European Direction in GCI Enhancements

D2.4

Functional and non-functional enhancements specification v2.0

Workpackage:	WP2	User requirements elicitation and functional analysis	
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Abstract:

This document describes the generic scenarios derived from the analysis of the use cases and user requirements elicited from the user communities (described in the *EDGE project deliverable D2.3 – Use cases and user requirements document)* and the high-level scenarios derived from the need for GEOSS to evolve from being data-oriented to being knowledge-oriented, at the time of writing, being discussed in the context of the GEOSS Infrastructure Development Task Team.

Based on these scenarios, the underpinning system required capabilities, both functional and non-functional, are identified and documented. These drive the enhancement of the GEOSS Platform and

represent an input to GEOSS Evolve and the GEOSS Infrastructure Development Task Team.

For each system requirement, the impacted GEOSS Platform components are preliminarily identified, along with its priority, which results from a compromise between the urgency of the user requirements and the status and feasibility of the technical implementations needed.

Document Log

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Executive Summary

This document describes the generic scenarios derived from the analysis of the use cases and user requirements elicited from the user communities (described in the EDGE project deliverable *D2.3 – Use cases and user requirements document)* and the high-level scenarios derived from the need for GEOSS to evolve from being data-oriented to being knowledge-oriented, at the time of writing, being discussed in the context of the GEOSS Infrastructure Development Task Team.

Based on these scenarios, the underpinning system required capabilities, both functional and non-functional, are identified and documented. These drive the enhancement of the GEOSS Platform and represent an input to GEOSS Evolve and to the GEOSS Infrastructure Development Task Team.

These capabilities include the need for users to **discover**, **access and use** heterogeneous *resources*, along with relationships and dependencies between each other, as well as the need for resource providers to "**provide**", i.e. expose to the interested audience, resources for easily sharing.

The mentioned *resources*, might be *Data* (satellite, in situ, airborne, etc.), *Services*, e.g. software applications (processing services) implementing a "model" used in an experiment; *Information* such as experiment results, value added products, and also websites, publications, etc.

These resources need to be linkable through well-defined *relationships*: e.g. when users find an experiment result, they shall be enabled to easily gain details regarding how the experiment was originally set-up, references to the *Service* (or details regarding the model) and the *Data* used, with identification of all the steps (recipe). These relationships are essential for supporting *knowledge* acquisition.

Discovery refers to the capability for the user to search for resources of interest based on defined criteria and find them; It involves an **inspection** capability for users to browse through a list of resources (typically the outcome of a search), analyse the metadata (which might include feedback directly provided by other users), visualize them on a map, etc. It also involves a **selection** capability to choose one or more particular resources, as a consequence of inspection.

Access refers to the capability for users or user applications to reach the resource of interest for use in the analysis. This might include their visualization (on a map, in case of georeferenced resources) and might include a download, depending on the type of resource and on the intended use.

Use refers to the exploitation of the accessed resource for the user's purpose. This might be the execution of a computation that, according to a given model or algorithm, implemented by a Service, transforms the input data into value added products.

TABLE OF CONTENTS

1. Introduction

1.1 Purpose and Scope

This document describes the generic scenarios derived from the analysis of the use cases and user requirements elicited from the user communities and the high-level scenarios derived from the need for GEOSS to evolve from being data-oriented to being knowledge-oriented, at the time of writing, being discussed in the context of the GEOSS Infrastructure Development Task Team.

Based on these scenarios, the underpinning system required capabilities, both functional and non-functional, are identified and documented.

For each system requirement, the impacted GEOSS Platform components are preliminarily identified, along with its priority, which results from a compromise between the urgency of the user requirements and the status and feasibility of the technical implementations needed.

1.2 Document Organisation

The document is organised as it follows:

- Section 1 - Introduction: describes the purpose and scope of the document and its organization.
- Section 2 - Context and System Perspective: provides an overview of the system being enhanced and of its main components.
- Section 3 - User requirements summary: briefly describes the use cases and user requirements that drive the specification of the system requirements in this document, along with the involved user communities.
- Section 4 – Generic Scenarios: describes the generic scenarios deriving from the analysis of the use cases and user requirements elicited from the user communities and the high-level scenarios deriving from the need for GEOSS to evolve from being data-oriented to being knowledge-oriented.
- Section 5 - System required capabilities: describes the detailed, specific requirements deriving from the above mentioned user needs.
- Section 6 - Requirements traceability matrix: Traces the system requirements to the user requirements and the generic scenarios to the system requirements.
- Annex A - References: List the references used in the document.
- Annex B - Figures and Tables: Provides links to figures and tables in the document.
- Annex C - Terminology: explains the meaning of the acronyms and definitions used in the document.

2. Context and System Perspective

The Global Earth Observation System of Systems (GEOSS) is a social and software ecosystem sharing independent and open Earth observation (EO) information and processing services.

GEOSS connects and coordinates a large array of observing systems, data systems and processing services to strengthen monitoring of the state of the Earth. It facilitates the sharing of environmental data and information collected by countries and organizations within GEO.

The GEOSS Platform, formerly called the GEOSS Common Infrastructure (GCI), is the cornerstone around which the GEOSS software ecosystem is implemented. Enabling the connection and coordination of the many autonomous and multi-organizational systems and services contributing to GEOSS, it is the technological tool implementing the Global Earth Observation System of Systems (GEOSS).

The birth of the former GCI has been in 2008, as Clearinghouse catalogue, in 2012 the GCI evolved into a Brokering infrastructure with the inclusion of the GEO Discovery and Access Broker (GEO DAB). The first user interface, the GEOSS Portal was initially created in 2010 and in 2016 has seen great enhancements in terms of user experience and enhanced discovery, access and visualization functionalities. In 2017 the formerly called GCI has evolved into a GEOSS Platform.

This document describes the system requirements that will drive further evolutions of the GEOSS Platform.

2.1 System Overview

Figure 1 provides an overview of the GEOSS Platform, its “connecting” between users and data providers and its components.

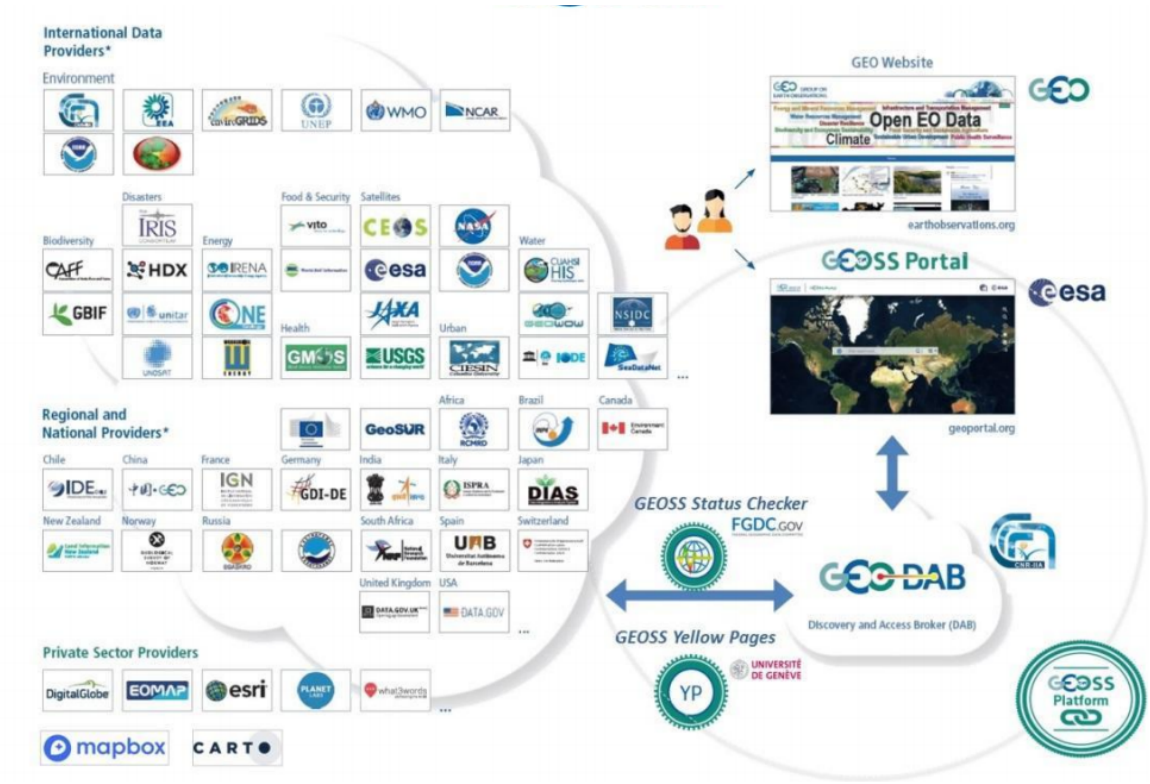

Figure 1: GEOSS Platform Overview

The **GEO Discovery and Access Broker (GEO DAB)** is the primary mechanism by which all data and information is discovered and accessed. The GEO DAB implements the necessary mediation and harmonization services through Application Program Interfaces (APIs). These APIs allow data providers to share resources without having to make major changes to their technology or standards.

