



**ЗАПОВЕДНАЯ  
РОССИЯ**

# Climate Actions in the Biosphere Reserves: case-study of two BRs in the Altai Mountains (Russia)

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*4<sup>th</sup> World Congress of Biosphere Reserves, Lima, March, 14-17, 2016*





# Altai: Natural Values

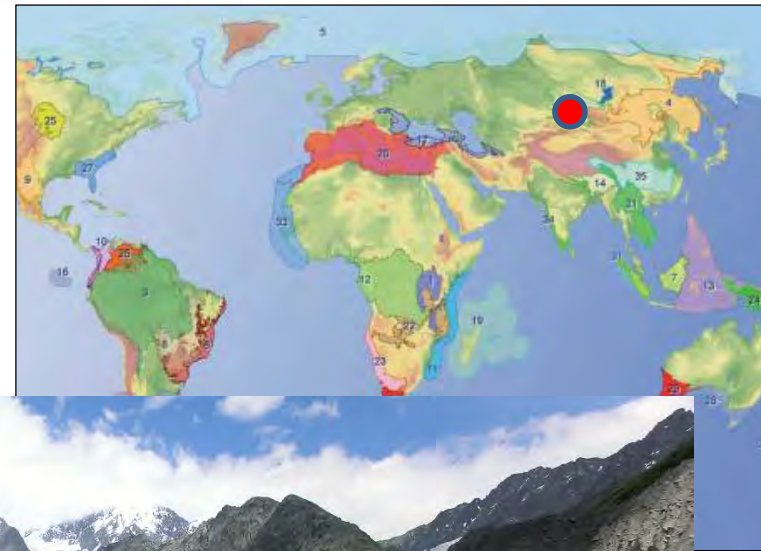
Altitudes: 150 – 4500 masl

Diversity of ecosystems includes desert steppes, coniferous taiga, alpine meadows and nival complexes

The largest center of modern glaciation in Siberia

Water tower for great Siberian and Asian rivers

Habitat for 3700 spp of higher vascular plants (10% are endemics).







# Altai: Cultural Values

Altai is unique for its history dated back to 200 000 years

Cultural heritage is extremely diverse and includes world-famous frozen tombs of Skythian epoch

Modern population of the region is about 5 mln (without Chinese part)

Traditional land use types are practiced (nomads of Mongolia, deer farming and apiculture in Russian part)





# Threats to biodiversity

**Poaching and illegal animal trade** (derivates of the Musk deer, Brown bear, Red deer; falcons; skins of Snow leopard and trophies of Argali)

