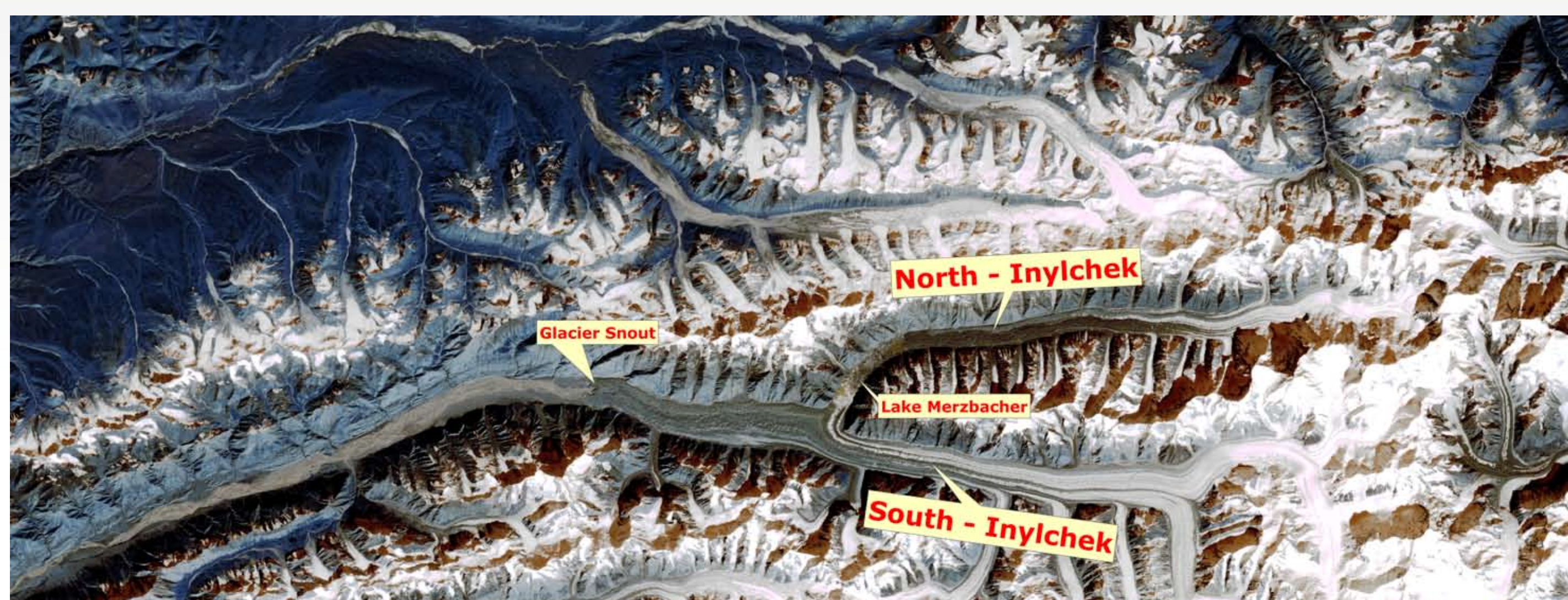


INTRODUCTION

Within the Inylchek - Tien Shan Global Change Observatory (GCO), initiated by Geoforschungszentrum Potsdam (GFZ) and the Central Asian Institute for Applied Geosciences (CAIAG), the work group for Applied Geology, Remote Sensing and GIS of the University of Vienna (Austria) is performing a detailed analysis of spaceborne and airborne remote sensing data to reconstruct the glacial history and change in the Inylchek region.

The Inylchek Glacier System located in the Kyrgyzstan, Kazakhstan, China border triangle, stretching about 60 km and covering an area of approx. 650 sq km, is well known for its spectacular glacier morphology. In the area of the Lake „Merzbacher“ the northern and southern branches of the glaciers are joining. The Lake is named after the famous German geographer Gottfried Merzbacher (1843 - 1926), who mapped the area in the year 1903 already.



