Some results of Siberia Integrated Regional Study

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

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

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

Major challenges:

- **Permafrost fate, especially its border shift (serious threats to infrastructure and significant potential carbon source);**
- **Desert - steppe- forest-tundra ecosystems borders shifts (change of region carbon cycle and serious socio-economical consequences for local population; and**
- **Temperature/precipitation/hydrology regime change (increase risks of forest and peat fires leading to enormous carbon release from the region.**

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 — ИРИС — SIBERIA INTEGRATED REGIONAL STUDY — SIRS — http://sirs.scert.ru

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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 (in both biophysical and socio-economic senses) and small changes in regional systems may lead to profound changes in the ways in which the Earth System operates.

News

30.03.2010 | RNC IGBP open meeteng

Open Meeting of Russian National Committee for IGBP: Development of Siberia Integrated Regional Study will take place on 10 July in Tomsk during ENVIROMIS 2010 Conference.

18.12.2009 | Workshop on Siberia Integrated Regional Study 2009

Workshop on Siberia Integrated Regional Study (SIRS) took place in the framework of International Conference on Computational Information Technologies for Environmental Sciences: "CITES-2009", July 5-15, 2009, Krasnoyarsk, Russia. Workshop

Siberia Integrated Regional Study: multidisciplinary investigations of the dynamic relationship between the Siberian environment and global climate change

Author E P Gordov [1] and E A Vaganov [2]

Affiliations [1] Siberian Center for Environmental Research and Training and Institute of Monitoring of Climatic and Ecological Systems SB RAS, 10/3, Akademicheskii Ave, 634055 Tomsk, Russia
[2] Siberian Federal University and Sukhachev Institute of Forest SB RAS, 79, Svobodny Ave, 660041 Krasnoyarsk, Russia

E-mail gordov@scert.ru rector@sfu.ru

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This is an editorial overview of the Siberia Integrated Regional Study (SIRS), which is a large-scale investigation of ongoing and future environmental change in Siberia and its relationship to global processes, approaches, existing challenges and future direction.

Introduction

The SIRS is a mega-project within the Northern Eurasia Earth Science Partnership Initiative (NEESPI), which

Clusterization: Some new RAS and SB RAS projects (results will be reported by coordinators):

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)

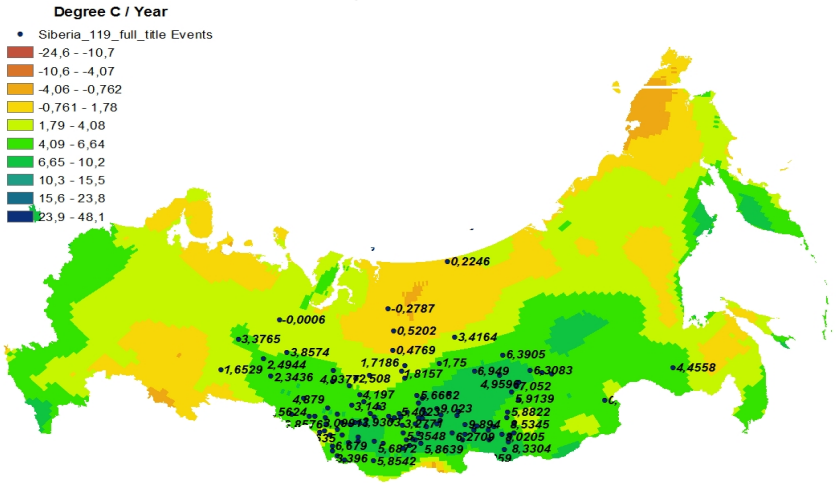
Development of distributed analytical environment supporting ecological systems study (fedotov@sbras.ru)

Cooperation to initiate more cooperative projects is welcomed!

