ECOPOTENTIAL

Improving future ecosystem benefits through Earth Observations

This project is funded by the European Union (Grant agreement No. 641762)

GEO GROUP ON EARTH OBSERVATIONS

A. Provenzale, coordinator
National Research Council of Italy

48 partners

12 Work Packages

www.ecopotential-project.eu

ECOPOTENTIAL in a nutshell:

Make best use of Earth Observations to characterize the state and changes of ecosystems and improve their conservation and management

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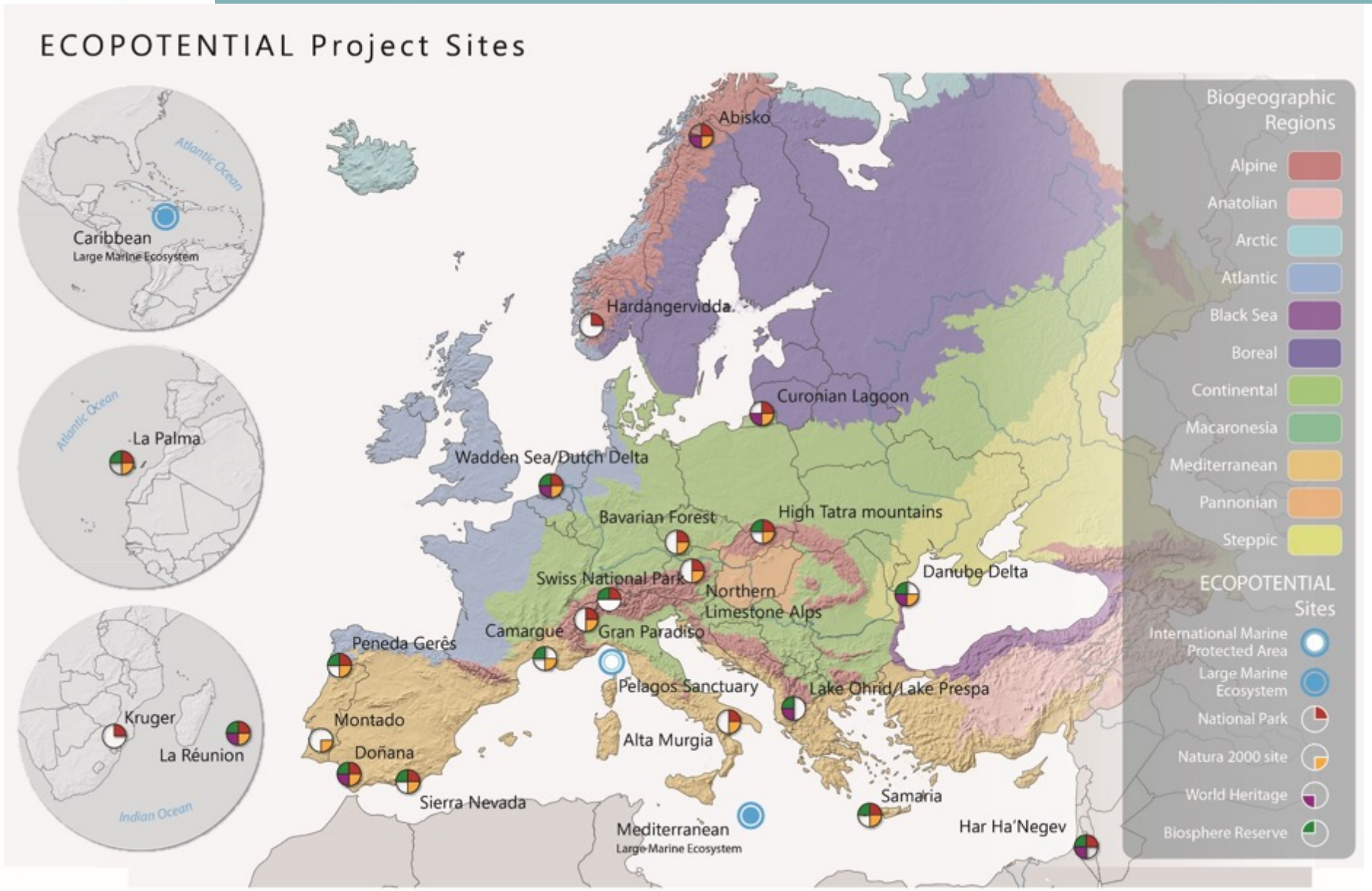
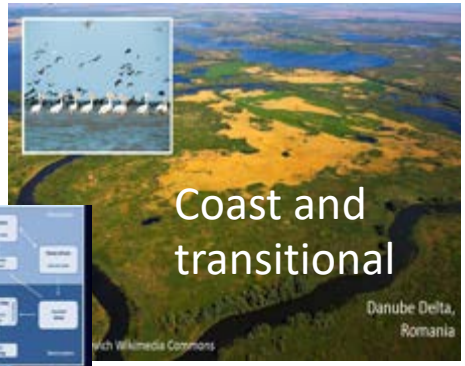
ECOPOTENTIAL:
Protected Areas and regional scales