The Inylchek - Tien Shan Glacier System represented on an enhanced Landsat TM satellite image acquired in October 2002. Band combination 1/2/3, ground resolution 30m. source: GLCF

Ground check for the satellite image interpretation Lake Merzbacher area:



Ice cliffs detached from the southern Inylchek glacier. Initially these ice cliffs were floating on the water of the Merzbacher Lake. After the sudden drainage of the Lake, end of July 2009, the ice cliffs grounded on the lake bottom.

Ground check for the satellite image interpretation Glacier snout - Western Inylchek Glacier:



Snout of the Western Inylchek Glacier as seen during the field expedition of August 2009.



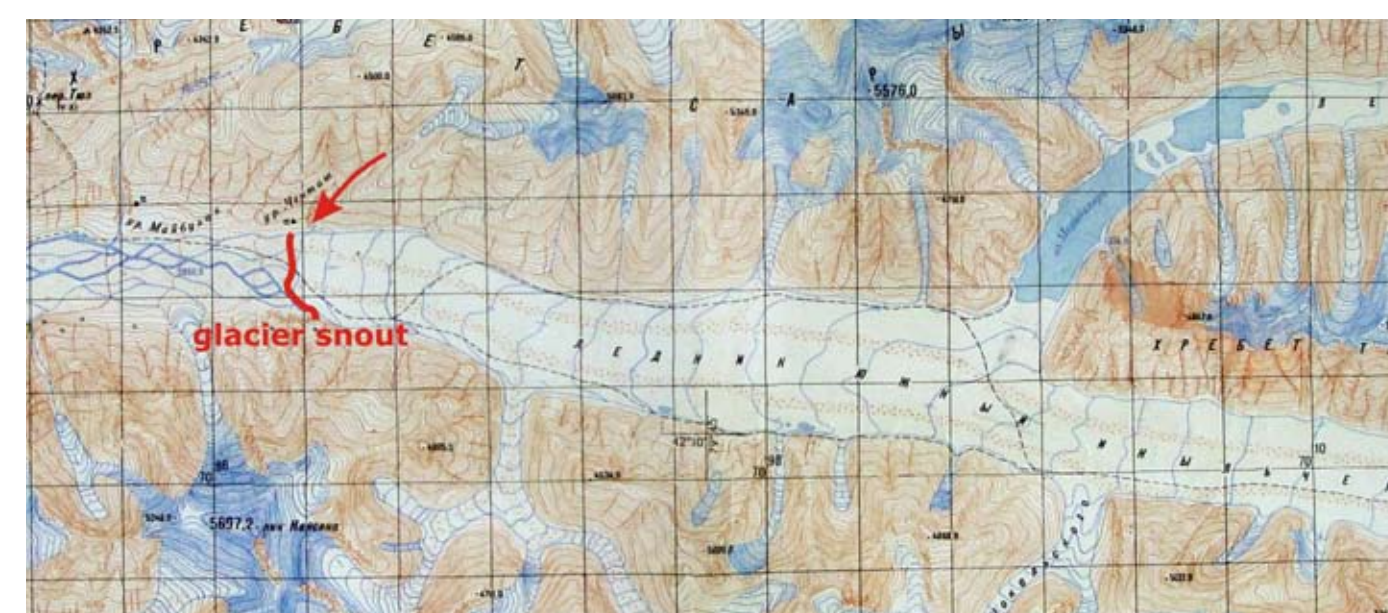
Detail - Glacier mouth



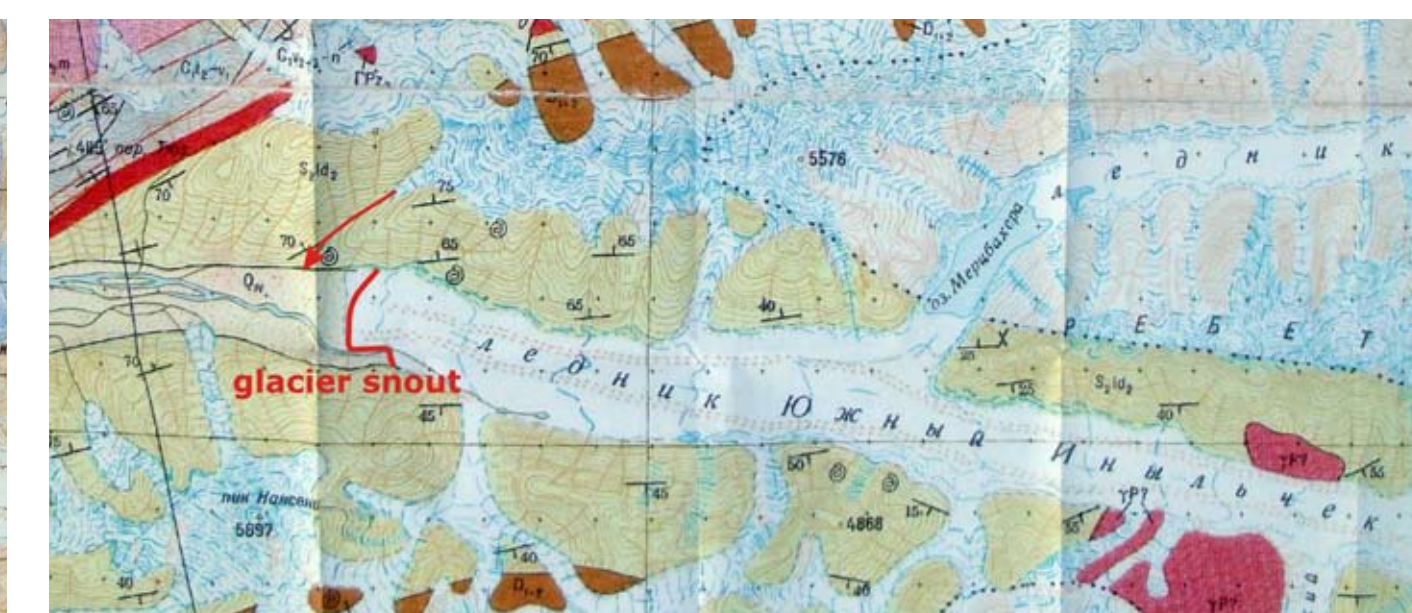
Detail of nearby water discharge and silt-sedimentation

GLACIER RETREAT AND DECAY - HISTORIC ANALYSIS:

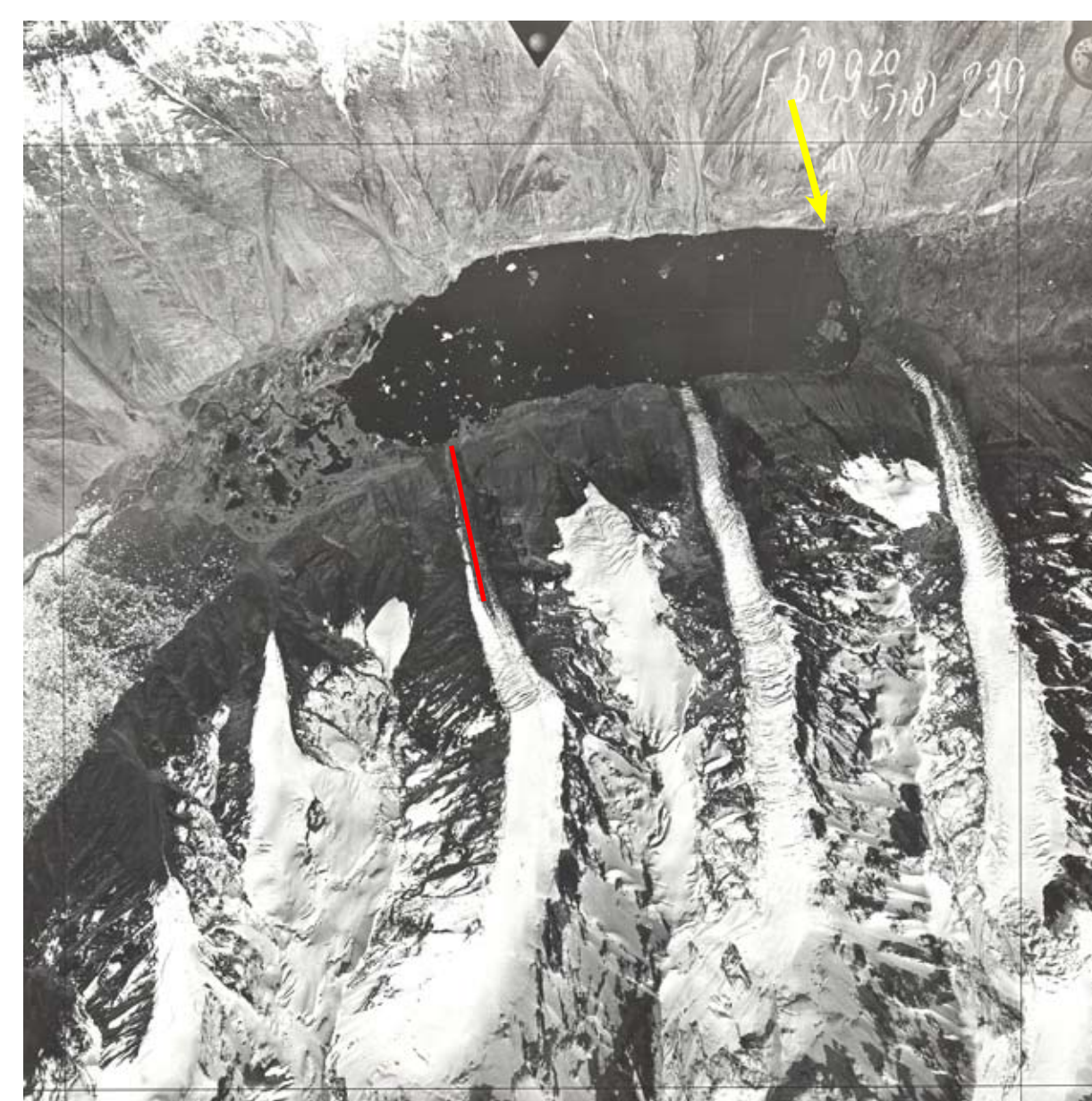
Within the joint geoscientific study multitemporal and multisensoral Remote Sensing data and collateral information (topographic maps, historic photos, etc.) dating back to the early 1950s, are processed and interpreted to gain information on the change of the glacier system and possible related changes of drainage (which are important for the water supply of the Tarim Basin, China) and glacier hazards.



