



Glacier “Medvejiy” - the most famous pulsating glacier of the world

Main characteristics of the Glacier

- ▶ The glaciers cause real danger only when they cause formation of lakes, which is called a marginal lake, which can collapse due to erosion of a glacier, the water pressure in the lake, earthquakes and so on which will consequently result in terrible disasters.
 - ▶ The Glacier “Medvejiy” is located upstream of the river Vanjob and already caused the formation of clusters of large volumes of water.
 - ▶ Glaciological studies were carried out on the Glacier “Medvejiy” by D.R. Zabiroy in September 1950. Glacier length 15.4 km, of which 7 km - its front part, an area of approximately 25.5 km².
 - ▶ This is the most famous pulsating glacier in the world, which has been well observed during its movements in 1963, 1973, 1989 and 2001. The glacier has started moving even earlier in 1937 and 1951.
 - ▶ The pulsating Glacier “Medvejiy” moves every 10- to 15 years.
-



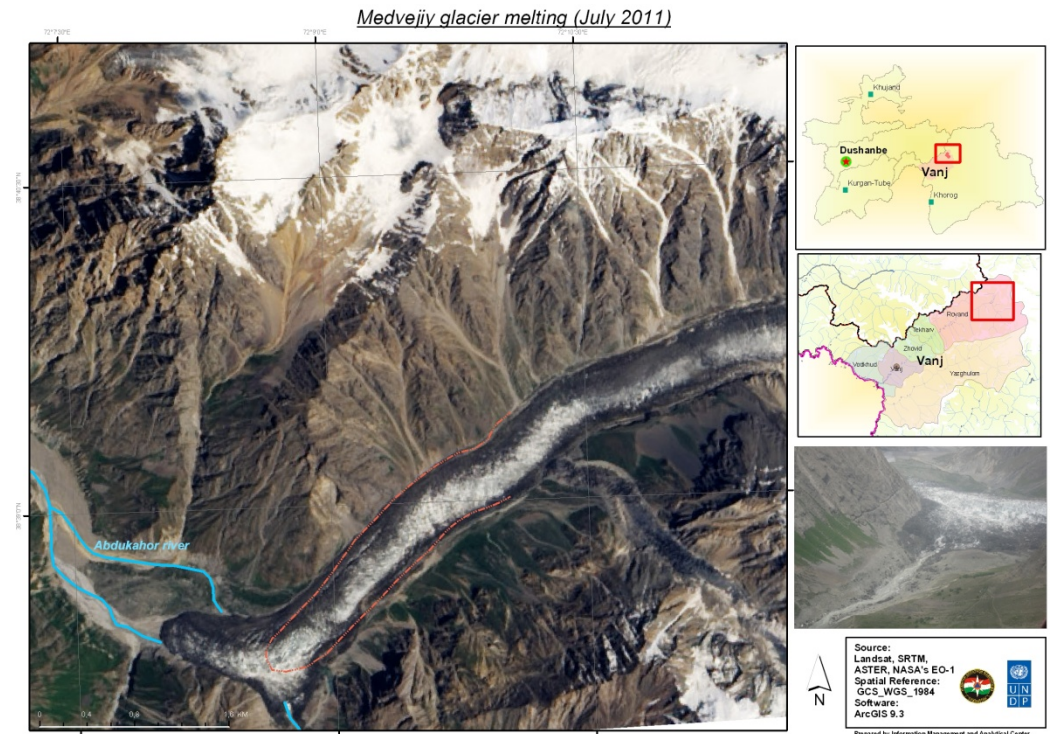
Examples of Impacts

- ▶ The most recent movement has been observed in 2001.
- ▶ The greatest damage to the population and to the national economy was caused by its movement in spring of 1963 triggering severe flooding. Hundreds of houses were flooded, an airport has been washed away located in the center of Vanj including aviation and navigation equipment. Total damage caused amounted in more than 1.5 million rubles.
- ▶ Mustered over a decade of new forces in the spring of 1973, the glacier “Medvejiy” lunged forward again. This time, the glacier had been lengthened to 175 meters more than it was in 1963. Its height in the front reached almost 200 meters and the amount of lengthening was 184 million cubic meters: It was its most powerful hit.



