



## WP6: Stakeholder knowledge and innovation pathways

SEEDS KO

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## Who are we?

**isardSAT is a recognised expert in satellite missions and processing algorithms since 2006**

isardSAT is acknowledged as expert support laboratory for the European Space Agency

isardSAT is part of the consortium that developed Sentinel-6 built by ESA in cooperation with EU, EUMETSAT, NASA and NOAA

<https://www.isardSAT.cat>



# Who are we?

## **Lobelia is isardSAT's spin-off since 2018**

Lobelia bridges the gap between science and operational services

Our team is specialized in Earth observation, computing and data science, physics, artificial intelligence, communication and user experience.

<https://www.lobelia.earth>

## WP6: General objective

To identify pathways for the uptake and integration of SEEDS products in downstream services through co-creative approaches and involvement of relevant stakeholders.

Common IT platform for all SEEDS products to test new ideas for the use and develop proof-of concept with key stakeholders focusing on policy areas and addressing in particular industrial emission challenges, agricultural sector practices and air quality and citizen science involvement.

API and user-friendly interface to be developed.



# Stakeholder engagement

## **Workshop 1 - Involvement of industrial stakeholders**

→ improved Top-down emissions

The project will work both with industrial stakeholders and with emission expert networks such as FAIRMODE or TFEIP to test the capabilities of the SEEDS top-down emission inventories in comparison with the emission data provided by bottom-up approaches.

# Stakeholder engagement

## Workshop 2 - Involvement of agricultural stakeholders

SEEDS products on soil moisture, vegetation variable and deposition fluxes will be further developed in co-operation with the precision agriculture community, through on-line questionnaires to identify the barriers for uptake of these products and co-creation workshops to present different approaches to overcome these barriers and test innovation ideas for uptake of these products

# Stakeholder engagement

## Workshop 3 - Citizen science knowledge and urban air quality

Existing NO<sub>2</sub>/PM monitoring and forecasting service developed by KNMI and Lobelia.

→ Ingestion of the improved CAMS developed in SEEDS. The improvement of the existing NO<sub>2</sub>/PM forecast can increase the engagement of citizens, raising awareness of environmental concerns, including healthy mobility.

## Short and long-term objectives

**Short-term objective:** increase the number of users and the usage of the platform all along the project → These users could become later potential customers of downstream services

**Long-term objective:** capacity to integrate SEEDS platform services into the customer's operating environment and information systems.



## EMISSIONS

Monthly, worldwide emissions at 1-km resolution

[Know more](#)



## FORECAST

World-class hourly forecast, 3 days in advance.

[Know more](#)



## RETINA

Near-real-time monitoring and 3-day forecast, at street-level resolution

[Know more](#)



## ATMO-PLAN











ATMO-Plan supports urban air quality plans and designing Low Emission Zones.

[Know more](#)

