



# Glaciers and relief

# Oroclimatic base of the mountain glaciation

- It is a combination of general features of climate and relief that determine existence and scale of glaciation , the types of the glaciers and the tendencies of their development [Tronov, 1978]. Oroclimatic base of the mountain glaciation includes the following factors:
  - 1. climatic or general climatic
  - 2. orographic or oroclimatic
  - 3. morphologic, including microclimatic features of the forms of relief.

# 1. General Climatic

- It combines the influence of main climatic features of the region (macroclimate) and of the general features of relief, that take part in the development of the macroclimate. Macroclimate depends on geographic position (climatic zone, continental sector), altitude and aspect of the mountain ridges. It is usually characterized by climatic parameters within very wide limits. For example, for the Alps the annual precipitation is within 2000-3500 mm, firn line altitude – 2500-3200 m.

## 2. Oroclimatic

- It is determined by the mesoclimate (climates of particular valleys, slopes in their long extension, large flat areas (planation surfaces) etc. that depends on the location of the ridges and plains within the mountain region, their aspect, slope angles etc. Mesoclimate is characterized by average values of climatic parameters (precipitation, vertical gradient of temperature,

# 3. Morphologic

- Microclimate of some point is defined by the features of the forms of division of the slope where it is situated. The most typical are microclimates of the cirques.

# General climatic

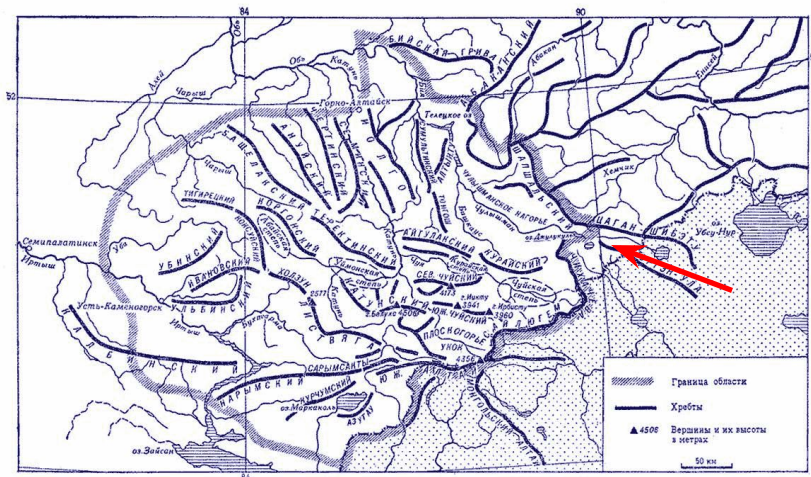
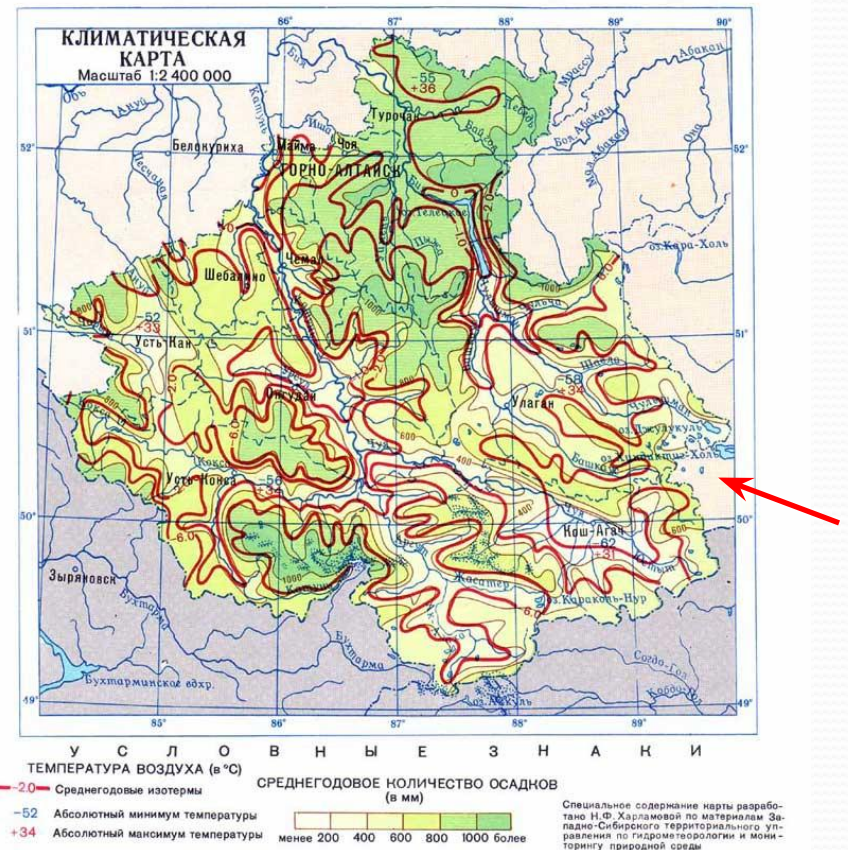
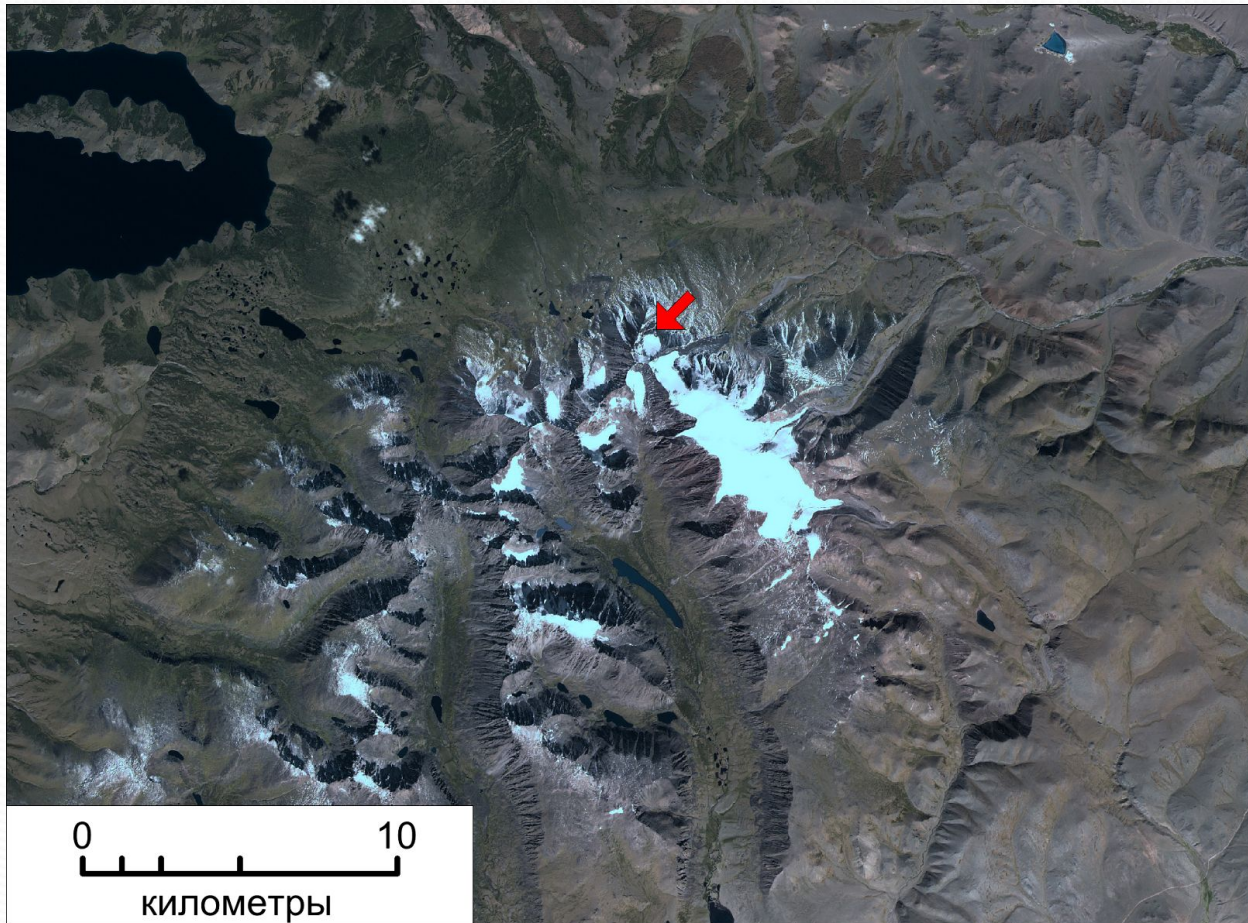