Ongoing processes: Some recent results (SB RAS and RFBR projects)

(S 2) Short oral paper **(changed from oral)** Shulgina et al. **Climatic characteristics which control Siberian forest ecosystems dynamics in the second half of XX century**

Trends for sums of temperatures above 5 C / 10 year (ECMWF data (0.5x0.5))



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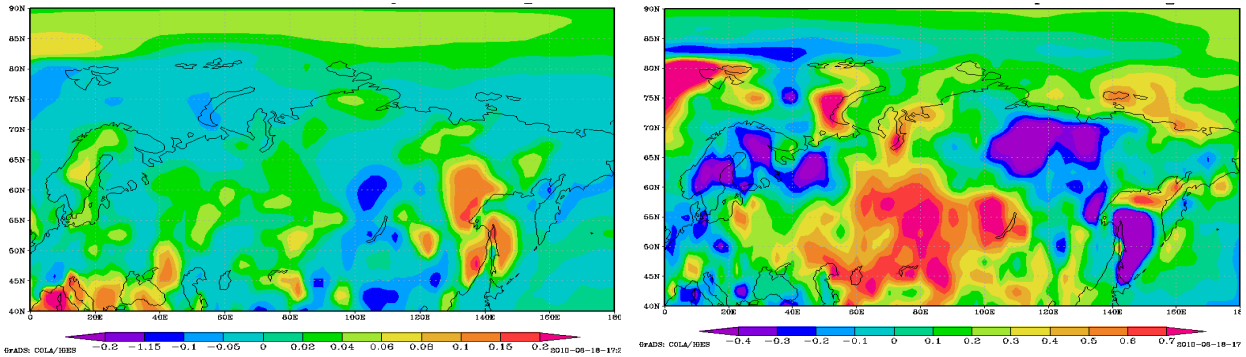
Trend of daily temperature range and intra-annual extreme temperature range based ERA-40 data (°C/year)



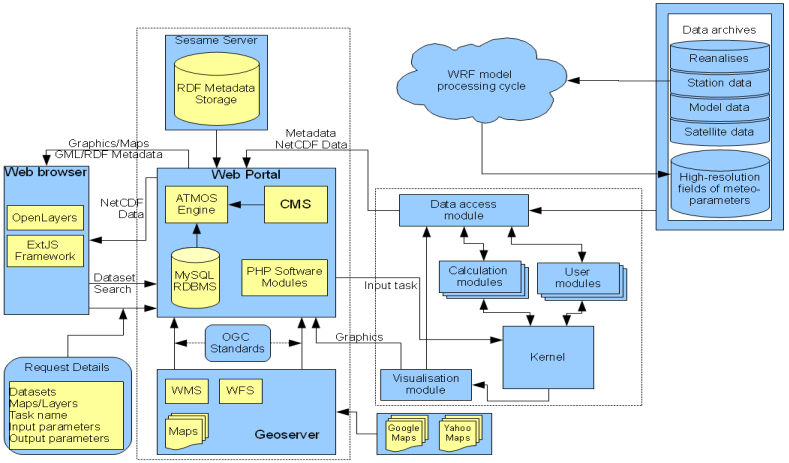
IC infrastructure developing in cooperation with European and American partners is aimed at support of multidisciplinary and "distributed" teams of specialists performing cooperative work with tools for exchange and sharing of data, models and knowledge optimizing the usage of information-computational 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/)
- New web-GIS portal under development

IC infrastructure: Some recent results (SB RAS and RFBR projects)

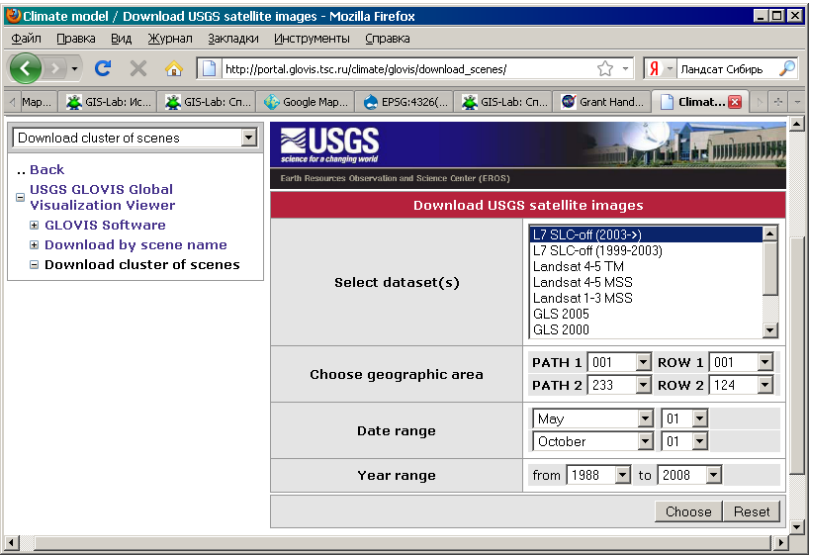


(S 6.3) Short oral paper A. Titov et al.

