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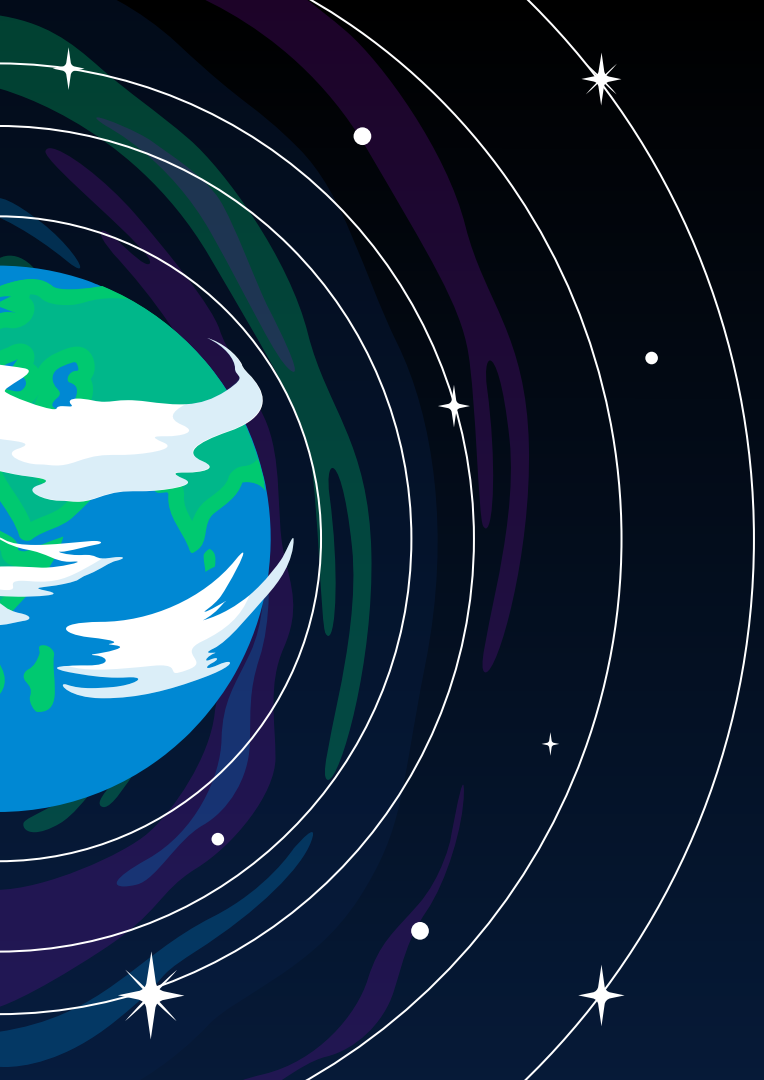
Satellite Data and AI



