

Siberia Integrated Regional Study: The state of the art

E. Gordov (1) and E. Vaganov (2)

(1) Siberian Center for Environmental research and Training and Institute of Monitoring of Climatic and Ecological Systems SB RAS, Tomsk, Russia; gordov@scert.ru

(2) Institute of Forest SB RAS and Siberian Federal University, Krasnoyarsk, Russia

ESSP/IGBP Integrated Regional Studies (IRS)

- **Based on the concept of the region as a holistic entity in the context of the Earth System;**
- **Contribute to a quantitative and qualitative understanding of regional-global linkages and the consequences of changes in these linkages.**

NEESPI regional mega project

Siberia Integrated Regional Study (SIRS, <http://sirs.scert.ru/>)

Why Siberia:

Drastic regional climate variations;

Role in carbon cycle (forestry, bogs, peat);

Permafrost;

**Siberia-global system linkages; and last but not least,
SB RAS research infrastructure**

2003 – beginning of SB RAS specific activity!

Siberian Branch of the Russian Academy of Science (SB RAS) incorporates 74 research institutions in research centers (Novosibirsk, Tomsk, Krasnoyarsk, Irkutsk, Yakutsk, Ulan-Ude, Kemerovo, Tyumen, and Omsk) as well as in cities Barnaul, Chita, and Kyzyl.



ИНТЕГРИРОВАННОЕ РЕГИОНАЛЬНОЕ ИССЛЕДОВАНИЕ СИБИРИ | SIBERIA INTEGRATED REGIONAL STUDY

ИРИС **SIRS** <http://sirs.scert.ru>

Guest |

Program | Climate | News

Rus | Eng

Few years ago IGBP suggested to develop in selected regions integrated regional studies of environment, which would represent a complex approach to reconstruct the Earth System dynamics from its components. It considered as a complementary effort to the thematic project approach employed so far in the international global change programs. Nowadays Integrated Regional Study (IRS) approach is developed by the Earth System Science Partnership (<http://www.essp.org/>), joining four major Programs on global change research. IGBP initiative aimed at development of IRS in the most important regions of the planet puts a set of prerequisites for such studies:

- The concept should be developed in the context of the Earth System as a whole;
- Scientific findings should support sustainable development of the region;
- Qualitative and quantitative understanding of global-regional interconnections and the consequences of changes in these interconnections should be achieved.

The regional (region here is a large geographical area, which functions as a biophysical, biogeochemical and socio-economical entity) aspect of science for sustainability and of international global change research is becoming ever more important nowadays. Modern technologies in land use, industrial and economical development lead to rapid changes both at regional social-economical system and the Earth System. Consequences of these changes are very important on a regional and global scale. Regional approach to the study is also important with respect to the point of view of Earth sciences. Regional compounds of the Earth System may manifest significantly different Earth System dynamics and changes in regional biophysical, biogeochemical and anthropogenic components may produce considerably different consequences for the Earth System at the global scale. Regions are "open systems" and the interconnection between regional and global processes plays a key role. Some regions may function as choke or switch points (Lubchenco, 1985) and studies on their interconnections and the

<http://sirs.scert.ru>

News

19.08.2008 | Report on Open Meeting of Russian National Committee for IGBP: Development of Siberia Integrated Regional Study (SIRS) is available online

Authors: Pr E. Gordov, SCERT, Tomsk, Russia, & Dr. G. Begni, CNES, France. Click [here](#) to download.

24.10.2007 | SIRS Workshop report is available online

Authors: Pr E. Gordov, SCERT, Tomsk, Russia, & Dr. G. Begni, CNES, France.

18.09.2007 | Workshop on Siberia Integrated Regional

Siberia Integrated Regional Study (SIRS, <http://sirs.scert.ru/en/>)

Northern Eurasia Earth Science Partnership Initiative (NEESPI) megaproject coordinating national and international activity in the region aimed at investigation of environmental changes in Siberia in their interrelations with Global Change.

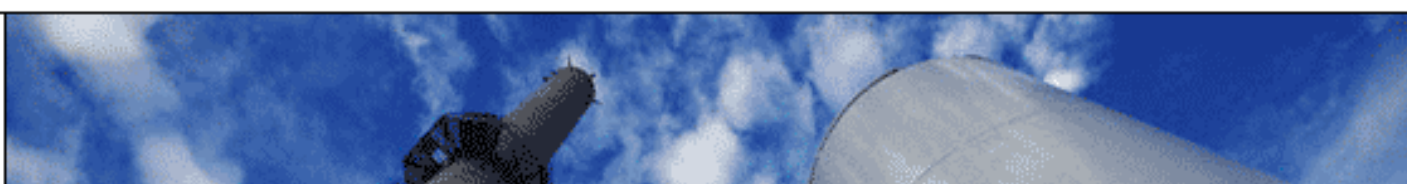
Approach adopted

Clusterization of national and international projects (knowledge and data sharing)

Development of information-computational infrastructure to support multidisciplinary investigations of the region

YS Training&Education

Organizationally SIRS is supervised by the Russian National Committee for IGBP and managed by its Siberian Branch via **SCERT**



Siberian center for Environmental Research and Training

Siberian Center for Environment Research and Training (SCERT) is a multidisciplinary research center comprising efforts of several research Institutes of Siberian Branch RAS and Universities from Tomsk, Barnaul, Irkutsk, Krasnoyarsk, Novosibirsk and Moscow in area of regional climate change monitoring and modeling, regional climate impact applications. The Center is located at Tomsk Akademgorodok. The Center is organized on the base of initiative of the Institute of Monitoring of Climatic and Ecological Systems SB RAS (former Institute for Optical Monitoring SB RAS) and according decision of the Siberian Branch RAS operates now as SB RAS International Research Center.

