Weihe Basin Drilling Project (WBDP): Cenozoic tectonic-climate interactions

tetonic forcing

Asian rainfall in warming period

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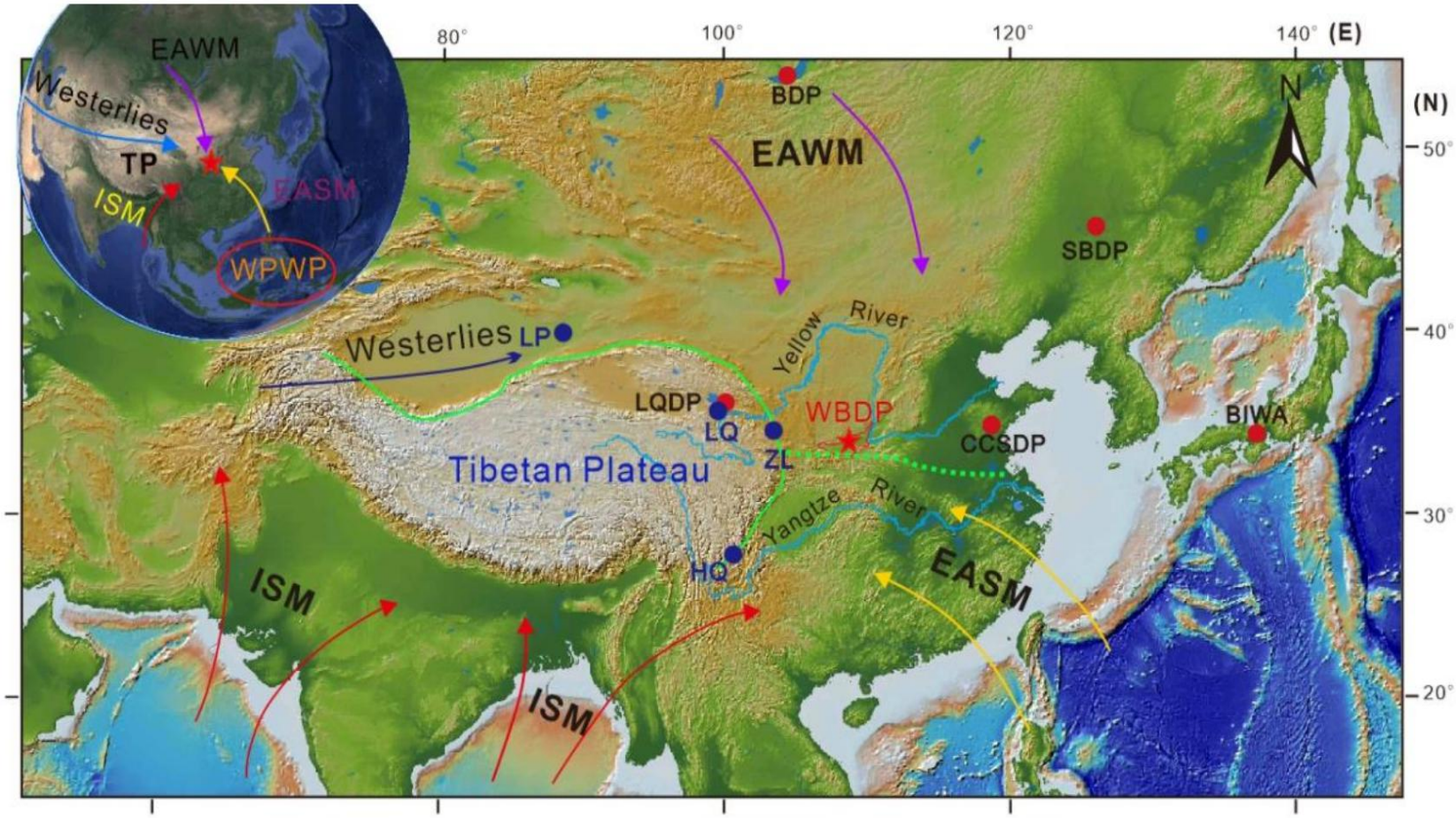
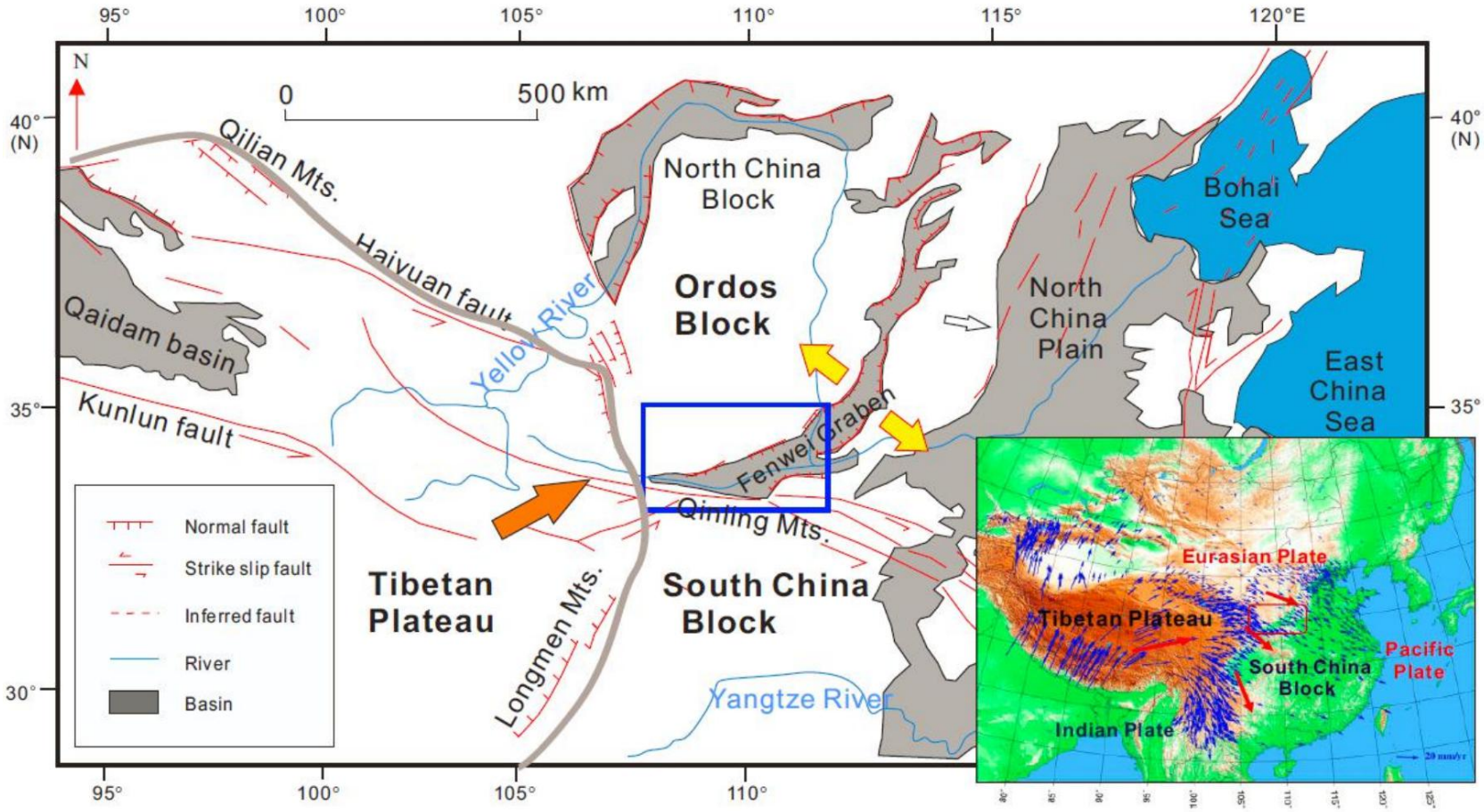
西安地质调查中心

