

## Report for the year 2017 and future activities

### SOLAS ‘Turkey’ compiled by: ‘Nazli Olgun’

This report has two parts:

- **Part 1:** reporting of activities in the period of January 2017 – Jan-Feb 2018
- **Part 2:** reporting on planned activities for 2018/2019 and 2020.

The information provided will be used for reporting, fundraising, networking, strategic development and updating of the live web-based implementation plan. As much as possible, please indicate the specific SOLAS 2015-2025 Science Plan Themes addressed by each activity or specify an overlap between Themes or Cross-Cutting Themes.

- 1 Greenhouse gases and the oceans;
  - 2 Air-sea interfaces and fluxes of mass and energy;
  - 3 Atmospheric deposition and ocean biogeochemistry;
  - 4 Interconnections between aerosols, clouds, and marine ecosystems;
  - 5 Ocean biogeochemical control on atmospheric chemistry;
- Integrated studies;  
Environmental impacts of geoengineering;  
Science and society.

**IMPORTANT:** This report should reflect the efforts of the SOLAS community in the entire country you are representing (all universities, institutes, lab, units, groups, cities).

#### PART 1 - Activities from January 2017 to Jan/Feb 2018

##### 1. Scientific highlight

Describe one scientific highlight with a title, text (max. 200 words), a figure with legend and full references. Please focus on a result that would not have happened without SOLAS, and we are most interested in international collaboration. (If you wish to put more than one, feel free to do so).

**Scientific Highlight 1: To which extent organic matter at the ocean surface affect properties of marine boundary layer aerosols? (Related SOLAS Theme-2, Air-sea interface and fluxes of mass and energy)**

**N. Olgun** attended the SOLAS/ESA meeting ‘HARNESSING REMOTE SENSING TO ADDRESS CRITICAL SCIENCE QUESTIONS IN THE OCEAN-ATMOSPHERE INTERFACE’ on 12-15 June 2016 in Frascati, Italy. The scientific highlight indicated below is the outcome of ‘Organic Matter’ working group led by Dr. Yoav LeHahn and the manuscript is still in preparation.

Sea spray aerosols (SSA), which are emitted from the ocean to the atmosphere through wind-driven processes, originate in an aquatic environment that contains varying amounts of organic matter (OM). The presence of OM may have a strong impact on SSA population, both through enrichment of the emitted particles and through altering the efficiency of the aerosol production process. Observed properties of organic marine aerosols is the contribution of marine hydrogels which are emitted during the sea spray production process. Orellana et al. (2011), have shown that marine gels may have an important effect on the chemical and physical properties of the atmosphere, by providing an important source of cloud condensation nuclei during the pristine arctic summer. Although it is well acknowledged that OM has an important effect of the properties of sea spray aerosols, fundamental questions on the nature of this effect are still open. Importantly, there is an ongoing debate on the dependency of sea spray aerosols on localized (in space and in time) events of enhanced biological activity, and on the efficiency of using chlorophyll-a (Chl, a measure to phytoplankton biomass) data as a proxy for OM enrichment. The manuscript will focus on the use of remote sensing tools to understand the impact of organic matter in the physico-chemical properties of marine boundary layer.

Citation: Manuscript in preparation (author list is not available yet).

## **2. Activities/main accomplishments in 2017 (projects, field campaigns, events, model and data intercomparisons, capacity building, international collaborations, contributions to int. assessments such as IPCC, interactions with policy makers or socio-economics circles, social sciences, and media).**

