



**National Aeronautics and Space
Administration**

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Integrated Air Quality Information Platform

Thomas Huang

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Group Supervisor – Instrument Software and Science Data Systems section
Strategic Lead - Interactive Data Analytics

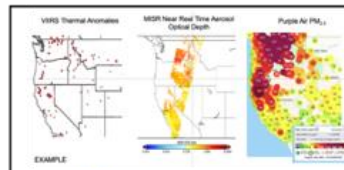
NASA Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive, Pasadena, CA 91109-8099, U.S.A.



Wildfire and Air Quality Information Platform



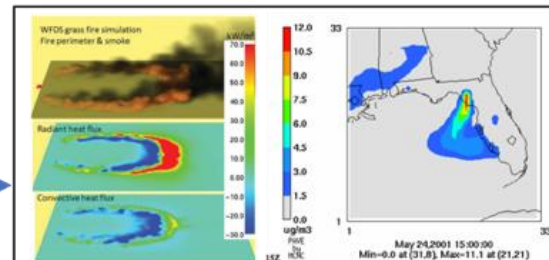
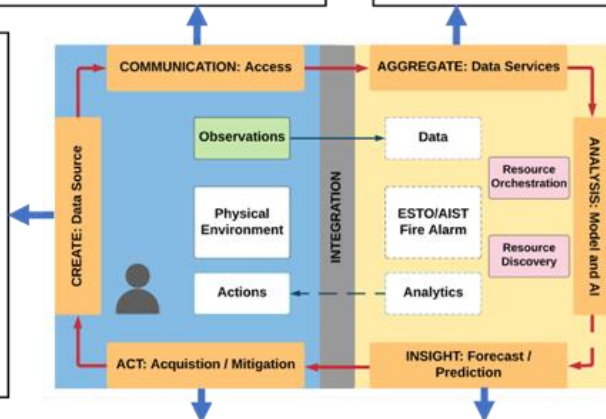
Automate access to fire data
repositories for the each fire
event of interest



Harmonize datasets to track pre-
fire, active fire, and post fire
impacts for the event of interest



Acquire Observations



Dynamic Data Assimilation; AI-based
Models; Dynamic Downscaling;