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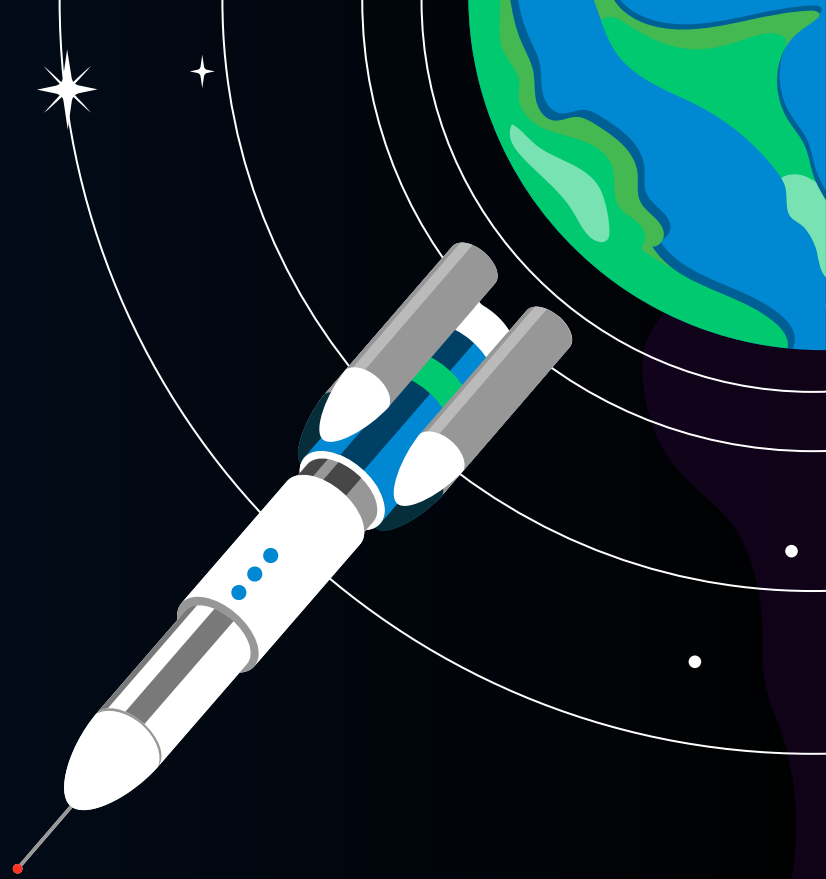
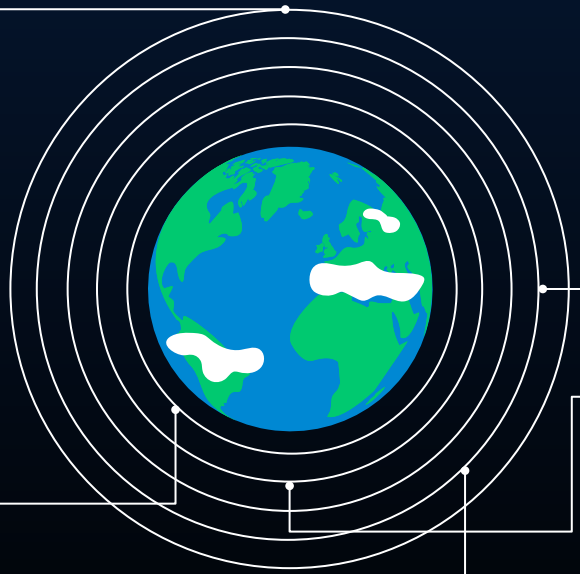
SATELLITE DATA



What are they and what are they for?

Data extracted from satellites at different heights.

They are used for sciences that carry out analysis of the Earth's surface.



They are generally used to detect or classify elements.

Some are oriented in conjunction with telescopes or drones to apply to celestial bodies.

Some even use infrared, radio frequencies or other technologies to add information.

Together with other types of data, they can be used for analysis and development.

Although it can also be just data

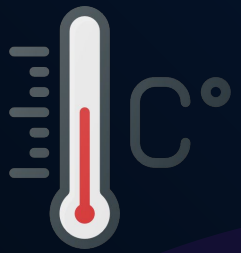
Using only information through data instead of images, it is possible to obtain results quickly, in addition to being able to study and analyze the information in more precise ways than only using images.

Oxygen

Humidity

Ozone

Temperature



But how does it work?

