

# A comparison of spatial information access policies of transnational environmental modeling and global climate change programs

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**ABSTRACT:** Technology barriers to acquiring, processing and using environmental information continue to fall, often dramatically. Yet policy oriented barriers still exist, especially in regard to data access, use and re-use. This paper examines policy issues by comparing information access policies of several international (global and regional) environmental monitoring and global climate change programs, highlighting commonalities and disparities, especially where the later may prevent access to data required to achieve the objectives of allied programs. Researchers have become more aware of the interconnectedness of all aspects of the global environment and climate change, and for the need to collect and share data across sectors, disciplines and country borders. Yet several of the data access policies now in effect in a range of international programs were developed and promulgated many years ago, focusing on the needs of one research sector, e.g. meteorology or ocean temperature or land cover.

## 1 INTRODUCTION

Before environmental monitoring and global change information can be used, it must be accessible to, and accessed by, researchers from a wide range of disciplines in a number of countries. Virtually all such data is spatial information acquired by remote sensing technology, e.g. via satellite based platforms, ocean based sensor systems or via national meteorological data gathering systems. While technology barriers to locating, acquiring, processing and using such information continue to fall, information policy barriers still exist, especially in regard to data access, use and re-use. Models, techniques and software are now sometimes patented to protect the intellectual property rights of research staff or their institutions. A global debate is now in progress concerning access to scientific data for research purposes, where government information policies are often in conflict.

This paper examines policy issues by comparing information access policies of several international agencies and environmental monitoring and global climate change programs, highlighting commonalities and disparities, especially where the later may prevent access to data required to achieve the objectives of allied programs. Researchers have become more aware of the interconnectedness of all aspects

of the global environment and climate change, and for the need to collect and share data across sectors, disciplines and country borders. Yet several of the data access policies now in effect in a range of international programs were developed and promulgated many years ago, focusing on the immediate needs of a single research sector, e.g. meteorology, ocean temperature or land cover.

Current data access policies from the following programs are reviewed and discussed in the paper.

- IGBP (International Geosphere-Biosphere Programme),
- CEOS (Committee on Earth Observation Satellites),
- WMO (World Meteorological Organization) and ECOMET,
- IOC (Intergovernmental Oceanographic Commission),
- GOOS (Global Ocean Observing System) and EuroGOOS (European Global Ocean Observing System),
- GSDI (Global Spatial Data Infrastructure) initiative and the Global Map Project,
- ESA (European Space Agency) data policy for use in scientific research,
- EEA (European Environment Agency) data policy.

Conflicts already exist between certain of these programs in regard to data access and dissemination

policies, and sometimes among partners within the same program. These problems will not disappear in the near future without the concerted effort of all parties, including national governments. Commercialization of data lies at the heart of many of the current conflicts, especially in regard to meteorological and oceanographic data and models.

## 2 GLOBAL OBSERVING PROGRAMS

### 2.1 *IGBP - International Geosphere-Biosphere Programme*

Over the past four decades, scientists, policymakers and government officials have become ever more aware of the degree to which our environment is degrading and climate is changing, leading to increased research into all aspects of environmental change. Efforts of the International Council of Scientific Unions (ICSU) are carried out by programs like IGBP, the International Geosphere-Biosphere Programme (IGBP), founded in 1986. From its earliest days, IGBP favored and fostered an open data access policy, as indicated in this IGBP ICSU report in 1990:

"Data should be provided at the lowest possible cost which, as a first principle, should be no more than the cost of reproduction and distribution."

IGBP research focuses on six key questions, addressed by eight Core Projects, examining a wide range of questions concerning the global atmosphere, the role of biological processes, terrestrial ecosystems, vegetation and hydrological cycles, land use, coastal ecosystems, ocean biogeochemical processes and more. In order to manage the huge volumes of data being collected and shared around the world, across disciplines, one of IGBP's three Framework Activities is the Data and Information System (IGBP-DIS). The goals of IGBP-DIS are "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."

One example of the data available is the IGBP DISCOVER data set developed from 1 km AVHRR data, coordinated by the IGBP-DIS Land Cover Working Group. This global land cover data set represents baseline conditions and is an important input to global dynamic models. Completed in 1998, global version 1 DISCOVER initially had no constraints in its distribution policy.

