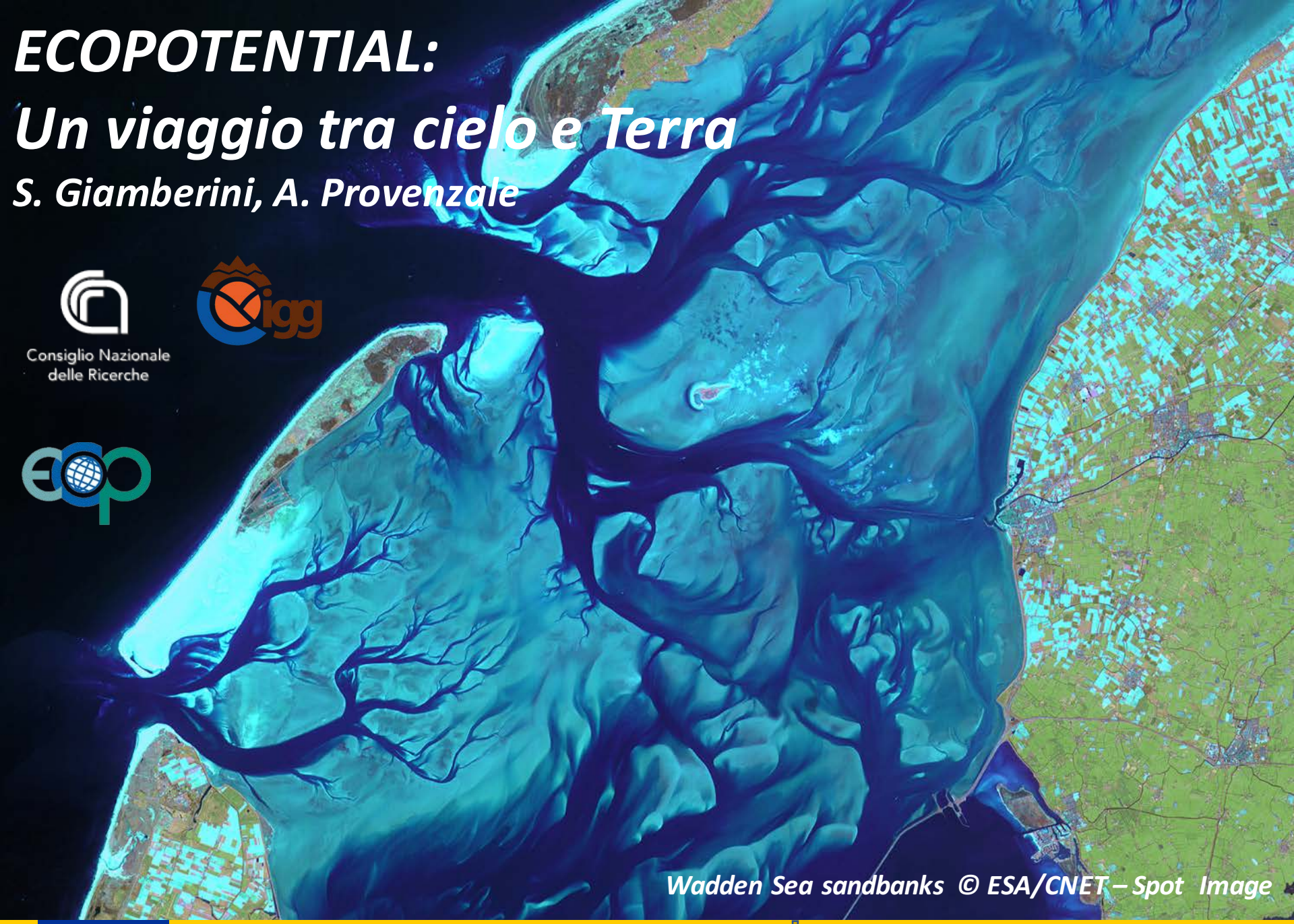
ECOPOTENTIAL:
Un viaggio tra cielo e Terra

S. Giamberini, A. Provenzale

Consiglio Nazionale delle Ricerche



Wadden Sea sandbanks © ESA/CNET – Spot Image

This project has received funding from the *European Union's Horizon 2020 research and innovation*

