



The H2020 Project ECOPotential: Improving future ecosystem benefits through Earth Observations

Starting date: 1st June 2015, Duration: 4 years

Coordinator: Antonello Provenzale

Institute of Geosciences and Earth Resources, National Research Council of Italy

Co-Coordinator: Carl Beierkuhnlein

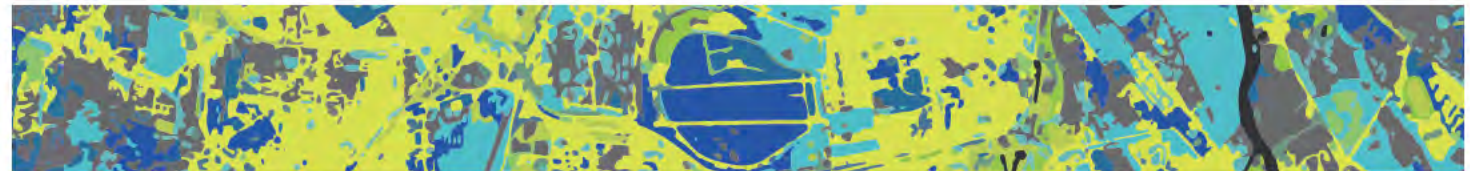
Biogeography, BayCEER, University of Bayreuth, Germany

Project Manager: Carmela Marangi

Institute of Applied Mathematics, National Research Council of Italy

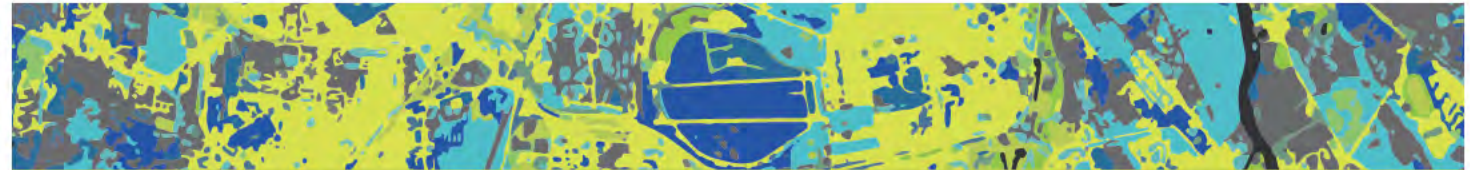


FOSTERING OPEN
EARTH OBSERVATION
FOR EUROPE

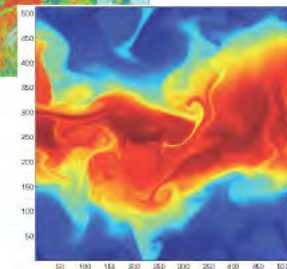
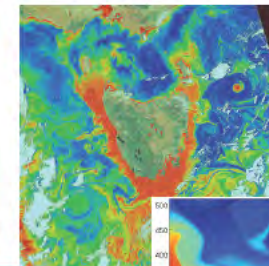
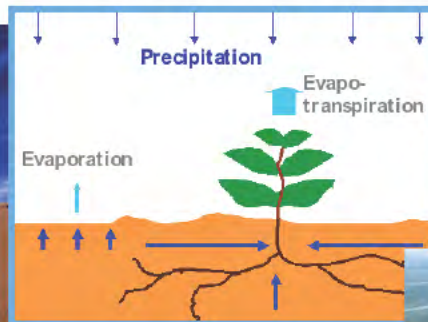