Difference in 10 years

Satellite imagery 2001 and 2011



Last movement of glacier Medvejiy

- ▶ As the result of hot dry weather in the beginning of July 2011 the glacier blocked the river Abdukagor.
- ▶ Distance of movement from the initial point is around 800 meters. The front part of the glacier which blocked the river Abdukagor consist of the following parameters: length – 800 m, height 100-150 m, width 300-350 m.
- ▶ Glacier surface is covered with mud layer, fractured with the division of large blocks. In the frontal part of the glacier on the left side of the valley of the river a cave (tunnel) is formed under a glacier at a rate of 8.7 cubic meters of water per second.
- ▶ During the overlap of the river, water conservation was caused the outburst of which later caused wash-away of the river banks. Downstream in the area of Kuhi-zog floods washed away the foundation of a bridge. Currently this bridge is partially damaged and dangerous to be used.
- ▶ Further movement of this 15,4 ice block consisting of 24 square kilometers can cause a real potential of danger of blocking of local rivers and subsequent flooding of populated areas.



Conclusion of the last monitoring of the glacier

- ▶ 18 July 2011 with the support of Aga Khan Foundation a helicopter was provided by Focus Tajikistan to assess glacier Medvejiy.
- ▶ During the assessment no accumulation of water or formation of lakes was observed.

Recommendations :

- ▶ Continuous observation of the glacier by introduction of observation posts ;
- ▶ All relevant organizations dealing with disaster risk reduction linked with the glacier movement should be prepared in advance and develop preventative measures to avoid possible disasters.

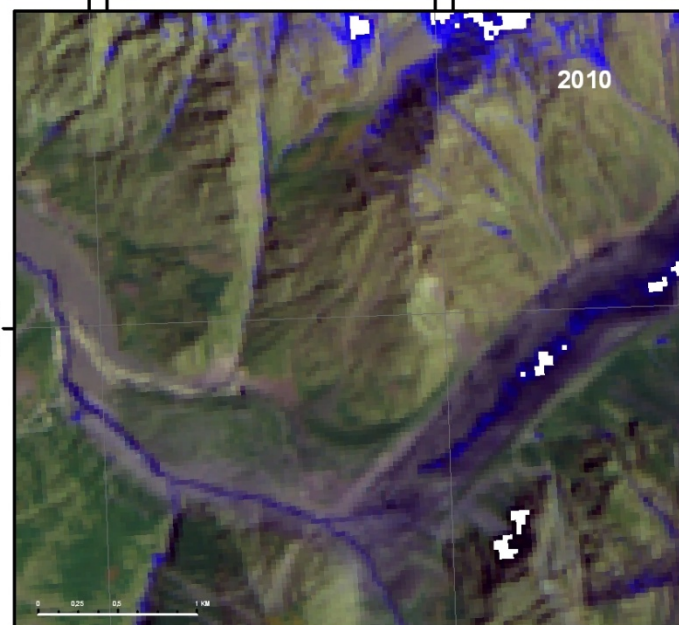
Assessment team:

- ▶ Anvar Khamidov, Head of Department of Hydrometeorology of Committee of protection of Environment under the government of the republic of Tajikistan;
 - ▶ Zaripov Rajabali, Senior geologist, Focus Humanitarian Assistance;
 - ▶ Zamon Azizibekov, Engineer-geologist of ES and CD Headquater, GBAO;
 - ▶ Davlat Abdurakhmonov, Head of protection of population and territories of ES and CD Headquarters GBAO;
 - ▶ Yusuf Ishokov, Head of EC and CD Headquarter of Vanj District:
-





Medvejiy glacier melting (from 1992-2011)



N

1:40 385

Source:
Landsat, SRTM,
ASTER, NASA's EO-1
Spatial Reference:
GCS_WGS_1984
Software:
ArcGIS 9.3