**Infrastructure development** (transboundary projects)

**Overgrazing** (Tyva and Mongolia)

**Deforestation** (for industrial purposes and caused by fires)

**Climate change** (increase of mean annual t by 1,5°C since 1970s, increased frequency of droughts)



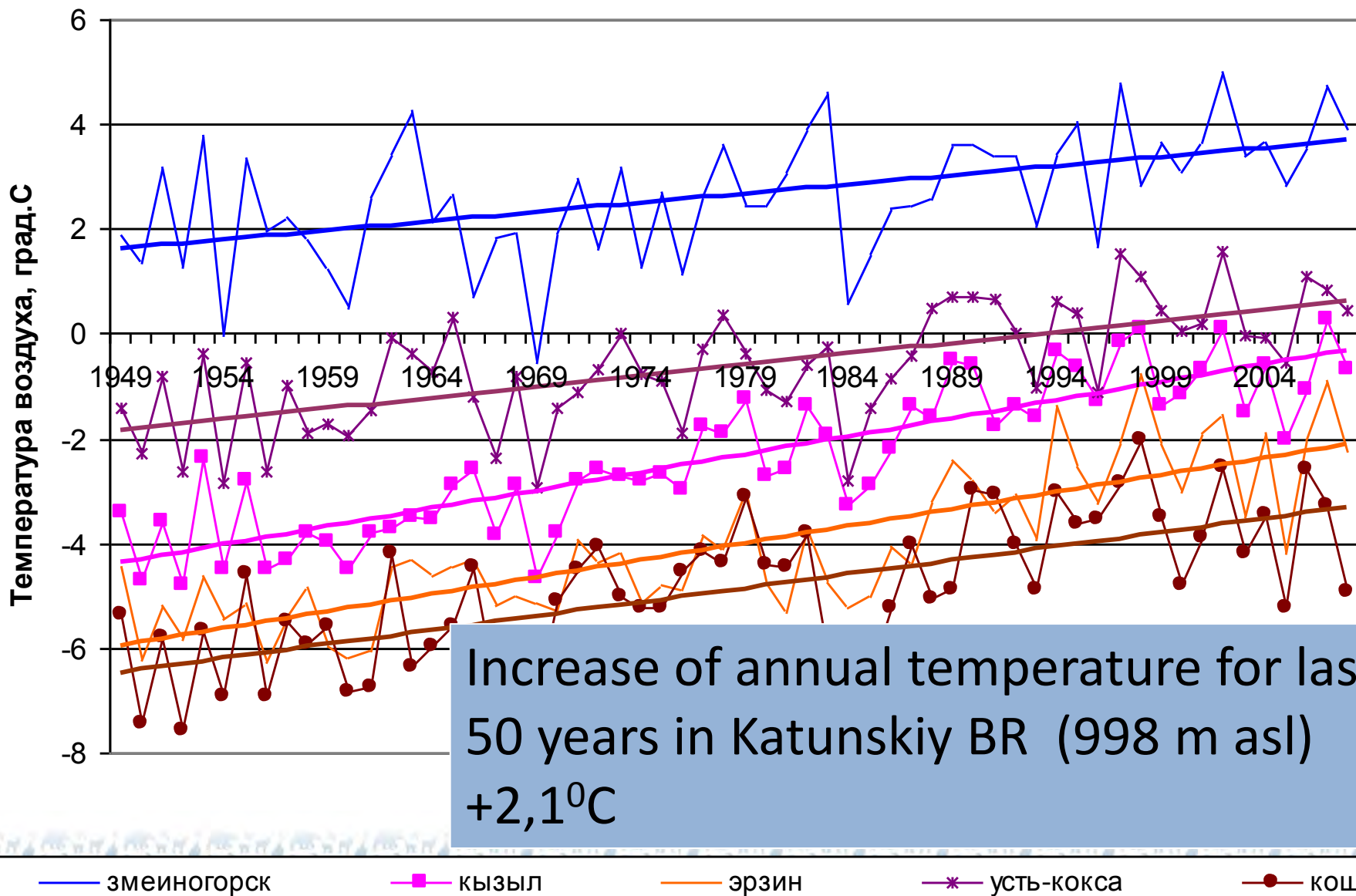


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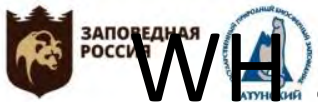
КАТУНСКИЙ

# Trends of mean annual temperature, 1949-2008 in different parts of Altai Mountains



Источники: Харламова, 2010





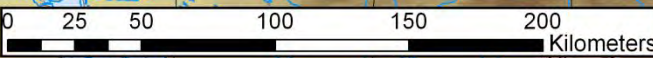
# World Heritage Site The Golden Mountains of Altai

Protected Areas and World Heritage Sites in the Altai Transboundary Region



**Legend**

- World Nature Heritage Site
- Proposed sites for the World Cultural Heritage Site