1) Data Capture

The equipment obtains the information when scanning

2) Transmission

The information is sent to the Ground Base

3) Processing

Data is decoded to be understandable

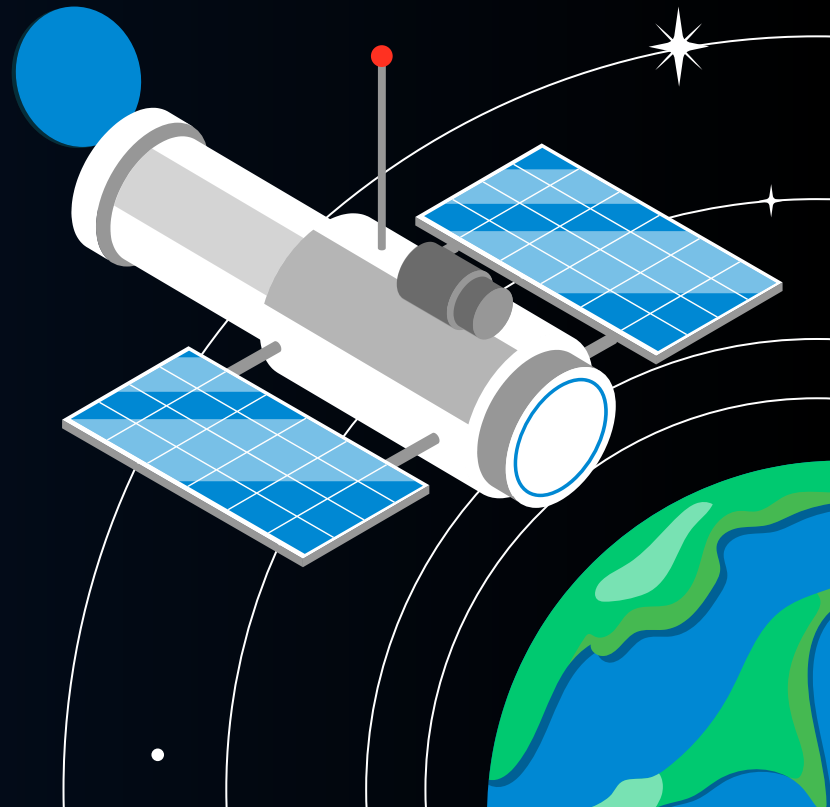
4) Storage

This data is saved to be used

5) Distribution

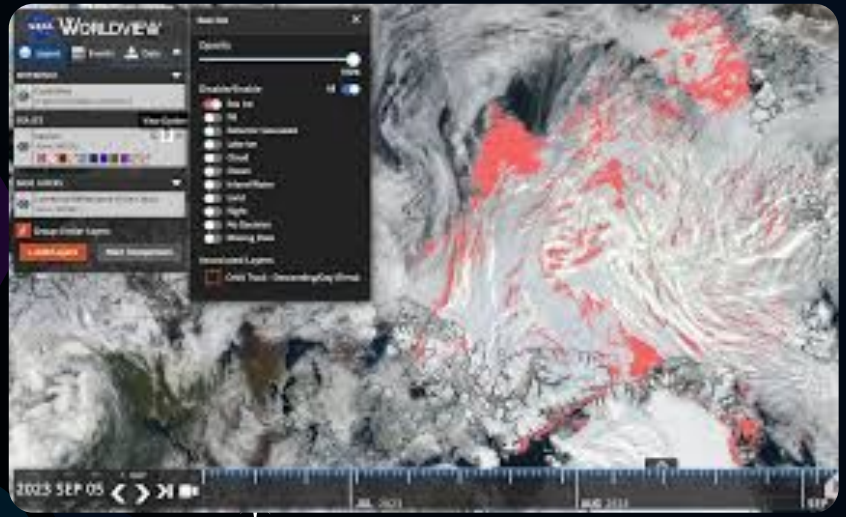
The information is made available to private or public users for use

SOURCES OF INFORMATION



GIBS

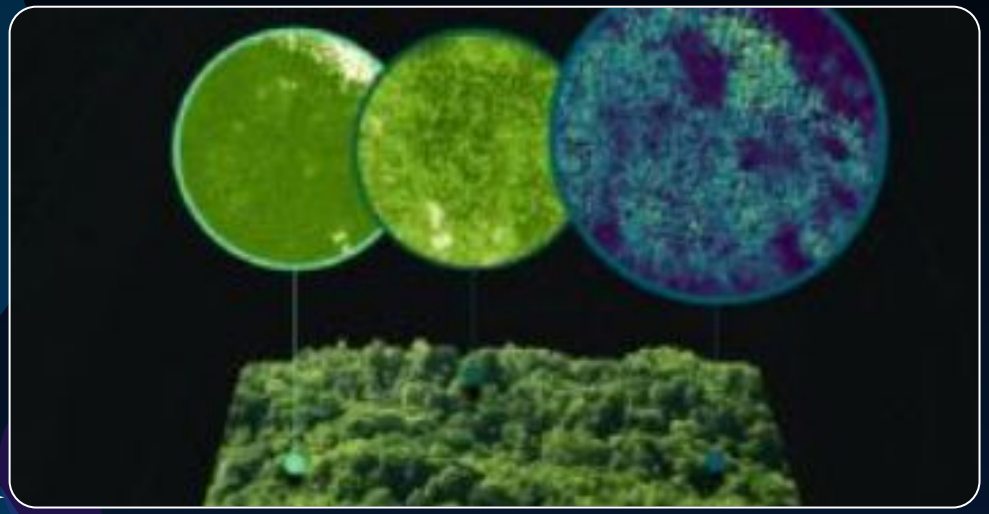
The Global Image Search Service (or GIBS) is a NASA service that they use and allow access for research and studies.



ESRI

Service more focused on Geotechnologies, among which are solutions oriented to satellite systems for land analysis.