Architecture of software framework for development of web-systems for georeferenced data analysis

oral paper (S 6.3) Gordov E.P., Okladnikov I.G., Titov A.G., Shulgina T.M.

Development of geoinformation web-system for processing and analysis of large archives of spatially distributed data



(S 6.3) Short oral paper A. Titov et al.

Web portal for dissemination of remote sensing data for Northern Eurasia

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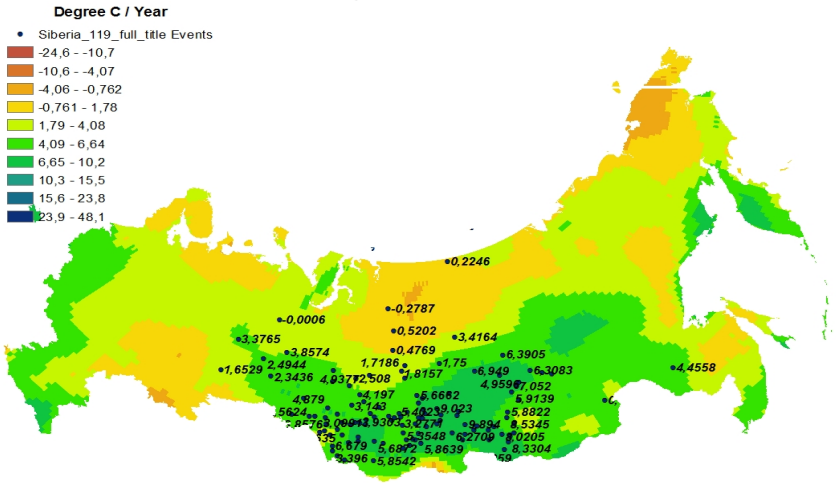

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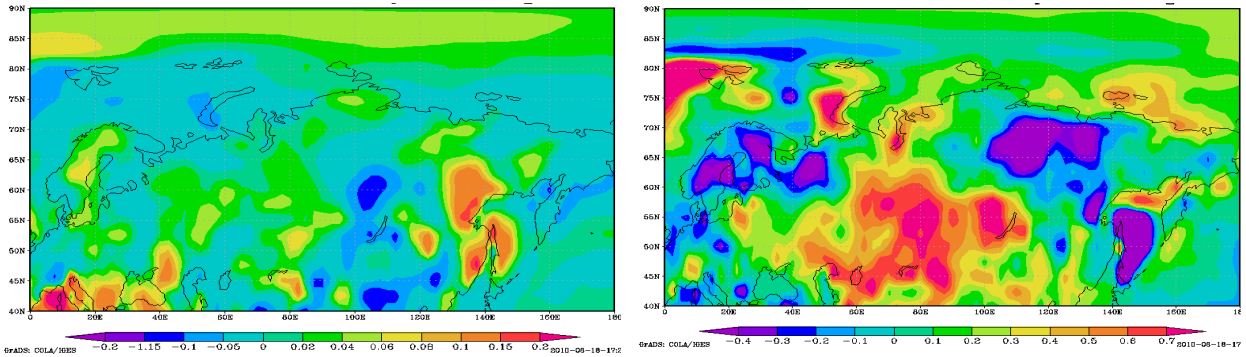


Input into environmental educational/capacity building (http://scert.ru/en/conferences/)

Earth Sciences specifics:
Multidisciplinarity;
Necessity to use information-computational technologies;
Results should be delivered to regional decision makers.
It requires special education/training program.

