Juvenile source of the North Tianshan turbidite and implication for continental growth of the Central Asian Orogenic Belt

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Outline

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Background and significance

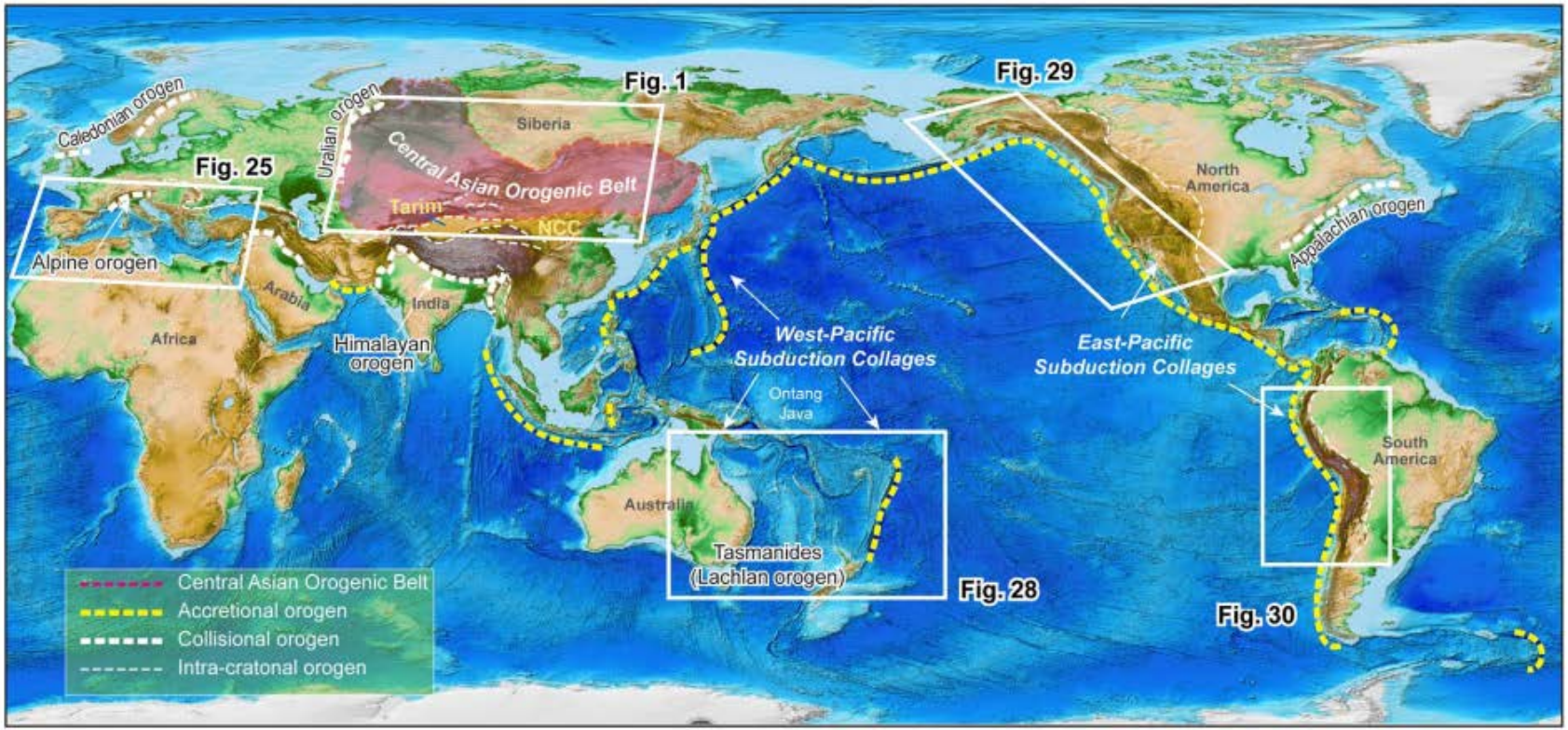
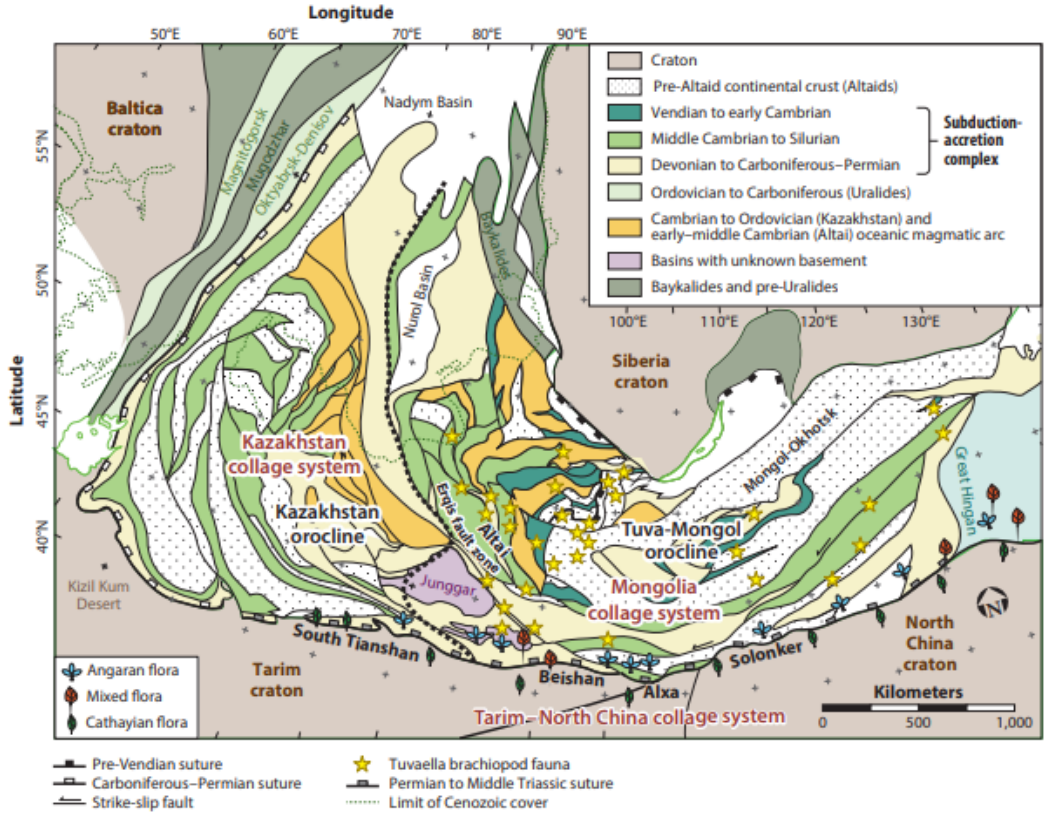


