Satellite imagery processing in the cloud

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Marco Menapace

2023.03.07

https://www.wasdi.cloud/

Speakers

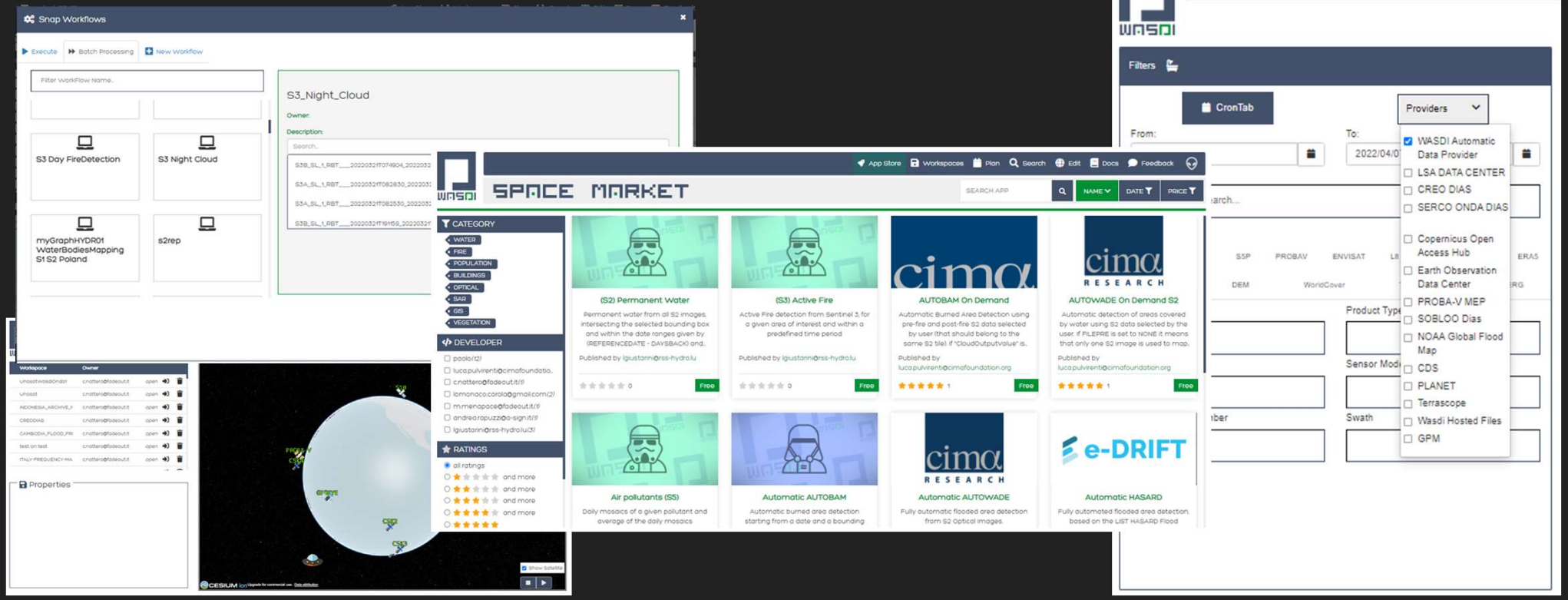
Cristiano Nattero, PhD

FadeOut

Marco Menapace, PhD

FadeOut

WHAT


Snap Workflows
Execute
Batch Processing
New Workflow
Filter WorkFlow Name..
S3_Night_Cloud
Owner:
Description:
S3 Day FireDetection
S3 Night Cloud
myGraphHYDR01 WaterBodiesMapping S1 S2 Poland
s2rep
Properties
WASDI
SPACE MARKET
App Store
Workspaces
Plan
Search
Edit
Docs
Feedback
SEARCH APP
NAME
DATE
PRICE
CATEGORY
WATER
FIRE
POPULATION
BUILDINGS
OPTICAL
SAR
GIS
VEGETATION
DEVELOPER
RATINGS
(S2) Permanent Water
Permanent water from all S2 images, intersecting the selected bounding box and within the date ranges given by (REFERENCEDATE - DAYSBACK) and..
(S3) Active Fire
Active Fire detection from Sentinel 3, for a given area of interest and within a predefined time period
AUTOBAM On Demand
Automatic Burned Area Detection using pre-fire and post-fire S2 data selected by user (that should belong to the same S2 tile). If "CloudOutputValue" is..
AUTOWADE On Demand S2
