

Use of EOSC to support Protected Area Management applications in the context of GEOSS

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GEO/GEOSS

- GEO is a partnership of **more than 100 national governments** and in excess of 100 **Participating Organizations** that envisions a future where decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations.
- Earth observations from diverse sources, including satellite, airborne, in-situ platforms, and citizen observatories, when integrated together, provide powerful tools for understanding the past and present conditions of Earth systems, as well as the interplay between them.

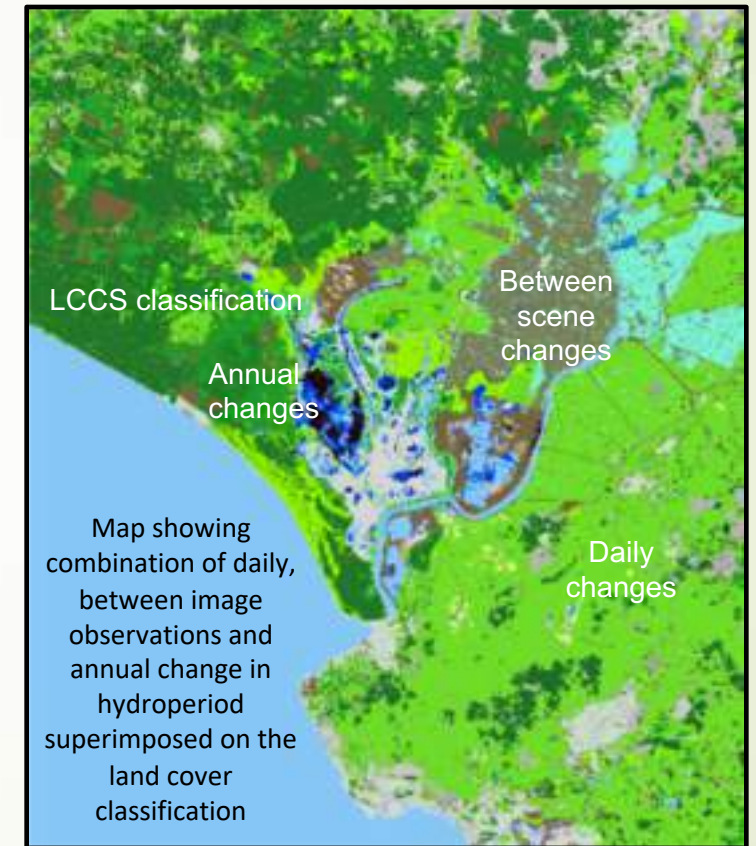
GEO DAB

- ▶ The GEO DAB (Discovery and Access Broker) is a key component of the GEOSS Platform (a.k.a. GEOSS Common Infrastructure), transparently connecting GEOSS User's requests to the resources shared by the GEOSS Providers.
- ▶ GEO DAB scope is to simplify cross and multi-disciplinary discovery, access, and use (or reuse) of disparate data and information.
- ▶ GEO DAB is a brokering framework that interconnects hundreds of heterogeneous and autonomous supply systems (the enterprise systems constituting the GEO metasystem) by providing mediation, harmonization, transformation, and QoS capabilities.



