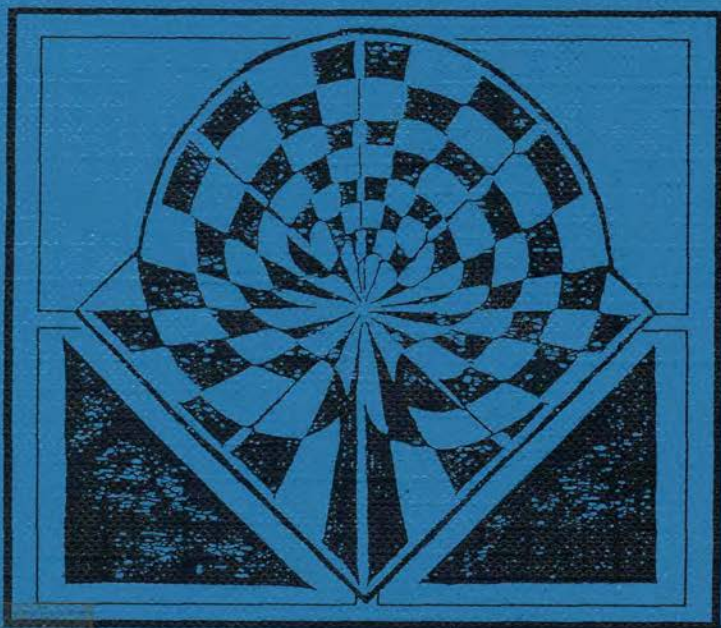


A SURVEY OF  
ENVIRONMENTAL MONITORING &  
INFORMATION MANAGEMENT  
PROGRAMMES  
OF INTERNATIONAL ORGANIZATIONS



UNITED NATIONS ENVIRONMENT PROGRAMME  
Global Environmental Monitoring System  
Harmonization of Environmental Measurement  
UNEP-HEM



**A SURVEY OF  
ENVIRONMENTAL MONITORING &  
INFORMATION MANAGEMENT  
PROGRAMMES  
OF INTERNATIONAL ORGANIZATIONS**

Second Edition

Researched, Compiled and Written by Jan-Stefan Fritze  
within the scope of the HEM project



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1.8

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Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which our life and well-being depend. Conversely, through fuller knowledge and wiser action, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes.

United Nations Conference on the Human Environment, Stockholm 1972.

## FOREWORD

It is our conviction that many international environment monitoring and information management programmes dealing with threatening environmental problems could be more effective if related local, regional, and global activities would function in a more interdisciplinary fashion and data of established quality were used.

Due to the increasing concern about global environmental changes caused by anthropogenic activities including climatic change, transboundary air pollution, pollution of oceans and coastal areas as well as the destruction of forest ecosystems the demand for environmental data have increased drastically. This has led to the implementation of many new programmes to research and forecast changes in the global environment. Their work in developing methodologies and procedures for researching the environment is incalculable, especially when practically applied. This, in addition to the use of new technologies like remote sensing, automated measuring equipment, and computers are providing an enormous bulk of data, which although potentially useful, are often overseen.

Currently we are facing a situation where the increasing flood of environmental data are not representative of our still very limited knowledge of ecosystems. This discrepancy results because most of the data available are neither uniform, comparable nor compatible. Furthermore, their quality is not assured, the formats for exchanging them are not standardized, as well as countless other problems. Consequently, a need exists to harmonize environmental measurement, thus promoting the improved collection and management of data, and thereby enhancing the quality and compatibility of information on the state of the environment world-wide.

The three key areas which must be addressed in this regard are:

- harmonization of ongoing and planned environmental monitoring programmes and projects;
- harmonization of taxonomies; and
- harmonization of environmental data.

These areas require knowledge of issues including: what is being done and by whom in environmental monitoring and research; methods and procedures; kinds of data being collected; quality control; data systems; datasets and their applications in the development of models; as well as the different types of classification systems and their harmonization.

To manage such information, a system is needed which can provide the relevant facts and figures. Currently, the UNEP Harmonization of Environmental Measurement (HEM) project, which is part of the Global Environmental Monitoring System (GEMS), is in the process of developing the first comprehensive meta-database containing information on all significant, global environment related activities. This Survey, is the first step in compiling information as to what programmes exist. As such, it aims to be a preliminary source of information and to be used as a basic reference manual.

This Survey was compiled and updated by Jan-Stefan Fritz, from the University of Waterloo, Canada, with funds generously provided to the HEM project by the Federal Government of Germany. I would also very much like to acknowledge the excellent work done by Jan-Stefan Fritz, without whom this Survey could not have been completed.

*Dr. Hartmut Keune*  
*Director, UNEP-HEM office Munich*  
*April, 1991*

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## INTRODUCTION

### I

In 1986, the Secretariat of the Environment Experts of the Economic Summit published a Survey of Environment Related Monitoring Programmes of International Organisations. Using the 1986 Survey as a basis, an updated and revised Survey was prepared.

This Survey of Environmental Monitoring and Information Management Programmes of International Organizations is an up-to-date compendium of environmental monitoring, information management and harmonization programmes of international organizations. It has been prepared as an initial step in addressing the issue of harmonizing environmental information at the international level. This Survey is intended to be a brief, but thorough, overview of what is currently being done in terms of environment related activities. In light of the vast amount of work being done, world-wide, in the field of environmental data collection and management, this manual can only be seen as an overview and not as a complete list of all programmes which currently exist. Moreover, it must be seen, not as a project complete in itself, but as part of the creation of an inventory and meta-database containing information on work being done in the field of environmental information collection and management.

In order to obtain information for this Survey and the HEM Inventory and Meta-Database, letters and questionnaires were sent out. Information graciously supplied by the many organizations and institutions that responded to these letters has allowed the compilation and writing of this Survey. In particular, very valuable information was also provided by the many institutions that updated and contributed to the Draft Version of the Survey that was sent to them. Their contribution is hereby acknowledged. Unfortunately, information was not received from other institutions, explaining why references to certain organizations or programmes are sporadic. At the same time, many supplied information, but could not be included in this Survey. This information will, however, be essential to the HEM Inventory and Meta-Database. As this is a continuing project, entries are being updated and revised on an ongoing basis. Any additional information would, therefore, be most welcome.

### II

This Survey has been divided into three core sections: Monitoring -; Data and Information -; and Harmonization - Programmes. Each section contains a list of programmes and activities, which are expanded upon individually. Entries in each section have been formatted according to specific criteria, ensuring a degree of similarity and continuity in the type of information given about the various programmes. Each entry is to provide the reader with information about the type of programme or institution; basic background information; what field(s) it is engaged in and more specific related information; any affiliated activities; and with which other organizations or institutions co-operative efforts exist. Each type of information is dealt with individually as this allows for quick referencing and easier information retrieval. More specific information, not in the Survey, can be

obtained from the UNEP-HEM office or the address provided with each entry.

The Monitoring & Research Programmes section is, according to the number of entries, the largest in size. Included are programmes which either engage in direct environmental monitoring or monitor and promote the flow of environment related information. Of the countless programmes locally, regionally or globally active in monitoring the environment, many have begun to harmonize the information they collect. Though a relatively recent development, the harmonization of environmental monitoring is playing an increasingly important role. It will play a crucial role, in whether or not we are to comprehend and overcome the complexities of global environmental change. In recognizing this fact, emphasis is placed on addressing the inter-organizational flow of information and project planning.

The harmonization of environmental information plays an even greater role in the development of Data and Information Systems. It becomes particularly important when data are to be used for integrated purposes. In other words, at that moment where data from either different monitoring sources or from different spheres of the environment are utilized, the quality and intercompatibility of the data will define the value and validity of the work the data is being used for. This Survey primarily focuses on those Databases and Information Systems which are somehow linked to monitoring programmes. It should not be forgotten that the databases included in this Survey represent only a fraction of what actually exists.

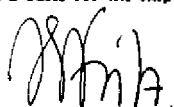
The third section of the Survey deals with organizations involved in developing standards and harmonizing information. Unlike the other sections this one emphasises activities of various kinds, not programmes. Specifically, it lists and discusses organizations which have developed standards or defined reference materials for regulating environmental pollution and ensuring information and data quality. Several national organizations have been included, as these are extensively involved in international work; for example in developing international standards.

### III

For the purpose of this Survey, emphasis is placed on listing the existing programmes and briefly describing their activities. Although as much information as possible was included, for such a time restrained project, several important types of information were left out by necessity.

More detailed qualitative and quantitative information was not formally included in this Survey. In terms of qualitative information, such issues as data quality and type, were not addressed. At the same time, quantitative information about a programme's size and budget was not included either. Likewise, issues such as the harmonization of data classification schemes and environmental specimen banking have not been addressed either. In leaving out more detailed information, some institutions have not been given representation equal to their value. As a result, these will be emphasized and will form key pillars of the HEM Inventory and Meta-Database.

The value of this brief Survey lies in the overview which it provides of work currently being done within the international community. As such, it should prove useful as a user-friendly reference manual for persons working in the field of environmental research or administration, for gaining information on present environmental activities within the framework of international organizations, as well as a basis for the improved Harmonization of Environmental Measurement.

A handwritten signature in black ink, appearing to read 'J. Fritz', with a stylized flourish at the end.

*Jan-Stefan Fritz  
Waterloo, Canada  
April 1991*

**1. MONITORING & RESEARCH PROGRAMMES**

ACRONYM  
PROGRAMME NAME (SPONSORS)  
ADDRESS

REF. NO.

- 1.1. TYPE OF PROGRAMME
- 1.2. GEOGRAPHIC AREA OF IMPLEMENTATION
- 1.3. PROGRAMME OBJECTIVES
- 1.4. DATA MANAGEMENT
- 1.5. CO-OPERATION

**ACSAD  
ARAB CENTRE FOR THE STUDIES OF ARID ZONES AND  
DRY LANDS (Arab League)**

P.O. BOX 2440  
DAMASCUS  
SYRIA  
TELEPHONE: +963 11 755 713

101

**1.1. Intergovernmental Scientific Centre**

**1.2. Regional: Arab League nations**

1.3. Established in 1971, by the Arab League, ACSAD focuses its activities on studies related to arid zones, such as water resources, soils, plants and animal production. Within this frame, ACSAD has initiated a number of programmes, including:

1. Programmes for Water Resource Studies;
2. Programmes for Soil Studies;
3. Plant Studies Programme;
4. Programme for Livestock Studies;
5. Programme for Agro-Climatic Studies; and
6. Statistics Programmes.

Currently, these programmes are initiating and researching such things as an **Arab Soil Map**, an **Encyclopedia of Arab Livestock** as well as projects aimed at preventing further desertification in the Region.

ACSAD's past achievements include:

1. The development of a computerized methods for determining the hydrodynamic characteristics of groundwater. In particular, two models water resources mathematical models have been developed.
2. The establishment of its own technical approaches and feasibility studies of using isotopic (both stable and radioactive) methodology and remote sensing techniques in arid regions.

1.4. See ACSAD Database entry.

1.5. ACSAD co-operates extensively with international organizations including, among others, the FAO, UNEP, UNESCO, and WMO. Much co-operation also occurs at a bilateral level between the Centre and Arab Governments.

AMCEN  
AFRICAN MINISTERIAL CONFERENCE  
ON THE ENVIRONMENT

102

SECRETARIAT  
C/O REGIONAL OFFICE FOR AFRICA  
UNEP  
P.O. BOX 30552  
NAIROBI, KENYA  
TELEFAX: +254 2 22 68 10

1.1. International Governmental Programme

1.2. Regional: Africa

1.3. The first African Ministerial Conference on the Environment was held in Cairo, Egypt from 16-18 December, 1985. It was sponsored by UNEP, the Organization of African Unity (OAU), and the Economic Commission for Africa (ECA). At this first Session, AMCEN introduced the Cairo Programme for African Co-operation. This Programme is important as it provides the basis for the planned course of action. In particular, the Cairo Programme was to address primarily the halting of environmental degradation, enhancing food productivity, achieving energy self-sufficiency, and rectifying the imbalance between population and resources.

In order to address these issues, AMCEN initiated a number of committees and networks. At the first AMCEN session in 1985, four committees were founded to deal with the four major African ecosystem types:

1. Deserts and Arid Lands;
2. Rivers and Lake Basins;
3. Forests and Woodlands; and
4. Seas.

The third Session of AMCEN, held in Nairobi from 10-12 May, 1989, endorsed the creation of a fifth Committee on African Island Ecosystems.

At the same time, eight specialized regional Networks were proposed to develop and strengthen technical and scientific co-operation between the African countries. For every network the Regional Co-ordination Unit (RCU) has been selected as follows:

1. Environmental Monitoring @ GEMS, Nairobi;
2. Climatology @ WMO Regional Office for Africa, Bujumbura, Burundi;
3. Soils and Fertilizer @ Soil Research Institute, Council for Scientific and Industrial Research, Kumasi, Ghana;

4. Water Resources @ Water Research Centre, Cairo, Egypt;
5. Energy @ Renewable Energy Research Centre, Dakar, Senegal;
6. Environmental Education and Training @ Institute of Ecology, Obafemi Awolowo University, Ile-Ife, Nigeria;
7. Genetic Resources @ Plant Genetic Centre, Addis Ababa, Ethiopia; and
8. Science and Technology @ Regional Office for Science and Technology in Africa, UNESCO, Nairobi, Kenya.

In order to create practical examples of sustainable development AMCEN includes a Pilot Project Programme which covers 150 villages and 30 pastoral areas in Africa. The aim of this programme is to achieve self-sufficiency in food and energy by the traditional skills and experience of the villagers and pastoral people themselves in economically feasible, environmentally sound and socially acceptable development.

- 1.4. GEMS has been given the responsibility for establishing a resource monitoring and assessment programme for Africa by AMCEN. GRID is to establish a node in Africa to manage the resulting data.
- 1.5. As an inter-governmental programme, AMCEN closely works not only with international organizations, but also with a great number of national offices and projects. AMCEN is attempting to take an integrative approach to the study of the African Region and as such its work is closely harmonized to that which is generally being done within Africa.

**CONPACSE  
CO-ORDINATED PROGRAMME ON MARINE POLLUTION  
MONITORING AND CONTROL IN THE SOUTH-EAST PACIFIC  
(CPPS/IOC/OPS/UNEP)**

103

COMISION PERMANENTE DEL PACIFICO SUR (CPPS)  
CASILIA 16658  
AGENCIA 6400-9  
SANTIAGO, CHILE  
TELEFAX: +56 2 695-1100

- 1.1. International Scientific Programme
- 1.2. Regional: South East Pacific Region including Chile, Colombia, Ecuador, Panama, Peru
- 1.3. CONPACSE was established by merging two regional programmes, namely the Programme on the Characterization, Surveillance and Monitoring of Marine Pollution from Domestic, Agricultural, Industrial and Mining sources in Ecologically Sensitive Areas of the South East Pacific; and the Programme on Research and Surveillance of Marine Pollution of the South East Pacific due to Oil Hydrocarbons.  
CONPACSE began monitoring and research activities in 1984. In 1989, the network comprised 44 institutions including state-run laboratories, universities, specialized centres, maritime authorities, as well as others. Emphasis has been placed on the development and adoption of common analytical techniques and the running of intercomparison and intercalibration exercises and training courses. In total more than 500 experts from CPPS Member Nations have been involved in CONPACSE activities.  
From 1984-1989, CONPACSE was considered in Phase I. During this period, projects and activities were developed and implemented. Following a 1987 experts meeting, problems associated with Phase I were discussed and a more comprehensive Phase II was proposed. Particular emphasis in Phase II is being placed on ensuring high quality results from monitoring and research activities.
- 1.4. In the implementation of Phase II, several aspects of improving information accuracy and quality have been identified including:
  1. the need for skilled and experienced staff, using proven, analytical methods, working in adequate laboratory facilities;



2. the need for active participation in intra- and intercalibration exercises and the acquisition of certified reference samples to control accuracy and reproducibility;
3. the need for control of statistical quality through the use of control sheets and the use of appropriate computer statistical programmes;
4. the need to acquire high quality analytical standards for equipment calibration; and
5. the adoption of agreed reporting format and procedures and use of reference materials.

In the adoption of analytical methodologies for marine pollution studies, CONPACSE will use those developed by UNEP with the support of IAEA and IOC.

- 1.5. CONPACSE was implemented within the guidelines of UNEP OCA/PAC's Action Plan for the Protection of the Marine Environment and Coastal Areas of the South East Pacific (see Regional Seas Programme entry). Support has also been given by IAEA, IOC and the Oficina Panamericana de la Salud (OPS)

**EARTH OBSERVATION PROGRAMMES  
(ESA)**

104

ESA/ESTEC  
KEPLERLAAN 1  
NL-2200 AG MOORDWIJK  
TELEFAX: +31 1719-17400

1.1. International Scientific Programme

1.2. Regional: Europe

1.3. ESA is involved in environmental monitoring through its Earth Observation Programmes. These programmes include:

- the ERS-1 and ERS-2 (remote sensing satellites) programmes;
- the Earth Observation Preparatory Programme;
- the EARTHNET programme;
- the METEOSAT procurement, launch and operations for EUMETSAT;
- The Preparatory Programme for the first Polar Orbit Earth Observation Mission (POEM-1 PP); and
- The future Polar Orbit Earth Observation Missions (POEM's).

1.4. Data for the Earth Observation Programmes are being stored at the EARTHNET facilities at ESA/ESRIN in Frascati, Italy. EARTHNET datasets consist of raw and pre-processed data as well as data from other related ESA activities. Environmental data is currently being collected about sea level change (by ERS-1), changes in the earth's magnetic field, as well as measurement of tectonic movement and the earth's rotation. Discussions are under way to develop environmental datasets in co-operation with the European Community's Joint Research Centre (JRC) at Ispra, Italy.

1.5. ESA co-operates not only with the EC-JRC but also as part of the International Space Year (ISY). ESA's contributions to ISY will be from the ERS-1 (launched on 17 July 1991), EARTHNET and METEOSAT (in collaboration with EUMETSAT) programmes. The projects will contribute to the ISY "Land Cover Change", "Ocean Variability and Climate", "Productivity of the Global Ocean" and the "Rate of Deforestation" projects. (see ISY entry).

**EEA**  
**EUROPEAN ENVIRONMENT AGENCY (CEC)**

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DG XI ENVIRONMENT, NUCLEAR SAFETY AND CIVIL PROTECTION,  
AGENCY TASK FORCE  
RUE DE LA LOI 200  
B-1049 BRUXELLES  
TELEFAX: +32 (02) 235 01 44

1.1. International Governmental Agency

1.2. Regional: European Community

1.3. The establishment of the EEA was agreed upon at a March 1990 meeting of the European Ministers' Environment Council in Bruxelles. EEA was conceived as a smaller co-ordinating unit of large decentralized network. Along with EEA's creation, the EC also established a **European Environment Information and Observation Network (EEION)** at the same time. Together, the Agency and the Network are to provide the European Community and its member states with objective and reliable information and assessments about the state of the environment in Europe (see 1.4.).

EEION is to be co-ordinated by the EEA and participants will come from three different backgrounds:

1. a national focal point is to be set up in each Member State;
2. various national information networks; and
3. institutions will be given responsibilities for specific task and projects. These will be termed Centres of Excellence.

In the first years of its operation emphasis will be placed on providing information which can be directly used in environmental policy implementation. Such areas include:

- air quality and atmospheric emissions;
- water quality, pollutants and water resources;
- the state of soil, flora and fauna and of biotopes;
- land use and natural resources;
- waste management;
- noise emissions;
- environmentally hazardous chemical substances; and
- coastal protection.

As of April 1991 no decision has been made as to the

location of the EEA. Its implementation phase is to begin immediately after such a decision has been made.

- 1.4. Upon its implementation, EEION will co-ordinate and provide Member States with objective, reliable and comparable information at the European level to enable them to take the necessary measures to protect the environment as well as assess the results of measurements they have taken.  
For more information on current activities see CORINE entry.

- 1.5. EEA will be open to other non-EC Members. Already, interest has been shown by EFTA, Eastern and Central European nations as well as by the OECD and ESA. ESA will be of particular importance as information provided by the ERS-1 satellite is crucial to assessing the state of the environment.  
Within the EC, JRC and EUROSTAT have also expressed an interest in co-operating closely with EEA. JRC, for example, will play an essential role in researching, developing and harmonizing new environmental measuring methods and the standardization of data.

**EMAP  
ENVIRONMENTAL MONITORING AND ASSESSMENT  
PROGRAMME (EPA)**

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DIRECTOR  
ORD/OMMSQA (RD-680)  
U.S. EPA  
WASHINGTON, D.C. 20460  
U.S.A.  
TELEFAX: +1 (202) 252-0929

1.1. National Governmental Scientific Programme

1.2. National: U.S.A.

1.3. The concept of EMAP grew out of the conclusions of the 1984 National Environmental Improvement Act Congressional hearings. In 1990, EMAP was formally initiated by the EPA, in order to provide information on the state of the environment, its changes and characteristics. The programme, will address issues including:

1. What is the current status, extent, and geographic distribution of the U.S. ecological resources (wetlands, forests, deserts, etc.)?
2. What proportions of these resources are degrading, improving, and at what rate?
3. What are the likely causes of adverse effects?
4. Are adversely affected ecosystems responding as expected to control and mitigation programmes?

These issues will be addressed as part of the EMAP's major activities during 1990. These major activities include:

1. Indicator Evaluation and Testing;
2. Network Design;
3. Landscape Characterization; and a
4. Near-Coastal Demonstration Project.

As part of the Network Design, emphasis will be placed on developing an environmental monitoring strategy. The monitoring network will be defined by developing a global grid system and using this to identify suitable sampling sites. This system will be applied within the boundaries of the U.S.A.

1.4. Data collection will occur with emphasis on remote sensing technology for high-resolution data on selected sites and low-resolution data over broad geographical regions. Remote sensing techniques will also be applied within the framework of the Network Design to identify grid points.

In order to gain accurate and thus useful monitoring data, a system of data quality assurance and standardization will be implemented. This includes the development of a comprehensive set of environment related indicators. This will be pursued within the framework of the Indicator Evaluating and Testing phase.

- 1.5. Formal co-operation has so far been foreseen primarily with national American institutions.

EMEP  
CO-OPERATIVE PROGRAMME FOR THE MONITORING  
AND EVALUATION OF LONG RANGE AIR POLLUTANTS  
IN EUROPE (UN-ECE/UNEP/WMO)

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ENVIRONMENT & HUMAN SETTLEMENTS  
UN-ECE  
PALAIS DES NATIONS  
CH-1211 GENEVA 10  
TELEFAX: +41 22 733 98 79

1.1. International Scientific Programme

1.2. Regional: Europe

1.3. EMEP was founded by UN-ECE, WMO, and UNEP in 1977. In 1983 it became a project under the Convention on Long-Range Transboundary Air Pollution, itself under the auspices of the ECE Protection of the Environment framework. It is one of two regional networks, the other in North America, where a denser network of precipitation monitoring stations has been established to evaluate SO<sub>2</sub> and NO<sub>x</sub> emissions and transport, in particular.

1.4. EMEP collects precipitation chemistry data from 106 ground level monitoring stations in 25 European countries. The data are collected daily and are analyzed to establish the transportation patterns of essential pollutants. These data are analyzed and results published by EMEP's Chemical co-ordinating Centre (CCC), Norwegian Institute for Air Research (NILU), P.O. Box 64, N-2001 Lillestrom, Norway. To develop model calculations, of long range transport and deposition of acidifying compounds, the EMEP established two Meteorological Synthesizing Centres (MSCs) at the end of the 1970s; one in Oslo (MSC-West) and one in Moscow (MSC-East).

1.5. As part of the 1983 Convention on Long Range Transboundary Air Pollution, EMEP is linked directly to the UN-ECE's Pilot Programme on Integrated Monitoring (IMP) and to its International Co-operative Programmes (ICPs) (see entries). Moreover, more than 30 of the 106 monitoring stations also participate in WMO's Background Air Pollution Monitoring Network (BAPMON). The CEC's Joint Research Centre (JRC) also co-operates in implementing this programme and is a site for one of the monitoring stations.

In addition, the database containing EMEP information has been identified, for the variables its covers, as a lead database by a U.N. Intersecretariat Working Group on Environmental Data.



ENVIRONMENT COMMITTEE  
(OECD)

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2, RUE ANDRE-PASCAL  
F-75775 PARIS CEDEX 16  
FRANCE  
TELEFAX: +33-1-45 24 85 00

1.1. International Scientific and Political Committee

1.2. Inter-Regional: OECD Member Countries

1.3. As part of the OECD Environment Committee, the Group on the State of the Environment is responsible for the organisation's major projects. These include the System of Information on Resources and the Environment (SIREN), Report on the State of the Environment (ROSE) and the International Review of Environment Information Systems (IRIS).

1. SIREN: The main project within this sub-programme is the compilation and publication of environmental data. Questionnaires are sent out annually requesting the most up to date information from the relevant institutions in the member states of the OECD. Supplementary data are collected from international sources and from within the OECD itself. The data are published in the OECD Environmental Data Compendium, the last of which was published in 1989.
2. ROSE: Within this sub-programme, the major activity is the publishing of the Report on the State of the Environment. In 1990, the third Report will be completed. The Report addresses not only the state of the environment, but also the various anthropogenic pressures on it and the responses; such as legislation, information dissemination and other environmental protection measures.
3. IRIS: This sub-programme provides for the exchange of information on ways to make the management and application of environmental information more effective.

Currently, the Group on the State of the Environment is also researching the development of environmental

indicators. In December of 1989 a Workshop was held regarding this issue.