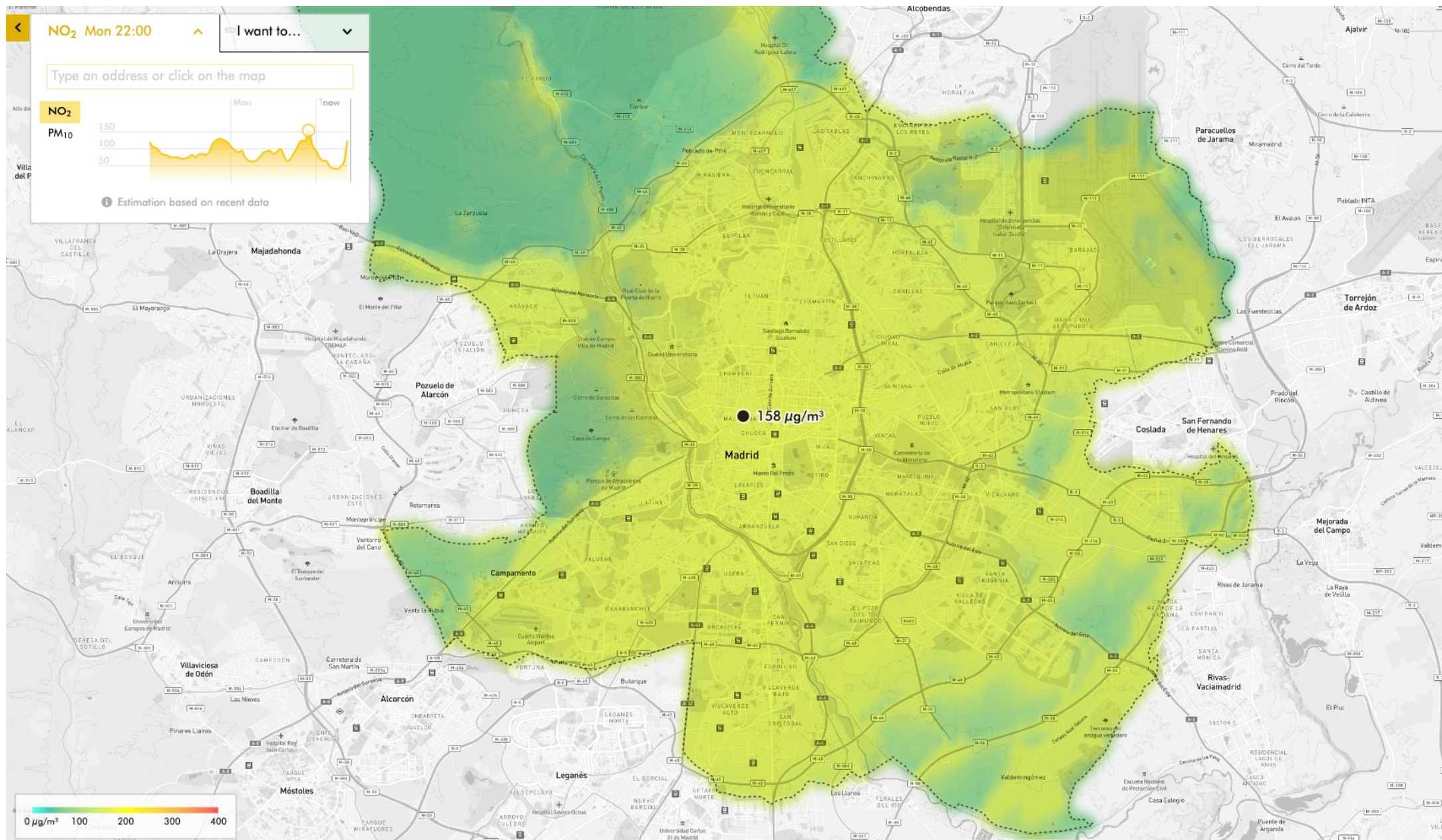
You're currently logged in as [airqast@lobelia.earth](#). [Log out](#)

## AirQast products

Choose one of the following products. For more information, please visit: [AirQast](#). To access these products, email us at: [info@airqast.com](mailto:info@airqast.com).