Silvia Giamberini
Antonello Provenzale – IGG- CNR

Consiglio Nazionale delle Ricerche

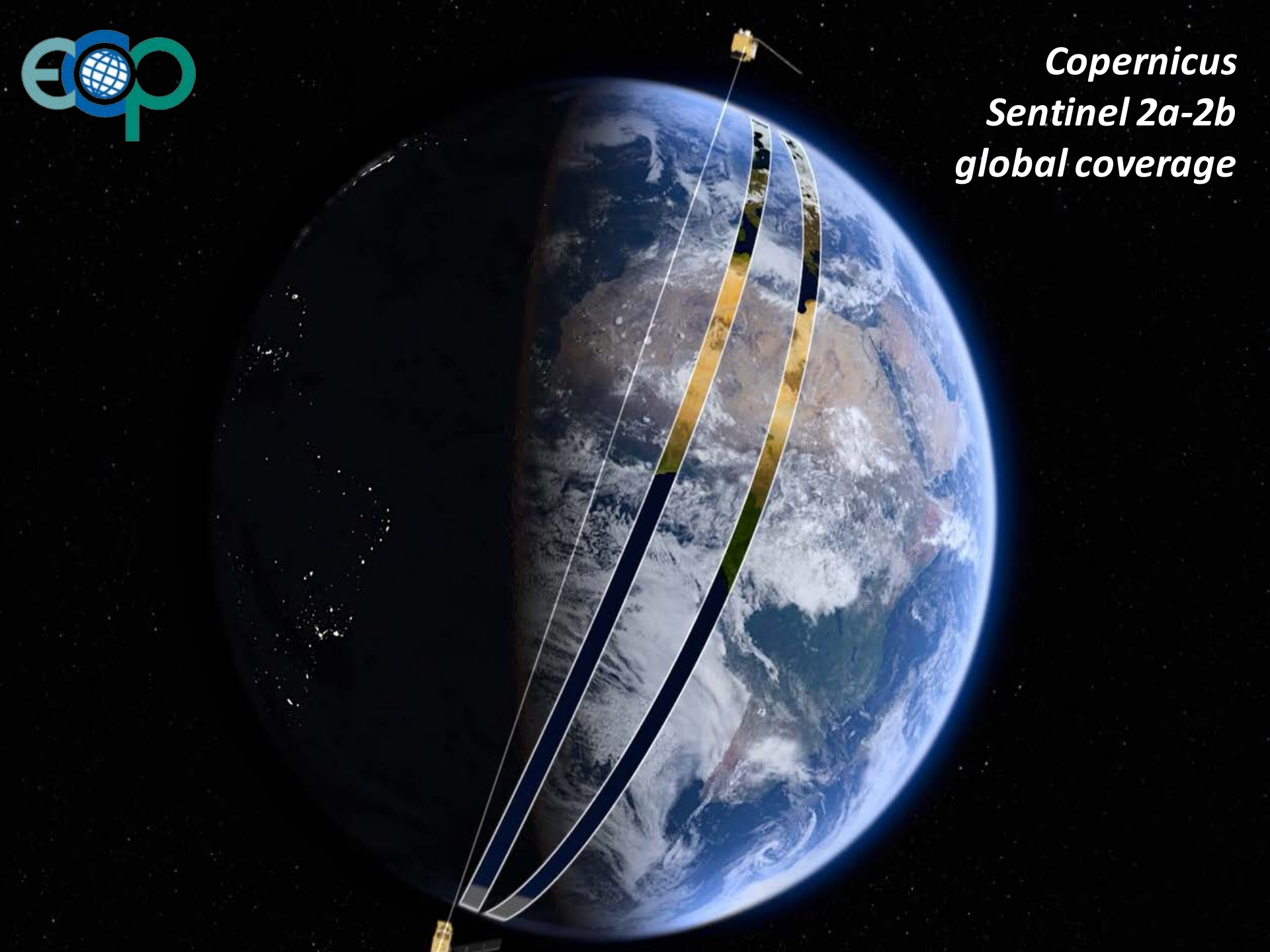
ECOPOTENTIAL
Improving future ecosystem benefits through Earth Observations

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

The H2020 project ECOPOTENTIAL: Improving Ecosystem benefits through Earth observation

2015-2019 – 47 partners

http://www.ecopotential-project.eu/


Copernicus
Sentinel 2a-2b
global coverage

Abisko National Park, Sweden © S. Wilson

ECOPOTENTIAL

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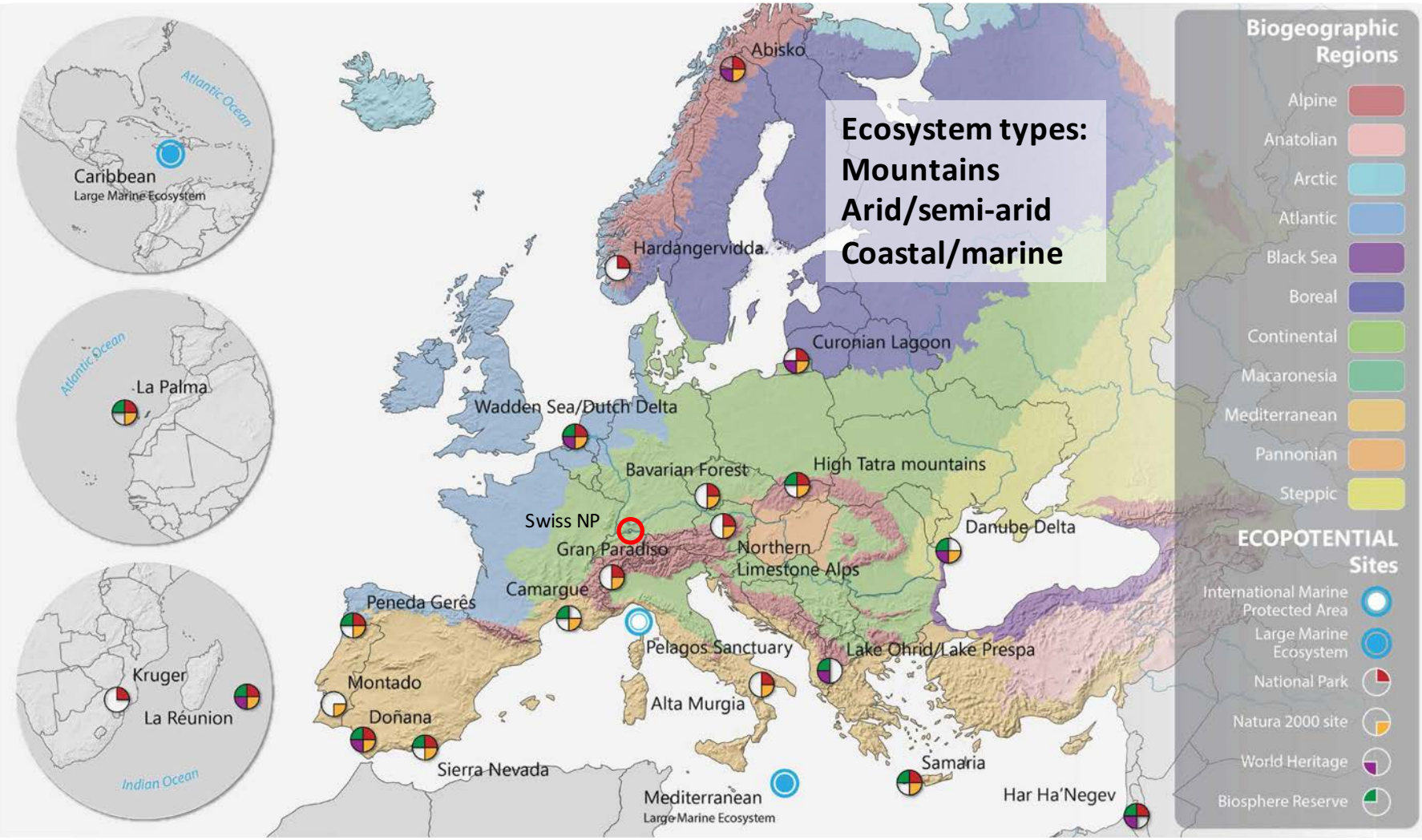
Working in partnership with 23 Protected Areas in Europe and beyond