The **GEOSS Portal** (www.geoportal.org) is an online map-based user interface which allows users to discover and access Earth observation data and resources from different providers from all over the world. It connects users to existing databases and portals and provides reliable, up-to-date and user friendly information – vital for the work of decision makers, planners and emergency managers. The portal is implemented and operated by the European Space Agency and provides a single internet discovery and access point to the ever-growing quantities of heterogeneous collections of Earth observations from satellites, airplanes, drones and in-situ sensors at global, regional and local scales.

The **GEOSS Yellow pages** service implements the simplified registration process for new Data Providers.

The **GEOSS Service Status Checker** is the component, developed by USGS/FGDC and integrated into the GEO DAB, which aims at improving user experience by providing information on Reliability of Services. The Status Checker is an automatic mechanism to monitor, diagnose and alert data providers and users on the Health status of the web services provided by the GEOSS Platform.

In addition to the above described main components of the Platform, GEOSS offers the so-called **Reuse Components** to serve the specificities of the various user communities. This means that user communities, which might have their own data, portals and corresponding specific needs, can reuse some of the GEOSS Platform components customized and tailored to their specific requirements.

The Reuse Components are:

- The *GEOSS View*, which provides access to a subset of specifically defined GEOSS resources using temporal, thematic and spatial criteria;
- The *GEOSS APIs*, which expose the discovery and access functionalities of the GEO DAB and as such can be exploited by user communities' client applications or portals;
- The *GEOSS Mirror* is a GEOSS Portal site customisation for SBAs, Flagships, Initiatives, and Communities. The customisation better serves the specific community interests by filtering catalogues and search results by a specific theme or GEO DAB view, location of interest, etc.
- The *GEOSS Widget* is a freely-available instantiation of selected GEOSS Portal widgets made available for possible customization in various areas of application (e.g. a specific SBA, Initiatives, etc.). This is accomplished by publishing portal code parts (widgets) wrapped up in API.

3. User requirements summary

Main sources of the requirements are:

- User communities from the following thematic areas: Disaster Resilience Management (which is a GEO Priority Area, see 2.2), Water Resources Management, Biodiversity and Ecosystem Sustainability, Public Health Surveillance, Agriculture and Food Security, Sustainable Urban Development, Climate (another GEO Priority Area);
- GEO regional Hubs such as AmeriGEO, EuroGEO and AOGEO;
- Communities linked to the Sustainable Development Goals (another GEO Priority Area);
- Cross-thematic communities.

The requirements from the thematic communities mainly concern the need to search in a theme-specific domain through domain-specific keywords and receive in response at the same time resources from different and heterogenous sources. In some cases, specific search and visualization features are required. In other cases, discovery and access of processing services as well as their execution in a seamless and transparent way is required (e.g. in the case of the ESA Thematic Exploitation Platforms or the Copernicus Services). In some cases, specific search and visualization features, as well as access to trusted knowledge sources are required.

Requirements concerning the GEO Regional Hubs mainly regard the need to connect to their infrastructures, thus providing access to their resources to the wide GEOSS audience. In some cases ad-hoc features such as the creation of search sub-domains within a given domain and accessibility from an ad-hoc portal are also required.

Specific search capabilities are required for the SDGs, as well as the capability to compute SDG indicators according to defined models. Comparison capabilities are also required, to be able to analytically compare SDG indicators from official sources (e.g. the UN Statistics Division) with indicator computed through defined models, provided by trusted sources.

Cross-thematic communities' requirements mainly regard ad-hoc portals with search and access capabilities as well as discovery, access and execution of processing services provided by trusted sources (e.g. DIAS platforms).

Further details about the use cases, corresponding user requirements and involved communities can be found in D2.3 [RD-4].

4. Generic scenarios

The scenarios described here derive from:

- Generalization of the user community-oriented scenarios described in D2.3 [RD-4];
- Formalization of the high-level generic scenarios arising from the need for GEOSS to evolve from data-oriented to knowledge oriented, being discussed, at the time of this writing, in the context of the GEOSS Infrastructure Development Foundational Task.

4.1 Generic scenarios deriving from the analysis of the user communities needs (use cases and user requirements)

The use cases elicited by the user communities described in D2.3 [RD-4] have been analysed to the purpose of identifying the corresponding generic scenarios. They are listed in the table below, along with the use cases (user community – specific) from which they derive. Please refer to D2.3 [RD-4] for details regarding the mentioned source use cases and corresponding user requirements.

#	User	Title	Description	Source
S1	Any	Resources discovery and access with linked information (relationships)	The user searches for resources of interest (such as *data*, *information,* URL, documents, thematic communities, aggregated indicators, scientific articles, *cloud platforms*, *scientific workflows* provided by different organizations, services) based on criteria of interest. (S)he receives in result a list of resources matching the selected criteria and including the relevant information that helps the user to use, understand and contextualize the searched item. The user selects and inspects the resources of interest among the results and if desired, (s)he can inspect (including visualization on a map) and use them.	UC-DRM-01 Earthquake search and visualization UC-DRM-02 – Access to data from the Copernicus Emergency Management Service UC-DRM-03 – Access to GEOHazards TEP UC-CLI-01 - Searching climate resources in GEOSS by the GCOS Essential Climate Variables. UC-CLI-02 – Access to data from the Copernicus Climate Change Service UC-CLI-03 – Retrieval of publications from Zenodo regarding Coastline changes on Koh Tao island UC-CLI-05 – Accessing Climate risk information for Central America from the GEO regional node AmeriGEO UC-CLI-06 – Access to ESA Coastal TEP UC-CLI-07 – Access to ESA Polar TEP UC-WRM-04 – Access to data from the Copernicus Marine Environment Monitoring

				Service UC-WRM-05 – Access to data from the Copernicus Land Monitoring Service UC-WRM-07 – Access to ESA Hydrology TEP UC-BES-03 – Access to ESA Forestry TEP UC-PHS-02 – Access to data from the Copernicus Atmosphere Monitoring Service UC-AFS-02 – Creating a crop mask UC-AFS-03 – Access to ESA Food Security TEP UC-SUD-01 – Access to ESA Urban TEP UC-GRH-03 – Discovery and visualization of resources from EuroGEO UC-GRH-04 – Discovery and visualization of resources from AmeriGEO UC-SDG-02 – Searching for SDG indicators UC-SDG-03 – Access to SDG indicator values from UNSD UC-CRT-03 – Access to DIAS platforms UC-AFS-01 – Land degradation due to forest fires UC-SUD-02 – Exploring SDG Indicator 11.6.2 and its sensitivity to a city's definition and comparing with values from other sources
S2	Earth Scientist	Service Execution	The user searches for a service of interest (might be a service for the generation of Value Added Products, or indicators), selects it, defines the required service parameters, discovers and selects the input data and starts the service execution.	UC-BES-01 - The ECOPotential Knowledge Generator UC-SDG-04 – Generating SDG indicator 15.3.1 and comparing with values from other sources UC-SDG-05 – Generating SDG

			The user receives an estimate of the amount of time needed for the results to be available. After an amount of time close to the above-mentioned estimate, the results become available. The user can inspect and use them.	indicator 14.1.1 and comparing with values from other sources UC-SDG-06 – Generating SDG indicator 11.3.1 and comparing with values from other sources
S3	Resources Provider	Resources Registration	Resources providers shall be able to make their resources discoverable and accessible through the system. It shall be possible to do this both manually and automatically.	UC-CLI-04 – Making visible to GEOSS users own knowledge regarding coastline change
S4	Any	Promotion and collaboration.	Users shall be able to create, curate and share information regarding resources of interest, through mediated collaboration, for decision and policy makers. This will enable the promotion of models, algorithms and scientific workflows provided by well recognized and authoritative institutions, thus also fostering international cooperation.	UC-CLI-04 – Making visible to GEOSS users own knowledge regarding coastline change
S5	Earth Scientist or decision maker	Analytical comparison	The user is enabled to compare the same variable on the same area from different sources and in different times.	UC-SUD-02 – Exploring SDG Indicator 11.6.2 and its sensitivity to a city's definition and comparing with values from other sources UC-SDG-04 – Generating SDG indicator 15.3.1 and comparing with values from other sources UC-SDG-05 – Generating SDG indicator 14.1.1 and comparing with values from other sources UC-SDG-06 – Generating SDG indicator 11.3.1 and comparing with values from other sources
S6	Developer	Exporting discovery and access capabilities	Users are enabled to easily exploit in their own infrastructure data discovery and access capabilities of their own or GEOSS-provided resources or both simultaneously.	UC-WRM-01 - AtlantOs: Optimising and Enhancing the Integrated Atlantic Ocean Observing Systems UC-WRM-02 - GEO-GNOME:

				GEO Global Network for Observation and Information in Mountain Environments UC-WRM-03 – GTN-H: The Global Terrestrial Network for Hydrology UC-WRM-06 – GEOSS for the Space4Water UC-BES-02 – GEOSS for the Satellite-based Wetland Observation Service UC-PHS-01 - GOS4M: Global Observation System for Mercury UC-GRH-01 – AmeriGEO Community Portal UC-GRH-02 - DBAR: Digital Belt And Road UC-SDG-01 - GEO Essential and the Essential Variables Portal UC-CRT-01 - ENERGIC OD: European NEtwork for Redistributing Geospatial Information to user Communities - Open Data UC-CRT-02 – EnviDat: The Environmental Data Portal of the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL)

4.2 Knowledge-oriented scenarios

The high-level scenarios included in this paper respond to the general need to share knowledge regarding scientific research with Earth Observation (EO) data to facilitate the spreading and the utilization of the research results and to maximize their exploitation.