Domain	Type	Variables	Time (UTC)	Access
Barcelona2	Street-level forecast (observations)	NO <sub>2</sub>	19/01/2021 – 19/01/2021 (08:00)	Full 
Beijing	High-resolution inventory	NOx, SO <sub>2</sub> , PM <sub>25</sub> , VOC, NH3, CO, PM <sub>10</sub> , BC	01/01/2014 – 01/12/2014	Full 
Beijing	High-resolution inventory	NOx, PM <sub>25</sub> , SO <sub>2</sub>	01/01/2017 – 01/06/2018	Full 
Catalunya	Standard-resolution inventory	NOx, PM <sub>25</sub>	01/01/2019 – 01/12/2019	Full 
East China	Standard-resolution inventory	NOx, PM <sub>25</sub> , SO <sub>2</sub>	01/01/2017 – 01/06/2018	Full 
East China	High-resolution inventory	NOx, PM <sub>25</sub> , SO <sub>2</sub>	01/01/2017 – 01/06/2018	Full 
East China	Standard-resolution inventory	NOx, PM <sub>25</sub> , SO <sub>2</sub>	01/01/2018 – 01/12/2018	Full 
East China	High-resolution inventory	NOx, PM <sub>25</sub> , SO <sub>2</sub>	01/01/2018 – 01/12/2018	Full 
East China	Standard-resolution forecast	PM <sub>25</sub> , NO <sub>2</sub> , O <sub>3</sub> , PM <sub>10</sub> , NO, SO <sub>2</sub> , CO	06/02/2019 (16:00) – 07/02/2019 (15:00)	Full 
East China	Standard-resolution forecast	PM <sub>10</sub> , NO <sub>2</sub> , O <sub>3</sub> , PM <sub>25</sub> , NO, SO <sub>2</sub> , CO	07/02/2019 (16:00) –	Full 







# Aire metropolità

Avisos

Visor

ZBE

Mobilitat sostenible

Salut ambiental

Canvi d'hàbits

NO<sub>2</sub> 10:00

Vull anar



**F09, Sant Feliu de Llobregat en bici**

**Ruta més ràpida**

52 min · 16.2 km · 58.9 µg/m<sup>3</sup> d'NO<sub>2</sub>

**Ruta saludable**

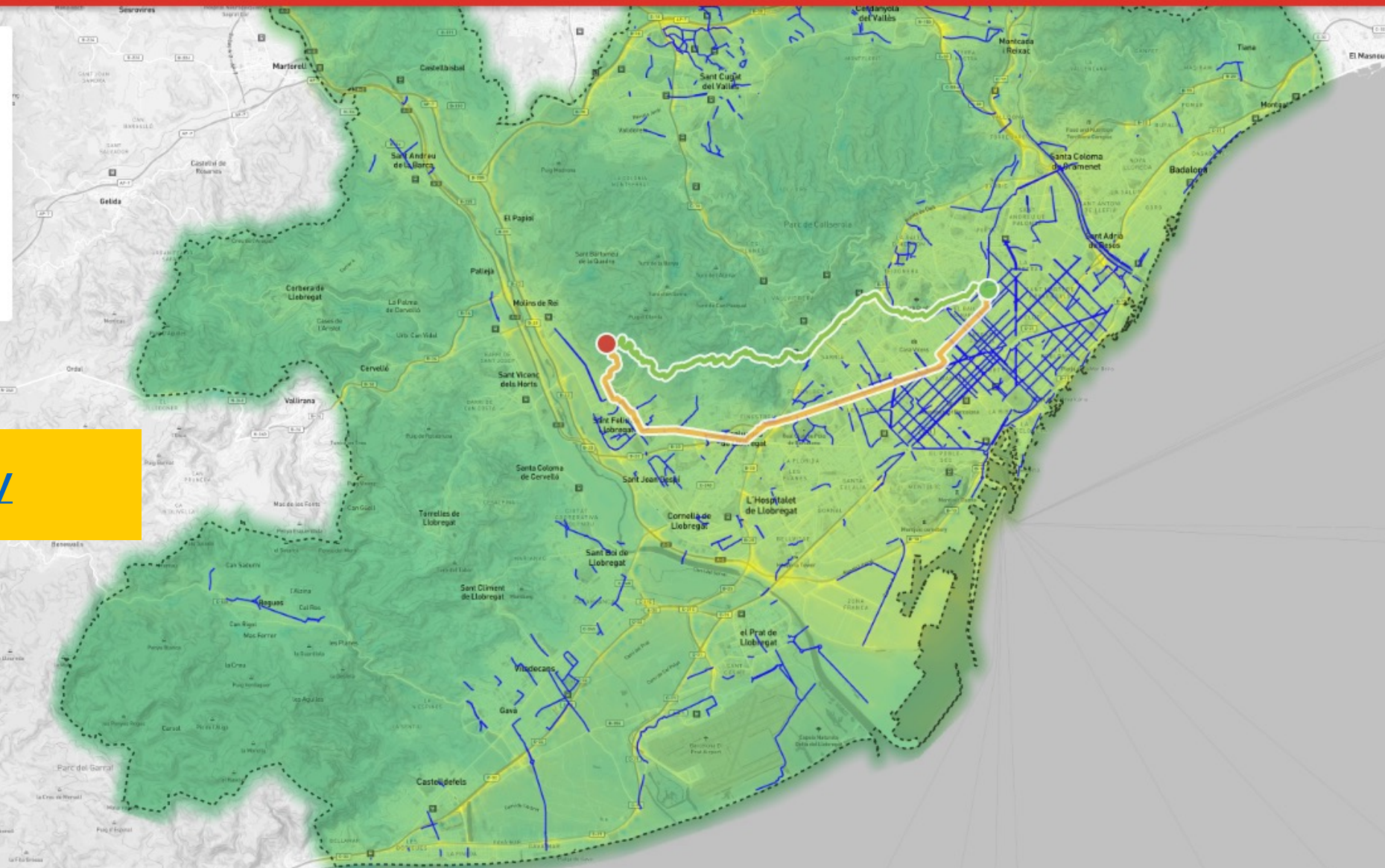
60 min · 16 km · 40 µg/m<sup>3</sup> d'NO<sub>2</sub> **- 32%**

