6th Surface Ocean – Lower Atmosphere Study (SOLAS) Summer School

by Emilie Brévière

From the initial proposal to develop the Summer School during the first SOLAS conference in Damp, Germany, in early 2000, it has been the sincere wish of the SOLAS Scientific Steering Committee and the organizers that the next generation of SOLAS scientists be intellectually prepared to conduct exemplary science in a rapidly changing world. SOLAS believes that by providing excellent training, it adequately prepares future proficient scientists to contribute to the understanding of global change and its significant environmental and societal challenges. The SOLAS Summer School is a 2-week advanced international capacity-building program for early career scientists. The SOLAS Summer Schools are an integral part of the project SOLAS. As per today, 427 young scientists have been trained to understand the nature of air–sea interactions, including biogeochemical and physical processes and feedbacks.

Following on the success of all five previous schools, the 6th SOLAS Summer School took place from August 23 to September 2, 2013, in Xiamen, Fujian Province, P.R. China, directed by Véronique Garçon (CNES/LEGOS, France) and Minhan Dai (Xiamen University). The school brought together (Photo 1) 69 early career scientists from 24 countries, mostly PhD-level students, and 15 world-leading scientists, from a variety of fields, for a combination of plenary lectures and hands-on practical workshops in small groups on not only core SOLAS science but also on soft skills, such as scientific communication. Its comprehensive schedule provides the next generation of scientists opportunities to interact and network with their peers. One third of the students came from PICES member countries, and PICES kindly fully supported three of them to attend the school.

The first part of the school included a mixture of lectures on basic SOLAS topics and poster sessions, the second part consisted of hands-on practicals in small groups, and the last part was a mixture of lectures on more advanced SOLAS topics and 5-minute oral presentations by students in plenary.

Photo 1 The participants, lecturers and instructors of the 6th SOLAS Summer School (August 23 to September 2, 2013, Xiamen, P.R. China).

Photo 2 Students exchanging research results during an evening poster session.

On the first 3 days, every student presented a poster displaying his/her research at the evening poster sessions (Photo 2). These sessions allow students to learn about each other's research topics from the very first days of the school and, therefore, to facilitate scientific interactions amongst participants. A committee composed of lecturers selected the four posters to receive the best poster award. We congratulate Shlomit Sharoni (Israel), Hilary Palevsky (USA), Young-Shin Kwon (Korea) and Meri Eichner (Germany) for their excellent poster contribution.

Photo 3 Maurice Levasseur giving his plenary lecture on marine ecology to a captivated audience.

Over the duration of the school, the 1-hour lectures presented an insightful depth of the full breadth of SOLAS science, including an introduction to SOLAS (Véronique Garçon); the carbon and iron cycles (Laurent Bopp and Phil Boyd); greenhouse and trace gases and their relationship to climate change and its variability (Laurent Bopp, Peter Liss and Alberto Piola); atmospheric chemistry and modeling (Roland von Glasow); air–water gas exchange (David Ho); ocean physics and coastal processes (Alberto Piola and KK Liu); remote sensing and time-series observations (I-I. Lin, Phil Boyd and Eric Saltzman); marine ecology, aerosols, genomics and macronutrients (Maurice Levasseur (Photo 3), Eric Saltzman, Phyllis Lam and Phil Boyd); solar radiation in the ocean (David Kieber); and biogeochemical modeling and its changes over long time-scales (Véronique Garçon and Meixun Zhao). As well as the lectures, special sessions were adopted to deal with issues that arise when working within the world of science. These included sessions on ethics in science (Eric Saltzman), scientists and the press (Phil Boyd) and changing Earth (Kitack Lee).

Photo 4 Phyllis Lam and 'her' students during the marine molecular ecology hands-on practicals.

Photo 5 Mingxi Yang running the gas exchange hands-on practical.

Half way through the school, the students took part in hands-on practicals in small groups where they were introduced to techniques used within the field (Photos 4 and 5). Ran by lecturers, this encompassed atmospheric and carbon cycle modeling, marine molecular ecology, gas exchange, laboratory and cruise work on the University of Xiamen Research Vessel *Ocean II* in the Jiulong River Estuary (Photo 6).

