

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN CHINA-BEIJING

May 1st, 2016 to April 30th, 2017

New scientific results

- Cu speciation in southern Yellow Sea are greatly influenced by in situ primary production; while in Bohai Sea, the complexing ligands are mainly coming from fluvial discharge.
- Southern Yellow Sea is a complex and dynamic coastal area, and the spatial distribution of dissolved trace metals is influenced by fluvial discharge, as well as various physical and biological processes.
- The average dissolved trace metal concentrations of southern Yellow Sea are comparable to pristine coastal seawaters of the US and Europe.
- Identification of large benthic flux of dissolved iron from coastal sediments using the $^{224}\text{Ra}/^{228}\text{Th}$ disequilibrium method.
- Toxic Metal pollution in the Yellow Sea and Bohai Sea, China: distribution, controlling factors and potential risk.

New publications (published or in press)

- Li, L., Wang, X.J., Liu, J.H. and Shi, X.F. (2017) Dissolved trace metal (Cu, Cd, Co, Ni, Ag) distribution and Cu speciation in the Southern Yellow Sea and Bohai Sea, China. *Journal of Geophysical Research Oceans*. doi: 10.1002/2016JC012500
- Grasse P., M. Brzezinski, D. Cardinal, G. F. de Souza, P. Andersson, I. Closset, Z. Cao, M. Dai, C. Ehlert, N. Estrade, R. Francois, M. Frank, G. Jiang, J. L. Jones, E. Kooijman, Q. Liu, D. Lu, K. Pahnke, E. Ponzevera, M. Schmitt, X. Sun, J. N. Sutton, F. Thil, D. Weis, F. Wetzel, A. Zhang, J. Zhang and Z. Zhang (2017) GEOTRACES inter-calibration of the stable silicon isotope composition of dissolved silicic acid in seawater, *Journal of Analytical Atomic Spectrometry*, 32, 562-578.
- Hong Q.Q., P.H. Cai, X.M. Shi, L. Qing, G.Z. Wang (2017) Solute transport into the Jiulong River estuary via pore water exchange and submarine groundwater discharge: New insights from $^{224}\text{Ra}:^{228}\text{Th}$ disequilibrium. *Geochimica et Cosmochimica Acta* 198, 338-359.
- Xiao, C.L., H.M. Jian, L.F. Chen, C. Liu, H.Y. Gao, C.S. Zhang, S.K. Liang, Y.B. Li (in press) Toxic metal pollution in the Yellow Sea and Bohai Sea, China: distribution, controlling factors and potential risk. *Marine Pollution Bulletin*.
- Song, B.B., H.J. He, L.F. Chen, S.F. Yang, Y.G. Yin, Y.B. Li (in press) Speciation of Mercury in Microalgae by Isotope Dilution – Inductively Coupled Plasma – Mass Spectrometry, *Analytical Letters*.
- Xu, B.C., D.S. YANG, W.C. Burnett, X.B. Ran, Z.G. YU, M.S. Gao, S.B. Diao, X.Y. Jiang (2016) Artificial water sediment regulation scheme influences morphology, hydrodynamics and nutrient behavior in the Yellow River estuary, *Journal of Hydrology*, 539: 102-112.

Cruises

- July 2016, a cruise to the Bohai Sea and Yellow Sea in China. 40 stations were visited and both surface and bottom water were collected. Dissolved trace metals (Cu, Pb, Zn, Co, Ni, Cd, etc.) will be analyzed. Cu, Pb, Zn and Cd speciation will also be analyzed in bottom waters.

New projects and/or funding

- On the barium isotopic compositions, fractionation and its potential as a proxy for paleoproductivity in the ocean, Youth Foundation supported by National Natural Science Foundation of China (PI: Zhimian Cao), 2017.01-2019.12.
- Distributions and influencing factors of dissolved Al in northern South China Sea and its application in tracing terrestrial material transport, NSFC (2017.1-2020.12).

PhD theses

- Wang Z.W. (supervised by S.M. Liu and J. L. Ren of OUC) 2017. Biogeochemical cycle of dissolved manganese and its impact factors in the marginal seas of China. Ocean University of China.

Meetings

- Special session - Biogeochemical Cycling of Trace Elements in the Ocean: GEOTRACES and Beyond. The 3rd Xiamen Symposium on Marine Environmental Sciences (XMAS-III), Jan 9th - 11th, 2017, Xiamen, China. Conveners: Martin Frank, Jing Zhang, Zhimian Cao.
- East Asia GEOTRACES Workshop: Trace Element and Isotope (TEI) study in the Northwestern Pacific and its marginal seas. The Institute of Low Temperature Science (ILTS), Hokkaido University, Sapporo, Hokkaido, Japan, Jan 16-18, 2017.
- 1st Planning Meeting for the 2019 GEOTRACES-China Cruise, 6th Jan, 2017, Xiamen, China. Participants: Jing Zhang, Minhan Dai, Meixun Zhao, Liping Zhou, Jingling Ren, Fei Chai, George T.F. Wong, Zhimian Cao.
- Symposium of preliminary results for GEOTRACES GP06-CN cruise. Ocean University of China, Qingdao, China, Apr 21, 2017. Attendees come from Ocean University of China, Xiamen University, Kyushu University, Shanghai Jiao Tong University, Tongji University, East Normal University, Dalian Maritime University, the First Institute of Oceanography (SOA) etc. There are 14 talks, including three invited talks.

Outreach activities

- Open Day of the new *R/V Tan Kah Kee* of Xiamen University equipped with a clean sampling system for GEOTRACES-type study, Apr 15th - 16th, 2017, Xiamen, China.

Other activities

- Xiamen University's new vessel *R/V Tan Kah Kee* was launched in May 2016.

- The State Key Laboratory of marine environmental science (MEL) of Xiamen University is building the first Trace Elements and Isotopes Sampling System in China. The system consists of a winch unit with an 8000 meter Vectran conducting cable, a commercial available CTD unit designed for TEIs sampling with twenty-four 12 liters Niskin-X or OTE C-Free bottles mounted on an epoxy-coated aluminum carousel, a 20' subsampling clean van, and a 20' analytical clean van for a microwave-assisted digestion instrument and a Fe(II)Lume FIA analyzer. The sampling system will be tested during the sea trial cruise of *R/V Tan Kah Kee* in July, 2017 and is expected to be launched in 2018. With the sampling system ready, scientists in China will start to contribute to the international GEOTRACES program.

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