



Socially-oriented observations in coupled human-nature system

investigations in the Russian North within IPY PPS Arctic

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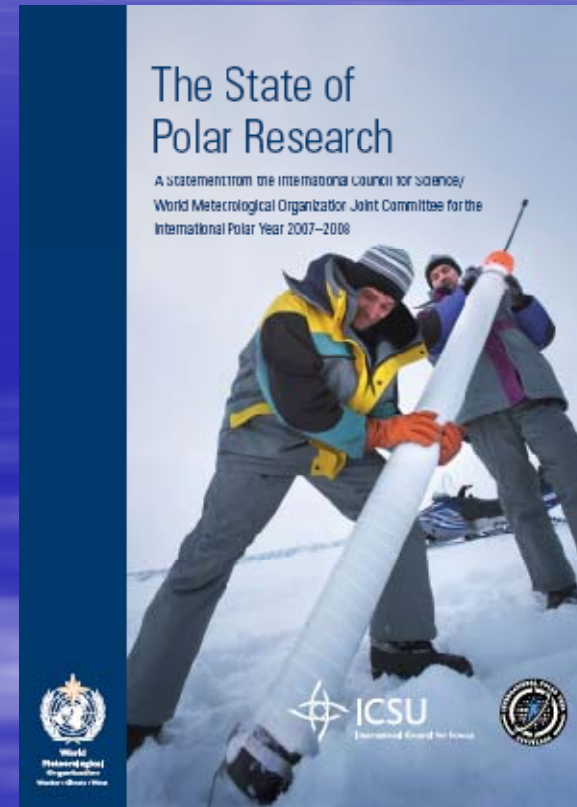


4<sup>th</sup> PPS Arctic Conference, Moscow 2009



## PPS Arctic is the project of Cross-disciplinary collaboration, synthesis and integration

“The very complexity of the Earth system, in which physics, biology, chemistry and geology all interact, demands an interdisciplinary approach to advance understanding and improve predictions of the future. The science scope of this IPY was remarkably different from that of its predecessors and other large-scale science programmes in polar research. Dedicated efforts were made to include synthetic cross-disciplinary studies and projects exploring the human dimension, ecological diversity, and community and ecosystem health. For the first time in IPY-IGY history, physical, natural, social and humanistic scientists and local community-based experts worked together under a common multidisciplinary science programme. This new form of cross-disciplinary collaboration is widely perceived as a lasting achievement of IPY. It marks an extraordinary advance in our perception of the complexities of the polar regions and of the importance of synthesis, knowledge integration and data sharing in the understanding of processes that affect our planet” The State of Polar Research 2009



*Vlasova T. First Results of IPY. IPY Celebration, Geneva 25-26 February. Izvestia RAS, Geography, N 4, 2009 (in print)*

# The methodology of coupled human-nature system investigations is in a process of development within PPS Arctic

- As Robert Correll said at the closing ceremonies of the Second International Conference on Arctic Research Planning in Copenhagen in November 2005, we have entered a new paradigm: global change forces us to see humans and environments as inextricably interconnected.
- How to see in such a way ? ????  
What kind of glasses should be put on ? ???

We very much hope that the construction of SOO can bring some new points to this process of natural and social science integration

# The aim of SOO System

- The aim is to monitor and control changes on the way to better (or worse) quality of life and sustainability, increase knowledge of trends in socio-economic, political and living conditions of northern residents under the impacts of happening changes in climate, biodiversity, character of human impacts, globalization, socio-economic and political changes and human responses.

# Main objective of social activities

- The construction of socially-oriented observation (SOO) system within PPS Arctic:
- Socio-oriented observation is monitoring of specially identified **key issues** (challenges or limits to quality of life) and human-defined **targets** set to achieve better quality of life and sustainability.
- For this purpose **socially-oriented key indicators (key variables)** should be identified in order to observe changes on the way to better (or worse) quality of life and sustainability.



