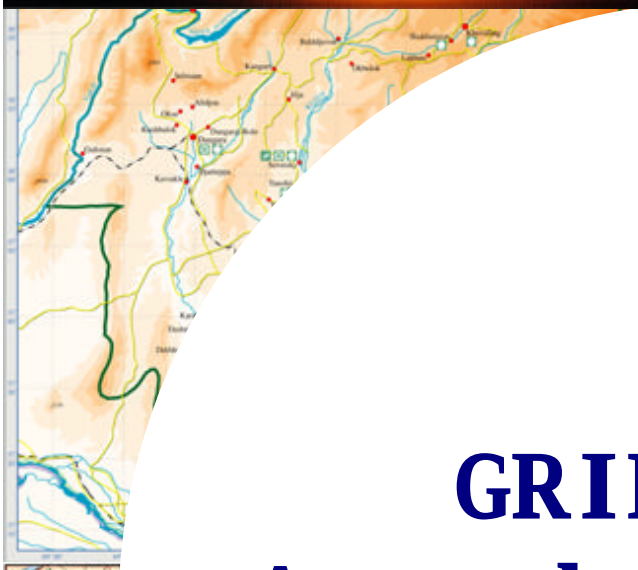

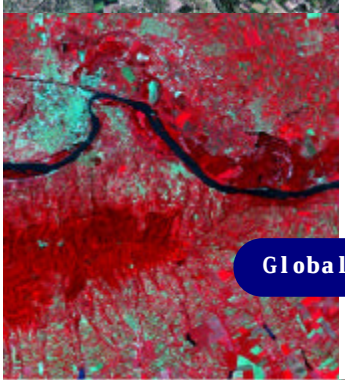

GRID-Geneva
Annual Report 1999

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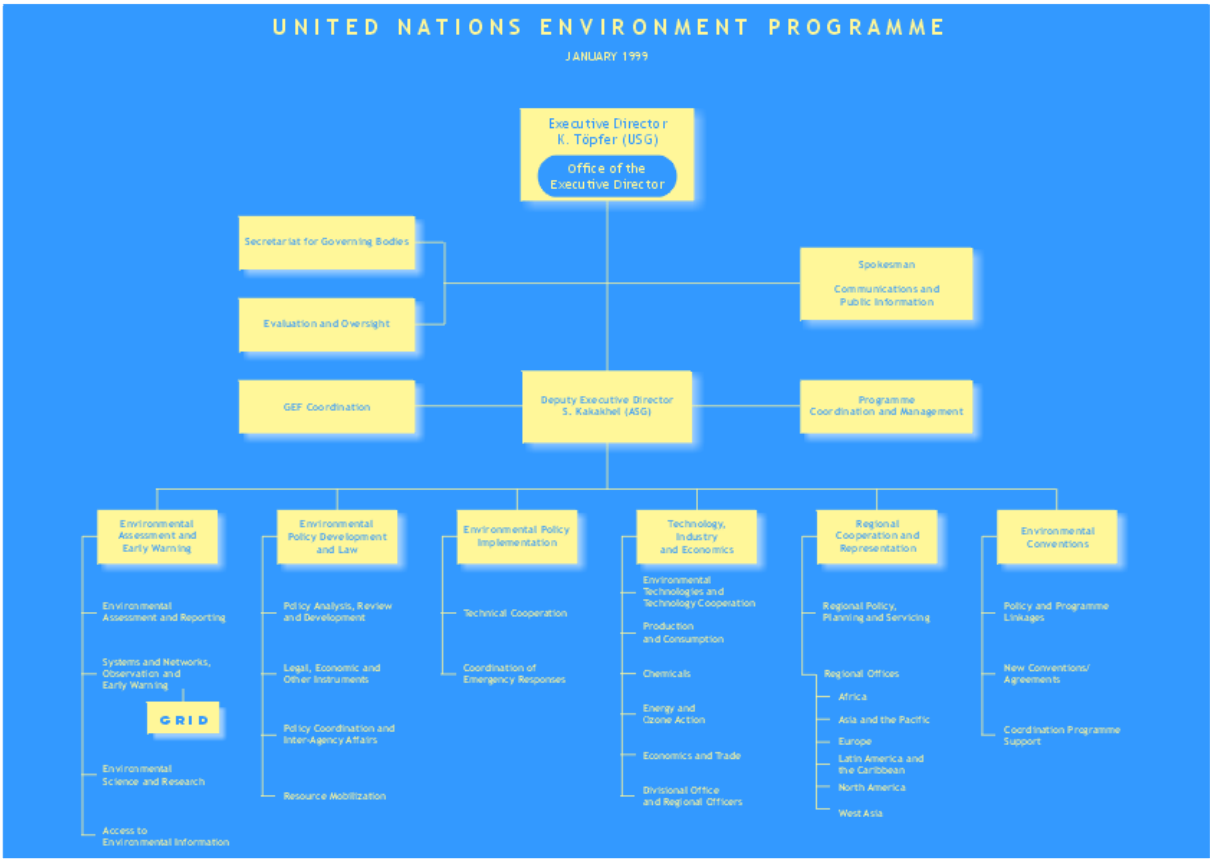
Global Resource Information Database - United Nations Environment Programme

UNEP's Mission

"To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations".



Adapted from UNEP Annual Report 1998

About the GRID Network

A worldwide network of Global Resource Information Database (GRID) centres was initiated by UNEP in 1985 as part of its environmental information network and is administered by its Division for Environmental Information, Assessment and Early Warning (DEIA&EW).

Front Cover

Pictures from top down:

- Pancevo oil refinery, Kosovo, April 1999. (Source: Pancevac)
- Map of Kulyab Area, Tajikistan, August 1999. (Source: GRID-Geneva)
- Map of Selected Sites Vulnerable to Environmental Damage due to Conflict in the Balkans Region, June 1999. (Source: GRID-Geneva)
- Pre-war satellite image of Novi Sad, Federal Republic of Yugoslavia taken on 31 July 1998 by Landsat Thematic Mapper sensor. (Source: ESA 1999, distributed by Eurimage, processed by GRID-Geneva)
- Post-war satellite image of Novi Sad, Federal Republic of Yugoslavia taken on 19 August 1999 by Landsat Thematic Mapper sensor. (Source: ESA 1999, distributed by Eurimage, processed by GRID-Geneva)

GRID-Geneva Annual Report 1999

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Contents

Message from UNEP Headquarters

The last year of the millennium broke new ground in UNEP's approach to and policy focus on environmental crises. Under the leadership of Executive Director Dr. Klaus Töpfer, the organization re-inforced its role as the environmental conscience of the United Nations family, by carrying out objective and scientific assessments of the environment in highly sensitive contexts, such as the results of armed conflicts, humanitarian crises and natural disasters.

