

Environmental Information Systems in the Russian Federation

Nickolai B. Denisov



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For Masha and Yulia

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LIST OF ABBREVIATIONS

AN SSSR	Academy of Science of the USSR
BAPMON	Background Atmospheric Pollution Monitoring
CAN	Centre for Analysis of Science
CD-ROM	Compact Disk Read-Only Memory
CEC	Commission of the European Communities
CINAO	Central Institute for Agrochemical Support of Agriculture
CIP	Centre for International Projects
CIS	Commonwealth of Independent States
CISN	Centre of Research and Statistics on Science
CNIIAtomInform	Centre for Public Information on Nuclear Energy
CNTI	Centre of Information on Research and Engineering
DEA	Division of Environment Assessment
EEA	European Environment Agency
EEP	East European Programme
ENRIN	Environment and Natural Resource Information Networks
EPA	Environmental Protection Agency
ESA	European Space Agency
FAPSI	Federal Agency for Governmental Communications and Information
FCGS	Federal Centre for Geo-Ecological Systems
GDP	Gross Domestic Product
GenProkuratura	Office of the Prosecutor-General
GGO	Main Geophysical Observatory
GIPE	State Institute of Applied Ecology
GIS	Geographic Information System
GKhI	Hydrochemical Institute
GlavNIVC	Main Research and Computation Centre
GosAtomNadzor	Federal Supervisory Board for Nuclear and Radiation Safety
GosComOboronProm	State Committee for Defence Industry
GosComSanEpidNadzor	State Committee for Sanitary-Epidemiological Supervision
GosComStat	State Committee for Statistics
GosComVuz	State Committee for Higher Education
GosGISCentre	State Research and Innovation Centre of Geoinformation Systems and Technologies
GosGorTekhNadzor	Federal Supervisory Board for Mining and Industry
GosStandart	Committee for Standardisation, Metrology and Certification
GosStroy	Ministry of Civil Construction and Architecture
GosTekhKomissiya	State Technical Commission
GPNTB	State Public Library on Research and Engineering
GRID	Global Resource Information Database
GVC	Main Computation Centre
HEM	Harmonisation of Environmental Measurement
IASC	International Arctic Science Committee
ICSU	International Council of Scientific Unions
IEC	Inter-State Ecological Council
IEVB	Institute of Ecology of the Volga Basin
IGCE	Institute of Global Climate and Ecology
ILO	International Labour Organisation
IUCN	International Union for Conservation of Nature
MARC	Monitoring and Assessment Research Centre
MBI	International Bank of Ideas
MBIT	International Bureau for Information and Telecommunications
MChS	Ministry of Civil Defence and Emergency Response
MinAtom	Ministry of Nuclear Energy
MinEkonomiki	Ministry of Economy
MinFin	Ministry of Finances
MinKultury	Ministry of Culture
MinNauki	Ministry of Science and Technical Policy
MinOborony	Ministry of Defence
MinObrazovaniya	Ministry of Education
MinPrirody	Ministry of Environmental Protection and Natural Resources

MinSelKhozProd	Ministry of Agriculture and Food Production
MinTopEnerg	Ministry of Fuel and Energy
MinZdravMedProm	Ministry of Public Health and Medical Industry
MVD	Ministry of Internal Affairs
NASA	National Aeronautics and Space Administration
NGO	Non-Governmental Organisation
NIC	Research Centre
NII	Research Institute
NII InformLes	Research Institute for Forestry Information
NPO	Research and Production Enterprise
NPP	Research and Production Enterprise
NTC	Research and Technology Centre
NTCIT	Research Centre for Information Technologies
OECD	Organisation for Economic Co-operation and Development
PKO	Map-Production Enterprise
RAS	Russian Academy of Science
REFIA	Russian Environmental Federal Information Agency
RF	Russian Federation
RGB	Russian State Library
RKA	Russian Space Agency
RosAPO	Agency for Legal Protection of Programs, Databases and Microcircuit Topologies
RosArkhiv	State Archive Service
RosComInform	Presidential Committee for Informatisation Policy
RosComNedra	Committee for Geology and Mineral Resources
RosComRybolovstvo	Committee for Fisheries
RosComVod	Committee for Water Resources
RosComZem	Committee for Land Resources and Management
RosGeoInform	Russian Research and Production Centre of Geoinformation
RosHydroMet	Federal Agency for Hydrometeorology and Environmental Monitoring
RosIMZ	Russian Institute of Land and Ecosystem Monitoring
RosKartografiya	Federal Agency for Geodesy and Cartography
RosLesKhoz	Federal Agency for Forestry
RosNII IS	Russian Research Centre for Information Systems
RosPatent	Committee for Patents and Trademarks
RSFSR	Russian Soviet Federal Socialist Republic
TPP	Chamber of Commerce and Industry
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organisation
USGS	United States Geological Survey
USSEM	Unified State System of Environmental Monitoring
USSR	Union of Soviet Socialist Republics
VAK	Higher Attestation Commission
VGBIL	V.I. Lenin All-Union State Library
VINITI	Institute of Information on Science and Engineering
VNICLesResurs	Research and Information Centre for Forest Resources
VNIC SMV	Research Centre for Standardisation, Information and Certification of Materials
VNIERKh	Research Institute of Economics, Information and Decision Support in Fisheries
VNII	All-Russian Research Institute
VNIIGMI-MCD	Research Hydrometeorological Institute - World Data Centre
VNII Priroda	Research Institute of Environmental Conservation
VNIIPVTI	Research Institute of Computer Technology and Information Problems
VNIRO	Research Institute of Fisheries and Oceanography
VNTIC	Centre of Information on Research and Engineering
VodNIIInformProyekt	Research Institute for Water Resource Information Systems
VSEGINGEO	Research Institute of Hydrogeology and Engineering Geology
WCMC	World Conservation Monitoring Centre
WHO	World Health Organisation
WWF	World-Wide Fund for Nature

FOREWORD

In 1994, UNEP initiated a program to support environment assessment, reporting and data management capacities in countries with economies in transition in Central and Eastern Europe. This includes identification of needs and the formulation of project proposals to meet these needs. With partner agencies and other donors, UNEP seeks to leverage finances to correct any imbalances. This activity is a part of UNEP's global ENRIN (Environment and Natural Resources Networking) programme, which is a direct follow-up of Agenda 21, chapter 40 on information for decision-making. This chapter underlines that there is a need for easily accessible environmental information at all levels, from that of senior environmental decision-makers to the grass roots. An agreement has been made with the GRID-Arendal centre in Norway for implementation of the ENRIN program in Central and Eastern Europe.

In response to the invitation from UNEP's Regional Director for Europe, Hans Alders, the Russian Minister of Environmental Protection and Natural Resources, Victor I. Danilov-Danilyan, stated in his letter dated February 23, 1995 of Russia's strong interest in participating in the program, and expressed his support to the idea of programme's importance.

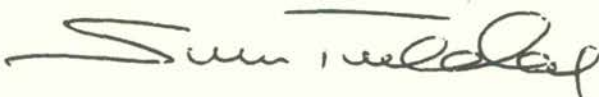
This report is the result of the initial analyses in Russia. It is intended to distil and present promising avenues of co-operation, stimulate discussion and promote international consensus on the way ahead. It also seeks to attract other partners to this important venture of ensuring true international co-operation in stimulating co-operative action on issues affecting our shared resources.

Nairobi, 31 August 1995



Assistant Executive Director *Harvey Croze*, UNEP

Arendal, 31 August 1995



Director *Svein Tveitdal*, GRID-Arendal

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Arendal, 9 September 1995



Otto Simonett
Programme Manager
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1. INTRODUCTION

This report has been prepared in the context of the international programme *Environment and Natural Resource Information Networks (ENRIN)* for countries with economies in transition in Central and Eastern Europe, which is implemented by UNEP/DEA and is co-ordinated through the UNEP/GRID centre in Arendal (Norway). The report presents an overview of the current status of environmental information in the Russian Federation, with an emphasis on the federal level and with special reference to the needs and problems of integration and harmonisation of national environmental information systems.

The report is based on research carried out from September to November 1994, when the first draft was compiled. The text was then further revised and updated in 1995. The scope of the research included interviews with local experts in the fields of generation, use, and/or dissemination of environmental data, as well as the examination of published information sources. Among the publications consulted were scarce sources of metainformation, catalogues of general and specialised information services, current legislation and institutional structure documentation, and environmental reporting products. Publications and documents available at GRID-Arendal and conclusions of the OECD evaluation of Russia's environmental information systems were also used.

The report comprises four chapters and five attachments. In Chapter 1 the background information is provided. Chapter 2 presents a country background, including the economic and political situation in Russia, environmental problems and the environmental management framework, and the national information policy and status. Chapter 3 contains a description of activities and of the structure related to the generation, storage, distribution and use of environmental information. Chapter 4 discusses how the actions outlined in the *ENRIN* programme match national practices and needs presented in the preceding chapters. The attachments contain lists of selected contact addresses, metainformation sources, state-of-the-environment reporting products, basic acts related to environmental information, and an overview of the *ENRIN* programme.

Since it is vital that environmental information should be available in digital form, attempts have been made to pay special attention to digital information products and systems. At the same time, large amounts of environmental information in Russia are still being derived, recorded, processed and used, wholly or in part, in analogue form. Hence no special distinction between digital and analogue data has been made in the order of presentation, although the form of data storage has been indicated wherever possible.

One of the serious difficulties in preparing this report was associated with the fact that legislation, institutional structure, names and addresses are changing in Russia so rapidly that one can hardly follow the current organisational status. Besides, in describing certain institutions, activities and products, the author had to rely partly on available secondary information sources such as directories, reference books and other similar publications. Some of these might have presented inaccurate data that could not always have been properly verified. Nevertheless every effort has been made to communicate the most up-to-date and reliable information.

A few words must be said about the notation used throughout the text. With some exceptions, the shorter titles of Russian agencies, rather than the acronyms common in Russian official publications, have been used. (This is done in order to help the reader, who is neither used to

such terms as *GosComSanEpidNadzor* or *RosComRybolovstvo* nor interested in acquiring this kind of knowledge.) Furthermore, the words 'data' and 'information' have been used interchangeably, in spite of the fact that their meanings in the strict sense are different. The same applies to the words 'local' and 'territorial', which are used to refer to the sub-national level instead of the word 'regional', which is common in this sense in Russian literature but has a different meaning in an international context. The titles of institutions and organisations are underscored, whereas the titles of acts, programmes, systems, initiatives, and publications are italicised. Bold script is sometimes used to draw the reader's attention to the main points of discussion.

The appearance of this report would have been impossible without the help that the author received at various institutions in Russia and throughout Europe. The list includes, but is not limited to, the management and staff of M.V. Lomonosov Moscow State University, the Russian Association for Information Resources of Research and Technological Development, the Russian Environmental Federal Information Agency, the Ministry of Environmental Protection and Natural Resources of the Russian Federation, UNEP/GRID-Arendal, and the World Conservation Monitoring Centre.

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In expressing sincere gratitude to all those who, directly or indirectly, have contributed to this report, the author takes full responsibility for any confusions and inaccuracies that appear in the text.

The conclusions and results included in this report are preliminary, and probably not altogether indisputable. More time and effort would be required to gain a relatively complete understanding of the current situation and of the necessary actions, given the complexity and scope of the problems. A truly comprehensive insight thus can result only from intensive multilateral consultations involving all the interested parties.

2. BACKGROUND

2.1. RUSSIA TODAY

The **Russian Federation** within its present boundaries has an area of over 17 million km², with approximately 150 million population. The federation comprises 89 territories, including 21 republics, 6 krais, 49 oblasts, 2 cities with federal status (Moscow and St. Petersburg), and 11 national (autonomous) territories, i.e. 1 autonomous oblast (Jewish) and 10 autonomous okrugs (Fig. 1).

After the breakdown of the Union of Soviet Socialist Republics, the Russian Federation has become the largest independent state among the member states of the former Soviet Union as well as among the members of the newly created Commonwealth of Independent States. Russia has inherited over 50% of the population and over 75% of the territory of the former USSR.

The election of the first Russian president and the suppression of the *coup d'état* in 1991 were factors which gave rise to the development of a modern **political system**. Further political developments have resulted in a series of political crises, of which the most powerful one occurred in October 1993, escalating into a sharp, almost armed conflict between the Parliament, on one side, and the President and the Government on the other side. The crisis was resolved through the dissolution of the Parliament. A new Parliament was elected in December 1993, along with the public adoption of the new *Constitution* (the previous one was adopted in 1977).

Today the political situation in Russia has become highly complicated. Numerous disagreements have arisen between the main political forces, frequently resulting in various kinds of political and organisational counteractions. The crisis in Chechnya has recently served as one of the major catalysts of social and political instability, although on the other hand it has considerably strengthened the positions of the conservatively-minded political wing. The contradictions are very likely to become even more pronounced as the country approaches its next parliamentary and presidential elections, taking place in 1995 and 1996 respectively.

Russia has been recognised by the global community as a country with an **economy** in transition. The country is in a stage of transition from a planned socialist economy to a Western-style market system. However, for many political, historical, economic, social and cultural reasons, the practical introduction of a market economy has been conducted very inconsistently, if not chaotically. Among the various consequences are the still unpredictable behaviour of the national currency and an overall decline of economic activity.

The gross domestic product has dropped by 25% for the period 1993-94 (GosComStat 1995). There has been a 50% drop in total industrial production between 1990 and 1995, with a 60% reduction in the petrochemical, pulp-and-paper, construction-material and food industries and machine building, and a more than 80% reduction in light industry (Finansovye Izvestiya 1995). The decrease of industrial production made up 32% in 1993-94. The corresponding drop in agricultural production equalled 13%.

The deficit of the consolidated federal budget in 1995 equalled 10% of the GDP (GosComStat 1995). The very complicated and inefficient taxation system is one of the main obstacles to an

increase of budget revenues. The financial situation for the single enterprises is not better, being at its worst at still numerous state-owned enterprises¹

The drop in production is naturally accompanied by a fall in **living standards**: in 1994 the income of almost 25% of the population was less than the estimated physiological minimum, and this number exceeded 30% at the beginning of 1995. Average wages in physical equivalent dropped by 33% in 1994 (Latsis 1995). With the current high mortality and low birth rate, depopulation goes on at an annual rate of 0.5-0.6% (GosComStat 1995). There has been a 25% growth in unemployment in 1994 (GosComStat 1995), and the rate is continuing to grow in 1995 (Savvateeva 1995). The current unemployment estimated using ILO methodology exceeds 5 million, which makes up 7.5% of the economically active population (Latsis 1995). Accompanying phenomena are growing social stratification and a corresponding increase of the income gap between the richest and the poorest.

At the same time, certain indications of financial and economic **stabilisation** have been reported in late 1994 and early 1995. The annual inflation in 1994 was only 315%, compared to 2,600% in 1992 (GosComStat 1995). The rate of industrial decline is steadily decreasing (Savvateeva 1995), and there are fairly favourable forecasts for a 1995 inflation rate of the order of 20-30% (Aslund 1995). In the first quarter of 1995 a stabilisation or even an increase of production has been observed in such sectors as the chemical and petrochemical industries, ferrous metallurgy, machine building, and the pulp-and-paper industry (Latsis 1995).

Foreign investors have shown considerable interest in large-scale projects in Russia, mainly in those related to mineral resources, transportation, and communications. The foreign **investment** portfolio made up US\$ 200 million by May 1995 (McKay 1995). Russia is still one of the biggest industrial countries in the world in terms of net production². The rapidly growing private sector occupies a significant position in the fields of finance, trade and services. The federal programme of privatisation accounts for the growing share of private enterprises in all sectors of the economy³.

Any longer-term economic **predictions** must take into account a substantial political component. The uncertainties are associated with the concrete ways of future political and economic development, and there is a fairly wide spectrum of possibly achievable alternatives⁴. A significant uncertainty is also associated with the notable trend towards economic and political separation of certain territories from the federal centre. The process finds its legal support in the new *Constitution*, and is economically based on locally available resources and efficient enterprises. It is difficult to say at present how far this disintegration may go in practice⁵.

¹ Almost 40% of the GDP is still produced at state-owned enterprises (GosComStat 1995).

² For example, 317 million tons of crude oil, 607 billion m³ of natural gas, and 271 million tons of coal were extracted in 1994 (GosComStat 1995).

³ There were over 1 million small businesses in Russia in 1994 (cf 40,000 in 1990) providing jobs for approximately 10 million employees.

⁴ However, an experiment recently undertaken by leading US analysts to forecast the development of the Russian political system using the *Factions* methodology suggested that the country will inevitably move towards a mixed market economy with a strong state sector (Chugaev 1995). The same idea is shared in general by a number of other analysts (e.g. Financial Times 1995).

⁵ The above-mentioned *Factions* experiment also suggested that although conflicts between the centre and territories are not unlikely, a unitarian model most probably will be the final one (Chugaev 1995).



Oblasts (regions) - 49

- 1 - Pskov oblast
- 2 - Novgorod oblast
- 3 - Smolensk oblast
- 4 - Tver oblast
- 5 - Bryansk oblast
- 6 - Kaluga oblast
- 7 - Yaroslavl oblast
- 8 - Kursk oblast
- 9 - Orel oblast
- 10 - Tula oblast
- 11 - Ryazan oblast
- 12 - Vladimir oblast
- 13 - Ivanovo oblast
- 14 - Kostroma oblast
- 15 - Belgorod oblast
- 16 - Voronezh oblast
- 17 - Lipetsk oblast
- 18 - Tambov oblast
- 19 - Penza oblast
- 20 - Nizniy Novgorod oblast

- 21 - Kirov oblast
- 22 - Rostov oblast
- 23 - Volgograd oblast
- 24 - Astrakhan oblast
- 25 - Saratov oblast
- 26 - Ulyanovsk oblast
- 27 - Samara oblast
- 28 - Orenburg oblast
- 29 - Chelyabinsk oblast
- 30 - Kurgan oblast
- 31 - Murmansk oblast
- 32 - Archangel oblast
- 33 - Vologda oblast
- 34 - Perm oblast
- 35 - Sverdlovsk oblast
- 36 - Tumen oblast
- 37 - Omsk oblast
- 38 - Tomsk oblast
- 39 - Novosibirsk oblast
- 40 - Kemerovo oblast
- 41 - Irkutsk oblast
- 42 - Chita oblast

- 43 - Amur oblast
- 44 - Magadan oblast
- 45 - Kamchatka oblast
- 46 - Sakhalin oblast
- 47 - Kaliningrad oblast
- 48 - Leningrad oblast
- 49 - Moscow oblast

Krays (territories) - 6

- 50 - Krasnodar kray
- 51 - Stavropol kray
- 52 - Krasnoyarsk kray
- 53 - Khabarovsk kray
- 54 - Primorskiy kray
- 55 - Altai kray

Autonomous okruga (national districts) - 10

- 56 - Komi-Perm aut. okrug
- 57 - Nenets aut. okrug

- 58 - Taimyr aut. okrug
- 59 - Evenki aut. okrug
- 60 - Khanty-Mansi aut. okrug
- 61 - Yamal-Nenets aut. okrug
- 62 - Ust-Orda Buryat aut. okrug
- 63 - Agin-Buryat aut. okrug
- 64 - Chukotka aut. okrug
- 65 - Koryak aut. okrug

Autonomous oblast (national region) - 1

- 66 - Jewish autonomous oblast

Republics - 21

- 67 - Mordov republic
- 68 - Chuvash republic
- 69 - Mariy-El republic
- 70 - Tatarstan republic
- 71 - Udmurt republic
- 72 - Bashkortostan republic

- 73 - Adygei republic
- 74 - Karachai-Cherkess rep.
- 75 - Kabardino-Balkarian rep.
- 76 - North-Ossetian republic
- 77 - Ingush republic
- 78 - Chechen republic
- 79 - Dagestan republic
- 80 - Kalmyk republic
- 81 - Khakass republic
- 82 - Karelian republic
- 83 - Komi republic
- 84 - Altai republic
- 85 - Buryat republic
- 86 - Yakutsk-Sakha republic
- 87 - Tuva republic

Cities with federal status - 2

- 88 - Saint Petersburg
- 89 - Moscow

Figure 1. Administrative division of the Russian Federation

Finally, with regard to any forecast, it is worthwhile to note that an important feature of the Russian political and administrative systems, which is not uncommon also outside Russia, is that the motivation for any kind of decision-making at almost any level is a complex mixture of official, personal, and economic interests, which always must be taken into account. Furthermore, not uncommon is that the special importance of personal factors is misunderstood or underestimated by analysts and newcomers to the Russian market.

2.2. ENVIRONMENTAL PROBLEMS AND MANAGEMENT

Despite the immense territory and the world's largest share of wilderness in the land-use balance, the negative impact of human activity on the natural environment in Russia is pronounced¹.

Regardless of both an overall decrease of industrial production and the associated reduction of emissions into the environment, violations of **air quality** standards were reported in 208 cities and towns surveyed in 1994. Cases where concentrations were over 10 times higher than the air quality standards were reported in 83 cities. While there is an overall favourable trend in the national air quality over time, negative trends have been observed in some of the biggest cities. There has been 13% overall reduction of emissions into the atmosphere in 1994; however on the single-source level about 4,000 enterprises (25% of all enterprises for which emission estimates are available) further increased their emissions.

Negative trends have been reported for **water quality**. The number of water bodies with severe violations of water quality standards is gradually increasing. Contamination was detected in 1993 in approximately 5% of the ground-water supplies used by industrial and municipal systems. About 10% of ground-water intakes have reported exhaustion of water supplies. Approximately 20% of the drinking water samples taken in 1990-94 did not meet chemical safety criteria, and 11-13% of the samples showed microbiological problems. The level of pollution of the coastal seas is constantly high.

Over the last 25 years the total area of agricultural **land** has decreased by more than 30 million ha. Approximately 1.5 million ha of agricultural land were lost in 1994 alone. The reduction of soil fertility is related to a loss of soil humus at an annual rate of 600 kg/ha. More than 1.5 million ha of land were destroyed in 1970-91 in the course of geological exploration and mining. The area damaged by industrial and agricultural toxic pollution equalled 74 million ha in 1993. At the same time, the total area of protected land reached 27 million ha in 1993.

Over 300,000 ha of **forests** were destroyed in 1994, including 270,000 ha of forests lost due to fires. Desertification problems have been reported within 17 territories of Russia. During recent years the area of reindeer pastures has decreased by 15-20%. There are pronounced trends towards a decrease of **wildlife** habitats (especially in the European part of Russia) and a reduction of wildlife populations. Fish populations in inland and coastal waters have been seriously affected by wastewater discharges.

¹ Most of the figures on the state of the Russian environment in this section have been taken from (MinPrirody 1994b, MinPrirody 1995a, Danilov-Danilyan 1995).

As a result of the Chernobyl accident, over 50,000 km² of Russian territory (1.5% of the area of the European part of Russia) has been polluted with radionuclides, with **radioactivity** exceeding 1 Ci/km². An area of 310 km² in the Bryansk oblast is polluted with radioactivity with the 1993 level of up to 40 Ci/km². Over 1,500 local patterns of radioactive pollution were detected in 53 of 98 cities surveyed in 1993. As a result of radioactive ore extraction and fuel preparation for nuclear power stations, 60,000 ha of land had been contaminated with radionuclides by 1993.

Approximately 1,500 million Ci of solid and liquid radioactive **wastes** are currently stored at radio-chemical plants. High-radiation solid wastes (13 million Ci) are stored at 24 dumping sites. Another 200 dumping sites contain 30,000 Ci of medium- and low-radiation liquid wastes. Radioactive wastes from military and naval installations continue to be a significant threat to the environment. About 80 billion tons of industrial wastes have so far been accumulated in Russia, 1.1 billion tons of this amount being toxic wastes. Over 120 million tons industrial toxic wastes were accumulated in 1994 alone.

Examples of more **specific** environmental problems present in Russia are the contamination of drinking water with dioxins, biological contamination and introduction of undesirable species, and electro-magnetic pollution. Industrial **accidents** are still a major problem; the recent oil and natural gas spills in the Komi Republic serve as examples.

Combinations of various environmental problems account for the unhealthy environment in many **areas** of Russia, including virtually all big cities and urban agglomerations, the European North of Russia, the catchment basins of the Baikal Lake and the Great European Lakes (the Ladoga and the Onega lakes), the Caspian and the Black seas, the Ural and Kuzbass regions, and numerous areas polluted as a result of the Chernobyl accident (Tab. 1)¹.

One of the main reasons for the dramatic decline in environmental quality is the utterly insufficient **funding** of environmental needs, and thus the inability to maintain and develop an efficient environmental infrastructure. Less than 1% of the federal budget was directly allocated for environmental purposes in 1994 and 1995. Also important is the fact that the external market situation stimulates the development of environmentally unhealthy industries in Russia, such as chemical and petrochemical industries, and ferrous and non-ferrous

¹ For a more detailed treatment of environmental problems both in the USSR and in present-day Russia, see the publications listed in Appendix 3, as well as such overviews and collections as:

- Goldman, M. *The Spoils of Progress*. Cambridge, MIT Press, 1972
 Pryde, P.R. *Conservation in the Soviet Union*. Cambridge, Cambridge University Press, 1972
 Volgyes, I. (ed.). *Environmental Deterioration in the Soviet Union and Eastern Europe*. New York, Praeger Publ., 1974
 Singleton, F. (ed.). *Environmental Misuse in the Soviet Union*. New York, Praeger Publ., 1976
 Wolfson, Z. (Komarov, B.) *The Destruction of Nature in the Soviet Union*. London, Pluto Press, 1979
 Singleton, F. (ed.). *Environmental Problems in the Soviet Union and Eastern Europe*. Boulder, Lynne Rienner Publ., 1987
 Ziegler, C.E. *Environmental Policy in the USSR*. Amherst, University of Massachusetts Press, 1987
 Pryde, P.R. *Environmental Management in the Soviet Union*. Cambridge, Cambridge University Press, 1991
 Stewart, J.M. (ed.). *The Soviet Environment: Problems, Policies, and Politics*. Cambridge, Cambridge University Press, 1992
 Feshbach, M. *Ecocide in the USSR. Health and Nature under Siege*. New York, Basic Books, 1992
 Mnatsakanian, R.A. *Environmental Legacy of the Former Soviet Republics*. Edinburgh, University of Edinburgh, 1992
 Danilov-Danilyan, V.I., Kotlyakov, V.M. (eds). *Problemy Ekologii Rossii*. (Problems of Russian Environment/ Russia in Environmental Crisis.) Moscow, Federal Ecological Fund of the Russian Federation, 1993
 Peterson, D.J. *Troubled Lands. The Legacy of Soviet Environmental Destruction*. Boulder, Westview Press, 1993
 Mnatsakanian, R.A. *L'Heritage Ecologique du Communisme (dans les Republiques de l'ex URSS)*. 2nd edition. Paris, Ed. Frison-Roche, 1994
 Wolfson, Z. (Komarov, B.) *The Geography of Survival. Ecology in the Post-Soviet Era*. Armonk, M.E. Sharpe, 1994
 Feshbach, M., Friendly, A. *Ecological Disaster: Cleaning Up the Legacy of the Soviet Regime*. New York, Basic Books, 1995



I	Central Russia	IV	Ural-Volga Region	VI	West Siberia
II	North-West Russia	V	European South	VII	East Siberia
III	European North			VIII	Far East

Figure 2. Socio-economic regions of Russia (Dronov *et al.* 1994)

Table 1. Major environmental problems by regions of Russia;
Modified from (Mnatsakanian 1992)

PROBLEM DESCRIPTION	I	II	III	IV	V	VI	VII	VIII
Air Pollution								
Conventional Air Pollution	•	•	•	•	•	•	•	•
Toxic Air Pollution	•	•	•	•	•	•	•	•
Acid Precipitation	•	•	•	•		•		
Water Pollution								
Point Source River Pollution	•	•	•	•	•	•	•	•
Non-Point Source River Pollution	•	•		•	•		•	
Pollution and Eutrophication of Lakes	•	•	•	•		•	•	•
Pollution of Seas		•	•	•	•	•	•	•
Pollution of Ground Water	•			•				
Soil and Land-Use Problems								
Soil Erosion	•	•		•	•	•		•
Deflation	•			•	•	•	•	
Desertification and Salinisation				•	•			
Acidification		•	•					
Soil Pollution with Heavy Metals	•		•	•		•	•	•
Soil Pollution with Pesticides	•			•	•			
Radioactive Pollution of Land	•	•	•	•			•	
Destruction of Land due to Mining	•	•	•	•		•	•	•
Solid Waste Disposal Problems	•	•		•	•	•		
Liquid Waste Disposal Problems	•	•	•	•			•	•
Deforestation								
Excess Cuts of Forests	•	•	•	•		•	•	•
Forest Fires			•				•	•
Degradation of Forests due to Pollution	•	•	•	•		•	•	•

metallurgy, which are now steadily being removed from the developed countries. In addition, for the time being, neither the politicians nor the public in the country are very much concerned about the state of the environment, although certain positive trends in public opinion have recently been noticed.