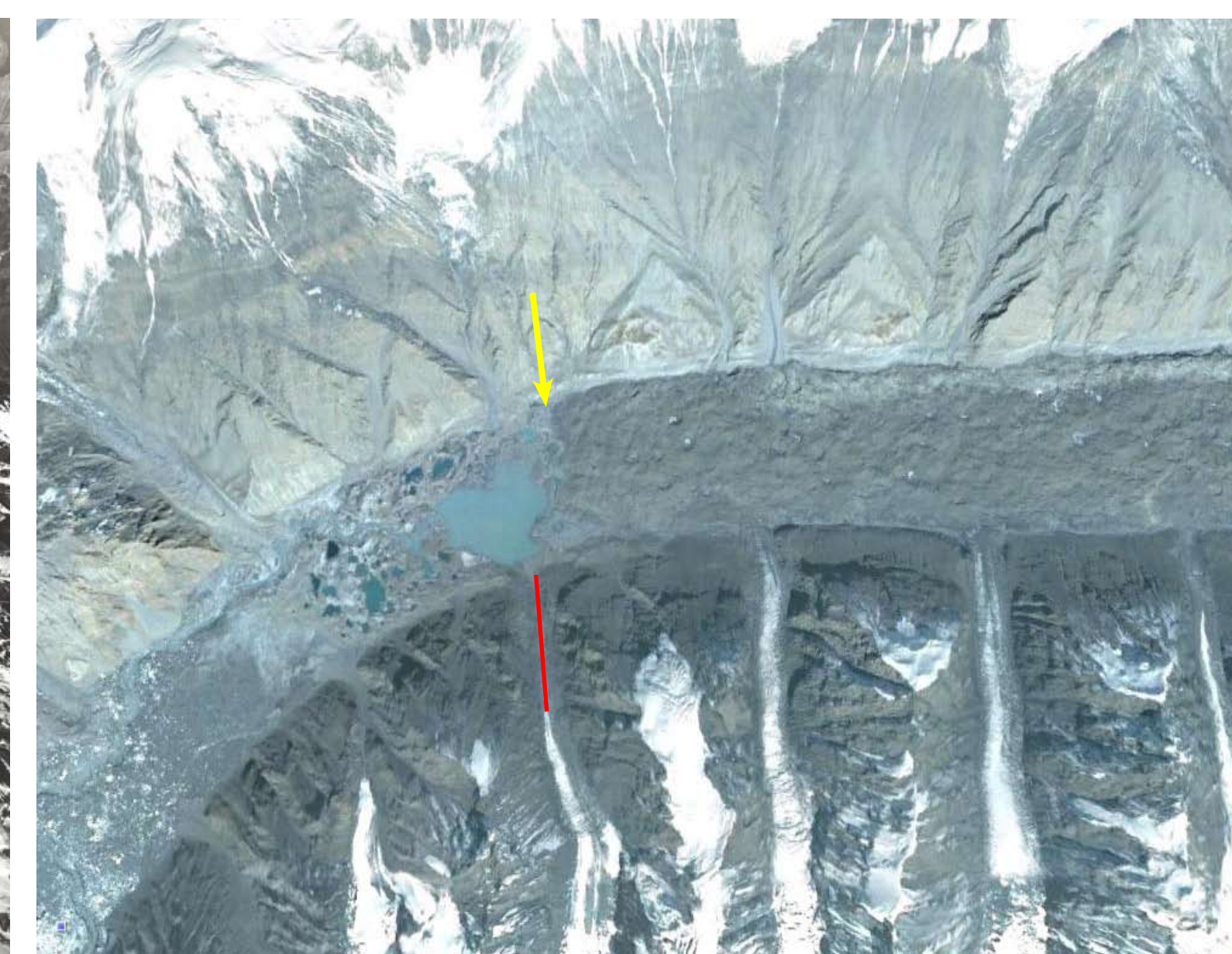
Topographic Map of Kyrgyzstan orig. 1:50 000 (1963 - 1992; source: GFZ Potsdam, processed by U. Wetzel)