- 1.4. As was stated above, SIREN is responsible for the majority of environmental data and statistics within the OECD. The Compendium of Environmental Data publishes these, without attempting to present interpretations. As with most of the environmental reports, the Compendium is organized into three components. First, the state of the environment is presented using relatively unprocessed data. This section is divided in to air, water, land and living resources. Then the anthropogenic "pressures" on the environment are addressed, followed by the responses to environmental degradation and pollution.
  
- 1.5. The OECD co-operates with such organization as the EC, UNEP and the World Bank in its environment related activities. As stated above, SIREN questionnaires are developed in close co-operation with the European Communities Statistical Office (EUROSTAT).

**ENVIRONMENT PROGRAM  
(IIASA)**

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1.1. International Research Institute

1.2. Global

1.3. The International Institute for Applied Systems Analysis (IIASA) was founded in 1972 by the U.S.A. and U.S.S.R., as well as the participation of the governments of 14 other Eastern and Western nations. Its research efforts are primarily related to the development and use of scenarios and computer models. These activities have been divided into four main programmes:

1. Environment;
2. Systems and Decision Sciences;
3. Technology, Economy and Society; and
4. Population.

Each Programme, in turn, is responsible for a number of projects. The **Environment Program** is currently involved in a number of projects including:

1. The **Biosphere Dynamics (BIO) Project**, which focuses on the changes of global vegetation, including examining future potential responses of the world's boreal forests, to changes in global climate and atmospheric chemistry.
2. The **Transboundary Air Pollution (TAP) Project**, has activities covering regional acidification, regional pollution from hazardous substances such as heavy metals and climatic change. Within the first activity, efforts are being concentrated on the Regional Acidification Information and Simulation (RAINS) Model. It was to be completed by the end of 1990 for ultimate use by the UN-ECE Convention on Long Range Transboundary Air Pollution to develop new protocols for sulphur and nitrogen emission reductions in Europe. TAP is also in the process of developing a Database Information System (see 1.4.).
3. The **Water Resources (WAT) Project** is addressing methods and procedures for water resources management policies. In particular, the related

policy implications of the anthropogenic changes in inland waters and of shared aquatic systems.

4. The **Environmental Monitoring (MON) Project** aims, among other things, to develop a scheme for predicting the effects of anthropogenic activities on atmospheric concentrations of greenhouse gases. This is being carried out in conjunction with the construction of a "Decisions Support System for Diagnosis and Prediction" of the long-term tendencies of the atmospheric concentration of CO<sub>2</sub> caused by the burning of fossil fuels. This project's ultimate goal is to provide a better theoretical and statistical basis for the design of environmental monitoring systems.
5. The newly initiated **Climate Change (CLI) Project** will initially be function as part of TAP. Work will include such things as developing feasibility strategies of reducing radiatively active gas emissions in individual countries.

1.4. Data and information management are an integral part of model and scenario development. As such most projects have compiled data essential for their work. Within the Environment Program, TAP is in the process of developing a Database Information System. This Database would not only serve as a source of information, but also such practical purposes as establishing cause-and-effect relationships in mapping critical loads for sulphur and nitrogen under the ECE Convention on Long Range Transboundary Air Pollution.

1.5. IIASA is a member of such organizations as ICSU, SCOPE and IFIAS. It collaborates extensively with such programmes as IFIAS's Human Dimensions of Global Change (see HDGC entry) and ICSU's International Geosphere-Biosphere Programme (IGBP). The Environment Program actively contributes to and/or works with such institutions as UNEP/WMO Intergovernmental Panel on Climate Change (IPCC), WMO's World Climate Programme (WCP), as well as many others.

**ENVIRONMENT PROGRAMME  
(UNIDO)**

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1.1. International Governmental Programme

1.2. Global

1.3. The Environment Programme is currently being developed by the UNIDO Environment Co-ordination Unit as a result of numerous General Assembly resolutions and a mandate from the Director General of UNIDO. The objectives of the Programme will be to ensure the environmental sustainability of industrial development and to maximize the beneficial impact of industry on the quality of life by minimizing its adverse environmental effects. More specifically, several priorities have been defined, including:

1. enhancing awareness in developing countries of industry-related environmental problems and to assist the governments of these nations in formulating environment related industrial policies as well as establishing the requisite technological infrastructure;
2. supporting developing countries in the prevention of environmental and resource degradation through the adoption of cleaner technologies and recycling programmes;
3. supporting developing nations in mitigating the adverse impacts of existing industry through effective pollution control; and
4. continuing to improve inter-national and inter-institutional co-operation in the areas of policy formulation, adoption of cleaner technologies and the control of industrial pollution.

To address its priorities, UNIDO will enhance in-house co-ordination and co-operation of environment related activities as well as develop its staff capacity through training, education and recruitment in the fields of technology and policy development and implementation. In addition, four sub-programmes have been defined to further address UNIDO's environmental activities:

1. enhancing the Organization's capacity in

rendering industry-related assistance with regard to the environment;

2. assistance to developing countries in formulating industry-related environmental policies and legislation;
3. promotion of clean, low-waste, energy efficient and recycling or re-use technologies; and
4. technical assistance in pollution abatement.

1.4. Work is currently under way to develop a global report on the environment for which statistical information within UNIDO is being prepared.

1.5. In developing and implementing its Environment Programme, UNIDO will draw on the experiences of other organizations, such as UNEP. Co-operative efforts are also being initiated with the Industrial Development Fund (IDF) and the United Nations Development Programme (UNDP).

**ENVIRONMENT RESEARCH PROGRAMME  
(CEC-JRC)**

111

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1.1. International Scientific Programme

1.2. Regional: European Community

1.3. The Environment Research Programme was adopted on 14 October 1988 by the EC Council of Ministers as part of the "Quality of Life" activities within the Community. Research in the Environment Programme is being carried out at four of the nine institutes of the Joint Research Centre:

- Environment Institute;
- Institute for Remote Sensing Applications;
- Institute for Systems Engineering; and
- Safety Technology Institute.

This programme concentrates on environmental protection (assessment of environmental chemicals, atmospheric pollution, chemical waste, water quality, as well as food and drug analysis); application of remote sensing techniques on land and marine monitoring (in particular of marine pollution and areas of upwelling); and industrial hazards.

Within the Environment Institute, the **Central Laboratory for Air Pollution Measurements** is a key activity. It is extensively involved in improving and harmonizing atmospheric monitoring, research and information management techniques. It was designed to provide technical support for the preparation and implementation of EC directives on the regulation of air quality.

1.4. N.A.

1.5. The Joint Research Centre contributes information to and collaborates with such programmes and institutions as ESA, EEA, and EMEP at the European level and with ISY at the international level.

More specifically, JRC contributes information to and collaborates with European Community (EC) programmes, such as the European Programme for Climatology and Natural Hazards (EPOCH) and the Science and Technology for Environmental Protection (STEP).



## **EUREKA Environmental Projects**

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### 1.1. International Scientific Agency

### 1.2. Regional: Europe

1.3. EUREKA was established in 1985 by 19 Western European countries and the Commission of the European Communities (CEC). Currently, 32 projects within EUREKA can be defined as being environmentally related. These projects have been grouped in four categories. Each category has umbrella projects as well as independent ones. The following, is a list of the four categories and some of the activities existing within each:

1. Large Scale Research and Systems Studies:  
Among the various projects within this category, three umbrella projects can be identified:
  - **EUROTRAC** (Project EU 7) - see individual entry (No.111).
  - **EUROMAR** (Project EU 37) - focuses on the development and exploitation of Europe's marine technology which is considered to have worldwide market potential. Eighteen projects have been implemented involving remote sensing, models, data systems, bottom systems, instruments and carrier systems and atmospheric input.
  - **EUROCARE** (Project EU 140) - studies the effects of pollution on historic objects and monuments.
  
2. Development of Clean and Purifying Technologies:
  - Here **EUROENVIRON** can be seen as the largest programme. It seeks to emphasize the use of environmental technology to solve and/or prevent environmental problems. Its ten sub-projects deal with wastewater treatment, contaminated groundwater, polluted soil and atmospheric dispersion of process and accidental releases.

3. Protection Applications:

- Within this category most sub-projects are being initiated under the auspices of EUROCARE. These sub-projects are involved in protecting items including Roman mosaics, foundations, wood protection, wall paintings, marble, cooper, as well as other items.

4. Development of Instrumentation:

- Within this category most sub-projects fall within the framework of EUROMAR. Most sub-projects are involved in developing instruments for use in monitoring and researching ocean and sea movements and sediments.
- Two independent projects, however, also exist in this category. Project EU 94 is developing low-weight, easily operated equipment to identify and simultaneously measure several gases. The second project is LASFLEUR (Project EU 380). It aims to develop an instrument to measure the status of vegetation from an aeroplane.

1.4. EUREKA has launched a database project which should ultimately make all projects within the EUREKA-framework publicly accessible. Currently, this database exists on two computer systems, one called ECHO (European Commission Host Organization) and the other managed by the Ministry of Trade and Industry in Paris.

1.5. Almost 2000 European corporations and research centres participate in Eureka projects. Co-operative efforts are generally between the member countries of EUREKA and their respective institutions and programmes.

**EUROTRAC**  
**EUROPEAN EXPERIMENT ON TRANSPORT AND TRANS-**  
**FORMATION OF ENVIRONMENTALLY RELEVANT TRACE**  
**CONSTITUENTS IN THE TROPOSPHERE OVER EUROPE**  
**(EUREKA)**

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1.1. International Scientific Programme

1.2. Regional: Europe

1.3. EUROTRAC's implementation phase began on January 1, 1988. It is scheduled to run for 8 years, with a reassessment after the first four years. The objectives on which EUROTRAC is to focus are:

1. to increase the basic knowledge in atmospheric science;
2. to promote the technological development of sensitive, specific and fast response instruments for environmental research and monitoring; and
3. to improve the scientific basis for taking future political decisions on environmental management in the European countries.

The scientific projects and activities are carried out by Sub-projects. Currently 14 of these exist (see list at end of entry). The Sub-projects are not only involved in monitoring and research activities, but also in the development of models and advanced monitoring instruments.

1.4. Currently, a EUREKA database is being developed to make all existing projects publicly accessible. (see EUREKA entry)

1.5. EUROTRAC co-operates closely with the CEC, as the CEC sponsors research activities within the Programme. Results, obtained in research activities, will be contributed to ICSU's International Geosphere-Biosphere Programme (IGBP), especially to its core project: the International Global Atmosphere Chemistry project (IGAC). National co-operative efforts have also been launched. In particular, relations with EMEP and co-operation with the EEA is envisaged.

**EUROTRAC Sub-projects:**

**Laboratory experiments:**

1. HALIPP (Heterogeneous and Liquid Phase Processes)
2. LACTOZ (Laboratory Studies of Chemistry Related Tropospheric Ozone)

**Field Experiments:**

3. ACE (Acidity in Clouds Experiment)
4. ALPTRAC (High Alpine Aerosol and Snow Chemistry Study)
5. GCE (Ground-based Cloud Experiments)
6. TOR (Tropospheric Ozone Research)

**Biosphere/Atmosphere Interactions:**

7. ASE (Air-Sea Exchange)
8. BIATEX (Biosphere-Atmosphere Exchange of Pollutants)

**Model Development:**

9. EUMAC (European Modelling of Tropospheric Constituents)
10. GLOMAC (Global Modelling of Atmospheric Chemistry)
11. TRACT (Transport of Pollutants over Complex Terrain)

**Development of Instruments:**

12. JETDLG (Joint European Development of Turnable Diode Laser Absorption Spectroscopy for Measurement of Atmospheric Trace Gases)
13. TESLAS (Tropospheric Environmental Studies by Laser Sounding)
14. TOPAS (Tropospheric Optical Absorption Spectroscopy)

GAW  
GLOBAL ATMOSPHERE WATCH (WMO)

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1.1. International Scientific Programme

1.2. Global

- 1.3. The WMO-GAW System can be seen as the umbrella programme for the Background Air Pollution Monitoring Network (BAPMON) and the Global Ozone Observing System (GO<sub>3</sub>OS); for details see entries for both sub-programmes. Established in 1989, GAW integrates WMO monitoring and research activities involving the chemical composition and related physical characteristics of the global atmosphere under GO<sub>3</sub>OS and BAPMON as well as EMEP and IM.

Results from GAW activities are used, among other things, to serve as an early warning system to detect changes in the transport of pollutants, changes in the concentrations of greenhouse gases, and changes in the ozone layer.

The number of measurement parameters recommended at present for GAW varies from station to station, however the core programme includes carbon dioxide, chlorofluorocarbons and their substitutes, methane, nitrous oxide, ozone (surface, total column, vertical profile), radiation (including UV-B) and atmospheric turbidity, total aerosol load, water vapour, chemical composition of rainfall and snow, reactive gas species (sulphur dioxide, nitrogen oxides, etc.), particle concentration and chemical composition, and some radionuclides.

- 1.4. Data are collected and managed by specially trained staff according to specified criteria and using recommended instruments. In this way the issue of data quality is addressed.

Data are stored at various WMO Data Centres operated by WMO member countries on behalf of the Organization. Canada operates the World Ozone Data Centre (WODC) and publishes results bimonthly; the NOAA National Climatic Data Centre in the USA stores data for turbidity; the EPA Environmental Monitoring Laboratory

in the U.S.A. stores data on precipitation chemistry analyses, and suspended particulate matter; and the U.S.S.R. is responsible for the collection of solar radiation data. Since October 1990, the WMO's World Data Centre for Greenhouse Gases (WDCGG) in Japan is responsible for the storage of data on all atmospheric gases except ozone.

- 1.5. GAW is a main contributor of background atmospheric composition data to GEMS and co-operates with other programmes, such as the International Geosphere-Biosphere Programme's (IGBP) International Global Atmospheric Chemistry project (IGAC), which will receive data and assessments from GAW. This information will pertain primarily to tropical forest degradation and its relation to climate change; the changing chemistry of the troposphere; and Arctic and Antarctic stratospheric ozone depletion.

GAW  
GLOBAL ATMOSPHERE WATCH (WMO)

BAPMoN  
BACKGROUND AIR POLLUTION MONITORING NETWORK

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1.1. International Scientific Programme

1.2. Global

1.3. Established in 1968, by the WMO's constituent bodies, BAPMoN was intended to provide continuous information on the changing chemical composition and related physical characteristics of the Earth's atmosphere. Currently, BAPMoN is the only globally operational system for monitoring background atmospheric pollution. BAPMoN monitors the tropospheric atmosphere composition at both global and regional levels through a global network of stations. In 1990 the BAPMoN network consisted of about 200 monitoring stations. Of these, many have varying functions, including:

1. 160 that measure precipitation chemistry;
2. 95 BAPMoN stations which measure wind turbidity;
3. 80 measure suspended particulate matter;
4. 38 measure carbon dioxide concentrations;
5. 26 measure surface ozone;
6. methane is monitored at 9; and
7. CFCs are monitored at 5 stations.

1.4. Monitoring at global stations is done in remote locations so as to minimize direct regional influences. Data are collected on a long-term basis. This allows evaluated data to be used, for example, to determine trends in the chemical concentrations of various substances in the atmosphere. The databases for precipitation chemistry analyses and suspended particulate matter and atmospheric turbidity measurements are located in the U.S.A., while the U.S.S.R. collects solar radiation data. Other WMO member states also provide central laboratory services and training facilities. Moreover, in October 1990, an arrangement was entered into whereby Japan ensures processing and archiving of greenhouse gases data.

1.5. BAPMoN co-operates extensively with other international programmes, such as UNEP-GEMS, the CMEA (see GEMS IBM Programme entry) and the Co-operative Programme for the Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe (see EMEP entry). The BAPMoN Network is a major source of atmospheric information to the UNEP-Global Environmental Monitoring System (GEMS). At the same time it co-operates with EMEP by sharing some monitoring stations and information. The BAPMoN database has been identified, for the variables it covers, as a lead database by a U.N. Intersecretariat Working Group on Environmental Data.



GAW  
GLOBAL ATMOSPHERE WATCH (WMO)

GO<sub>3</sub>OS  
GLOBAL OZONE OBSERVING SYSTEM

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1.1. International Scientific Programme

1.2. Global

1.3. In 1957 the WMO first established an international framework for standardized and co-ordinated ozone observing projects, related research and publications. It is from this that GO<sub>3</sub>OS eventually developed. Currently, GO<sub>3</sub>OS has a world-wide network of approximately 140 monitoring stations. These ground-level monitoring activities have been complemented by the implementation of remote sensing techniques. This monitoring versatility has allowed GO<sub>3</sub>OS to develop the only ozone observing network which is capable of providing data not only on the horizontal distribution of ozone, but also its total atmospheric concentration and vertical distribution.

At the same time, GO<sub>3</sub>OS is the only provider of ozone related information to the UNEP-Global Environmental Monitoring Systems (GEMS). To date, GO<sub>3</sub>OS has published its monitoring results in a variety of reviews, as well as four major reports on the state of the ozone layer (published 1981, 1985, 1988 and 1989). Each report was prepared in co-operation with the U.S. National Aeronautics and Space Administration (NASA), with the participation of UNEP and various other national agencies.

1.4. Ozone related data are stored at the World Ozone Data Centre (WODC) at the Atmospheric Environment Service in Canada. This Centre has been operational since the 1960s. Consequently, it is able to provide long term data indispensable for calculation of ozone trends. The WMO Centre publishes its findings in a bimonthly bulletin - Ozone Data for the World.

Data gathering, retrieval and reporting procedures are standardized by the WMO, with support from the International Ozone Commission of the International Association of Meteorology and Atmospheric Physics (IAMAP). Quality assurance is both addressed in this way along with periodic recalibrations against a given

standard. In the future, the issue of quality assurance is to be increasingly addressed.

- 1.5. Through the WMO-Global Atmosphere Watch (GAW), GO<sub>3</sub>OS is tightly linked with the WMO-Background Air Pollution Monitoring Network (BAPMON), with which it shares a number of stations. Together these programmes are attempting to develop a comprehensive network to study the dispersion, transport, chemical transformation and deposition of atmospheric pollutants, both on terrestrial and aquatic surfaces. In its monitoring, data management, research and publishing activities, GO<sub>3</sub>OS also closely co-operates with the relevant programmes of other organizations.

**GEMS**  
**GLOBAL ENVIRONMENT MONITORING SYSTEM (UNEP)**

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1.1. International Scientific Programme

1.2. Global

1.3. GEMS was established as part of UNEP's Earthwatch programme in 1975. GEMS major objectives are to make comprehensive assessments of major environmental issues and thus provide the scientific data needed for the rational management of natural resources and the environment as well as to provide early warning of environmental changes by analysing monitoring data. To address these objectives, GEMS has developed several methods including:

1. developing techniques for establishing monitoring activities and networks;
2. improving the quality and comparability of data collected; and
3. improving existing networks and establish new ones.

Currently, GEMS is involved in over 30 international monitoring projects implemented by FAO, UNEP, UNESCO, WHO, and WMO. Several GEMS projects have been included in this Survey, namely GEMS /Air, /Food, /Integrated Background Monitoring, /Water. GEMS itself has a number of programmes under its auspices which have also been included; these being GRID, HEM, MARC, and WCMC (see individual entries).

GEMS concentrates on primarily five areas: climate, transboundary pollution, terrestrial renewable resources, oceans, and the health consequences of pollution. The Programme Activity Centre in Nairobi was established as an umbrella to co-ordinate and expand global monitoring activities within its areas of concentration. In the future, GEMS, through GEMS/PAC, aims to place more emphasis on such issues developing multi-media and integrated monitoring and assessment as well as improving the harmonization of data and measurement techniques.

1.4. See individual programme entries.

1.5. GEMS co-operates extensively with other international organizations as well as national institutions in implementing and maintaining its activities. This is particularly the case with the projects, which are usually sponsored by several different organizations.

GEMS/Air  
URBAN AIR QUALITY MONITORING PROJECT  
(UNEP/WHO/WMO)

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1.1. International Scientific Programme

1.2. Global

1.3. The GEMS/Air programme was initiated by the WHO in 1973. In 1975 it became part of the Global Environment Monitoring System (GEMS). GEMS/Air was implemented to monitor SO<sub>2</sub> and suspended particulate matter in urban regions. Approximately 170 monitoring stations in 80 cities in 47 countries contribute to the programme. Most cities have established three monitoring sites: one in the industrial zone, one in a commercial area and one in a residential area. The intention is to collect complete data over the long period.

Although a standardized system of data monitoring and exchange has been implemented there have developed certain problems. In particular, data exchange has been subject to substantial time lags due to procedural matters. Moreover, some datasets are not entered by the monitoring sites and thus are missing at the data centre. Efforts are underway to correct these problems and to make GEMS/Air's data representative of world-wide urban air quality.

1.4. Data compiled from contributing monitoring sites are managed by the U.S. Environmental Protection Agency (EPA) at Research Triangle Park in North Carolina, U.S.A. Regular statistical quality assurance tests are made of these data to ensure internal consistency. These results have been published by UNEP and the WHO. In addition, long-term trends have been calculated, for all cities providing regular data. Data are also used to compare to WHO guidelines for short-term (24 hour) and long term (years) human exposure. Currently, GEMS/Air is researching a more efficient system by which to monitor, exchange and handle dataflows. This includes the development of two software packages:

1. GEMS-DATA: for the transfer of data, from individual institutions to the Data Centre.

2. GEMS-ASYST: for the analysis of air quality data.

GEMS/Air publishes urban air data on a city-by-city basis, on a regional basis and reports annually on air quality issues.

- 1.5. Co-operative activities are primarily pursued between the contributing institutions and the GEMS/Air Project Secretariat. Participating institutions are currently attempting to further improve the GEMS/Air programme. The database, containing information for GEMS/Air has been identified, for the variables it covers as a lead database by a U.N. Intersecretariat Working Group on Environmental Data.

GEMS/Food  
FOOD CONTAMINATION MONITORING PROJECT  
(FAO/UNEP/WHO)

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1.1. International Scientific Programme

1.2. Global

1.3. GEMS/Food was initiated in 1976. Its primary objective is to provide reliable and internationally comparable information to governments, the Codex Alimentarius Commission, other relevant institutions and to the general public on levels and trends of contaminants in food, their contribution to total human exposure and their significance in relation to public health and to food trade. At present 40 countries participate in GEMS/Food by providing information on levels and trends of chemical contaminants in food including PCBs; lead and cadmium; organophosphorous pesticides such as DDT, aldrin, dieldrin; and aflatoxins. Microbial contamination of food is not covered by the project. Data are available for the period 1977-1988.

1.4. The major components of GEMS/Food are:

- Monitoring: collecting relevant information through the GEMS/Food network, Codex contactpoints, scientific reports and other sources. Data from national food contaminating monitoring programmes are collected and computer processed at WHO headquarters in Geneva.
- Technical Co-operation: strengthening national food contamination monitoring capabilities and infrastructure through training, advisory services and provision of guidelines.
- Quality Assurance: ensuring the quality and the comparability of monitoring data at the global through the operation of an international quality assurance programme and regional training programmes.
- Assessment: analyzing and interpreting the collected information and disseminating authoritative assessments related to human exposure and health risk due to contaminated food.

- 1.5. GEMs/Food is a joint UNEP/FAO/WHO programme. Collaborating institutes for quality assurance include the International Agency for Research on Cancer (IARC), Lyon, for aflotoxins; the Ministry of Agriculture, Fisheries and Food (MAFF), United Kingdom, for metals /cadmium, mercury and lead); and the National Food Administration (NFA), Sweden, for organochlorine compounds (organochlorine pesticides and PCBs).



**GEMS/HEAL  
HUMAN EXPOSURE ASSESSMENT LOCATION PROJECT  
(UNEP/WHO)**

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1.1. International Scientific Programme

1.2. Global

1.3. GEMS/HEAL was initiated by UNEP and the WHO in order to promote the improved monitoring and assessment of human exposure to environmental pollutants. It has been part of the GEMS network since 1984. GEMS/HEAL is also dedicated to improving, testing, co-ordinating and demonstrating methods for human exposure monitoring, promoting human exposure assessment as a basis for environmental control strategies to protect human health and improving national exposure monitoring capabilities, especially in developing countries.

For each project within HEAL, a participating national institution is appointed to serve as a **Technical Co-ordinating Centre (TCC)**. A TCC is responsible for preparing monitoring protocols, designing and implementing quality assurance programmes.

1.4. Currently, 20 countries are actively participating in the GEMS/HEAL project with additional 4 countries being in the process of joining. New components dealing with information exchange, methodology development and training are being introduced into the programme.

1.5. The GEMS/HEAL project is co-ordinated by WHO and UNEP in collaboration with the GEMS Monitoring and Assessment Research Centre (MARC) in London, U.K.; the WHO Collaborating Centre at the U.S. Environmental Protection Agency (EPA) in Washington, D.C., U.S.A. as well as various national institutions in Brazil, China, Germany, Hungary, India, Japan, Sweden, U.S.S.R. and Yugoslavia.

**GEMS-IBM**  
**INTEGRATED BACKGROUND MONITORING (UNEP)**

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1.1. International Scientific Programme

1.2. Inter-Regional: CMEA Member Countries, Chile and U.S.A.

1.3. GEMS-IBM was established in 1976 to be a multi-media integrated monitoring project. Currently, soil, water, vegetation, forest litter, air and atmospheric deposition are all monitored in the given locations. Co-ordinated with these measurements are selected ecosystem parameters. The initial phase of the project is being carried out in selected regions to test the concept, methods and logistics. It will then be expanded to a global scale.

To date, two components of the GEMS-IBM global network have been initiated. The first are three monitoring sites in Biosphere Reserves, set up by UNESCO's Man and the Biosphere (MAB) programme. One of these sites is in Chile, while two are located in the U.S.A. The second component is a regional network of about 26 sampling stations in CMEA member countries. In the Soviet Union, these are located in selected MAB Biosphere Reserves.