The Balkans crisis in May 1999 sparked fears that potential trans-boundary pollution from military activities could lead to a regional environmental disaster. GRID-Geneva played a critical role in the joint UNEP/UNCHS (Habitat) Balkans Task Force (BTF), which was mandated to assess the environmental consequences of the conflict. It was specifically charged with hosting the Information Unit of the BTF and providing for the collection, synthesis and analysis of relevant data and information, as well as technical support (preparation of a complete website, regular bulletins, thematic maps and satellite image analysis). This task was carried out by GRID-Geneva as a timely and effective response.

The major challenge for GRID-Geneva in 2000 and for several years to come will be to consolidate UNEP's new focus on "early warning" and reinforce its capacities for emergency response to environmental problems (global forest fires, etc.), while maintaining a solid foundation in environmental information management and assessment.

We envisage that GRID-Geneva will uphold a sound reputation of excellence in meta-data activities and play an important role in promoting Catalogues of Data Sources at the local, national and regional levels. We also expect a continuation in the development of customized GIS databases such as that commissioned by UNOPS for Tajikistan, as well as capacity building and training in GIS and Remote Sensing in Francophone Africa and the Eastern Mediterranean. The support that GRID-Geneva provides to UNEP's Global Environment Outlook process is another important contribution to the Programme, while the linkages and networking that GRID-Geneva has forged in coordinating regional activities and in strengthening environmental information systems is another significant achievement to its credit.

UNEP's strategy to "encourage partnerships" has taken on a heightened sense of urgency due to financial uncertainties and an ever-growing list of environmental issues. The GRID-Geneva partnership agreement has proved to be a sustainable and cost-effective arrangement between an international agency, a national government and a local academic institution, which UNEP sincerely encourages others to emulate. In this respect, I am looking forward to the fulfilment of GRID-Geneva's potential as a major link to the Francophone data and information community based on the unique combination of institutions comprising the agreement.

I thank the staff of GRID-Geneva for their dedication to the core tasks of UNEP and our Division, and for creating synergies with UNEP headquarters and our partners in 1999; may we duplicate our efforts and build on this success in the year to come.

Daniel van R. Claasen

Officer-in-Charge
UNEP/Division of Environmental Information, Assessment and Early Warning (DEIA&EW)

Greetings from the University of Geneva

Ever since the establishment of a GRID centre in Geneva in 1985, the University of Geneva has been engaged in valuable scientific collaboration with the office. Indeed, GRID-Geneva currently hosts two part-time University researchers as part of its permanent staff body. Many doctoral and postgraduate students have also over the years benefited from GRID-Geneva's facilities and resources to carry out their research and internships. Another important step forward was made recently with the creation of a tripartite Advisory Board in 1998, comprised of representatives from UNEP, the Swiss Agency for the Environment, Forests and Landscape (SAEFL/ BUWAL) and the University of Geneva. The Board is helping to further the cooperation between the three entities, oriented as they are at different levels of operation: local, national and international. Moreover, it is noteworthy that the GRID-Geneva partnership effectively reinforces the strong and growing aspirations of Geneva's academic community to build working relationships and information exchange mechanisms with international organisations present in Geneva, particularly in the fields of environment, health, social development and humanitarian assistance.

The GRID-Geneva partnership can be considered as the forerunner of similar initiatives aimed at promoting cooperation, such as the recently established International University Network of Geneva (RUIG), which was created by the University of Geneva, the Graduate Institute of International Studies and the Graduate Institute of Development Studies. I am pleased to report today that our collaboration has produced positive results, which go beyond the initial objectives set by the Advisory Board, such as advising on the GRID-Geneva work strategy and the information products produced by the office.

For University of Geneva staff, who are often constrained within the bounds of an "ivory tower", working with GRID-Geneva offers an important interface with national authorities and the international community, as well as the possibility to exchange perspectives on various environmental problems that are of a regional and global significance; in short, the "real world". GRID-Geneva's role in setting up the Balkans Task Force, and in collecting, analysing and disseminating information about emerging environmental problems and threats clearly underscores the importance of building strategic partnerships.

In concluding, I would like to reiterate that the University holds GRID-Geneva as an exceptional example of cooperation, and state that it is our determined resolve to further develop our relationship in the future.

Prof. András November

University of Geneva/IUED
GRID-Geneva Advisory Board Member

About GRID-Geneva

The Global Resource Information Database (GRID) is a worldwide network of 15 environmental data centres managed by UNEP's Division of Environmental Information, Assessment and Early Warning (DEIA&EW) from its headquarters in Nairobi, Kenya. The GRID network was first launched in 1985 with centres in Geneva and Nairobi. GRID centres have now been established in five of the six geographical regions around which UNEP has organised its global activity. On a sub-regional basis, GRID centres are present in seven of the 19 UNEP sub-regions.

GRID-Geneva has benefited from the support of the Government of Switzerland ever since its establishment in mid-1985. As a reflection of its standing with Swiss partner institutions this relationship was reinforced, in June 1998, with the signing of a "Partnership Agreement" between UNEP, the Swiss Agency for Environment, Forests and Landscape (SAEFL) and the University of Geneva.

Aims

The principal aim of GRID-Geneva is to support environmental decision-making within UNEP, and the UN system as a whole, by generating and disseminating information about the state of the world's environment in a timely and understandable manner. To this end, GRID-Geneva specialises in handling and analysing spatial data on environmental and natural resource issues through computerised Geographic Information Systems (GIS) and Image Processing Systems of satellite imagery. Over the years, GRID-Geneva has amassed a vast archive of global, European and other geo-spatial databases as part of its information management function. These data, which are typically in digital format, include maps, satellite imagery, statistical tables and reports. In response to the recent restructuring of UNEP, GRID-Geneva has sharpened its focus to provide "early warning" on emerging environmental stresses and threats, mobilising environmental information to backstop international action in crisis situations, and providing value-added information products. GRID-Geneva also closely monitors developments in Information Technologies and examines their utility to environmental monitoring and policy formulation, and creates client-specific databases and Internet websites.

GRID-Geneva plays an important coordinating role for regional activities undertaken by its six European GRID centre partners. The office also works to develop and strengthen environmental information management capacities within governmental and regional organisations and the United Nations system.

Location

GRID-Geneva is housed at the International Environment House (IHE) which was jointly inaugurated on 14 September 1999 by Dr. Klaus Töpfer, UNEP's Executive Director, Dr. Philippe Roch, the Director of SAEFL, and Mr. Laurent Moutinot, the Geneva State Councillor for the Department of Physical Planning, Equipment and Housing. Located in Geneva's Châtelaine suburb, the IHE is situated within short distances from the Geneva city-centre and the main UN offices at the Palais des Nations. Several other UNEP programmes are also accommodated at the IHE including UNEP's Regional Office for Europe (ROE), System-wide Earthwatch, the Chemicals Programme as well as the secretariats of several global Environmental Conventions such as CITES and the Basel Convention.

