ECOPOTENTIAL

Improving future ecosystem benefits through Earth Observations

This project is funded by the European Union

ECOPOTENTIAL Project Sites

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ECOPOTENTIAL in a nutshell

Healthy ecosystems provide essential goods and services to human societies and are of crucial importance for meeting the Sustainable Development Goals (SDGs). Recent advances in Earth Observation data (Remote Sensing and in situ measurements) offer new opportunities to monitor the state of and changes in ecosystem functions, processes and services, and the pressures they face.

ECOPOTENTIAL focuses its activities and pilot actions on a targeted set of internationally recognized Protected Areas in Europe and beyond, including mountain, arid and semi-arid, and coastal and marine ecosystems. The project aims to deliver products of Earth Observation data to understand and monitor changes to ecosystems and support the effective management of these Protected Areas.

Quick facts about ECOPOTENTIAL

- A flagship EU – Horizon 2020 project
- One of the largest EU funded projects on ecosystems
- Project duration: 4 years (2015–2019)
- 47 partners and 23 protected areas which cover all biogeographic regions of Europe
- Coordinated by the National Research Council of Italy (CNR)

Building on the knowledge gained in individual Protected Areas, ECOPOTENTIAL will address cross-scale ecological interactions and geosphere-biosphere interactions from local to continental scales. All data, model results and acquired knowledge will be made available on common and open platforms, contributing to the Global Earth Observation System of Systems (GEOSS) and be fully interoperable with the GEOSS Common Infrastructure (GCI). In this way, ECOPOTENTIAL will benefit different communities, scientists, Protected Area managers and citizens.

ECOPOTENTIAL's scientific approach

ECOPOTENTIAL applies a unified conceptual framework making the best use of Earth Observation data, from Remote Sensing products to field-based [in situ] measurements. ECOPOTENTIAL's view is that ecosystems are "one physical system" with their environment, and they are characterized by strong geosphere-biosphere-anthroposphere interactions across multiple space and time scales. The project develops knowledge on ecosystem functions, processes and services, contributing to the definition of a set of Essential Variables for ecosystems.

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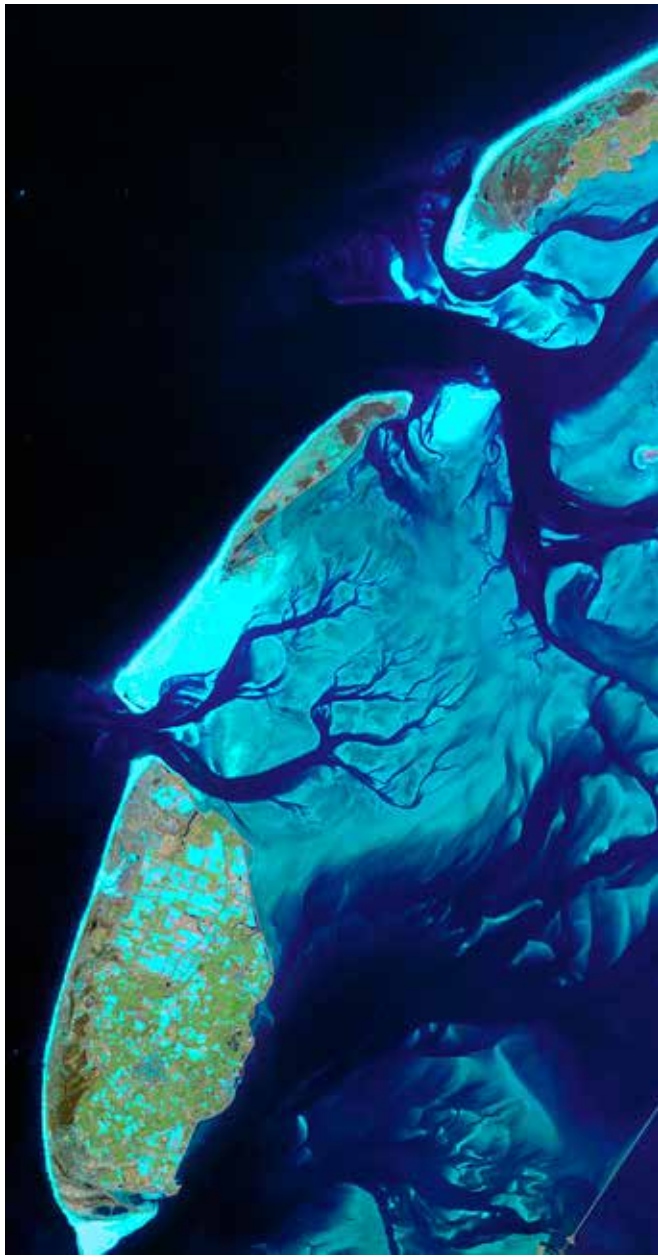
The scientific partners of ECOPOTENTIAL are defining a number of narratives (storylines) that link real-life issues to the project's Protected Areas. The storylines capture the need for Earth Observation data for ecosystem modelling, ecosystem services, cross-scale topics, demands for future protection, policy and capacity building. They are aimed to be broad yet locally relevant, engaging with stakeholders and decision-makers, forming the basis for further operational work in the field. The storylines will evolve over time following the demands of stakeholders and as new knowledge is generated.