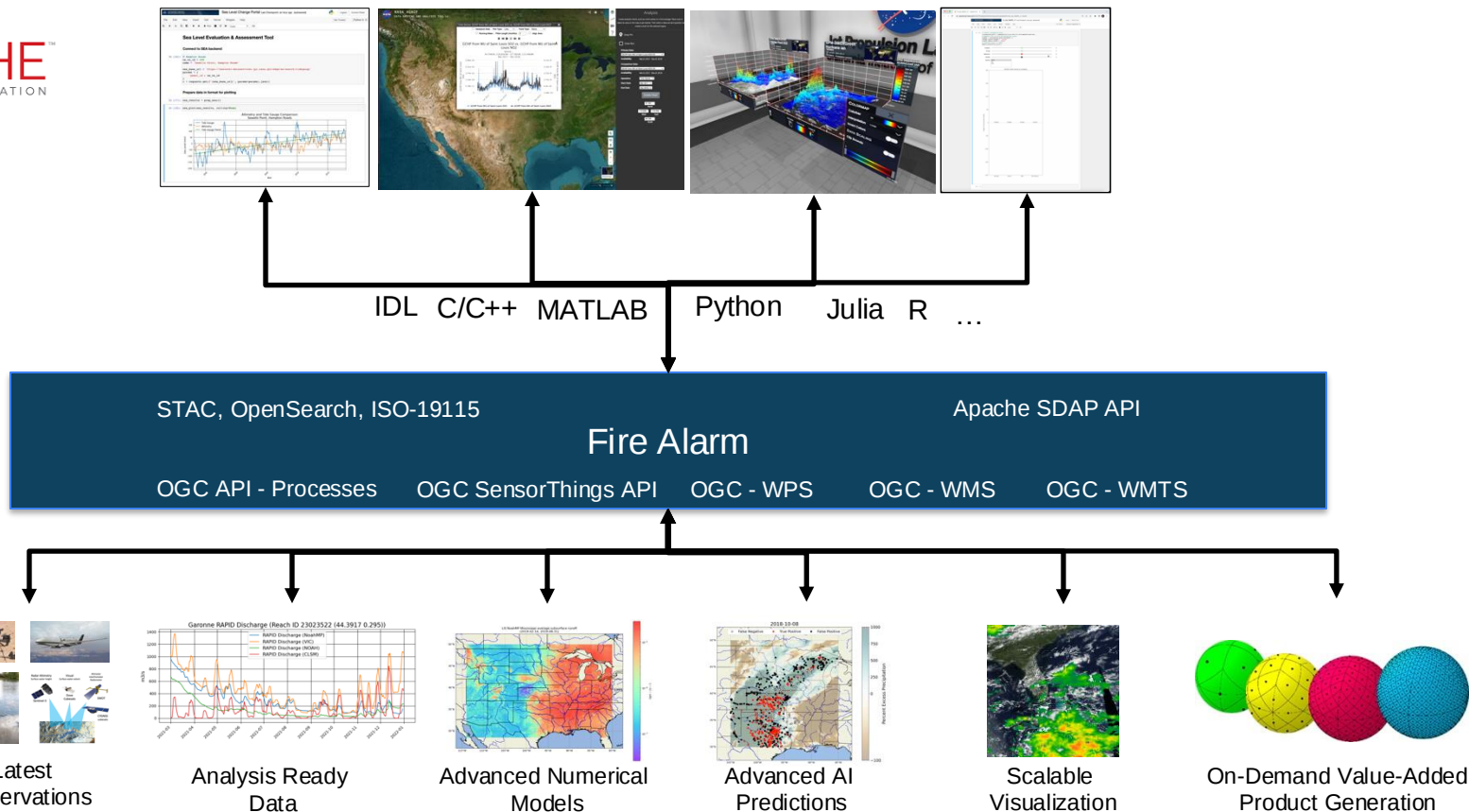
Decision Support
and Science



Forecast and Prediction

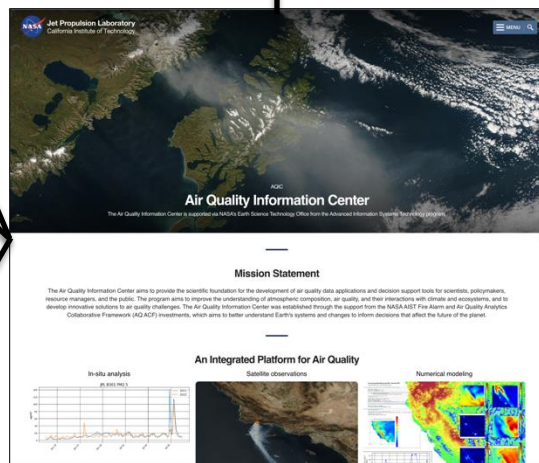
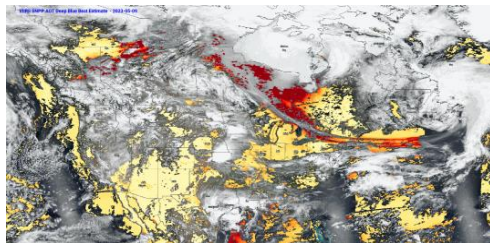
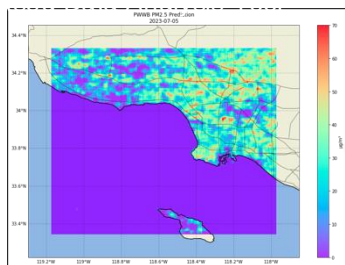
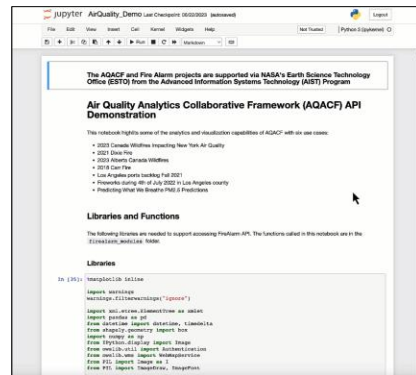
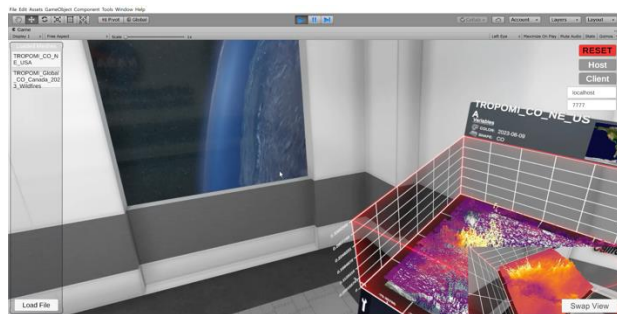
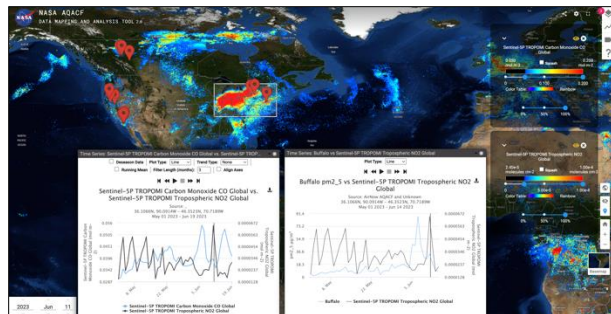


