

Russia: Country Report on the Current Oceanographic Data Management Activities

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Introduction

Considerable progress in the sphere of oceanographic data management in Russia has been achieved at the expense of means concentration and efficient coordination of studies developed for the last 6 years in the frame of the Subprogram "Creating a Unified System of Information on the World Ocean Condition" (ESIMO). It represents an important part of the Federal Target Program "The World Ocean" and is realized by organizations of different Federal Departments under 8 projects. Actually it is most significant National Program in the field of data management. The Principal Coordinator of ESIMO development is All-Russia Research Institute of Hydrometeorological Information – World Data Centre "B" (RIHMI-WDC/B) of Roshydromet <<http://www.meteo.ru>>.

The objective of the Subprogram is to develop a Unified System, which is based on the existing agency systems and intends to provide information support for various marine activities by:

- creating a unified regulatory - methodical, organizational, metrological and technological basis for maintaining information resources;
- creating and maintaining Governmental, Departmental and Regional Information Funds on marine and coastal areas;
- developing and standardizing monitoring technologies for control of state and pollution of marine environment;
- integrating agency information systems and providing access to the whole set of information resources for the World Ocean;
- establishing exchange with similar systems within International cooperation and participating in International Programs.

1. Activities of RIHMI-WDC/Russian NODC

(1) Maintenance and management of State databases on oceanography, hydrometeorology and marine environment.

(2) Support of WDC (B) activity.

(3) Participating in the major projects:

- Medar/Medatlas II - Development of cruises catalogues for the Black and Mediterranean Seas, data quality check.
- Sea Search - descriptions of EDMERP, EDMED, CSR; development of CDI.
- JCOMM Pilot Project - development of E2EDM technology (methods and soft) for data integration and data exchange between software applications.
- ESIMO Project for development of:
 - web-portal;
 - information resources for oceanography, meteorology, hydrology, social information, cartography etc.;
 - metadata (information about data sets, formats, instruments, organizations, experts, software, web - resources, observing platforms, coastal stations, satellites);

- unified parameters dictionary;
- applications.

(4) Organization of International conferences and IOC Workshops.

(5) Other.

One of eight specific projects of ESIMO is: “To develop technologies of integration and a complex supply with information of marine activity, including interaction of ESIMO with national and international information systems”.

Goal for 2006-2007 is formulated as:

Improvement and put into operation components of the 1-th step system’s integration module for creation of uniform information space in the field of the World Ocean state on the basis of an exchange with national and international information systems and a supply of marine activity by data and information.

Within the framework of the project RIHMI-WDC/B develops:

- The module of integration of the ESIMO 1-st step.
- Technology of formation and management of distributed DBs (conception, documentation on data management, software, systems - supervisor).
- Technology of a complex supply with information on DBs (conception, documentation on data management, software, systems – regional and departmental levels).
- Technology of information interaction with the international information systems (Russian components of GOOS, WMO, IOC etc.).
- System of the distributed information resources (IR).
- Data classification and coding standards.

2. Data-ware for the marine activity of Russia

In 2006 the first ESIMO line was carried into the operation. It was realized in the manner of horizontal web portal <<http://www.oceaninfo.ru>>, integrating information resources in the field of oceanography and sea activity. Portal is an instrument of information resource management allowing users to gain access to varied information kept in different formats (html, xml, ftp, databases) in many organizations, including foreign, and use it for scientific studies and decision makings. Portal integrates information resources and presents this information to users in comprehensible and logical type. It is intended for ensuring interaction with all applications in the unified information space. Portal is created as an instrument, allowing a user to get interesting information on any region, at any time, regardless of its location and type of terminal. To the end of 2005, in the portal there were more than 55 thousand documents (descriptions of data sets, cruises information, information about research vessels, information on projects, organizations, experts, instruments etc.).

The ESIMO web-portal involves a great volume of information on the following topics: description of information resources; metadata; data on marine environment; scientific and technical, legal, social-economical documentation and information; news and publications under the ESIMO subjects; links. On the site there are about 2300 references to the foreign and national web-resources, they are systematized by 15 categories.