"All data used or generated during the course of the project (source, interpretations, attributes, and

derived data), unless protected by copyrights or trade secret agreements, will be distributed through the EOSDIS DAAC Web Page." (visit [http://edcwww.cr.usgs.gov/landdaac/glcc/glcc\\_na.html](http://edcwww.cr.usgs.gov/landdaac/glcc/glcc_na.html))

The reference to "copyright and trade secret" protection is the first of many examples in this paper of how intellectual property rights (IPR) must be taken into consideration in data access policies for global-scale environmental research programs, even when such data is not collected for, or used for, commercial purposes.

### 2.2 *CEOS - Committee on Earth Observation Satellites*

The Committee on Earth Observation Satellites (CEOS) was founded in 1984 and is now a framework for coordination of all space-borne Earth observation systems. Since its formation, 40 Earth observation missions have been launched. The Working Group on Information Systems and Services (WGISS) was re-established in 1995 and is responsible for monitoring and harmonizing data exchange policy for space-borne Earth observation data. Within WGISS, the Access Sub-group strives to ensure that Earth-observation data and services are readily accessible to data providers and users on a global basis, via international coordination. (WGISS 2001)

An amendment to the Terms of Reference under which CEOS was formed, adopted in November 1990, states the goal to "provide non-discriminatory and full access to data which will be made available to the international community." A CEOS Resolution in December 1992 reinforces this data sharing goal recommending "non-discriminatory access to satellite data by all users for global change/climate and environmental research and monitoring is essential" and "programs should have no exclusive use period."

## 3 METEOROLOGICAL DATA EXCHANGE

### 3.1 *WMO - World Meteorological Organization*

WMO's 185 member nations operate the World Weather Watch program, which costs over \$US 5 million per day, producing enormous volumes of data. The WMO Twelfth Meteorological Congress in 1995 proposed Resolution 40 (Cg-XII) covering "WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities." With this resolution, WMO adopted its policy on the international exchange of meteorological and related data and products (WMO 1995):

"As a fundamental principle of the World Meteorological Organization (WMO), and in consonance with the expanding requirements for its scientific and technical expertise, WMO commits itself to broadening and enhancing the free and unrestricted international exchange of meteorological and related data products."

The term "free and unrestricted" was previously defined by WMO Resolution 23 (EC-XLII) to mean non-discriminatory and without charge where "without charge", in the context of Resolution 40, means at no more than the cost of reproduction and delivery, i.e. without charge for the data and products themselves.

While recognizing the importance of free and unrestricted access to data and products "essential for the provision of services in support of the protection of life and property and the well-being of nations", WMO also recognized that some WMO Members wanted to place conditions on re-export of data to countries other than the receiving country if such re-export was for commercial purposes. Resolution 40 requests all WMO members to provide free and unrestricted access to the research and education communities for all data and products "exchanged under the auspices of WMO" with the understanding that any commercial activities are still subject to the conditions mentioned above.

A similar resolution, 'Exchange of Hydrological Data and Products', Resolution 25 (Cg-XIII) was adopted in 1999. The primary objective of these policies is to protect and strengthen the fundamental principle of free and open exchange of meteorological data and products, while at the same time recognizing the need for some Members to engage in commercial activities as directed by their governments. These policies were developed as a result of constraints by some Members' government policies to recover a substantial portion of their operating costs through commercial activities, including value-added product development and a portion of the basic costs of the observing networks, data management, and data processing activities. To protect their databases and prevent commercial competitors from undercutting the prices set by the agencies, certain restrictions on data exchange and usage have been implemented.

### 3.2 *ECOMET – European Weather Services*

ECOMET is a European Economic Interest Group (EEIG), created under Belgian Law in 1995, representing the interests of 15 European national weather services, with yet more considering membership.

ECOMET's main objectives are (AEDUE 2000):

- To maintain and increase the free exchange of meteorological information.
- To have commercial users of meteorological services contributing to the financing of the in-

frastructure of the National Meteorological Services (NMSs).