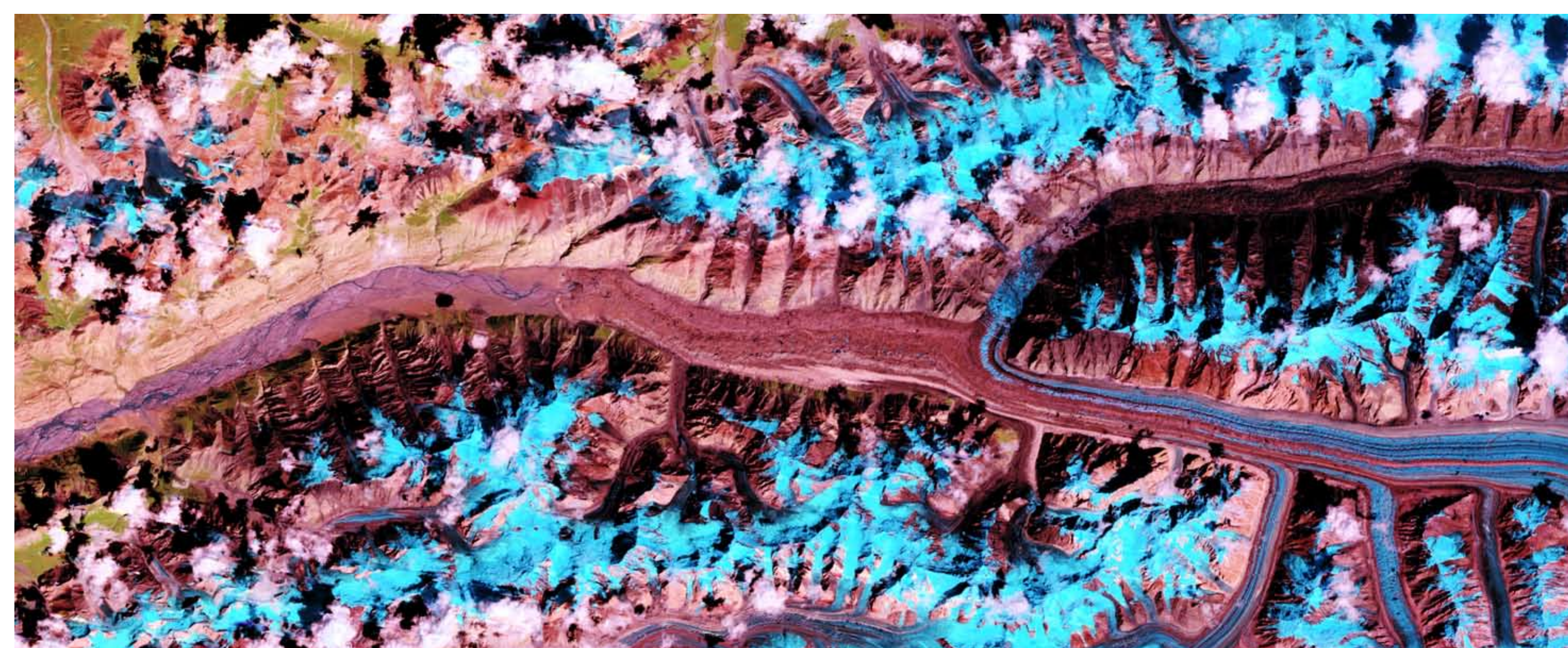
Geological Map (source: Geological Survey Kyrgyzstan), red arrow indicates retreat of glacier snout



Aerial photo dating 1981, North-Inylchek (Upper See). Yellow arrow marks glacier terminal. Red line marks same location as in satellite image (right).