Automatic detection of areas covered by water using S2 data selected by the user. If FILEPRE is set to NONE it means that only one S2 image is used to map.
Free
Air pollutants (S5)
Daily mosaics of a given pollutant and average of the daily mosaics
Automatic AUTOBAM
Automatic burned area detection starting from a date and a bounding
Automatic AUTOWADE
Fully automatic flooded area detection from S2 Optical images
Automatic HASARD
Fully automated flooded area detection, based on the LIST HASARD Flood
cima RESEARCH
e-DRIFT
Filters
CronTab
Providers
From:
To:
WASDI Automatic Data Provider
LSA DATA CENTER
CREO DIAS
SERCO ONDA DIAS
Copernicus Open Access Hub
Earth Observation Data Center
PROBA-V MEP
SOBLOO Dias
NOAA Global Flood Map
CDS
PLANET
Terrascope
Wasdi Hosted Files
GPM
Product Type
Sensor Mode
Swath

Back to the Future

Data Provider Benchmark

Publisher: paolo

MORE DETAILS

New Workspace

Open Workspace

RUN

Input

Help

History

JSON

Data Provider

AUTO

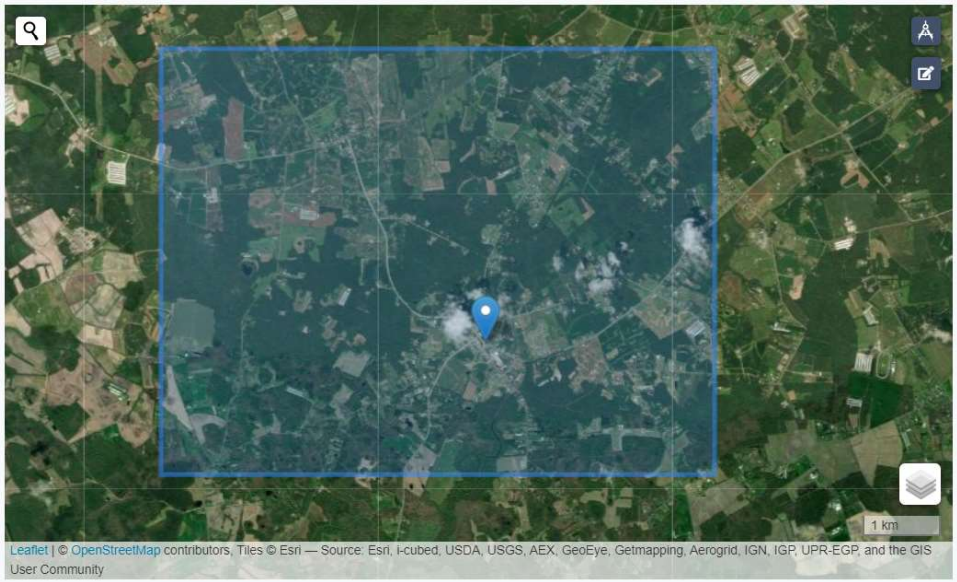
Days to search

1 30 50

Products to Import

1 10 20

Bounding Box



Why?

“Move the processors to the data”