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ECOPOTENTIAL in a nutshell

ECOPOTENTIAL studies ecosystems status, functions, processes, changes and services in protected areas using Earth observation

Builds ecological models capable of assimilating EO and in-situ data, capable to include uncertainty estimates

Estimates current and future state of ecosystems

aimed to Knowledge driven management of Protected Areas

Main pillars regarding use and production of data:

Copernicus
Europe's eyes on Earth

GEO GROUP ON EARTH OBSERVATIONS

Use existing Earth Obs. data

use of COPERNICUS data

Generate EO data products

Make data open and available through GEO/GEOSS

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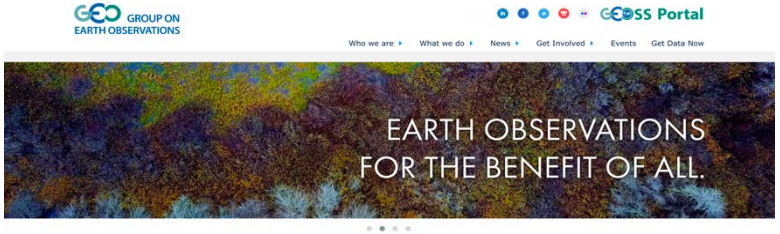
GEO: Group on Earth Observations

GEO: an intergovernmental body that promotes open Earth Observation data availability, access and use

Number of Members (2017)

Africa:	27
Americas:	16
Asia/Oceania:	21
C.I.S.:	7
Europe:	34
Total:	105

https://www.earthobservations.org



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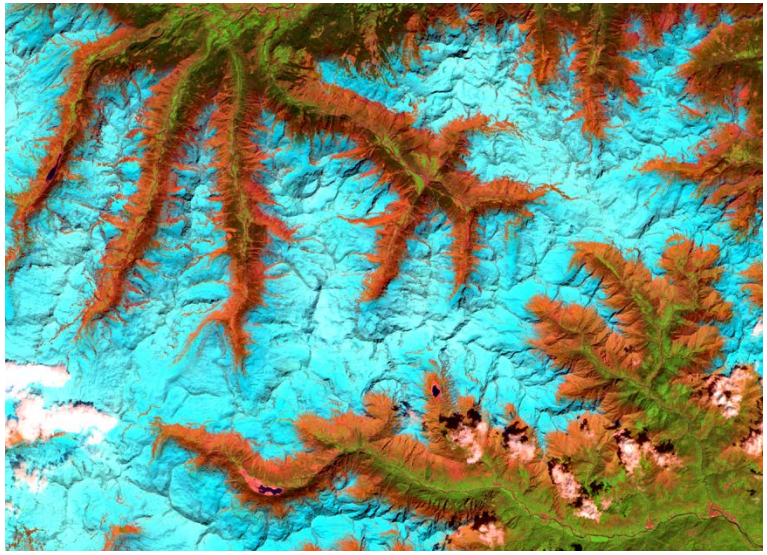
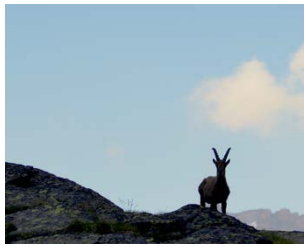
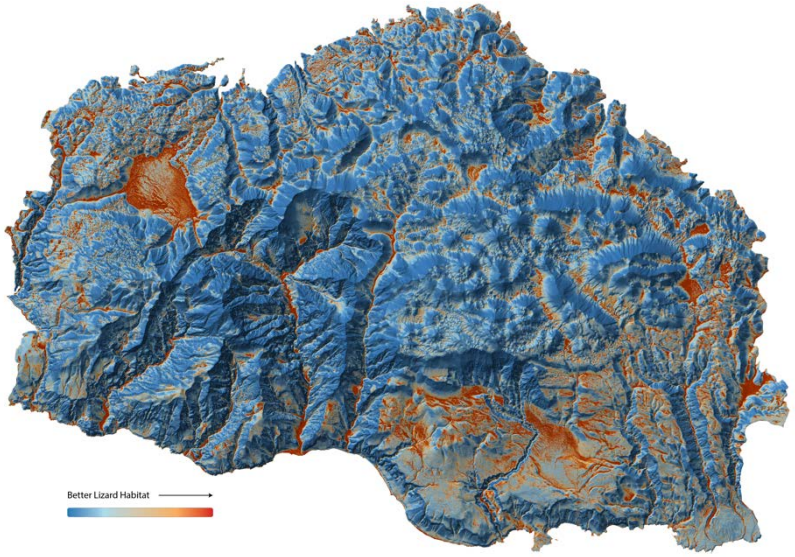
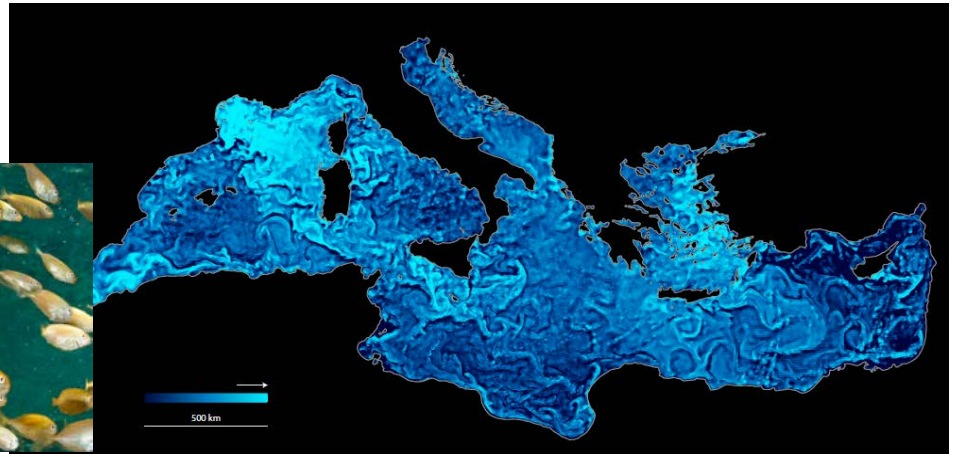
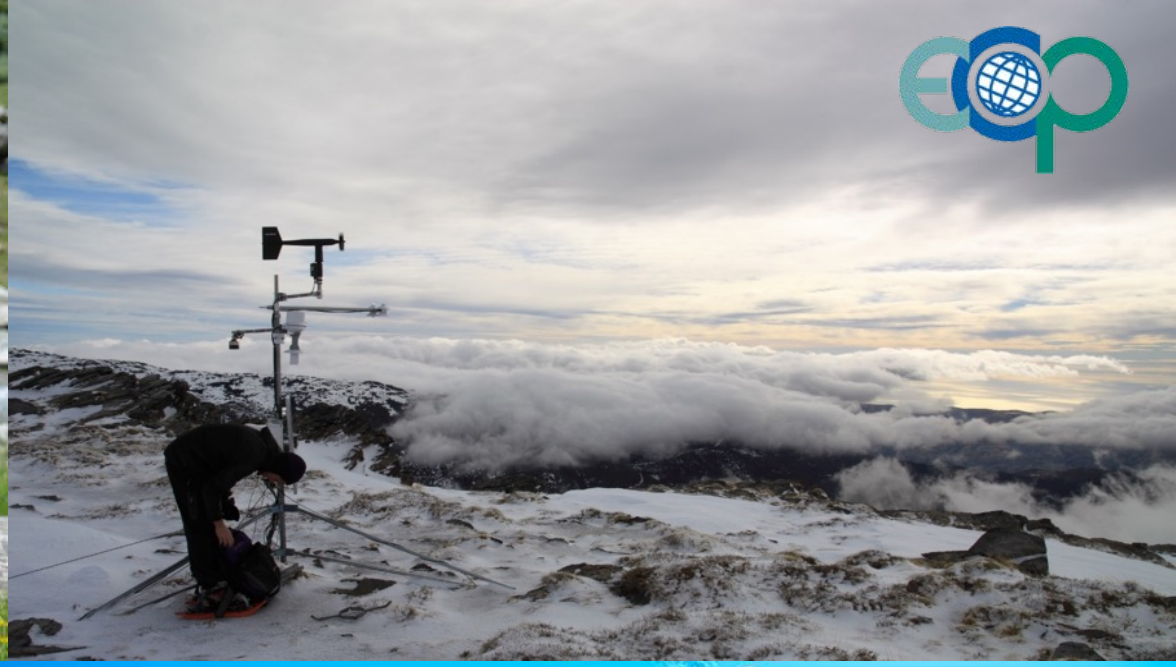





