An international partnership for global environmental observation

IGOS Integrated Global Observing Strategy

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Editorial

THE WORLD WEATHER WATCH, A PRECURSOR OF IGOS

Robert C. Landis

Former Director, World Weather Watch Applications (WMO)

Outgoing Chairman IGOS-P

The World Weather Watch (WWW) is considered as an excellent example of international co-operation. It is premised on the understanding that every nation contributes what it can to a total INTEGRATED GLOBAL OBSERVING effort, and in turn, each nation is free to draw on the common pool of data, information and services according to their needs. The evolution of the WWW provides a precursor for an expanded and broader Integrated Global Observing Strategy (IGOS) that must support not only many facets of Meteorology, such as weather and climate, but also the science and services involving our total environment including the oceans and land masses.

In terms of a precursor for the IGOS, the many dimensions of integration within the WWW should be recognised. The early integration of research and services, fostered by the partnership of WMO and ICSU, within the joint activities of the WWW and Global Atmospheric Research Programme (GARP) is considered as one precursor aspect for future consideration. The idea was to mount an integrated overall global effort that balanced the needs of operational services and research so as to optimise the expected large resource required for the common data element in both WWW and GARP. In this way, the research and services became mutually reinforcing, permitting full participation of the world scientific community. This provided for a direct assault on the solution of several theoretical problems related to the time and space sampling of global observing so as to plan the WWW within limited budget guidelines. This also provided a second precursor of integrating both governmental and non-governmental organisations in the programme. From this

aspect, it is possible to see a precursor for the "Themes" now being developed within the IGOS Partnership.

The initial "driver" for the IGOS was also a precursor from WWW. In its initial design the WWW called for an integrated surface and space-based observing system. This led to another precursor, that of integrating Assistance and Implementation. Global systems, by their nature require significant participation by nations that are both developed and developing, particularly if consistency and continuity is required. To affect this participation, it is necessary to provide some level of technology support as well as education and training. Like the WWW, this suggests an IGOS precursor of implementation that must integrate national, regional and global elements.

The WWW was designed as an observing and services system and as such another precursor is the need to assure that the investors in an IGOS clearly see the benefits or output. This might be then described as an "end to end" system which is now being considered as an underlying principle of IGOS.

During the last decade the objectives of the WWW were expanded to include support to many other programmes, particularly those related to understanding climate and even to prediction of climate. This gives rise to another important precursor that suggests that the IGOS must then integrate across the total time spectrum if it is to be truly global.

Finally, it is difficult to deny that a major force in marshalling national and international support for large-scale science must come from the integration of scientific and political dynamics. Most advances in understanding the natural world have come when there is a confluence of events - scientific, technological, economic and political. The satellite, super computer, and world peace contributed to these events for the WWW. Can a similar set of precursors be extended to the IGOS?

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CEOS Disaster Management Support Group (DMSG)

Earth observation satellite data are not being fully utilized to support disaster prediction, monitoring, and mitigation on a worldwide basis. Information systems and services are needed to locate, acquire, reformat as necessary, and deliver Earth observation satellite data products rapidly to emergency response authorities in countries vulnerable to environmental hazards. New space-based capabilities can further improve hazard support. One approach to address this issue was the decision by the Committee on Earth Observation Satellites (CEOS) at its Plenary in November 1999 to establish an ad hoc Working Group on Disaster Management Support (DMSG). Consultations are underway on the appropriateness of an IGOS Disaster Applications Theme.

by **Larry Enomoto**[1]

Among the IGOS Demonstration Projects initiated by the CEOS Strategic Implementation Team at its first meeting in February 1997 was one for Disaster Management Support (DMS). It was selected to demonstrate the added value benefits that IGOS could yield given the scope for mitigating human and economic losses caused by disasters through more effective use of Earth Observation (EO) satellite data. Led by the National Oceanic and Atmospheric Administration (NOAA), the DMS Project held several meetings around the world at which many organizations presented their current and planned disaster activities. Within the DMS Project, several hazard teams and an information server team were established. The teams were charged with compiling user requirements, identifying shortcomings and gaps in the provision of satellite data, and developing recommendations for alleviating them.

In the Disaster Management Support Project Progress Report submitted to the 4th IGOS Partners Meeting and 13th CEOS Plenary at Stockholm, Sweden, in November 1999, an Appendix contained two proposals. The first was to establish an *ad hoc* CEOS Disaster Management Support Group (DMSG) and its proposed Terms of Reference (TOR). The second proposed an IGOS Disaster Applications Theme and included its draft objective, roles and responsibilities.

