GEOTRACES Activities in China 2013-2014

October 8, 2014

By China-GEOTRACES Working Group

- **Capacity building**
- **GEOTRACES-relevant research in China**

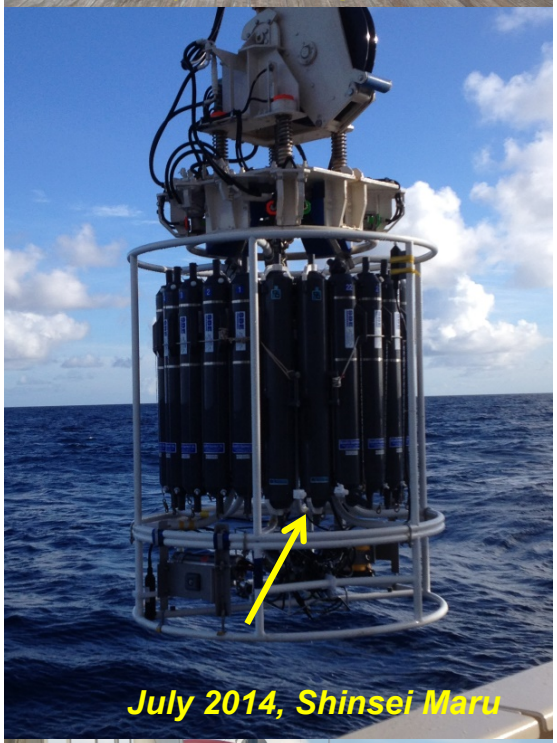
A NEW R/V BEING Built

1. **The new vessel will be available in 2016.**
2. **Chris Measures and his colleagues are helping to set up the clean sampling system.**

Capacity Building in OUC:

- **Inter-calibrations:**
  - **Cross station (July 2013):**
    - **Research vessels: *Dong Fang Hong 2* (China, Max Zhao) and *Nagasaki-Maru* (Japan, J. Zhang)**
    - **Parameters: DO, Alk, pH, Chla**
  - **Sampling bottles' inter-calibrations (July 2014)**
    - **Research vessel: *Shinsei Maru* (KS14-11, Japan)**
    - **Stations Z2 and Z3 (depth >1000 m): X-Niskin (OUC) and X-Niskin (Shinsei, Japan)**
    - **Parameters: REEs, Al, Mn**
- **Training and sampling:**
  - **August 2013: *Hakuhō Maru* (KH13-4, Japan, J. Zhang)**
  - **Parameters: REEs, Al, Mn**

