



# Integrated Intelligent Platform for Monitoring the Cross-Border Natural-Technological Systems

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## INFROM

**Priority 2** Common challenges

**Measure 2.1** Joint actions aimed at protection of environment and natural resources





## Short summary of the project

Nowadays, monitoring and control methods are applicable only to specific Natural Technological System (NTSs). As a result, the statistical information about existing systems is not well coordinated. This drawback becomes more evident in case of different incidents and disasters, when effective decisions must be taken within a short time period and different information flows should be analyzed.

Monitoring information regarding incidents and disasters is received typically from different facilities (e.g. biometric systems, aerospace systems, etc.), and, therefore, it is heterogeneous in nature (e.g. electrical signals, audio and video information, text, etc.).

Thus, since modern NTS are very complex and multi-functional objects, their monitoring and control should be performed in conditions of large-scale heterogeneous data sets. Up to now, the monitoring and control processes of NTS are not completely automated.

The project addresses the topical problem of integrated real-time monitoring and control of cross-border natural-technological systems (NTS) in normal and emergency situations based on heterogeneous data received from space and ground-based facilities.

The project idea is to develop a universal common intelligent platform in order to unify efforts of specialists from Russia and Latvia to protect the environment, based on integrated space-ground monitoring.

## Overall objective

To develop the universal common intelligent platform for unifying efforts of specialists from Russia and Latvia to protect environment, based on the integrated space-ground monitoring.

## Specific objective

- ✚ Description of state-of-the-art in automation and intellectualization of NTS monitoring and control in normal and emergency situations considering integrated data from space and ground-based sources
- ✚ Development of a conceptual framework for integrated intelligent monitoring and control of NTS based on mixed-type data processing
- ✚ Development of IT for analysis and synthesis of integrated intelligent platform for cross-border NTS monitoring and control
- ✚ Development of software prototype which demonstrates possibilities and advantages of suggested new IT for analysis and synthesis of integrated system for the cross-border NTS monitoring and control
- ✚ Establishment of integrated distributed information network of workstations

## Beneficiary

**Riga Technical University** (Latvia)

## Partners

**Saint Petersburg Institute for Informatics and Automation of RAS** (Russia)





## Expected results

- + **improvement of the cross-border natural-technological system monitoring system** by the implementation of the developed integrated intelligent platform in Latvia and Russia
- + **increased precision of the forecast** for the course of situation by simulation techniques
- + **increased quality of the results** via the discussion at seminars in Latvia and Russia and **increased specialist's skills** by organization of training in Latvia and Russia
- + **intelligent information technology for NTS** monitoring and control considering integrated data from space and ground-based sources;
- + **models of NTS** as well as monitoring and control system in normal and emergency situations;
- + **model and method of NTS monitoring** and control systems dynamically reconfiguration;
- + **set of techniques for synthesis** of an intellectual NTS monitoring and control system considering heterogeneous space and ground-based data
- + **software prototype** for NTS monitoring and control considering heterogeneous space and ground-based data
- + **experimental results** of the software prototype approbation on the existing NTS
- + **integrated distributed information network of workstations** which is aimed to provide remote access to data archives and their integrated processing in Latvia and Russia
- + **state-of-the-art Technical Economical Foundation (TEF) creation** for the improving of the cross-border monitoring infrastructure.
- + **approbation and maintenance of the developed technology** by organizing interviews with representatives of the local governments and interested organizations.

## Final beneficiaries

- + The ministries and agencies of regional development
- + Environment, geology and meteorology centers
- + Departments of civil defense and emergency
- + Local authorities
- + Academic and research staff of universities and institutes
- + Local people

## Duration

24 months

## Budget

Total budget: **989 356,00** EUR

Programme co-financing: 881 156,00 EUR (89,06%)

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