The ultimate goal of the GEMS-IBM project will be to establish reference levels for both naturally and anthropogenic originating compounds.

1.4. N.A.

1.5. GEMS-IBM is being implemented with support from UNESCO, WMO as well as several national agencies. It also co-operates extensively with WMO's Background Air Pollution Monitoring Programme (BAPMON).

GEMS/Water  
ASSESSMENT OF FRESHWATER QUALITY (UNEP/WHO/Canada)

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1.1. International Scientific Programme

1.2. Global

1.3. GEMS/Water was initiated in 1976 as a freshwater monitoring network. It is operated by UNEP and WHO with the support of UNESCO and WMO as part of the GEMS environmental pollution monitoring programmes. The primary objectives of the GEMS/Water Programme are to monitor the pollution and contamination loads and trends of the world's freshwater resources. Information is used to determine trendlines and to provide a centre for expertise in the fields of water quality and related issues.

In August 1990 a new phase for GEMS/Water was formally approved. At that point, three long-term objectives were defined:

1. to provide governments, the scientific community and the public timely access to information on the state of fresh waters of the world, long term trends in the levels of critical fresh water quality indicators, cause-effect relations and impact assessment of observed trends and policy options for problem containment and solution;
2. to make accessible, assessments on the flux of toxic chemicals, nutrients and other pollutants from major river basins to the world's oceans and inland seas; as well as
3. to strengthen national water quality monitoring networks in developing countries, including the improvement of analytical capabilities and data quality assurance.

1.4. A computerized database is maintained at the WHO Collaborating Centre on Surface and Ground Water Quality, at Canada's National Water Research Institute (NWRI). Data results are published on a regular basis.

The USA Environment Protection Agency (US/EPA) provides quality control (AQC) support to the programme. Eight laboratories in 40 countries participate in the AQC programme in order to ensure good and comparable data quality. GEMS/Water publishes global water quality data every five years as well as biennial reports on special global water quality issues.

- 1.5. In co-operating with other programmes, emphasis will be placed on sharing information with UNEP's Oceans and Coastal Areas Programme Activity Centre (OCA/PAC); the ECE's programme centre at Norway's Institute for Water Research (NIVA); IGBP; and the International Lake Environment Committee (ILEC). To enable comprehensive assessment, covering water quality and quantity, co-operation has been established with the WMO's Global Runoff Data Centre in Koblenz, Germany. The database containing GEMS/Water information has been identified, for the variables it covers, as a lead database by a U.N. Intersecretariat Working Group on Environmental Data.

**GIPME**  
**GLOBAL INVESTIGATION OF POLLUTION IN THE MARINE**  
**ENVIRONMENT (IOC/UNEP)**

123

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1.1. International Scientific Programme

1.2. Global

1.3. GIPME was established by the IOC in response to Recommendation 90 of the 1972 Stockholm Conference on the Human Environment. It is intended to provide scientifically sound scientific, assessment and regulation of marine pollution.

The scientific activities are primarily developed by three Groups of Experts:

1. Methods, Standards and Intercalibration (**GEMSI**) (IOC/UNEP sponsored);
2. Effects (biological) of Pollutants (**GEEP**) (IMO/IOC/UNEP sponsored); and
3. Standards and Reference Materials (**GESREM**) (IAEA/IOC/UNEP sponsored).

GEMSI is involved in a number of studies, including the Spring 1990 **Open Ocean Baseline Study**, which monitored the level of heavy metals and nutrients at four deep ocean stations in the South Atlantic. Moreover, it published a manual on quality assurance and good laboratory practices in marine pollution monitoring in 1989.

GEEP and GESREM have both addressed the treatment and interpretation of data. Among other things, GEEP has prepared manuals on the Statistical Treatment and Interpretation of Marine Community Data. GESREM, on the other hand, has placed emphasis on promoting the use of standards and reference materials, as well as the improvement of data quality.

Closely involved with the GIPME Programme is the IOC's Marine Pollution Monitoring System (MARPOLMON). MARPOLMON functions as a network of regional components from the South East Pacific, Caribbean, West and Central Africa and the Mediterranean. Data from these regional activities are regularly delivered to the IOC's International Oceanographic Data Exchange system (IODE).

1.4. see IODE Database entry.

1.5. GIPME co-operates extensively with national, regional and global institutions and projects. It both collects information from these activities and promotes information storage, management and dissemination. Many of these co-operating bodies have been mentioned in the above summary.

**GLOSS**  
**GLOBAL SEA LEVEL OBSERVING SYSTEM (IOC)**

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- 1.1. International Scientific Programme
- 1.2. Global
- 1.3. GLOSS is an international network of sea level measuring stations, co-ordinated by the IOC. Some 300 stations world-wide contribute to GLOSS. These provide standardized information on the level of seas locally, regionally and globally. Such information is important as sea level is considered a good indicator of ocean heat, which directly affects the global climate.  
GLOSS operates a set of tide gauges as part of its monitoring activities. These will be connected as a network and to the global geodetic reference system, established by the **International Earth Rotation Service (IERS)**. The development of new geodetic techniques, based on **Very Long Baseline Interferometry (VLBI)**, the **Global Positioning System (GPS)** and absolute gravity measurements have created the opportunity to link these tidal gauges to a highly accurate global reference system.
- 1.4. Standardized collection and handling procedures have allowed for the intercompatibility of data. The near real time data is to be stored in the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory, U.K. Data are collected and analyzed in specialized data centres such as TOGA Sea Level Data Centre in Honolulu, Hawaii and the WOCE Sea Level Data Centre in Bidston, U.K.; the archived data are stored in data banks of the Permanent Service for Mean Sea Level, Proudman Oceanographic Laboratory, U.K.
- 1.5. GLOSS co-operates extensively with other organizations involved in monitoring and research the oceans. In particular, it co-ordinates many of its activities with those of the World Climate Research Programme's (WCRP) Tropical Ocean and Global Atmosphere (TOGA) and World Ocean Circulation Experiment (WOCE) activities.

**HDGC**  
**HUMAN DIMENSIONS OF GLOBAL CHANGE**  
**(IFIAS/ISSC/UNU/UNESCO)**

125

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1.1. International Non-Governmental Scientific Programme

1.2. Global

1.3. The HDGC Programme was initiated by the International Federation of Institutes of Advanced Studies (IFIAS), the International Social Sciences Council (ISSC), the U.N. University and UNESCO in Tokyo, 1988. It was originally named the Human Response to Global Change Programme (HRGCP), but this was changed at the 1988 Tokyo Conference. In many ways the HDGC Programme is seen as a social scientific counterpart to ICSU's International Geosphere-Biosphere Programme (IGBP). At the Tokyo Conference the following Programme objectives were adopted:

1. to improve scientific understanding and increase awareness of the complex dynamics governing human interaction with the total Earth System;
2. to strengthen efforts to study, explore, and anticipate social change affecting the global environment;
3. to identify broad social strategies to prevent or mitigate undesirable impacts of global change, or to adapt to changes that are already unavoidable;
4. to analyze policy options for dealing with global environmental change and promoting the goal of sustainable development.

1.4. Although not formalized yet, HDGP will focus its data collection on Remote Sensing and other computer aided techniques and instruments. In particular, emphasis will be placed on collecting data in the form of Geographical Information Systems (GIS).

1.5. As this programme is essentially still in the planning phase, co-operative efforts have been made primarily in the areas of planning and idea exchange.



**ICPs**  
**INTERNATIONAL CO-OPERATIVE PROGRAMMES (UN-ECE)**

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1.1. International Scientific Programme

1.2. Inter-Regional: Europe, Canada & U.S.A.

1.3. Under the auspices of the Convention on Long Range Transboundary Air Pollution, UN-ECE initiated four ICPs. The following is a list and brief description of each:

1. The ICP for **Assessment and Monitoring of Air Pollution Effects on Forests**. Established in 1985, this Programme is supported by UNEP-Global Environment Monitoring System (GEMS). The ICP for Forests is primarily responsible for monitoring and documenting the extent of forest damage in Europe. It has established methods and criteria for harmonizing sampling, assessment and monitoring of the effects of air pollution on forests. Based upon this information, the amount of defoliation the forest regions have been classified. Monitoring is done by national stations and data is supplied to one of two Programme Co-ordinating Centres for digitization and evaluation.
2. The ICP for **Assessment and Monitoring of Acidification of Rivers and Lakes**. The ICP on Rivers and Lakes was established in 1986. Its aim is to identify long-term trends and the extent of surface water acidification in the ECE region. Data are collected by national monitoring and research stations. These are delivered to the Programme Centre at the Norwegian Institute for Water Research (NIVA). To ensure their comparability, inter-laboratory analytical quality control exercises were conducted. Results were to be published in 1989.
3. The ICP on **Effects of Air Pollution on Materials, including Historic and Cultural Monuments**. This Programme was established in 1986 to monitor the

effects of sulphur and nitrogen compounds on the weathering rates of buildings. At chosen sites, humidity, temperature, solar radiation, ozone, precipitation amount and chemistry are also routinely measured. Measurements are being made at 39 sites in 13 countries. Data are collected and managed at the Main Research Centre of the Swedish Corrosion Institute.

4. The ICP for **Research on Evaluating Effects of Air Pollutants and other Stresses on Agricultural Crops**. Approved for implementation in 1987 and co-ordinated by the U.K., this ICP researches dose/response relationships between pollution exposure and economically important crops. The use of agricultural crops as indicators of pollutant impacts on ecosystems is also being explored. The full implementation of this programme began in 1989.

1.4. See individual ICP entries above for more detail, where available.

- 1.5. The ICP programmes function in conjunction with all other international and national activities adhering to the Convention on Long Range Transport of Air Pollutants in Europe. Among others, it co-operates with EMEP (see entry), which is also sponsored by ECE. The actual implementation of the programmes is done in collaboration with UNEP's Global Environmental Monitoring System (GEMS) and the Commission of the European Communities (CEC). More specifically, the database containing information for the ICP on Forest Damage has been identified, for the variables it covers, as a lead database by a U.N. Intersecretariat Working Group on Environmental Data.

**IGBP**  
**INTERNATIONAL GEOSPHERE-BIOSPHERE PROGRAMME**  
**(ICSU)**

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1.1. International Non-Governmental Scientific Programme

1.2. Global

1.3. The IGBP was established in September 1986, by the ICSU General Assembly. Since then it has developed extensively, receiving support from various organisations including UNEP, UNESCO and the Andrew W. Mellon Foundation. IGBP activities are steered by an ICSU Special Committee.

The emphasis of the IGBP is *"to describe and understand the interactive physical, chemical and biological processes that regulate the total Earth System, the unique environment that it provides for life, the changes that are occurring in this system, and the manner in which they are influenced by human actions."* To facilitate this aim the Special Committee has established eight **Core Projects**:

1. the **International Global Atmospheric Chemistry Project (IGAC)** has been established in co-ordination with the Commission of Chemistry and Global Pollution of the International Union of Geodesy and Geophysics (IUGG) of ICSU to determine the chemical composition of the atmosphere and its importance to the global climate system;
2. the **Joint Global Ocean Flux Study (JGOFS)** of ICSU's Scientific Committee for Ocean Research (SCOR) was established to study the role of oceans and its biogenic elements in relation to global changes;
3. **Biospheric Aspects of the Hydrological Cycle (BAHC)** is a complement to the Global Energy and Water Cycle Experiment (GEWEX) of WCRP;
4. **Global Change and Terrestrial Ecosystems (GCTE)** will focus on the physiology of ecosystems, the dynamics of ecosystems and the impacts of global change on agriculture and forestry;
5. **Past Global Changes (PAGES)** aims to reconstruct a detailed history of climatic and environment change since 2000 B.C. and also through a full glacial-interglacial cycle;

6. **Stratosphere-Troposphere Interactions and the Biosphere** (STIB) has been developed with IAMAP, IAGA, and SCOSTEP to address stratospheric-tropospheric interactions and their link to the climate system;
7. **Land-Ocean Interactions in the Coastal Zone** (LOICZ) will address the impact of climate change and human development on the functioning and sustainability of coastal zones; and
8. **Global Analysis, Interpretation and Modelling** (GAIM) will develop a fundamental, quantitative understanding of physical, chemical, and biological interactions in the Earth system over the past 100,000 years and their possible effects on future changes.

A **Global Ocean Euphotic Zone Study** and a **Global Change and Ecological Complexity** project are being planned as potential IGBP Core Projects.

Monitoring activities will particularly occur within the framework of the **Global Geosphere-Biosphere Observatories**. Here emphasis will be placed on collecting data using remote sensing techniques. Monitoring results and other information will be valuable in the construction of global geosphere-biosphere and paleo-climate models, for example.

- 1.4. The development of a global **Data and Information System** that will make accessible information needed for Earth system models and to provide long-term observations needed to detect global changes. For more information see IGBP-DIS entry.
- 1.5. An integral part of the implementation of IGBP will be its co-operation with other programmes and organizations. In particular, it IGBP will work with its sponsors and with other ICSU affiliated Programmes such as those mentioned in connection with the Core Projects. Along with WCRP, the IGBP are the two principal international organizations addressing the issues surrounding global environmental change. Both programmes have contributed information to the IPCC and its report, which was presented at the Second World Climate Conference.

**IGOSS**  
**INTEGRATED GLOBAL OCEAN SERVICES SYSTEM**  
**(IOC/WMO)**

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1.1. International Governmental Programme

1.2. Global

1.3. IGOSS is the international operational system for the collection and exchange of ocean data and the timely preparation and distribution of products and services. IGOSS consists of three components:

1. **Observing System:** Surface based and space-based, the system includes research vessels, ships of opportunity, buoys and satellites.
2. **Data Processing and Services System:** National, specialized and world oceanographic centres process observational data, provide products and manage data exchange activities for various marine user groups. Over 500 products from 50 countries are prepared routinely using IGOSS data.
3. **Telecommunications Arrangements:** Telecommunications facilities of the WMO Global Telecommunications System (GTS) are used to rapidly and reliably collect and distribute data and information.

1.4. Close collaboration is maintained with the companion programme, IODE (see entry). Operational IGOSS data is submitted to the IODE archives to update existing data and insure a comprehensive data set for users. Within IGOSS data management is the responsibility of the Data Processing and Services System.

1.5. IGOSS is a joint programme of the IOC and WMO. Close co-operation is maintained with international research and scientific activities such as those of the World Climate Research Programme (WCRP).

**IHP**  
**INTERNATIONAL HYDROLOGICAL PROGRAMME**  
**(UNESCO)**

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**1.1. International Scientific Programme**

**1.2. Global**

**1.3. IHP was initially founded as the International Hydrological Decade (IHD) by UNESCO in 1965. In 1975, IHP was established as an international co-ordinating programme with a mandate to improve the scientific and technological basis for the development of methods and human resources to rationally manage and develop water resources while protecting the environment. In 1990, IHP began implementing its fourth five-year-plan (1990-1995), entitled **Hydrology and Water Resources for Sustainable Development in a Changing Environment**. Within this plan, IHP's objectives were divided into three sub-programmes, each with a number of themes:**

- 1. Hydrological Research in a Changing Environment** was established with themes researching issues such as Interface Processes between Atmosphere, Land and Water Systems, the Relationship between Climate Variability (and Expected Change) and Hydrological Systems, the Changes in Water Quality through the Hydrological Cycle, the Role of Snow and Ice in the Global Water Cycle, as well as Hydrological Problems of Specific Regions;
- 2. Management of Water Resources for Sustainable Development** was divided into themes researching Methodologies for Water Resources Assessment and Hydrological Design, Scientific and Technical Water-Related Information and Documentation Systems, Evaluation of Social and Environmental Aspects of Fresh Water Systems and Prediction of Impacts of Man's Activities, Integrated Water Resources Development and the Incorporation of Risk-Based Decision-Making, as well as Hydrological and Water Management Aspects of International Water Systems;

**3. Education, Training, the Transfer of Knowledge and Public Information** includes themes involving Educations and Training of Senior Technicians, University Education, Postgraduate Training, Continuing Educations, as well as Public Education and Information.

To effectively implement its objectives, IHP has established several **National Committees** in Member States. The role of these Committees is to be strengthened to ensure that activities within the fourth Plan are implemented in a fully co-ordinated and co-operative fashion.

- 1.4. Within Sub-Programme 2, the theme addressing the Scientific and Technical Water-Related Information and Documentation Systems aims to assist in the establishment and maintenance of various hydrological information and data systems. Special emphasis will be on using the Geographical Information System (GIS) to handle the large amounts of data resulting from IHP activities. Several projects have been planned for the next five years including;
1. the development of national water-related information and documentation systems on non-numerical information;
  2. the use of internationally available water-related information systems; and
  3. the use of GIS in hydrological and water resources studies.
- 1.5. As mandates often overlap, IHP co-operates closely with IAHS and IAH. Efforts are also being made to co-operate with organizations and programmes including IAHR, ICID, IWRA and IGBP. Within UNESCO, IHP is establishing links with programmes such as MAB and IGCP.

**IJC**  
**INTERNATIONAL JOINT COMMISSION (CANADA/U.S.A.)**

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- 1.1. International Scientific Organization
- 1.2. Regional: Canada and the U.S.A.
- 1.3. The IJC was established by the Boundary Waters Treaty of 1909. Signed in 1909, the Treaty was signed to provide the principles and mechanisms to help prevent and resolve disputes, primarily those concerning water quantity and quality. The Commission has three members appointed by the United States and three by Canada. Traditionally, the IJC's work falls into 2 categories:
  1. **Applications** made to the Commission to obstruct, use or divert waters are considered and authorized; and
  2. **References** are considered situations where the IJC is requested by a government to investigate a specific issue or monitor a situation.

Although all waterbodies along the Canada-United States boundary fall within the IJC's mandate, it primarily concentrates on the following:

1. St. Croix River Basin;
2. The Great Lakes/St. Lawrence River Basins;
3. Rain Lake/Lake of the Woods Basins;
4. Souris/Red River Basins;
5. St. Mary/Milk River Basins; and
6. Columbia River Basin.

The Great Lakes programmes are the largest and most comprehensive. These programmes mainly focus around the fluctuating lake levels and water quality. Fluctuating lake levels are addressed by five study groups:

1. Group 1: hydraulics, hydrology, and climate;
2. Group 2: coastal zone ecology, resources, uses and management
3. Group 3: socio-economic and environmental assessment;
4. Group 4: public participation and communications; and



5. Group 5: cross impact evaluation.

To monitor and evaluate watery, the Great Lakes Water Quality Agreement was signed in 1972. Under this Agreement, a **Great Lakes Water Quality Board** was initiated to advise the IJC on issues such as eutrophication, toxic substances, Areas of Concerns and the general health of the Great Lakes Basin ecosystem. To fulfil its mandate, the Water Quality Board has developed **Remedial Action Plans (RAPs)** in addition to its Subcommittees:

1. **Objectives Evaluation Subcommittee;**
2. **Restorations Subcommittee** which co-ordinates the RAPs, point source impact zones, the phosphorous management plans and lake wide management plans, and
3. **Surveillance Subcommittee** which will review the implementation of the **Great Lakes International Surveillance Plan (GLISP)**; and
4. **Loadings and Sources Subcommittee** which will develop parts of GLISP including the loading and sources components as well as related data.

In addition, a **Great Lakes Science Advisory Board** was established to advise both IJC and the Water Quality Board on scientific matters. In the period 1987-1988 the Science Advisory Board changed its committee membership to enhance the use of integrated science in exploring ecosystem approaches to managing human uses of the Great Lakes Basin ecosystem. To fulfil its mandate, the Science Advisory Board has established four standing committees on Health, Society, Technology, and Ecology.

A **Council of Great Lakes Research Managers**, implemented within the framework of the Science Advisory Board, to enhance the ability of the Science Advisory Board and the IJC to provide effective leadership, guidance, support and evaluation of Great Lakes research programmes. In the past, the Council has completed a **RAP Research Needs Report**.

1.4. N.A.

- 1.5. The IJC is a binational organization which co-ordinates efforts between the governments of the U.S.A. and Canada. As such, it co-operates with the contracting parties and other individuals. On matters concerning the fisheries and other aquatic flora and fauna in the Great Lakes, the IJC co-operates with the Great Lakes Fisheries Commission.

IM  
INTEGRATED MONITORING  
(THE NORDIC COUNCIL OF MINISTERS)

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1.1. International Scientific Programme

1.2. Regional: Nordic Countries

1.3. The Integrated Monitoring (IM) projects are implemented under the auspices of the Working Group of Environmental Monitoring, which is supported by the Environment Committee of The Nordic Council of Ministers. The many programmes exist within the IM framework are fully co-ordinated. This is intended to stimulate the development of harmonized methods between the various laboratories and institutions. IM activities include projects in the fields of atmospheric deposition, soil water chemistry and ion fluxes in forests, groundwater monitoring in small catchments, soil chemistry and discharge measurements. Results of these projects are published.

1.4. Environmental data standardization and co-ordination is done by the Environmental Data Centre (EDC) in Helsinki, Finland according to guidelines set by the Environment Data Group of The Nordic Council of Ministers.

For additional information see EDC and INSTA entries.

1.5. Currently co-operative activities are primarily between the member states of The Nordic Council and their respective environmental institutions. However, the EDC is both responsible of Nordic and ECE-IMP (see IMP entry) IM project datasets. Consequently, there exists a substantial amount of co-operation between the U.N. system and The Nordic Council on this level.

**IMP**  
**INTERNATIONAL PILOT PROGRAMME on INTEGRATED**  
**MONITORING (UN-ECE)**

132

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1.1. International Scientific Programme

1.2. Regional: Europe

- 1.3. Established under the auspices of the Convention on Long-Range Transboundary Air pollution, the Pilot Programme began its activities in 1989. Sweden has been entrusted with the planning, co-ordination, and evaluation of this Programme. Programme activities will be reported, by Sweden, to the EMEP Steering Body and Working Group on Effects.

The main objectives of this Programme are the integrated determination and prediction of the state of ecosystems and their predicament under the influence of anthropogenic transboundary air pollutants. Monitoring will concentrate on the fields of air chemical analysis, precipitation, soil, soil water, groundwater, surface water, as well as monitoring aquatic and terrestrial biological factors within smaller catchments or hydrologically well-defined areas. Results will be used to assess evidence that biosphere ecosystems change according to the interaction between land-use, air pollution climate and climate factors.

- 1.4. The Nordic Environmental Data Centre in Helsinki, Finland has sole responsibility for storing, processing and analyzing data from the Integrated Monitoring Programme. (see EDC entry)

- 1.5. The Pilot Programme on Integrated Monitoring was, as the EMEP, established under the auspices of the Convention on Long-Range Transboundary Air Pollution. It can therefore be viewed as an integrated part of air pollution monitoring in Europe.

**INTEGRATED BIO-MONITORING SYSTEM  
(F.R.GERMANY)**

133

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**1.1. National Scientific Programme**

**1.2. National: F.R.Germany**

**1.3. This programme has not yet been implemented and is still in its initial stages. It stems from a proposal discussed by the Committee of Environmental Experts, the advisory body to the German Government and Federal Minister of the Environment, in March 1990. It is seen as an essential programme for several reasons:**

- 1. international responsibilities;**
- 2. the transnational transport of pollution;**
- 3. the necessary background for Federal environmental legislations;**
- 4. the need for environmental information systems and databases; and**
- 5. to harmonize environmental monitoring of the individual states (Länder) in the FRG.**

**Several components of the proposed programme have also been identified:**

- 1. a register of all components of a biomonitoring project (flora, fauna, etc.);**
- 2. a register of passive components of a biomonitoring system (biological zones);**
- 3. a register of experimental impacts;**
- 4. food chain and ecosystems monitoring; and**
- 5. representative areas for continual ecosystems research and monitoring.**

**Use will be made of the newest methodology and technology in implementing this programme. This includes strong links to satellite remote sensing capabilities, in particular those of the European Space Agency (ESA). In particular, use is to be made of ESA's remote sensing satellite ERS-1 which became operational in 1990.**

1.4. Information management is to occur on three levels: Regional, Federal and Internationally. At the Federal level information is to be stored by such database programmes as UMPLIS, LANIS and STABIS; which are all information systems aimed at environmental information. At the international level, this Programme will establish links to CORINE, the CEC's environment and natural resources information system. UNEP's Global Resource Information Database (GRID) should also be a key element within such a project (possibly via a German GRID node). Emphasis will be placed on storing information in GIS form to allow an integrated approach to the data management aspect of this programme.

1.5. This Biomonitoring Programme is based upon the efforts of both the Federal Ministry of Research and Technology (BMFT) and the Federal Ministry of the Environment, Nature Protection and Nuclear Safety (BMU). It will further co-operate with numerous organizations and programmes both within Germany and internationally. As this programme is still in its proposal phase, formal links have yet to be fully established.

**IPCC**  
**INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE**  
**(UNEP/WMO)**

134

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- 1.1. Intergovernmental Scientific and Expert Committee
- 1.2. Global
- 1.3. IPCC was established in 1988 after both Governing Bodies of UNEP and WMO adopted resolutions calling for such a body. Its specific tasks are:
  1. to assess the scientific information related to the various components of the climate change issue, such as emission of major greenhouse gases and their modification of the earth's radiation balance;
  2. to evaluate the environmental and socio-economic impacts of climate change;
  3. to formulate realistic response strategies for the management of the greenhouse issue;
  4. to promote, as quickly as possible, the full participation of the developing countries in IPCC activities.

