

AWS Geospatial

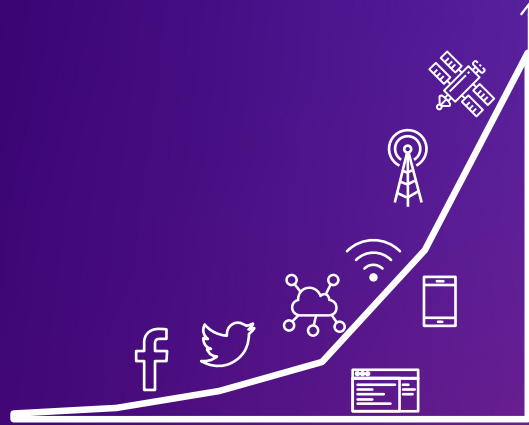
Acelere sus cargas de trabajo geoespaciales con AWS

Boris Cortes – Sr. Solutions Architect – Aerospace and Satellite

La realidad de lo datos geoespaciales



**Necesidad de
rápida toma de
decisiones**

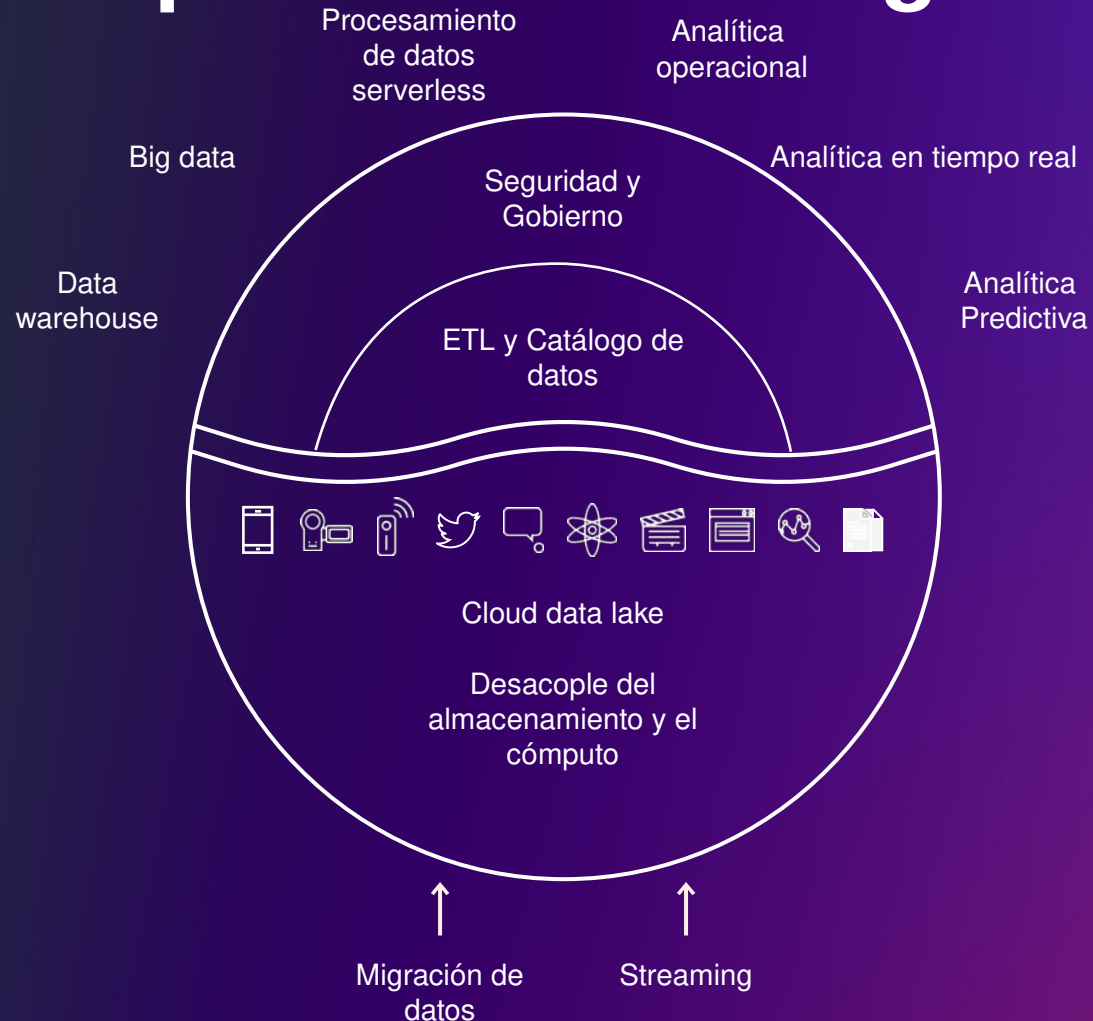


**Explosión
de datos**



**Explosión de
estándares
geoespaciales**

Soportando datos geoespaciales vía Data Lakes



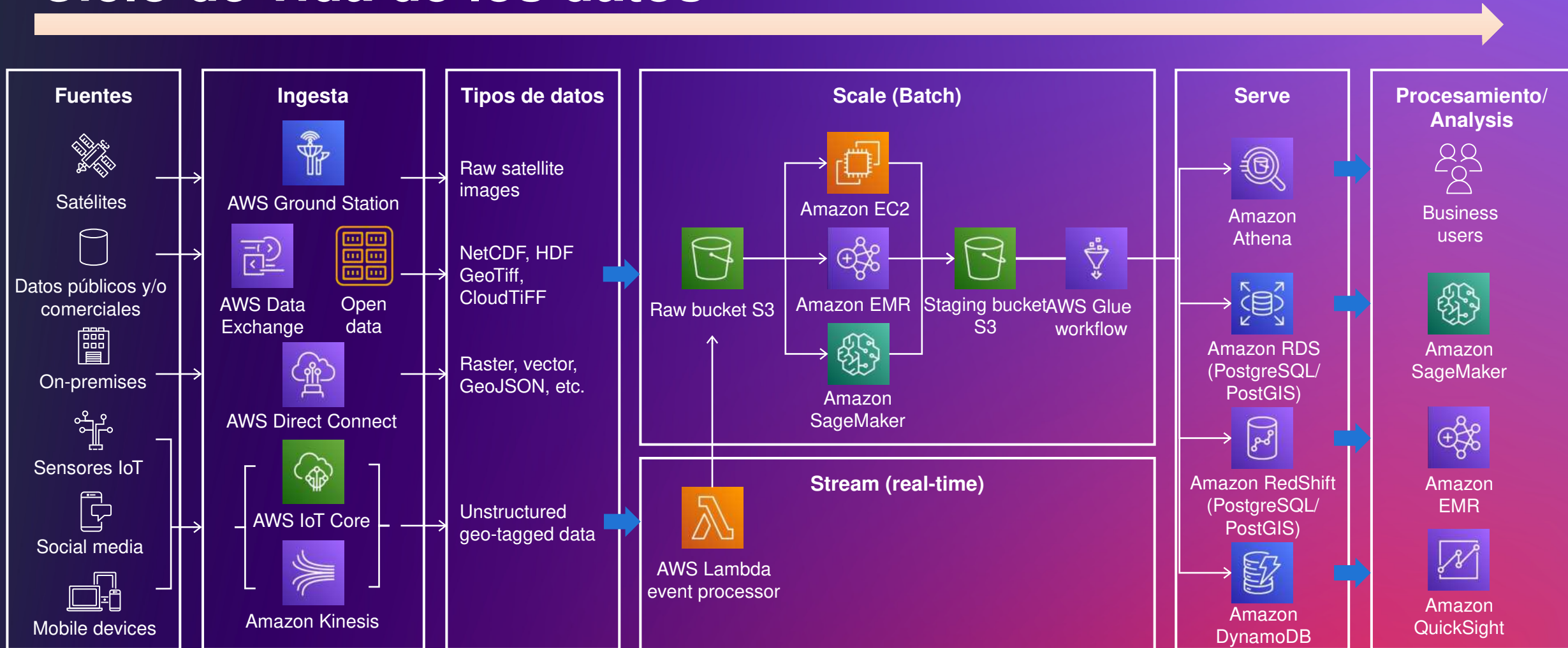
Cientes necesitan:

Una plataforma unificada y costo-eficiente para almacenar los datos.

Usar el estándar de datos de su elección.

Analizar los datos en varias formas.

Ciclo de vida de los datos



Datos Geoespaciales en AWS

Earth on AWS

Build planetary-scale applications in the cloud with open geospatial data.

Geospatial ML with Amazon SageMaker

Build, train, and deploy ML models faster using geospatial data

Up to 10 hours of free compute resources for 60 days with the [AWS Free Tier](#)

Get started with SageMaker geospatial capabilities

Access readily available geospatial data sources, including satellite imagery, maps, and location data.

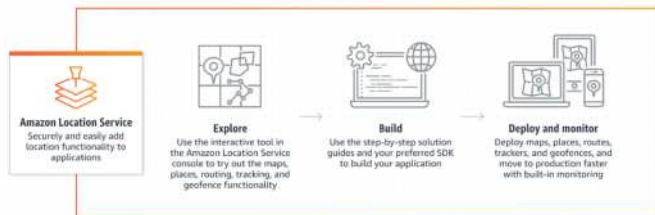
Efficiently transform or enrich large-scale geospatial datasets with open-source libraries or purpose-built operations such as mosaicking and reverse geocoding.

Accelerate model building by using built-in, pretrained deep neural network models such as land cover segmentation and cloud masking.

Analyze geospatial data and explore model predictions on an interactive map using 3D accelerated graphics with built-in visualization tools.

How it works

Amazon Location Service makes it easy for developers to add location functionality, such as maps, points of interest, geocoding, routing, tracking, and geofencing, to their applications without sacrificing data security and user privacy.



Swisstopo Case Study

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Our Federal Spatial Data Infrastructure platform serves one million users per month. Running it on AWS has significantly shortened the time needed to allocate new servers, which helps us better serve our customers.