- To improve the availability of all data and products from the NMSs for commercial use on the European market.
- To create the conditions for fair competition under European rules.

ECOMET members attempt to make meteorological data and weather models as freely available as possible for scientific and educational purposes. However, the commercial nature of the operations of many of the members often puts them in a difficult position with regard to fulfilling their obligations under programs such as the WMO World Weather Watch and certain EU Directives.

### 3.3 *Why the Policies Matter*

The data access, use and re-use policies set by the WMO and ECOMET are often used as models for similar policies in national, regional or global projects or programs that involve meteorological data. For example, the INDOEX (Indian Ocean Experiment) project collected in-situ data on the regional cooling effect of sulfate and other aerosols from the Arabian Sea and Indian Ocean between 1994 and 1999 to provide data for input to various climate change models. INDOEX adopted WMO Resolution 40 as the basis for the INDOEX data protocol to be followed at each of the planned INDOEX data centers based at various institutes around the world.

As Weiss and Backlund noted (1997), meteorological data provides a good example for the problems faced in harmonizing information policy issues on an international level. Two models compete for financing government production of meteorological information and are in direct conflict. This conflict is occurring within the context of a long accepted international framework for the production and distribution of information. "The conflict between the public good/private enterprise partnership arrangements followed in the U.S., exemplified by the diversity principle ... and the efforts of some government entities to restrict the flow of information for quasi-commercial purposes is threatening the traditional framework of open and unrestricted exchange of weather related data."

## 4 OCEANOGRAPHIC DATA EXCHANGE

The International Oceanographic Commission of UNESCO is a key policy maker for remote sensing programs dealing with global ocean observation, such as GOOS, the Global Ocean Observing System and its European sub-system EuroGOOS. The interplay between these programs and their approach to

data access and dissemination policy is described in the following sections.

#### 4.1 *IOC – Intergovernmental Oceanographic Commission (UNESCO)*

Recommendation IODE-XIV.6, was adopted by the IOC Assembly during its Seventeenth Session (1993) and is current policy of the IOC. It recognizes the ICSU Data Policy for the IGBP, the CEOS Satellite Data Exchange Principles and the WMO policy on free and open international exchange of meteorological data. This shows how entwined such policies become and why harmonization is important, especially across disciplines. The IOC recognizes that global ocean programs require an international commitment in regard to data issues for cooperative projects. They also believe that the objectives of important UN conventions on climate change and biodiversity require full and open access to global data sets of oceanographic and marine biological data.

The Working Group on Oceanographic Data Exchange Policy proposed a Draft Statement on Data Management Policy for Global Ocean Programmes, as an Annex to Recommendation IODX-XIV.6 (IOC 2000). This led to adoption of a draft policy statement “to facilitate full and open access to quality ocean data for global ocean research programmes” under which a fundamental principle of IOC is “that there shall be free and unrestricted sharing of all ocean data and related information”. ‘Free and unrestricted’ were defined as “non-discriminatory and without charge, i.e. made available at no more than the cost of reproduction and delivery ... without charge for the data and products themselves.”

Under this definition of ‘free and unrestricted’, Member States are requested to provide ocean data and products “necessary for the provision of services in support of the protection of life and property and for the well-being of all peoples.”

They are also asked to provide data, on the same basis, to “programmes and projects of IOC, including those undertaken jointly with other organizations, related to operational oceanography and ocean research at the global, regional and national levels.” The research and education communities are to have free and unrestricted access to ocean data exchanged within IOC-supported programs, as long as this is for non-commercial use, i.e. not for profit and the results will be published in the open scientific literature.

To satisfy demands from some countries for intellectual property protection of certain types of ocean data (i.e. data to be used for commercial exploitation), the draft policy permits Member States to place conditions on the re-export (for commercial purposes) of such ocean data and products (models) outside the receiving country. Where such condi-

tional use of data is claimed, this must be made known to all Member States. This is in line with similar policy set by WMO Resolution 40 regarding meteorological and hydrological data.