In order to address these tasks more effectively, IPCC established three **Working Groups** and a **Special Committee on the Participation of Developing Countries**. The first Working Group was to address the scientific aspects of global climatic change with a focus on assessing the current level of knowledge. Working Group II was given responsibility for assessing the environmental and socio-economic impacts of climatic change. Working Group III was charged with developing policy responses and strategies. The Special Committee was to examine the ways and means of increasing the participation of developing countries in climate change studies and activities. The Working Groups have completed their reports which form the basis of the IPCC First Assessment Report.

- 1.4. N.A.

1.5. As an intergovernmental panel, the IPCC is responsible to the individual supporting nations and co-operates accordingly with them. Internationally, the majority of co-operation is between UNEP and WMO in implementing and maintaining the panel.

**ISLSCP  
INTERNATIONAL SATELLITE LAND SURFACE  
CLIMATOLOGY PROJECT  
(COSPAR/IAMAP/UNEP/WMO)**

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**1.1. International Scientific Project**

**1.2. Global**

1.3. ISLSCP was initiated in 1983 to promote and improve the interdisciplinary studies of land surface and climate system interactions. Specifically, research will focus on climate induced changes to land surfaces and climatically significant changes in land surfaces, regardless of their origin. Primary emphasis has been on the development and improvement of General Circulation Models (GCMs). It was also to study the climatic impact on land surfaces using satellite data analysis.

Key areas of research have been defined to organize ISLSCP's activities:

1. demonstrate usefulness of satellite information for the assessment of climate relevant changes at land surfaces;
2. specification of type, resolution and accuracy of information needed for studies and to improve the algorithms to derive this information from the primarily pixel-radiance measurements; and
3. to develop validation and calibration methods for direct surface measurements information inferred from satellite information.

One of the more important ISLSCP tasks is to acquire data, necessary for the refinement and testing of the reliability of parameterisation of the interaction between atmosphere and land surfaces. This requires that monitoring activities are functional on a continuous basis.

1.4. ISLSCP was initiated to promote and foster interdisciplinary research in the area of satellite remote sensing and to develop methods as well as models for deriving the quantitative information content of remotely sensed data.



1.5. In the future ISLSCP is planning to conduct research as part of ICSU's International Geosphere-Biosphere Programme (IGBP). It also works closely with the World Climate Research Programme's (WCRP) Global Energy and Water Cycle Experiment (GEWEX), and NASA's Global Change initiative under the ISY's Mission to Planet Earth (MTPÉ). Funding for ISLSCP activities is also provided by the Commission of the EC (CEC)

**ISOTOPES-IN-PRECIPITATION NETWORK  
(IAEA/WMO)**

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1.1. International Scientific Programme

1.2. Global

1.3. In 1958 the Isotopes-In-Precipitation Network was initiated by the IAEA in collaboration with WMO. In 1977, it was extended to fit within the framework of UNEP's Global Environment Monitoring System (GEMS). The initial objective of the programme was to collect systematic data on isotope content of precipitation on a global scale. In 1988, 80 Network stations were in operation, while another 82 nationally implemented stations contributed data. Approximately 50% of the collected precipitation samples are analyzed in the IAEA laboratories at Vienna.

Recently, the Project objectives have changed in view of global climatic change. Data is valuable for the verification and further improvement of global atmospheric General Circulation Models (GCMs) and other climatological investigations. Using such data should improve the understanding of what mechanisms control climatic conditions, thus making predictions of future climatic trends more reliable.

1.4. See Isotopes-In-Precipitation Network Database entry.

1.5. Apart from with the WMO, the central Network laboratory at the IAEA co-operates with many local and national institutions that either operate their own monitoring stations or network stations.

ISY  
INTERNATIONAL SPACE YEAR-1992

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1.1. International Co-operative Scientific Event

1.2. Global

1.3. The first initiatives for ISY were made by the late U.S. Senator S. Matsunaga, who proposed such an event in 1985, and NASA who sponsored the first ISY planning conference in 1988. Soon after, it was endorsed by such organizations as COSPAR, The International Astronautical Federation (IAF), ICSU and the U.N. General Assembly. ISY has three main objectives:

1. to enhance international collaboration among space agencies and among scientists on the global phenomena of the Earth's environment;
2. to enhance public awareness of the benefits resulting from space activities, in particular from spaceborne Earth observation data for scientific and applications research; and
3. to demonstrate the usefulness of space technology and its contributions to the better understanding of key problems of the environment on our planet.

Presently, the Space Agency Forum for ISY (SAFISY) has 28 members and 8 affiliates. To advise it on the different fields of expertise, SAFISY created three panels of experts:

1. Panel of Experts on Earth Science and Technology;
2. Panel of Experts on Education and Applications;  
and
3. Panel of Experts on Space Science.

In 1988, a Mission to Planet Earth (MTPE) was adopted by SAFISY members. It will be ISY's primary theme, with the Panel of Experts on Earth Science and Technology. The following is a list of MTPE projects with their lead participants:

- Global Consequences of Land Cover Change (France, USA);
- Enhanced Greenhouse Effect Detection Experiment (NASA with the participation of NOAA);

- Ocean-Climate Interrelationships (ESA);
- Polar Stratospheric Ozone (ISY Ozone Hole Project) (NASA and Germany);
- Productivity of the Global Ocean (Canada and the EC's Joint Research Centre (JRC) at Ispra, Italy);
- Global Tropical Forest Monitoring (Rate of Deforestation) (Brazil and JRC);
- Sea-Surface Temperature (U.K. and Japan);
- Polar Ice Extent (Japan and ESA);
- Global Change Encyclopedia (Canada with significant input from USA); and
- Global Change Atlas (Austria).

1.4. The collection and management of advanced spaceborne data and information is the focus of ISY's data activities. The Panel of Experts on Earth Science and Technology divided their data and information related work into three general categories:

1. **Space Data for Global Change (SDGC):** This is an overall category involving initiatives in the fields of the Global Consequences of Land Cover Change, Greenhouse Effect, Ocean-Climate Interrelationships, and Polar Ozone Holes.
2. **Global Information System Test (GIST):** This project aims to improve the efficiency of data exchange between sources. To do this a GIST was devised and implemented on four selected areas: the productivity of the global oceans, rate of deforestation, global sea surface temperature, and extent of polar ice.
3. **Global Change Outreach:** This project aims to provide the information from space related environmental observations to the widest possible audience. The "Global Change Encyclopedia" and a "Global Change Atlas" would serve this purpose. These are to be published by 1992.

In February, 1990 a meeting of the Panel of Experts on Education and Application held a major Conference on the training in applications of remote sensing. It was organised by the French Centre National d'Etudes Spatiales (CNES) and NASA with the participation of ESA.

1.5. ISY is a co-operative effort between national agencies, international organizations as well as of other affiliates and supporters. As such it is bringing together vast amounts of information from an equally large number of sources.

ITSU  
TSUNAMI WARNING SYSTEM IN THE PACIFIC (IOC)

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1.1. International Governmental Programme

1.2. Regional: Pacific

1.3. Established in 1968, ITSU consists of regional and national centres which take the responsibility for monitoring seismological and tidal stations and instruments around the Pacific Ocean to evaluate potentially tsunami genic earthquakes. The **Tsunami Warning Centre (PTWC)** near Honolulu is the headquarters of the **Operational Tsunami Warning System (OTWS)**. PTWC is responsible for determining the location of the earthquake epicentre and for issuing the tsunami watch, which tells the participants of the system about the possibility of a tsunami. When there is an indication of the existence of a tsunami, the PTWC issues a tsunami warning, alerting warning system participants to the approach of a potentially destructive tsunami. Tsunami Watches, Warnings and Advisory Bulletins are disseminated throughout the Pacific to member states in accordance with procedures outlined in the **Communication Plan for the Tsunami Warning System**.

Activities of the warning system participants are co-ordinated by an **IOC International Co-ordination Group** for ITSU, which meets every two years and is comprised of 24 member states from the Pacific.

1.4. Data collection occurs with emphasis on sea-level and seismic data. Data and information collection and dissemination is being carried out by and **International Tsunami Information Centre (ITIC)** maintained by IOC. ITIC is responsible, among other functions, for monitoring international tsunami warning activities in the Pacific and recommending improvements with regard to communications, data networks, data acquisition and information dissemination; for gathering and promulgating knowledge on tsunamis and fostering tsunami research and its application to prevent loss of life and damage to property.

1.5. ITSU co-operates closely with international organizations including ICSU (IUGG Tsunami Commission), IDNDR, UNDRO, IGOSS and GLOSS, as well as IAPSO.

**IWRB  
INTERNATIONAL WATERFOWL AND WETLAND  
RESEARCH BUREAU**

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1.1 International Scientific Organization

1.2. Global

1.3. IWRB was established in 1954, as an independent non-governmental organization, with a mandate to stimulate international co-operation for the conservation of migratory waterfowl and their wetland habitats. The Bureau pursues its mandate through research and monitoring programmes whose results are made available for conservation activities through conferences and workshops, publications and training programmes. IWRB has played an important role activities as the Ramsar Convention on the conservation of wetlands. IWRB activities are implemented by its three divisions:

1. **Waterfowl Division:** This division co-ordinates studies of the status and populations of waterfowl world-wide and promotes research into their ecological requirements and population dynamics. For the immediate future activities will include an International Waterfowl Census; Management and Recovery Plans for certain endangered waterfowl; publications including population statistics and annual report; workshops and symposia; as well as research groups.
2. **Wetlands Division:** This division aims to promote the preservation of wetlands through monitoring the status of wetlands, researching the functions, value and management of wetlands; holding on-site workshops and training courses; urging governments to safeguard wetlands; and further co-ordinating wetland research and conservation activities. Activities for the future will include the development of directories (see 1.4.); developing a Wetland Management Group to aid in such things as implementing a computer-based wetland management plan; a Wetland Site Management Group to collaborate with WWF and actions to submit inter-

-ventions on threatened wetlands; publications including Caribbean, Central American and East African Wetland Management Workshop Reports as well as an Asian Wetland Plant Handbook; workshops and symposia; and training courses in Eastern Africa, Papua New Guinea and Pakistan.

3. **Administrative Division:** This division aims to support to the governing bodies of IWRB as well as to the Waterfowl and Wetland Divisions and their collaborating bodies. Information and Publications are also handled through this division.

- 1.4. IWRB data are primarily collected and managed as part of the Waterfowl Division's **International Waterfowl Census** and the Wetland Division's **Directories**. The Census will be conducted in the Western Palaearctic, Asia, Africa and Neotropical Regions. Data will be computerized and, in particular, much will be placed in DBASE files.

As part of the Wetland Division's Directories a database on Ramsar sites in addition to a feasibility study on a European estuaries inventory.

- 1.5. IWRB co-operates with many international and national organizations and institutions. In particular, much work is done in collaboration with WWF and affiliated national groups.

Currently IWRB has some 40 Member Countries, including Australia, Canada, EC Member Countries, Finland, Hungary, Iran, Japan, Norway, Pakistan, Sweden, Switzerland, Tunisia, U.S.A., U.S.S.R. and Yugoslavia.



**MAB  
MAN AND THE BIOSPHERE PROGRAMME (UNESCO)**

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1.1. Intergovernmental Scientific Programme

1.2. Global

1.3. MAB was initiated by UNESCO to address problems relating to the conservation of resources, resources systems and human settlement development. Activities are proposed and implemented by MAB National Committees, who in turn are also responsible for co-ordinating these internationally. Currently, more approximately 100 countries are participating in the MAB Programme. Overall MAB activities are co-ordinated by an International Co-ordinating Council (ICC). In the period from 1975-1984, MAB concentrated on six key areas:

1. Coastal Areas and Islands;
2. Humid and Sub-Humid Tropics;
3. Arid and Semi-Arid Zones;
4. Temperate and Cold Zones;
5. Urban Systems; and
6. Biosphere Reserves.

These key areas were expanded in 1984 to include four new research areas involving the human dimension:

1. Ecosystem functioning under different intensities of human impact;
2. Management and restoration of human-impacted resources;
3. Human investments and resource use; and
4. Human responses to environmental stress.

MAB has organized these activities by developing Pilot Projects, Biosphere Reserves, Networks, Institutions and by providing appropriate training.

MAB **Biosphere Reserves** are of particular interest here. Biosphere Reserves are protected areas which serve to provide scientific knowledge, training and human values needed to support sustainable development. Currently, some 285 Reserves exist in 72 countries. Since 1983, the Action Plan on Biosphere Reserves has provided the ICC guidelines for choosing Biosphere Reserves. The Action Plan was the result of

the first International Biosphere Reserve Congress in Minsk, USSR which was sponsored by UNESCO and UNEP in co-operation with FAO and IUCN. Among other things, the Action Plan intends to bind these Reserves together as a Network. Such a Network is intended to promote voluntary co-operation as well as information and expertise exchange.

Although no formal programme exists for the development of institutions, two have been initiated by MAB and UNESCO. The first is the **Kenya Arid Lands Research Station (KALRES)**. Although it is currently a national centre for arid lands research, there are plans to convert it into a sub-regional research and training centre. The second institution is the **International Centre for Integrated Mountain Development (ICIMOD)** in Nepal. ICIMOD is involved in studying the options in developing the Himalayas in an ecologically sound fashion.

1.4. The **MAB Information System (MABIS)** has been established to provide continuously updated information on MAB activities.

1.5. Co-operation between MAB and other institutions is dependent on the specific activity. Co-operative activities with other international organizations is best presented this:

**Humid Tropics:**

- UNEP
- FAO Tropical Forestry Action Plan
- International Union of Forestry Research Organizations (IUFRO)

**Arid and Semi Arid Land:**

- UNEP
- U.N. Statistical Office (UNSO)
- FAO

**Urban Projects:**

- UNEP
- Habitat (UNCHS)
- IIASA (see IIASA Environment Program entry)
- International Federation of Institutes of Advanced Studies (IFIAS)

Within UNESCO, activities are co-ordinated with the International Hydrological Programme (IHP), Intergovernmental Oceanographic Commission (IOC), International Geological Correlation Programme (IGCP) and the Coastal Marine Programme (COMAR). MAB is also extensively involved in collaborating with ICSU's International Geosphere-Biosphere Programme (IGBP). MAB's implementation is a co-operative effort between UNESCO, IUCN, WHO and WMO as well as several others.

**MEKONG COMMITTEE**  
**INTERIM COMMITTEE FOR CO-ORDINATION OF**  
**INVESTIGATIONS OF THE LOWER MEKONG BASIN**  
(Lao PDR, Thailand, Viet Nam)

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1.1. International Scientific Programme

1.2. Regional: South-East Asia, Mekong River Basin

1.3. The Mekong Committee was established in 1957 during the 13 th session of the Economic and Social Committee for Asia and the Pacific (ESCAP) to address the comprehensive development of water resources and related resources in the Lower Mekong Basin. It primarily concentrates on areas such as hydroelectric power generation, irrigation, flood control measures, drainage, navigation improvement, agriculture, watershed management fisheries and water supplies as well as training programmes.

To ensure the maintenance of good water quality in the Lower Mekong Basin, a comprehensive and permanent monitoring network has been established. Water quality is to be regularly monitored, over the long-term, and a data storage and management system will be developed. Monitoring has focused on the river water, groundwater and rain water chemistry; sediment transport; biological factors such as faecal coliforms and streptococci and bottom feeders; and pesticides.

1.4. Currently, data are being collected from different areas including:

1. meteorological, hydrologic and hydrographic data;
2. geographical data;
3. economic and social data; and
4. environmental impact assessment.

These data will be used for river forecasting services such as floods, droughts, salinity intrusions and water quality; thematic mapping; as well as for project evaluations pollution and erosion control projects, monitoring activities, etc.

The Mekong Committee have developed and maintain databases for their activities including a **Hydrologic**

and Meteorologist Database (HMDB) and a Mekong Bibliographic Database (MBDB). In total, the databases currently contain about 5,100 records. The development of a Mekong Secretariat Socio-Economic Database (MSEDB) began in 1987 to collect Macroeconomic data about the three Member States. MSEDB is currently being overhauled by a group of local consultants.

- 1.5. In addition to co-operative efforts between the participating nations, the Mekong Committee is supported by UNDP and ESCAP. Projects were also initiated between the Committee and the EC to exchange information on the development of the Rhine and Mekong River Basins.

**REGIONAL SEAS PROGRAMME  
(UNEP OCA/PAC)**

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1.1. International Scientific Programme

1.2. Global

1.3. The UNEP Oceans and Coastal Areas/Programme Activity Centre is responsible for implementing and maintaining the Regional Seas Programme. Currently there exist ten individual programmes, each governed by corresponding Conventions and Agreements, referred to as **Action Plans**. The following is a list of the Action Plans, as well as the contributing institutions:

1. **Mediterranean Action Plan (MAP)** has several contributing institutions including the Co-ordinating Unit for MAP, Regional Activity Centre (RAC) for the Blue Plan (BP/RAC), the RAC for the Priority Actions Programme (PAP/RAC), the RAC for Specially Protected Areas (SPA/RAC), and the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC);
2. **Caribbean Action Plan** is co-ordinated by the Regional Co-ordinating Unit for the Caribbean Environment Programme;
3. **Kuwait Action Plan** operates in co-operation with the Regional Organization for the Protection of the Marine Environment (ROPME) and the Main Emergency Mutual Aid Centre (MEMAC-ROPME);
4. **West and Central African Action Plan (WACAF)** is to be established in 1991 and will be co-ordinated by the Regional Co-ordinating Unit for WACAF;
5. **South-East Pacific Action Plan (SEPCF)** is co-ordinated by the Regional Co-ordinating Unit for SEPCF;
6. **Gulf of Aden and Red Sea Action Plan** is maintained by the Secretariat of the regional Environment Programme for the Red Sea and Gulf of Aden;
7. **South Pacific Action Plan (SPREP)** is organized by the SPREP Secretariat;
8. **East Asian Seas Action Plan** is co-ordinated by the Association of Southeast Asian Marine Scientists (ASEAMS); as well as

9. South Asian Seas Action Plan and
10. Eastern African Action Plan which are both under the direct mandate of UNEP's Director General.

To work on an scientific justification for an integrated global ocean monitoring programme, OCA/PAC initiated the Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP). This will be of importance to monitoring programmes, because this should be a first attempt to interconnect marine biology, geology, chemistry and physical oceanography.

- 1.4. Each programme collects and manages its own data, according to its own criteria. Results are published by OCA/PAC.
- 1.5. The Regional Seas Programme are implemented with the help of the concerned nations. In addition, UNEP also collaborates with such international organizations as the UN Economic Commissions for each region, FAO, IAEA, IOC, IMO, UNESCO's Man and the Biosphere Programme (MAB), UNDP, UNIDO, WHO, WMO as well as many others.

**SCOPE**  
**SCIENTIFIC COMMITTEE ON PROBLEMS OF THE**  
**ENVIRONMENT (ICSU)**

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1.1. International Non-Governmental Programme

1.2. Global

1.3. SCOPE was first established by ICSU in 1969 with a mandate to prepare a report on global environmental monitoring for the 1972 Stockholm Conference on the Human Environment. It deals with scientific problems that have global significance for the world environmental scene. Since its beginning, SCOPE has greatly expanded its activities, which it has currently organised into four main cluster areas. Each cluster has been given different priorities.

1. **Sustainable Development:** focuses on projects in phosphorous cycles, groundwater contamination, sea level rise and subsiding coastal areas, the use of scientific information for sustainable development, biogeochemistry of small catchments, and sustainable agriculture.
2. **Biogeochemical Cycles:** has projects in trace gas exchange, sulphur, metals, particle flux in the ocean, and cycles interactions in continental seas.
3. **Global Change & Ecosystems:** sponsors studies in organic matter budgets, ecotones, ecosystem experiments, long-term ecological research, UV radiation effects, genetically modified organisms and biodiversity.
4. **Health & Ecotoxicology:** has programmes including ecotoxicology, safety of chemicals, and health effects of climate change.

SCOPE itself does not directly engage in primary research, instead focusing on synthesizing existing information, organizing balanced appraisals and pointing out more important research needs.

1.4. N.A.

1.5. In the past, SCOPE has published joint reports with both UNESCO's Man and the Biosphere (MAB) programme and the International Union of Biological Sciences (IUBS). SCOPE also co-operates closely with UNEP, as well as the CEC and the WHO, with which it has co-sponsored a joint programme on chemical safety called SGOMSEC.



**SPREP POL**  
SOUTH PACIFIC REGIONAL ENVIRONMENT PROGRAMME-  
MARINE POLLUTION PROGRAMME (SOUTH PACIFIC  
ISLAND NATIONS)

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1.1. International Scientific Programme

1.2. Regional: South Pacific

1.3. SPREP POL is a regional programme which was initiated and is maintained by governments of South Pacific Island nations. In January, 1989 a panel of scientific experts on the pollution of the South Pacific concluded that the four major environment problems were the destruction of coastal ecosystems; lowering of water quality; changing ocean processes and properties; as well as climate change and sea level rise. The first three, are problems which can directly be addressed by the island governments. In addition, several sources for the first three problems were also identified:

1. disposal of domestic wastes (sewage and solid waste);
2. disposal and management of non-domestic waste;
3. increased sedimentation due to land use changes, mining and construction;
4. coastal development activities, such as gravel extraction;
5. over-exploitation of living marine resources; and
6. natural disasters.

To address the problems of pollution various monitoring and research activities have been implemented including:

Monitoring Activities:

1. ocean processes and properties such as circulation patterns, thermal structure, salinity distribution, nutrient fluxes, etc.;
2. heavy metals, especially mercury, cadmium, lead and tin levels;
3. pesticides levels, especially of organochlorine pesticides;
4. sewage related parameters including the problems of increased nutrients and microbiological contamination; and

5. other pollutants such as hydrocarbons and detergents.

Research Activities:

6. preparation of a regional status report on land-based pollutants entering the marine environment;
7. study of the role of sedimentation in marine pollution;
8. development of a circulation model for the main Southwest New Caledonia lagoons; and
9. review of the Guam EPA coastal water pollution monitoring programme (1978-88).

These projects were implemented with several long term objectives in mind and the ultimate goal of gaining comprehensive as well as consistent information and data which can be implemented in the development of a sustainable economic and social base.

- 1.4. Data varies from island to island and institution to institution in terms of quality. As part of its long term objectives SPREP POL intends to collect a consistent and comparable time-series of data on the state of the marine environment in the South Pacific. As part of UNEP's Regional Seas Programme (see entry), SPREP POL will ensure data quality, by implementing the use of relevant reference methods for marine pollution studies. This includes regional and global intercalibration and data quality control exercises.
- 1.5. SPREP POL co-operates with UNEP's Regional Seas Programme in implementing its activities and is seen as the South Pacific Region's contribution to the Programme and the Global Environmental Monitoring System (GEMS). Co-operative efforts are also being discussed with the South East Asian Seas Programme in terms of sharing data and relevant evaluations.

**SWMTEP  
SYSTEM-WIDE MEDIUM-TERM ENVIRONMENT  
PROGRAMME (UNEP)**

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1.1. International System Co-ordinating Programme

1.2. Global

1.3. SWMTEP was established by the UNEP Governing Council in March 1988 as a planning tool for all environment related activities within the U.N. system for the period of 1990 to 1995. It was intended to reflect the interconnectedness of environmental problems and specifically to:

1. advance the understanding of sustainable development as well as related problems;
2. define the complementarity of the environmental goals and policies of the UN system;
3. present an overall strategy for the allocation of funds from the UNEP Environment Fund;
4. define and co-ordinate co-operative efforts and relation between UN system activities;
5. define methods for increasing efficiency and effectiveness; and
6. enable monitoring of evaluation of system as a contribution to improving it.

1.4. see ACCIS database entry

1.5. SWMTEP was developed by UNEP in co-operation with other organizations, in particular UNESCO, which contributed extensively in its preparation. SWMTEP co-operates with most environment programmes within the UN system. In particular, it collaborates with the Advisory Committee for Co-operation (ACC) which has been given the mandate to co-ordinate activities within the UN system.

**WCP  
WORLD CLIMATE PROGRAMME  
(WMO/ICSU/UNEP/UNESCO)**

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**1.1. International Scientific Programme**

**1.2. Global**

**1.3. WCP was initiated as a result of the (first) World Climate Conference held in 1979. It has been maintained by decisions of the four-yearly Congresses of WMO held in 1983, 1987 and 1991. The current structure of WCP as adopted by the Eleventh Congress (May 1991) taking into account the recommendations of the Second World Climate Conference (1990) includes the following four sub-programmes:**

- 1. World Climate Data and Monitoring Programme (WCDMP):** see entry.
- 2. World Climate Applications and Services Programme (WCASP):** To promote the application of climate information and knowledge in selected special fields of activity such as those relating to food, water, energy, urban planning and construction, etc.
- 3. World Climate Research Programme (WCRP):** see entry.
- 4. World Climate Impact Assessment and Response Strategies (WCIRP):** To study the economic and social impacts of predicted climate changes and to develop related policy options and responses.

**1.4. see WCDP entry**

**1.5. WMO as the lead agency, provides for the overall co-ordination of the WCP as well as for the WCDMP and WCASP. The United Nations Environment Programme (UNEP) is responsible for the WCIRP; the WCIRP is being jointly implemented by the International Council for Scientific Unions (ICSU) and WMO; IOC offered to become a sponsor to the WCRP. The Executive Heads of these and other organizations involved such as the Food and Agriculture Organization, the World Health Organization and the United Nations Development**

Programme meet regularly to ensure co-ordination of all inter-agency climate activities. Co-operation with major international programmes such as the International Geosphere-Biosphere Programme is to be extended as the programme develops further. Co-ordination of activities on the climate change issue involves overall co-ordination of the WCP mentioned above, public information aspects and support to intergovernmental mechanisms such as the WMO/UNEP Intergovernmental Panel on Climate Change, and to the development of international agreements on climate and its protection, such as Framework Convention on Climate Change (FCCC) that is developed through the Intergovernmental Negotiating Committee for the FCCC.

