Cryospheric and related observations at Tianshan and Altay mountains in China

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TGS Mountain Station

Altai Station for Glacier, Snow and Environment

TGS Base Station
Observation Locations
Circulation systems: westerly jet stream, Arctic air mass, and the Siberian high.

Snow: Heavy snow cover areas in China

River: The Ertix is the only river in China that flows into the Arctic Ocean

Glacier: The highest altitude and the lowest glacier terminus in China

Ecology: Siberia southern taiga ecoregion
Altai Station: Climatology, Snow, Glacier, Hydrology and Ecology
Glacier in Tomur Area
55 ablation stakes were set throughout the glacier since 2008, and were subjected to a monthly measurements in summer.
Ice Motion Observations

Locations of ice stakes were measured by high precision GPS using post-processing method. These were conducted every month in summer, which allow us analyses the seasonal characteristic of ice motion.
AWS Network

4500 m
4000 m
3500 m
3000 m
Glacial Runoff Measurement
Glacial Observations

- Mass balance
- Ice motion
- Changes in Area, length, volume
- Borehole temperature
- ......
Meteorological and Hydrological Stations

- Qingbingtan Glacier No.72
- Muchang AWS
- Xiaokuergan Hydrologic Station
- Glacier Hydrologic Station
- AWS on the glacier
- AWS on the moraine
天山北坡经济带，面临经济发展和水资源短缺的矛盾

共发育冰川 **3400** 条，分布在博格达、天格尔、依连哈比尔尕山北坡

形成了大小近百条河流，是乌鲁木齐和北疆诸多重镇的主要水资源

小于 **1km²** 冰川为主的河流，融水径流占 **6-20%**：乌河、头屯河、三屯河等

冰川面积多在 **5 km²** 以上河流，融水径流占 **35-53%**：包括玛纳斯河、霍尔果斯河、安集海河等

气候变化影响不同，需要分别研究
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WGMS network

Urumqi Glacier No. 1 is the one of ten reference glaciers around world
Observation & Facilities in the Headwaters of UR

Hydrological Gauge (UG1)

Hydrological Gauge (Dry Cirque)

Hydrological Gauge (for whole watershed)

Integrated Observation Field (Dry Cirque)

Meteorological Observation Field (Daxigou)

Permafrost Monitoring Field (Mountain Station)

Integrated Monitoring Tower (the first in China built for glaciology study)
Observation Locations

K. No. 51
Miaoergou
U. No. 1
Altai
Kazakhstan
Uzbekistan
Kyrgyzstan
Turkmenistan
Uzbekistan
Kazakhstan
Mongolia
Russia
China
Nepal
Bhutan
Bangladesh
Myanmar
India
Pakistan
Afghanistan
Tajikistan
Iran

Map showing the location of Miaoergou, K. No. 51, and U. No. 1 in relation to other countries and regions.
Hydro-meteorological observation System

**Yushugou**: 集水面积 308 km²，源区冰川 9 条，面积 22.85 km²

**Baijie**: 集水面积 431 km²，源区有冰川 12 条，面积 13.36 km²

**Weizixia**: 集水面积 1047 km²，源区冰川 39 条，面积 35.63 km²

**Toudaogou**: 集水面积 371 km²，源区无冰川
Glacial runoff observation

榆树沟冰川径流观测断面
3500 m

冰川水文断面缆道测流装置

水文断面观测用房
Precipitation Monitoring Network in high elevation by using T200B precipitation gauge

Qingbingtan glacier No.72: 3950m
Urumqi Glacier No.1: 4130m
Yushugou glacier: 3710m
Altai Station: 1384m
Qiyi glacier: 4309m
Thank you!