NEONEA

NEWSLETTER BY NAVARINO ENVIRONMENTAL OBERVATORY

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OUR WARMEST WISHES FOR A SAFE & FRUITFUL 2023!

EDITED BY NEO TEAM

During the reported period, NEO welcomed seven interns (BSc, MSc), two course visits and two fieldwork campaigns.

In autumn, NEO team presented the final outcomes of COASTAL, a milestone EU project which created strong links with local stakeholders towards a more sustainable future. Building on COASTAL experience, networking and results, NEO team is now actively involved in SALAM-MED, a PRIMA funded project which focuses on research and innovation within the field of integrated olive-orchard management. NEO researchers are also engaged in GeoVT, an ERASMUS+ project which aims to create and promote powerful educational tools for distance learning.

You can read more about the developed tasks below!
Happy Reading!

TOPICS INSIDE:

INTERNSHIPS

MEET OUR INTERNS

During Summer 2022 seven students (bachelor and master) chose NEO for their internship and got involved in different projects related to NEO's research activities.

Artemis, a bachelor student in Biological Applications and Technologies Department at University of Ioannina, participated in monthly fieldwork campaigns for monitoring the quality of the surface water within Gialova Lagoon wetland. In addition, Artemis studied the fish fauna of the area.

Elina, a bachelor student in Environmental Studies at Deree - The American College of Greece, studied the trophic availability for local reptiles. Her research was based on arthropods found in Divari beach. In addition, Elina participated in monthly fieldwork campaigns for assessing the supporting and regulating ecosystem services of coastal habitats within a Natura2000 area.

Katerina, a bachelor student in Environmental Studies and **Erika**, a bachelor student in Biomedical Sciences at Deree - The American College of Greece spent their summer at NEO working on local reptile species. Their research involved a lot of fieldwork and data analysis.

Nadia and **Marika,** both bachelor students at the Biomedical Sciences at Deree - The American College of Greece, focused their work on collecting and analysing data to better understand the pressures on the Natura 2000 protected areas. Their basic work was to monitor the traffic density and the distribution of parked vehicles within the sensitive habitats of the area.

FIELD COURSE VISITS

Masters' course in Ecohydrology

MSc students attending the course "Ecohydrology: a Mediterranean perspective" (Department of Physical Geography, Stockholm University) visited NEO for a week of lectures, field work and excursions. They were given lectures by Fernando Jaramillo, Feifei Cao, Daniel Althoff, and Giorgos Maneas in order to be prepared for their field work. Divided in three groups they studied three different topics:

1. Water quality gradients of Coastal Wetlands - a case study on the Gialova Lagoon
2. Spatial variability of nutrients based on water sampling and lab analysis
3. Measuring soil moisture of agricultural land in a Mediterranean climate

Värmdö Gymnasium

The class 20NAD from the NaSa-programme at Värmdö Gymnasium visited NEO in October and that was the 9th year that a student group from Värmdö Gymnasium visited NEO. The group participated in several excursions and fieldwork activities in the area.

Among others, they experienced wine making process, developed field measurements in the Gialova Lagoon, and visited several interesting places and archaeological sites of the area.

FIELD WORK VISITS

Pylos Geoarchaeological Program

The Pylos Geoarchaeological Program (GEAPP) is a synergy of the Ephorate of Antiquities of Messenia and the Laboratory of Archaeometry of the Department of History, Archaeology and Cultural Resources Management - University of the Peloponnese, operates towards the archaeological and cultural environment of the area of Pylos for the years 2021-2025.

During the period of 3 – 18 September, the NEO Station hosted 15 people from the University of the Peloponnese and the Ephorate of Antiquities of Messenia during the field work centered at Koukoura hill and Alryrolaka shoreline. An additional visit by a group of 5 people took place during the period November 8 – 11.

The American College of Greece

Always aiming forward towards education for sustainability through immersive and experiential learning, students from a variety of majors offered at Deree - The American College of Greece, have been visiting NEO to pursue crucial research and educational goals in one of the most pristine biotopes in Greece.

A successful synergy between ACG and NEO, seeking to strengthen their ties by engaging into meaningful workshops and field research, in order to holistically understand and appreciate the multifaceted entity that is an ecosystem, especially a fragile and important biotope as the UNESCO - protected Yalova region.