WATER

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1.1. International Scientific Programme

1.2. Global

1.3. WATER was established by the World Climate Programme (WCP) to research the effective use of climate data and information in planning and operating water-resource systems as well as the use of hydrological data in climate-related studies. Several projects have been implemented, in co-operation with other international organizations and institutions, under the following six areas:

1. Studies of hydrological data in the context of climate variability and change;
2. Modelling of hydrological cycles;
3. Application of climate information in the planning, design and operation of water-resource systems;
4. Studies of the influence of climate change and variations of water resources.
5. Climate impacts on society through water resources; and
6. Humankind's influence on climate through its activities.

1.4. N.A.

1.5. WCP-WATER's activities are planned under the auspices of WMO and UNESCO. These are then implemented jointly or separately by FAO, IAHS, IIASA, ICSU, UNEP, UNESCO and WMO as well as with WMO and UNESCO National Member governments and institutions.

WCP  
WORLD CLIMATE PROGRAMME (WMO)

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WCRP  
WORLD CLIMATE RESEARCH PROGRAMME  
(WMO/ICSU/UNESCO)

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1.1. International Scientific Programme

1.2. Global

1.3. The WCRP was initiated in 1980 by the WMO and ICSU as a follow-up to the Global Atmospheric Research Programme (GARP). Its primary objectives are to determine whether or not climate can be predicted and the extent of anthropogenic influences on climate. In order to best pursue these goals, the WCRP initiated a number of projects and experiments, including:

1. Tropical Oceans and Global Atmosphere (TOGA) programme;
2. World Ocean Circulation Experiment (WOCE);
3. Global Energy and Water Cycle Experiment (GEWEX);
4. Global Precipitation Climatology Project (GPCP); and
5. International Satellite Cloud Climatology Project (ISCCP).

Together these projects and experiments should allow the WCRP to gain an improved understanding of climatological processes as they relate to anthropogenic influences on them.

1.4. Climate research data is primarily managed by ICSU's World Data Centres. ISCCP, though, has its data collected, digitized and managed by the U.S. National Oceanographic and Atmospheric Administration's (NOAA) National Climate Data Centre in Washington, D.C.

1.5. As part of the WCP, the WCRP is automatically a component of an inter-organizational effort to develop an understanding of the global atmosphere. Co-operation has been organized with ICSU's International Geosphere-Biosphere Programme (IGBP), particularly in the fields of biospheric aspects of the hydrological cycle and global atmospheric modelling.

1.1. International Scientific Programme

1.2. Global

1.3. In 1967, the International Commission on Snow and Ice (ICSI) established the Permanent Service on the Fluctuations of Glaciers (PSFG). The PSFG compiled and standardized data of glacial fluctuations. In 1976, ICSI then established the World Glacial Inventory (WGI) in co-operation with WMO and within the framework of the UNEP Global Environmental Monitoring System (GEMS). WGI studies were designed to serve as a baseline for the long-term monitoring of glacial behaviour in various climatic regions. First results were published in 1988 and provided details of the extent of the world's ice as recorded at more than 750 glaciers in 21 countries.

In 1986, these two ICSI components combined to form the World Glacial Monitoring Service (WGMS). WGMS is now located at the facilities of the Swiss Federal Institute of Technology (ETH).

1.4. In the recent past, particular attention has been given to monitoring and assessing glacial mass balances. Mass balance is seen as the difference in water equivalent between accumulation and ablation averaged over the surface area of the glacier. Such measurements serve as a general index for glacial systems and are valuable in analyzing and evaluating glacial fluctuations and run-off. More recently, this information is being used to monitor climatic change. In 1989, WGMS published a **WGI Status Report** of existing perennial ice and snow masses. The report contained information on issues including:

1. global trends in alpine glaciers, from 1960-present;
2. trends in continental snow cover for the northern hemisphere;
3. trends in the duration of snow cover in the Arctic tundra; and
4. trends in sea-ice extent, Arctic and Antarctica.



1.5. WGMS is a co-operative effort between the sponsoring organizations which are the International Commission on Snow and Ice (ICSI), the International Association for Hydrological Sciences (IAHS) as well as UNEP, UNESCO and the Swiss Federal Institute of Technology (ETH).

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1.1. International Scientific Programme

1.2. Global

1.3. WWW was initiated by the Fourth World Meteorological Congress in June 1963. It was the first attempt to collect and analyze weather and environmental information on a world-wide scale through a fully integrated system taking full advantage of technological developments in the space-based observing and communications systems. WWW comprises observing systems on land, sea, in the air and in outer space, and advanced data processing centres operated by WMO member states. The main objectives of WWW are:

1. to make available world-wide, on a real-time basis, meteorological and related geophysical and environmental information needed for socio-economic development; and
2. to build up and make accessible compatible data banks of digitized meteorological and environmental data (non-real-time applications).

To realize these objectives, the WWW has three key components:

1. The Global Observing System (GOS), consisting of facilities and arrangements for monitoring activities at stations on land and sea, from aircraft, satellites and other platforms;
2. The Global Data-Processing System (GDPS), consisting of meteorological centres which process required observational data (real-time applications) and for the storage and retrieval of data (non-real-time applications); and
3. The Global Telecommunications System (GTS) consisting of telecommunication facilities and arrangements necessary for the rapid dissemination of observational data and processed information.

Currently, GOS includes about 9,500 land stations; 7,500 mobile ship stations; 3,000 aircraft stations; 250 buoys; 200 background pollution monitoring stations; and several polar-orbiting and geostationary satellites providing meteorological and other environmental observations. The GDPS and GTS components operate at present through a system of three World Meteorological Centres (WMCs), 26 Regional Specialized Meteorological Centres (RSMCs), 30 Regional Telecommunications Hubs (RTHs), and about 160 National Meteorological Centres (NMCs), linked together by a data transmission network.

- 1.4. Data is collected, managed and exchanged by the GDPS. At the same time, the INFOCLIMA system provides a referral service to these data. The Catalogue of Meteorological Data for Research, provides an inventory of data held by GDPS centres. The information provided by the WWW system consists of:

1. basic meteorological, hydrological, oceanographical and other environmental data, stored in numerical code, for various applications;
2. weather analysis, warnings and forecasts for general purposes and for many types of specialized activities, such as agriculture, shipping, fishing, transportation, hydrology, water management, industry and recreation.
3. warnings against natural disasters caused by meteorological phenomena, particularly tropical cyclones.

To maintain its system, WWW has a number of support facilities including Data Management, System Support Activity as the Operational Information Service (OIS) which collects and distributes information made available within the WWW system.

- 1.5. The technical co-ordination of the WWW is carried out by the WMO Commission for Basic Systems and by the WWW Department of WMO. The collection of information is done through operational facilities operated by WMO members as part of the WWW system. Information is distributed to a wide variety of users. This includes, for example, the Red Cross and Red Crescent in emergency situations.

**2. DATA & INFORMATION SYSTEM PROGRAMMES**

ACRONYM  
PROGRAMME NAME (SPONSORS)  
ADDRESS

REF. NO.

2.1. TYPE OF PROGRAMME

2.2. PROGRAMME OBJECTIVES

2.3. DATA MANAGEMENT

2.4. AFFILIATED MONITORING PROGRAMME

2.5. CO-OPERATION

ACCIS  
ADVISORY COMMITTEE FOR THE CO-ORDINATION OF  
INFORMATION SYSTEMS (ACC)

201

SECRETARIAT  
PALAIS DES NATIONS  
CH-1211 GENEVA 10  
TELEFAX: +41 22 740 12 69

2.1. International Information Co-ordinating System

2.2. ACCIS was established by the Advisory Committee on Co-ordination (ACC) in 1983. ACCIS aims to facilitate access by Member States to United Nations information and to promote the improvement of the information infrastructure of the United Nations system. Its activities help to ensure a more efficient operation of planned or existing UN information systems and services by enhancing the capacity of the UN system to collect, store, retrieve and disseminate information.

2.3. ACCIS has produced several publications containing environment related information including:

1. Directory of United Nations Databases and Information Services (DUNDIS), which provides information on 872 computerized databases and information services managed by 39 UN bodies and organizations;
2. Directory of United Nations Serial Publications, which contains bibliographic and ordering information on approximately 4,000 serial publications produced within the UN system;
3. Register of development Activities of the United Nations System, published annually from 1988, consists of descriptive and financial information on all activities funded or executed by organizations of the UN system in support of economic and social development; and the
4. ACCIS Guide to United Nations Information Sources on the Environment, produced in collaboration with the Programme Activity Centre of the International Environmental Information System (INFOTERRA PAC, see entry) of UNEP, is a comprehensive guide to a wide range of sources on the environment which are available within the UN system.

2.4. N.A.

2.5. ACCIS is a co-ordinating body and works directly with all participating United Nations organizations.

ACSAD  
ARAB CENTRE FOR THE STUDIES OF ARID ZONES AND  
DRY LANDS (ARAB LEAGUE)

202

P.O. BOX 2440  
DAMASCUS  
SYRIA  
TELEPHONE: +963 11 755 713

2.1. International Scientific Centre

2.2. In the collection of data, ACSAD has placed emphasis on the compilation, management, and dissemination of water data. Consequently, ACSAD has established:

1. the ACSAD Water Resource Data Bank
2. the Hammad Basin Water Resource Data Bank and
3. the Water Resource Documentation Centre.

Large quantities of data have also been collected relating to agricultural and animal production in the Arab nations. These are part of an attempt to integrate arid lands development efforts and the prevention of further desertification.

2.3. Data is primarily collected and managed through the use of field survey equipment, air photos, agro-meteorological stations and computerized storage and evaluation capabilities.

2.4. see ACSAD monitoring programme entry.

2.5. ACSAD primarily collects and manages its own data. Information, however, flows from both participating nations to ACSAD and vice versa. As such, ACSAD is attempting to integrate development efforts between itself and national programmes.

**ASFIS**  
**AQUATIC SCIENCES AND FISHERIES INFORMATION**  
**SYSTEM (FAO/IOC/OALOS)**

203

FISHERIES INFORMATION, DATA AND STATISTICS SERVICE  
FISHERIES DEPARTMENT/FAO  
VIA DELLE TERME DI CARACALLA  
ITALY-00100 ROME  
TELEFAX: +39 6/679 9563

2.1. International Information System

2.2. ASFIS was established in 1971 as an abstracting/indexing service and information centre. It is sponsored co-operatively by the FAO, UNESCO's Intergovernmental Oceanographic Commission (IOC) and the UN Office for Ocean Affairs and the Law of the Sea (OALOS). Internationally, ASFIS provides a range of products, services and standards on subjects including aquaculture, fishery, littoral zones, the marine environment, oceanography and water pollution. At a national and regional level ASFIS aims to catalyze local identification of specific information needs and efforts to build-up information services and personnel with the help of funding agencies.

2.3. The principal global product of ASFIS is the **Bibliographic Data Base-Aquatic Sciences and Fisheries Abstracts (ASFA)**. ASFA is produced by a network of the three ASFIS sponsors, UNEP, 12 Member States, and a commercial publisher. The database contains some 400,000 references to scientific literature collected since 1975 and is available on numerous online information retrieval services, on magnetic tape, and on CD-ROM (entries since 1982). About 3000 new references are added each month. A journal in three sections appears monthly on these updates and there are specialized journals for Aquaculture and Biotechnology. ASFIS is also involved in other activities including:

1. a **Reference Series** which sets bibliographic standards widely used in aquatic information management and by ASFA itself; and
2. **Current Awareness Services** which include Freshwater and Aquaculture Contents Tables, Marine Science Contents Tables and a list of scheduled meetings.

2.4. N.A.



2.5. ASFIS was founded as a collaborative effort between the sponsor organizations and member states. There is also developing collaboration with other international governmental and non-governmental organizations such as UNEP, the Helsinki Commission (HELCOM), the Southeast Asia Fisheries Development Centre and the International Association of Aquatic and Marine Science Libraries and Information Centres.

**BALTIC  
BALTIC MARINE ENVIRONMENT BIBLIOGRAPHY  
(HELSINKI COMMISSION)**

204

BALTIC, LIBRARY AND DOCUMENTATION SECTION  
SWEDISH ENVIRONMENTAL PROTECTION AGENCY  
BOX 1302  
S-171 85 SOLNA, SWEDEN  
TELEFAX: +46 8 292 382

- 2.1. International Database Programme
  
- 2.2. The Baltic Marine Environment Bibliography has been produced by the Baltic Marine Environment Protection Commission (Helsinki Commission HELCOM) since the 1970's. An online version of the bibliography, database BALTIC, was established in 1987. BALTIC contains 4100 references to documents published since 1980. The database is updated 1-2 times per year and the annual increase is about 500 references. All aspects of the Baltic Sea area are covered, for example ecology, fauna and flora, fisheries, hydrography, pollution, environmental impact, research planning, and administrative measures.
  
- 2.3. Baltic is a computerised database which is available online through the Swedish Environmental Protection Agency and the host service Dafa Data AB. Two retrieval languages, one of which consists of ISO commands, can be used, either alone or in combination. Up till 1990 the Baltic Marine Environment Bibliography was also published on computer output microfiche.
  
- 2.4. Monitoring and assessment activities in the Baltic Sea area are one of the responsibilities of HELCOM. HELCOM was established by the states bordering the Baltic Sea to prevent and abate all forms of pollution and to protect and enhance the marine environment of the Baltic Sea area. According to the Ministerial Declaration in 1988, the contracting parties agreed to reduce discharges from point sources, such as industrial installations and urban waste water treatment plants in order to reduce 50 per cent of the total discharges as soon as possible but not later than 1995.

2.5. Denmark, Finland, Germany, Poland, Sweden and the USSR contracting parties of the Helsinki Commission and co-operate in collecting, cataloguing and indexing relevant reports, journal articles, books, conference documents, dissertations etc. As contracted by the Commission, the bibliography (database BAL TIC) is compiled by the Technical Research Centre of Finland and made publicly accessible online by the Swedish Environmental Protection Agency.

**CODATA  
COMMITTEE ON DATA FOR SCIENCE AND TECHNOLOGY  
(ICSU)**

205

SECRETARIAT  
51 BOULEVARD DE MONTMORENCY  
F-75016 PARIS  
TELEFAX: +33 1 63 05 53

**2.1. International Data Management Committee**

2.2. CODATA is a scientific committee of the the International Council of Scientific Unions (ICSU). It was implemented to address data quality and utilization on an international level. In this respect, CODATA was given several general objectives:

1. to improve data quality and accessibility, as well as the collection, management, and analysis methodology;
2. to facilitate international co-operation among those collecting, managing and using data; and
3. to promote an increased awareness in the scientific and technical community of the importance of these activities.

In order to address and achieve these objectives, CODATA initiated several projects, including:

1. co-ordinating multinational projects;
2. establishing format standards to promote compatibility of databases;
3. developing guidelines for the presentation of data in the primary literature;
4. training and educational programmes; and
5. Organizing conferences and workshops.

2.3. Only recently CODATA has begun formally addressing environmental data in a comprehensive fashion. To date, it has been concerned with all types of quantitative data collected from a wide varitey of monitoring sources and disciplines. The following is a list of current CODATA projects and a brief description of each:

1. **Hybridoma Data Bank:** This is a joint project with the International Union of Immunological Societies (IUIS) which provides information on hybridoma characteristics;

2. **Chemical Thermodynamic Tables:** This is a standardized, computer based mechanism for the collaboration of thermodynamic data centres in five countries;
3. **CODATA Referral Database (CRD):** The CRD provides an automated international compilation of records describing numerical data sources in science and technology;
4. **Fundamental Physical Constants:** A Task Group of physics and metrology experts is responsible for maintaining this database of fundamental constants which are generally accepted; and
5. **Biological Macromolecules:** This project is addressing the improved co-ordination of protein and DNA sequence data compiling institutions.

2.4. N.A.

2.5. CODATA co-operates extensively with a wide variety of organization including international scientific unions, UNESCO, OECD, EC, WHO, UNEP, and national scientific bodies.

**CORINE**  
**CO-ORDINATION OF INFORMATION ON THE ENVIRONMENT**  
**(CEC)**

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DG XI ENVIRONMENT, NUCLEAR SAFETY AND CIVIL PROTECTION  
AGENCY TASK FORCE  
RUE DE LA LOI 200  
B-1049 BRUXELLES  
TELEFAX: +32 02 235 01 44

**2.1. International Information Co-ordinating Network**

**2.2. CORINE was established in June 1985 by the European Community's Council of Ministers. It was given three main objectives:**

1. gather information on the state of the environment, for use in priority Community applications;
2. co-ordinate national initiatives taken by Member States, and to improve information at the international level; and
3. ensure the consistency of nomenclatures, definitions, etc., as well as creating the conditions necessary to compare data.

All three objectives were intentionally seen as interdependent. Within this framework, there were defined a number of priority areas, including the protection of biotopes, combatting local and transboundary air pollution and to preserve the environment of the Mediterranean region.

**2.3. The CORINE Information System has three components:**

1. projects (air pollution, biotopes, coastal erosion, land cover, marine environment, soil erosion/quality, and water resources;
2. data collected under EC Legislation; and
3. basic data required for analysis and presentation of results.

These components aim to provide the information requirements of the objectives. The associated data sets and information have been organized within two broad areas:

1. the compilation of environmental data and the development of a Geographical Information System (GIS) on the state of the environment in Europe; and
2. the improvement of consistency, comparability, and availability of environmental data. This is

to be addressed by developing standards for the collection, handling and management of environmental data.

The essential component of this system is its integration. In other words, information from various sources must be made intercompatible. The ARC/INFO system contains modules which will allow the conversion between commonly used projections. Once fully developed, this system will be similar in nature to UNEP's Global Resource Information Database (GRID).

2.4. see EEA entry.

2.5. CORINE co-operates extensively with other organizations and programmes. The following is a list, organized by environmental media, which shows some of the groups with whom CORINE co-operates:

Biotopes: Council of Europe  
IUCN and others

Air: OECD air pollution inventory  
EUROTRAC  
IIASA and others

Marine: EUROMAR  
OSPARCOM  
ICES  
MAP and others

Climate: WMO

**DESIS**  
**DESERTIFICATION INFORMATION SYSTEM (UNEP-DC/PAC)**

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INFORMATION AND DATABASE UNIT  
UNEP-DESERTIFICATION CONTROL/PROGRAMME ACTIVITY CENTRE  
P.O. BOX 30552  
NAIROBI, KENYA  
TELEFAX: +254 2 52 07 11

**2.1. International Information Co-ordinating System**

2.2. Since the adoption of the 1977 Plan of Action to Combat Desertification, efforts to address the problems of desertification have increased dramatically. As a result of increasing amounts of data from remote sensing and other monitoring activities, the Desertification Control/PAC has developed DESIS. DESIS is an information resource centre offering services encompassing agriculture, environmental degradation, food and natural resources within the context of desertification.

2.3. As part of its mandate, DESIS is developing and maintaining several databases including:

1. **Activities on Wind Effect and Techniques to Wind Erosion Control (ACWIND):** This database offers approximately 200 items encompassing climate, land use, soils and wind.
2. **Desertification Library (DELI):** This database was initiated in 1987 and currently contains over 1,200 items encompassing agriculture, desertification, environment, food and natural resources.
3. **Desertification Mailing List (MAIL):** This database currently contains over 3,000 items and is currently being developed as a referral service.
4. **Desertification Thesaurus (KEYS):** This database is currently being developed as a controlled vocabulary reference service.
5. **Directory of Organizations Dealing with Desertification Control and Dryland Development (DIOR):** This database was initiated in 1985 and developed as a referral service.
6. **Network of Researchers and Institutions Dealing with Wind Erosion (REWIND):** This database is currently being developed as a referral service.
7. **Query/Response Database (Q/R):** This database is currently in the planning stage and will function as a factual and referral service.



8. **UN Compendium on Dryland Development and Desertification Control Projects (PROCOM):** This Compendium was established in 1987 as a factual and full text database.
9. **UNEP Desertification Control Projects (DEPRO):** This database was established in 1987 and currently contains some 62 entries; it is continuously updated.
10. **Worldwide Documentation on Wind Erosion Control (BIWIND):** This database contains over 5,700 items, but is still considered in the developing stage of becoming a bibliographic service.

All databases are stored on Compaq 386 computers using CDS/ISIS software. Information is available to all UN institutions as well as to external users in most cases.

2.4. N.A.

2.5. DC/PAC co-operates extensively with organizations outside of UNEP. In particular, emphasis is placed on co-operating with institutions in Africa, including AMCEN.

**EDC**  
**ENVIRONMENTAL DATA CENTRE (FINLAND)**

P.O. BOX 250  
SF-00101 HELSINKI  
FINLAND  
TELEFAX: +358 0 731 4280

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**2.1. International Scientific and Data Centre**

2.2. The EDC was established as a unit of the Finnish National Board of Waters and the Environment (NBWE) in 1988. Its steering is divided between the NBWE, the Finnish Ministry of the Environment, the UN-ECE and the Nordic Council of Ministers. In particular, it has become an integral part of the UN-ECE International Pilot Programme on Integrated Monitoring. In this regard, the EDC functions as the Central Integrated Monitoring Data Bank and Management System.

2.3. Data are collected by **National Focal Centres (NFCs)**, who then send these to the EDC. Sampling, analysis and reporting are done according to manuals prepared by the EDC. Consequently, quality assurance can be controlled to a great extent. The responsibility for data quality lies primarily with the NFC. The importance in the EDC is its work for the development and maintenance of uniform and centralized data bases. As such, it provides the basis for an integrated network of nationally collected data. The EDC has access to an extensive network of computer hardware and software. This is provided by NBWE resources, other Finnish sources as well as international ones. These form an integral part of the EDCs modelling, GIS, Remote Sensing and other computerized information management system capabilities.

2.4. See International Pilot Programme on Integrated Monitoring (IMP) entry.

2.5. Although established nationally, the EDC is primarily engaged in work international in scope. Not only does it function as part of the UN-ECE IM Programme, but the EDC also collects data for the UNEP GRID (see entry) network.

ADENAUER ALLEE 214  
D-5300 BONN 1  
GERMANY  
TELEFAX: +49 228-2692-250

## 2.1. International Legal Information System

2.2. In accordance with the IUCN's Environmental Law Programme, ELIS was established to provide information on existing legal instruments and literature on both national and international levels. Specifically, ELIS is a bibliographic and factual data and information system. The broad subject categories included in ELIS are: soils, water and seas, hazardous substances and wastes, noise, fauna and flora, protected areas, hunting and fishing, forestry, land-use and planning as well as other related information. Currently, ELIS contains:

1. 35,035 laws and other legal documents;
2. 42,420 literature references;
3. 492 supranational legal documents (eg. EC Guidelines);
4. 1,006 international treaties and agreements;
5. 11,726 faunal species; and
6. 3,667 floral species.

This collection has an annual growth rate of approximately 5000 documents. Information is primarily from and regarding European environmental activities.

2.3. Currently, ELIS databases are operated on an IBM/38 mainframe using Romulus software developed specifically for ELIS. ELIS is not yet available on an On-line basis. Information, however, will be retrieved by IUCN upon demand for a minimum base price of DM 50.--. Keyword and Descriptor searches can be carried out by IUCN in English, French, German, Spanish, Italian, Dutch and Danish.

2.4. The Environmental Law Programme is not involved in actual environmental monitoring or research, but monitors and co-ordinates legal activities related to the environment.

2.5. The Environmental Law Programme is supported by institutions including the Karl Schmitz-Scholl Fond, the Swedish International Development Authority, the Royal Norwegian Ministry of Development Co-operation, the Finnish International Development Agency, Germany, and the EC.

**ENREP/ENDOC**  
**ENVIRONMENTAL RESEARCH PROJECTS / ENVIRONMENTAL**  
**INFORMATION AND DOCUMENT CENTRES (CEC)**

210

CEC, DG XIII  
RUE DE LA LOI 200  
B-1049 BRUXELLES

- 2.1. International Database Programmes
- 2.2. ENREP and ENDOC were established in 1980 by the Commission of the European Communities (CEC). They contain information on environment related projects within the bounds of the European Community. This two tiered Database contains over 30,000 datasets of EC Environmental Research Projects and Environmental Information and Documentation Centres. Both are updated quarterly with inputs from the CEC and its national member states.
- 2.3. ENREP and ENDOC are computerised databases which provide information free of charge. ENREP uses the **Multilingual Descriptor System** to provide information in six of the official languages of the EC, namely French, English, German, Danish, Italian and Dutch. Both ENREP and ENDOC are available On-line. The Databases are available on the European Commission Host Organization (ECHO) using the retrieval language CCL-GRIPS/DIRS.
- 2.4. N.A.
- 2.5. ENREP and ENDOC were developed and are maintained by the CEC in collaboration with its National Member States.

**ENVIS  
ENVIRONMENTAL INFORMATION SYSTEM  
(THE WORLD BANK)**

211

ENVIRONMENTAL OPERATIONS AND STRATEGY DIVISION  
ENVIRONMENTAL DEPARTMENT, THE WORLD BANK  
1818 H STREET, N.W.  
WASHINGTON, D.C., 20433  
U.S.A.  
TELEPHONE: +1 202 477 1234

**2.1. International Database System**

2.2. In September 1987, the Environmental Operations and Strategy Division (ENVOS) began developing ENVIS. The main objective was to provide World Bank staff with a central source of environmental information and tool for environment related analysis, project design and policy development work. ENVIS was designed with three components:

1. **Project Monitoring and Tracking System:** which provides access to project-related information;
2. **Country Module:** This component of ENVIS has two important sub-modules:
  - i. the **Protected Areas Sub-Module (CMCP):** information for this database was provided by the WCMC's Protected Areas Database (see WCMC entry).
  - ii. the **Environmental Legislation Sub-Module (EMCL)** is only in the preliminary stages, but will incorporate the Environmental Law Centre's (ELC) Environmental Law Information System (ELIS) in much the same way as the Protected Areas Database is being incorporated;
3. **Environmental and Economic Bibliography:** this database provides information on reports and studies carried out by the World Bank, but are not considered project documents.