Fig. 1. A simple map showing the distribution of some typical accretionary, collisional, and intra-cratonic orogens. Xiao et al., 2018

Background and significance



Tectonic map of the main components of the Central Asian Orogenic Belt (Xiao et al., 2015)

Şengör et al. (1993) first proposed that virtually the entire orogenic system is derived from a giant intra-ocean arc system and that ca. 50% of the present crust in Central Asia is juvenile.

Background and significance

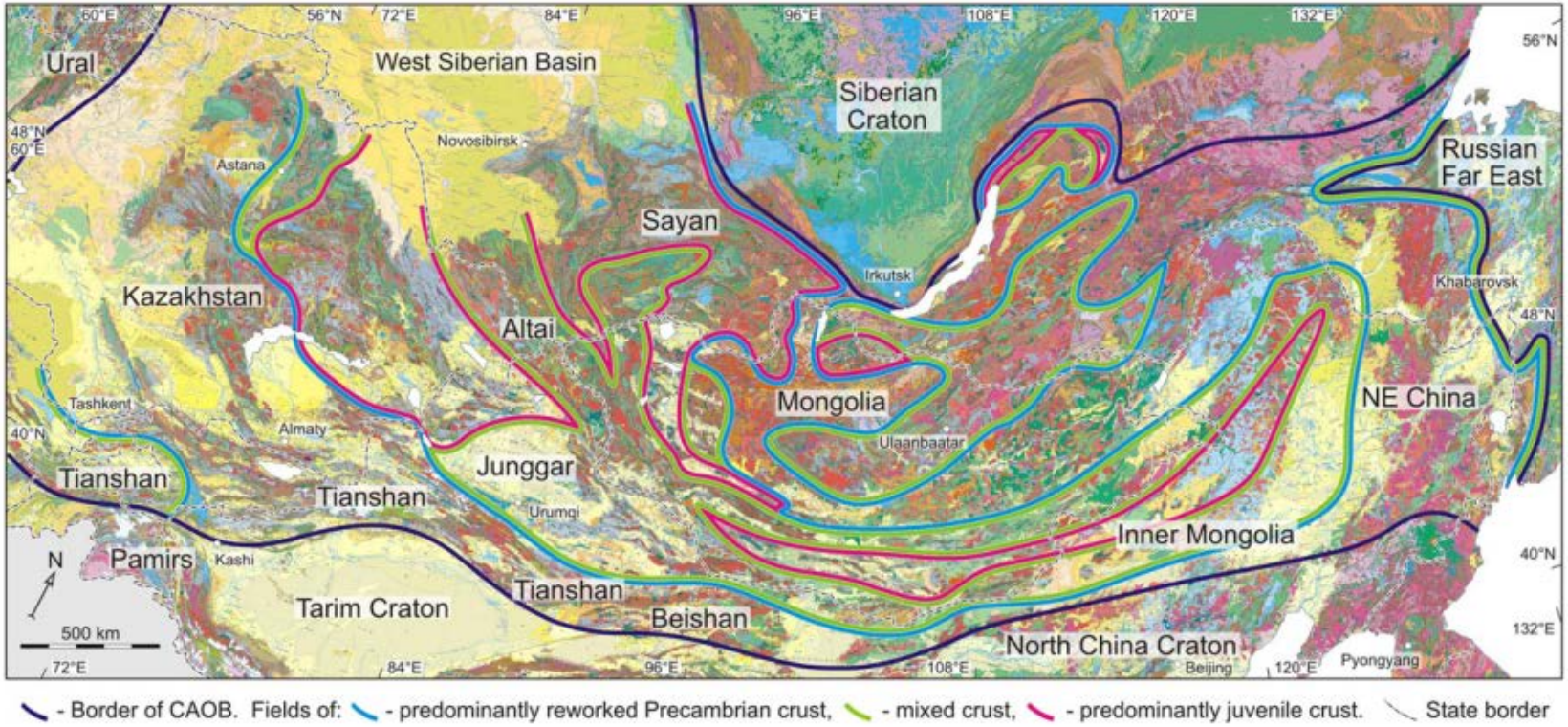
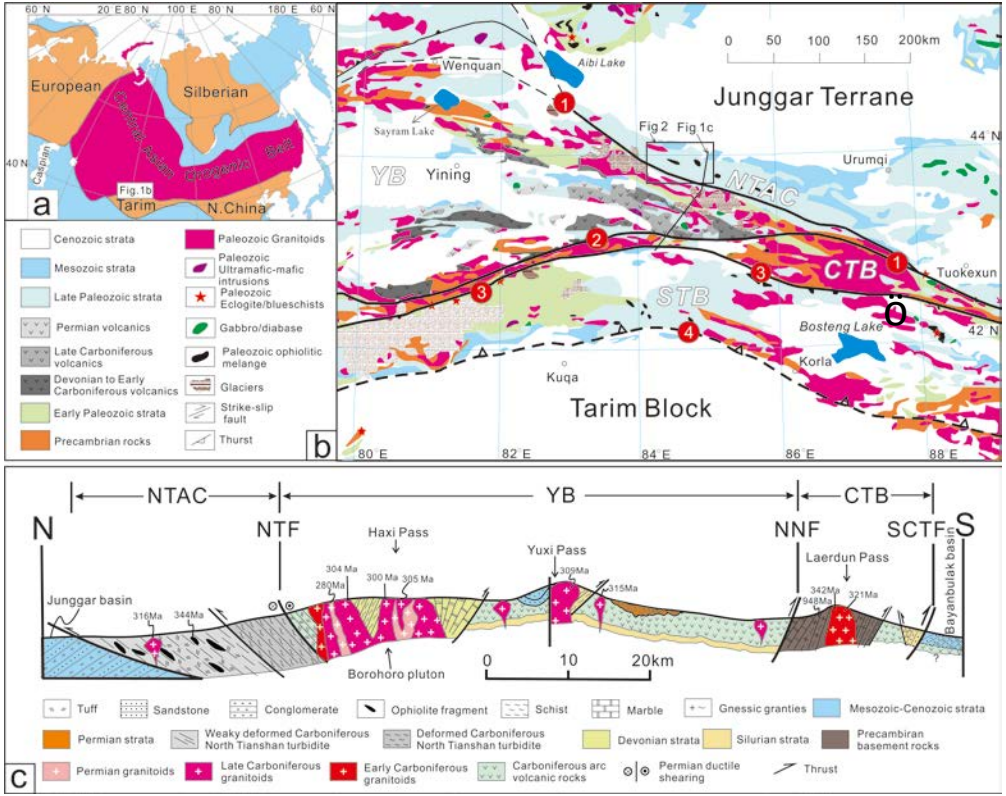