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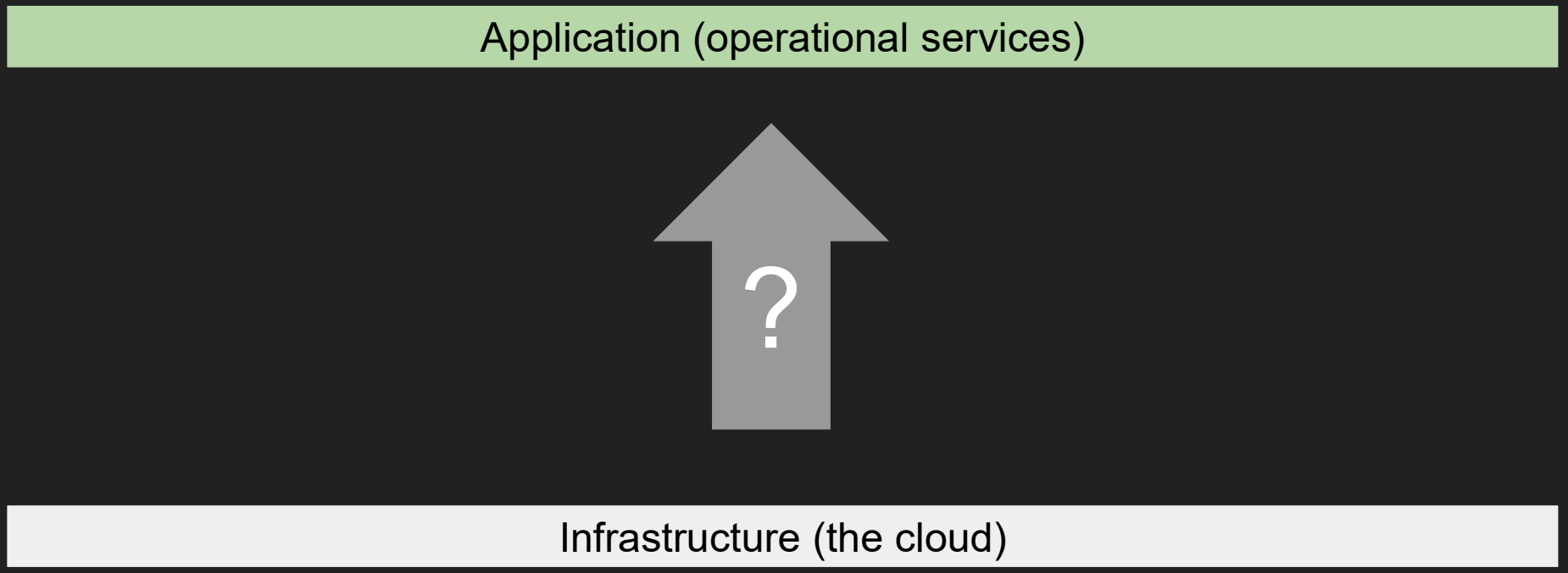
Infrastructure (the cloud)

“Move the processors to the data”

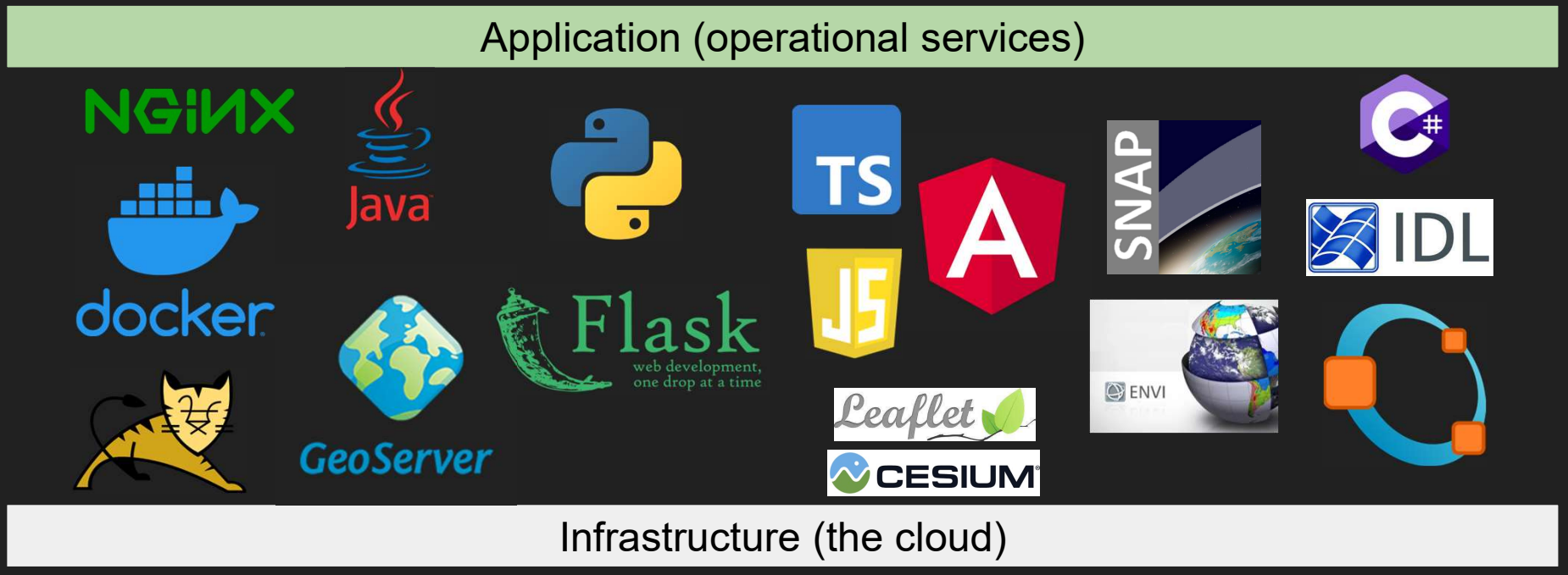
Application (operational services)