Professional Open-Source AQ Platform





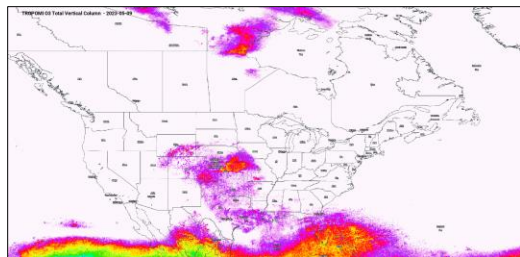
NASA's Open-Source ESDT Platform for Air Quality



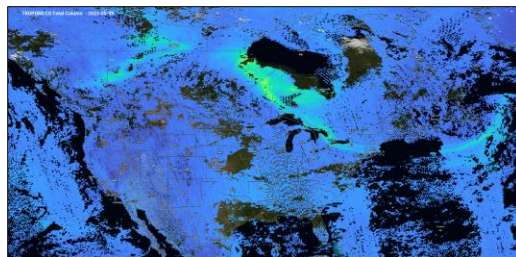
- Built on a decade of NASA's big data investment
- Professionally Open-Source through the Apache Software Foundation
- One AQ information platform for access, visualize, and analyze measurements from
 - Satellite
 - Model
 - In-situ
 - ML Predictions



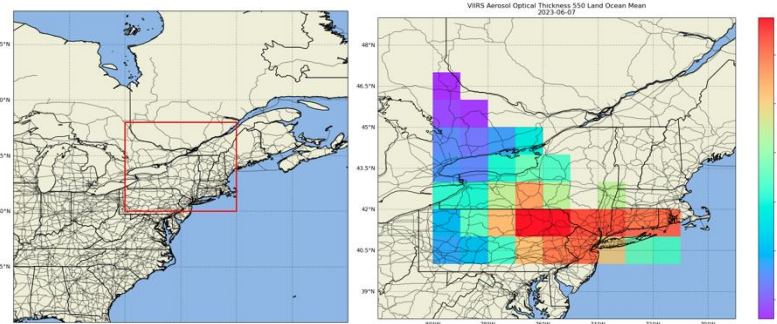
Visualize and Analyze Smoke from the Canadian Wildfire



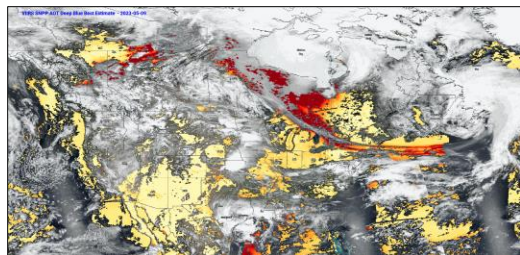
TROPOMI O3 Total Vertical Column
2023-05-09 – 2023-06-08



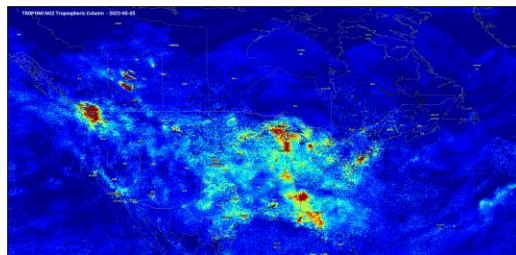
TROPOMI CO total column
2023-05-10 – 2023-06-09



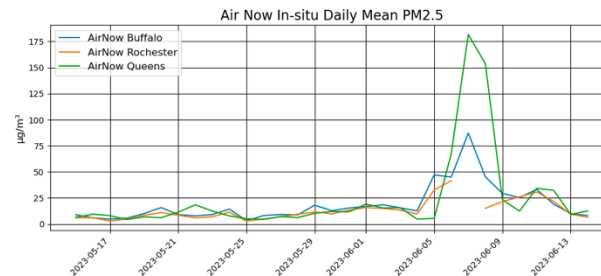
VIIRS Aerosol Optical Thickness
2023-06-07