Revision: 25 May 2008

## PPS Arctic Manual

Common protocols for field measurements  
and handling of collected material

Compiled and discussed at the 2<sup>nd</sup> annual  
meeting in Tromsø, March 2007

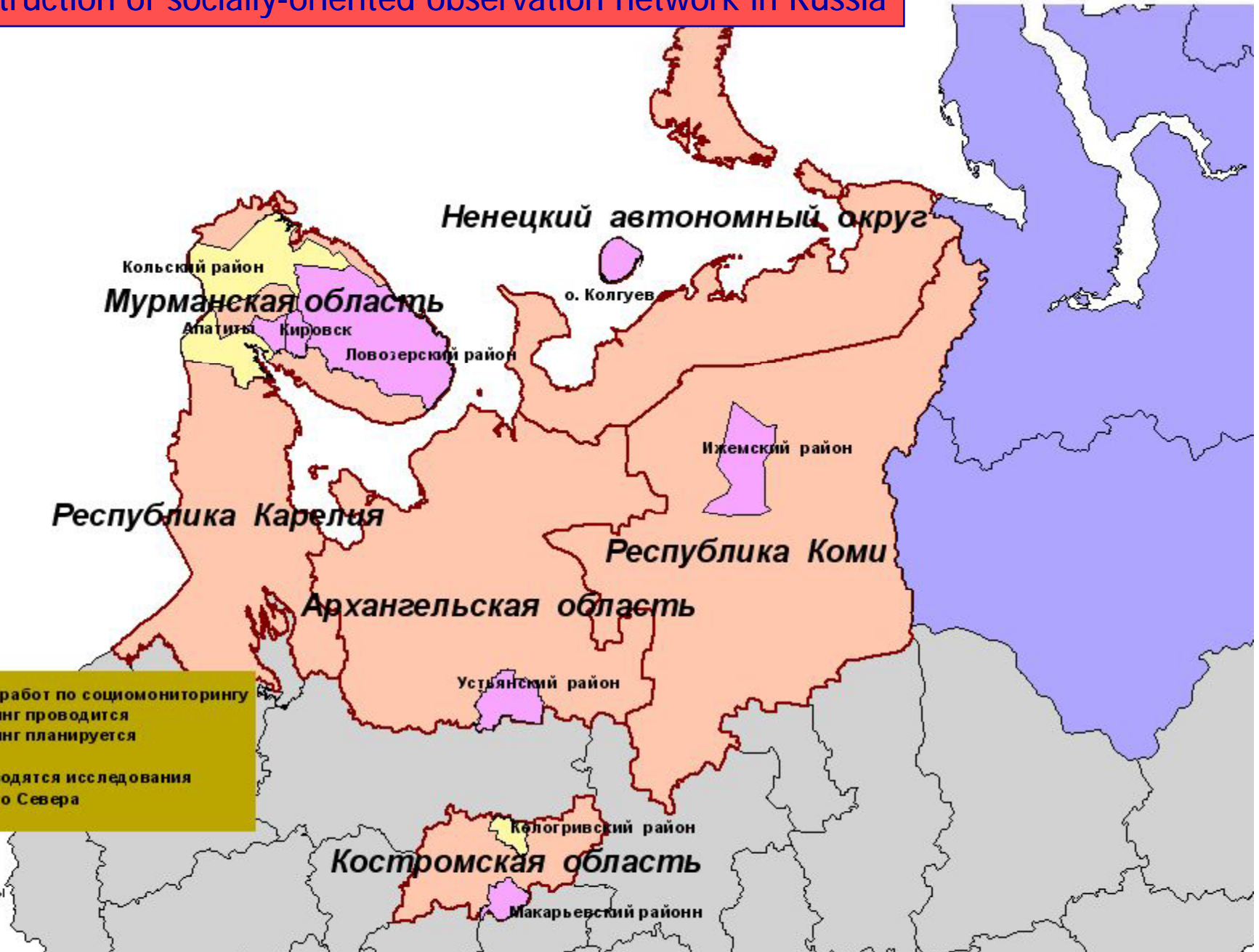
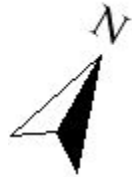
Completed and approved by the PPS Arctic  
group April 2008.