Another reason for environmental degradation is the inconsistency or misuse of environmental **legislation**, although its development has a rather long history. The first acts relevant to the protection of areas appeared in Russia during the 1880s in the form of hunting, land use and forestry regulations, followed by the first conservation measures in 1909. The first legislation of an environmental nature, however, was adopted as early as the 14th-17th centuries, when forests along the southern boundaries of the Russian state were granted special protection (WCMC 1991). Legislation on protected areas appeared in 1921 in the form of a decree of the Council of People's Commissioners entitled *Protection of Natural Monuments, Gardens and Parks*. In 1960 the law of the Russian Federation *On Environmental Protection in the RSFSR* was adopted, followed by a set of separate acts related to the protection of land (1968), public health (1965), waters (1972), mineral resources (1975), forests (1977), the atmosphere (1982), and wildlife (1982). These laws tended to be general and are often considered to have contained weak sanctions with regard to infringements and hence to have had little impact. However, they have played an important part in creating the foundation of the contemporary system of environmental legislation.

Currently, several hundred acts, presidential decrees, enactments of the government, ministries and sectoral agencies provide regulations in the field of environmental management (REFIA and MinPrirody 1995). The fundamental law *On the Protection of the Natural Environment* was enacted in 1991. The law was regarded as setting a foundation for more specialised environmental acts. However, the 1993 political crisis and the following adoption of the new *Constitution* have made the 1991 law partially inadequate with regard to the new conditions. Preparation of the new law *On Protection of the Environment in the Russian Federation* is currently being considered, whereas another alternative would be to update the 1991 law to meet the new requirements. For the time being, the 1991 law remains the main general environmental act in Russia.

Besides this fundamental law, a set of new specialised acts has recently been adopted, which comprises the laws *On Mineral Wealth*, *On Sanitary-Epidemiological Public Well-Being*, *On Protected Areas*, *On Wildlife*, as well as the *Principles of Forest Legislation*, the *Land Code*, and the *Principles of Health Protection Legislation*. Plans exist for the adoption of additional acts in the near future, including the *Water Code*, the law *On Federal Natural Resources*, and laws on wastes, protected ecosystems, environmental and radiation safety, drinking water, air protection, environmental insurance, payments for natural resources, environmental education, environmental management, and ecological security (Danilov-Danilyan 1995, Lemeshev 1994, Serov 1993, MinPrirody 1994d). Presidential decree No. 236 of 04.02.94 *On the State Strategy of the Russian Federation for Environmental Protection and Sustainable Development* required the elaboration of the *Governmental Environmental Action Plan for 1994-95*, which was approved by the governmental edict of 18.05.94 No. 496. An action plan for 1996-97 is to be developed in the near future, along with the *Concept of the Transition of Russia to the Model of Sustainable Development*.

Chapters related to environmental problems are also present within acts which regulate the status of enterprises and business activities, consumer rights, local self-government, and taxation (Petrov 1995). Relevant chapters already exist in the current *Criminal*, *Administrative* and *Civil Codes* (Petrov 1995, Selivanov and Skoromnikov 1994), and up-to-date

environment-oriented modifications are further being made to previously adopted and newly-drafted general legislation. The Russian Federation currently participates in 21 international treaties, agreements and conventions on environmental protection (Danilov-Danilyan 1995), and this number can be increased to over 70 if taking into account binational, regional, and international agreements which are indirectly related to the environment (IUCN 1993, Nikitina 1995). In addition, the territories of Russia can and do issue their own acts devoted to the environment and natural resources on the issues that fall under joint federal/territorial jurisdiction according to the *Constitution*.

Despite the considerable number of acts in force, the number of violations of environmental regulations remains very high. Possible reasons for this are the far from complete harmonisation of existing acts, and the lack of an efficient mechanism of law enforcement, including economic incentives. The complexity of the system of environmental responsibilities of the various state agencies further complicates the situation.

Up to the beginning of the 1970s, **environmental management** in the USSR, and hence in Russia, was performed primarily by sectoral agencies, each responsible for specific natural resources (*e.g.* waters, forests, land, minerals). Inter-sectoral monitoring was provided by the sanitary and hydrometeorological systems. In 1972 a decree was issued jointly by the Central Committee of the USSR Communist Party and the Council of Ministers to strengthen environmental conservation and to improve the use of natural resources. Consequently the Parliament and the Government of the USSR were made formally responsible for developing strategies for environmental management, and environmental departments were established within the system of the State Planning Committee both at central and territorial levels. This gave rise to the development of a set of environmental action plans for the country as a whole and for the separate territories, aimed at both integrated and sector-oriented environmental management (MinPrirody 1994e, Mazurov 1994). The environmental protection planning was then formally incorporated into the USSR state planning system, and various environmental management functions were delegated to over 15 different agencies¹

In 1988 the administrative structure was streamlined and simplified with the creation of the USSR State Committee for Environmental Protection, which was made responsible for co-ordinating environmental activities throughout the entire USSR. A corresponding branch in Russia was also established. In 1991 the latter became the Russian Ministry of Ecology and Natural Resources². The USSR ministry ceased to function in autumn 1991, having left its Russian counterpart as a separate and independent body, the present title of which is the Ministry of Environmental Protection and Natural Resources of the Russian Federation.

The **present-day** Russian system of environmental management incorporates elements of virtually all existing branches of power (Fig. 3)³. The Inter-Agency Commission on Ecological Safety works under the Presidential Security Council to provide advice and consultations. Environmental legislation is prepared by the Committee for Ecology and the Committee for Natural Resources and Environmental Management of the lower house of the Parliament (the State Duma). The permanent Higher Ecological Council, consisting of distinguished experts in environmental sciences, has been formed under the auspices of the

¹ Here we set aside the question of how effective and efficient this system was, since much has already been said about it in numerous publications (*see* footnote above).

² In the course of establishing the Russian ministry, an attempt was made to bring under its umbrella almost all relevant agencies. However, the attempt had little success.

³ The description of the system of environmental management generally follows (Hefter 1994, Petrov 1995), as well as the corresponding *Statutes* devoted to single agencies.

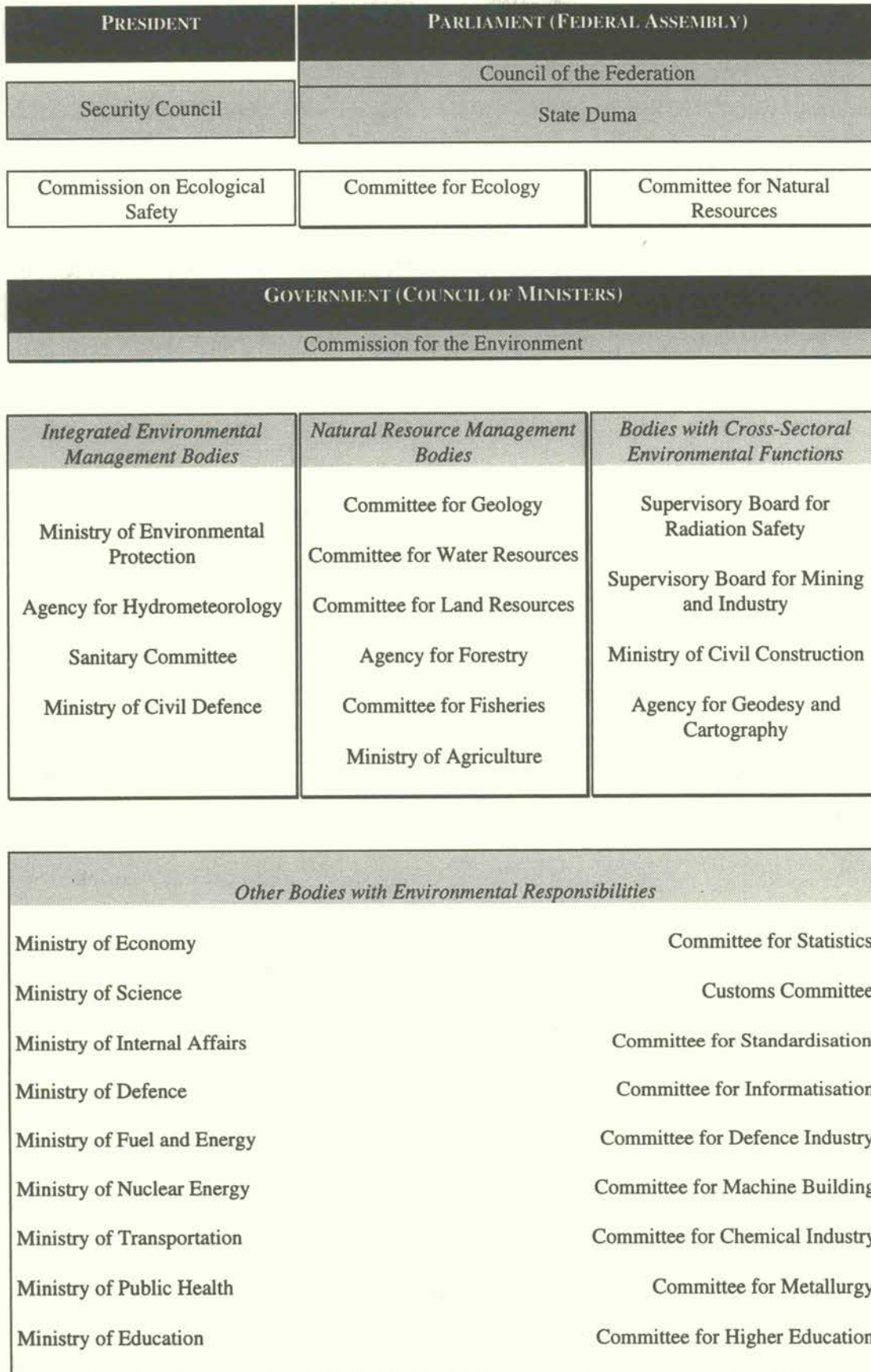


Figure 3. Federal-level environmental management system in the Russian Federation

State Duma to provide advice. Co-ordination of the environmental activities of the various agencies is performed by the Governmental Commission for the Environment and Natural Resources¹.

According to current legislation, the Ministry of Environmental Protection plays a **central co-ordinating role** in the system of agencies involved in and responsible for solving particular environmental problems². Besides general co-ordination, the ministry performs management functions with regard to protected areas of federal importance, issues regulations on environmental protection and management and environmental permits, performs and co-ordinates environmental monitoring, and manages and disseminates environmental information. Besides the Ministry of Environmental Protection, the system of agencies with **integrated** environmental functions also includes:

- Sanitary Committee (co-ordinates the sanitary-/ hygiene-related activities of other agencies; monitors the sanitary state of the environment; issues, supervises and enforces compliance with sanitary regulations),
- Agency for Hydrometeorology (monitors the quality of the air, surface and marine waters and sediments, urban and agricultural soils, and radiation levels; performs integrated background and impact monitoring and environmental assessment),
- Ministry of Civil Defence (responsible for emergency response in case of natural or man-induced accidents; monitors and evaluates the sources of prospective accidents).

The system of sectoral agencies, each responsible for specific **natural resources**, includes:

- Committee for Geology (explores and manages the resources of the geological environment; monitors the state of the geological environment, including ground-water quality and hazardous geological processes).
- Committee for Land Resources (surveys, registers, supervises and manages land use and protection, performs land monitoring),
- Committee for Water Resources (supervises and controls the use, protection and restoration of water resources; performs inventories of water bodies and of their uses),
- Agency for Forestry (controls the exploitation, restoration and protection of forests; performs forest surveys and monitoring; supervises and enforces compliance with regulations),

¹ There are several other inter-agency commissions which wholly or in part work with environmental problems covering such issues as marine accidents, emergency response, sanitary problems and epidemics, the ozone layer, outer space, climate change, implementation of the UNCED resolutions, radioactive wastes, radiation monitoring, forest fires, flood control, the Caspian Sea, the Black Sea, the Baikal Lake, the Barents-Euroarctic region, the Arctic and the Antarctic (SB RF 1995, Hefter 1995, REFIA and MinPrirody 1995).

² The total staff of the Ministry of Environmental Protection with its local branches exceeded 30,000 in 1995, including more than 2,000 employees in research centres, institutes and commissions and 2,700 specialists in environmental quality inspectorates. Its Moscow staff in 1993 exceeded 600 (550 in 1995), while the Moscow personnel of five other environment-related agencies (Agency for Forestry, Committees for Water Resources, Land Resources, Fisheries and Geology) comprised then 1,250 employees altogether (Danilov-Danilyan 1995, MinPrirody 1995a, Tolkachev 1995, Zhagel 1994). The estimated 1995 budget of the ministry equalled to US\$ 30 million (Tolkachev 1995).

- Committee for Fisheries (controls the exploitation, restoration and use of fish resources; monitors aquatic life; issues, supervises, and enforces compliance with fisheries permits and regulations),
- Ministry of Agriculture (surveys, registers and manages wildlife, manages fish-breeding facilities; monitors and supervises the use of chemicals in agriculture; provides veterinary protection).

Agencies performing only limited but well-defined environmental functions **over a wide range of activities** are:

- Supervisory Board for Radiation Safety (supervises the production, transportation, storage, use and treatment of radioactive materials),
- Supervisory Board for Mining and Industry (supervises compliance with occupational and environmental regulations in mining),
- Agency for Geodesy and Cartography (performs and co-ordinates cartographic and remote sensing activities in the support of operations of other agencies),
- Ministry of Civil Construction (issues construction regulations containing environmental requirements, supervises urban and industrial construction and municipal engineering activities).

Integrated environment-related **programmes** are carried out by the Ministry of Economy and the Ministry of Science. The Committee for Statistics is responsible for the nation-wide collection and aggregation of statistical information on sectoral, territorial and national levels. The State Automobile Inspection of the Ministry of Internal Affairs performs routine checks of automobile engine emissions. The ministry also participates in the safeguarding of protected areas and supports legislation enforcement. The Customs Committee bears responsibility for preventing the illegal export of natural heritage, including *Red-Data-Book* species, and the illegal import of environmentally dangerous products and goods. The Committee for Standardisation maintains the system of state standards and verifies their compliance with legislation, including that in the field of the environment. In addition it carries out, in co-operation with relevant agencies, a programme of environmental analytical laboratories certification.

Besides agencies with direct environmental responsibilities, many other ministries and departments perform certain **limited** environmental functions as part of their regular duties. The list includes the Ministry of Fuel and Energy, the Ministry of Nuclear Energy, the Ministry of Defence, the Ministry of Transportation, the Ministry of Public Health, the Committee for Defence Industry, the Committee for Machine Building, the Committee for Chemical and Petrochemical Industry, and the Committee for Metallurgy.

Independent **supervision** of compliance with the environmental legislation is officially performed by the Environmental Law Enforcement Department of the Office of the Prosecutor-General.

The structure of environmental management in the **territories** generally follows a similar pattern, since many of the enumerated agencies operate systems of their offices or departments on a sub-national level. Territorial bodies with environmental responsibilities are therefore

involved in both vertical interactions with federal agencies and horizontal interactions with local authorities.

2.3. NATIONAL INFORMATION POLICY AND PRACTICE

Since the collection, interpretation, analysis and distribution of information is an important part of the activities of many governmental and private agencies and institutions, certain attempts are being made towards nation-wide co-ordination and regulation of information resource management. A number of laws are currently being considered to establish a **legal foundation** for the national information policy and to provide legal tools for the implementation of the rights of citizens stated in the *Constitution*:

- “to get acquainted with the documents and materials which directly affect their rights and freedoms” (24 (2)),
- “to freely search for, obtain, transfer, produce, and distribute information by any legal means” (29 (4)).

The fundamental federal **information law** *On Information, Informatisation¹ and the Protection of Information* was adopted in 1995 with the intention to regulate

“... the creation, collection, processing, accumulation, storage, search, dissemination and delivery to users of documented information” (1 (1))².

The main guidelines of the state information policy, as formulated in the law (3 (2)), are:

- provision of conditions for the development and protection of all forms of ownership of information resources,
- creation and protection of state information resources, establishment and development of federal and sub-national information systems and networks, support of informatisation programmes and projects,
- provision of conditions for qualified and efficient information support of citizens, state and local authorities, organisations and public groups on the basis of state information resources,
- provision of national security and implementation of information rights of citizens and organisations,
- assistance in creating a market of information resources, services, systems and technologies,
- establishment and implementation of the unified scientific and technological policies of informatisation,
- development and improvement of corresponding financial and legal mechanisms.

The law also contains a number of statements that make up a breakthrough in the regulation of access to information, including information classified as “state information resources” which is produced on a state-funded basis (7) or supplied on an obligatory basis by citizens, authorities, organisations and public groups (8).

¹ The term ‘informatisation’ is used in the text in an attempt to provide equivalent to the Russian term ‘informatizatsiya’ which is not formally defined in standard Russian and has only recently been introduced from technical literature. In general, the term refers to establishing, maintaining and improving the practices in the fields of production, storage, analysis and distribution of information, especially in digital form.

² The law is intended to serve as a basic act regulating processes related to products (analogue or digital) which contain data, rather than to the data themselves. The latter is regulated by the law *On Copyright and Related Rights*.

A number of articles define the conditions and rights of access to state information resources:

- “State information resources are open to general use, with the exclusion of information classified by law as having limited access” (10 (1));
- “Documented information with limited access is divided by its legal status into state secrets and confidential information” (10 (2));
- “Classification of information as confidential is subject to regulations established by federal legislation ...” (10 (5));
- “The users -- citizens, state and local authorities, organisations and public groups -- have equal rights of access to state information resources and are not obliged to justify to owners of information their request, excluding cases where the information of interest has been classified as having limited access...” (12 (1));
- “Owners of information resources provide information services on the basis of legislation, statutes of data-holding organisations, and on contract basis. Information obtained thereby can be used for creating derivative information products intended for commercial dissemination...” (12 (2));
- “The order of access to information (location, time, responsible person, procedure) is defined by an owner or holder of information in accordance with the given federal law. Data and services catalogues and terms of access to open documented information must be provided to users on a free-of-charge basis” (12 (3));
- “State and local authorities maintain openly accessible information resources in relation to their mandate and provide information services to users in the fields of their rights, freedoms, responsibilities, safety and other problems of social significance” (13 (1));
- “The government of the Russian Federation produces lists of data from state information resources which are available to users on a free-of-charge or less-than-cost-of-production basis” (13 (4));

Article 24 defines the order of protection of the right of access to information:

- “Denial of access to open information or deliberate provision of false information can be appealed against in court...” (24 (1));
- “The court considers conflicts arising from inappropriate limiting of access to information, or related to the indemnification of losses resulting from inappropriate denial of access to information or from other infringements of users’ rights” (24 (2));
- “Heads and employees of state bodies and organisations imposing illegal limitation on access to information or breaking the regime of information protection are subject to responsibility in accordance with criminal, civil or administrative law” (24 (3)).

The law requires that the registration, certification and licensing of information products and services should be made in accordance with current Russian legislation (*e.g.* the law *On Certification of Products and Services*). This idea has caused a lot of concern in the private sector (Andreeva 1994, Shestopal 1994), since in general this might lead to state monopolisation of information sources and activities, and can also in practice simplify the access of state agencies to confidential private and commercial information¹.

¹ According to the law, the certification of information systems and products is carried out on a voluntary basis. On the other hand, certification and licensing are required for handling confidential or personal data or for designing corresponding systems and frameworks. This may enable strong centralised control over such activities. The recent orders to license all information protection technology through the Agency for Governmental Communications show that such concerns may be well-founded.

The **copyright** is protected in Russia by the laws *On Copyright and Related Rights*, *On the Legal Protection of Computer Programs and Databases*, and some other acts. Russia is also a member of the *International Copyright Convention* and the *Berne Convention*.

Restrictions on access to and/or dissemination of information are also regulated by the law *On State Secrets*, the governmental edict of 05.12.1991 No. 35 *On the List of Types of Information that can not be Classified as Commercial Secrets*, and a number of other acts¹.

The law *On State Secrets*, adopted in 1993, defines a state secret as

“...information protected by the state in the fields of its military, foreign policy, economic, intelligence, counter-intelligence, and criminal investigation activities, the dissemination whereof may result in damage to the security of the Russian Federation” (2).

The law determines the types of information that can be classified as state secrets, such as information on the national economy, research, or technology of great economic or military importance related to the provision of state security (5(2)).

Similarly defined is the range of types of information that can not be classified as state secrets, followed by the statement that

“Officials having made a decision to classify such information as a state secret... are subject to responsibility according to criminal, administrative or disciplinary regulations, depending upon the physical or moral damage caused to the society, state, or citizens. Citizens have the right to appeal against such actions in court” (7).

In addition, the law *On Commercial Secrets* is currently in preparation. Public hearings were held in October 1994 (Gerasimov 1994).

Although legally required, the access of citizens to information is still quite often considered by officials to be a less important problem compared to information exchange between agencies and authorities of various levels. This is also supported in practice by regulations and guidelines which govern the implementation of legislative acts and state policy. Regulations defining concrete mechanisms and procedures for the implementation of rights to information are still absent.

Other acts specifically devoted to information are the laws *On the Legal Protection of Microcircuit Topologies*, *On the Provision of the Uniformity of Measurements*, *On the Responsibility for Violating the Order of Statistical Reporting*, *On the Obligatory Deposition of Documents' Copies*, *Principles of Legislation on Archive Fund and Archives*. Among the acts in preparation are the federal laws *On Information Support of Economic Development and Business*, *On Statistical Information*, *On Legal Information*, *On Research and Engineering Information*, *On Personal Data*, *On Participation in International Information Exchange and on Supervision over the Export of Information Products* (Voloitin and Kopylov 1994). Underlying lower-level regulations are also under consideration. In addition to the acts already mentioned, information activities are regulated by selected chapters of other acts not directly devoted to information. These are other general laws, such as the laws *On Security*, *On Citizenship*, *On Property*, *On Standardisation*, *On Certification*, as well as acts devoted to the status and/or activities of certain state agencies involved in managing information resources (see also Section 3.4).

¹ Altogether a few dozen regulations of various levels currently govern the protection of state secrets (Savin 1995).

In spite of the introduction of an impressive number of acts, the **practical treatment** of conflicts related to information, as mentioned before, still lacks guidelines and corresponding experience. For instance, changes are yet to be made to the *Civil, Administrative and Criminal Codes*, which will define sanctions for infringement of information legislation.

The elaboration of information **legislation** is carried out and co-ordinated by the Committee on Information Policy and Communications of the State Duma. The protection of **governmental** and presidential information and communication systems as well as the collection and analysis of special information for top-level authorities are performed by the Agency for Governmental Communications. **Decision-making** at the presidential level is supported by a system of information services, including the Presidential Analytical Centres.

The State Technical Commission, with its 20-year experience of protecting **state secrets** from foreign intelligence services, has been charged with implementing the functions of an Inter-Agency Commission for the Protection of State Secrets as required by the law *On State Secrets*. The commission unites 19 principal agencies concerned with state secrets (Balyberdin 1994). Another body advising on the issues of state secrets is the Inter-Agency Commission on Informational Safety of the Presidential Security Council. It is responsible for elaborating the state policy in the field of information safety (Balyberdin 1994, Kurilo and Streltsov 1994).

The Inter-Agency Commission on Protection of Intellectual Property was formed in 1995 on the initiative of the Ministry of Science, the Ministry of Culture, the Committee for Patents and other agencies.

The Committee for Statistics bears the central responsibility for the nation-wide collection of socio-economic information and its regular delivery to authorities at all levels. **Sectoral** agencies manage their own information resources and perform information functions according to their mandates. Owing to the lack of federal co-ordination of information management, each agency basically follows its own sectoral information policy (Melyukhin 1993).

To create a **central co-ordination** mechanism, the Committee for Informatisation was established in 1993 and acquired a more solid status in 1994 (Agapov 1995a). Among its recent activities is the development of a concept for the federal programme *Informatisation of Russia*, aimed at the overall co-ordination and harmonisation of on-going activities as well as at providing the necessary financial, legal and organisational basis (Golubkov 1994, Kurnosov 1994)¹. Extensive collaboration between the committee and regional and international organisations such as UNESCO, the OECD and the CEC is under way (Korchagin and Fontanov 1994).

Registration of databases and the corresponding collection of metainformation are carried out by the Agency for Governmental Communications, the Agency for Legal Protection of Computer Programs, Databases, and Microcircuit Topologies attached to the Committee for Patents, and the InformRegister Centre attached to the Committee for Informatisation. The InformRegister Centre is the leading institution collecting metainformation about databases produced at state expense. The International Bureau for Information and Telecommunications

¹ One problem with the nation-wide development of information processes, however, is related to the fact that the federal information policies tend to focus on technology rather than on the supporting of collection, interpretation and proper use of information. In other words, on the national level there is often a lack of balance between the technology framework and its content in favour of the former (Kedrovskiy 1994b).

is a private company primarily gathering information on private and/or commercially available databases. The Russian Chamber of Commerce collects and updates information about existing telecommunications.

Currently approximately 12,000 **enterprises**, of which 9,000 are state-owned, have formally declared that some of their activities are related to information systems and processes (Golubkov 1994). Over 400-500 new information centres of various kinds and purposes were established in 1989-91. Most of them now offer business information on a commercial basis, partly making use of data-sets initially created at major state-owned information institutions. At the same time in the state sector personnel involved in information support has decreased in the past few years by 50-70% (Antopolskiy and Nosikov 1995).

On the sub-national level information activities are partly co-ordinated by **local** authorities, who develop territorial information projects and establish systems for information analysis. By the beginning of 1994, local information systems and services had been established in most of the Russian territories (Melyukhin 1994b). A recent trend is that information centres are also created on the sub-territorial level -- down to districts, cities and towns¹. Over 20 agreements between the Committee for Informatisation and the territories have been signed to form a basis of information systems on the sub-national level (Golubkov 1994). About 30 centres are to be created under the federal programme *Informatisation of Russia*, and a pilot project has already been implemented (Kurnosov 1994).

Institutionally the status of territorial bodies of information analysis at present varies from small groups which support the needs of local authorities to large well-established organisations. It is not unlikely that this system in the future will in part withdraw certain functions from the presently operational local level of the State Committee for Statistics (Melyukhin 1994b). The current problems of the territorial analytical services are the absence of unified analytical methodologies, compatible technologies and telecommunications. Another observed problem is that the amount of interpreted information is relatively small compared to the amount of raw data which sometimes already overload decision-makers. Thus there is growing demand for qualified staff in the fields of sociological, economic and political analysis (Melyukhin 1994a).

A new development in the field of sub-national information systems is the concept of a *Unified System of State Cadastres* (Manoshkin 1995), which will contain information on various aspects of local development, including social and economic statistics, engineering infrastructure, housing, utilities, communications, natural resources and the environment (more about the latter components is presented in Section 3.2). Experiments in this direction are being carried out in Moscow as well as in the Nizhny Novgorod, Sverdlovsk, Tomsk and Tumen oblasts (Lisitsyn and Monastyrskaya 1994).

Besides centres attached to local authorities, other **networks of information centres** exist or are being created at the sub-national level, including the networks of the Russian Chamber of Commerce, the State Committee for Industrial Policy, and the Agency for Governmental Communications (Kedrovskiy 1994b).

Information resources in Russia are located within various state-funded information systems, research institutions and private companies. For the last 3 to 4 years the national

¹ The second work meeting of local analytical centres in October 1994 brought together 150 participants from 71 territories and cities (Melyukhin 1994b).

information market has become relatively well developed. Digital information of nation-wide interest generated by many institutions can, with a very high degree of likelihood, be found in one of numerous information systems. Over 250 organisations specialise in information brokerage (Antopolskiy and Nosikov 1995).

Enormous amounts of information, however, are still stored **on paper**. The transfer of these data into digital form would require substantial time and labour input. The problems with regard to the production and publishing of paper information products are often associated with the insufficient capacities and quality standards of the paper industry and book publishing as well as with the weak enforcement of copyright law. The latter also refers to digital products (Andreeva 1995).

The number of Russian **databases**¹ may be as large as 25,000-30,000 by expert estimates. Of this number 75% are supposed to be held either in Moscow or in St. Petersburg. The number of databases registered (partly on a self-reporting basis) by the InformRegister centre reached over 10,000 in 1994, with about 30% located in Moscow or in the Moscow Region². Only 16% of the known databases are remotely accessible. The largest proportion of existing databases contain data on business, science and engineering. Analysis of the current dynamics of subjects covered by databases discloses that the proportion of reference and legal databases has the highest growth rate, that databases on social studies and multiple subjects have a decreasing share, and that the proportion of databases on business, arts, natural sciences, engineering, and medicine remains constant. The total number of database holders is of the order of 10,000, 70% of which are state-owned enterprises.