Better Lizard Habitat


2015-2016
2016-2017


500 km

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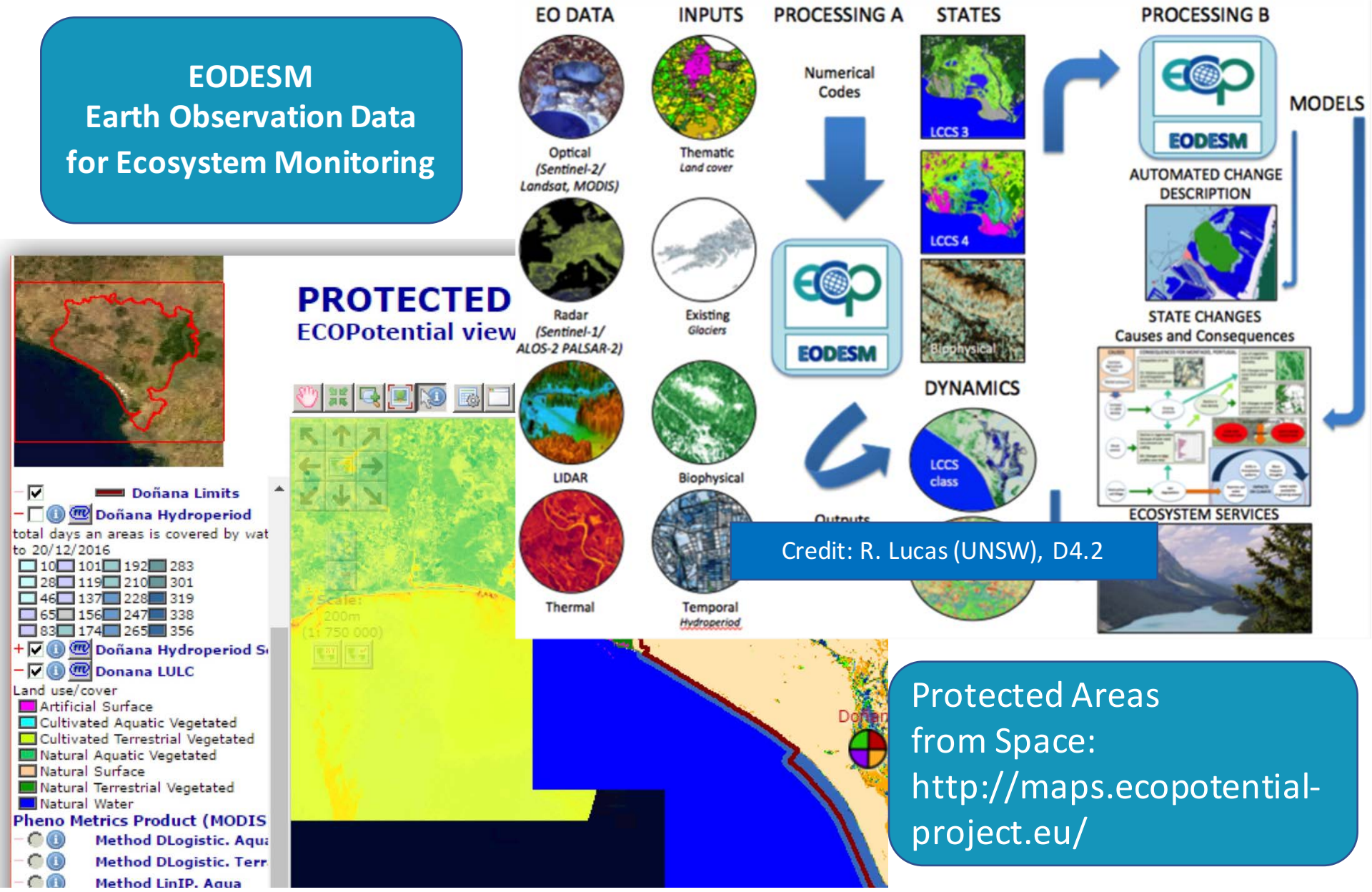
2 ECOPOTENTIAL products

