



SOLAS Japan

by Mitsuo Uematsu

1. Scientific Highlights and Achievements

- Carbon isotopic characterization for the origin of excess methane in subsurface seawater:
Samples of seawater, zooplankton, and sinking particles were collected in the northwestern North Pacific to determine the source of excess CH₄ over the saturation value in equilibrium with the atmospheric CH₄ in the oxygenated open ocean, using stable carbon isotope as a tracer. The $\delta^{13}\text{C}$ of CH₄ emitted from sinking is within the range of that of excess CH₄ in seawater, suggesting that the major source of subsurface excess CH₄ is sinking particles. (Sasakawa et al., J. Geophys. Res., 2008)
- Single particle analysis of oceanic suspended matter during the SEEDS II iron fertilization experiment:
Suspended particles collected from surface seawater during the SEEDS II (Subarctic Iron Experiment for Ecosystem and Dynamics Study II) experiment were analyzed individually using an electron probe X-ray micro analyzer and characterized by size and elemental composition. Results suggest that the increase in suspended particles following the iron enrichment was due to a combination of detrital material and live phytoplankton. (Iwamoto et al., Mar. Chem., in press, 2009)

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

STAGE program

Oceanographic observations were carried out in January 2008 onboard RT/V Umitaka-maru (Tokyo University of Marine Science and Technology) and in February 2008 onboard R/V Hakuho-maru (JAMSTEC) in the Indian sector of the Southern Ocean as a part of STAGE (Studies on the Antarctic Ocean and Global Environment) program.

W-PASS program

- March 17 - April 13, 2008

W-PASS Intensive Atmospheric Observation Campaign 2008 at NIES Cape Hedo Observatory, Okinawa, JAPAN

A few Kosa (dust) events, anthropogenic air outflows, typical local air and occupation of marine background air were identified during the campaign period. A workshop for data analysis was held in June 13, 2008.

- July 29 – September 18, 2008

SPEEDS (Subarctic Pacific Experiment for Ecosystem Dynamics Study) Cruise by R/V Hakuho-MarU (KH-08-2: SOLAS/IMBER joint cruise): Northwestern North Pacific

We found phytoplankton bloom patches of various stages with age and determined differences among composition of marine biogases from age of the patches.

- October 13 – November 10, 2008

R/V Mirai Cruise (MR08-04, 05): Equatorial and Northwestern North Pacific

Eddy-covariance flux measurements have been carried out during cruises from Japan to the equatorial and subarctic regions by R/V Mirai during the summer and fall of 2008.

- January 15 – March 30, 2009

R/V Mirai Cruise (MR08-06): Western North Pacific, Central Pacific, Eastern South Pacific

ATOFMS (Aerosol Time-of-Flight Mass Spectrometer) was set up below the bow hold of the ship as well as various atmospheric sampling equipments on the compass deck from Japan to Chile.

- March 12, 2008

W-PASS Eddy-Covariance Workshop

Ocean Research Institute, The University of Tokyo, Convener: Osamu Tsukamoto

- June 13, 2008

Data Workshop of Intensive Atmospheric Observation Campaign 2008

NIES Tokyo Office, Convener: Yoko Yokouchi and Akinori Takami

- December 12, 2008

Workshop on the biological responses to typhoon passing in the subtropical Pacific and its marginal seas

Faculty of Agriculture, The University of Tokyo, Convener: Atsushi Tsuda

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

Publications by the SOLAS-Japan scientists (W-PASS)

- Buesseler, K.O., S.C. Doney, D.M. Karl, P.W. Boyd, K. Caldeira, F. Chai, K. Coale, H.J.W. de Baar, P.G. Falkowski, K.S. Johnson, R. S. Lampitt, A.F. Michaels, S.W.A. Naqvi, V. Smetacek, S. Takeda and A.J. Watson, Ocean iron fertilization: moving forward in a sea of uncertainty. *Science*, 319, 162, doi: 10.1126/science.1154305, (2008).
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4. Interactions and Collaborations

- May 24, 2008

Workshop on Linkages in Biogeochemical Cycles between Surface Ocean and Lower Atmosphere as part of the IOC/WESTPAC 7th International Symposium
Kota Kinabaru, Sabah, Malaysia
Conveners:

Mitsuo Uematsu, Gi-Hoon Hong, Che Abd. Rahim Mohamed, Jing Zhang,

- October 24, 2008

Working Group 22 on Iron supply and its impact on biogeochemistry and ecosystems in the North Pacific Ocean, PICES 17th Meeting
Dalian, China
Co-Chairman: Shigenobu Takeda and Fei Chai

5. Goals and Plans for Future Activities

- May, 2010

SNIFFS II (Subtropical Nitrogen Fixation Flux Study) Cruise by R/V Hakuho-Maru (KH-10-1: SOLAS/W-PASS cruise): subtropical western North Pacific (PI: Atsushi Tsuda)

- March, 2011

W-PASS project will end. We may organize an international symposium or sessions to present

- December, 2011 – March, 2012

Cruise by R/V Hakuho-Maru: Subtropical and tropical regions of North and South Pacific
Linkages in biogeochemical cycles between surface ocean and stratospheric atmosphere over the high productive region in the Tropical Pacific Ocean (PIs: Ken Furuya, Mitsuo Uematsu)

6. Other Comments

Deep-Sea Research Special Volume of SEEDS II was completed its review process and will be published soon.

- Mitsuo Uematsu will be awarded the 2009 Oceanographic Society of Japan Award in April 2009.

- Atsushi Tsuda will be awarded the Hidaka Outstanding-Publication Award from Oceanographic Society of Japan in April 2009.

- SOLAS-Japan Committee was reorganized and increased members from 10 to 18. (See our HP)

- We have to start discussion on a core project beyond SOLAS or SOLAS phase II soon.