

# NAVARINO ENVIRONMENTAL OBSERVATORY

NEO Management

Friday, 30 January 2016

## NEO NEA #19 (October - December, 2015)

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

*As you will see in this newsletter, also October to December 2015 was a period full of research, education and dissemination activities at NEO! We are so happy to see the continuing interest in the NEO initiative! But we will aim for even more in the future! Can NEO develop into something comparable with the Cyprus Institute or Santa Fe? Should this be our forthcoming vision? Our aim is to organize a research workshop in Stockholm during the autumn 2016, inviting all NEO-engaged researchers, for discussion on these ideas and to identify possible synergies among existing NEO-related research projects. The year 2016 will also be the year when we will see some changes in the NEO management and the Steering Committee. But more in that in the next NEONEA! Happy reading!*

Karin and Giorgos



**Figure :** Sunset at NEO in October (photo by Paul Strehlenert, Värmdö Gymnasium)

## Activities

### Research

- **Installation of new instruments**

During the period October - December there have been several visits from the National Observatory of Athens, associated member of NEO, in order to set up new instrumentation at the site.

In particular, during October Dr. Vassilis Psiloglou, Senior Researcher at NOA, visited NEO and established an automatic meteorological station to cover the need for direct and immediate access to meteorological observations for NEO researchers. The setup includes sensors for temperature, relative humidity, pressure and precipitation on the roof of NEO station, while an anemometer (wind speed and direction) was adjusted on a 6m mast, 10 meters to the east.



**Figure 1:** The new automatic meteorological station at Methoni

In November, Dr. Evangelos Gerasopoulos, Research Director at NOA, and Antonis Bezes (eng.) setup a beta attenuation PM<sub>10</sub> analyzer, for continuous monitoring of particulate pollution in the area. The installation included a new inlet on the roof of the station with a 10  $\mu\text{m}$  cut-off. The instrument is one of the five that are now operated by NOA's weather forecast service ([www.meteo.gr](http://www.meteo.gr)), the most highly visited weather site in Greece (second site in total regarding visibility in Greece), and the operation of the still expanding network is intended for the observation of Sahara dust outbreak over Greece and evaluation of the relevant forecast.



**Figure 2:** NEO researchers working at Methoni (NEO Atmospheric laboratory)

- **Cave field work**  
**November 2015**

A team consisting of Karin Holmgren, Martin Finné, Martina Hättestrand from SU and NEO, together with Jan Sundberg and cave dog Doris conducted field work in the cave Mavri Trypa (the black hole) on the hard-to-get-to Schiza Island. The island, a military training ground, is located off the coast of Methoni/Finikounda, Messenia. The aim of the field work was to collect stalagmites for paleoclimate studies to better understand how climate variability have affected past societies in the area. The cave was reached after a 30 minute boat transfer and a 30 minute hike up the hill side. A number of stalagmites were collected from the interior part of the cave. The stalagmites will be analyzed during the spring 2016.



**Figure 3:** Doris, the cave-dog

- **Co-adaptive management of ecosystem services for sustainable use and conservation of the Gialova Lagoon, Messinia, SW Greece.**  
**A new NEO-PhD thesis**

**Giorgos Maneas** was accepted as a PhD student at the Department of Physical Geography, Stockholm University. The overall objective of his study is to “Identify and develop a management strategy/framework for sustainable use and conservation of the Gialova Lagoon by multi-stakeholders, in Messinia, SW Greece”. Senior lecturer and Associate Professor Håkan Berg will be the main supervisor.

- **Scientific Publications**

- **Katrantsiotis C., Norström E., Holmgren K., Risberg J. and Skelton A.** (2015) High-resolution environmental reconstruction in SW Peloponnese, Greece, covering the last c. 6000 years: Evidence from Agios Floros fen, Messenian plain. *The Holocene* 26(2): 188-204.

(<http://hol.sagepub.com/content/26/2/188.full.pdf?ijkey=PKlbG4Zasz4adjG&keytype=finite>)

- Jaramillo F, **Destouni G**, 2015. Local flow regulation and irrigation raise global human water consumption and footprint, *Science*, 350 (6265), 1248-1251, DOI: 10.1126/science.aad1010.



## NEO PhD thesis

**Meighan Boyd**, 2015. *Speleothems from Warm Climates. Holocene records from the Caribbean and Mediterranean Regions*. PhD Dissertation, No 51, Department of Physical Geography, Stockholm University, Sweden. ISBN 978-91-7649-246-8, Printed in Sweden by Holmbergs, Malmö 2015.