Hanspeter Christ

Deputy Head of Geoinformatics



MODIS

NOAA GHE

USGS 3DEP LiDAR

NWM

GEFS

TCGA

OpenStreetMap

GEOS-Chem

ECMWF ERA5 NEXRAD

Sentinel-1

HRRR

Sentinel-2

OFS

eBird

Terrain Tiles

GOES-16

NAIP

CBERS

NOAA ERI

HIRLAM

ISD

Registry of Open Data on AWS

gnomAD

GHCN

Kids First

Landsat

GFS

SILAM Air Quality

NREL Solar Radiation

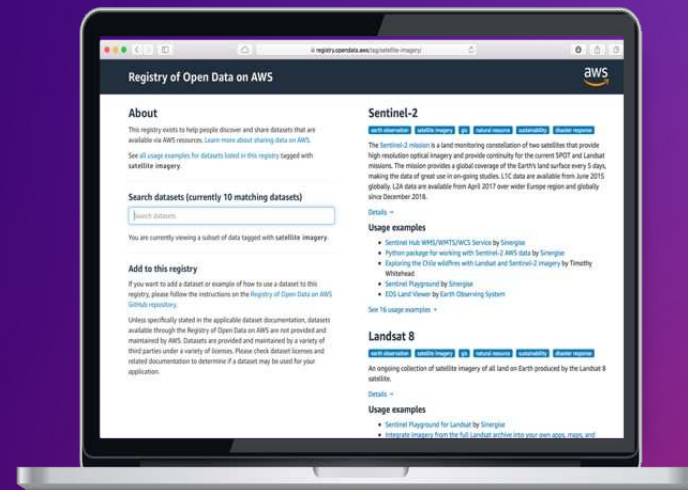
CESM LENS TARGET

GOES-17

OpenAQ

NREL Wind Integration

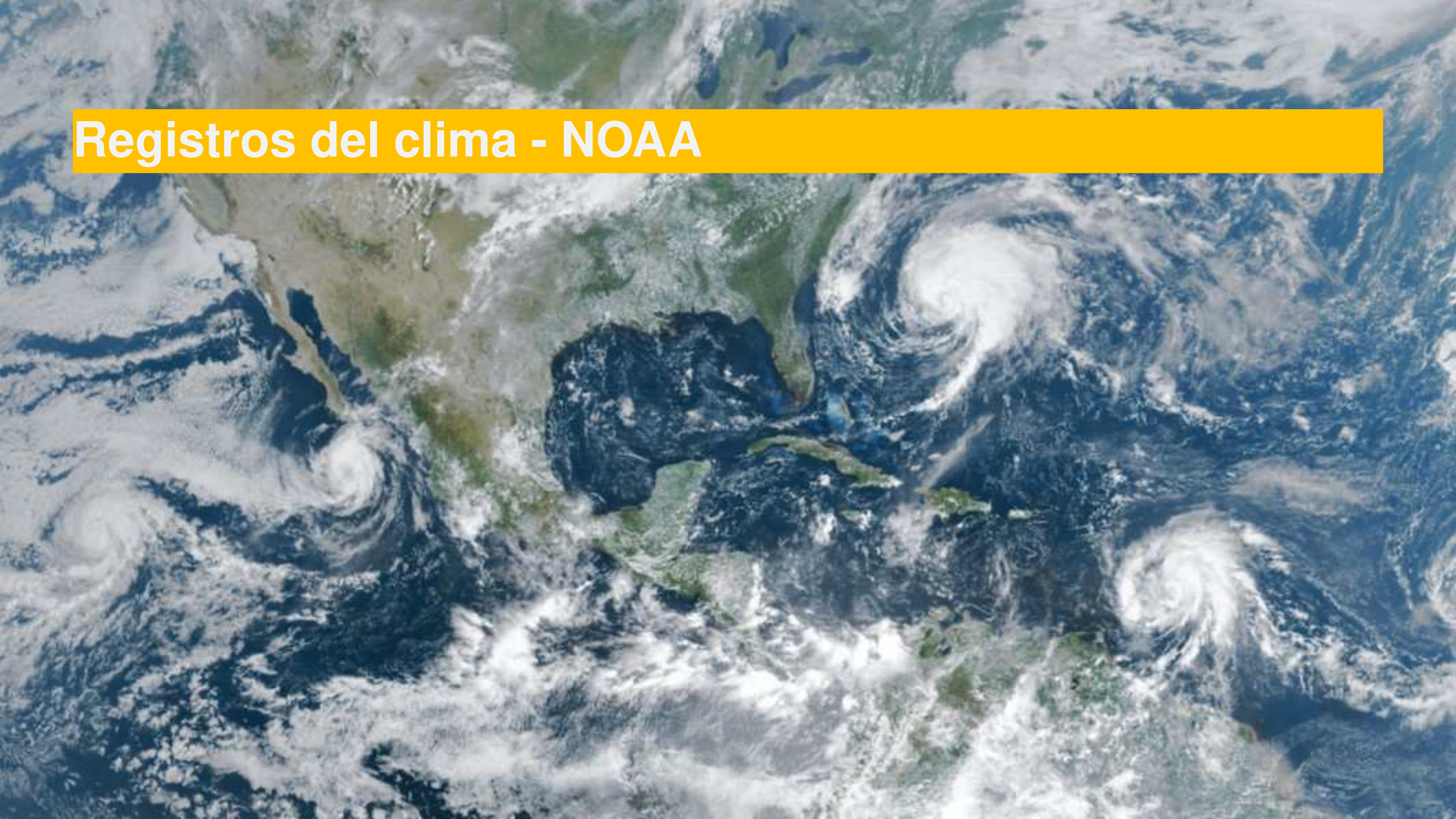
Common Crawl



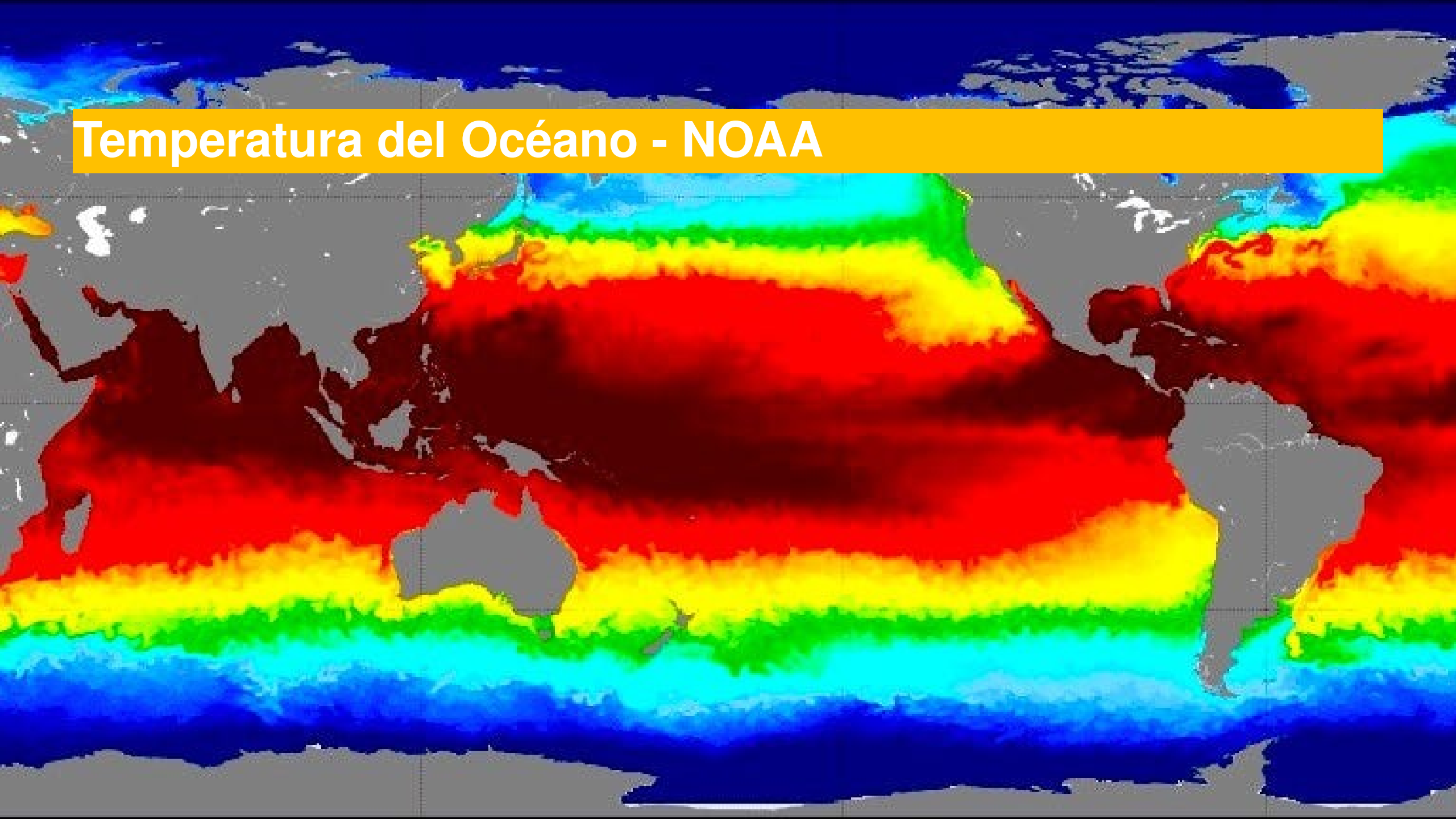
registry.opendata.aws