Scientific Importance of WBDP: Climatic link to Tripolar environmental changes



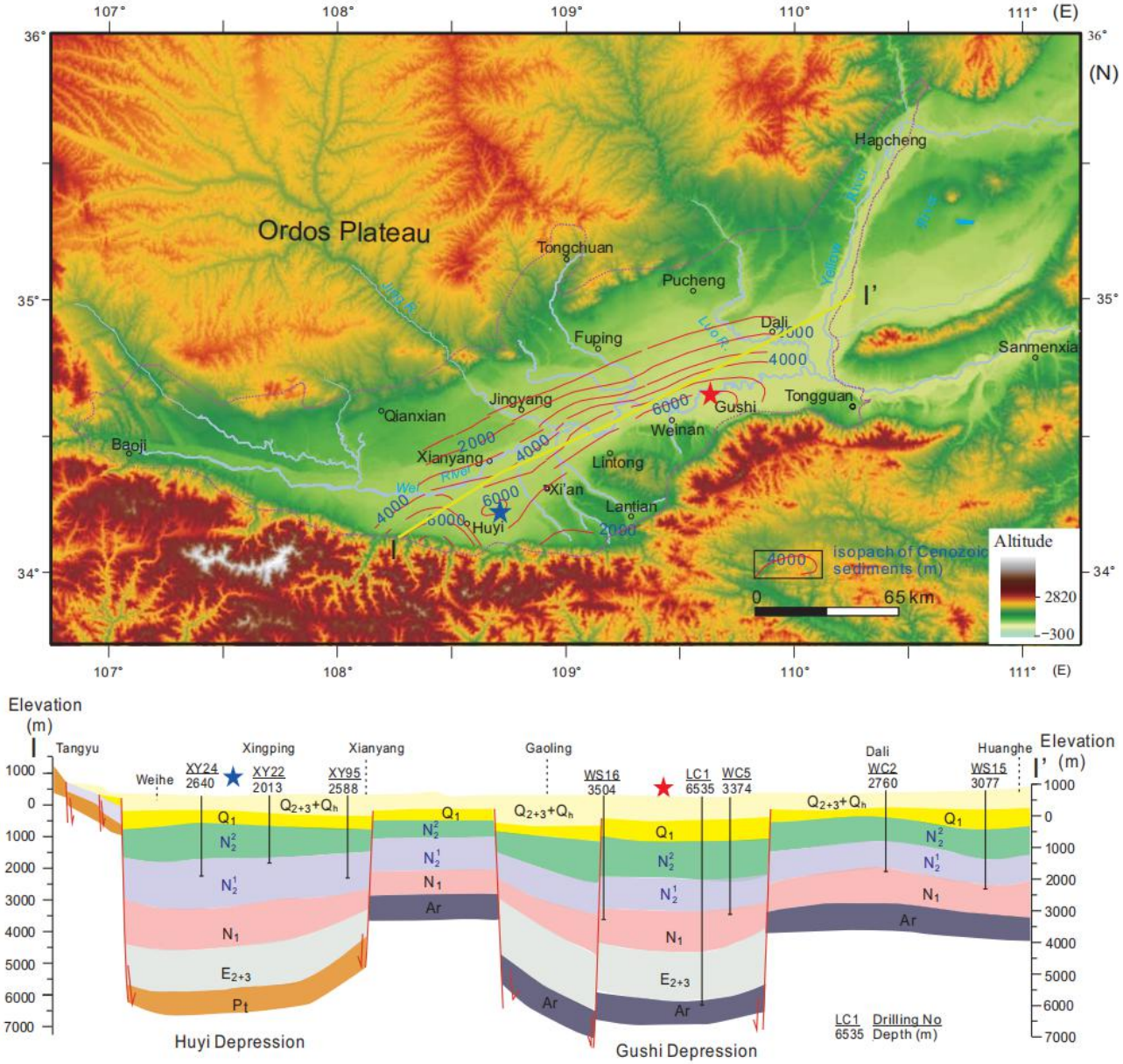
- South Pole-ISM &
- North Pole-Westerlies & EAWM
- Tibet-Mechanical & thermal

Tectonic link to Tibetan Plateau and Qinling Mts.

