

May 1st, 2016 to April 30th, 2017

New scientific results

We analyzed trace metal concentrations and their solubility of the size-fractionated aerosols collected daily for a whole year in Dongsha atoll, which is located in the Northern South China Sea (SCS), to investigate the impact of anthropogenic aerosols on trace metal cycling in the SCS and the Northwestern Pacific Ocean. Figure 2 exhibits the Fe concentrations and solubility in the aerosols. We have also measured elemental composition in the sinking particles collected in 2015 and 2016 at 2000 and 3500 m of Taiwan time series station (SEATS) in the SCS to study elemental fluxes in the ocean. Collaborating with Kyoto University, we have measured the isotopic composition of Cd, Zn, Ni, Cu, and Fe in the aerosol and sinking particle samples to identify their sources and investigate their fractionation mechanism.

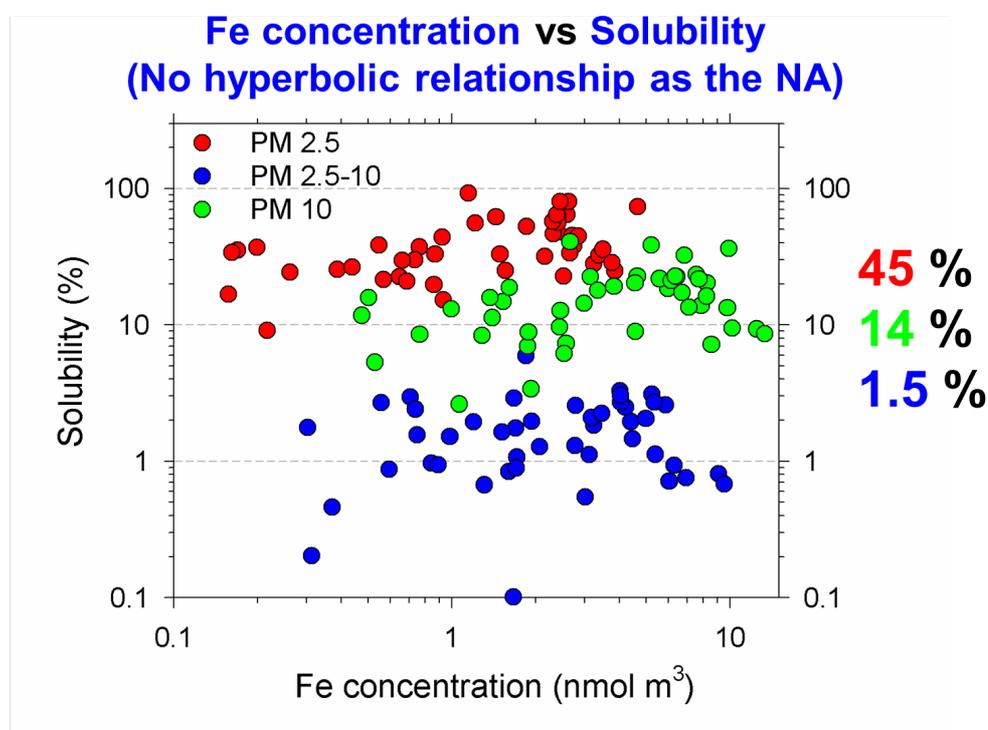


Figure 2. Comparison of Fe concentration and solubility in size-fractionated aerosols collected in the South China Sea (Ho et al. in prep). The averaged solubility of PM 2.5 and PM 2.5-10 are 45 and 1.5%, respectively, resulting in the total averaged Fe solubility to be 14%. The result indicates that anthropogenic aerosols are the major soluble Fe sources in the surface water of the oceanic region.

New Publications (2016/5-2017/4)

- Liao, W.-H., S.-C. Yang, and T.-Y. Ho (2017) Trace metal composition of size-fractionated plankton in the Western Philippine Sea: the impact of anthropogenic aerosol deposition. *Limnology and Oceanography* doi: 10.1002/lno.10564.
- Chien, C.-T., T.-Y. Ho, M. E. Sanborn, Q.-Z. Yin, and A. Paytan (2017) Lead concentrations and isotopic compositions in the Western Philippine Sea. *Marine Chemistry* 189: 10-16.
- Lee, C.-P., Cheng, C.-Y., and L.-S. Wen (2017) Vertical distributions and diurnal variations of high-molecular-weight dissolved arsenic in the oligotrophic ocean *Limnology and Oceanography* doi: 10.1002/lno.10560.

New projects

- A three year GEOTRACES project proposed by Tung-Yuan Ho to Taiwan Ministry of Science and Technology (MOST) has been funded. The title of the project is: *Taiwan GEOTRACES II: Biogeochemical cycling and seasonal transformation of aerosol trace metals in the Western Philippine Sea*. The GEOTRACES scientific cruises are most likely to be carried out in 2018 and 2019.

Other activities

- Five Taiwanese researchers, including four junior scientists, were invited by Prof. Hajime Obata to attend the East Asia GEOTRACES workshop held on 16-18 January 2017 in Sapporo, Japan to discuss the current status of trace elements and their isotopes (TEI) studies in the Northwestern Pacific Ocean and its marginal seas.
- The second new R/V, 3900 ton and 85×16 m long and wide, of Taiwan Ocean Research Institute (TORI) has been designed and the RV will be mainly used for open ocean research, including GEOTRACES study.

Submitted by Tung-Yuan Ho (tyho@gate.sinica.edu.tw).