## Urban air quality

0 µg/m<sup>3</sup> 50 100 150 200

• Bicibox • e-Bicibox • Bicing

— Carrils bici — Vies pacífiques



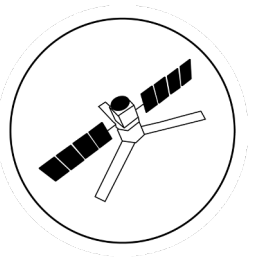


# Example of downstream service exploitation

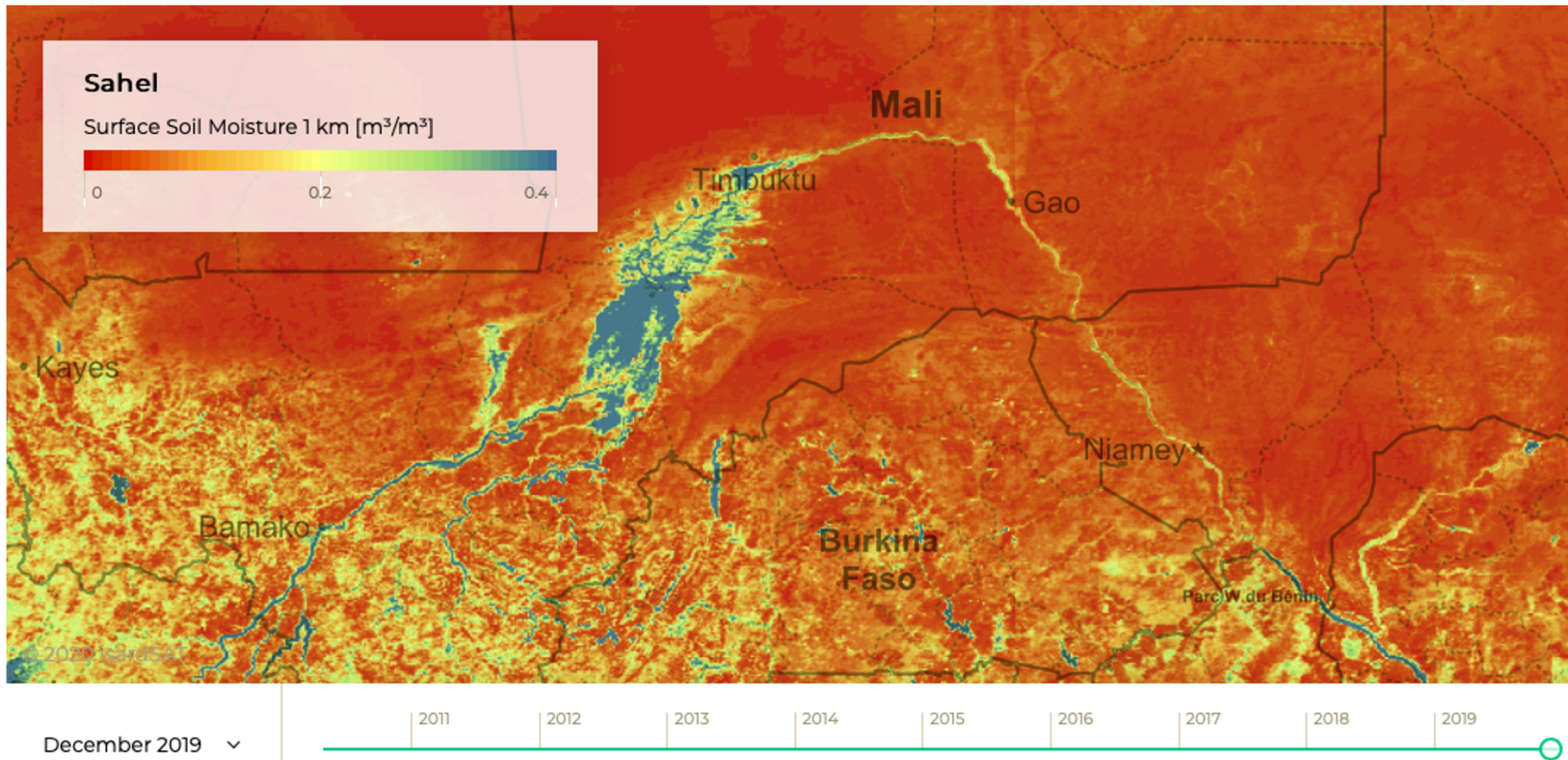
- Air quality information in the TV News and weather section daily
- Operational service embedded in Barcelona public TV weather section
- Higher citizen interest leads to increased media coverage



# Drought



Applications: crop yield insurance, fires prediction, reforestation monitoring, plague prevention



Data	Soil moisture derived from L-band MW
Temporal coverage	since 2010
Spatial coverage	Global
Temporal resolution	every 2/3 days
Spatial resolution	1Km
Delivery	API, WMS, FTP, direct download

High resolution soil moisture, disaggregation with SMOS/SMAP in combination with optical data, Lobelia 2020