Conceptual framework

In ECOPOTENTIAL, ecosystems are seen as "**one (complex) physical system**" with their environment, with cross-scale geosphere-hydrosphere-climate-biosphere interactions



4 ecosystem types

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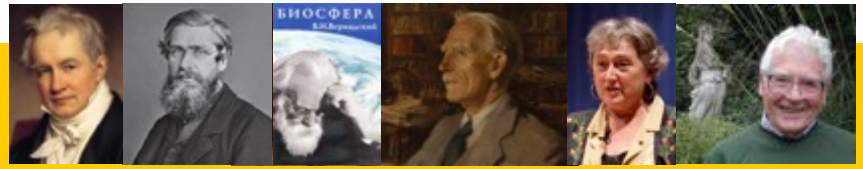
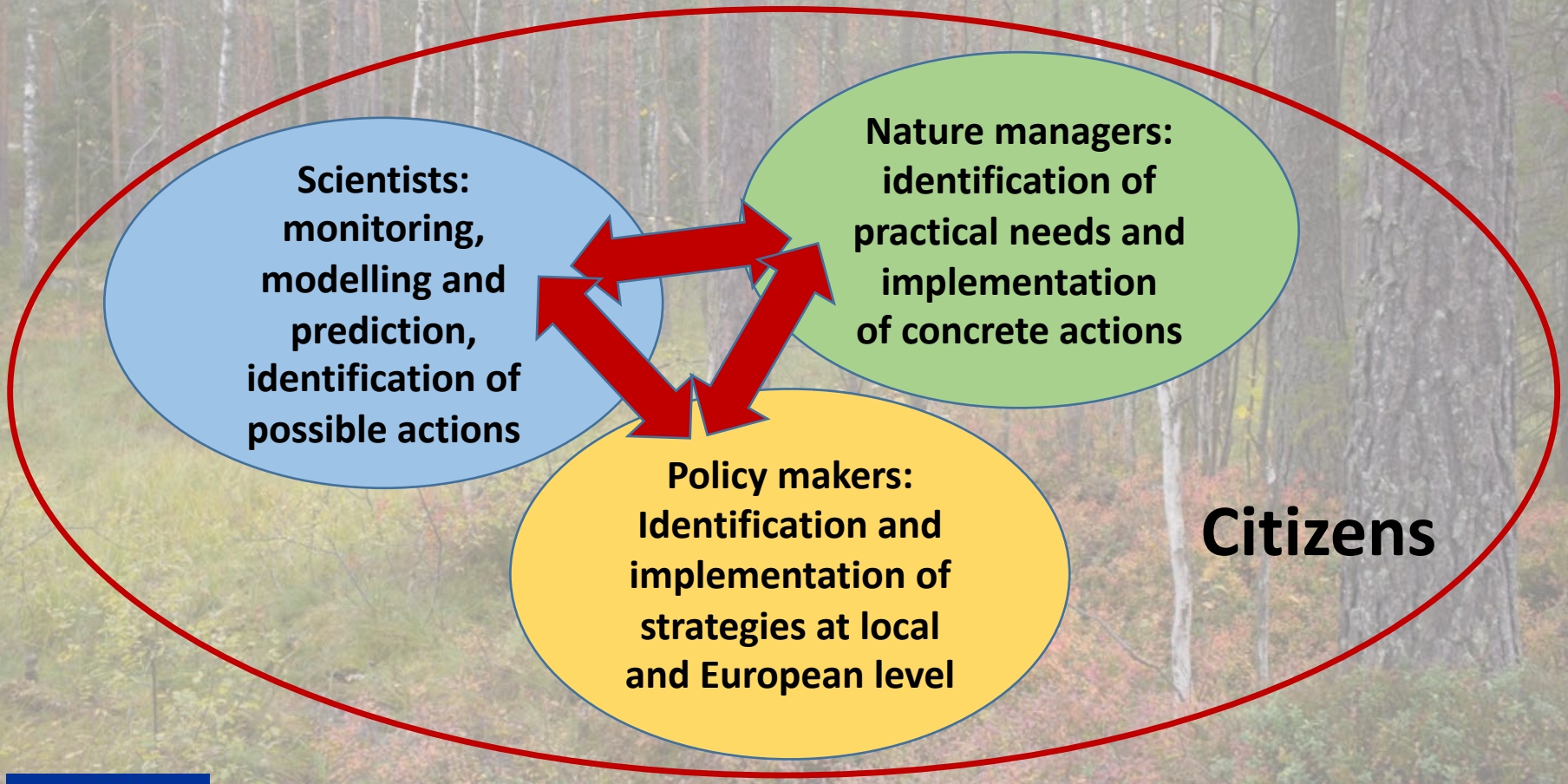