Researchers undertake a scientific procedure (hereafter referred to as *experiment*) to make a discovery, test a hypothesis, or demonstrate a known fact. The experiments undertaken by Earth Science researchers are usually aimed to produce useful and actionable information (*value added products* or other results) by transformation of satellite, in-situ or other data (hereafter called *input data*), through their elaboration on the basis of a defined "model", i.e. a mathematical algorithm, whose validity is often tested with the experiment itself.

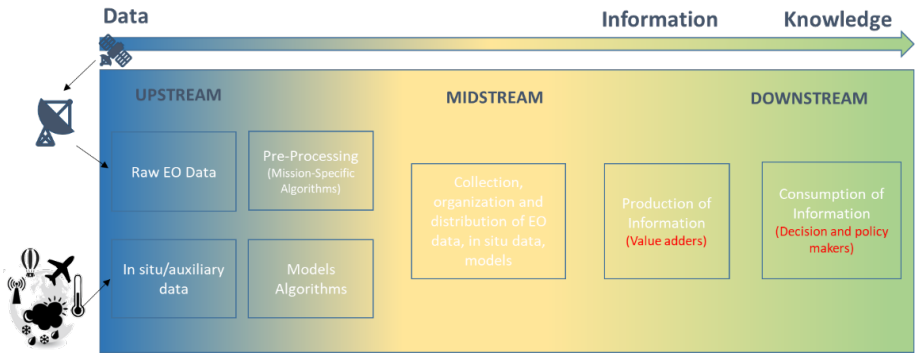

Figure 2: Data value chain

In other words, Earth scientists act as *producers of information* in the data value chain from data to knowledge[1]. In doing so, they follow a process, encounter issues, solve problems, document procedures, with the aim to provide actionable information to those who will consume it to perform their activities, such as decision and policy makers (see Figure 1).

The process of knowledge acquisition is often cumbersome, costly and time consuming. Preservation of it shall be done in a way that it can benefit other scientists, ensuring well-structuredness and accessibility. Scientists shall be enabled to easily *reproduce*, *replicate* or *reuse*[2] previously performed experiments.

The following sections describe four typical scenarios of increasing complexity. The first two can be typically carried out by an Earth Scientist, while the last two, more complex, might require in addition the expertise of a decision maker representative. These scenarios originate from the analysis of the GEOSEC GEO Knowledge Hub Implementation Plan.

[1] Data value chain is defined as an information flow that describes a series of steps required to generate value and useful insights from data (European Commission, 2014), (Curry, 2016). To fully realize the value chain of EO data, the Data-Information-Knowledge-Wisdom (DIKW) paradigm can facilitate evidence-based decision-making processes and informs about the limits of our planet (Ackoff, 1999), (Rowley, 2007). In DIKW, *data* is considered as a collection of facts/measurements in a raw or unorganized form (e.g., numbers); *information* is an ***added-value product*** generated from data that has been cleaned of errors and further processed in a form that makes it easier to visualize, analyze and interpret for a specific purpose (e.g., relation with physical and/or social phenomena). In turn, *knowledge* is generated when information is not only perceived as a description of collected and organized facts (e.g., contextualization), but also when one understands how to apply it to achieve certain objectives (i.e., elaborating valuable patterns). Finally, *wisdom* is when knowledge is applied to action to explore future scenarios and answer question such as "what is the best" or "why do something" (Ackoff, 1999), (Rowley, 2007).

[2] The terms reproducibility, replicability and reusability (or generalizability) are used in the sense defined by the *National Science Foundation's Subcommittee on Replicability and Science (2015):*

- **Reproducibility** refers to the ability of a researcher to duplicate the results of a prior study using the *same materials and procedures* as were used by the original investigator.
- **Replicability** refers to the ability of a researcher to *duplicate* the results of a prior study if the *same procedures* are followed but *new data* are collected.
- **Generalizability** (**reusability or reuse**) refers to whether the results of a study apply in *other contexts or populations* that differ from the original one.

In short, *reproducibility* involves the original data and code; *replicability* involves new data collection(s) to test for consistency with previous results of a similar study; *reusability* (*reuse* for short) involves the original code (or a slightly modified version) with data for a different region of study, to aim to obtain similar results.

#	User	Title	Description
S7	Earth Scientist	Discovering experiment results	A user wants to **discover** a given experiment result, with associated relationships e.g. the references to *Data* and *Services* used in the experiment. More in detail, the user shall be able to do a search based on several criteria, such as time-frame, location, theme, etc; the search outcomes are displayed in a list and on a map from which the user can **inspect** them, **select** the one(s) of interest and possibly **access** them for **use** (or save the results for future use). The search outcomes are organized in a well-structured manner that would enable the reproduction of the experiment: this might include indication of the paper describing the experiment (or a *recipe*) with the possibility to access it; information on how to access the in situ and/or satellite *Data* and the *Service(s)* used.
S8	Earth Scientist	Reproducing an experiment	A user wants to reproduce exactly an experiment (e.g., for peer review purposes) and regenerate the result. Specifically, the user would like to **discover** and **access** *information* (as described in *Scenario 1)* and follow the steps and guidelines described. For example, he/she shall be able to access the paper to repeat the steps described in it (or other recipe book), **access** the referenced *Service* and **use** it, with the provided Data references as inputs.
S9	Earth scientist and decision maker representative	Replicating an experiment	A user wants to replicate an experiment e.g. to generate the same kind of product in a different period. Specifically, the user shall be able to **discover** and **access** *information* as described in *Scenario 1* and follow the steps and guidelines in there, with new data, i.e. different from the ones used in the original experiment, as inputs. For example, he/she can **access** the paper (or other recipe book) to repeat the steps described in

			it, **access** the referenced *Service* and **use** it for executing the computation that transforms the input data into products. The user shall be enabled to **discover** the input data based on several criteria, such as data type, time-frame, location, theme, etc., to **inspect** the search outcomes and **select** the data of interest as input to the *Service*.
S10	Earth scientist and decision maker representative	Reusing an experiment	A user wants to reuse an experiment by adapting it to his/her specific necessities and purposes. He/she could use the same or a slightly modified model and different data as inputs, **use** the same Service(s) on a different region, or context, or scale; or use, if desired, (a) different Service(s). To do this, he/she might need, for example, to **discover** a Service of interest, based on several criteria such as resulting product, time-frame, location, theme, etc. and might be enabled to **discover** and **select** the input data of interest.

5. System required capabilities

The above described scenarios pose many challenges including the need for users to **discover**, **access and use** heterogeneous *resources*, along with relationships and dependencies between each other, as well as the need for resource providers to "**provide**", i.e. expose to the interested audience, resources for easily sharing.

The mentioned *resources*, might be *Data* (satellite, in situ, airborne, etc.), *Services*, e.g. software applications (processing services) implementing a "model" used in an experiment; *Information* such as experiment results, value added products, and also websites, publications, etc.

These resources need to be linkable through well-defined *relationships*: e.g. when users find an experiment result, they shall be enabled to easily gain details regarding how the experiment was originally set-up, references to the *Service* (or details regarding the model) and the *Data* used, with identification of all the steps (recipe). These relationships are essential for supporting *knowledge* acquisition.

Discovery refers to the capability for the user to search for resources of interest based on defined criteria and find them; It involves an **inspection** capability for users to browse through a list of resources (typically the outcome of a search), analyse the metadata (which might include feedback directly provided by other users), visualize them on a map, etc. It also involves a **selection** capability to choose one or more particular resources, as a consequence of inspection.

Access refers to the capability for users or user applications to reach the resource of interest for use in the analysis. This might include their visualization (on a map, in case of georeferenced resources) and might include a download, depending on the type of resource and on the intended use.

Use refers to the exploitation of the accessed resource for the user's purpose. This might be the execution of a computation that, according to a given model or algorithm, implemented by a Service, transforms the input data into value added products.

The following sections provide detailed descriptions of the system required capabilities (SR – System Requirements) for which, the following definitions apply:

- 'Shall': Requirements containing 'shall' are considered essential, i.e. mandatory;
- 'Should': These are strongly recommended requirements although non-mandatory;
- 'Could': These are nice-to-have requirement (time and resources permitting), but the solution will still be accepted if the functionality is not included;
- 'Will': this can be used in a requirement text to provide additional information such as background or rationale, to help understand the requirement genesis and meaning. Will statements are not subject to verification.