A major component of ECOPOTENTIAL is dedicated to storing and making existing Earth Observations usable and inter-operable, supporting new algorithms to recover Remote Sensing data, and creating ecosystem-relevant knowledge. The project will also spend considerable effort to recover and address gaps in in situ monitoring data.

The Virtual Laboratory Platform allows access to all of the project's data and results and is interoperable with the GEO Common Infrastructure (GCI) and the GEOSS Portal. The scientific results are used in developing requirements for future Protected Areas, supporting better decision-making and design of policy and capacity building/knowledge exchange activities.



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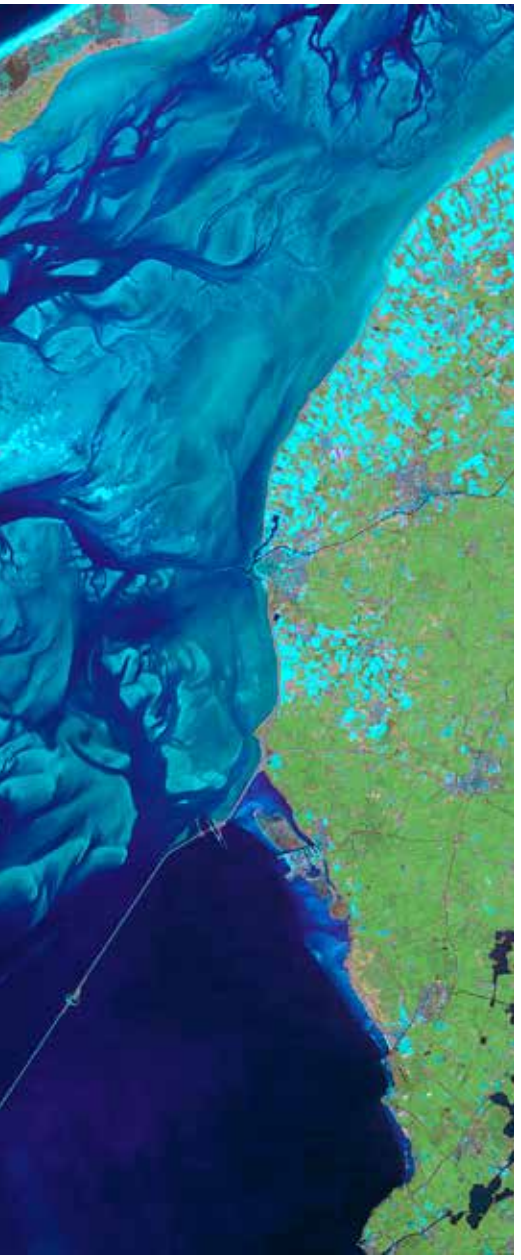

