NASA-ESA-JAXA EO Dashboard

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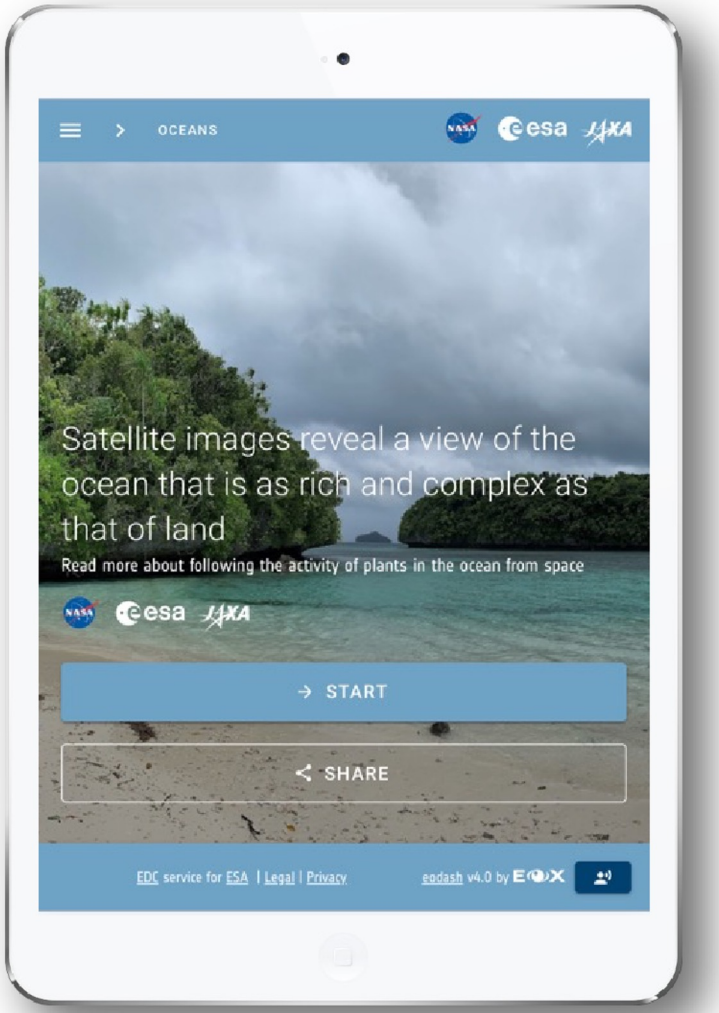
Project overview

- Objectives and timeline
- Contributing activities
- Main Features & Demo
- Vision and roadmap



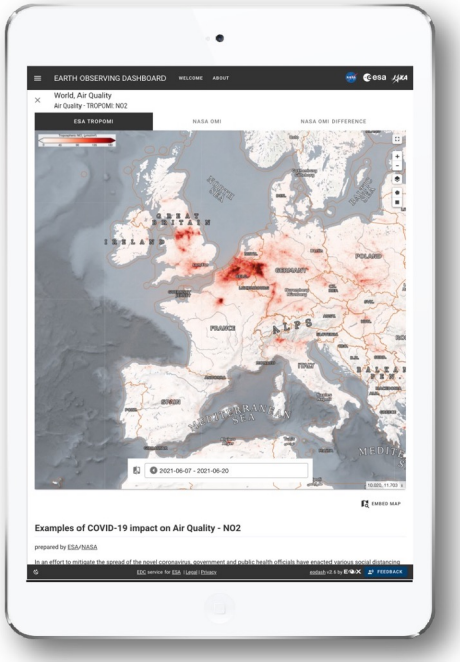
Objectives & Timeline

First Release June 2020

OBJECTIVE 1. Demonstrate joint capabilities of NASA-ESA-JAXA to observe COVID-19 environmental and economic impacts from space

OBJECTIVE 2. Communicate indicators to the general public and decision makers

OBJECTIVE 3. Engage the wider public via competitions, e.g. EO Dashboard Hackathon, SpaceApps



KEY ACHIEVEMENTS

Rapid release

3 months

https://eodashboard.org released in June 2020

EO Indicators

12 EO missions

Tri-agency science teams developed indicators using EO data from 12 ESA, NASA, JAXA missions

Global Users

146 countries

Accessed from all regions and continents

Communication

251 citations

Cited on 251 websites and joint participation to CEOS, AGU, SpaceApps, etc.

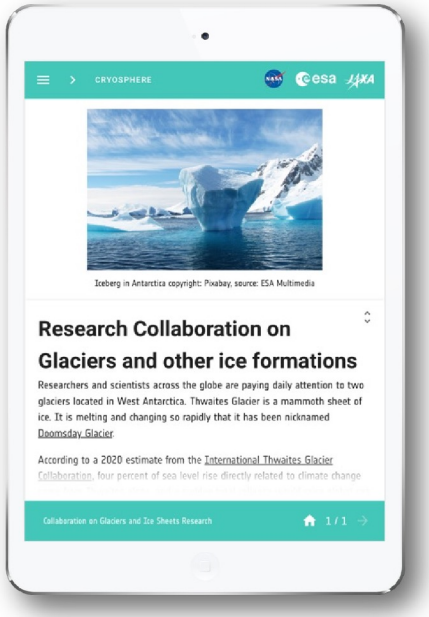
Objectives & Timeline

Second major release 2022

OBJECTIVE 1. Communicate tri-agency scientific findings with societal relevance through storytelling for 7 thematic domains: atmosphere, oceans, biomass, cryosphere, agriculture, economy, covid-19, using open data

OBJECTIVE 2. Strengthen the links with relevant communities including data science and related training and education, and enhance participation and awareness on EO for societal impact

OBJECTIVE 3. Promote Open Science Practices



KEY ACHIEVEMENTS

New Content

25 EO Missions

Expanded EO indicators covering 7 new domains

Storytelling

15 Stories

Jointly developed stories to communicate tri-agency scientific findings

Training & Education

3 Workshops

Jointly delivered hands-on workshops and trainings at major events LPS, IGARSS, FOSS4G, etc.

