

# EO 4 Ecosystem Accounting 2022



## AccoRD-HUB: Account Ready Data Hub to facilitate Natural Capital Accounting applications

Marcel Buchhorn<sup>1</sup>, Bruno Smets<sup>1</sup>, Thomas Danckaert<sup>1</sup>

<sup>1</sup> VITO, Belgium

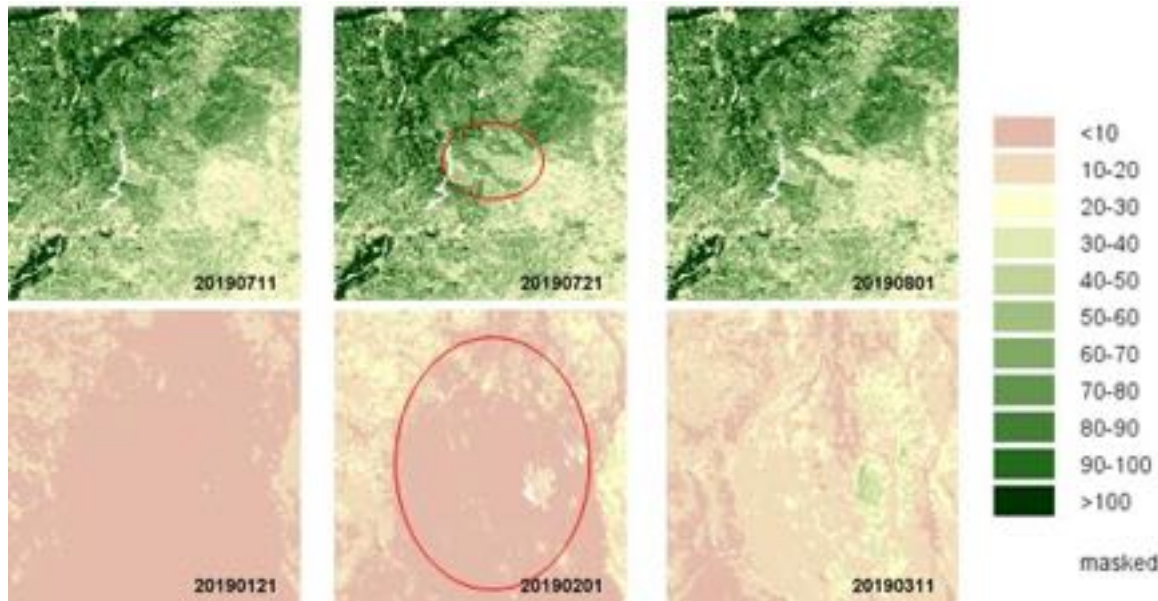
01/12/2022



+ THE EUROPEAN SPACE AGENCY

# EO complexity problem (e.g. DMP)

- the vast amount of EO data, image processing technology and applications can create barriers to the use of EO data in ecosystem accounting
- e.g. Dry Matter Productivity (DMP) represents the overall growth rate or dry biomass increase of the vegetation → is directly related to ecosystem Net Primary Productivity (NPP) → useful in Condition & Service accounts



Maps of PROBA-V Collection 300m DMP before (left) and after (right) the event in 2019: fire in Portugal (top) and a vegetation re-greening after flood in Australia (bottom).