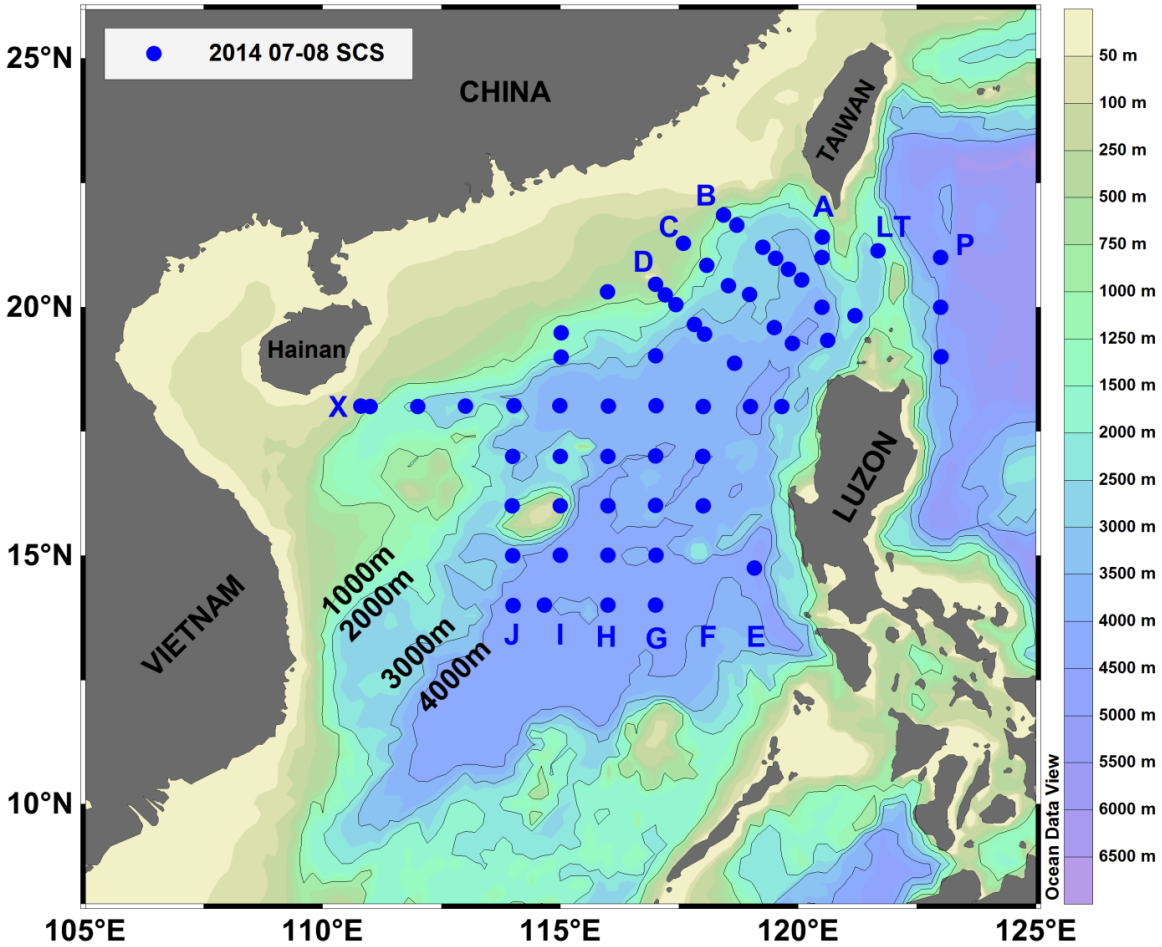

July 2013, Nagasaki Maru


July 2014, Shinsei Maru

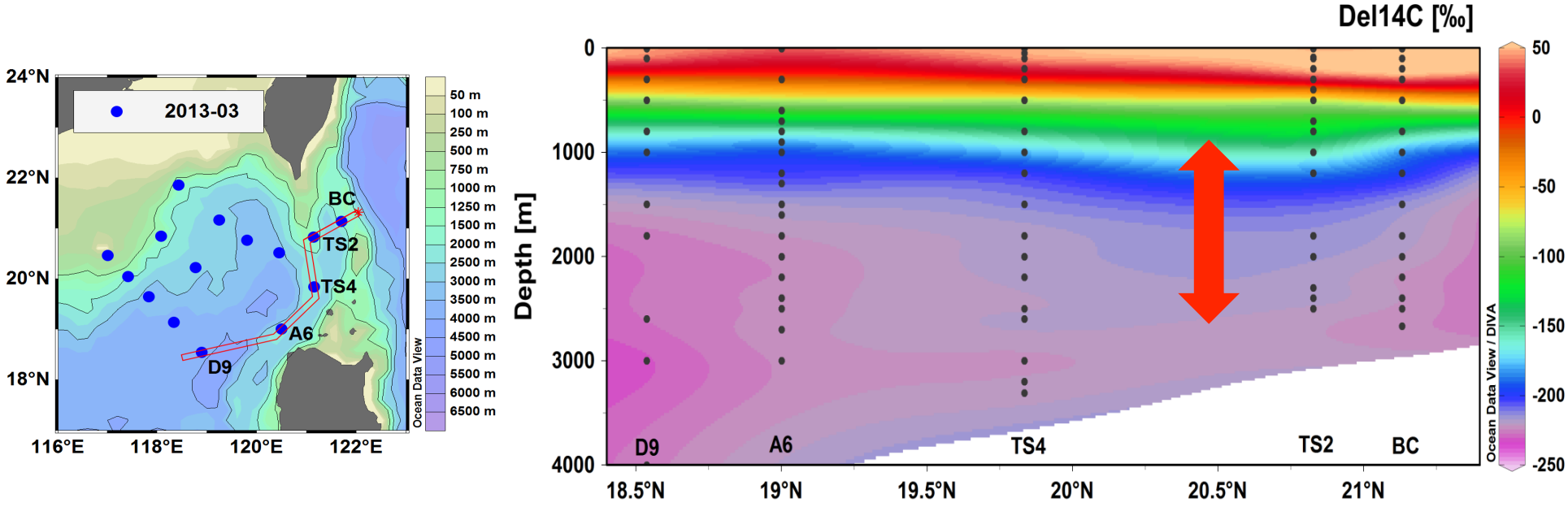
August 2013, Hakuhō Maru

GEOTRACES-relevant research

1. The $\delta^{18}O$, δD, $\delta^{13}C$ and $DI^{14}C$ are being measured to generate 3D maps for multiple isotopes, primarily, at the present stage, for better understanding of the deep water mixing and turnover time of the SCS.