Successes of IODE policy during the past 40 years include establishment of more than 60 data nodes globally; generation of “a positive family spirit”; and ocean data made available by the IODE community through a wide variety of media. Failures of the policy include delays in submitting data beyond recommended time intervals; IOC member states who have ‘classified data’ or other restrictions that limit data exchange; limits to the ‘volunteer’ principle used by IODE; and the need to improve the relationship between researcher and data center, as the scientist is both a data provider and user.

#### 4.2 *GOOS – Global Ocean Observing System*

Data policy for GOOS (2001), the Global Ocean Observing System, is still evolving, although it has established a set of design principles, principles of involvement, and guiding principles for data sharing, as indicated below (IOC 2000: Annex VI pp.13-16)

##### 4.2.1 *Principle D7. The management, processing and distribution of data will follow a specified data policy*

“... following the data management plan for the World Weather Watch of the WMO, commitment is required by GOOS participants to establishing, maintaining, validating, making accessible, and distributing high quality, long term data meeting internationally agreed standards. ... GOOS contributors are responsible for full, open and timely sharing and exchange of GOOS-relevant data and products for non-commercial activities. Exchange implies that donation by individual nations gains access to data from others as well as to products derived using all available data, such that the benefit of cooperation exceeds the cost.”

##### 4.2.2 *Principle P8. Participants will have full autonomy in the management of their contributions to GOOS*

Although coordinated internationally, GOOS data policy is implemented by nations and their agencies, whose methods and internal policies may vary. Principle P8 “is an assurance that GOOS has no role in these internal processes, and its influence will be confined to the encouragement of adherence to the quality assurances protocols, data exchange policy, etc. according to the other GOOS Principles.” As a corollary to Principle P8, Principle P9 reaffirms that “nations must always retain full control of the resources and contributions they make to GOOS.”

#### 4.2.3 *GOOS Data Policy*

The draft GOOS Data and Information Management Strategy and Plan of May 2000 (GOOS 2001) outlines three basic principles for data sharing:

Data obtained by GOOS should have “no periods of proprietary holding, nor any restrictions on to whom or when the data are disseminated.”

Data quality must be assured.

Because nation and personal (intellectual property) interests must be considered, “it may not be possible to apply the first principle totally in all cases.”

Thus we see that GOOS data policy already takes into account the later provisions of WMO policy designed to accommodate participants with commercial interests.

#### 4.3 *EuroGOOS – European Global Ocean Observing System*

EuroGOOS, the European Global Ocean Observing System, has a draft data exchange policy (EuroGOOS 2001) that follows the policy of WMO Resolution 40 and is in line with ECOMET, as well as the EC’s Directive 90/313/EC on the freedom of access to information on the environment, updated in 2000 (EU 2000) and the EC Directive 96/9/EC on the legal protection of databases (EU 1996).

Under provisions of the EuroGOOS draft policy (IOC 2000: Annex VI pp.16-21), “essential, additional and other data products” should be exchanged “on a free and unrestricted basis ... between the Members of EuroGOOS.” The originator of data and products has a right “to place conditions on ... redistribution for commercial purposes.” “Free and unrestricted access to data and products for non-commercial research and education” purposes should be encouraged. If data and products, financed by public funds, are made available for commercial purposes, then they also must be available for other Service Providers. Availability of data, prices and conditions for re-use must be transparent “through the maintenance of a EuroGOOS Product Catalogue.” As with WMO and GOOS policy, provisions are made for control of data by intellectual property rights holders, especially when used for commercial purposes.

#### 4.4 *Why the Policies Matter*

Common sense suggests that the true value of data is maximized when data are used as much as possible and that charging for data is likely to inhibit such use. A typical case proving this point was the increase in cost of Landsat imagery for a period of time, when control passed from NASA to a commercial entity. This policy was later reversed partly due to the dramatic fall in use of Landsat imagery due to the price increase.

