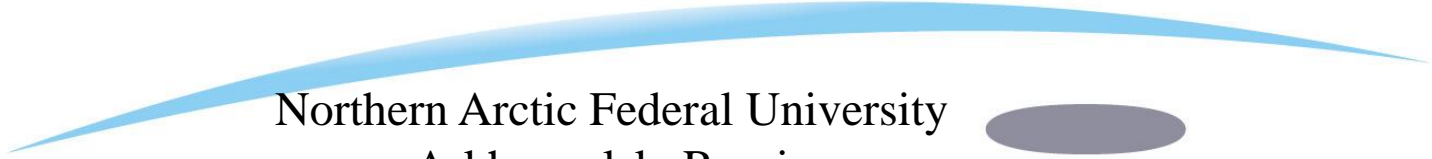


Climate change in the European North of Russia: causes and consequences

presented by
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for an online Graduate Student Seminar Series



Northern Arctic Federal University
Arkhangelsk, Russia
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- From in Kyrgyzstan, Central Asia
- MS degree in Environmental Risk Management in the Arctic, NArFU, 2019
- Graduate exchange studies at the UiT-Arctic University of Norway, Fall 2018
- Arctic Floating University-2019 participant (expedition to Spitsbergen (Svalbard))
- Currently 2-year Ph.D student in Earth Sciences (Geoecology), NArFU
- Teaching assistant at the department Geography and Hydrometeorology, NArFU since September 2019
- Expert at the Institute for Strategic Development in the Arctic, NArFU since July 2019



I will talk about

- European North of Russia: its geography and importance
- Climate Change in Russian European North
- Climate Change and Local Communities: an outward glance (Climate change impact on the traditional use of natural resources – an outward glance)

European North of Russia



Peculiarities of geographical location

- Northern
- Coastal



Peculiarities of economic and geographic location

- North-West (economically developed territories)
- Norway, Finland – foreign trade partners
- Location of military naval bases of Northern Fleet

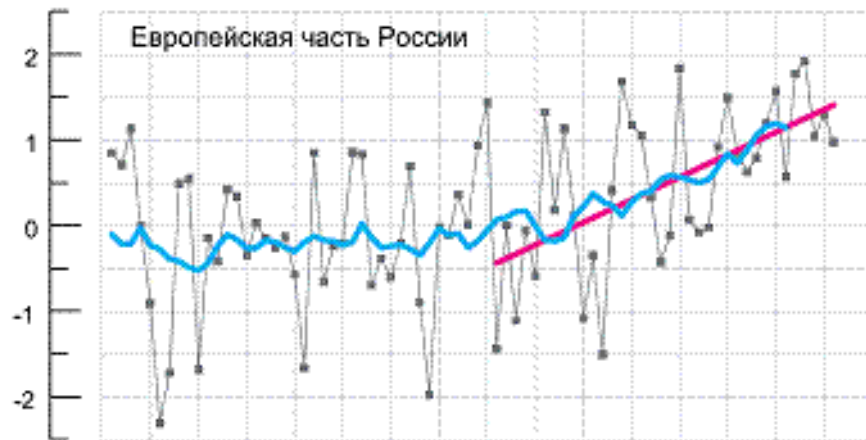
Climate Change in the European North of Russia: Causes

1. Global climatic processes (radiation balance, interglacial periods)
2. Influence of human economic activity on the climate (deforestation, mining, agriculture, etc.)



Climate Change in the European North of Russia

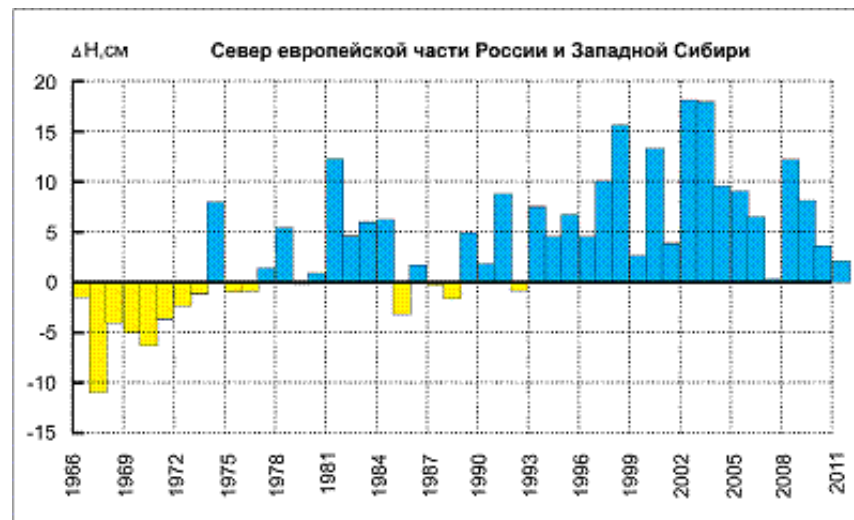
1. Increase of annual average temperature
2. Increase in the maximum thickness of the snow cover
3. Increase in Autumn temperature in all northern regions and increase in winter temperature in Murmansk and Arkhangelsk regions



Отклонение от средней температуры за 1961-1990 гг.



Отклонение от средних значений осадков в 1961-1990 гг.