O. Mikati

Inauguration of the International Environment House in Geneva on 14 September 1999. From left to right: Mr. L. Moutinot (Geneva State Councillor, DAEL), Dr. K. Töpfer (Executive Director, UNEP) and Dr. P. Roch (Director, BUWAL).

Year in Review

The year 1999 was one of substantive progress for the GRID-Geneva "Partnership" office, marked by a significant expansion of activities and augmented budget and staffing, as GRID-Geneva diversified its resource base. With strong support from UNEP, the Swiss Agency for the Environment, Forests and Landscape (SAEFL/BUWAL) and the University of Geneva, GRID-Geneva was able to take on numerous new projects which responded to UNEP's and the other partners' highest priorities: environmental "early warning" and emergency response; scientific information for decision-making at global to local scales; and networking with UN and other bodies to expand UNEP's reach and raise its profile.

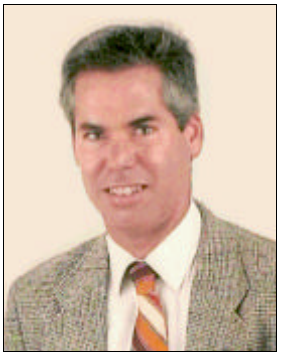
Perhaps the embodiment of UNEP's new orientation in early warning and emergency response was the decision to establish the joint UNEP-UN Centre for Human Settlements (Habitat) "Balkans Task Force" (BTF), to assess the environmental and human settlement impacts of the Balkans conflict. GRID-Geneva participated directly in the BTF through the Regional Coordinator, and assumed from the very beginning responsibility for the BTF's Information Unit, which supported its work through an entire suite of activities. These included the compiling of regular situations reports, preparation and update of digital maps on the conflict's impacts, satellite image analysis of the most heavily affected areas and an extensive website.

Significant progress was made in environmental decision support through a series of activities aimed at making environmental data and related information more easily accessible for decision-makers and managers. These included an on-line GIS for the continent of Africa ("GIS-Web Africa") which allows the interactive query and analysis of geo-spatial data using the Internet Map Server technology; support to SAEFL's national and the Canton of Geneva's local versions of the European Environment Agency's Catalogue of Data Sources; a new version of the GRID-wide Meta-data Directory sponsored by NASA's Global Change Master Directory project; and preparation of a digital GIS database and maps for Tajikistan to support work of the UN Office of Project Services local development work in that country.

New project activities in capacity building for information management in the Eastern Mediterranean, use of GIS and remote sensing for biodiversity assessment in Madagascar and support to the Caspian Environment Programme's data and information management component were also launched or prepared in 1999.

As UNEP enters the year 2000 with a newly revitalised sense of its mission, GRID-Geneva's parent Division of Environmental Information, Assessment and Early Warning (DEIA&EW) is at the forefront of some of UNEP's most critical activities. The process for the third Global Environment Outlook (GEO-3) assessment has already been launched, and GRID-Geneva will be directly involved in many aspects of GEO-3's preparation, including coordination of the European GEO Collaborating Centres, participation in the regional consultations, database development, information and "gap filling" and capacity building/training activities for other centres involved.

The "early warning" team at GRID-Geneva has recently been re-inforced, which should allow it to address this priority area in a more systematic manner, through the development of new methodologies and systems, as well as relevant databases for early warning purposes. One major goal is to enhance the office's and DEIA&EW's capability for reliable and timely information delivery in the face of additional and unpredictable environmental and human-related disaster events in the year to come. Along with all the current and planned data and information management and capacity-building activities foreseen, it is certain that GRID-Geneva's highly capable and motivated staff are already involved in a challenging programme of work in the year 2000.



Ron Witt

Regional Co-ordinator
DEIA&EW/GRID-Geneva

Early Warning Systems

The significant number of disaster events that occurred in 1999 underscored the need to invest in strengthening early warning capacities, to help decision-makers better understand the environmental and human impacts and invest in policies including preventative measures. Human-induced and natural disasters, as well as "complex" ones that are a mixture of both, have wrought havoc in all corners of the globe. Disasters have ranged from the environmental impacts of the Kosovo conflict, major earthquakes in Turkey and devastating floods in Venezuela. These events have taken place against a background of unabated forest fires, mainly in Russia and Brazil, accompanied with vegetation clearing which causes considerable loss of biodiversity and land degradation.

Establishing Early Warning Systems

Increasingly alarmed by these dramatic events, the international community has been generally compelled to respond on a case-by-case basis with varying success. Attention is now focused on the use of Information Technologies, including improved sensor capabilities for satellite image acquisition, ground positioning systems, and widespread use of Geographic Information Systems and the Internet as important tools for collecting, analysing and disseminating information. Concurrently, universities and scientific research organisations are multiplying efforts to develop models that would assist in forecasting the occurrence, magnitude and impacts of natural disasters. Definitions of "early warning" vary according to hazard predictability and time scale. An Early Warning Systems (EWS) is probably best described in generic terms as a system that includes models, sensors for detection, a telecommunication network and trained people to forecast, assess impacts and alert the general public and decision-makers. Considerable resources, however, are still needed to improve EWSs to enable an effective response to disaster outbreaks.

During 1999, GRID-Geneva focused its early-warning activities on four main areas. These were:

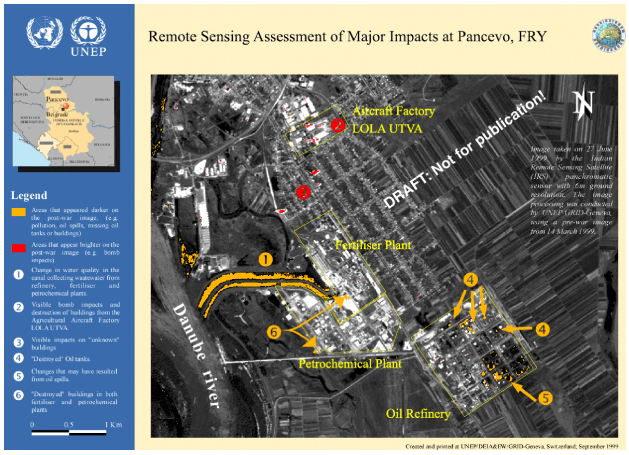
Information products were prepared to keep decision-makers and the general public abreast with wildfire occurrences.

Forest and Wildfires

Systematic reporting on forest and wildfires, largely based on interpretation of satellite imagery, was initiated in April 1998 and continues to date. The aim is to compile, analyse and disseminate information on forest fires worldwide via a Wildfires website hosted by GRID-Geneva (http://www.grid.unep.ch/fires/). Initially, weekly progress reports on fire status were prepared but due to other emerging priorities, these were later provided only on a "special request" basis.