Registros del clima - NOAA

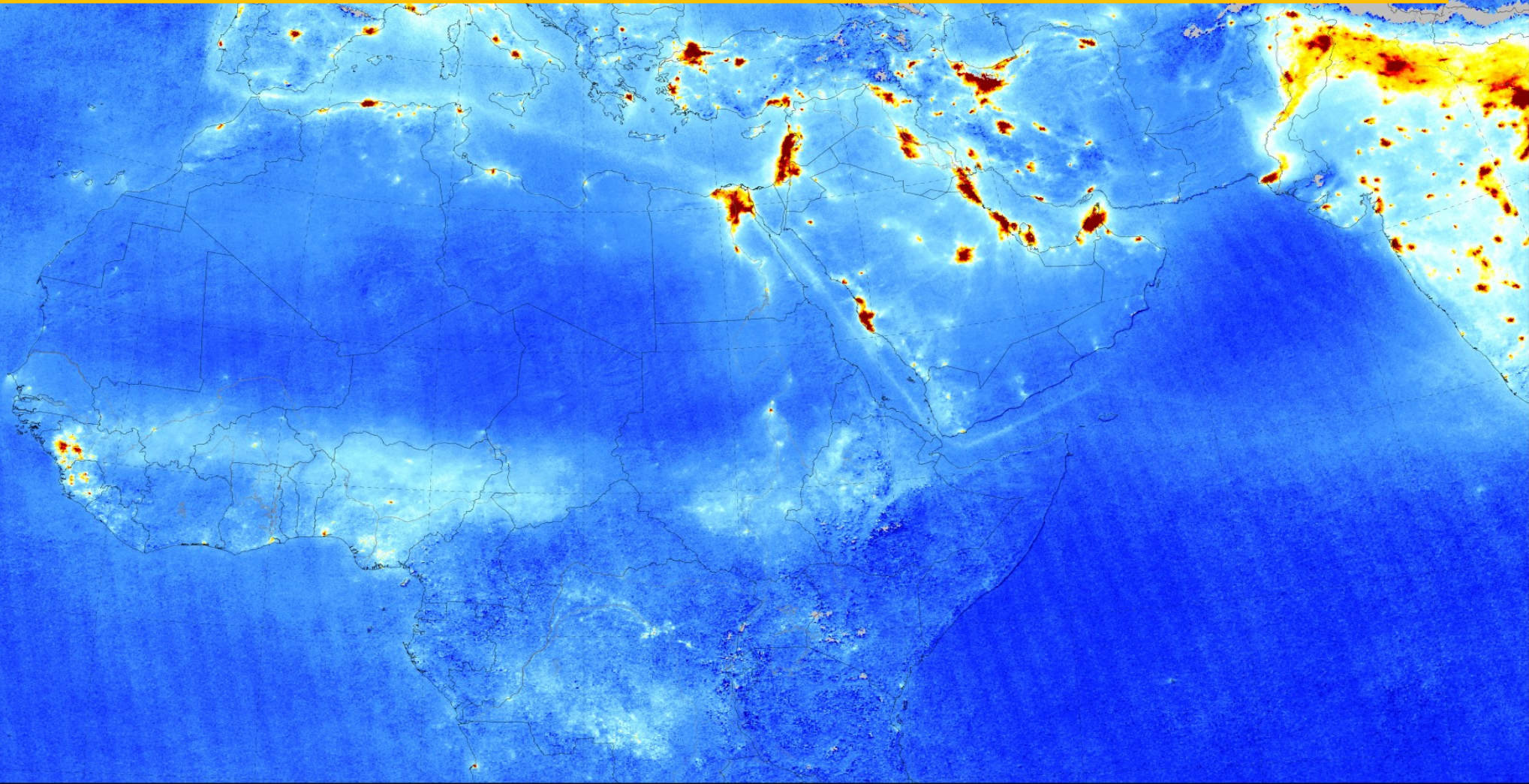


Temperatura del Océano - NOAA

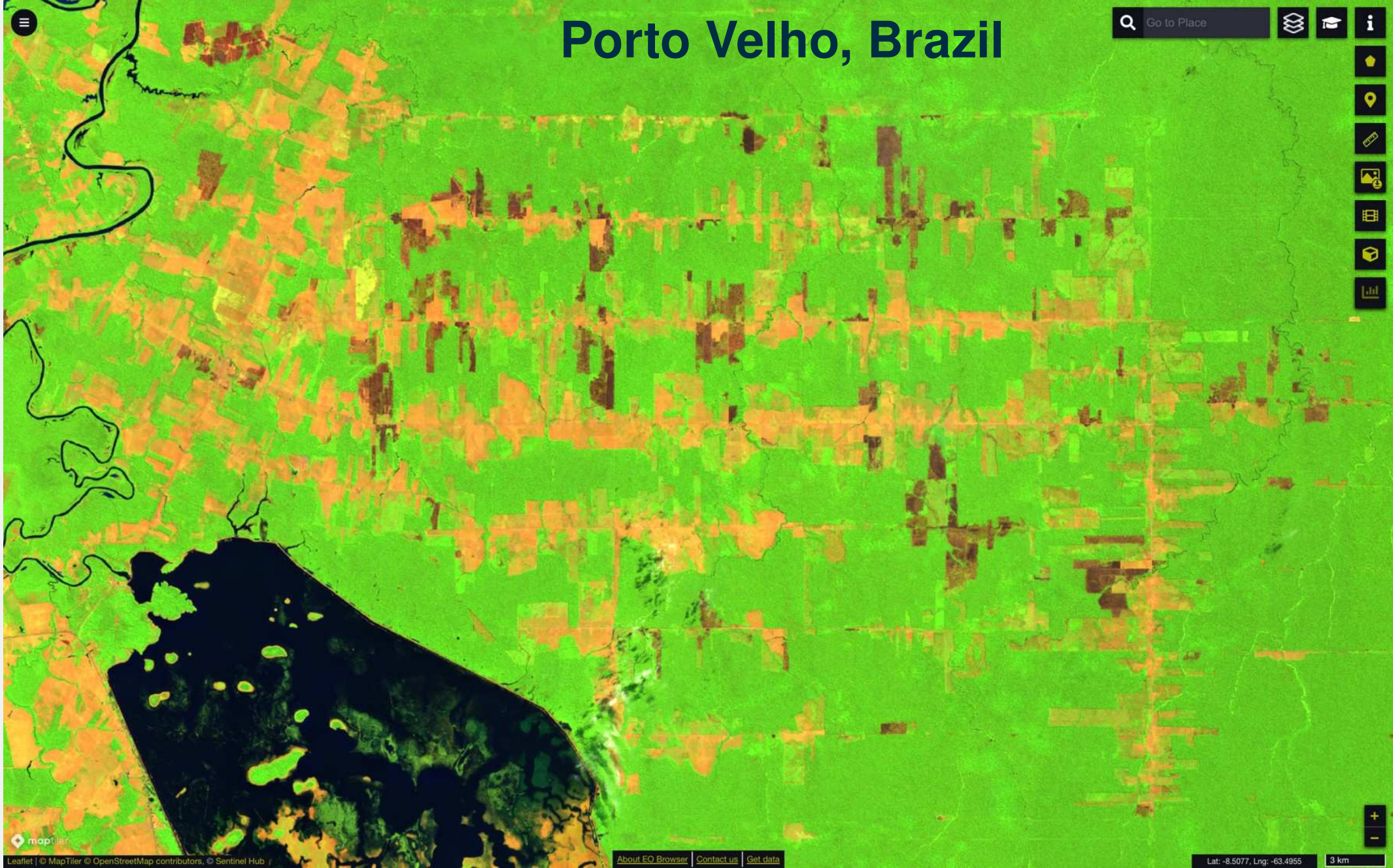


TROPOMI tropospheric NO₂, April 2018

Contaminación del aire – Sentinel 5P



NO₂ tropospheric column gridded mean, TROPOMI sensor (10^{-6} mol m⁻²)