<https://accwa.isardsat.space/eo-products-sahel/>



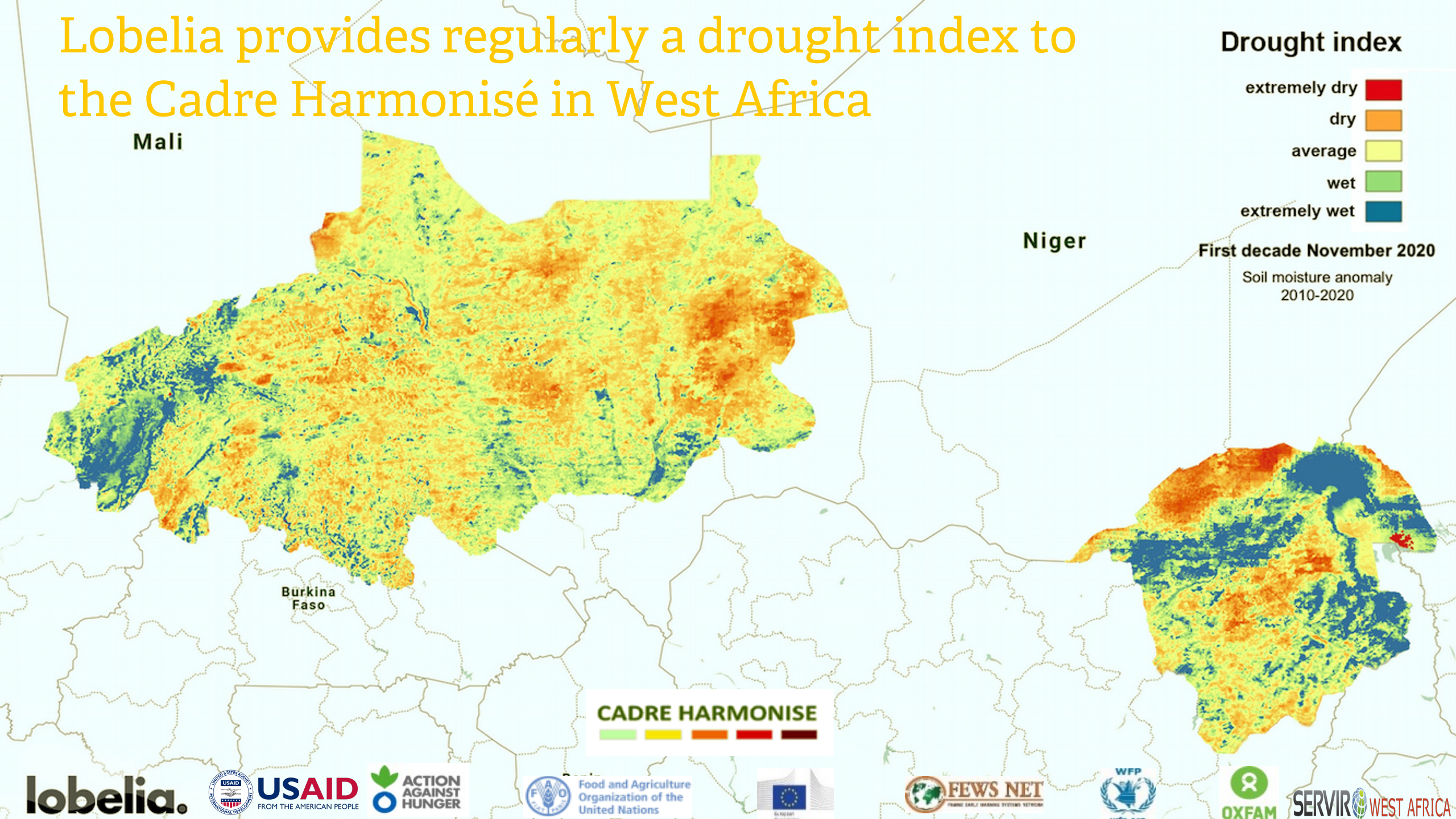
# Lobelia provides regularly a drought index to the Cadre Harmonisé in West Africa