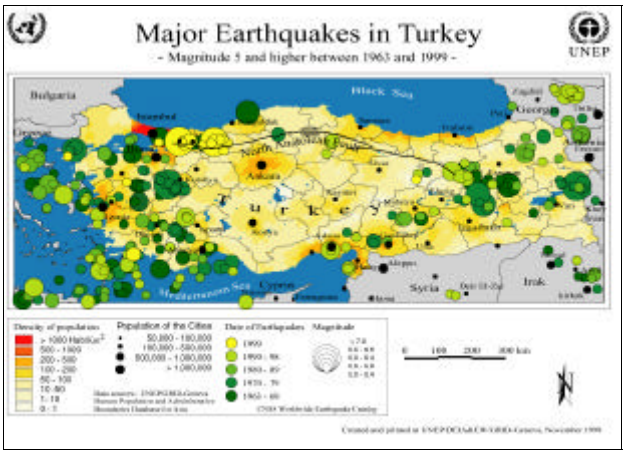
Support to the Balkans Task Force

Several sets of satellite images (pre- and post war) were acquired from high-resolution satellite



GRID-Geneva analysed satellite imagery to evaluate environmental impacts of targeted industrial sites in the Balkans conflict.

sensors to assess the environmental impact of military strikes on industrial sites in Serbia. A methodology was developed to automatically highlight changes on the imagery. Studies focused on damaged industrial sites in Pancevo, Novi Sad and Baric. The final output consisted of images and maps highlighting the conflict's impact, which were incorporated in the Balkans Task Force's final report.



This map produced by GRID-Geneva for OCHA provides a historical account of major earthquakes in Turkey, and illustrates the potential impact of earthquake occurrence on population centers.

The Turkey Earthquake

In responding to this major crisis and its associated environmental impacts, the Office for the Coordination of Humanitarian Affairs (OCHA) called on GRID-Geneva and the Joint Research Centre (JRC) of the European Commission for technical support. An information package, which included satellite based impact assessments as well as several maps highlighting potential risks and impacts, was prepared to support the OCHA field mission in Turkey. Follow-up research will focus on the elaboration of a model to estimate the number of victims and their needs, based on seismic magnitude, soil type and population density.

Building a network of partners, training and related outreach activities

The high-profile closing conference of the International Decade for Natural Disaster Reduction held in Geneva in July 1999 called on partners to harmonise efforts in developing Early Warning Systems. An information booth was set-up to demonstrate and explain GRID-Geneva's activities relating to Early Warning at the forum. Several posters were also prepared for the occasion focusing on "Information on Global Fires for Decision-Makers". For its part, GRID-Geneva has been endeavouring to strengthen its network of early warning partners, namely with the UN Food and Agriculture Organisation, the Joint Research Centre and the World Conservation Monitoring Centre.

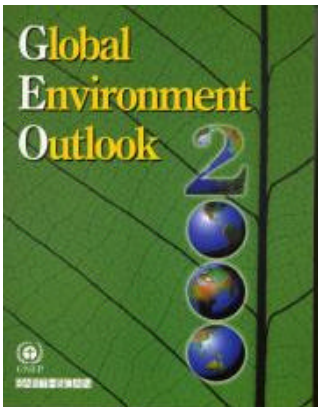
UNEP considers education of the general public on the causes and impacts of natural disasters to be particularly important in ensuring effective co-operation among all sectors of society. Throughout the year GRID-Geneva staff gave presentations and lectures at various fora and provided inputs to the media, including television interviews. In terms of training, four university students were able to successfully complete their internships at the Early Warning section.

Global Environment Outlook Process

GRID-Geneva has been closely involved in the Global Environment Outlook (GEO) process since the publication of the first issue in 1997. GEO reports, which are published biennially, provide a comprehensive review of the planet's state of the environment based on a region-by-region analysis. Inputs are drawn from an extensive array of information sources throughout the world: a global network of Collaborating Centres, UN organisations and independent experts. In July 1999, UNEP launched its millennium report, GEO-2000, which can be accessed via the Internet from various locations including the GRID-Geneva website. GRID-Geneva provided extensive support to GEO-2000, not only by way of core data sets' collection, verification and synthesis, but also by networking with Collaborating Centres and UN agencies at the regional and international levels, as well as contributing to the methodological development of the reporting process. Other GEO-related products have also been released including "Pachamama" (Mother Earth) or GEO-for-Youth, a training manual on Integrated Environmental Assessments and Small Island Developing States Environment Outlooks.

Even as GEO-2000 was being launched, preparations were already underway to initiate the "GEO-3" process in a series of meetings held during the last quarter of 1999. A GEO-3 'Start-up' Meeting took place in November 1999 in Nairobi and was attended by UNEP staff, representatives of around 30 GEO Collaborating Centres as well as other key participants and advisors, to examine lessons learned from previous work and plan for the next two years of GEO-related activities. UNEP's Executive Director Dr. K. Töpfer also provided his views on what GEO-3 ought to encompass in a lengthy give-and-take session with participants.

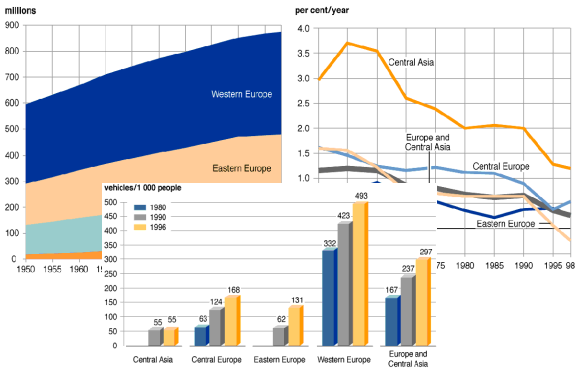
An important decision was made during the 'Start-up' Meeting to turn GEO from a project into a self-standing programme, which implies greater and broader resources and longer-term stability. Support from the Turner Foundation (UNFIP) has been secured for this purpose, and plans are underway to lay the groundwork for GEO-3 and bring about the institutionalisation of the GEO process. One of the key objectives is to strengthen the environmental assessment capacity of GEO's



An on-line version of GEO-3 is accessible from the GRID-Geneva website.

Collaborating Centres. GRID-Geneva is party to this effort and will provide capacity building and training in its specialised areas of data and information management, information technology and early warning.

In a separate but related development, the Regional Coordinator has developed a proposal from the GRID network and DEIA&EW regional officers to provide data/information-related and capacity building support for the GEO-3 process in 2000. This will consist of a series of activities including collection, "gap-filling", improvement and on-line provision of core data sets for environment assessment. Training in relevant areas such as GIS, Internet based applications and State of the Environment reporting, for UNEP's network of GEO collaborating centres and other partners will also be undertaken. The proposal was approved by the GEO-3 management team in late 1999 and is linked to UNEP's Environmental Observation and Assessment Strategy (E.O.A.S) and project for the Turner Foundation.