SALAM-MED PROJECT

Researchers from NEO and the Academy of Athens are participating in **SALAM-MED**, a RIA project funded by PRIMA (2022-2025). SALAM-MED underlines the need of an integrated approach in restoring degraded land and enhancing resilience of socio-ecological systems around the Mediterranean. The Greek case study is located in Messinia, and the aim is to assess agri-ecological farming practices for improving soil quality & water retention together with local stakeholders towards an **Integrated Olive Orchard Management.** During the project we are planning to run 2 different experiments, one for soil erosion on hilly terrains and another one for sustainable irrigation system.

SOIL EROSION EXPERIMENT

Our goal is to quantify soil erosion risk on hilly terrains associated to 3 different agricultural practices (herbicides, mowing natural vegetation, cover crops), to understand the added value of **cover crops** in an olive orchard, and relate the outcomes with existing policies. In order to measure soil erosion, we have established a **surface run-off collection system** which allows us to take samples and separate the sediments with a simply way.

IRRIGATION EXPERIMENT

In collaboration with local farmers, we have selected an experimental plot where we are planning to test 3 different irrigation practices (rainfed, current irrigation practices, irrigation based on phenological phases of olive trees). To better understand the **impact** of each irrigation practice in the olive trees we have scheduled to **monitor** some basic parameters in the olive orchard.

In July NEO' team participated in a 3 days training session at **CIHEAM Bari**, with respect to capacity building within a **Living Lab (LL)** approach. LLs offer the opportunity to get in touch with **stakeholders**, to co-define challenges and opportunities and co-create Natural Based Solutions for Integrated Olive Orchards Management.

COASTAL
Collaborative Land-Sea Integration Platform

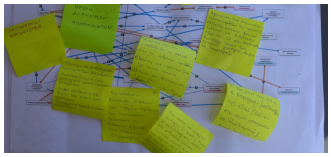
HORIZON 2020

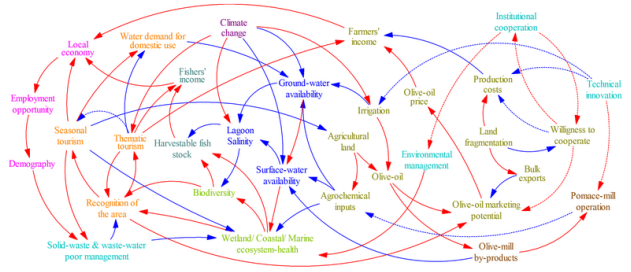
COASTAL PROJECT

COASTAL EU project funded by H2020, was completed in October 2022. For the case of Greece, the aim of the project was to combine scientific knowledge with local experience into Systems Dynamics (SD) models which will be suitable to explore policy recommendations & business roadmaps, under different scenarios. The SD model was co-developed to be used as a tool to explore alternatives for the sustainable transformation and development of the local society with regards to agriculture (olive-orchards), tourism and protected areas. The focus area was South West Messinia.

CO-DEVELOPMENT OF A SYSTEM DYNAMICS MODEL

- 100 Local and Regional Stakeholders and Scientific Experts engaged in a Multi-actor process for Knowledge Exchange
- 6 Cognitive maps of each group's perceptions of the system
- 1 integrated Causal Loop Diagram with Challenges & Opportunities for improving rural-coastal synergies
- Model development (structure & behaviour))
- Data availability & model quantification
- Reflect Review and Validate model





MULTI-ACTOR ANALYSIS – TAKE HOME MESSAGES

In recognition that the wetland has been gradually transformed from brackish to saline, and at the moment is at a critical state.

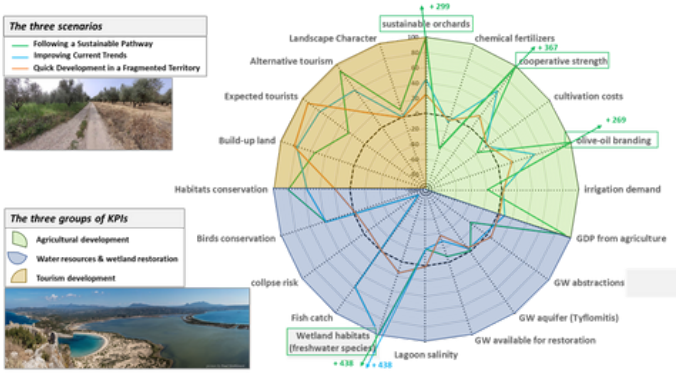
Quick implementation of restoration work to prevent a possible lagoon collapse

In recognition that current farming practices and the lack of trust among farmers, coupled with the lack of policy support for small scale farming, hinder the sustainable development of the sector.