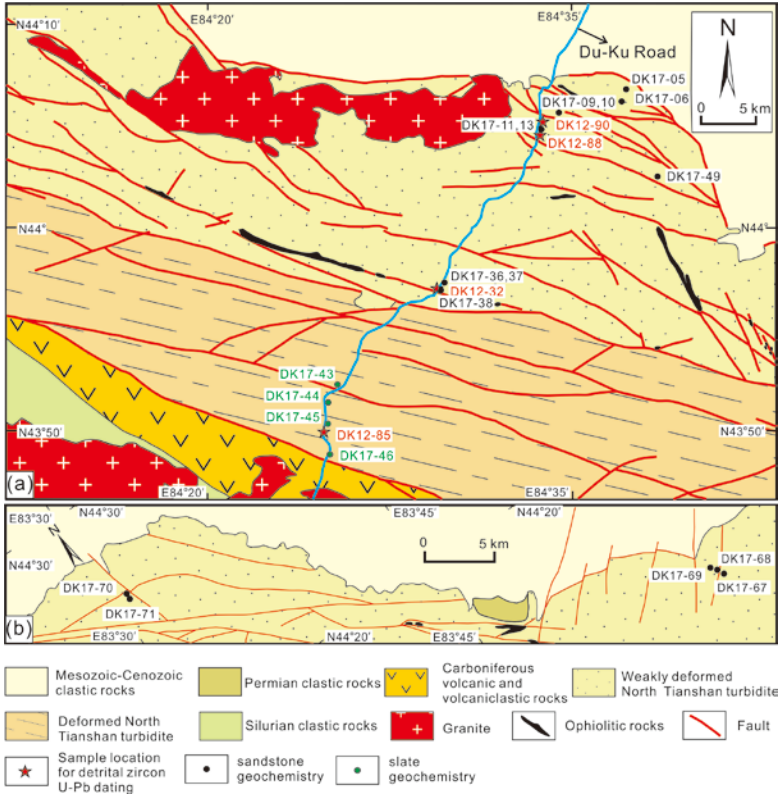
Fig. 15. Geological map of the CAOB showing isotopic provinces. Colour coding as in Figs. 1 and 3. (Base map adapted from T. Li, 2008).