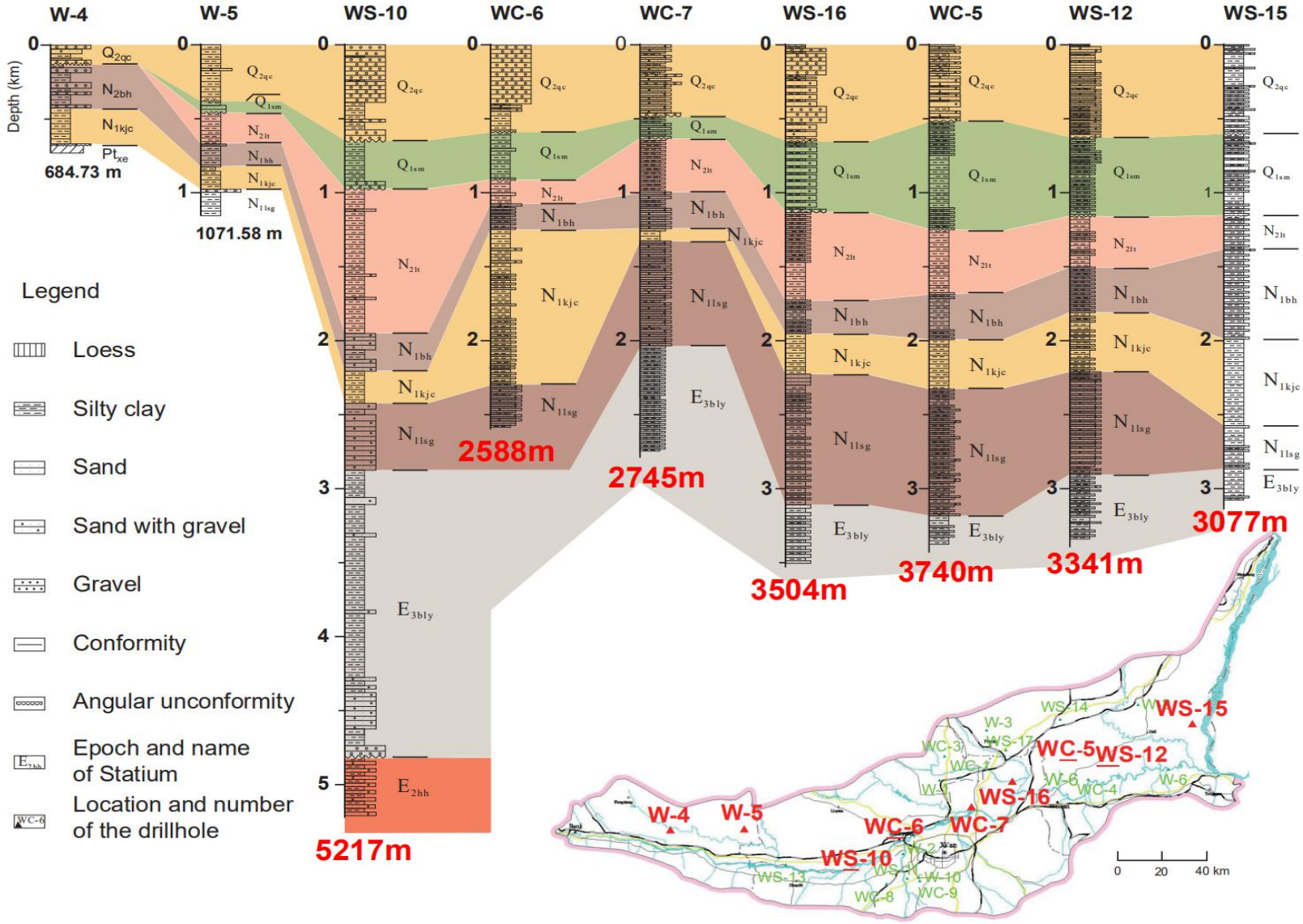


- Jointly influenced by the Indian Plate, Eurasian Plate and Pacific Plate

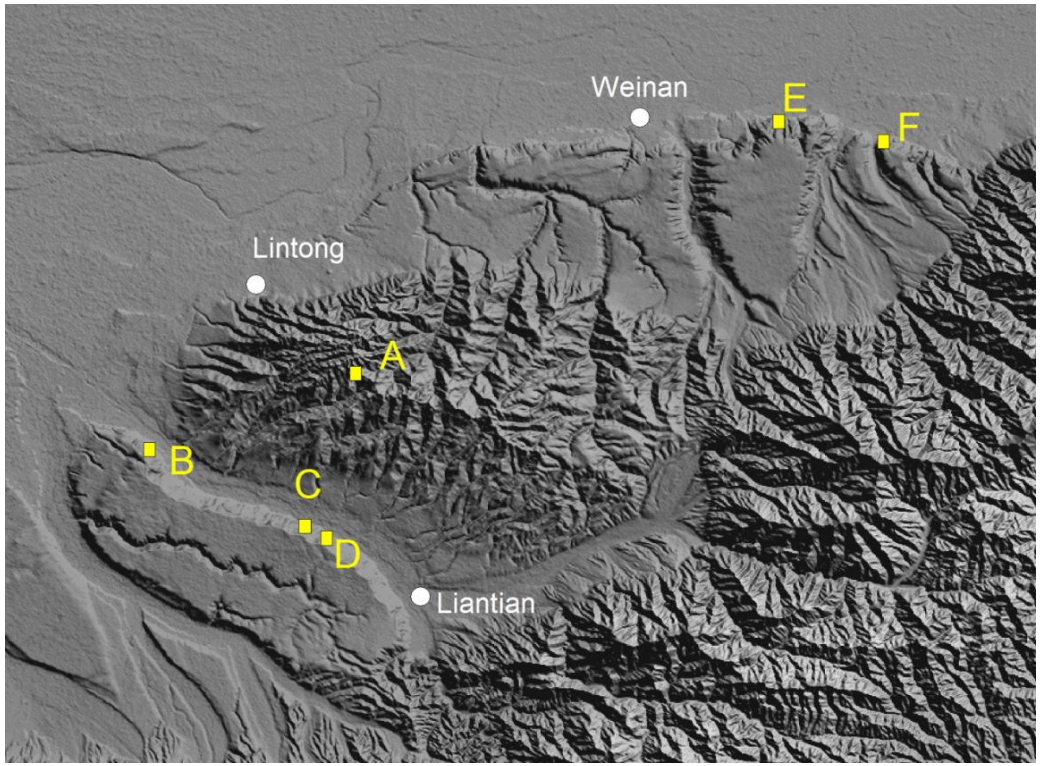
Unique Archive from Eocene to present



Recent studies : Fluvial-lacustrine sediments



Typical outcrops of Cenozoic strata



Eocene
Honghe formation

Oligocene
Bailuyan formation

