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EUROPEAN EARTH OBSERVATION PROGRAMME COPERNICUS AND "LANDCOVER PILOTS"

Armenia, Azerbaijan, Georgia, Moldova, Ukraine - 2022 – 2024

umweltbundesamt
PERSPEKTIVEN FÜR UMWELT & GESELLSCHAFT

Austrian Development Agency

OiEau International Office for Water

OECD
BETTER POLICIES FOR BETTER LIVES

UNECE

Photo: Stefanie Grüssl / BMLV

COPERNICUS – THE EUROPEAN EARTH OBSERVATION PROGRAMME

Vienna, 12/04/2022

COPERNICUS: „Europe‘s eyes on Earth“

- European earth observation programme – https://www.copernicus.eu/en
- Service and data provider
- Services based on satellite and in situ data
- **All data and services are free and open to all users**

PRODUCTS

Essential climate variables (ECVs)

Sea level rise

Climate forecasts

Phenology & vegetation development

Air quality

Climate indicators

Emissions

Monthly „State of the Climate“ reports

Land use

Water temperature

Natura2000

Reference maps for crisis situations, surveillance...

Urban Atlas

Water quality

Corine Land Cover

Early warning systems

Drought

Snow & Ice

EU-DEM

Floods

Wildfire risk

Soil moisture

Riparian zones

SENTINEL SATELLITES

- Copernicus space segment

Sentinel-1

Sentinel-2

Sentinel-3

Sentinel-4

Sentinel-5

Sentinel-5P

Sentinel-6

PLANNED COPERNICUS MISSIONS

Mission	Applications (examples)
CO2M	Emissions from human activities
CRISTAL	Climate change impacts in the Arctic
CIMR	Sea ice extent, soil moisture, vegetation, oceans, cryosphere
LSTM	Sustainable agriculture, water resources management
CHIME	Soil properties, crop health, biodiversity, water quality
ROSE-L	Geohazard,forest management, food security