SCERT performs national and international projects (including INTAS and EC projects) in area of climate change monitoring and modeling including regional social and economic impacts of processes occurring now in the climatic system.

08.04.2009 | [CITES-2009](#)

Tentative program of CITES-2009 conference and NEESPI Workshop is available at the event site

02.03.2009 | [CITES-2009](#)

Tentative young scientists's school program

16.12.2008 | [Enviro-RISKS Project is completed](#)

Enviro-RISKS Project is completed. Its main results are available at the Project site.

The main objectives of the Center activity are:

- To investigate contemporary climatic and environmental changes in Siberia as a part of the global Earth system thus arriving to understanding major regional climatic tendencies including social consequences for population (SIRS)**
- To facilitate participation of Siberian young and prominent researchers in scientific cooperation, especially in European.**
- To train researchers (especially young) in contemporary methods and approaches of Environmental Sciences thus filling generation gap occurred recently in Russia scientific community**

SIRS Components

•Scientific:

Clustering national (SB RAS, RAS, RFBR) and international projects on Siberia environment (data and knowledge sharing, harmonization)

•Infrastructural:

Development of informational-computational infrastructure of integrated regional study of Siberia environment

•Organizational:

Russian National Committee for IGBP appointed its Siberian Branch to manage SIRS development

•Educational (capacity building):

ENVIROMIS Multidisciplinary Conference with elements of YSS (Invited lectures embedded as well as thematic Workshops);

CITES (Computational and Information Technologies for Environmental Sciences)

YSS and Conference (Lecture courses, Training sessions as well as Invited lectures)

All listed directions has international dimension.

ZOTTO Project



Russian organizations involved:

- Siberian federal university, Krasnoyarsk;
- V.N. Sukachev Institute of Forest SB RAS (Krasnoyarsk) - local host institution;
- Institute of Atmospheric Physics RAS, Moscow



MAX-PLANCK-GESELLSCHAFT



- MPI for Biogeochemistry (Jena, Germany) - continuous biogeochemical trace gas measurements, eddy covariance flux measurements, meteorology observations and local ecosystem process studies;
- MPI for Chemistry (Mainz, Germany) - measurements of aerosols and CO concentration and isotopes;
- Institute of Troposphere Research (Leipzig, Germany)



- International science and technology center (ISTC) – recently started Project 2770

International Projects performed/performing (FP6):

Environmental Observations, Modeling and Information Systems Special Support Action (ENVIROMIS SSA), 2004-2005;

Environmental Observations, Modeling and Information Systems–2 (ENVIROMIS-2), 2006-2007;

Man-induced Environmental Risks: Monitoring, Management and Remediation of Man-made Changes in Siberia (Enviro-RISKS), 2005-2008;

Climate Impact Research Coordination for a Larger Europe (CIRCLE ERANET), 2005-2009;

Gmes Network of Users (GNU ERANET), 2007-2011.

Asia Pacific Network for Global change (APN):

CBA2007-08NSY and ARCP2008-14NMY

WANTED Cooperation and new projects!

RAS and SB RAS funded projects:

Monitoring climatic and ecosystem changes in West Siberia (krutikov@imces.ru)

Great Vasyugan Bog dynamic under natural and anthropogenic change (kabanov@imces.ru)

Development of Internet-accessible satellite data Centers in the Region (shokin@ict.nsc.ru)

Development of distributed analytical environment supporting ecological systems study (fedotov@sbras.ru)

Cooperation is welcomed!

IC infrastructure developing in cooperation with European and American partners is aimed at support of multidisciplinary and “distributed” teams of specialists performing cooperative work with tools for exchange and sharing of data, models and knowledge optimizing the usage of information-computational resources, services and applications.

Key elements:

Web portals with thematic web sites providing an interactive access to data, models and tools:

- **ATMOS** (<http://atmos.iao.ru/> and <http://atmos.scert.ru/>)
- **RISKS** (<http://climate.risks.scert.ru/>)
- **ENVIROMIS** (<http://enviromis.scert.ru/en/>)

Each portal is provided with extensive tutorial and educational materials

SIRS Educational/capacity building

(<http://scert.ru/en/conferences/>)

IRS specifics:

Multidisciplinarity;

Necessity of information-computational infrastructure;

Results should be delivered to regional decision makers.

