

Study reveals the Southwest Tianshan Mountains contribute the majority of the Kyzylkum desert sand and river system

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Geography of Central Asia and sample locations (prevailing summer/winter wind directions at 850 hPa indicated in green and blue, respectively, modified after Shi et al. Credit: *Geophysical Research Letters* (2024). DOI: 10.1029/2024GL108951

Arid Central Asia is an important dust source in the northern hemisphere, which has a significant impact on the ecological

environment of Central Asia, Northwest China and even the East Asian monsoon region. The Kyzylkum Desert is one of the biggest deserts in Central Asia and the eleventh largest desert in the world.

There were few studies on the [dust](#) sources of the desert, which limited the understanding of the sedimentation process in the area. Therefore, studying the dust material sources and transport routes of the Kyzylkum Desert is essential for understanding the impact of Central Asian dust on global climate and [environmental change](#).

[In a study published](#) in *Geophysical Research Letters*, researchers from the Institute of Earth Environment of the Chinese Academy of Sciences, and Uzbek scientists, collected topsoil samples from the [desert](#) in Uzbekistan, the Syr Darya and Amu Darya river basins and the piedmont area of West Tianshan Mountains.

They obtained 1,278 groups of age data based on laser ablation multiple-receiver plasma mass spectrometry analyses of the U-Pb dating of detrital zircon.

Researchers established a mixing model of the Kyzylkum Desert by combining multiple regression analyses and previously published data of the potential source area.

They found that the main source of the Kyzylkum Desert is the Southwest Tianshan, and that the river system dominated by the Syr Darya River, including the Amu Darya River and the Zeravshan River, is the main transportation channel for these dust materials.

Researchers found that the dust of the Kyzylkum Desert can be transported to the piedmont area by wind, and the transport and deposition process is mainly controlled by topography.

This study provides important evidence for understanding the origin and transport process of dust materials in the Kyzylkum Desert, which is of great significance for the study on the paleoenvironmental changes and geomorphological evolution processes in Central Asia.

More information: Mingyu Zhang et al, Provenance and Fluvial-Aeolian Process of Kyzylkum Desert: Constrained by Detrital Zircon U–Pb Dating, *Geophysical Research Letters* (2024). [DOI: 10.1029/2024GL108951](https://doi.org/10.1029/2024GL108951)

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