



Report on Deliverable 1.2

Knowledge Base services Platform

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Executive Summary

On December 2018, the first version of the ERA-PLANET Knowledge Platform has been released. It provides functionalities for data and model sharing, in particular allowing model developers to share their models making possible to run them on cloud infrastructures. The release accomplishes several functional and non-functional requirements from the ERA-PLANET Knowledge Platform system architecture described in deliverables GEOESSENTIAL D1.1 and SMURBS D6.1.

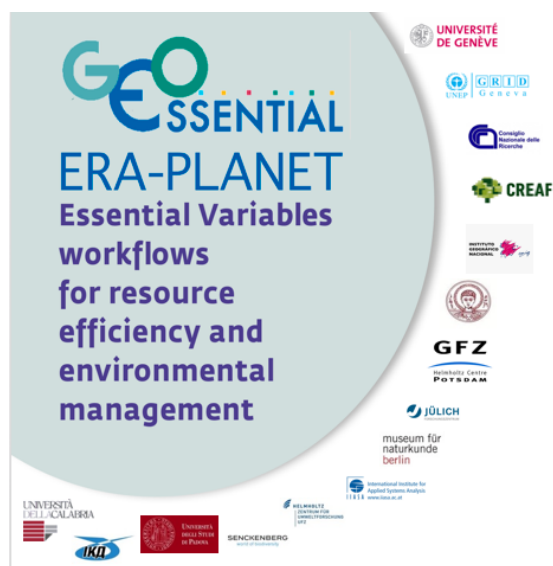
The first version of the ERA-PLANET Knowledge Platform has been presented to ERA-PLANET users at the VLAB Workshop held in Florence, Italy, on 26-28 February 2019, preceded by Introductory and Advanced Webinars held on December 2018 and January 2019 respectively.

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1 Introduction

The deliverable D1.2 on Knowledge Base services Platform is classified as Prototype. As such it is accessible online at <https://vlab.geodab.org/>. The present document is a report about the delivery of the prototype. It includes basic information about the accessibility and status of the prototype.

The GEOESSENTIAL Knowledge Base services Platform is the personalization of the ERA-PLANET Knowledge Platform for GEOESSENTIAL objectives. Its architecture is described in the deliverables GEOESSENTIAL D1.1 and SMURBS D6.1. The implementation is organized into two major phases. The first phase aims at providing the discovery, access and usage services for data and models. The second phase will focus on knowledge formalization and services.

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2 The ERA-PLANET KP

2.1 User interfaces

The ERA-PLANET Knowledge Platform will provide dedicated access to four user categories:

- *Model/Workflow developers* who would like: a) to publish their models for use in scientific workflows; b) to build workflows using published models and data. (The Model/Workflow developer is a *KP Provider* according to the definition of actors in the ERA-PLANET KP system architecture.)
- *App developers* who would like to create mobile and desktop applications based on existing workflows. (The App developer is a *KP App Developer* according to the definition of actors in the ERA-PLANET KP system architecture.)
- *End-users* who would like to execute existing workflows or to use existing applications. (The end-user is a *KP End-User* according to the definition of actors in the ERA-PLANET KP system architecture.)

The current release of the ERA-PLANET KP addresses model developers while some demo is available for end-users through the integration of dedicated UI (dashboard).

2.1.1 The ERA-PLANET KP general portal

In the final release a general portal will provide access to the ERA-PLANET KP with dedicated sections for each user category (see Figure 1)