Kröner et al., 2017

Geological setting

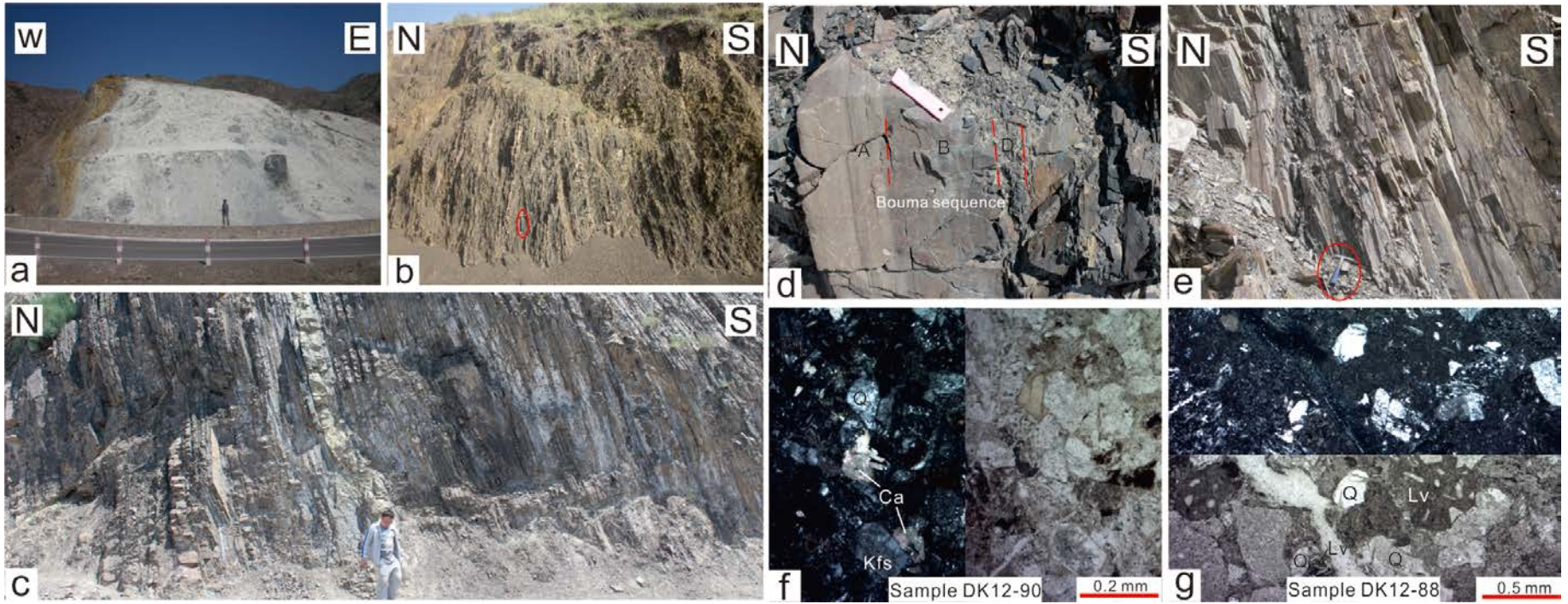


Geological map of the Chinese West Tianshan Orogen(Wang et al., 2019)