GRID data and graphics used in GEO-3

Backstopping the Balkans Task Force

In early May 1999, UNEP's Executive Director Dr. Klaus Töpfer established the Joint UNEP-UNCHS (Habitat) Task Force on the Balkans (BTF) and which operated from UNEP offices at the International Environment House in Geneva. The BTF was mandated to monitor and assess the environmental and human settlements impacts of the Kosovo conflict in the Federal Republic of Yugoslavia and neighbouring countries. Under the chairmanship of former Finnish Environment and Development Co-operation Minister, Mr. Pekka Haavisto, the BTF identified major environmental 'hot spots' requiring immediate assistance, formulated response measures and provided recommendations on specific actions to be taken in the short, medium and long-term, in collaboration with the United Nations Mission in Kosovo.

GRID-Geneva was involved in the BTF from its debut, providing logistical and technical assistance to the Task Force in a wide range of activities. Its main role, however, was to set-up and host the BTF Information Unit which was responsible for data and information collection, compilation and analysis of the potential or proven environmental and human settlement impacts of the conflict. Outputs provided by the Information Unit included weekly "situation reports", value-added maps, detailed information packages for meetings and field missions, development and maintenance of a comprehensive website, analyses of satellite imagery and contributions to the final report of the BTF. GRID-Geneva's Regional Co-ordinator, as a member of the BTF, also participated in most of its internal and external meetings and helped network with a large group of partner institutions, including UN agencies, environmental NGOs and research and academic institutions.

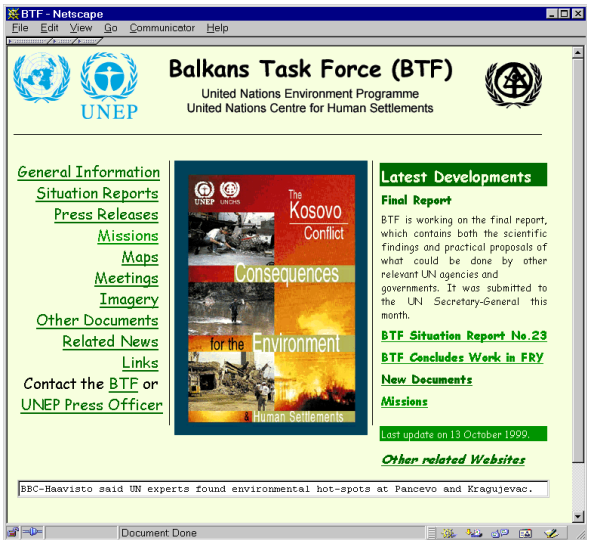
Based on a systematic analysis of information from a wide range of sources on the possible impacts of the conflict on the environment and human settlements, the BTF identified five priority issues requiring more detailed investigation. For this purpose, the BTF organised "technical environmental assessment missions" composed of UNEP and UNCHS staff as well as international experts to participate in field missions to Serbia and Kosovo. The field missions focused on four main areas: (i) environmental consequences of air strikes on industrial sites, (ii) monitoring pollution in the Danube River, (iii) conflict's impact on biodiversity in protected areas and (iv) consequences of the conflict for human settlements and the environment in Kosovo. In addition, a desk assessment of possible use of depleted uranium weapons in Kosovo was also prepared. The BTF Information Unit prepared the necessary information dossiers and maps to support the field missions. GRID-Geneva staff also complemented the work of the field missions by undertaking satellite image analysis of damaged industrial sites in Serbia obtained from the Indian Remote Sensing satellite, Landsat TM and SPOT systems.

The BTF report can be downloaded from GRID-Geneva's website at: http://www.grid.unep.ch/btf/

The findings of the field missions, as well as the results of satellite image analysis and maps prepared by GRID-Geneva, were consolidated into a final report detailing the environmental and human settlements impacts of the Balkans conflict, and submitted to the United Nations

Secretary General, Mr. Kofi Anan, in early October 1999. The report entitled, *The Kosovo Conflict - Consequences for the Environment and Human Settlements,* was subsequently officially launched by Dr. Töpfer and Mr. Haavisto, at a press conference held in Stockholm, Sweden on 14 October 1999. The Report has been translated into Albanian, Serbian and French and can be downloaded from the BTF website. The main conclusion reached is that the conflict did not lead to a regional environmental disaster in the Balkans. In specific localities identified as environmental "hot spots", however, chemical contamination from damaged industrial sites is serious and poses a significant risk to human health.

Urging donors to consider environmental rehabilitation as an integral part of the overall humanitarian assistance being provided to the war-torn region, the BTF in collaboration with the United Nations Development Programme has called for support of environmental priority emergency projects, estimated at U.S. $17 million. This assistance has been presented as part of the Office for the Coordination of Humanitarian Affairs consolidated UN inter-agency Appeal 2000. The proposed emergency projects are aimed at preventing further environmental contamination in the Federal Republic of Yugoslavia, particularly the Danube River, from the damaged industrial sites. For its part, the BTF has assumed a new role of monitoring proposed emergency and rehabilitation projects.



The BTF website is an important source of information on the environmental impacts of the Balkans conflict and follow-up rehabilitation measures by the international community. It is frequently updated and can be accessed at: http://www.grid.unep.ch/btf/

The BTF project has proved to be a challenging experience for GRID-Geneva, demonstrating its ability to mobilise the necessary resources and skills for the collection, analysis and dissemination of environmental information to all audiences including high-level decision-makers, in a complex and politically sensitive situation. GRID-Geneva's timely response to the information needs of the BTF, including geo-spatial analysis and preparation of specific value-added information products, received wide acclaim and attests to the office's grasp of decision-makers' information needs, and ability to respond with reliable and timely products.

Source: BTF

Inspection of damaged oil tanks by BTF experts.

Promoting Regional Coordination and Related UN Activities

Euro-GRID Process

The second consecutive annual meeting of the European GRID Centres "Euro-GRID '99" was held in Budapest, Hungary, on 5-7 September. The "Euro-GRID" process was initiated by the Regional Coordinator and the first "Euro-GRID" meeting was hosted by GRID-Geneva in November 1998. These meetings are organised for the purposes of exchanging information, co-ordinating plans and discussing such key topics as a European-wide GRID network strategy. Representatives from six of the seven European centres attended the meeting, namely GRIDs Arendal, Budapest, Geneva, Moscow, Tbilisi and Warsaw. The two days of discussions allowed for a lively exchange of information and views on opportunities for substantive co-operation among the European GRID centres. Specifically, these focused on the critical issues of early warning, fresh water, conflict mapping as well as such topics as a common Euro-GRID strategy and pricing policy for products and services.

