ECOPOTENTIAL: Improving future ecosystem benefits through Earth Observations

Starting date: 1st June 2015, Duration: 4 years, 47 partners

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

Communication Officer: **Mariasilvia Giamberini**

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

www.ecopotential-project.eu

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Working in partnership with Protected Areas in Europe and beyond

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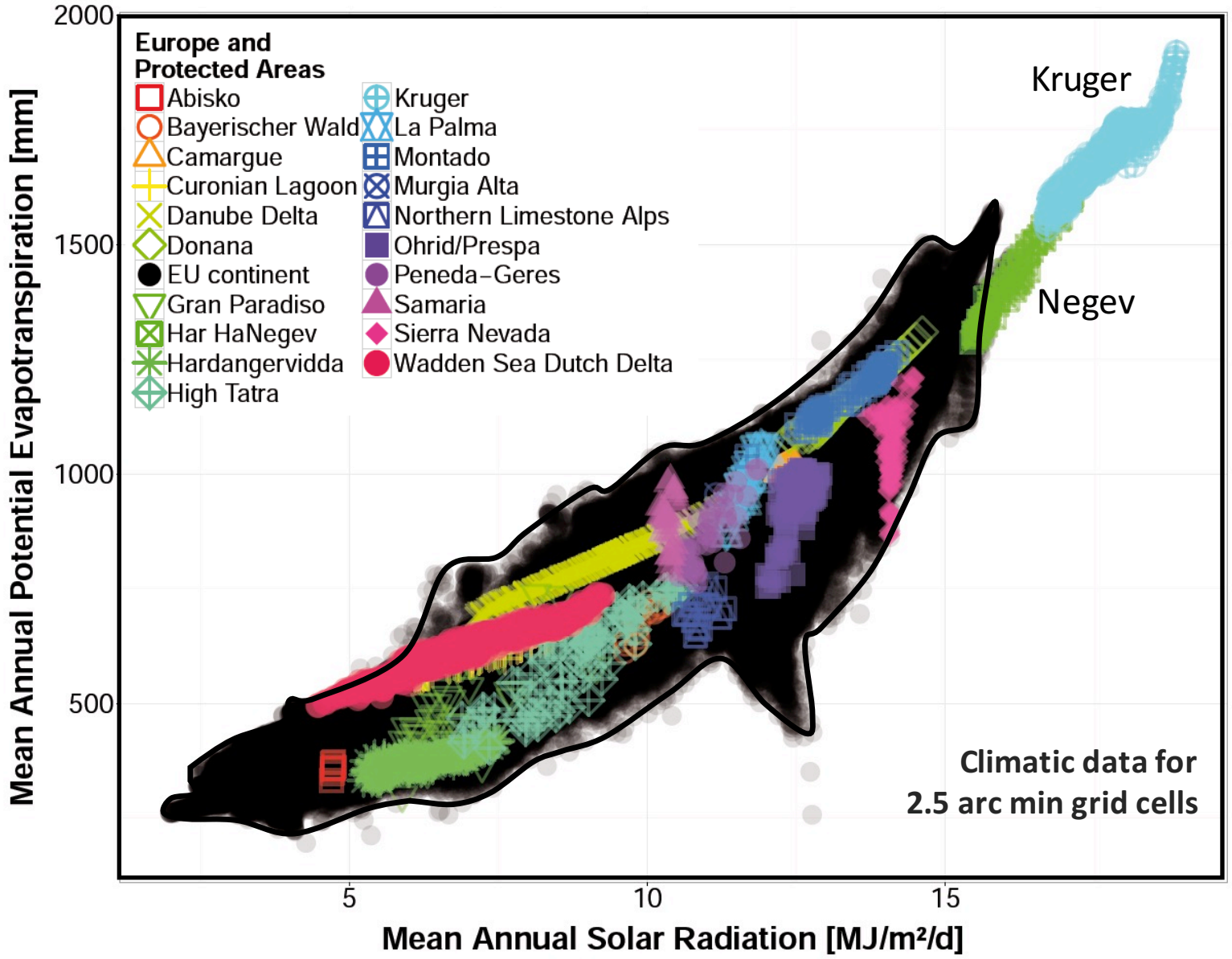
ECOPOTENTIAL PAs and climate