## Drought index



First decade November 2020

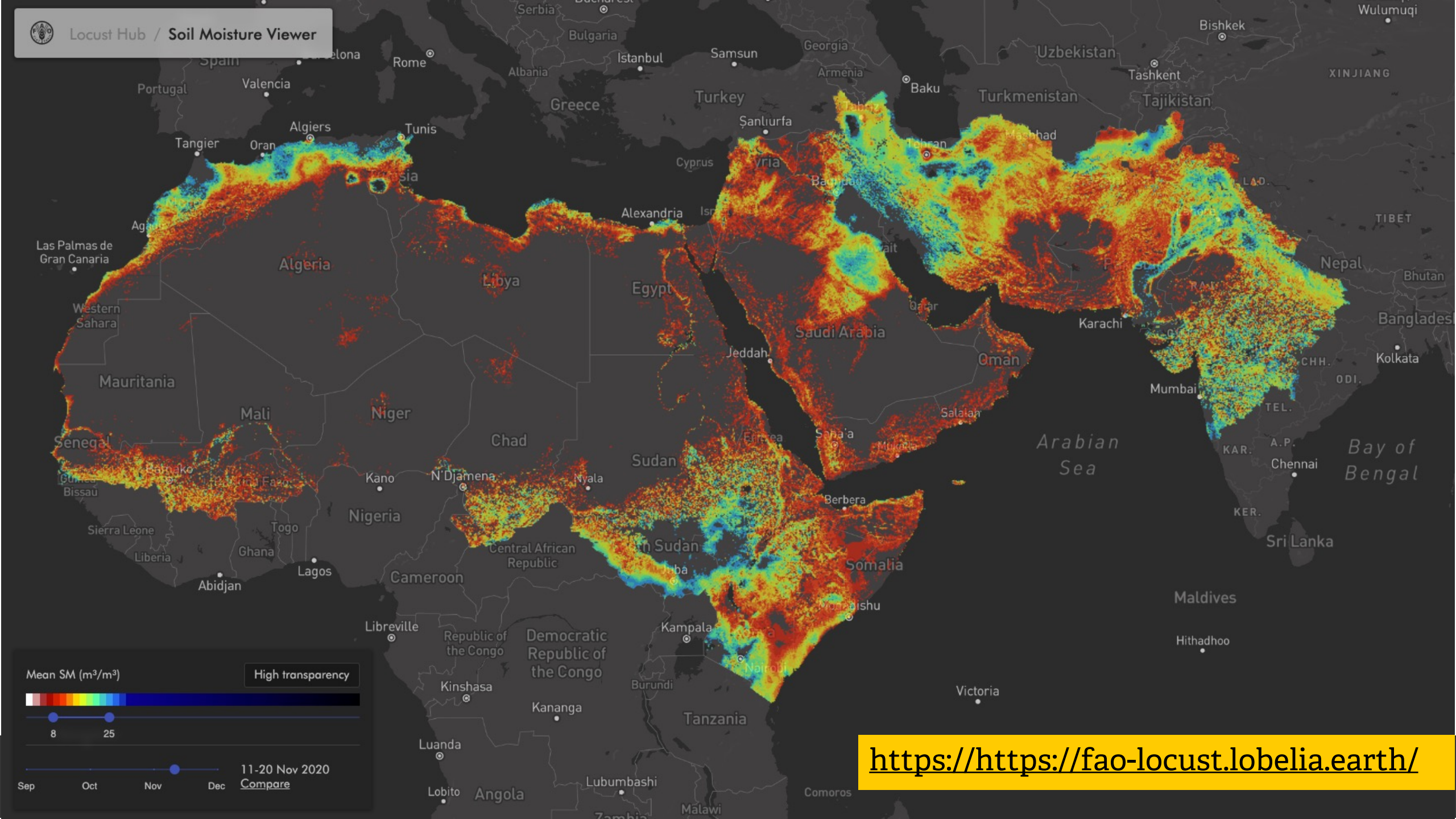
Soil moisture anomaly  
2010-2020



CADRE HARMONISE





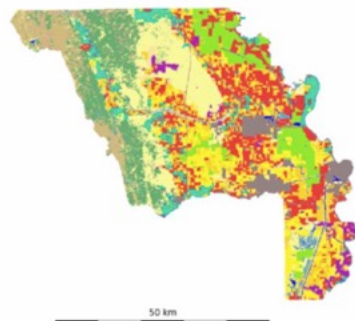


<https://https://fao-locust.lobelia.earth/>

# Features of interest

## Land

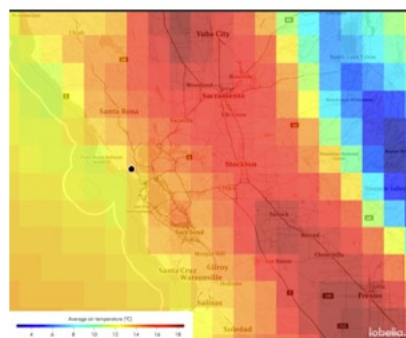
- Soil moisture
- Land Cover
- Land use
- Vegetation index
- Forest coverage