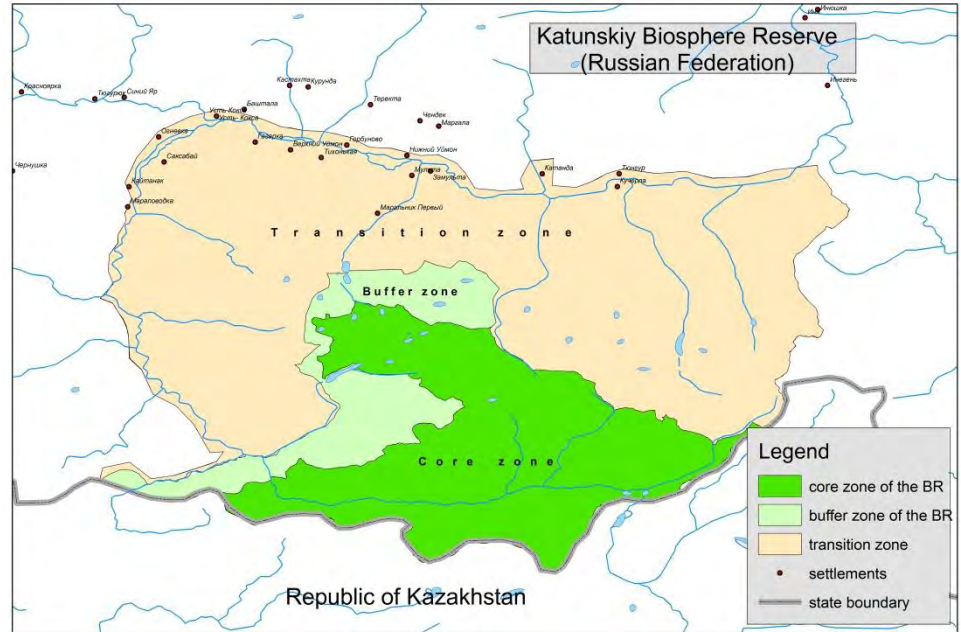






# Katunskiy BR

- Designated in 2000
- 695 000 ha of highlands with glaciers and upstreams of key rivers
- Core: 21%
- Buffer: 6%
- Transition: 73%
- Population 5 400

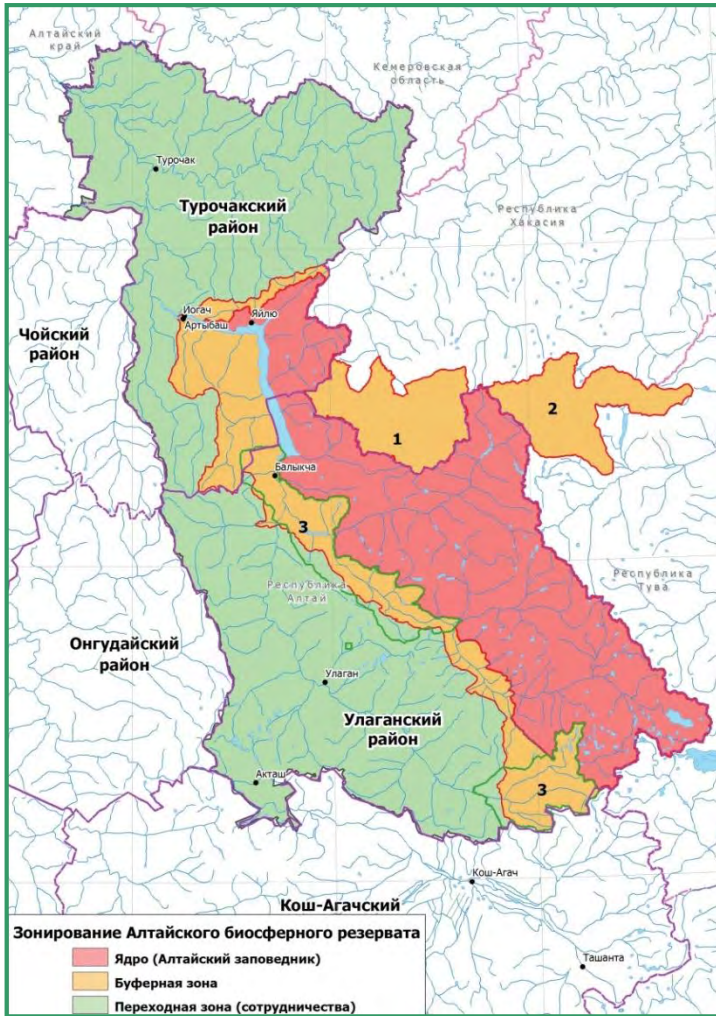






# Altaiskiy BR

- Designated in 2008
- Area 3,5 mln ha
- Largest lake, montane forests
- Core 25%
- Buffer 27%
- Transition zone 48%







# Climate Actions in the BRs

Monitoring

Research and Modeling

Education

Implementation of mitigation measures

Development and implementation of adaptation options

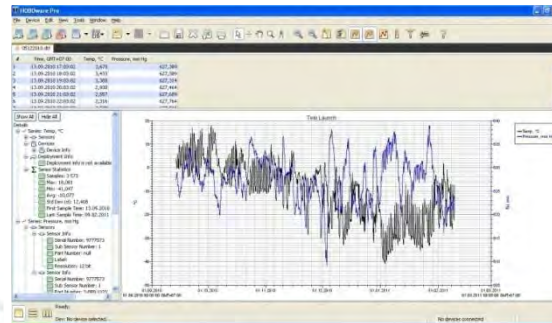






# Monitoring Climate

- Basic hydrometeorological monitoring (including snow cover) using automated weather stations (4 in 2 BRs)
- Licensed by Federal Hydrometeorological Service







# Associated Monitoring of Biodiversity

- Combined observations of water regime, glaciers and biodiversity at vulnerable ecosystems
- Katunskiy BR is member of Global Research and Observation Network of Alpine Environments



