



Activity Report 2025 – Task Forces / Coordination Committees

Project Title: Lithospheric evolution and tectonic carbon cycle

Project No.: 2024-TF1

PI(s): Rixiang Zhu

1. Highlights of recent ILP Task Force work/results

The main highlights of recent ILP Task Force work/results follow below:

- 1) The team of Institute of Geology and Geophysics, Chinese Academy of Sciences in collaboration with the International Lithosphere Program, organized the 1st Interdisciplinary Workshop on Lithospheric Evolution and Earth's Habitability in Beijing from July 21–25, 2025. The Organizing Committee of the workshop, which is chaired by professors Liang Zhao and Bo Wan, brought together geologists, geophysicists, and geochemists from 11 countries for in-depth academic exchanges, aiming to provide guidance for future research on the Tethyan tectonic domain. The workshop consisted of two parts: a scientific presentation session held on July 22–23, followed by a two-day geological field trip. During the academic sessions, experts shared their latest research findings and perspectives around four core themes: "Deep Earth and Carbon Cycle", "Earth System Coupling and Habitability", "Tethys Evolution: Tectonics, Carbon and Climate", and "Early Earth and Habitability Evolution". The successful convening of this workshop has enhanced our understanding of the first-order controls of lithospheric dynamics on the Earth system's volatile cycle and their cascading impacts on Earth's climate system and habitability.
- 2) The Institute of Geology and Geophysics, Chinese Academy of Sciences in collaboration with the International Lithosphere Program, organized the International Workshop on New Methods and Challenges of Oceanic Bottom Seismic Observation in Beijing from July 15–26, 2025. The Organizing Committee of the workshop, includes Liang Zhao, Chenxi Xu, Lei Yang, and Xinxin Wang, brought together excellent students from well-know institutions or universities for a comprehensive exchange of new methods and challenges of oceanic bottom seismic observation, lithospheric evolution, and environmental evolution. The workshop format involves systematic training lectures, an international workshop on lithospheric evolution and Earth's habitability, and a geologic field trip. By providing an international platform for

young students and researchers, this workshop effectively promoted academic exchanges and cooperation across the global geoscience community.

2. Presence at international meetings/workshops (this year)

- 1) International Workshop on Lithospheric Evolution and Earth's Habitability (More than 100 peoples)
- 2) International Workshop on New Methods and Challenges of Oceanic Bottom Seismic Observation (More than 50 peoples)

3. Important publications of ILP Task Force members (max. five)

- 1) **J.F. Yang, M. Faccenda***, L. Chen, X. Wang, H. Shen, B.P. VanderBeek, **L. Zhao***. The origin and fate of subslab partial melts at convergent margins. *National Science Review*, 2025, 12(10): nwaf314. DOI: 10.1093/nsr/nwaf314.
- 2) Q.R. Meng*, G.L. Wu, **B. Wan, R.X. Zhu**, L. Duan, B. Wang, J. M. Hu, Proto-Tethyan tectonics in East China: a revisit, *National Science Review*, 2025, 12(6): nwaf153, DOI: 10.1093/nsr/nwaf153.
- 3) Y.T. Mao, X.T. Tang, **L. Zhao***, **M.G. Malusa***, S. Guillot, A. Paul, S. Solarino, X.B. Xu, C. Aubert, E. Eva, S. Pondrelli, S. Salimbeni, L. Yang. P and S wave finite-frequency tomography reveals the impact of slab interference on mantle flow beneath the greater Alpine region. *Earth and Planet Science Letters*, 2025, 673: 119716. DOI: 10.1016/j.epsl.2025.119716.
- 4) X.X. Wang, **J.F. Yang***, **L. Zhao**, G. Lu, Z.Q. Ma. Lithospheric control on the deep mantle carbon transfer in the Magadi-Natron basins, East Africa. *Tectonophysics*, 2025, 910, 230829. DOI: 10.1016/j.tecto.2025.230829 .

4. New contacts (this year)

- (1) Professor Riama Nelly Florida, BMKG, Indonesia
- (2) Professor Simon Wilde, Curtin University, Australia
- (3) Professor Robert Spicer, The Open University, UK
- (4) Professor Taras Gerya, ETH Zurich

5. Usage of ILP funding (this year)

We co-organized the International Workshop: Lithospheric Evolution and Earth's Habitability, which was held in Beijing from July 21-25, 2025, and related expenses of the conference includes: accommodation, car rental charges, document printing fees, etc.

6. Activities planned for 2026

- 1) session on tectonic carbon cycle at the EGU, Vienna, Austria.

2) session on tectonic carbon cycle at the AGU, tbd, USA.

Appendixes:

Pictures of activities in 2025.