AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

WPS202

Methods for analyzing climate and weather data

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Chalk talk overview

Amazon Sustainability Data Initiative

Open data on AWS

Introduction to climate & weather data

Demonstrations with Dask

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The Amazon Sustainability Data Initiative significantly reduces the **cost**, **time**, and **technical barriers** associated with analyzing large datasets to generate sustainability insights

amazonsdi.com

aws

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Helping tell the sustainability story

- Community of practice for weather, climate, and sustainability
- Blog series on the AWS Public Sector blog
  - https://aws.amazon.com/blogs/publicsector/tag/asdi/
- Hosting round tables
  - **Roundtable and Webinar on Data for Climate Risk Assessment in Vulnerable Communities**
- Webinars and informational sessions
  - AWS education: research seminars
  - Informational sessions for new datasets

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AWS Open Data Sponsorship Program

The AWS Open Data Sponsorship Program covers the cost of storage for publicly available high-value cloud-optimized datasets; we work with data providers who seek to:

- Democratize access to data by making it available for analysis on AWS
- Develop new cloud-native techniques, formats, and tools that lower the cost of working with data
- Encourage the development of communities that benefit from access to shared datasets



opendata.aws/odp

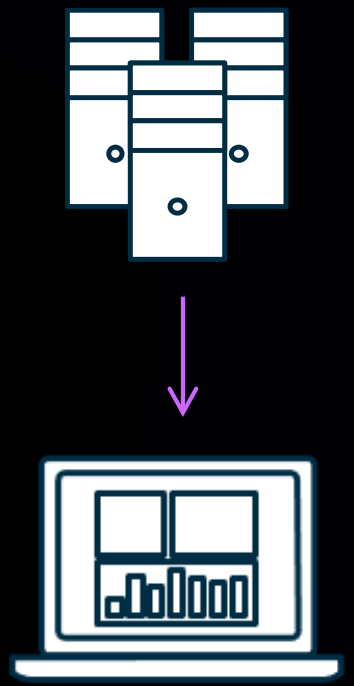
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Flipped data flow in the cloud

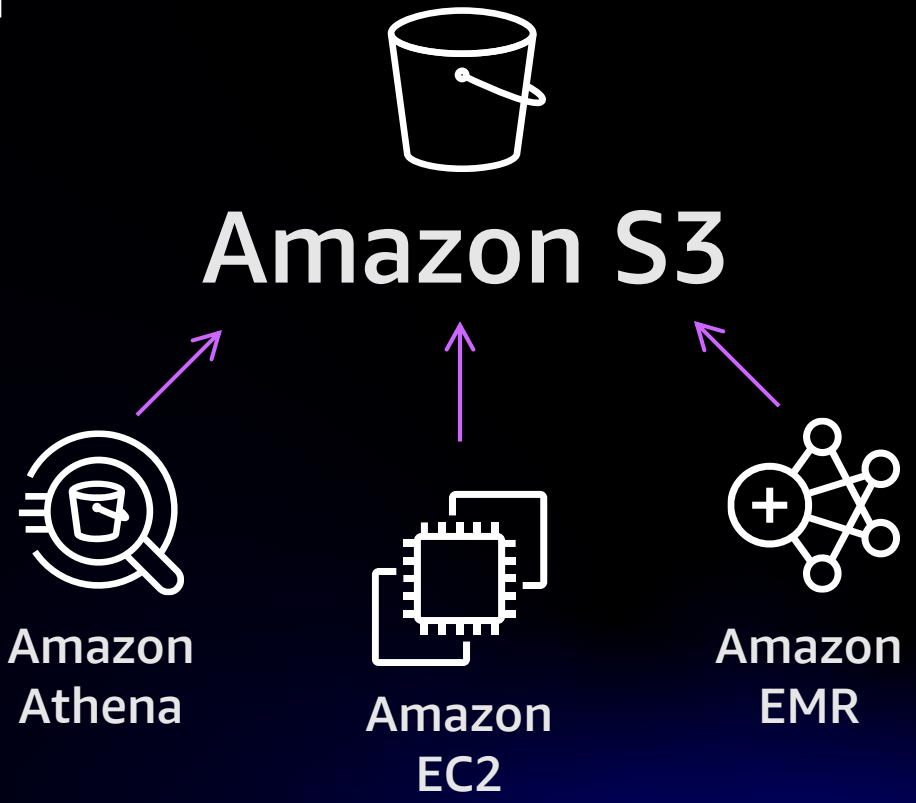
Traditional approach:

Move data to computing resources



Cloud approach:

Move computing resources to data



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MODIS NOAA GHE USGS 3DEP LiDAR NWM GEFS

TCGA OpenStreetMap GEOS-Chem ECMWF ERA5 NEXRAD

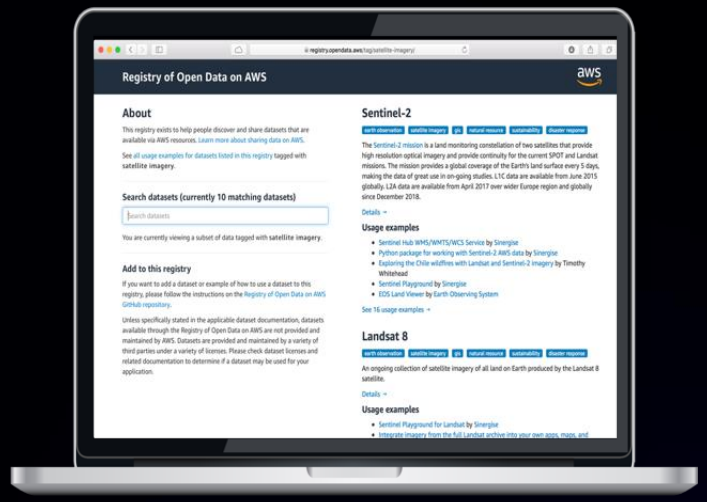
Sentinel-1 HRRR Sentinel-2 OFS eBird Terrain Tiles