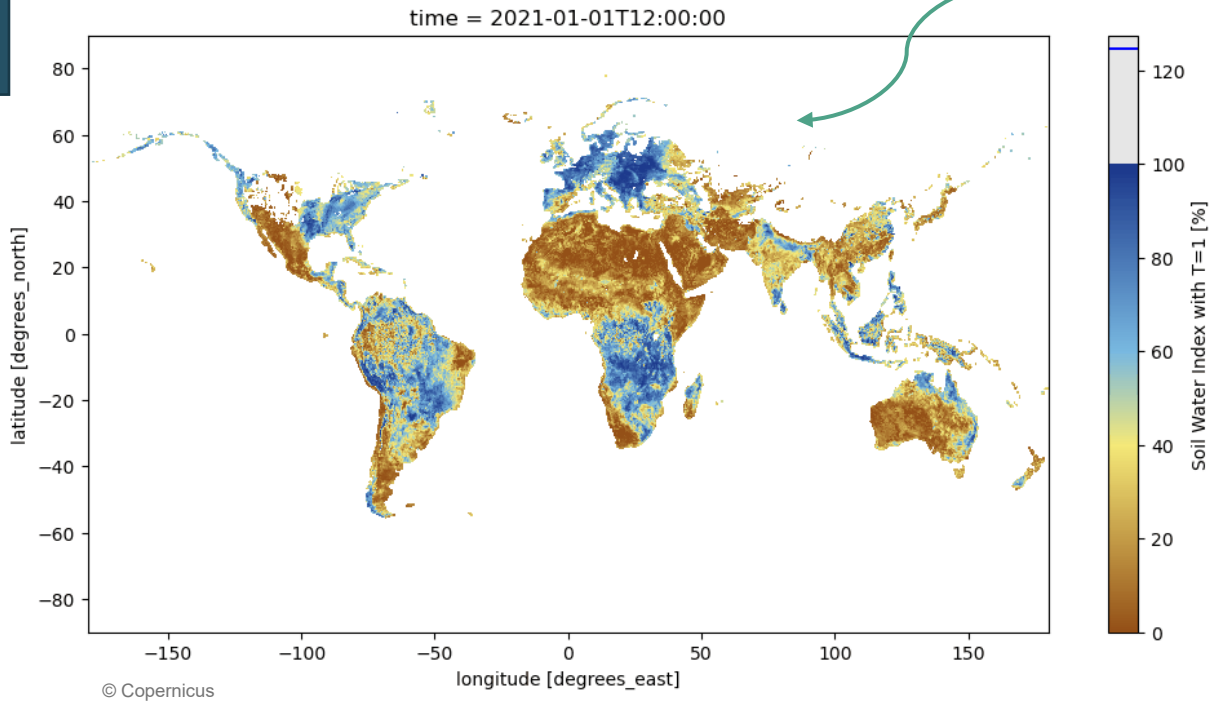
COPERNICUS GLOBAL LAND SERVICE

- A component of the Land Monitoring Service https://land.copernicus.eu/global/
- Bio-geophysical products
  - Vegetation
  - Water cycle
  - Energy budget
  - Terrestrial cryosphere
- Global
- Near-real time
- Long-term time series

EXAMPLE: GLOBAL SOIL MOISTURE

Jan 2021 – March 2022
SWI T=1

Frozen soils are masked out



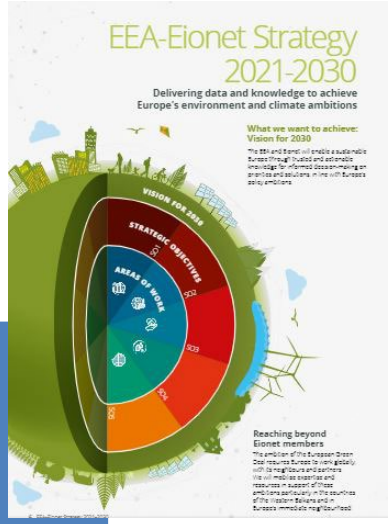
https://land.copernicus.eu/global/products/swi

Strategic objective 4 EEA-Eionet Strategy 2021-2030

Making full use of the potential of data, technology and digitalisation

…embracing the European data strategy and digital agenda, the potential of big data, artificial intelligence and earth observation for improved information delivery

Exploit the full potential of Copernicus data and information services, citizen science, big data and artificial intelligence



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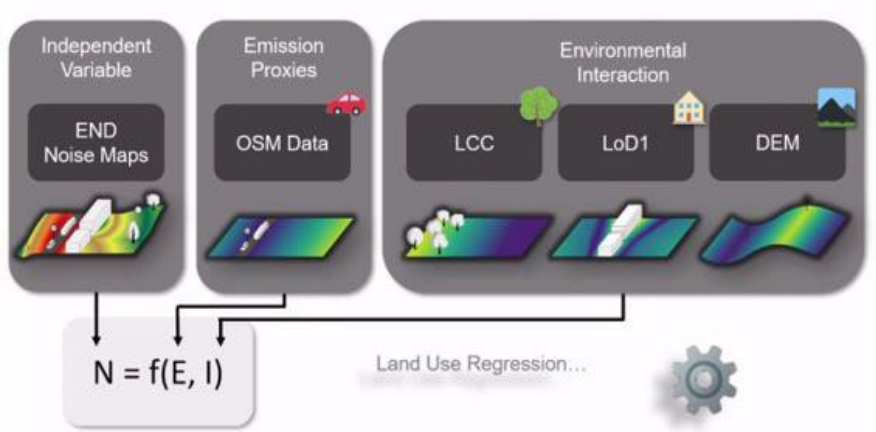
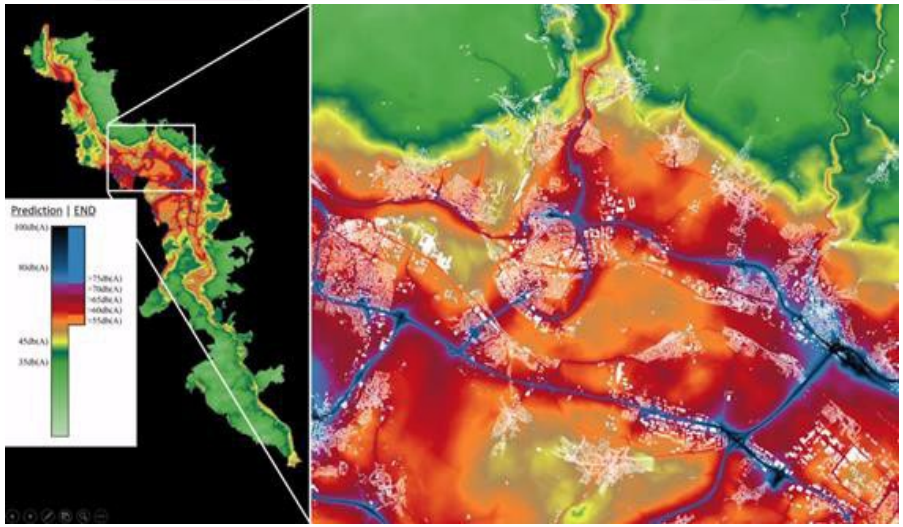
Developing policy-relevant data applications