VIIRS SNPP Aerosol Optical Thickness
Deep Blue Best Estimate
2023-05-10 – 2023-06-09



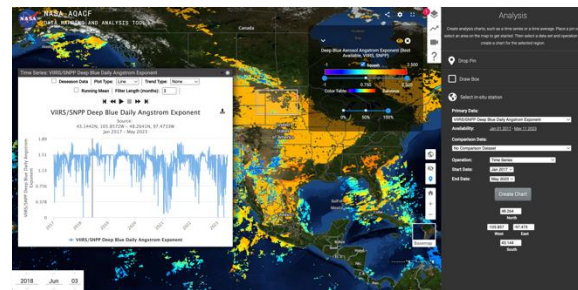
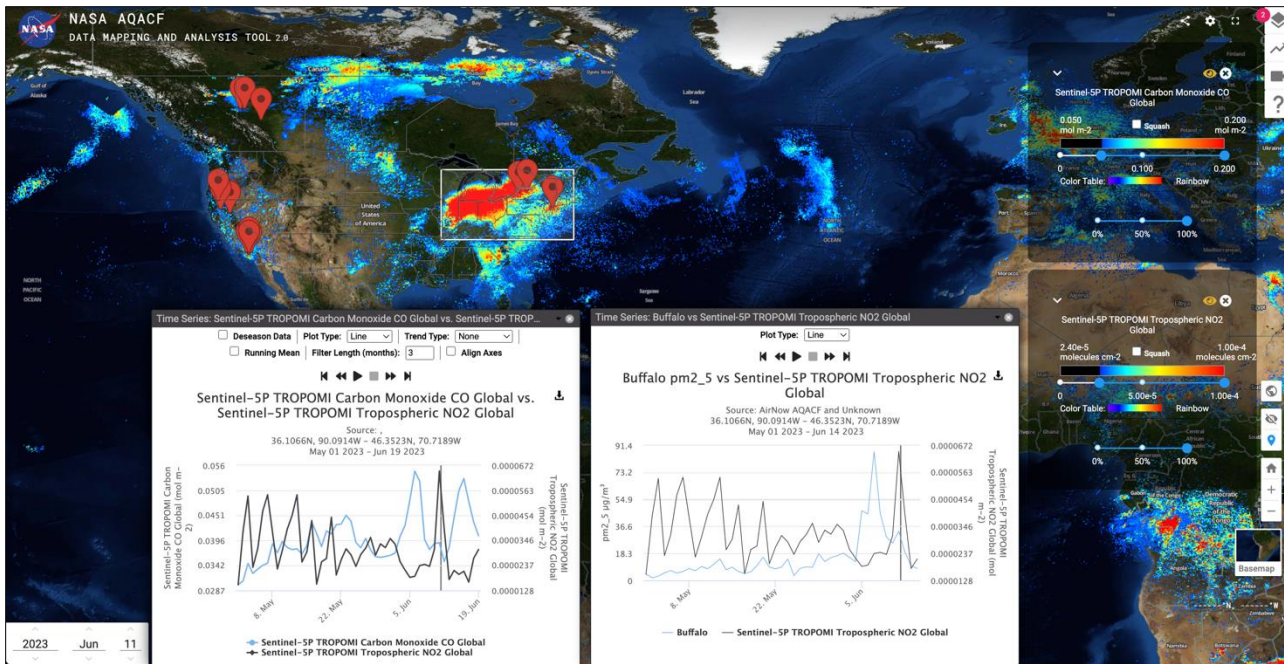
TROPOMI NO2 Tropospheric Column
2023-05-06 – 2023-06-05