Estadísticas de uso



Cloud API

 **170K**
usuarios

 **500M**
Solicitudes procesadas

 **50+ PB**
De imagenes satelitales

 **700 TB**
Añadidos mensualmente

4 Sentinel

7 Landsat, MODIS

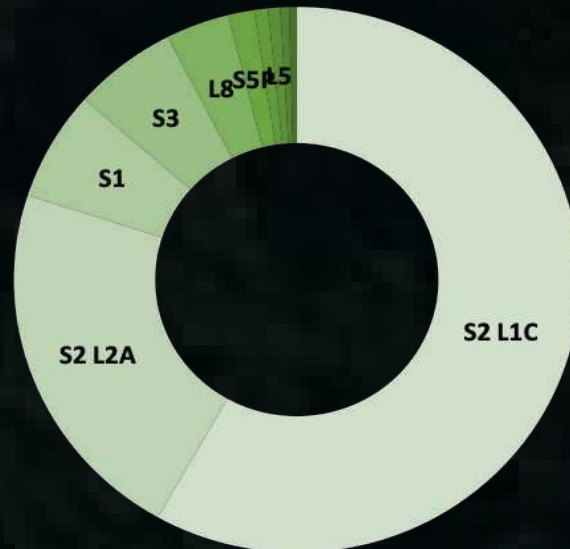
Envisat, Airbus, Maxar, Planet

Copernicus s

EO Browser

 **60K**
Visitantes al mes

 **60M**
Solicitudes procesadas

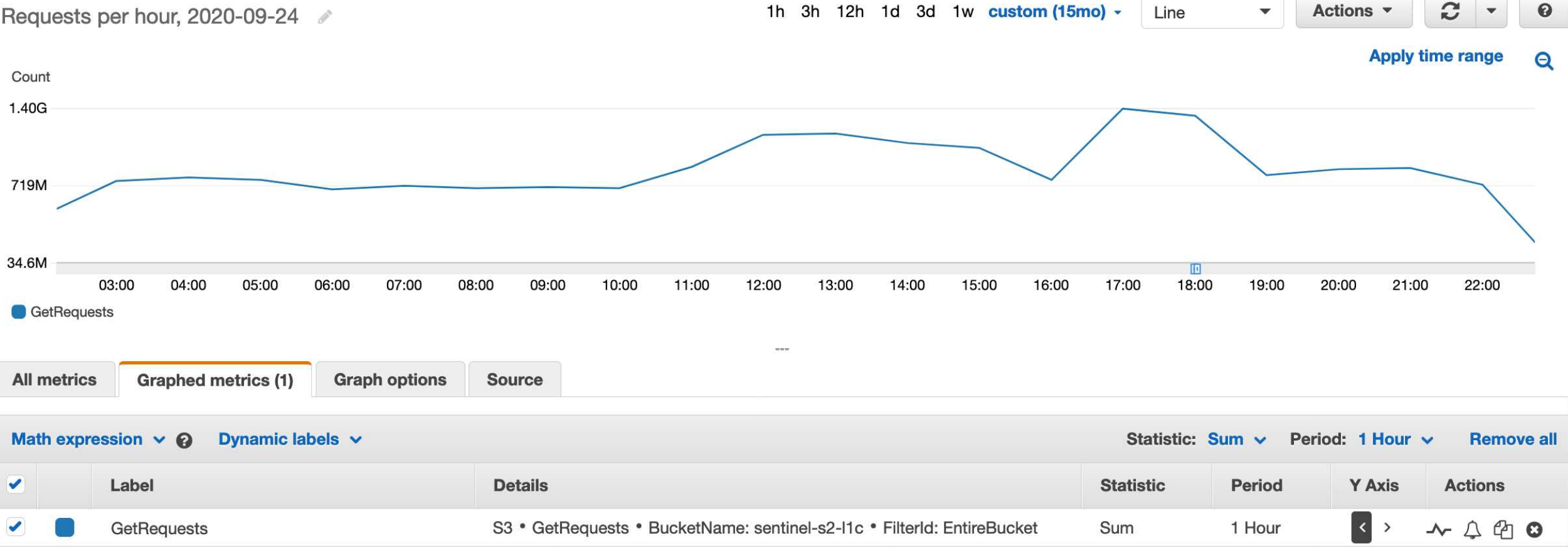


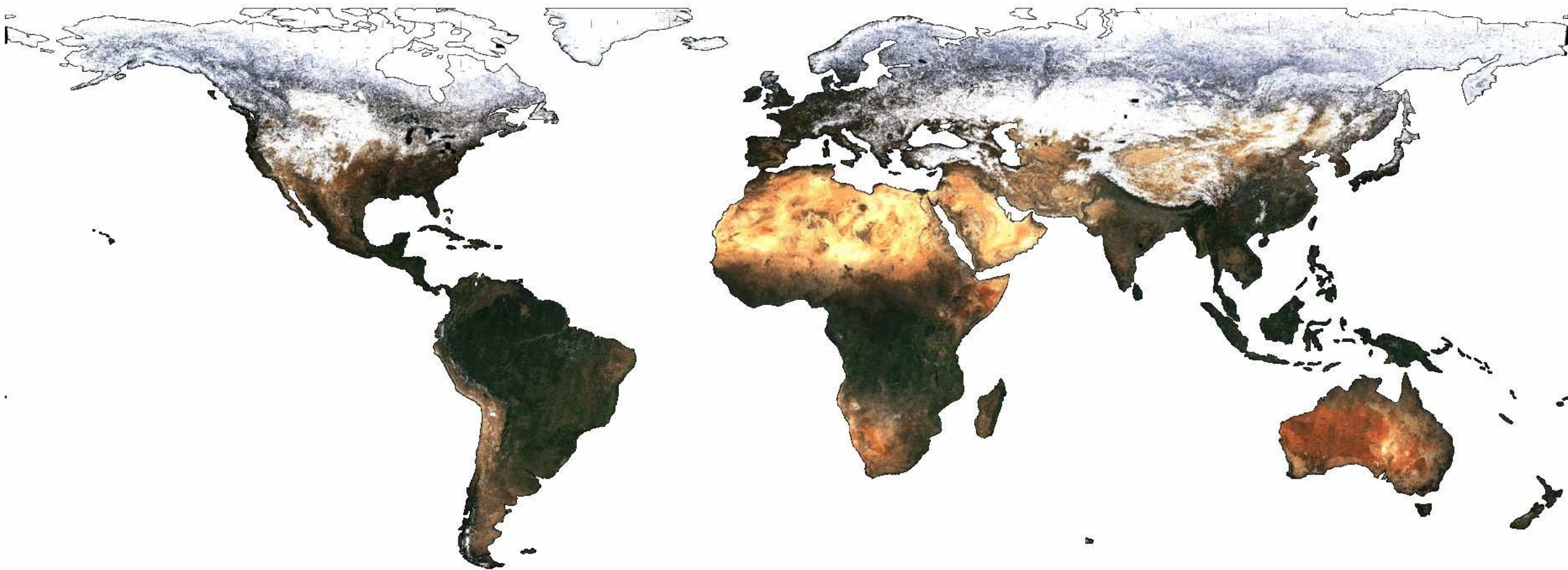
Open-source y gratis



Visitantes de 200 países

400 000 requests per second









403639000
AND
SAUDI ARABIA

SageMaker Soporta ML Geoespacial

Cree, entrene y despliegue modelos de ML utilizando datos geoespaciales.