### Abstract

This thesis contributes to increased knowledge on Holocene climate and environmental variability from two complex and sparsely studied areas. Using a speleothem from Gasparee Cave, Trinidad, as a paleoclimate archive, the local expression of the 8.2 ka (thousand years before 1950) climate event and associated patterns of the inter-tropical convergence zone (ITCZ) and rainfall is provided. Subsequent speleothem studies using multi-proxy analysis of stalagmites from Kapsia Cave and Alepotrypa Cave, Greece, provide records of climate, vegetation and human induced changes in the cave environment during parts of the Holocene. The speleothems from the well-studied Neolithic habitation site, Alepotrypa Cave, have produced a climate and habitation record which covers the period of 6.3-1.0 ka. The cave was inhabited between 8.0-5.2 ka and was closed by a tectonic event, which has preserved the settlement. The stable oxygen record shows the first well-dated and robust expression of the 4.2 ka dry event in the Peloponnese, places the timing of the 3.2 ka dry event within an ongoing dry period, and shows a final dry event at 1.6 ka. The North Atlantic as well as more regional drivers, such as the North Sea Caspian Pattern Index is proposed to, in a complex interplay, govern many of the climate trends and events observed.

Trace element variation after the site is abandoned indicate what is interpreted as two volcanic eruptions, the Minoan eruption of Thera (Santorini) around 3.6 ka and the 2.7 ka eruption of Somma (Vesuvius). Variations in trace elements during the habitation period show clear human influence, indicating an association with specific cave activities. One of the most interesting prospects for continued work on Alepotrypa Cave is this successful marriage of speleothem studies and archeology. A framework of dates which constrain some behavior of people living in the cave is only the beginning, and there is great potential to continue finding new clues in the speleothem data.



**Figure 4:** Cover picture of Meighan's PhD dissertation

## Education

### Courses

- **“Natural disasters from a natural- and social science perspective”**  
*Students’ course, Värmdö Gymnasium, Upper secondary school from Stockholm (October 10-17)*

As part of a one semester Natural Science Specialization course a group of students from the upper secondary school, Värmdö Gymnasium, visited NEO in October for a third year in a row. The specialization course is aimed at third year students attending the natural science programme with a global perspective, and the course theme is **“Natural disasters form a natural- and social science perspective”**. New for this year was a focus in Gialova Lagoon area. The students photo-documented the habitats and species that define the habitats, and then looked at how these areas can be preserved and what the threats are. Moreover, the students conducted salinity measurements in the lagoon, and had lectures and discussions about the geography and history of the area.



**Figure 5:** Students and teachers from the Värmdö Gymnasium, Stockholm.



- **“Water management issues from a social science and management perspective”**  
**Masters’ course, Department of Human Geography, Stockholm University (November 16-22)**

The question of water quality and quantity in urban and rural areas was studied with a focus on Greece, including examples of sustainable water usage and exploitation over time. During their visit at NEO, the students followed several lectures and also organized and implemented a series of interviews with farmers, locals, representatives from the Water Management agency of Pylos and associates from the Costa Navarino resort in order to deal with different aspects of water related issues for settlements and water management. This master course is one of the courses within a broader university programme for internationalization developed by Swedish universities and the Swedish Institutes around the Mediterranean. (For more details see [www.usinetwork.se](http://www.usinetwork.se).)



**Figure 6:** Students taking the path from Palaiokastros back to Gialova lagoon

- **“Course in Air Pollution”**  
**Bachelor students’ course, Physics Department, University of Patras, Greece (November 24-25)**

The 4<sup>th</sup> year students of the Physics Department, University of Patras that followed the course on "Atmospheric Pollution" had the chance to visit Navarino Environmental Observatory (NEO) for a 2-days training course on air pollution. They visited the air pollution station at Methoni, followed lectures about the air pollution characteristics of the area, the measurement methodologies, the quality control and assurance procedures of the station instrumentation and delivered projects based on the air pollution and meteorological measurements at NEO.



**Figure 7:** Happy students on top of the old HNMS (Hellenic National Meteorological Service) meteorological station building at Methoni.