Edited by Annika Hofgaard and Gareth Rees

Section IV: Common protocols for regional socioeconomic and  
cultural observations

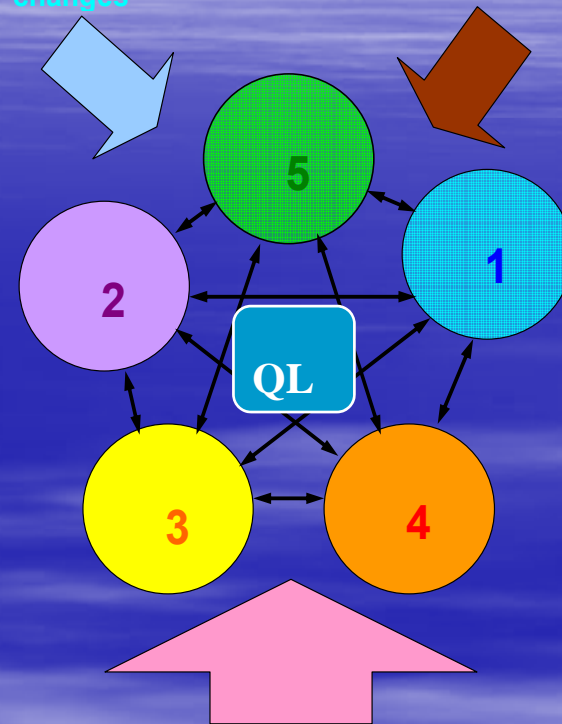
We are working according to the instructions  
approved in PPS Arctic socioeconomic and  
cultural observations protocols and testing this  
protocol

**ионы субъектов Российской Федерации, в которых проводится и планируется социомониторинг**  
**The construction of socially-oriented observation network in Russia**



Developing the procedure for Key Indicators  
Identification within 5 spheres of human-nature  
system

Climate and biodiversity changes      Human Impacts



Domains → Issues → Indicators

	Spheres	Topics	Challenges	Indicators
1	Spiritual-Cultural			
2	Governance, Law			
3	Social			
4	Financial-Economic			
5	Natural Environmental			

3. The interdisciplinary approach in SOO based on the five-sphere Concept of the structural organization of human-nature system is very perspective nowadays. According to this Concept in order to achieve the main target - the QL improvement, it is necessary to adapt and implement the development strategies for sound solution of appearing issues of QL and strategic goals set for its enhancement in interrelated spheres – social, economic, nature-environmental, management as well as the spiritual-cultural.

This methodology is included in PPS Arctic Protocol



# Common protocol on socially-oriented observations of the Quality of life (PPS Arctic Manual)

- Questionnaire:
- Record location, date and name of the researcher.
- 1. What are main issues affecting the quality of life in the region where you are? Please list issues of concern to your quality of life (e.g., nature, economic, social, culture, governance...etc.).
- 2. What are the main driving forces contributing to the issues you listed in your answer to question 1 above?
- 3. What are the main consequences for quality of life of the issues that you listed in your answer to question 1 above ?
- 4. What can be done to achieve a better quality of life and sustainability ?
- 5. What are main indicators, or variables that we should observe to understand the trends for better and worse in the quality of life?
- 6. Is your environment healthy? (Yes or no, with an invitation to add comments)
- 7. Is your life better than it was 5 years ago? (Yes or no, with an invitation to add comments)
- 8. Is your personal health good? (Yes or no, with an invitation to add comments)
- 9. Are you happier now than you were 5 years ago? (Yes or no, with an invitation to add comments)
- 10. Are environmental changes that are taking place influencing your well-being? If yes, please