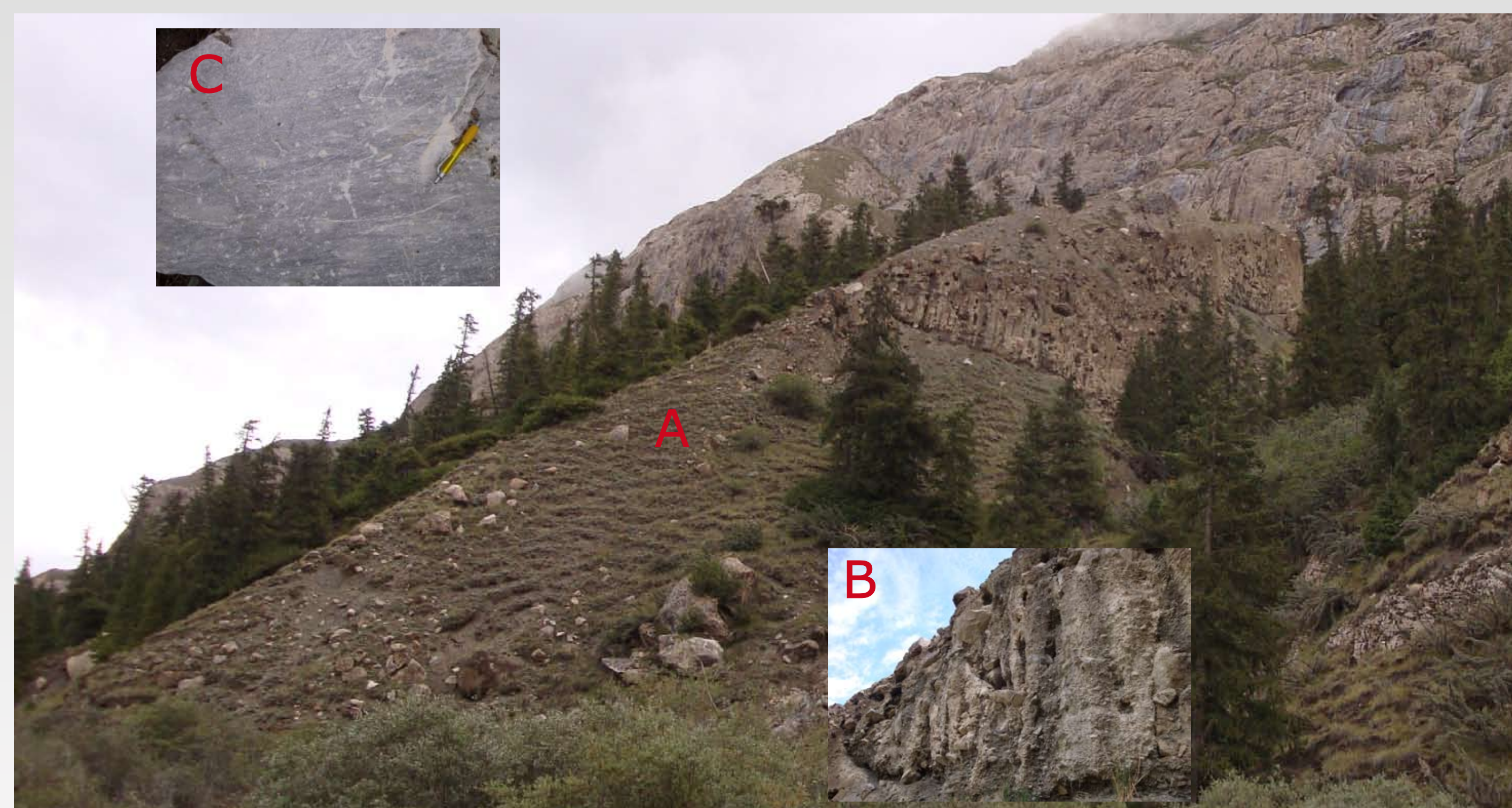
Quick Bird scene, source: Google Earth, date of acquisition: September 2005, North-Inylchek (Upper See). Yellow arrow probably indicates glacier surge.



Landsat ETM+ scene (pan-sharpened, ground resolution 15m, band combination 1/4/7). Source: GLCF, date of acquisition: August 2006

A first interpretation of available satellite imagery and maps shows the fast decay of the Inylchek Glacier System. Nevertheless glacier advances are visible, and in the Northern Inylchek System a glacier surge can be assumed (compare aerial photo dating 1981 and the Quick Bird scene from 2005). Additional recent and historic data will be included in the future work.

Ground check for the satellite image interpretation Remnants of the left side moraine in the Inylchek Valley:



Remnants of the side moraine of the Western Inylchek Glacier discovered on the way between the Gribkov Base and the actual terminus of the glacier prove a former glacial cover of the whole Inylchek Valley.

- A) Left lateral moraine wall
- B) Detail of the sedimentary composition of the side moraine
- C) Glacial striation on calcareous rock.