



Advancing Open Source Science Initiatives through Public-private Partnerships

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Background

NASA Space Act Agreements (SAAs) were established as non-reimbursable research partnerships to bridge the knowledge gap between government agencies and private industries. Two examples are with the Amazon Web Services (AWS) Open Data Sponsorship Program and IBM Research. Within these agreements, partners jointly develop and conduct research on topics of mutual interest and provide their own resources to support the activities.

Partnership Initiatives

AWS: Cloud-based Data Discovery & Capacity Building

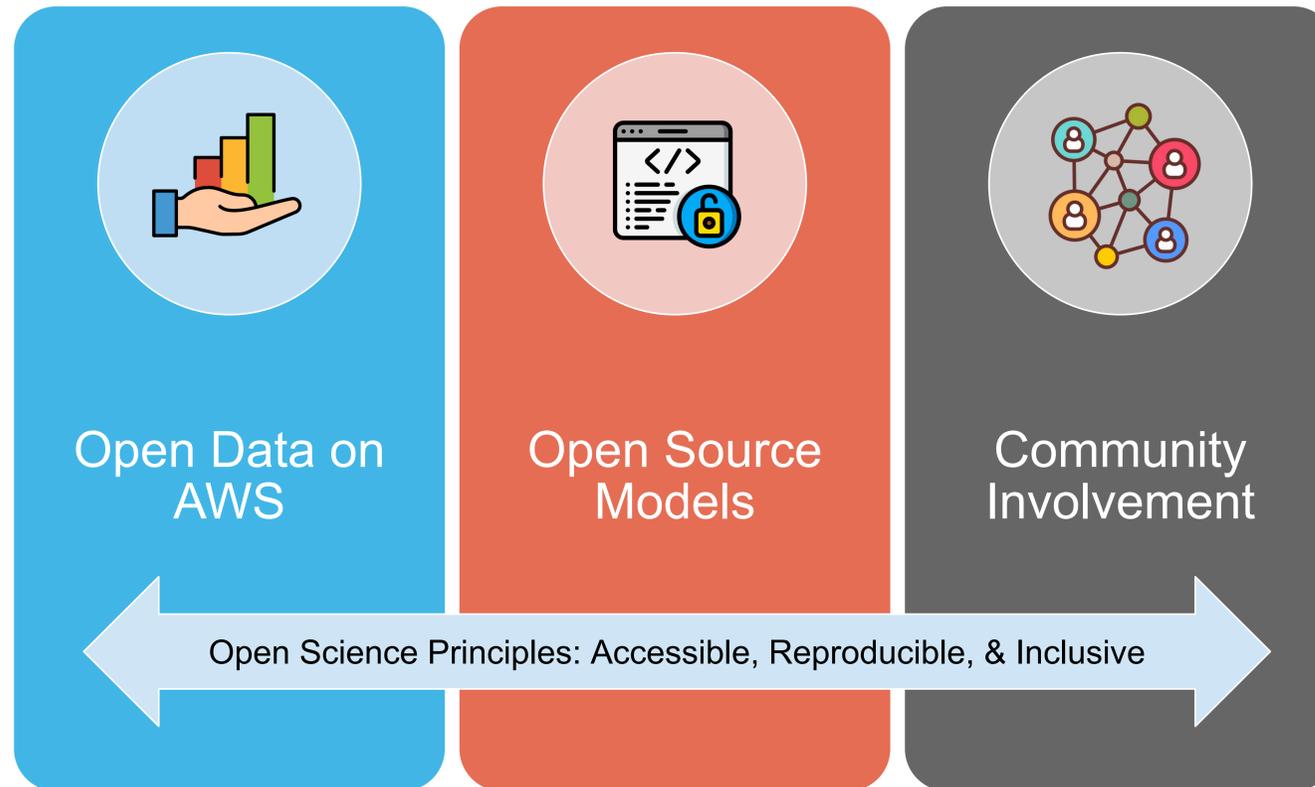
- Provide cloud storage resources to allow the science community to discover high-value cloud-optimized NASA datasets within AWS's Registry of Open Data.
- Provide cloud compute resources to support workshops focused on promoting hands-on experience with using NASA data and artificial intelligence (AI) models co-located on the cloud.

IBM Research: Applications of Artificial Intelligence (AI)

- Explore the concept of AI Foundation Models (FM) to advance NASA science research and applications.
- Create a FM for Earth science using geospatial data which can be applied to multiple downstream applications.



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Representation of how public-private partnerships contribute to all aspects of Open Science

Public-private Partnerships combine the strength of government and the innovation of the private sector to create solutions that benefit both parties.

Success Stories

Interdisciplinary NASA science data on AWS:

- Astrophysics Division Galaxy Segmentation Benchmark Dataset
- Biological and Physical Sciences (BPS) Microscopy & RNA Sequencing Benchmark Training Dataset
- Nighttime-Fire-Flare from NASA's Black Marble product
- Mars Spectrometry: Detect Evidence for Past Habitability

All 5 of NASA's Science Mission Directorates have science datasets within the AWS Registry. **Access the full inventory of NASA datasets at <https://registry.opendata.aws/collab/nasa/>**

Open Source Models on Hugging Face:

- Prithvi: the Harmonized Landsat Sentinel-2 Data (HLS) Geospatial FM family pipelines is a temporal Vision transformer pre-trained by NASA and IBM teams on contiguous U.S. HLS data
- Downstream use cases include flood mapping, burn scar detection, crop and other land use classifications.

Full Model Access and Demo videos can be found at <https://huggingface.co/ibm-nasa-geospatial>

Open Science Events:

Examples of NASA community events and workshops using AWS compute resources:

- IEEE GRSS High-Performance and Disruptive Computing in Remote Sensing (HDCRS) Summer School 2023 - <https://github.com/NASA-IMPACT/summer-school-2023>
- NASA Openscapes - <https://github.com/NASA-Openscapes>

References/Acknowledgment

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