Dear Reader,

Welcome to the ECOPOTENTIAL Project Newsletter. ECOPOTENTIAL is a large European-funded H2020 project that focuses its activities on a targeted set of internationally recognised Protected Areas, blending Earth Observations from remote sensing and field measurements, data analysis and modelling of current and future ecosystem conditions and services. ECOPOTENTIAL considers cross-scale geosphere-biosphere interactions at regional to continental scales, addressing long-term and large-scale environmental and ecological challenges with the goal of improving future ecosystem benefits. This Newsletter will regularly report the activity and progress of the Project, and it can be downloaded from the Project website, www.ecopotential-project.eu, to which we refer for further details.

Antonello Provenzale, CNR-IGG, Coordinator of ECOPOTENTIAL

Lake Trebecchi at the Gran Paradiso National Park, Italy
What is ECOPOTENTIAL?

ECOPOTENTIAL is a EU-H2020 project, funded under the call SC5-16-2014 - Making Earth Observation and Monitoring Data usable for ecosystem modelling and services. It started in June 2015 and it will last four years. With 48 partners and 28 protected areas involved, it is one of the largest EU funded projects on ecosystems and it is coordinated by the National Council of Research of Italy (CNR).

The ECOPOTENTIAL project focuses its activities and pilot actions on a targeted set of internationally recognised protected areas (PA) in Europe and beyond, including mountain, arid and semi-arid, and coastal and marine ecosystems, and they cover all the bio-geographic regions of Europe. The geographical position and the complete description of the protected areas involved in Ecopotential can be seen here: http://www.ecopotential-project.eu/protected-areas The Figure below reports the map of the Protected Areas currently involved in the Project as study sites. Building on the knowledge gained in individual PAs, ECOPOTENTIAL will address cross-scale ecological interactions and landscape-ecosystem dynamics at regional to continental scales. Improving the use of Earth Observation data, together with in situ data and modelling, is one of the major aims of the project. All data, model results and acquired knowledge will be made available on common and open platforms, coherent with the Global Earth Observation System of Systems (GEOSS) data sharing principles and fully interoperable with the GEOSS Common Infrastructure (GCI).

More info are available here: http://www.ecopotential-project.eu/project/mission

Map of the Protected Areas currently included in the ECOPOTENTIAL Project, with the indication of their protection status and the main biogeographic regions of Europe.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 641762 – Copyright: Ecopotential Consortium

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Who are the ECOPOTENTIAL Partners?

The ECOPOTENTIAL consortium is formed by 48 partners, including research institutions, universities, environmental agencies, international institutions, small and medium enterprises, with a high complementarity and expertise in all the various fields needed in the Project. The whole structure of the ECOPOTENTIAL Consortium creates a chain of research/applications/actions that go from the recovery, analysis and interpretation of EO and monitoring data, to modelling, to Ecosystem Services, to the development of policy options and to dissemination. ECOPOTENTIAL includes highest level research, application and management groups. The participation of researchers and policy experts working on both terrestrial (mountains, arid/semiarid) and marine/coastal ecosystems is especially important, because it allows for the inclusion and comparison of ecosystems with very different environmental conditions, pressures and services. The involvement of SMEs is especially important as it allows creating new job opportunities, related to the processing and use of EO data. The complete list of partners can be found here: [http://www.ecopotential-project.eu/partners](http://www.ecopotential-project.eu/partners)

A picture of the ECOPOTENTIAL participants at the Project Kickoff meeting, in June 2016 at the Valentino Castle in Torino, Italy.

What are the ECOPOTENTIAL Storylines?

The scientific partners are defining a number of narratives (the storylines), which contextualize the overall workflow of ECOPOTENTIAL in particular ecological, management and policy settings. A storyline links real-life issues which have broad relevance to many Protected Areas included in the ECOPOTENTIAL project. The storylines will specify the needs for Earth Observation data and in-situ data for ecosystem modelling, ecosystem services, cross-scale
topics, demands for future protections, policy and capacity building. While storylines do not have to cover actions in all the Work Packages of the project, they are aimed to be broad yet locally relevant, engaging with stakeholders and decision-makers. Each storyline is focused within at least one Protected Area and it puts the basis for further operational work in the field, adding specifics, defining a work plan, assigning tasks, and allocating resources (person-months) among partners. Storylines are iterative processes whose flow of activity and practical implementation evolves with the increase of knowledge and the demands by stakeholders.