Open Science

Open-Source

Jointly developed open-source code, notebooks and tools to exploit tri-agency data

Objectives & Timeline

Ongoing work 2023-2024

OBJECTIVE 1. Strengthen interoperability across ESA, NASA and other agencies' infrastructures

OBJECTIVE 2. Expand scientific findings supported by joint EO data and communicate via storytelling with advanced visualization

OBJECTIVE 3. Promote Open Science best practices and engage with the community

KEY ACHIEVEMENTS

Interoperability

ESA-NASA-OGC Open Science Persistent Demonstrator

Storytelling

4 new Stories

Released 4 new stories on Cryosphere. Biomass and Inland Water stories are in development

Training & Education

3 Workshops

IGARSS Sessions on Open Science, FOSS4G and IGARSS Workshops, BiDS 2023, EGU, GEO ODOK, etc.

Promote Cooperation

IAF Award "Space for Climate Protection"

Contributing Activities

- EO Dashboard is supported by the three agencies via several activities
- Each agency contributes with:
  - EO Data and EO Science
  - In-kind expertise (scientific analyses, communication)
  - Infrastructure and technology: NASA's VEDA, ESA's Euro Data Cube, Jaxa's Earth Graphy
- Through the **Open Science Persistent Demonstrator** ESA and NASA will sponsor pilots to further open-source development by the community to enhance EO Dashboard visualisation and information exchange (among other actiivites) → **see presentation on Wednesday by OGC to learn how to participate**

veda
Visualization Exploration & Data Analysis

EDC

Network of Resources
Sponsorship

JAXA Space Technology Directorate I
Earth-graphy
All about JAXA's Earth Observations

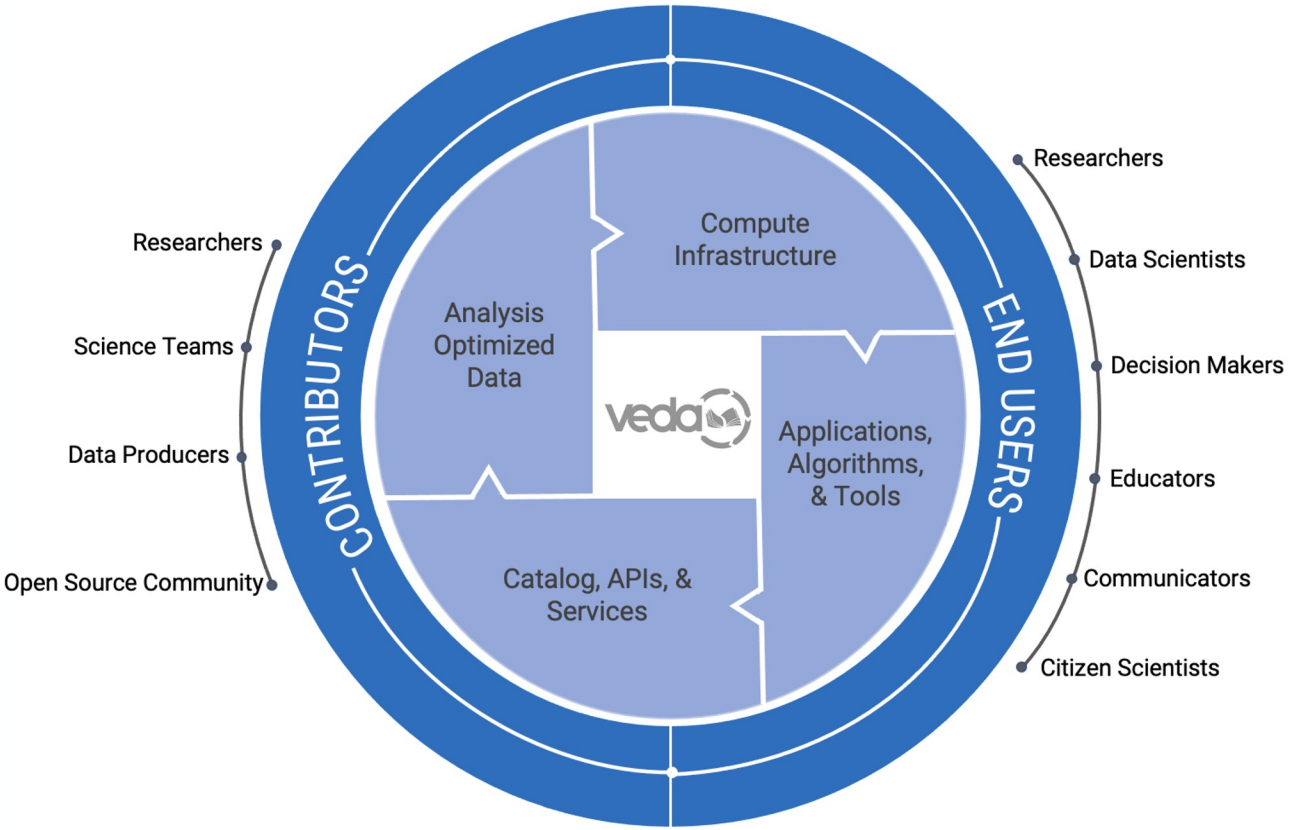
NASA's VEDA:
Visualization, Exploration, and Data Analysis

Why?

Interdisciplinary science depends on large amount of Earth science data and computational resources