EODESM
Earth Observation Data for Ecosystem Monitoring

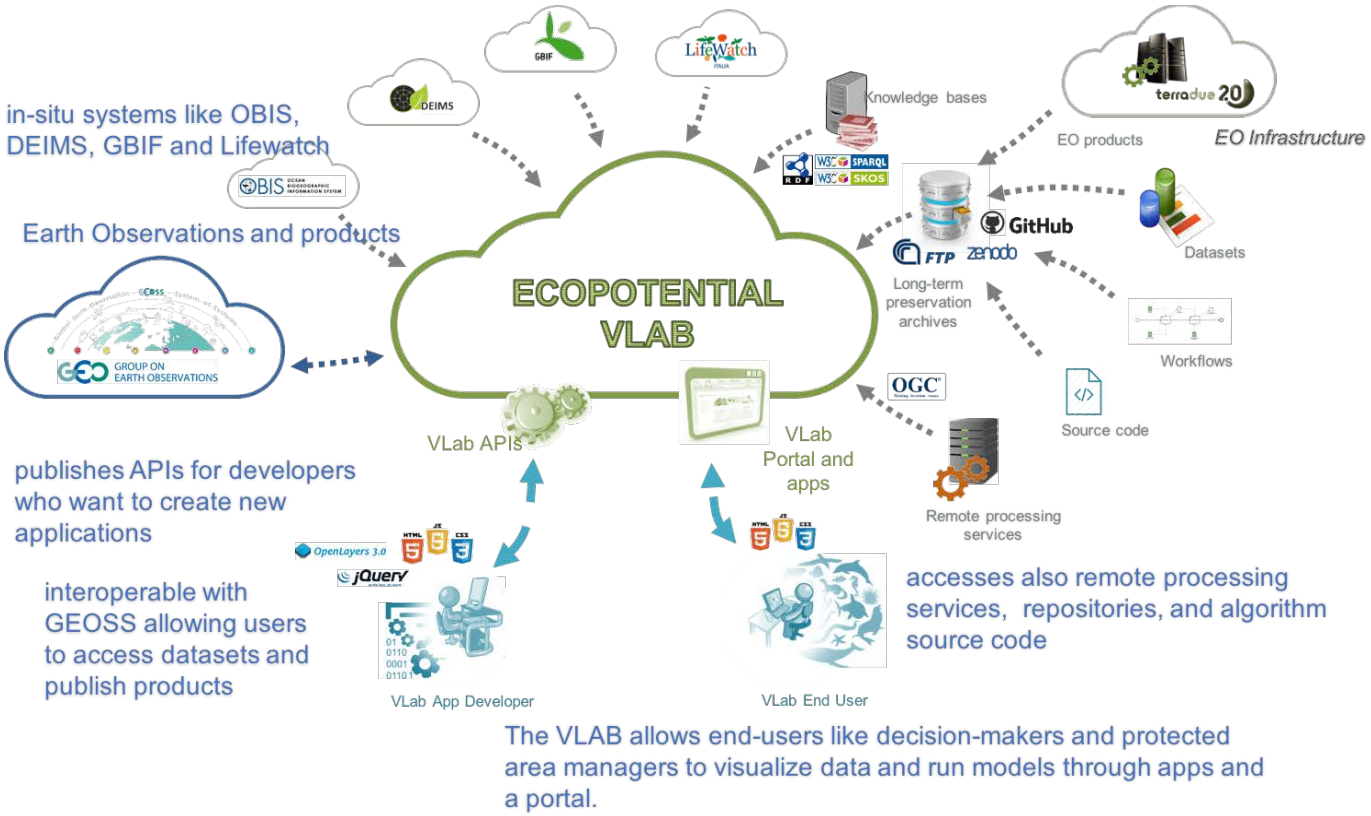


Credit: R. Lucas (UNSW), D4.2

Protected Areas from Space: http://maps.ecopotential-project.eu/

The ECOPOTENTIAL virtual laboratory

a cloud-based virtual platform enabling information access and knowledge generation for the ecosystem science community of practice.



Users can access and run workflows enabling knowledge generation for selected storylines

Users can access data, information and knowledge on ecosystems, protected areas and related storylines (scenarios)

