The Planetary Computer: Putting Global-Scale Geospatial Data to Work for Conservation and Sustainability

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gratuitous pictures of animals that aren't related to my talk

AI for Earth is three things...

Grants

aka.ms/ai4egrants

ML stuff

aka.ms/ai4etech

Planetary Computer

aka.ms/planetarycomputer

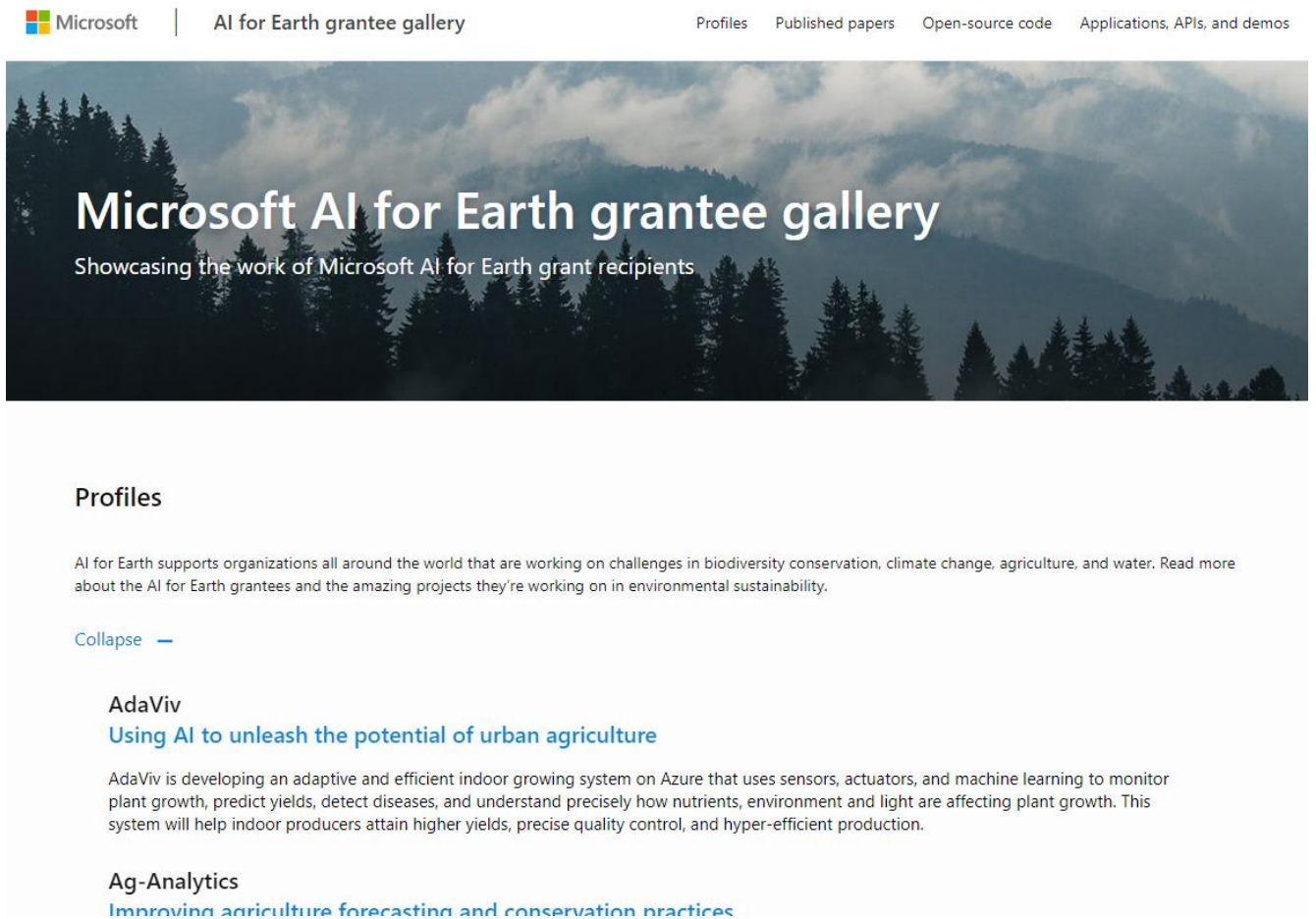
AI for Earth: our grants program

aka.ms/ai4egrants

GEO-Microsoft RFP

aka.ms/geogrant

AI for Earth: grantee stories



aka.ms/ai4egrantees

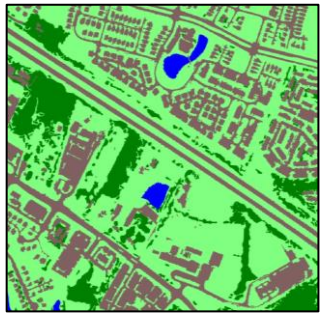
ML stuff AI for Earth builds:

Using ML to help conservation scientists spend *less time clicking stuff*, and *more time doing conservation*.

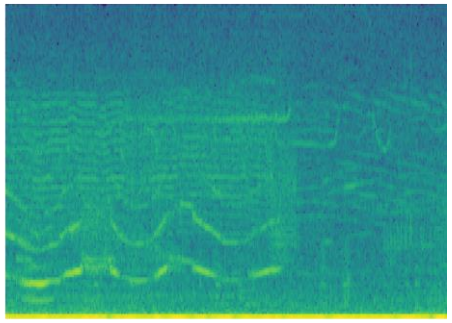
Accelerating *camera trap* surveys
github.com/microsoft/cameratraps

Accelerating *aerial* wildlife surveys
github.com/microsoft/aerial_wildlife_detection
github.com/microsoft/arcticseals

Accelerating *land cover* surveys
aka.ms/landcovermapping



Accelerating *acoustic* wildlife surveys
github.com/microsoft/belugasounds
github.com/microsoft/multi_species_bioacoustic_classification

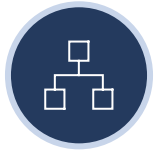


All the fun animal-related work in one place
aka.ms/biodiversitysurveys

Why a Planetary Computer?

Environmental sustainability depends on huge geospatial data sets, especially satellite imagery and climate data.

Working with geospatial data is a pain unless you have a PhD in remote sensing.



Working with very large data is a pain unless you have a PhD in distributed computing.

The people at the front lines of conservation usually have neither of the above.

The Planetary Computer ***platform*** puts key environmental datasets alongside processing tools and a managed compute environment to lower the access barrier for sustainability practitioners.

Planetary Computer ***applications*** put that platform to work for environmental decision-making.

Planetary Computer Components

Geospatial **data** (currently ~25PB)

Data querying and processing **APIs**

Compute environment (aka “Hub”) for analytic workflows

(Partner) **applications** that put all of the above to work for sustainability

Planetary Computer Data

Remote sensing data

- Landsat 4, 5, 7, 8
- Sentinel-1, -2, -3, -5P
- GOES-16, -17
- MODIS, NAIP, ASTER, HLS
- NASADEM, ALOS DEM, Copernicus DEM