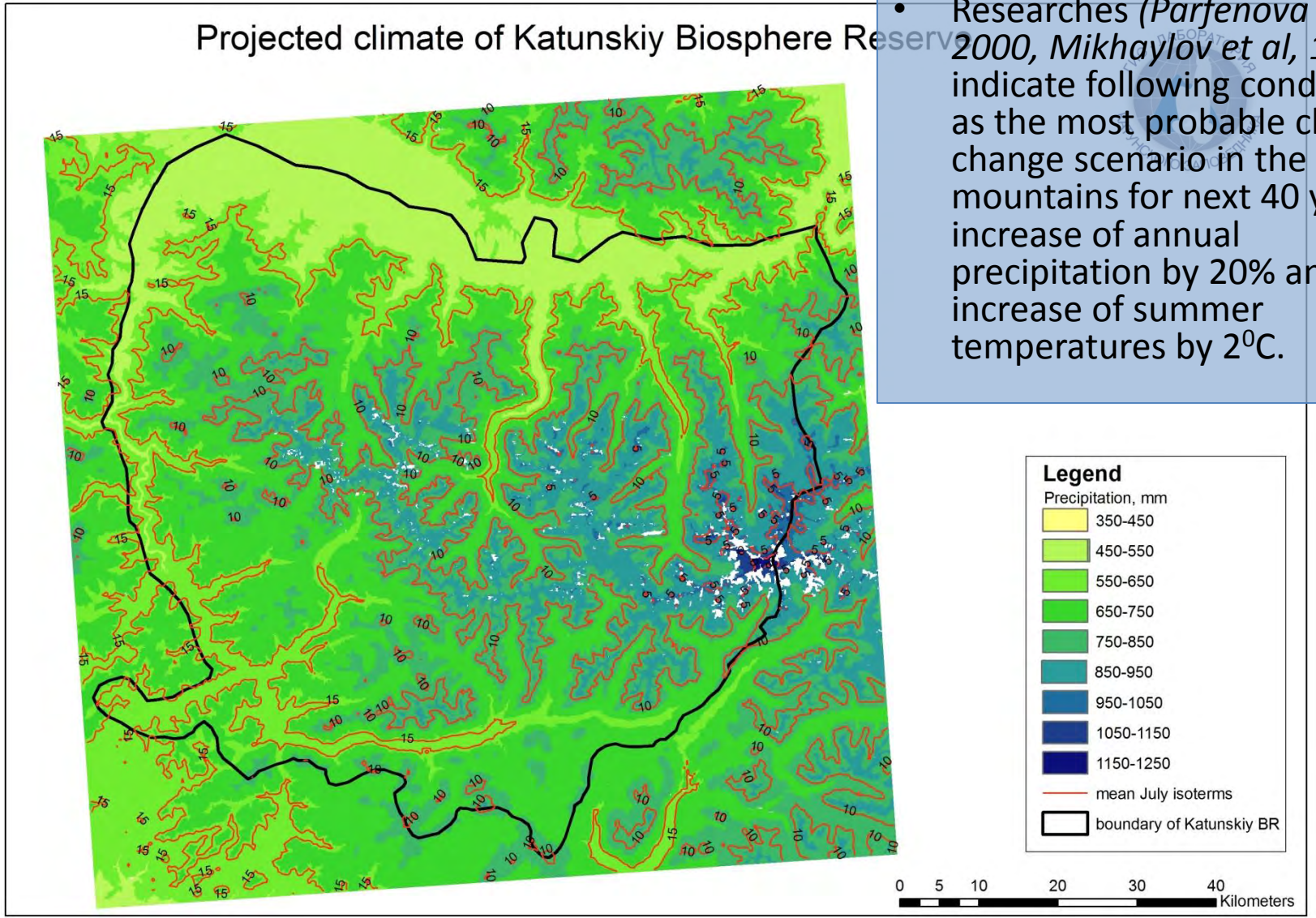




# Modeling

Projected climate of Katunskiy Biosphere Reserve

- Researches (*Parfenova et al, 2000, Mikhaylov et al, 1992*) indicate following conditions as the most probable climate change scenario in the Altai mountains for next 40 years: increase of annual precipitation by 20% and increase of summer temperatures by 2<sup>0</sup>C.