AirNow Buffalo, Rochester, and Queens
PM_{2.5} – 2023-05-15 – 2023-06-14

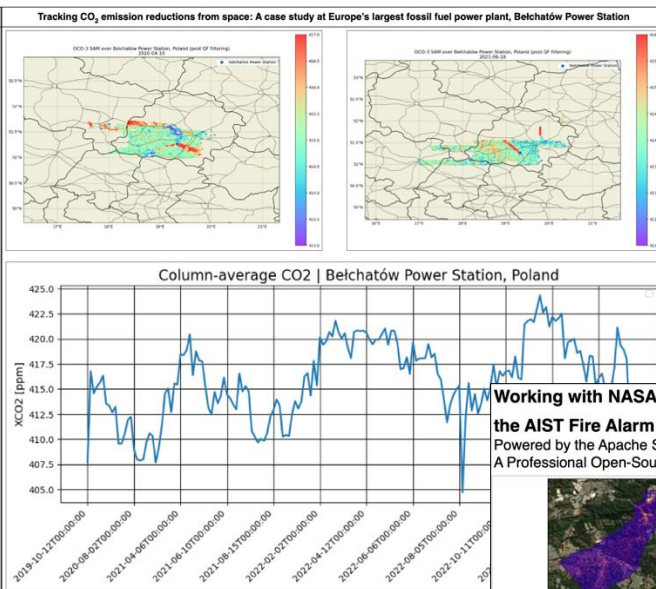
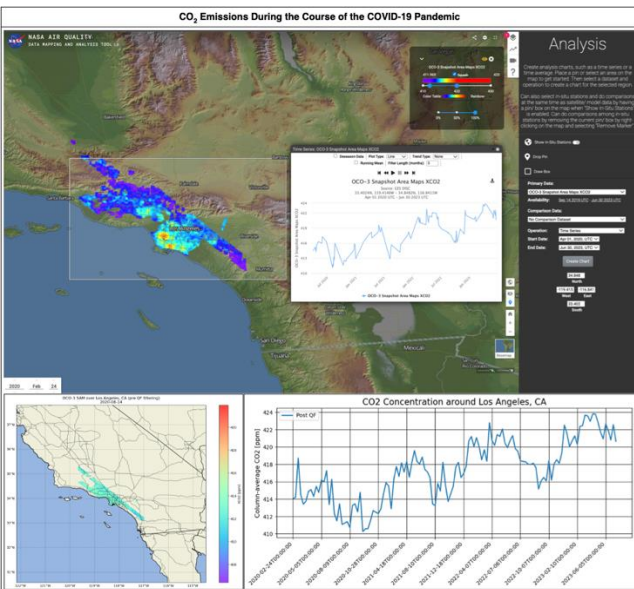