Weather/climate data

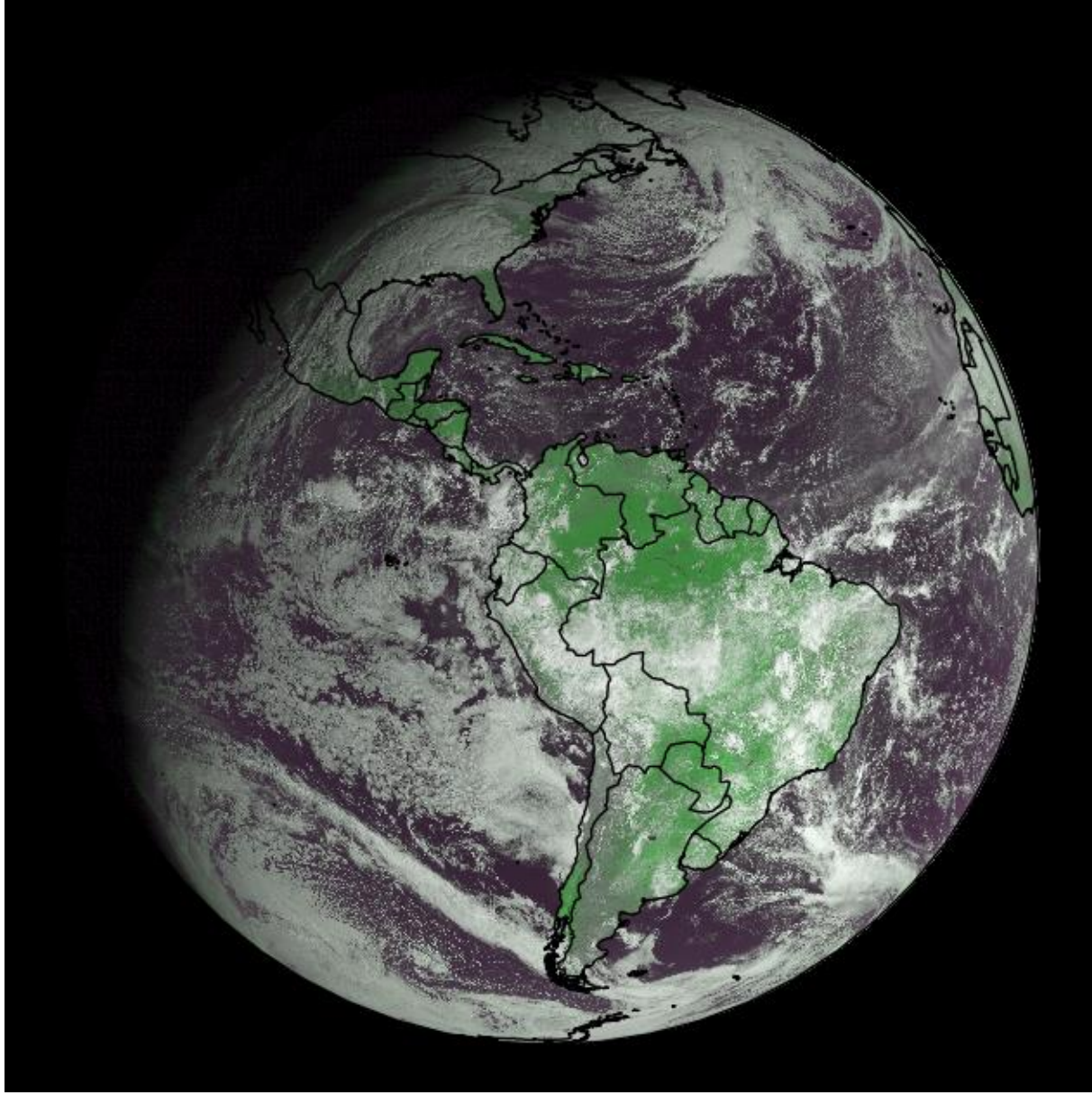
- GFS, HRRR, ISD, GHE, TerraClimate, Daymet, CMIP6