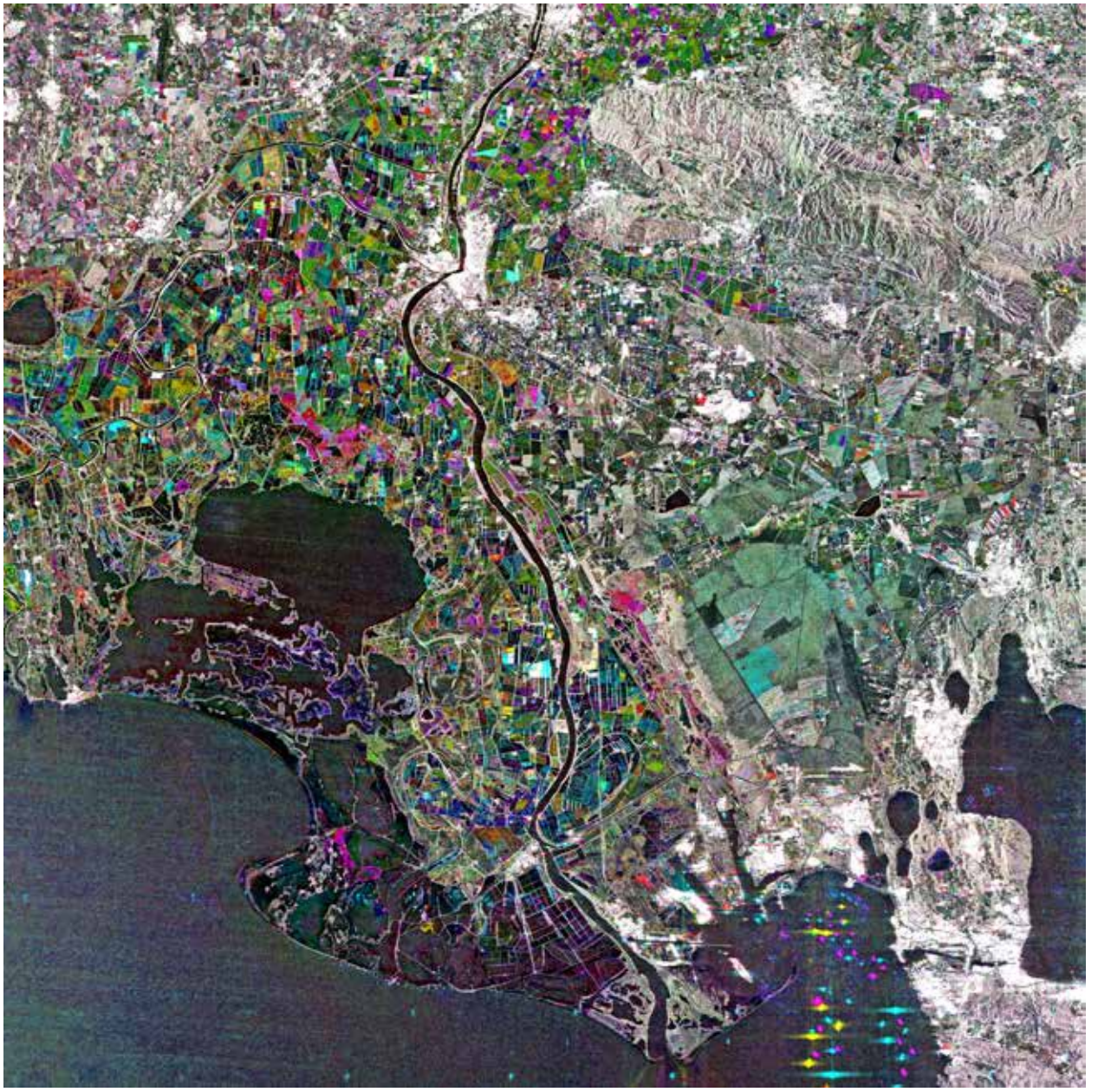

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From knowledge to action – ECOPOTENTIAL products and impacts