GOES-16 NAIP CBERS NOAA ERI

Registry of Open Data on AWS

HIRLAM ISD gnomAD

GHCN Kids First Landsat GFS



SILAM Air Quality NREL Solar Radiation

CESM LENS TARGET GOES-17 OpenAQ

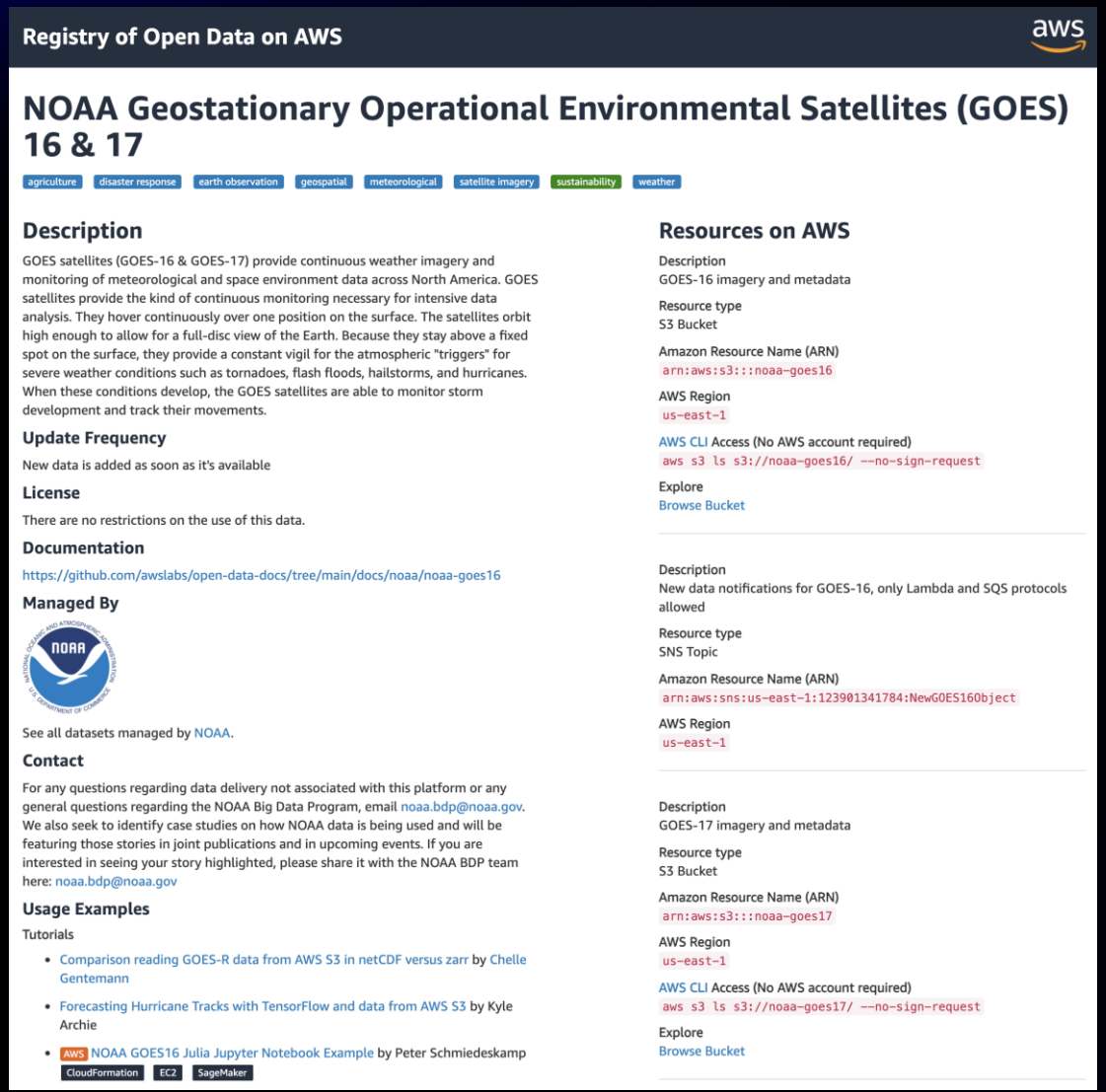
NREL Wind Integration Common Crawl

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NOAA GOES-16 Data



Registry of Open Data on AWS

NOAA Geostationary Operational Environmental Satellites (GOES) 16 & 17

agriculture | disaster response | earth observation | geospatial | meteorological | satellite imagery | sustainability | weather

Description

GOES satellites (GOES-16 & GOES-17) provide continuous weather imagery and monitoring of meteorological and space environment data across North America. GOES satellites provide the kind of continuous monitoring necessary for intensive data analysis. They hover continuously over one position on the surface. The satellites orbit high enough to allow for a full-disc view of the Earth. Because they stay above a fixed spot on the surface, they provide a constant vigil for the atmospheric "triggers" for severe weather conditions such as tornadoes, flash floods, hailstorms, and hurricanes. When these conditions develop, the GOES satellites are able to monitor storm development and track their movements.

Update Frequency

New data is added as soon as it's available

License

There are no restrictions on the use of this data.

Documentation

https://github.com/awslabs/open-data-docs/tree/main/docs/noaa/noaa-goes16

Managed By

See all datasets managed by NOAA.

Contact

For any questions regarding data delivery not associated with this platform or any general questions regarding the NOAA Big Data Program, email noaa.bdp@noaa.gov. We also seek to identify case studies on how NOAA data is being used and will be featuring those stories in joint publications and in upcoming events. If you are interested in seeing your story highlighted, please share it with the NOAA BDP team here: noaa.bdp@noaa.gov

Usage Examples

Tutorials

- Comparison reading GOES-R data from AWS S3 in netCDF versus zarr by Chelle Gentemann
- Forecasting Hurricane Tracks with TensorFlow and data from AWS S3 by Kyle Archie
- AWS NOAA GOES16 Julia Jupyter Notebook Example by Peter Schmiedeskamp

CloudFormation | EC2 | SageMaker

Resources on AWS

Description
GOES-16 imagery and metadata

Resource type
S3 Bucket

Amazon Resource Name (ARN)
`arn:aws:s3:::noaa-goes16`

AWS Region
`us-east-1`

AWS CLI Access (No AWS account required)
`aws s3 ls s3://noaa-goes16/ --no-sign-request`

Explore
Browse Bucket

Description
New data notifications for GOES-16, only Lambda and SQS protocols allowed