A founding principle of the IOC is to provide member states with ready access to data collected by IOC programs. Many examples exist of negative consequences for global programs when this principle is not respected. However, some IOC members feel that observation systems may be damaged financially, leading to loss of coverage, of continuity and data quality, if they cannot seek additional funding through commercialization of their data. They feel that data access policies must reflect this option. Within the European Union, there are EC directives that give data holders the right to restrict access and to charge fees for data in order to protect data providers from competition outside Europe. A case in point is the EU Directive giving legal protection to databases, in addition to normal copyright protection conventions, which does not exist elsewhere in the world. Today, guiding principles aside, the WMO, ECOMET, GOOS and EuroGOOS allow such data restrictions for commercial purposes, while stressing that the goal should be to distribute this vital information as freely and as openly as possible.

## 5 GLOBAL AND REGIONAL SPATIAL INFORMATION PROVISION

Two major global spatial data initiatives are underway in the sphere of topographic data. These are the Global Spatial Data Infrastructure (GSDI) project and the Global Map Project, described in the following sections. Because of the global nature of these projects and their high profile, the data access policies that they propose and implement are of great interest, especially as models for other national or sector-specific projects.

### 5.1 *GSDI – Global Spatial Data Infrastructure*

The Global Spatial Data Infrastructure (GSDI) initiative began in 1996 at a meeting in Bonn, Germany, attended by heads of national mapping agencies and international organizations who shared a common interest in developing a global view for SDI development. Four further meetings have since been held in the USA, Australia, South Africa, Colombia and the sixth will take place in Hungary in September 2002. Attendance has increased at every meeting as interest has grown and as practical results have emerged.

A GSDI working group created the “GSDI Cookbook” which has a specific chapter on “Geospatial Data Access and Delivery - Open Access to Data”, key points of which are summarized below (GSDI 2001) highlighting the main issues faced by both users and suppliers of spatial information.

“Access to geospatial data from the consumers point of view ... goes from discovery to evaluation, to access and finally to exploitation. Discovery (find,

locate) involves the use of services such as metadata catalogs to find data of particular interest over a specific geographic region. Evaluation involves detailed reports, sample data and visualization ... to help the consumer determine whether the data is of interest. Access involves the order, packaging and delivery, offline or online, of the data ... specified. Finally exploitation (use, employ) is what the consumer does with the data for their own purpose."

"Typically ... the focus of geospatial data access was supplier side with a strong emphasis on technology and community based standards and specifications. With the growth of the Internet, in particular Web based technologies, access has become a demand driven operation. Consumers expect simple discovery and access to cheap (or free) data in simple standard formats that can be used in desktop applications. Increasingly non-traditional suppliers are offering geospatial services. The ability to leverage off other major developments such as the World Wide Web, and in some cases electronic commerce, has allowed broader participation in the Industry. The further democratisation of access to geospatial data thus enables value-added suppliers to create new data products and services."

From an organizational point of view, the issues are (a) how broad is the client group and (b) how broad is the supplier group. Issues appear and grow more complicated as the groups become broader and, generally, revolve around copyright, licenses (end user versus reseller), cost, privacy, data formats and standards.

## 5.2 Global Map Project

The International Steering Committee for Global Mapping was created in 1994 with the view of creating a 1:1 million scale map of the world, comprising 17 thematic data layers. As of 29 January 2002, there were 90 countries participating in the project, with 31 countries or regions (e.g. EU) still considering participation. The map is not yet complete, but those portions that are available can be accessed from the Web at [www.iscgm.org](http://www.iscgm.org).

Working Group 3 of ISCGM is responsible for establishing data policy, including "a framework policy for access to Global Map data" (ISCGM 2000). Only long after the technical specifications had been agreed were the access issues addressed, within the framework of the different public sector information cultures among participating countries.

The objectives of WG 3 are:

- to develop a framework policy for provision of Global Map data to the Project by the National Mapping Agencies,
- to re-assess the potential and actual users and uses of Global Map data,
- to develop a framework policy for access to Global Map data.

The data policy recommendations presented by WG3 in May 2001 (ISCGM 2001) include:

- Free distribution of Global Map data for non-commercial use via the Internet, and acknowledgement of copyright, as the default and recommended option for Global Map version 1.
- Mechanisms to be established to record and report the use of Global Map data and report any improper use of Global Map.
- Assess possible delivery procedures by media other than the Internet.
- WG3 to assess options and make proposals regarding the market potential of Global Map, a global survey of national mapping agencies' positions on data policy issues and options, a data policy model for Global Map version 2, issues of sensitivity, and evaluate the effectiveness of the data policy for Global Map version 1.

