Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00303, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00303
EGU General Assembly 2008

Distributed collection and management system for environmental datasets based on the Semantic Web technologies

A. Titov (1, 2), E. Gordov (1, 2), I. Okladnikov (2)

(1) Institute of Monitoring of Climatic and Ecological Systems SB RAS, Tomsk, Russia, (2) Siberian Center for Environmental Research and Training, Tomsk, Russia, (office@scert.ru / Phone: +7-3822-49-21-87)

In this report the results of the work devoted to the creation of working model of the distributed software system for collection, management, storage, retrieval and possible processing and visualization of environmental datasets containing results of meteorological and air pollution observations, field campaigns and mathematical climate modeling produced by different models are presented.

Specially designed metadata standard for machine-readable description of datasets related to meteorology, climate and atmospheric pollution transport domains is introduced as one of the key system components. The Resource Description Framework (RDF) technology means have been chosen for metadata description model realization (http://www.w3.org/RDF/) in the form of RDF Schema. The final version of the RDF Schema is implemented on the base of existing widely used standards, such as Dublin Core Metadata Element Set (http://dublincore.org/), Ecological Metadata Language (http://knb.ecoinformatics.org/software/eml/) and others.

As a whole the system will be available as a Web server (http://climate.risks.scert.ru/metadatabase/) based on the web-portal ATMOS engine [1] and implementing dataset management functionality including SeRQL-based semantic search as well as statistical processing and visualization of selected data archives. The core of the system is Apache web server in conjunction with Tomcat Java Servlet Container (http://jakarta.apache.org/tomcat/). Sesame Server,

(http://www.openrdf.org/), used as a database for RDF and RDF Schema, is run within Tomcat framework and provides necessary environment for handling RDF metadata.

At present mathematical and statistical analysis of meteorological and climatic data with subsequent visualization of results is implemented for such datasets as NCEP/NCAR Reanalysis, Reanalysis NCEP/DOE AMIP II and local measurements obtained from meteorological stations on the territory of Russia. This functionality is aimed primarily at finding of main characteristics of regional climate change.

The proposed system represents a step in the process of development of a distributed collaborative information-computational environment to support multidisciplinary investigations of Earth regional environment, especially those required meteorology, atmospheric pollution transport and climate modeling. This work is partially supported by SB RAS Integration Project 34, SB RAS Basic Program Project 4.5.2.2, APN Project CBA2007-08NSY and FP6 Enviro-RISKS project (INCO-CT-2004-013427).

References

1. E.P. Gordov, V.N. Lykosov, and A.Z. Fazliev. Web portal on environmental sciences “ATMOS” // Advances in Geosciences. 2006. Vol. 8. p. 33 - 38.