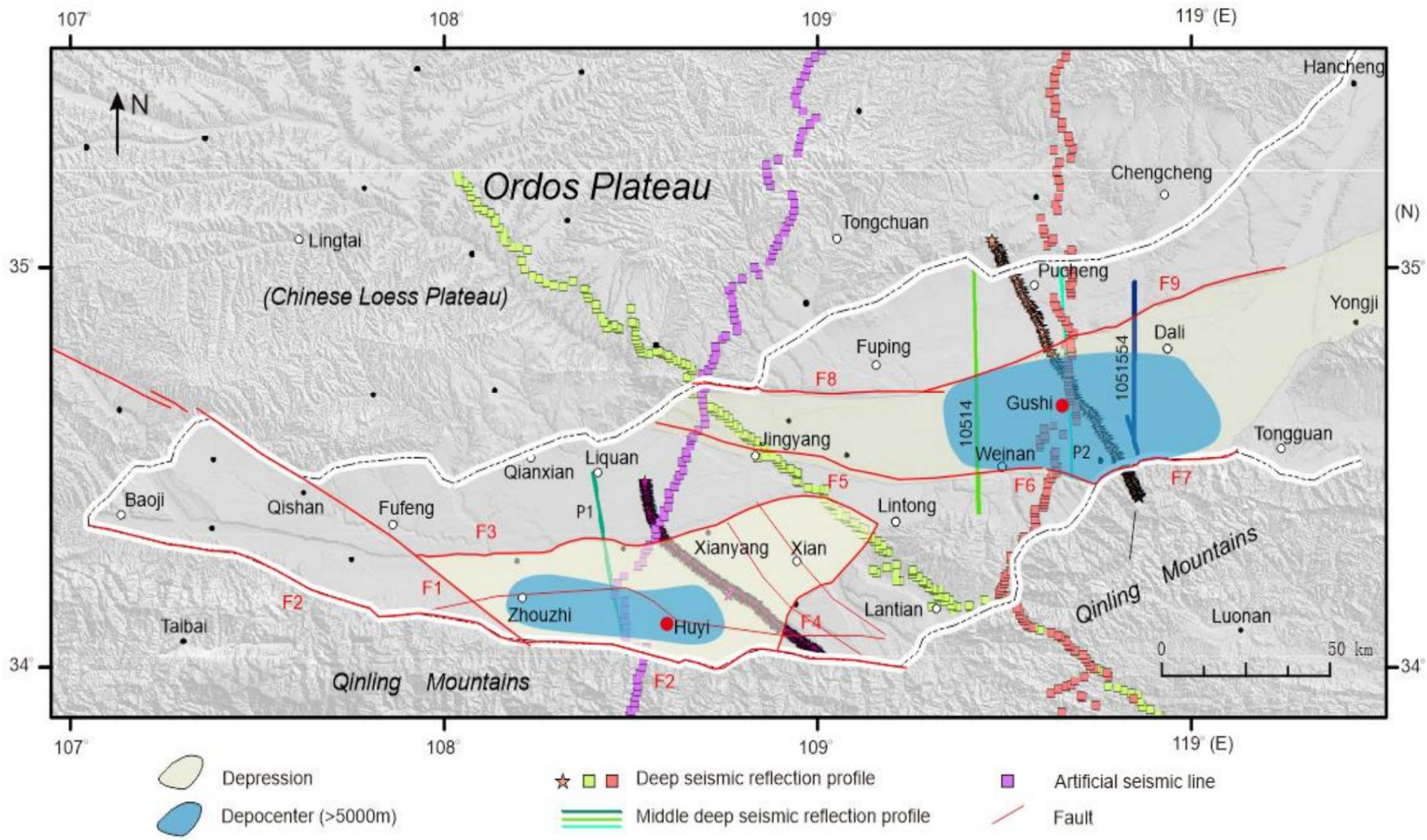
Miocene
Bahe formation

Pliocene
Lantian formation

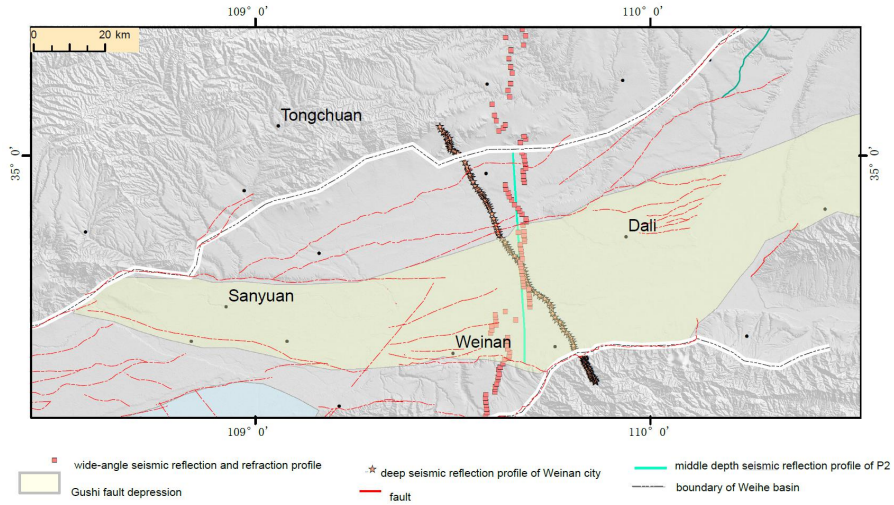
Sanmen formation

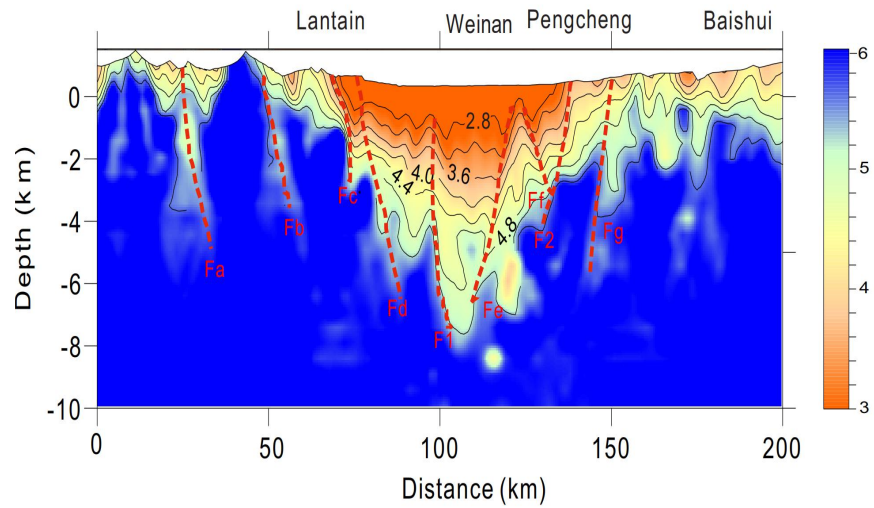
Zhangjiapo formation

Geophysical survey in Weihe Basin

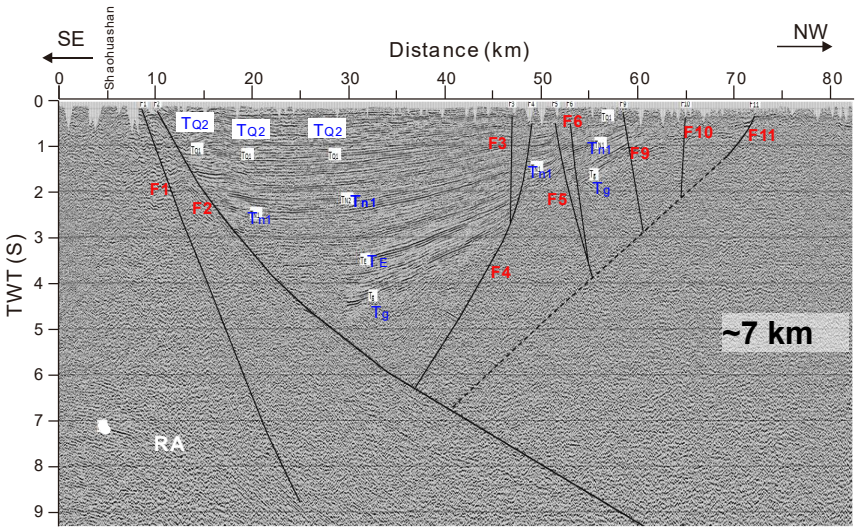


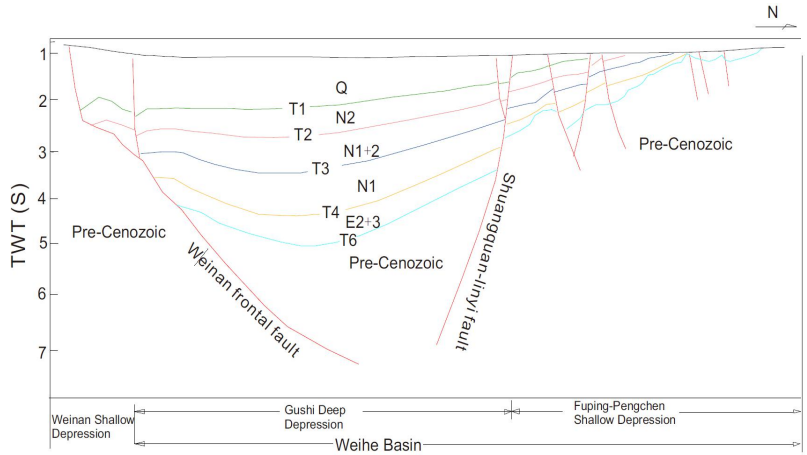
Geophysical Survey Results of East Depression