Each requirement has the following attributes:

- 'Identifier': Symbolic identifier following the convention:
  SR-< Requirement Type>-<Counter> where <Requirement Type> refers to one of the different kinds of requirements, i.e. Functional (FUN), Interface (INT), Non Functional (NFC), Security, Privacy and Access Control (SEC); <Counter> is a requirements counter that uniquely identifies the requirement.
- 'Title': a very concise textual description of the requirement;
- 'Requirement Description': This is the formulation of the requirement. Each requirement attempts to be clear, concise and unambiguous, with each statement containing one and only one requirement;

- 'Linked User Requirements': the user requirements (described in D2.1 [RD-4]) that need to be satisfied with this system requirement; they are identified in this document here by code and title, **please refer to D2.3 [RD-4] for full text description.**
- 'Priority': This can be High, Medium or Low. High priority means early delivery needed, low means late delivery acceptable. They reflect the importance and urgency given to each requirement.
- 'Stability': this allows flagging requirements which are unstable, i.e. which are still under discussion and as such might change.
- 'Affected/Used GEOSS Platform Components': this represents a preliminary allocation of the requirements to the GEOSS Platform Components that are expected to be mainly affected by the requirement.

5.1 SR-FUN-001 – Data discovery (with relationships to associated concepts)

Identifier

SR-FUN-001

Title

Data Discovery (with relationships to associated concepts)

Requirement Description

The GEOSS Platform shall enable users to search for data, which might be satellite, in situ or other. S(he) will perform searches using natural language and will receive all the results regarding the searched concept without need to switch between data types and sources. Additionally, it shall allow them to extend their knowledge by checking related topics, viewing search term definitions, related services, information, data.

Each item (data or product) in a list resulting from a user data query shall be equipped with the following: (i) If any, associated *relationships* (context, use, description, related concepts, etc.) and link to corresponding source; (ii) If any, provenance information (how and when the product has been generated, which services/computing resources have been used, validation information); (iii) If any, associated services, including (a) links to services that can be used with this product as input, (b) links to services that can be used to generate this kind of product.

Source scenarios

S1	Resources discovery and access with linked information
S9	Replicating an experiment
S10	Reusing an experiment

Linked User Requirements

UR-CLI-011	Retrieving climate information from different knowledge sources
UR-BES-001	Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-003	Graph-based navigation of the ECOPOTENTIAL Ontology concepts
UR-BES-004	Input data for ECOPOTENTIAL workflows in GEOSS
UR-DRM-007	Discovery and access of data and information produced by the Geohazards TEP
UR-CLI-015	Discovery and access of data and information produced by the Coastal TEP

UR-CLI-018	Discovery and access of data and information produced by the Polar TEP
UR-WRM-017	Discovery and access of data and information produced by the Hydrology TEP
UR-BES-008	Discovery and access of data and information produced by the Forestry TEP
UR-AFS-001	Discovering and accessing land degradation showcases from EuroGEO
UR-AFS-002	Retrieving knowledge on the creation of a crop mask
UR-AFS-004	Discovery and access of data and information produced by the Food Security TEP
UR-SUD-002	Discovery and access of data and information produced by the Urban TEP
UR-DRM-001	Earthquake search

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.2 SR-FUN-002 – Service Discovery (with relationships to associated concepts)

Identifier

SR-FUN-002

Title

Service Discovery (with relationships to associated concepts)

Requirement Description

The GEOSS Platform shall enable users to discover previously registered services e.g. software applications (processing services) implementing a “model” used in an experiment, based on user search criteria that include:

- Service Name;
- Service Provider;
- Geographical area of interest;
- Access Conditions;
- Input Data;
- Output Data.

They shall be equipped with links to related concepts, e.g. context, type of input or output data, etc.

Source scenarios

S1	Resources discovery and access with linked information
S10	Reusing an experiment

Linked User Requirements

UR-DRM-006	Discovery of ESA GEOHazards TEP

UR-CLI-014 Discovery of ESA Coastal TEP
UR-CLI-017 Discovery of ESA Polar TEP
UR-WRM-016 Discovery of ESA Hydrology TEP
UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-007 Discovery of ESA Forestry TEP
UR-AFS-003 Discovery of ESA Food Security TEP
UR-SUD-001 Discovery of ESA Urban TEP
UR-SDG-008 SDG indicator 15.3.1 computation service discovery
UR-SDG-012 SDG indicator 14.1.1 computation service discovery
UR-SDG-016 SDG indicator 11.3.1 computation service discovery
UR-CRT-008 Discovering and accessing DIAS Platform services

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.3 SR-FUN-003 – Information Discovery (with relationships to associated concepts)

Identifier

SR-FUN-003

Title

Information Discovery (with relationships to associated concepts)

Requirement Description

The GEOSS Platform shall enable users to discover information of all kinds, including experiment results, value added products, publications, websites, along with relationships with associated concepts. In the case of value added products, for instance, these relationships might include information regarding how they were generated, details regarding the service or the model used, with identification of all the steps (recipe), and data used to generate that product.

Source scenarios

S1 Resources discovery and access with linked information
S7 Discovering knowledge regarding the generation of a product or the execution of an experiment
S8 Reproducing an experiment
S9 Replicating an experiment
S10 Reusing an experiment

Linked User Requirements

UR-CLI-010 Accessing climate information on coastal changes
UR-CLI-011 Retrieving climate information from different knowledge sources
UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO
UR-AFS-002 Retrieving knowledge on the creation of a crop mask
UR-GRH-011 Accessing data, information and knowledge from EuroGEO
UR-GRH-012 Accessing data, information and knowledge from AmeriGEO
UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.4 SR-FUN-004 – Inspection of search results

Identifier

SR-FUN-004

Title

Inspection of search results

Requirement Description

The GEOSS Platform shall enable users to inspect the results of a search for data, services, or information. The inspection is the capability for users to browse through the results of a search, filter them based on keywords, analyse the metadata and the user feedback, visualize them on a map.

Source scenarios

S1 Resources discovery and access with linked information
S7 Discovering knowledge regarding the generation of a product or the execution of an experiment
S8 Reproducing an experiment
S9 Replicating an experiment
S10 Reusing an experiment

Linked User Requirements

UR-DRM-002 Earthquake search results
UR-DRM-003 Sorting earthquake search results
UR-DRM-004 Selecting the earthquake magnitude type
UR-CLI-010 Accessing climate information on coastal changes
UR-CLI-011 Retrieving climate information from different knowledge sources
UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO

UR-AFS-002	Retrieving knowledge on the creation of a crop mask
UR-GRH-011	Accessing data, information and knowledge from EuroGEO
UR-GRH-012	Accessing data, information and knowledge from AmeriGEO
UR-DRM-006	Discovery of ESA GEOHazards TEP
UR-CLI-014	Discovery of ESA Coastal TEP
UR-CLI-017	Discovery of ESA Polar TEP
UR-WRM-016	Discovery of ESA Hydrology TEP
UR-BES-001	Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-007	Discovery of ESA Forestry TEP
UR-AFS-003	Discovery of ESA Food Security TEP
UR-SUD-001	Discovery of ESA Urban TEP
UR-SDG-008	SDG indicator 15.3.1 computation service discovery
UR-SDG-012	SDG indicator 14.1.1 computation service discovery
UR-SDG-016	SDG indicator 11.3.1 computation service discovery
UR-CRT-008	Discovering and accessing DIAS Platform services
UR-CLI-011	Retrieving climate information from different knowledge sources
UR-BES-001	Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-003	Graph-based navigation of the ECOPOTENTIAL Ontology concepts
UR-BES-004	Input data for ECOPOTENTIAL workflows in GEOSS
UR-DRM-007	Discovery and access of data and information produced by the Geohazards TEP
UR-CLI-015	Discovery and access of data and information produced by the Coastal TEP
UR-CLI-018	Discovery and access of data and information produced by the Polar TEP
UR-WRM-017	Discovery and access of data and information produced by the Hydrology TEP
UR-BES-008	Discovery and access of data and information produced by the Forestry TEP
UR-AFS-001	Discovering and accessing land degradation showcases from EuroGEO
UR-AFS-002	Retrieving knowledge on the creation of a crop mask
UR-AFS-004	Discovery and access of data and information produced by the Food Security TEP
UR-SUD-002	Discovery and access of data and information produced by the Urban TEP
UR-DRM-001	Earthquake search

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.5 SR-FUN-005 – Selection of search results

Identifier

SR-FUN-005

Title

Selection of search results

Requirement Description

The GEOSS Platform shall enable users to select the results of a search for data, services, or knowledge. The selection is the capability for the user to choose one or more particular result items, as a consequence of inspection, and to visualize further details about it.

