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Environmental changes in Central Asia during 1000 years

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To clarify the environmental changes in Central Asia during the past 1000 years, we summarized proxy data of various types, including data from tree rings, and old maps, and data showing changes in lake level, lake area, and glaciers. In lowland areas, lake-level changes can be used to reconstruct environmental change. Old maps and lacustrine terraces indicate lake-level changes. Tree-ring data substitute for summer temperature and precipitation data. Changes in glaciers reflect the climatic condition, and old documents and maps record historical changes in human activity and lifestyle. To reconstruct past environmental changes, we should synthetically interpret several types of proxy data rather than relying on a single type. Some reports suggest that the Aral Sea in the 13th century would have been similar to the current lake area. Changes in lake level have also been reported for other Central Asian lakes during the past 1000 years. For example, Issyk-Kul Lake expanded between the 18th and 19th centuries, when old maps show that the Chu River connected to the lake. The results highlight the significant environmental changes that have occurred in the past millennium in Central Asia.

Keywords: Central Asia, proxy data, old map, lake level change, glacier changes, tree-ring data