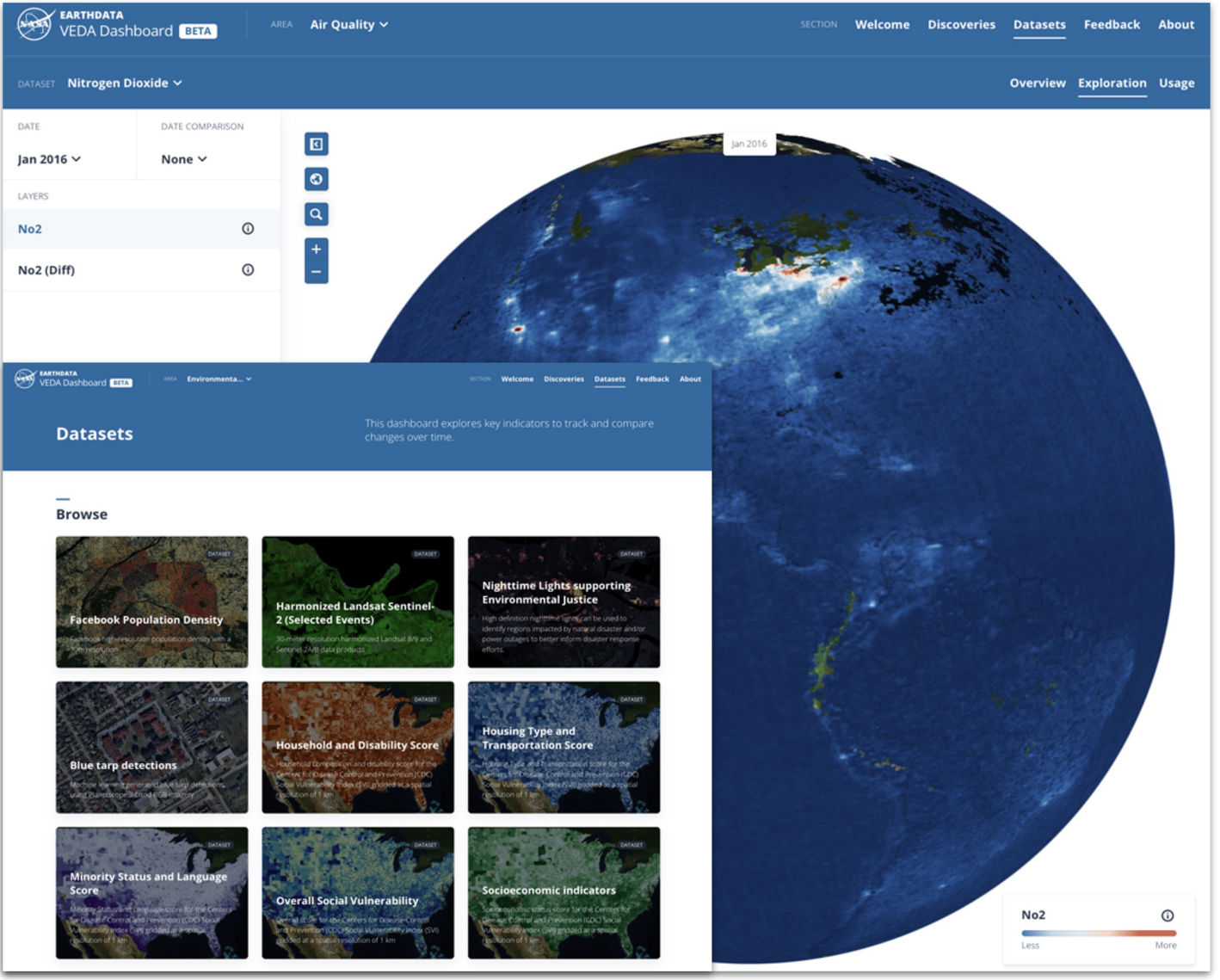
Working with these datasets is non-trivial

Big data science requires advanced distributed computing knowledge



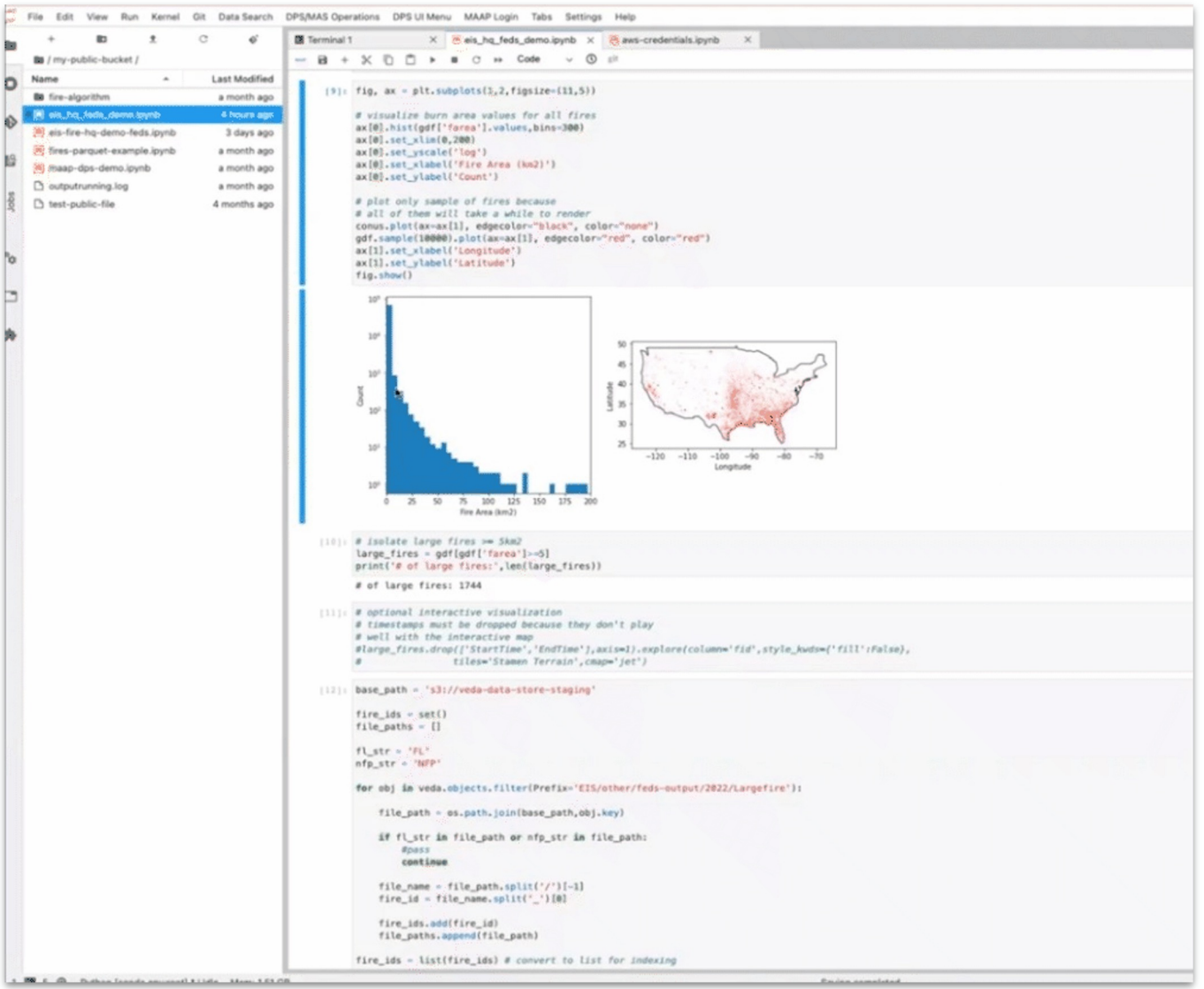
What?

