



## **Recent change of glacier volume in the Chon-Kyzylsuu river basin, Teskey Ala-Too range, Tien Shan mountains, using airphotos, topographic maps, and ALOS PRISM satellite stereo data**

**C. Narama** (1,2), A. Kääh (2), G. Moholdt (2), K. Abdrakhmatov (3)

(1) Research Institute for Humanity and Nature, Kyoto, Japan, (2) Department of Geosciences, University of Oslo, Norway, (3) Institute of Seismology, Kyrgyz Academy of Science, Bishkek, (narama@chikyu.ac.jp / Phone: +81-75-707-2398)

In order to clarify recent glacier volume changes in the Tien Shan mountains, Digital Elevation Models (DEMs) from different times are compared in this study. The study area is the Chon-Kyzylsuu river basin, located the eastern part of the Teskey Ala-Too range in the northern Tien Shan of Kyrgyz Republic. In the study site, glacier area diminished by about 8% in the western Teskey Ala-Too range between 1971 and 2002 (Narama et al., 2006). For this study we produced DEMs from airphotos taken in 1976, topographic maps from 1985, and ALOS PRISM satellite stereo data from 2006. The ALOS PRISM sensor includes a nadir, a forward, and a backward sensor, generating a stereoscopic image data set of 35 km in width with a spatial resolution of 2.5 m. The airphotos and the ALOS PRISM data were oriented using ground control points from the 1:50,000 topographic maps. A DEM from the topographic map was generated by digitizing and interpolating contour lines from the 1:50,000 topographic maps. The quality of the different DEMs was assessed for stable terrain outside the glaciers using data from kinematic-GPS field campaigns in 2007, the ASTER DEM, the SRTM DEM, and the 1:50,000 topographic maps. The resulting remotely-sensed glacier volume changes are compared to mass balance data from the Kara-Batkak glacier observed from 1957 onwards. Glacier area in the Chon Kyzylsuu river basin shrank by 9% between Corona data from 1971 and ASTER data from 2004. Most

glacier volume was lost in the period 1985-2006, and glacier termini of some glaciers lost up to 50 m in surface elevation.