Infrastructure (the cloud)

“Move the processors to the data”



“Move the processors to the data”

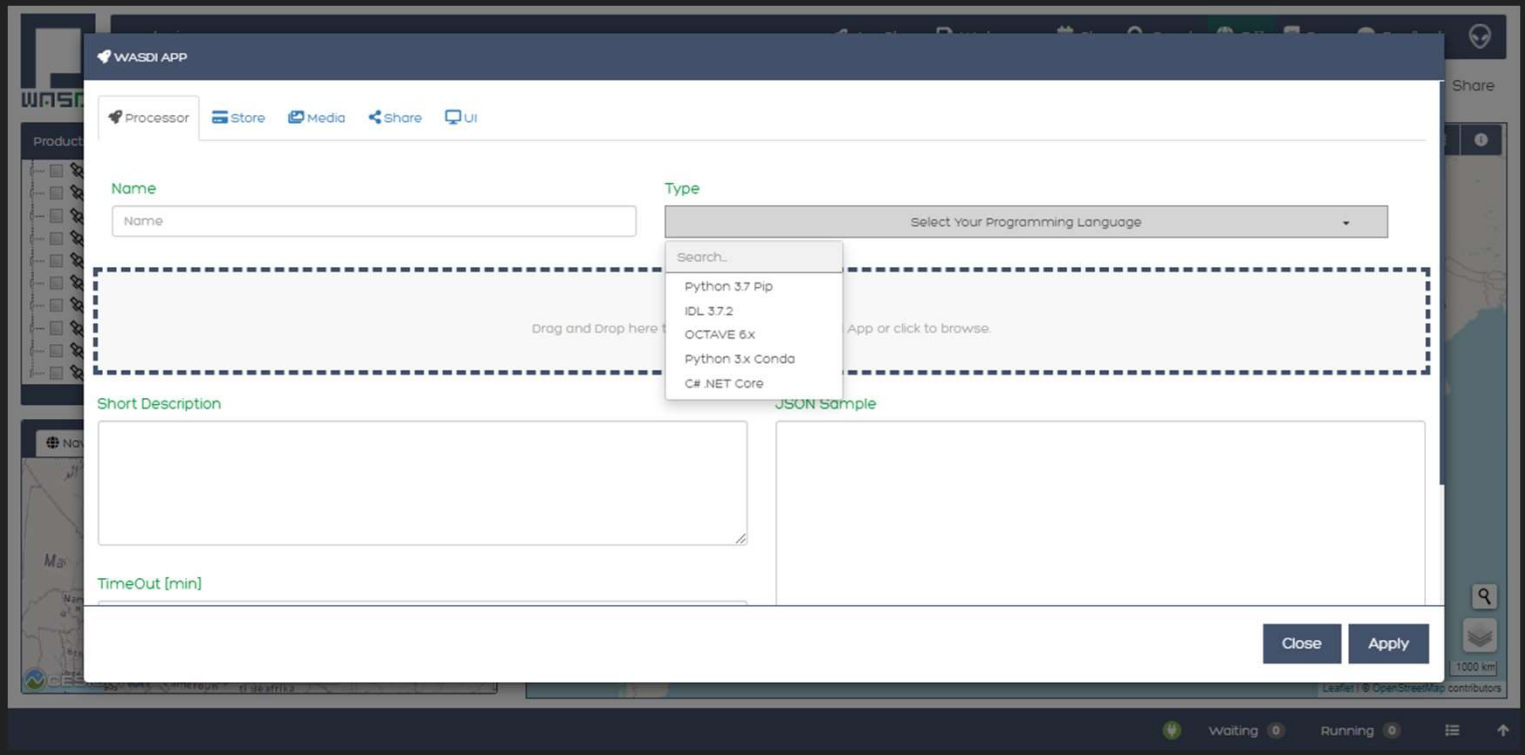


“Move the processors to the data”

Application (operational services)

Infrastructure (the cloud)