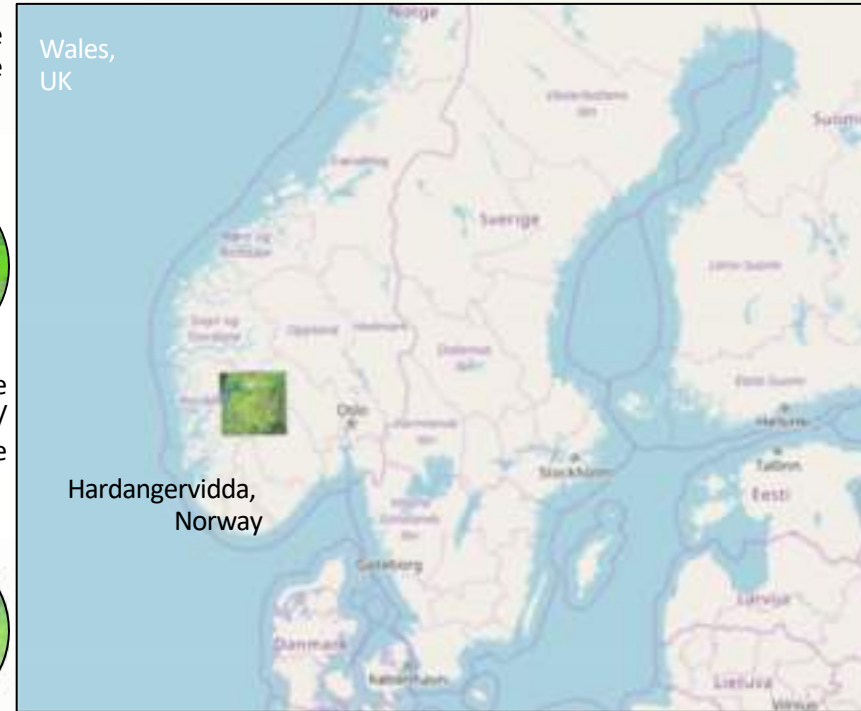
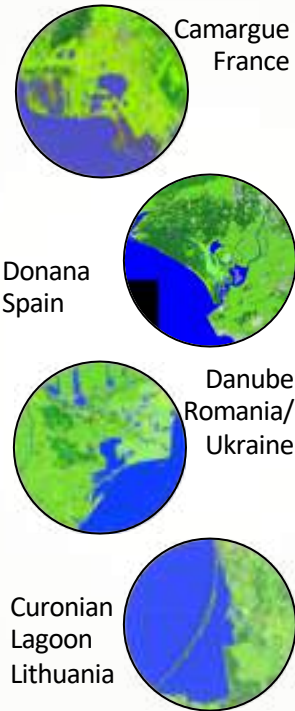
Protected Area Management

- ▶ Europe's protected areas and surrounds are vulnerable to human-induced events and processes including those associated with climate change.
- ▶ As an example, the biodiversity of Doñana National Park in Spain is affected by agricultural expansion, and urban development and climatic variability with all impacting on water supply.
- ▶ Whilst large amounts of Earth Observation data are available, these are vastly underexploited for monitoring changes and implementing management actions aimed at nature conservation and sustainable and wise use.



EODESM

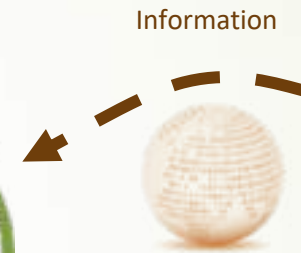
The EODESM system automatically classifies land cover from environmental variables (EVs) according to the FAO Land Cover Classification System (LCCS-2) but also changes by comparing both classes and EVs for any time and time-separated period. Over 100 types of pre-defined change can be mapped based on accumulated evidence.