### Selected Projects:

1. Impact assessment of Hydroelectric Power Plants (HEPP) to marine ecosystems, Coordinator: Prof. Dr. Zahit Uysal, Institute of Marine Sciences, Middle East Technical University, Turkey, 2017/2019 (active).
2. Development of Integrated Modelling System for the Marmara Sea, National Project, Coordinator: Dr. Barış Salihoğlu, Institute of Marine Sciences, Middle East Technical University, 2017/2017 (active).
3. New approaches for investigating the marine microbial reactions: genetic, biogeochemistry and modelling, National Project, Coordinator: Dr. Barış Salihoğlu, Institute of Marine Sciences, Middle East Technical University, Turkey, 2016/2017 (active).
4. Impact of microplastic particles and 'Bisphenol A' compound on marine zooplankton communities in the Gulf of Mersin. Coordinator: Prof. Dr. Ahmet E. Kideys, Institute of Marine Sciences, Middle East Technical University, Turkey, 2016/2018 (active).
5. In situ observations of hydrogen sulphur in anoxic marine environments: Development of voltammetric micro sensor methods for detecting low concentrations, Dr. Mustafa Yücel, Institute of Marine Sciences, Middle East Technical University, Turkey, 2016/2018 (active).
6. Phosphorous compounds and their redox related processes: Atmosphere, river water column and sediment phosphorous speciation, Coordinator: Dr. Mustafa Yücel, Institute of Marine Sciences, Middle East Technical University, Turkey, 2016/2018 (active).
7. Determination and quantification of microplastic compounds and possible impacts of accumulation of microplastic on marine products. Coordinator: Prof. Dr. Ahmet E. Kideys, Institute of Marine Sciences, Middle East Technical University, Turkey, 2016/2018 (active).
8. Investigation of the impacts of primary productivity on methane emissions in lakes in Cape Horn (55° S) ve King George (62° S) Islands in Antarctica' **Olgun N.**, Istanbul Technical University (ITU) Project 42605 ' ended 29.03.2017, related to SOLAS Theme 1 Greenhouse gases and the oceans.

## **3. Top 5 publications in 2017 (only PUBLISHED articles) and if any, weblinks to models, datasets, products, etc.**

1. Spatio-temporal variability of the size-fractionated primary production and chlorophyll in the Levantine Basin (northeastern Mediterranean), Yücel N., 2017, Oceanologia 155, doi.org/10.1016/j.oceano.2017.12.0033
2. Microplastic litter composition of the Turkish territorial waters of the Mediterranean Sea, and its occurrence in the gastrointestinal tract of fish, Güven O., Gökdağ K., Jovanovic B., Kideys A. E., 2017, Environmental Pollution, <http://dx.doi.org/10.1016/j.envpol.2017.01.025>.
3. Seasonal and spatial variation of bacterial production and abundance in the northern Levantine Sea, Yücel N., Mediterranean Marine Science, 18/1, 97-106, <http://dx.doi.org/10.12681/mms.1627>
4. Eutrophication assessment, classification and management in the Northeastern Mediterranean Sea S. Tugrul\*, K. Ozhan and I. Akcay, 2017, Sixth International Conference On Environmental Management, Engineering, Planning And Economics (CEMEPE) And SECOTOX Conference
5. A high-resolution modelling study of the Turkish Straits System, Sannino G., Sözer A., Özsoy A., 2017, Ocean Dynamics, 67, 397-432, DOI 10.1007/s10236-017-1039-2

*For journal articles please follow the format:*

*Author list (surname and initials, one space but no full stops between initials), year of publication, article title, full title of journal (italics), volume, page numbers, DOI.*

#### **4. Did you engage any stakeholders/societal partners/external research users in order to co-produce knowledge in 2017? If yes, who? How did you engage?**

Two pretentions were given to introduce SOLAS in different departments at İstanbul Technical University in Turkey:

- Surface Ocean Lower Atmosphere - SOLAS Research Initiative, Dr. N.Olgun, İstanbul Technical University Meteorological Engineering Seminars, 11.10.2017
- Surface Ocean Lower Atmosphere - SOLAS Research Initiative, Dr. N.Olgun, İstanbul Technical University Eurasia Institute of Earth Sciences Seminars, 22.11.2017

## **PART 2 - Planned activities for 2018/2019 and 2020**

### **1. Planned major field studies and collaborative laboratory and modelling studies, national and international (incl. all information possible, dates, locations, teams, work, etc.).**

### **2. Events like conferences, workshops, meetings, schools, capacity building etc. (incl. all information possible).**

- A SOLAS workshop organization in Turkey is intended for 2018-2019, to be organized in ITU or METU.

### **3. Funded national and international projects / activities underway.**

**4. Plans / ideas for future projects, programmes, proposals national or international etc. (please indicate the funding agencies and potential submission dates).**

Planned Project Proposal: N. Olgun 'Evaluating the carbonate chemistry dynamics and the climate change response of The Sea of Marmara, Turkey', to be submitted on **September 2018** to The Scientific and Technological Research Council of Turkey (TUBITAK). The project is related to SOLAS Theme-1, Greenhouse gases and the oceans.

**5. Engagements with other international projects, organisations, programmes etc.**

**Comments**