Land cover data

- USGS GAP, Esri 10m, JRC Water, NLCD

Biodiversity data

- GBIF, NatureServe MoBI, USFS FIA



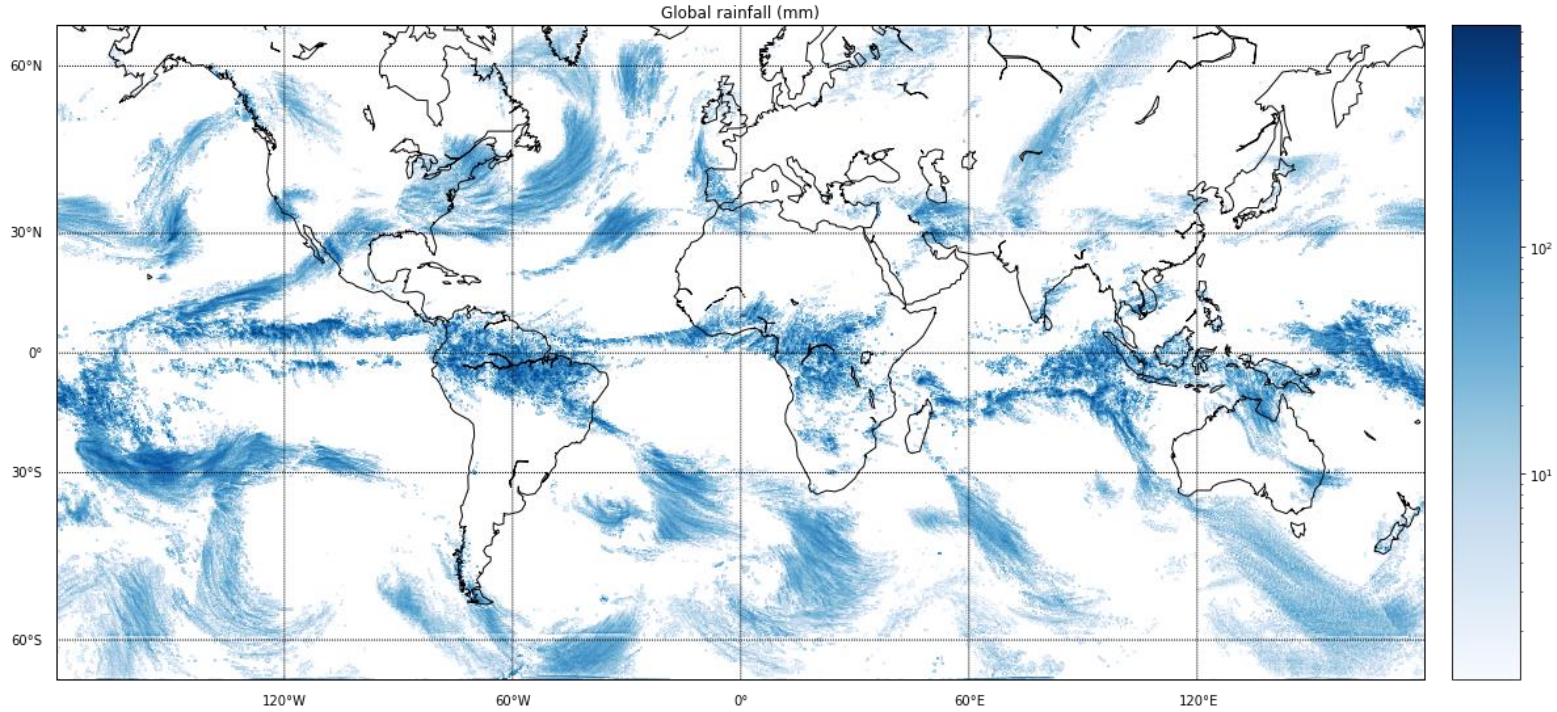
planetarycomputer.microsoft.com/catalog

That gets us to a super-slick pile of files…

Planetary Computer APIs

Spatiotemporal queries
("find me all the images that overlap with Wyoming in 2012")