based on Copernicus data

(examples from EEA work programme):

- Habitats mapping – their potential, conditions, fragmentation, connectivity
- Land degradation neutrality
- Indicators for forest strategy
- Gap filling for Noise maps →
- Indicators for Common Agricultural Policy
- LULUCF (Land Use, Land-Use Change and Forestry) monitoring for Greenhouse Gas Inventories





Example from: Staab et al. (ICBEN 2021)

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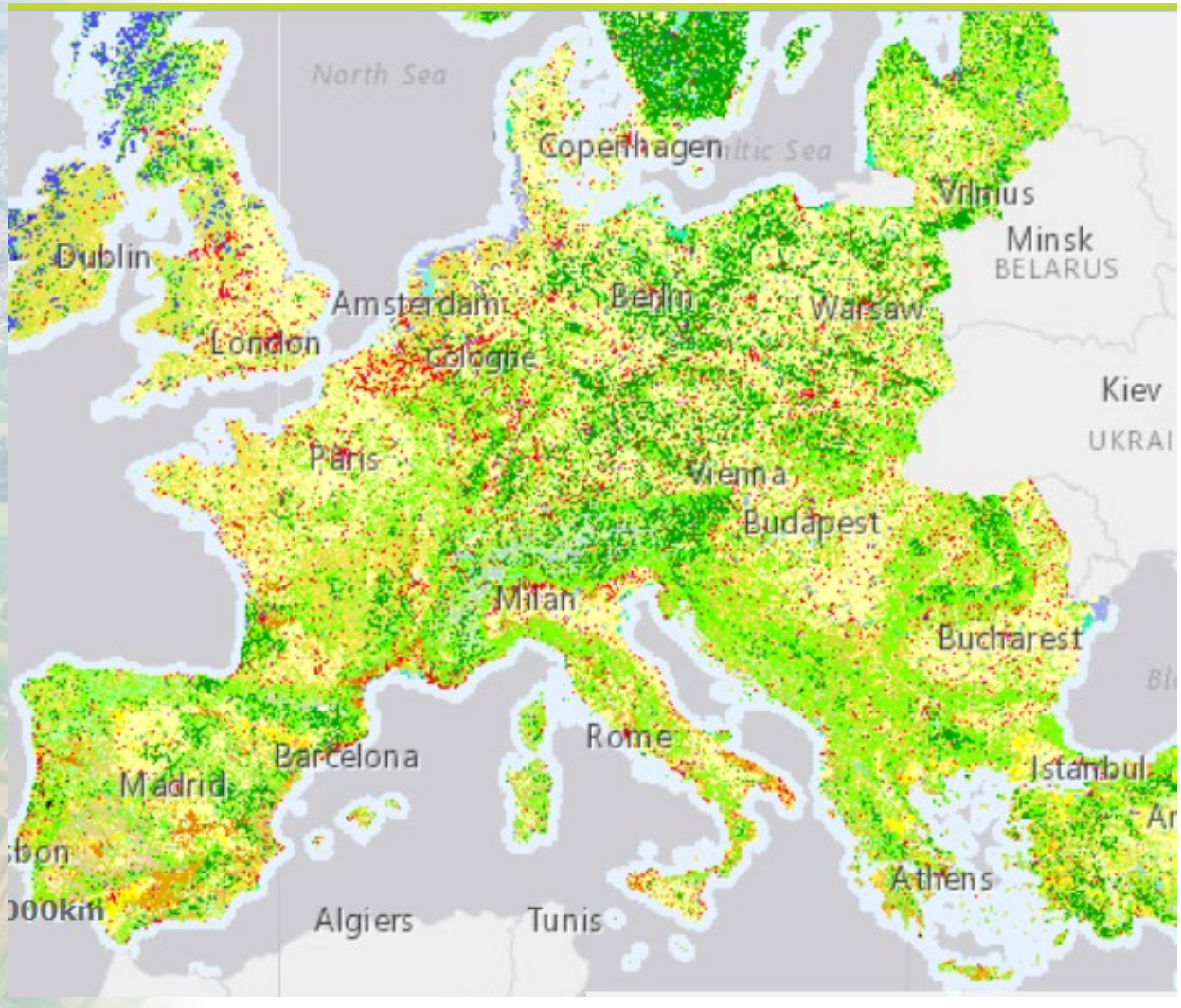
Land Monitoring

