

GEOTRACES Activities in China 2016-2017

September 18, 2017

Outline

- **Capacity building**

XMU, OUC, FIO, SIO(model), ECNU, PKU

- **GEOTRACES-relevant research in China**

- **The XMU new vessel and activities**

- **Outlook**

Scientific research:

- **Dissolved trace metals in southern Yellow Sea and Bohai Sea:** spatial distributions and their influencing factors and processes, and comparison with coastal seawaters of the US and Europe.
- **Toxic Metal pollution in the Yellow Sea and Bohai Sea:** its distribution, controlling factors and potential risk.
- **Benthic flux of dissolved Fe from coastal sediments using the $^{224}\text{Ra}/^{228}\text{Th}$ disequilibrium method.**

Publications:

- 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}Ra : ^{228}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 (2017) Speciation of Mercury in Microalgae by Isotope Dilution – Inductively Coupled Plasma – Mass Spectrometry, *Analytical Letters*. 2161-2176.
- 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**
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.

Not officially GEOTRACES cruise

- **August, 2017, test cruise of the new vessel of Xiamen**
University

New Projects:

- **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).**

Meetings

Jan 9 - 11, 2017, Xiamen: *Special session - Biogeochemical Cycling of Trace Elements in the Ocean: GEOTRACES and Beyond. The 3rd Xiamen Symposium on Marine Environmental Sciences (XMAS-III). Conveners: Martin Frank, Jing Zhang, Zhimian Cao.*

Jan 16-18, 2017, Sapporo: *East Asia GEOTRACES Workshop: Trace Element and Isotope (TEI) study in the Northwestern Pacific and its marginal seas. Hokkaido University.*

Jan 6, 2017, Xiamen: *1st Planning Meeting for the 2019 GEOTRACES-China Cruise. Participants: Jing Zhang, Minhan Dai, Meixun Zhao, Liping Zhou, Jingling Ren, Fei Chai, George T.F. Wong, Zhimian Cao.*

Meetings (cont)

Apr 21, 2017, Qingdao: Symposium of preliminary results for GEOTRACES GP06-CN cruise. Attendees came 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. 14 talks, including three invited talks.

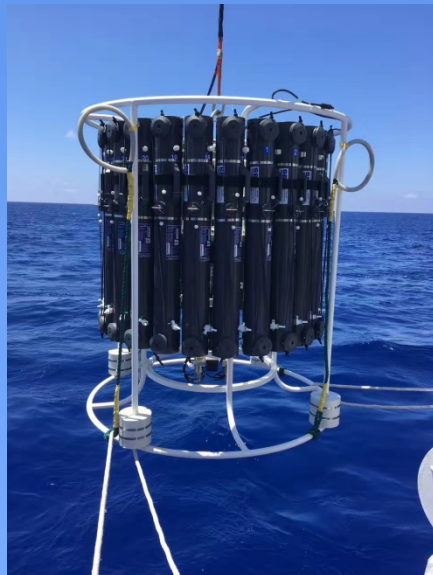
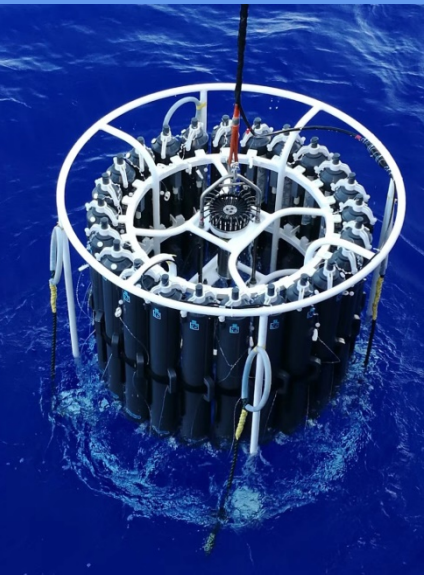
Outreach activities



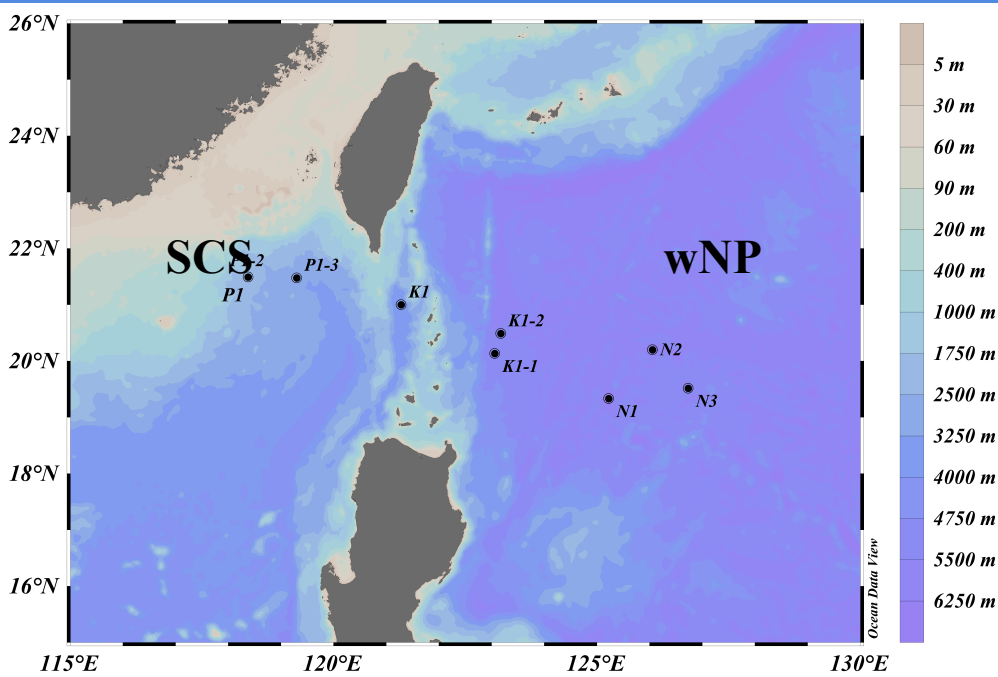
Open Day of the new vessel: 15-16 April 2017



