



## SOLAS Turkey

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Institute of Marine

### 1. Scientific Highlights and Achievements

Although in Turkey there was neither a group of Turkish SOLAS nor a national funding to carry out SOLAS science at Turkey during 2008, especially at the Institute of Marine Science-Middle East Technical University (IMS-METU) SOLAS related activities has been carried out (cf. part 2).

### 2. Main activities (research projects, cruises, special events, workshops, outreach, capacity building etc)

#### **Main SOLAS related research projects**

##### **Southern European Seas: Assessing and Modelling Ecosystem change (SESAME) project**

Currently Turkish research vessel R/V Bilim's cruises are ongoing as part of [SESAME](http://144.122.146.197/SESAME/index.asp) (<http://144.122.146.197/SESAME/index.asp>) project under FP6 of EC. During the oceanographic cruise in Mediterranean, the Aegean Sea, the sea of Marmara and the Black Sea aerosol samples have been collecting.

On the other hand IMS-METU has an atmospheric sample collection tower located at the campus of IMS-METU which is located of the Turkish coast of the eastern Mediterranean. Aerosol and rain samples is collected on the tower to perform nutrient (nitrate, ammonium, phosphate, silicate) analyses since 1999.

##### **Climatic Importance of Aerosols above the Eastern Mediterranean Area**

A comprehensive study was conducted of the chemical and optical aerosol characteristics, of their interrelation, for the eastern Mediterranean (Turkish Scientific and Technical Research Council – TUBITAK, 105Y368). This is a region where the direct radiative forcing by anthropogenic and natural aerosols is expected to be much larger than average, and for which model calculations suggested that anthropogenic sulphate levels and their direct radiative effects are very pronounced. At sites in Crete (Greece) and in Erdemli (Turkey) long –term measurements have been performed of (a) the chemical and optical characteristics of the boundary layer (in situ) aerosol, (b) the column integrated optical depth, aerosol size distribution. The various data sets obtained have been interrelated to each other to assess to what extend the ground-level in situ aerosol characteristics are representative for, are related to, or can be used for the prediction of the chemical and optical aerosol properties in the entire vertical column.

##### **Evaluation of the Seawater solubility of Fe in the Eastern Mediterranean Aerosol**

Project started in September 2007 (NATO collaborative Linkage Grant, CLG – Ref 982862). Study aims to develop and test a novel approach to determine the seawater solubility of aerosol Fe, to determine the seawater solubility and solid state speciation of Fe in (i) the Eastern Mediterranean marine aerosol (range of aerosol population types – ranging from anthropogenically dominated to Saharan dust dominated populations) at three contrasting sites (ii) changing seawater solubility and solid state speciation of Fe (and other trace metals) during the transport of intense Saharan



dust events and to define the change in chemical composition (major, minor and water soluble constituents) of the marine aerosol during the passage of intense Saharan dust events over the Levantine Basin of the Eastern Mediterranean.

#### **megaCITY-Zoom for the Environment**

The main objectives of CityZen project (megaCITY-Zoom for the Environment, FP7 IP) are: quantify and understand current air pollution distribution and development in and around megacities/hot spot regions, estimate the future impact from emission changes with a focus on the effect of rapid growth in the population of megacities/hot spots, estimate how megacities/hot spots influence climate change, develop tools to estimate interactions between different spatial scales (megacities to global) and bring the scientific results and methods developed and applied during the course of the project to semi-operational use with those consortium partners that on a more permanent basis provide technical underpinning of policy work.

#### **METEOROLOGY / OCEANOGRAPHY NETWORK OF EXCELLENCE (MOMA) PILOT PROJECT**

Within the context of MOMA project (<http://144.122.146.46>) there are two workpackages that focus on regional atmospheric models and aerosol dust transport models.

#### **URBAN WASTEWATER MANAGEMENT ALONG COASTAL AREAS OF TURKEY: REIDENTIFICATION OF HOT SPOTS & SENSITIVE AREAS (SINHA) Pilot Project**

Atmospheric versus river nutrient inputs into the NE Mediterranean (Cilician Basin) will be analysed. Within the context of this project certain atmospheric and marine hydrodynamic models coupled with ecosystem models will be used. Observed atmospheric inputs will be used in the model to test the influence of atmospheric pollutants on the defined sensitive areas.

#### **AERONET**

IMS-METU is also part of AERONET (<http://aeronet.gsfc.nasa.gov/>) network. A sunphotometer belonging to the network has been collecting data since 1999 and readily accessible public domain database can be reached via URL site given below.

[http://aeronet.gsfc.nasa.gov/cgi-bin/type\\_one\\_station\\_opera\\_v2\\_new?site=IMS-METU-ERDEMLI&nachal=2&level=1&place\\_code=10](http://aeronet.gsfc.nasa.gov/cgi-bin/type_one_station_opera_v2_new?site=IMS-METU-ERDEMLI&nachal=2&level=1&place_code=10)

#### **Modelling phosphorus and nitrogen cycles at oxic-anoxic interfaces in the water column**

This is an IMS-METU/IfM-GEOMAR collaborative project

The main focus of the project is to analyse how the O<sub>2</sub> sensitive cycles of P and N affect productivity and atmospheric CO<sub>2</sub> in ocean basins of decreased O<sub>2</sub> (i.e. in the Black Sea basin)?

#### **Climate change scenarios for Turkey**

This project is carried out by Istanbul Technical University (ITU) by H. Nüzhet Dalfes Mehmet Karaca, Ömer Lütü Şen, Tayfun Kındap, Ozan M. Göktürk, Deniz Bozkurt, Altuğ Ekici). The group from ITU specifically focuses on development of the On-Line MM5 Tracer Model and its Applications to Air Pollution Episodes in Istanbul Turkey and Sahara Dust Transport and Quality



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control and homogeneity of Turkish precipitation data.

### 3. Publications in 2008 (Reports, articles, models, datasets, products, website etc)

### 4. Interactions and Collaborations

IMS- METU collaborates with Prof Nikos Mihalopoulos (Environmental Chemical Processes Laboratory, Department of Chemistry, University of Crete, POBox 2208, 71003 Voutes, Heraklion, Greece) within the cityZen and TUBITAK/GSRT frameworks

IMS-METU collaborates with Dr Malcolm Nimmo ( Plymouth Enviromental Research Center, School of Environmental Sciences, Uiversity of Plymouth, UK), Dr Barak Herut (Israel Oceanographic & Limnological Research, National Institute of Oceanography, P.O.Box 8030, Haifa 31080, ISRAEL ) within the framework of a NATO linkage project.

IMS-METU and CNRS (Veronique garcon), IfM GEOMAR (Andreas Oschlies) and Istanbul Technical University (e.g., Mehmet Karaca, Namık Cagatay) collaborates on various SOLAS related projects.

### 5. Goals and Plans for Future Activities

Considering that the Turkish SOLAS program has just started one of the initial goals will be to bring together Turkish researchers that carry out SOLAS related science. Baris Salihoglu will apply to TUBITAK to get funding to organize the first Turkish SOLAS workshop. This workshop will be open to all the scientists that can be interested in SOLAS related research. One of the main objectives of this workshop will be to introduce SOLAS to the scientific community and to encourage science that is in line with SOLAS. During this workshop efforts will be made to structure some collaborative projects that focuses on SOLAS themes.

Baris Salihoglu will seek for national funding in order to receive funding for Turkish students that are interested In joining the SOLAS summer school.

### 6. Other Comments