A storyline: alpine mountain lakes
Ohrid/Prespa, Gran Paradiso National Park, Sierra Nevada: Ecosystem services and biodiversity crisis across mountain lakes

Mountain lakes are usually oligotrophic and host specialized ecosystems, rich in endemic species but with limited species range. This, paired with increasing environmental pressures, makes their biodiversity particularly sensitive to external pressures. As one of the primary species responses to changing conditions is a shift in geographic distribution, the lake watershed isolation may force species adaptation or, ultimately, extinction.
The major threats to alpine lake biodiversity are growth in tourism, rapid urbanization, pollution, land use intensification, water uptake, eutrophication, introduction of alien species and climate change. Typical phenological responses to changing conditions include shifts in timing, magnitude and duration of phytoplankton blooms, altered community composition, changes in water quality and a decrease in biodiversity, potentially implying a loss in ecosystem services. The introduction of allochthonous fish (often for recreation purposes) can lead to the disappearance of larger zooplankton species (such as Daphnia spp.) with a change in the ecosystem structure and loss of invertebrates and amphibians, as documented in some high-altitude oligotrophic lakes in the Gran Paradiso National Park (GPNP), Italy. For transboundary mountain lakes, such as Prespa and Ohrid lakes (shared between FYR of Macedonia, Greece and Albania), the situation is even more complex. The two lakes are subject to a broad range of management concerns including transnational management, recreation/tourism, water supply and biodiversity protection. Though considerable efforts have been undertaken to reduce pollution and to protect flagship species, Lake Ohrid, probably the most diverse lake in the world and one of the most ancient ones in Europe, is facing a “biodiversity crisis”.

Preserving and improving the benefits provided by mountain ecosystems requires information regarding the level of ongoing changes as well as scenarios to estimate possible future developments. In particular, management of freshwater ecosystems generally relies on the availability of accurate in situ measurements and analyses of water samples. Fortunately, many data on the physical, chemical and biological properties of these lakes are available. In-situ data, however, give information only for a point in time and space, thus providing limited information on spatial and temporal changes of environmental parameters across surface waters. On the other hand, the high spatial resolution of satellite images allows for the estimation of several water quality and hydrological parameters. Information at catchment scale on land cover, land use, vegetation status and forest fires facilitate the establishment of linkages between catchment scale alterations and lake ecosystem processes. As such, remote sensing data complement and extend traditional lake sampling methods, facilitating understanding of the current state of lake ecosystems and supporting the application of appropriate management strategies.
Discover a Protected Area: The Gran Paradiso National Park (Italy)

The Gran Paradiso National Park (GPNP) is located in Italy, in the western Alpine region. Instituted in 1922, it is the oldest Italian National Park and, with its surface covering 70,000 ha, is one of the most extended. It borders with the Vanoise National Park in France, thus forming a huge system of high-elevation protected areas in the Alps, with significant glaciers and high-altitude environments, and it hosts the original surviving population of Alpine ibex (*Capra ibex*), the symbol of the Park.

Since its foundation, it is actively involved in the protection of its faunal and floral biodiversity, and since 1947 it is equipped with its own vigilance service. The rangers have a detailed knowledge of the Park’s territory, and they provide a unique service, watching continuously over the territory and censing the population of target species. The activities run in the park include the preservation of biodiversity and landscapes, scientific research, environmental education, and the promotion and the development of sustainable tourism. More than 10 Universities and Research Institutes actively cooperate with the Park, developing research and monitoring projects in the territory of the protected area and publishing the results on high-level scientific journals.