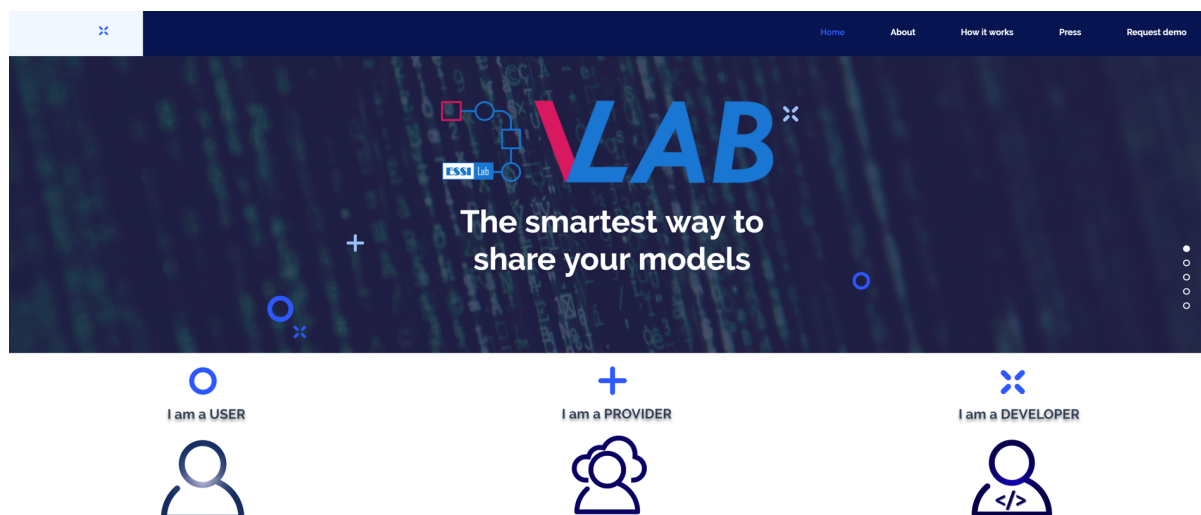


Figure 1 Mock-up of the ERA-PLANET general portal

2.1.2 The ERA-PLANET KP model developer portal

The model developer portal provides the dedicated access for model developers (see Figure 2). It is accessible at the URL: <https://vlab.geodab.org/>. It provides Log In functionality for personalized services, and access to model sharing functionalities and related documentation.

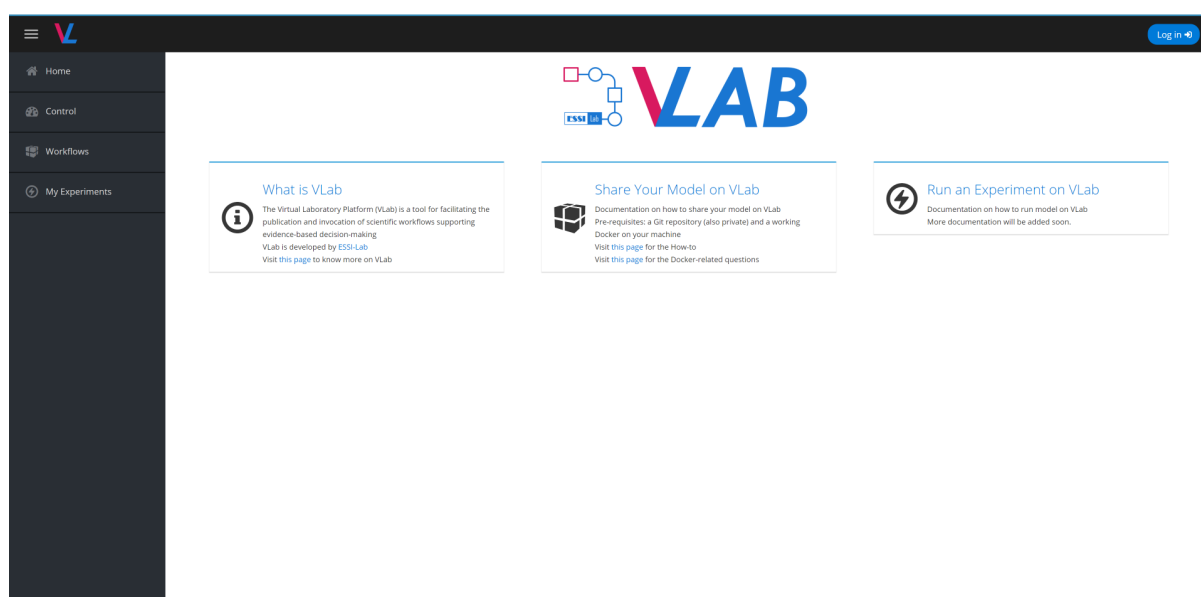


Figure 2 The model developer portal available at <https://vlab.geodab.org/>

2.1.3 Example of end-user interface

It is expected that app developers will be able to build dedicated user interface for end-users using the ERA-PLANET KP APIs. The development of the GEOESSENTIAL dashboard is an example of what can be obtained (see Figure 3).