Acceda a fuentes de datos geoespaciales fácilmente disponibles



Procese o enriquezca eficientemente datos geoespaciales a gran escala



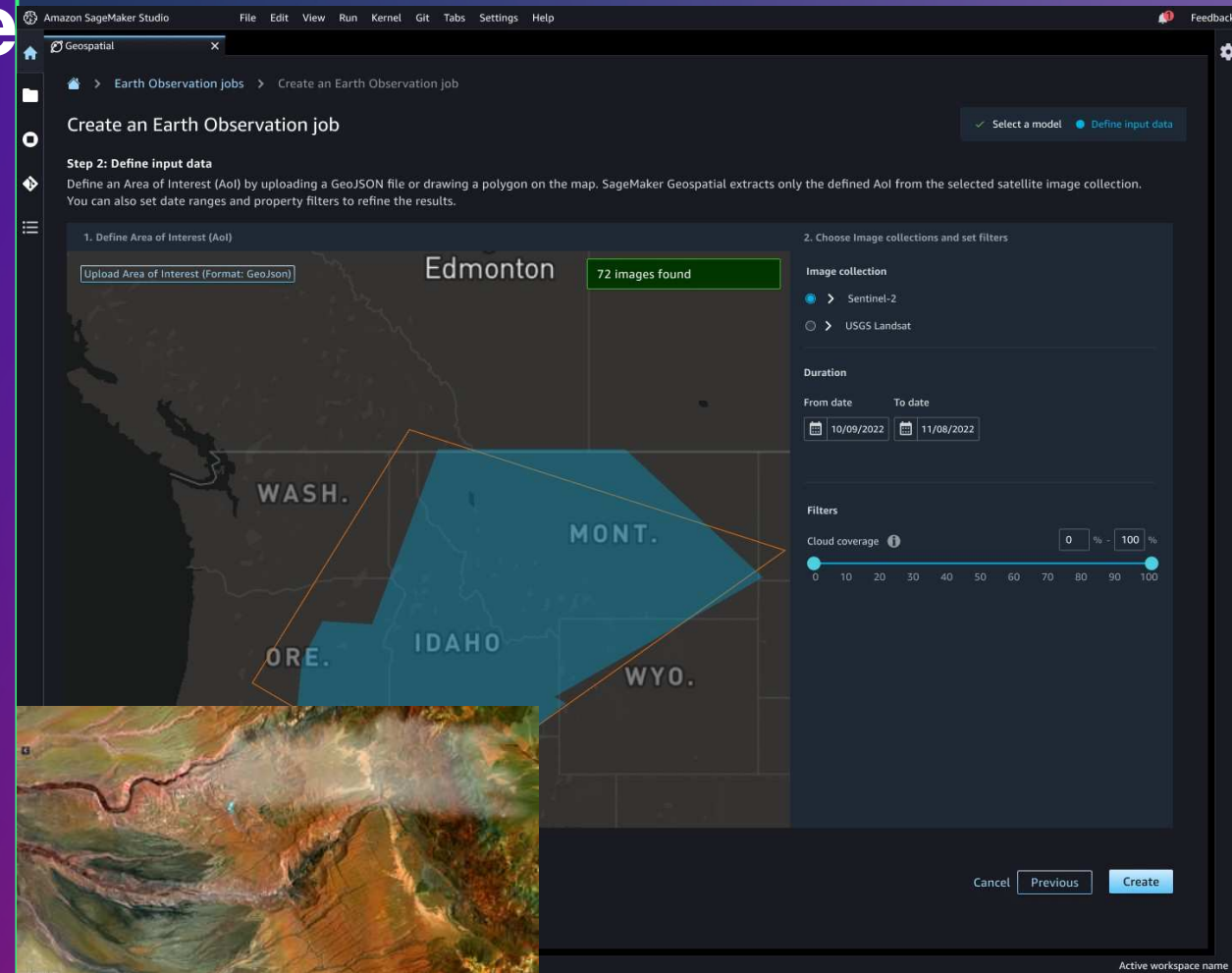
Acelere la creación de modelos con modelos de aprendizaje automático previamente entrenados



Analice y explore predicciones con herramientas de visualización.

Acceso a datos geoespaciales

1. Acceso directo a Open Data on AWS, tales como as Landsat 8, Sentinel-2.
2. Utilice sus propios datos o proveedores tales como Planet.
3. Administre los privilegios de acceso en su organización.



Uso de Imágenes Satelitales para el monitoreo de granjas

- **Monitoree la salud de los cultivos, los ciclos de crecimiento y la producción a lo largo de las estaciones.**
1. Definir el área de interés (campo o granja).
 2. Usar un modelo de detección de cambios para monitorear las áreas cosechadas y los patrones de crecimiento.
 3. Usar ML para incrementar la producción, eficacia y sustentabilidad.



Uso de Imágenes Satelitales para monitorear el cambio climático.

- **Realice un seguimiento de los cambios en la superficie terrestre y controle el impacto climático.**
 1. Definir el área de interés.
 2. Usar un modelo de detección de cambios para entender los cambios a largo plazo entre el pasado y hoy.
 3. Usar ML para alimentar los planes de sustentabilidad y políticas publicas.



Sagemaker Geospatial demo

The screenshot displays the Amazon SageMaker Studio interface, specifically the Geospatial section. The left sidebar contains a navigation menu with options: Home, Data, Data Wrangler, Feature store, Clusters, Geospatial (selected), Experiments, Models, Deployments, Jobs, Quick start solutions, and Learning resources. The main content area is titled 'Geospatial' and includes tabs for Overview, Earth Observation jobs, Vector Enrichment jobs, and Map visualization. A large banner with a satellite image background reads 'Geospatial Build, train, and deploy ML models with geospatial data' and features a 'Create Earth Observation job' button. Below this, the 'Features' section is divided into four cards: 'Earth Observation jobs' (describing data acquisition and visualization), 'Map visualization' (describing data upload and visualization), 'Vector Enrichment jobs' (describing reverse-geocoding and map matching), and 'Geospatial Notebooks' (describing data transformation and visualization within notebooks). Each card includes a 'View' or 'Try it' button and a 'Learn more' link.