Hoffmann et al, 2017, submitted



What do we study in the ECOPOTENTIAL Protected Areas:

Current state of Protected Areas from Remote Sensing

Ongoing changes in the ecosystems and the environment

Future projections on the state of the ecosystem

Narratives related to Protected Area needs: The Storylines

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Remote sensing variables

Type of ecosystem	RS variable	Period	Frequency	Spatial resolution	Satellite	Referent expert
Mountains	NDVI	2000-2017	Daily averages	250 m	MODIS TERRA/AQUA	BGU, CREAF
	Snow cover (duration)	2002-2016	yearly	250 m (EURAC) 500 m (MODIS)	MODIS TERRA/AQUA	EURAC, FORTH
	Land surface temperature	2000-2017	Daily averages	1 km	MODIS TERRA/AQUA	FORTH
Arid ecosystems	NDVI	2000-2017	Daily averages	250 m	MODIS TERRA/AQUA	BGU, CREAF
	Albedo	2000-2015	Yearly	500 m	MODIS	FORTH
	Land surface temperature	2000-2017	Daily averages	1 km	MODIS TERRA/AQUA	FORTH
Marine	Chlorophyll a	1998-2015	monthly	4 km	Several	ISPRA
	Sea Surface Temperature	1986-2016	Daily	2 km-4km	Several	ISPRA
	Total suspended solids /Turbidity	From 1984	16 day images (if available and no clouds)	30 m	Landsat /Sentinel 2	EBD-CSIC provides software not product
Common to all PAs - Global	GPP proxy	2002-2016	Yearly	250 m	MODIS	UFZ
	Phenological metrics	2002-2016	Yearly	250 m	MODIS	UFZ

Integrated approach with PA Staff:
The ECOPOTENTIAL storylines

- Focus on given Protected Area(s) and identify the main Ecosystem Services of interest and the functions/processes supporting them.
- Identify indicators for the state of the ecosystem and of ecosystem processes (DPSIR SoE), for the most important control factors on the ecosystem, for the main (human-induced) pressures (DPSIR Pressures).
- Identify the most critical/endangered/fragile ecosystem components and identify indicators of the impacts/response of ecosystem structure, functions and services (DPSIR Impacts).
- Identify, retrieve, collect and possibly extend the data base (in situ and Remote Sensing) for the above indicators and the relevant Essential Variables.
- Identify societal and management responses (DPSIR Responses) and develop conservation and management policy options.