A co-designed system approach to nature conservation in times of rapid change



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Products and scientific results across PAs

Developments of **EO products to assess the ecosystem state and changes in PAs**, to be used for conservation and management:

- The Virtual Laboratory Platform: EO data and models
- Online service for RS data
- Protected Areas from Space Map Browser
- Data Cubes
- EODESM
- DEIMS (together with eLTER)

Scientific results: Continental-scale and PA-scale assessments of ecosystem changes, Threats to PAs, a bottom-up view of Essential Variables for Ecosystems, Future scenarios

Focus on specific PA issues: co-design of **Storylines**

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The ECOPOTENTIAL Storylines

- An example of co-design by scientists and PA staff

- Focus on given Protected Area(s) and identify the main ecosystem conservation issues of interest and the ecosystem functions and processes associated with them, the threats and the management policy issues.

- Co-design a strategy to address the issues, identify the data needed to provide the required information, the models, and provide suggestions for management policy.

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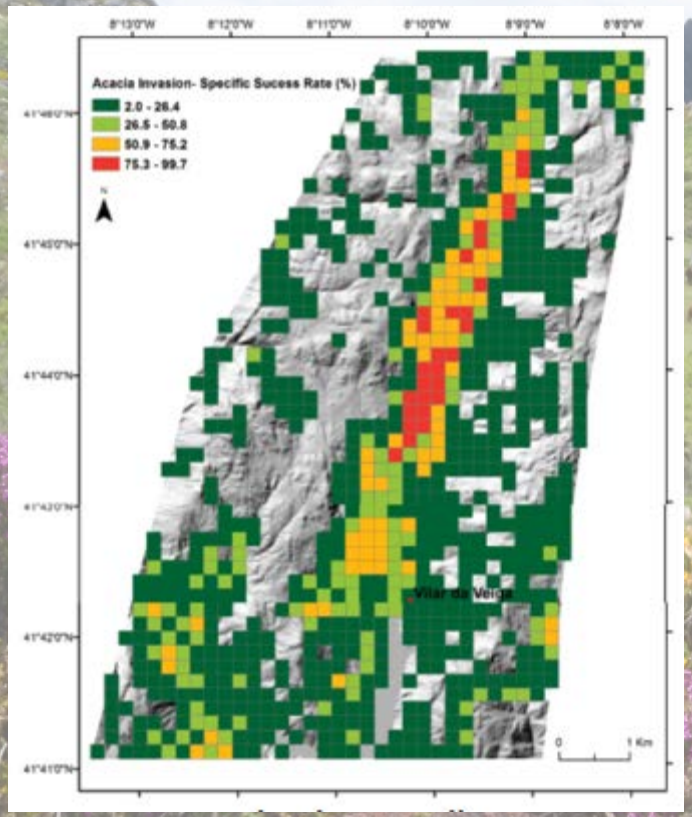
Peneda-Geres: estimating invasion success of non-native trees using VHR satellite data and population dynamics models