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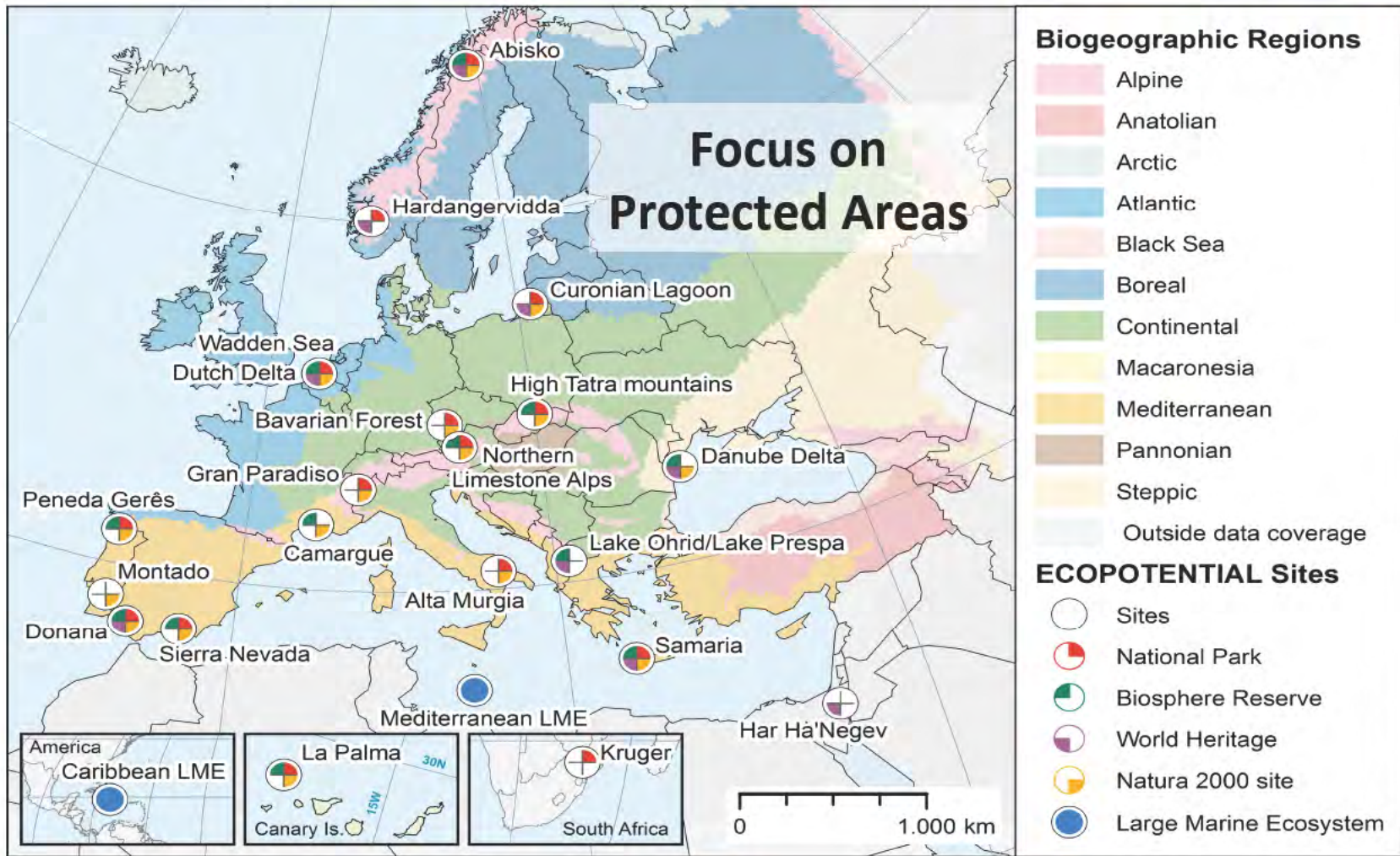
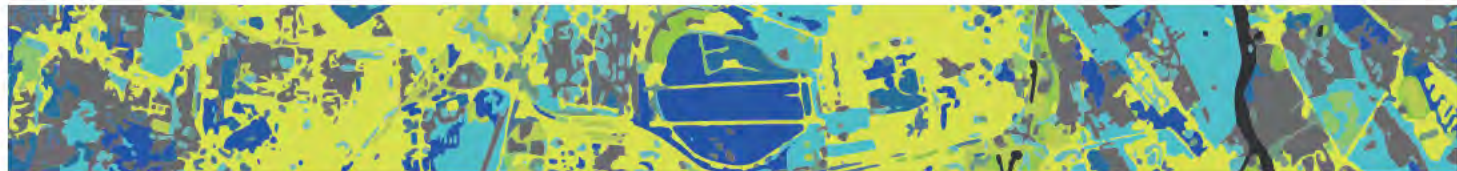


In ECOPotential, ecosystems are seen as complex adaptive systems characterized by strong geosphere-biosphere interactions across multiple space and time scales



What we do in ECO-POTENTIAL and key outputs:

- Identify relevant **ecosystem services**
- Focus on **ecosystem functions/processes** that support the specific ecosystem services
- Build **EO data products** and make them widely available
 - Build **models** capable of including EO data
 - Assess the current state and estimate the future evolution of ecosystems (processes/functions/services)
 - Define **policy options** and the requirements of future protected areas
 - Make **all results available to the community**, contributing to GEO and GEOSS (Virtual Laboratory Platform)



Change Detection of natural/semi-natural Grassland in «Murgia Alta», Natura 2000 site