Shaanxi Seismological Bureau, 2017



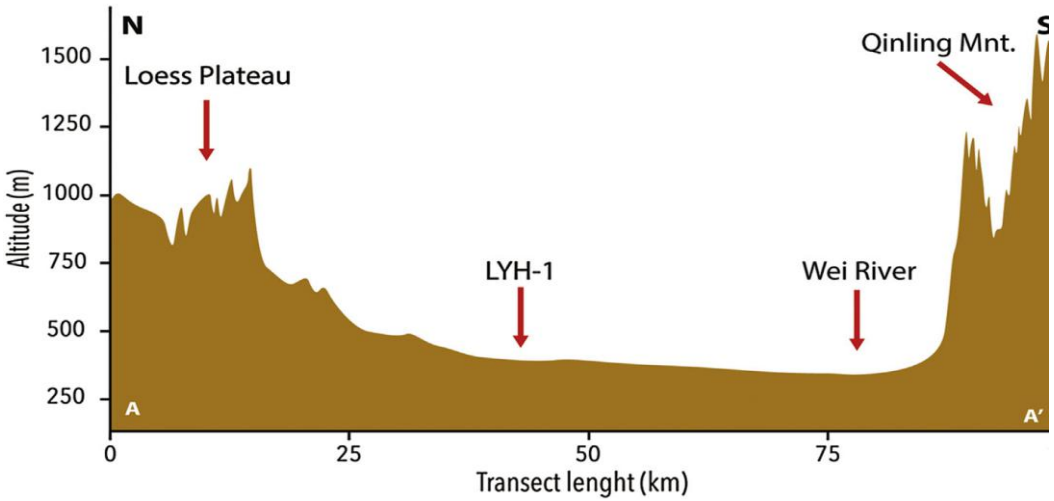


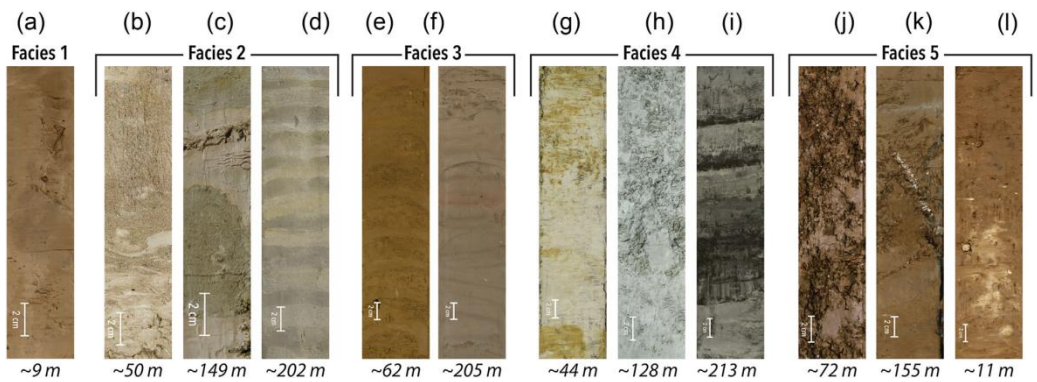
Shaanxi Seismological Bureau, 2017

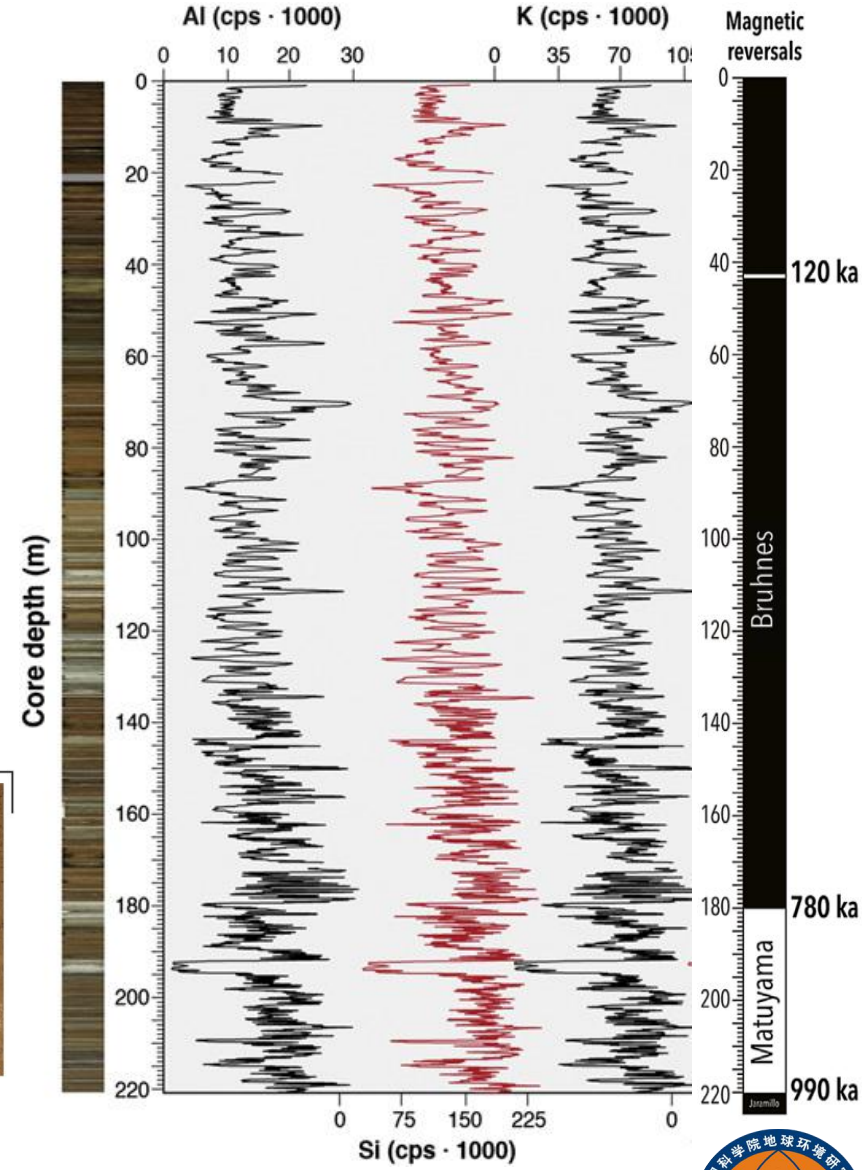
Liu et al, 2018

Preliminary results of the LYH Core from the East Depression