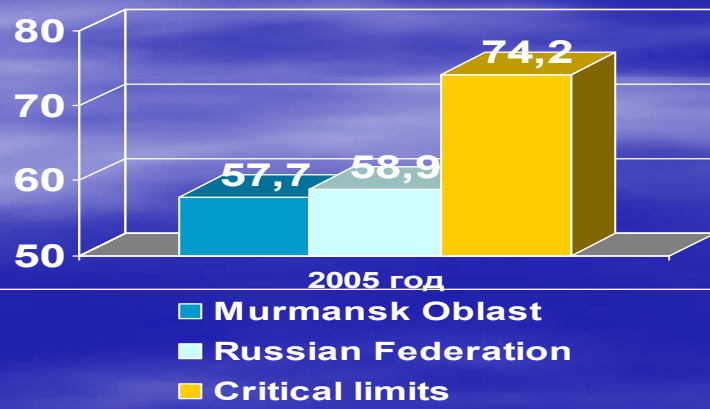
Permanent long- term SOO (Kola Peninsular)  
Express short-term SOO (Kola and other regions)  
Rapid stakeholder assessments sessions (Kola and other regions)

## Data:

Tools and Methods for key indicators of quality of life identification and acquisition by science with local and traditional knowledge integration



Life expectancy at birth, men, years



Paper: Annika, Tatiana, Nancy, 2009



Stakeholder sessions (Apatity 2008)

Statistics, literature, maps, images, Photos

Semi structured interviews

Analyses of samples of drinking water and food in polluted areas

Phenological observations

# Main first general conclusions

- Main issues and indicators for further observations identified for all our sites, although there are some local differences in specific sites of observations are:
- **material well-being (wages)** and level of income differentiation among the poorest and the most reach groups of the society;
- Unemployment level is becoming more and more important issue and indicator
- Life expectancy and child mortality;
- Quality of health-care system;
- State of the natural environment (pollution and quality of drinking water);
- Poor level of administration control from the local government;
- Poor level of peoples' participation in decision making;
- Quality of education;
- Quality of socio-cultural service

We have gathered a lot of semi-structured interviews and continue to collect interviews, photos, statistics at our sites. We have started already the work on analyzing these documents. That is why now we can make only preliminary

## Results of Rapid stakeholder assessments sessions (Kola , Apatity, Februa

Issues of Quality of Life	Total Summ of Values	Indicators based on people's perception (subjective)	Indicators based on statistics ( objective)
Low material well-being (standards of life)	6	Poorness ( perception of yourself to be poor or not ). Percent of people who consider themselves to be poor.	Average salaries ? The relation of average salaries to living minimum of life
Low life expectancy	11	People (percent of )worried about low life expectancy	Mortality (men !!!), infant mortality
Low quality of health-care system	14	People (percent of ) considering health-care system to be accessible (1), and satisfied with its quality (2)	Mortality, infant mortality .....
Environmental pollution and degradation	15	issue of water quality air pollution, , the lack of well equipped recreational zones, the problem of biodiversity protection, the esthetic view of the territory ( garbage relocation, etc )	Number of days with exceeding maximum allowable concentration (in air). The alternative source of water supply existence.
Low level of peoples' activity (participation) in self-governance ( in decision making)	26	People (percent) considering themselves participating ( in NGO, etc.)	Number of NGO, number of people participating in public activities.

Larisa Riabova from Kola Science Centre and others participated

# Apatity-Kirovsky region (long-term inquiry)

- QL is mainly perceived by local people as material well-being
- The priority problem (issue)- low salaries;
- Unemployment
- Low salaries 100%  
3 value
- Pollution 100 %  
4 value
- Limits to job opportunities 90 %  
3 value
- Insufficient local administration control 90 %  
1 value !

## Trend to observe - Unemployment problem is becoming more and more urgent

- If earlier (till November) the problem of a lack of working places was mentioned by 30% of respondents, it was already 100% in the last months of 2008. The financial-economic crisis is more and more mentioned among factors influencing a lack of working places.