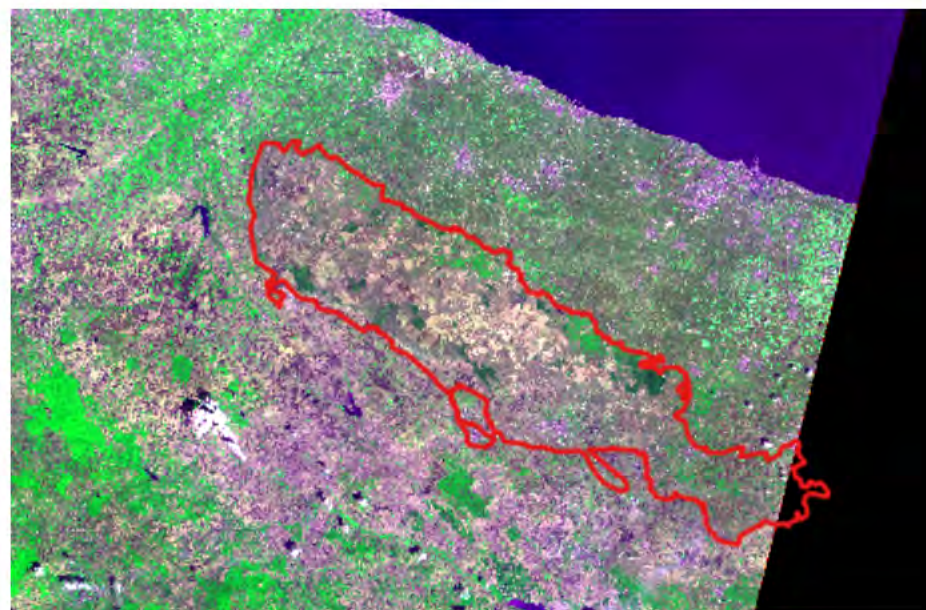
C. Tarantino, F. Lovergine, P. Blonda
CNR-Bari, Italy



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**T₁ data: Copernicus layer
natural/semi-natural Grassland
Year: 2012**