VEDA is an open platform that brings key Earth science datasets next to **open source tools** for data processing, analysis, visualization, and exploration in a managed and **more accessible** computing environment



Finding relevant data products

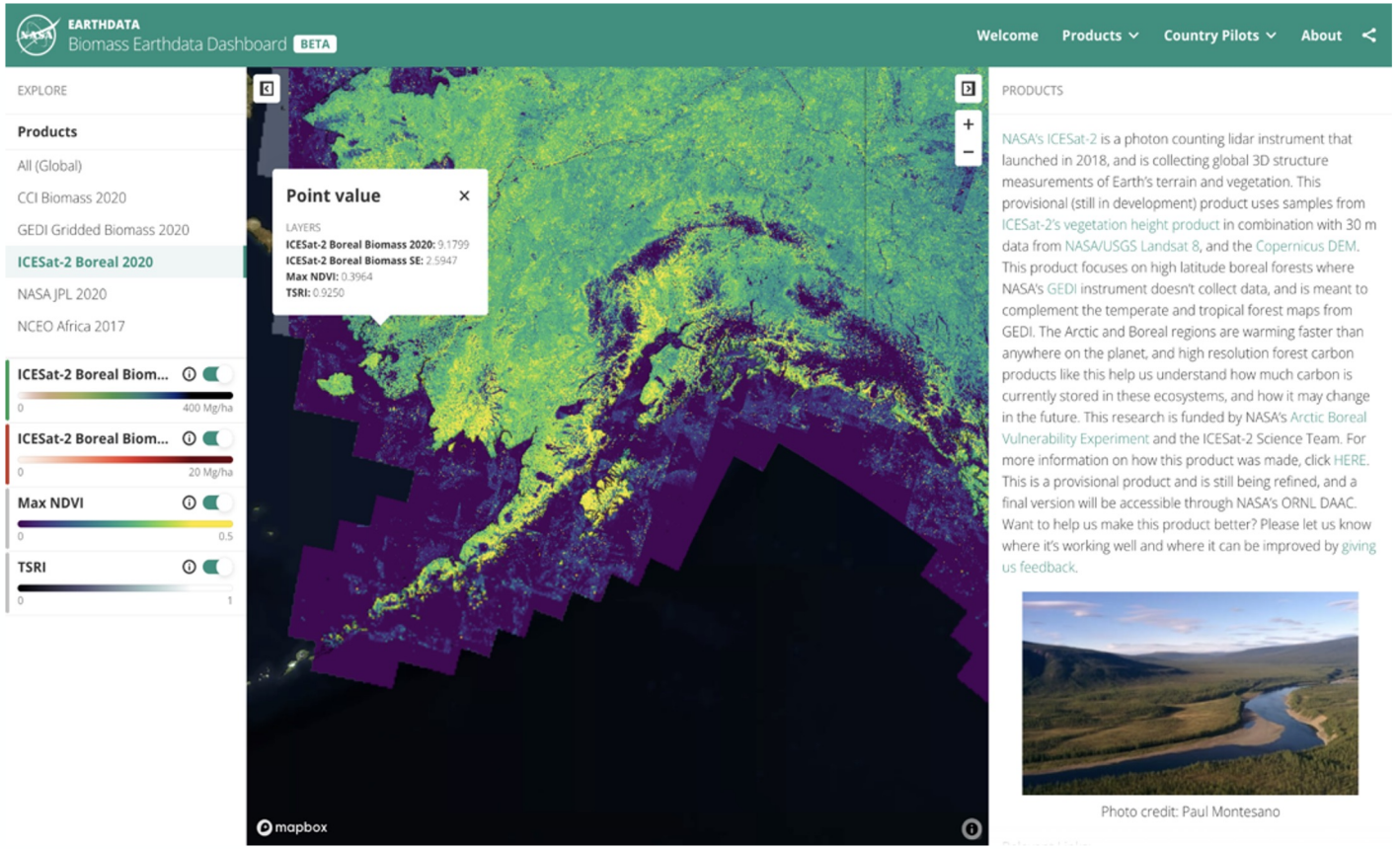
Exploring data to identify interesting features



Developing advanced data products and analysis

Carrying out calculations "in place" without the need to download data

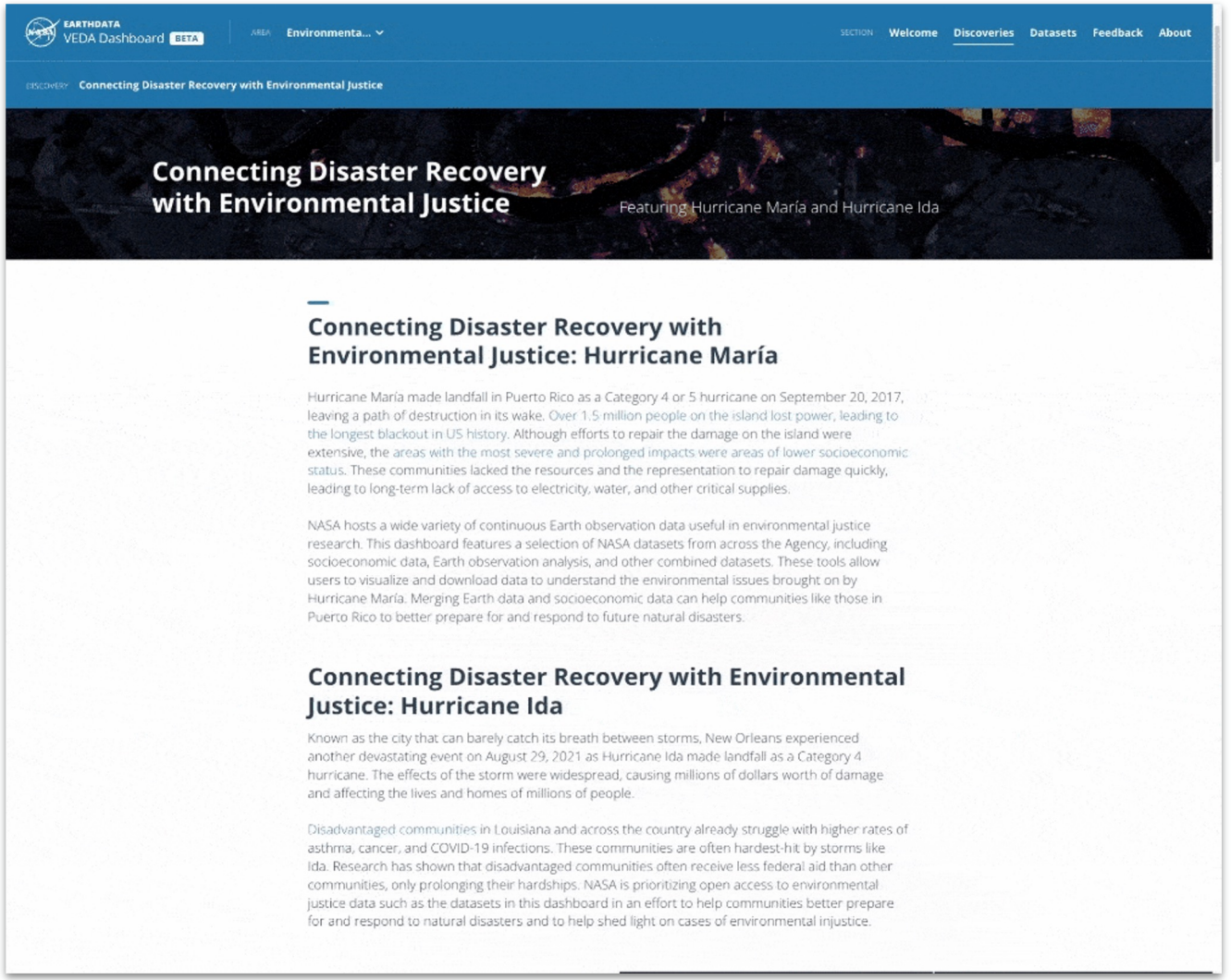
Dynamically allocating resources for computationally demanding processing



