

# NAVARINO ENVIRONMENTAL OBSERVATORY

NEO Management

Thursday, 9 November 2017

## **NEO NEA #26 (July - September 2017)**

NEO stands for Navarino Environmental Observatory. But NEO in Greek (νέο) means news as well and NEA is its plural. So this is our news!

### **Foreword**

This summer was busy with writing EU proposals for financing new research activities related to NEO. A number of proposals were submitted in September, including both Horizon 2020 and LIFE projects. The proposed projects involve a large number of international and national partners and have expanded NEO's networks. We keep our fingers crossed that these proposals will be funded and that new research and outreach activities will be initiated at NEO!

Environmental monitoring in the Gialova Lagoon has been intensified in preparation for some of the future activities.



**Figure 1:** Sand dunes ecosystem behind Voidokilia bay (photo: Paul Strehlenert )

## Activities

### Research

- Research proposals**

The follow up of the NEO workshop, “Achievements and future perspectives”, which was held at Stockholm University in November, 2016, resulted in the submission of several EU research proposals. All these proposals are joint initiatives between academy, NGOs, small-medium-size enterprises, farmer organizations etc., at local, regional and international levels.

Proposals submitted to EU	Financial instrument	Work Programme Part	Project coordinator	Consortium	In collaboration with	Status
<b>AENEO</b> A bluePrint for open science in action: research-society-policy interface in sustainable tourism developed by the Navarino Environmental Observatory	EU, Research and Innovation Action <b>H2020-SwafS-2016-17</b>	Science with and for Society	Stockholm University (SU)	11 partners (including SU, AoA, TEMES, NOA)	Research institutions, policy makers, farmers, tech. SME:s, NGO:s	Submitted on August 30
<b>COASTAL</b> COllaborative lAnd-Sea inTegrAtion pLatform	EU, Research and Innovation Action <b>H2020-RUR-2016-2017</b>	Food security, sustainable agriculture, forestry, marine and inland water research and bio-economy	Flemish Inst. Techn. Res. (VITO), Belgium	29 partners (including SU and TEMES)	Policy makers, farmers' association, industry, private enterprises	Submitted on September 14
<b>EVIDENS</b> EVIDence based Demonstrators for effective Nature based Solutions	EU, Research and Innovation Action <b>H2020-SC5-2016-2017</b>	Climate action, environment, resource efficiency and raw materials	Norwegian Inst. of Bioeconomy Res., Norway	28 partners (including SU and NOA)	NGO:s, SME:s, tech companies, public institutions	Submitted on September 5
Enhancing biodiversity and ecosystems through engaging enterprises: <b>the Messinia business model</b>	<b>LIFE Nature and Biodiversity</b>		Piraeus Bank SA, Greece	7 partners (including SU and TEMES)	Agriculture foundations, NGO:s, educational institution, SME:s	Submitted on September 14

- Dendrochronology**

#### Field-work, Pindos Mountains – Northern Greece (August)

A group of dendroclimatologists from the Department of Geography, Johannes Gutenberg University Mainz, Germany in cooperation with the NEO visited several treeline sites at the Pindos Mountains in Northern Greece. After finding the oldest living and sampled tree in Europe at former fieldtrips, Lara Klippel, Yannick Esser, and Oliver Konter were looking specifically for dead trees at four sites in the region: Smolikas (2637 m), Vasilitsas (2249 m), Avgo (2151 m) and Flega lakes (ca. 2000 m). Due to the climate in the region at these altitudes, the dead wood of Bosnian pine trees is rarely decomposing, enabling the sampling of wood which might reach ages of up to two millennia.

The newly sampled material will hopefully extend and improve the replication of the already existing chronology from CE 575–2014 (L. Klippel, P.J. Krusic et al., 2017, Dendrochronologia 44). Not only tree-ring width but also maximum latewood density will be analyzed in order to compute climate variations throughout the last two millennia.



**Figure 2:** Lara Klippel, Yannick Esser, and Oliver Konter during fieldwork on Pindos mountains.

- ***Environmental monitoring of Gialova Lagoon***

- **Bird monitoring, Water Quality Monitoring (July – September)**

Bird monitoring in the Gialova wetland continued on a scheduled monthly basis. The focus during this period of time was mainly the monitoring of nesting species and their juveniles, as well as species indicating the start of the autumn migration period. Basic water parameters monitoring (temperature/conductivity/depth) as well as meteorological conditions (temperature, wind speed/direction, relative humidity, precipitation and solar radiation) in the area were continued on a daily basis (data logged at 5-minute resolution).