Monteiro et al, Diversity 2017

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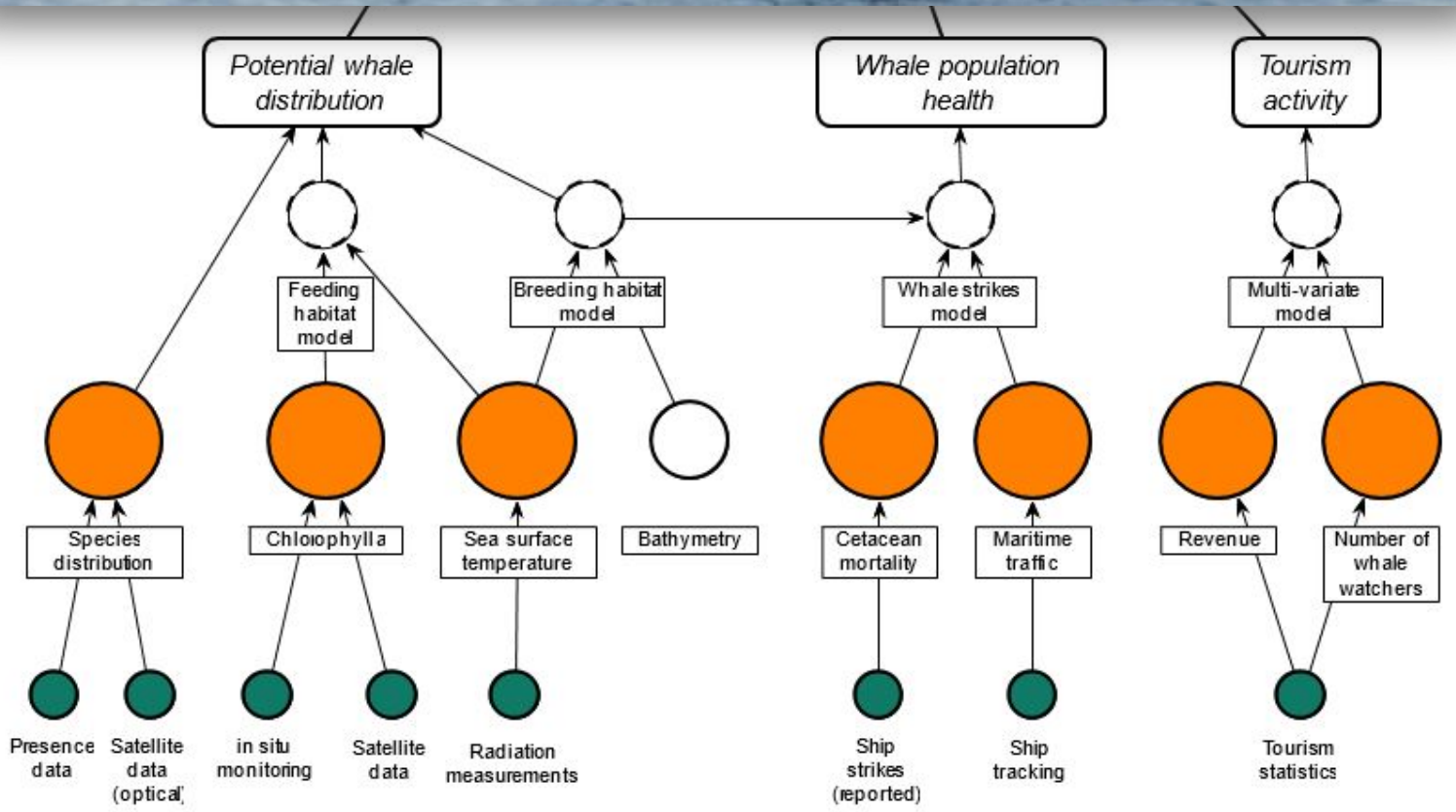