Source scenarios

S1 Resources discovery and access with linked information

S7 Discovering knowledge regarding the generation of a product or the execution of an experiment

S8 Reproducing an experiment

S9 Replicating an experiment

S10 Reusing an experiment

Linked User Requirements

UR-DRM-002 Earthquake search results
UR-DRM-003 Sorting earthquake search results
UR-DRM-004 Selecting the earthquake magnitude type
UR-CLI-010 Accessing climate information on coastal changes
UR-CLI-011 Retrieving climate information from different knowledge sources
UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO
UR-AFS-002 Retrieving knowledge on the creation of a crop mask
UR-GRH-011 Accessing data, information and knowledge from EuroGEO
UR-GRH-012 Accessing data, information and knowledge from AmeriGEO
UR-DRM-006 Discovery of ESA GEOHazards TEP
UR-CLI-014 Discovery of ESA Coastal TEP
UR-CLI-017 Discovery of ESA Polar TEP
UR-WRM-016 Discovery of ESA Hydrology TEP
UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-007 Discovery of ESA Forestry TEP
UR-AFS-003 Discovery of ESA Food Security TEP
UR-SUD-001 Discovery of ESA Urban TEP
UR-SDG-008 SDG indicator 15.3.1 computation service discovery
UR-SDG-012 SDG indicator 14.1.1 computation service discovery
UR-SDG-016 SDG indicator 11.3.1 computation service discovery
UR-CRT-008 Discovering and accessing DIAS Platform services
UR-CLI-011 Retrieving climate information from different knowledge sources
UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-003 Graph-based navigation of the ECOPOTENTIAL Ontology concepts
UR-BES-004 Input data for ECOPOTENTIAL workflows in GEOSS
UR-DRM-007 Discovery and access of data and information produced by the Geohazards TEP

UR-CLI-015 Discovery and access of data and information produced by the Coastal TEP
UR-CLI-018 Discovery and access of data and information produced by the Polar TEP
UR-WRM-017 Discovery and access of data and information produced by the Hydrology TEP
UR-BES-008 Discovery and access of data and information produced by the Forestry TEP
UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO
UR-AFS-002 Retrieving knowledge on the creation of a crop mask
UR-AFS-004 Discovery and access of data and information produced by the Food Security TEP
UR-SUD-002 Discovery and access of data and information produced by the Urban TEP
UR-DRM-001 Earthquake search

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.6 SR-FUN-006 – Access to selected resource

Identifier

SR-FUN-006

Title

Access to selected resource

Requirement Description

The GEOSS Platform shall enable users to reach the resource (Data, Service, Information) of interest (among the result items of a search) for use in their analysis. This might include their visualization - on a map, in case of georeferenced resources, and might include a *download*, depending on the type of resource and on the intended use.

Source scenarios

S1 Resources discovery and access with linked information
S7 Discovering knowledge regarding the generation of a product or the execution of an experiment
S8 Reproducing an experiment
S9 Replicating an experiment
S10 Reusing an experiment

Linked User Requirements

UR-CLI-010 Accessing climate information on coastal changes
UR-CLI-011 Retrieving climate information from different knowledge sources
UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO
UR-AFS-002 Retrieving knowledge on the creation of a crop mask

UR-GRH-011	Accessing data, information and knowledge from EuroGEO
UR-GRH-012	Accessing data, information and knowledge from AmeriGEO
UR-DRM-006	Discovery of ESA GEOHazards TEP
UR-CLI-014	Discovery of ESA Coastal TEP
UR-CLI-017	Discovery of ESA Polar TEP
UR-WRM-016	Discovery of ESA Hydrology TEP
UR-BES-001	Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-007	Discovery of ESA Forestry TEP
UR-AFS-003	Discovery of ESA Food Security TEP
UR-SUD-001	Discovery of ESA Urban TEP
UR-SDG-008	SDG indicator 15.3.1 computation service discovery
UR-SDG-012	SDG indicator 14.1.1 computation service discovery
UR-SDG-016	SDG indicator 11.3.1 computation service discovery
UR-CRT-008	Discovering and accessing DIAS Platform services
UR-CLI-011	Retrieving climate information from different knowledge sources
UR-BES-001	Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-003	Graph-based navigation of the ECOPOTENTIAL Ontology concepts
UR-BES-004	Input data for ECOPOTENTIAL workflows in GEOSS
UR-DRM-007	Discovery and access of data and information produced by the Geohazards TEP
UR-CLI-015	Discovery and access of data and information produced by the Coastal TEP
UR-CLI-018	Discovery and access of data and information produced by the Polar TEP
UR-WRM-017	Discovery and access of data and information produced by the Hydrology TEP
UR-BES-008	Discovery and access of data and information produced by the Forestry TEP
UR-AFS-001	Discovering and accessing land degradation showcases from EuroGEO
UR-AFS-002	Retrieving knowledge on the creation of a crop mask
UR-AFS-004	Discovery and access of data and information produced by the Food Security TEP
UR-SUD-002	Discovery and access of data and information produced by the Urban TEP
UR-DRM-001	Earthquake search

Priority

High

Stability

Stable

Affected/Used GEOSS Platform Components

GEOSS Portal, GEO DAB

5.7 SR-FUN-007 – Service execution

Identifier

SR-FUN-007

Title

Service Execution

Requirement Description

The GEOSS Platform shall enable users to execute registered processing services, which means enabling the use of interfaced external processing power provided by a processing platform to elaborate, according to the model implemented by the service, the input data, for transforming them into the resulting products.
This means that the GEOSS Platform shall enable users who access a service to define/refine the area of interest and time range, search for and select the input data, select the Cloud Computing platform of preference among the available and start the service execution. The user shall also be able to visualize information on the underlying workflow and logging info.

A user who has started the execution of a service shall be notified via email when the processing ends and shall find the processing results in the personal workspace.

Source scenarios

S2 Service Execution
S8 Reproducing an experiment
S9 Replicating an experiment
S10 Reusing an experiment

Linked user requirements

UR-BES-002 – Running ECOPOTENTIAL workflows
UR-BES-003 – Graph-based navigation of the ECOPOTENTIAL Ontology concepts
UR-BES-004 – Input data for ECOPOTENTIAL workflows in GEOSS
UR-DRM-008 – Geohazards TEP service execution and products generation
UR-CLI-016 – Coastal TEP service execution and products generation
UR-CLI-019 – Polar TEP service execution and products generation
UR-WRM-018 - Hydrology TEP service execution and products generation
UR-BES-009 - Forestry TEP service execution and products generation
UR-AFS-005 - Food Security TEP services execution and products generation
UR-SUD-003 - Urban TEP service execution and products generation
UR-SDG-008 - SDG indicator 15.3.1 computation service discovery
UR-SDG-009 - SDG indicator 15.3.1 computation service execution
UR-SDG-012 - SDG indicator 14.1.1 computation service discovery
UR-SDG-013 - SDG indicator 14.1.1 computation service execution
UR-SDG-016 - SDG indicator 11.3.1 computation service discovery
UR-SDG-017 - SDG indicator 11.3.1 computation service execution

Priority

High

Stability

Stable, in so far as the corresponding user requirements are stable. See D2.1.

Affected/Used GEOSS Platform Components

GEOSS DAB, GEOSS Portal, GEOSS APIs.

5.8 SR-FUN-008 – Data provision (registration)

Identifier

SR-FUN-008

Title

Data provision (registration)

Requirement Description

The GEOSS Platform shall enable users to register their data (in situ, satellite, websites, publications, etc.) according to a defined metadata model. Registered data, once approved, shall become discoverable through the GEOSS Platform.

Source scenarios

S3 Resources Registration

S4 Promotion and collaboration

Linked User Requirements

UR-DRM-007	Discovery and access of data and information produced by the Geohazards TEP
UR-CLI-015	Discovery and access of data and information produced by the Coastal TEP
UR-CLI-018	Discovery and access of data and information produced by the Polar TEP
UR-WRM-017	Discovery and access of data and information produced by the Hydrology TEP
UR-BES-008	Discovery and access of data and information produced by the Forestry TEP
UR-AFS-004	Discovery and access of data and information produced by the Food Security TEP
UR-SUD-002	Discovery and access of data and information produced by the Urban TEP

Priority

High

Stability

Stable

Affected/Used GEOSS Platform Components

GEOSS Platform, GEO DAB

5.9 SR-FUN-009 – Services provision (registration)

Identifier

SR-FUN-009

Title

Service provision (registration)

Requirement Description

The GEOSS Platform shall enable service providers to register services based on metadata defined in the service definition model, which include:

- Service Name;
- Service Icon;
- Service Provider;
- Contact;
- Service Description;
- Service Coverage;
- Service Endpoint;
- Access Conditions;
- Input Data;
- Output Data;
- Other Service-specific metadata.