The Russian authorities and state agencies are generally reluctant to purchase, use or finance databases produced in the private sector (Antopolskiy and Nosikov 1995). However, the redistribution of responsibilities for information product and services in favour of the private sector is officially recognised as one of the important goals of the national information policy (Golubkov 1994).

A frequent problem with existing digital databases is that many of them are available only in Russian, although 14 foreign languages are known to be used in various Russian databases and translation into European languages is under way for the most popular data-sets. The formats and classifications used often do not correspond to those internationally accepted³. Quite often the overall quality of a product is simply insufficient to match the strict requirements of international users. This explains the relatively low level of international activity of the Russian database community. Nowadays national enterprises are losing control even over the internal market, as the most paying sectors of economy (*e.g.* banking and insurance) are becoming increasingly dominated by international competitors.

¹ The overall status of Russian databases is presented primarily based on the national report *Automated Information Resources: Status and Trends* prepared in 1994 by the Committee for Informatisation, as summarised in (Antopolskiy and Nosikov 1995), and on data from (Andreeva 1994).

² However, it is likely that the institutions responsible for database registration are unable to get the appropriate information on many databases currently available in the territories, while local database holders do not hurry to register their products. On the other hand it is known that some of the registered databases have been declared only and do not constitute complete products.

³ The Committee for Standardisation currently carries out a number of internationally-accredited certification programmes, some of which are related to information technology. Database and information product certification is under way and will be expanded (Efimov 1994).

The total number of **telecommunication** systems¹ for data transfer in Russia approaches 250, with 50-60 systems actively operational. Among the leading Russian and joint companies operating telecommunications are *RelCom*, *SPRINT*, *RosNet*, *Sovam-Teleport*, *IASNet*, *SITEC*, *RosPac*, and *InfoTel*. There is strong competition between telecommunication operators. In 1994 the number of cities served by hosts of 5 or more different systems exceeded 50. The largest number of networks is represented in Moscow, St. Petersburg and Novosibirsk. The list of cities where the number of networks is smaller, but still exceeding 5-6, includes Archangel, Barnaul, Khabarovsk, Ekaterinburg, Irkutsk, Krasnodar, Perm, Rostov-on-Don, Samara, Tver, Tumen, Vladivostok, Volgograd, and Voronezh. The total number of network hosts exceeds 600 in more than 200 Russian cities and towns. This would be enough to connect over 10,000 organisations with 300,000 users, which could equal 10-20% of the computer users in the country (REFIA 1994). In Moscow telecommunications provide on-line access to at least 40 hosts holding over 600 databases. Altogether more than 200 hosts in Russia offer various database access services. Access to thousands of international databases is provided via connection to international networks, such as *INTERNET*, *BITNET*, *EUNET*, *MCI-mail*, *CompuServ*, *NSFnet*, *DATEX-P*, *ADC*, *SPRINT-INT*, *AT&T*, *DATAPAC*, and the *GLASNET*.

The principal problem for many interested users today is not physical access to telecommunications, but the data traffic and channel-rent fares as well as the high cost of the required hardware and software. Another problem is that the quality of telecommunications on the local level is still unsatisfactory, so that these systems cannot always be reliably used for transferring important information. Besides, high enough transfer rates cannot be maintained at all times, so that the usual rate even in main lines is 2,400-9,600 bps². Inability to transfer data between different networks due to incompatibility of hardware and protocols is not uncommon.

In seeking for an alternative, growing attention has been paid to **teletext** technology, which has been in operation in Russia since 1993, and which is currently employed by a number of federal agencies as well as private companies. At present almost the whole territory of the country, as well as most countries of the CIS and Western Europe, parts of Canada, the USA and Australia, are accessible for teletext transmission from Moscow (Melyukhin *et al.* 1994).

The prospects of data distribution are also associated with the **CD-ROM** technology, which is a rapidly growing sector in Russia. Although the variety of CD-ROMs containing databases is still small (about 30 at the end of 1994), the sales data for CD-ROM drives suggest that the potential current capacity of the Russian market could be as high as 100,000 disks (Sedyakin 1994).

Metainformation remains one of the bottlenecks in obtaining data, although some metainformation and/or meta-knowledge products are available from specialised organisations (*see above and Appendix 2*) or, in some cases, from state agencies.

A limiting factor for many users is the **cost** of data, which can be high both at private companies and state-owned institutions. The high cost of data may in practice make it impossible to implement the open access to information required by law. It is also not uncommon that state institutions object to sharing their data or try to charge the users, even if

¹ The sources for the data on telecommunication systems are (MBIT and TPP RF 1994, REFIA 1994).

² Estimates suggest that the cost of radical modernisation of the Russian telecommunications may approach US\$ 15 million (Melyukhin *et al.* 1994).

free access to the data must be provided in theory. The evaluation of the cost of information is a very complicated and controversial issue, and so far it has found a more or less satisfactory solution only in the private sector, in the fields of financial, economic and legal information trade. The cost of data which are less attractive for private market players but are more socially significant involves the problem of trade-off between the cost of production and systems maintenance and the availability of information. Nonetheless, the absence of centralised financial support for information services make further introduction of market-oriented relations into information business, with all the related advantages and disadvantages, the most realistic prospect.

3. ENVIRONMENTAL INFORMATION CAPACITIES

3.1. INSTITUTIONAL STRUCTURE AND DATA GENERATION ACTIVITIES

The two main institutions which collect environmental data relying on their own observation networks are the Sanitary Committee and the Agency for Hydrometeorology. The Committee for Statistics is responsible for the compilation of self-reporting information from enterprises and territories, thus complementing the monitoring data on environmental quality. The Ministry of Environmental Protection is entitled to co-ordinate environmental monitoring activities of these and other sectoral agencies, each of which is responsible for a specific sector, natural resource or problem (Tab. 2)¹.

The Ministry of Environmental Protection operates a system of 89 territorial agencies, over 240 analytical centres (special inspectorates), 21 marine inspectorates, and over 20 research institutes. The ministry checks the compliance of wastewater (over 17,000 pollution sources, 17-60 parameters), gas effluents (1 million pollution sources, 20 parameters) and solid waste composition and allocation practices with issued permits and/or established standards. It also monitors the state of wildlife and vegetation in federal nature reserves² and records the state of rare and endangered species. The ministry is also responsible for the registration of all kinds of protected areas in Russia. The ministry collects statistical reporting data on emissions into the atmosphere, wastewater discharges, and toxic wastes. Some local offices, depending on their capacities, undertake more comprehensive monitoring programmes, e.g. testing the water quality of selected aquatic systems.

Together with the Committee for Land Resources the ministry is responsible for land quality monitoring (8 million ha of soil pollution sources are monitored by the ministry for 28 parameters through 160 laboratories). In co-operation with the Ministry of Civil Defence it also operates an emergency response and prevention information system. Along with the Ministry of Nuclear Energy and many other involved agencies, the ministry is developing an integrated system of radiation monitoring around nuclear power plants (Gavrilov and Zubkov 1994), and is also developing a national register of radioactive materials.

To standardise monitoring procedures utilised by various agencies, to ensure the compatibility of results, and to avoid parallel projects, the ministry was recently made responsible for the establishment of the *Unified State System of Environmental Monitoring* and of the system of *Integrated Territorial Cadastres of Natural Resources* (see Section 3.2).

The Agency for Hydrometeorology is responsible for the monitoring of air, water, and soil quality, as well as for impact and background monitoring. Regular hydrological and meteorological monitoring has been carried out at selected stations in Russia since the 19th century. Regular hydrochemical monitoring at selected hydrological stations of the then existing Hydrometeorological Service started in 1936, and the programme was further expanded in the 1940-60s. Since the 1960s regular and comprehensive water and air quality monitoring has been implemented. Soil quality monitoring has been carried out since 1974. In

¹ Information and figures on institutional structure, monitoring networks and activities presented in this section are based on numerous publications, including (MinPrirody 1994b, MinPrirody 1995a, Hefter 1994, Hefter 1995, Gromov 1994, GVC GosComStat 1994).

² 77 out of 83 federal nature reserves maintain time-series of *Chronicles of Nature* records on the state of the biotic and abiotic components of the environment (Danilov-Danilyan 1995).

Table 2. Principal environmental data responsibilities of selected state agencies

SUBJECT	MOE	HME	SAN	GEO	WAT	LND	FOR	FSH	AGR	CON	STA
STATE/ CONTAMINATION											
Air		•	•								
Water		•	•	•	•			•		•	
Land/ Soils	•	•	•			•			•		
Rocks/ Minerals				•							
Vegetation	•	•	•				•		•		
Wildlife	•	•	•					•	•		
EXPLOITATION/ USE											
Water	•			•	•					•	•
Land						•				•	•
Rocks/Minerals				•						•	•
Vegetation							•			•	•
Wildlife								•	•		•
EMISSIONS/ WASTES											
Atmospheric Emissions	•	•	•		•					•	•
Wastewater Discharges	•		•	•	•					•	•
Conventional Wastes	•		•							•	•
Toxic Wastes	•		•								•
Radioactive Wastes	•		•								•
PROTECTION/ RESTORATION											
Air	•	•	•								•
Water	•		•	•	•						•
Land/ Soils	•		•			•				•	•
Rocks/ Minerals	•			•							•
Vegetation	•						•			•	•
Wildlife	•							•	•		•

KEY:

- MOE -- Ministry of Environmental Protection
 HME -- Agency for Hydrometeorology
 SAN -- Sanitary Committee
 GEO -- Committee for Geology
 WAT -- Committee for Water Resources
 LND -- Committee for Land Resources
 FOR -- Agency for Forestry
 FSH -- Committee for Fisheries
 AGR -- Ministry of Agriculture
 CON -- Ministry of Civil Construction
 STA -- Committee for Statistics

1978 the body was renamed the State Committee of the USSR for Hydrometeorology and Environmental Monitoring, which later gave rise to the agency currently operating in Russia. Monitoring programmes are managed through a system of 25 territorial offices and 21 environmental monitoring centres, including 7 centres with federal status. The agency operates a comprehensive monitoring network, which in 1994 included:

- 661 air quality stations in 236 cities and towns, with over 100 chemical laboratories,
- 131 stations for analysing the chemical composition of atmospheric precipitation (11 to 20 parameters) and 108 precipitation acidity stations,
- 586 snow pollution monitoring stations,
- 3 stations for transboundary air pollution monitoring,
- 6 regional *BAPMON (Background Atmospheric Pollution Monitoring)* stations,
- 1,891 inland water quality stations on 1,172 rivers and streams and on 154 lakes and reservoirs (27,800 samples taken in 1994), and 454 hydrobiological stations on 186 water bodies (6,200 samples taken in 1994),
- 603 marine water quality stations, and 327 marine hydrobiological stations on 11 seas (more than 3,000 hydrobiological samples are being taken annually and analysed for 12 parameters),
- more than 800 soil quality monitoring sites, including those in 234 agricultural areas (4,000 samples taken in 1994) and in 32 urban areas,
- 35 stations of integrated impact monitoring of the environment and vegetation in heavily polluted areas,
- 6 stations of integrated background monitoring in the biosphere reserves,
- network for monitoring the composition and properties of the atmosphere, including ozone (30 stations), optical density (12 stations), carbon dioxide (3 stations), and atmospheric electricity (4 stations),
- more than 1,300 radioactivity monitoring stations.

In addition, a decision has been taken to expand the already existing network of solar radiation measurements into a national solar radiation monitoring system, with particular reference to ultra-violet radiation (Kalenikin 1994). The latter will include 6 on-the-ground stations and will make use of Russian and international meteorological satellite data (SB RF 1995). Other prospective networks may be devoted to the monitoring of dioxins and greenhouse gases. The federal programme *The Development of a System of Hydrometeorological Support of the National Economy in the Russian Federation* is aimed at maintaining the capacities of the agency. The agency is also responsible for licensing the environmental pollution monitoring activities in Russia.

Since 1957 the agency has been responsible for maintaining the *State Data Bank of Hydrometeorological Information* (later renamed the *State Data Bank on the State of the Environment*), which officially forms part of the *State Archive Fund*. The responsible institution is the Research Institute of Hydrometeorology - World Data Centre. The agency provides access to certain kinds of satellite imagery through its NPO Planeta.

The Sanitary Committee was among the first agencies in Russia to begin the collection of environmental contamination data. The initial concern was the impact of environmental

quality on public health¹. Currently the committee operates a system of over 2,500 territorial and transportation centres and 2,600 sanitary offices which collect data on (GosComSanEpidNadzor 1992):

- raw and drinking water quality,
- contamination of air and soil in settlements,
- urban sources of environmental impact,
- quality of sold, produced and imported food and consumer goods,
- toxic and microbiological contamination of food,
- indoor air quality,
- physical factors of environmental quality (noise, vibration) in urban and industrial areas,
- radiation doses,
- epidemics,
- sanitary status of territories.

To assess the environmental impact on public health, health statistics are collected from health care institutions. An introduction of the committee's own small-sample population health surveys is presently being considered. The sanitary monitoring activities are outlined in the governmental decree of 06.11.94 No. 1146 *On Socio-Hygienic Monitoring*, by which the committee is also entitled to maintain the corresponding data bank.

The **Committee for Geology**, with its 3 regional (sub-national) and 53 territorial centres, over 200 prospecting and research enterprises and 60 specialised enterprises of hydro-geological and engineering-geological monitoring, operates a network of 18,000 wells and polygons for monitoring ground water quality and 15,000 sites for monitoring natural geological hazards. The committee is the successor of the Ministry of Geology, which controlled all geological surveying and mapping activities in the USSR, and is responsible for these activities throughout Russia. It carries out extensive geological and geo-ecological mapping programmes with the use of both field and remotely-sensed data (Kochetkov 1994).

A comprehensive information system on mineral resources and the geological environment is now under development. The system will be based on the network of 18 already existing information centres, including 11 regional centres (*e.g.* in St. Petersburg, Irkutsk, Novosibirsk, Khabarovsk, Yuzhno-Sakhalinsk) and 7 specialised centres. The co-ordination is performed through the Main Computation Centre. The work is carried out under the auspices of the Inter-Agency Council for the Creation of the Unified Geological Information System which is chaired by the deputy chairman of the committee.

The **Committee for Land Resources** comprises a dense network of territorial committees of land resources which survey and regulate land use on the sub-national level. Land resources and land quality surveys in Russia have been carried out at least since the 15th-16th centuries. The first national land survey was conducted in 1680-86. The next national survey of the 18th century was accompanied by the investigation of land quality and land use as well as by the collection of data on soil quality, forests, vegetation and wildlife (Karimov 1994). Systematic surveying and mapping of soils was initiated in 1838 by the Ministry of State Property, and was also incorporated into the activities of the Land Cadastre Commissions started in 1842 (Sadovnikov 1952). The USSR cadastre of land resources was maintained at local and federal levels and was accompanied by a programme of systematic soil and land-use mapping.

¹ The first environmental standards in the USSR were those for drinking water quality introduced in 1939; prior to that sanitary inspectors had long been performing routine raw and drinking water quality surveys.

The committee collects statistical data on land ownership, distribution and management, and is presently responsible for updating the land cadastre to be used in the context of the new economic conditions. The digital technology support of the land cadastre is provided by the committee through its Research Centre Zemlya. A number of local offices of the committee are already equipped with the necessary hardware.

As mentioned above, along with the Ministry of Environmental Protection, the committee is also responsible for the federal-level, sub-national and local monitoring of land quality, including:

- soil fertility,
- swamping and salinisation,
- state of agricultural lands,
- soil pollution with heavy metals, pesticides, radionuclides, and other toxicants,
- hazardous exogenous processes,
- state of land under intensive industrial, transportation or urban use.

According to the *State Programme of Land Monitoring in the Russian Federation in 1993-95*, 100 monitoring polygons and 1,200 monitoring stations are to be established in 1993-95. The areas to be covered by the land quality surveys in 1993-95 are:

- 60 million ha agricultural land,
- 100 million ha land in the Arctic,
- 5 million ha land affected by desertification,
- 25 million ha to assess toxic contamination,
- 25 million ha to assess radioactive contamination.

The Committee for Water Resources, with its 18 catchment-basin management directorates, 85 territorial offices, and 18 offices for water reservoir management, collects and verifies self-reporting data on water consumption, wastewater allocation and hydro-engineering systems. Reporting currently covers over 50,000 sites of water withdrawal, 11,000 sites of wastewater discharge, 1,800 reservoirs and 30 canals. The committee also carries out its own programme of surface water quality monitoring.

The Agency for Forestry, with its territorial agencies, 1,600 forest management enterprises, and 8,000 forestries, monitors the stock, use and quality of forest stands. Forest surveys have been carried out in Russia for centuries, and the use of aerial data dates back to the 1920s. Since the 1980s special attention has been paid to the elaboration of methods of digital registration and mapping, as well as to more advanced use of satellite remote sensing. About 20 institutes throughout the country are now concerned with forest inventory methodology, the leading one being the Research and Information Centre for Forest Resources. Experiments on digital registration and forest mapping are currently under way on the local level. A prospective initiative is the introduction of an agency-wide geoinformation system.

The Committee for Fisheries with its 27 catchment-basin offices and more than 450 local inspectorates, is responsible for monitoring the state of freshwater and marine fish populations as well as of other aquatic biological resources. The Inter-Agency Ichthyological Commission was established to provide inter-sectoral co-ordination.

The Department for Hunting and Wildlife Management of the Ministry of Agriculture performs species-by-species and integrated field surveys of the state of game wildlife and habitats, and collects statistical data on wildlife exploitation. The Department of Fish Breeding controls the operations of fish-breeding ponds. The ministry also collects data on

nutrients, heavy metals and pesticides (300 sites in 1990) (Serov 1993), and on radionuclides (350 sites), in agricultural soils and products. The latter activities are carried out on the basis of the system of AgroChemRadiology centres, renamed from the system of Stations for Agrochemistry established in 1979 in the form of a unified agricultural survey network led by the Institute of Agrochemical Support of Agriculture. In 15 territories which suffer from area-wide radioactive pollution extensive surveys of radionuclides in agricultural soils and products are conducted on a regular basis. The Research Institute of Lands and Ecosystems Monitoring employs remote sensing methods in the interest of agricultural assessment of land.

Local municipal enterprises which previously belonged to the system of the Department of Municipal Engineering of the Ministry of Civil Construction collect data on water quality in public water supplies, and also hold information on the planting of trees in urban areas. The system is decentralised now, but the offices on the territorial level do assemble this information. Local committees of the ministry also maintain data files on land use and planning in urban areas.

The Agency for Geodesy and Cartography is the central body responsible for cartographic activities in Russia (including digital mapping), and is also one of the leading bodies in remote sensing. The first national topographic surveys of Russia were undertaken in the 18th century (Salishchev 1976). Civil cartography and topography in the USSR was administered by the Directorate-General for Geodesy and Cartography, which, among its other responsibilities, supervised the publishing of virtually all thematic maps which are now in use. The Agency for Geodesy and Cartography has inherited all of its research centres and 3 of the 9 map publishing enterprises.

The agency is active both in its traditional field (topographic surveys and map publishing) and in such fields as remote sensing and GIS. It is responsible for cartographic and geodesic support of state authorities, and is charged with the licensing of all geodesic, cartographic, and digital mapping activities throughout the country. Remote sensing is co-ordinated by the State Centre Priroda. Since 1992 the agency has been officially entitled to create a series of digital maps and geoinformation systems for the Russian Federation. Under the *Federal Programme of Digital Mapping* 8 territorial centres have been established to co-ordinate and perform the work, including those in Moscow, St. Petersburg, Ekaterinburg, Novosibirsk, Irkutsk, and Khabarovsk. The technology leader in digital cartography is the RosGeoInform centre, while research and methodological support is provided by the GosGISCentre. Research in digital cartography and GIS is also conducted, among others, at the State Centre Priroda and the PKO Kartografiya. The Inter-Agency Commission on Geoinformation Systems, chaired by the director of the agency, was established in 1993 to co-ordinate the corresponding activities of various state agencies. The agency is currently involved, along with other federal bodies, in the development of a geoinformation system for state authorities.

The Committee for Statistics collects data through the state statistical reporting system. The committee partly duplicates the work of the sectoral information systems in collecting copies of the same self-reporting forms (i.e. data from the same sources are also collected and accumulated by relevant sectoral agencies). The self-reporting information comes from all kinds of enterprises to the territorial statistical offices, and then, in integrated form, to the Main Computation Centre of the committee in Moscow.

The environmental reporting information includes data on (GVC GosComStat 1993, 1994):

- emissions into the atmosphere and air quality control,
- wastewater discharges and water quality control,

- exploration and use of mineral resources,
- status and use of forest resources,
- status and use of land resources,
- game wildlife protection and restoration,
- protected areas,
- generation and allocation of industrial, municipal, toxic and radioactive wastes,
- operation of water supply and sewerage systems,
- public health,
- environmental investments and construction.

Environment-related information is also collected by, and stored in the **information systems** of the Ministry of Civil Defence, the Ministry of Public Health, the Ministry of Culture, the Agency for Governmental Communications, the Supervisory Board for Radiation Safety, and the Supervisory Board for Mining and Industry.

Industrial sectoral agencies and **municipalities** also carry out environmental performance monitoring of their enterprises, which is supposed to be soon partly co-ordinated through the *Unified State System of Environmental Monitoring*.

Another source of high-quality environmental data (primarily of sub-national scale) is the **research projects** conducted by sectoral research institutes, by institutes attached to the Russian Academy of Science and other traditional academies (e.g. the Russian Academy of Medical Science and the Russian Academy of Agriculture), and by universities and other institutions of higher education.

The research work of various institutions is partly co-ordinated through **environmental programmes** governed by federal agencies. The Ministry of Environmental Protection operates the federal programme *Ecological Safety of Russia* (MinPrirody 1992), which among other problems covers:

- environmental risk factors,
- medical and sanitary aspects of ecological safety,
- recreation and population aspects,
- environmental monitoring and mapping, information support,
- regional problems and accidents,
- sustainable management of natural resources,
- protection of biodiversity and natural ecosystems,
- environmental education and culture.

The Ministry of Science financed 16 environmental programmes in 1993, including (MinPrirody 1994b, Hefter 1994):

- *Russian Forest*,
- *Global Change of Environment and Climate*,
- *Population and Economy Safety with Regard to Natural and Man-Induced Accidents*,
- *Integrated Research of Oceans, Seas, the Arctic and the Antarctic*.

Some examples of other sectoral and inter-sectoral federal data-related environmental programmes are (MinPrirody 1994b, Hefter 1994, SB RF 1995):

- *Inter-sectoral Problems of Environmental Protection in the Fuel and Energy Industries in 1993-95*,
- *Geo-Ecology of Russia: Geo-Ecological Investigation of the Russian Territory in 1991-95 and until 2005*,
- *Geochemical Map of Russia: Geochemical Mapping of the Russian Territory in 1991-95 and until 2005*,
- *Rehabilitation of Territories Polluted with Radioactive and Toxic Substances*,

- *Ecological Safety in Military Areas,*
- *Participation of Russia in Improving the State of the Marine and Arctic Environment,*
- *Protection and Restoration of Plant and Animal Species Diversity,*
- *Clean Air of Russia,*
- *Management and Restoration of Water Resources,*
- *Waste Management,*
- *Universities of Russia.*

The Committee for Informatisation considers health-related and environmental information systems among its priorities within the context of the prospective federal programme *Informatisation of Russia* (Kurnosov 1994).

There are environmental information activities which are related to **international programmes** developed under international or binational initiatives. Examples include programmes of the World Bank, WWF, UNEP, WHO, UNESCO, OECD, IUCN, IASC, UNDP, ICSU.

Environmental projects are also carried out by private **consulting** companies, but because of the relatively low profitability of these services the number of such companies is not large. Environmental **NGOs** may be another source of valuable (though often only local-scale) environmental data.

On the local level, the collection of environmental data may also be associated with the preparation of territorial/urban **development programmes** or environmental **impact assessments**. Environmental protection or impact assessment chapters in corresponding reports may contain data on air quality and emissions, water quality and wastewater discharges, the state of soils, vegetation and wildlife, sanitary conditions, protected areas, natural and cultural monuments, and environmental regionalisation. Territorial environmental projects may also be initiated by local authorities and be aimed at solving specific local problems or at performing integrated environmental assessments.

Two groups of **problems** arise in association with data generation activities:

- In spite of the considerable amount of generated data, monitoring procedures are often incompatible with each other, which leads to incomparable results, along with an abundance of parallel unrelated projects and information gaps in thematic and/or geographic sense¹. Data quality also varies between programmes.
- Following the overall economic decline, environmental management activities are also going down². The current level of funding is not sufficient for maintaining the present network and technological capacities, some of which are far from being advanced. Consequently, a further breakdown of the present system of environmental monitoring due to financial reasons is not unlikely.

¹ *E.g. according to some estimates, of all the emissions and discharges only 15-20% are somehow measured and monitored. The rest -- which are night releases, unregistered dumps, etc. -- is outside the state registration system. There is also little direct monitoring of sources; all the available data are being supplied mostly through self-reporting. Similarly, not all areas (e.g. those under military control) are covered by a monitoring network.*

² *As compared to 1991, there has been a 50% reduction in activities on testing the air quality around industrial enterprises. Similar trends are known for many other monitoring activities.*

3.2. ENVIRONMENTAL INFORMATION SYSTEMS AND PRODUCTS

The only general statement regarding environmental information products that can be made safely is that all collected data are stored on paper for a certain time within the institutions which directly performed or ordered a corresponding survey. Data can be stored in the form of draft or outgoing **maps**, collections of **tables**, or project **reports**. The number of document copies produced may be as low as 1 to 10.

Recently it has become more common to store the same kind of data in digital form (*e.g.* by digitising maps, making simple electronic databases, or preparing project reports using word processors). Yet in many cases these products are intended only for internal use rather than for sale and/or distribution. Usually the copies of such paper or digital products can be obtained only either from a data-set developer or from the person and/or institution that ordered the data-set (the latter can also represent a higher institutional or management level).

Generally speaking, the only way to guarantee the proper delivery of an information product is to contact the data holder directly¹. Higher administrative or territorial levels may in practice not be receiving all information from below, or may be receiving it in a substantially generalised form. At the same time the information flows do exist, resulting in the concentration of certain data at specially designated federal and/or regional nodes. On a sub-national level the most substantial amounts of environmental data are held by the territorial offices of the agencies enumerated in Section 3.1. Systematic transfer of information to central locations is arranged within the currently existing monitoring system operated by the Agency for Hydrometeorology, within the system of statistical reporting (Committee for Statistics), and within the system of sectoral cadastres of natural resources (*see below*).

Territorial integration of environmental data is performed in the course of the compilation of **environmental maps and atlases** of territories. Maps of the state of the environment have recently been compiled, among many others, for St. Petersburg city, the Moscow, Leningrad, Archangel, Voronezh, Ryazan, and Lipetsk oblasts, the Krasnoyarsk kray, and the Khakass and Buryat republics. Environmental atlases are being prepared for the Irkutsk and Murmansk oblasts. Digital environmental maps and atlases are in preparation *e.g.* for the Lake Baikal area, the Archangel, Irkutsk, Moscow, Murmansk, and Ryazan oblasts, the Altai kray, and Moscow, St. Petersburg, Obninsk, and Kostroma cities. The Agency for Geodesy and Cartography has signed agreements with approximately half of the Russian territories to develop various kinds of digital information products, including GISs, thematic spatial databases or corresponding software. Environmental information is also present in general-purpose geographic maps and atlases of the territories, of which a large number have been compiled.

Some local environmental authorities and/or statistical offices publish **territorial reports** on the state of the environment and **territorial compendia** of environmental statistics.

Data contained in background materials for emission permits as well as for other kinds of environmental **permits** are stored at local environmental agencies and at corresponding enterprises, and can also provide insights into pollution loading. **Environmental passports**

¹ *E.g.* travel to a location of interest is very often the only way to obtain local data, even in cases where these data in theory should be available elsewhere.

for enterprises have been compiled since 1980 and contain information on the consumption of natural resources, production and allocation of emissions and wastes at a single enterprise¹.

Information regarding the compliance of various activities with environmental regulations is found at local and central offices of bodies performing supervisory functions, e.g. the Prosecutor Offices, the Ministry of Internal Affairs, the Ministry of Environmental Protection, the Ministry of Agriculture, the Sanitary Committee, the Committee for Fisheries, the Committee for Land Resources, the Agency for Forestry, the Supervisory Board for Mining and Industry, the Supervisory Board for Radiation Safety, and the Committee for Statistics, as well as at other sectoral agencies and at the enterprises themselves.

Raw **statistical reporting** data are usually available only from territorial statistical offices. The aggregated data are regularly distributed among the authorities and selected users by the Main Computation Centre of the Committee for Statistics. The data are originally delivered in digital form but are not stored longer than the time needed for the preparation of a publication due to the lack of space and resources. The centre is now planning to produce a series of territorial statistical compendia which will include, along with other data, information about the protection of the environment (GVC GosComStat 1993). The federal-level environmental data yearbooks are regularly published and distributed by the Division of the Computation Centre (former RosInformCentre) of the committee (see also Appendix 3). Besides, this division holds a set of nationally-aggregated digital statistical data-sets, including those on environmental protection and management (RosInformCentre 1994).