It requires special education/training program

ENVIROMIS – biannual Multidisciplinary Conference with elements of YSS

(Invited lectures embedded as well as thematic Workshops);

CITES (Computational and Information Technologies for Environmental Sciences) biannual YSS and Conference

(Lecture courses, Training sessions as well as Invited lectures)

70-80/ year NIS YS were selected and supported (sponsors INCO EC, APN, RFBR, Ministry of Education and Science RF, NASA, new sponsors are wanted!)

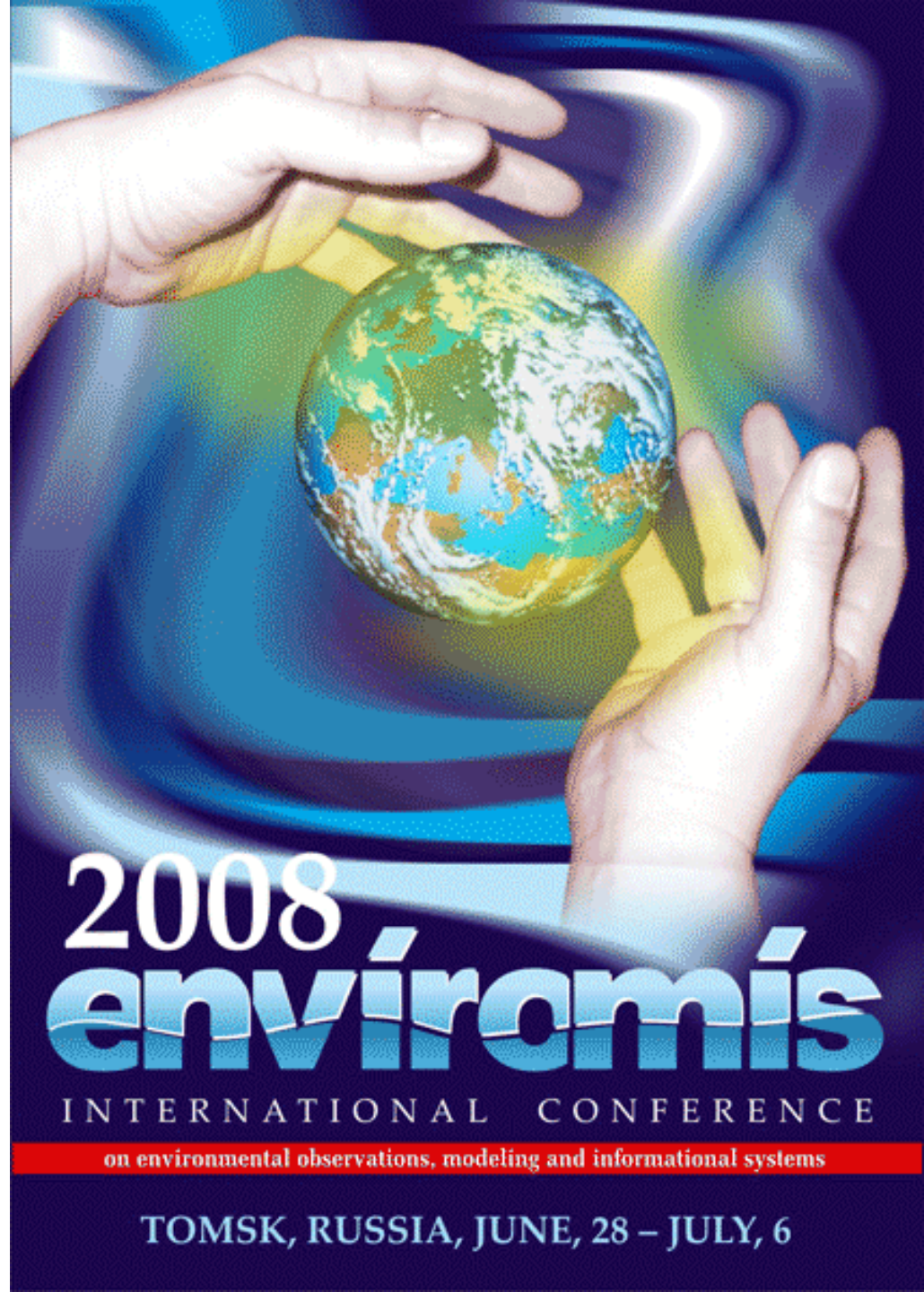
International Conference with elements of Young scientists school “Environmental Observations, Modeling and Information Systems” (ENVIROMIS-2010), August 2010 , Akademgorodok, Tomsk, Russia

NEESPI NATO ARW (Proposal submitted)

NEESPI Early Career Scientists School

Workshop on Northern Eurasia Land Dynamic Assessment

Joint future initiatives to involve YS into the domain and improve cooperation



**International School and
Conference on Computational
Information Technologies for
Environmental Sciences
(CITES-2011), Petrozavodsk,
August-September, 2011**

**Major theme: Regional Climate
Change**

**Northern Eurasia Earth System
Science Partnership Workshop?**

**Sponsors: RFBR (Russia), RAS,
NASA/NEESPI? , MPS?, EPA?, ...?
List is still open!**



**International
conference**

on Computational Information Technologies
for Environmental Sciences

July, 11-15, Krasnoyarsk

Thank you!