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

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

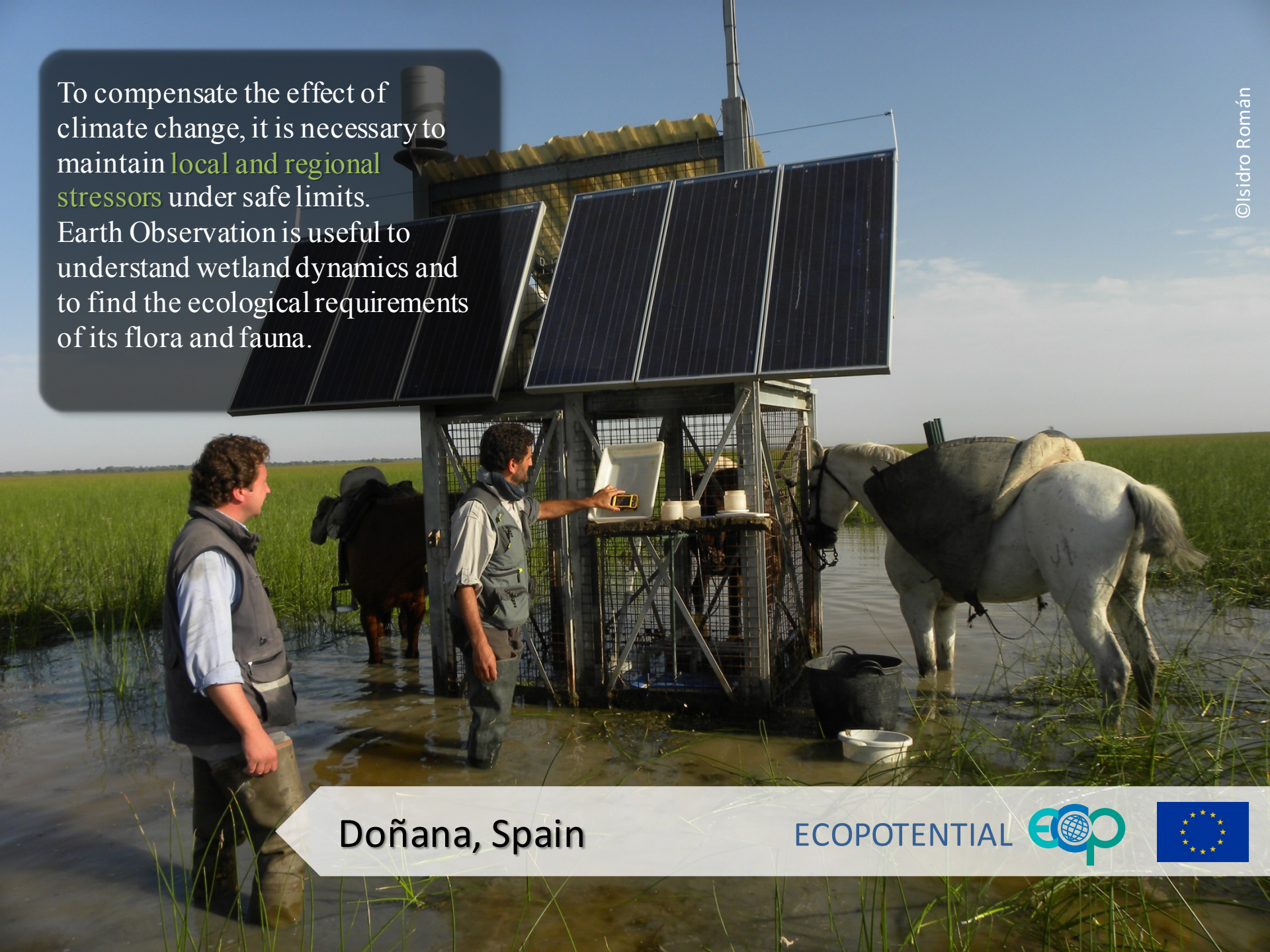
Camargue, France

ECOPOTENTIAL


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


The Doñana National Park was established in the 1960's for the protection of waterbirds.
©Rubén Rodríguez-Olivares
Doñana, Spain
ECOPOTENTIAL


Global (climate change), regional (water extraction, eutrophication) and local (modification of hydrological and grazing regimes) stressors could act in synergy and can push the ecosystem to undesirable states.
Doñana, Spain
ECOPOTENTIAL


To compensate the effect of climate change, it is necessary to maintain local and regional stressors under safe limits. Earth Observation is useful to understand wetland dynamics and to find the ecological requirements of its flora and fauna.
©Isidro Román
Doñana, Spain
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Wadden Sea, The Netherlands

ECOPOTENTIAL

Wadden Sea, The Netherlands

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The ECOPOTENTIAL approach is based on the development of remediation and management plans aiming at:

limiting fishing for mussel,

decreasing the influence of sand extraction and dredging on shellfish and benthic communities,

and reducing the pollution.