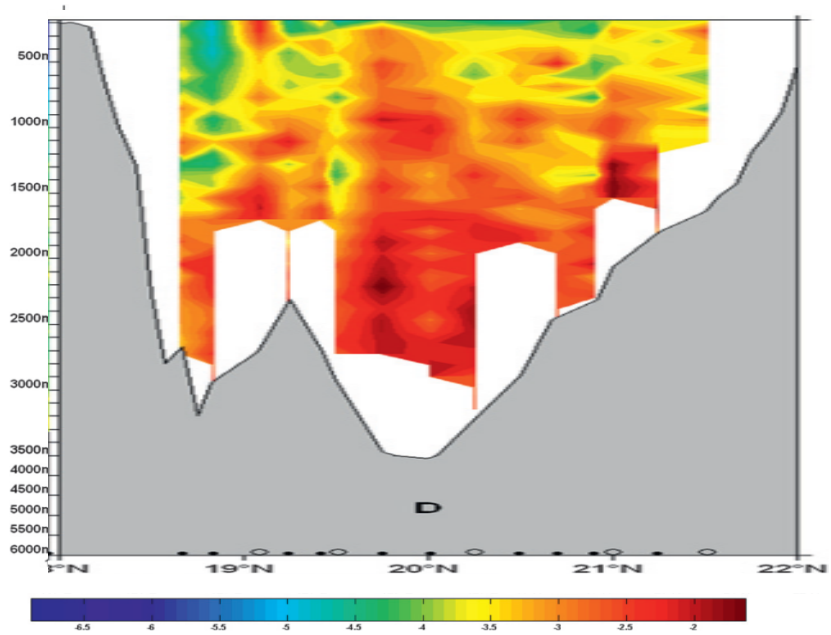


Example: Deep water inflow in the Luzon Strait

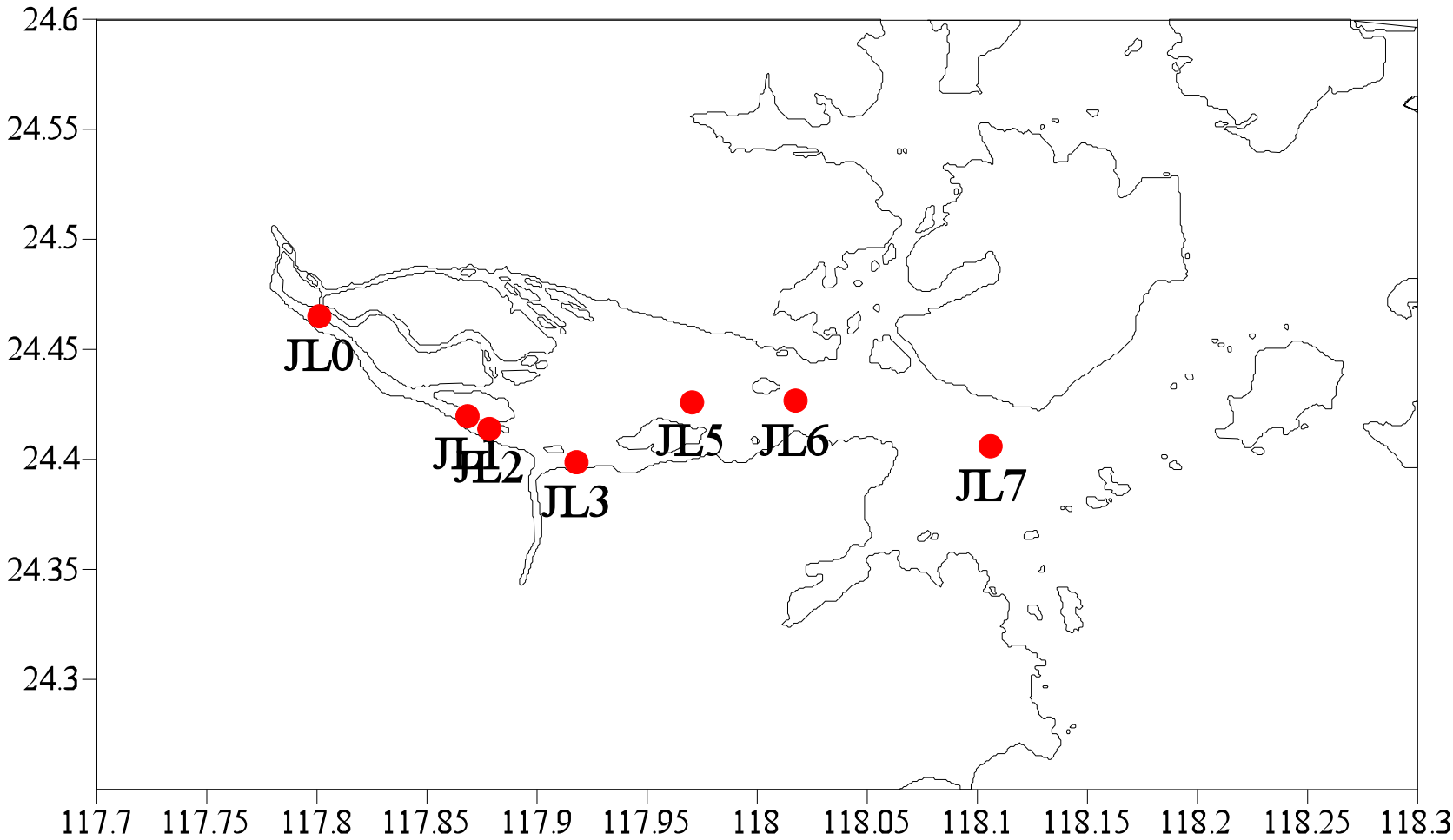


Seawater DI^{14}C section along the deep water pathway of Luzon Strait.