# Insufficient local administration control 90 %                      1 value !

- Consequences are evident
- 1. The mayor of the city of Kirovsk and his deputy were killed recently
- 1. The accident in Kirovsk
- Many people were injured in the overnight explosion at the mine near Kirovsk, in the Murmansk region.
- Workers were conducting controlled explosions at the mine when the blast occurred, the officials said.
- The mine is operated by OAO Apatit, a major Russian company that produces apatite - a mineral commonly used in making fertiliser. **Many of Russia's mines have poor safety standards and have not been updated since the fall of communism.**



# PPS Arctic Protocol 4.4.5 Factors affecting quality of life – self-reported in Apatity - Kirovsk region

- What are limits to quality of life in your region (settlement)? Please mark all that apply.
- 1.Limits to job opportunities
- **2.Low salaries**
- 3.Poor access to transport
- 4.Poor access to drinking water of good quality
- 5.Poor access to traditional food
- 6.Hunger
- 7.Poor access to medical service
- 8.Bad food supply
- 9.Poor physical health
- 10.Poor mental health (alcoholism, suicide...)
- 11.Poor housing conditions
- **12.Pollution**
- 13.Reindeer pasture degradation
- 14.Forest degradation
- 15.Tundra changing to shrubs
- 16.Water reservoirs shrinking
- 17.Climate change
- 18.Biodiversity change and ecosystem fragmentation
- 19.Traditional culture or indigenous language disappearing
- 20.Limited access to education
- 21.Limited access to information (e.g. internet, TV etc)
- 22.Traditional knowledge and practices disappearing
- 23.Inadequate laws
- **24.Insufficient local administration control**
- 25.Insufficient federal government control
- Other (please list)



In both long-term and short term inquiries in Apatity - Kirovsk region the second key problem is low salaries. After law salaries is pollution (environmental degradation and pollution).