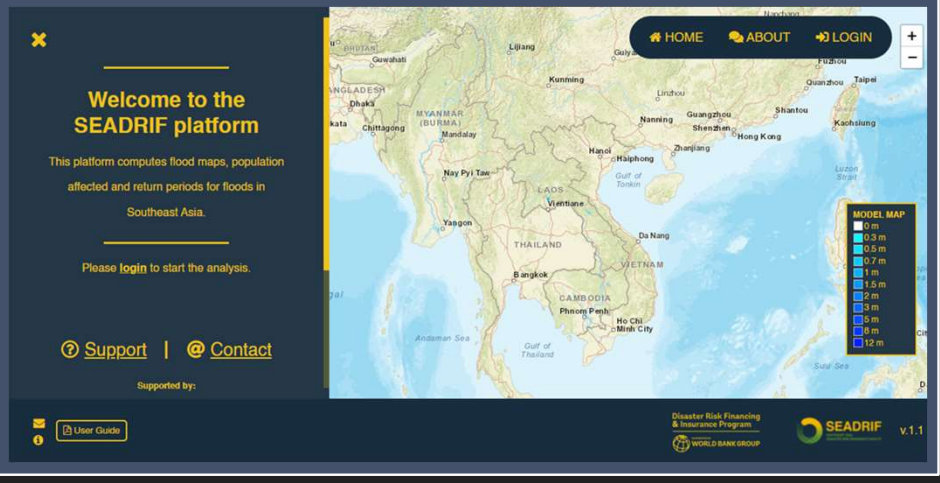
HOW


WASDI APP
Processor
Store
Media
Share
UI
Name
Name
Type
Select Your Programming Language
Search..
Python 3.7 Pip
IDL 3.7.2
OCTAVE 6.x
Python 3.x Conda
C# .NET Core
Drag and Drop here
App or click to browse.
Short Description
JSON Sample
TimeOut [min]
Close
Apply
Waiting 0
Running 0