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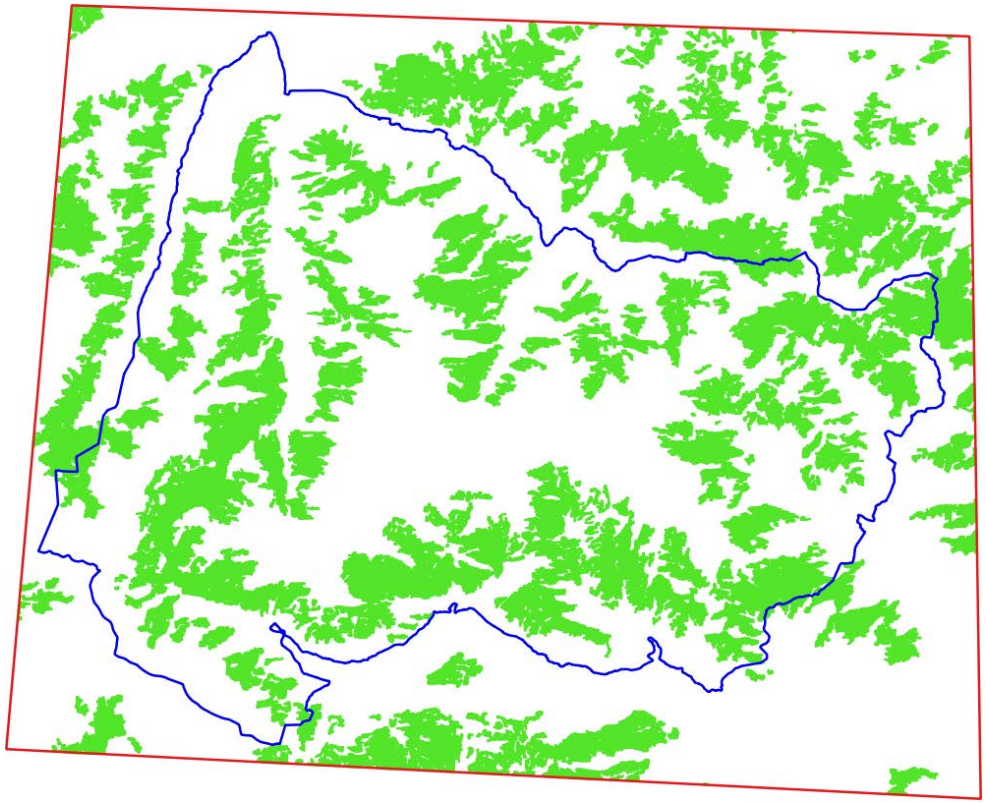
Changes detection in GPNP grasslands (IIA-CNR)

«Gran Paradiso»: Copernicus (semi-) Natural Grasslands

in verde (≈312 km² nell'area analizzata; 178 km² nel parco) - tempo T_1

C. Tarantino, M. Adamo, P. Blonda - IIA-CNR



- **Data: 2012**
- **Risoluzione spaziale: 20 metri**

Limite PA (≈ 700 km²)

Area Analizzata (≈ 1400 km²)

(semi-) Natural Grasslands

1:350.000

Ecosistema montano: grassland alpino

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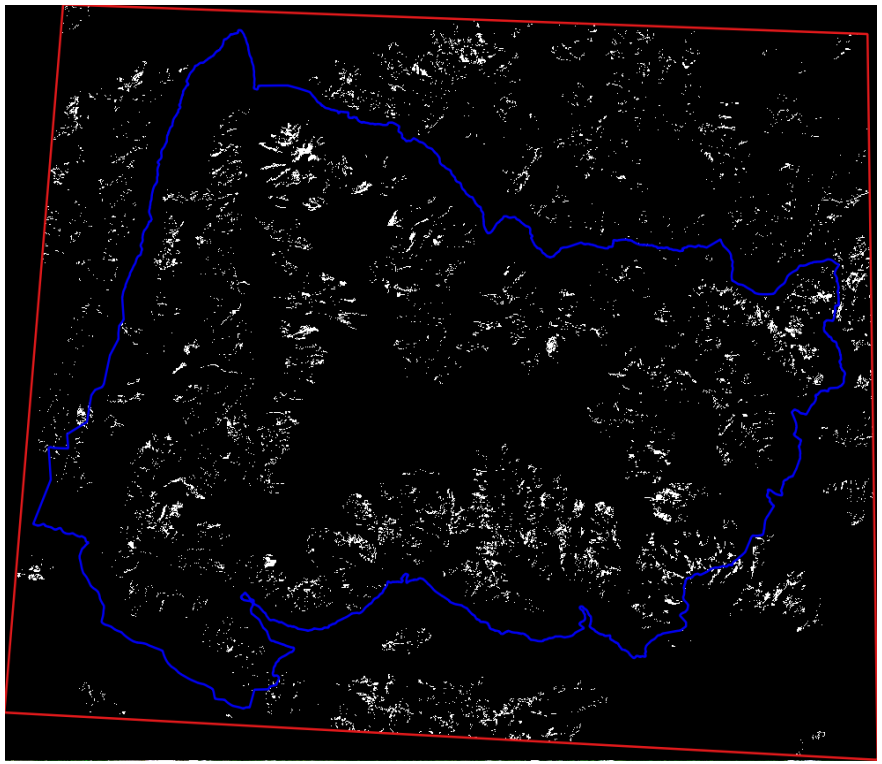
Changes detection in GPNP grasslands (IIA-CNR)

«Gran Paradiso»: Mappa dei cambiamenti per il (semi-) Natural Grasslands in altro dal 2012 al 2016



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Limite PA

Area Analizzata

Cambiamenti del (semi-) Natural Grasslands in Altro

Nessun Cambiamento/Area non considerata

OA %=91.88 ± 0.15%

≈25 km² di cambiamento dal 2012 al 2016 pari a ≈ 14% del (semi-) Natural Grasslands esistente al tempo T1 nella PA.