Corine Landcover CLC 2018

39 countries (all EEA Member States & co-operating countries) fully covered with satellite data and field work



includes landcover change analyses to previous CLC1990, 2000, 2006, 2012

EU Eastern partner countries not yet covered

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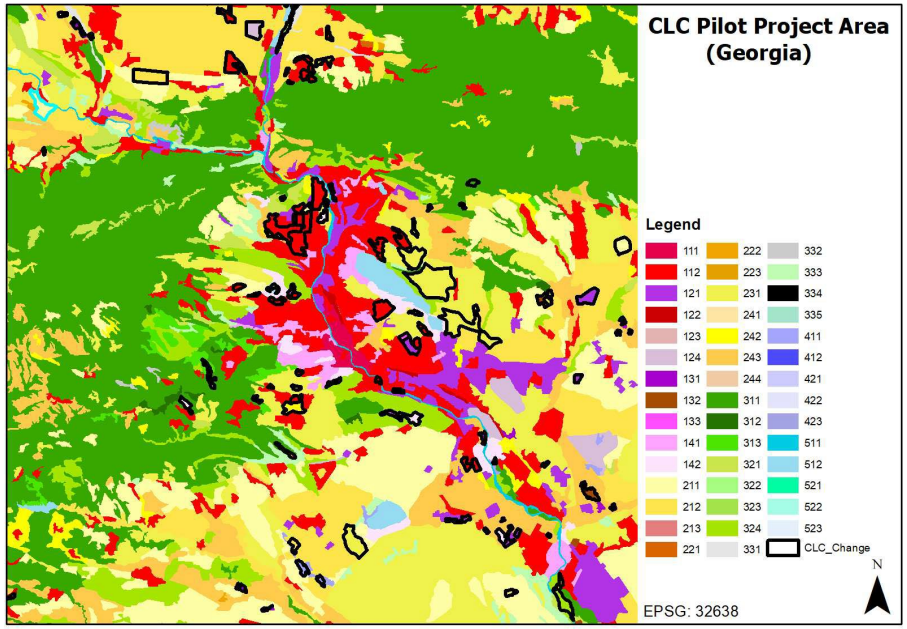
ENI SEIS EAST II Pilot projects

– CLC2018 and CLC-change layers were derived for Pilot areas in or around capitals

– CLC mapping technology has been learnt; countries and experts teams ready to use this knowledge to extend the pilot project



– The European (level-3) CLC nomenclature was easily applicable for the countries

– CLC-changes show the main processes that have taken place over the pilot area.