Five lithofacies: (1) Aeolian deposits, (2) Fluvial flooding deposits, (3)Lacustrine suspension deposits, (4) Playa lake deposits and (5) Alluvial sediments.

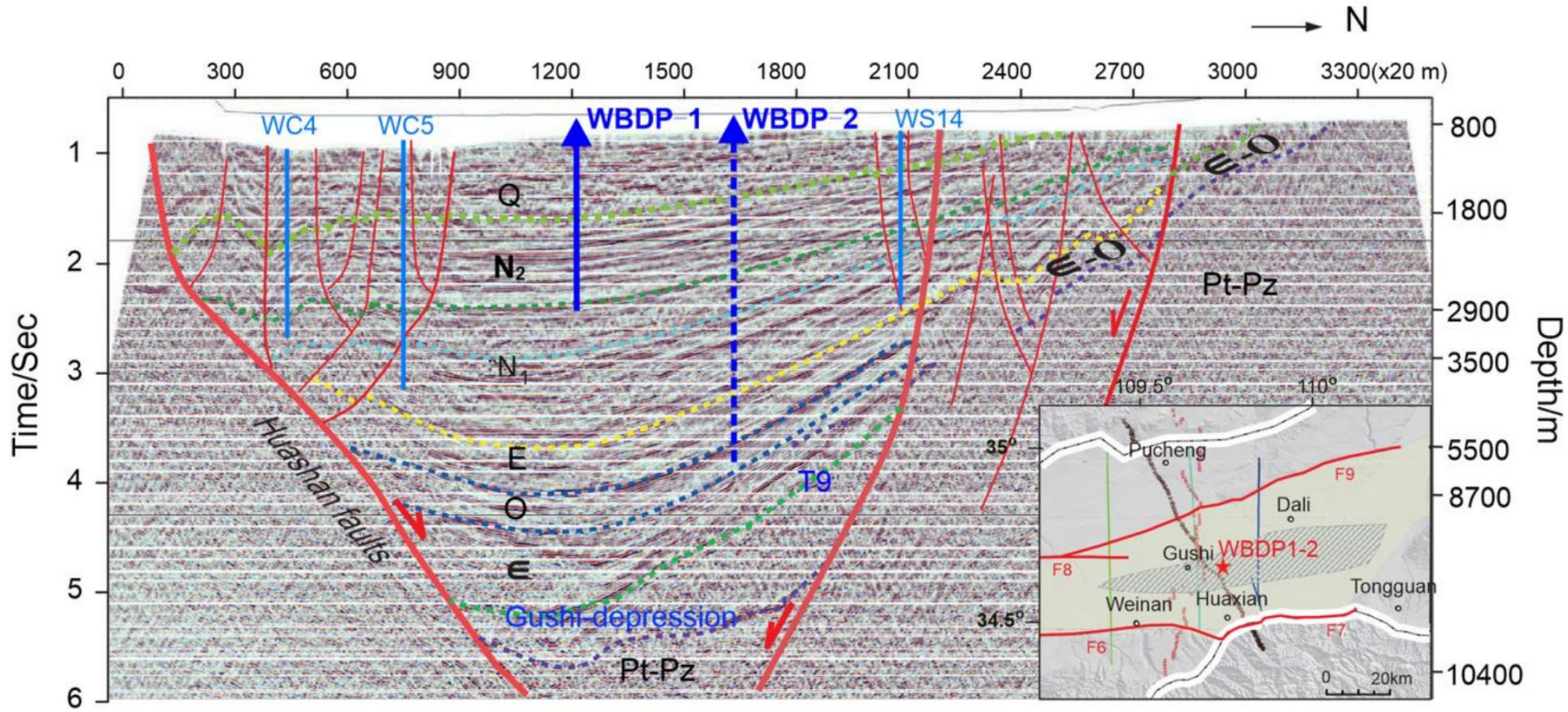






Rits et al., 2017, Paleo-3

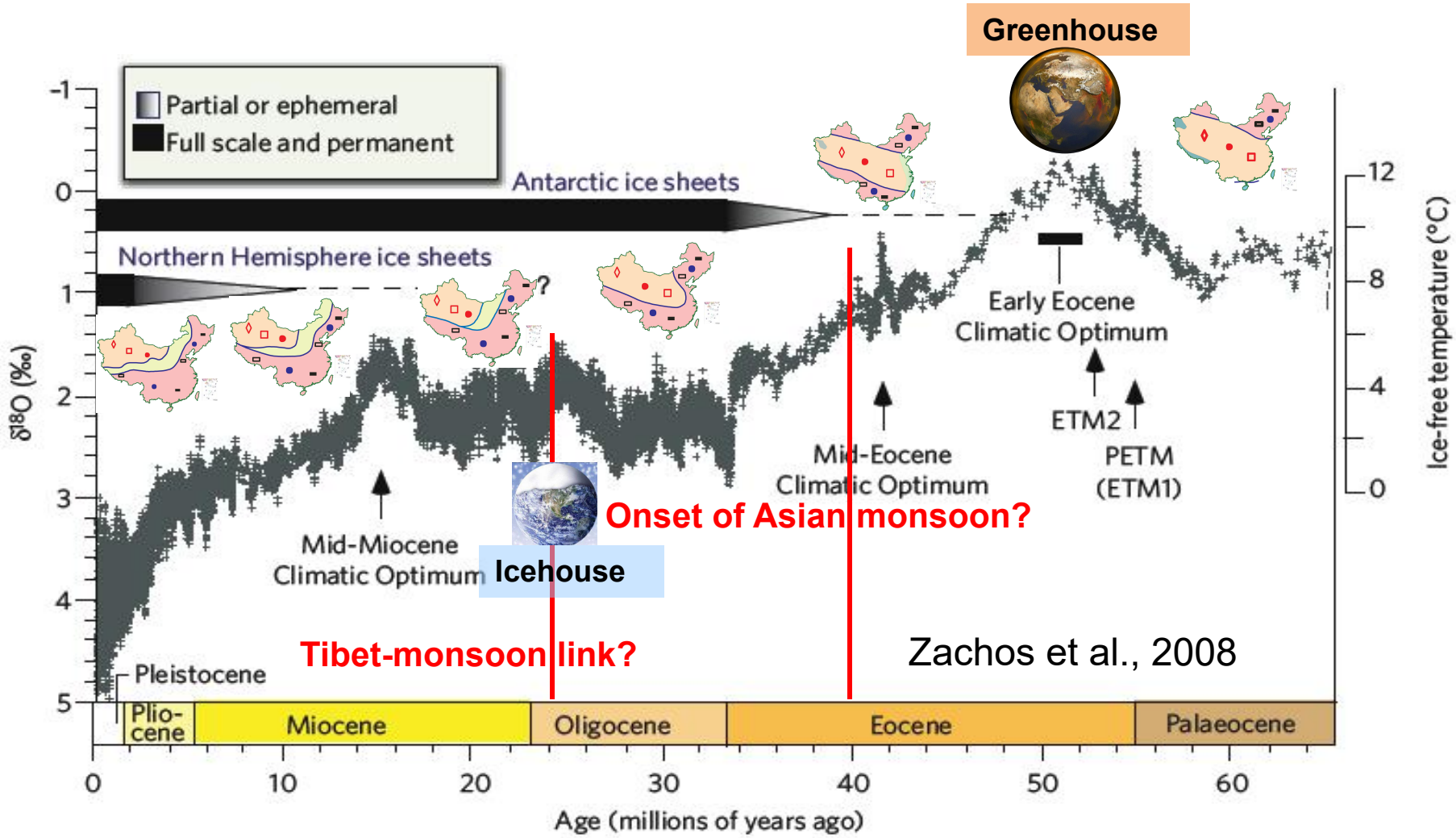
Proposed Drilling Site in the East Depression