Wadden Sea, The Netherlands

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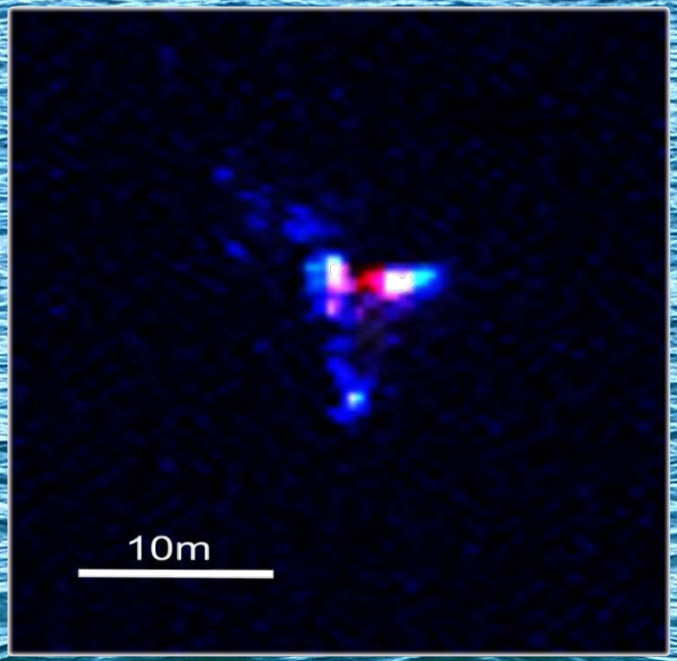
The Pelagos Sanctuary for Mediterranean Marine Mammals is a vast marine protected area in the north-western Mediterranean Sea.