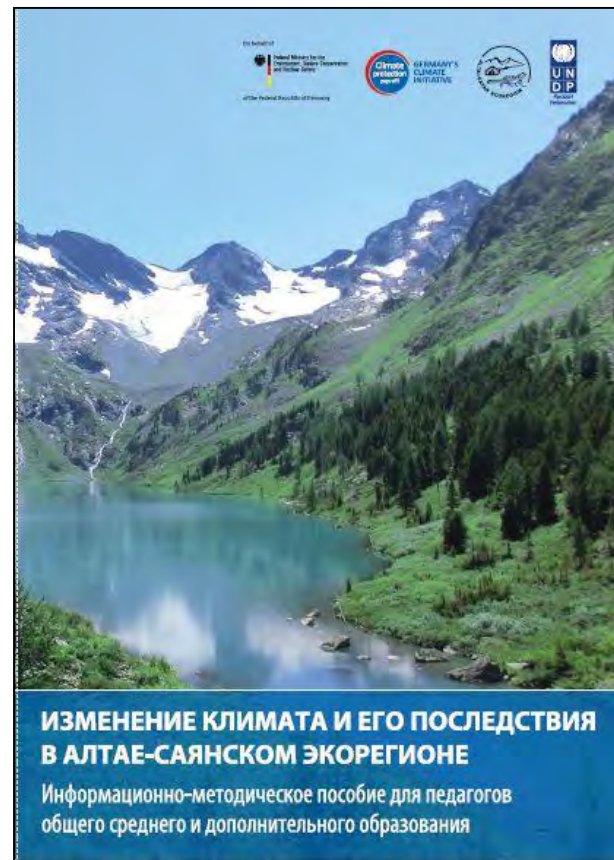






# Education in Climate Change

- Target group: school teachers
- Trainings conducted by the BR staff
- Guidelines on incorporation climate change issues into educational programs





# Education in Climate Change

- Target group: protected areas staff and journalists
- Training workshop and guidelines *“How and to whom communicate climate change issues?”*





# Education in Climate Change

- Target group:  
wide public
- Photo exhibition  
of historic and  
modern photos  
showing natural  
climate-caused  
dynamics



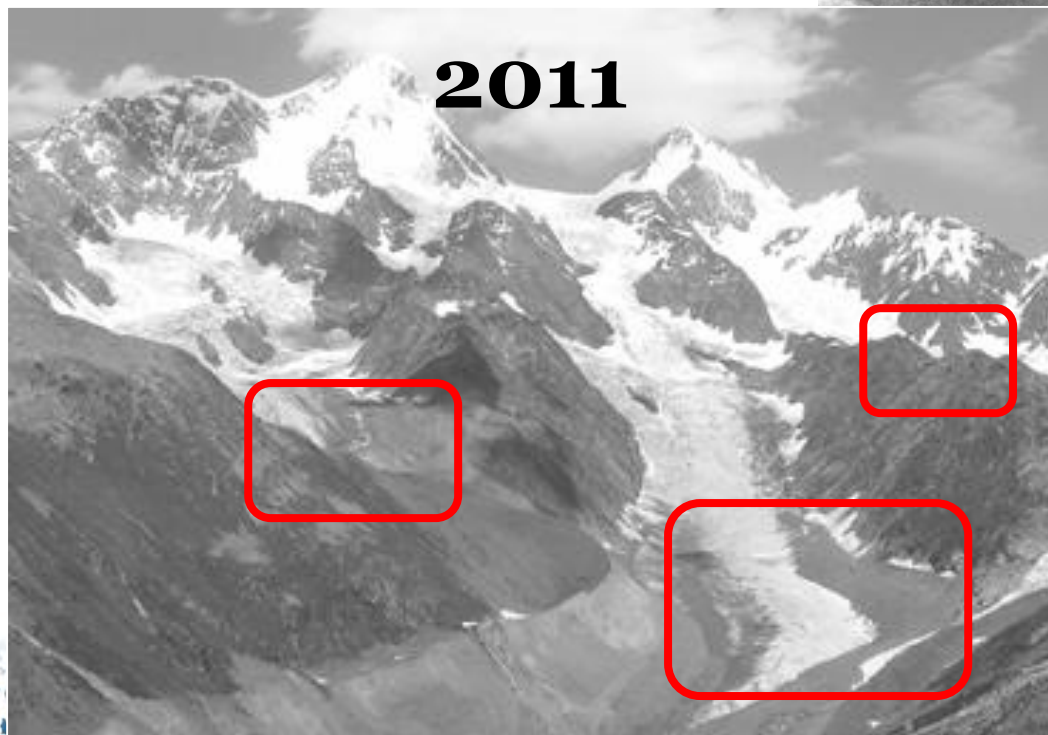


# Gebler Glacier, Katunskiy BR



**1897**

Photo by T. Yashina, © Katunskiy BR



**2011**

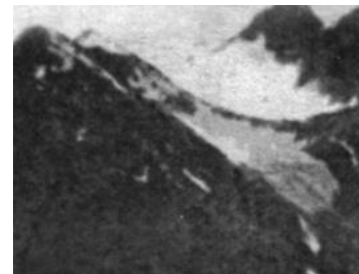
Photo by V. Sapozhnikov,  
© Altai Museum of Natural History