In 2007, GPNP obtained the European Diploma of Protected Areas, a prestigious award of the Council of Europe.

More info can be found here: http://www.ecopotential-project.eu/protected-areas/24-gran-paradiso-national-park

*The high-mountain landscape of the Gran Paradiso National Park and the Nivolet plain.*

Lake Ohrid, from the FYR of Macedonia.
Discover a Protected Area: The Wadden Sea (The Netherlands)

The international Wadden Sea is a productive estuarine area, and one of the largest coastal wetlands of the world, in the southeastern coastal zone of the North Sea bordering northern Netherlands, Germany and Denmark. It is characterized by extensive tidal mud flats, saltmarshes, and deeper tidal creeks between the mainland and the chain of islands along the outer side. The area has a UNESCO World Heritage Status and a Natura 2000 status. It has a length of about 500 km, and a surface of around 9000 km² (about a quarter is located in the Netherlands). Almost all the area is submerged at high tide, and half the area (the mud flats where many birds feed) is emerged during low tide.

Because of its size, the high variety of habitats, its dynamics and its production the Wadden Sea is home for a high biodiversity and huge numbers of plant and animal species. The high production has given rise to major (mussel) aquaculture plots in the area, that now are decreasing in size due to increasing protection of the area.

The Wadden Sea is a nursery area for many fish species, and a resting and fuelling station for a wide variety of wading birds. More than half of the juvenile plaice population (a flatfish) of the North Sea grows up in the area. Moreover, more than 10 million migrating birds spend a short or longer period of time in the region, often on their way from nesting grounds near the North Pole region to winter homes as far away as Africa and back again. This gives the Wadden Sea unparalleled importance worldwide.

Due to its beauty, an intense flow of tourists alongside and in the area does exist. The Wadden Sea does represent next to a high natural thus also a strong socio-economic value.

In the ECOPOTENTIAL project, the above described ecosystem services (ES) and functions will be linked to each other and related to environmental variables and anthropogenic drivers and impacts. Are there conflicting ES functions, or can different socio-economic and natural ESS functions exist next to each other? E.g. mussel harvesting in winter; recreational activities in summer; growth of flora and fauna mainly in spring, highest biodiversity in autumn. Are there conflicting situations impacting the function of the Wadden Sea as a protected area? Finally we will assess whether results found for the Wadden Sea can be a model for the requirements of other or new protected areas around the North Sea or further in Europe.

More info about Wadden Sea can be found here:
http://www.ecopotential-project.eu/protected-areas/25-the-wadden-sea-dutch-delta-area
Links of ECOPOTENTIAL with other projects

ECOPOTENTIAL benefits from strong links with other European and international projects and programmes, to avoid duplication of activities and to foster synergies between the different research groups.

Important links exist with the sister EU project SWOS: Satellite-based Wetland Observation Service (http://swos-service.eu/), funded under the same SC5-16-2014 H2020 Call. One important Protected Area (the Camargue) is included in both projects and it is a natural site where to compare and combine the approaches of the two projects ECOPOTENTIAL and SWOS.

A Memorandum of Understanding has been signed with the EU FP7 Project EU BON (http://www.eubon.eu/), also with the goal of continuing some of the activities of EU BON, after its conclusion, inside ECOPOTENTIAL.

The activities of ECOPOTENTIAL are conducted in the framework of GEO, the Group on Earth Observations, and GEOSS, the Global Earth Observation System of Systems (https://www.earthobservations.org), to which ECOPOTENTIAL provides significant support.