– Extension to national CLC mapping was proposed

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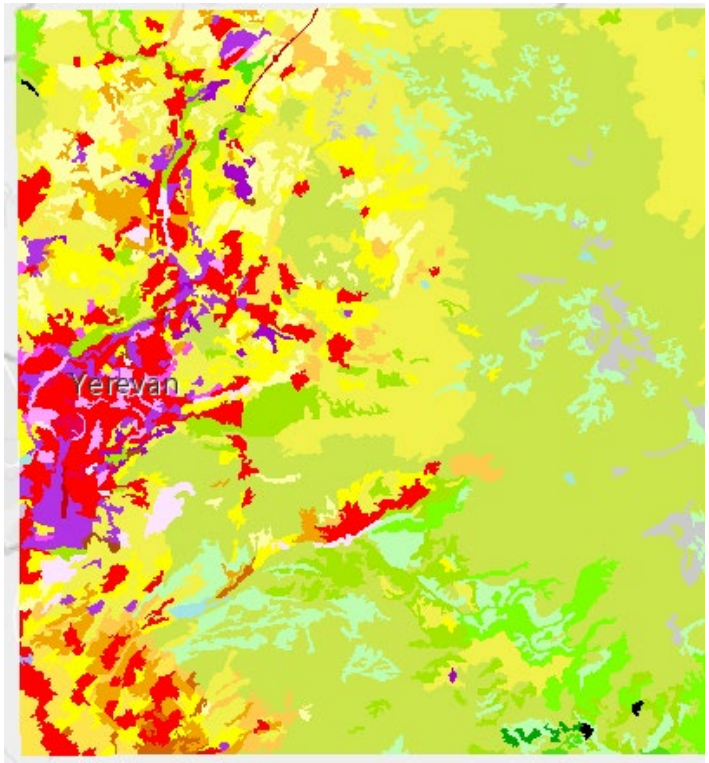
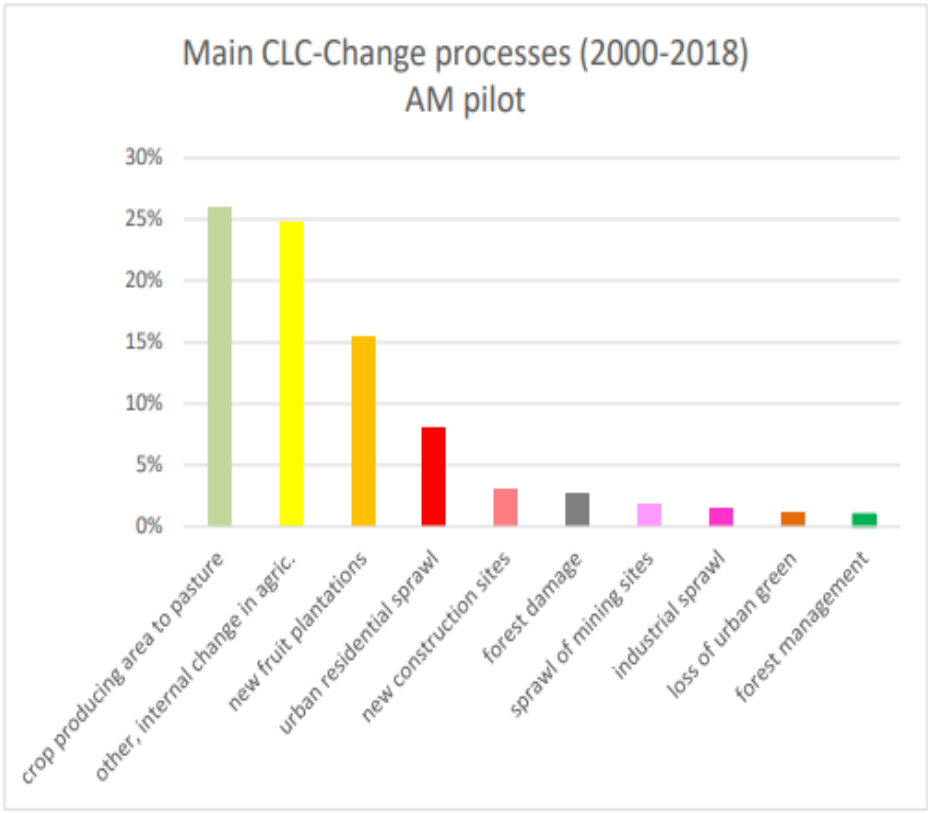
Landcover Changes – Yerevan East area 2000 - 2018