Source scenarios

S3 Resources Registration

S4 Promotion and collaboration

Linked User Requirements

UR-DRM-006	Discovery of ESA GEOHazards TEP
UR-CLI-014	Discovery of ESA Coastal TEP
UR-CLI-017	Discovery of ESA Polar TEP
UR-WRM-016	Discovery of ESA Hydrology TEP
UR-BES-001	Search for Ecosystems, Protected Areas, Storylines and Workflows
UR-BES-007	Discovery of ESA Forestry TEP
UR-AFS-003	Discovery of ESA Food Security TEP
UR-SUD-001	Discovery of ESA Urban TEP
UR-SDG-008	SDG indicator 15.3.1 computation service discovery
UR-SDG-012	SDG indicator 14.1.1 computation service discovery
UR-SDG-016	SDG indicator 11.3.1 computation service discovery
UR-CRT-008	Discovering and accessing DIAS Platform services

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.10 SR-FUN-010 – Information provision (registration)

Identifier

SR-FUN-010

Title

Knowledge provision (registration)

Requirement Description

The GEOSS Platform shall enable information providers to link their resources to GEOSS and to describe them with metadata, to define related resources and to add relationships (in general, to edit related information).

Source scenarios

S3 Resources Registration

S4 Promotion and collaboration

S7 Discovering knowledge regarding the generation of a product or the execution of an experiment

S8 Reproducing an experiment

S9 Replicating an experiment

S10 Reusing an experiment

Linked User Requirements

UR-CLI-012 Registering own knowledge sources regarding coastline changes to GEOSS

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.11 SR-FUN–011 - User feedback

Identifier

SR-FUN-011

Title

User feedback

Requirement Description

The GEOSS Platform shall enable users to comment, *like*, request update and in general enrich the information regarding a resource. The GEOSS Platform shall also enable a moderation process by which the user feedback will be reviewed and possibly accepted as part of the information accompanying the resource.

Source scenarios

S4 Promotion and collaboration

Linked User Requirements

UR-CLI-012 Registering own knowledge sources regarding coastline changes to GEOSS

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.12 SR-FUN-012 – Time series access

Identifier

SR-FUN-012

Title

Time series access

Requirement Description

The GEOSS Platform shall enable users to generate and visualize the time profile (time series) of a given variable/quantity on a given geographical point/area (provided that the corresponding data are available in GEOSS).

Source scenarios

S5 Analytical comparison

Linked User Requirements

UR-PHS-002 Accessing data and information from the Copernicus Atmosphere Monitoring Service

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.13 SR-FUN-013 – Analytical comparison

Identifier

SR-FUN-013

Title

Data comparison in different dates

Requirement Description

The GEOSS Platform shall provide tools that enable the graphical comparison, in a selected geographical area, of the values of a given variable/quantity, in two or more user-selected date/times (provided that the corresponding data are available in GEOSS).

Source scenarios

S5 Analytical comparison

Linked User Requirements

UR-SUD-005 Comparison of SDG indicator 11.6.2 from multiple sources

UR-SDG-011 Comparison of SDG indicator 15.3.1 from multiple sources

UR-SDG-015 Comparison of SDG indicator 14.1.1 from multiple sources

Priority

High

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

5.14 SR-NFC-001 – Exportability of discovery, inspection, selection and access capabilities

Identifier

SR-NFC-001

Title

Exportability of discovery, inspection, selection and access capabilities

Requirement Description

The GEOSS Platform shall be designed according to a modular architecture that enables to export the GEOSS Platform capabilities (including the necessary graphical elements) of discovery, inspection, selection and access capabilities for import in an external Portal, the necessary graphical elements.

Source scenarios

S6 Reuse of discovery and access capabilities

Linked user requirements

UR-BES-005 – Searching for GEOSS data via the SWOS Portal

UR-BES-006 – Browsing through GEOSS data via the SWOS Portal

UR-WRM-014 – Searching for GEOSS data via the Space4Water Portal

UR-WRM-015 – Browsing through GEOSS data via the Space4Water Portal

Priority

High

Stability

Stable, in so far as the corresponding user requirements are stable. See D2.1.

Affected/Used GEOSS Platform Components

GEOSS Widget

5.15 SR-NFC-002 – Configurability of search domain

Identifier

SR-NFC-002

Title

Configurability of search domain

Requirement Description

The GEOSS Platform shall enable the configuration of specific "views" of the GEOSS Search domain, i.e. to tailor the search domain to the specific needs of specific communities., according to configurable community-defined keywords.

Source scenarios

S6 Reuse of discovery and access capabilities

Linked User Requirements

UR-CLI-001 – Climate search domain

UR-CLI-002 – Search by GCOS ECV

UR-CLI-003 – Search by GCOS Measurement Domain

UR-CLI-004 – Search by GCOS focus "area"

UR-CLI-005 - Search by GCOS ECV products

UR-SDG-002 – Search by EBV

UR-SDG-003 – Search by EWV

UR-WRM-002 – the AtlantOs search keywords

UR-WRM-003 – The AtlantOs Region Of Interest

UR-WRM-004 – the AtlantOs search domain

UR-WRM-006 – The GEO-GNOME search keywords

UR-WRM-007 – The GEO-GNOME Region Of Interest

UR-WRM-008 – The GEO-GNOME search domain

UR-WRM-010 – The GTN-H search keywords

UR-WRM-011 – The GTN-H search domain

UR-CRT-004 – The EnviDat search keywords

UR-CRT-005 – The Envidat Region Of Interest

UR-CRT-006 – The EnviDat search domain

UR-GRH-008 – Search by DBAR focus “area”
UR-GRH-009 – The DBAR search domain
UR-GRH-002 – The AmeriGEOSS search keywords
UR-GRH-003 – The AmeriGEOSS Region Of Interest
UR-GRH-004 – The AmeriGEOSS search domain

Priority

High

Stability

Stable

Affected/Used GEOSS Platform Components

GEOSS View

5.16 SR-NFC-003 – Portal Customizability

Identifier

SR-NFC-003

Title

Portal Customizability

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

Requirement Description

The GEOSS Platform shall enable customizability of the GEOSS Portal for the specific needs of different communities. See *linked requirements* below for details.

Source scenarios

S6 Reuse of discovery and access capabilities

Linked user requirements

UR-SDG-001 – The Essential Variables Portal
UR-WRM-001 – the AtlantOs Portal
UR-WRM-005 – The GEO-GNOME Portal
UR-WRM-009 – The GTN-H Portal
UR-PHS-001 – The GOS4M Portal
UR-CRT-001 – The ENERGIC-OD Portal
UR-CRT-003 – The EnviDat Portal
UR-GRH-007 – The DBAR Portal
UR-GRH-010 – Chinese language support
UR-GRH-001 – The AmeriGEOSS Portal
UR-GRH-005 – The AmeriGEOSS filtering capabilities

Priority

High

Stability

Stable, in so far as the corresponding user requirements are stable. See D2.3.

Affected/Used GEOSS Platform Components

GEOSS View, GEOSS Mirror, ad-hoc functional enhancements

5.17 SR-NFC-004 – Accessibility through API

Identifier

SR-NFC-004

Title

Accessibility through API

Requirement Description

The GEOSS Platform shall be designed to enable web based machine-to-machine access to the GEOSS Platform capabilities of discovery, inspection, selection and access for use in an external Portal or application.

Source scenarios

S6 Reuse of discovery and access capabilities

Linked User Requirements

UR-WRM-014 Searching for GEOSS data via the Space4Water Portal
UR-WRM-015 Browsing through GEOSS data via the Space4Water Portal
UR-BES-005 Searching for GEOSS data via the SWOS Portal
UR-BES-006 Browsing through GEOSS data via the SWOS Portal

Priority

High

Stability

Stable

Affected/Used GEOSS Platform Components

GEOSS API

5.18 SR-NFC-005 – Increasing user traffic

Identifier

SR-NFC-005

Title

Increasing user traffic

Requirement Description

The GEOSS Platform shall implement Search Engine Optimization techniques to increase user traffic. A user typing search phrases related to Earth Observation in the Google Search will find the GEOSS Portal on the first result page.

Source scenarios

S4 Promotion and collaboration.

Priority

Medium

Stability

Stable.