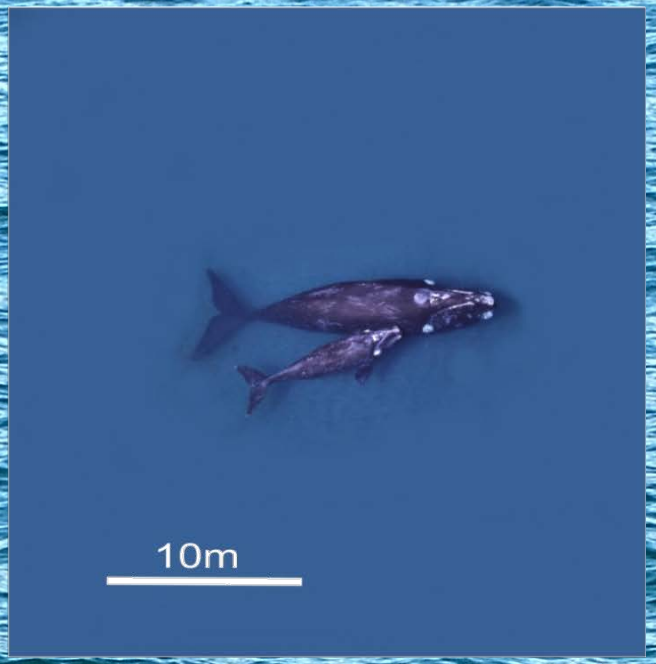
Pelagos Sanctuary, Mediterranean

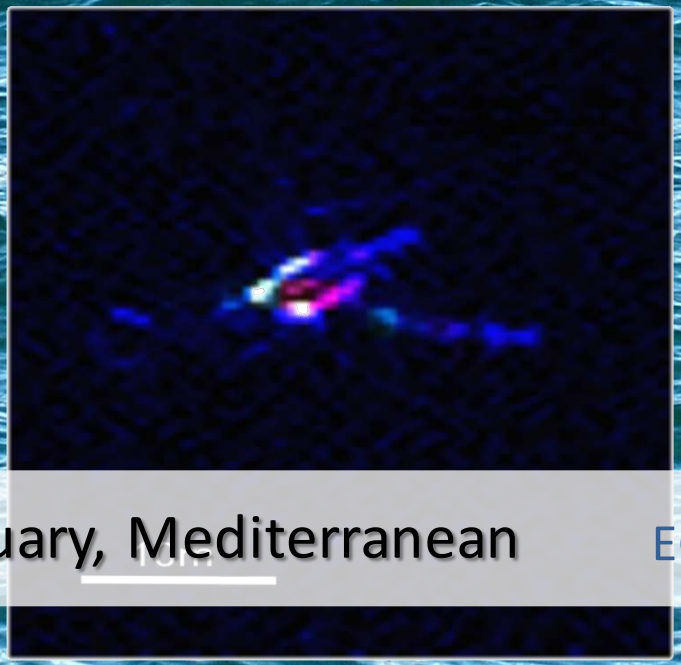
ECOPOTENTIAL

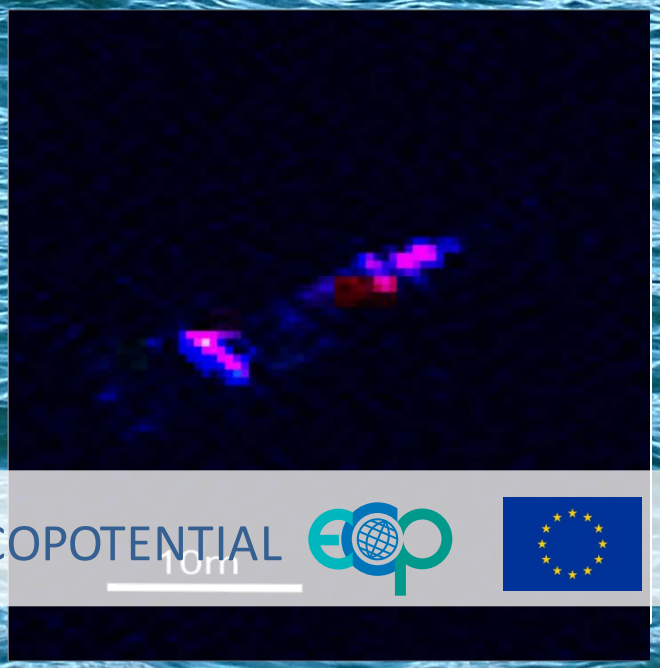
Credits: F. Bendinoni, Tethys Institute

Within ECOPOTENTIAL, remote sensing and in situ data are collected to assess and model the distribution of cetacean populations and associated benefits to humans. Results will be used to identify the areas where greatest intervention or change in management practices is required.