2.3. The ENVIS system functions using an IBM computer system. The software used in ENVIS is the **Storage and Information Retrieval System (STAIRS)**. STAIRS is also provided by IBM Corp.

2.4. N.A.

2.5. As stated above, ENVOS co-operates with and receives information from WCMC and the ELC in implementing ENVIS.

**GDPP**  
GLOBAL DATABASE PLANNING PROJECT (IGU)

IGU GDPP  
17 KIPPEWA DR.  
OTTAWA, ONTARIO  
K1S 3G5, CANADA

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2.1. International Database Project

2.2. In 1988, the International Geographical Union (IGU) started a Global Database Planning Project (GDPP). It was initiated with the intention that it become one of the IGU's contributions to ICSU's International Geosphere-Biosphere Programme (IGBP). At its first meeting, the GDPP formed six Study Groups:

1. SG on a Global Digital Database Directory;
2. SG on Effects of Spatial Data Errors on Global Models;
3. SG on Legal and Institutional Aspects of Global Database Development;
4. SG on Global Socio-Economic Databases;
5. SG on Long-Term Global Geographic Information System (GIS) Objectives; and
6. SG on Global GIS Data Interchange.

2.3. As the GDPP is seen as one of IGU's contributions to the IGBP, emphasis is being placed on assisting in the use of both spatial and temporal geographical data. Thus, GDPP is looking at the various issues related to the creation of an integrated, multi-disciplinary, and comprehensive database. The specific topic under study is planned to be global digital databases containing geographically referenced earth descriptive data. These data will represent the vertical bounds between the ozone layer and the Mohorovičić Discontinuity.

2.4. Affiliated monitoring programmes.

2.5. Not only will GDPP provide ICSU's IGBP with information, but co-operative efforts are also being discussed with CORINE in the areas of data processing (co-operative efforts).



**GRDC**

**GLOBAL RUN-OFF DATA CENTRE (Germany/UNESCO/WMO)**

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BUNDESANSTALT FÜR GEWÄSSERKUNDE  
POSTFACH 3 09  
KAISERIN-AUGUSTA-ANLAGEN 15-17  
D-5400 KOBLENZ  
TELEFAX: +49 261 130 63 02

2.1. International Database Centre

2.2. GRDC was initiated in May 1987 by the German Ministry of Research and Technology (BMFT) at the German Federal Institute of Hydrology (BfG) on behalf of WMO and UNESCO. Currently, data sets for both WMO and UNESCO are being managed by GRDC.

As part of their Global Atmospheric Research Programme (GARP), ICSU and WMO first established a run-off database. This was later included as part of the World Climate Programme (WCP) Water Programme. The database was given two components:

1. to collect world-wide run-off data; and
2. to develop a spatial grid system for hydrological measurements.

Data was collected on the basis of two questionnaires (Aug. 1982, June 1984). In total 1200 laboratories from 67 countries contributed data representing a time period from 1978 to 1983. Unfortunately, contributions were not sent from several regions causing gaps in the data. Currently and expansion of the database is foreseen by researching documents for relevant data and using UNESCO data.

UNESCO's database was established as part of the International Hydrological Decade (IHD, 1965-74). This data set represents data from 860 stations in 106 countries for a period from ca. 1900 to 1965. Results were published as part of the series "Studies and Reports in Hydrology" with the title Discharge of Selected Rivers of the World. Currently, work is underway to publish data up until 1984. The ultimate goal will be to publish up-to-date data from all the major rivers in the world.

2.3. The two programmes have data representing different collection techniques. WMO's WCP-Water project "Analysis of Long Time Series of Hydrological Data" collected data which represented daily flow values, whereas IHD data represent weekly flow rates. Data

for WMO had to be collected according to guidelines which included that the water way was relatively untouched and that the flow system was representative of the region. Data is thus collected on an individual river basis. The data for the IHD project was more regional in character as monitoring was done at river mouths.

2.5. N.A.

2.5. As a co-operative effort between WMO and UNESCO, GRDC receives information gathered by both organization's programmes. Ultimately, this will allow it to bring together data and information from a wide variety of programmes and initiatives.

GRID/PAC  
UNEP  
P.O. BOX 30552  
NAIROBI  
KENYA  
TELEFAX: +254 2 22 64 91

- 2.1. International Database and Information Programme
- 2.2. GRID was established as part of the Global Environmental Monitoring System (GEMS) network after the 1972 U.N. Stockholm Conference on the Human Environment. GRID aims to collect and disseminate the most advanced information available on the state of natural resources world-wide.
- In order to better collect, manage and disseminate datasets and other information, GRID has established a series of Nodes. At the moment four Nodes exist, in Nairobi, Geneva, Bangkok and Arendal, Norway. GRID Arendal was the first national Node when it was inaugurated in August of 1989. The Arendal centre will be responsible for a number of different tasks including, collecting and collating data; assisting in the establishment of national GIS in developing countries, and exploring the possibilities of expanding into a regional Node for the Nordic Countries and polar regions.
- Additional GRID Nodes are to be established in such regions as West Africa, Latin America and the South Pacific. Together these should form an interconnected network of data management and exchange.
- 2.3. The information GRID holds consists of processed geo-referenced data sets drawn from various sources, including the GEMS network. The data are inter-compatible and can be used for global, regional and national applications.
- GRID stores all its data in the form of Geographic Information Systems (GIS). Using GIS and image processing technologies allows GRID to collate information from satellite photographs and other remote sensing images, aerial photographs, maps, tables and other sources. GRID can be used then to locate areas within a given region with specific geomorphological, biological or climatic characteristics. Models can also be developed showing changes in regions due to climate change, population increases or other impacts.

2.4. For details see individual GEMS monitoring programme entries.

2.5. In co-operation with the African Ministerial Conference on the Environment (AMCEN, see entry), GEMS is working on identifying a suitable national centre to become a GRID Node in Africa. Training for personnel will be done together with UNITAR.

GRID also co-operates with national governments, most noticeably with Norway in establishing the Arendal Centre.

WMO's Climate System Monitoring (CSM) programme is also to provide selected materials, including global and regional data, to the GRID database.

In collaboration with other organizations such as the International Arctic Science Committee (IASC) and the Arctic Monitoring and Assessment Programme (AMAP), GRID-Arendal is currently developing a Meta-database of activities involved in monitoring and researching pollution in the Arctic region.

**ICPIC**  
**INTERNATIONAL CLEANER PRODUCTION INFORMATION**  
**CLEARINGHOUSE (UNEP-IEO/U.S.A.-EPA)**

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UNEP/IEO  
39-43 QUAI ANDRÉ CITRÖEN  
F-75739 PARIS CEDEX 15  
TELEFAX: +33 1 40 58 88 74

**2.1. International Information Exchange Programme**

**2.2. The ICPIC was developed by UNEP's Industry and Environment Office (IEO) in collaboration with the US Environmental Protection Agency (EPA) to serve as a computer-based information clearinghouse. Currently, its database holds information including:**

1. case studies of over 450 cleaner production initiatives and techniques;
2. list of cleaner production programmes by country and company;
3. list of suppliers of cleaner production machinery and designs;
4. global events calendar;
5. bibliography of cleaner production publications;
6. current and recent research abstracts;
7. other databases (the Industry Co-operative on Ozone Layer Protection will be linking its database on CFC-free technologies to ICPIC early in 1991); and
8. news bulletins and announcements.

**2.3. ICPIC is an online database accessible to anyone using and Apple or IBM personal computer or terminal equipped with a modem and the appropriate communications software, such as CROSSTALK. Information may be obtained free of charge, though users must pay their own telefax/phone costs. In many nations, ICPIC is also accessible through Transpac, the French packet-switching network. This will make the database available in 65 countries for the cost of a local phone call. In addition, ICPIC has a Data Harmonization Working Group, whose mandate it is to standardize clean technology data systems from member nations**

**2.4. N.A.**

2.5. ICPIC was developed as a co-operative effort between the IEO and EPA. Currently, it co-operates with such international organizations of IMO, UNCSTD, UNIDO, UNECE, OECD, CEC, the ICC's International Environmental Bureau (IEB) and the International Petroleum Industry Environmental Conservation Association (IPIECA).

SECRETARIAT  
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## 2.1. International Information and Data Management System

2.2. IGBP is based on coupling observations over a range of spatial and temporal scales through studies and developing models, to understand and eventually predict global change. To understand Earth system processes, geographically references models and datasets must be developed to permit the integrated use of various types of data and information. Moreover, methods and protocols for managing large volumes of data must also be developed. To address these points, IGBP will not develop a centralized information facility within the next two years, but will instead:

1. develop a programmatic infrastructure;
2. perform pilot studies to develop methodologies for producing globally consistent datasets; and
3. attempt to install data directories world-wide to make data more accessible to the scientific community.

2.3. After the initial implemetation phase is over in 1992, IGBP will begin focusing on the actual installation of a DIS facility. The location of the Facility should be at an established data centre either within the UNEP or WDC system. The EROS Data Centre, which receives information from the EOS Data and Information System, has already been identified as a possible location for DIS facilities. Upon its implementation, DIS should serve the following functions:

1. to co-ordinate access and exchange of IGBP data sets, including developing standards and protocols for data exchange;
2. assist in locating important IGBP datasets while at the same time co-ordinating new datasets that fall outside the direct domain of individual Core Projects;
3. provide initial data processing and management experience by co-ordinating prototype projects, the first two being a Land Cover Pilot Study and a Surface Temperature Pilot Project;

4. provide training and experience at the international level, through information dissemination, workshops, etc.;
5. encourage and organize data and information review, to ensure the best possible data, and
6. implement and maintain a **Global Environmental Data Directory** (GEDD), which would provide information on the location of IGBP and other datasets.

Emphasis in acquiring data will be on long-term measurements of an advanced nature, such as Remote Sensing from satellites as this information is most suitable for use in modelling. Consequently, the EROS Centre could be seen as a choice location.

2.4. See IGBP monitoring programme entry.

2.5. Co-operative efforts have been proposed between IGBP-DIS and other appropriate data systems operating within ICSU, such as the WDC system, WDDIS, IGU, etc. as well as with such UN activities as UNEP-GRID, WMO, UNESCO-IOC and the proposed ISSS/UNEP World Soils and Terrain Database (SOTER).

Regarding more specific issues co-operation has been suggested with other institutions including SAFISY and NASA for remote sensing data on Land-Cover Change; with GRID/UNITAR regarding training and education; and with NASA (Master Directory) and NOAA on GEDD.



**INFOHYDRO**  
**HYDROLOGICAL INFORMATION REFERRAL SERVICE**  
**(WMO)**

WMO SECRETARIAT  
P.O. BOX  
CH-1211 GENEVA 2  
TELEFAX: +41 22 734 23 26

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2.1. International Information Referral Service

2.2. INFOHYDRO was established to disseminate information on several fields including:

1. national and international, governmental and non-governmental organizations, institutions, and agencies dealing with hydrology and their activities;
2. principal river and lake basins of the world;
3. networks of national hydrological observing stations and related information about size, number of stations, duration of records, etc.; and
4. national hydrological data bases and their activities related to the collection, processing and archiving of data.

2.3. INFOHYDRO does not collect or manage actual hydrological data. It was designed to facilitate the prompt dissemination of continually updated hydrological information. The information for this INFOHYDRO is collected by means of questionnaires and published information available through the UN system. Updating and revision of the information is conducted by the contributors themselves. As a computerized service, INFOHYDRO is expecting to develop into an On-line service, which will be made available to Members and other users.

2.4. N.A.

2.5. INFOHYDRO co-operates primarily with WMO Member Countries in completing and verifying the updated information. In future, emphasis will be placed on collecting information through WMO channels, such as WMO experts' reports, mission statements, the WMO Commission for Hydrology, working groups on hydrology and WMO regional associations.

**INFOTERRA  
INTERNATIONAL ENVIRONMENTAL INFORMATION SYSTEM  
(UNEP)**

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PROGRAMME ACTIVITY CENTRE  
UNEP  
P. O. BOX 30552  
NAIROBI, KENYA  
TELEFAX: +254 2 52 07 11

- 2.1. International Information Network
- 2.2. INFOTERRA was established by UNEP in 1974 in order to identify and aid in the exchange sources of environmental information and expertise. It was established as a decentralized world-wide network of information storage and dissemination facilities. These are primarily independent **National Focal Centres (NFCs)** whose activities are co-ordinated by the INFOTERRA Programme Activity Centre. Currently, approximately 135 countries have designated NFCs within their borders. In addition, INFOTERRA has contracted approximately 20 institutions, including IRPTC and the IUCN's Environmental Law Centre (ELC, see ELIS entry), to act as **Special Sectoral Sources**. These would response to queries related to their specific areas of expertise. In order to facilitate regular demands for information **Regional Service Centres** have been established in Australia, India, Morocco and Chile.
- 2.3. The type of data being managed by INFOTERRA is extremely broad, including scientific data as well as literary data. Consequently, management procedures and quality considerations will vary from data set to set and from storage centre to centre. Information, however, is made readily available through variety of means. These include regular publications such as International Directory of Sources and the World Directory of Environmental Expertise.
- 2.4. N.A.
- 2.5. INFOTERRA co-operates extensively with other institutions in the area of information exchange. This is seen in its extensive network of NFCs and Regional Service Centres. It also co-operates with the

UN Advisory Committee for the Co-ordination of Information Systems (ACCIS) in its Guide to UN Information Sources on the Environment (see ACCIS entry).

**INTERAISE**  
**INTERNATIONAL ENVIRONMENTAL AND NATURAL**  
**RESOURCE ASSESSMENT INFORMATION SERVICE**  
**(IIED/IUCN/WRI)**

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IIED  
3 ENDSLEIGH STREET  
LONDON W2TH 0DD  
U.K.  
TELEFAX: +44 71 388 2826

**2.1. International Information Co-ordinating Project**

2.2. INTERAISE is an 18 month project which commenced in May 1990 as a joint effort between the International Institute for Environment and Development (IIED), the International Union for the Conservation of Nature and Natural Resources (IUCN) and the World Resources Institute (WRI). The project's goals include the identification and location of key national environmental and natural resource assessment documents and to disseminate this information to those who need it in the development aid community as well as developing nations.

2.3. To make the information which it has collected useful, INTERAISE aims to establish several services including:

1. an expanded Directory of environmental and natural resource assessments based on a computerized database (publication date: October 1991);
2. the establishment of libraries holding hard copies of national environmental studies as IIED, IUCN, WRI as well as at the offices of the Australian International Development Assistance Bureau (AIDAB);
3. the development of a prototype information service to facilitate the processing of requests for information and referrals concerning resource documents; and
4. an evaluation of the utility of the directory and prototype information service and the development of recommendations for establishing and expanded and permanent service.

2.4. INTERAISE itself is not involved in monitoring activities, but the three sponsoring organizations are. IIED, for example, focuses on environmental and developmental issues in developing nations, including forest and land use, energy, urban development, economic policies and desertification. It has projects

world-wide, with particular focus on African and Latin American countries.

- 2.5. INTERAISE is a result of co-operation between IIED, IUCN and WRI with support from such institutions as the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), the Dutch Foreign Ministry, USAID, the Swiss Directorate for Development Co-operation and Humanitarian Aid, AIDAB as well as the Development Assistance Committee (DAC) of the OECD.

IODE  
INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE  
SYSTEM (IOC)

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IOC SECRETARIAT  
UNESCO  
7, PLACE DE FONTENAY  
F-75700 PARIS  
TELEFAX: +33 1 40 56 93 16

2.1. International Data Management Programme

2.2. IODE was established by IOC in 1961 to provide data related to a better understanding of the oceans and their applications. IODE is actively supporting global ocean research programmes. These help to expand the global marine database and improve the dissemination of marine data for applications in science, industry and education.

The IODE system is designed as a global service oriented network. Currently, it incorporates nearly 50 National Oceanographic Data Centres (NODCs) which are responsible for data collection, management and exchange at the national level; 14 Responsible National Oceanographic Data Centres (RNODCs) which have been specialized on given functions; and World Data Centres (WDCs) established by ICSU for the final archiving of oceanographic data.

IODE is co-ordinated through the IOC's Committee on International Oceanographic Data and Information Exchange. This committee also co-ordinates IOC's activities relating to the management of marine information (see ASFIS entry).

2.3. The IODE System is oriented toward disseminating oceanographic data. It aims to aid users in finding and applying marine data and information world-wide. Access is available to millions of measurements and observations. The data results from more than 10,000 research expeditions by ships from over 70 countries and is archived in more than 2,000 databases.

The IODE System operates on the basis of voluntary contributions of data to the IODE data centres network. Users can approach data centres of the system with requests for data and/or information or advice regarding data or information management. Data are intended to be easily accessible and quality controlled.

To simplify the exchange of ocean data sets, a system for handling geo-referenced data, called GF3, was developed. This system includes a well documented data format and a large library of software utility routines. Subsets of GF3 have been defined for widely used data types.

Work has also begun on the development of the OCEAN PC software package for oceanographic data processing and exchange on microcomputers. The system will include the capability to process diverse data types including marine biology, marine chemistry, pollution and coastal zone data, and will provide good facilities for the exchange of data monitoring information, data inventories and actual data sets.

One of the IODE's key activities is the development of Data Monitoring Systems which include dissemination of information on National Oceanographic Programmes (research cruise schedules), oceanographic observations collected by research cruises and on sources and availability of oceanographic data sets (MEDI). The Marine Environmental Data Information Referral System (MEDI) is an automated, systematic method for recording and archiving information about marine environmental data files that exist in international and national centres. A MEDI catalogue is available containing full descriptions of all registered data holdings.

In collaboration with IGOSS, IODE is implementing a Global Temperature-Salinity Pilot Project (GTSPP) to build a continuously updated database of ocean temperature and salinity combining historical and near-real-time observations and subject to careful scientific quality control. GTSPP will provide products and services from this database.

2.4. See GIPME monitoring programme entry.

2.5. Co-operation between IODE activities and those of other international ocean science programmes are emphasised. Communications, for example, are maintained with programmes including WMO World Climate Research Programme's TOGA and WOCE projects, ICSU's International Geosphere-Biosphere Programme (IGBP) and its Joint Global Ocean Flux Study (JGOFS), as well as with several national oceanographic institutions.

**IRPTC**  
INTERNATIONAL REGISTER ON POTENTIALLY TOXIC  
CHEMICALS (UNEP)

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UNEP/IRPTC  
PALAIS DES NATIONS  
CH-1211 GENEVA 10  
TELEFAX: +41 22 733 26 73

2.1. International Data Management Programme

2.2. In 1976, UNEP established the IRPTC in Geneva. The UNEP Governing Council gave the IRPTC four main objectives, a fifth being added in 1989:

1. to facilitate access to existing data on the production, distribution, release and disposal of chemical and their effects on humans and their environment, thereby contributing to a more efficient use of national and international resources available for the evaluation of the effects of the chemicals and their control;
2. on the basis of information in the Register, to identify the important gaps in existing knowledge on the effects of chemicals, and call attention to the need for research to fill those gaps;
3. to identify, or help identify, potential hazards from chemicals and wastes, and to improve awareness of such hazards;
4. to provide information about national, regional and global policies, regulatory measures and standards and recommendations for the control of potentially toxic chemicals; and
5. to facilitate the implementation of policies necessary for the exchange of information on chemicals in international trade.

IRPTC is functional through a network of national and international organization, industries and external contractors, and national correspondents. To date, IRPTC has correspondents in approximately 110 countries.

Within IRPTC, the UNEP Governing Council established two information services. The first is the IRPTC Legal File, and the second is the IRPTC Query-Response Service.

The IRPTC Legal File was established in the late 1970s and published its first "Legal Data Profiles for Selected Chemicals" in 1980. This File was established primarily to manage special files on waste management and disposal, chemicals currently being tested for toxic effects, and national chemical restrictions.



The Query-Response Service was established to answer questions from national governments, environmental authorities, industry and individuals world-wide. In its development, IRPTC has encountered various problems. Most pressing were to obtain the original legal texts, obtaining correct translations of non-english texts and difficulties in identifying chemical substances covered by legislation. The issue of language has entered into each of the three main problems. The IRPTC Legal File is functional in English. Consequently, the interpretation of texts, the usage of differing classification schemes and direct translations all have presented substantial problems. Currently, these issues are being addressed in consultation with national institutions.

- 2.3. Currently, the IRPTC database contains around 42,000 records of 8000 different chemical substances. Data profiles, consisting of 17 descriptive attributes and characteristics has been established for over 600 internationally important chemicals.

Chemical substances are identified within the IRPTC Legal Files computerised system using registry numbers of the **Chemicals Abstracts Service (CAS)** and of the **Registry of Toxic Effects of Chemical Substances (RTECS)**. The files are available through on-line networks from both ECDIN (the Environmental Chemicals Data and Information Network of the EC) through EURONET, TELEPAK, and TYMNET; and from the Department of National Health and Welfare (Canada) through the National Telecommunications Network (INET 2000). Information can also be accessed, free of charge, directly from IRPTC through the Query-Response Service.

Presently, different forms of information dissemination are being examined, including storage on CD ROM.

- 2.4. N.A.

- 2.5. As the IRPTC is set up as a world-wide network, its co-operation with other national and international institutions is extensive.

**ISOTOPES-IN-PRECIPITATION NETWORK**  
(IAEA/WMO)

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IAEA, SECTION OF ISOTOPE HYDROLOGY  
DIVISION OF PHYSICAL AND CHEMICAL SCIENCES  
P. O. BOX 100  
A-1400 VIENNA  
AUSTRIA

**2.1. International Scientific Programme**

2.2. In 1958 the Isotopes-In-Precipitation Network was initiated by the IAEA in collaboration with WMO. In 1977, it was extended to fit within the framework of UNEP's Global Environment Monitoring System (GEMS). The initial objective of the programme was to collect systematic data on isotope content of precipitation on a global scale. In 1988, 80 Network stations were in operation, while another 82 nationally implemented stations contributed data.

2.3. Data are collected on a monthly basis for the tritium, deuterium and  $^{18}\text{O}$  contents of precipitation samples collected by participating national stations. Samples are evaluated directly at the IAEA Section of Isotope Hydrology laboratory facilities in Vienna. Detailed technical procedures to be followed by individual sampling stations for the collection and shipment of samples and a standardized data reporting format were introduced from the beginning of the network's operation. This allows a comprehensive statistical evaluation of the data, which in turn secures good data quality. In addition, regular intercomparisons among the national laboratories are organized by the IAEA.

To manage the information a system of four components were developed.

1. **Station Data:** To identify stations and related information, the Network uses a system of index numbers. Although slight variances exist, the same is used as was developed by the WMO to identify its stations.
2. **Meteorological Data:** The great majority of data is collected monthly or annually. The data is sub-categorised into amount of precipitation, type of precipitation, vapour pressure, and temperature.
3. **Sampling/Analysis Information:** This includes the date of sampling; the concentrations of tritium, deuterium and  $^{18}\text{O}$  and the laboratory code (sampling station identification)

4. **Calculations:** Further calculations of the samples are conducted including the sums and means of the precipitation and vapour pressure. Weighted annual means of Tritium, Deuterium and  $^{18}\text{O}$  are also calculated.

The isotope and meteorological data are published regularly in the form of data books and are also available in digitized form on magnetic tape. Network data are useful for global and/or regional scale atmospheric circulation models; which in turn should improve the actual understanding of the mechanisms controlling present climatic conditions and future trends.

- 2.4. For more information see Isotopes-in-Precipitation monitoring programme entry.
- 2.5. For more information see Isotopes-in-Precipitation monitoring programme entry.

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2.1. International Scientific Centre

2.2. MARC was established in 1975 on the recommendation from ICSU to help international and intergovernmental organizations address global environmental issues. MARC is a part of GEMS and is responsible for issues including:

1. storing and processing environmental data;
2. preparing assessments;
3. organizing training programmes on environmental monitoring aimed at helping developing countries acquire and develop low-cost monitoring and assessment techniques; and
4. preparing research reports, of which 43 have been published, on specific aspects of monitoring and the environment.

2.3. MARC's most important publication is the UNEP Environmental Data Report (EDR). The Report is published biennially, the third edition of which has just recently been published. The EDR contains processed information from all the GEMS activities as well as additional sources. Data, used in the EDR are selected from MARC's computer-stored environmental database. This database is currently being developed into a key source of environmental data focusing on trends and long time series data. Unprocessed data is stored by individual GEMS activities.

2.4. MARC is primarily active in organizing training workshops on monitoring, rather than engaging in actual monitoring itself. Each year a different nation is chosen, in which such workshops are held. In 1988, the workshop was held in Malaysia, Brazil in 1989 and India in 1990. By 1990, over 60 overseas visiting scientists have worked at MARC on topics related to environmental monitoring and the assessment of environmental pollutants.