Geological map of the NTAC showing sampling locations

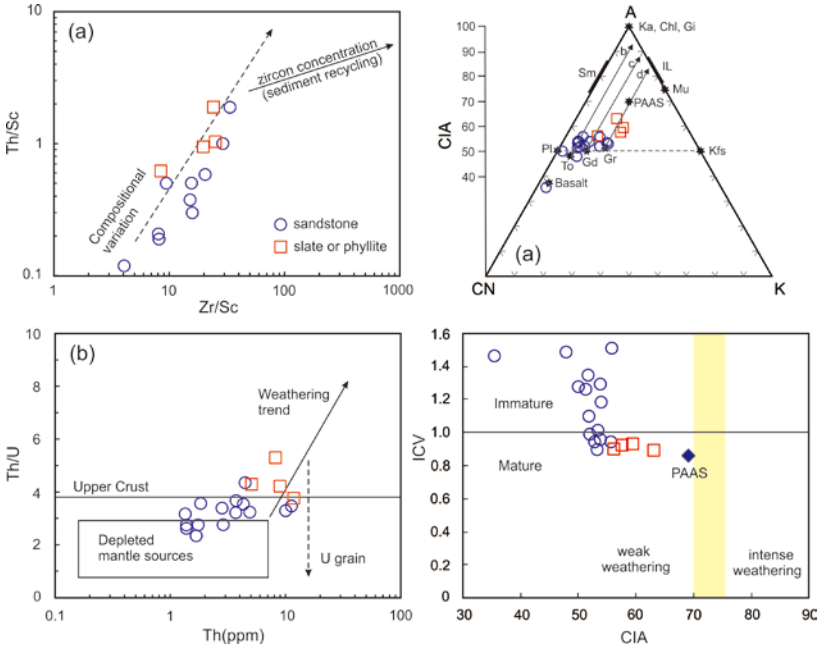
Geological setting



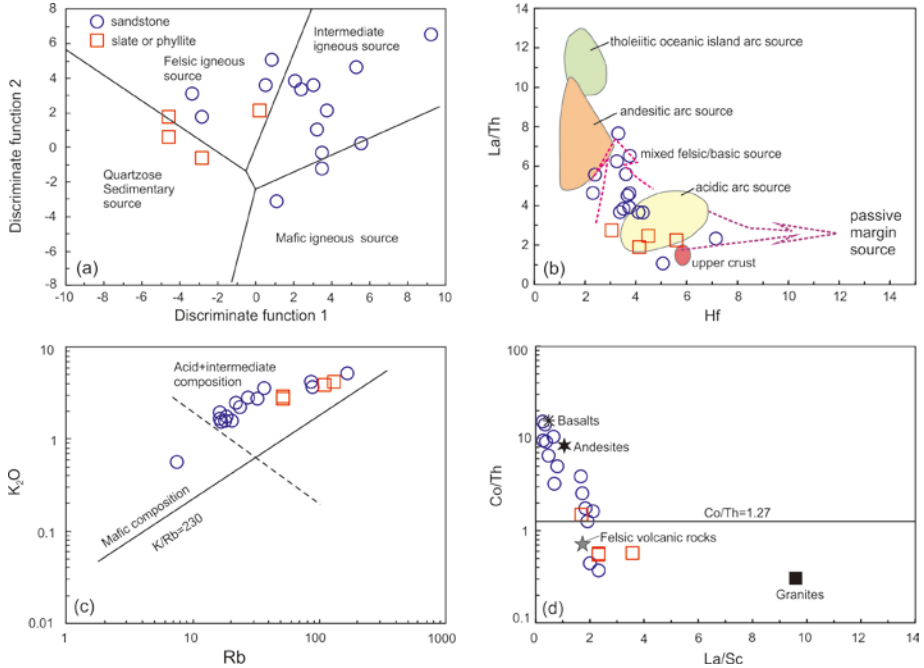
Outcrop and microscope-photographies of the turbidites from the NTAC