Threefold approach:

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 NIS YS / year are selected/supported and trained

Thematic Web portals with embedded tools for distant professional education/training

International School and Conference on Computational Information Technologies for Environmental Sciences (CITES), Krasnoyarsk, July 5-15 2009

Major theme: Statistical Methods for Environmental Problems

Basic Sessions:

Data, metadata and ontologies;
Basic and applied information-computational systems;
Physics of climate system, and
Urban and regional atmosphere (modeling, monitoring and risk estimation)

Northern Eurasia Earth System Science Partnership Workshop (Session on SIRS is included)

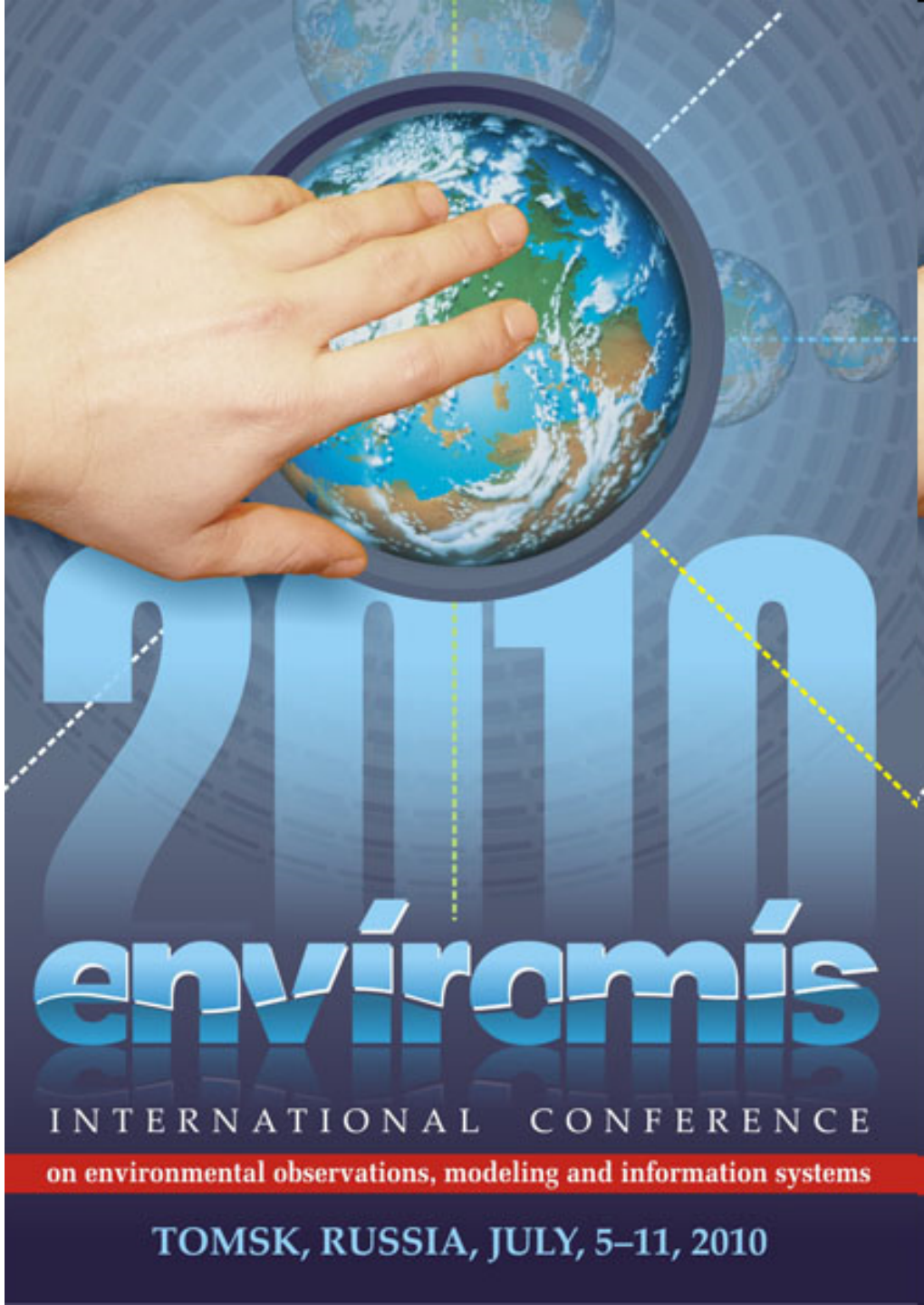
Sponsors: RFBR (Russia);NASA , MPS

International Conference with elements of Young scientist school "Environmental Observations, Modeling and Information Systems" (ENVIROMIS-2010) and