The meeting stressed the importance of initiating joint projects among multiple European GRID centres on common priority issues of conflict mapping, early warning of "hot spots" and "Cities SoE on-line", in order to give a more tangible dimension to Euro-GRID centre collaboration. The co-operation between GRID's Arendal and Geneva in BTF activities, the upcoming Caspian Environment Programme and the GEO process were highlighted as potential opportunities that need to be closely examined and built upon. It is envisaged that increasing collaboration would be able to draw on the strengths of the individual centres, in terms of skills and resources, in a complementary and efficient manner. The report of "Euro-GRID '99" can be obtained on request from GRID's Geneva, Budapest or Arendal.

Networking with UN Environmental Observation Systems

The Global Terrestrial Observing System (GTOS) is a joint initiative of FAO, ICSU, UNEP, UNESCO and WMO which focuses on monitoring land quality, freshwater resources, biodiversity, climate change impacts, and pollution and toxicity. GTOS recently launched a series of pilot programmes to establish regional centres in Central and Eastern Europe (CEE), Southern and Eastern Africa and Southeast Asia. This initiative aims at linking existing terrestrial observing networks at the regional level in order to improve data exchange, harmonisation and information access for users, and to provide improved environmental monitoring data and better calibration of wide-coverage remotely-sensed data collected by global satellite systems.

A "Regional Synthesis Workshop" for the GTOS Pilot CEE Programme was convened in Budapest, Hungary from 9-10 September 1999 to summarise the planning phase prior to its implementation in the sub-region, with FAO, UNEP and the Hungarian Ministry of Environment as sponsors. Aside from FAO and UNEP, representatives from 11 countries attended the meeting. The Regional Coordinator made an overview introduction of the GRID network and its activities, and highlighted potential linkages between the GRID network and the GTOS' sub-regional programme. The directors of GRIDs Budapest, Tbilisi and Warsaw also participated in the meeting in their capacity as National Focal Points for the GTOS CEE Pilot Programme of their countries.

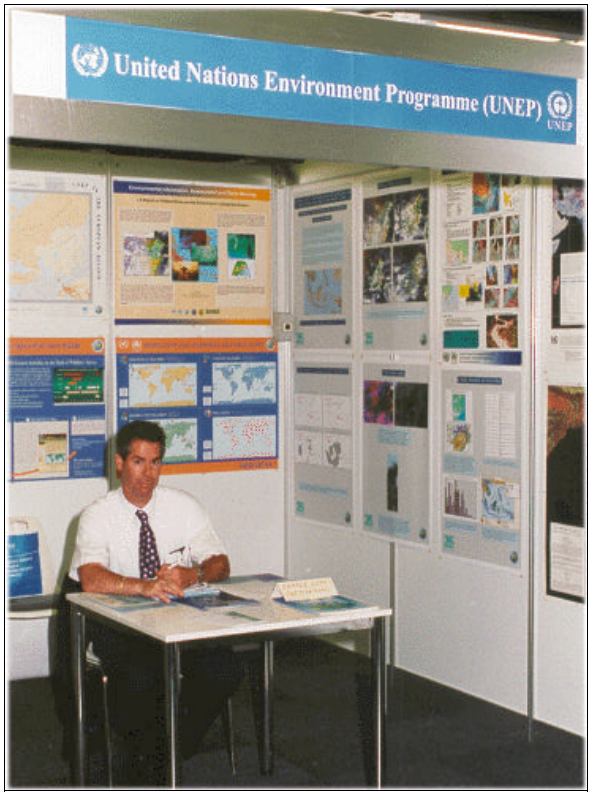
Promising areas of collaboration between the GRID network and GTOS include data dissemination, meta-databases and thematic priorities of both networks (e.g., biodiversity, fresh water and land quality). Follow-up discussions confirmed that the goals and priorities of UNEP/GRID and GTOS converge in several areas. As a result there is a good likelihood that efficiencies could be achieved by the two programmes working together, not only in the CEE, but elsewhere as well.

(For more information visit: //www.fao.org/gtos)

UNISPACE-III Conference

The UNISPACE-III Conference, organised by the UN Office for Outer Space Affairs, was held from 18-24 July in Vienna, Austria. The event was the most important space-related meeting of governments, UN organisations, national and regional space agencies, private industry and civil society representatives since the last UNISPACE Conference of 1982. It also marked the last major UN Conference of the 20th century. Governments were participating to determine future space-related policies. The conference's Technical Exhibition, which was open to the public, covered a wide array of topics from global warming to the recently developed Integrated Global Observing Strategy for the Global Observing Systems as well as cutting-edge, space-based applications for environmental management.

GRID-Geneva co-ordinated the UNEP information booth at the Technical Exhibition, which also included poster contributions from five of the GRID centres. Several hundred of the 2,300 registered delegates attending UNISPACE-III called on the UNEP stand. This provided an opportunity to sensitise the public on the important role of space related technology in environmental assessment, as well as to establish contacts with representatives of space agencies and commercial vendors. Ron Witt gave a radio interview to the UN Department of Public Information in New York about UNEP's participation in, and the expected outcomes of UNISPACE-III. UNEP Senior staff were also amongst the guest speakers in the "technical fora" held and took part in various panel discussions. The most prominent of these were the NASA Scientific Forum on Climate Variability and Global Change, and the Integrated Global Observing Strategy Forum.



UNEP information stand at UNISPACE-III in Vienna, Austria.

GIS and Remote Sensing Capacity Building

Supporting Sustainable Development in Tajikistan

As part of its "Rehabilitation, Reconstruction and Development Programme" in Tajikistan, the United Nations Office for Project Services (UNOPS) commissioned GRID-Geneva to develop databases and prepare maps of three regions in that country. GRID-Geneva was able to successfully complete the GIS databases for the regions of Gharm, Kulyab and Shartuz in Tajikistan with short notice, and handed these over to UNOPS in August 1999. These databases include large-scale (1:1,000,000) information on topography, hydrology, political boundaries, inhabited places, transport infrastructure, location of various offices and programmes.

The GIS-compatible spatial database was provided to UNOPS on a CD-ROM accompanied with a technical report and a series of large-scale colour maps of the aforementioned regions. It is intended to form the cornerstone of a planned GIS unit to be established by UNOPS field offices in Tajikistan, and which is meant to service sustainable development and local environmental management activities in that country. Other organisations, such as the Agha Khan Foundation, have also expressed an interest in contracting GRID-Geneva to adapt the GIS database for their development-oriented activities in Tajikistan.

The Tajikistan GIS Database is available on CD-ROM, accompanied with a technical report for users.