Affected/Used GEOSS Platform Components

GEO DAB, GEOSS Portal

6. Requirements traceability

6.1 System required capabilities vs User requirements

#	Code	Title	Linked User Requirements
1.	SR-FUN-001	Data Discovery (with relationships to associated concepts)	UR-CLI-011 Retrieving climate information from different knowledge sources UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-003 Graph-based navigation of the ECOPOTENTIAL Ontology concepts UR-BES-004 Input data for ECOPOTENTIAL workflows in GEOSS UR-DRM-007 Discovery and access of data and information produced by the Geohazards TEP UR-CLI-015 Discovery and access of data and information produced by the Coastal TEP UR-CLI-018 Discovery and access of data and information produced by the Polar TEP UR-WRM-017 Discovery and access of data and information produced by the Hydrology TEP UR-BES-008 Discovery and access of data and information produced by the Forestry TEP UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO UR-AFS-002 Retrieving knowledge on the creation of a crop mask UR-AFS-004 Discovery and access of data and information produced by the Food Security TEP UR-SUD-002 Discovery and access of data and information produced by the Urban TEP UR-DRM-001 Earthquake search

2.	SR-FUN-002	Service Discovery (with relationships to associated concepts)	UR-DRM-006 Discovery of ESA GEOHazards TEP UR-CLI-014 Discovery of ESA Coastal TEP UR-CLI-017 Discovery of ESA Polar TEP UR-WRM-016 Discovery of ESA Hydrology TEP UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-007 Discovery of ESA Forestry TEP UR-AFS-003 Discovery of ESA Food Security TEP UR-SUD-001 Discovery of ESA Urban TEP UR-SDG-008 SDG indicator 15.3.1 computation service discovery UR-SDG-012 SDG indicator 14.1.1 computation service discovery UR-SDG-016 SDG indicator 11.3.1 computation service discovery UR-CRT-008 Discovering and accessing DIAS Platform services
3.	SR-FUN-003	Information Discovery (with relationships to associated concepts)	UR-CLI-010 Accessing climate information on coastal changes UR-CLI-011 Retrieving climate information from different knowledge sources UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO UR-AFS-002 Retrieving knowledge on the creation of a crop mask UR-GRH-011 Accessing data, information and knowledge from EuroGEO UR-GRH-012 Accessing data, information and knowledge from AmeriGEO UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows

4.	SR-FUN-004	Inspection of search results	UR-DRM-002 Earthquake search results UR-DRM-003 Sorting earthquake search results UR-DRM-004 Selecting the earthquake magnitude type UR-CLI-010 Accessing climate information on coastal changes UR-CLI-011 Retrieving climate information from different knowledge sources UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO UR-AFS-002 Retrieving knowledge on the creation of a crop mask UR-GRH-011 Accessing data, information and knowledge from EuroGEO UR-GRH-012 Accessing data, information and knowledge from AmeriGEO UR-DRM-006 Discovery of ESA GEOHazards TEP UR-CLI-014 Discovery of ESA Coastal TEP UR-CLI-017 Discovery of ESA Polar TEP UR-WRM-016 Discovery of ESA Hydrology TEP UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-007 Discovery of ESA Forestry TEP UR-AFS-003 Discovery of ESA Food Security TEP UR-SUD-001 Discovery of ESA Urban TEP UR-SDG-008 SDG indicator 15.3.1 computation service discovery UR-SDG-012 SDG indicator 14.1.1 computation service discovery UR-SDG-016 SDG indicator 11.3.1 computation service discovery UR-CRT-008 Discovering and accessing DIAS Platform services UR-CLI-011 Retrieving climate information from different knowledge sources UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-003 Graph-based navigation of the ECOPOTENTIAL Ontology concepts UR-BES-004 Input data for ECOPOTENTIAL workflows in GEOSS UR-DRM-007 Discovery and access of data and information produced by the Geohazards TEP UR-CLI-015 Discovery and access of data and information produced by the Coastal TEP UR-CLI-018 Discovery and access of data and information produced by the Polar TEP UR-WRM-017 Discovery and access of data and information produced by the Hydrology TEP

5.	SR-FUN-005	Selection of search results	UR-DRM-002 Earthquake search results UR-DRM-003 Sorting earthquake search results UR-DRM-004 Selecting the earthquake magnitude type UR-CLI-010 Accessing climate information on coastal changes UR-CLI-011 Retrieving climate information from different knowledge sources UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO UR-AFS-002 Retrieving knowledge on the creation of a crop mask UR-GRH-011 Accessing data, information and knowledge from EuroGEO UR-GRH-012 Accessing data, information and knowledge from AmeriGEO UR-DRM-006 Discovery of ESA GEOHazards TEP UR-CLI-014 Discovery of ESA Coastal TEP UR-CLI-017 Discovery of ESA Polar TEP UR-WRM-016 Discovery of ESA Hydrology TEP UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-007 Discovery of ESA Forestry TEP UR-AFS-003 Discovery of ESA Food Security TEP UR-SUD-001 Discovery of ESA Urban TEP UR-SDG-008 SDG indicator 15.3.1 computation service discovery UR-SDG-012 SDG indicator 14.1.1 computation service discovery UR-SDG-016 SDG indicator 11.3.1 computation service discovery UR-CRT-008 Discovering and accessing DIAS Platform services UR-CLI-011 Retrieving climate information from different knowledge sources UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-003 Graph-based navigation of the ECOPOTENTIAL Ontology concepts UR-BES-004 Input data for ECOPOTENTIAL workflows in GEOSS UR-DRM-007 Discovery and access of data and information produced by the Geohazards TEP UR-CLI-015 Discovery and access of data and information produced by the Coastal TEP UR-CLI-018 Discovery and access of data and information produced by the Polar TEP UR-WRM-017 Discovery and access of data and information produced by the Hydrology TEP

6.	SR-FUN-006	Access to selected resource	UR-CLI-010 Accessing climate information on coastal changes UR-CLI-011 Retrieving climate information from different knowledge sources UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO UR-AFS-002 Retrieving knowledge on the creation of a crop mask UR-GRH-011 Accessing data, information and knowledge from EuroGEO UR-GRH-012 Accessing data, information and knowledge from AmeriGEO UR-DRM-006 Discovery of ESA GEOHazards TEP UR-CLI-014 Discovery of ESA Coastal TEP UR-CLI-017 Discovery of ESA Polar TEP UR-WRM-016 Discovery of ESA Hydrology TEP UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-007 Discovery of ESA Forestry TEP UR-AFS-003 Discovery of ESA Food Security TEP UR-SUD-001 Discovery of ESA Urban TEP UR-SDG-008 SDG indicator 15.3.1 computation service discovery UR-SDG-012 SDG indicator 14.1.1 computation service discovery UR-SDG-016 SDG indicator 11.3.1 computation service discovery UR-CRT-008 Discovering and accessing DIAS Platform services UR-CLI-011 Retrieving climate information from different knowledge sources UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-003 Graph-based navigation of the ECOPOTENTIAL Ontology concepts UR-BES-004 Input data for ECOPOTENTIAL workflows in GEOSS UR-DRM-007 Discovery and access of data and information produced by the Geohazards TEP UR-CLI-015 Discovery and access of data and information produced by the Coastal TEP UR-CLI-018 Discovery and access of data and information produced by the Polar TEP UR-WRM-017 Discovery and access of data and information produced by the Hydrology TEP UR-BES-008 Discovery and access of data and information produced by the Forestry TEP UR-AFS-001 Discovering and accessing land degradation showcases from EuroGEO

7.	SR-FUN-007	Service Execution	UR-BES-002 – Running ECOPOTENTIAL workflows UR-BES-003 – Graph-based navigation of the ECOPOTENTIAL Ontology concepts UR-BES-004 – Input data for ECOPOTENTIAL workflows in GEOSS UR-DRM-008 – Geohazards TEP service execution and products generation UR-CLI-016 – Coastal TEP service execution and products generation UR-CLI-019 – Polar TEP service execution and products generation UR-WRM-018 - Hydrology TEP service execution and products generation UR-BES-009 - Forestry TEP service execution and products generation UR-AFS-005 - Food Security TEP services execution and products generation UR-SUD-003 - Urban TEP service execution and products generation UR-SDG-008 - SDG indicator 15.3.1 computation service discovery UR-SDG-009 - SDG indicator 15.3.1 computation service execution UR-SDG-012 - SDG indicator 14.1.1 computation service discovery UR-SDG-013 - SDG indicator 14.1.1 computation service execution UR-SDG-016 - SDG indicator 11.3.1 computation service discovery UR-SDG-017 - SDG indicator 11.3.1 computation service execution
8.	SR-FUN-008	Data Provision (Registration)	UR-DRM-007 Discovery and access of data and information produced by the Geohazards TEP UR-CLI-015 Discovery and access of data and information produced by the Coastal TEP UR-CLI-018 Discovery and access of data and information produced by the Polar TEP UR-WRM-017 Discovery and access of data and information produced by the Hydrology TEP UR-BES-008 Discovery and access of data and information produced by the Forestry TEP UR-AFS-004 Discovery and access of data and information produced by the Food Security TEP UR-SUD-002 Discovery and access of data and information produced by the Urban TEP