**T₂ data: Sentinel-2 image:
August 7, 2016
False Color Composite:
R=B3, G=B4, B=B2, 20 meters**



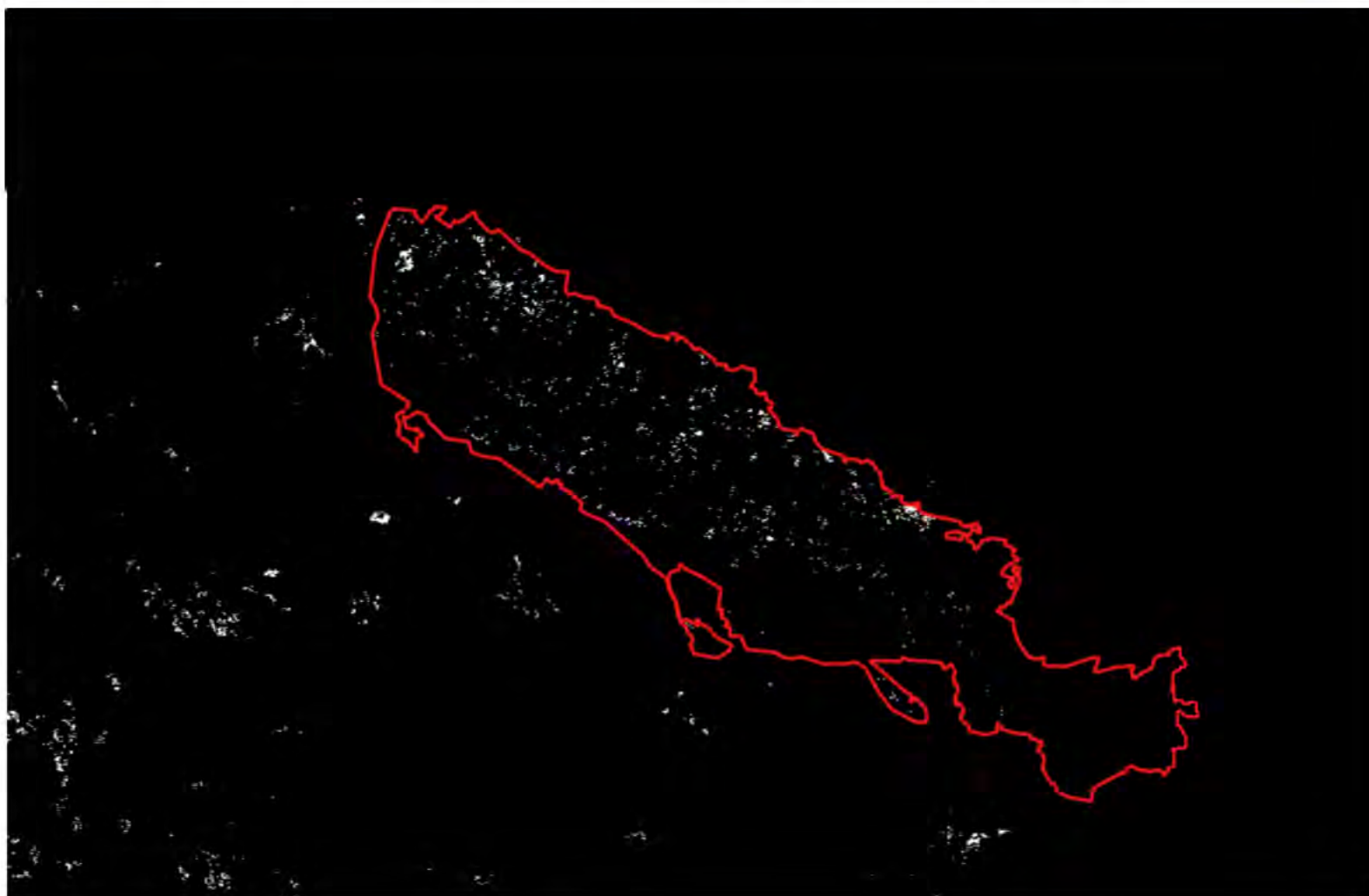


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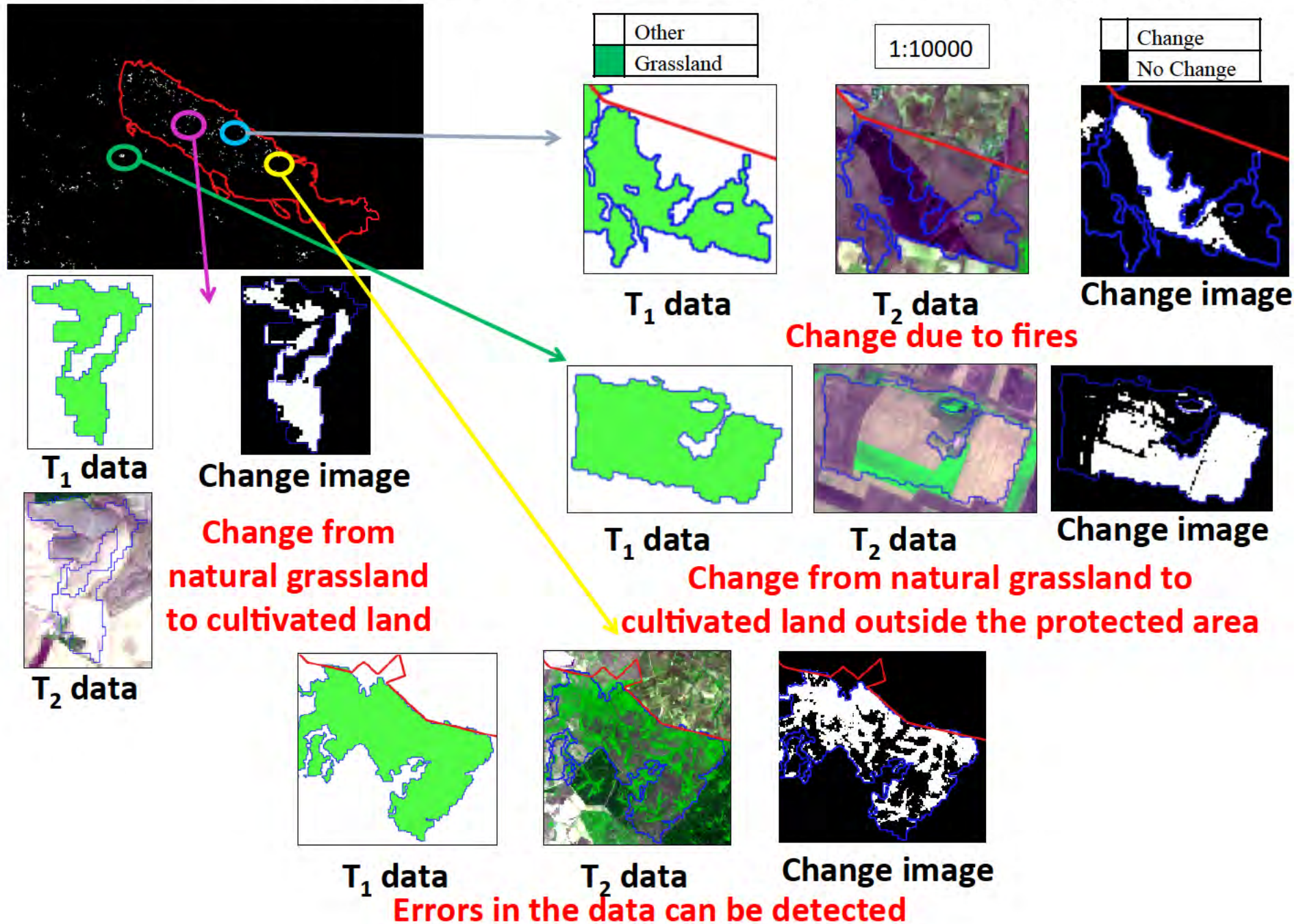
Cross Correlation Analysis: change map