In the site section <<http://data.oceaninfo.ru/spr/index.htm>> there is an integrating document - Electronic manual "ESIMO information resources - 2003", assigned for examination of the general state of the problems to be solved, guidelines and results of activities. The manual presents the results of generalization and analysis of information on the state of information resources and technologies of processing, distribution, and use of the information on the situation in the World Ocean, which were conducted by RIHMI-WDC, Roshydromet by using an

interagency base of metadata. The document presents catalogs of information included in the initial data holding of the first ESIMO stage. The catalogs have been prepared by the Project executors. Summary characteristics of information resources on the situation in the World Ocean are presented. Brief background of marine data collection is provided. The current state of observation systems is considered. National and International marine data sets and databases are described. Scientific-technical, regulatory and legal information and the results of International data exchange are presented. Users' demands to the information and the ways of satisfying the requirements are also considered.

Section Search by subject contains the references for 800 descriptions of the available objects of information resources by the following subjects: analysis, forecast, observations, climate, and documents.

Section Search by map provides the opportunity to use the geographical map for the fast-access retrieval of diverse information for various areas of the World Ocean.

Section Search by Marine organizations contains the catalog of data bases for 1800 Russian and oversea organizations.

Section Applications provides the opportunity of an access to the data coming by the GST channels, to the information on cruises/"Cruise Descriptions" data base, to ARGO data, to IODE data, to the uniform dictionary of parameters (access to parameters by sphere, process, by statistics, by a single parameter, by groups).

Section Metadata presents the data on the research vessels and cruises, projects and programs, observation nets and devices, data files and data bases, electronic atlases, data formats and software.

Section Decision making contains one of the versions of the regional system of taking decisions on various kinds of the seaside and social-economic activity demanding the data-ware.

Setting into operation the web-site, that helps to obtain the information on the sea environment at any instant, at any point, in any area, gives the on-line users an opportunity to access the data-ware as the operative data, analyses, forecasts, and climate generalizations presented on the ESIMO web-site and on the sites of organizations-executors of the Program, and also on sites of the International and oversea organizations. The results obtained in the course of studies are the significant input to the development of the information technologies, and they will help to overcome the consequences of the man-caused and nature catastrophes at sea. On the basis of these resources and technologies, in Russia it is being created a sub-system of complex and comprehensive data provision of the users of federal and regional level.

At present, there are no analogues of the acting systems adequate to the goals and objectives of the ESIMO. In Russia and abroad, the specialized forms of the information service predominate, when the centers prepare and provide this or that prognostic, diagnostic, climate information on the sea environment and seaside activity. Still, recently, it has been stirred up the activity in the field of integrating diverse informational resources, and their well-coordinated use to solve complex problems.

14 Centers of ESIMO were established in Russia to the end of 2006. One of them is FERHRI Center based on RODC facilities. The main goal of the Center is to organize and facilitate the cooperation of the Russian Far East marine institutions in the provision of comprehensive information for government authorities, industry, science and the private sector using web technologies. The Centers' major functions are connected with the activities related to the data collection; development of information technologies; receiving and providing information products in oceanography, marine meteorology, biology, ecology; and other fields. The Center's activities include the following tasks:

- creation, storage, use and protection of information resources for the NW Pacific, adjacent seas, and coastal territories;

- establishment of metadata bases;
- development and improvement of systems to provide users with environmental information on the condition of the sea and atmosphere along with information on economic aspects and environmental monitoring; and
- scientific research.

POI, FERHRI and TINRO-Centre (Vladivostok) carry out their own activities for development of independent regional segments of ESIMO and departmental DBs for the Far Eastern Region of Russia.

3. Indicators of ESIMO development

Number of the ESIMO Centres by IR categories:

2006

Roshydromet	Fishery	Navy	Natural resources	Transport	Acad. of Sci	Security
6	2	2	1	1	1	1

in 2007

Disasters	Space	Education	Infotechnology	Energy	Foreign Affairs	Frontier Service
1	1	1	1	1	1	1

ESIMO Network involves 29 organizations, providing about 800 information resources on 180 parameters as follow:

- 70 % - marine environment data and information, including 20 % GTS data, 20 % on-line DBs, 60 % object files.
- 30 % - marine activity related information.

ESIMO Legal base:

- Government Decree R.F. No. 836 of 29.12.2005.
- Operation Plan for 2006-2007.
- ESIMO Regulation.
- Statute of ESIMO Centers.

4. Data provision/exchange policy

The provision of information and services from State marine information resources will be carried out in accordance with the following principles of the Russian Federal Law, "On information, informatization, and information protection" (No. 24, Feb. 20, 1995):

- (1) State marine information resources are open and accessible for users. Only confidential information and information concerning state security has restricted access.
- (2) Information of general interest is provided to every category of users free of charge. A list of available information is prepared by the State Agencies and approved by the Federal Government.
- (3) Specialized information is provided to users within joint programs or according to agreements on information services.