Source nature of the North Tianshan turbidites

- Geochemistry of the turbidite

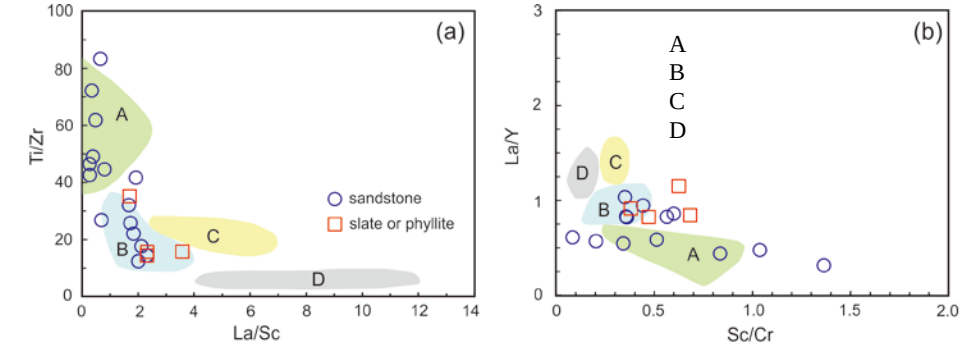


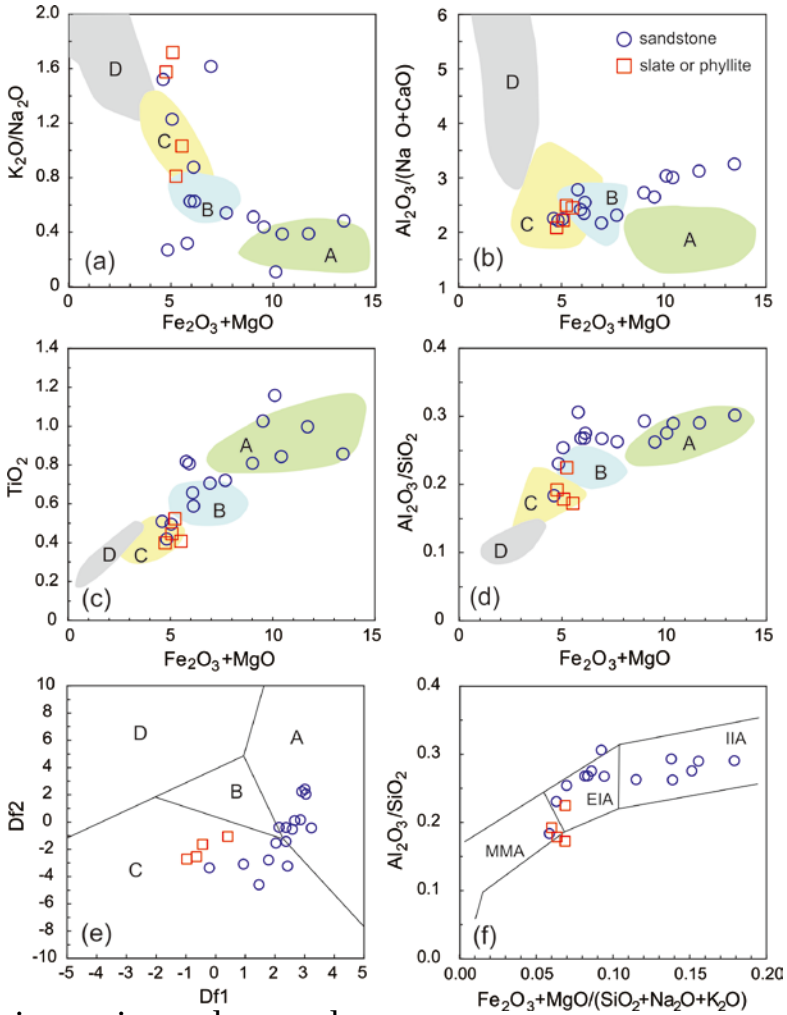
Weathering character of the turbidites