Land cover (Jackson et al. 2012)

## Climate

- Temperature
- Precipitation
- Surface roughness
- Wind speed
- Humidity
- Due point



Average temperature  
Lobelia, by isardSAT

## Topography

- Digital Elevation Model
- Slope
- Aspect



DEM 90 M from SRTM  
Databasin

## Human activities

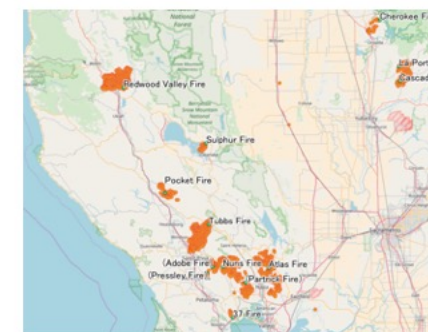
- Road network
- River network
- Electricity lines



River network  
geology.com

## Fire archive


- Burned areas
- Past fire hotspots




VIIRS Fire dataset



2001 2004 2007 2010 2013 2016 2019

 Fire risk per county Fire danger index (anomaly)

0 0.5 1

 Burned area (accum. from 2001) Land cover Power transmission line (> 150 kV)

✓ BLYTHE ENERGY ✓ ESJ

✓ IID ✓ IPA

✓ LADWP ✓ MID

✓ MWD ✓ NVENERGY

✓ PG&amp;E ✓ SCE

✓ SDG&amp;E ✓ SMUD

✓ TANC ✓ TID

✓ WAPA

## Fires California



# Digitalization-Augmented value

Big Data dashboards

Data discovery platforms

# Copernicus Marine

- New viewer “My Ocean” by Lobelia Earth
- My Ocean, an important step in broadening access to the wealth of Copernicus marine data
- From temperature, currents, and waves to ocean acidification and plankton, users can access maps, time series, and charts as hindcasts, nowcasts and forecasts based on information generated by the Copernicus Marine Service.



<https://cmems.lobelia.earth>



# WEkEO by Copernicus

The Wekeo Data Discovery Platform:  
Copernicus and Sentinel data at your  
fingertips



<https://www.wekeo.eu>

Catalogue

## Filters

FREE-TEXT SEARCH

Free-text

FAVOURITES ★

COPERNICUS SERVICE ▲

C3S (Climate) 17

CAMS (Atmosphere) 3

CLMS (Land) 29

CMEMS (Marine) 133

PLATFORM ▲

Sentinel-1 3

Sentinel-2 2

Sentinel-3 13

Sentinel-5P 1

SENSOR ▼

AREA ▲

Arctic 16

Atlantic-Iberian Biscay Irish Ocean 6

Baltic Sea 14

Black Sea 20

Europe 6

European North-West Shelf Ocean

6

Global 97

Mediterranean Sea 20

North Atlantic 9

TIME ▲

Future 28

Past 195

## Planning for the next 6 months in WP6

### Task 6.1 IT Platform Design, Service Integration & Operations (ISAT)

→ **Del 6.1 (M3) First milestone of Exploitation and IPR plan**

→ **(M6) Platform design and operations plan**

### Task 6.2 Dissemination & Communication activities (ISAT)

→ **D6.2 (M6) SEEDS partners to elaborate a set of questionnaires addressed to pre-defined list of interested users in order to understand their products' needs.**

## Planning for the next 6 months

### Task 6.3 Co-creation approaches towards innovation (NILU)

→ **D6.3 (M9, M24, M34)**

- a. Innovation pathway 1 -Involvement of industrial stakeholders
- b. Innovation pathway 2 -Involvement of agricultural stakeholders
- c. Innovation pathway 3 -Citizen science knowledge and urban air quality

**Deliverables: no official deliverables planned, but communication with other groups is important in these first months.**

# lobelia.

Thanks!

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