Processing and Solutions



1. Google Earth Engine

Google Service with GCP Processing

2. Pix4D

Multiple software solutions with I.S. and drones

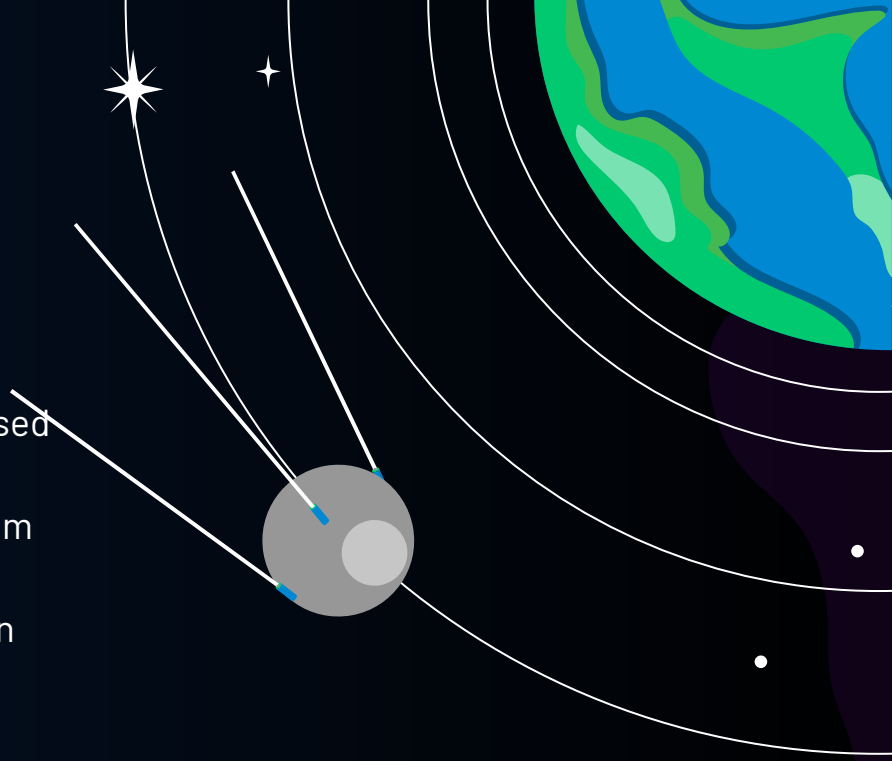
3. Sentinel Hub

Main source of information and data for the Sentinel mission

AI APPLICATIONS

Land Analysis

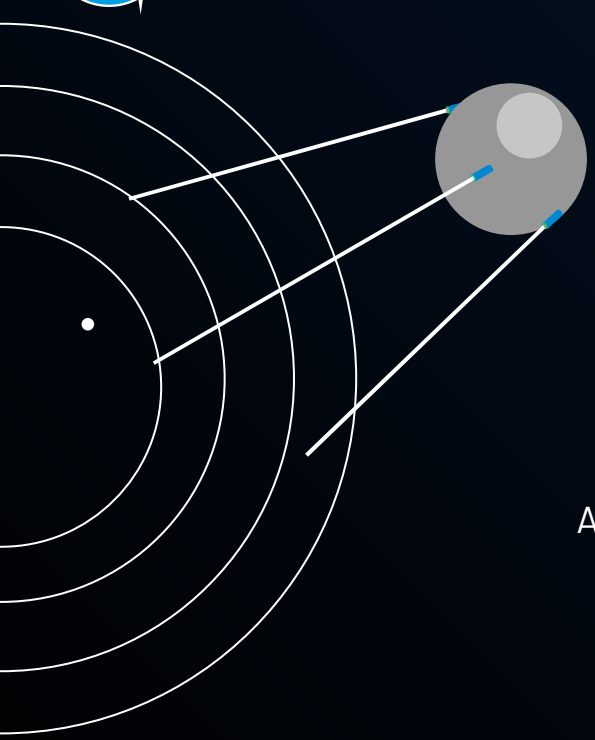
Through the images and the different sensors used to obtain these images, these technologies are combined to obtain more informative results from the places, elements or situations that can be observed, such as the increase in temperature in the clouds, which would indicate tornado possibilities. Possible areas of water, due to low temperature, etc.