The Russian Federation is a member of many specialized International organizations providing the cooperation in the field of marine activity, oceanography, hydrometeorology, monitoring of the radioactive pollution, and other kinds of the environment contamination. So, while developing the ESIMO, considerable attention is paid to the improvement of the normative-legal basis to make better the interaction with the International organizations and information systems.

Perspectives of the International cooperation are related, first of all, to the extensive partnership in the GOOS Program that is integrating the majority of the International (IOC, WMO, UNEP) and National information systems.

Internal/International data exchange is regulated by different Federal laws, bilateral and multilateral agreements and conventions:

- “About the information, informatization and protection of the information”.
- “About participation in the international information exchange”.
- Others (<http://www.oceaninfo.ru>)

ESIMO Center of FERHRI carries out International data exchange on the following basis:

- data exchange is realized in accordance with the existing legislation. Conditions of information provision are defined by International agreements in which Russia participates.
- Information exchange is fulfilled as voluntary and free information transfer for noncommercial users with accounting of equivalent of data exchange and other conditions required by the legislation.
- Center has to get the government approval for international information transfer.

Current problems:

- Departmental instructions and rules define restrictions of the internal and international data exchange.
- Oceanographic data obtained within the EEZ.
- Recommended ways - international data exchange through RIHMI-WDC (B) or in the bounds of special agreements.

5. Related activities of the Far Eastern marine organizations

The main Russian marine Organizations/Institutions in the WESTPAC region are the follows:

- Far Eastern Regional Hydrometeorological Research Institute (FERHRI, Roshydromet <http://rus.ferhri.ru/>);
- V.I. Il'ichev Pacific Oceanological Institute, Far Eastern Branch, Russian Academy of Sciences (POI FEBRAS <http://www.poi.dvo.ru/>);
- Pacific Research Fisheries Centre (TINRO-Centre, SCF <http://www.tinro-center.ru/>) and its branches in Khabarovsk (KhabTINRO) and Anadyr (KolymTINRO);
- Territorial Institutes of Fishery and Oceanography (Sakhalin (SakhNIRO <http://www.sakhniro.ru/>), Kamchatka (KamchatNIRO <http://www.kamchatka.ru/~kamniro/>), Magadan (MagadanNIRO), SCF).
- Institute of Marine Biology (IMB FEBRAS <http://www.imb.dvo.ru/>);
- Territorial Departments for Hydrometeorology and Environmental Monitoring (Primorski Krai (PDHEM), Sakhalin (SakhDHEM), Kolyma (KoldHEM), Kamchatka (KamDHEM), Roshydromet);
- Universities.

The Institutions of the Russian Far East have accumulated the vast factual material comprising many tens of thousands of stations and sites of oceanographic data and other types of observation. The major part of the data is obtained in the research cruises performed by FERHRI, TINRO-Centre and POI FEB RAS (more than 2200 cruises).

A lot of data is not digitized yet, especially TINRO data. FERHRI and POI are involved to the process under ESIMO Project now. On this stage of “data mining and rescue” they pay much attention to the oceanographic/hydrochemical/ biological data on the North Pacific Seas and data QC.

All digitized data (about 1900 cruises) are stored into thematic data bases and are accessible for the institute's users.

General description of the institutional data bases is given to NOWPAP/DINRAC Nat. Rep. that is available on the

http://dinrac.nowpap.org/documents/NOWPAP_DINRAC_National_Reports_DataInfo.pdf.

Data catalogues are partly available on the sites:

- FERHRI <http://rus.ferhri.ru/esimo/Data/CatalogDeep/index.htm>;
- POI <http://pacificinfo.ru/data/cdrom/1/pages/0-20.html>;
- TINRO <http://www.tinro.ru/basemet/index.cgi?lang=en>.

During 1992-2001 the main Far Eastern marine Institutes participated in the GODAR Project jointly with the Russian RIHMI-WDC/B and US NODC/WDC-A. Results of the activity were given in the Report of Russia presented at the 2nd GODAR-WESTPAC Workshop. It was our history of GODAR.

Conclusion

Russia actively forms the most completed local, regional and global data bases on different aspects of oceanography, hydrometeorology, marine biology and ecology. It develops the modern technologies for data management and creates information products as well. During the last five years many of these works were made within the Federal Target Program "The World Ocean". The most important part of the Program is Subprogram "United System of Information on the World Ocean Condition". Its development will allow solving many problems on data observation, collecting, processing and storage by using national and international information systems and by cooperation with international information projects.