case studies

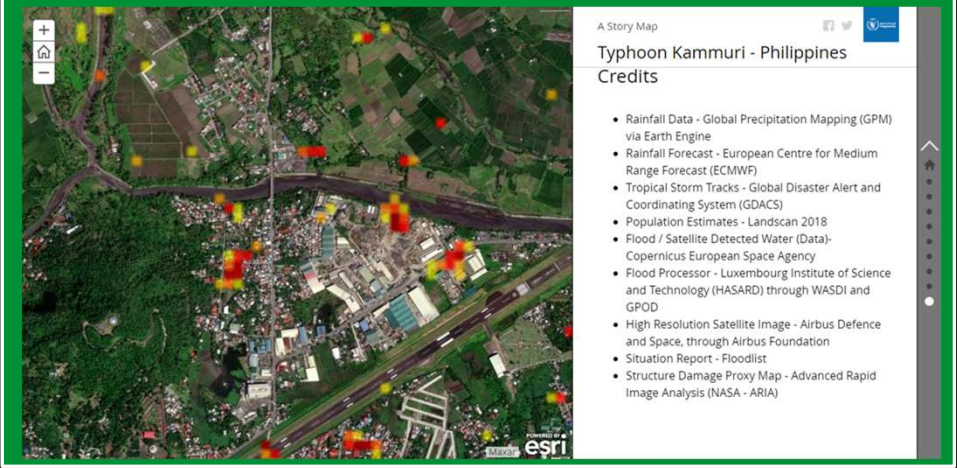
Flood monitoring

World Bank



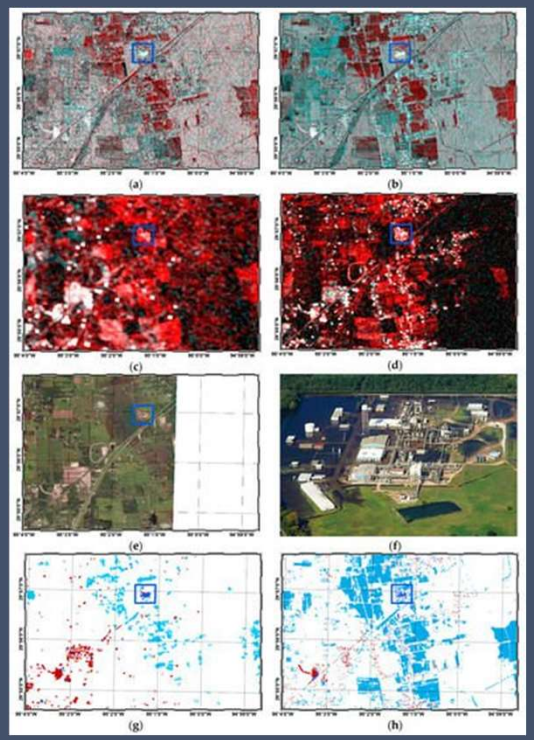
http://seadrif.cimafoundation.org/

World Food Programme

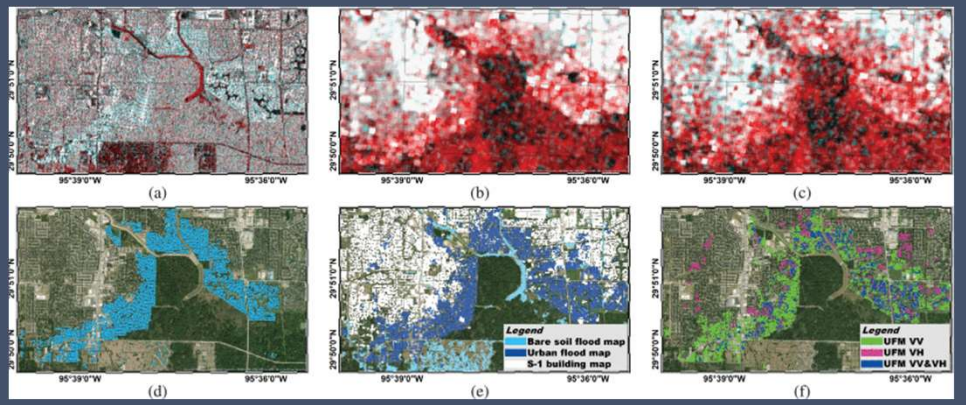


https://unwfp.maps.arcgis.com/apps/MapJournal/index.html?appid=f801c6243448460893e123f792afc4c9

Urban flood

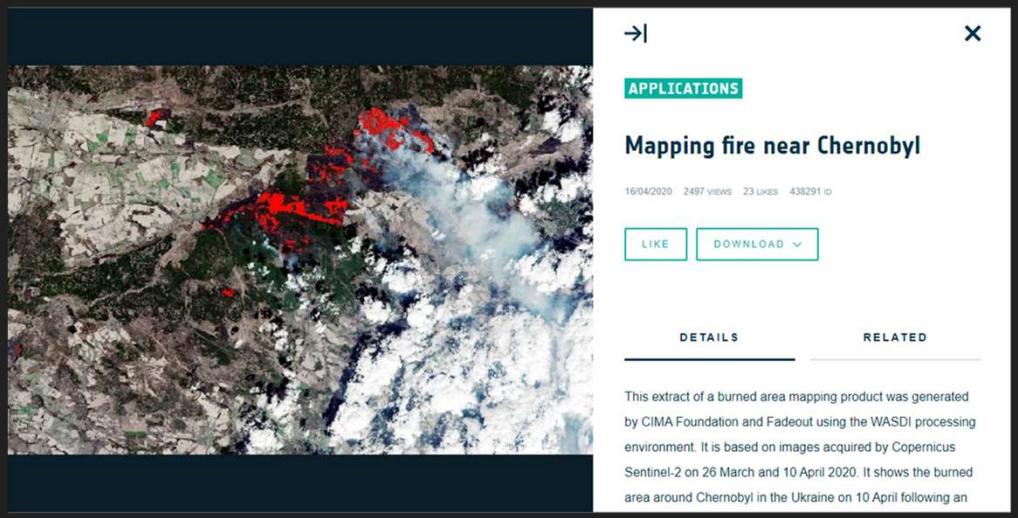


Chini, Marco, et al. "Sentinel-1 InSAR coherence to detect floodwater in urban areas: Houston and Hurricane Harvey as a test case." *Remote sensing* 11.2 (2019): 107.



Pelich, Ramona, et al. "Mapping floods in urban areas from dual-polarization InSAR coherence data." *IEEE Geoscience and Remote Sensing Letters* 19 (2021): 1-5.