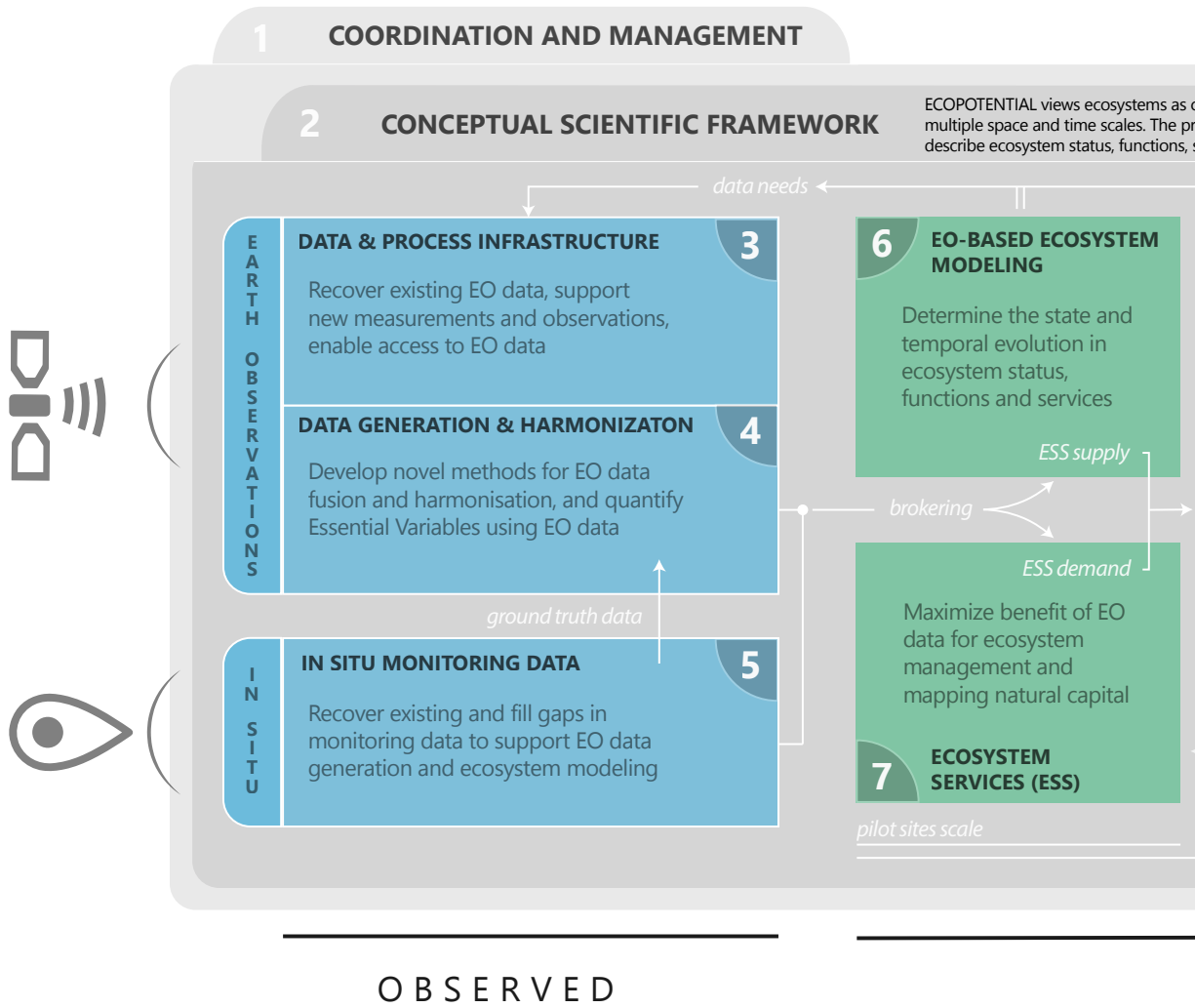
Making the best use of Earth Observations: ECOPOTENTIAL generates and provides new remote sensing products, contributing to Copernicus services. These products, joined with in situ data, will provide relevant information on the state of and changes in selected ecosystems. New models, able to incorporate Earth Observations, will be developed, tested and implemented.

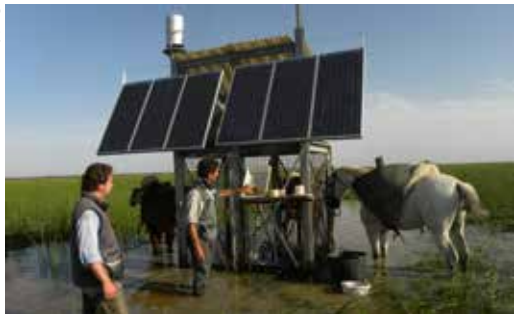
Improving ecosystem benefits from Protected Areas: ECOPOTENTIAL focuses on a set of relevant ecosystem services associated with Protected Areas, and develops scenarios of future ecosystem benefits as well as strategies to enhance them. Extensions to regions outside Protected Areas are addressed.