# Small glaciers, Katunskiy BR



# 1895



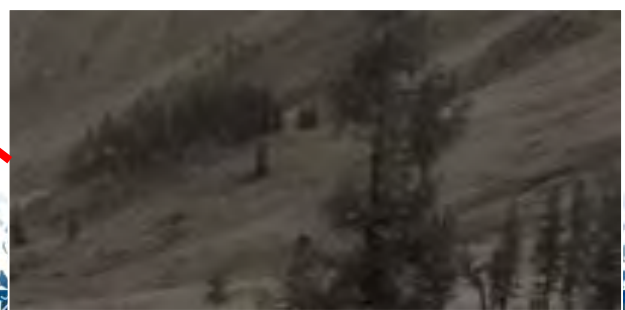
Фото В.С. Сапожникова  
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# 2011



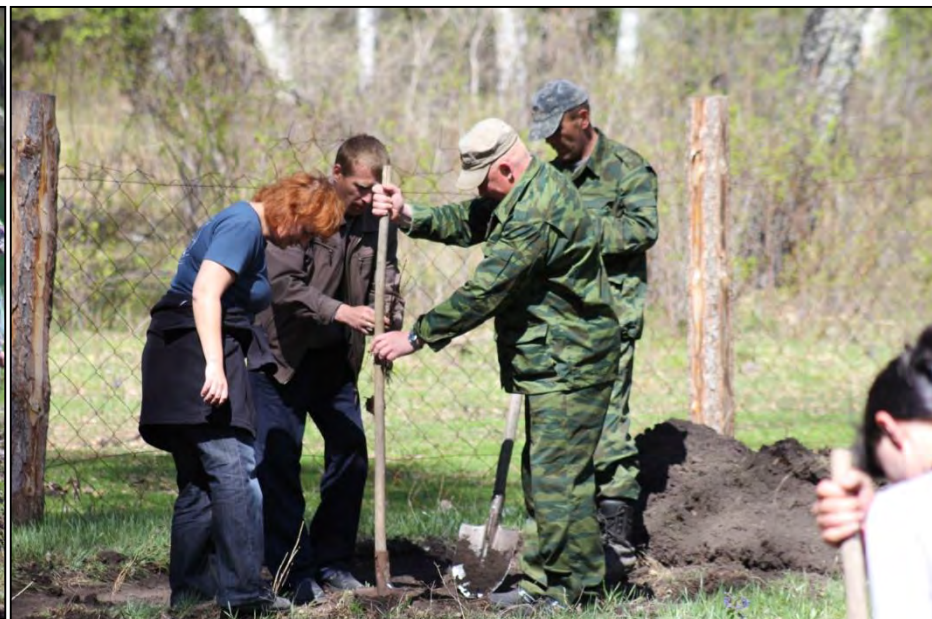
Фото Т. Яшиной





# Mitigation Measures:

- “*Plant Your Tree – Protect Our Climate*” annual action in Katunskiy BR

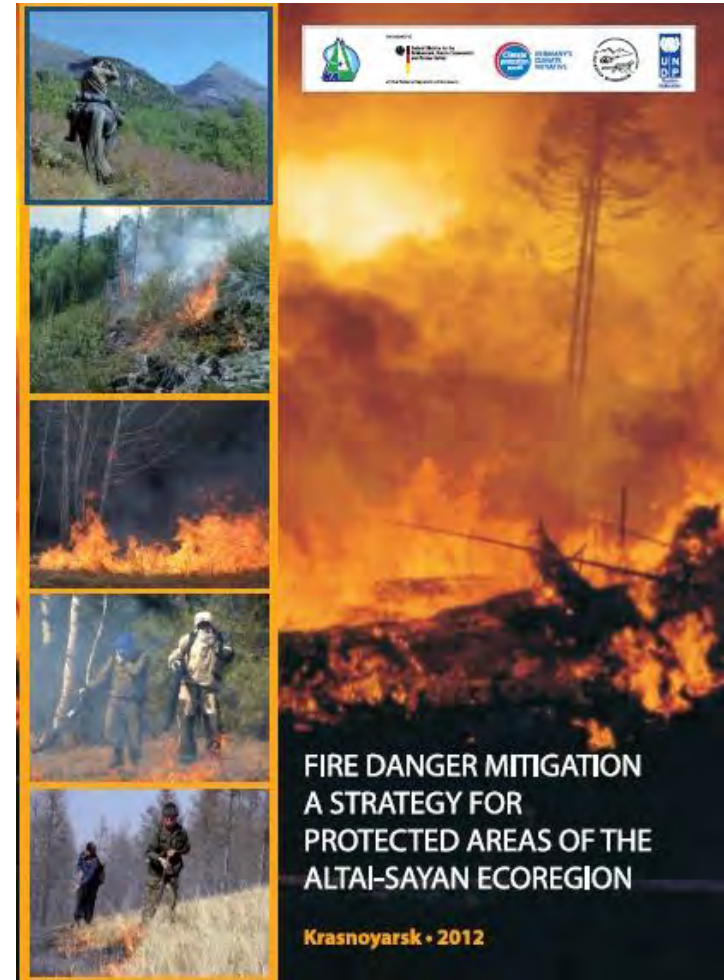






# Mitigation: Improving preparedness to adverse effects of climate change

- For all BRs of the region:
- Fire danger mitigation strategy
- Increasing capacities of the BR for fire prevention and mitigation (fire fighting equipment)



<http://www.altai-sayan.com/about/publications.php>

# Promotion of renewable energy

- Trainings on RES for local communities in Katunskiy BR





# Demonstration projects on RES

- Hybrid power plant in Altaiskiy BR