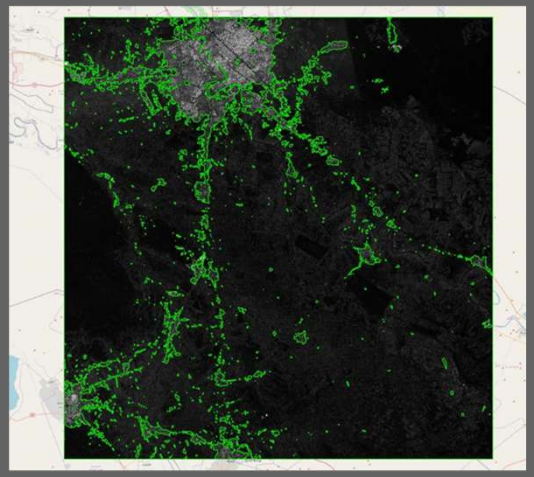
Mapping fires and burned areas



https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Sentinel-2/Mapping_Chernobyl_fires_from_space

Challenges…

ESA Phi-unet AI4EO challenge for UNOSAT



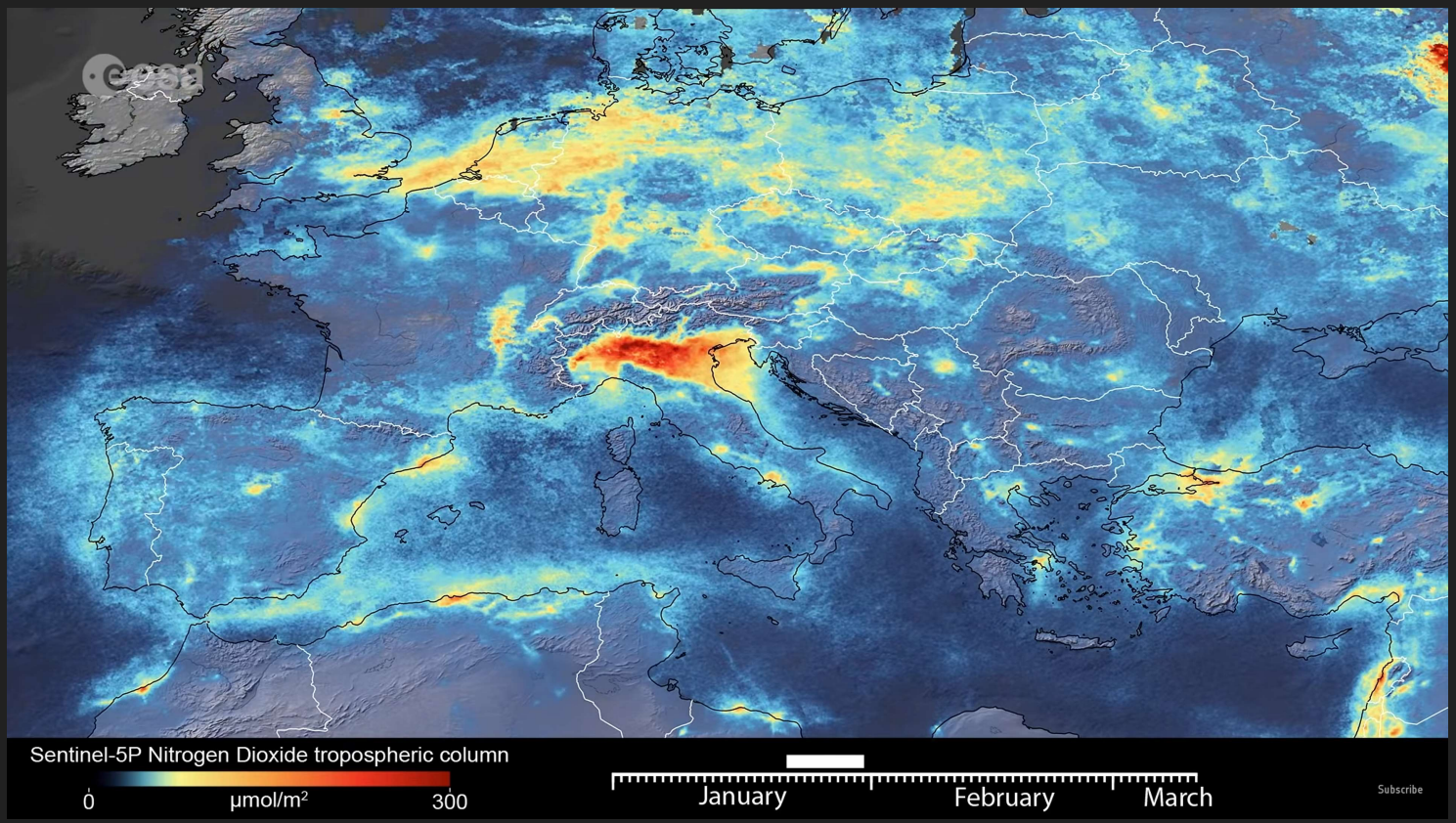
https://www.datascienceseed.com/2020/06/08/dss-online-2-ai-e-immagini-satellitari-unosat-ai4eo-challenge/

