

# Q-TiP – Tipping points of lake systems in arid central Asia – water budget in the Gaxun Nur Basin

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**Q-Tip** ist Teil von **CAME II**: Kipp-Punkte im Klimasystem und ihre Konsequenzen für Zentralasien

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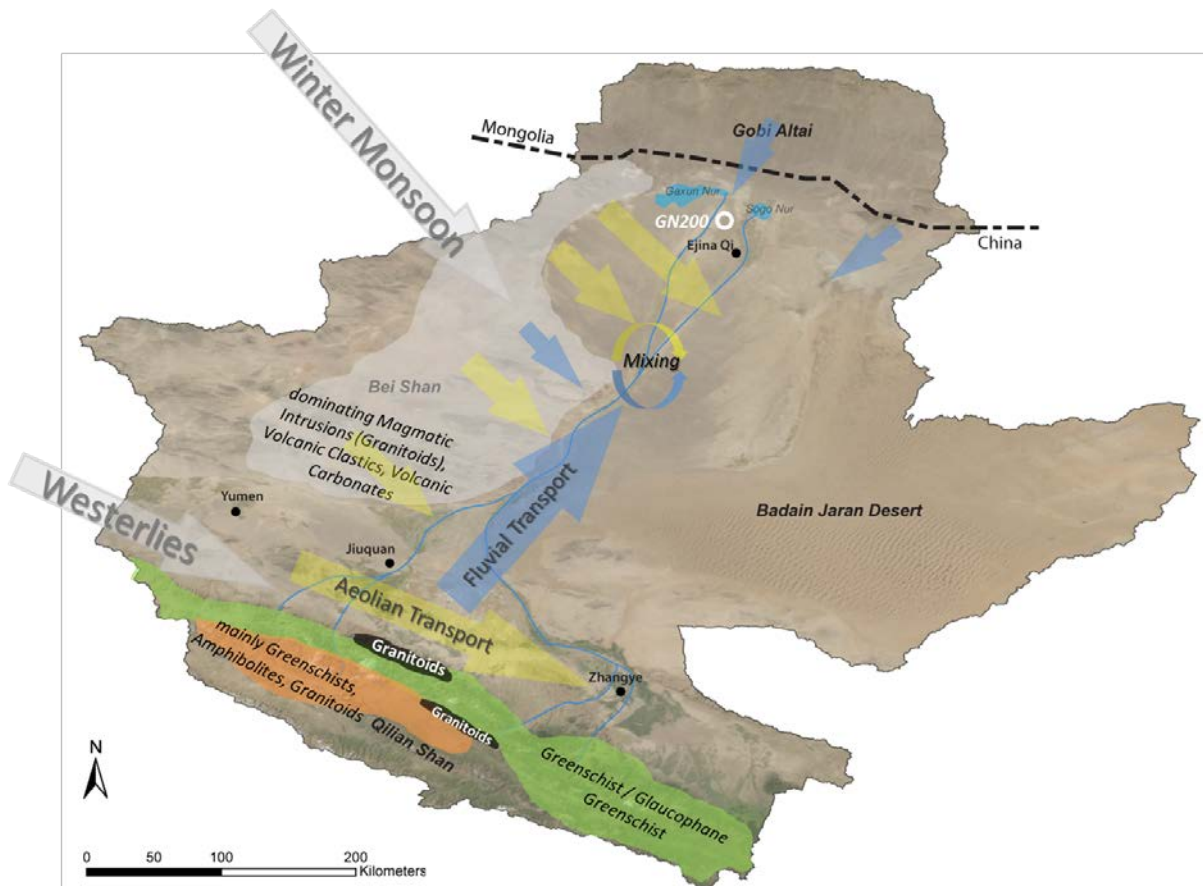
Central Asia is an important habitat and a large-scale source of dust transport. Within Q-TiP we study the control factors of tipping points in hydrological systems of arid central Asia, conditioned by climate and other processes, projected in the geological past and on the present or the future. The project has two questions: (1) What keeps large lake systems alive in this arid zone over long periods of time and what causes tipping points that lead to their disappearance? (2) What are the effects of tipping points on the landscape system, also with regard to recent and future climate changes? These questions will be examined on the timescales of glacial / interglacial cycles (last 3 to 2 million years) and for the last glacial cycle (last 120,000 years). The methodological approach combines the analysis of proxy indicators of past climate and environmental change from existing sediment cores (up to 223 m core length), geomorphological work and sensitivity studies using climate modeling. Basic hypotheses are (a) a regional water recycling over glacial / interglacial timescales and (b) the impact of tectonic changes that can trigger tipping points and thereby make sea systems disappear. This subproject (AP1) is jointly conducted by FU Berlin and AWI Potsdam and highlights tipping points from sediment core analysis (GN200, 223 m long). GN200 has been extracted from the Gaxun-Nur Basin in NW China. With the help of granulometric, palynological, isotopic (i.e.  $\delta^{18}\text{O}$ ,  $\delta^{13}\text{C}$  on ostracod shells), geochemical (i.e. ICP-analyzes on carbonate) and mineralogical (i.e. XRF core scans, XRD of mineral phases) analyzes as well as comprehensive multivariate statistics, the transition from a humid to an arid zone in the area is being highlighted and the environmental conditions at the time of deposition are specified.

Milestones are:

M1-1. Completion of the sampling

M1-2. Completion of all laboratory analyzes

M1-3. Validation of tipping points in the context of climate and environmental change



Position of core GN200 in the Gaxun-Nur Basin, NW China, with geological units in the basement and main transport processes.

## Partners

Alfred-Wegener-Institut, Helmholtz-Zentrum für Polar- und Meeresforschung (AWI), Potsdam

RWTH Universität Aachen, Fachgruppe für Geowissenschaften und Geographie, Geographisches Institut, Lehrstuhl für Physische Geographie und Geoökologie

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