A system of **cadastres** (registers) of natural resources has been established in the USSR with the purpose of systematic collection and registration of information about the stock, status, and use of:

- mineral resources,
- water resources,
- land resources,
- forest resources,
- game wildlife resources,
- fish/aquatic animal resources.

Some information included in sectoral cadastres is stored in the form of digital databases². Other data are not yet available in digital form, but their transfer is under consideration.

Data on deposits of **mineral resources** have been collected and published under *State and Territorial Balances of Mineral Resources* for over 30 years (Buyanov *et al.* 1994). Since 1981 work has been carried out to rearrange this information in an expanded form into the *State Cadastre of Mineral Resources*. Co-ordination of activities is provided by the *Federal Data-Bank* holder RosGeolFund and by territorial data banks. Examples of nation-wide digital data-sets produced on the basis of cadastre information are the database *Mineral Deposits as Natural System*, which contains data on mineral resources, their quality, and geological conditions of extraction (RosGeolFund), the databases *Mineral Deposits*, *Nickel/Copper Deposits*, and *Local Oil/Natural Gas Containing Systems* (Institute of Mineral Resources Economics), the database *Deposits of Construction Materials in Russia* and the *Economic Cadastre of Deposits of Non-Ferrous Metals* (Main Computation Centre of the Committee for

¹ The reliability of such data, like of any self-reported data, however, may not be very high.

² The information presented in this section about digital products has to a large extent been taken from (Antopolskiy 1992, MBIT 1994c, InformRegister 1993).

Geology), the database *Deposits of Construction and Non-Ore Materials in Russia* (Central Geophysical Expedition), the database *Coal Deposits in the CIS* (VNIGRIUgol), and the spatially-registered database of mineral deposits (VNIIZarubezhGeologiya).

Geological monitoring data on hazardous exogenous processes and on the state of permafrost are partly stored in digital form at the Geo-Ecological Centre of the Institute of Engineering Geology and Hydrogeology. Large quantities of geological and geo-ecological data are also stored in either analogue or digital form at geological research institutions and at local offices of the Committee for Geology.

Data on meteorology, **air** quality and emissions, and on the composition of atmospheric precipitation are published regularly by the Agency for Hydrometeorology. Existing federal-level digital databases cover atmospheric emissions and air quality (Central Geophysical Observatory), snow pollution (Institute of Global Climate and Ecology), meteorology and solar radiation (Hydrometeorological Institute - World Data Centre and Central Geophysical Observatory), agro-meteorology (Institute of Agrometeorology). Air quality data collected under programmes of international co-operation (e.g. *BAPMON*, *EMEP*) are passed on to corresponding international centres and are published thereby.

The **aquatic** digital databases of the *State Water Cadastre* contain data on river hydrology, marine hydrology and pollution (all at the Hydrometeorological Institute - World Data Centre), surface water quality (Hydrochemical Institute), run-off distribution and the hydrology of lakes and impoundments (State Hydrological Institute), water consumption and wastewater allocation (VodNIInformProyekt and local offices of the Committee for Water Resources). Digital data on ground-water, including a database of potential exploitation resources of ground-water integrated by the territories of Russia, and the database of monthly-averaged ground-water levels at selected wells, are stored at the Geo-Ecological Centre of the Institute of Hydrogeology and Engineering Geology; digital databases on ground-water regime and quality are also under development at the territorial offices of the Committee for Geology. A catalogue of the glaciers of the USSR has been turned into a spatial database at the Institute of Geography. A substantial amount of state monitoring data on marine water quality is stored at the State Oceanographic Institute. Data on water quality in public water supplies are also held, mainly in analogue form, by municipal enterprises and by the territorial offices of the Department of Municipal Engineering of the Ministry of Civil Construction.

Hydrological and water quality monitoring data collected by the Agency for Hydrometeorology are published annually. Ground-water data are published by the local offices of the Committee for Geology. Water use data are summarised and partly published by the Committee for Water Resources.

Analogue data products on **land resources** are held by various-level offices of the Committee for Land Resources and include information on land quality, classification, use and ownership. However, few data are present at these offices with regard to measured soil quality, as well as for non-cultivated lands. The accuracy of boundaries is also sometimes questionable. Therefore extensive surveys are planned for the updating and expanding of these data-sets, along with transition to storage of data in digital form. According to the *State Programme of Land Monitoring*, the *Database on Land Quality* and the spatially-distributed *Land Monitoring Information System* are to be developed in 1993-95 at the Committee for Land Resources, to be used by the *State Land Cadastre* and by the *Federal System of Land Monitoring*.

Data on soil pollution which are currently collected by the Agency for Hydrometeorology and by the Ministry of Agriculture are published regularly. The offices of the Ministry of Civil Construction hold data on urban land use.

Digital databases and analogue data-sets on **forests** containing information on forest resources at different levels of aggregation are held at central institutions (Research and Information Forest Institute, Institute of Forest Industry, Research and Information Centre for Forest Resources) and at some local forestry enterprises. A database on forest fires is held at the Research Institute for Forestry.

Data on the state and habitats of **vegetation** and/or **wildlife** are stored (only partly in digital form) at the Ministry of Environmental Protection, the Agency for Hydrometeorology, the Committee for Fisheries, the Inter-Agency Ichthyological Commission, the Departments for Hunting and Fish-Breeding of the Ministry of Agriculture, the territorial and local offices of the Ministry of Civil Construction and municipal engineering enterprises. The Agency for Hydrometeorology monitoring data on the state of freshwater plankton and benthos communities are published annually. Data on rare and endangered species are published in national and territorial *Red Data Books*. Examples of known or declared digital data-sets are the *Database of Fish and Other Marketable Aquatic Life* (Committee for Fisheries), the *ZooMonitor* database on populations of birds, mammals, amphibia and reptilia (Siberian Branch of the Russian Academy of Science), the databases *Impact Monitoring* (under development) and *Background Monitoring* (Institute of Global Climate and Ecology)¹, databases on the state of biota of protected areas (State Institute of Applied Ecology), rare animals and medicinal plants (NPP Logus), common and rare animals distribution, communities and habitats (Institute of Environmental Conservation, Institute of Geography, Moscow State University).

Since 1982 the Ministry of Public Health of the USSR has been operating the *Unified State Information System ZDOROVIE* devoted to environmental aspects of public **health**, which contains data on air pollution, drinking water quality, population mortality, and health statistics for cities of the USSR, including more than 80 cities in Russia (Abrosimova *et al.* 1994). This database is now operated independently by the Russian Republican Information-Analytical Centre of the Sanitary Committee and by the MedSocEconInform Centre of the Ministry of Public Health. The latter is also developing an urban health-environment information system that will serve as an information framework for the WHO Healthy Cities programme in Russia. The Information-Analytical Centre of the Sanitary Committee is establishing an information system to support the *Federal Programme of Socio-Hygienic Monitoring*. Besides, the *Federal Programme of the Development of a Sanitary-Epidemiological System in Russia in 1993-95* has envisaged the elaboration of local, territorial and federal information systems and databases on public health and the environment (Melyukhin 1993).

An important set of information products is the series of **national reports** on the state of the environment, which since 1992 have been prepared annually by the Ministry of Environmental Protection. Other nation-wide federal-level reports, both general and problem-specific, have also been produced in the past few years (*see Appendix 3*).

Other initiatives related to the development of environmental data-sets of national or subnational coverage are projects aimed at **small-scale environmental mapping** and/or at the

¹ Both databases also contain data on other components of the environment, i.e. air, soil and water.

development of wide-coverage **environmental databases**. Some examples of initiatives resulting in general-purpose environmental information products are nation-wide general or environmental mapping or database projects (the Institute of Geography, Moscow State University, the Committee for Geology, the Agency for Geodesy and Cartography), the *Atlas of Public Health and Environment* (the Public Health and Environment Foundation and the Centre for Post-Soviet Studies), the *Arctic Environmental Database* and the *Environmental Atlas of Russia* (Moscow State University), the *Environmental Data Report Database* (the Institute of Global Climate and Ecology), the *Volga River Catchment Basin* database (the Institute of Environmental Problems of the Volga Basin).

There are also many examples of more **problem-specific projects** which result in the production of analogue or digital environmental data-sets of national or sub-national coverage on related subjects¹.

An important source of raw data directly related to the state of the environment is the **remotely-sensed data** from USSR/Russian satellites. Raw or processed aircraft and satellite imagery in either analogue or digital form is available from the Agency for Geodesy and Cartography through the State Centre Priroda and through some of its local enterprises. Of special value for environmental purposes is the multiband photographic imagery of high spatial resolution, like that derived by the *RESURS-F1/F2* satellites. The Agency for Hydrometeorology supplies images from meteorological satellites, as well as from the *OCEAN* and the general-purpose *RESURS-O* platforms. These images are primarily held at NPO Planeta and at the Research Institute of Hydrometeorology - World Data Centre, as well as at a few other centres and institutes. In addition, the inter-departmental SovInformSputnik agency has been established for the release of the disclosed (mainly panchromatic, but very high resolution) imagery from military satellites.

Two important **initiatives**, which are being built upon the currently existing environmental information systems, and which are likely to significantly alter the current patterns of data flow and practices of information management, are the *Unified State System of Environmental Monitoring* and the *Integrated Territorial Cadastres of Natural Resources*. Both concepts are supported by a number of currently operational acts as well as present in the draft law *On Protection of the Environment in the Russian Federation*.

The concept of the *Unified State System of Environmental Monitoring* was approved by the governmental edict of 24.11.93 No. 1229 *On the Establishment of a Unified State System of Environmental Monitoring*. The purpose of the system is to provide information support for the integral assessment of the state of the environment in the Russian Federation as a whole as well as on the sub-national level².

The essence of the concept is to create data flows between various agencies undertaking environmental monitoring in Russia, so that all relevant sectoral information will be concentrated and further processed in an integrated form at the federal and territorial centres

¹ E.g. on geology, soils, surface waters, vegetation and wildlife, population, and socio-economic infrastructure.

² The idea of a unified system in its present sense first appeared at least in 1989, when an attempt was made to bring together all existing monitoring networks under the State Committee of the USSR for Environmental Protection. Owing to the breakdown of the USSR, the concept has never been implemented. The attempt was later repeated in 1991 by the Russian Ministry of Ecology and Natural Resources, but without notable success. Moreover, as early as in 1972 the State Committee of the USSR for Hydrometeorology and Environmental Monitoring was charged with the creation of a *Unified State System of Observation and Supervision (OGSNK)*, which, however, has also been unable to function as a truly inter-agency network.

of the Ministry of Environment Protection and other agencies. The actual structure of existing sectoral monitoring networks is to be distorted as little as possible. The data to be covered by the system would ideally comprise virtually all existing information on environmental contamination, pollution sources, ecosystem response and public health. The Federal Centre for Geo-Ecological Systems and the State Institute of Applied Ecology bear the federal-level responsibility for the concept implementation. Apart from federal centres of general competence, the establishment/ assignment of federal-level centres for processing more specialised information is also under consideration. Similar centres of information analysis are to be created on the territorial level by the local offices of the ministry. An *Information-Analytical System* is to be established at the ministry to serve as an integrated all-ministry database. The federal information-analytic centre thereunder has already been opened in Moscow.

On the territorial level one of the first steps taken in 1994 was the enactment of local regulations on monitoring activities (the Krasnodar, Primorskiy, and Stavropol krays, the Bashkortostan, Chuvash, Mariy-El, Mordovian, and Tatarstan republics, the Amur, Astrakhan, Kirov, Perm, Sverdlovsk, Tumen, and Vologda oblasts, and the Khanty-Mansi autonomous okrug). Some of these and other territories also came up with conceptual frameworks suited to local needs and conditions and/or with the creation of fragments of monitoring or analytical subsystems (the Bashkortostan, Karelian, Udmurt, and Yakut republics, the Krasnodar and Krasnoyarsk krays, the Amur, Archangel, Astrakhan, Irkutsk, Kalinigrad, Kaluga, Kirov, Leningrad, Lipetsk, Murmansk, Nizhny Novgorod, Novgorod, Novosibirsk, Orenburg, Perm, Pskov, Ryazan, Samara, Saratov, Sverdlovsk, Vologda, and Yaroslavl oblasts, and Chelyabinsk city). Several territories were selected to serve as model areas for the creation of territorial-level monitoring systems (the Astrakhan, Chita, Kaluga and Kurgan oblasts, the Bashkortostan, Karelian, Chuvash, Mordovian and Udmurt republics, the Khanty-Mansi and Yamal-Nenets autonomous okrugs, and the Mineralnye Vody area in the North Caucasus). So far it has been admitted that the most serious problems are of organisational nature and associated with establishing links with and between various data holders. Another bottleneck is that funding for the programme on the territorial level comes from local budgets and thus is dependent upon local authorities. At the initial stage of system implementation, its main products will be metainformation and a limited number of analytical overviews on the basis of existing data (Gavrilov 1995, Novoselova 1995, MinPrirody 1994b, 1994c, 1995b).

As a further development of the environmental monitoring system, its incorporation into a more comprehensive national security monitoring system is under consideration. The latter may be formed under the auspices of the Presidential Security Council to support national-level decision-making in terms of various aspects of national security, including environmental safety (Gerasimenko *et al.* 1994).

The concept of *Integrated Territorial Cadastres of Natural Resources* (Shevchuk *et al.* 1994, Itkin *et al.* 1995) has originated primarily from the need of local governments to incorporate environmental components into everyday decision-making. The integration of environmental data on the inter-sectoral level is necessary for providing an overall assessment of the local environment as part of a territorial socio-economic system. The cadastres of natural resources are considered to form part of the system of state cadastres which may be established under the leadership of the Committee for Informatisation (Lisitsyn and Monastyrskaya 1994, Manoshkin 1995) or other relevant agency. Of special importance is the calculation of payments to local budgets for the use of natural resources of the territory, which requires consistent, up-to-date, accurate, and officially certified information on natural resource availability, status and use.

The territorial cadastres are intended to create links between sectoral environmental and natural resource cadastres, existing urban/settlement cadastres which contain data on housing and engineering infrastructure, and socio-economic statistical data. The environmental monitoring data received through the *Unified State System of Environmental Monitoring* should contribute to the state-of-the-environment sections of integrated cadastres.

A pilot experiment on creating territorial cadastres is currently carried out under the supervision of the Ministry of Environmental Protection and in co-operation with other agencies and local authorities in 30 territories of Russia, including the Adygei, Karelian, Khakass, and Komi republics, the Krasnoyarsk, Primorskiy, and Stavropol krais, and the Amur, Belgorod, Ivanovo, Irkutsk, Kamchatka, Kaliningrad, Kaluga, Kemerovo, Kostroma, Kurgan, Leningrad, Moscow, Nizhny Novgorod, Omsk, Orenburg, Perm, Sverdlovsk, Tver, Tula, Ulyanovsk, Vologda, and Yaroslavl oblasts. Actually active at the current stage are 20% of these territories (including the Irkutsk, Leningrad and Yaroslavl oblasts).

A regional approach will be implemented for ensuring the consistency of data and methodologies, with the co-ordination of the activities of several territories through regional centres rather than through a federal one. A regional pilot project involving the territories around Leningrad oblast is under way.

The guidelines on territorial cadastres are developed by the Ministry of Environmental Protection and by its specialised centres¹. The sub-programme *Cadastres of Natural Resources* is included into the federal programme *Ecological Safety of Russia* for 1995.

The list of sources of cadastre information may include state and sectoral internal statistical reporting products, routine survey and monitoring data, and data related to impact assessments, inspections, or other special purpose activities. Besides already existing cadastre data on mineral resources, land and soil resources, surface and ground waters, forests, game wildlife, and fish resources, the integrated cadastres are intended to cover such themes as climatic resources and natural risks, non-arboreous forest resources, endangered species and protected ecosystems, protected areas, areas of special recreational or cultural importance, recovered materials, and the generation and disposal of wastes. The parameters to be attributed to resource description include the stock and properties of the resource, its legal status, its quality in terms of environmental impacts and state, and its relative or absolute economic value. Cadastre information is supposed to be stored both in digital and in analogue form. This refers to both spatial and tabular parts of a cadastre².

The already available preliminary results of the experiment show that the insufficient activity of most of the territories can be explained by a number of objective as well as subjective factors (Itkin *et al.* 1995). These include the inability of the territories to allocate necessary funding, the absence of environmental management experience which would be relevant to the new economic conditions, and, finally, the reluctance of some officials to set up the proper inventory mechanisms for the use of the natural resources which are under their control.

It should be noted that both the monitoring and the cadastre programmes are often to be based on essentially the same data-sets operated by the same agencies. However, in an organisational sense the monitoring system is somewhat more top-to-down oriented, while

¹ Two centres, i.e. the NIC Cadastre in Irkutsk and the NPP Cadastre in Yaroslavl, are operational. The establishment of similar centres in St. Petersburg, Krasnoyarsk and Kemerovo is under consideration.

² It is estimated that 50-70% of the associated tasks would require spatially-referenced data (Itkin *et al.* 1995).

territorial cadastres pay almost exclusive attention to the local/territorial level. Since it is required that unified protocols for collection, exchange and use of monitoring data should be established, the sectoral agencies must thus be able to deliver data to both programmes, the difference being the level of integration and the form of delivery depending upon the prospective use.

Like data-generation activities (*see* Section 3.1), the most important **problems** associated with the development of environmental information systems and products in Russia are the lack of co-ordination, product incompatibility, and the abundance of parallel projects. These are accompanied by an overall decline in activity. A special problem is the lack of metainformation: although certain metainformation sources do exist (*see* Appendix 2), their comprehensibility and reliability is far from being satisfactory. (Unfortunately, it must be admitted that this also applies to the corresponding sections of this report.) The maintenance and regular updating of metainformation for operational use is certainly carried out by interested institutions. However, since this is a very time- and labour-intensive process, not all of the existing metainformation is, or can be, made compatible with external standards and requirements given a very limited market and a pronounced lack of fund-supported demand.

3.3. PROFESSIONAL AND PUBLIC USE OF ENVIRONMENTAL INFORMATION

One of the main kinds of decision-making to be supported by the state system of environmental information is the **supervision** and **enforcement** of compliance with environmental regulations. The supervision is carried out by federal and local authorities, as well as by the Ministry of Environmental Protection, the Sanitary Committee, the Prosecutor Offices, the Ministry of Internal Affairs, the Ministry of Agriculture, the Committee for Fisheries, the Committee for Land Resources, the Agency for Forestry, the Supervisory Board for Mining and Industry, and the Supervisory Board for Radiation Safety. The ultimate goal is a gradual improvement of the state of the environment, while practical aims may be the termination of dangerous operations or the collection of fines to finance specialised funds (*see* Section 3.4).

Decisions most often made in the course of supervision are concerned with:

- initiation and carrying out of administrative, disciplinary or criminal investigation,
- imposing fines,
- limiting or termination of certain activities,
- issuing/cancellation of licenses for the use of natural resources (including air emission, wastewater or solid waste allocation),
- acceptance/rejection/correction of construction and development plans and operation procedures.

Environmental information is also used during the preparation of environmental **impact assessments** required for many projects or activities able to negatively affect the environment, including:

- concepts, plans and programmes of sectoral or territorial development,
- natural resource use and protection programmes,
- urban development and construction projects,
- construction, reconstruction and technology renovation projects,
- regulation documents.

In the case of **court trial** hearings connected with environmental problems, environmental data are used as evidence (Selivanov and Skoromnikov 1994), although related experience is still controversial and limited¹. Related problems and data requirements are likely to be associated with the introduction of **environmental insurance**, which is supported by the law *On the Protection of the Natural Environment* and is being introduced jointly by the Ministry of Environmental Protection and the Russian Insurance Company.

Environmental information is widely used for justifying a **special environmental status** of a territory, including its classification as a “zone of environmental emergency” or a “zone of environmental disaster” (MinPrirody 1994f, Petrov 1995), or for supporting the establishment of protected areas.

The concept of integrated cadastres of natural resources (*see* Section 3.2) is aimed at an **integrated assessment** of environmental management efficiency. This is another prospective use of data. The particular problems to be solved on the territorial level based on the information from integrated cadastres include (Itkin *et al.* 1995):

- defining and licensing of acceptable uses of a territory,
- setting of spatial and temporal frameworks for economic development,
- development of environmental taxation policy,
- assessment of environmental damage,
- distinguishing between resources under federal, local and municipal jurisdiction,
- provision of an information base for privatisation of natural component systems.

The problem, however, is that the methodology for integrated assessment of environmental values is not yet widespread and routinely used, though it is being worked on in a number of institutions.

The draft law *On Protection of the Environment in the Russian Federation* suggests the introduction of a “**post-project monitoring**” aimed at the “verification of preliminary forecasts of environmental impact”, and of a system of “independent external **environmental audits**” of enterprises. Both initiatives seem to be relatively data-demanding.

In relation to the appearance of a **realty market** in Russia, the attention to environmental conditions in evaluating the cost of property will undoubtedly grow further. The variations of environmental quality already play an important role in realty assessments, *e.g.* in Moscow.

Another kind of use of environmental data is associated with their transfer to **international organisations**, as well as with data utilisation and analysis within various **research projects**.

Except for research projects, the routine methodology of environmental data **analysis** is not very advanced as yet. Statistical and modelling approaches are not common in routine practice, with the exclusion of the Agency for Hydrometeorology. No statistical concept of environmental and health risk is in practical use. Officially certified models of pollutant transport in the atmosphere and in the aquatic environment do not reflect the present-day state of knowledge in these fields. The culture of field model calibration and verification in everyday practice is not widespread. On the other hand, quite sophisticated analytic and modelling techniques and approaches have been developed in research institutions across Russia. Their implementation is impeded not only by the absence of proper approval

¹ The number of environmental cases make up no more than 5% of all cases brought before Russian courts (Petrov 1995).

mechanisms for new developments, but also by the inability of decision-makers to understand the procedures and to properly use their outcomes.

According to different estimates, there are several hundred to several thousand **public** environmental groups in Russia, varying with respect to their attitude to problem-solving from 'eco-fundamentalists' to pure pragmatics (Yanitskiy 1994). One of the oldest groups is the Russian Society for the Conservation of Nature, which started its operation in 1924¹. NGO activities vary at present from local protest actions to broad-scale environmental public hearings and assessments, although public mass actions seem to steadily be losing their impetus. Many of these groups are aware of existing sources of environmental information and make use of them, although it is not uncommon for NGOs not to trust any official information. In their turn, many officials are extremely reluctant to supply any data to public groups for fear of "improper and prejudiced interpretation".

The **dissemination** of environmental information is probably the least developed field in the range of environmental information activities. The access to information products (e.g. those described in Section 3.2) is hampered for "medium-" to "low-level" users (including the public, NGOs, and research and consulting institutions) by the small number of publication copies, high cost of data, and, quite often, by the reluctance of data holders to share their resources. Obtaining the necessary data to a great extent depends upon the person's or institution's experience, their connections in government and research sectors, and their financial capacities.

Media remain an important mean of distributing environmental information and knowledge. The central environmental newspapers *Zelenyy Mir* (The Green World, 40,000 copies, more than 20 issues a year), *Spaseniye* (Salvation), and the magazines *ECOSInform* (1,000 copies), *Eurasia-Monitoring* (2,000 copies), *Ekologicheskiy Vestnik Rossii* (Ecological Bulletin of Russia), *Svet: Priroda i Chelovek* (Light: Man and Nature), *Priroda* (Nature), *Bereginya* (Cherish-Goddess), *Svirel'* (A Reed-Pipe, children magazine, 15,000 copies) publish various environmental materials, including national state-of-the-environment reports. Over 50 environmental periodicals were published regularly in 30 territories in 1993 (MinPrirody 1994b). More than 100 popular periodicals devoted to local geographical and environmental studies were published regularly in 1990-93 (Boykova 1994). Non-specialised periodicals and news agencies also pay considerable attention to environmental affairs, though the public has lost a lot of interest in the environment in recent years. A number of environmental programmes are broadcasted at central and local TV and radio stations (e.g. *People's Earth*, *Ecological Microphone*). Again, the pronounced lack of funding and the fact that environmental programmes and publications are not very attractive for commercial advertisers make the operation of such media extremely difficult. Some financial support is provided by the Ministry of Environmental Protection, ecological funds and other external sources. A number of professional periodicals devoted to the environment experience similar problems.

The NOOFACT, ECO-ACCORD and other agencies use **telecommunications** to distribute environmental information. International environmental electronic bulletins are available in Russia through the INTERNET. On-line access to information from the Ministry of Environmental Protection has been provided through a *Bulletin Board System*. The Russian Environmental Federal Information Agency operates the teletext-type *TV-EcoInform* information system for the distribution of environmental information to territorial

¹ Strictly speaking, it could not have been regarded as a pure NGO during the USSR period, since membership for a long time was almost obligatory for virtually everyone. However, its contribution to environmental protection is not questioned.

environmental protection offices and other interested users (MinPrirody and TV-Inform 1994). The agency regularly sends information to over 80 local offices, some of the central environmental agencies in the CIS member states, research and educational institutions, and international organisations (e.g. the information from *TV-EcoInform* is received through the *INTERNET* by UNEP and OECD headquarters). The transferred information packages contain environmental legislation acts, reference and educational materials, conference information, and environmental status reports. Technically the system is capable of transmitting over 100 KB of uncompressed data per day¹, and the practical effectiveness is at present more often limited by the lack of appropriate information and by the inability of data receptors to use such amounts of data. The cost of transmission with *TV-EcoInform* is in many cases much lower than the cost of using alternative telecommunications, and the reliability is higher due to a generally low quality of telecommunication infrastructure outside central Russia and few other key areas. The National Information Agency which operates a teletext system using the first channel of the Russian television has been planning a transfer of geophysical data collected by the Agency for Hydrometeorology (Melyukhin *et al.* 1994). The establishment of the *Local Space Service* system for on-the-ground direct reception of data from *RESURS* satellites is now under consideration (Ascont 1995). The system will comprise a network of personal stations able to continuously receive compressed multiband 20-m resolution data at the rate of 3 Mbit/sec. The pilot experiment is to be conducted in 1995-98, and to be followed by a fully-operational stage upon its successful completion.

Environmental **book publishing**, in spite of the recent drop in the number of titles and copies, greatly contributes to the dissemination of environmental knowledge. Over 300 environmental titles came out in 1993, including 170 educational and popular texts and monographs and 130 conference proceedings, reviews, pre-prints, and reference publications. The total number of copies in 1993 was 50,000, varying from 50 to 50,000 copies per title (which is not very many given the 150 million population). The support of environmental publishing from the Ministry of Environmental Protection and from the Russian Ecological Fund is critical, though not sufficient to maintain the desired level (MinPrirody 1994b).

Environmental **education** forms a basis for the literate environmental information **user community**. General environmental programmes are being introduced at all levels of education, including pre-school (kindergarten), primary to high school, technical colleges, and institutions for higher education. The theory and methodology of environmental education are dealt with at about 140 institutions under 60 sub-programmes within the programme *Ecological Safety of Russia*. The Association of Environmental Education and the Inter-Agency Commission on Public Environmental Education have been created as a national-level co-ordinating mechanism, and sub-national centres of environmental education have been locally established, e.g. in the Kamchatka, Leningrad, Perm, Sverdlovsk and Tumen oblasts, and in the Altai and Stavropol krais (Sostoyaniye... 1994).

A number of **secondary-/high-school** institutions have introduced special environmental courses, e.g. *Health and the Environment*, *Man and the Biosphere*, *Basic Ecology*, *Human Ecology*, *Nature and Culture*. Environmental problems are also being taught in the context of international school projects, i.e. international projects on river watch *GREEN* (Zelenyy Mir 1994), and a project on domestic animals and acid rain, the *KidNet*. A considerable environmental component is present in basic high-school courses in *Biology* and *Geography*. A separate compulsory course *Ecology* has recently been introduced in school curricula. Local

¹ Over 300 packages, containing in total 13 MB of information, have been transferred during 1994 (MinPrirody 1995a).

and national *Olympiads* (contests) in *Biology* and *Geography* for school students have been arranged for years, and a national *Olympiad* on the *Environment* has been held since 1994¹. Environmental projects and camps are held in many parts of the country, including the *All-Russian Summer School on Ornithology, Geo-Botany and Aquatic Ecology* held on the Black Sea since 1993. A national competition for school students *Water on the Earth* was held in 1994 (Sostoyaniye... 1994, MinPrirody 1994b).