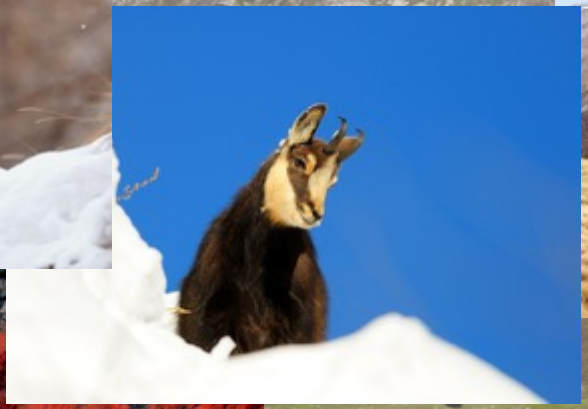
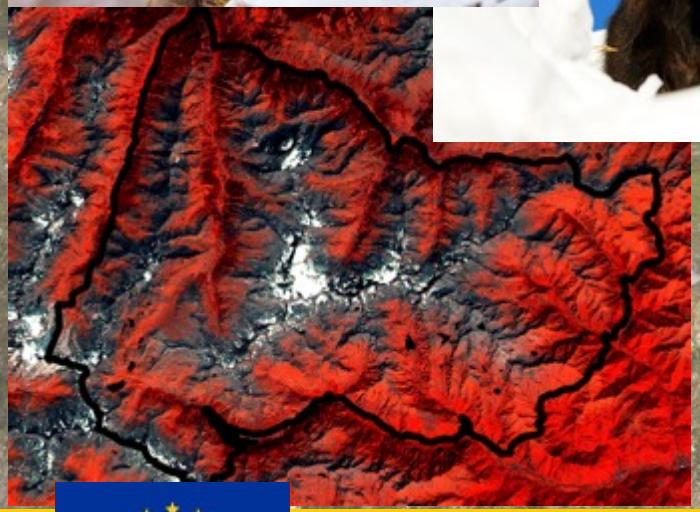
the Pelagos storyline