Image processing APIs: e.g. resampling to new grids, blending images

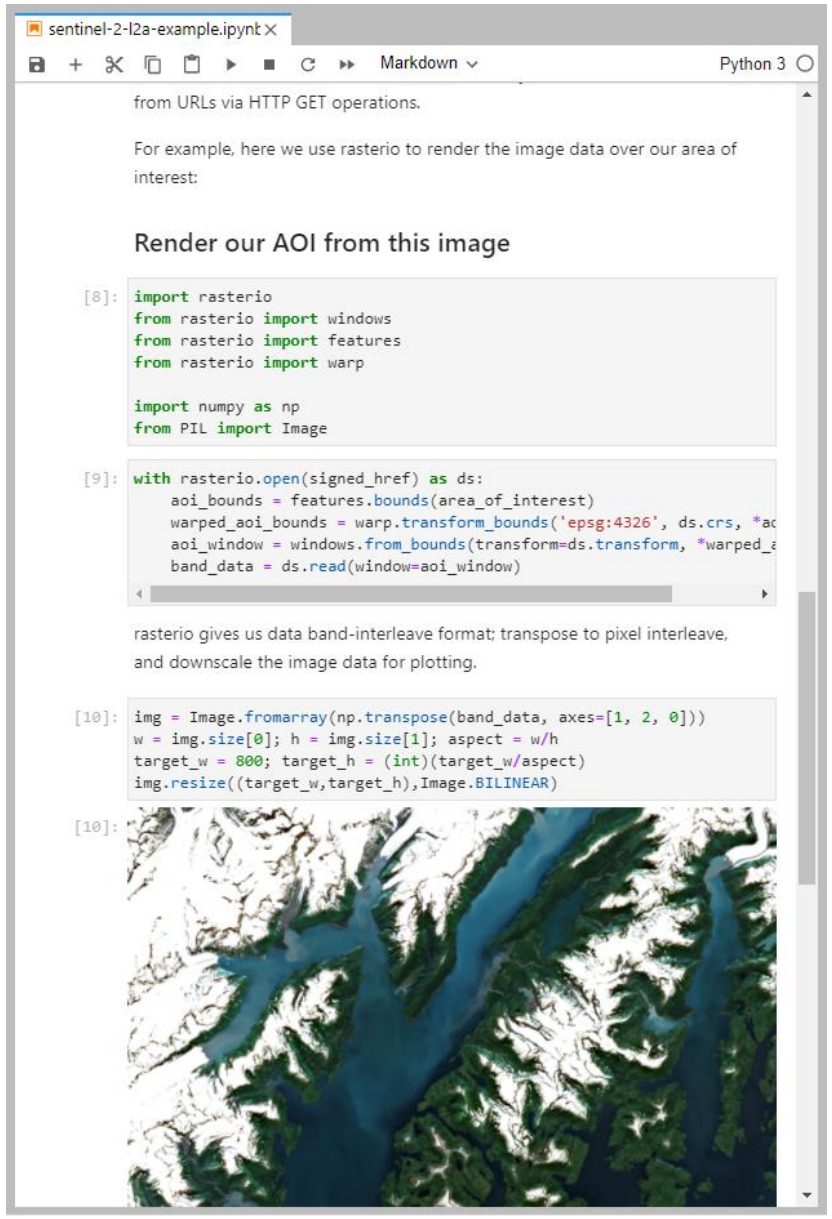


That gets us to a super-slick pile of files that's easy to query…

Planetary Computer Hub

- JupyterLab front-end
- Access to Planetary Computer Data and APIs, and to user data on Azure storage
- Distributed processing (without having to know what “distributed processing” is)

planetarycomputer.microsoft.com/compute

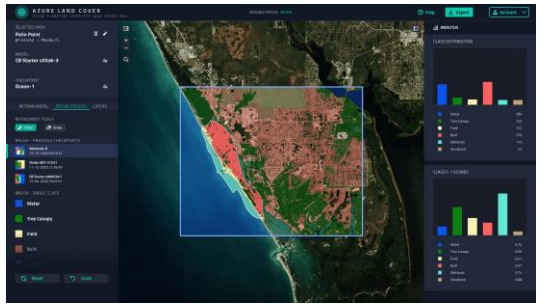


That gives us a super-slick pile of files that's easy to query, and the power to compute over it…

Some key launch applications…

Land use and land cover assessment

Accelerating geospatial image analysis with cloud-based AI, in partnership with Development Seed

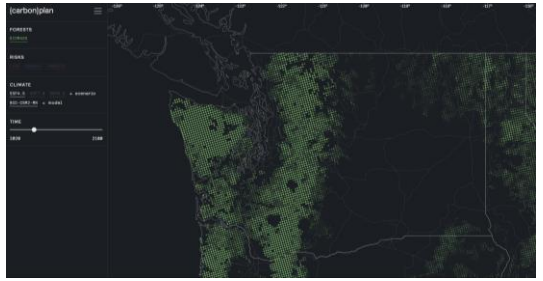


Deforestation risk analysis

Estimating at-risk areas in the Amazon, in partnership with Imazon and Fundo Vale

Prioritizing carbon offset projects

Leveraging climate and fire risk models to inform decisions about forest protection projects, in partnership with CarbonPlan



planetarycomputer.microsoft.com/applications

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