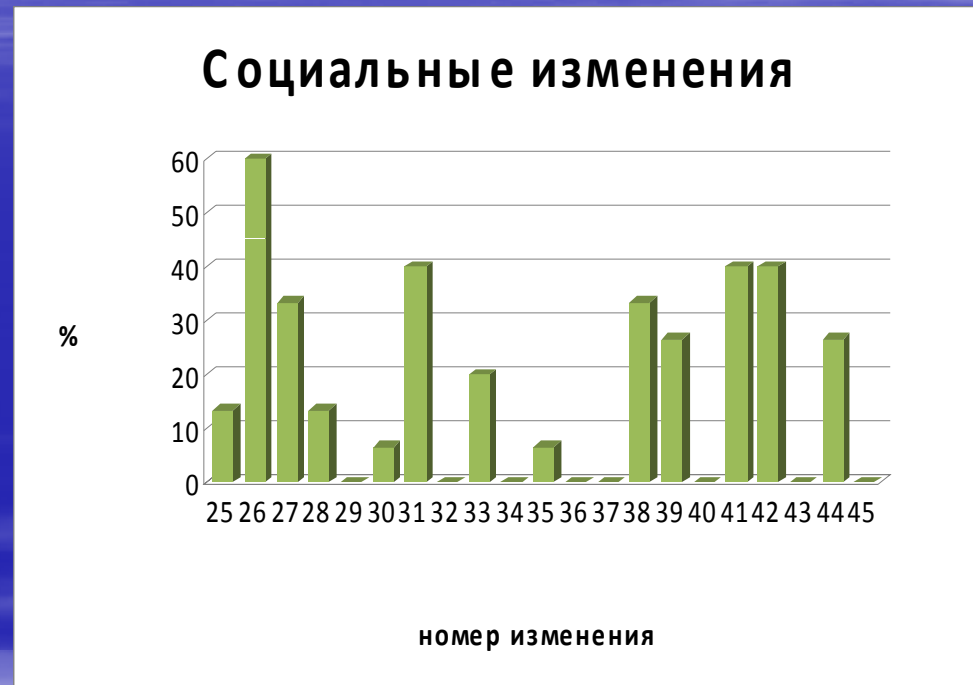


# Pollution and environment degradation and poor health

- This issue according to percent of respondents mentioned is of the same importance as low salaries and unemployment.
- Environmental pollution and degradation by industry and transport is one of the factors people note that led to bad physical health along with low wages, difficult working conditions in the Extreme North, bad accessibility and low quality of health service. This cause high sickness rate, low birth rate, high mortality, decreasing life quality and productivity of labour.
- The high children sickness rate arouses particular alarm. The head of a kindergarten in Apatity say that 5 years ago only 24 persons of 120 children had the second group of health and 2 (in average) had the third group, while all others had the first group. In the beginning of 2008 only 20 persons of 120 children had the first group of health, while all others had the second or third group (Report, 2008). According to the official statistics of Murmanskaya Oblast, the share of children of the first and second groups of health makes up 81.4% of all pupils; it means that about 19% of children belong to the third group (Concept..., 2008).
- Poor access to drinking water of good quality 60% value 2

## 4.4.2 Social changes

- 25. Loss of access to traditional foods
- 26. **Loss of fishing**
- 27. Loss of hunting
- 28. Loss of berries
- 29. Loss of herding
- 30. Loss of knowledge
- 31. Increased mining
- 32. Increased oil and gas activity
- **33. Increased accidents**
- 34. Reduced travel on the land
- 35. Increased agriculture
- 36. Increased forestry
- 37. Increased commercial plant harvesting
- 38. Increased tourism
- 39. Increased drug and alcohol problems
- 40. Increased hunger
- **41. Increased poverty**
- **42. Increased violence**
- 43. Increased social assistance
- 44. Housing shortage
- 45. Increased housing availability
- 46. Other (please list)



*Among "social" changes:*

**Increased accidents**

**Increased violence** were mentioned

*Loss of fishing – important non-formal economic activity*

Medvedev and students, Apatity-Kirovsk, 2008

# 4.4.1. Environmental change

- 4.4.1 Environmental change
- Indicate all that apply
- 1. Rising temperatures
- 2. Increasing river flows
- 3. Decreasing snow cover
- 4. Increasing precipitation
- 5. Thawing of permafrost
- 6. Diminishing lake and river ice
- 7. Melting glaciers
- 8. Retreating summer sea ice
- 9. Rising sea level
- 10. Wetland changes
- 11. Vegetation shifts
- 12. Increasing fires in nature
- 13. Increasing abundance of insects
- 14. New insect species
- 15. New mammal species
- 16. New plant species
- 17. New bird species
- 18. New fish species
- 19. Changes in fish
- 20. Changes in marine mammals
- 21. Changes affecting marine mammals
- 22. Changes in land animals
- 23. Changes affecting land animals
- 24. Changes in land use

In comparison with social changes, natural changes in climate, river flows, vegetation shifts are poorly valued by respondents



Medvedev and students, Apatity-Kirovsk, 2008

# Peoples' Quality of Life is the major driving force effecting the state of natural environment

- In some sites uncontrolled clear-cutting, illegal logging and tourism had greater impact on forest degradation, even more than air pollution;
- Results of SOO based on interviewing and information-educational workshops, statistics, government reports, literature, etc. show that: 1. People's QL (well-being, health, human resources and capacities, etc.) is the major driving force effecting the natural environment in the Northern regions (especially in the more populated Northern regions of the Russian Federation).
- Changes in climate and its consequences to the environment are important factors, but in relation to the future of settlements, communities and cultures, in the end it is the people of the North and their QL that are decisive.
- People's QL directly influences (as well as responses to) the state of natural environment, including northern forests and tundra ecosystems in the Russian North which is well-illustrated in observation sites.

## Clear-cutting still is the main industrial harvesting method in Russia

- Although Russian forestry regulations do suppose many different types of selective logging, clearcut still is the main industrial harvesting method in Russia. Its upper size is currently restricted with 50 hectares.
- View at a typical Russian clearcut.
- Here below You could see the space view to the massive clearcuts in the Republic of Komi. Chess-shaped logging plots are clearly visible. Newer plots (up to 50 hectares) could be separated by their size from older ones, which had up to 200 hectares according to the previous regulations.