Gran Paradiso and Hardangervidda: health state of alpine/northern grasslands as a life support system for wild ungulates





Changes in the Critical Zone at high-altitude or high-latitude treeless environments

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The Har HaNegev Storyline for an arid environment limited mainly by water availability

The multitude of competing land uses, particularly settlements, are the most pressing driver of change to the ecological integrity of this area

A major goal of ECOPOTENTIAL is to develop tools to use Earth Observation in arid environment in order to track changes in biodiversity, ecosystem dynamics, water redistribution and ecosystem services provisioning, driven by land use changes.

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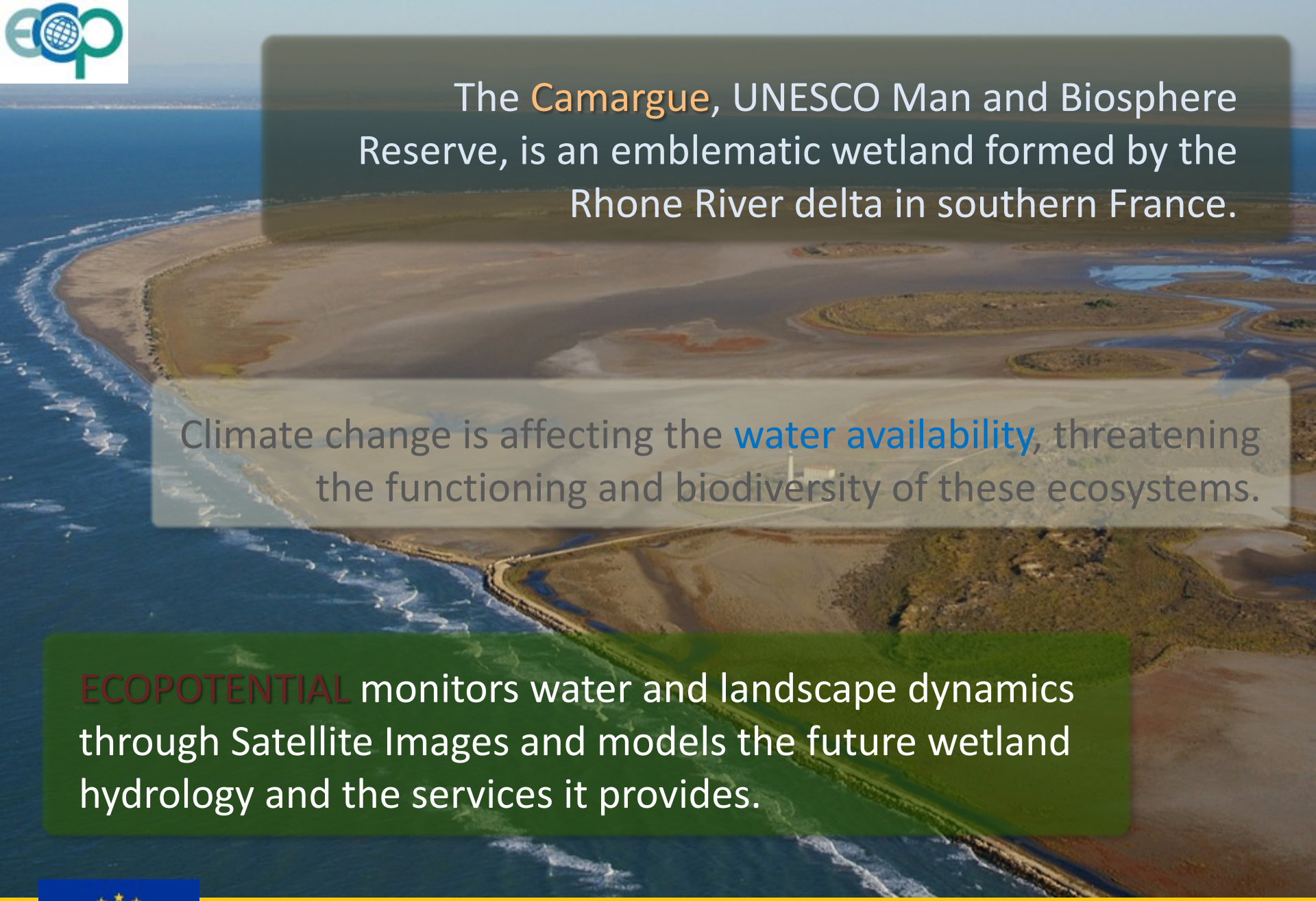

The Camargue, UNESCO Man and Biosphere Reserve, is an emblematic wetland formed by the Rhone River delta in southern France.

Climate change is affecting the water availability, threatening the functioning and biodiversity of these ecosystems.

ECOPOTENTIAL monitors water and landscape dynamics through Satellite Images and models the future wetland hydrology and the services it provides.