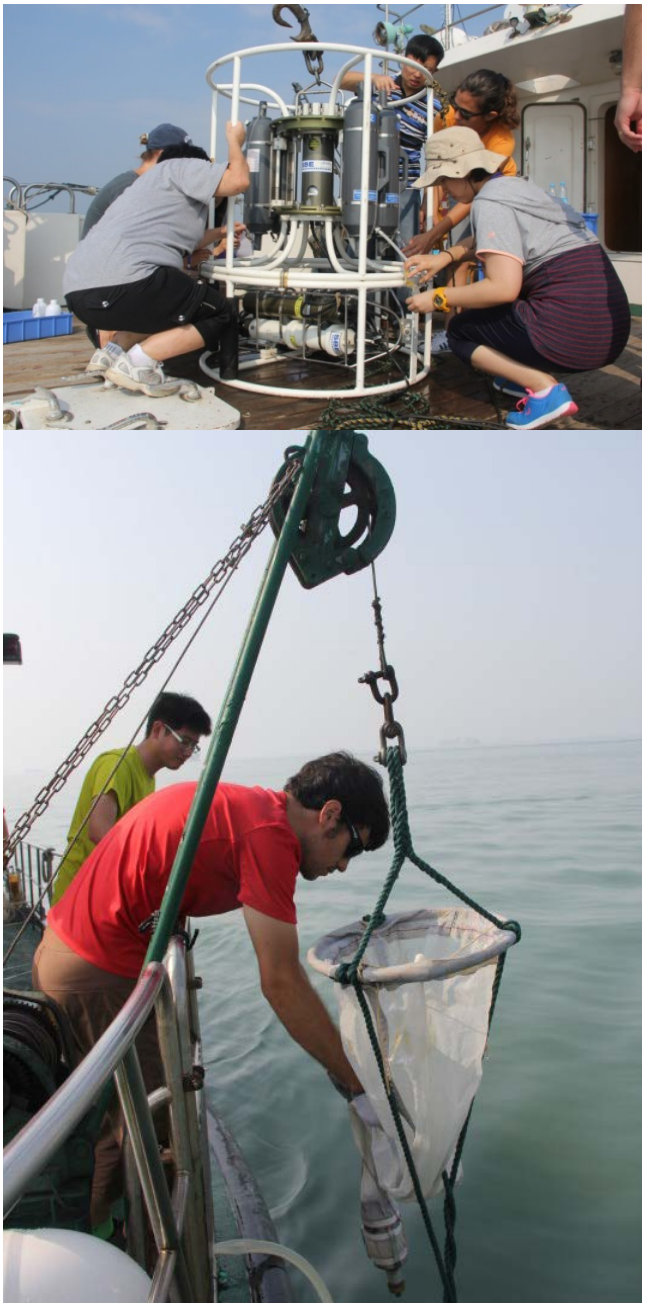

Photo 6 Students collecting water samples from the CTD Niskin bottles (top) and a net deployed to sample phytoplankton and zooplankton (bottom) during the cruise hands-on practicals on board the R/V Ocean II in the Jiulong River Estuary.

Communication workshops were also conducted in which the students were given guidance and constructively criticized on maximizing opportunities of presenting their research, writing and designing posters and papers. Before the school the students were assigned to prepare and bring to the school their own 5-minute oral presentations. Every student then gave a presentation, using power point, in plenary sessions during the second half of the school. This exercise, taking place right after the mandatory practical workshop on scientific communication, allowed the students the opportunity to immediately draw on their newly acquired skills to present their improved work to the rest of the school. A committee composed of lecturers selected three oral presentations for best presentation awards: Eva Mayol (Spain), Natalie Freeman (USA) and Neil Clark (UK). The students themselves also selected three of their peers to receive a best presentation award: Jana Schneider (Germany), Raissa Philibert (South Africa) and Shlomit Sharoni (Israel). Congratulations to all six of them!

All the participants made the most of the available free time by discovering and enjoying the Chinese culture of the Fujian Province.

We would like to acknowledge the generosity of the numerous sponsors of the 6th SOLAS Summer School, such as PICES, Asia-Pacific Network for Global Change Research, Scientific Committee on Oceanic Research, State Key Laboratory of Marine Environmental Science, National Natural Science Foundation of China, Natural Environment Research Council, Xiamen University, Centre National d'Etudes Spatiales, Ocean Carbon and Biogeochemistry and many more.

Every edition of the SOLAS Summer School is a smashing success as demonstrated by the high and stable number of applications received every time (up to 230) and the excellent results out of the anonymous evaluation forms that all participants, students and lecturers, filled in last hours before departure. Finally, the 7th SOLAS Summer School will most likely take place in 2016; exact dates and location are still under investigation. Follow us at www.solas-int.org.

Photo credit: 6th SOLAS Summer School Local Organizer.

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