Conveniently delivering data through existing interfaces

Providing automatic access to interactive visualization capabilities

Allowing users to analyze your products within the environment



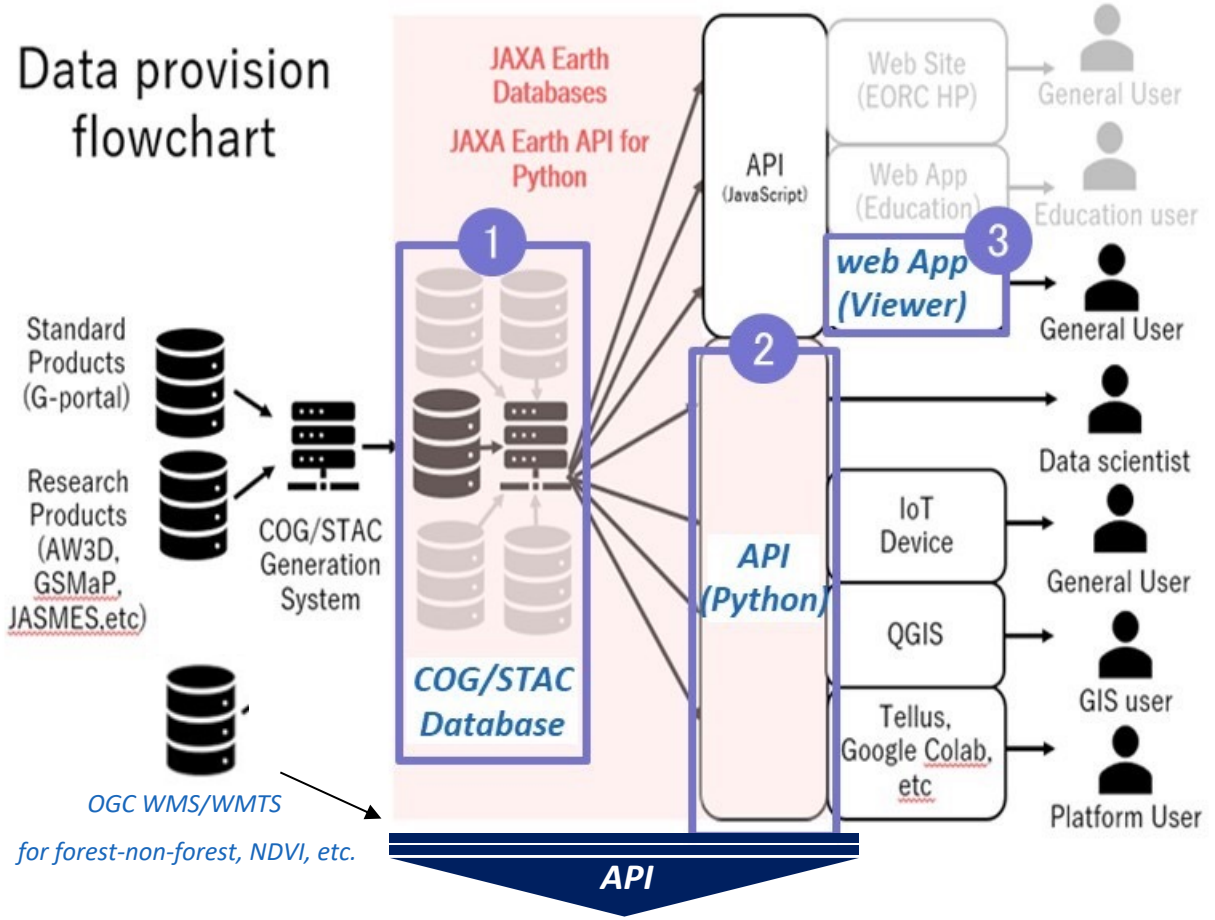
User friendly data-driven storytelling

Enrich science and applications narratives with interactive exploration

VEDA supports the NASA-ESA-JAXA EO Dashboard

JAXA's "Earth-graphy" interconnected with EO Dashboard through API and WMS/WMTS

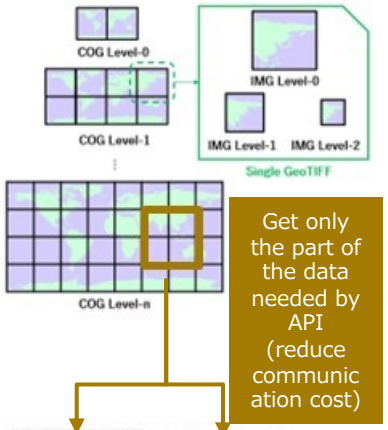
To provide easy access of JAXA's earth observation data and information



1 JAXA Earth Database

*: contains 74 types of JAXA's EO satellites data with Cloud Optimized GeoTIFF **(COG)** format and metadata by SpatioTemporal Asset Catalogs **(STAC)** format named "CEOS Analysis Ready Data for Land **(CARD4L)**"*

https://data.earth.jaxa.jp/en/datasets/

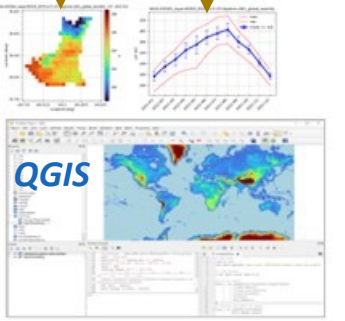


2 JAXA Earth API (for Python)

: acquires EO data from database directly
: performs remote sensing processes, statistical processing and imaging
: has an IF function with QGIS