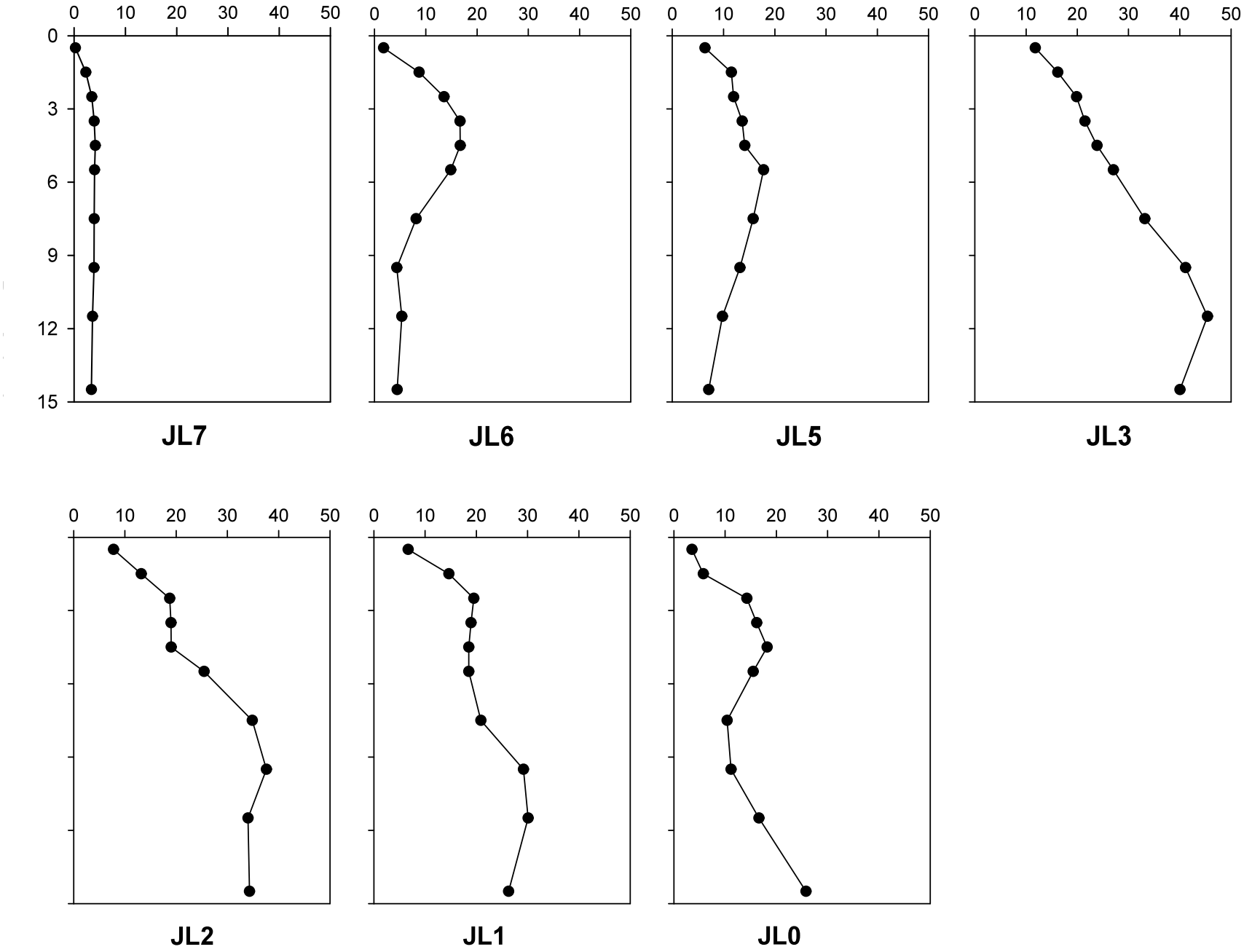
Two stations inside Luzon Strait (TS2 and TS4) show significantly higher DI^{14}C values, indicating strong vertical mixing in agreement with the physical oceanographic measurements (Tian et al., 2009).