Basic environmental courses are included in the curricula of the **technical colleges**. Specialised technician-level training is offered within programmes in *Environmental Protection, Industrial Air Quality Control, Water Supply and Wastewater Disposal, Air Quality Monitoring, Water Quality Monitoring, Soil Quality Monitoring, Hydrology, Meteorology, Hydrogeology and Engineering Geology, Forestry, Land Management, Irrigation and Drainage, Wildlife Management, Aero-Geodesy, Cartography, Sanitary Medicine and Epidemiology* (Novikov 1993, MinPrirody 1994b).

The universities and other institutions of **higher education** in Russia are the main sources of environmental professionals for all sectors of the economy. The first environmental department was formed at Kazan State University in 1969. Furthermore some 10 more departments were established throughout the USSR by 1988, including those at the universities and other institutions of higher education in Ekaterinburg, Perm, Rostov-on-Don, St. Petersburg, and Voronezh. In the 1980s *Environmental Engineering* departments were established at the Moscow Institute of Chemical Engineering and at other institutes with similar background. Over 250 Russian institutions offered in the early 1990s training in fields with significant environmental components, such as *Biology, Zoology, Botany, Microbiology, Soil Science, Geography, Meteorology, Hydrology, Hydrography, Oceanography, Sanitary Medicine, Hydrogeology and Engineering Geology, Environmental Engineering, Architecture and Urban Construction, Landscape Architecture, Civil Construction, Air Quality Control, Water Resources, Aero-Geodesy, Cartography, Remote Sensing, Agro-Chemistry and Soil Science, Land Management, Irrigation and Drainage, Forestry and Gardening* (Tatur 1991).

Nowadays, along with the state institutions of higher education, some private institutions offer extensive environmental programmes (e.g. Moscow College of Arts and Ecology, the International Independent University of Ecology and Political Science, the International University).

At present the system of higher education in Russia is undergoing a transition from the previously existing 5-year system of education leading to the *Diploma of Higher Education* to a more complex arrangement which incorporates training towards 3 kinds of undergraduate/graduate degrees, i.e. the *Bachelor's Degree* (a 4-year programme), the *Master's Degree* (an additional 2-year programme), or the *Diploma of Higher Education* (a 5-year programme, without the requirement of earning the *Bachelor's Degree*). Due to the changes a rearrangement of the classification of qualifications has taken place (Shadrikov 1994), accompanied by a substantial change in course contents. State educational standards containing basic course requirements are to be introduced by 1998. Before that a set of preliminary standards is being prepared.

The classification of the *Bachelor's Degree* qualifications has already been formed and officially approved. Along with many traditional entries (i.e. *Biology, Geography, Geology,*

¹ The winners of national contests have participated in similar international events: *Geography* (1993, 1995), *Environment* (1994).

Hydrometeorology, Civil Engineering, Geodesy, Agro-Chemistry, Forestry, Fisheries, Aquatic Bioresources), new qualifications have been added such as *Ecology and Environmental Management, Engineering Protection of the Environment* (already offered at 2 institutes), *Environmental Construction, Land Management and Land Cadastre*.

Two umbrella groups of qualifications for the *Diploma of Higher Education* have been established. These are *Ecology and Environmental Management* and *Life Safety*. The first group comprises 7 separate qualifications related mostly to natural and social sciences (*Environmental Management, Geo-Ecology, Bio-Ecology, Agro-Ecology, Irrigation and Drainage, Protection and Management of Water Resources, and Environmental Construction*; in the future the qualification in *Geological Ecology* may be added to this group and is now considered by 12 universities). The *Environmental Protection and Natural Resource Management* qualification, which is also in this group, however, has a much stronger engineering component¹. The second group covers 4 qualifications of engineering nature (*Life Safety, Engineering Protection of the Environment, Technological Safety, Emergency Response*), which are already offered by at least 20 engineering institutes. Some other new related qualifications are *Environmental Education* (for institutions offering degrees in pedagogy), *Ecology* (for environmental departments of purely engineering sectoral institutions of higher education), *Land Cadastre* and *Urban Cadastre*.

Intensive training for working professionals is offered within several programmes, i.e. *Ecology and Environmental Management, Ground-Water Protection, Landscape Architecture, Environmental Education*.

As regards the non-professional environmental education in the institutions of higher education, *Biology and Basic Ecology* course for science students and a *Life Safety* course for engineering students (which covers the issues previously taught within *Occupational Safety, Civil Defence and Environmental Protection* courses) are now being taught on a compulsory basis at the institutions of higher education.

Given the variety of programmes, there is, however, a limited number of training programmes directly related to **environmental information** management. Mapping is taught at all institutions with *Geography, Cartography, Geology, Soil Science, Forestry* and similar programmes. Several institutions already teach GIS, and over 30 more are introducing corresponding programmes in the near future (Lourie 1994). The statistical foundations of data processing is taught within almost all programmes. All programmes of engineering nature have strong components related to higher mathematics and computer science (these are also taught to a lesser extent to science students). At the same time there are only a few institutions offering really advanced courses in environmental data analysis, environmental modelling or environmental decision-support. This, among other factors, accounts for the insufficient use of existing and elsewhere known techniques.

Nevertheless, in spite of the economic difficulties, the Russian educational system, with its deep traditions, numerous links to industry, government, the business and research community, and its highly-qualified personnel, has much to offer with regard to the development of environmental information systems and networks.

¹ The corresponding programme has been in existence since the 1980s, and was offered by 27 departments in 1992, with over 500 students graduating every year. The current estimates are about 60 departments and 1,500 students a year.

3.4. LEGAL AND ECONOMIC FRAMEWORK

The framework for the generation, distribution and use of environmental information is defined by current environmental and information legislation, which is eclectic by nature and has not been comprehensively developed as yet (*see* Sections 2.2 and 2.3).

The new *Constitution* adopted in 1993 contains a number of statements directly related to environmental information problems. The most important innovation is the special regime of environmental data distribution. Besides the general rights of citizens to information expressed in article 24 (information affecting rights and freedoms) and article 29 (collection and dissemination of information; *see* also Section 2.3), the *Constitution* directly states that

- “Everyone has the right to a healthy environment and to reliable information about its state” (42),
- “The concealment by officials of facts and circumstances which threaten the life or health of people entails responsibility in accordance with federal legislation “ (41 (3)).

The specific mechanisms of public access to environmental data are as usual supposed to be defined by supplemental laws and acts, none of which has yet been enacted.

The law *On the Protection of the Natural Environment*, currently in force, states that the “designated agencies receive environmental information from other agencies, institutions, organisations and enterprises on a free-of-charge basis” (7). These agencies, in their turn, are entitled to provide the public with necessary environmental information (6, 7), including the annual national state-of-the-environment report (6). Citizens and public groups have the right of access to “timely, complete and reliable information on the state of the environment and on measures for its protection” (12, 13). Conditions should be provided for free, unrestricted international exchange of information on environmental research and engineering (92).

Collection and analysis of environmental data are dealt with in the governmental edict of 24.11.93 No. 1229 *On the Establishment of a Unified State System of Environmental Monitoring* (*see* Section 3.2). The draft law *On Protection of the Environment in the Russian Federation*, prepared by the expert group of the Ministry of Environmental Protection, similarly to the current law entitles the specially designated agencies to carry out environmental **monitoring** within the framework of the *Unified State System of Environmental Monitoring* as well as within the system of sectoral and integral territorial cadastres (20, 21, 22). The agencies performing environmental monitoring should provide interested users with “current and urgent information on environmental change, corresponding warning and forecasts” (22 (4)). It has also been suggested that monitoring data should be provided free-of-charge to federal and territorial legislative bodies and to Russian citizens (22 (5)), while sold to other institutions and organisations (22 (6)).

Maintenance of the systems of **cadastres** of natural resources is required by the acting law *On the Protection of the Natural Environment* (8, 9, 16). The directive of the government of 05.04.92 No 695-r (3) assigns the Ministry of Environmental Protection together with the Committee for Statistics the responsibility for improving the registration of natural resources and recovered materials. By the governmental edict of 19.08.92 No. 602 *On Measures for the Implementation of the Programme of In-Depth Economic Reforms* (83) the Ministry of Environmental Protection together with the Ministry of Agriculture, the Ministry of Fuel and Energy, and the Sanitary Committee are made responsible for the preparation of the cadastres of natural resources.

Laws devoted to the protection of specific **resources** (e.g. air, water, land, forests, wildlife), or to the regulation of activities with substantial environmental components (e.g. civil construction, sanitary supervision) usually also contain chapters on related information activities. The laws *On the Protection of Atmospheric Air in the RSFSR* (45), *On Public Sanitary-Epidemiological Well-Being* (5, 32), *On Mineral Wealth* (27-32), *On the Principles of Urban Construction in the Russian Federation* (6, 8), *On Wildlife* (15, 16), *Water Code of the RSFSR* (104-108), *Land Code of the RSFSR* (109-111), and *Principles of Forest Legislation of the Russian Federation* (74-78) explicitly and in more or less detail regulate the collection and use of relevant data. It is generally required that information collected and stored under state programmes (such as national monitoring systems or state cadastres) should be managed according to unified standards, and unconditionally used for official purposes. Relevant state agencies are made responsible for managing certain kinds of data by the above-mentioned acts, as well as by the corresponding *Statutes*, of which each one is devoted to a single agency, describes its functions, rights and responsibilities, and is approved by the government.

Environmental **data access** policies are, besides the *Constitution*, highlighted in general information legislation. The law *On Information, Informatisation and the Protection of Information* (see Section 2.3) states that:

“No restrictions can be imposed on the access to documents containing... data on accidents, environmental, meteorological, demographic, sanitary-epidemiological or other information which is necessary to support the safe functioning of settlements, industries, safety of citizens and the public as a whole” (11 (3)).

The law *On State Secrets* (7) includes data on accidents and catastrophes, the state of the environment, public health, sanitary, demography, and agriculture in the list of types of information that can not be classified as state secrets, and defines the responsibility for inappropriate classification (see Section 2.3). On the other hand, scientific and economic information, including data on “distribution and amount of state material reserves”, as well as scientific data “of defence or economic importance, significant for the provision of security of the Russian Federation” (2) can be declared a state secret¹.

According to the governmental edict No. 35 of 05.12.91 *On the List of Types of Information that can not be Classified as Commercial Secrets*, access to information on environmental pollution cannot be restricted due to reasons of confidentiality.

The law *On Public Sanitary-Epidemiological Well-Being* (5) states that citizens have the right to complete and reliable information on:

- the state of the environment and public health, epidemic conditions, and sanitary regulations,
- actions undertaken for the improvement of sanitary conditions, and corresponding results,
- the quality of consumer goods, including food and drinking water.

¹ This means in practice that distinguishing between various possible statuses of environmental data is likely to be ambiguous and dependent upon the situation, especially given the current vagueness of definitions in environmental sciences and management. In general, the considerations of national security in relation to environmental and, especially, natural resource data are gaining a growing importance. The list of officials with a mandate to classify information as a state secret contains, among others, the heads of the Ministries of Nuclear Energy, Civil Defence, Public Health, Science, Defence, Environmental Protection, Agriculture, Committees for Higher Education, Geology, Informatisation Policy, Agencies for Geodesy and Cartography, Hydrometeorology, and Governmental Communications.

The law *On Mineral Wealth* provides a comprehensive treatment of geological data ownership:

“Information on geological composition... contained in geological reports, maps and other materials, is the property of the client who has financed the work which has resulted in the production of the given information... The sub-contractor is allowed to use this information for research or academic purposes insofar as the commercial interests of the client are not affected¹.”

The *Principles of Forest Legislation* require that forest registration and cadastre data should be subject to publication (77).

Some environment-related acts explicitly define the data access principles. For instance, governmental edict No. 532 of 03.08.92 *On Increasing the Efficiency of the Use of Data on Hydrometeorology and Environmental Pollution in the National Economy* states that the public and interested institutions must be provided free-of-charge with information on background environmental quality, regular weather forecasts, and natural disaster warnings, while private companies and other interested institutions (excluding federal and territorial agencies and authorities) may obtain necessary environmental and hydrometeorological data on a paid basis.

However, as mentioned before, quite often the issued acts are not appropriately accompanied by underlying guidelines and practical mechanisms, which are yet to be set up. For the time being it has been observed that “the provision or publishing of up-to-date reliable information is systematically refused” (O Pravovykh... 1994). Besides, the release of sectoral data to external users must in many cases be carried out under control of sectoral or institutional expert commissions, which can also have its practical implications.

Separate acts have also been adopted on the **presidential** or **governmental** level to regulate certain other environmental information activities, i.e. land cadastre and land monitoring, socio-hygienic monitoring, registers of radioactive materials, and national state-of-the-environment and public health reporting (*see* Appendix 4).

As regards the **economic** framework of the development of environmental systems, this must be looked at within the overall context of the situation with regard to the funding of environmental activities in Russia (*see* also Section 2.2). The two principal mechanisms for the funding of environmental activities are federal/territorial budgets and ecological funds (Petrov 1995). The latter are raised from various fines for violating environmental legislation, voluntary contributions, and dividends resulting from previous investments. The amount spent from these sources for environmental information purposes at either federal or territorial level depends mainly upon what degree of importance is attributed to particular kinds of environmental data by funds holders, i.e. by state agencies or local authorities. Most likely to be funded are programmes which result in economic benefits, such as territorial cadastres of natural resources. However, even in this area the interest and level of activity are not yet very high (Itkin *et al.* 1995).

One of the obstacles for the establishment of an appropriate level of funding is the uncertainty associated with the benefits of possessing environmental data compared with their cost. While the market value of information is often obvious, the government systems usually find it

¹ This approach is somewhat different from those employed by the basic copyright and information legislation of Russia (*see* Section 2.3), especially taking into account that geological information may be part of state-of-the-environment data.

difficult to determine the value of data and information and the required amount of investments, especially under the conditions of a considerable budget deficit and inability to finance the basic needs of the society.

The problems associated with the current low level of funding of environmental information activities (*see* Sections 3.1 and 3.2) and of environmental management as such (*see* Section 2.2) make it difficult to predict how soon the concepts introduced by the above-mentioned regulations will be implemented in practice, and how this will influence the performance of the respective agencies and institutions. A major contradiction is the fact that environmental data can be made completely open only if the government takes the full financial responsibility for data generation and information analysis systems. Otherwise, either no data will be produced or efforts will be made at every level to avoid their free dissemination.

4. NETWORKING NEEDS AND PROBLEMS¹

4.1. CO-OPERATIVE AGREEMENTS

From a legal point of view the Ministry of Environmental Protection is the most centrally positioned in terms of **co-ordinating** the generation, analysis, and dissemination of environmental information. It is also responsible for the annual preparation of reports on the state of the environment. Correspondingly the ministry has a mandate to collect environmental data from a wide range of sectoral agencies. The implementation of the concepts of the *Unified State System of Environmental Monitoring* and of the *Integrated Territorial Cadastres of Natural Resources* (see Section 3.2) is likely to further enhance the capabilities of the ministry to gather necessary data. Therefore it is the first natural candidate for the establishment of co-operative relations with the *ENRIN* programme.

On the other hand, at least some of the **sectoral agencies** may possibly not always be eager to share their data with the Ministry of Environmental Protection beyond their formal obligations. This may be especially relevant with respect to subnational-scale aggregated data of sectoral programmes. It is also not uncommon that the agencies themselves, as well as their offices or research institutions, officially or unofficially try to charge each other for information, even in cases where it formally must be provided free of charge and without restrictions (see Section 3.4).

Under any circumstances it will be necessary to establish good working relations with the most important federal agencies involved in environmental monitoring and data management (the list may include the Agency for Hydrometeorology, the Sanitary Committee, the Committee for Water Resources, the Committee for Land Resources, the Agency for Forestry, the Committee for Geology, the Committee for Statistics, and others (see also Sections 3.1, 3.2 and Appendix 1)). Such relations will also be important from the point of view of establishing actual networking and data exchange mechanisms.

To mitigate the possible friction between some of the involved parties, it would be helpful to obtain a principal approval of the programme by some of the top-level national **authorities**, including the Presidential Administration, the Government, and parliament committees (see Section 2.2 and Appendix 1), as well as by the corresponding authorities of the territories selected for pilot projects. This will be especially relevant if the networking programme needs the co-ordination of its funding strategy with regard to the allocation of funds within the federal and local budgets, or if tax/financial advantages for the programme are desirable. Another reason is that some of the participating institutions may require that the programme should hold a mandate from top Russian authorities.

However, it must be kept in mind that a co-operation agreement between the programme and any agency or authority may not necessarily guarantee reliable links to lower positioned **institutions**, nor access to their data. It is very common that an agency does not have complete control over such data, since many activities are performed by the institutions on a contract commercial basis so that the resulting intellectual property does not formally belong to the supervising body. Therefore, in order to involve some institutions in the programme,

¹ The sections of this chapter correspond to the *ENRIN* activities as outlined in the programme overview (see Appendix 5).

agreements must be made in certain cases between the programme or single institutions, or even parts thereof.

4.2. REGIONAL PROGRAMMES

Regional programmes can serve as good *ballons d'essai* for the **modelling** of relationships between an environmental information network and the international community of prospective users and contributors. Being commonly limited thematically as well as in space and time, regional programmes offer a cost-efficient mechanism for the testing and adjustment of the networking strategy by confronting the networking developments with the real needs.

Since regional programmes usually involve a broad range of users with various requirements, procedures and standards, they provide a very demanding environment for examining the efficiency of networking in helping to find answers to practical questions arising, and for matching the procedures adopted within the network with international standards, *e.g.* in terms of classification, analysis and presentation.

As soon as the national **network** reaches its full capacity, regional programmes are likely to become one of the main consumers of its data. They will also continue to contribute to the development of international links between co-operating national environmental information systems.

One sort of **target** regional programmes may be represented by problem-specific programmes dealing with the international and transboundary problems of air and water transboundary pollution, migration and distribution of protected species, transportation of wastes, natural and man-induced accident prevention and emergency response. Another kind of target programmes may be of a more comprehensive nature, and be related to general problems of environmental protection and management in areas falling under several national jurisdictions (*e.g.* the Circumpolar Arctic).

Global initiatives are also very suitable for linking to the networking programme. However, they often incorporate much longer time-scales and require co-ordination on the level of top national officials, which is probably not appropriate at the early stage of networking development. At a later stage global initiatives, like regional programmes, will inevitably become very important network partners.

4.3. STRENGTHENING THE NATIONAL INFORMATION NETWORK

The strengthening of the Russian environmental information network is probably the central and the most controversial component of the networking programme. The most obvious **problems** that can be expected are the following:

- Networking involves direct or indirect interference with the responsibilities of Russian federal and/or territorial authorities. On the one hand, care must be taken to avoid inconsistencies with existing national standards, regulations and traditions, *e.g.* in terms of funding, legislation, national security, and organisational and institutional structures.

On the other hand, certain traditions and standards must be broken wherever possible, *e.g.* sectoral monopolism, inattention to public needs, and plain corruption.

- The attempts to strengthen the national network can succeed only if a sufficient amount of funding is brought from external sources. The amount required may be considerable given the dimensions of the country and the severity of the economic problems. In order to ensure the proper and lasting operation of the network, funding should be provided on a regular basis within a certain time period, and the allocation of funds must be monitored.
- The competition for power, funding and technology can be strong both between and within involved agencies, institutions, and territories. Hence it will be important to take a well-balanced approach, trying to avoid sectoral, institutional, regional, or personal biases.

The strengthening of environmental information network activities should include components associated with **all aspects** of the environmental information process, including the creation of information resources, their management, distribution and use.

While it may seem natural for a networking programme to pay more attention to the already existing data and take less account of the data collection activities themselves, a notable effect can be achieved by restructuring current multi-sectoral system of environmental **monitoring** to provide harmonised and more focused spatio-temporal and thematic coverage, while avoiding the duplication of efforts. This idea is already partially present in the concept of the *Unified State System of Environmental Monitoring*. However its implementation will definitely be impeded by the attempts of agencies and territories, first, to keep their control over information and resources allocated to data collection (if any), and, second, to follow their own goals, which may be different from those of the system. A comprehensive project for the restructuring and harmonisation of the monitoring network, accompanied by the transfer of field and laboratory analytical technologies, will then make an invaluable contribution to the building of the capacities of the existing systems of environmental information.

Transfer of technology and know-how in the field of data **storage and management** is also important. In fact many information system offices operate completely out-of-date equipment and procedures and thus are incapable of efficient management of large stocks of data. To achieve a really comprehensive treatment of a problem, attempts should be made to assist in the introduction of appropriate information technologies at all levels, from field sites to top-level decision makers.

Strengthening is also required in the field of treatment of environmental information. While the traditions of mapping in Russia are very deep, routine **analysis** of digital environmental data is at its initial stage. The approaches and procedures widely implemented elsewhere (*e.g.* statistical analysis of environmental quality data, fate and transport modelling, use of remote sensing products, geoinformation technologies, methods of assessing the economic value of the environment) are known and used by the research community and selected sectoral institutions, but are not applied in the everyday practice of environmental decision-making. Among limitations are the lack of expertise and of technological capacities.

Reporting capacity building will be needed to bring the quality of reporting products to standards which would meet the needs of users and decision-makers. The analysts must be able to integrate and present information in a way that is useful and understandable from a user's point of view. As with information analysis, the assistance needs can be envisaged on both the knowledge and technology sides. Users and decision-makers must in turn be able to appropriately understand the reported environmental data. Hence by supporting the already existing system of general and specialised environmental education (*see* Section 3.3) the networking programme can notably increase the number of qualified environmental information users.

The problems of transfer and **dissemination** of environmental information are discussed in Section 4.5.

4.4. ACCESS TO INTERNATIONAL INFORMATION RESOURCES

Among users in Russia, those working on international projects as well as those interested in applying and/or learning about foreign experience and methodologies have the greatest interest in having access to international databases. State-owned and private academic, research and consulting organisations are the most likely **users** of international information resources. Most of the NGOs will also be interested in such access.

The main **limitations** currently are the lack of knowledge about available information resources (both digital databases and paper products and publications) and the absence (or high cost) of necessary telecommunications and hardware.

Besides the UN and UNEP databases, access to information resources of other international, regional and national **institutions**, such as the EEA, ESA, EPA, USGS, and NASA will be greatly appreciated by the user groups listed above.

4.5. PUBLIC DOMAIN DATA AND INFORMATION DISTRIBUTION

The distribution of environmental information, as mentioned above several times, is also a very controversial issue. Two **strategies**, or some kind of a combination thereof, are possible regarding the development of public and international access to environmental information:

- To rely on current and prospective Russian legislation which requires unrestricted access to environmental data (*see* Section 3.4), or
- To try to develop a mechanism to make information holders interested in sharing or exchanging their data.

Although legislation to underlie a public-domain policy already exists, no legal or administrative mechanism is available to put it into practice. As mentioned above, the only practical way to obtain data is to buy them from their owner or another holder, provided that the necessary care is taken to avoid conflicts with the interests of national security. The costs are in general negotiable, while some institutions (*e.g.* the Committee for Statistics) have a more or less defined policy for fixing a price.

International organisations which regularly work with Russian authorities, as well as the authorities themselves, normally have no problems in obtaining data that should be regularly supplied to them in accordance with certain regulations or obligations. However, whenever a non-standard request is made, the most feasible way to solve the problem is, again, to order and/or purchase a required data-set.

Generally speaking, it is unclear how the **public-domain** concept is to be applied in practice. For many organisations working with environmental data, selling their information is a very important source of funding (and sometimes the most significant one). Any attempt to require free delivery is likely to result in declaring the respective data-sets as “non-environmental”, which is not difficult to do with the existing vague classification systems. If the elaboration of a special mechanism to encourage (*e.g.* economically) data exchange is considered, this must be subject of a separate comprehensive research. However, as the economic problems become less acute, more institutions are likely to be interested in exchanging data rather than in making a financial profit from them.

In general there is a number of **activities** which in any case may facilitate the access to environmental data in Russia:

- Development of a comprehensive metainformation and reference system that will contain information about sources of data, available databases, environmental programmes and institutions. To a certain extent this project can be based on already existing products and on-going activities (*see* Appendix 2);
- Matching of the environmental data classification system with international standards;
- Assistance in developing an infrastructure for the dissemination of environmental information. This could include the establishing of public access node(s) and agreements with telecommunications operators regarding the tariffs;
- Building of capacities in environmental publishing, including technology transfer to designated national environmental focal centre(s), as well as support in increasing the number of copies of published documents;
- Establishing a system of agreements with and between interested agencies, institutions and authorities in order to ensure the exchange of environmental data (or at least metainformation) and to define access mechanisms.

All of the above will hopefully help to eventually create an informed and competitive market of environmental information, which functions in accordance with regulations and good practice.

REFERENCES

- Abrosimova, Yu.E. *et al.* 1994. Podkhody k Otsenke Zdorovya Naseleniya v Svyazi s Sostoyaniem Okruzhayushchey Sredy i k Sozdaniyu Programm Ozdorovleniya Gorodov. (Approaches for the Assessment of Public Health in Relation to the State of the Environment and to the Elaboration of Healthy Cities Programmes.) In *Zdorovie Naseleniya Rossiyskoy Federatsii i Puti Ego Uluchsheniya*. (Public Health in the Russian Federation and the Ways to Improve It): Proceedings of the 1st Research-Practical Conference/ May 30-31, 1994, Moscow, MedSocEconInform. Moscow: Ministry of Public Health Care and Medical Industry of the Russian Federation, 122-126
- Agapov, A. 1994a. Systema Federal'nogo Informatsionnogo Zakonodatel'stva: Perspektivy Razrabotki i Priorityty Zakonotvorcheskoy Deyatel'nosti. (The System of Federal Information Legislation: Prospects and Priorities.) *Informatsionnye Resursy Rossii* 4 : 15-16
- Agapov, A. 1994b. Pravovaya Zashchita Informatsionnoy Intellectual'noy Sobstvennosti. (Legal Protection of Information Intellectual Property.) *Informatsionnye Resursy Rossii* 5: 25-26
- Agapov, A.B. 1995a. *Osnovy Federal'nogo Informatsionnogo Prava Rossii*. (Principles of Federal Information Law of Russia.) Moscow: Ekonomika. 220 pp.
- Agapov, A. 1995b. Sotsial'no-Politicheskiye Predposylki Razrabotki Informatsionnogo Zakonodatel'stva Rossii. (Socio-Political Prerequisites for the Development of Information Legislation of Russia.) *Informatsionnye Resursy Rossii* 1: 10-11
- AIS GVK. 1-ya Ochered'. Seriya "Gidrometeorologicheskoye Obespecheniye Narodnogo Khozyaystva". *Obespecheniye Potrebiteley Dannymi o Vodnykh Ob'ektakh, Vodnykh Resursakh, Rezhime, Kachestve i Ispol'zovanii Vod*. 1988. (Automated Information System of State Water Cadastre. 1st Version. User Provision with Data about Aquatic Bodies, Water Resources, Flow, Quality and Use. Series: "Hydrometeorological Support of National Economy".) Moscow: HydroMetIzdat. 9 pp.
- Alba. 1994. *Informatsionnye Tsentry Moskvy. Spravochnik*. (Information Centres of Moscow. Guide.) Moscow. 183 pp.
- Altshuler, I.I., Golubchikov, Yu.N., Mnatsakanian, R.A. 1992. Glasnost, Perestroika and Eco-Sovietology. In *The Soviet Environment: Problems, Policies, and Politics*, ed. J.M. Stewart. Cambridge: Cambridge University Press, 197-212
- Andreeva, I. 1993. Informatsionnyy Potentsial Rossii: Ego Razvitiye na Primere Industrii Baz Dannykh. (Information Potential of Russia: A Case Study of Database Development.) *Informatsionnye Resursy Rossii* 1: 18-19
- Andreeva, I. 1994. Budet li u Informatsii Svetloye Budushchee? Obzor Sobytiy v Informatsionnoy Sfere. (Will There Be a Bright Future for Information? Overview of Events in the Field of Information.) *Informatsionnye Resursy Rossii* 6: 9-11
- Andreeva, I. 1995. Problemy Rossiyskogo Rynka Informatsionnykh Produktov i Uslug. (Problems of the Russian Market of Information Products and Services.) *Informatsionnye Resursy Rossii* 2: 17-20
- Antopolskiy, A. 1992. Elektronnyy Katalog Otechestvennykh Baz Dannykh. (Electronic Catalogue of Domestic Databases. [Thematic review].) *Informatsionnye Resursy Rossii* 2-4
- Antopolskiy, A., Nosikov, S. 1995. Bazy Dannykh Rossii: Otsenki, Problemy, Perspektivy. Iz Natsional'nogo Doklada po Informatizatsii Rossii. (Databases of Russia: Assessments, Problems, Prospects. From the National Report on Informatisation of Russia.) *Informatsionnye Resursy Rossii* 1: 6-9
- Ascont. 1995. *Local Space Service. Pilot Experiment Description*. Moscow. 6 pp.
- Aslund, A. 1995. Slowly, Russia Moves to Normality. *International Herald Tribune* April 25: 8
- Babayan, V.K. *et al.* 1994. Rybnye Resursy. (Resources for Fisheries.) In *Vremennyye Metodicheskiye Ukazaniya po Formirovaniyu Kompleksnykh Territorial'nykh Kadastror Prirodnykh Resursov. Ch. 2. Rekomendatsii po Napolneniyu Resursnykh Razdelov*. (Provisional Guidelines for the Creation of Integrated Territorial Cadastres of Natural Resources. Part 2. Recommendations for Filling in

Resource Sections of the Cadastres.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation, 79-87

Baker & McKenzie. 1993. *Regulating the European Environment*. 2nd Edition. London. 170 pp.