- **Remote sensing**

As part of the wider investigations into the environmental status of the lagoon, water quality and the hydrology of the catchment, remote sensing research is being performed at NEO. In summer 2017 a number of spectro-radiometers were installed at sites in the lagoon to measure water leaving radiance. These instruments measure the amount of radiation reflected from the water surface and upper water column at specific wavelengths. The research aims to couple fluctuations in water leaving radiance to changes in the water quality of the lagoon, particularly fluctuations in chlorophyll and suspended organic matter. In turn the in situ data from these monitoring stations will be used to validate satellite observations including from the new Sentinel-2 satellites launched by the EU and European Space Agency. Satellite data and hydrological investigations will also help attribute sources and timings of water quality changes, for example associated with surface runoff events and agriculture sources.



**Figure 3:** Sentinel-2 image over the study area from July 18th showing a wide range of spectral features in the lagoon

### **Related internships**

Gabriel Sainz spent six weeks at NEO in July and August as part of his internship. Gabriel helped to set up the spectro-radiometers sensors in Gialova area while he conducted a basic water parameter monitoring (temperature, conductivity, turbidity) covering the whole area of the lagoon.

### **Research publications**

- Zerefos, C. S.,** K. Eleftheratos, J. Kapsomenakis, S. Solomos, A. Inness, D. Balis, A. Redondas, H. Eskes, V. Amiridis, C. Repapis, M. Allaart, R. Engelmann, A. Dahlback, V. De Bock, H. Diémoz, P. Eriksen, J. Gröbner, A. Heikkilä, J. Jaroslowski, W. Josefsson, T. Karppinen, U. Köhler, C. Meleti, C. Repapis, J. Rimmer, V. Savinykh, V. Shirovov, A. M. Siani, A. R. D. Smedley, M. Stanek, and R. Stübi. 2017. Detecting volcanic sulfur dioxide plumes in the Northern Hemisphere using the Brewer spectrophotometer, other networks, and satellite observations. *Atmos. Chem. Phys.*, 17, 551–574.
- Norström, Elin; Katrantsiotis, Christos;** Smittenberg, Rienk; Kouli, Katerina 2017. Chemotaxonomy in some Mediterranean plants and implications for fossil biomarker records. *Geochimica et Cosmochimica Acta* 219, 96-110.

## Education

### *Field Courses @ NEO*

- **“Värmdö Gymnasium”**

#### **Students’ course, Värmdö Gymnasium, Stockholm (September 23-29)**

This was the fifth consecutive year that a student group from Värmdö Gymnasium visit NEO (class 15NAD from the NaSa-programme). The trip was highly appreciated by the students and very successful in its objectives. The geography of Greece and the Mediterranean Sea, Greek history, and religion were studied during the trip, but as every year, the main focus was the Natura 2000 protected area around the Gialova Lagoon. The area brings amazing potential for understanding nature preservation from a local and European perspective. Parallels were drawn to similar Natura 2000-protected areas in Sweden, so that the students better understand the rules and regulations surrounding nature conservation. The perspective of the local population, and local commercial interests were also discussed.

This year the main product of the student’s efforts was a *management plan* for the area, using a Swedish management plan as a template. The focus of the plan was the protection of the lagoon, so only the habitats adjacent to the lagoon were included. This project started well before the trip to NEO, and ended a few weeks after.



**Figure 4:** Värmdö Gymnasium students and teachers on top of Palaiokatro hill (photo: Paul Strehlenert )

In parallel, soil has become a priority topic for the NaSa-programme at Värmdö Gymnasium. This year, for the first time, *Visual Soil analysis (VSA)* was performed in an olive orchard and a vineyard. The group had previously performed VSA at a Swedish cattle farm, and the comparison was very interesting. Even though the soil properties were significantly different in many ways, the VSA-method was relevant and the grading of the soil could be used as a base for very interesting discussions.