… JavaScript API is under development

https://data.earth.jaxa.jp/en/

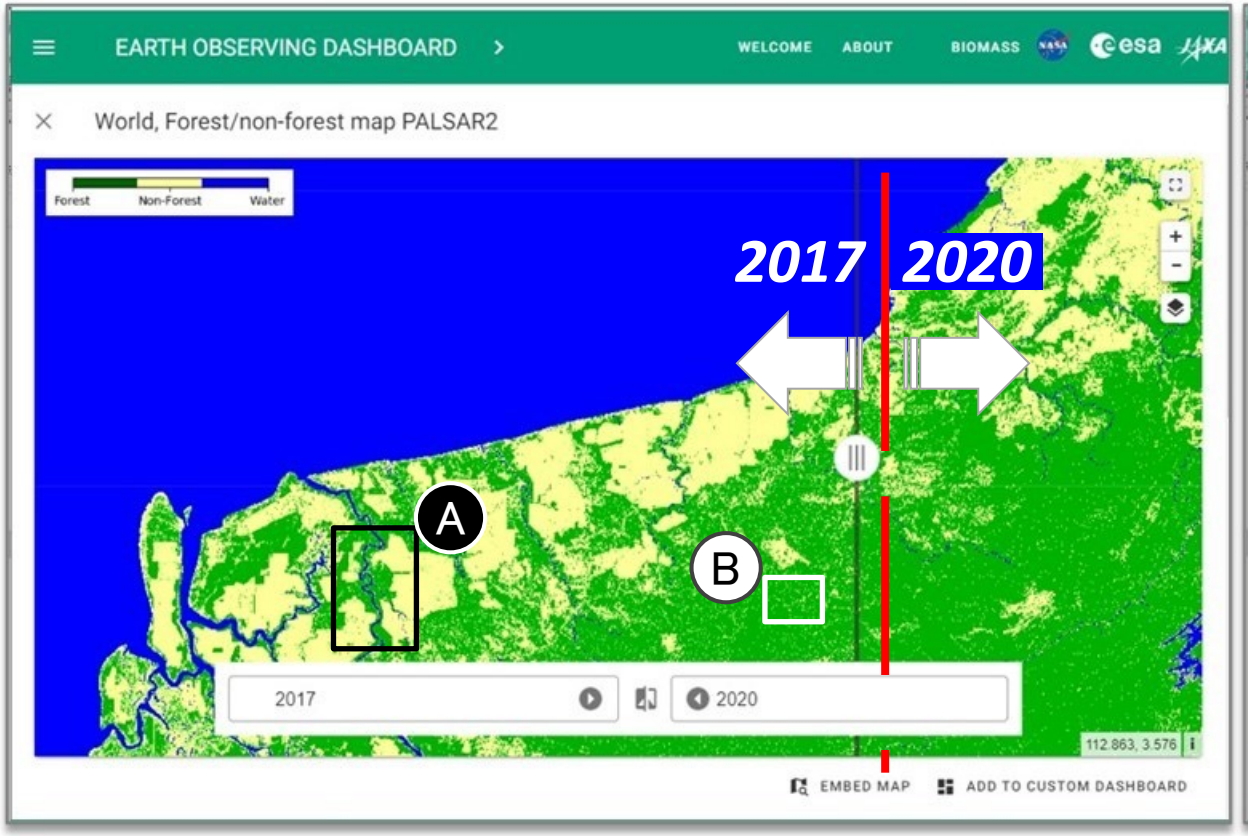


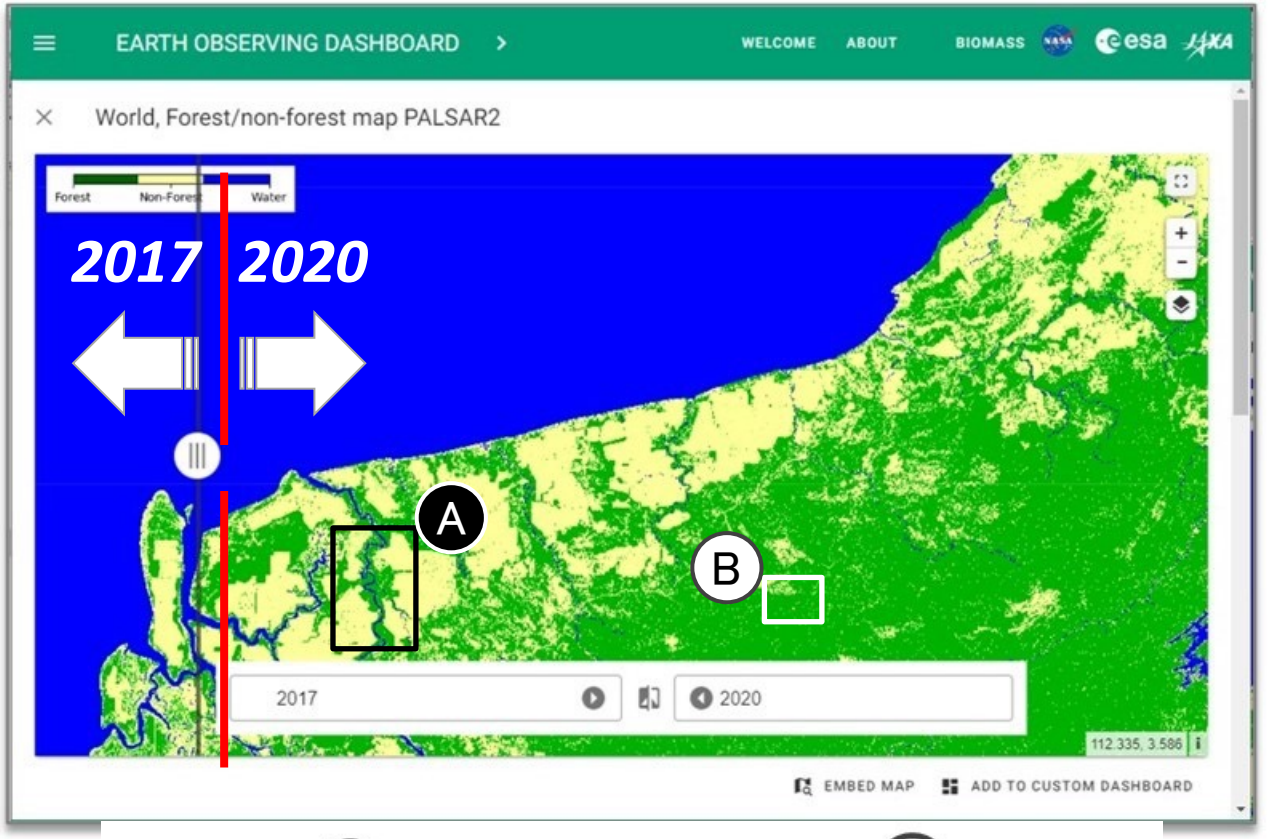
3 JAXA Earth Data Explore

: a web application that allows to check various satellite data stored in COG/STAC database

