

SOLAS Open Science Conference 2009
Discussion Session Report:
Future for the Asian Dust and Ocean Ecosystem (ADOES) with Asian SOLAS
18th November 2009

Mitsuo Uematsu¹ (Convener), Huiwang Gao² (Co-convener) & Maurice Levasseur³ (Rapporteur)

¹ University of Tokyo, Japan

² Ocean University of China, Qingdao, China

³ Laval University, Canada

The goals of the session were 1) to initiate the planning of an international experimental program, 2) to identify key scientific issues that should be addressed in such a program, and 3) to establish an international network to exchange information on dust and its impact on the ocean ecosystems. Following a brief introduction by the chair, five invited speakers presented short talks related to the session theme. Collectively, these talks highlighted the impact of Asian dust deposition not only in HNLC waters (Gulf of Alaska), but also in Fe-rich coastal waters (Yellow Sea and Taiwan Strait) probably as a result of increase turbidity and/or macronutrients. An example of the long range transport of Taklimakan desert dust was presented, stressing the importance to consider the different dust Asian sources of dust in future study. In contrast with Gobi desert dust which is transported at altitudes of 3-5 km, Taklimakan dust is transported at ca. 7km. As a result, this dust may travel over longer distances and be less exposed to anthropogenic compounds. A report on the last meeting of the PICES WG22 on *Iron supply and its impact on biogeochemistry and ecosystems in the North Pacific Ocean* was presented. WG22 proposed to conduct a PICES research program on dust and acidification in the North Pacific.

The session represented a unique opportunity for the ‘global dust community’ to meet and share ideas and look for collaborative projects. The main message from this session was that given the increasing interest in the field of dust atmospheric transport and impact on oceans, there is a need for a network. The network would bring together the researchers working on the four main dust sources: Asian, Saharan, Australian, and Patagonian. ADOES will be the contact point for related studies in the North Pacific. The next 5th ADOES workshop will take place in Nagasaki, Japan, in spring 2010.

The discussions generated the following recommendations:

1. To establish a SOLAS-GEOTRACE Dust working group.
2. To establish mineral dust standards (such as CJ-1 and CJ-2) for purpose of inter-laboratory calibration of chemical analysis. This could be a ToR of the above WG.
3. To develop a standardised experimental protocols (e.g., onboard incubation techniques with dust). Given the high level of ongoing activities in the field, the participants considered that we need to move quickly on this issue. Such protocol will allow the comparison between the different dust sources and oceanic region/basins. This could be a ToR of the above WG.

4. To evaluate the potential effect of dust deposition on water turbidity and macro-nutrient depositions.
5. To investigate the co-effect of dust and ocean pH on ecosystems and climate relevant gases. This is particularly important in regions where calcifiers often dominate the phytoplankton assemblage.
6. To study the effect of volcanic ash depositions in order to better evaluate the respective role of dust and ash on ocean ecosystems. Ash depositions are Fe-rich and have the potential to decrease locally the pH in the ocean.
7. To include funds to allow students from different regions (dust source and ocean) to participate to the cruises when submitting proposal. This will allow students to explore different dust and oceanic systems.