# Illegal logging



- It's no secret that the damage caused by illegal logging each year is of hundreds of millions of rubles. As a result of common efforts of the Department of Forestry and the forest police in the Arkhangelsk region in 2008 was found 174 cases of illegal logging. The volume of timber harvested by criminals is more than 43 thousand cubic meters, and economic losses amounted to 300 million ... Law enforcement agencies initiated 500 criminal cases, 147 people were brought to criminal responsibility
- One of the important problems the head of Rosleskhoz (Valery Roshchupkin) called timber theft. 15% forest in 2007 was simply a stolen.
- Another acute problem - illegal saw bench. Today, in the Arckhangelsk Oblast are about a thousand small and medium-sized sawmill.

<http://www.dvinainform.ru/news/2009/02/03/73682.shtml>

# Forests drying

- Another relevant topic is drying forests. Arkhangelsk Region is considered one of the most problematic. And the problem of shrink forests typical today for the western countries like Canada and Sweden. There are already way out of the situation, it is necessary and in the Arkhangelsk region have to do something in this direction "-

# The problem of drying forests along the railway near Velsk, Arkhangels Oblast



The problem of taiga forests drying can be explained by different factors in our case study regions

1. along railroad routes- pollution from rail transport ( by oil, coal transport)
2. Waterlogging due to disruption of hydrological regime
3. Climate change effects- droughts



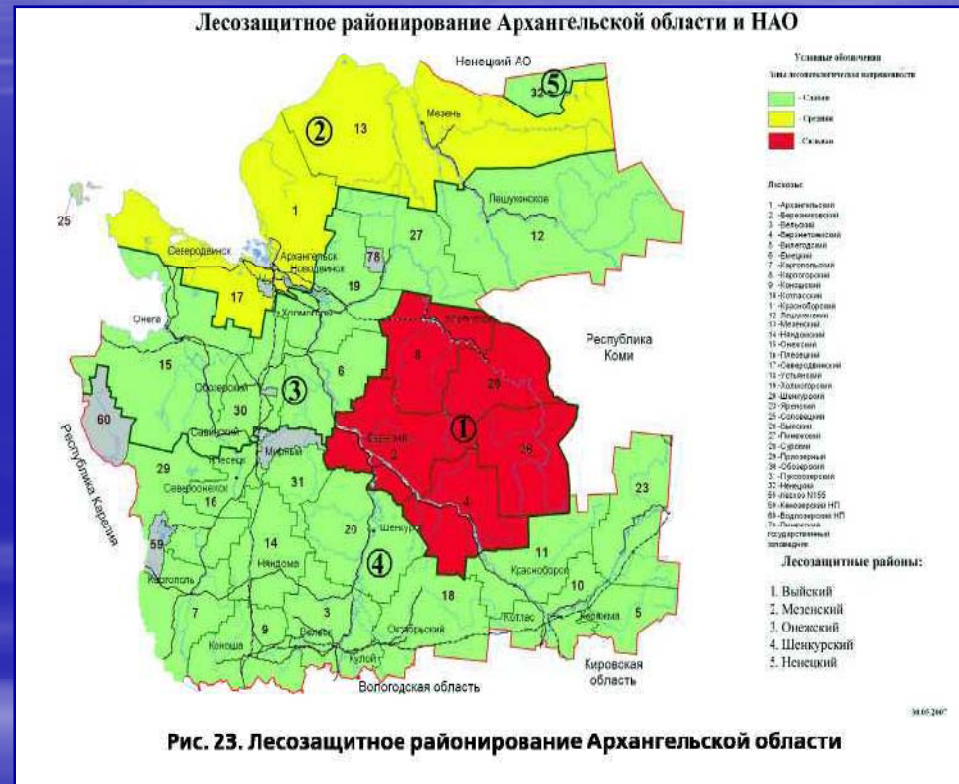


Drving pine forest, Village Bestuzheva, Summer 2008

# Forests drying in Viyskom area( between Northern Dvina and Pinega

According to the forest Service Agency causes shrinkage of old plantation of spruce is a complex of factors: dry and hot summer periods 2002 to 2003., snow storms, mass reproduction of pests and deceases.