| | |
|--|-----------|
| | Change |
| | No Change |

Recently applied to WorldView2 and Landsat 8 OLI in [C. Tarantino, et al., Remote Sensing of Environment, vol. 175, 65-72, Mar 2016]



Cross Correlation Analysis: close-up from change map



ECOPOTENTIAL: The storylines

Focus on a given Protected Area and identify the main ESS of interest

Identify main ecosystem functions/processes that support the ESS

Identify indicators for the state of the ecosystem and of ecosystem processes (DPSIR SoE)

Identify indicators for the most important (abiotic and biotic) control factors on the ecosystem

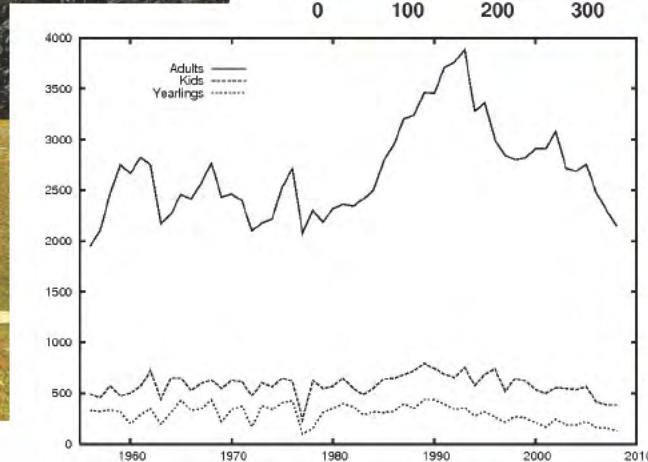
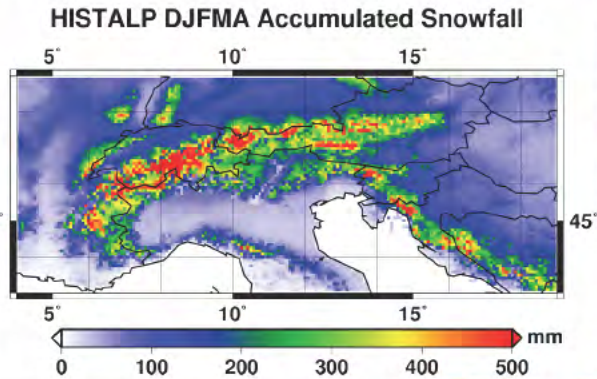
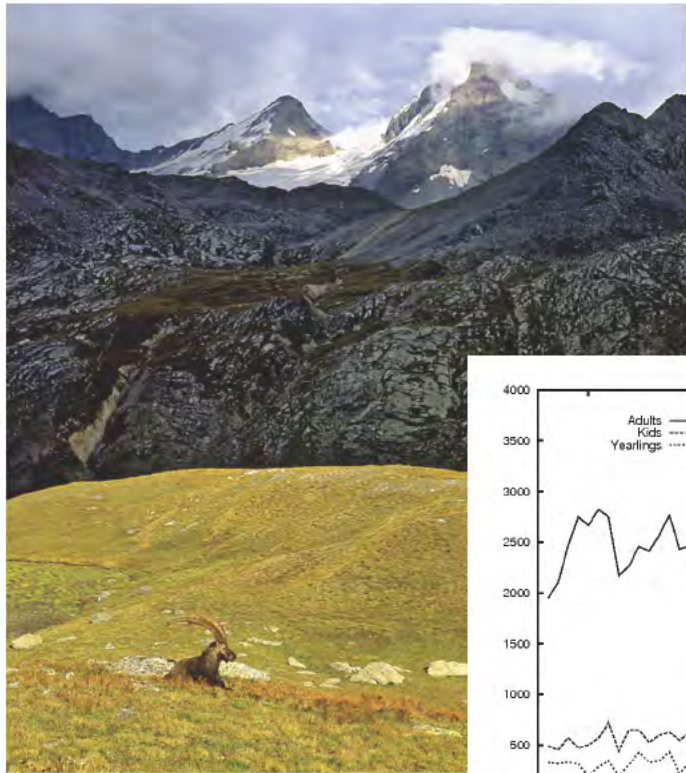
Identify indicators (either from literature review or novel) that can describe the main (human-induced) pressures (DPSIR Pressures)