9.	SR-FUN-009	Service Provision (Registration)	UR-DRM-006 Discovery of ESA GEOHazards TEP UR-CLI-014 Discovery of ESA Coastal TEP UR-CLI-017 Discovery of ESA Polar TEP UR-WRM-016 Discovery of ESA Hydrology TEP UR-BES-001 Search for Ecosystems, Protected Areas, Storylines and Workflows UR-BES-007 Discovery of ESA Forestry TEP UR-AFS-003 Discovery of ESA Food Security TEP UR-SUD-001 Discovery of ESA Urban TEP UR-SDG-008 SDG indicator 15.3.1 computation service discovery UR-SDG-012 SDG indicator 14.1.1 computation service discovery UR-SDG-016 SDG indicator 11.3.1 computation service discovery UR-CRT-008 Discovering and accessing DIAS Platform services
10.	SR-FUN-010	Information Provision (Registration)	UR-CLI-012 Registering own knowledge sources regarding coastline changes to GEOSS
11.	SR-FUN-011	User Feedback	UR-CLI-012 Registering own knowledge sources regarding coastline changes to GEOSS
12.	SR-FUN-012	Time series access	UR-PHS-002 Accessing data and information from the Copernicus Atmosphere Monitoring Service
13.	SR-FUN-013	Analytical comparison	UR-SUD-005 Comparison of SDG indicator 11.6.2 from multiple sources UR-SDG-011 Comparison of SDG indicator 15.3.1 from multiple sources UR-SDG-015 Comparison of SDG indicator 14.1.1 from multiple sources
14.	SR-NFC-001	Exportability of discovery, inspection, selection and access capabilities	UR-BES-005 – Searching for GEOSS data via the SWOS Portal UR-BES-006 – Browsing through GEOSS data via the SWOS Portal UR-WRM-014 – Searching for GEOSS data via the Space4Water Portal UR-WRM-015 – Browsing through GEOSS data via the Space4Water Portal

15.	SR-NFC-002	Configurability of search domain	UR-CLI-001 – Climate search domain UR-CLI-002 – Search by GCOS ECV UR-CLI-003 – Search by GCOS Measurement Domain UR-CLI-004 – Search by GCOS focus “area” UR-CLI-005 - Search by GCOS ECV products UR-SDG-002 – Search by EBV UR-SDG-003 – Search by EWV UR-WRM-002 – the AtlantOs search keywords UR-WRM-003 – The AtlantOs Region Of Interest UR-WRM-004 – the AtlantOs search domain UR-WRM-006 – The GEO-GNOME search keywords UR-WRM-007 – The GEO-GNOME Region Of Interest UR-WRM-008 – The GEO-GNOME search domain UR-WRM-010 – The GTN-H search keywords UR-WRM-011 – The GTN-H search domain UR-CRT-004 – The EnviDat search keywords UR-CRT-005 – The Envidat Region Of Interest UR-CRT-006 – The EnviDat search domain UR-GRH-008 – Search by DBAR focus “area” UR-GRH-009 – The DBAR search domain UR-GRH-002 – The AmeriGEOSS search keywords UR-GRH-003 – The AmeriGEOSS Region Of Interest UR-GRH-004 – The AmeriGEOSS search domain
16.	SR-NFC-003	Portal customizability	UR-SDG-001 – The Essential Variables Portal UR-WRM-001 – the AtlantOs Portal UR-WRM-005 – The GEO-GNOME Portal UR-WRM-009 – The GTN-H Portal UR-PHS-001 – The GOS4M Portal UR-CRT-001 – The ENERGIC-OD Portal UR-CRT-003 – The EnviDat Portal UR-GRH-007 – The DBAR Portal UR-GRH-010 – Chinese language support UR-GRH-001 – The AmeriGEOSS Portal UR-GRH-005 – The AmeriGEOSS filtering capabilities

17.	SR-NFC-004	Accessibility through API	UR-WRM-014 Searching for GEOSS data via the Space4Water Portal UR-WRM-015 Browsing through GEOSS data via the Space4Water Portal UR-BES-005 Searching for GEOSS data via the SWOS Portal UR-BES-006 Browsing through GEOSS data via the SWOS Portal
18.	SR-NFC-005	Increasing user traffic	N.A.

Table 1: System vs User Requirements Traceability

6.2 Scenarios vs system required capabilities

#	Code	Title	System Requirements
1.	S1	Resources discovery and access with linked information	SR-FUN-001 – Data Discovery (with relationships to associated concepts) SR-FUN-002 – Service Discovery (with relationships to associated concepts) SR-FUN-003 – Information Discovery (with relationships to associated concepts) SR-FUN-004 – Inspection of search results SR-FUN-005 – Selection of search results SR-FUN-006 – Access to selected resource
2.	S2	Service Execution	SR-FUN-007 – Service Execution
3.	S3	Resources Registration	SR-FUN-008 – Data provision (registration) SR-FUN-009 – Service Provision (registration) SR-FUN-010 – Information Provision (registration)
4.	S4	Promotion and collaboration.	SR-FUN-008 – Data provision (registration) SR-FUN-009 – Service Provision (registration) SR-FUN-010 – Information Provision (registration) SR-FUN-011 – User feedback SR-NFC-005 – Increasing user traffic

5.	S5	Analytical comparison	SR-FUN-012 – Time series access SR-FUN-013 – Analytical comparison
6.	S6	Exporting discovery and access capabilities	SR-NFC-001 – Exportability of discovery, inspection, selection and access capabilities SR-NFC-002 – Configurability of search domain SR-NFC-003 – Portal Customizability SR-NFC-004 – Accessibility through API
7.	S7	Discovering experiment results	SR-FUN-003 – Information Discovery (with relationships to associated concepts) SR-FUN-004 – Inspection of search results SR-FUN-005 – Selection of search results SR-FUN-006 – Access to selected resource
8.	S8	Reproducing an experiment	SR-FUN-003 – Information Discovery (with relationships to associated concepts) SR-FUN-004 – Inspection of search results SR-FUN-005 – Selection of search results SR-FUN-006 – Access to selected resource SR-FUN-007 – Service Execution
9.	S9	Replicating an experiment	SR-FUN-003 – Information Discovery (with relationships to associated concepts) SR-FUN-004 – Inspection of search results SR-FUN-005 – Selection of search results SR-FUN-006 – Access to selected resource SR-FUN-007 – Service Execution SR-FUN-001 – Data Discovery (with relationships to associated concepts)

10.	S10	Reusing an experiment	SR-FUN-003 – Information Discovery (with relationships to associated concepts) SR-FUN-004 – Inspection of search results SR-FUN-005 – Selection of search results SR-FUN-006 – Access to selected resource SR-FUN-007 – Service Execution SR-FUN-001 – Data Discovery (with relationships to associated concepts) SR-FUN-002 – Service Discovery (with relationships to associated concepts)

Table 2: Scenarios vs System Requirements Traceability

Annex A. References

[RD-1] EDGE: European Direction in GEOSS Common Infrastructure Enhancements – Grant Agreement Number 776136

[RD-2] GCOS Implementation Plan 2016 - https://ane4bf-datap1.s3-eu-west-1.amazonaws.com/wmocms/s3fs-public/programme/brochure/GCOS-200_OnlineVersion.pdf?PlowENiCc1RGh9ReoeAoGBT0QhnJYm6_

[RD-3] ECOPOTENTIAL Project: http://www.ecopotential-project.eu/

[RD-4] EDGE-WP1-DEL-D2.3 – v1.0 – Use cases and user requirements

Annex B. Figures and Tables

B.1 List of Figures

B.2 List of Tables

Annex C. Terminology

C.1 Acronyms and Abbreviations

EDGE	European Directed GCI Enhancements
BON	Biodiversity Observation Network
CA	Consortium Agreement
CAMS	Copernicus Atmosphere Monitoring Service
C3S	Copernicus Climate Change Service
CEOS	Committee on Earth Observation Satellites
CLMS	Copernicus Land Monitoring Service
CMEMS	Copernicus Marine Environment Monitoring Service
CNR-IIA	Consiglio Nazionale delle Ricerche – Istituto per l'Inquinamento Atmosferico
CO	Confidential
DESCA	Development of a Simplified Consortium Agreement
DEL	Deliverable
DG	Directorate-General
DN	Direct Negotiation
DOW	Description of Work
EAB	External Advisory Board
EC	European Commission
EGU	European Geosciences Union
EMS	Emergency Management Service
EO	Earth Observation
EOP	Earth Observation Programme
ESA	European Space Agency
ESAW	European Ground System Architecture Workshop
ESRIN	European Space Research Institute
EU	European Union
FP7	Seventh Framework Programme
GA	Grant Agreement
GCI	GEOSS Common Infrastructure
GEO	Group on Earth Observation
GEO DAB	GEO Discovery and Access Broker
GEOSS	Global Earth Observation System of Systems
GFOI	Global Forest Observation Initiative
GLAM	Global Agriculture Monitoring
GPE	GEOSS Portal Enhancements
GSNL	Geohazard Supersites and Natural Laboratories

GWOS	Global Wetlands Observing System
H2020	Horizon 2020
INT	Internal Note
IPR	Intellectual Property Right
JRC	Joint Research Centre
MOM	Minutes of Meeting
OTH	Other
PD	Project Director
PP	Programme Participants
PQMP	Project Quality Management Plan
PRE	Presentation
PSB	Project Strategic Board
PU	Public Usage
QA	Quality Assurance
QAS	Quality Assurance Support
RE	Restricted
SDG	Sustainable Development Goal
SUS	System Usability Scale
TBD	To Be Defined
TEP	Thematic Exploitation Platform
UNICEF	United Nations International Children's Emergency Fund
USGS	United States Geological Survey
UTB	User and Technical Board
WBS	Work Breakdown Structure
WGISS	Working Group on Information Systems and Services
WP	Work Package
WPL	Work Package Leader