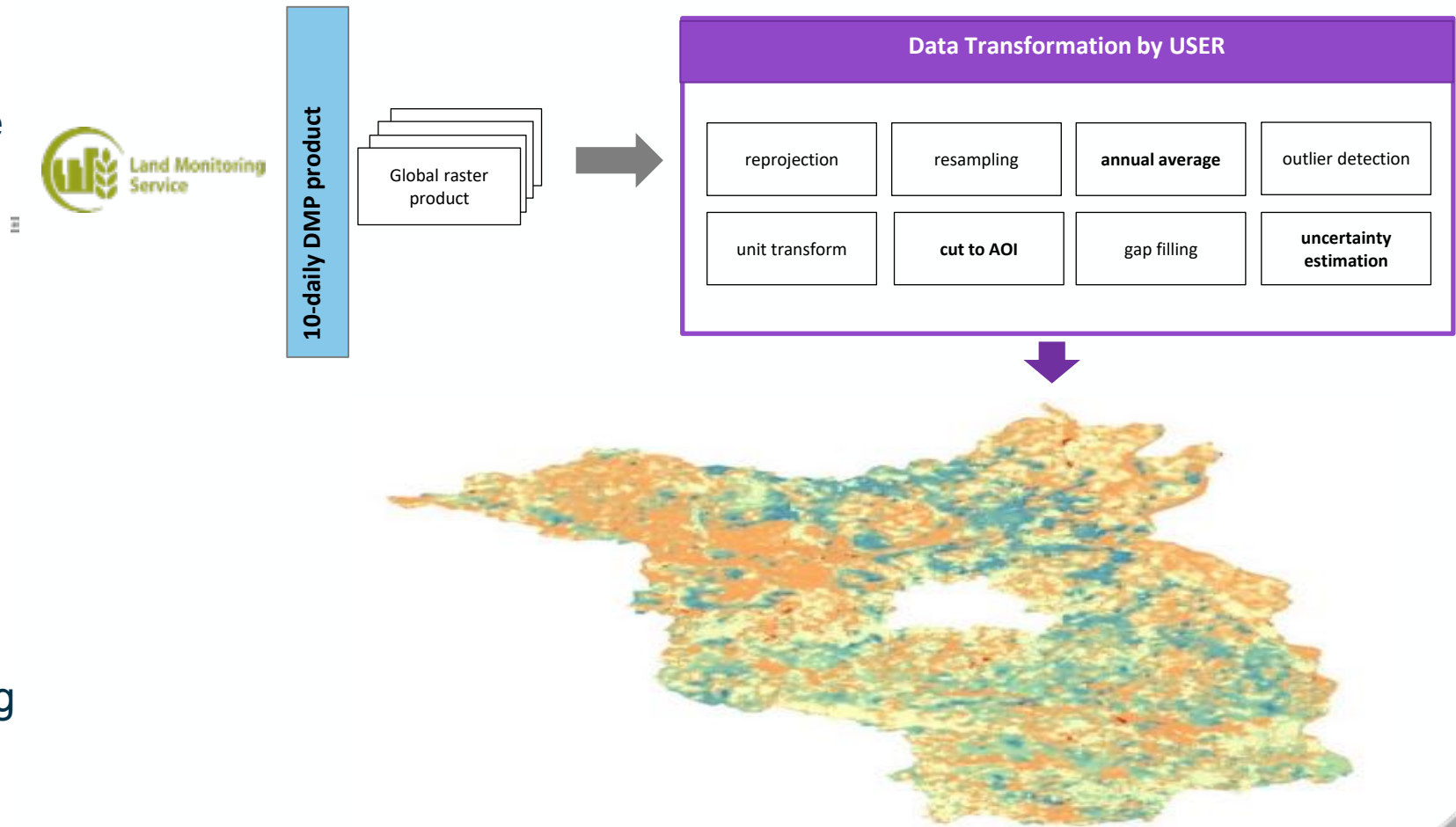
Temporal profile of PROBA-V DMP products over site damaged by fires in 2019 in Spain. The green dashed line locates the date of the event.

Contains modified Copernicus Service information [2022]



# EO complexity problem (e.g. DMP)

- to come from the satellite raw data to a validated and regularly updated DMP product is a complex workflow
- luckily, this processing is automated, and products are available via data providers like Copernicus Global Land Monitoring Service
- BUT still several collections exists & mainly global datasets in 10daily intervals in 300m
- → for accounting we need annual datasets and maybe further processing (e.g. reprojection, resampling, cutting to AOI, unit switch...) PLUS indicator of uncertainty



# EO complexity problem (e.g. population grid)

- a variety of tools exist to help the user, but the lack of interoperability between these platforms pose a challenge and a risk of lock-in to the user
- Nevertheless, most of the existing tools/platforms are not optimized to the needs of EA which can lead to huge uncertainties in data processing (e.g. statistics extraction from absolute data sources like population grids)

reference		POP after TOOL	resample		warp	warp & resample	
100m	1000m		down	up		down	up
3,140,196.22	3,140,196.22	<i>GHS-POPWARP</i>	3,140,196.22 0.00%	3,140,196.22 0.00%	3,140,196.22 0.00%	3,140,196.22 0.00%	3,140,163.15 0.00%
3,140,196.22	3,140,196.22	<i>GDAL</i> nearest	31,938.24 -98.98%	314,019,621.67 9900.00%	3,146,317.47 0.19%	31,304.81 -99.00%	314,226,875.66 9906.60%
3,140,196.22	3,140,196.22	<i>GDAL</i> sum	3,140,196.22 0.00%	314,019,621.67 9900.00%		3,397,355.20 8.19%	320,523,647.28 10107.12%
3,140,196.22	3,140,196.22	<i>AccoRD-HUB</i>	3,140,196.22 0.00%	3,140,008.26 -0.01%	3,141,006.48 0.03%	3,138,976.90 -0.04%	3,141,556.44 0.04%

GHS-POP WARP = specialized tool (pro: perfect results, con: slow)

GDAL = standard tool mainly used by all platforms (pro: easy to use & integrate, con: standard options are not always the best)