Identify the most critical/endangered/fragile Ecosystem Processes

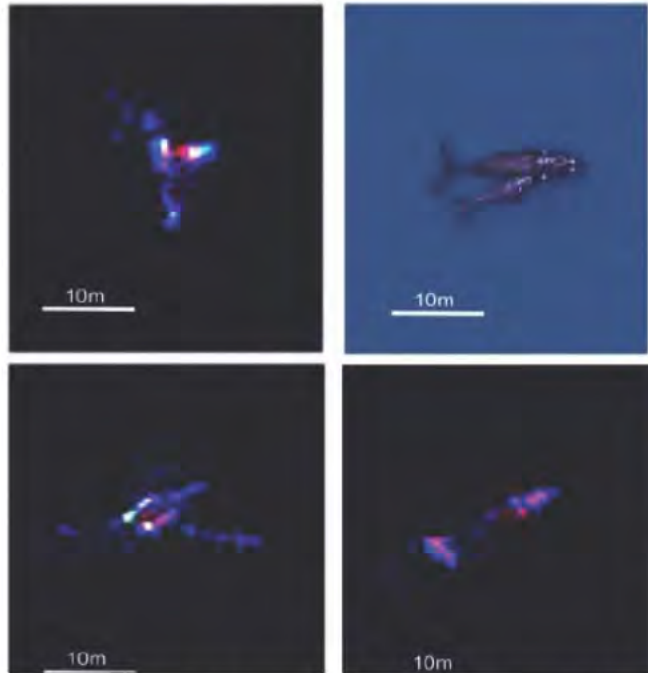
Identify indicators of the impacts on ecosystem structure, functions and services (DPSIR Impacts)

Describe societal and management responses (DPSIR Responses) and develop conservation and management policy options

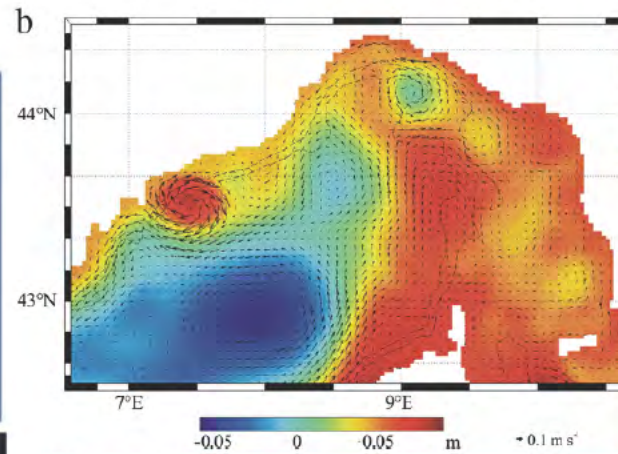
A mountain storyline: high-altitude environments as a life-support system to wild herbivores



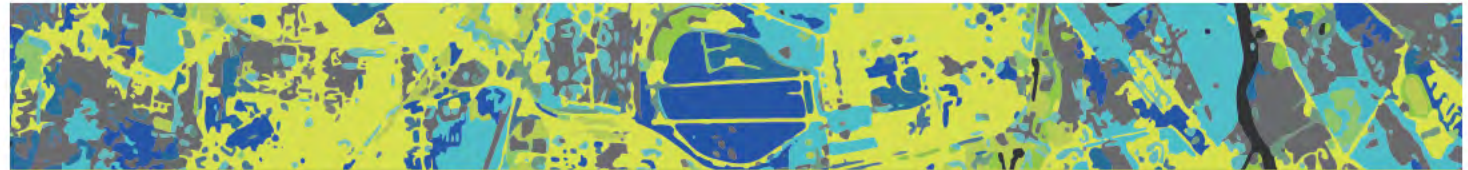
A marine storyline: the Pelagos sanctuary