Discrimination diagrams for source rock types

➢ Source characteristics

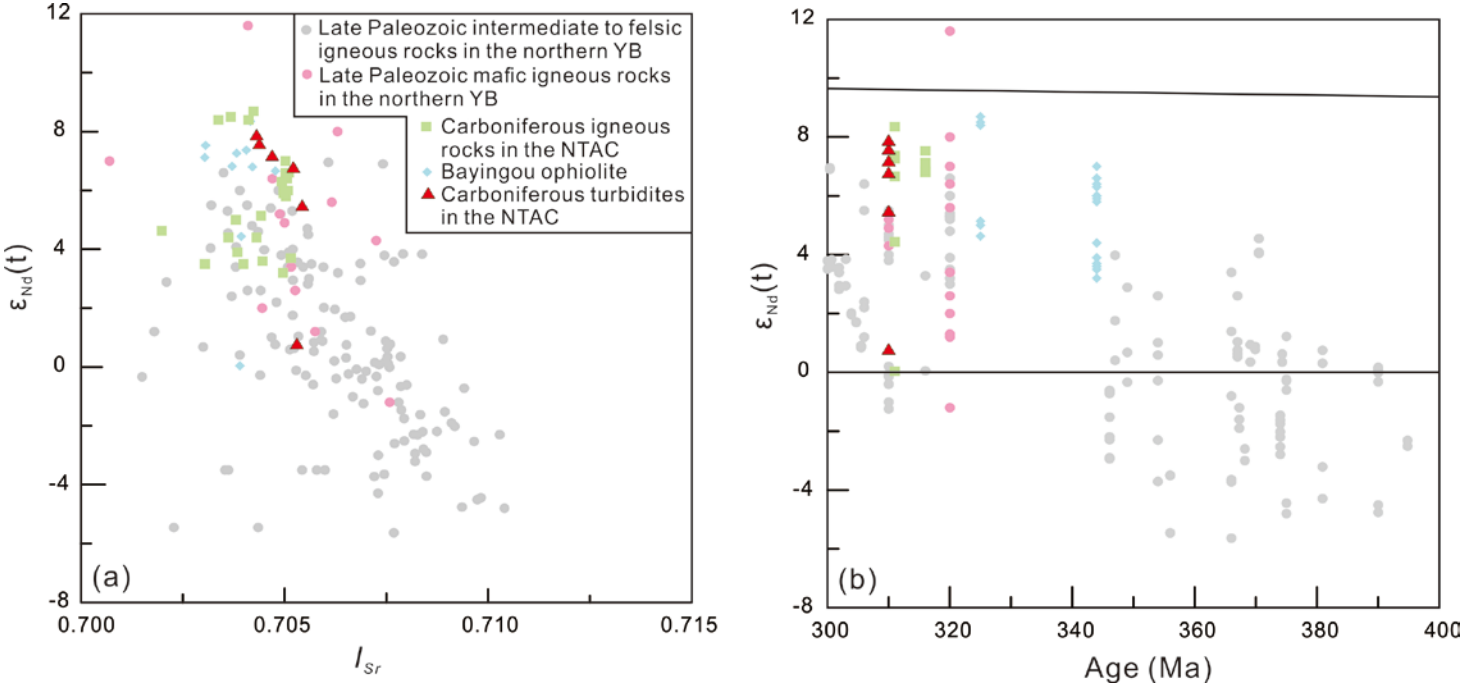




Tectonic setting discrimination diagrams of source rocks using major and trace element