AccoRD-HUB = in development



- the Account Ready Data Hub (AccoRD-Hub) is an architecture for on-the-fly discovery, manipulation and validation of data (geospatial and temporal manipulation of raster, vector, and tabular datasets) in a statistical compliant way
- The AccoRD-HUB mainly provides processing functions and methods for data manipulation and compilation of harmonized data stacks following the FAIR principles for ecosystem accounting
- In easy words: an intelligent data broker and job distributor (processing / storage / catalog generation)
- usage of preferably standardized platforms (e.g. OpenEO) and data providers (e.g. Copernicus catalogs, STAC)
- Empathies are laid on data quality and tracking of uncertainties to support statistical reporting



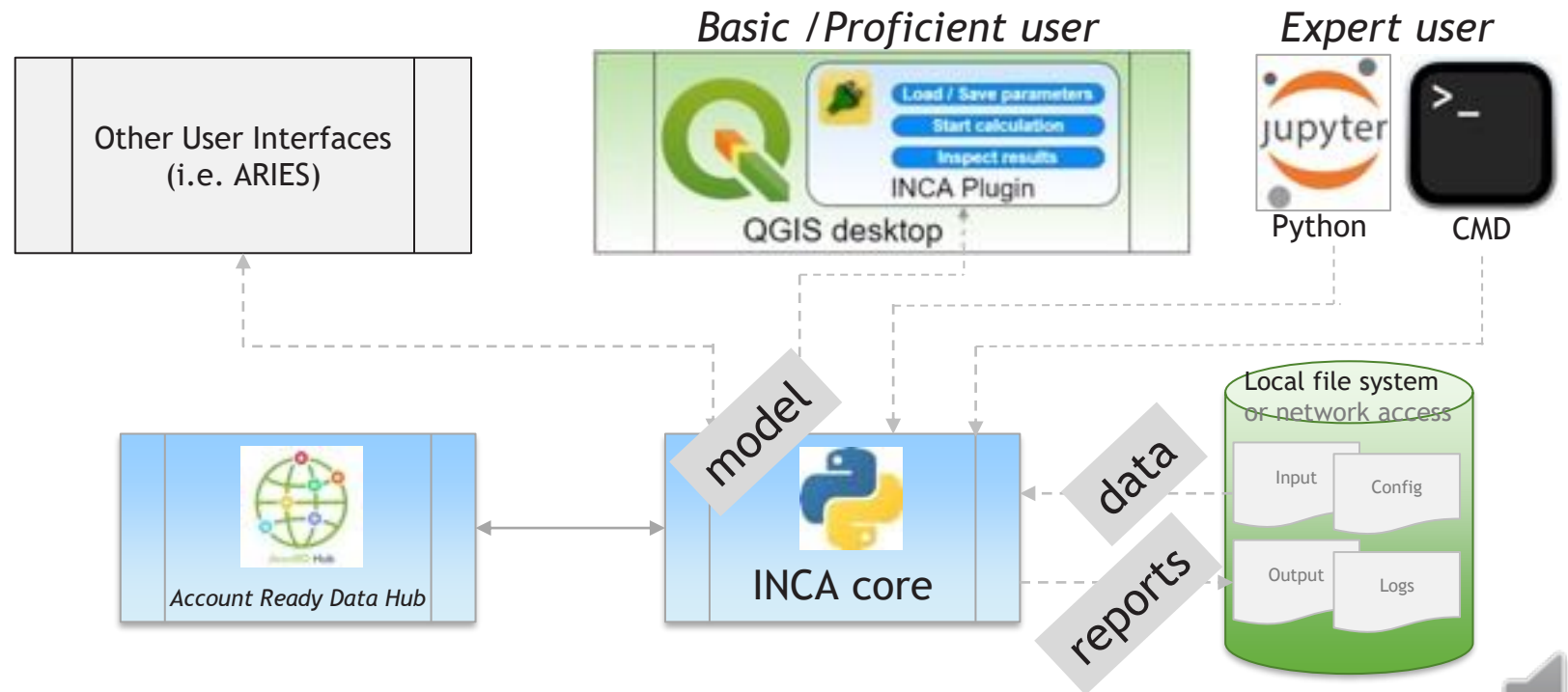
AccoRD Hub



# Local AccoRD-HUB integration

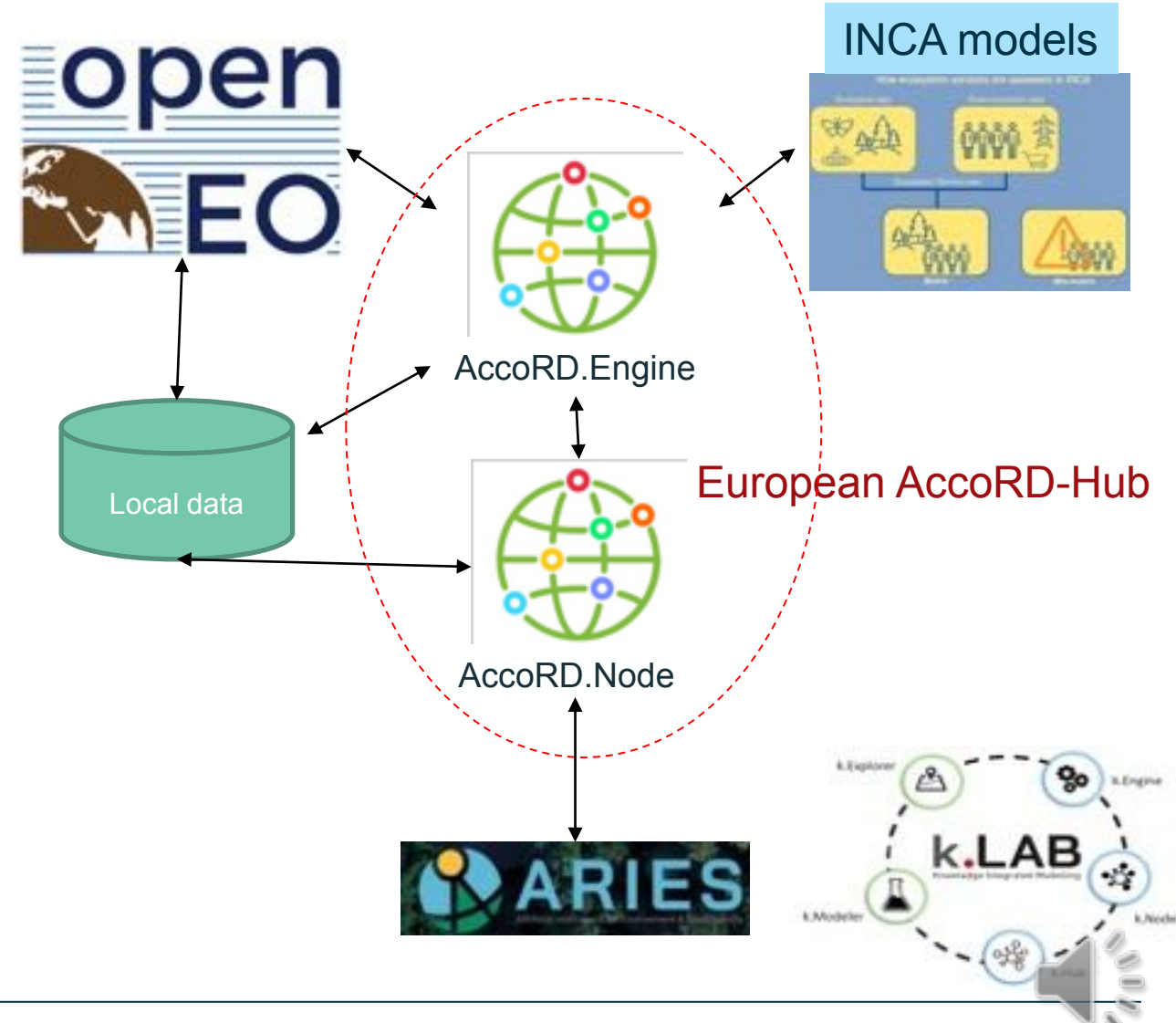
- The AccoRD-HUB concept is successfully tested in two projects
  - PABIO (<https://papbio.org>) → local implementation to manipulate raster & vector data for natural capital accounting following the ENCA methodology to support park management in West Africa
  - INCA (<https://ecosystem-accounts.jrc.ec.europa.eu/>)

- in INCA local integration and connection to a QGIS-plugin to discover the data for manipulation
- AccoRD-HUB provides standard gridded data for ES model runs → allows decoupling of input data regions and reporting regions / thematic groups  
**see presentation INCA Tool (ID:132)**



# First cloud-based implementation in PEOPLE-EA

- In ESA PEOPLE-EA project we develop an online tool to support ecosystem accounting at European national and regional scale (Tier-2/3) through combining several state-of-art technologies (INCA accounting models, ARIES semantic platform, openEO Earth Observation processing platform).
- the tool will be used to generate a number of “EO for Ecosystem Accounting” demonstrators that show the value of Earth Observation in national ecosystem accounting of ESA/EU Member States
- first large-scale test of the AccoRD-HUB architecture and concept



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Contact:

[marcel.buchhorn@vito.be](mailto:marcel.buchhorn@vito.be)

Thank you, questions?