2.5. MARC is supported by both UNEP, as part of GEMS, and WHO, with which it is a Collaborating Centre. MARC is involved in research and monitoring activities on behalf of both organizations. For the EDR, MARC receives support for organizations outside of UNEP and GEMS, including the World Resources Institute (WRI) and the U.K. Department of the Environment

WCP  
WORLD CLIMATE PROGRAMME (WMO)

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WCDMP  
WORLD CLIMATE DATA MONITORING AND PROGRAMME  
(WMO)

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CASE POSTALE 2300  
CH-1211 GENEVA 2  
TELEFAX: +41 22 734 23 26

### 2.1. International Data Management Programme

2.2. The WCDMP is one of four components of the WCP, which also includes the World Climate Research Programme (WCRP), the World Climate Impact Assessment and Response Strategies Programme (WCASP), and the World Climate Applications and Services Programme (WCASP). It was initiated to promote the improved collection, digitization, quality control, storage, retrieval and use of climate related information. These aspects of climatic data management are focused on both international and national activities.

2.3. In order to facilitate the storage, management and retrieval of climate related data, the WCDMP has developed primarily two data base projects:

1. **INFOCLIMA** (World Climate Data Information Referral Service): INFOCLIMA is intended to provide information on the nature and accessibility of climatic information world-wide. It is available in catalogue form and on diskette.
2. **CLICOM** (Climate computing): CLICOM is the WMO's system for the management of climatic data. Data entry, quality control, archiving, inventories, and station histories are all managed by the CLICOM system. In addition, it provides access to world-wide climate data and information sources and can be used in conjunction with INFOCLIMA.

In the third Long-term Plan adopted by the WMO Congress in 1991, two other projects (in addition to INFOCLIMA and CLICOM) relate to databases: Project 21.4 aims at developing global and regional databases for both research and applications; for project 21.1: Climate Change Detection Project (CCDP).

2.4. The Climate System Monitoring (CSM) project was initiated in 1984 to provide meteorological services and other national and international organizations consolidated data and data analysis on the state of the climate system and diagnostic insights into

significant climatic anomalies. Data from the CSM project is also entered into relevant UNEP-GRID data sets.

2.5. For more information see WCRP and WCP entries.

2.1. International Information Management Centre

2.2. WCMC was established in 1983 as the IUCN Conservation Monitoring Centre (CMC). In 1988, the Centre was re-launched as a joint venture between IUCN, UNEP and WWF-International.

The Centre's main objective is to support international programmes for conservation and sustainable development by providing reliable scientific data on the world's biological diversity.

2.3. To provide this information service, WCMC has five data management units:

1. **Threatened Plants Unit (TPU)**: Currently holds records for some 52,000 plant taxa, of which 20,000 are considered threatened. An additional 12,000 records for 5,000 threatened plant taxa are being cultivated by the IUCN Botanic Gardens Conservation Secretariat.
2. **Species Conservation Monitoring Unit (SCMU)**: This database holds records for 18,700 animal species along with 70,000 associated distribution records.
3. **Habitats Data Unit (HDU)**: This database manages extensive files on habitats of conservation concern, and critical sites for the conservation of biological diversity within these habitats. The main focus is on tropical forests, with extensive GIS files of forest distribution, wetlands and coral reefs.
4. **Protected Areas Data Unit (PADU)**: PADU holds records on approximately 18,000 national parks and protected areas. It also contains overviews of the species and habitats to be found as well as the effectiveness of management efforts. (see ENVIS entry)
5. **Wildlife Trade Monitoring Unit (WTMU)**: WTMU holds data on some 2 million trade transactions carried



out under CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora). Moreover, it also contains a further 600,000 data sets on the ivory trade.

WCMC is now embarking on a five-year development plan, 1990-95, to restructure its operations and to upgrade its information management capabilities. Parts of this programme necessitates the transfer from the obsolete Wang computer system to a new UNIX/Ingres network, based on the principles of open system architecture. These plans are set out in the WCMC Computer Systems Strategy. The new structure will provide a relational database management system, linking data on species, habitats and areas. The data will be geo-referenced and linked to digitized GIS files, using ARC/Info, so that mapped outputs on biodiversity can be integrated with other biogeographic and ecological datasets. A library of GIS files covering species, habitats and protected areas is being developed, so that WCMC can develop as part of the GRID network providing compatible biodiversity data files.

- 2.4. WCMC is developing its monitoring capability through programmes of fixed interval data recording using standardized methodologies and terminologies, particularly through the use of GIS to monitor the loss of tropical forests.
  
- 2.5. The primary theme of the five-year plan is the development of information networks for the two-way exchange of data. WCMC is, therefore, seeking the co-operation of other data management agencies to set up such networks, including the establishment of conservation data centres within developing countries, with WCMC acting as the central repository for the storage and dissemination of biodiversity data. The Centre is, therefore, actively involved in the preparation of standard taxonomies and classification systems for data transfer formats.  
WCMC has greatly diversified its project activities. It now provides an information service to a broad spectrum of users ranging from The World Bank, bilateral development agencies, government agencies and NGOs to individual scientists, journalists and the general public. It charges for "added-value" services on an ability-to-pay basis, but encourages the free flow of raw data between sources and users.

**WDC**  
**WORLD DATA CENTRES (ICSU)**

ICSU  
51, BOULEVARD DE MONTMORENCY  
F-75016 PARIS  
TELEFAX: +33 1 42 88 94 31

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**2.1. International Network of Data Centres**

2.2. The WDCs were originally established in 1957 to store information from ICSU's 1957 International Geophysical Year. An ICSU-WDC Panel is responsible for co-ordinating the activities of the individual data centres. Currently, 27 WDCs are active collecting, archiving, and disseminating data which encompass most facets of the global environment. WDCs are generally co-located with national data centres and are funded by the respective nation. The U.S.A. (designated WDC-A) sponsors nine centres, while the U.S.S.R. (WDC-B) operates two and 16 other WDCs (WDC-C) are located in other nations, including Japan, Switzerland and the U.K. A WDC-D is to be established in Tiajin, China.

2.3. Data is acquired from various sources and is managed according to internationally recommended procedures. Information can be obtained from these centres generally for a cost.

Given advancing computer technology, the ICSU WDC Panel is developing a revised workplan for the Centres. In particular, emphasis is being placed on the improved electronic exchange of datasets. A study is also being undertaken to assess the benefits of making larger data sets available on CD-ROM.

2.4. N.A.

2.5. The WDCs store much information from various sources. Among others, they store data for the IOCs International Oceanographic Data Exchange (IODE) system (see IODE entry).

### 3. STANDARDIZATION & HARMONIZATION ACTIVITIES

ACRONYM  
ACTIVITY NAME (SPONSORS)  
ADDRESS

REF. NO.

3.1. TYPE OF ACTIVITY

3.2. ACTIVITY OBJECTIVES

3.3. TYPE OF STANDARDS

AFNOR  
ASSOCIATION FRANÇAISE DE NORMALISATION  
(FRANCE)

301

TOUR EUROPE-CEDEX 7  
F-92000 PARIS LA DEFENCE  
TELEFAX: +33 1 42 91 56 56

3.1. National Standardization Organization: France

3.2. AFNOR is engaged in preparing environment related standards in most fields of the environment. In particular AFNOR is involved in monitoring air, water, and soil quality.

As the French member to ISO and CEN, AFNOR is extensively participating in the preparation of international standards. Bilaterally, it has co-operated with DIN on matters of air and water quality and with the Dutch Standardization Organization (NNI) on soil quality.

3.3. AFNOR engages in laboratory research and measuring itself. With regards to air pollution, AFNOR uses its facilities to engage in research on ambient air, carbon dioxide analysis, emission controls, gas analysis methods, suspended particles and the work place atmosphere.

**ASTM**  
**AMERICAN SOCIETY FOR TESTING AND MATERIALS**  
**(U.S.A.)**

1916 RACE STREET  
PHILADELPHIA, PA 19103-1187  
U.S.A.  
TELEFAX: +1-215-977-9679

302

3.1. National Standardization Organization: U.S.A.

3.2. ASTM was organized in 1898 as a voluntary standards development system. Currently, approximately 33,000 qualified ASTM members, from around the world, submit technical research or testing results. These are published annually in 68 volumes of 8,500 standards.

3.3. ASTM has several Committees which work in fields environmentally related, including:

1. D18 on Soil and Rock;
2. D19 on Water;
3. D22 on Sampling and Analysis of the Atmosphere;
4. D34 on Waste Disposal;
5. E35 on Pesticides; and
6. E47 on Biological Effects and Environment Fate.

These Committees are involved in also determining reference materials, providing cross media standards and working other associated fields. The Committee D18, for example, is conducting a series of Symposia on the Geotechnics of Waste Fills, Mapping and Geographical Information Systems (GIS) and Agriculture Analysis in Environmental Studies.

To provide standards on an on-line basis, ASTM and the Society of Automotive Engineers (SAE) developed Standards Search. Standards Search provides details on 13,000 standards, testing methods, specifications, recommended practices and information reports for engineering materials.

**BCR**  
**COMMUNITY BUREAU OF REFERENCE (CEC)**

RUE DE LA LOI, 200  
B-1049 BRUXELLES  
TELEFAX: +32 2 235 8072

303

**3.1. Regional Reference Materials Committee: European Community**

**3.2. BCR was established by the Commission of the European Communities as a member of ISO. BCR was intended "to improve the accuracy of measurements, and thereby to bring harmony to the results obtained throughout the Community." The areas of Applied Metrology and Chemical Analysis are the two broad areas covered by the BCR.**

- 1. Applied Metrology** refers to calibrations and other metrological results which are developed in collaboration with national laboratories and institutes.
- 2. Chemical Analysis** is primarily of materials being prepared as reference materials

**3.3. BCR does not formulate and publish standards itself. Instead, it develops Certified Reference Materials (CRMs) to compliment the process of standardization. Apart from preparing reference materials, BCR evaluates toxic and other materials for use in standards and other applications.**

**BSI**  
BRITISH STANDARDS INSTITUTE (UNITED KINGDOM)

2 PARK STREET  
LONDON, W1A 2BS  
UNITED KINGDOM  
TELEFAX: +44 1 629 0506

304

3.1. National Standardization Organization: United Kingdom

3.2. BSI was established with the purpose of supporting British industry in its drive to improve and maintain the quality of British goods. BSI offers services including the development of standards, testing materials, quality assurance and technical assistance to exporters. To facilitate these objectives, BSI offers an on-line service, **Standardline**, which gives information on 10,000 British, French, German, European and international standards. Within Europe, BSI is making an effort to support the Commission of the EC (CEC) in its move to technical harmonization, recognizing this as a key step to achieving a Common Market.

3.3. BSI produces a large number of standards on measurement techniques and practices for environmental measurement. Environmental media included in BSI's work are air; fresh, ground and marine waters; soil; food; biological matrices; indoor pollution; as well as noise pollution. In preparing standards, BSI co-operates with other organizations within the framework of ISO. In the past, BSI has written standards with such organizations as DIN on air and water quality, NNI on soil quality and the Danish Standards Organization (DS) on acoustics. In producing measurements and standards, BSI aims to address such issues as pollutant control monitoring, early warning systems, the development and control of reference materials as well as identifying sources of pollution.

CEN  
EUROPEAN COMMITTEE FOR STANDARDIZATION (CEC)

305

RUE BREDERODE 2, BTE. 5  
B-1000 BRUXELLES  
TELEFAX: +32 2 519 68 19

3.1. Regional Standardization Organization: European Community

3.2. CEN is the organization responsible for standards in the European Community. Only recently has CEN become involved in environment related activities. Due to their similarities, this committee co-operates with its global counterpart, the International Standardization Organization (ISO). Despite any similarities, however, CEN is fundamentally different from ISO as its norms and standards become legally binding within the EC and other participating European countries.

3.3. To address the various issues, CEN established **Technical Committees**. Water quality issues, for example, are addressed by Technical Committee 260 on "Water Quality". TC 260 was established in November, 1989 and is among the first Committees to address environmental concerns.



**COMMISSION ON AIR POLLUTION PREVENTION  
(VDI/DIN)**

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D- 4000 DÜSSELDORF 1  
TELEFAX: +49 211 6214 575

306

3.1. National Standardization Commission: F.R. Germany

3.2. The Commission on Air Pollution Prevention was formed through a merger of the German Association of Engineers' (VDI) Commission on Air Pollution Prevention and the German Institute for Standardization's (DIN) Committee on Air Pollution Prevention. The Commission's mandate is to establish scientific and technical guidelines that will address the problem of existing air pollution and the means to prevent it. The Commission concentrates on preparing standards and norms as well as describing methods and procedures for collecting, evaluating and applying research and monitoring results.

3.3. Although, the Commission is not involved in any direct measurements, its work addresses such compounds as SO<sub>2</sub>, SO<sub>3</sub>, NO<sub>x</sub>, ozone, peroxides, fluorine compounds, CO, and various organic compounds. Guidelines for monitoring and sampling procedures and methods are being standardized and calibrated. This will support the development of further guidelines for the development of mathematical models which describe the relationship between emissions and immissions, for example. Results are published under the auspices of the Commission.

DIN  
DEUTSCHES INSTITUT FÜR NORMUNG e.V.

BURGGRAFENSTRASSE 6  
POSTFACH 11 07  
D-1000 BERLIN 30  
TELEFAX: +49 30 26 01 231

307

3.1. National Standardization Organization: F.R. Germany

3.2. DIN is extensively involved in developing standards which have environmental relevance. Currently some 26 **Technical Groups** are involved in standards development within DIN.

To collect, manage and disseminate information related to its activities, DIN established DITR (**Deutsches Informationszentrum für Technische Regeln**) information system. DITR is a database containing internationally relevant standards, technical regulations and guidelines. Information is available On-line with FIZ-technique as its Host and DSO as retrieval language. Documents are also available on magnetic tape, floppy disk, and CD-ROM. Currently, over 41,000 documents are stored at DITR which are updated monthly. The service is available in German, although many documents have been translated into English and/or French. Information on DIN's activities is not only available through DITR, but DIN publishes its environment related norms and activities, for example, directly.

3.3. DIN's Technical Groups are involved in a wide variety of activities. These include construction, household appliances, agriculture and related products, medicine, water quality, textiles, plastics, chemicals such as cleaners and solvents, etc. In many cases, their ties to the environment are by way of environmental health related activities.

**ENVIRONMENT AGENCY  
(JAPAN)**

INTERNATIONAL AFFAIRS DIVISION  
1-2-2 KASUMIGASEKI, CHIYODA-KU  
TOKYO 100 JAPAN  
TELEFAX: +81 3-504-1634

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**3.1. National Governmental Agency: Japan**

3.2. The Environment Agency is responsible for the state of the environment in Japan and related matters. Consequently, it has a very broad based programme including monitoring, research and assessment work, national and international political issues, and setting standards for environmental protection. Monitoring activities are focused on air, water and chemical pollution. The related environmental laws are published in separate volumes, in collaboration with the Air Quality Bureau and Air Pollution Control Division in matters of air pollution; the Water Quality Board and Water Pollution Control Division in matters of water pollution; and the Office of Health Studies and the Environmental Health Bureau in matters of toxic chemicals.

3.3. The Environment Agency is not only involved in research efforts, but it also establishes a number of standards. These include:

1. ambient air quality standards for substances as sulphur dioxide, carbon monoxide, suspended particulate matter, nitrogen oxide, and photochemical oxidants;
2. environmental quality standards for noise from such sources as roadside areas, aircraft, and the Shinkansen Superexpress Railway;
3. water quality standards related to human health such as levels of cadmium, cyanide, organic phosphorus, lead, chromium (hexavalent), arsenic, total mercury, alkyl mercury, and PCBs;
4. national emission standards for substances related to human health; and
5. national effluent standards for substances potentially harmful to humans.

Internationally, co-operation is pursued in the development and implementation of pollution controls and standards. In particular, pollution control

projects have been developed in places including air pollution control projects in Mexico City and Shanghai as well as a water pollution control project at Lake Ipacarai in Paraguay.

As part of the Ministry of International Trade and Industry, the National Research Laboratory of Metrology (NRLM) also develops and improves standards in the form of Japan Industrial Standards (JIS). It focuses on establishing analytical methods of pollutants, and standard gas and liquid which are used in the calibration of measuring instruments. NRLM is active internationally in that it is a member of the International Organization of Legal Metrology (ILMO) and also co-operates with various standardization organizations.

**HEM  
HARMONIZATION OF ENVIRONMENTAL MEASUREMENT  
(UNEP/F.R. GERMANY)**

309

c/o GSF  
INGOLSTÄDTER LANDSTR. 1  
D-8042 NEUHEBERG b. MÜNCHEN  
TELEFAX: +49 89 3187 3325

**3.1. International Data Harmonization Centre**

**3.2. The HEM office was established in 1989 by UNEP with financial support from the German Ministry of the Environment (BMU) as part of the the Global Environmental Monitoring System (GEMS). The initiative to establish such an office was taken by the Economic Summit in Venice 1987. This initiative was based on the work of the Secretariat of the Environment Experts of the Economic Summit (EEES). Currently, HEM is in its implementation phase.**

**HEM will concentrate on the harmonization of environmental monitoring and research programmes to promote the improved collection and management of data, and thereby to enhance the quality and compatibility of information on the state of the environment world-wide.**

**Three main areas will be addressed in this respect:**

- 1. Harmonization of ongoing and planned programmes and projects:** refers to the need to provide one centre with the relevant information;
- 2. Harmonization of Taxonomies:** refers to the problems of matching different classification schemes; and
- 3. Harmonization of Data:** refers to the problem of the consistency and comparability of measurement systems, data quality, data management systems and data formats.

**3.3. The first issue being addressed by HEM is the creation of a meta-database. This database should contain:**

- information about ongoing and planned environmental programmes/projects; and
- All important existing databases with environmental information.

**Future areas of consideration will include the compilation of all geo-ecological classification systems in use (together with WCMC); to address data**

quality issues in collaboration with ISO, ICSU, etc.; and to develop guidelines for Environmental Specimen Banking (ESB). The issue of ESBs should be addressed in collaboration with the International Register of Potentially Toxic Chemicals (IRPTC).

HEM is also currently engaged in establishing co-operative efforts with such activities as ICSU's IGBP, CODATA, SCOPE, and UNESCO's MAB. In future, emphasis will be placed on co-operating with ISO on projects and other activities.

**INSTA**  
**INTERNORDIC STANDARDIZATION (NORDIC COUNTRIES)**

310

SIS  
BOX 3295  
S-103 66 STOCKHOLM  
TELEFAX: +46 8 613 52 00

**3.1. Regional Standardization Organization: Nordic Countries**

3.2. INSTA is a co-operative effort between Denmark, Norway, Sweden and Finland located at the Swedish Standards Organization (SIS). INSTA aims to harmonize activities and standards between the Nordic countries, by disseminating information and sponsoring joint working groups which, at the same time, are to prevent the duplication of efforts from country to country. INSTA does not publish its own standards. Instead, it identifies and collects national standards and defines these with an INSTA number.

Currently, INSTA is concentrating on its participation within the European frame. Through its national member institutions, it has contact to both the European Committee on Standardization (CEN) and the International Organization for Standardization (ISO).

3.3. INSTA does not develop and define its own standards. This is the responsibility of the national institutions. To date approximately 10 INSTA standard numbers have been given.

The development of environmental standards has also been given a high priority by The Nordic Council of Ministers. It, for example, has defined and implemented a comprehensive system of standardized methodologies being used for integrated monitoring.

**ISO**  
**INTERNATIONAL ORGANIZATION FOR STANDARDIZATION**

311

CASE POSTALE 56  
CH-1211 GENEVA 20  
TELEFAX: +41 22 733 34 30

3.1. International Standardization Organization

3.2. ISO is a world-wide federation of national standards bodies from some 90 countries. The scope of ISO covers standardizations in all field except for electrical and electronic engineering which are the responsibility of the International Electrotechnical Commission (IEC). The results of ISO technical work are published as International Standards; mid-1990 more than 7500 standards had been published, and are listed in the ISO Catalogue.

ISO's technical work is carried out through **Technical Committees (TCs)**. Currently, it has TCs working in fields including:

1. Air Quality;
2. Water Quality; and
3. Soil Quality.

The ISO/TC 190 on Soil Quality has not yet published any International Standards. Many standards have, however, been written for air pollution, including work-place air, ambient air and stationary source emissions. In addition, technical reports have been compiled on the monitoring of ambient air quality. To promote and develop **Certified Reference Materials** ISO initiated the Committee on Reference Materials (REMCO, see entry).

3.3. ISO is active in many fields related to the environment. It has developed International Standards for such environment-related topics as: acoustics; air quality; building construction; chemistry; fertilizers; fire protection; mining; nuclear energy; pesticides; petroleum products; natural gas; soil and water quality.



**REMCO**  
**COMMITTEE ON REFERENCE MATERIALS (ISO)**

CASE POSTALE 56  
CH-1211 GENEVA 20  
TELEFAX: +41 22 733 34 30

312

**3.1. International Reference Materials Committee**

**3.2. REMCO was established as part of the International Organization for Standardization (ISO) in 1975. The aim of the committee is to promote and implement an international effort to establish and harmonize Certified Reference Materials. In addition to this basic aim, it has a broad list of objectives:**

- to establish definitions, categories, levels and classification of reference materials for use by ISO;
- to formulate criteria to be applied for choice of sources for mention in ISO documents (includes legal aspects);
- to prepare guidelines for technical committees for making reference materials in ISO documents;
- to propose, as necessary, action to be taken on reference materials required for ISO work; and
- to deal with matters within its competence concerning other international organizations and to advise the ISO governing council on action to be taken.

**3.3. To address its objectives, REMCO established three Task Groups dealing with CRMs and related details, calibration exercises and related items, and to promote information exchange and co-operation with ISO and the International Electrotechnical Commission (IEC).**

**Their work has been published in several ISO Guides on Reference Materials and also reference documents of various kinds.**

**UNICHIM**  
ASSOC. PER L'UNIFICAZIONE NEL SETTORE DELL'  
INDUSTRIA CHIMICA FEDERATA ALL'UNI (ITALY)

PIAZZALE R. MORANDI, 2  
I-20121 MILANO  
TELEFAX: +39 2 78 42 36

313

3.1. National Standardization Organization: Italy

3.2. UNICHIM is a non-profit organization which, among other things, sets environment related standards and standard methodologies. Moreover, in many cases UNICHIM collects and manages datasets. Work is published in the form of manuals; available on request.

3.3. UNICHIM concentrates its efforts on issues related to water quality, human workplace exposure, ambient air pollution and emissions of pollutants into the atmosphere. In terms of water quality, emphasis is placed on the determination and assessment of pollutants in waste waters and waters for human use. The workplace exposure effort is centred around determining pollutants of all kinds in the work environment. At the same time atmospheric pollution is being addressed from the sides of ambient air pollution and emissions.

**ANNEXES**

**ANNEX I: MONITORING PROGRAMMES vs.  
ENVIRONMENTAL PROBLEM AREAS**

**ANNEX II: MONITORING PROGRAMMES vs.  
selected ORGANIZATIONS**

**ANNEX III: DATA & INFORMATION SYSTEMS vs.  
selected ORGANIZATIONS**

**ANNEX IV: ACRONYM LIST AND REFERENCE  
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**SELECTED REFERENCES**

**ANNEX I: MONITORING PROGRAMMES vs. PROBLEM AREAS**

MONITORING PROGRAMME	PROBLEM AREA							OTHERS	CROSS-MEDIA	INTEGRATED
	CLIMATIC CHANGE	ATMOSPHERE	DESERTIFICATION	TROP. DEFOREST.	MID-LAT. FORESTS	FRESH WATER	MARINE			
ACSAD			•			•		AGRICULTURAL STUDIES		
AMCEN			•	•		•				
CONPACSE							•			
EARTH OBSERVATION PROGRAMMES (ESA)	•	•	•				•	LANDCOVER CHANGE	•	
EEA		•				•	•			
EMAP (U.S.A.)			•		•	•	•	ECOL. RESOURCE STUDIES	•	
EMEP		•								
ENVIRONMENT COMMITTEE (OECD)								STATE OF THE ENVIRONMENT REPORTS		
ENVIRONMENT PROGRAM (ILASA)	•	•			•	•		MODELLING		
ENVIRONMENT PROGRAMME (UNIDO)								PROMOTION OF CLEANER TECHNOLOGY & RECYCLING		
ENVIRONMENTAL RESEARCH PROG. (JRC)		•					•	REMOTE SENSING	•	
EUREKA	•	•			•	•	•	UMBRELLA PROGRAMME		
EUROTRAC		•			•			MODELLING/TECHN. DEVEL.		
GAW	•	•						UMBRELLA PROGRAMME		
BAPMoN		•								
GO <sub>3</sub> OS	•	•								
GEMS	•	•	•	•	•	•	•	UMBRELLA PROGRAMME	•	•
GEMS/Air		•								
GEMS/Food							•			
GEMS/HEAL							•			
GEMS/IBM		•			•	•				•
GEMS/Water						•				
GIPME						•				

MONITORING PROGRAMME	PROBLEM AREA							OTHERS	CROSS-MEDIA	INTEGRATED
	CLIMATIC CHANGE	ATMOSPHERE	DESERTIFICATION	TROP. DEFOREST.	MID-LAT. FORESTS	FRESH WATER	MARINE			
GLOSS							•			
HDGC								SOCIO-ECONOMIC STUDIES		
ICP <sub>s</sub>		•			•	•		AGRICULTURE		
IGBP	•	•	•	•	•	•	•	UMBRELLA PROGRAMME	•	•
IGOSS							•			•
IHP						•		HYDRO. CYCLE RESEARCH		
IJC						•				
IM (NORDIC COUNCIL)		•			•	•		ECOSYSTEM STUDIES		•
IMP		•				•		ECOSYSTEM STUDIES		
INTEGRATED BIO-MONITORING (Germany)								UNDER DISCUSSION		•*
IPCC	•									
ISLSCP			•		•					
ISOTOPES-IN-PRECIP. NETWORK	•					•				
ISY	•			•		•		UMBRELLA PROGRAMME		
ITSU								TSUNAMI RESEARCH & INFO.		
IWRB								WATERFOWL/WETLAND RES.		
MAB	•	•	•	•	•	•	•	ECOL. MONITORING (planned)		•*
MEKONG COMMITTEE						•	•			
REGIONAL SEAS PROG.							•			
SCOPE	•						•	•		
SPREP POL							•			
SWMTEP								CO-ORDINATING PROGRAMME		
WCP	•	•						UMBRELLA PROGRAMME		
WCP-Water	•	•				•				
WCP-WCRP	•	•					•			
WGMS	•							GLACIAL STUDIES		
WWW	•	•								

\* proposed

## ANNEX I: DEFINITIONS

### INTEGRATED MONITORING:

"Integrated monitoring is defined as the repeated measurement of a range of related environmental variables or indicators in the living and non-living compartments of the environment, and the investigation of the transfer of substances or energy from one compartment to another.