Web-based AQ Data Analysis Tool

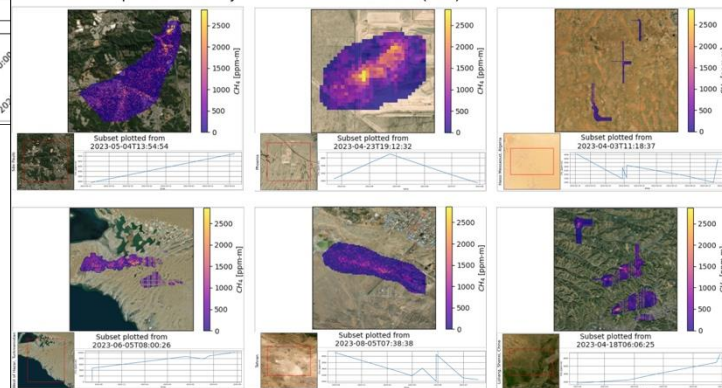




Greenhouse Gas

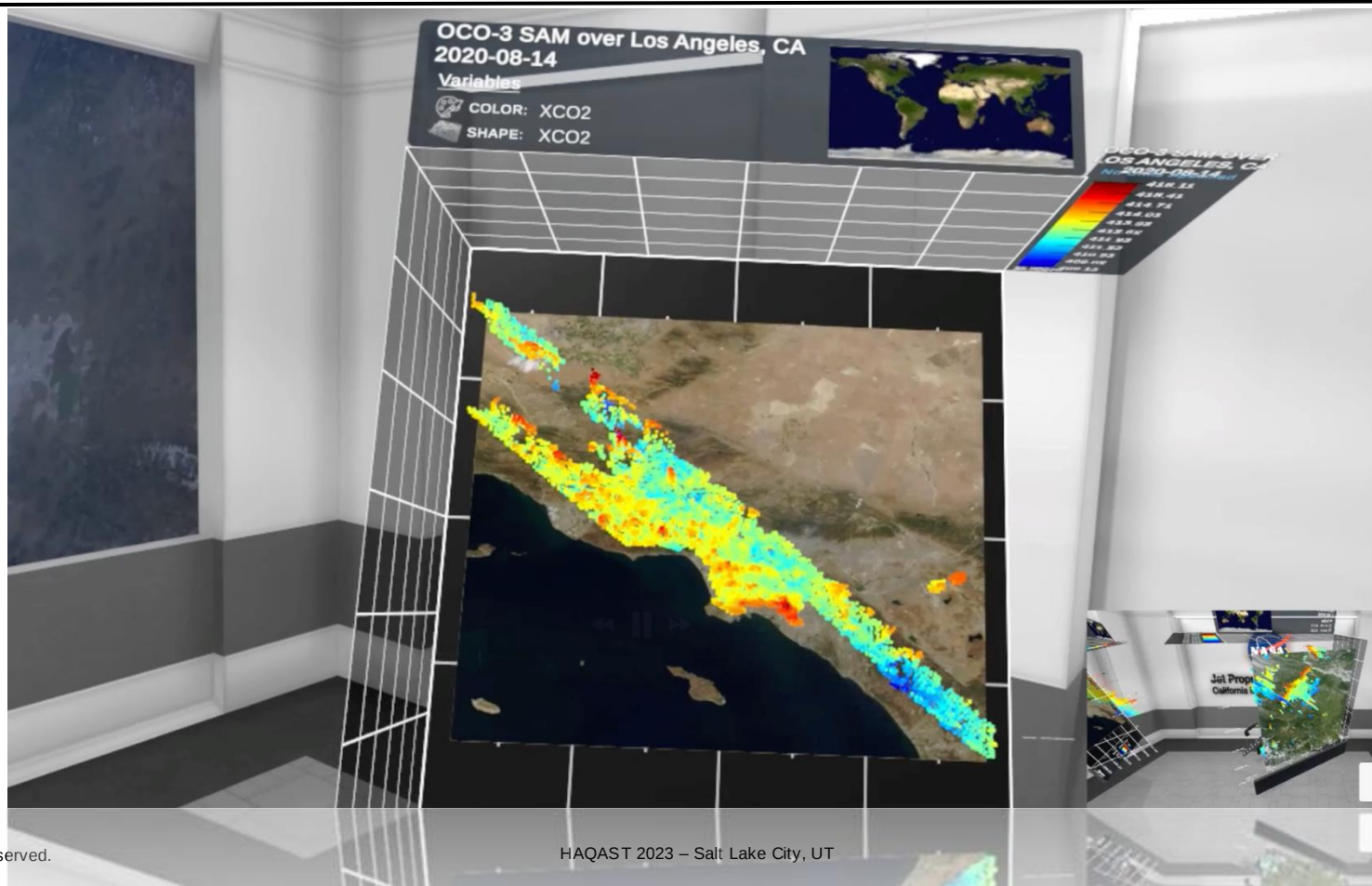


Working with NASA EMIT Mission's Methane (CH₄) Plume Data on the AIST Fire Alarm - an Integrated Air Quality Information Platform
Powered by the Apache Science Data Analytic Platform (SDAP)
A Professional Open-Source Analytic Collaborative Framework (ACF)





Greenhouse Gas (XCO₂ in LA and Wuhan)





Open-Source Science and Community Collaboration

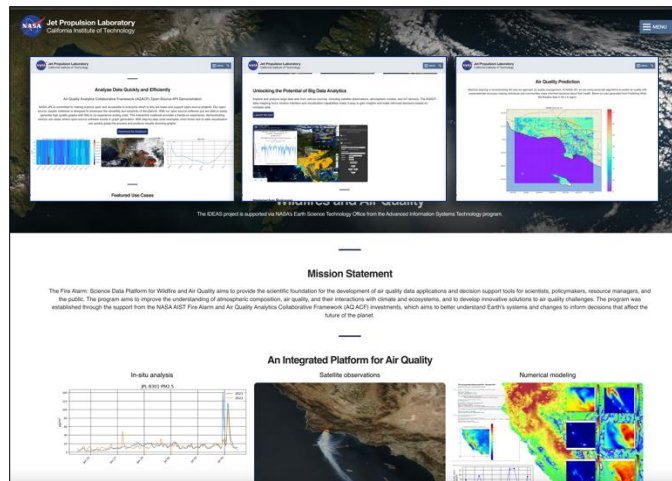
- Partnership with Apache Software Foundation
- Define and refine standards by working with OGC, GEO, NIH, CNES, EU, and ESA
- Evolve the technology through community contributions
- Open-Source Science
 - Technology demonstrations. Share recipes and lessons learned
 - Inclusive and Diverse Project Management Committee (PMC)
- Host webinars, hands-on cloud analytics workshops and hackathons



NASA HEALTH AND AIR QUALITY
APPLIED SCIENCES TEAM



ONE PLATFORM for AIR QUALITY



<https://ideas-digitaltwin.jpl.nasa.gov/airquality/>



**DARE MIGHTY THINGS
TOGETHER!**