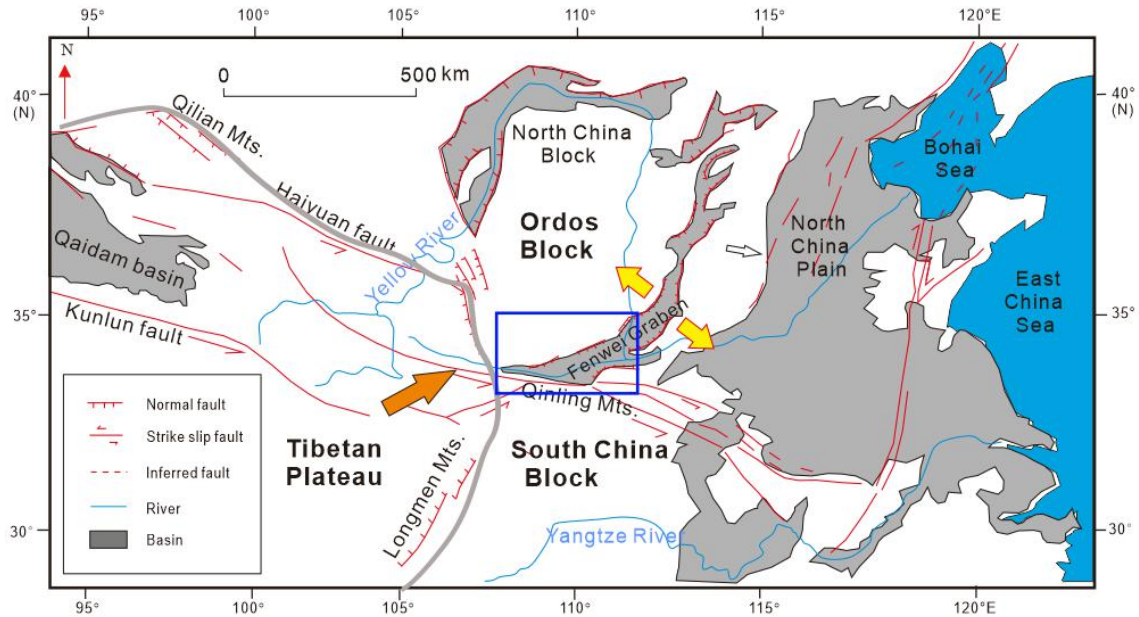
- Phase I: WBDP1 （3000m ）
- Late Miocene-Quaternary
- High-resolution paleoclimate reconstruction using multiple proxies.

- Phase II WBDP2（~7500m）
- Bedrock, Eocene-Quaternary sediments
- Tectonic-climate interactions

