

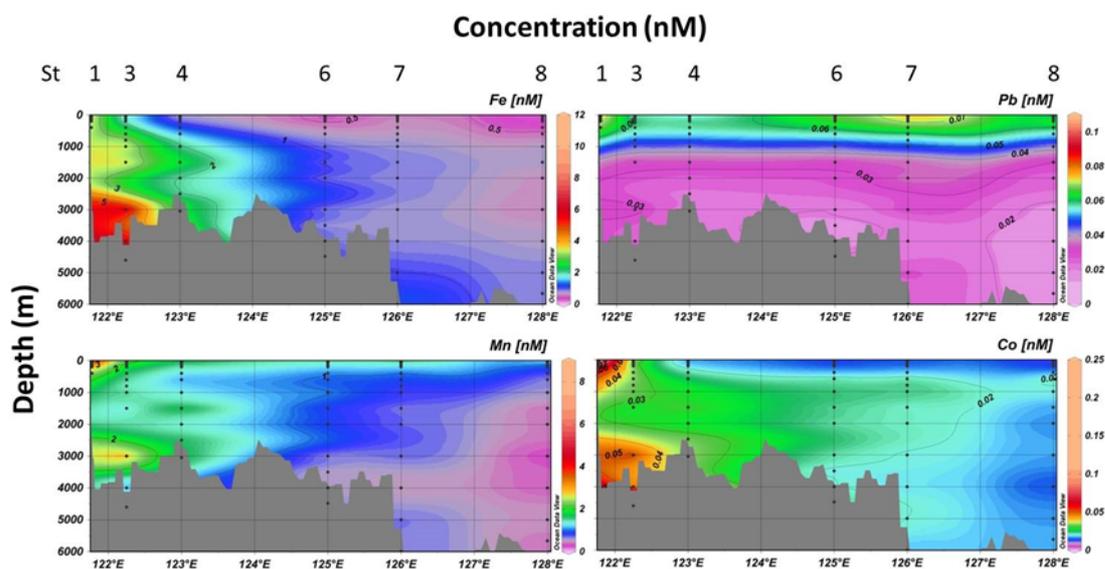
ANNUAL REPORT ON GEOTRACES ACTIVITIES IN CHINA-TAIPEI  
JUNE 2013 – JUNE 2014

### *Cruises*

The 2nd Taiwan GEOTRACES cruise was carried out during March 25<sup>th</sup> - April 3<sup>rd</sup> 2014 in the Western Philippine Sea by using Taiwan new 3,000 ton research vessel, *Ocean Research 5 (OR/5)*. The 8 sampling sites, located between 122° and 128°E at 23.5°N, are exactly the same as our first test cruise. Please see our 2013 National report for the exact locations. The major objectives of this cruise are to investigate the seasonal variations of the distribution of trace elements and their isotopes in the Western Philippine Sea, particularly focusing on the impact of anthropogenic and natural aerosols brought to the region by East Asian winter monsoon. We have also studied the roles of particles on trace metal cycling in the sea. We have collected various particulate samples, including total suspended particles, size-fractionated particles and plankton, sinking particles, total suspended aerosols, and size-fractionated aerosols. Twenty-nine scientists, students, and technicians from 12 laboratories joined the cruise (Chief scientist: Tung-Yuan Ho), including 5 foreign students and researchers from Xiamen University, HKUST, and UC Santa Cruz.

### *New results*

We have been determining the trace metal and isotopic composition of the dissolved and particulate samples collected in our first GEOTRACES cruise, carried out in July 2013. We have obtained many reliable TEI data, witnessed by the systematic concentration gradients among elements (e.g., the following figure). We have also observed interesting composition interaction among dissolved seawater, size-fractionated SPM, and sinking particles. A few manuscripts are under preparation.



### *Relevant Publications (2013/6-2014/5)*

- Huang, K.-F., C.-F. You, C.-H. Chung, Y.-H. Lin, and F.Z. Liu (2014) Tracing the Nd isotope evolution of North Pacific Intermediate and Deep Waters through the last deglaciation from South China Sea sediments. *Journal of Asian Earth Sciences* 79, 564-573.

- Jiann, K.-T., L.-S. Wen, and C.-L. Wei (2013) Spatial and temporal distribution of trace metals (Cd, Cu, Ni, Pb, and Zn) in near-shore waters off the west coast of Taiwan. *Terrestrial, Atmospheric and Oceanic Sciences*. 25, 121-135.
- Lee, C.-S., C.-L. Wei, L.-S. Wen, D. D.-D Sheu, and W.-H. Lee. (2013) Distribution and removal of silver and lead in the near shore waters of Western Taiwan. *Estuaries and Coasts*. 36, 854-865.
- Rodriguez, I. B. and T.-Y. Ho (2014) Diel nitrogen fixation pattern of *Trichodesmium*: the interactive control of light and Ni. *Scientific Reports* /4:4445/DOI: 10.1038/srep04445.
- Wang, B.-S., C.-P. Lee, and T.-Y. Ho (2014) Trace metal determination in natural waters by automated solid phase extraction system and ICP-MS: the influence of low level Mg and Ca. *Talanta* 10.1016/j.talanta.2014.04.077.
- Wang, R.-M. and C.-F. You (2013) Uranium and strontium isotopic evidence for strong submarine groundwater discharge in an estuary of a mountainous island: A case study in the Gaoping River Estuary, Southwestern Taiwan *Marine Chemistry* 157, 106-116.
- Yang S.-C., D.-C. Lee, and T.-Y. Ho (2014) Reply to the “Comment by Murphy et al. (2014) on ‘the isotopic composition of Cadmium in the water column of the South China Sea’” *Geochimica et Cosmochimica Acta* /10.1016/j.gca.2014.02.015.

#### ***Other activities***

- Dr. Tung-Yuan Ho has received 3-yr funding from 2013 to 2016 to carry out GEOTRACES related research in the Western Philippine Sea. He plans to lead a scientific cruise by using *OR/5* to the region every year. The *OR/5* management agency, Taiwan Ocean Research Institute (TORI), is purchasing a Kevlar wire with 8,500 m long and a related winch.
- Two young oceanographers, Drs. Kuo-Fang Huang and Haojia Ren, have recently settled down in Taiwan to start their academic career. Both have expressed their strong interests in GEOTRACES related research. It is expected that GEOTRACES research in Taiwan will become more active in the near future.

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