- *“Climate, climate change impacts, Greece”*

Joint course, Justus-Liebig University of Giessen, Germany - Aristotle University of Thessaloniki, Greece (September 30- October 4)

A group of BSc, MSc and PhD students from the Justus-Liebig University of Giessen (JLU) and the Aristotle University of Thessaloniki (AUTH) (departments of Geography, Meteorology and Climatology, Atmospheric Physics, Agricultural Economics and Field Crops and Ecology), visited NEO during a joint JLU-AUTH excursion. The field excursion at NEO – which is the fifth since 2013 – is a milestone of the project-course “Climate, Climate Change Impacts: Greece” established in the JLU Geography studies curriculum and also a core activity of the German Academic Exchange Service project “The Mediterranean Hot-Spot: Challenges and Responses in a Changing Environment”. The group visited many sites in the area including Gialova lagoon, Paleokastro and Methoni under the guidance of Mr. Giorgos Maneas. The students had the opportunity to learn and then to identify themselves in the interdisciplinary group discussions the challenges and opportunities the area is facing and pointed to the need for science informed policy under the already observed and even more under the future projected climate change conditions. The project course is aiming at providing interdisciplinary knowledge on the climate of Greece and the Eastern Mediterranean, volcanism and impacts on climate and societies, the Mediterranean Sea circulation, palaeoproxies, climate reconstruction and methodologies, impacts of climate variability and change on ecosystems, hydrology and water resources, atmospheric monitoring, archaeology and plant eco-physiology. The project consists of three interrelated parts, theoretical, methodological and the field excursion. The students prepare a scientific report combining knowledge acquired from the theory and methods and knowledge obtained during the excursion.



**Figure 5:** Students following the joint course “Climate, climate change impacts, Greece”.

## Dissemination

### *Events*

- *30th Anniversary of the Montreal Protocol*  
**Paris, 19-20 September**

Professor C. Zerefos from NEO presented with colleagues the current status of UV-B solar radiation. Hailed as an example of exceptional international cooperation for the protection of the ozone layer, the Montreal Protocol became in 2010 the first international treaty to achieve universal ratification. In October 2016, the Kigali amendment was added to the Protocol for controlling the growth of the substitutes of ozone depleting substances, some of which are powerful greenhouse gases and thereby mitigating their impact on the Earth's climate.

- *Astronomy nights,*  
**Costa Navarino, summer 2017**

"Astronomy nights" is an interactive experience at Costa Navarino organized by the Navarino Environmental Observatory where visitors are introduced to the stars and the constellations of the night sky and they become the astronomers deciding how the night unfolds.

Under the guidance of the National Observatory of Athens and with the excellent support from the Navarino Collections team, we have managed to organize this event on a weekly basis and we are happy to see that it was fully booked! During the summer period 2017 we gave a tour to more than 210 visitors!

### *Visits @ NEO premises*

- *Swedish group visiting NEO*

A group of 14 representatives from the Hellenic Foundation, the Stockholm Chamber of Commerce, the Stockholm Merchant Club and PGA Sweden National, visited NEO as part of their visit to Costa Navarino. Giorgos Maneas gave them a presentation about research, educational and outreach activities conducted at NEO and the presentation was followed by a fruitful discussion which took place in our veranda.

## NEO management

Giorgos Kosmopoulos was employed by NEO management for the period July – August 2016. Giorgos was entrusted with the tasks of Methoni atmospheric lab monitoring and implementation of Astronomy nights under the guidance of NEO Station Manager.

## *Upcoming*

### Research

- Carl Osterlin and Andreas Gazis will be at NEO for several weeks working on data collection from drone flights.
- The annual Bird-monitoring in the Gialova lagoon area, implemented on a monthly basis will be finalized in October. The aim of the monitoring is to record the bird species, their habitats and their behavior and produce a data base which will be used for scientific and popular publications.
- A core sampling from Gialova lagoon will take place in the coming months. The aim of the sampling is to retrieve a longer sediment core from previous sampled areas in order to cover the whole Holocene period

### Education

- A group of students from the upper secondary school, Hersby Gymnasium, will visit NEO in October.
- Sara Cousins and Ingmar Borgstrom will be at NEO for a week in November and will visit new areas to be included in Physical Geography field course 2019.

### Events

- Zerefos C., “Lessons learned downscaling to the Eastern Mediterranean hotspot”, Joint JLU-AUTH Workshop “Bridging disciplines to address the challenges and prepare responses in the Mediterranean changing environment”, Thessaloniki, Greece, 13 October 2017.