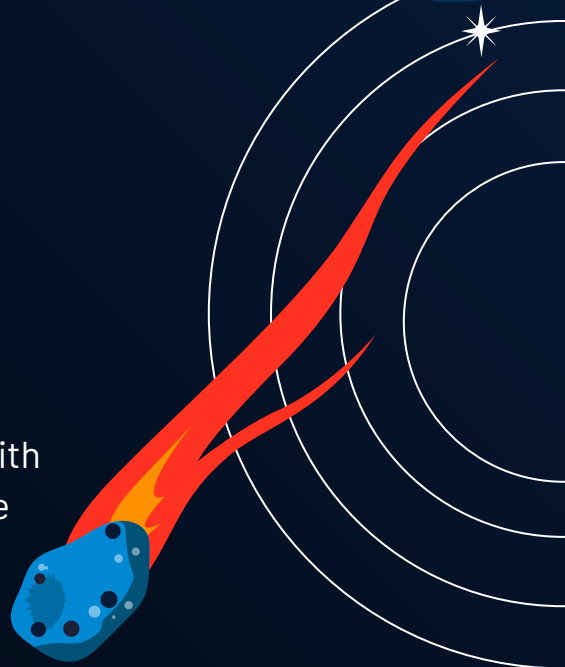


Object Classification

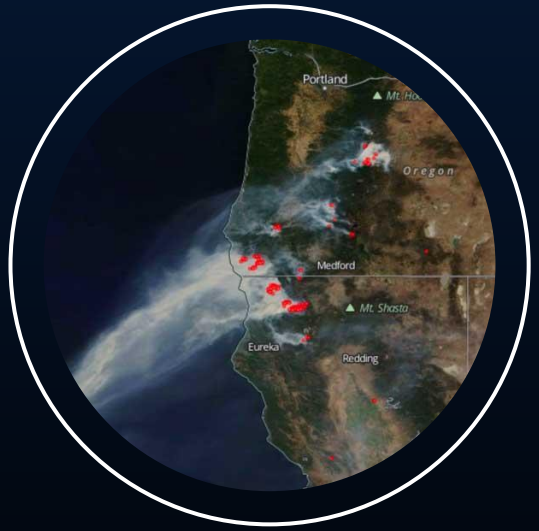
By observing both the earth and space, it is possible to generate models that detect the presence of objects in the images, or directly perform classifications to identify situations.

A clear example is the solutions in conjunction with telescopes to classify stars, or to determine the category of tornadoes on the Earth's surface.



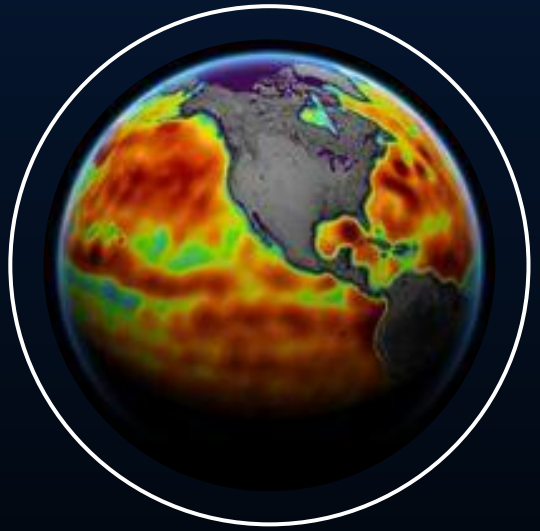


Some Examples with Images



Wildfires

Detect and estimate damage from wildfires



Humidity

Analyze droughts or areas for agriculture

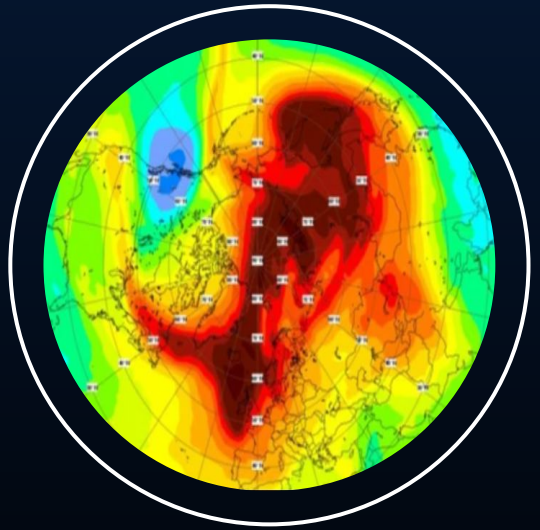
Agriculture

Analysis, segmentation and classification of sectors for wheat cultivation

And only using information

Tsunamis

Early warning systems are a clear example of prediction



Ozone Layer Damage

With current sensors, it is even possible to predict damage to the Ozone layer

Considerations

Main Considerations

Time

The images are almost never in real time, only in specific cases

Distance

Only some services can show close-up images, most are of large areas

Damage

It is normal that some images, due to obstacles or interference, have damage.

Training

Related to the previous ones, images may not always be useful for training data

¡THANK YOU SO MUCH!

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