

Report for the year 2016 and future activities

SOLAS 'Turkey'

compiled by: 'Nazlı Olgun Kıyak'

This report has two parts:

- **Part 1:** reporting of activities in the period of January 2016 – Jan-Feb 2017
- **Part 2:** reporting on planned activities for 2017/2018 and 2019.

The information provided will be used for reporting, fundraising, networking, strategic development and updating of the live web-based implementation plan.

IMPORTANT: *May we remind you that this report should reflect the efforts of the SOLAS community in the entire country you are representing (all universities, institutes, lab, units, groups, cities)!*

SOLAS Community involves scientists from two institutes in Turkey:

Dr. Nazlı Olgun Kıyak, Eurasia Institute of Earth Sciences, Istanbul Technical University (ITU), Istanbul, Turkey (SOLAS Turkey Representative)

Dr. Barış Şalihoğlu, The Institute of Marine Sciences, Middle East Technical University (METU), Mersin, Turkey

Dr. Mustafa Koçak, The Institute of Marine Sciences, Middle East Technical University (METU), Mersin, Turkey

PART 1 - Activities from January 2016 to Jan/Feb 2017

1. Scientific highlight

- **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 on 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).

- **Scientific Highlight 2: Methane Emissions in Antarctic lakes (Related to SOLAS Theme 1: Greenhouse gases and the oceans)**

Although lakes cover only 0.9% of the Earth surface, they represent one of the most biogeochemically active environments. For example, 6-16% of the natural methane emissions, which is an important greenhouse gas, is produced by the lake and wetland environments. Recent studies showed the correlation between the primary productivity (algae or phytoplankton) is strongly affecting with the methane production. Most of the algae produced in lakes are deposited in lake bottom as organic substrate (e.g. acetate) and under anoxic conditions transformed into methane by bacterial activity. Organic production is therefore important to understand the methane cycling in lakes. Antarctic, is one of the least studied environments in terms of lake ecosystems. In this study, we performed limnological and biogeochemical investigations in 11 lakes in the Fildes Peninsula in King George Island (62°S) in the Antarctic. Field studies were performed in lakes near the Chilean Escudero Station between 17 February – 07 March 2017. Lake water samples were collected for nutrient and metal contents, phytoplankton species, chlorophyll-a and sediment/soil samples were collected for mineralogical and biogeochemical analyses including bacterial activity, organic carbon content, hydrocarbons, fossil content). New data will improve our understanding of the impacts of Antarctic lake ecosystems on the carbon cycling.

Citation: *In preparation. Olgun N., Çelik-Balçı N., Kurt M. A., Yakan S. D., Yılmaz A., Astorga M. S., Thalasso F., Cabrol L., Hoffmann L., Methane cycling in Antarctic lakes.*

2. Activities/main accomplishments in 2016 (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, etc.)

Projects:

- **Olgun N.**, Istanbul Technical University (ITU) Project 42605 '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' finished 29.03.2017, related to SOLAS Theme 1.

3. Top 5 publications in 2016 (only PUBLISHED articles) and if any, weblinks to models, datasets, products, etc.

For journal articles please follow the proposed 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 2016? If yes, who? How did you engage?

PART 2 - Planned activities from 2017/2018 and 2019
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)
<ul style="list-style-type: none">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 (if possible please list in order of importance and indicate to which part(s) of the SOLAS 2015-2025 Science Plan and Organisation (downloadable from the SOLAS website) the activity topics relate – including the core themes and the cross cutting ones)
4. Plans / ideas for future projects, programmes, proposals national or international etc. (please precise to which funding agencies and a timing for submission is any)
<ol style="list-style-type: none">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 2017 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