Pelagos Sanctuary, Mediterranean

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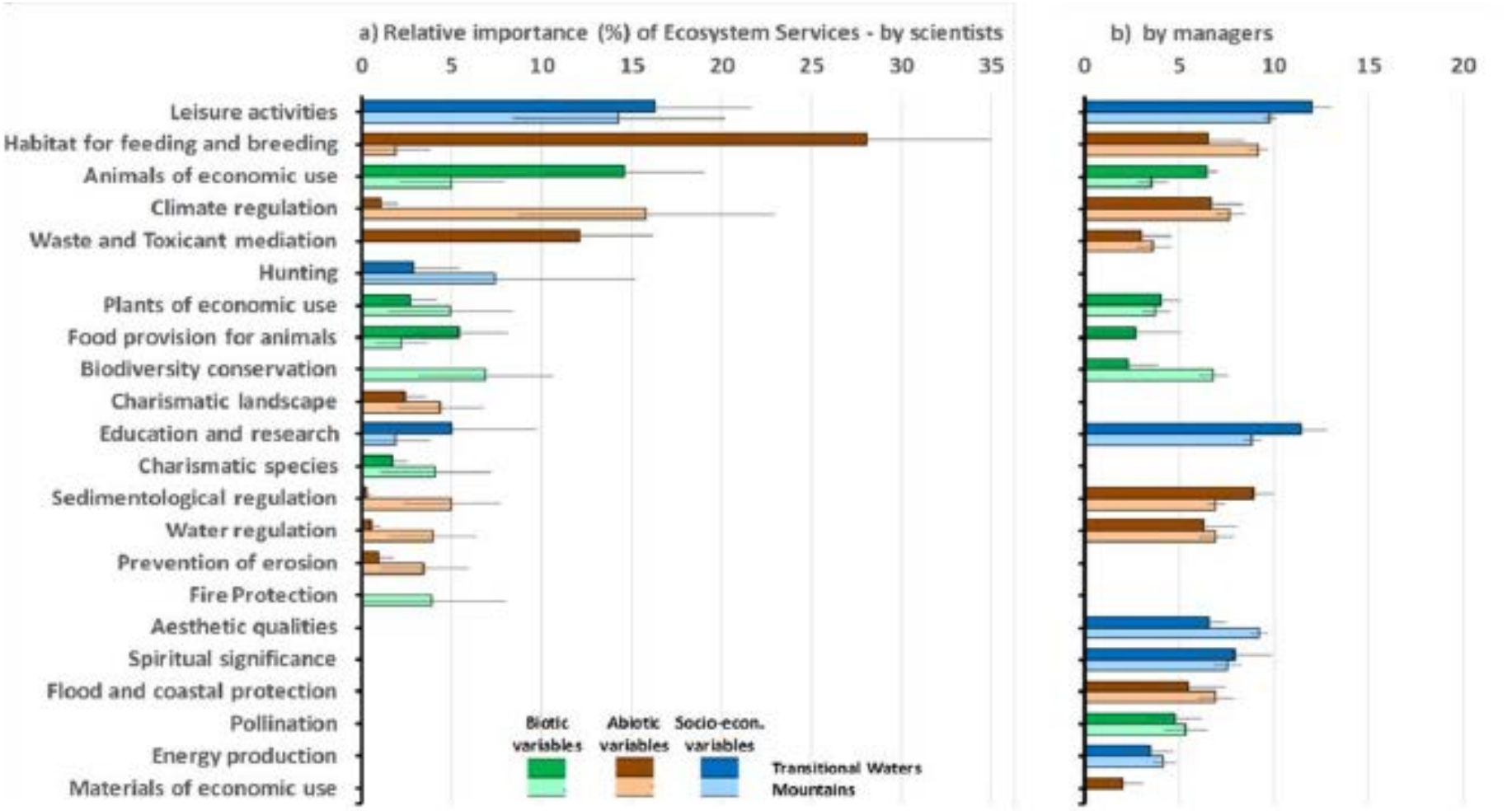
Scientists and PA staff: different perspectives?

Ecosystem services in European protected areas: Ambiguity in the views of scientists and managers?

Christiaan Hummel[1,2*], Antonello Provenzale[3], Jaap van der Meer[2,4], Sander Wijnhoven[5], Arno Nolte[6], Dimitris Poursanidis[7], Guyonne Janss[8], Matthias Jurek[9], Magnus Andresen[9], Brigitte Poulin[10], Johannes Kobler[11], Carl Beierkuhnlein[12], João Honrado[13], Arturas Razinkovas[14], Ana Stritih[15], Tessa Bargmann[16], Alex Ziemba[6], Francisco Bonet-García[17], Mihai Cristian Adamescu[18], Gerard Janssen[19], Herman Hummel[1]