Bakkes, J.A. 1994. *Environmental Information Systems in the Russian Federations*. An OECD Assessment. Draft. 25 pp.

Bachilo, I. 1995. Spetsifika Nauchno-Tekhnicheskoy Informatsii v Sisteme Informatsonnykh Resursov. (A Special Position of Research and Engineering Information within the System of Information Resources). *Informatsonnye Resursy Rossii* 1: 12-14

Balyberdin, A.L. 1994. K Voprosu o Sozdanii Mezhdovedomstvennoy Kommissii po Zashchite Gosudarstvennoy Tayny. (On the Creation of an Inter-Agency Commission for the Protection of State Secrets.) *Voprosy Zashchity Informatsii* 27: 4-11

Belov, S.V. Novoye v Ekologii -- Bezopasnost' Zhiznedeyatel'nosti. (New in Environmental Education: Life Safety.) Paper presented at the conference *Environmental Education in the Institutions of Higher Education in Russia*. Moscow State University. Moscow, March 21-22, 1995. 29 pp.

Boikova, O.F. 1994. Kraevedcheskiye Zhurnaly Rossii. (Local Studies Magazines in Russia.) In *Mezhdunarodnyy Forum Informatizatsii*. (International Forum of Informatisation.) Ecology Section. Abstracts. Moscow, Vostok, 44-45

Buyanov, Yu.D. et al. 1994. Mineral'nye Resursy dlya Izgotovleniya Stroitel'nykh Materialov. (Mineral Resources of Construction Materials.) In *Vremennyye Metodicheskiye Ukazaniya po Formirovaniyu Kompleksnykh Territorial'nykh Kadaстров Prirodnykh Resursov. Ch. 2. Rekomendatsii po Napolneniyu Resursnykh Razdelov*. (Provisional Guidelines for the Creation of Integrated Territorial Cadastres of Natural Resources. Part 2. Recommendations for Filling in Resource Sections of the Cadastres.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation, 31-47

Chugaev, S. 1995. Rossiya Obrechena na Stabilnost' ... (Russia is Doomed to Stability...) *Izvestiya* 62: 1, 4

Danilov-Danilyan, V.I. 1995. Itogi Raboty Minprirody Rossii i ego Territorialnykh Organov za 1994 god i Zadachi na 1995 god. (Performance of the Ministry of Environmental Protection of Russia in 1994, and Tasks for 1995). Report to the Ministry Board on 30.01.95. Moscow. *TV-EcoInform*. 23 pp.

De-Jure. 1994. *Prava na Rezul'taty Intellektual'noy Deyatel'nosti: Avtorskoye Pravo. Patentnoye Pravo. Drugiye Isklyuchitel'nye Prava. Sbornik Normativnykh Aktov*. (Rights to Intellectual Products. Copyright. Patent Right. Other Exclusive Rights. A Collection of Acts.) Moscow. 480 pp.

Dobrynina, N.G. 1991. Ecological Information: A Dialogue between Producers and Users. In *Northern Sciences Network. Meeting Report, 25-27 September 1990*, Rovaniemi, ed. A.-L. Sippola, E.F. Roots. Rovaniemi: Arctic Centre, 271-276

Drobot, M.V., Khitrov, D.M. (comps). 1994. *Neftegaz-Geologorazvedka-Ekologiya. Rossiya i Blizhnee Zarubezhye. Ezhegodnik'94*. (Oil and Gas/Geology/Ecology. Russia and Adjacent States. Yearbook '94.) 2nd Edition. Moscow: Slant. 296 pp.

Dronov, V.P. et al. 1994. *Ekonomicheskaya i Sotsial'naya Geografiya. Spravochnye Materialy*. (Economic and Social Geography. Reference Materials.) Moscow: Prosveshcheniye. 208 pp.

Efimov, A. 1994. Standarty i Sertifikatsiya Vedut k Uspekhu. (Standards and Certification is the Way to Success.) *Telekommunikatsii i Informatika* 6: 26-27

EuroAddress. 1994. *Adres-Moskva 1994/95*. (Commercial Addresses of Moscow.) Moscow: Kommercheskiye Adresnye Knigi. 496 pp.

Federal'nyy EkoFond. 1994. Federal'nyy Ekologicheskiy Fond Rossiyskoy Federatsii: Rezul'taty Rabot v 1993 godu i Perspektivy na Budushchee. (Federal Ecological Fund of the Russian Federation: 1993 Results and Future Prospects.) *Zelenyy Mir* 20: 8-11

Federal'nyy Zakon "Ob Informatsii, Informatizatsii i Zashchite Informatsii". 1995. (Federal Law "On Information, Informatisation, and the Protection of Information".) Moscow: Administration of the President of the Russian Federation. 32 pp.

Federal'nyy Zakon "Ob Okhrane Okruzhayushchey Sredy Rossiyskoy Federatsii". Proyekt. 1994. (Federal Law "On Environmental Protection in the Russian Federation". Draft.) *Zelenyy Mir* 22: 5-13

Financial Times. 1995. Rossiya Vryad li Stanet Takim Gosudarstvom, Kakim ee Khotel by Videt' Zapad. (Russia Will Hardly Become the Country the West Would Like to See.) *Finansovye Izvestiya* 26: 1

Finansovye Izvestiya. 1995. Strukturnye Peremeny Diktuyut Korrektirovku Otsenok Promyshlennogo Spada. (Structural Changes Suggest the Correction of Estimates of Industrial Decline.) *Finansovye Izvestiya* 24: 2

Gavrilov, V., Zubkov, D. 1994. IRIS-Rossiya: Proyekt Integrirovannoy Informatsionnoy Sistemy Kontrolya za Radioaktivnost'yu. (IRIS-Russia: An Integrated Information System of Radiation Monitoring.) *Zelenyy Mir* 21: 13

Gavrilov, V. 1995. About the Work to Create Environmental Monitoring Systems on Federal, Local and Branch Levels. In *Development of the Unified State Environmental Monitoring System in the Russian Federation*. Proceedings of the seminar held by the OECD/UNEP and the Ministry of Environmental Protection and Natural Resources of the Russian Federation/ Moscow, January 26, 1995. (In print)

Gerasimenko, V.G. et al. 1994. Osnovy Kontseptsii Tekhnicheskogo Kontrolya Ob'ektov i Territoriy Strany v Interesakh Natsional'noy Bezopasnosti. (Principles of the Concept of Technical Monitoring of Establishments and Territories of the Country in the Interest of National Security.) *Voprosy Zashchity Informatsii* 27: 73-80

Gerasimov, B. 1994. Obshchestvennoye Obsuzhdeniye Pravovykh Problem Informatsii i Informatizatsii. (Public Discussion on the Legal Problems of Information and Informatisation.) *Informatsionnye Resursy Rossii* 4: 17

GIS Association. 1995. *GIS-Ezhegodnik '94. Programmno-Apparatnoye Obespecheniye, Fond Tsifrovogo Materiala, Uslugi i Normativno-Pravovaya Baza Geoinformatiki v Rossii i SNG. Ezhegodnyy Obzor*. (GIS Yearbook '94. Software/Hardware, Digital Data, Services and Legal Basis of Geoinformation in Russia and the CIS.) CIS GIS Market Support Association. Moscow. 273 pp.

Golubkov, A. 1994. Informatizatsiya Rossii - Tseli, Problemy i Puti ikh Resheniya. (Informatisation of Russia: Goals, Problems, Solutions.) *Telekommunikatsii i Informatika* 6: 6-9

GosComSanEpidNadzor. 1992. *Gosudarstvennaya Statisticheskaya Otchetnost' po Forme No 18 "O Sanitarnom Sostoyanii Rayona, Goroda, Oblasti, Respubliki za 199... god". Instruksiya po Sostavleniyu*. (State Statistical Reporting with Form No. 18 "Sanitary Status of a District, City, Oblast, Republic in the Year 199...". Reporting Directions.) Moscow: State Committee of the Russian Federation for Sanitary-Epidemiological Supervision

GosComStat. 1995. *Sotsial'no-Ekonomicheskoye Polozheniye Rossii. 1993-1994*. (Socio-Economic State of Russia. 1993-94.) Moscow: State Committee of the Russian Federation for Statistics. 387 pp.

Gromov, S.A. 1994. *Seti Monitoringa Okruzhayushchey Sredy v Rossii*. (Environmental Monitoring Networks in Russia.) Project Report. Institute of Global Climate and Ecology. Moscow. 15 pp.

GVC GosComStat. 1993. *Katalog Uslug*. (Catalogue of Services.) State Committee of the Russian Federation for Statistics. Main Computational Centre. Moscow. 73 pp.

GVC GosComStat. 1994. *Tabel' (Perechen') Form Gosudarstvennoy Statisticheskoy Otchetnosti dlya Predpriyatiy i Organizatsiy, Utverzhdennoy Goscomstatom Rossii na 1995 god*. (List of the State Statistical Reporting Forms to be Submitted by Enterprises and Organisations as Approved by the State Committee for Statistics for 1995.) State Committee of the Russian Federation for Statistics. Main Computational Centre. Moscow. 251 pp.

Hefter, V.M. (comp.). 1994. *Ekologiya Rossii - 93. Spravochnik*. (Ecology of Russia - 93. Reference Book.) Moscow: Federal Ecological Fund of the Russian Federation, PostFactum Agency. 128 pp.

- Hefter, V.M. (comp.). 1995. *Ekologiya Rossii. Spravochnik-Ezhegodnik*. (Ecology of Russia. Yearbook.) Moscow: Federal Ecological Fund of the Russian Federation, 'Media' Information Agency. 148 pp.
- InformRegister. 1993. *Bazy Danykh Rossii. Katalog*. (Databases of Russia. Catalogue.) Moscow. 330 pp.
- IMPD. 1992. *Ekologicheskie Organizatsii na Territorii Byvshego SSSR*. (Environmental [Non-Government] Organisations in the Territory of the Former USSR.) Institute of Mass Political Movements. Moscow: RAU-Press. 162 pp.
- Itkin, B., Shevchuk, A., Anokhin, A. 1995. Informatsionnoye Obespechenie Upravleniya Prirodnymi Resursami na Regional'nom Urovne. (Information Support for the Management of Natural Resources on the Regional Level). In *Integrated Environmental Information Systems in Support of Decision-Making on the Oblast Level in Russia*. Proceedings of the seminar held by the OECD/UNEP and the Ministry of Environmental Protection and Natural Resources of the Russian Federation/ Golitsyno, January 24-25, 1995. (In print)
- IUCN. 1993. *Status of Multilateral Treaties in the Field of Environmental Conservation*. International Union for the Conservation of Nature. Environmental Law Centre. Gland.
- Kalenikin, S. 1994. Razverzlos' Nebo nad Sibir'yu. (The Sky Yawned over Siberia.) *Izvestiya* 63: 7
- Karimov, A.E. 1994. *Istoriya Izucheniya i Osvoyeniya Zemel'nykh Resursov Moskovskoy Gubernii*. (The History of Investigation and Exploitation of Land Resources in the Moscow Province.) Cand. Sci. Theses. Moscow: Institute of the History of Technology and Natural Science. 29 pp.
- Karpowicz, Z.J. 1988. Conservation and Environment Protection. In *Science and Technology in the USSR*, ed. M.J. Berry. London: Longmans Publ., 361-379
- Kedrovskaya, L., Yarochkin, V. 1992. Kommercheskaya Tayna v Usloviyakh Rynochnoy Ekonomiki. (Commercial Secrets and Market Economy.) *Informatsionnye Resursy Rossii* 5-6: 11-15
- Kedrovskiy, O. 1994a. Informatsionnoye Prostranstvo Rossii. (The Information Space of Russia.) *Informatsionnye Resursy Rossii* 4: 2-3
- Kedrovskiy, O. 1994b. Informatizatsiya "Po-Rossiyski". (Informatisation: "The Russian Way".) *Informatsionnye Resursy Rossii* 6: 2-3
- Kedrovskiy, O. 1995. Informatizatsiya i Izmeneniya. (Informatisation and Changes.) *Informatsionnye Resursy Rossii* 1: 3-4
- Konstitutsiya Rossiyskoy Federatsii*. 1993. (The Constitution of the Russian Federation.) Adopted by the Public Voting on December 12, 1993. Official Edition. Moscow: Juridicheskaya Literatura. 63 pp.
- Kochetkov, M.V. 1994. Potrebnosti Geoecologicheskogo Kartographirovaniya. (The Needs of Geo-Ecological Mapping.) In *Metody Dstantsionnogo Zondirovaniya v Geoecologicheskoy Kartografirovanii i Monitoringe Geologicheskoy Sredy*. (Remote Sensing Methods in Geo-Ecological Mapping and Monitoring of the Geologic Environment.) Workshop Proceedings/ September 27 - October 1, 1993, Moscow, AeroGeologiya, 3-4
- Korchagin, V., Fontanov, Yu. 1994. Na Puti v Mirovoe Informatsionnoe Soobshchestvo. (On the Way to the Global Information Community.) *Telekommunikatsii i Informatika* 6: 14-17
- Koshklarev, A.V., Tikunov, V.S. 1993. *Geoinformatika*. (Geoinformation.) Moscow: KartGeoCentre-GeodesIzdat. 213 pp.
- Kurnosov, I. 1994. Programma Yest', Resultaty Budut. (The Programme Exists, the Results are Coming.) *Telekommunikatsii i Informatika* 6: 20-22
- Kurilo, A.P., Streltsov, A.A. 1994. Problemnye Voprosy Obespecheniya Informatsionnoy Bezopasnosti v Rossiyskoy Federatsii. (Problems of the Provision of Information Safety in the Russian Federation.) *Voprosy Zashchity Informatsii* 27: 21-25

Latsis, O. 1995. Statistika Utverzhaet... (The Statistics Tells Us...) *Izvestiya* 70: 1

Lemeshev, M.Ya. 1994. Spravka po Voprosu o Realizatsii Rossiyskogo Zakonodatel'stva v Oblasti Okhrany Okruzhayushchey Sredy i Ratsional'nogo Ispol'zovaniya Prirodnykh Resursov. (Information on the Introduction of Russian Legislation on Environmental Protection and Natural Resource Management.) Committee for Ecology of the State Duma of the Russian Federation. *TV-EcoInform*. 6 pp.

Lisitsyn, V., Monastyrskaya, N. 1994. Naznachenije i Osnovnye Printsipy Sozdaniya Edinoy Sistemy Vedeniya Gosudarstvennykh Kadastrov Rossiyskoy Federatsii. (Purpose and Principles of the Unified System of State Cadastres of the Russian Federation.) *Informatsionnye Resursy Rossii* 5: 29-30

Lourie, I.K. 1994. GIS Education in Russian Universities. Modern State and Prospects. In *The 5th International Conference and Exhibition on GIS*. Proceedings, ed. J.J. Harts *et al.*/ Paris, March 29 - April 1, 1994, 557-562

Mazurov, Yu.L. 1994. *Ekologicheskaya Informatsiya v Rossiyskoy Federatsii: Sovremennoye Sostoyaniye i Problemy Sovershenstvovaniya*. (Environmental Information in the Russian Federation: Present State and Problems of Improvement.) Project Report. Moscow State University. Moscow. 34 pp.

MBIT. 1994a. *Rossiyskaya Entsiklopediya Informatsii i Telekommunikatsiy*. (Russian Encyclopaedia of Information and Telecommunications.) V.1. Institutions. Moscow: International Bureau of Information and Telecommunications. 240 pp.

MBIT. 1994b. *Rossiyskaya Entsiklopediya Informatsii i Telekommunikatsiy*. (Russian Encyclopaedia of Information and Telecommunications.) V.2. Individuals. Moscow: International Bureau of Information and Telecommunications. 206 pp.

MBIT. 1994c. *Rossiyskaya Entsiklopediya Informatsii i Telekommunikatsiy*. (Russian Encyclopaedia of Information and Telecommunications.) V.3. Products. Moscow: International Bureau of Information and Telecommunications. 353 pp.

MBIT & TPP RF. 1994. *Spravochnik Telekommunikatsionnykh Setey i ikh Informatsionnykh Resursov*. (Directory of Russian Telecommunications and their Information Resources.) Moscow: International Bureau of Information and Telecommunications and Chamber of Commerce and Industry of the Russian Federation. 128 pp.

McKay, B. 1995. Europe in Transition. *The Wall Street Journal Europe* June 16-17: 4

Melyukhin, I.S. 1993. Normativnaya Baza Informatizatsii Rossii: 1992-1993. (Legal Basis for the Informatisation of Russia: 1992-1993.) *Nauchno-Tekhnicheskaya Informatsiya* 7: 25-30

Melyukhin, I.S. 1994a. O Sostoyanii Informatsionno-Analiticheskoy Deyatel'nosti v Rossii. (On the State of Information Analysis Activities in Russia.) *Informatsionnye Resursy Rossii* 2: 2-4

Melyukhin, I. 1994b. Problemy Razvitiya Informatsionno-Analiticheskikh Sluzhb Organov Iсполnitel'noy Vlasti. (Problems of Development of Information-Analytical Systems of the Executive Bodies.) *Informatsionnye Resursy Rossii* 5: 6-8

Melyukhin, I., Kharybin, E., Feldshtein, A. 1994. Peredacha Dannykh v Televisionnom Signale -- Tekhnologiya Formirovaniya Informatsionnogo Prostranstva Rossii. (Teletext Data Transfer is the Technology to Frame the Information Space of Russia.) *Informatsionnye Resursy Rossii* 6: 4-8

Menoshkin, A.P. 1995. Normativno-Pravovye Osnovy Sozdaniya Edinoy Sistemy Gosudarstvennykh Kadastrov v Rossiyskoy Federatsii. (Legal Basis for the Creation of the System of State Cadastres in the Russian Federation.) In *Munitsipalnye Geoinformatsionnye Sistemy*. (Municipal Geoinformation Systems.) MGIS '95. Conference Proceedings/ Obninsk, 31.01.94 - 04.02.95, 5-6

Miller, S.A. 1994. Assotsiatsiya GIS SNG. Rozhdeniye, Pervye Rezul'taty, Perspektivy. (GIS Association of the CIS. Its Birth, First Achievements, and Prospects.) *Nauka i Bizness* 15: 7

MinPrirody. 1992. Federal'naya Tselevaya Kompleksnaya Nauchno-Technicheskaya Programma "Ekologicheskaya Bezopasnost' Rossii": 1993-1995 goody. (Federal Special-Purpose Integrated Research Programme "Ecological Safety of Russia": 1993-1995.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. *Zelenyy Mir*, Special Issue: 3-14

- MinPrirody. 1994a. *Ekologicheskiye Informatsionnye Sistemy Rossiyskoy Federatsii. Proyekt.* (Environmental Information Systems of the Russian Federation. Draft.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation. 17 pp.
- MinPrirody. 1994b. Gosudarstvennyy Doklad o Sostoyanii Okruzhayushchey Prirodnoy Sredy Rossyskoy Federatsii v 1993 godu. (National Report on the State of the Environment in the Russian Federation in 1993.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. *Zelenyy Mir* 24 (1994) - 5 (1995)
- MinPrirody. 1994c. Osnovnye Printsipy Organizatsii i Funktsionirovaniya Edinoy Gosudarstvennoy Sistemy Ekologicheskogo Monitoringa. (Main Principles of the Organisation and Operation of the Unified State System of Environmental Monitoring.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. State Institute of Applied Ecology. *TV-EcoInform*. 27 pp.
- MinPrirody. 1994d. Plan Meropriyatiy na 1994 god po Pravovomu Obespecheniyu Deyatel'nosti Minprirody Rossii i ego Territorial'nykh Organov. (Action Plan for the Legal Support of Activities of the Ministry of Environmental Protection and its Territorial Bodies in 1994.) *Zelenyy Mir* 15: 10
- MinPrirody. 1994e. *Sostoyaniye Okruzhayushchey Sredy i Prirodookhrannaya Deyatel'nost' na Territorii Byvshego SSSR. - Ot Stokgolma k Rio - . Spravochnoye Posobiye.* (State of the Environment and the Environmental Protection Activities in the Territory of the Former USSR. - From Stockholm to Rio. - A Reference Book.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. Research Institute of Environmental Conservation. Moscow, 1994. V.1, 111 pp. V. 2, 121 pp.
- MinPrirody. 1994f. Trebovaniya k Sostavu i Kachestvu Informatsii o Sostoyanii Okruzhayushchey Sredy dlya Opredeleniya Statusa Territorii kak Zony Chrezvychainoy Ekologicheskoy Situatsii ili Ekologicheskogo Bedstviya. Proyekt. (Information Content and Quality Requirements for Defining Zones of "Environmental Emergency" or "Environmental Disaster". Draft.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. *Zelenyy Mir* 17: 7-9
- MinPrirody. 1995a. *Gosudarstvennyy Doklad o Sostoyanii Okruzhayushchey Prirodnoy Sredy Rossyskoy Federatsii v 1994 godu.* (National Report on the State of the Environment in the Russian Federation in 1994.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. Moscow. 340 pp.
- MinPrirody. 1995b. *Obshchaya Spravka o Sostoyanii Del po Postroyeniyu EGSEM v Rossiyskoy Federatsii na May 1995 g. Gosudarstvennye Zvenia. Territorial'nyy Uroven'. Forma 1.* (General Information Regarding the Creation of the USSEM in the Russian Federation as of May 1995. State components. Territorial Level. Form 1.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. Federal Centre for Geocological Systems. Moscow. 9 pp.
- MinPrirody. 1995c. Spisok Sluzhebnykh Telefonov Ministerstva Okhrany Okruzhayushchey Sredy i Prirodnikh Resursov Rossiyskoy Federatsii. (List of Office Telephone Numbers in the Ministry of Environmental Protection and Natural Resources of the Russian Federation.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. *TV-EcoInform*.
- MinPrirody & TV-Inform. 1994. Podsystema Rasprostraneniya Massovoy Ekologicheskoy Informatsii (TV-EcoInform) v Sostave Avtomatizirovannoy Informatsionno-Upravlencheskoy Sistemy "Ekologicheskaya Bezopasnost' Rossii". Proyekt. (Subsystem for the Dissemination of Mass Environmental Information ("TV-EcoInform") as Part of the Automated Information and Decision Support System "Ecological Safety of Russia". Draft.) Ministry of Environmental Protection and Natural Resources of the Russian Federation and TV-INFORM. *TV-EcoInform*. 23 pp.
- Mnatsakanian, R.A. 1992. *Environmental Legacy of the Former Soviet Republics.* Edinburgh: University of Edinburgh, Centre for Human Ecology. 209 pp.
- Natsional'ny Plan Deystviy po Realizatsii Resheniy Konferentsii OON po Okruzhayushchey Srede i Razvitiyu. 1993. (National Action Plan for the Implementation of Resolutions of UNCED.) *Zelenyy Mir* 19-22
- Nazarov, A.A. 1994. Resursy Promyslovykh Nazemnykh Zhivotnykh. (Resources of Marketable Terrestrial Animals.) In *Vremennye Metodicheskiye Ukazaniya po Formirovaniyu Kompleksnykh Territorial'nykh Kadastrov Prirodnikh Resursov. Ch. 2. Rekomendatsii po Napolneniyu Resursnykh Razdelov.* (Provisional Guidelines for the Creation of Integrated Territorial Cadastres of Natural

Resources. Part 2. Recommendations for Filling in Resource Sections of the Cadastres.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation, 88-93

Nikitina, E. (ed.) 1995. *Russia and Other States of the Former Soviet Union: Participation in Multilateral Environmental Agreements*. Working Paper WP-95-25. International Institute of Applied Systems Analysis. Laxenburg. 58 pp.

Novikov, P.N. (ed.). 1993. *Spravochnik dlya Postupayushchikh v Sredniye Spetsial'nye Uchebnye Zavedeniya (Kolledzhi, Tekhnikumy, Uchilishcha, Shkoly) v 1993 godu*. (Guide to Technical Colleges in the Russian Federation in 1993.) Moscow: Vysshaya Shkola. 223 pp.

Novoselova, O.A. 1995. Unified State System of Ecological Monitoring in Russia. In *Integrated Environmental Information Systems in Support of Decision-Making on the Oblast Level in Russia*. Proceedings of the seminar held by the OECD/UNEP and the Ministry of Environmental Protection and Natural Resources of the Russian Federation/ Golitsyno, January 24-25, 1995. (In print)

Novoye Vremya & Vse dlya Vas. 1993. *Kto Est' Kto v Rossii i v Blizhnem Zarubezhye*. (Who is Who in Russia and Adjacent States.) Moscow. 783 pp.

O Pravovykh Osnovakh Vzaimodeystviya Nepravitel'stvennykh Ekologicheskikh Organizatsiy s Prirodookhranitel'nymi Organami. 1994. (On legal aspects of Relations between Non-Government Organisations and Environmental Agencies.) Declaration of the Seminar of Environmental Lawyers and NGO Representatives to the Russian Minister of Environmental Protection. *Zelenyy Mir* 4: 2

Petrov, V.V. 1995. *Ekologicheskoe Pravo Rossii*. (Environmental Law of Russia.) Moscow: BEK. 557 pp.

Polozheniye ob Otsenke Vozdeystviya na Okruzhayushchuyu Sredy v Rossiyskoy Federatsii. Proyekt. 1994. (Statute of Environmental Impact Assessment in the Russian Federation. Draft.) *Zelenyy Mir* 17: 4-5

Polozheniye o Sotsial'no-Gigienicheskom Monitoringe. 1994. (Statute of Socio-Hygienic Monitoring.) Approved by the Governmental Edict of 06.10.94 No. 1146. *Informatsionnye Resursy Rossii* 6: 19-20

Popov, G.S. et al. 1994. Zemel'nye Resursy. (Land Resources.) In *Vremennyye Metodicheskiye Ukazaniya po Formirovaniyu Kompleksnykh Territorial'nykh Kadaстров Prirodnykh Resursov. Ch. 2. Rekomendatsii po Napolneniyu Resursnykh Razdelov*. (Provisional Guidelines for the Creation of Integrated Territorial Cadastres of Natural Resources. Part 2. Recommendations for Filling in Resource Sections of the Cadastres.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation, 5-14

REFIA. 1994. Analiticheskiy Obzor o Sushchestvuyushchikh Setyakh v Rossii. (Analytical Overview of Existing Telecommunications in Russia.) Russian Environmental Federal Information Agency. *TV-EcoInform*. 11 pp.

REFIA and MinPrirody. 1995. *Sbornik Normativnykh Aktov. Pravovoye Regulirovaniye Prirodopol'zovaniya i Okhrany Okruzhayushchey Sredy*. (Collection of Acts. Legal Framework for Environmental Management and Conservation.) Russian Environmental Federal Information Agency, Ministry of Environmental Protection and Natural Resources of the Russian Federation. Moscow: REFIA. 120 pp.

RosInformCentre. 1994. *Katalog Izdaniy i Informatsionnykh Uslug*. (Catalogue of Publications and Information Services.) Moscow: State Committee of the Russian Federation for Statistics. 36 pp.

Rusin, I.I., Shvetsov, M.M. 1988. *Prirodookhrannaya Deyatel'nost' v Stranakh-Chlenakh SEV*. (Environmental Activities in CMEA Member Countries.) Moscow: AgroPromIzdat. 158 pp.

Sadovnikov, I.F. 1952. *Pochvennaya Kartografiya*. (Soil Cartography.) Moscow: GeographGiz. 125 pp.

Salishchev, A.K. 1976. *Kartovedenie*. (Map Science). Moscow: Moscow State University. 438 pp.

Savin, A.N. 1994. O Zashchite Gosudarstvennoy Tayny pri Provedenii Nauchno-Issledovatel'skikh i Opytno-Konstruktorskikh Rabot. (On the Protection of State Secrets in the Course of Research and Engineering Activities.) *Voprosy Zashchity Informatsii* 27: 25-31

Savvateeva, I. 1995. Finansovaya Stabilizatsiya: Chego Zhdat', Chego Opasatsya. (Financial Stabilisation: What to Wait, What to Fear.) *Izvestiya* 63: 2

SB RF. 1995. *Ekologicheskaya Bezopasnost' Rossii. Vypusk 1. Materialy Mezhhvedomstvennoy Komissii po Ekologicheskoy Bezopasnosti. Oktyabr' 1993 - Iyul' 1994.* (Ecological Safety of Russia. Volume 1. Proceedings of the Inter-Agency Commission on Ecological Safety. October 1993 - July 1994.) Security Council of the Russian Federation. Inter-Agency Commission on Ecological Safety. Moscow: Yuridicheskaya Literatura. 224 pp.