The "Hiroshima Statement for the Global Map" (ISCGM 2000) states: "The challenge for us now is to maintain and enhance the Global Map; to implement policies that result in the widest possible access and use of the product; and to continue to work together with individuals and groups dedicated to the cause of improved Global Map products."

The current registered user's agreement for the Global Map states that the "data is made available here for governmental or research users. THIS DATA IS FOR NON-COMMERCIAL USE ONLY! ANY UNAUTHORIZED USE OF THESE DATA FOR ANY COMMERCIAL PURPOSES IS IN VIOLATION OF INTERNATIONAL COPYRIGHT LAWS AND STRICTLY FORBIDDEN. The copyright of the Global Map data V.1.0 you are going to download belongs to Mapping Organizations of respective countries."

(see <http://www.iscgm.org/agreement.html>)

The agreement also states that: "In order to view the Global Map Data, GIS software corresponding to the Global Map Data is needed. Please ask each GIS vendor for GIS software usable for the Global Map Data." This requirement raises interesting questions as to accessing this data via IPR-protected software packages, until such time that suitable software is either put into the public domain or otherwise made readily accessible at reasonable cost.

## 6 REGIONAL EUROPEAN AGENCY POLICIES

### 6.1 European Space Agency Data Policy

ESA, the European Space Agency, operates a number of important remote sensing platforms, including the recently launched ENVISAT satellite, comprising 10 separate instruments. These add considerably to the remote sensing data already gathered by the ERS-1 and ERS-2 platforms.

The stated ENVISAT data policy (ESA 1998) is “to maximize the beneficial use of ENVISAT data and to stimulate a balanced development of science, public utility and commercial applications, consistent with the ENVISAT mission objectives.” Under this policy, ESA retains rights to and ownership of all primary data originating from the satellite payload and for derived (value-added) products “to the extent that the contribution of ENVISAT is substantial and recognizable.” ESA protects its rights through existing EU legislation, including laws on protection of databases, copyright and other forms of intellectual property rights (IPR).

Data is made available for two categories of use, which impose different conditions on the users. “Category 1” use is for research and applications development in support of mission objectives, including research “on long term issues of Earth system science, ... and ESA internal use.” “Category 2” covers all other uses, including operational and commercial use.

The cost for ENVISAT data for Category 1 use is set “at or near the cost of reproduction of the data.” This cost may be waived for approved projects under an existing scheme. For Category 2 use, ESA sets a price for ENVISAT standard products and services which it then provides to appointed distributors. The price is set at a level “comparable to the price for Category 1 use.” However, distributors are allowed to then set prices for Category 2 use at or above the price that ESA charges the distributor. They may also charge a lower price, with ESA approval, and ESA has the right to fix a maximum level for the market price that distributors can charge.

ESA’s stated data distribution policy is to make data available “in an open and non-discriminatory way, in accordance with the United Nations Principles on Remote Sensing of the Earth from Space (United Nations Resolution 41/65, 3 December 1986).

For research and educational purposes, where data has been made available at “cost of reproduction”, any additional special processing charges are not included. Once accepted as an ESA data user, the named research project leader becomes fully responsible for the data, regarding its proper use and dissemination (to named co-investigators only).

ESA does impose additional conditions of which research staff should be aware (ESA 2001), such as the requirement to “publish the results of his project in publications of international renown both during and on completion of the project period.” There are also stiff reporting requirements to be met and ESA has the right to monitor progress of the project. On the financial side, the project leader must also “indemnify the Agency for the full amount of any loss, expense, cost or liability (other than arising from any act, omission or direction of the Agency) resulting

from the Project Leader’s utilization of ESA data for which the Agency might be held responsible for any reason whatsoever.” Nor can any of the “rights, interests, duties or obligations” in respect of the data use contract be reassigned without approval of ESA.