NEESPI Workshop,

July 2010, Tomsk, Russia

scert.ru/en/conferences/enviromis2010



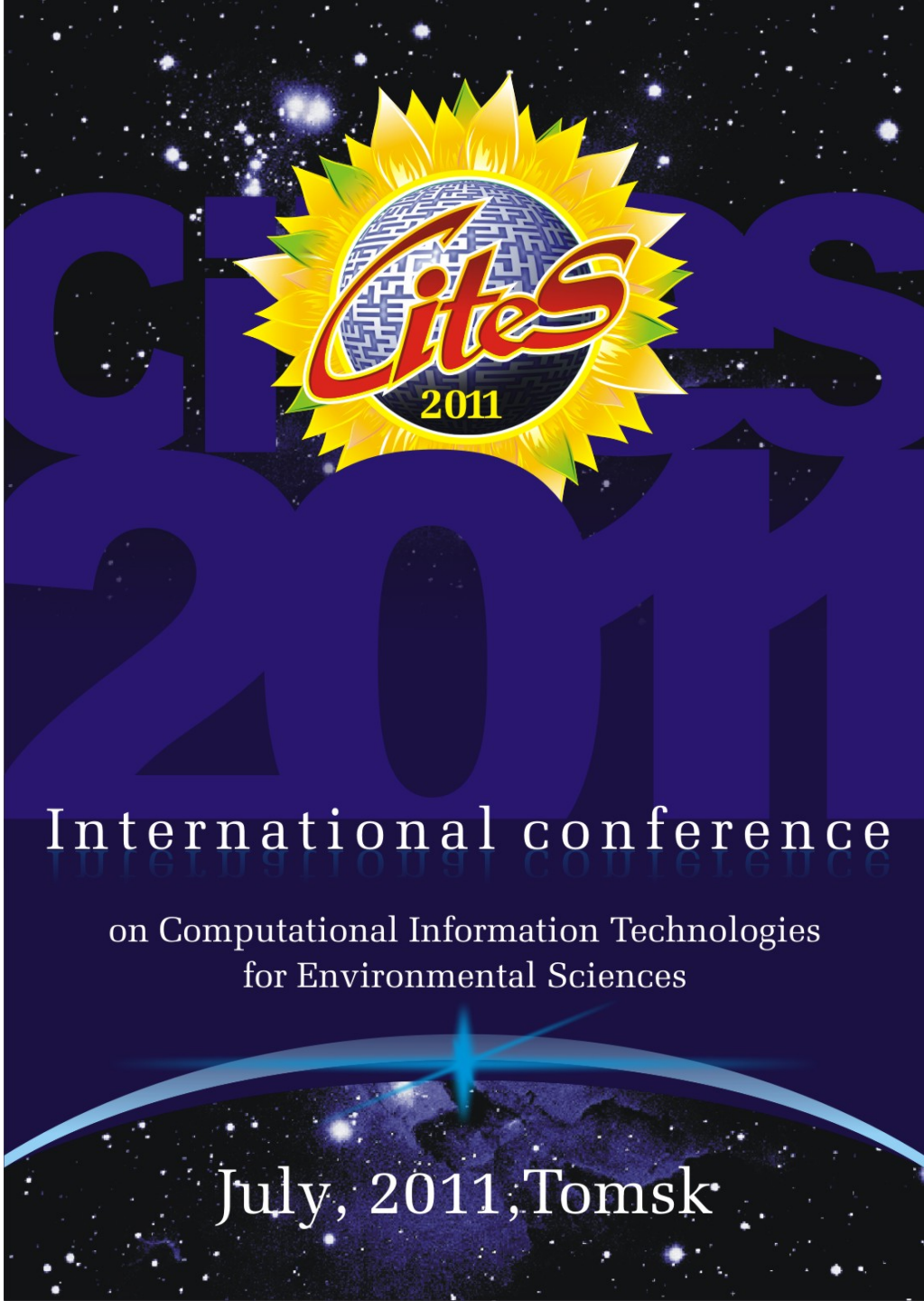
Next year event!

International School and Conference on Computational Information Technologies for Environmental Sciences (CITES), Tomsk, July, 2011

Major theme: Regional climate modeling

Waiting list is open!

Cooperation and sponsorships are welcome!



Thank you for attention!