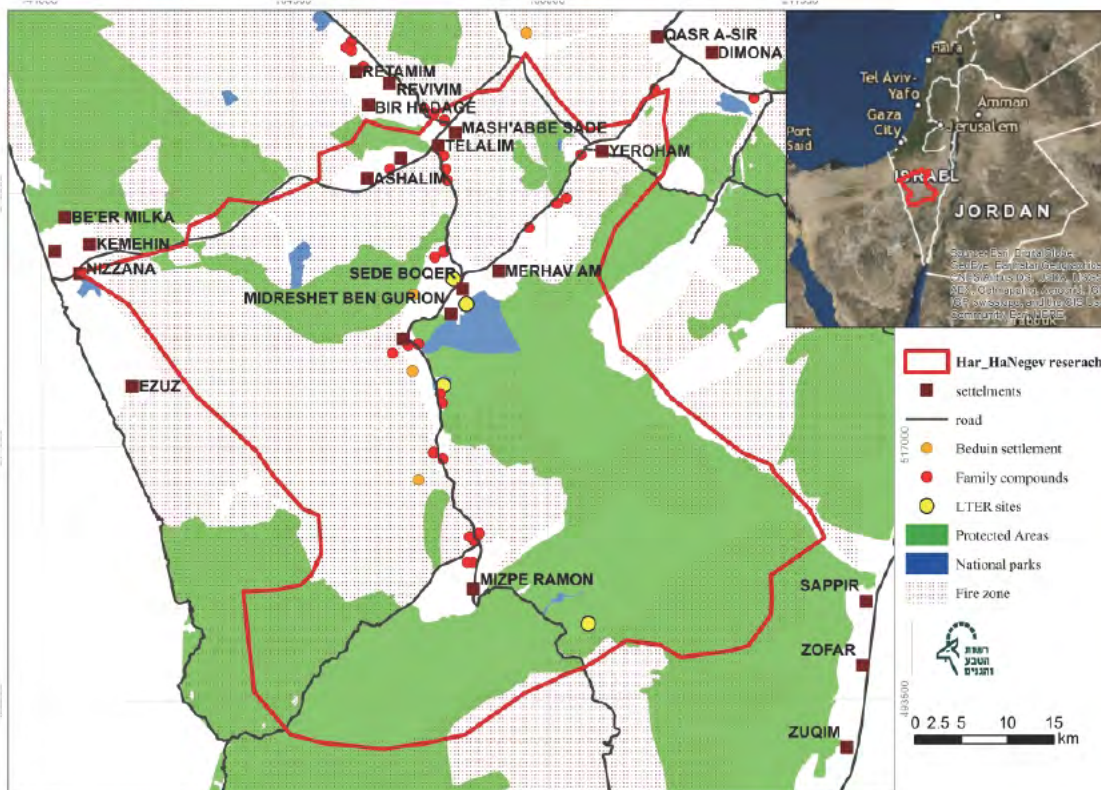
Southern Right Whales in Valdes Peninsula, captured with WorldView3 images from Digital Globe - © British Antarctic Survey/Digital Globe



Fin Whale observed in the Pelagos Sanctuary - Photo ©: F. Bendinoni - Thetis Research Institute



A desert storyline: impact of residential settlements on the life supporting capacity of Har HaNegev arid environment



ECOPOTENTIAL Conceptual threads:

Need for **data analysis and interpretation** tools

Propagation and estimate of **uncertainties** in ecosystem projections

Role of changing **climate extremes** and driver intermittency

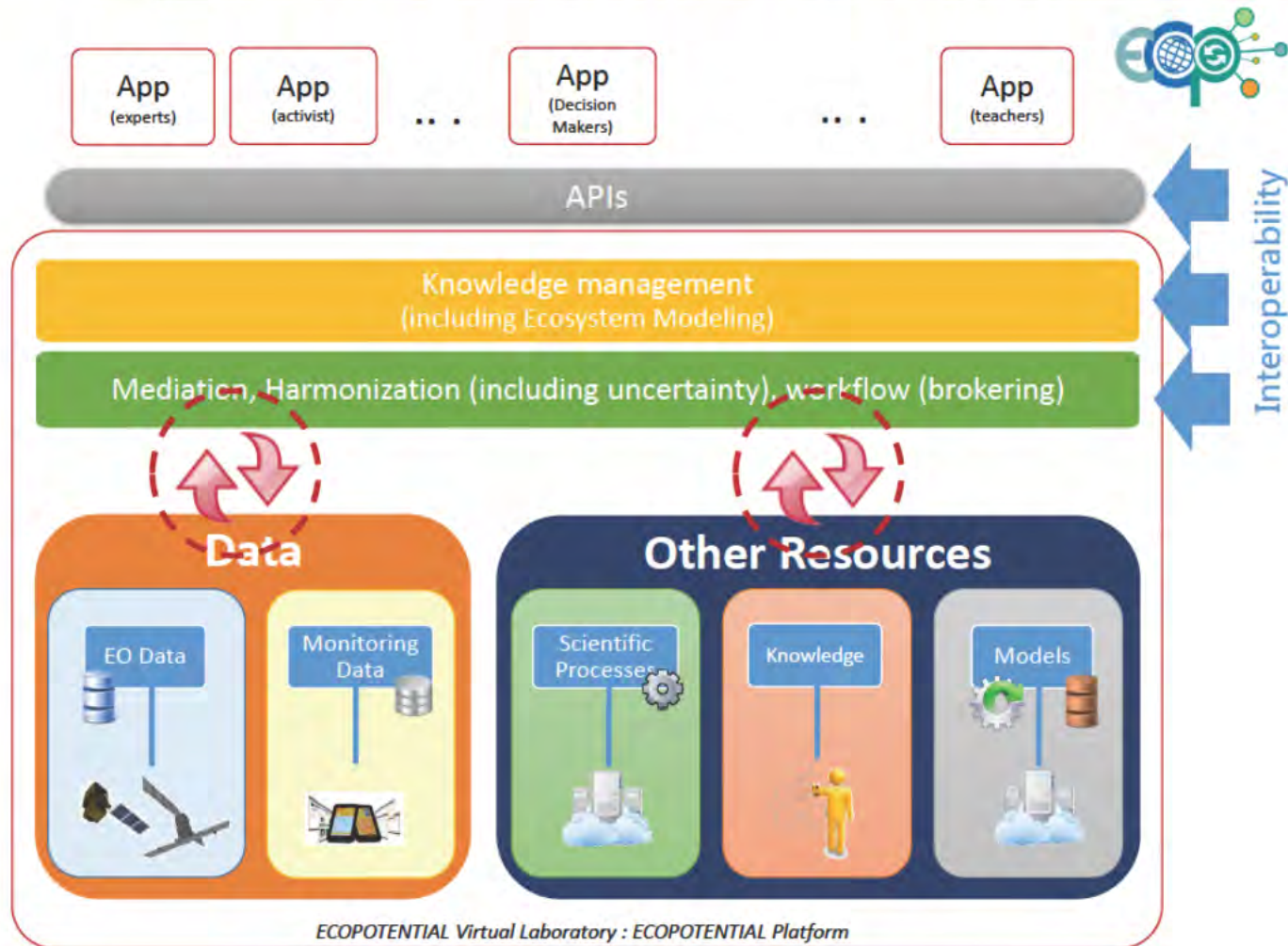
Ecosystem Services and their conceptual role
in conservation and management:

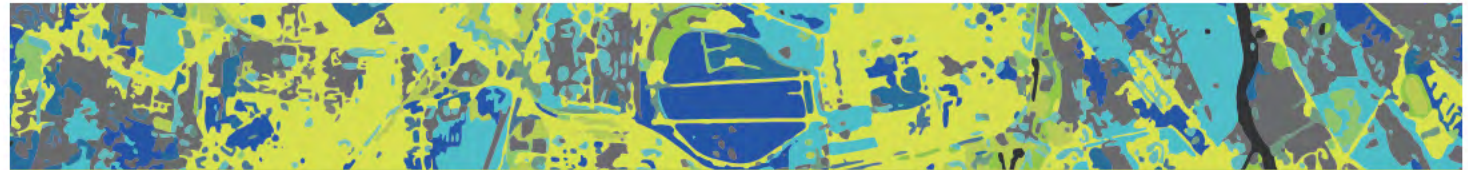
Benefits and dangers of the ESS approach

How are PAs **identified and selected?**

Essential Ecosystem Variables

Essential for what questions? How many do we need?

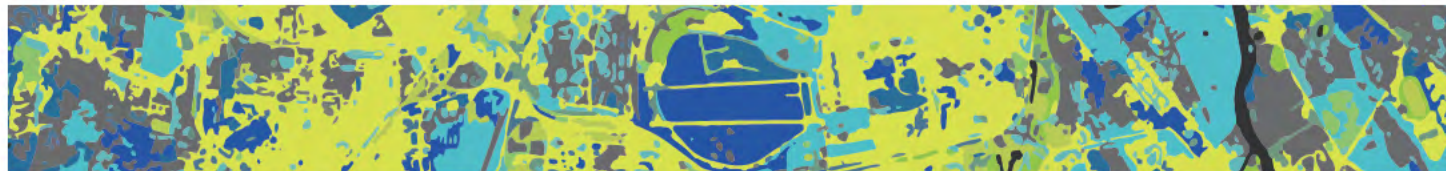




ECOPOTENTIAL contribution to GEO/GEOSS:

**GEO ECO Initiative - Global Ecosystem Monitoring:
Extend the ECOPOTENTIAL approach at global level**

**Creation of a
GEO Ecosystem Community of Practice:
User-driven questions/issues**



Thank you for your attention