The Virtual Laboratory



Domain Expert



Earth Observation data and products



Knowledge For Informed Decision-Making



Indicators



Environmental/Ecological Decision-maker, Policy-maker

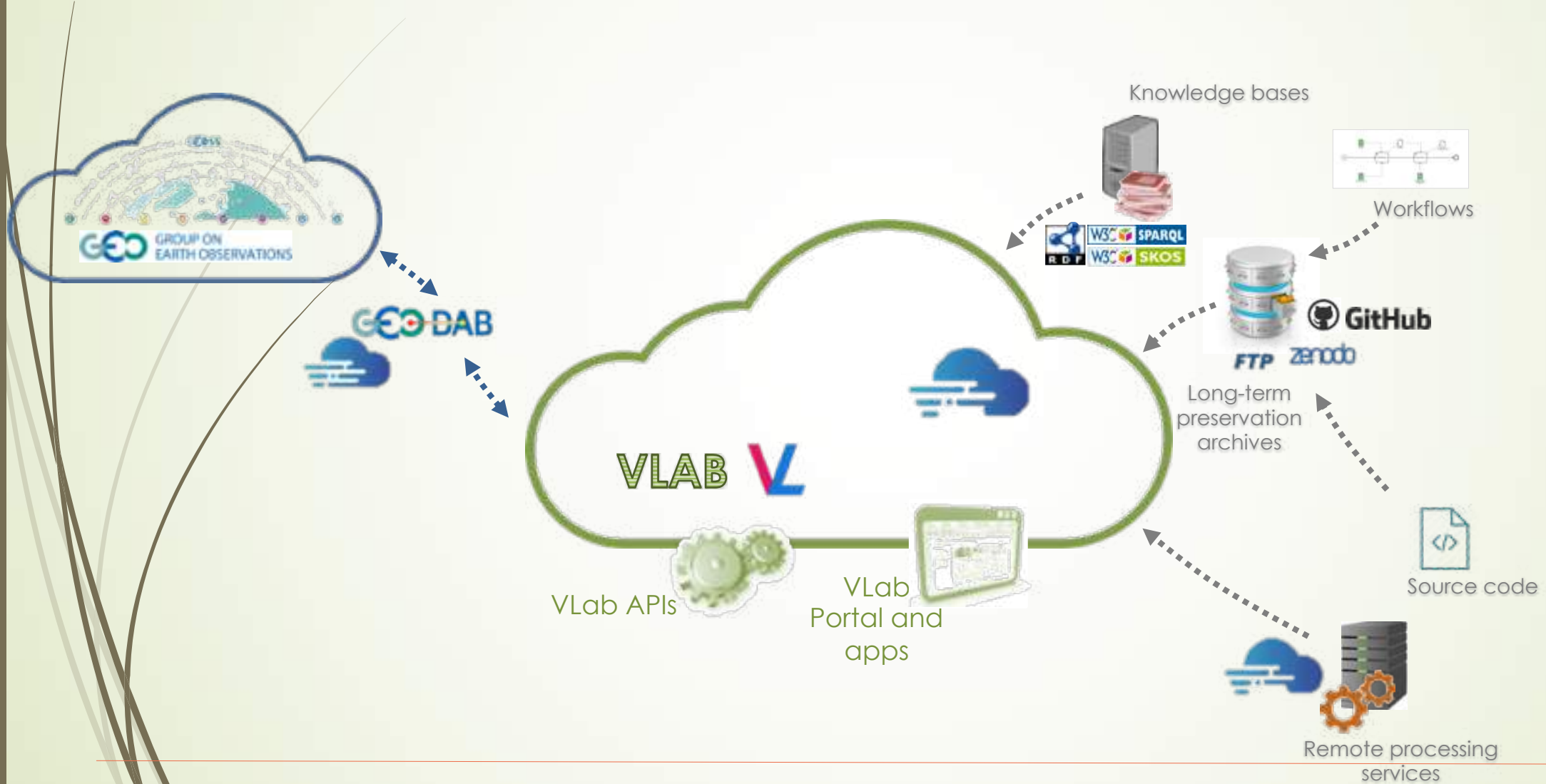
The VLAB Concept

The Virtual Laboratory

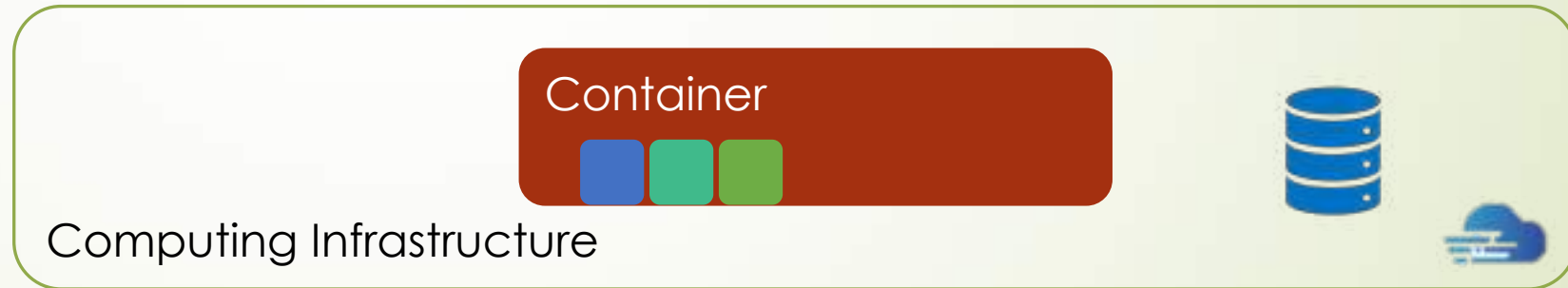
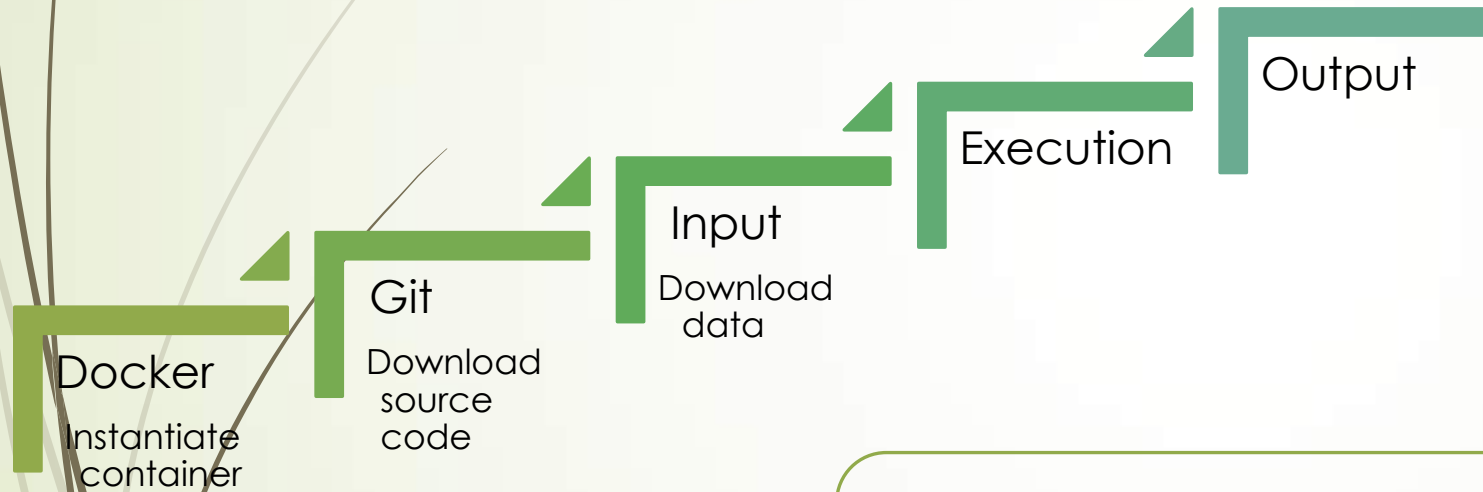
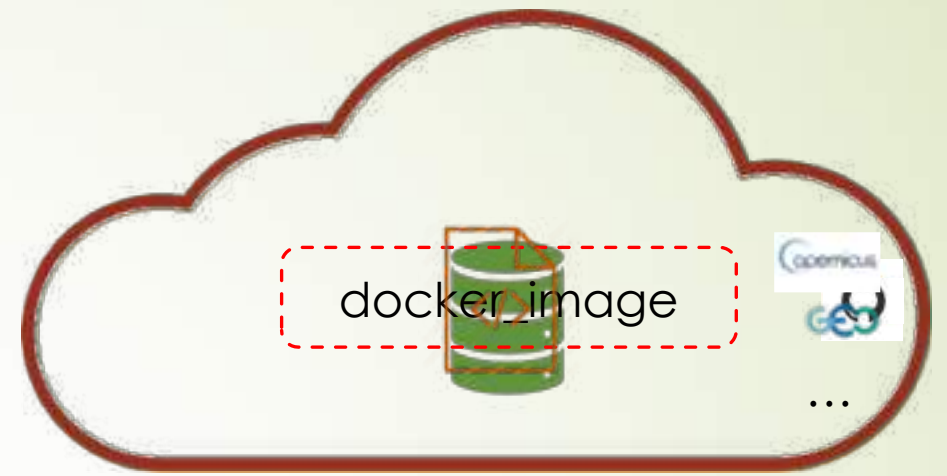
- Main functionalities:
 - Handling of different kind of resources: datasets, algorithms, workflows, ...
 - publishing, harmonized discovery, access and visualization
 - Running workflows implementing scientific business processes for informed decision-making
 - Interaction through GUI (Portal) and APIs



Use of EOSC



Model Execution



EOSC Launch

- Discover the service through the **EOSC Portal**
- Identify available related **workflows** related to the issue of interest
- Explore available **data** through GEOSS
- **Execute the workflow** taking advantage of the EOSC infrastructure



Requirements

Big Data - Variety

- Addressed by GEO DAB
 - Presently, more than 180 brokered systems
 - Requires not only computation power, but a set of ancillary cloud services (monitoring, queue, load balancing, etc.)

Big Data - Volume

- Requires cloud-native data access
- Possible use of Data Cubes:
 - optimizes the access to only required portion of data

Scientific Models - Variety

- Addressed by VLab:
 - Requires container orchestration from the cloud provider
 - Dynamic VMs provisioning based on model requirements (e.g. RAM)
 - Ancillary cloud services for API publication, run queue, monitoring, etc.

Next steps

Enhance the use of EOSC

- Support a more dynamic computing nodes allocation

AAI Integration

- Allow user to select execution nodes based her/his AAI authorizations

EuroGEOSS S2M

- An EC initiative to select a set of mature showcases for the next coming GEO Ministerial meeting
- CNR is leading the proposal of an enhanced version of EOSC Launch demo



Thank you