NASA Airathon on Drivendata (5th out of 702 teams)

	User or team		Best private R^2	RMSE	Timestamp	Trend (last 10)	# Entries
	vstark21	1	0.8058	32.2494	2022-03-21 21:22:51		63
	karelds	2	0.7984	32.8523	2022-03-21 16:02:11		27
	Katalip	3	0.7722	34.9252	2022-03-16 13:43:01		28
	_NQ_	4	0.7698	35.1067	2022-02-24 19:32:30		21
	A-SIGN WASDI	5	0.7686	35.2039	2022-03-13 17:31:03		114

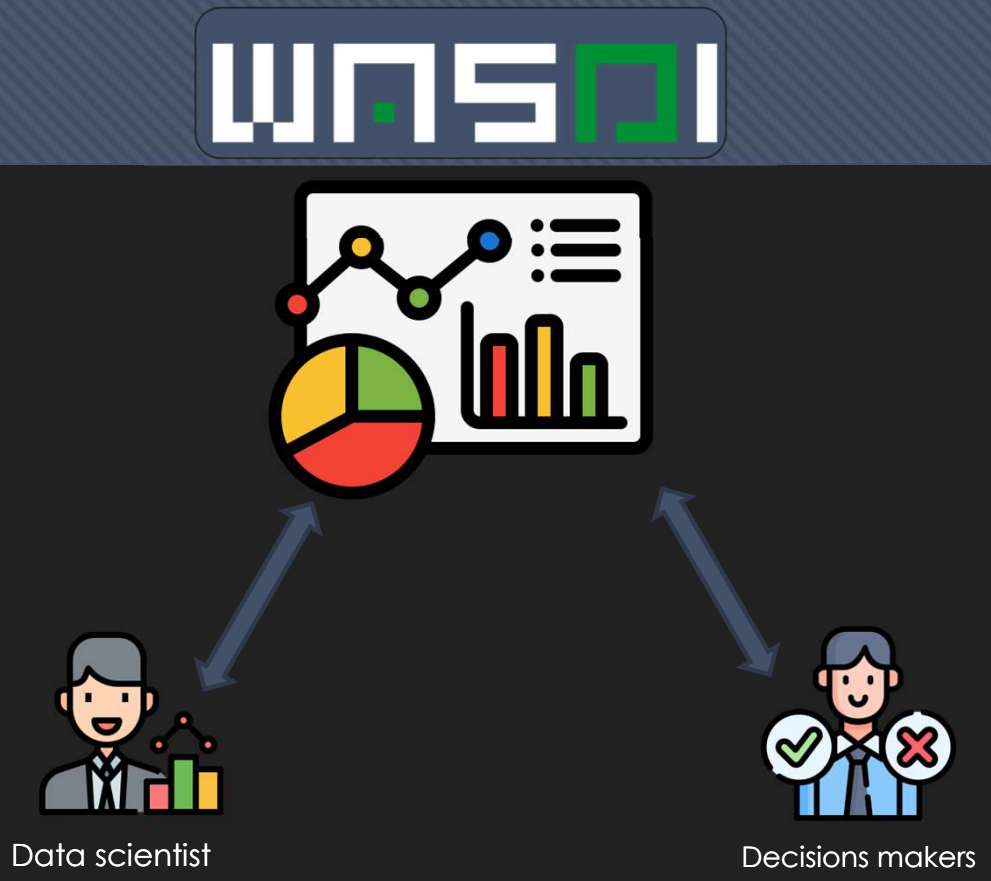
https://www.drivendata.org/competitions/88/competition-air-quality-pm/

Air pollution super-resolution



Project proposal

- Develop data presentation layer (Dashboard/Reporting tools)
- Target: **Decisions makers**



Thanks for your attention

Questions?