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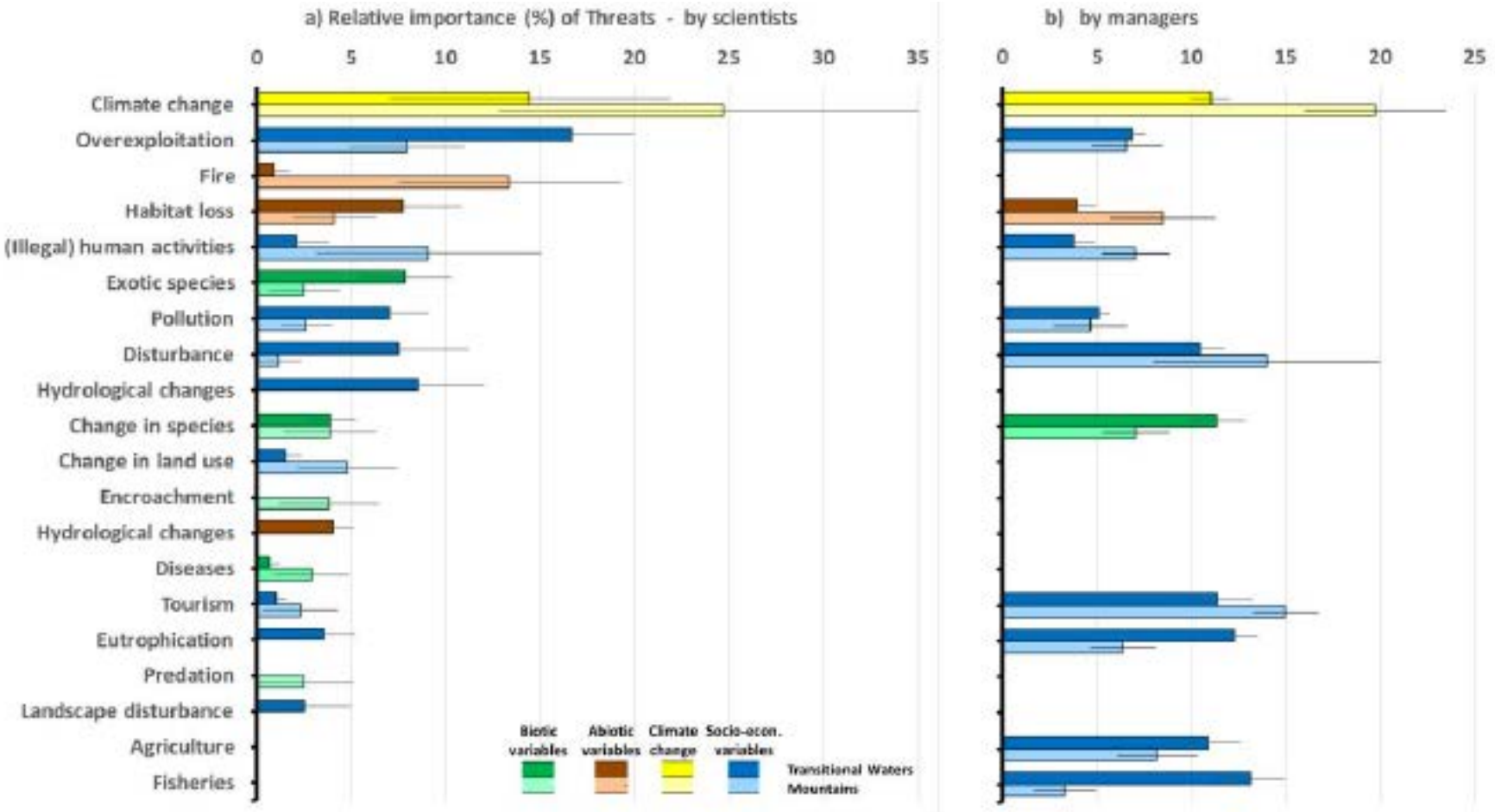

A workshop with PA staff (May 2017) and a EO/RS training week (February 2018)

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Challenge:
A deeper integration of Remote Sensing with in situ data, possibly mediated by the use of Essential Variables for Ecosystems

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Upscaling of the Storylines to gain a continental cross-scale view of the challenges and drivers of ecosystem change

Assessment and reduction of uncertainties in future ecosystem projections

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User uptake of RS products: stronger contact with PA staff (and other potential users) with continuous assessment of the possibly different priorities, views and needs

Provision of data, results and knowledge to larger-scale infrastructures and programs: GEO (GEO ECO), eLTER, LifeWatch

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Thank you for your attention