A flock of knots over a tidal flat in the Wadden Sea. Photo © Jan van de Kam (via NIOZ)
La Palma Science School 2016

Research stay on La Palma (Canary Islands, Spain): 11 - 25 March 2016  
Analysis and Writing Phase (Bayreuth, Germany): April to June  
Presentation of final results (Bayreuth, Germany): July (date to be announced)

The La Palma Science School 2016 led by Prof. Anke Jentsch (Disturbance Ecology, University of Bayreuth, Germany) and Dr. Severin Irl (Biogeography, University of Bayreuth, Germany) and supported by several international guest researchers will focus on research topics revolving around the novel concept of disturbance-driven island ecology and will integrate different aspects of island biogeography, island ecology and, where applicable, also remote sensing. The aim of the Science School is for students to experience all aspects of scientific research, ranging from the elaboration of research questions and hypotheses through developing adequate sampling methods to be applied in the field (during the stay on La Palma) and an in-depth analysis of the collected data to the final presentation of the results in written and oral form. Student groups (generally composed of three students each) will go through all of these steps independently to acquire basic and advanced scientific skills (e.g. field methods, statistics and modeling, scientific writing).

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Summer Course: Cross-Scale Interactions in the Coupled Geosphere-Biosphere System

15-24 June 2016, Valsavarenche, Valle d'Aosta (Italy)
This Summer Course aims at providing young researchers – in particular Ph.D. students – with an up-to-date interdisciplinary course presenting a quantitative approach to the physical, chemical, geological, biological and ecological principles of geosphere-biosphere interactions on multiple spatial and temporal scales, focusing on the role of Earth Observations and of modelling approaches. The Course is organised in the framework and with funding from the H2020 European Project 641762 "ECOPOTENTIAL: Improving Future Ecosystem Benefits through Earth Observation".
Website: www.to.isac.cnr.it/aosta

ECOPOTENTIAL General Assembly – Texel (the Netherlands) June 27th-30th 2016
The ECOPOTENTIAL General Assembly will take place in Texel (The Netherlands), on June 27th-30th 2016. It will be a unique occasion for gathering all the consortium partners and the scientific advisors, and it provides an important forum for discussing all scientific issues of the project. As the ultimate decision-making body, it will decide on all issues affecting the project as a whole.
The project General Assembly meetings is held in a different Protected Area every year, with local Protected Area managers invited to some sessions to foster direct dialogue and knowledge-exchange with the broader research team. It will include a visit to the Wadden Sea Protected Area.

Other Initiatives and Congresses

First ECSA Conference 2016
Citizen Science – Innovation in Open Science, Society and Policy
19–21 May 2016, Berlin, Germany
Submission deadline: 3 March 2016
Website of the conference: http://www.ecsa2016.eu/
to submit a contribution: http://www.ecsa2016.eu/call-for-abstracts.html

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International LTER

International LTER network's first Open Science Meeting
9-13 October 2016, Kruger National Park, South Africa
Long-Term Ecosystem Research for sustainability under global changes: Findings and challenges of LTER from local to global scales.
Deadline for submissions: 15 March 2016, 12:00 GMT
Website of the conference: http://www.alter-net.info/events/ilter-osm-1
To submit a contribution: https://www.eiseverywhere.com/eselectv2/frontend/index/156435

GEO BON Open Science Conference

GEO BON Open Science Conference & GEO BON All Hands Meeting
4-9 July 2016, Leipzig, Germany
This conference will be a major event to bring together all of those interested in developing biodiversity monitoring programs, biodiversity observations research, and sound biodiversity management.
Deadline for submissions: 1 April 2016
Website of the conference: http://conf2016.geobon.org/
To submit a contribution: https://express2.converia.de/frontend/index.php?sub=107

ESA Earth Observation Summer School

1-12 Aug 2016, ESRIN, Frascati (Rome), Italy
The European Space Agency (ESA) is inviting young researchers to join leading experts in Earth Observation, Modelling and Data Assimilation for keynote lectures, hands-on computing practical and poster sessions on the occasion of the 8th ESA EO Summer School. Applications can be made on-line at: https://earth.esa.int/web/eo-summer-school/home

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Fostering Europe's role in Earth Observation

Fostering Europe's role in Earth Observation GEO European Projects Workshop
31 May - 2 June 2016, Berlin, Germany
The conference is jointly organised by the European Commission, the Federal Ministry of Transport and Digital Infrastructure of Germany and the Museum für Naturkunde - Leibniz Institute for Evolution and Biodiversity Science.

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