Изменение высоты снежного покрова

Climate Change in the European North of Russia

1. Increase in the number of storms and increase in coastal erosion processes
2. Increase in the frost-free period and increase in the amount of precipitation (winter)
3. Changes in hydrometeorological conditions for navigation and mining
4. Heat and cold waves
5. Change in the flora and fauna habitat (northward movement)





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Climate Change and Local Communities:

Climate change impact on the traditional use of natural resources – an outward glance

- Berry and mushroom picking
- Coastal fishing (including fishing in rivers and lakes)
- Hunting
- Nomadic reindeer herding
- Animal husbandry
- Timber harvesting
- Crop production:
- Beekeeping (apiculture)



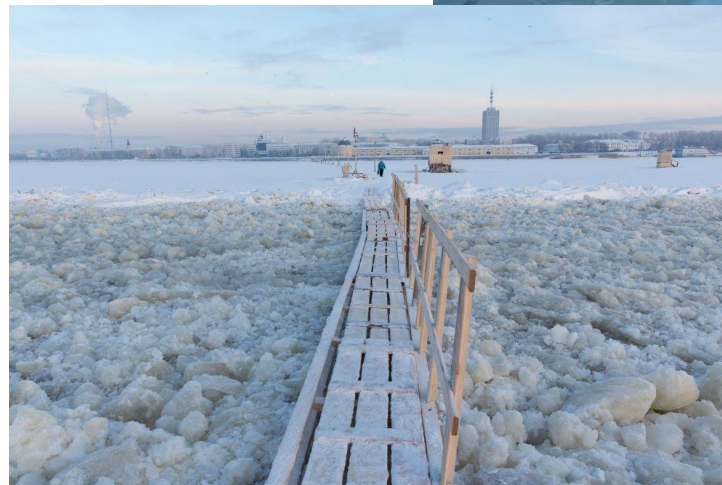


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Climate Change and Local Communities


Climate change impact on the traditional use of natural resources – an outward glance

- ✓Northern Infrastructure
- ✓Ice bridge, ponton bridge and ferryboat
- ✓Winter roads
- ✓Unpaved roads
- ✓Low level bridges
- ✓Humid temperature



Climate Change and Local Communities

Climate change impact on the traditional use of natural resources – an outward glance

Climate change	Consequences
<p>Increase of average temperature</p> 	<ul style="list-style-type: none"> - Winter roads are built later, they melt earlier, availability instead of 4-5 months, 2-3. - The condition of highways is worse. - Impossibility to store frozen food (meat, fish, etc.) without freezers. - Harder to save a take (fish, etc.) during the thaw - Winter logging is harder. - Snowmobile movement on snow becomes harder. - Elks get stuck in deep snow in winter and become easy prey. - Bees die from increased dampness in the thaw - Fruit trees are dying, pines break and die (stumps of dunces remain), broadleaf trees are dying in plantings (example)

Climate Change and Local Communities

Climate change impact on the traditional use of natural resources – an outward glance

Climate change

Late winter



Consequences

- Many settlements across the rivers out of transport accessibility.
- The movement of reindeer herds into the forest zone from the tundra is delayed, the slaughtering period changes, the reindeer lose weight.
- Animals change color in winter at the first snowfall (hares, squirrels, foxes) and turn out to be without protective coloration when snow falls, their number decreases.
- The gills of the fish are clogged with suga, it dies
- Changing the timing of the arrival of fish for spawning in the fall
- Traditional ice fishing is difficult Bees are dying
- Floods and floods

Climate Change and Local Communities

Climate change impact on the traditional use of natural resources – an outward glance

Climate change

Late spring



Ice on the rivers is "eaten away", there is no drift, it disappears earlier.

Consequences

Fruit trees, bushes, berries in the garden, field, forest, swamps bloom early, the blossom dies, there is no harvest.

Moisture leaves the soil before the possibility of planting in the garden without risk.

- The risk of crop failure in cereals, potatoes and other garden and field plants increases
- The birds that have arrived are dying
- Less spills, does not flood flooded meadows and fields, their productivity decreases.
- Earlier ice melting - open water gives birds access to hunting fish fry, salmon fry perish.



Climate Change and Local Communities

Climate change impact on the traditional use of natural resources – an outward glance

Climate change	Consequences
<p>Summer season division into dry (May, June) and rainy (July - August) (or vice versa), due to an uneven distribution of precipitation.</p> <p>Overall summer is getting cooler</p>	<ul style="list-style-type: none"> - For plants in the garden, fields and lack of moisture during flowering and laying the crop and an excess (soaking roots, lack of sun and heat) during ripening. - As a result of a decrease in the yield of berries and mushrooms, a noticeable decrease in the yield of potatoes, a delay in the ripening of cereals. - Difficulty harvesting grain, decreased quality (harvesting in a wet state) - Inability to make hay, lack or poor quality of fodder in winter, reduction in the number of livestock. Sharp fluctuations in the number of blood-sucking insects from year to year. Lack of harvest in the forest leads to hunger in bears, birds, moose and deer and other animals (access to humans)

Climate Change and Local Communities

Climate change impact on the traditional use of natural resources – an outward glance

Climate change	Consequences
<p>Strengthening of winds and changing direction</p> 	<ul style="list-style-type: none"> - Increase of storms - Blowing away blossom of berries - Fish spawning difficulties - Difficulties with fishing
<p>Increase in the water level in small and medium-sized rivers (floods)</p> 	<ul style="list-style-type: none"> - Drying out of soil - Worsening of condition beekeeping - Flooding of low level bridges

Climate Change and Local Communities

Climate change adaptation mechanisms – an outward glance



The use of environmentally friendly agricultural technologies (permaculture, etc.)



Creation of shelterbelts, development of adaptive measures with the assistance of timber procurers



Water protection, bank protection and bank protection measures, creation of new infrastructure



Increase of a health care possibilities in remote areas



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Thanks!

*Theme: Climate change in the European North of Russia:
causes and consequences*

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