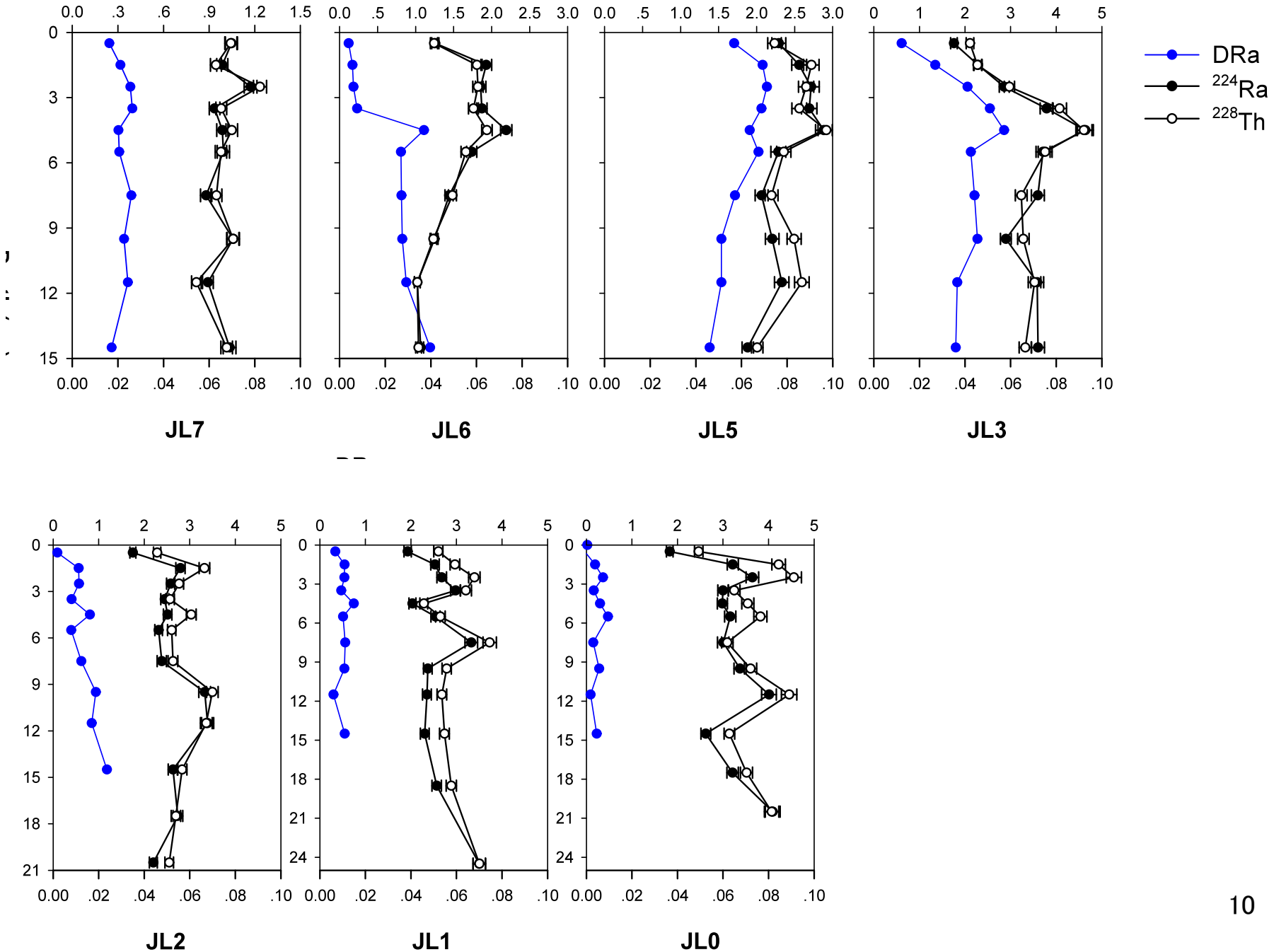
2. A quantitative understanding of the behavior of Mn during mixing in the estuary based on the measurements of $^{224}Ra/^{228}Th$ disequilibrium in bottom sediments