Monitoring becomes truly integrated when the measurements of different variables in different compartments are co-ordinated in time and space to provide a comprehensive picture of the system under study." (as quoted by Wiersma, 1990)

### CROSS-MEDIA MONITORING:

For the purposes of this Survey, Cross-Media monitoring is taken to occur when several living and non-living environmental variables or indicators are monitored at the same site.

**ANNEX II: MONITORING PROGRAMMES vs. SPONSORING ORGANIZATIONS**

MONITORING PROGRAMME \ ORGANIZATION	ORGANIZATION														OTHER
	UN-ECE	FAO	UNEP	UNESCO	WHO	WMO	ICSU	IUCN	OECD	CEC	ESA	EUREKA	NATIONAL		
ACSAD															ARAB LEAGUE
AMCEN			•												OAU
CONPACSE			•	•											CPPS, OPS
EARTH OBSERVATION PROGRAMME												•			
EEA										•					
EMAP (U.S.A.)														USA	
EMEP	•		•			•									
ENVIRONMENT COMMITTEE (OECD)									•						
ENVIRONMENT PROGRAM (ILASA)															NAT. MEMBER STATES
ENVIRONMENT PROGRAMME (UNIDO)															UNIDO
ENVIRONMENTAL RESEARCH PROC. (JRC)										•					
EUREKA										•					NAT. MEMBER STATES
EUROTRAC												•			
GAW							•								
BAPMoN			•			•									CMEA
GO <sub>3</sub> OS						•									IAMAP
GEMS			•												
GEMS/Air			•			•									
GEMS/Food		•	•		•										
GEMS/HEAL			•		•										
GEMS/IBM			•												CMEA
GEMS/Water			•	•	•	•									
GIPME			•	•											LARA, IMO, ICES





**ANNEX III: DATA & INFORMATION PROGRAMMES vs. SPONSORING ORGANIZATIONS**

ORGANIZATION MONITORING PROGRAMME	ORGANIZATION											OTHER		
	FAO	UNEP	UNESCO	IAEA	WMO	UN	WORLD BANK	ARAB LEAGUE	ICSU	IUCN	WWF		CEC	NATIONAL
ACCIS						•								
ACSAD								•						
ASFIS	•		•											UN-OALOS
BALTIC													S	HELCOM
CODATA								•						
CORINE												•		
DESI		•												
EDC (Finland)													SF	
ELIS									•					
ENREP/ENDOC												•		
ENVIS						•								
GDPP														IGU
GRDC			•		•								D	
GRID		•												
ICPIC		•												
IGBP-DIS								•						
INFOHYDRO					•									
INFOTERRA		•												
INTERAISE									•					IIED, WRI
IODE			•											
IRPTC		•												
ISOTOPES-IN-PRECIP. NETWORK				•	•									
MARC		•												GB
WCP-WCDP		•			•									
WCMC		•							•	•				
WDC								•						

**ANNEX IV: ACRONYM LIST AND REFERENCE INDEX**

ACC	Advisory Committee for Co-ordination (UN)	145,201
ACCIS	Advisory Committee for the Co-ordination of Information Systems (ACC)	<u>201,218</u>
ACE	Acidity in Clouds Experiment (EUROTRAC)	113
ACSAD	Arab Centre for Studies of Arid Zones & Dry Lands	<u>101,202</u>
ACWIND	Activities on Wind Effect and Techniques to Wind Erosion Control (DESIS)	207
AFNOR	French Standards Association (France)	<u>301</u>
AIDAB	Australian International Development Assistance Bureau (Australia)	219
ALPTRAC	High Alpine Aerosol and Snow Chemistry (EUROTRAC)	113
AMAP	Arctic Monitoring and Assessment Programme	214
AMCEN	African Ministerial Conference on the Environment	<u>102,207,214</u>
ASE	Air-Sea Exchange (EUROTRAC)	
ASEAMS	Association of Southeast Asian Marine Scientists	142
ASFSA	Bibliographic Data Base--Aquatic Sciences and Fisheries Abstracts (ASFIS)	203
ASFIS	Aquatic Sciences and Fisheries Information System (FAO)	<u>203,220</u>
ASTM	American Society for Testing and Materials (U.S.A.)	<u>302</u>
BAHC	Biospheric Aspects of the Hydrological Cycle (IGBP)	127
BALTIC	Baltic Marine Environment Bibliography (HELCOM)	<u>204</u>
BAPMoN	Background Air Pollution Monitoring Network (GAW)	107,114-116,121
BCR	Community Bureau of Reference (CEC)	<u>303</u>
BfG	Federal Centre for Water Research (Germany)	213
BIATEX	Biosphere-Atmosphere Exchange of Pollutants (EUROTRAC)	113
BIO	Biosphere Dynamics Project (IIASA)	109
BIWIND	Worldwide Documentation on Wind Erosion Control (DESIS)	207
BMFT	Ministry of Research and Technology (Germany)	133,213
BMU	Ministry of Environment, Nature Conservation and Nuclear Safety (Germany)	133,309
BSI	British Standards Institution (United Kingdom)	<u>304</u>
CAS	Chemical Abstracts Service (IRPTC)	221
CCC	Chemical Co-ordinating Centres (EMEP)	107
CEC	Commission of the European Communities (see also EC)	105,107,111-113, 126,133,135,143, 206,210,215,303, 304
CEN	European Committee for Standardization (CEC)	<u>301,305,310</u>
CENELEC	European Committee for Electrotechnical Standardization	305
CITES	Convention on International Trade in Endangered Species (IUCN/UNEP)	225
CLI	Climate Change Project (IIASA)	109
CLICOM	Climate Computing (WCDP)	224
CMC	Conservation and Monitoring Centre (WCMC)	225
CMCP	Protected Areas Sub-Module (ENVIS)	211
CMEA	Council for Mutual Economic Assistance	115,121
CNES	National Space Research Centre (France)	137
CODATA	Committee on Data for Science and Technology (ICSU)	<u>205,309</u>
COMAR	Coastal Marine Programme (UNESCO)	140
CONPACSE	Co-ordinated Programme on Marine Pollution Monitoring and Control in the South-East Pacific	<u>103</u>

CORINE	Co-ordinated Information System on the State of the Environment and Natural Resources (CEC)	133,206,212
COSPAR	Committee on Space Research (ICSU)	135,137
CPPS	Permanent Commission on the South Pacific	103
CRD	CODATA Referral Database (CODATA)	205
CSM	Climate System Monitoring (WMO)	214,224
DAC	Development Assistance Committee (OECD)	219
DC/PAC	Desertification Control / Programme Activity Centre (UNEP)	207
DELI	Desertification Library (DESI)	207
DEPRO	UNEP Desertification Control Projects (DESI)	207
DESI	Desertification Information System (DC/PAC)	207
DIN	German Institute for Standardization (Germany)	301,304,306,307
DIOR	Directory of Organizations Dealing with Desertification Control and Dryland Development (DESI)	207
DIS	Data and Information System (IGBP)	127,216
DITR	German Information Centre for Technical Regulations (DIN)	307
DS	Danish Standards Association (Denmark)	304
DUNDIS	Directory of U.N. Databases and Information Systems (ACCIS)	201
EC	European Communities (see also CEC)	105,108,111,137,141,205,209,221,304
ECA	Economic Commission for Africa (UN)	102
ECDIN	Environmental Chemicals Data & Information Network (CEC)	221
ECE	Economic Commission for Europe (UN)	107,122,126,131,132,208,215
ECHO	European Commission Host Organization (CEC)	111,210
EDC	Environmental Data Centre (Finland)	131,132,208
EDR	Environmental Data Report (UNEP)	223
EEA	European Environment Agency (CEC)	105,111,112,206
EEES	Environment Experts of the Economic Summit	309
EEION	European Environment Information and Observation Network (EEA)	105
EFTA	European Free Trade Association	105,304
ELC	Environmental Law Centre (IUCN)	209,211,218
ELIS	Environmental Law Information System (ELC)	209,211,218
EMAP	Environmental Monitoring and Assessment Program (EPA)	106
EMCI	Environmental Legislation Sub-Module (ENVIS)	211
EMEP	Co-operative Programme for the Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe (ECE)	107,111,113-115,126,132
ENDOC	Environmental Information and Document Centres (CEC)	210
ENREP	Environmental Research Projects (CEC)	210
ENVIS	Environment Information System (The World Bank)	211,225
ENVOS	Environmental Operations and Strategy Division (The World Bank)	211
EOS	Earth Observing System (U.S.A.)	216
EPA	Environmental Protection Agency (U.S.A.)	106,114,118,120,122,215
EPOCH	European Programme for Climatology and Natural Hazards (CEC)	171
EROS	Earth Resources Observing Satellite (U.S.A.)	216
ERS	European Remote Sensing Satellite (ESA)	104,105,133

ESA	European Space Agency	104,105,111,133, 137
ESCAP	Economic and Social Commission for Asia and the Pacific (UN)	141
ESTEC	Euro. Space Research and Technology Centre (ESA)	111
ETH	Swiss Federal Institute of Technology (Switzerland)	149
EUMAC	European Modelling of Tropospheric Constituents (EUROTRAC)	113
EUMETSAT	European Meteorological Satellite Organization	104
EUREKA	European Research Co-ordinating Agency	110,112,113,
EURISY	European Association for the International Space Year	137
EUROMAR	European project on marine research and technology (EUREKA)	206
EUROSTAT	Statistical Office (CEC)	105,108
EUROTRAC	European Experiment on Transport and transformation of Environmentally Relevant Trace Constituents in the Troposphere over Europe (EUREKA)	112,113,206
FAO	Food and Agricultural Organization (UN)	101,117,119,140, 142,147,203
GAIM	Global Analysis, Interpretation and Modelling (IGBP)	127
GARP	Global Atmosphere Research Programme (ICSU/WMO)	148,213
GAW	Global Atmosphere Watch (WMO)	114-116
GCE	Ground-based Cloud Experiments (EUROTRAC)	113
GCTE	Global Change and Terrestrial Ecosystems (IGBP)	127
GDPP	Global Database Planning Project (IGU)	212
GDPS	Global Data-Processing System (WWW)	150
GEDD	Global Environmental Data Directory (IGBP)	216
GEEP	Group of Experts on Effects of Pollution (GIPME)	123
GEMS	Global Environmental Monitoring System (UNEP)	102,115-117,118- 122,126,133,136, 144,149,214,222, 223,309
GEMSI	Group of Experts on Methods, Standards, and Intercalibration (GIPME)	123
GESREM	Group of Experts on Standards and Reference Materials (GIPME)	123
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Pollution (OCA/PAC)	142
GEWEX	Global Energy and Water Cycle (WCRP)	127,135,148
GIPME	Global Investigation of Pollution in the Marine Environment (IOC/ICES)	123
GIST	Global Information System Test (ISY)	137
GLISP	Great Lakes International Surveillance Plan (IIC)	130
GLOMAC	Global Modelling of Atmospheric Chemistry (EUROTRAC)	113
GLOSS	Global Sea Level Observing System (IOC)	124,138
GO <sub>3</sub> OS	Global Ozone Observation Network (GAW)	114,116
GOS	Global Observing System (WWW)	150
GPCP	Global Precipitation Climatology Project (WCRP)	148
GPS	Global Positioning System (GLOSS)	124
GRDC	Global Run-Off Data Centre (Germany/UNESCO/WMO)	213
GRID	Global Resource Information Database (GEMS)	102,117,133,206, 208,214,216,224, 225
GTS	Global Telecommunications System (WWW)	128,150
GTSP	Global Temperature-Salinity Pilot Project (IODE)	220
GTZ	German Society for Technical Co-operation (Germany)	219
HALIPP	Heterogeneous and Liquid Phase Processes (EUROTRAC)	113

HDGC	Human Dimensions of Global Change	109,125
HDU	Habitat Data Unit (WCMC)	225
HEAL	Human Exposure Assessment Locations (GEMS)	120
HELCOM	Helsinki Commission	203,204
HEM	Harmonization of Environmental Measurement (GEMS)	117,309
HMD8	Hydrologic & Meteorologist Database (Mekong Committee)	141
HRGCP	Human Response to Global Change Programme (HDGC)	125
IAEA	International Atomic Energy Agency	103,123,136,142, 222
IAF	International Astronautical Federation	137
IGA	International Association of Geomagnetism and Aeronomy (ICSU)	127
IAH	International Association of Hydrogeologists	129
IAHR	International Association for Hydraulic Research	129
IAHS	International Association for Hydrological Sciences	129,147,149
IAMAP	International Association of Meteorology and Atmospheric Physics	116,127,135
IAPSO	International Association for the Physical Sciences of the Ocean (IUGG)	138
IASC	International Arctic Science Committee	214
IBM	Integrated Background Monitoring (CMEA/GEMS)	115,121
ICC	International Chamber of Commerce	215
ICC	International Co-ordinating Council (MAB)	140
ICES	International Council for the Exploration of the Sea	204,206
ICID	International Commission on Irrigation and Drainage	129
ICIMOD	International Centre for Integrated Mountain Development (MAB)	140
ICP	International Co-operative Programme (ECE)	107,126
ICPIC	International Cleaner Production Information Clearing- house (IEO)	215
ICSI	International Commission for Snow and Ice	149
ICSU	International Council of Scientific Unions	109,113,114,125, 127,135,137,138, 140,143,146-148, 205,212,213,216, 220,223,226,309
IDF	International Development Fund	110
IDNDR	International Decade for Natural Disaster Reduction	138
IEB	International Environmental Bureau (ICC)	215
IEC	International Electrotechnical Commission	311,312
IEO	Industry and Environment Office (UNEP)	119,215
IERS	International Earth Rotation Service (GLOSS)	124
IFIAS	International Federation of Institutes of Advanced Studies	109,125,140
IGAC	International Global Atmospheric Chemistry Project (IGBP)	113,114,127
IGBP	International Geosphere-Biosphere Programme (ICSU)	109,113,114,122, 125,127,135,140, 148,212,216,220, 309
IGCP	International Geological Correlation Programme (UNESCO)	129,140
IGOSS	Integrated Global Ocean Services System (IOC)	128,138
IGU	International Geographical Union	212,216
IHD	International Hydrological Decade (IHP)	129,213
IHP	International Hydrological Programme (UNESCO)	129,140
IIASA	International Institute for Applied Systems Analysis	109,140,147,206

IIED	International Institute for Environment and Development	219
IJC	International Joint Commission (Canada/U.S.A.)	<u>130</u>
ILEC	International Lake Environment Commission	122
ILMO	International Organization of Legal Metrology	308
IM	Integrated Monitoring (The Nordic Council of Ministers)	114, <u>131</u> , 208
IMO	International Maritime Organization (UN)	123, 142, 215
IMP	International Pilot Programme on Integrated Monitoring (ECE)	107, 131, <u>132</u> , 208
INFOCLIMA	Climate Data Referral System (WCDP)	150, 224
INFOHYDRO	Hydrological Information Referral Service (WMO)	<u>217</u>
INFOTERRA	International Environmental Information System	201, <u>218</u>
INSTA	Internordic Standardization	131, <u>310</u>
INTERAISE	International Environment and Natural Resources Assessment Information Service (IIED)	<u>219</u>
IOC	Intergovernmental Oceanographic Commission (UNESCO)	103, 123, 124, 128, 138, 140, 142, 203, 216, 220, 226
IODE	International Oceanographic Data Exchange System (IOC)	123, 128, <u>220</u> , 226
IPCC	Intergovernmental Panel on Climate Change (UNEP/WMO)	109, 127, <u>134</u>
IPIECA	International Petroleum Industry Environmental Conservation Association	215
IRIS	International Review of Environmental Information Systems (OECD)	108
IRPTC	International Register for Potentially Toxic Chemicals (UNEP)	218, <u>221</u> , 309
ISCCP	International Satellite Cloud Climatology Project (WCRP)	148
ISLSCP	International Satellite Land-Surface Climatology Project	<u>135</u>
ISO	International Organization for Standardization	301, 303, 304, 305, 309-312
ISSC	International Social Science Council	125
ISSS	International Society of Soil Science	216
ISY	International Space Year	104, 111, 135, <u>137</u>
ITIC	International Tsunami Information Centre (ITSU)	138
ITSU	Tsunami Warning System in the Pacific (IOC)	<u>138</u>
IUBS	International Union of Biological Sciences	143
IUCN	International Union for the Conservation of Nature and Natural Resources	140, 206, 209, 218, 219, 225
IUFRO	International Union of Forestry Research Organizations	140
IUGG	International Union of Geodesy and Geophysics	127, 138
IUIS	International Union of Immunological Societies	205
IWRA	International Water Resources Association	129
IWRB	International Waterfowl & Wetlands Bureau	<u>139</u>
JETDLAG	Joint European Development of Turnable Diode Laser Absorption Spectroscopy for Measurement of Atmospheric Trace Gases (EUROTRAC)	113
JGOFS	Joint Global Ocean Flux Study (IGBP)	127, 220
JIS	Japan Industrial Standard (Japan)	308
JRC	Joint Research Centre (CEC)	104, 105, 107, 111, 137
KALRES	Kenya Arid Lands Research Station (MAB)	140
KEYS	Desertification Thesaurus (DESI)	207

LACTOZ	Laboratory Studies of Chemistry Related to Tropospheric Ozone (EUROTRAC)	113
LOICZ	Land-Ocean Interactions in the Coastal Zone (IGBP)	127
MAB	Man and the Biosphere programme (UNESCO)	121,129,140,142,143,309
MABIS	Man and the Biosphere Information System (MAB)	140
MAIL	Desertification Mailing List (DESIS)	207
MAP	Mediterranean Action Plan (OCA/PAC)	142,206
MARC	Monitoring and Assessment Research Centre (GEMS)	117,120,223
MARPOLMON	Marine Pollution Monitoring System (IOC)	123
MBDB	Mekong Bibliographic Database (Mekong Committee)	141
MEDI	Marine Environmental Data Information Referral System (IODE)	220
MEMAC	Main Emergency Mutual Aid Centre (ROPME)	142
MON	Environmental Monitoring Project (IIASA)	109
MSC	Meteorological Synthesizing Centres (EMEP)	107
MSEDB	Mekong Secretariat Social-Economic Database (Mekong Committee)	141
MTPE	Mission to Planet Earth (ISY)	135,137
NASA	National Aeronautics and Space Administration (U.S.A.)	116,135,137,216
NBWE	National Board of Water and the Environment (Finland)	208
NCAR	National Center for Atmospheric Research (U.S.A.)	146
NEPB	National Environmental Protection Board (Sweden)	204
NILU	Norwegian Institute for Air Research (Norway)	107
NIVA	Norwegian Water Research Institute (Norway)	122,126
NMC	National Meteorological Centre (WWW)	150
NNI	Dutch Institute for Standardization (The Netherlands)	301,304
NOAA	National Oceanic & Atmospheric Administration (U.S.A.)	114,137,148,216
NODC	National Oceanographic Data Centres (IODE)	220
NRLM	National Research Laboratory of Metrology (Japan)	308
NWRI	National Water Research Institute (Canada)	122
OALOS	U.N. Office of Ocean Affairs and the Law of the Sea	203
OUA	Organization of African Unity	102
OCA/PAC	Oceans and Coastal Areas / Programme Activity Centre (UNEP)	103,122,142
OECD	Organization for Economic Co-operation and Development	105,108,205,206,215,219
OIS	Operational Information Service (WWW)	150
OPS	Pan-American Health Office	103
OSPARCOM	Oslo and Paris Commissions	204,206
OTWS	Operational Tsunami Warning System (ITSU)	138
PADU	Protected Areas Data Unit (WCMC)	225
PAGES	Past Global Changes Project (IGBP)	127
PROCOM	U.N. Compendium on Dryland Development and Desertification Control Projects (DESIS)	207
PSFG	Permanent Service on the Fluctuations of Glaciers (ICSI)	149
PTWC	Tsunami Warning Centre (ITSU)	138
RAC	Regional Activity Centre (OCA/PAC)	142
RAINS	Regional Acidification Information & Simulation Model (IIASA)	109
RAP	Remedial Action Plan (IJC)	130
RCU	Regional Co-ordinating Unit (AMCEN)	102
REMCO	Committee on Reference Materials (ISO)	311,312
REMPEC	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (OCA/PAC)	142
REWIND	Network of Researchers and Institutions Dealing with Wind Erosion (DESIS)	207

RNODC	Responsible National Oceanographic Data Centre (IODE)	220
ROPME	Regional Organization for the Protection of the Marine Environment (OCA/PAC)	142
ROSE	Report on the State of the Environment (OECD)	108
RTH	Regional Telecommunications Hub (WWW)	150
RTECS	Registry of Toxic Effects of Chemical Substances (IRPTC)	221
RSMC	Regional Specialized Meteorological Centres (WWW)	150
SAE	Society of Automotive Engineers (U.S.A.)	302
SAFISY	Space Agency Forum for ISY	137,216
SCMU	Species Conservation Monitoring Unit (WCMC)	225
SCOPE	Scientific Committee on Problems of the Environment (ICSU)	143,309
SCOR	Scientific Committee for Ocean Research (ICSU)	127
SCOSTEP	Scientific Committee on Solar-Terrestrial Physics (ICSU)	127
SDGC	Space Data for Global Change (ISY)	137
SEPCF	South-East Pacific Action Plan (OCA/PAC)	142
SIREN	System of Information on Resources and the Environment (OECD)	108
SIS	Swedish Standardization Commission (Sweden)	310
SOTER	World Soils and Terrain Database (ISSS/UNEP)	216
SPREP	South Pacific Regional Environment Programme	142
SPREP POL	South Pacific Regional Marine Pollution Programme	144
STEP	Science and Technology for Environmental Protection (CEC)	111
STIB	Stratosphere-Troposphere Interactions and the Biosphere (IGBP)	127
SWMTEP	System-Wide Medium-Term Environmental Programme (UNEP)	144
TAP	Transboundary Air Pollution Project (IIASA)	109
TESLAS	Tropospheric Environmental Studies by Laser Sounding (EUROTRAC)	113
TOGA	Tropical Ocean and Global Atmosphere (WCRP)	124,148,220
TOPAS	Tropospheric Optical Absorption Spectroscopy (EUROTRAC)	113
TOR	Tropospheric Ozone Research (EUROTRAC)	113
TPU	Threatened Plants Unit (WCMC)	225
TRACT	Transport of Pollutants over Complex Terrain (EUROTRAC)	113
UNCHS	U.N. Centre for Human Settlements (HABITAT)	140
UNCSTD	U.N. Centre for Science and Technology for Development	215
UNDP	U.N. Development Programme	110,141,142
UNDRO	U.N. Disaster Relief Organization	138
UNEP	U.N. Environment Programme	101,103,107-110, 115-123,126,127, 134,135,140,142- 147,149,201,203, 205-208,214-216, 218,221-225,309
UNESCO	U.N. Educational, Scientific and Cultural Organization	101,102,117,121- 125,127-129,134, 135,140,142,143, 145-149,203,205, 213,216,220,309
UNICHIM	Chemical Industry Association for Standards (Italy)	313
UNIDO	U.N. Industrial Development Organization	110,142,215
UNITAR	U.N. Institute for Training and Research	214,216
UNSO	U.N. Statistical Office	140
UNU	U.N. University	125



VDI	Society of German Engineers (Germany)	306
VLBI	Very Long Baseline Interferometry (GLOSS)	124
WACAF	West and Central African Action Plan (OCA/PAC)	142
WAT	Water Resources Project (IIASA)	109
WCAP	World Climate Assessment Programme (WCP)	146,224
WCDP	World Climate Data Programme (WCP)	146,224
WCIP	World Climate Impact Studies Programme (WCP)	146,224
WCMC	World Conservation Monitoring Centre	117,211,225,309
WCP	World Climate Programme (WMO)	109,146-148,213,224
WCRP	World Climate Research Programme (WCP)	124,127,128,135,146,148,220,224
WDC	World Data Centres (ICSU)	216,220,226
WDCGG	World Data Centre for Greenhouse Gases (ICSU)	114,226
WDDIS	World Digital Database for Environmental Sciences (ICSU)	216
WGI	World Glacier Inventory (ICSI)	149
WGMS	World Glacier Monitoring Service (ICSI)	149
WHO	World Health Organization	117-120,122,140,142,143,205,223
WMC	World Meteorological Centres (WWW)	150
WMO	World Meteorological Organization	101,102,107,109,114-118,121,122,128,134-136,140,142,146-148,150,206,213,214,216,217,220,222,224
WOCE	World Ocean Circulation Experiment (WCRP)	124,148,220
WODC	World Ozone Data Centre (WCDP)	114,116
WRI	World Resources Institute	219,223
WTMU	Wildlife Trade Monitoring Unit (WCMC)	225
WWF	World Wide Fund for Nature	139,225
WWW	World Weather Watch (WMO)	128,150

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