Objectives: Cenozoic climate change and Global linkage

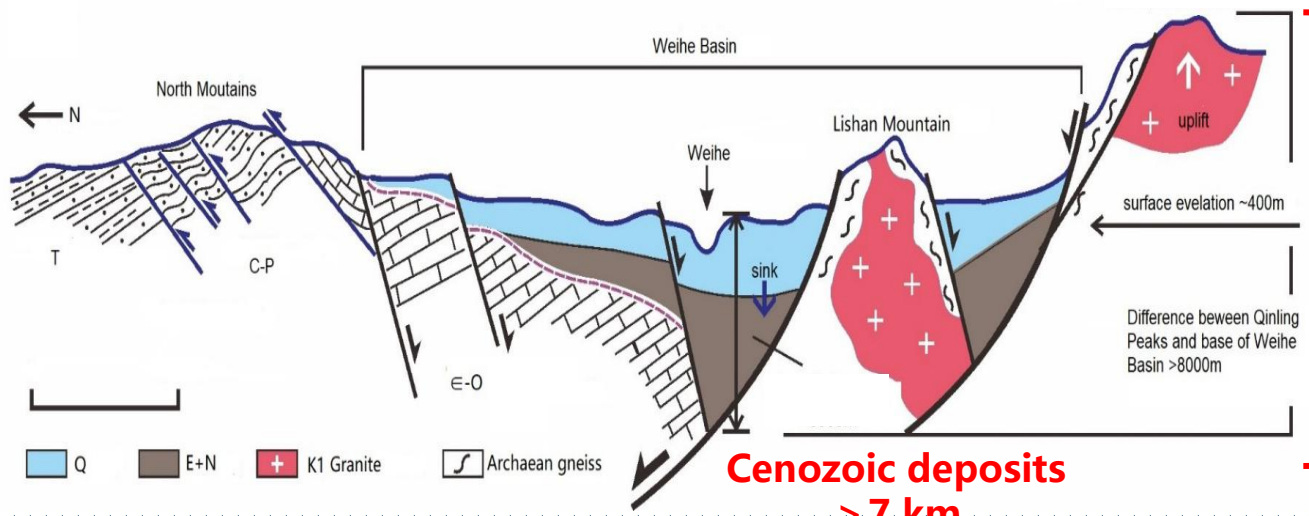


Objectives: Basin-Mountain Coupling and Tectonic links



Amplitude Difference (>9 km) between Qinling Peaks and base of Weihe Basin

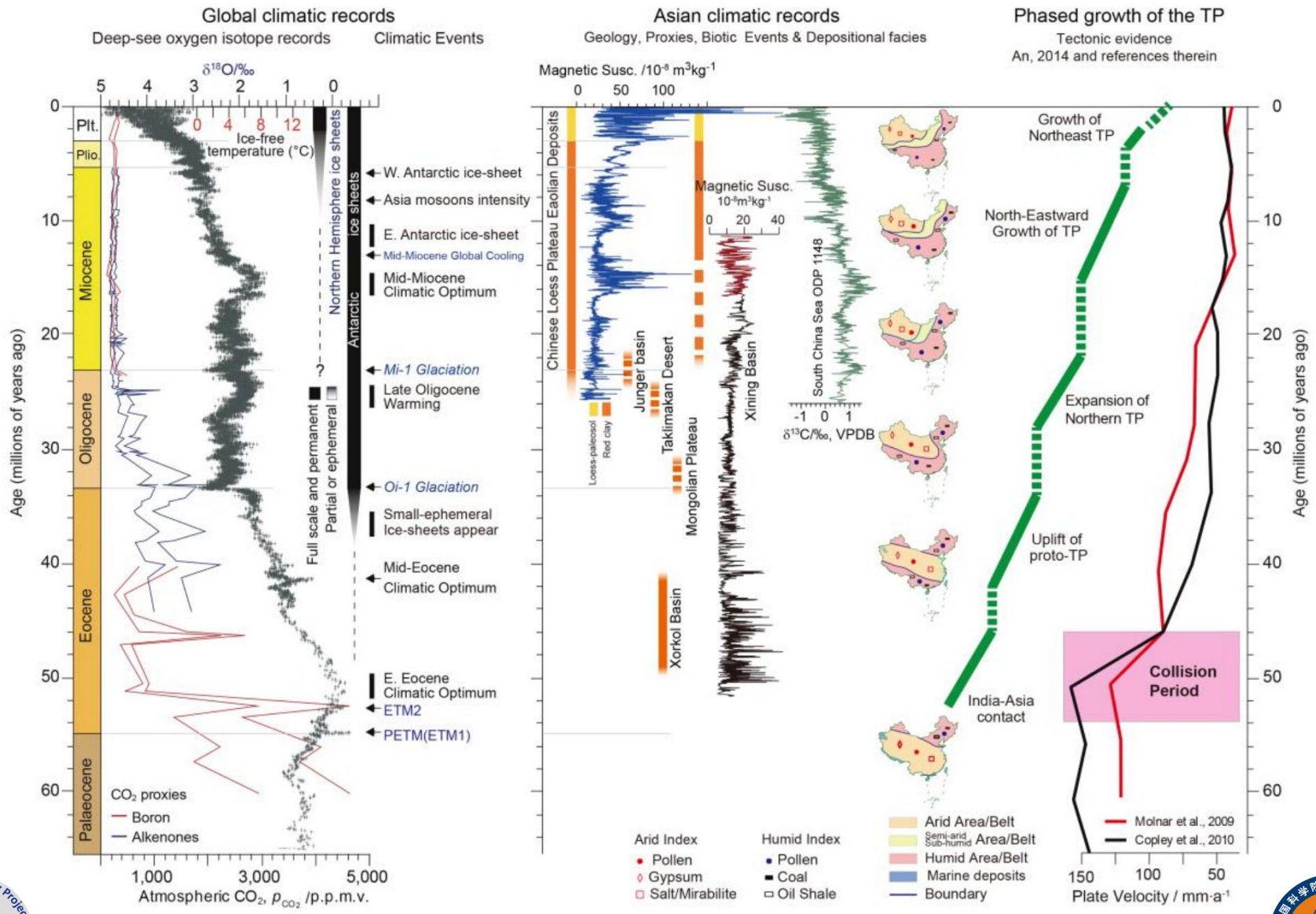
Qinling Mountains south peak Hua Mts ~2155m



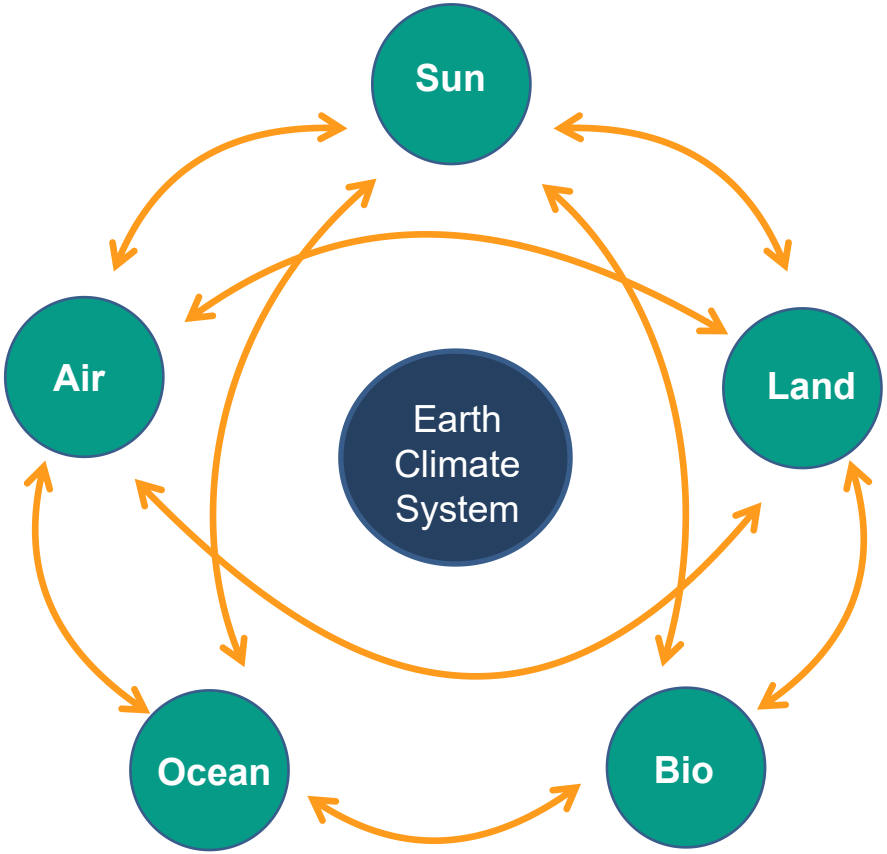
9 km

Cenozoic deposits > 7 km

Objectives: Cenozoic tectonic-climate interactions



Objectives: Deep time Global environment changes



The Weihe Basin Drilling Project

In preparation

Thank you