## Events

A Research Workshop entitled “Human-environment interaction in the Peloponnese” was held at NEO on 9-11 November 2015. The meeting was a follow up of the April 2014 workshop at NEO, on Mediterranean Holocene climate and societies. A narrative on human-environment interaction in the Peloponnese was formulated at the 2014 workshop and a paper on the topic was later submitted and accepted for inclusion in a QSR special issue on the Mediterranean Holocene. The aim of the 2015 workshop was to follow up on the question raised by the QSR-paper and to develop the narrative on several points. The workshop was coordinated by Erika Weiberg, Department of Archaeology and Ancient History, Uppsala University, and constituted the first international workshop of the newly initiated project Domesticated Landscapes of the Peloponnese (DoLP) (initial project description at <http://www.arkeologi.uu.se/Research/Projects/domesticated-landscapes/?languageId=1>). One outcome of the workshop was the establishment of a new network called PELOPS (Past Environment and Landscapes of Peloponnesian Societies). The network consists of a multi-disciplinary and international group of scholars with an active engagement with human-environment interaction in the Peloponnese during the Holocene



**Figure 8:** Participants at the Research Workshop entitled “Human-environment interaction in the Peloponnese” (photo by Ingmaor Unkel)

## Dissemination

- **Yoram J. Kaufman Unselfish Cooperation in Research Award, AGU Fall Meeting, December 14-18, San Francisco**

Professor Christos Zerefos, Research Center for Atmospheric Physics and Climatology, Academy of Athens was awarded by AGU Atmospheric Sciences section with the 2015 Yoram J. Kaufman Unselfish Cooperation in Research Award, for “his outstanding contributions in advancing the sciences of ozone, aerosols and ultraviolet radiation through international collaborations.” Professor Zerefos, is a member of the NEO Steering Committee and he is known internationally for his research in stratospheric ozone depletion and his studies demonstrating the interconnections between ozone, tropospheric aerosols, and ultraviolet radiation. Over the past several decades, he has been a leading force in developing and promoting ozone and ultraviolet radiation measurements in Greece and around the world.

The award recognizes “broad influence in atmospheric science through exceptional creativity, inspiration of younger scientists, mentoring, international collaborations, and unselfish cooperation in research.”

- **Interviews, Naturvetaren magazine  
NEO station, October**

An article about NEO and the partnership, phrasing the partnership as an example of a positive development in Greece was published in the latest issue of the Swedish union magazine for scientists, "Naturvetaren"! See pages 24-27:

[http://issuu.com/naturvetare/docs/naturvetare\\_nr7](http://issuu.com/naturvetare/docs/naturvetare_nr7)

Many thanks to Christos Zerefos and John Kapsomenakis who talked to the Swedish journalist!

- **Symposium of the 7 Wise Men, October 2-4**

Costa Navarino had sponsored the 2nd Symposium of 7 Wise Men, this time around the theme of Cosmology. The first Symposium was held in 2007, with the support of Captain Vassilis. This year's 7 Wise Men all came from the fields of Physics, Astrophysics, Cosmology and Science, and are leaders in expertise in their fields, local and international. The symposium was co-organised with the Greek Society of Physics and was under the auspices of his Excellence the President of the Hellenic Republic. During their visit at Messinia, the honored guests also visited NEO and met with Giorgos Maneas who introduced them to NEO activities.

#### NEO management

- The NEO Steering Committee was held in Athens in November.
- Giorgos Maneas visited his employer, Stockholm University, for meetings and skills development in December.



## Upcoming

### Research

- Senior Lecturer Stefano Manzoni, will visit NEO for a field trip in early spring. Stefano is planning to install moisture sensors in fields around NEO in order to estimate evapotranspiration processes in the area. Moreover, in collaboration with Giorgos Maneas, they plan to install sensors for water quality monitoring in Gialova lagoon.

### Education

- A new course in Geology, given by the Patras University, will take place at NEO in January
- Students and teachers from the master course Cultural Heritage Materials and Technology will visit NEO for a week as part of their studies. The master programme is oriented from the Department of History, Archaeology and Cultural Resources Management, University of the Peloponnese and operates in collaboration with the National Center for Scientific Research Demokritos, the Navarino Environmental Observatory (through the National Observatory of Athens) and key lecturers from other academic institutions in Greece.
- The Physical Geography course will take place at NEO on March 2015. During the excursion the course will visit a number of different sites mainly in Messinia among them, the Gialova/Navarino Bay area, Artemisia, Verga, Loussios River, Kapsia Cave, Mesochori, Methoni and Finikounda.

### Dissemination

- The **Café-NEO** meetings, organized by Navarino Environmental Observatory, will take place at several coffee shops in the Peloponnese as well as at University canteens, with a range of topics such as “Why Messinia? From Homer to Spielberg” or “How to educate your kids to respect nature