R/V TAN KAH KEE (Xiamen University)



R/V TAN KAH KEE Test Cruise I — Aug. 2-14, 2017



P1 & P1-2: OTE condition
P1-3 & K1-1: Niskin X
condition

N1: Niskin X cast to 2400 m

N2: Niskin X cast to 1000 m

N3: Niskin X cast to 4000 m

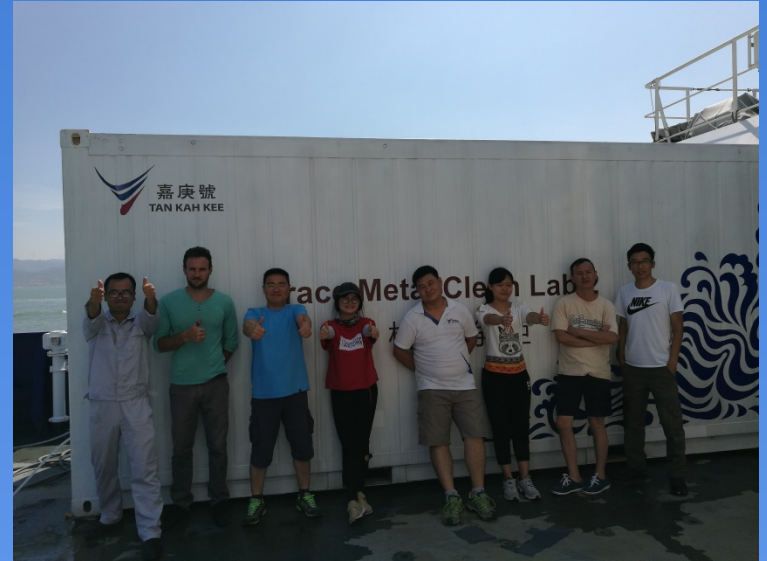
K1-2: OTE cast to 5200 m

K1: Niskin X cast to 1300 m

before the cruise



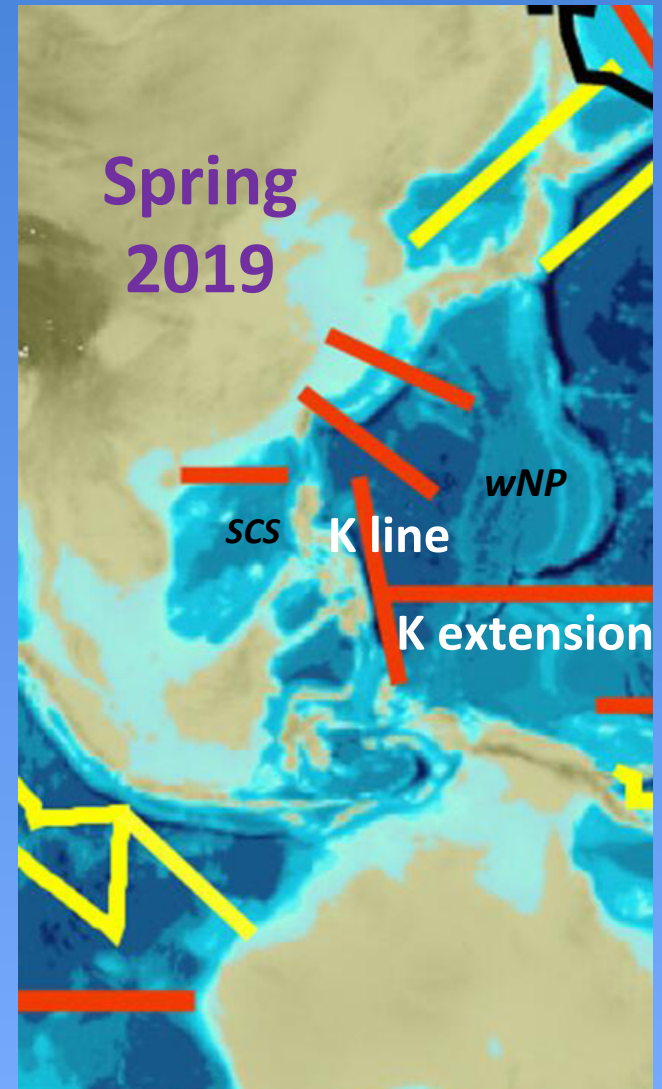
on the cruise



Outlook

Next with R/V TAN KAH KEE

- 2017.09-2018.02
Sample analysis:
FIA+Luminol-O₂ → Fe
ID+ICP-MS → Fe and other TMs
Inter-lab calibration (GEOMAR etc.)
- 2018.03-05
Test Cruise II to the SCS and wNP
Planning meeting for GEOTRACE-CHINA Cruise (International)
- 2019.04-05
GEOTRACE Section Cruise:
K line & K extension



Longer Term Plan

- **More GEOTRACES approved cruises**
- **Intercalibration and compliant data**
- **BioGEOTRACES**
- **Paleo-proxy: surface (core top) sediments**