Dedicated support to encourage the cooperation between farmers to enhance sustainable farming

In recognition that there is an increasing trend of land use change over the last 20 years, and in order to avoid coastal zone degradation (as this has happened in other touristic areas around Greece) and limit the risk of agricultural abandonment.

Spatial plan for regulating tourism development at low impact scale



Erasmus+
This project is funded by the European Union.

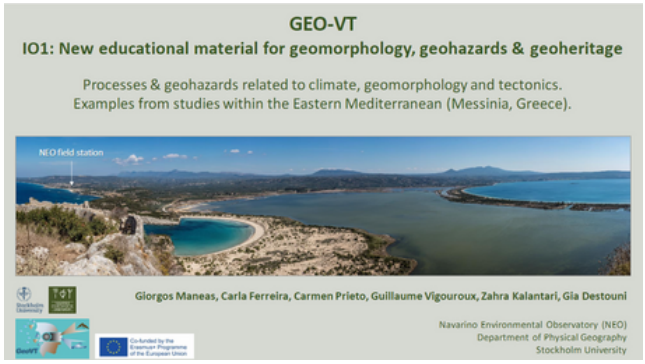
GEO-VT PROJECT

GeoVT (2022-2025) aims to give all students the opportunity to get to know various geomorphological sites which are inaccessible or unavailable in their country or require a time and money consuming visit. At the same time, GeoVT, through the outputs of the project and the study cases that will be developed, will act as a place for interaction and global concern, as a conduit for dialogue adapted to the rapid developments of societies. Overall, GeoVT aims to offer alternative forms of education to:

- tackle current problems caused by the COVID-19 pandemic
- contribute to a fundamental change in teaching methods in multiple domains of science
- enrich students' experience and provide deeper learning opportunities on geomorphology, geohazards and geoheritage cases

NEO researchers from Stockholm University have combined existing knowledge from the area of Messinia to produce new educational material focusing on:

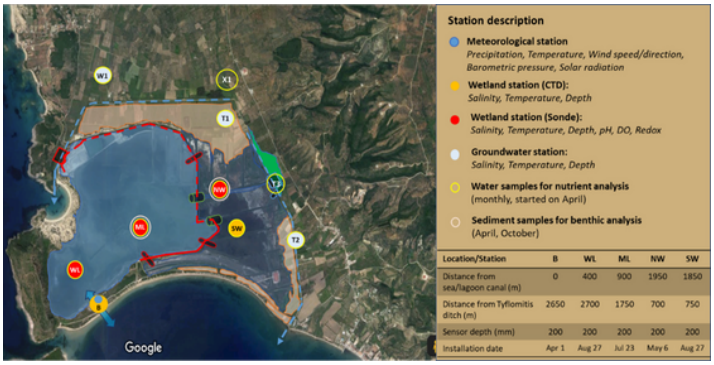
1. Hydro-climate processes & human interventions in the Eastern Mediterranean during the Holocene. The example of Navarino Bay & Gialova Lagoon, Greece.
2. Geohazards associated with tectonics, hydro-climate & human behaviour in the Eastern Mediterranean. The example of Messinia, Greece.



The second "GeoVT" Multiplier Event is approaching soon.
For more information please visit the official webpage of the project: https://www.geovt.eu/

GIALOVA PROJECT

GIALOVA project (2020 - 2023), is a collaboration between NEO, the Hellenic Centre of Marine Research (HCMR), the University of Ioannina (UoI), the Captain Vassilis and Karmen Konstantakopoulos Foundation (CVKKF), , funded by Yialova Lagoon, a company which has the fish management of the lagoon.



The project builds on the extended NEO network of field measurement stations inside and around the wetland, to suggest scientifically robust solutions for the gradual restoration and the co-management of Gialova Lagoon wetland, under different climatic scenarios. The final deliverable of the project will be a co-developed Decision-Making Support System, which will come in use after the completion of the project

The research team is working in close collaboration with the regional authorities of Messinia and the national Natural Environment & Climate Change Agency (N.E.C.C.A.). The management suggestions are included in reports which are presented, discussed and validated with relevant stakeholders and policy makers prior to implementation.

an example of research-based solution

The GIALOVA project, has offered the capacity to monitor Dissolved Oxygen (DO) within the wetland on a 24/7 basis for the first time. The outcomes suggest that during the summer period the levels of DO drop below the levels of concern, which could lead to fish suffocation. To mitigate the risk, the team has suggested the use of solar aerators as a environmental friendly way to mechanically enrich the lagoon with oxygen.