FULL TITLE OF THE PROJECT AND ITS ACRONYM

STRUCTURE AND DYNAMICS OF THE PECHORA DELTA ECOSYSTEMS (PECHORA DELTA)

BRIEF PREHISTORY OF PROJECT

With a length of 1,809 km, the Pechora river is the largest European river draining into the Arctic Ocean. The Pechora basin extends over a total area of 322,000 km^2 covering a considerable part of the Timan mountain range, the Pechora lowland depression plain, the western slopes of the Northern, Subarctic and Arctic Urals and the tundra zone. The Pechora river basin includes more than 31,500 tributaries of the 1st to 4th order as well as 62,140 lakes with an overall surface area exceeding 4,000 km^2.

Before draining into the Pechora Bay, the river forms a delta with surface area of about 15,000 km^2. To the West and East the delta is bordered by upland tundra ecosystems, while a coastal lowland plain extends to the North-West. The almost total absence of industry, the insignificant role of agriculture, the lack of infrastructure and the non-regulated discharge of the Pechora river make it possible to use the region as a amenable model for studying the structural-functional organization of natural terrestrial and aquatic ecosystems, as well as the processes related to the temporal and spatial distribution of flora & fauna diversity.

MAP OF THE PROJECT TERRITORY

DATES OF IMPLEMENTATION OF PROJECT

1995-1999

FUNDING ORGANIZATIONS

RIZA, Institute for Inland Water Management & Waste Water Treatment, Directorate-General for Public Works & Water Management, Ministry of Transport, Public Works & Water Management, the Netherlands Institute of Biology, Komi Science Centre, Ural Division, Russian Academy of Sciences, Russia

PROJECT CO-ORDINATOR

Dr. M.R. van Eerden, RWS RIZA, Lelystad, the Netherlands

RESPONSIBLE SCIENTISTS

Dr. A.I. Taskaev, Dr. I.A. Lavrinenko, Dr. V.I. Ponomarev

GOAL AND TASKS

The main goal of the project was to study the spatio-temporal landscape and biological characteristics of the Pechora delta ecosystems, the adjacent upland areas of the Bolshezemelskaya Tundra and Nenetskiy Hills, and the coastal plain of the Malozemelskaya Tundra. Landscape features obtained during multiple field work activities in selected pilot areas were related to large-scale remote sensing images (Landsat TM5). Together with detailed characterisations of the flora and fauna of distinguished landscape types, the elaborated Landscape Ecology Classification will serve as a basis for creating an ecological GIS, planned to be used, first of all, to rationalize nature conservation activities in the Nenets Autonomous Okrug (NAO). Overall, the "Pechora-Delta" project focused on a multidisciplinary approach. It involved specialists and data collection on terrestrial & aquatic ecology, botany & plant physiology, soil science, entomology, theriology, ornithology, ichthyology & hydrobiology, environmental pollution, and GIS.

PARTICIPATING ORGANISATIONS

Institute of Biology, Syktyvkar, Russia
RWS RIZA, Lelystad, the Netherlands
State Committee for Environmental Protection, Naryan Mar, Russia

MAIN SCIENTIFIC RESULTS

Ecosystem studies in the project region showed that three main landscape types can be distinguished, which also could be identified on the satellite images:

1) the real Pechora delta landscapes, characterised by the lowest topographical positions, dominated by shrub-meadow communities;

2) Rolling landscapes dominated by typical tundra dwarf shrub-moss and dwarf shrub-lichen communities related to the highest topographical locations;

3) Coastal tundra landscapes dominated by *Carex* marshes and halophytic communities close to the sea shore. A vegetation classification for the project area – the Pechora delta and the surrounding tundra – was generated. A large quantity of new information on the structure and dynamics of communities of birds, water and terrestrial invertebrates, fish, algae flora, lichens & mosses, as well as soils and soil cover were obtained. It was shown that indication and monitoring of the state of ecosystems and their structural-functional blocks can be conducted using systematic monitoring of several integrated spectral parameters and informative spectral indices. In addition to the possibilities of using the obtained results to solve fundamental ecological problems of arctic regions, the further development of integrated research activities and remote sensing methodologies contains many aspects of practical use.

MAIN PRODUCTS

The results of the project were integrated in an English-language monography published in the Netherlands:

Van Eerden M.R. (ed.), 2000. Pechora delta. Structure and Dynamics of the Pechora Delta ecosystems (1995-1999). Lelystad, the Netherlands. 367 p.

In addition, several papers were published in Russian and international issues:

Taskaev A., Fokkens B., Lavrinenko I., Van Eerden M., Lavrinenko O., Ponomarev V. Actual state of the Pechora basin ecosystems: biological richness of an undisturbed river flow // Dealing with nature in Deltas: proceedings of Wetland Management Symposium. – Lelystad, the Netherlands, 1998. – P.81-91.

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Ponomarev V.I. Modern state of fish communities of the Pechora inlet tidal zone // Third Workshop on Land Ocean Interactions in the Russian Arctic (LOIRA): Abstracts. Moscow, 2000. P. 122-124.

Photo: I.Lavrinenko

1. The International Pechora Symposium “Delta Ecosystems of Large Asian and European Rivers” (Syktyvkar, September 2000) concluded five-years of Netherlands-Russian cooperation.
2. Field work with a multidisciplinary team of natural science specialists was the functional unit for data collection within the Russian-Netherlands project “Structure and Dynamics of the Pechora Delta Ecosystems”.
3. The salinity gradient from fresh river water to saline water in the surroundings of the Peshanka-To estuary entering the Barents Sea creates a variation in wetland habitats conditions.
4. The Arctic fox (*Alopex lagopus*) is one of the main predator mammals at the top of the food chain in the riverine Pechora Delta and coastal wetlands of the Russkiy Zavorot peninsula.