Using the Information Highway to Strengthen GIS in Africa

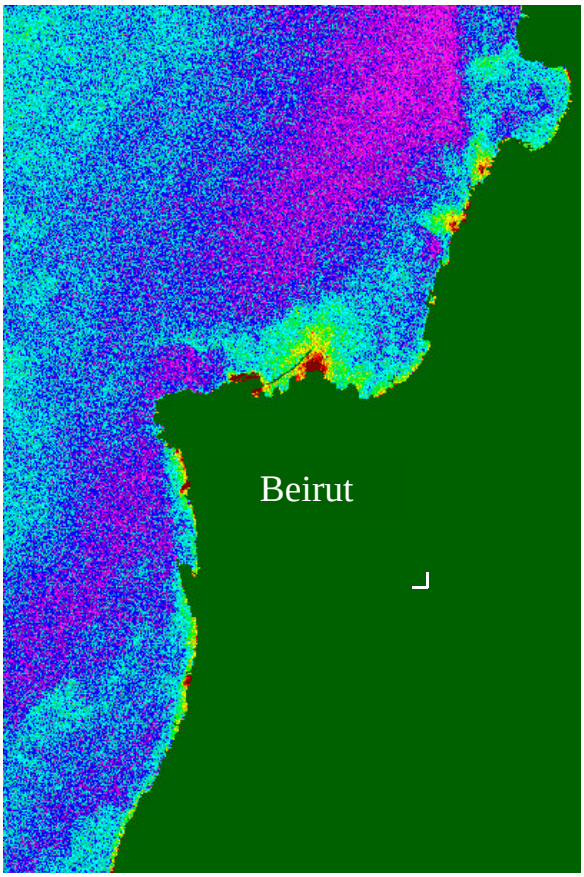
In January 1999, GRID-Geneva and UNITAR launched a joint undertaking to make environmental information in the form of dynamic maps more widely accessible to users through the use of electronic media, namely the Internet and CD-ROM. The "Environmental Information System on the Internet" project (which is known by its French acronym SISEI) aims to strengthen existing national capacities and provide new opportunities to remote users and decision-makers, particularly in Africa, to consult and analyse current environmental information. The final product will also offer map publishing services on the WWW using Internet Map Server technology to ensure timely and efficient information provision to decision-makers and planners, the academic community and general users around the world. In terms of data, GRID's extensive data archives as well as other information sources, were used to assess various environmental problems, particularly those related to drought and desertification in Africa.

A software program application, called "GISWeb-Africa", was developed to create dynamic maps and related GIS databases on Africa's physical environment. Follow-up steps focused on improving the GISWeb-Africa software application. This included expanding the scope of the cartographic database to include other non-environmental themes from population to infrastructure. The spatial analytical capacity of the software programme has also been improved, allowing the integration of more information layers at various geographic scales from the sub-regional to the local levels, as well as to carry out robust calculations and allow versatile map printing options. A prototype version of GISWeb Africa is now available as a CD-ROM accompanied with a user guide and manual. Based on feedback from users during training sessions in Africa, the GISWeb-Africa will be further enhanced and disseminated in CD-ROM format to users not having access to the WWW and eventually uploaded on the Internet in early 2000.

Monitoring Pollution in the Eastern Mediterranean

During 1999, GRID-Geneva worked on setting-up a joint GIS/Remote Sensing project in the eastern Mediterranean with the Centre for Environment and Development in the Arab Region and Europe (CEDARE), an intergovernmental organisation based in Cairo, Egypt. This work falls under the broad framework of UNEP's efforts to monitor and control land-based sources of marine pollution, as well as DEIA&EW's capacity building programme on Environment and Natural Resources Information Network. Following a preparatory mission to Lebanon in July 1999, a project document entitled "Capacity Building in GIS and Remote Sensing: A Coastal Information System for Lebanon" was prepared. The details of the work programme are in the process of being negotiated with partner organisations, which include: Lebanon's Council for Development and Reconstruction, the Lebanese Environment and Development Observatory within the Ministry of Environment and the National Centre for Remote Sensing. The project's immediate objective is to develop a Coastal Information System for Lebanon by integrating coastal zone geographic information and marine water quality data derived from satellite imagery analysis. More specific problems to which the project aims to contribute a solution include: (i) reducing pollution of coastal waters, (ii) improved management of public access to beaches and (iii) controlling coastal erosion. Once operational, the information system will be handed over to the Lebanese authorities, which will assume responsibility for its use and updating.

Already some of the analytic work has begun at GRID-Geneva such as the digitisation of nautical charts and analysis of Landsat 7 satellite images.



Water colour variations, as seen by Landsat 7 TM1, show changes in marine water quality around the city of Beirut.

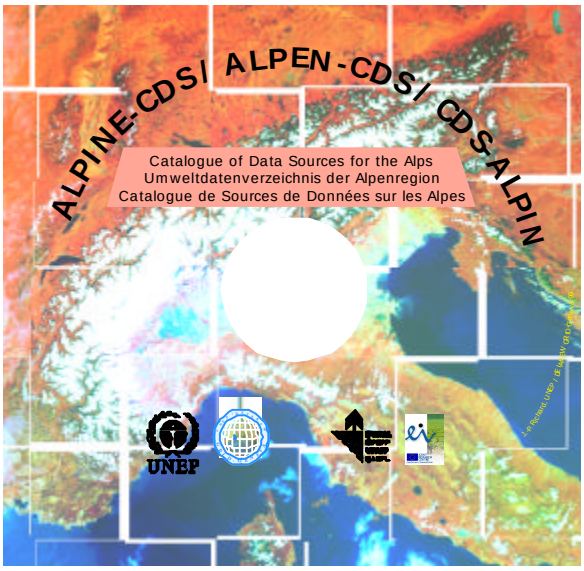
Data Management Activities

In light of the experience acquired in developing Catalogues of Data Sources (CDS) at the local, national and regional levels, meta-database technology has rapidly become one of the specialty areas of GRID-Geneva. This has been confirmed in discussions with the European Environment Agency, SAEFL and other partners which have focused on GRID-Geneva assuming a greater role in CDS capacity-building activities and dissemination at the regional level.

Improving Access to Information on the Alps

With a view to promoting information sharing between Alpine Convention member countries, the System for Observation and Information on the Alps (SOIA), in collaboration with the Swiss Agency for the Environment, Forests and Landscape (SAEFL) decided to develop a "Catalogue of Data Sources on the Alps" (Alpine-CDS). SAEFL subsequently commissioned GRID-Geneva in January 1999 to develop the Alpine-CDS with the support of the University of Geneva. The Alpine-CDS is meant to facilitate access to information on the Alps by providing meta-information (i.e. data description) of existing data sets and institutions. Designed according to the European Environment Agency WinCDS standards, this electronic catalogue will be an important reference tool for planning and co-ordinating environmental projects in the Alpine region.