During the deliberations on the Disaster Applications Theme proposal at the 4th IGOS Partners Meeting, it was concluded that there were differing views on finding the way forward to address both an IGOS theme and an *ad hoc* CEOS group related to disasters. Therefore, NOAA agreed to consult with interested IGOS Partners on the optimal way forward on a potential Disaster Applications Theme within the IGOS context and, if appropriate, to present revised proposals showing compliance with theme criteria at an upcoming IGOS-P meeting. NOAA scheduled this consultation in Paris on September 28, 2000. The results of this consultation will be reported to the 6th IGOS Partners meeting in November 2000.

During the deliberations on the *ad hoc* CEOS DMSG at the 13th Plenary, the DMS Project Chair, Helen Wood, noted that the group would continue the essential functions of the former project as well as address improved space agency coordination and other issues DMSG would serve as a forum to identify, and interact with, current and potential users of space-derived data as one of the tools to deal with disasters. She added that the group would address policy and technical issues including a focus on a comparison of requirements against capacity and would recommend steps to correct any mismatches between the two. With strong support among the representatives, the DMSG was formally established and the TOR approved by the 13th CEOS Plenary. Ms. Wood agreed to serve as the initial chair of the ad hoc CEOS DMSG.

Since its formation as an ad hoc working group in November 1999, the CEOS DMSG held a planning meeting in Tokyo, Japan, on February 14-15, 2000. At that meeting, hosted by Japan's National Space Development Agency, the DMSG focused on plans for 2000 by its hazard teams (drought, earthquake, fire, flood, landslide, oil spill and volcanic hazards) and information server team. The participants also agreed on a new strategy for demonstrating coordinated space agency responses to specific disasters by using guidelines to be drafted by representatives from the European (ESA) and French (CNES) space agencies. Representatives from two regional institutions – Asia Pacific Advanced Network and Asian Disaster Reduction Center – explained their roles in facilitating access to and better utilization of Earth observation satellite data products to local end users for disaster management in the Asia Pacific region. The ESA representative showed examples of space technologies that his organization has applied for disaster management and for developing partnerships with emergency management users in Europe.

At its second meeting – a workshop hosted by the Canada Centre for Remote Sensing (CCRS) in Ottawa, the DMSG welcomed participation by four representatives from the remote sensing industry: Spot Image, RADARSAT International, Orbimage and Space Imaging. This industry panel described examples of disaster support that can be provided by private satellite operators. Participants explored ways to cooperate on providing better information on all options available to those who need to obtain remotely sensed data. The Canadian Space Agency (CSA) provided updates on how it is using RADARSAT data for national and global disaster management support. Three participants spoke on behalf of other international entities – the International Strategy for Disaster Reduction (ISDR), the Global Disaster Information Network GDIN) and the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS). They explained the disaster support activities underway in those institutions and welcomed DMSG collaboration with them. ESA and CNES provided initial guidelines for demonstrating coordinated space agency responses to requests for satellite remote sensing data and imagery. These guidelines are based on the ESA-CNES charter that was signed on June 20, 2000. Demonstration activities to be pursued by DMSG imply no formal commitment to the charter and will reflect only the "best effort" of agencies that are willing to participate. A new Ice Hazards Team was established at the workshop.

DMSG has reached general agreement on its way forward:

- Demonstrate the application of EO satellite data for actual hazards support;
- Develop a web-based information locator for remote sensing data relevant to disaster management;
- Facilitate cooperation among space agencies that agree to work with the ESA-CNES charter;
- Use the DMSG "best efforts" pilot as an "incubator" in DMSG; and
- Draw on lessons learned to help focus the activity.

In conclusion, the CEOS DMSG is continuing its focus on fostering improved utilization of existing and planned Earth observation satellite data. DMSG is trying to demonstrate the coordination of space agency responses to specific disasters using guidelines based on the ESA-CNES charter. DMSG has established contact with and plans to work closely with other international groups such as ISDR, GDIN and UN COPUOS involved in disaster related activities. Finally, DMSG is cooperating with the CEOS Working Group on Information Systems and Services with respect to activities that support disaster management.

Further information about the CEOS DMSG can be found at URL: **http://disaster.ceos.org**

1 - NOAA National Environmental Satellite, Data and Information Service; DMSG Secretariat.

Global Monitoring for Environment and Security

Therefore, many environmental problems have a direct relevance to considerations of national, regional and even global security and examining the links between environment and security is becoming a serious consideration for many administrations. The issue has been explored in the US[1], in Russia[2], in a report from the NATO CCMS[3] and in May 1999, it was the subject of a resolution from the European Parliament[4].

Satellites can provide a unique capability to gather global information and the issue of Environment and Security provides a comprehensive framework to analyse the political information needs for monitoring the environment. Since this reflects a broad framework of policy concerns and a wide spectrum of environmental effects the analysis is focused on three concrete themes; global change, environmental stress, natural disasters.