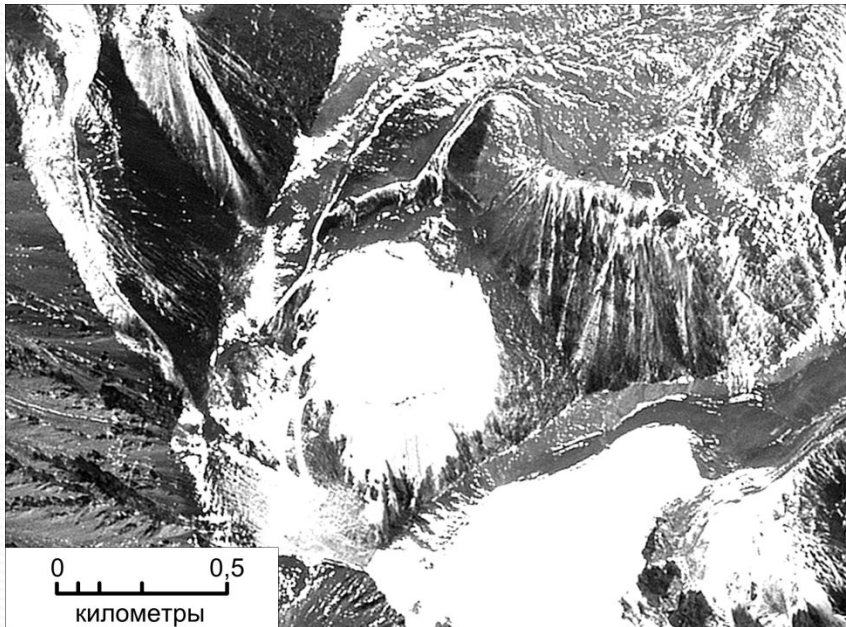
Рис. 15. Орографическая схема Алтайской ландшафтной области



# Oroclimatic



# Morphologic





# These factors act not as a sum of factors, but interact with each other

- A simple example: when the temperatures are positive almost all radiation is spent on melting, because albedo of wet snow and ice is lower; when temperature is a little below zero the amount of water is little and it only moistens the upper snow layer and then freezes, not forming meltwater flow; when it is pretty well below zero there is no melting even when radiation sums are high (for example Pamir at high altitudes). There are levels where in the morning the temperature is negative and in the evenings- positive. As a result melting is lower on the eastern slopes and higher on the western. This is how general climatic feature (amount of radiation) acts in a different way due to oroclimatic factor.