CLC2018 map covering the pilot area in Armenia (covering the Eastern suburbs of Yerevan and the surrounding agriculture and seminatural areas)



CLC Changes were grouped together to derive the main evolution processes between 2000 and 2018 over the pilot area in Armenia (ETC/ULS, 2020).

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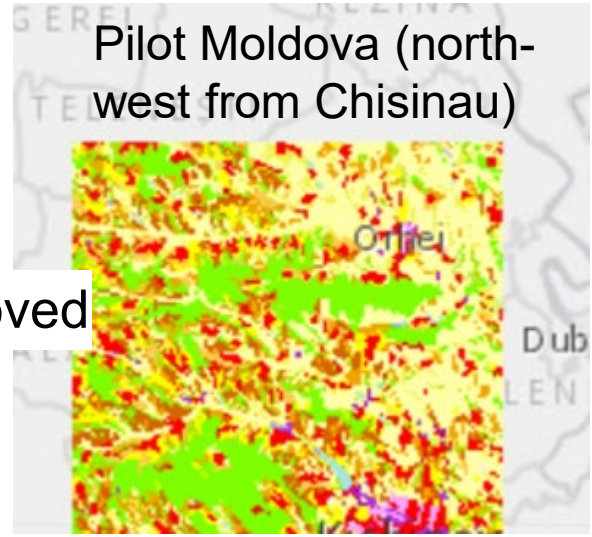
COMPONENT 2 – OUTPUT 2.2

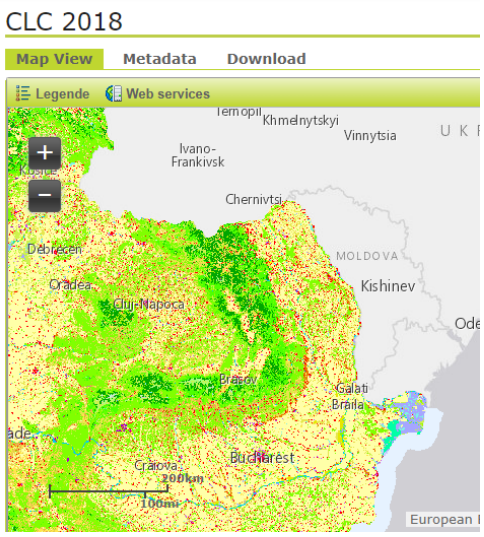


Objective:

Land and agriculture monitoring and data are improved

Activities & planned results:

- Review the Corine Landcover pilot done in the SEIS East project
- Renew dialogue with national partners (ministerial, technical teams)
- Explore upscaling and/or thematic extension according national and EU priorities
- Assess availability of further ancillary data (from global Earth Observation, national monitoring)



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Country	Area (km2)
Republic of Armenia	29 743
Republic of Azerbaijan	75 142
Georgia	69 700
Republic of Moldova	33 846
Ukraine	603 628
TOTAL	812 059