Amazon SageMaker Studio

File Edit View Run Kernel Git Tabs Settings Help

Home

Geospatial

Overview Earth Observation jobs Vector Enrichment jobs Map visualization

Geospatial

Build, train, and deploy ML models with geospatial data

Create Earth Observation job

Features

Earth Observation jobs

Acquire, transform, and visualize data collected from the Earth's surface to get insights or make predictions.

View Earth Observation jobs Learn more

Map visualization

Upload a CSV, JSON or GeoJSON files from Amazon S3 to visualize data using our powerful visualization tool.

+ Try it Learn more

Vector Enrichment jobs

Reverse-geocode map coordinates with human readable-addresses using Amazon Location Services. Snap inaccurate longitude and latitude to a known road network segment to perform map matching.

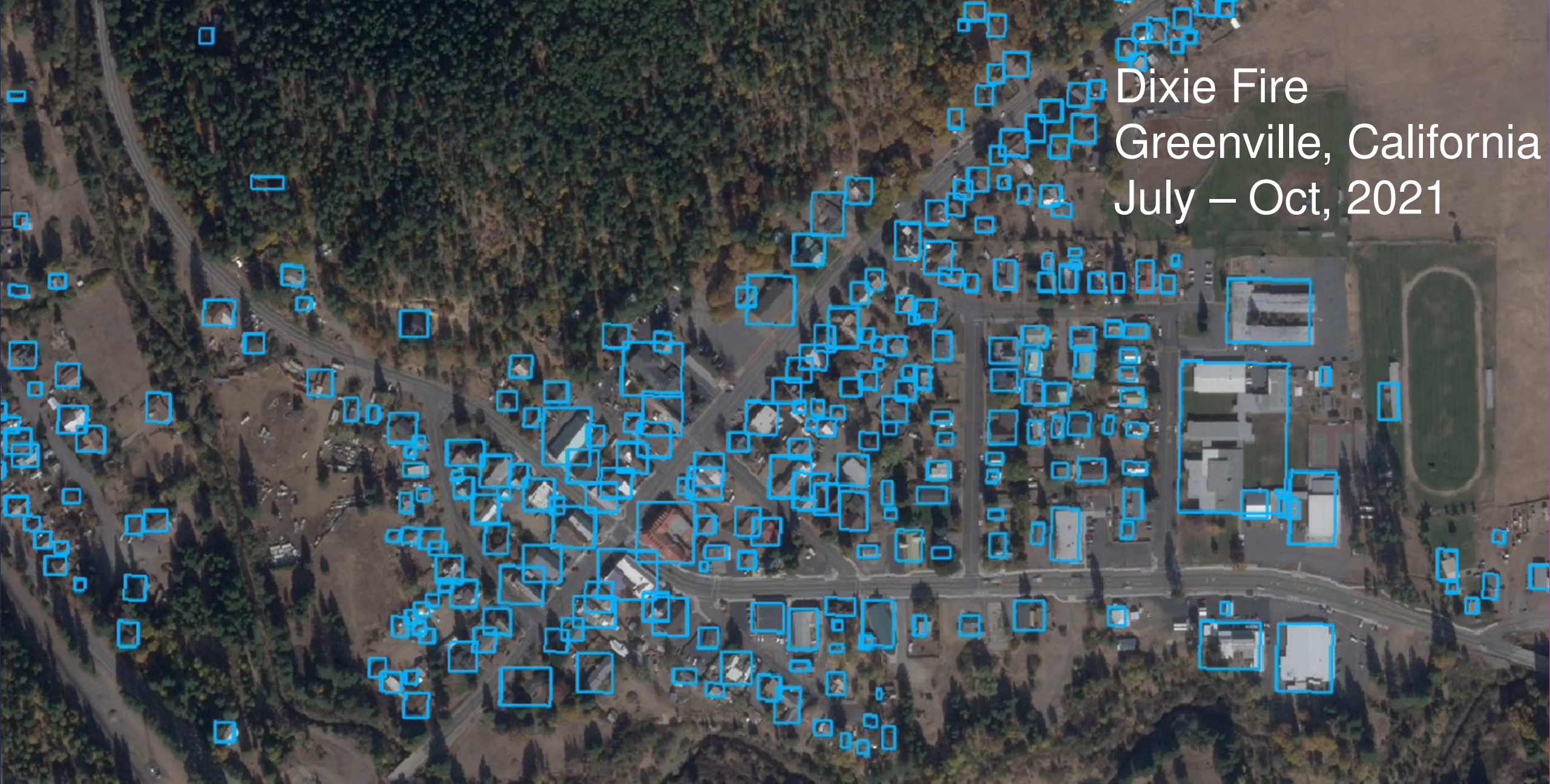
View Vector enrichment jobs

Geospatial Notebooks

Transform and visualize data inside geospatial notebooks, using libraries such as GDAL, Fiona, GeoPandas, Shapely, and Rasterio, as well as SageMaker-specific libraries.

Learn more about Geospatial image



An aerial photograph of a suburban area in Greenville, California. The image is overlaid with numerous blue rectangular bounding boxes of varying sizes, which represent building footprints. These boxes are densely packed in the central and right portions of the image, particularly around residential streets and commercial areas. The surrounding landscape includes green trees, grassy fields, and some larger industrial or commercial buildings. A road with a median runs horizontally across the middle of the image. In the top right corner, there is white text providing context about a fire event.

Dixie Fire Greenville, California July – Oct, 2021



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© OpenStreetMap

Image includes bounding boxes derived from the USBuildingFootprints dataset under the Open Database License (ODbL)

Image © 2022 Planet Labs PBC

Hurricane Ian

Fort Myers, Florida

Sept. 23 – Oct 2, 2022



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Image includes bounding boxes derived from the USBuildingFootprints dataset under the Open Database License (ODbL)

Image © 2022 Planet Labs PBC

Extendiendo el Cloud al Espacio



D-Orbit y UniBap colaboraron con AWS para ejecutar procesamiento EO y cargas de trabajo de ML en órbita para reducir la cantidad de datos descargados desde el satélite, reduciendo un 42% la cantidad de datos.

¡Gracias!



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