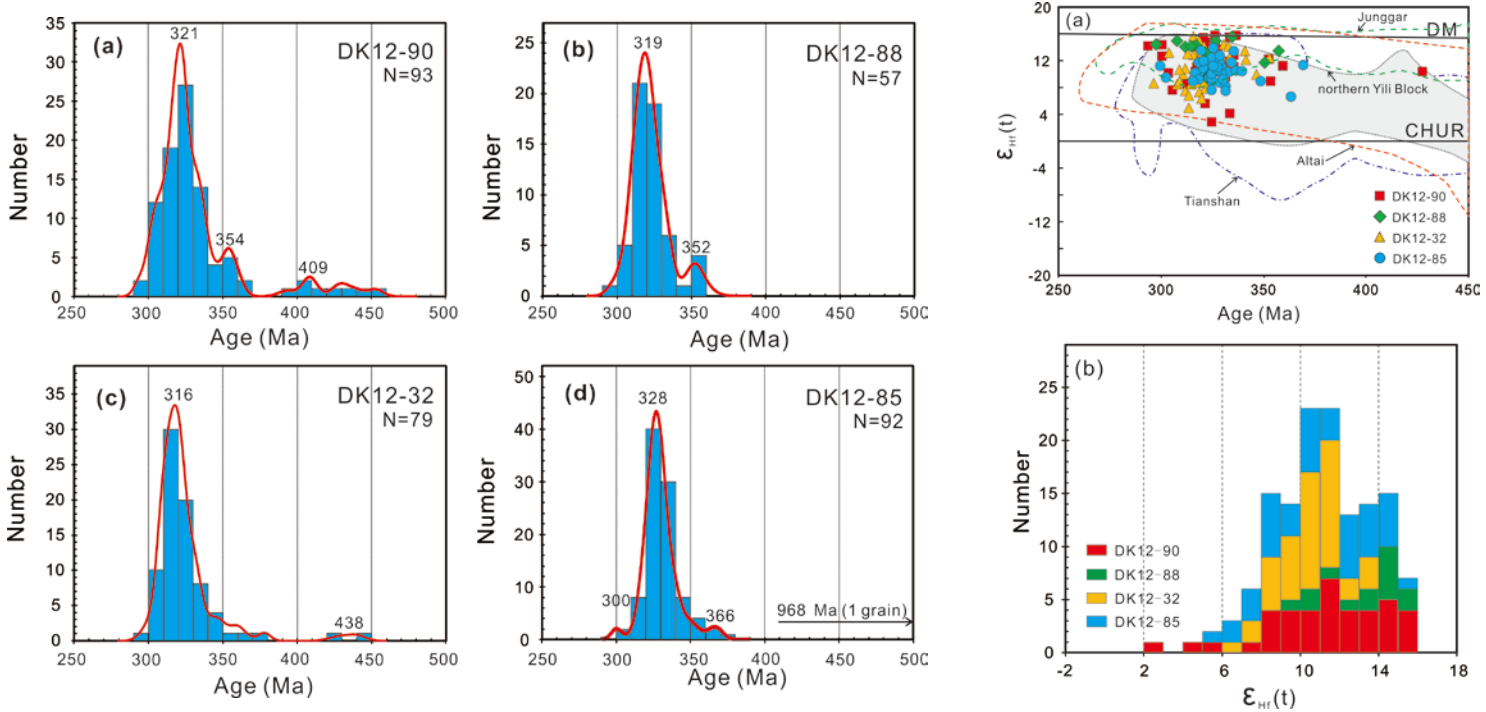
Source nature of the North Tianshan turbidites

- Sr-Nd isotope data



Source nature of the North Tianshan turbidites

- Detrital zircon U-Pb and Lu-Hf isotope data



Relative probability density-histogram plots of detrital zircons

Wang et al., 2019, JG

Conclusion

1. The North Tianshan turbidites were derived from juvenile intermediate to felsic igneous rocks.
2. The source rocks were formed in active continental margins.
3. The northern Chinese West Tianshan is an area mainly composed of juvenile crust.

Thanks for your attention!