Enhancing Protected Area management: The information created by ECOPOTENTIAL will be used to develop management options and strategies for Protected Areas, including determining the requirements of future Protected Areas.

GEO/GEOSS and the Virtual Laboratory Platform: ECOPOTENTIAL provides a Virtual Laboratory Platform for the data, products, services, models and information generated by the project, as a contribution to GEO/GEOSS.

Creating new opportunities for SMEs across Europe: ECOPOTENTIAL's activities will help small and medium enterprises (SMEs) to link Earth Observation data with the needs of Protected Area management, creating new opportunities in the field of monitoring and application of Earth Observations to ecosystem study, conservation and management.

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ECOPOTENTIAL Project Structure

complex adaptive systems characterized by strong geosphere-biosphere interactions across
roject will also distill a set of Essential Variables from EO and in situ monitoring data that best
services, scenarios and cross-scale interactions

8

CROSS-SCALE INTERACTION

Provide future ecosystem scenarios, estimate pan-European services, scale up local models and determine levels of uncertainty in ecosystem projections

scenarios

9

REQUIREMENTS OF FUTURE PROTECTED AREAS

Determine what information indicates the quality status of protected areas and can support the definition of future Protected Areas

pan-European scale

10

ECOPOTENTIAL VIRTUAL LABORATORY PLATFORM

Make all information and knowledge available to scientists, policy makers, citizens and other concerned stakeholders , in collaboration with GEO/GEOSS

11

EO SUPPORTED POLICY DEVELOPMENT & INTEGRATION

Strengthen the use of EO data and tools for improved decision making

12

CAPACITY BUILDING & KNOWLEDGE EXCHANGE

Enable and enhance participation of all players in environmental decision making

Disseminate results developed during the project, and contribute to the research requirements for the Copernicus operational services

ANALYSED

COMMUNICATED

The Pilot Sites: Internationally recognised Protected Areas in Europe and beyond

ECOPOTENTIAL focuses its activities and pilot actions on a targeted set of internationally recognised Protected Areas in Europe, European Territories and beyond. They include mountain, arid and semi-arid, coastal and marine ecosystems.

Mountain ecosystems

Mountain ecosystems, rich in endemic and endangered species, are directly linked to downstream regions through ecosystem goods and services including food and energy production, recreational services and options for tourism. Mountain ecosystems are "sentinels of change" with respect to climate change and human pressures, and they show several altitudinal zones and ecosystems. In Europe, the spatial heterogeneity of mountains (cloudiness, shade, etc.) creates methodological challenges for Earth Observations. The mountainous protected areas of ECOPOTENTIAL will provide excellent training grounds for the development of robust approaches.

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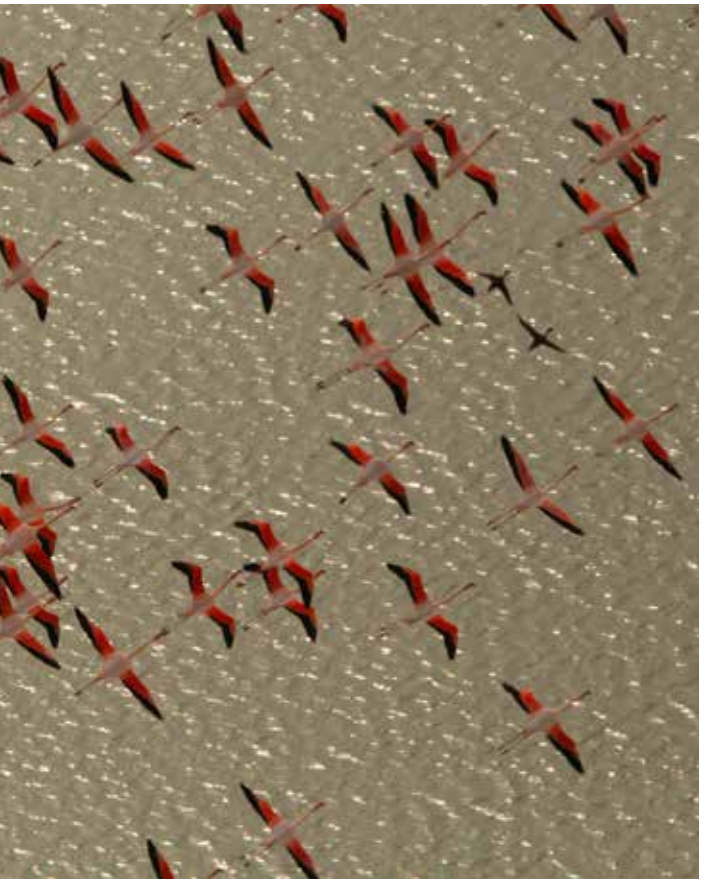