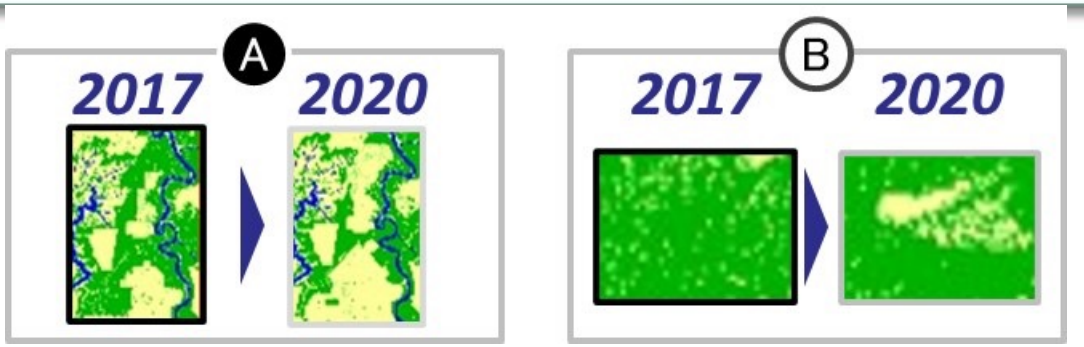
https://data.earth.jaxa.jp/app/explorer/

Global PALSAR-2 FNF using OGC WMS/WMTS through EO dashboard or QGIS





Comparison of Forest/Non-Forest area between 2017 and 2020



Identify the extent of deformation

https://ogcpreview1.restecmap.com/examind/api/WS/wms/JAXA_WMS_Preview

Euro Data Cube

EURO DATA CUBE

Euro Data Cube Services

Earth Observation Information Factory

- **one-stop-shop for EO** - you can find all important EO and derived data products at one place
- **analyse** an event or phenomena from different perspectives
- provision of multiple data sources
- **compare** and **correlate** several variables at the same time
- **customize** your data pipeline
- try it out for **free**
- kick-start your **Earth Observation Application**!

Data Access

Conveniently access global archives of analysis-ready Earth Observation data from all the major providers in one place

Processing Capabilities

Manage your own computation and storage environment. Take advantage of data cube technology or batch processing capabilities for resource-intense use cases

Collaborate & Sell

Share your data and algorithm with the community and customers on the EDC Marketplace

Euro Data Cube in a nutshell is a combination of several services:

Global Archives of Analysis Ready Data

Open satellite missions - Sentinel, Landsat, MODIS, etc.

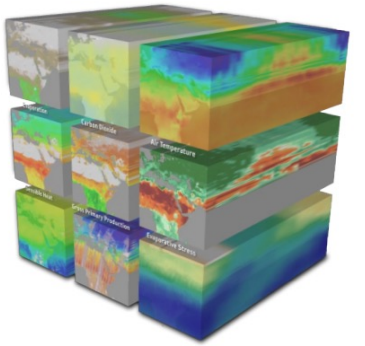
Commercial VHR datasets - PlanetScope, Pléiades, SPOT, etc.

Earth System Data Cube

ESA and Copernicus Climate Change Initiative

User contributed content

Data fusion in order to combine various datasets



https://eurodatacube.com

Network of Resources

- NoR Portfolio https://nor-discover.cloudeo.group/
- ESA Sponsorship:
- Any user can apply for ESA Sponsoring of cloud resources for research, pre-commercial, development and demonstration activities that do not generate revenue
- 3 steps:
  - Browse the NoR Discovery Portal and select provider
  - Use the Wizzard to calculate the price
  - Fill in the ESA sponsoring and send to nor-sponsorship-requests@esa.int
- The NoR will provide successful applicants with a voucher for the selected services, allowing free-at-point-of-use consumption for research

- **Get in touch if you are interested to become a provider of services on the NoR**