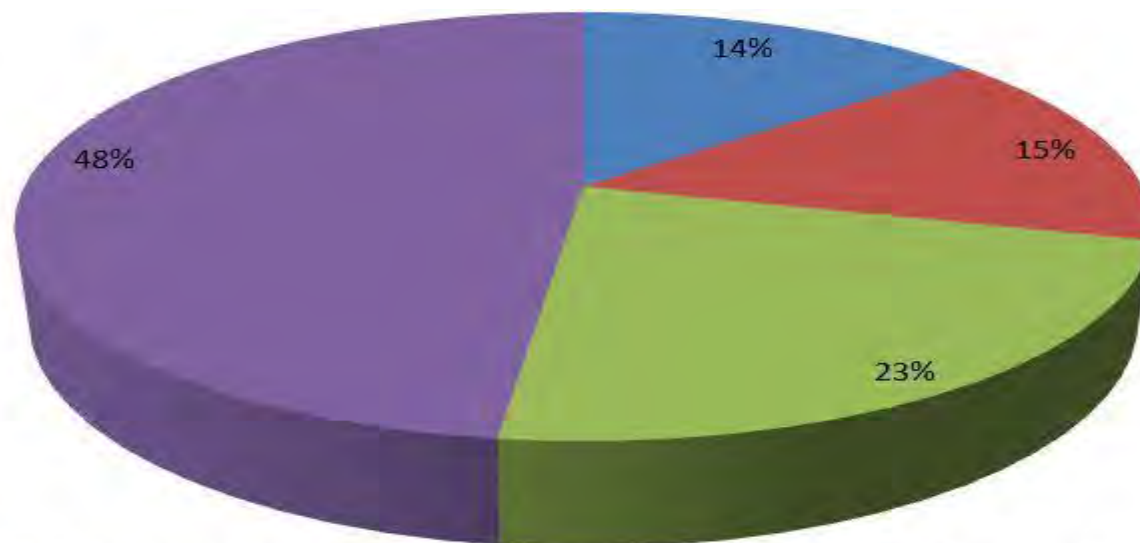
# Adaptation to climate change: Outlines of the regional adaptation strategy





# Vulnerability of local communities to climate change

- Share of income raised from direct use of natural resources in Katunskiy BR



- fully dependent (more than 90% of income comes from the use of natural resources)
- highly dependent (50-90% of income comes from the use of natural resources)
- moderately dependent (25-50% of income comes from the use of natural resources)
- less dependent (less than 25% of income comes from the use of natural resources)





# Diversification of livelihoods by involving local communities into ecotourism development

- Micro-credits for communities living within BR (EUR 70 000 invested in 2013-2016)
- Trainings and consultation on business-running and different aspects of ecotourism development