C. Tarantino, M. Adamo, P. Blonda - IIA-CNR

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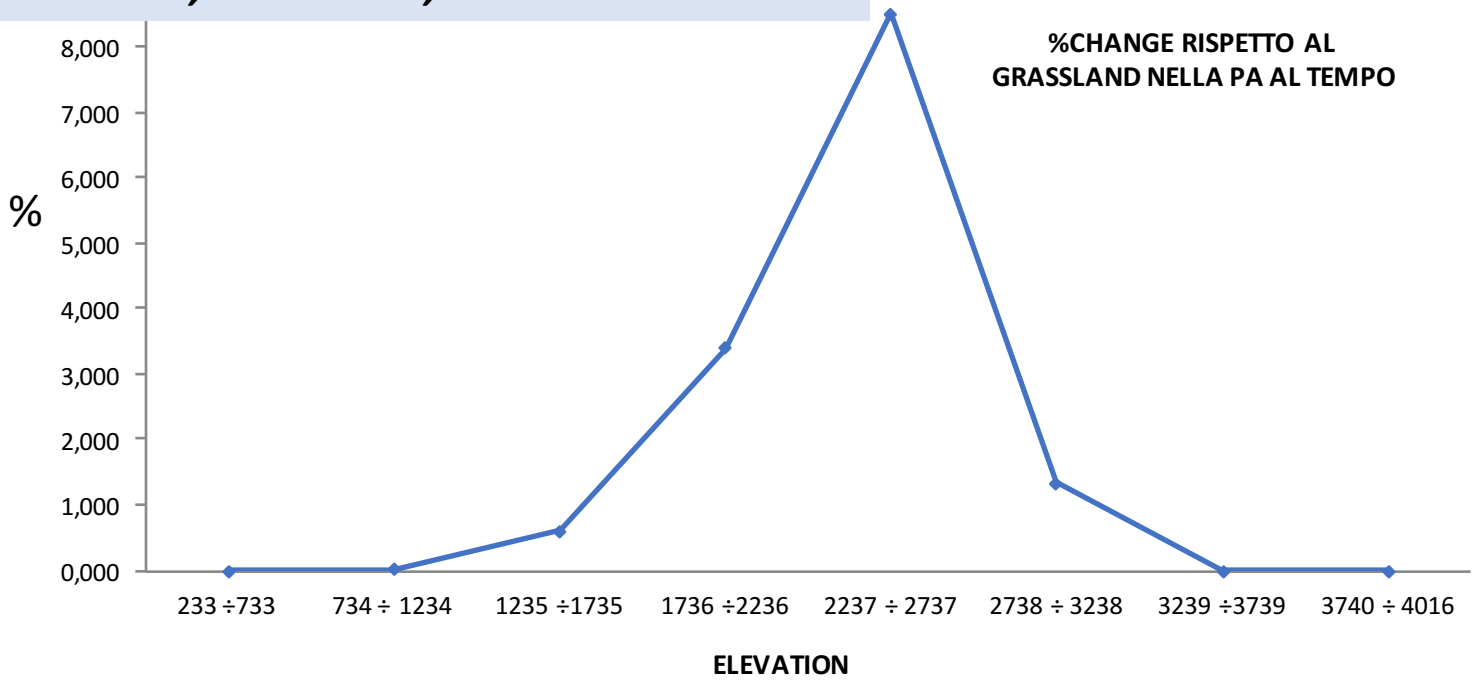
Changes detection in GPNP grasslands (IIA-CNR)

«Gran Paradiso»: Trend del cambiamento per il (semi-) Natural Grasslands in altro dal 2012 al 2016 vs. fasce di quota (passo: 500 metri)

C. Tarantino, M. Adamo, P. Blonda - IIA-CNR



Il grasslands tra la zona sub-alpina e quella alpina risulta l' habitat maggiormente soggetto al cambiamento. In tale zona si colloca la " treeline" in cui sono attesi I maggiori cambiamenti dovuti sia al cambiamento climatico che all'abbandono delle attività agro-pastorali (causa del tree-encroachment).

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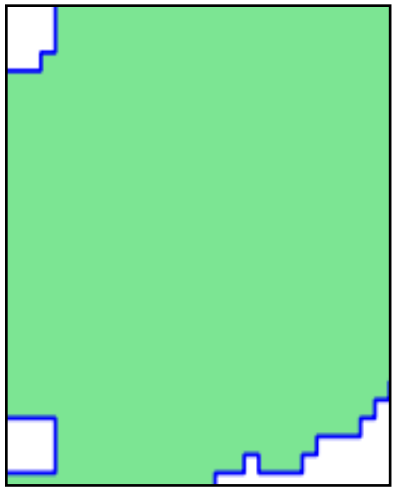
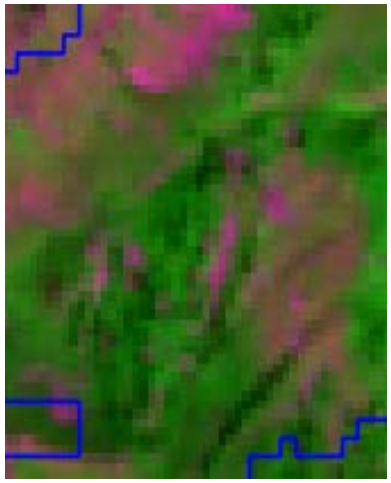
Changes detection in GPNP grasslands (IIA-CNR)

«Gran Paradiso»: zoom su alcuni cambiamenti

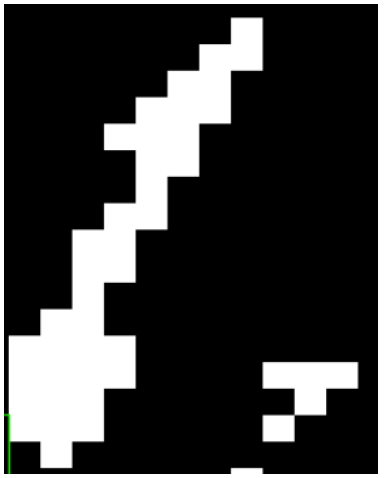


Tempo T_1 (2012): Strato Copernicus di (semi-) Natural Grasslands in verde.



Tempo T_2 (2016): Sentinel-2A RGB composizione in falsi colori: R=Red, G=Nir, B=Blue
Strato Copernicus delimitato in blu.