Resource type
SNS Topic

Amazon Resource Name (ARN)
`arn:aws:sns:us-east-1:123901341784:NewGOES16Object`

AWS Region
`us-east-1`

Description
GOES-17 imagery and metadata

Resource type
S3 Bucket

Amazon Resource Name (ARN)
`arn:aws:s3:::noaa-goes17`

AWS Region
`us-east-1`

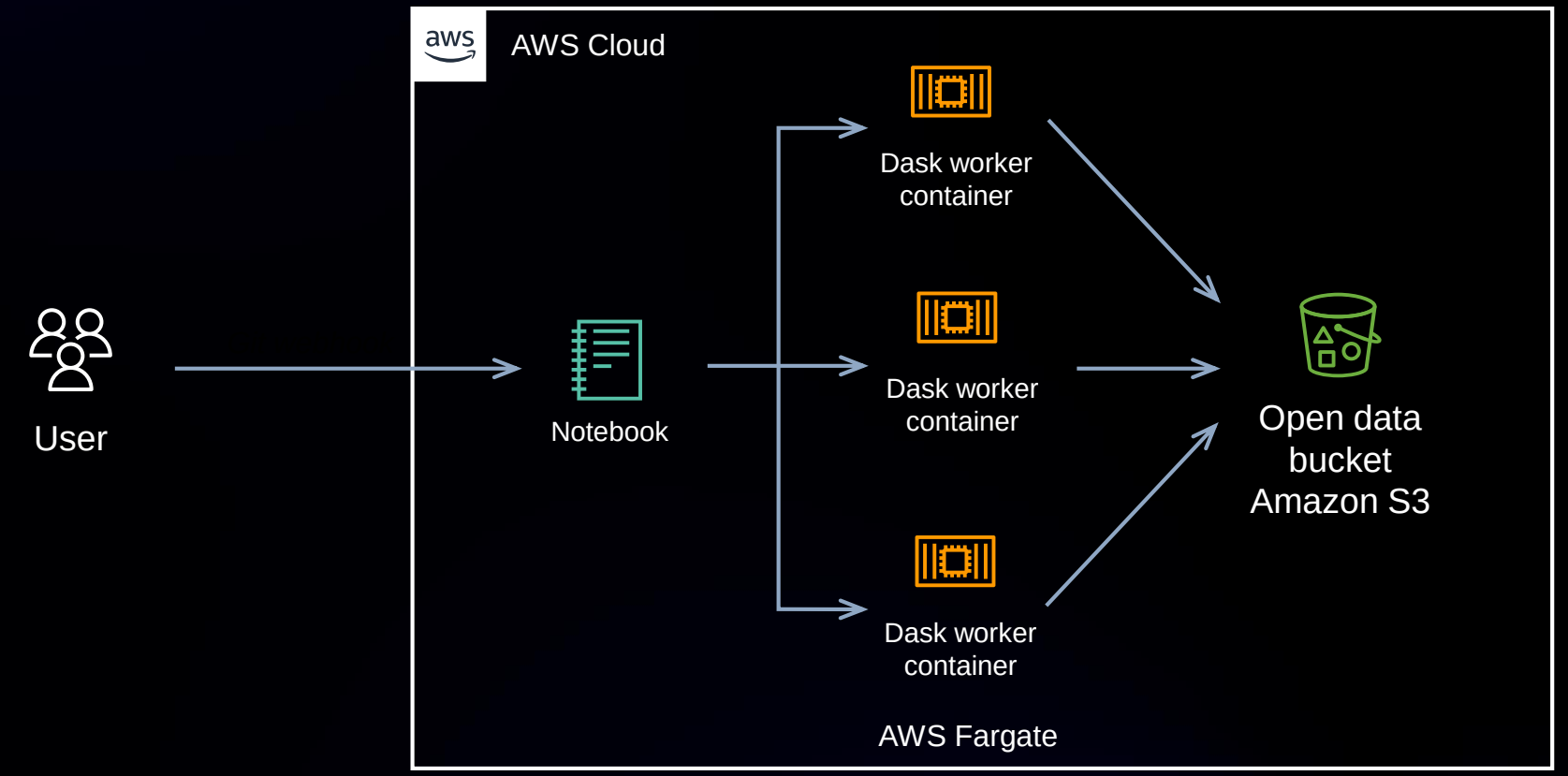
AWS CLI Access (No AWS account required)
`aws s3 ls s3://noaa-goes17/ --no-sign-request`

Explore
Browse Bucket

- Resources call out where to find the data
  - S3 buckets
  - Amazon CloudFront URIs
  - SNS topics
- Format of the data
  - NetCDF
  - Grib2
  - CSV

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Architecture



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Thank you!

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