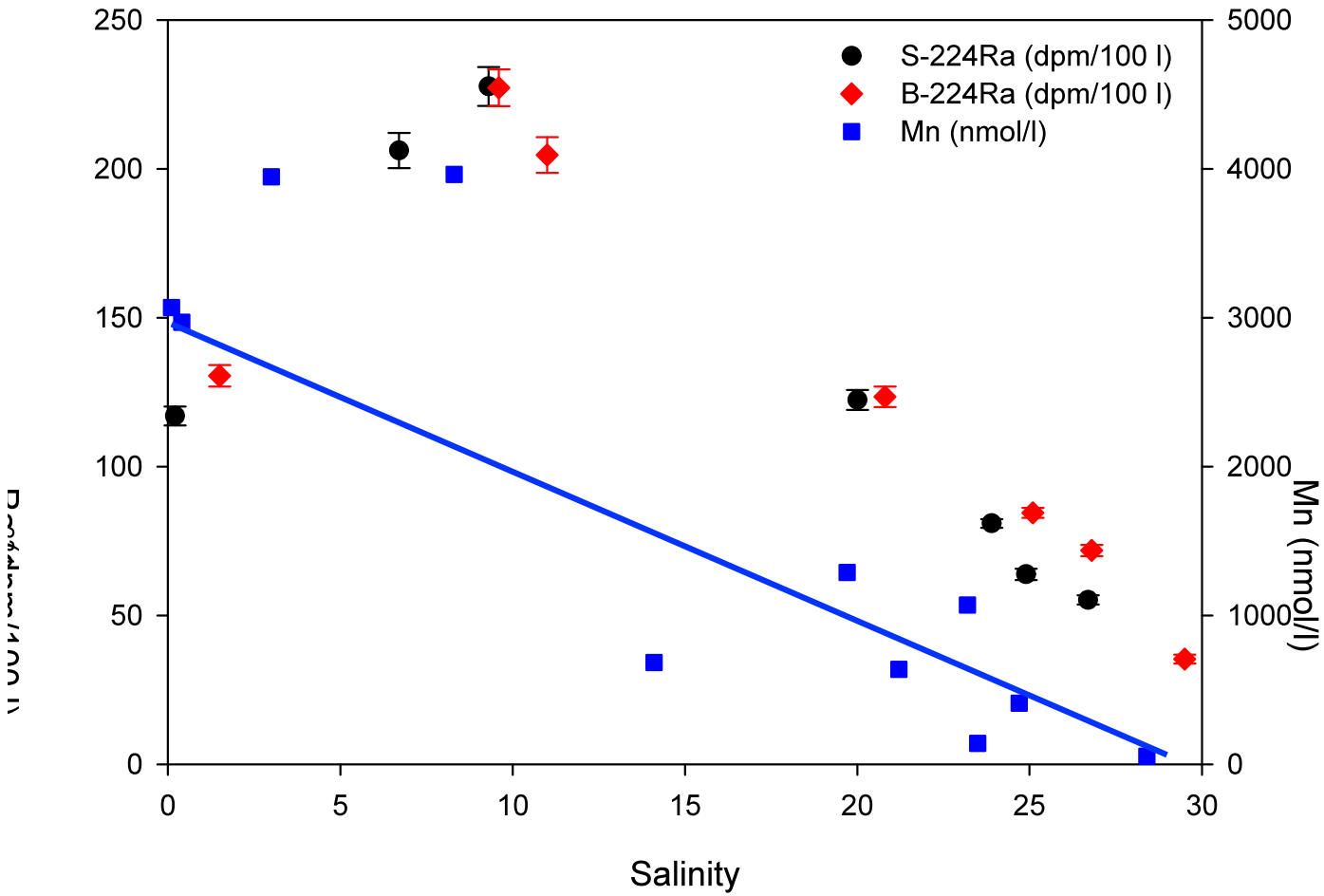
Mn profiles in porewater



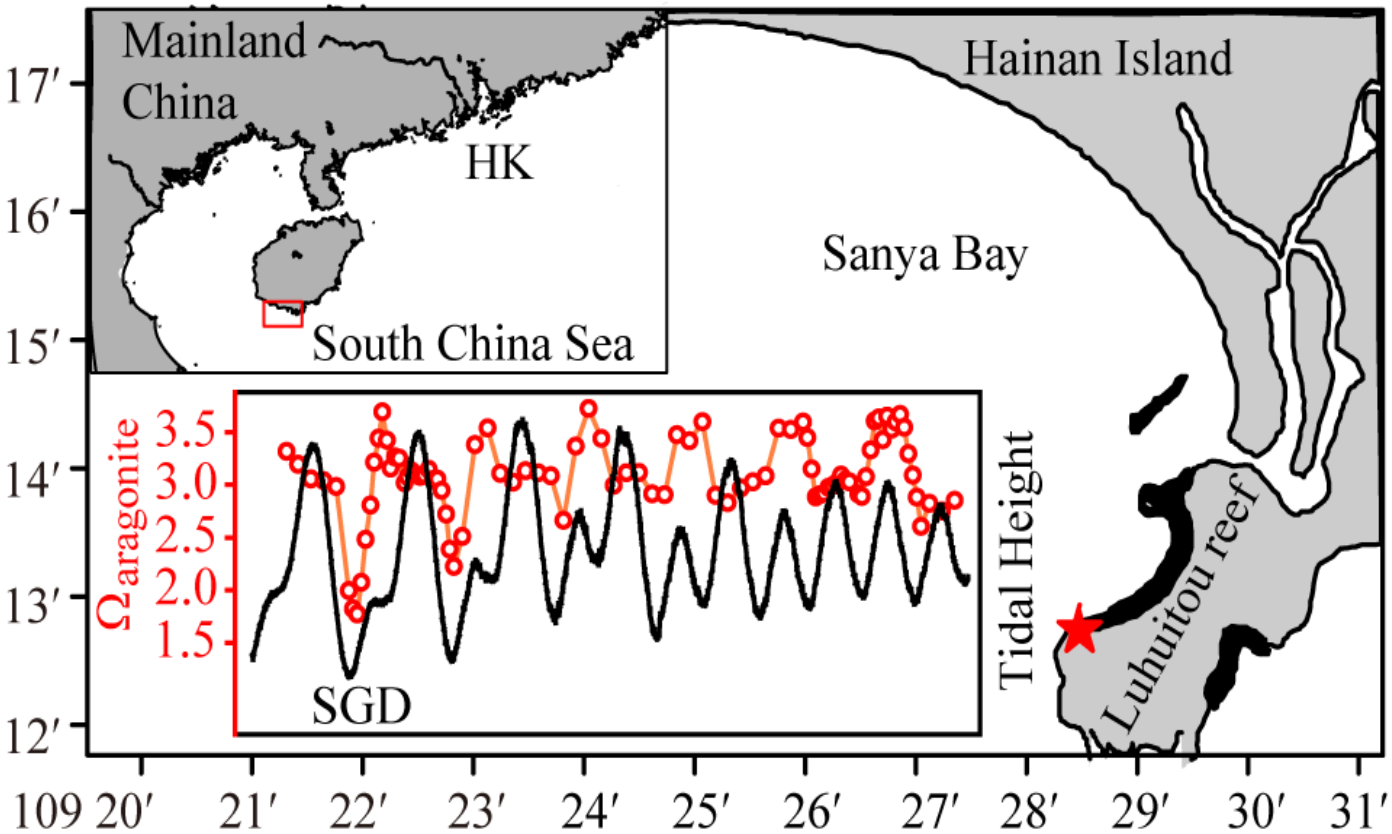
Profiles of $^{224}Ra/^{228}Th$



The results indicates that injection of interstitial waters is the dominant source of Mn in the Jiulongjing estuary, and Mn^{2+} may be efficiently oxidized to MnO_2 during mixing in the estuary



3. Assessment of Submarine Water discharge in the South China Sea using radium isotopes.



Tidal-driven SGD of low pH waters caused the saturation state of aragonite to as low as 1.77, which might affect calcification of local community in the coastal reef system in Sanya Bay (Wang et al., EST, under review).

Outlook: GEOTRACES process study cruise

- **We are planning to organize a GEOTRACS cruise in 2015.**
- **People training: funding source from China Science Council (CSC) to support PhD students and PIs to be trained in US and Europe.**