- CLC 2018: 7,5 Mill € for 6 Mill km² for national change detection
- For 800.000 km² 2-3 Mill. € needed, because of the production of status layer as prerequistite for change mapping

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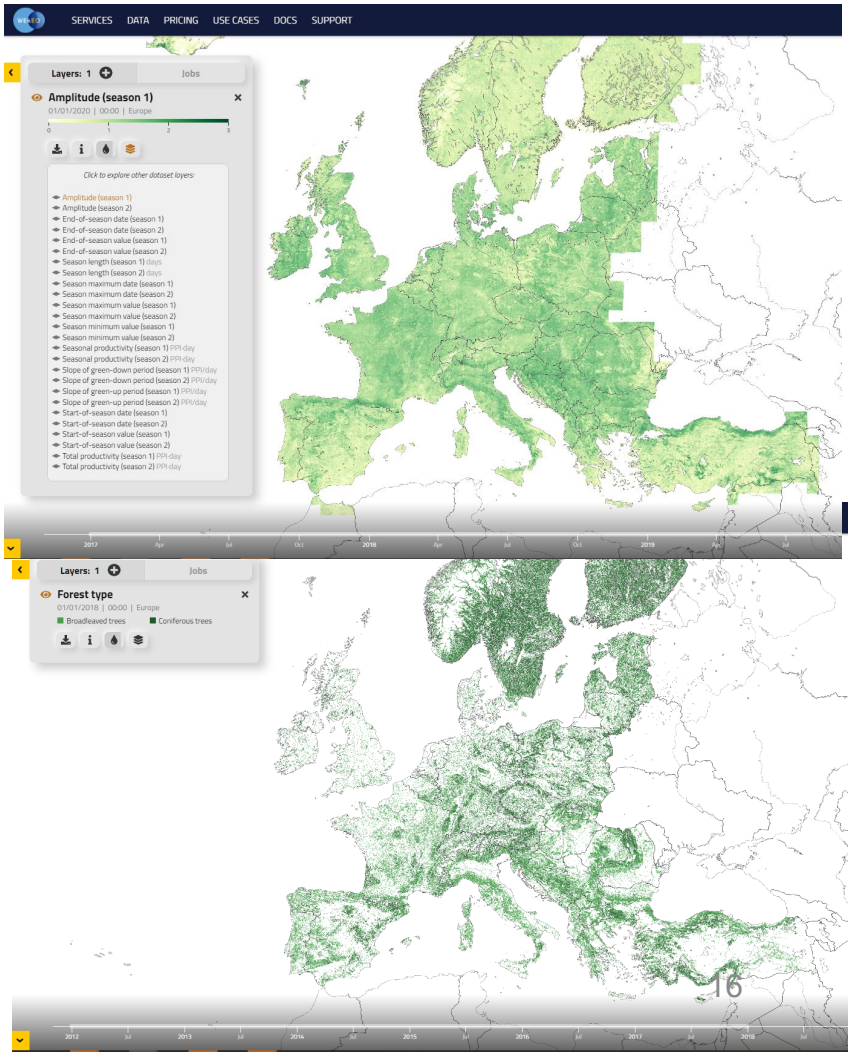
HIGH RESOLUTION LAYERS: – EXTRAPOLATION

- High resolution layers reflect **land cover and their dynamics (phenology)** with very high spatial resolution (10*10m)
- Satellite Data **(Sentinel 1+2) is available** for pan-European coverage
- Services (HRL production) is currently **limited to EEA-countries**
- **Extension** of services **to further countries** would provide up-to-date environmental information
  - HRL VPP: vegetation phenology and productivity – near-to-real time, around 10 days trajectories and annual parameters
  - HRL IMP: imperviousness – every 3 years
  - HRL TCD: tree cover density – ev. 3 years
  - HRL DLT: dominant leave type – ev. 3 years
  - HRL GRA: grassland – ev. 3 years
  - HRL W&W: water and wetness – ev. 3 years



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