Selivanov, N.A., Skoromnikov, K.S. 1994. *Rassledovanie Prestupnykh Zagryazneniy Prirodnoy Sredy.* (Investigating Cases of Felonious Pollution of the Environment.) Moscow: International Independent University of Ecology and Political Science. 104 pp.

Sedyakin, V. 1994. CD-ROM Produktsiya i Informatsionnye Resursy. (CD-ROM Products and Information Resources.) *Informatsionnye Resursy Rossii* 5: 27-28

Semenov, V.A. et al. 1994. Vodnye Resursy. (Water Resources.) In *Vremennye Metodicheskiye Ukazaniya po Formirovaniyu Kompleksnykh Territorial'nykh Kadaastrov Prirodnykh Resursov. Ch. 2. Rekomendatsii po Napolneniyu Resursnykh Razdelov.* (Provisional Guidelines for the Creation of Integrated Territorial Cadastres of Natural Resources. Part 2. Recommendations for Filling in Resource Sections of the Cadastres.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation, 14-30

SEN. 1993. *A Directory of Environmental Electronic Mail Users in the Former Soviet Union.* Petersham, MA: Sacred Earth Network. 80 pp.

Serov, G.P. 1993. *Osnovy Ekologicheskoy Bezopasnosti.* (Principles of Environmental Safety.) Moscow: International Independent University of Ecology and Political Science. 103 pp.

Shadrikov, V.D. (ed.). 1994. *Spravochnik dlya Postupayushchikh v Vysshiye Uchebnye Zavedeniya Rossiyskoy Federatsii v 1994 godu.* (Guide to Institutions of Higher Education in the Russian Federation in 1994.) Moscow: Vysshaya Shkola. 238 pp.

Shestopal, Ya. 1994. Zakonom ob Informatsii Gosudarstvo Khochet ee Monopolizirovat'. (By the Law on Information the Authorities Want to Monopolise It.) *Finansovye Izvestiya* 52: 8

Shevchuk, A.V., Itkin, B.A., Morozov, V.I. 1994. *Vremennye Metodicheskiye Ukazaniya po Formirovaniyu Kompleksnykh Territorial'nykh Kadaastrov Prirodnykh Resursov. Ch. 1. Osnovnye Polozheniya.* (Provisional Guidelines for the Creation of Integrated Territorial Cadastres of Natural Resources. Part 2. General Guidelines.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation. 66 pp.

Shikunov, V.A. et al. 1994. Lesnye Resursy. (Forest Resources.) In *Vremennye Metodicheskiye Ukazaniya po Formirovaniyu Kompleksnykh Territorial'nykh Kadaastrov Prirodnykh Resursov. Ch. 2. Rekomendatsii po Napolneniyu Resursnykh Razdelov.* (Provisional Guidelines for the Creation of Integrated Territorial Cadastres of Natural Resources. Part 2. Recommendations for Filling in Resource Sections of the Cadastres.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation, 59-78

Simonett, O.G. 1994. *Environment and Natural Resource Information Network. Countries with Economies in Transition in Central and Eastern Europe.* Arendal: UNEP/GRID. 6 pp.

Sokolov, V.E. (ed.). 1992. *Ekoinformatika: Teoriya, Praktika, Metody i Sistemy.* (Ecoinformation: Theory. Practice. Methods and Systems.) St. Petersburg: HydroMetIzdat. 520 pp.

Sostoyaniye Ekologicheskogo Obrazovaniya v Rossiyskoy Federatsii. Doklad UNESCO. 1994. (State of Environmental Education in the Russian Federation. A Report to UNESCO.) *TV-EcoInform.* 8 pp.

Tatur, Yu.G. (ed.). 1991. *Spravochnik dlya Postupayushchikh v Vysshie Uchebnye Zavedeniya SSSR v 1991 godu.* (Guide to Institutions of Higher Education in the USSR in 1991.) Moscow: Vysshaya Shkola. 495 pp.

Tikunov, V.S. 1994. Environmental Information Systems in the Russian Federation. *Journal of EIA* (Korean Society of EIA) 2.3: 3-7 [in Korean, with English summary]

Tolkachev, M.V. 1995. O Deyatel'nosti Minprirody Rossii. (On the activities of the Environmental Ministry of Russia.) In *Materialy Postoyanno Deystvuyushchey Nauchno-Prakticheskoy Konferentsii 'Kruglyy Stol po Okhrane Okruzhayushchey Sredy i Ratsional'nomu Prirodopol'zovaniyu'*. (Proceedings of the Permanent Round Table on Environmental Protection and Management) Vol. 1. Human Ecology: Medico-Biological, Construction, and Housing Considerations, ed. E.M. Zaslavskiy, N.G. Rybalskiy, Ministry of Environmental Protection and Natural Resources of the Russian Federation, Russian Environmental Federal Information Agency, Moscow: 10-19

Varfolomeev, V.P., Petrov, V.V. (eds). 1993. *Okhrana Okruzhayushchey Sredy. Postateynnyy Kommentariy k Zakonu Rossii*. (Protection of the Natural Environment. Comments to Paragraphs of the Law of Russia.) Moscow: Respublika. 224 pp.

Vinokurov, A.Yu. et al. (comps). 1993. *Zemel'noye Pravo. Sbornik Normativnykh Aktov*. (Land Law. A Collection of Acts.) Moscow: International Independent University of Ecology and Political Science. V. 1., 180 pp. V.2., 178 pp.

Vinokurov, A.Yu. et al. (comps). 1995. *Okhrana Okruzhayushchey Sredy. Sbornik Normativnykh Aktov*. (Environmental Protection. A Collection of Acts.) Volume 3. Moscow: International Independent University of Ecology and Political Science. 204 pp.

Vinokurov, Yu.E., Vinokurov, A.Yu. (comps). 1993. *Ekologicheskoye Pravo. Sbornik Normativnykh Aktov*. (Environmental Law. A Collection of Acts.) Moscow: International Independent University of Ecology and Political Science. 360 pp.

Vinokurov, Yu.E., Vinokurov, A.Yu. (comps). 1994. *Ekologicheskoye Pravo. Sbornik Normativnykh Aktov*. (Environmental Law. A Collection of Acts.) Volume 2. Moscow: International Independent University of Ecology and Political Science. 392 pp.

Volokitin, A., Kopylov, V. 1994. Zakon -- Nachalo Vsekh Nachal. (Law is the Origin.) *Telekommunikatsii i Informatika* 6: 10-13

Vsya Moskva & IIA. 1994. *Novaya Rossiya. Informatsionno-Statisticheskii Al'manakh*. (New Russia: An Anthology of Information and Statistics.) JV 'Vsya Moskva', International Information Academy. Moscow. 736 pp.

WCMC. 1991. *USSR. Environmental Profile*. Document No. 0146T. Cambridge: World Conservation Monitoring Centre. 8 pp.

WCMC. 1994. *The Biodiversity Information Clearing House -- Concept and Challenges*. Cambridge: World Conservation Monitoring Centre. 36 pp.

WCMC. 1995a. *Data Flow Model in the Context of Convention on Biological Diversity. Biodiversity Information Management. Document 1*. Cambridge: World Conservation Monitoring Centre. 73 pp.

WCMC. 1995b. *Guidelines for a National Institutional Survey in the Context of Convention on Biological Diversity. Biodiversity Information Management. Document 2*. Cambridge: World Conservation Monitoring Centre. 73 pp.

Yanitskiy, O. 1994. Kto Perekhvatyvaet Initsiativu? (Who is Catching Initiative?) *Zelenyy Mir* 29: 7

Zelenyy Mir. 1994. Proyekt "Green". (The "Green" Project.) *Zelenyy Mir* 16: 13

Zhagel, I. 1994. Tak vo Chto zhe Obkhodyatsya Nam Vlasti? (So How Much do We Pay for the Authorities?) *Izvestiya* 243: 4

MEETINGS USED AS INFORMATION SOURCES

The Inter-Agency Workshop *Use of Geoinformation Systems in Environmental Conservation and Management*. The State Committee of the USSR for Environmental Protection and the USSR Academy of Science. Moscow, January 16-18, 1991

The International Symposium *Problems of Ecoinformatics*. The Russian Academy of Science and the Russian Academy of Natural Sciences. Zvenigorod, December 14-18, 1992

The 2nd National Forum *Ecology of Russia*. Moscow, June 1994

The All-Russian Forum *GIS'94. Geoinformation Technologies: Management, Environment, Business*. The State Oil and Gas Academy and Moscow State University. Moscow, June 6-11, 1994

The 5th International Exhibition *Informatika'94: Digital Equipment and Information Technologies*. ExpoCentre. Moscow, October 3-8, 1994

The 8th School-Seminar of the Inter-University Aero-Space Centre *Remote Sensing and Geoinformation: Educational GISs*. Moscow State University. Moscow, January 24 - February 4, 1994

The Seminar *Integrated Environmental Information Systems in Support of Decision-Making on the Oblast Level in Russia*. The OECD/UNEP and the Ministry of Environmental Protection and Natural Resources of the Russian Federation. Golitsyno, January 24-25, 1995

The Seminar *Development of the Unified State Environmental Monitoring System in the Russian Federation*. The OECD/UNEP and the Ministry of Environmental Protection and Natural Resources of the Russian Federation. Moscow, January 26, 1995

The Conference *Environmental Education in the Institutions of Higher Education in Russia*. The State Committee of the Russian Federation for Higher Education and Moscow State University. Moscow, March 21-22, 1995

The International Seminar *Integrated Environmental Systems in Support of Decision-Making in Countries in Transition*. UNEP/OECD/IEC and the Ministry of Environmental Protection and Natural Resources of the Russian Federation. Moscow, May 29-31, 1995

The All-Russian Congress on Environmental Protection. The Ministry of Environmental Protection and Natural Resources of the Russian Federation, the Council of Ministers of the Russian Federation, and the Inter-Agency Commission on Ecological Safety of the Security Council of the Russian Federation. Moscow, June 3-5, 1995

The National Forum *Ecology and Economy of Russia*. The Ministry of Environmental Protection and Natural Resources of the Russian Federation, AO 'EcoForum', and the Russian Academy of State Service. Moscow, June 1995

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APPENDIX 2. META- INFORMATION AND DIRECTORIES¹

A. META- INFORMATION

A1. GENERAL

DIGITAL

- Catalogue of Domestic Databases.* InformRegister. {10,000/20 MB; 1991-94}
- Catalogue of Information Resources.* MBIT. {300/; quarterly}
- Characteristics of Popular Business, Commercial, Special and Research Databases.* DIZ. {1,000/0.8 MB; 1991-}
- Domestic and Foreign Databases.* VNIC SMV. {700/1.7 MB; 1991- }
- Electronic Catalogue "Databases in Russia".* InformProgress. {1461/; 1993-94}
- Information Resources of Batch Commutation Networks.* RosNet/Chelyabinsk.
- Information Products and Services in Russia.* InformElectro. {/350 KB; 1991- }
- Information Products of Russia.* MosVneshInform. {450/; 1/2 year}
- Meta-database "Electronic Catalogue of Russian Databases".* InformRegister. {3,000/8 MB}
- [Moscow] City Library of Software, Databases and Systems.* MBIT. {700/4 MB; current}
- Nation-Wide Informatisation Programmes.* VNIIPVTI. {7,000/10 MB; }
- Russian [and CIS] Databases.* DIZ. {2,800/3 MB; quarterly}

PRINTED

- Antopolskiy, A. *Elektronnyy Katalog Otechestvennykh Baz Danykh.* (Electronic Catalogue of Domestic Databases. [Thematic review].) *Informatsionnye Resursy Rossii 2-4* (1992)
- Elektronnye Znanya. *Komp'uternye Seti Rossii.* (Computer Telecommunications of Russia.) Moscow. (Scheduled for 1995)
- GVC GosComStat. *Katalog Uslug.* (Catalogue of Services.) Moscow: Main Computational Centre of the State Committee of the Russian Federation for Statistics. 1993. 73 pp.
- GVC GosComStat. *Tabel' (Perechen') Form Gosudarstvennoy Statisticheskoy Otchetnosti dlya Predpriyatiy i Organizatsiy, Utverzhdennoy Goscomstatom Rossii na 1995 god.* (List of the State Statistical Reporting Forms to be Submitted by Enterprises and Organisations as Approved by the State Committee for Statistics for 1995.) Moscow: State Committee of the Russian Federation for Statistics. 1994. 251 pp.
- InformRegister. *Bazy Danykh Rossii. Katalog.* (Databases of Russia. Catalogue.) Moscow. 1993. 330 pp. {>2,500; 1991-93}
- MBIT. *Katalog Informatsionnykh Resursov Rossii.* (Catalogue of Information Resources in Russia.) Moscow: International Bureau of Information and Telecommunications. (Published quarterly)
- MBIT. *Rossiyskaya Entsiklopediya Informatsii i Telekommunikatsiy.* (Russian Encyclopaedia of Information and Telecommunications.) V. 3: Products. Moscow: International Bureau of Information and Telecommunications. 1994. 353 pp. (2nd edition scheduled for 1995) {660; 1993-94}
- MBIT & TPP RF. *Telekommunikatsionnye Seti i ikh Informatsionnye Resursy.* (Telecommunications and their Information Resources.) Moscow: International Bureau of Information and Telecommunications and the Chamber of Commerce and Industry of the Russian Federation. 1994. 128 pp. {585; 1993-94}
- RosInformCentre. *Katalog Izdaniy i Informatsionnykh Uslug.* (Catalogue of Publications and Information Services.) Moscow: RosInformCentre of the State Committee of the Russian Federation for Statistics. 1994. 36 pp. (previous editions exist; English editions available)
- VIMI. *Bazy Danykh SSSR.* (Databases of the USSR.) Moscow: Institute of Inter-Sectoral Information. 1st Edition, 1990. 2nd Edition, 1991

¹ The products are in Russian, unless otherwise specified. Secondary sources, such as (MBIT 1994a, InformRegister 1993) were primarily used to collect the information about digital databases. The database parameters, if known, are shown in parentheses as follows: {number of records/ size; represented time period or frequency of updating}.

A2. ENVIRONMENT AND NATURAL RESOURCES

PRINTED

AIS GVK. 1-ya Ochered'. Seriya "Gidrometeorologicheskoye Obespecheniye Narodnogo Khozyaystva". Obespecheniye Potrebiteley Dannymi o Vodnykh Ob'ektakh, Vodnykh Resursakh, Rezhime, Kachestve i Ispol'zovanii Vod. (Automated Information System of State Water Cadastre. 1st Version. User Provision with Data about Aquatic Bodies, Water Resources, Flow, Quality and Use. Series: "Hydrometeorological Support of the National Economy".) Moscow: HydroMetIzdat. 1988. 9 pp.

Brunov, V.V. *Bibliografiya i Adresnyy Kadastr Rabot po Naseleniyu Ptits SSSR.* (Bibliography and Address Cadastre of Publications Devoted to the Bird Population of the USSR.) Moscow: Nauka. 1988. 117 pp. {1,586;}

Emelianova, L.E., Brunov, V.V. *Kadastrvoye Karty po Naseleniyu Mlekopetayushchikh i Ptits.* (Cadastre Maps on [Data on] the Populations of Mammals and Birds.) Moscow: Moscow State University. 1987. 35 pp.

Geologicheskaya Izuchennost' SSSR. (State of Knowledge on USSR Geology). Ed.-in-Chief D.V. Nalivkin. Academy of Science of the USSR, Ministry of Geology of the USSR, Commission on the State of Knowledge on USSR Geology. [50 volumes, several parts each; published in 1962-84; 1600-1970, period covered varies by area]

GIS Association. *GIS-Ezhegodnik '94. Programmno-Apparatnoye Obespecheniye, Fond Tsifrovogo Materiala, Uslugi i Normativno-Pravovaya Baza Geoinformatiki v Rossii i SNG. Ezhegodnyy Obzor.* (GIS Yearbook '94. Software/Hardware, Digital Data, Services and Legal Basis of Geoinformation in Russia and the CIS.) CIS GIS Market Support Association. Moscow. 1995. 273 pp.

GosComHydroMet. *Obzor o Sostoyanii Rabot na Seti Nablyudeniy za Zagryazneniem Poverkhnostnykh Vod Sushy SSSR v ... godu. Po Gidrokhimicheskim Pokazatelyam.* (Overview of the State of Activities on the Surface Water Pollution Monitoring Network of the USSR. Hydrochemical Parameters. Year ...). State Committee of the USSR for Hydrometeorology and Environmental Monitoring. Hydrochemical Institute. Obninsk: VNIIGMI-MCD. [Was published annually in 1989-92]

GosComHydroMet. *Spravochnik Gosudarstvennogo Fonda Danykh o Sostoyanii Prirodnoy Sredy.* (Directory of the State Data Bank on the State of the Environment.) [Was published periodically by local offices of the State Committee of the USSR for Hydrometeorology and Environmental Monitoring in 1983-92 in 1 to 4 parts]

IEVB AN SSSR. *Baza Ekologo-Ekonomicheskikh Danykh Krupnogo Regiona.* (Environmental-Economic Database of an Extensive Area). Rosenberg, G.S. et al. (comps). Institute of Ecology of the Volga Basin. Academy of Science of the USSR. Tolyatti. 1991. 62 pp.

Resursy Poverkhnostnykh Vod SSSR. Gidrologicheskaya Izuchennost'. (Surface Water Resources of the USSR. State of Hydrological Knowledge.) [Was published in 20 volumes, several parts each, by local hydrometeorological offices in 1964-67; partly updated later]

RGB. *Ekologicheskiye i Prirodokhrannyye Karty i Atlasy Rossii i Sopredel'nykh Gosudarstv; V Predelakh Byvshego SSSR. Annotirovanny Bibliographicheskiy Ukazatel'.* (Environmental State and Protection Maps and Atlases of Russia and Adjacent Countries; Within the boundaries of the Former USSR. Annotated Bibliography.) Russian State Library. Moscow. 1993-1995. 156 pp.

RosHydroMet. *Obzor o Sostoyanii Rabot na Seti Nablyudeniy za Zagryazneniem Poverkhnostnykh Vod Sushy Rossiyskoy Federatsii v ... godu. Po Gidrokhimicheskim Pokazatelyam.* (Overview of the State of Activities on the Surface Water Pollution Monitoring Network of the Russian Federation. Hydrochemical Parameters. Year ...). Federal Agency of Russia for Hydrometeorology and Environmental Monitoring. Hydrochemical Institute. Obninsk: VNIIGMI-MCD. [Published annually since 1993]

RosHydroMet. *Perechen' Dokumentov Gosudarstvennogo Fonda Danykh o Sostoyanii Prirodnoy Sredy.* (List of Documents Contained in the State Data Bank on the State of the Environment.) RD 52.19.143-87. Moscow: Federal Agency of Russia for Hydrometeorology and Environmental Monitoring. Published by the State Committee of the USSR for Hydrometeorology and Environmental Monitoring in 1987; modifications made in 1994

Spravochnik Gosudarstvennogo Gidrometeorologicheskogo Fonda SSSR. (Directory of the State Hydrometeorological Data Bank of the USSR. [Was published annually by the local offices of Hydrometeorological Service and then of the State Committee of the USSR for Hydrometeorology and Environmental Monitoring in 1963-82 in 4 parts]

VGBIL. *Ispol'zovaniye Zemel'. Annotirovanny Ukazatel'.* (Land-Use [Maps]. Annotated Bibliography.) V.I. Lenin All-Union State Library. Moscow. 1975

VGBIL. *Karty Prirody. Katalog.* Vypusk 1-3. (Maps of the Environment. Catalogue. Volumes 1-3.) V.I. Lenin All-Union State Library. Moscow. 1979

Viskov, V.V., Rodkin M.V. (eds). *Mezhdunarodnaya Geosferno-Biosfernaya Programma 'Global'nyye Izmeneniya'. Vyp. 2. Katalog Ekologo-Geograficheskikh i Geofizicheskikh Baz Danykh.* (International Geosphere-Biosphere Programme "Global Change". V. 2. Catalogue of Ecological-Geographical and Geophysical Databases.) Moscow: Presidium of the USSR Academy of Science Inter-Agency Geophysical Committee. 1989. 69 pp. [Expanded digital version was also planned]

VNIIZarubezhGeologiya. *The Catalogue of Geologic Maps of the World, Continents and their Parts, the USSR and its Regions.* Moscow. 1994. 10 pp.

Vremennye Metodicheskiye Ukazaniya po Formirovaniyu Kompleksnykh Territorial'nykh Kadaastrov Prirodnnykh Resursov. Ch. 2. Rekomendatsii po Napolneniyu Resursnykh Razdelov. (Provisional Guidelines for the Creation of Integrated Territorial Cadastres of Natural Resources. Part 2. Recommendations for Filling in Resource Sections of the Cadastres.) Moscow: Ministry of Environmental Protection and Natural Resources of the Russian Federation. 1994. 135 pp.

VSEGEI. *Atlas Geologicheskoi Izuchennosti SSSR.* (Atlas of the State of Knowledge on USSR Geology.) Leningrad: A.P. Karpinskiy Geological Institute. 1991

VSEGEI. *Comprehensive Geological and Predictive Study of Territories.* [Description of Published Geological Maps]. St. Petersburg: A.P. Karpinskiy Geological Institute. 1992

Supplemental Information:

Information about publications containing environmental data can be found at specialised libraries as well as in published subject or territorial catalogues.

Information about published and unpublished maps can be found in the catalogues of major specialised libraries (e.g. the Russian National Library, Moscow State University, the RosGeolFund, the University of Land Management, the Botanical Institute, the Russian Book Chamber) as well as in the published map bibliographies, mapping state-of-the-art overview publications, and in the publication plans of the *Karty i Atlasy* publishing house. Lists of various-subject thematic and environmental maps have also been compiled at the Institute of Geography, Moscow State University, and the Institute of Environmental Conservation.

A digital database of published maps of various scales and subjects has been in preparation at the Russian Book Chamber. Some information is also available from relevant international and national institutions (e.g. UNEP/GRID, IUCN, USGS). Digital catalogues of Russian/USSR space imagery are available from the Agency for Geodesy and Cartography through the State Centre Priroda. Many other major holders of environmental data also may already have, wholly or in part, or may be planning to prepare digital catalogues of their data.

B. INSTITUTIONS, PROJECTS AND EXPERTS

B1. GENERAL

DIGITAL

Abstracts of Research Project Reports. VNTIC. {50,000/60 KB; monthly}

ASPO: Research Institutions in the CIS. VNTIC. {4,500/16 MB; 1992-}

Bank of Ideas and Projects. MBI. {10,000/9 MB;}

Consulting Companies and Services. NIIEconomika. {3,000/5 MB;}

Consulting Companies in the CIS. Venture Agency.

Data-Bank Holders. MosVneshInform. {370/1.5 MB;}

Dissertation Abstracts. VNTIC. {23,000/46 MB; monthly}

Dissertation Registration Cards. VNTIC. {132,600/400 MB; 1985-}

[Dissertation Defence] Councils. VAK RF. {81,000/90 MB; annually}

[Dissertation] Registration. VAK RF {71,000/150 MB; 1987-}

Domestic Publications of Limited Circulation. GPNTB. {108,000/108 MB; current}

Federal Research Programmes and Projects. NTCIT. {5,000/ ; annually}

Information Organisations. Products and Services. VINITI. {300/1 MB;}

Institutions of Higher Education. RosNII IS. {700/;}

Leaders of CIS Research. CAN. {15,000/7.5 MB;}

Members of Dissertation Defence Councils. VAK RF. {100,000/50 MB; current}

Non-Traditional Information Services and Products [in the CIS]. CNTI Ryazan {460/30 KB;}

RDIK: Research in Russia. VNTIC. {24,000/24; 1989-}

Register of Research Organisations. GosComStat. { ; annually}

- Research and Education*. TeleCosmos. {10,000/11 MB; quarterly}
- Research Institutions of the Russian Academy of Science, and Educational Institutions*. MBIT. {130/60 KB;}
- Research Organisations in Russia*. CISN. {4,000/10 MB; annually}
- Research Organisations of Russia and the CIS*. GPNTB. {1,300/3.5 MB; 1/2 year}
- Research Project Registration Cards*. VNTIC. {405,000/700 MB; 1986-}
- Researchers of Superior Qualification*. VNTIC. {10,000/10 MB; annually}
- R&D: Abstracts of Research Project Reports and Dissertations*. VNTIC. {14,000/21 MB}
- Sectoral Information Organisations*. MosVneshInform. {100/50 KB;}
- Sectoral Information Organisations in the CIS*. IPKIR. {3,000/2 MB;}
- Scientific Register of Russia*. CAN. {2,600/3.5 MB; current}

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- Academy of Science of the USSR. *Akademiya Nauk SSSR. Spravochnik. Ch. 1. Chleny Akademii Nauk*. (Academy of Science of the USSR. Reference Book. P. 1. Members of the Academy of Science.) Moscow: Nauka 1989. 176 pp.
- Academy of Science of the USSR. *Akademiya Nauk SSSR. Spravochnik. Ch. 2*. (Academy of Science of the USSR. Reference Book. P. 2. [Institutions].) Moscow: Nauka. 1990. 544 pp.
- Alba. *Informatsionnye Tsentry Moskvy. Spravochnik*. (Information Centres of Moscow. Guide.) Moscow. 1994. 183 pp. {206;}
- Anisimov, P.F. (ed.). *Spravochnik dlya Postupayushchikh v Obrazovatel'nyye Uchrezhdeniya Srednego Professional'nogo Obrazovaniya Rossiyskoy Federatsii (Sredniye Spetsial'nyye Uchebnyye Zavedeniya). 1995*. (Guide to the Technical Colleges in the Russian Federation. 1995.) Moscow: Research and Methodology Centre of Technical Education of the State Committee for Higher Education of the Russian Federation. 1995. 285 pp.
- Glasnost Agency. *Nauchnaya Elita: Kto Est' Kto v Rossiyskoy Akademii Nauk*. (Research Elite: Who is Who in the Russian Academy of Science.) Moscow. 1993. 446 pp.
- Kommercheskiye Struktury. *Informatsionnye i Nauchnye Uslugi*. (Private Companies. Information/Research Services.) *Informatsionnye Resursy Rossii* 5-6 (1992): 40-51
- MBIT. *Rossiyskaya Entsiklopediya Informatsii i Telekommunikatsiy*. (Russian Encyclopaedia of Information and Telecommunications.) V.1. Institutions. Moscow: International Bureau of Information and Telecommunications. 1994. 240 pp. {1,200; 1993-94}
- MBIT. *Rossiyskaya Entsiklopediya Informatsii i Telekommunikatsiy*. (Russian Encyclopaedia of Information and Telecommunications.) V.2. Individuals. Moscow: International Bureau of Information and Telecommunications. 1994. 206 pp. {1,500; 1993-94}
- Otraslevye Organy Nauchno-Tekhnicheskoy Informatsii Rossii. (Sectoral Information Organisations of Russia.) *Informatsionnye Resursy Rossii* 4 (1992): 24-26
- Russian Academy of Science. *Rossiyskaya Akademiya Nauk. Spravochnik. Ch. 1. Chleny Akademii Nauk*. (Russian Academy of Science. Reference Book. P. 1. Members of the Academy of Science.) Moscow: Nauka. 1993
- Russian Academy of Science. *Rossiyskaya Akademiya Nauk. Spravochnik. Ch. 2*. (Russian Academy of Science. Reference Book. P. 2. [Institutions]) Moscow: Nauka. 1994. 568 pp.
- Shadrikov, V.D. (ed.). *Spravochnik dlya Postupayushchikh v Vysshiye Uchebnye Zavedeniya Rossiyskoy Federatsii v 1995 godu*. (Guide to Institutions of Higher Education in the Russian Federation in 1995.) Moscow: Vysshaya Shkola. 1995. 265 pp.
- Tatur, Yu.G. (ed.). *Spravochnik dlya Postupayushchikh v Vysshiye Uchebnye Zavedeniya SSSR v 1991 godu*. (Guide to Institutions of Higher Education in the USSR in 1991.) Moscow: Vysshaya Shkola. 1991. 495 pp.
- VNTIC. *Nauchnye Kadry Vysshey Kvalifikatsii. Spravochnik*. (Researchers of Superior Qualification. Reference Book.) Research Centre of Information on Research and Engineering. {10,000}
- Vysshiye Uchebnye Zavedeniya Rossiyskoy Federatsii*. (Russian Institutions of Higher Education.) Izhevsk: Udmurt University. 1995. {>700;}

Supplemental Information:

Extensive, though not always up-to-date, information on Russian research and academic institutions can be found in *The World of Learning* directory, published annually (London: Europa Publ.).