Tempo T_2 (2016): Ortofoto (1 metro)



Cambiamento: trees encroachment (invasione di alberi)

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1:10.000

Cambiamenti del (semi-) Natural Grasslands in Altro

Nessun Cambiamento/Area non considerata

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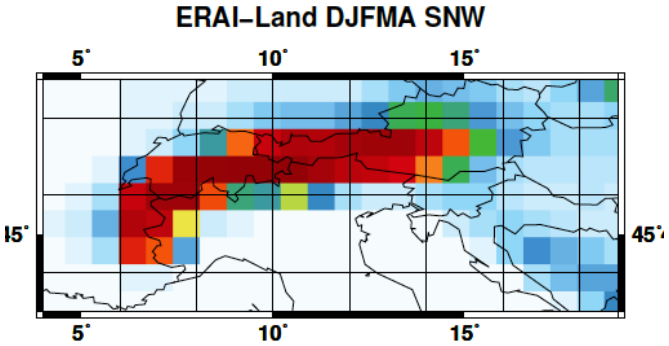
Specific example of PA changes: the Gran Paradiso National Park

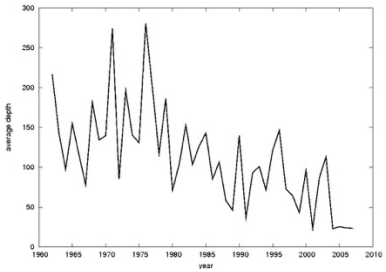
Gridded meteo-climatic datasets
E-OBS: 0.25°, EURO4M: 0.05° (only prec)
HISTALP, OI (Piedmont): 0125°

Model outputs and reanalyses
CMIP5, EURO-CORDEX,
ERA-Interim/Land and 20CRv2, MERRA, NCEP



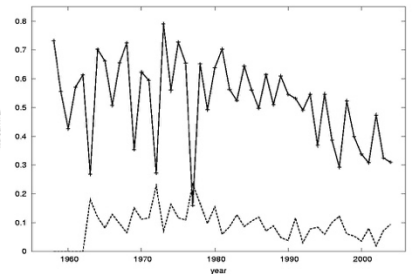
Satellite products
e.g. snow: Global SWE, AMSR-E
vegetation, NDVI, LC/LU

Water/carbon fluxes and Earth Critical Zone
eddy covariance
flux chambers



Local climatic datasets

Ecosystem and population dynamics
ibex, chamois, vegetation, biodiversity



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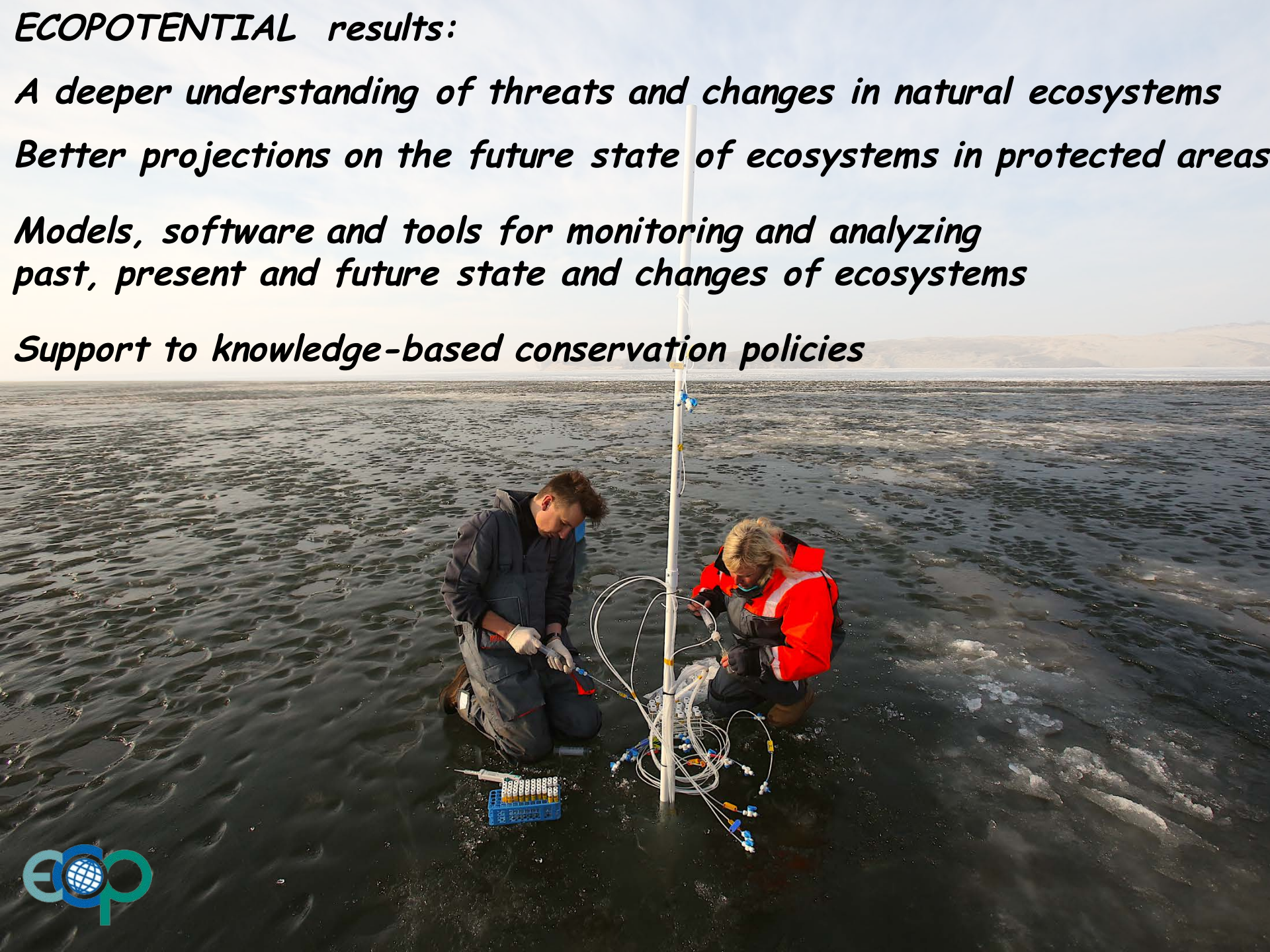
ECOPOTENTIAL results:

A deeper understanding of threats and changes in natural ecosystems

Better projections on the future state of ecosystems in protected areas

Models, software and tools for monitoring and analyzing past, present and future state and changes of ecosystems

Support to knowledge-based conservation policies

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Thanks a lot for your attention!!
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