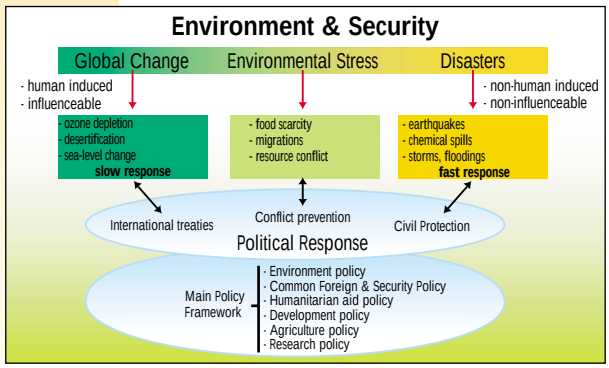
Against this background, in 1998, the Baveno Manifesto[5] introduced the concept of Global Monitoring for Environment and Security (GMES) with the underlying idea to create a political momentum by establishing the link between the political needs and the advanced technical and operational capabilities of observation satellites. Now, GMES forms an important element in the European Strategy for Space currently in preparation by the European Commission, together with the European Space Agency.

Growing concern about the environment has led to an increasing number of international environmental treaties that aim to reduce human activities with a negative impact on the environment. Climate change is but one of the possible consequences of human activity, but if today's trend continues, future generations will face even more extreme weather events, rising sea level and changing vegetation patterns. Not only environmental disasters, but also massive economic disruptions will be the result.

by H.J.Allgeier,
Director General of the EC Joint Research Centre

Meanwhile, the IGOS partnership has identified a number of themes on which it will concentrate its efforts. Priority is given to those topics where there is a visible political will and a strong federating tendency. A European commitment to GMES will provide an example of both these factors where the framework approach of GMES incorporates many of the aims of the IGOS partnership.

A plenary session at the IAF Forum to be held in Brazil in October will provide the setting for an international debate on the subject of GMES. A panel of distinguished experts will lead a discussion to examine, from an international perspective, the need for information gathering systems and the steps that can be taken to further encourage an international collaborative effort.



1- Pacific Northwest National Laboratory, Centre for Environmental Security. Sponsored by the U.S. Department of Energy's Office of National Security Policy Analysis.
2- Pan-European Governmental meeting on Environmental Monitoring, Moscow, 8th/9th December 1999
3- Environment and Security in an International Context; NATO Committee on the Challenges of Modern Society. Final Report 232.
4- Resolution on the environment, security and foreign affairs; Official Journal C128/92, May 1999
5- Baveno Manifesto: Statement from space agencies at Baveno in May, 1998.

THE ESA-CNES CHARTER

Space Agencies take initiatives to improve their contribution to disaster management

by Gerard BRACHET, Director General, CNES

Floods, tropical cyclones, landslides, earthquakes, volcanic eruptions, forest fires, threaten and hurt populations. The annual toll is approximately 100.000 casualties, more than 100 billion $ worth of destruction.

Much has to be done to organize the contribution of space science and techniques to disaster mitigation.

Scientific effort is, of course, the key to mid and long-term progress. Many space systems in orbit today, although not specifically designed for this purpose, have a lot to bring to support disaster management. There are two conditions to that :

- International cooperation, as no country controls the total set of systems which, operated in a coordinated can produce a complete pattern of the situation way over the disaster site,
- Improved capability for mobilization in emergency situations.

CNES and ESA have decided to take an initiative and to invite all other Space Agencies to join in this effort. This initiative is the commitment to respond to requests from civil protection governmental authorities by offering the necessary space data (archives or real time) in a fast and pertinent way, and by providing support for their utilization during the whole crisis.

This commitment is contained in a Charter, announced in Vienna at UNISPACE III, in July 1999, and signed on June 20, this year, in Paris by the Directors General of ESA and CNES. Full operation starts in November 2000. New partners (eg, the Canadian Space Agency) are soon to join the Charter.

The principle is very simple :

A 24 hour a day single phone number receives the requests coming from governmental civil protection authorities.

Within a couple of hours, a permanence officer in on duty with full authority to confer with the requesting institutions in order to initiate appropriate emergency actions: archive consultation, retrieval and diffusion and first tasking of satellites.

The responsibility is then handed over to regular staff, and a project manager is designated to deal with the support of Space systems during the whole crisis.

The other objective of the Charter is develop a support with most efficiency. Scenarii are to be elaborated, built from historical references, applied research and "lessons learned" from previous operations. A Secretariat, gathering experts from all the committed agencies and the civil protection authorities will tackle this task.