Network of Resources

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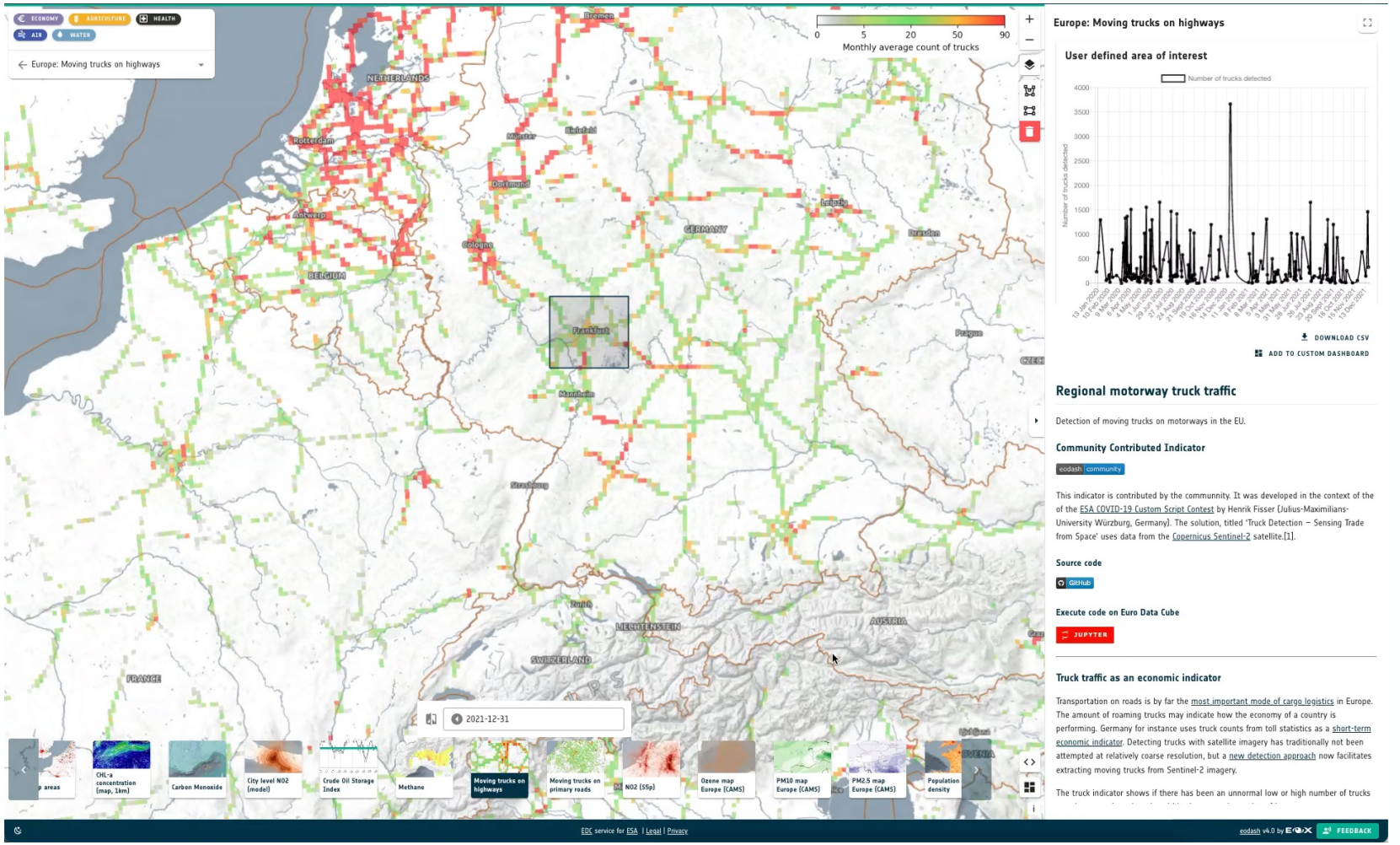
Vision and Roadmap

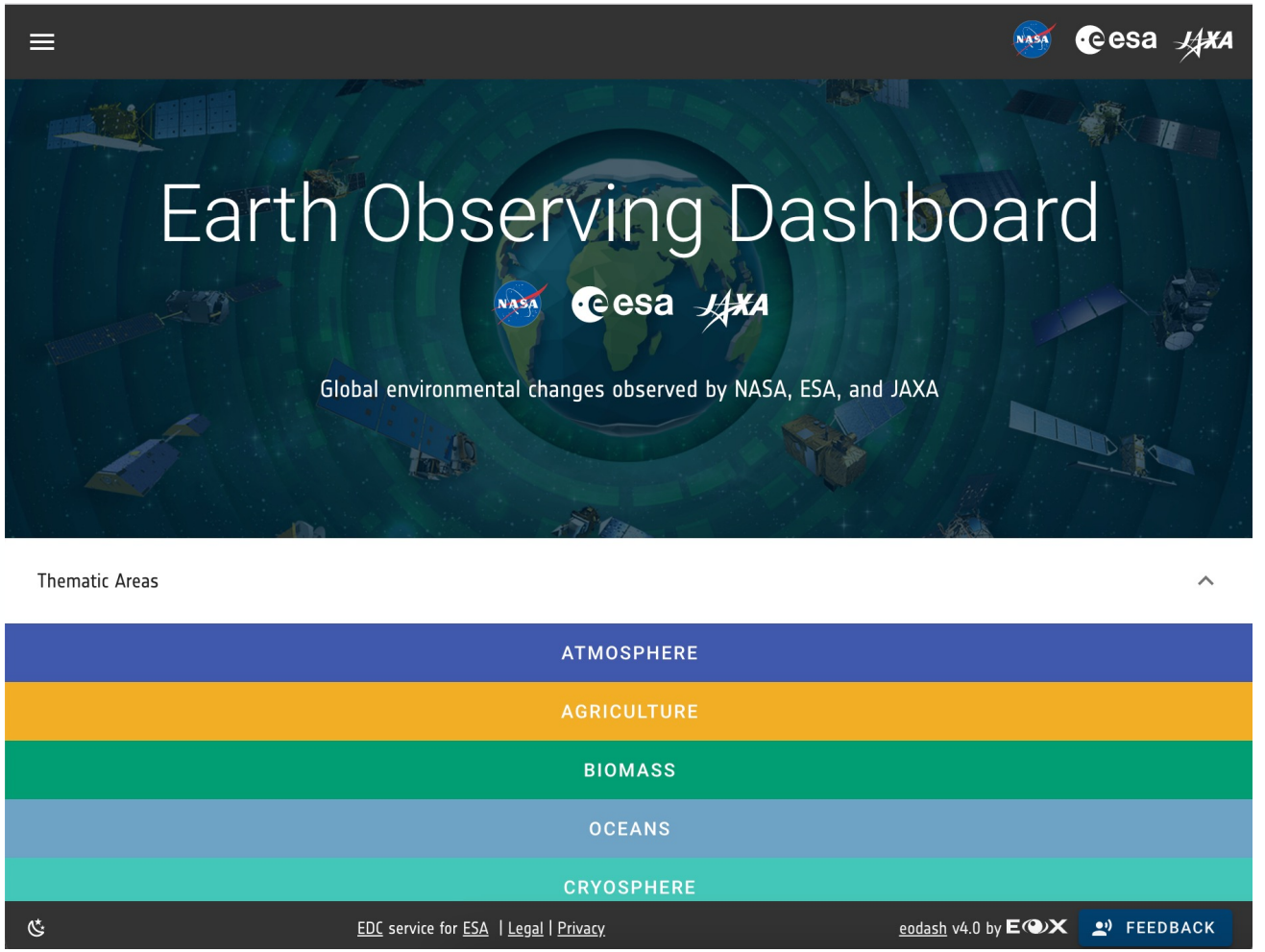
Foster Open Data Science

- Development of open access resources for data scientists to work with the EO data they discover in EO Dashboard
- Improve discoverability (STAC)
- EODASH-VEDA interoperability (e.g., common data format and API)
- EODASH contributors guide & resources (end 2023)



EO Dashboard Demo

- Storytelling
- EXPLORE DATASETS
- Custom Dashboard



Produced by

NASA-ESA-JAXA

EO Dashboard Team

https://eodashboard.org