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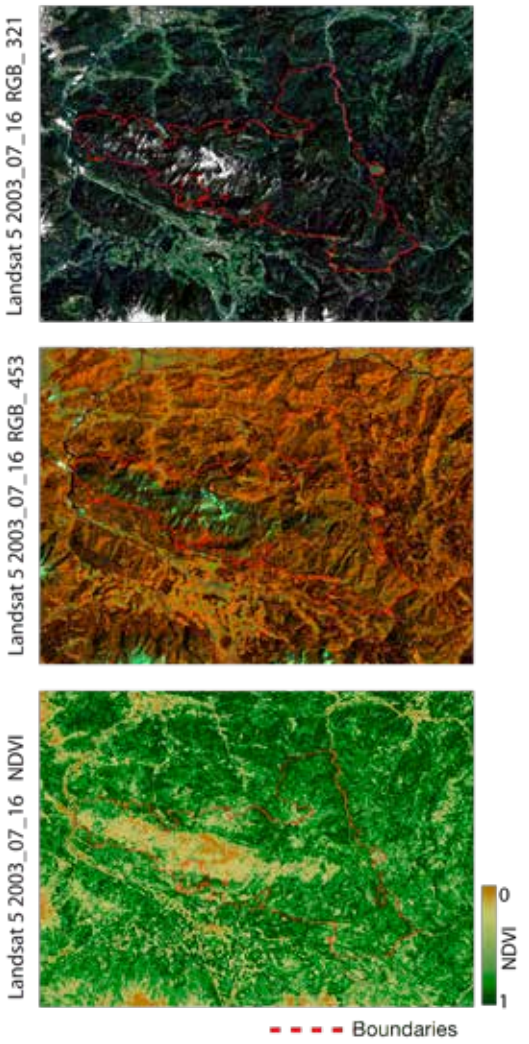
Arid and semi-arid ecosystems

Arid and semi-arid ecosystems represent life under extreme conditions. They are water-limited ecosystems especially vulnerable to impacts associated with global change. In addition, they exhibit unique pathways of ecosystem functions and specialized ecosystem services. In water-limited ecosystems, temporal variability is particularly important. Remote Sensing data and field monitoring in ECOPOTENTIAL sites will improve the understanding of drylands, a biome that is home to some 2.3 billion people worldwide.

Coastal and marine ecosystems

Coastal and marine ecosystems are essential components of the Earth's global ecosystem and are critical in sustaining biodiversity. The health of oceans and coasts is being negatively affected by the impact of human activities, leading to a loss of biodiversity, decreased abundance of species, damage to habitats and loss of ecological functions and ultimately, ecosystem services. Coastal areas, in particular, are particularly important for the migration and refuge of species with complex habitat requirements. ECOPOTENTIAL focuses on both marine and coastal sites and will support the sustained monitoring and development of indicators to inform policy makers and marine and coastal managers.

Limestone Alps National Park, Austria



Landsat data from 2003 with corresponding vegetation indices (NDVI) used to monitor vegetation type, amount and condition

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The ECOPOTENTIAL consortium consists of 47 partners, including research institutions, universities, environmental agencies, international institutions, and small and medium enterprises (SMEs).

Further information and contacts:

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