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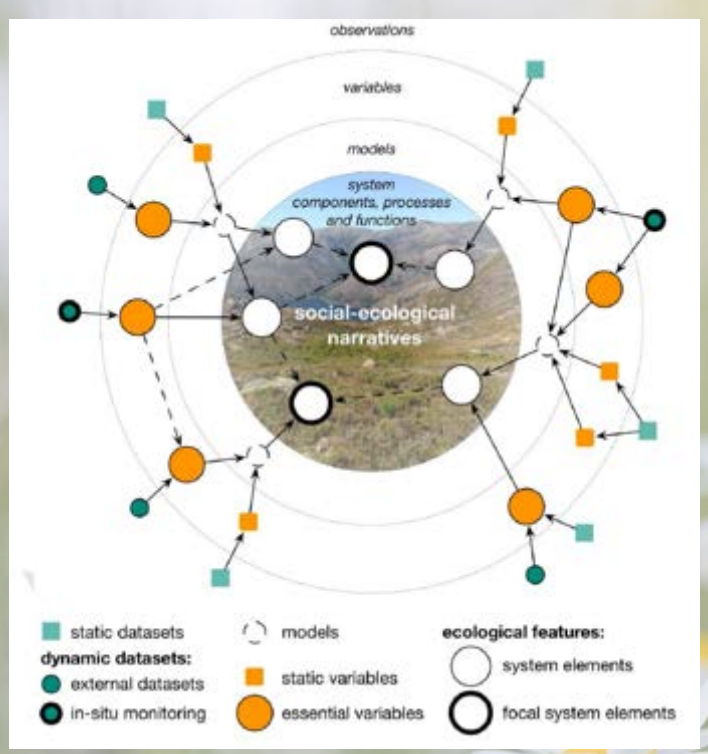
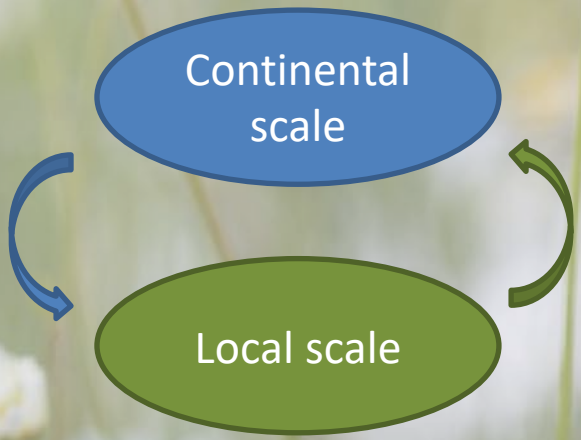
Finding the Essential:
Essential Variables across Storylines, space and time



Guerra et al. GECCO (2019)

top-down vs. bottom-up approaches



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Fires in Mediterranean Europe

Use of European datasets:
EFFIS, CRU TS for SPEI,
national inventories,
Remote sensing products

- **Summer burned area is highly dependent on same-summer drought conditions and delayed precipitation conditions**

- **With a global temperature rise > 1.5 °C above pre-industrial, estimated summer burned area in the Mediterranean can double**

- **Empirical file-climate models allow improving seasonal prediction of summer burned area**

Marco Turco et al., Scientific Reports 2017
Nature Communications 2018a, 2018b

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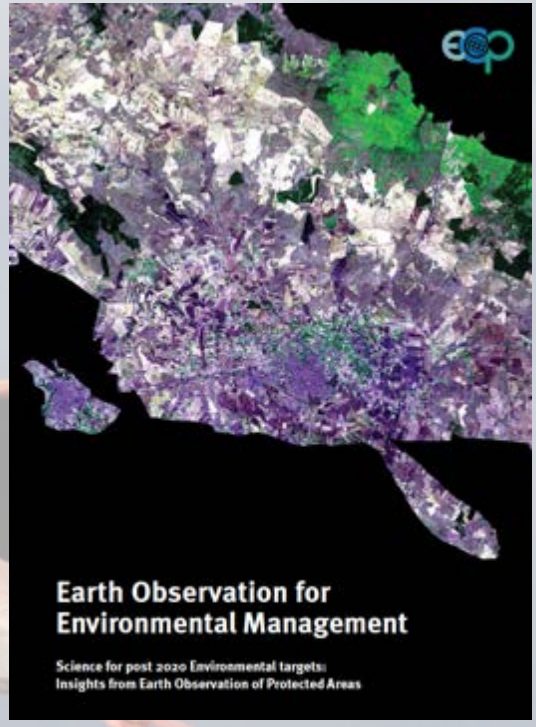
The policy issue: translating research results into knowledge for policy strategies and priorities

Brussels, January 2018 and September 2018

ESA Living Planet Symposium, May 2019



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The Ecosystems Community of Practice:
Training of PA staff on the use of RS products
Training of scientists on the needs of PAs
Continuous assessment of the
possibly different priorities, views and needs

Workshop with PA staff (May 2017),
a EO/RS training week (February 2018),
on-site training courses (fall 2018)

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The ECOPOTENTIAL Legacy

LifeWatch

eLTER RI

GEOSSENTIAL

ERA-PLANET

The GEO Global Ecosystem Initiative

H2020 e-shape

EuroGEOSS
A EUROPEAN APPROACH TO GEOSS

GEO GNOME

Horizon Europe

GEO BON

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Thank you for your attention