Questions- To Gareth and Olga:  
Can images show this ?



Отчет Состояние Охраны Окружающей Среды Архангельской Области 2007.  
Издан в 2008 г.

# The interaction of process of forests drying with the oil and gas industry development (Izma case observation region) in 40 meters from Shilyaurt deposit

Ионометрический анализ проб воды взятых вблизи к скважинам нефтедобычи показал существенные изменения химического состава поверхностных и грунтовых вод:

Высокая степень минерализации ( сумма катионов и анионов- более 600). В водах заказника Собысь- этот показатель в 50 раз меньше!

Высокое содержание хлорид -иона (более 500 мг на 1 литр, превышение ПДК в два раза), Избыточное количество губительно действует на корневую систему деревьев и приводит к высыханию большого массива леса. В естественных ландшафтах Севера, хлорид- иона в отличие от аридных, практически отсутствует.

Наиболее вероятной причиной гибели леса в этом месте является несоблюдение технологии при закачивании в скважину для поддержания пластового давления сильноминерализованных вод (гидрокарбонатов бария, содержащих хлорид-иона). К тому же нарушается гидрологический режим.

Высокое содержание азота: аммонийного наиболее опасного для здоровья( превышение ПДК в 23 раза), нитратного ( ПДК в 2 раза). Это связано с непосредственными разливами нефти, как органического вещества.



# One example of adaptation strategy to socio-environmental changes

- One example of such a coupled approach to human-nature system development is the enforcement of the adaptation strategy for sustainable forestry management (recultivation, planting establishment of new protected areas - national parks, especially in regions where natural afforestation occur due to climate change). In years of the world socio-economic crises, where many industrial enterprises are closing and people are losing their work, such strategies will give employment to people who have lost their previous jobs from one side, and from another- it will increase the overall forested area and will follow important requirements of sustainable use of forests becoming vital for the access of the Russian timber to the West-European markets, sensitive to environmental abuses and will provide important resources for recreation and tourism development as well. Forest area increase will also act as a mitigation measure to combat world climate change consequences.

The methodology of coupled human-nature system investigations  
is in a process of development

- **Three main points in such a new vision:**

- **1. Local and Indigenous People –Arctic Residents are unique observers** of changes happening in the nature and society ( in addition to such scientific devices as meteostations, satellites , statistics, etc. ) It has been well demonstrated in the process of ACIA implementation and approved by our PPS Arctic activities

- **2. People's quality of life –Human Resources and Capacities** is the major area (so called “reference point” for mentioned human-nature interconnections to be observed- not only with the help of scientific methods (such as statistics, images, etc.) but with the strong participation of local and indigenous peoples in the Quality of Life issues identification and observations\monitoring.

- **3. I would like to stress that Quality of Life, Human resources and capacities** is the major driving force effecting the natural environment in the Arctic (especially in the more populated Northern regions of the Russian Federation). Changes in climate and the environment are important factors, but in relation to the future of settlements, communities and cultures, in the end it is the people in the Arctic that are decisive!

# The implementation of Adaptation strategy needs education and awareness among local people

- It is not surprising, that some changes in Kola peninsular evident for scientists, such as forested area or treeline changes are not registered by respondents or ranked high as limits or opportunities for their QL. This is a result of the **lack of sufficient environmental education and awareness among the local people** and also of their greater concern with the low level of material well-being.
- **We expect that SOO including both scientists and local observers will help to raise peoples awareness of many coupled human-nature issues and opportunities of QL improvement in the North.**

Thank you !