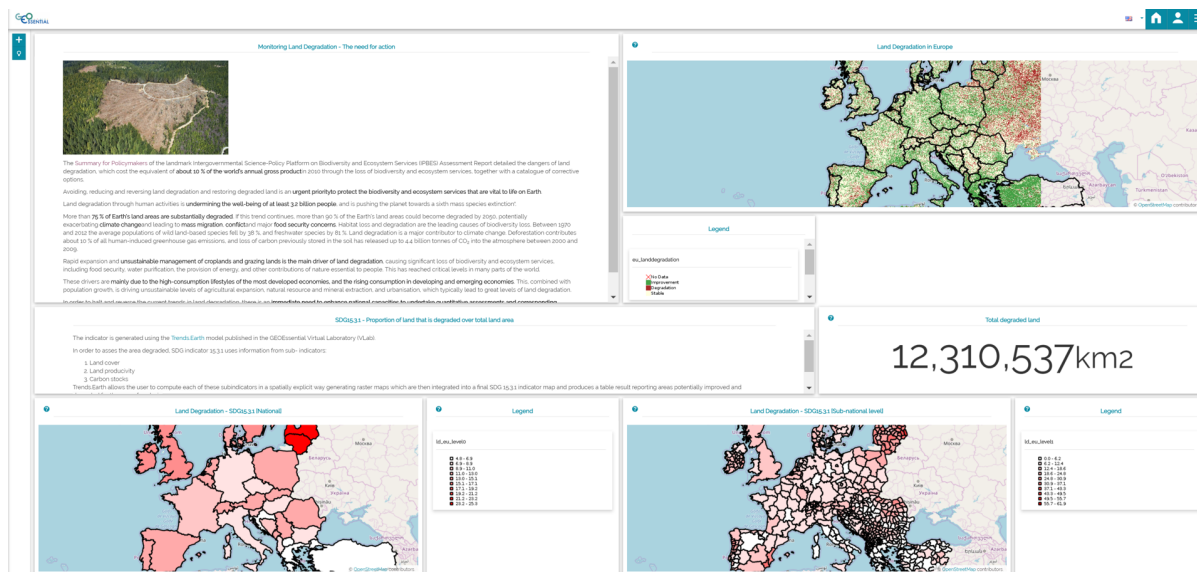


Figure 3 The GEOESSENTIAL Dashboard for the UN SDG 15.3.1 calculated with the ERA-PLANET KP

2.2 Documentation

Documentation for the available functionalities, in particular for model sharing, is available through a dedicated web site based on Confluence collaboration software accessible at <https://confluence.geodab.eu/display/ER/ERA-Planet> (see Figure 4). The documentation includes General Information, How-Tos, FAQs, and collection of presentations and tutorials from webinars and workshops.

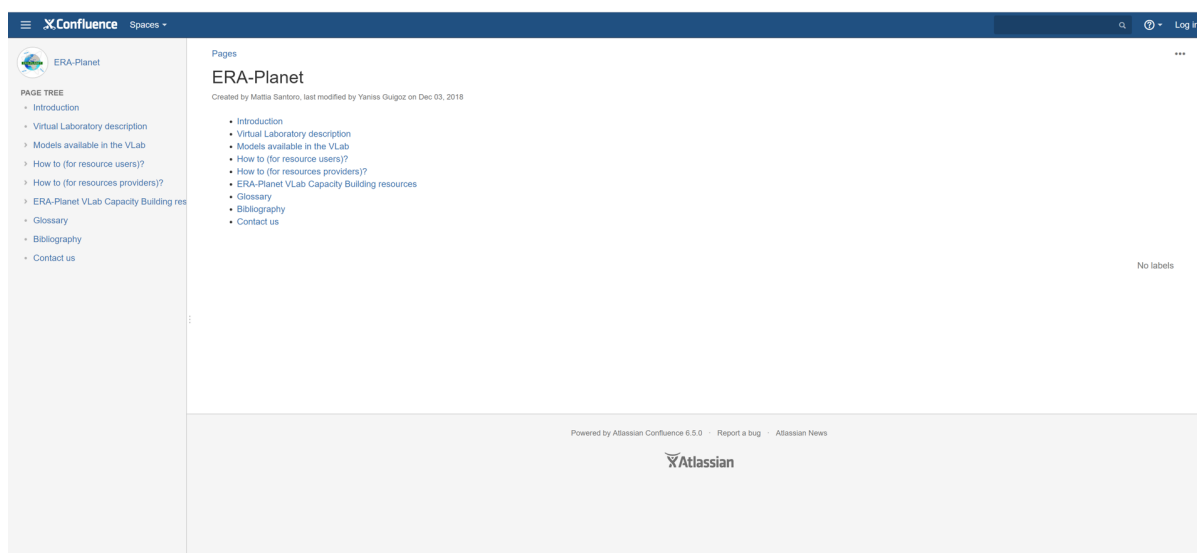


Figure 4 The Confluence documentation site for the ERA-PLANET Knowledge Platform

2.3 Capabilities

The table below summarizes how the current implementation fulfills the identified requirements. The status is expressed according to the following color legend:

Fulfilled
Under development
Not yet implemented

Code	Name	Description	Notes
FR1	Dataset discovery	The system provides discovery of datasets based on different criteria including at least: <ul style="list-style-type: none"> a) geographical coverage expressed as bounding box; b) temporal extent expressed as start and end date/hour; c) keywords present in multiple metadata fields; d) data provider expressed as catalog/inventory name; 	
FR1.1	Dataset discovery protocols (data sources)	The system supports the data discovery protocols identified in the DMP for connecting data sources	
FR1.2	Dataset discovery protocols (clients)	The system publishes the data discovery protocols identified in the DMP for communication with clients (see section §4.4.1): At the minimum the following discovery protocols will be supported: <ul style="list-style-type: none"> a) OpenSearch (and relevant extensions) b) OGC CSW 2.0 ISO Profile 	
FR2	Semantic discovery	The system provides semantic enhancements for discovery, supporting multilingualism, suggestions, and search for related terms.	The functionality is available in the KP, but the external service is discontinued and must be replaced
FR2.1	Semantic discovery protocols	The system provides the possibility to connect to SKOS RDF knowledge bases publishing a SPARQL interface.	
FR2.2	Semantic discovery – knowledge bases	The system is able to access at least the GEMET (General Multilingual Environmental Thesaurus) thesaurus for supporting multilingual discovery.	The functionality is available in the KP, but the external service is discontinued and must be replaced
FR3	Dataset access	The system provides access to datasets from heterogeneous data systems	
FR3.1	Dataset access protocols (data sources)	The system supports the data access protocols identified in the DMP for connecting data sources and dedicated APIs	
FR3.2	Dataset access protocols (clients)	The system publishes the data access protocols identified in the DMP for communication with clients (see section §4.4.1). At the minimum data can be accessed through any of the following protocols: <ul style="list-style-type: none"> a) OGC WCS, b) OGC WFS, c) OGC WMS, 	
FR3.3	Dataset access formats (data sources)	The system supports the data formats identified in the DMP for accessing data sources (see section §4.4.1)	
FR3.4	Dataset access formats (clients)	The system supports the data formats identified in the DMP for communication with clients (see section §4.4.1)	
FR4	Dataset transformation	Through the system, a user can access datasets from different data sources and retrieve them on a Common Grid Environment (same resolution, same CRS, same format, etc.).	

		The system supports basic data transformation functionalities including: <ul style="list-style-type: none"> a) subsetting b) interpolation c) reprojection on multiple Coordinate Reference Systems d) data format transformation 	
FR5	Algorithm evaluation	The system provides description of algorithms	Only basic information can be currently provided
FR6	Algorithm access	The system provides access to the code implementing the algorithm	
FR7	Scientific workflow discovery	The system provides discovery of scientific workflows based on different criteria including at least: <ul style="list-style-type: none"> a) Policy Goal b) Indicator 	To be improved developing a Knowledge base
FR8	Scientific workflow visualisation	The system provides a graphic visualization of a scientific workflow	To be improved with full support of workflows
FR9	Scientific workflow invocation	The system allows to run a scientific workflow on selected datasets	
FR10	AAA	The system must support Authentication, Authorization and Accounting allowing collecting information about the use for both technical and marketing purposes	Under development
FR11	Data Publishing	The system support resource publishing on a long-term preservation system, making the resource available for discovery and use	Under development
FR12	Data registration in GEOSS	Data available in the KP are accessible also through GEOSS (related to FR1.2 and FR3.2)	Under development
NFR1	Seamless discovery and access	The system provides discovery and access of heterogeneous resources through any of the available protocols	
NFR2	APIs	The system functionalities are accessible both server-side (for integration of tools enhancing system capabilities) and client-side (for application development through mash-up) through APIs	
NFR2.1	APIs implementation	The system supports at least: <ul style="list-style-type: none"> a) server-side open interface b) Web APIs (HTML5-JavaScript-CSS library) 	
NFR3	Availability	The system must assure high availability	
NFR4	Performance	The system must assure adequate performances	To be improved on some use-cases under investigation
NFR5	Scalability	The system must assure adequate scalability in terms of number of data sources, number of users, number of requests, etc.	To be evaluated
NFR6	Security	The system must assure security	Depending on AAA infrastructure
NFR7	Usability	The system must be user-friendly for both end-users and application developers	Under improvement
NFR8	Extensibility	The system must be extensible to support new data sources protocols, new apps without major changes	
NFR9	Accuracy	The system should not introduce loss of data quality (e.g. in data transformations)	

Table 1 GEOEssential system requirements

3 Current use of the ERA-PLANET KP

The ERA-PLANET KP consists of dedicated instances of the Discovery and Access Broker (DAB) for data sharing and harmonization and the Virtual Laboratory (VLAB) for model sharing. The DAB technology also enables the GEO DAB making interoperability between the GEOSS Platform and the ERA-PLANET KP straightforward. The VLAB was firstly adopted and enhanced in the context of the H2020 ECO-POTENTIAL project. It is also under deep evaluation and test in ERA-PLANET with the deployment of several models by different working groups in the four ERA-PLANET strands.

The VLAB is also a fundamental component of at least two proposals for showcases in the EuroGEOSS Sprint-to-Ministerial, namely the EODESM showcase by the ECO-POTENTIAL community and the Land Degradation showcase by the GEOESSENTIAL community.