Information about all kinds of Russian enterprises (with focus on industry and agriculture) is found in numerous directories and databases which are based on official statistical information and/or direct-mail surveys.

B2. ENVIRONMENT AND NATURAL RESOURCES

DIGITAL

EcoDir [Environmental Organisations, Research Projects and Dissertations in Russia and CIS]. EcoLink. (only preliminary version exists) {>2,000/5 MB; 1988-90}

[Environmental Dissertation Defence] Councils. GIPE. {81,000/90 MB; 1990-}

[Environmental Expert] Personal Data. GIPE. {300/80 KB; 1990-}

Environmental Management and Conservation [Publications of Limited Circulation]. GIPE. {1,700/2 MB; 1990-}

[Environmental] Organisations. GIPE. {600/1.2 MB; 1991-}

Environmental Organisations. Logus. {2,000/15 MB; annually}

EnviroWorld [Environmental Organisations and Activities in Russia and CIS]. Vazuza Ltd. (In English; preliminary version exists) {>2,500/5.5 MB; 1988-93}

Experts in the Field of Environment and Natural Resources in the Russian Federation. Logus. {2,000; annually}

GeoAddress [Geological Organisations]. CGE. { ; 1990-}

The GIS Community of the CIS. CIS GIS Market Support Association. {5,000/ ; 1995}

Individuals and Resources Involved in US-Eurasia Environmental Collaboration. Sacred Earth Network. (In English)

[CIS Institutions Active in GIS]. CIS GIS Market Support Association. {350/ ; 1994}

NIRD: Research Projects and Dissertations in Geology. CGE. {200/100KB; 1987-}

PRINTED

Arutyunov, V.V. et al. (comps). *Nauchno-Tekhnicheskaya Produktiya Otrastli "Geologiya i Razvedka Nedr" i Smeznykh Otrastley. Reklamnyy Katalog.* (Research Products in Geology, Mineral Resources Exploration and Related Fields. Advertising Catalogue.) Institute of Mineral Resource Economics

ASCONT. *Space Bulletin.* Association for the Advancement of Space Science and Technology. The Gordon and Breach Publ. { ; quarterly}

Drobot, M.V., Khitrov, D.M. (comps). *Neftegaz-Geologorazvedka-Ekologiya. Rossiya i Blizhnee Zarubezhye. Ezhegodnik.* (Oil and Gas/Geology/Ecology. Russia and Adjacent States. Yearbook.) Moscow: Slant. [Address directory; English edition available] { ; annually, since 1994}

Ekologiya i Ekonomika Rossii. Firmy i Organizatsii na Rossiyskom Ekologicheskom Rynke. (Companies and Organisations on the Russian Environmental Market.) National Forum 'Ecology and Economy of Russia'. Moscow: Iris-Press. 1995. 145 pp.

Galkin, Yu. *Zelenye v Rossii: Kto Oni?* (The Greens in Russia: Who are they?) Moscow: EcoInform. 1992. 141 pp.

Galkin, Yu.Yu. *Ekologicheskoye Dvizheniye.* (The Environmental Movement.) Russian Academy of Management. Moscow. 1995. 272 pp.

Galkina, L. *Zelenye v SSSR. Spravochnik.* (The Greens in the USSR. Reference Book). Moscow. 1991

GIS Association. *GIS-Ezhegodnik '94. Programmno-Apparatnoye Obespecheniye, Fond Tsifrovogo Materiala, Uslugi i Normativno-Pravovaya Baza Geoinformatiki v Rossii i SNG. Ezhegodnyy Obzor.* (GIS Yearbook '94. Software/Hardware, Digital Data, Services and Legal Basis of Geoinformation in Russia and the CIS.) CIS GIS Market Support Association. Moscow. 1995. 273 pp.

Hefter, V.M. (comp.). *Ekologiya Rossii - 93. Spravochnik.* (Ecology of Russia - 93. Reference Book.) Moscow: Federal Ecological Fund of the Russian Federation, PostFactum Agency. 1994. 128 pp.

Hefter, V.M. (comp.). *Ekologiya Rossii. Spravochnik-Ezhegodnik.* (Ecology of Russia. Yearbook.) Moscow: Federal Ecological Fund of the Russian Federation, 'Media' Information Agency. 1995. 148 pp.

IMPD. *Ekologicheskie Organizatsii na Territorii Byvshego SSSR*. (Environmental [Non-Government] Organisations in the Territory of the Former USSR.). Institute of Mass Political Movements. Moscow: RAU-Press. 1992. 162 pp.

Kompass Resources International. *The Directory of Environmental Groups in the Newly Independent States and Baltic Nations*. Washington, D.C. 1994

Kompass Resources International. *Russian Far East. A Directory of Research and Natural Resource Institutions and Organizations (including appendices with additional entries for the Russian North)*. Washington, D.C. 1994

Lika Centre. *Zelenye v SSSR. Krupneishiye Organizatsii i Dvizheniya. Kratkiy Spravochnik*. (The Greens in the USSR. Major Organisations and Movements: A Brief Guide.) Moscow. 1990

RAU-Corporation. *Ekologicheskiye Organizatsii v Rossii*. (Environmental Organisations in Russia.) Moscow, RAU-Press. (Scheduled for 1995). {2536}

Rybalskiy, N.G. *et al.* (comps). *Ekologicheskoye Obrazovaniye i Vospitaniye v Rossii. Spravochnoye Posobiye*. (Environmental Education in Russia. Reference Book.) Russian Environmental Federal Information Agency, Ministry of Environmental Protection and Natural Resources of the Russian Federation. Moscow: REFIA. 1995. 225 pp.

Smirnov, A.K. (ed.). *Obshchestvennoye Ekologicheskoye Dvizheniye Rossii. Spravochnoye Posobiye*. (Environmental Groups in Russia. Reference Book.) Russian Environmental Federal Information Agency, Ministry of Environmental Protection and Natural Resources of the Russian Federation. Moscow: REFIA. 1995. 255 pp.

Spravochnik: "Ekologicheskiye Organizatsii 90 Gorodov". (Ecological Organisations of 90 Cities. Directory.) *CMOT Information Bulletin 75* (1992)

SEN. *A Directory of Environmental Electronic Mail Users in the Former Soviet Union*. Petersham, MA: Sacred Earth Network. 1993. 80 pp.

Tesakov, S.N. *Geologicheskiye Organizatsii Rossii i Drugikh Stran SNG. Spravochnik*. (Geological Organisations of Russia and other CIS Countries. Directory.) Moscow: Institute of Mineral Resource Economics. 1992. { ; 1992}

VGBIL. *Okhrana Okruzhayushchey Sredy. Bibliograficheskiy Ukazatel' Doktorskiykh i Kandidatskiykh Dissertatsiy, Postupivshikh v GBL v 1981-1988 gg.* (Environmental Protection. Bibliography of Dissertations Received by the V.I. Lenin State Library in 1981-88.) Moscow: V.I. Lenin All-Union State Library. 1989. P. 1, 148 pp. P. 2, 139 pp. {2,900; 1981-88}

Warner, G. *The Invisible Threads: Independent Soviets Working for Global Awareness and Social Transformation*. Washington, DC: Seven Locks Press. 1991 (in English)

Supplemental Information:

Information about Russian environmental research and governmental institutions can be found in some of the UNEP/HEM directories, in the Arctic Monitoring and Assessment Programme Project Directory and in the part of the prototype Arctic Environmental Data Directory (held at GRID-Arendal), in the Database of Arctic Research Institutions held at the Rovaniemi Arctic Centre (Finland), and in other similar international databases.

A number of similar directories and databases are currently planned, declared or under preparation, including:

- Directory of Research Projects Related to Environmental Monitoring and Management, Database of Institutions and Specialists Participating in UNEP programmes in the USSR/CIS, Directory of Environmental NGOs (Centre for International Projects)
- Directory of Environmental Research Projects in the Institutions of Higher Education in Russia (St. Petersburg Technical University, under a grant from the federal programme *Ecological Safety of Russia*)
- Database on Environmental Business in Russia. (Ecological Committee of the Chamber of Commerce and Industry of the Russian Federation)
- Database of Environmental Education Specialists (State Committee of the Russian Federation for Higher Education in collaboration with other agencies; the first release scheduled for 1995)
- Updates of Directory of Environmental NGOs and Directory of Environmental Educational Institutions, and the Russian Environmental Directory in 4 volumes (Russian Environmental Federal Information Agency)
- Database of Environmental Research Institutions (Federal Centre for Geo-Ecological Systems)
- Database/Directory of Environmental Academic Programmes in Eastern and Central Europe (was planned to be prepared at the Central European University (Budapest), however, the project has not been completed as yet)
- Directory of Companies and Organisations on the Russian Environmental Market (National Forum 'Ecology and Economy of Russia'; scheduled for 1996)
- Database of Women's Organisations for Sustainable Development (Russian Academy of Management)
- Russian GIS Sourcebook (GIS Obozreniye magazine)

APPENDIX 3. NATIONAL STATE-OF-THE-ENVIRONMENT REPORTING

A. NATIONAL REPORTS ON THE STATE OF THE ENVIRONMENT

GosComPrirody. *Sostoyaniye Prirodnoy Sredy v SSSR v 1988 godu. Mezvedomstvennyy Doklad.* (State of the Environment in the USSR in 1988. Inter-Agency Report.) Ed. V.G. Sokolovskiy. State Committee of the USSR for Environmental Protection. Moscow. 1990. [English version exists]

GosComHydroMet and AN SSSR. *Obzor Sostoyaniya Okruzhayushchey Prirodnoy Sredy v SSSR. Po Materialam Nablyudeniy v 1988-1989 gg.* (Overview of the State of the Environment in the USSR Based on 1988-89 Monitoring Data.) Ed. Yu.A. Izrael, F.Ya. Rovinskiy. State Committee of the USSR for Hydrometeorology and Environmental Monitoring, Academy of Science of the USSR. Laboratory of Environmental and Climatic Monitoring. Moscow. 1990. [Published also in English by the UNEP/EarthWatch]

GosComPrirody. *Sostoyaniye Prirodnoy Sredy i Prirodookhrannaya Deyatel'nost' v SSSR v 1989 godu.* (State of the Environment and Environmental Protection Activities in the USSR in 1989.) State Committee of the USSR for Environmental Protection. Moscow. 1990. [Published also in English by the IUCN/EEP]

Administration of the President and MinEkologii. *National Report of the Russian Federation to the United Nations Conference on Environment and Development.* Administration of the President of the Russian Federation, Ministry of Ecology and Natural Resources of the Russian Federation. Moscow. 1992

Administration of the President and MinEkologii. *Gosudarstvennyy Doklad o Sostoyanii Okruzhayushchey Prirodnoy Sredy v Rossiyskoy Federatsii v 1991 godu.* (National Report on the State of the Environment in the Russian Federation in 1991.) Administration of the President of the Russian Federation, Ministry of Ecology and Natural Resources of the Russian Federation. Moscow. 1992

MinPrirody. *Gosudarstvennyy Doklad o Sostoyanii Okruzhayushchey Prirodnoy Sredy v Rossiyskoy Federatsii v ... godu.* (National Report on the State of the Environment in the Russian Federation in the Year ...) Ministry of Environmental Protection and Natural Resources of the Russian Federation. Moscow. [Published annually since 1993; English versions exist]

MinPrirody. *Okruzhayushchaya Prirodnaya Sreda Rossii. Kratkiy Obzor.* (The Natural Environment of Russia. A Brief Overview.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. Centre for International Projects. Moscow: Ecos. 1995. 119 pp. [Report covers the period 1991-93; English version exists]

B. OTHER RELATED REPORTS AND PUBLICATIONS

GKNT. *Resursy Biosfery na Territorii SSSR. Nauchnye Osnovy Ratsional'nogo Ispol'sovaniya i Okhrany. Natsional'nyy Doklad dlya Mezhdunarodnoy Konferentsii UNESCO po Resursam Bosphery, Sozvyvaemoy v 1968 godu.* (Biosphere Resources in the USSR. Scientific Basis of Management and Conservation. National Report to the International UNESCO Conference on Biosphere Resources Convened in 1968.) State Committee for Science and Technology of the Council of Ministers of the USSR. Moscow. 1968. 478 pp.

GosComHydroMet. *Obzor Fonovogo Sostoyaniya Prirodnoy Sredy v SSSR za ... god.* (Overview of the Background Environmental Quality in the USSR in the Year ...) State Committee of the USSR for Hydrometeorology and Environmental Monitoring. Moscow. [Was published annually in 1981-91]

RosHydroMet. *Obzor Fonovogo Sostoyaniya Prirodnoy Sredy na Territorii Rossiyskoy Federatsii za ... god.* (Overview of the Background Environmental Quality in the Russian Federation in the Year...) Federal Agency of Russia for Hydrometeorology and Environmental Monitoring. Moscow. [Published annually since 1992]

Ekologicheskaya Obstanovka v RSFSR v 1989 godu. (State of the Environment in the RSFSR in 1989.) Institute of Research and Engineering Information. Moscow: VINITI. 1990. 174 pp.

IUCN. *Environmental Status Report: 1990. Vol. 3. USSR.* International Union for Conservation of Nature. East European Programme. Cambridge. 1991. 103 pp. [Contains an overview and the translation of the 1989 USSR National Report]

Administration of the President, MinZdrav, GosSanEpidNadzor. *Gosudarstvennyy Doklad o Sostoyanii Zdorovya Naseleniya v Rossiyskoy Federatsii v 1991 godu.* (National Report on the State of Public Health in the Russian Federation in 1991.) Administration of the President of the Russian Federation, Ministry of Public Health Care of the Russian Federation, Committee of the Russian Federation for Sanitary-Epidemiological Supervision. Moscow. 1992. 75 pp.

RAMN, MinZdrav, GosComSanEpidNadzor. *Gosudarstvennyy Doklad o Sostoyanii Zdorovya Naseleniya v Rossiyskoy Federatsii v godu.* (National Report on the State of Public Health in the Russian Federation in the Year...) Russian Academy of Medical Sciences, Ministry of Public Health Care of the Russian Federation, State Committee of the Russian Federation for Sanitary-Epidemiological Supervision. Moscow. [Published annually since 1993]

Administration of the President. *Gosudarstvennyy Doklad. Fakty i Problemy, Svyazannye s Zakhoroneniym Radioaktivnykh Otkhodov v Moryakh, Omyvayushchikh Territoriyu Rossiyskoy Federatsii.* (National Report. Facts and Problems Related to the Dumping of Radioactive Wastes into Seas Adjacent to the Territory of the Russian Federation.) Administration of the President of the Russian Federation. Moscow. 1993

MinPrirody. *Sostoyaniye Okruzhayushchey Sredy i Prirodookhrannaya Deyatel'nost' na Territorii Byvshego SSSR. - Ot Stokgolma k Rio -. Spravochnoye Posobiye.* (State of the Environment and the Environmental Protection Activities on the Territory of the Former USSR. - From Stockholm to Rio - . A Reference Book.) Ministry of Environmental Protection and Natural Resources of the Russian Federation. Research Institute of Environmental Conservation. Moscow, 1994. V.1, 111 pp. V. 2, 121 pp.

RosComZem and MinPrirody. *Gosudarstvennyy Doklad o Sostoyanii i Ispol'zovanii Zemel' v Rossiyskoy Federatsii v ... godu.* (National Report on the State and Use of Land in the Russian Federation in the Year...) Committee of the Russian Federation for Land Resources and Management and the Ministry of Environmental Protection and Natural Resources of the Russian Federation. Moscow. [Published annually since 1993]

MinPrirody. *Sostoyaniye Biologicheskikh Resursov i Bioraznobraziya Rossii i Blizhnego Zarubezh'ya. 1988-1993 gg.* (Overview of the State of Biological Resources and Biodiversity in Russia and Adjacent States. 1988-1993.) Martynov, A.S. et al. Ministry of Environmental Protection and Natural Resources of the Russian Federation. Russian Research Institute of Environmental Conservation. Moscow. 1994

MinPrirody, GosComSanEpidNadzor, RosComVod, GosStroy, RosHydroMet, RosComNedra. *Gosudarstvennyy Doklad. Voda Pit'evaya.* (National Report. Drinking Water.) Ministry of Environmental Protection and Natural Resources of the Russian Federation, State Committee of the Russian Federation for Sanitary-Epidemiological Supervision, Committee of the Russian Federation for Water Resources, State Committee of the Russian Federation for Civil Construction and Architecture, Federal Agency of Russia for Hydrometeorology and Environmental Monitoring, Committee of the Russian Federation for Geology and Mineral Resources. Moscow. 1994

C. STATISTICAL COMPENDIA

MinSelKhoz. *Lesnoy Fond RSFSR. Statisticheskiy Sbornik.* (Forest Resources of the RSFSR. Statistical Compendium.) Khlantin, S.A. and Sinitsyn, S.G. (comp.) Ministry of Agriculture of the RSFSR. Directorate-General for Forestry. Moscow: GosLesBumIzdat. 1958. 92 pp.

GosLesKhos. *Lesnoy Fond RSFSR. Statisticheskiy Sbornik.* (Forest Resources of the RSFSR. Statistical Compendium.) Khlantin, S.A. and Sinitsyn, S.G. (comp.) Directorate-General for Forestry and Forest Conservation of the RSFSR Council of Ministers. Moscow: GosLesBumIzdat. 1962. 628 pp.

GosComStat. *Okhrana Okruzhayushchey Sredy i Ratsional'noye Ispol'zovaniye Prirodnikh Resursov v SSSR. Statisticheskiy Sbornik.* (Environmental Protection and Natural Resource Management in the USSR. Statistical Compendium.) State Committee of the USSR for Statistics. Information-Publishing Centre. Moscow: Finansy i Statistika. 1989. 174 pp.

GosComLes. *Lesnoy Fond SSSR po Uchetu na 01.01.88. Statisticheskiy Sbornik.* (Forest Resources of the USSR: Status as of January 1, 1988. Statistical Compendium.) M.M. Drozhalov (ed.). State Committee of the USSR for Statistics. Moscow, 1990. V.1, 1,005 pp., V.2, 1,021 pp.

GosComStat. *Lesnoye Khozyaystvo RSFSR v 1990 g. Statisticheskiy Sbornik.* (Forestry in the RSFSR in 1990. Statistical Compendium.) State Committee of the RSFSR for Statistics. Moscow. 1991

GosComStat. *Okhrana Okruzhayushchey Sredy i Ratsional'noye Ispol'zovaniye Prirodnikh Resursov. Statisticheskiy Sbornik.* (Environmental Protection and Natural Resource Management. Statistical Compendium.) State Committee of the USSR for Statistics. Moscow: InformCentre/ GosComStat. 1991. 253 pp.

GosComStat. *Problemy Okhrany Prirody v SSSR v 1986-1990 gg. Analiticheskiy Obzor i Statisticheskiye Materialy.* (Problems of Environmental Protection in the USSR in 1986-90. Analytical Overview and Statistics.) State Committee of the USSR for Statistics. Moscow: InformCentre/ GosComStat. 1991. 64 pp.

GosComStat. *Okhrana Okruzhayushchey Sredy v RSFSR v 1990 godu. Statisticheskiy Sbornik.* (Environmental Protection in the RSFSR in 1990. Statistical Compendium.) State Committee of the RSFSR for Statistics. Republican Publishing Centre. Moscow. 1991. 116 pp.

GosComStat. *Okhrana Okruzhayushchey Sredy v Rossiyskoy Federatsii v ... godu. Statisticheskiy Sbornik.* (Environmental Protection in the Russian Federation in the Year ... Statistical Compendium.) State Committee of the Russian Federation for Statistics. Moscow. [Published annually since 1993]

GosComStat. *Lesnoye Khozyaystvo Rossiyskoy Federatsii v 1992 godu. Statisticheskiy Sbornik.* (Forestry in the Russian Federation in 1992. Statistical Compendium.) State Committee of the Russian Federation for Statistics. Moscow: Republican Information-Publishing Centre. 1993. 33 pp.

D. OTHER REPORTING PRODUCTS

Other environmental statistics at various level of aggregation are regularly published and distributed by the Committee for Statistics. Atmospheric emission data are summarised and published by the Agency for Hydrometeorology. Water use and wastewater allocation information is summarised and in part published by the Committee for Water Resources.

Environmental monitoring data on air, water, soils, radioactive contamination and background environmental quality are regularly published by the Agency for Hydrometeorology. Some data are also published by the Committee for Geology and the Ministry of Agriculture. Yearbooks on the state of the environment in federal-level protected areas are published by the Ministry of Environmental Protection.

The Sanitary Committee publishes overviews of its activities and of the sanitary-epidemiological state of Russia (see e.g. *ECOSInform 5* (1993): 38-55). Public health and demographic data are summarised and published by the Committee for Statistics, the Institute of National Economy Forecasting of the Russian Academy of Science, and some other official as well as independent institutions.

Territorial reports on the state of the environmental and statistical compendia of environmental data are published, irregularly and unevenly, by local authorities, environmental committees and/or statistical offices.

Russia has been supplying environmental information for various international environmental reporting publications, including the EEA Europe's Environment report and the UNEP/WHO/MARC Environmental Data Report series.

APPENDIX 4. SELECTED ACTS ON ENVIRONMENTAL INFORMATION

TITLE OF FEDERAL ACT	DATE	ARTICLES
<i>Water Code of the RSFSR</i>	30.06.72	104-108
<i>Law On the Protection of Atmospheric Air</i>	14.07.82	45
Governmental Edict No. 500 <i>On the Establishment of the Red Data Book of the RSFSR</i>	09.09.82	
Governmental Edict No. 322 <i>On the Red Data Book of the RSFSR</i>	28.06.83	
<i>Law On Public Sanitary-Epidemiological Well-Being</i>	19.04.91	5, 32
<i>Land Code of the RSFSR</i>	25.04.91	109-111
Governmental Edict No. 35 <i>On the List of Types of Information that can not be Classified as Commercial Secrets</i>	05.12.91	
<i>Law On the Protection of the Natural Environment</i>	19.12.91	6-9, 12-13, 16, 92
<i>Law On Mineral Wealth</i>	21.02.92	27-32
<i>Law On the Principles of Urban Construction in the Russian Federation</i>	14.07.92	6, 8
<i>Statute of Land Monitoring in the Russian Federation. Approved by Governmental Edict No. 491</i>	15.07.92	
<i>The Order of the Inventory of Sites and Installations Related to the Extraction, Transportation, Processing, Use, Collection or Allocation of Radioactive Materials and Radioactive Emission Sources in the Territory of the Russian Federation. Approved by Governmental Edict No. 505</i>	22.07.92	
Governmental Edict No. 532 <i>On Increasing the Efficiency of the Use of Data on Hydrometeorology and Environmental Pollution in the National Economy</i>	03.08.92	
Governmental Edict No. 540 <i>On Measures to Control the Export of Geological Information</i>	03.08.92	
Governmental Edict No. 602 <i>On Measures for the Implementation of the Programme of In-Depth Economic Reforms</i>	19.08.92	83
Governmental Edict No. 600 <i>On the Unified State Automated System of Radiation Monitoring in the Territory of the Russian Federation</i>	20.08.92	
<i>Statute of the State Land Cadastre. Approved by Governmental Edict No. 622</i>	25.08.92	
<i>Law On the Legal Protection of Computer Programs and Databases</i>	23.09.92	
<i>The Order of the Preparation and Distribution of the Annual National Report on the State of the Environment. Approved by Governmental Edict No. 53</i>	24.01.93	
<i>State Programme of Land Monitoring in the Russian Federation in 1993-95. Approved by Governmental Edict No. 100</i>	05.02.93	
<i>The Order of the Preparation and Distribution of the Annual National Report on Public Health in the Russian Federation. Approved by Governmental Edict No. 195</i>	03.03.93	
<i>Principles of Forest Legislation of the Russian Federation</i>	06.03.93	74-78
<i>Law On the Provision of the Uniformity of Measurements</i>	27.04.93	
<i>Principles of Legislation of the Russian Federation on Archive Fund and Archives</i>	07.07.93	
<i>Law On Copyright and Related Rights</i>	09.07.93	
<i>Law On State Secrets</i>	21.07.93	2, 7
<i>Statute of State Licensing of Topographic-Geodesic and Cartographic Activities in the Russian Federation. Approved by Governmental Edict No. 1025</i>	11.10.93	
<i>On the Establishment of the Unified State System of Environmental Monitoring. Approved by Governmental Edict No. 1229</i>	24.11.93	
<i>Constitution of the Russian Federation</i>	12.12.93	29(4), 41(3), 42
Governmental Edict No. 379 <i>On the State Water Cadastre of the Russian Federation</i>	23.04.94	
Governmental Edict No. 418 <i>On the Federal Programme for 1994-95 and until 2000 'Modern Technologies of Cartographic-Geodesic Support in the Russian Federation'.</i>	03.05.94	
Governmental Edict No. 437 <i>On the Federal Programme on Development of Hydrometeorological Support of the National Economy in 1994-95 and until 2000.</i>	03.05.94	
<i>Statute of Socio-Hygienic Monitoring. Approved by Governmental Edict No. 1146</i>	06.10.94	
<i>Law On the Obligatory Deposition of Documents' Copies</i>	29.12.94	
<i>Law On Information, Informatisation and the Protection of Information</i>	20.02.95	
<i>Law On Wildlife</i>	24.04.95	15-16

APPENDIX 5. OVERVIEW OF THE *ENRIN* PROGRAMME

ENVIRONMENTAL INFORMATION NETWORKS IN COUNTRIES WITH ECONOMIES IN TRANSITION IN CENTRAL AND EASTERN EUROPE

(Otto G. Simonett, UNEP/GRID-Arendal)

The Need For Information Networks

At the United Nations Conference on Environment and Development in Rio in 1992, the need to improve environmental information for decision-making has been explicitly articulated (Agenda 21, Chapter 40). Various international and national organisations are now involved in the establishment of environmental information networks world-wide. These networks are expected to improve assessment of the positive and negative effects of development activities nationally and internationally.

The meaning of the term 'environmental information network' can, however, be very broad: The term 'environmental information' alone is used for all forms of data and information products, such as pollution databases, geographical information, technical guidelines and laws, news services, films, etc. Also the term 'network' can have different meanings, it can refer to a physical computer network (such as the Internet), it could, however, also refer to an institutional structure. Because of this wide use of the same wording, one usually has to make further inquiries as to the concrete nature of the network one is dealing with.

The Role of UNEP

The mission of the UNEP (United Nations Environment Programme) Division of Environment Assessment is 'to provide the world community with improved access to meaningful environmental data and information, and to help increase the capacity of governments to use environmental information for decision-making and action planning for sustainable human development'.

UNEP/DEA is developing an environment and natural resources information network in countries with economies in transition in Central and Eastern Europe. This programme focuses on the strengthening of institutions and management capacities in existing national and regional structures. The term 'network' thus has a distinct institutional significance. The programme focuses on spatially referenced information, aggregated on the national or regional level, which thus can be processed with Geographic Information Systems. One aim of the programme is to establish and strengthen UNEP/GRID-compatible centres organised in an international network. The programme is expected to improve decision-making on environment and development issues on both national and regional levels. These improvements will stem from:

- better accessibility and availability of information about the environment;
- increased ability to integrate data and information from different sources for environmental assessments;
- and improved dissemination of assessments and other information products to users such as planners, politicians and the public.

Focus on Countries Undergoing Economic Transition

The programme implemented by UNEP/GRID-Arendal is now providing preparatory assistance to countries with economies in transition in Central and Eastern Europe to formulate project proposals in support of national and international environment assessments. The programme aims to:

- establish co-operative agreements with national institutions undertaking environmental assessments;
- support regional programmes dealing with environment issues of transboundary and global concern;
- in partnership with participating countries and institutions, develop strategies to strengthen national information networks compatible with those of institutions such as UNEP and the European Union, whose main goal is to provide the information needed for environmental management;
- help participating governments access international environmental databases held by UNEP and other UN agencies and regional organisations;
- encourage participating institutions to distribute environment data as widely as possible, and enable them to contribute environmental information and products to the international community.

State of the Environment 2002

One of the most important long-term products to which the project will contribute is the next world-wide State of the Environment Report, scheduled for the year 2002. This milestone document is expected to be generated with the help of governments and institutions throughout the world.

ENVIRONMENT AND NATURAL RESOURCE INFORMATION NETWORKS IN COUNTRIES WITH ECONOMIES IN TRANSITION IN CENTRAL AND EASTERN EUROPE

Information for sustainable development planning and management is of major concern for the global community. As a follow up to the 1992 United Nations Conference on Environment and Development held in Rio de Janeiro, UNEP is helping to develop environment and natural resource information networks (ENRIN) worldwide. These networks consist of key institutions active in environmental information management at national and regional levels whose main aim is to generate environmental information needed by various users ranging from decision-makers to the general public.

The following publications can be requested from UNEP/GRID-Arendal at:

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