As regards intellectual property rights (IPR), data supplied by ESA is specifically covered by the EU Directive 96/9/EC of 11 March 1996 on the legal protection of databases. This has quite different ramifications than claiming protection under normal copyright principles, which still apply, in any case, yet offer more limited protection to databases of facts. Also, the EU database protection directive only operates in the EU member states. Researchers located outside the EU region need to be aware of the ramifications of using this form of IP protection.

While ESA claims copyright in all its data, and requires project leaders to indicate this on all published material, they do permit the project to claim copyright for any higher-level, value-added information or product derived from the base data. However, in respect of such new IP rights, ESA requires the project leader to grant ESA an “irrevocable free-of-charge non-exclusive license to use such intellectual property rights solely for its own use in the field of space research and technology”.

Finally, the project leader must police any potential misuse of unauthorized dissemination of data covered by the data provision contract and its implied IPR terms, including unlawful use by any third party or co-investigator. Under national copyright law in most countries, implementing the international copyright conventions, such infringement can be severely punished.

## 6.2 EEA – European Environment Agency

The EU Council Directive 90/313/EEC, of 7 June 1990, on the freedom of access to information on the environment, mandated the European Environment Agency (EEA) to make available sufficient environmental information to permit environmental policy to be made and monitored. The Directive began a process of openness regarding public access to environmental information that has changed the way public authorities approach the issues of openness and transparency. To further this process, the European Commission issued a new communication (EU 2000) for a new Directive on public access to environmental information that would strengthen the 1990 Directive and correct any deficiencies noted.

The EEA’s formal policy (EEA 2000) is for open and easy access to the data and information used in its work programs. An experimental data service for the public enacts this policy by providing access to a limited number of the datasets used by EEA. Access to the remaining data is restricted, for copyright reasons only, to participating (data collecting) institutions and consultants working for the EEA. Thus,

EEA does not claim copyright in the data, which remains with the national agencies acting as the primary data providers. The EEA requires users to sign an agreement before granting access to certain datasets. For all other public datasets, access is granted free of charge as long as the data is not used for commercial purposes and the data source is acknowledged in publications.

## 7 SUMMARY OF POLICY CONFLICTS

While trying to ensure widespread use of scientific data collected for environmental and global change monitoring and research, two conflicting issues emerge: (a) the desire that such data be as widely shared and used as possible (a "full and open" policy) and (b) the desire of some governments and agencies to recover costs for data collection, processing and dissemination operations, partly to ensure higher data quality and continuity of data collection.

Intellectual property (IP) protection is being used more often, and in new ways, to secure data owners' rights, even if they do not intend to sell their data, but rather to make it as freely available as possible. It has been proposed that strong IP protection, once entrenched in government or institutional data policy, can have a negative impact on development of new, value-added data products which could be of interest and use to the scientific research community. Such policies may negatively impact on researchers' ability to access data needed for larger programs, with truly global implications. A more complete discussion of how these issues directly impact scientific researcher is available in regard to global agricultural and environmental monitoring research (Longhorn, White, Henson-Appolonio 2002).

The data policies of many agencies and programs that collect spatial data on a global basis favor full and open disclosure and sharing of scientific data. Yet what does that mean? In 1997, the US National Academy of Sciences / National Research Council (NRC) adopted a definition of "full and open" based on internationally agreed language used by the Organization for Economic Cooperation and Development (OECD) and WMO. The report (NRC 1997) recommended the adoption of "full and open" data access as an international standard, using the following definition based on prior US policy statements:

"Full and open access to scientific data should be adopted as the international norm for the exchange of scientific data derived from publicly funded research. Full and open availability is defined as being available without restriction, on a non-discriminatory basis, for no more than the cost of reproduction and distribution."

A 1997 US government interagency report (DMWG 1997) reviewed and summarized the data access philosophies and goals of more than 20 na-

tional and international organizations and programs. All agreed that we should reaffirm the commitment to free and unrestricted international exchange of basic oceanic, environmental and meteorological data and products to those national services and international research and monitoring programs that need such data, on the least restrictive terms commensurate with existing laws and regulations. Where governments encourage cost recovery practices in regard to data production and dissemination, the environmental research community needs to continue to fight for free (least cost) access to the data needed to monitor the environment and global change.

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