Three main benefits are expected from this initiative :

- Provide maximum support from the present space systems to the disaster management operations.
- Serve as an exercise to test and improve the cooperation between space agencies.
- Gain experience to define and design space systems targetted for support to disaster management .

All agencies prepared to work along the same lines are welcome.

IGOS AND THE CONVENTIONS

By Arthur Dahl, U. N. Environment Programme - Linda V. Moodie, Committee on Earth Observation Satellites

One aim of the IGOS Partnership is to make observing systems more user driven and to encourage a dialogue with principal user groups such as the multilateral environmental agreements. The Rio Conventions in particular (Climate Change, Biodiversity and Desertification) have significant information and reporting requirements that will require an adequate base of environmental data collected routinely on a long-term basis to measure progress under the Conventions. Many other Conventions could also be well served by an effective system of environmental observations.

The dialogue that began the earliest and has gone the furthest is that between the Global Climate Observing System (GCOS) and the UN Framework Convention on Climate Change (UNFCCC). The Conference of the Parties has adopted resolutions on climate observations and requested national reports on the state of observing systems. GCOS is now a recognized UNFCCC partner helping the secretariat and the subsidiary bodies to strengthen national observation systems needed to measure climate change and the effectiveness of convention measures. This relationship serves as an example of how collaboration could develop with IGOS Partners.

The United Nations Environment Programme (UNEP) has been mandated to strengthen coordination among the environmental conventions, and it organizes periodic meetings for this purpose. UNEP has therefore taken the lead to initiate a dialogue between the IGOS Partners and the Convention Secretariats and their subsidiary bodies.

On 25 October 1999, the UNEP Division of Environmental Conventions organized the First Meeting of the Scientific and Technical Subsidiary Bodies of International Environmental Conventions on the margins of the Conference of the Parties of the UNFCCC in Bonn, Germany.

There have also been meetings addressing the need for linkages among the conventions, both in terms of their substantive areas of interest and with respect to their operations.

These meetings have raised four broad issues that are relevant to IGOS:

- working with the Conventions to identify their observation needs;
- harmonizing information systems and information exchanges, such as the joint biodiversity website;
- coordinating the work of the subsidiary bodies of Conventions;
- streamlining national reporting and encouraging coordinated national approaches to reduce the burden on national governments of reporting to many different conventions.

IGOS Partners should therefore not only develop working relationships with each relevant convention, but consider how they can respond to the observation and information needs of all the conventions in a coherent and cost-effective manner.

Future potential lines of action for the IGOS Partnership could include:

- Identification of issues for which conventions will require more comprehensive information, such as forests, dry lands, climate change impacts (terrestrial and oceanic), and status and changes in ecosystems, with a view to their becoming IGOS themes;
- Developing partnerships on an ongoing basis with specific multilateral environmental agreements to examine information needs and availability;
- Improving awareness among the conventions of IGOS activities and what information they can provide;
- Attending future inter-linkages meetings where data issues are discussed.

News

Argo Regional Implementation

An International Implementation Planning Meeting for Argo profiling Floats in the Pacific Ocean and Adjacent Regionswas held in Tokyo on April 13-14, 2000 gathering 6 countries, 2 intergovernmental organizations (IOC, WMO) and 2 regional organizations (PICES, SOPAC).
They agreed that the global environment is experiencing regional and global impacts through anomalous climate events, and that in order to understand the related mechanisms it is essential to undertake appropriate research in view of implementing observing systems with a capacity for predicting extreme events and climate variability.

The Argo program will contribute by installing profiling floats deployed overthe global ocean to routinely and consistently observe the state of the upper ocean.The six countries shared the view that cooperation and collaboration were essential for the successful implementation of the Argo initiative.
Several countries (including US and Japan) announced that new budgets had been secured, and PICES and SOPAC, expressed their interest in the Program. These statements are vital to the success of Argo and its global objectives. Further regional Argo Implementation meetings were proposed including the one for the Atlantic held, since, in France on July 10-11, 2000.

Meeting Calendar

	2000 Oct	2000 Nov	2000 Dec	2001 Jan	2001 Feb	2001 Mar	2001 Apr	2001 May	2001 Jun	2001 Jul
IGOS Partners		▲ Rio de Janeiro							▲ Paris	
G3OS Sponsors									▲ Paris	
CEOS		▲ Rio de Janeiro								
SIT		▲ Rio de Janeiro							▲ Paris	
Others	▲ IAF									

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for further information contact: D. FOURNY-DELLOYE, tel. (331) 44.76.75.71 – fax (331)44.76.78.67 - E-mail: dominique.fournydelloye@cnes.fr