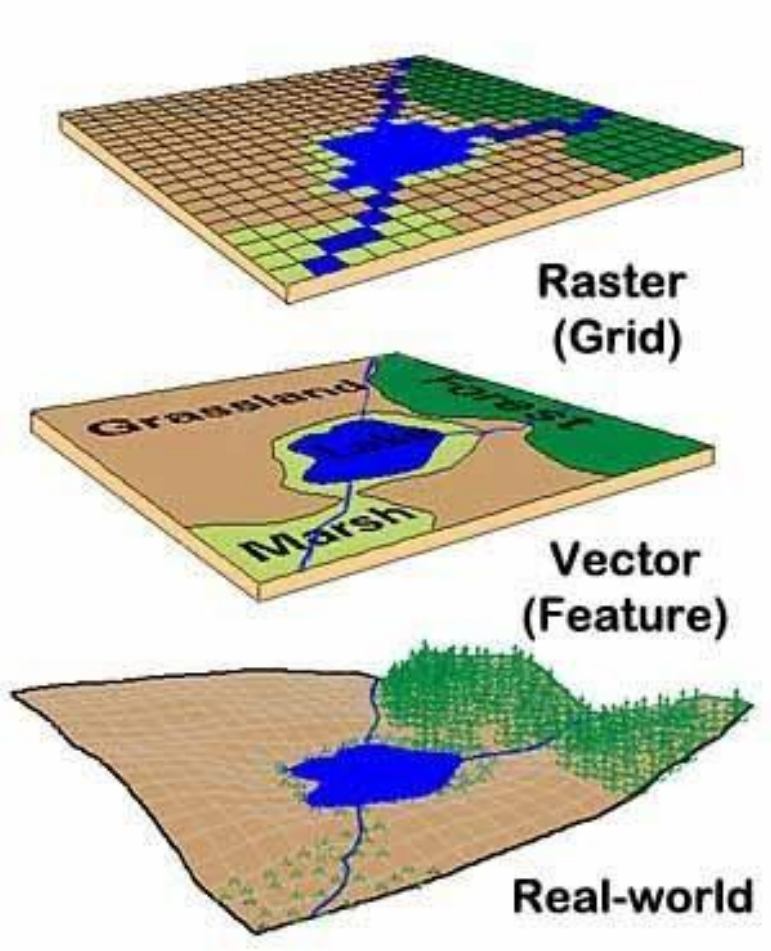
Data formats (most common)

Vector

- CSV
- XLS
- SHP
- GPX
- Geojson
- TXT
- KML/KMZ (Google)

RASTER

- Tiff or Geotiff


Raster
(Grid)
Grassland
Forest
Marsh
Vector
(Feature)
Real-world

The layer mindset

Placing different layers of geospatial data together allows them to dialogue with each other.

Tools to get started

Where to find satellite images

Copernicus Browser
https://browser.dataspace.copernicus.eu/

Google Earth Pro (desktop version)
https://www.google.com/earth/versions/#earth-pro

NASA Worldview
https://worldview.earthdata.nasa.gov/

Planet Explorer (paid)
https://www.planet.com/

Where to find geospatial data

Protected Planet
https://www.protectedplanet.net/en

Global Forest Watch
https://www.globalforestwatch.org/

Natural Earth
https://www.naturalearthdata.com/

NASA Earth Data
https://earthdata.nasa.gov/

Resource Watch
https://resourcewatch.org/data/explore

Earth Map
https://earthmap.org/

Tools to get started

Mapping tools

QGIS
https://qgis.org/en/site/

ArcGIS
https://www.arcgis.com/index.html

Mapbox
https://www.mapbox.com/

Carto
https://carto.com/

Self-learning resources

Mapping for Journalists (video)
https://datajournalism.com/watch/mapping-for-journalists

QGIS Uncovered by Steven Bernard (video)
https://www.youtube.com/channel/UCrBM8Ka8HhDAYvQY1VX2P0w

Intro to Mapping and GIS for Journalists(video)
https://journalismcourses.org/course/mappingandgis/

Mapping and QGIS for Journalists
https://jonathansoma.com/tutorials/mapping/

Mapping and OSINT video tutorials by Bendobrown
https://www.youtube.com/c/Bendobrown/videos

Let's get to work!

Access notes, files and tutorials from this shared folder:

bit.ly/dataharvest2025-qgis

Pulitzer Center

THANK YOU!

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