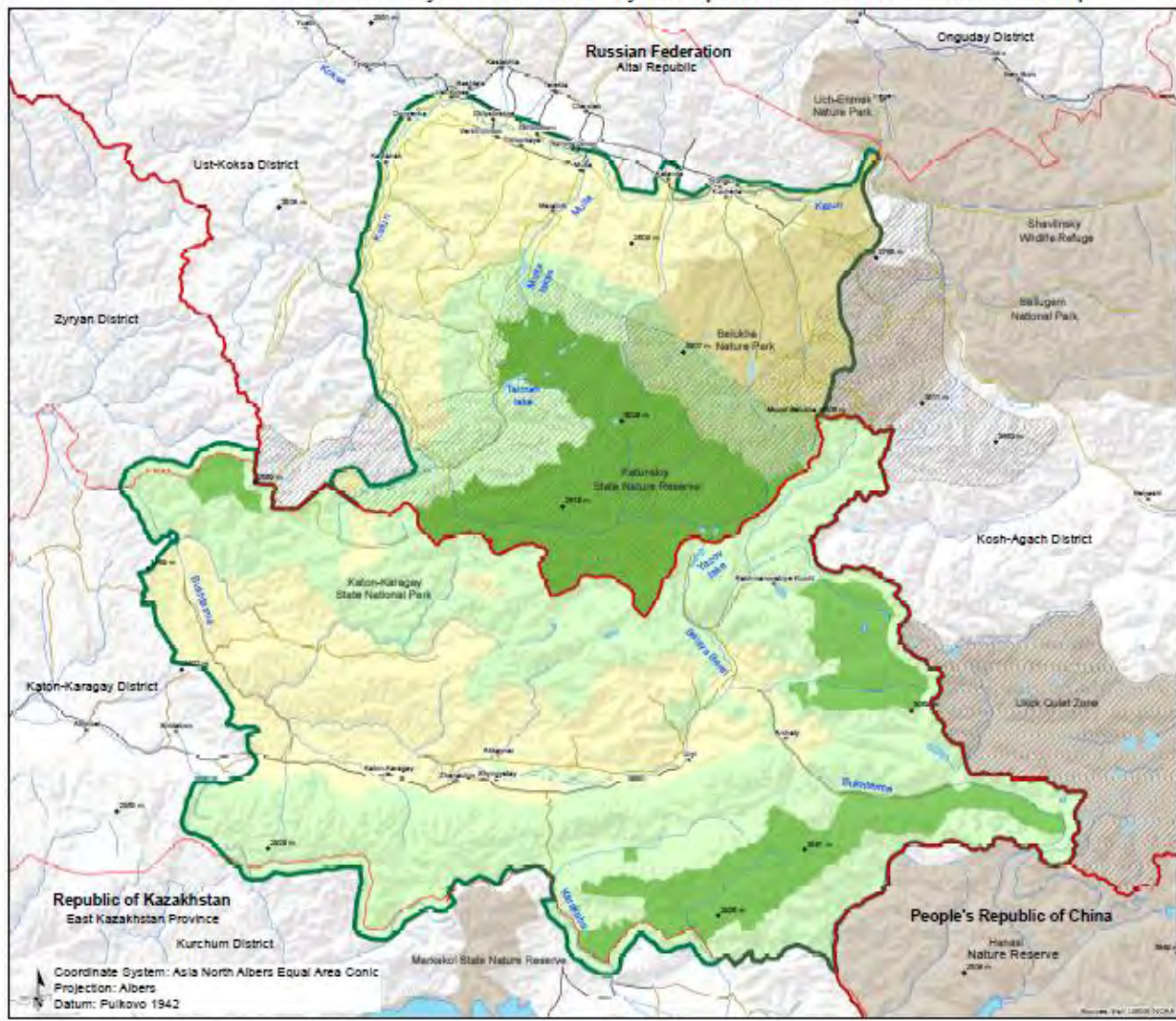






# Improving Connectivity through transboundary cooperation with Kazakhstan

Great Altay Transboundary Biosphere Reserve - zonation map





# Way Forward

- Strengthen research partnerships in climate change issues
- Incorporation of BR monitoring activities into international programmes
- Implementation of connectivity conservation principles as adaptive response to climate change







Thank you for your attention!

Katunskiy BR [www.katunskiy.ru](http://www.katunskiy.ru)  
Altaiskiy BR [www.altzapovednik.ru](http://www.altzapovednik.ru)