Information held by international organisations, national research and academic institutions working on mountain issues in countries not party to the Alpine Convention, as well as data from Swiss governmental agencies and research institutes was examined and inventoried. In total the database has been populated with over 1,200 addresses of persons and institutions handling data on the Alps plus some 1,300 metadata entries (including information about maps, data sets, projects, documents and tools). This will allow users to easily and quickly locate a considerable amount of data held by various organisations working in the Alpine region. In order to make the database interface more user-friendly, additional software tools initially developed by SAEFL have been significantly enhanced by GRID-Geneva. These include a "printing tool", an "importation/merging/conversion tool" and a "validation tool". The additional tools represent useful and complementary add-ons to the WinCDS.



The Alpine-CDS CD-ROM will be available on the Internet in the second quarter of 2000.

The Alpine-CDS CD-ROM was handed over to the SOIA in December 1999. The first version of the Alpine-CDS is planned for launching on the Internet in the second quarter of 2000. National information held by other member countries of the Alpine Convention should be included in the Alpine-CDS in follow-up steps.

Climate Indicators Project

SAEFL commissioned GRID-Geneva in collaboration with SOIA to prepare an inventory of suitable climate indicators for the Alpine region. The objective of this project was to identify a core group of climate indicators used by all Alpine Convention countries. Following research and consultations with climate experts from the Alpine Convention signatory states, an overall list of climate indicators was compiled from which it was possible to identify data that are commonly available in Alpine Convention countries. A core set of region-wide indicators was selected from the initial listing and which have been described in a final report submitted to SOIA.

Catalogue of Data Sources for Geneva Canton

In early 1999, the Department of Interior, Agriculture, Environment and Energy (DIAEE), Geneva Canton, Switzerland, commissioned GRID-Geneva to create a local meta-database tailored along the lines of the European-designed Catalogue of Data Sources (CDS). The Geneva-CDS aims to promote the exchange of environmental information by identifying "who has what environmental information in Geneva and how to access it". Information holders were identified and their contact addresses verified as a first step in this exercise. After the information had been double-checked by the information suppliers, the meta-data was incorporated in the CDS-Geneva. An online version of the CDS (called WebCDS) was subsequently installed on the Canton of Geneva's Intranet for an interim trial period.

An updated version of the Geneva-CDS was released in October 1999, and which is now available to the public via the Canton of Geneva's website. (http://cds.geneve.ch/)

Several presentations about the CDS-Geneva were held for information suppliers involved in environmental meta-data activities, grouped under the Technical Commission of the Environmental and Energy Information System for the Geneva Region. The CDS-Geneva was widely acclaimed by members of the Technical Commission, who emphasized its utility for the timely location of environmental information.

The Geneva-CDS is closely related to the development of a CDS at the national level for Switzerland, which is also being carried out by GRID-Geneva on behalf of SAEFL. The Swiss Web-CDS is temporarily hosted at the Canton of Geneva's website with support from GRID-Geneva.

Updating the GRID Meta-database Directory

The GRID Meta-data Directory (MdD) is an electronic catalogue of environmental data sets and institutions. It is an important tool that allows GRID network and external parties to know "who holds what data and information assets and where" at GRID nodes and partner institutions. The GRID-Geneva project, which began in late 1998 with support from NASA's Goddard Space Flight Centre (GSFC), aims to update the MdD and provide inputs for NASA's Global Change Master Directory (GCMD) for a wider community of users. An updated version of the MdD (version 2) on CD-ROM was prepared and distributed to the 15 GRID centres for their use, input of new meta-data entries and feedback in April 1999.

As maintenance of the MdD is an ongoing process, further harmonisation and verification of meta-data still needs to be undertaken. The meta-data will in-turn be provided to NASA's GSFC for inclusion in the GCMD and thereby offer greater accessibility to users. The new MdD (version 3) which offers extended functions should be completed in the first quarter of 2000 and will be made available to GRID centres and other interested parties.

The GRID Meta-data Directory is available on request from GRID-Geneva.

Cartographic and Poster Products

Maps are widely valued for their ability to transform scientific data about the state of the environment into visually appealing and easy-to-understand illustrations, thereby providing a powerful communication tool to help decision-makers and the general public better understand environmental phenomena and formulate appropriate response measures. During 1999, GRID-Geneva invested significant resources in upgrading its cartographic capabilities to produce high-quality maps for communicating environmental knowledge. It produced various sets of maps to support the BTF, ROE, UNITAR, UN-OCHA, UNOPS and other partner organisations in effectively carrying out their work.

Cartographic support to the Balkans Task Force

GRID-Geneva provided extensive cartographic support to the BTF from May to October 1999. A set of 23 maps was prepared, showing the environmental and human settlements impacts of the Balkans conflict. These maps were frequently updated to reflect the rapidly evolving situation on the ground and were disseminated on-line via the GRID-Geneva website (http://www.grid.unep.ch/btf). High-resolution maps were also created to assist BTF technical missions in undertaking field investigations in the Former Republic of Yugoslavia and Kosovo.

1. Colour Shaded Relief Map of the Balkans Region (October 1999)
2. Location and Type of Targeted Industrial Facilities in the Federal Republic of Yugoslavia (June 1999)
3. Selected Sites Vulnerable to Environmental Damage due to Conflict in the Balkans Region (June 1999)
4. Major Natural Features, Biodiversity and Protected Areas of the Balkans Region (May 1999)

Cartographic support to UN Agencies

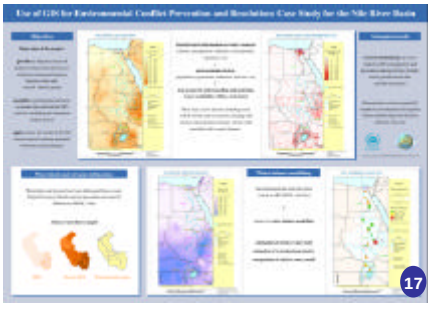
GRID-Geneva created GIS databases and various related maps for a number of UN agencies on a diverse range of topics from servicing environment and development programmes in Tajikistan, to demarcating regions around active nuclear power stations in Europe and modelling the impacts of earthquakes on human settlements in Turkey.

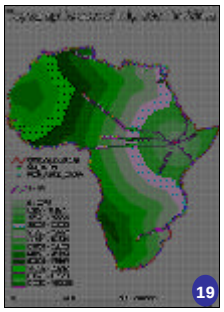
5. European Nuclear Power Sites with 200 Kilometre Overlapping Buffers around Active Reactors (December 1999)
6. Radioactive Waste in the Region of Grozny and Other Reported Environmental "Hot Spots" (December 1999)
7. Major Earthquakes in Turkey (November 1999)
8. Kulyab Area, Tajikistan (August 1999)
9. Shartuz Area, Tajikistan (August 1999)
10. Gharm Area, Tajikistan (August 1999)
11. The European Region of UNEP: Physical Features and Surrounding Lands (update, March 1999)
12. UNEP In The European Region (update, March 1999)

Posters

13. GISWeb-Africa: Analysis and Viewing Tool for Environmental Information in Africa (December 1999)
14. Land Cover Map of the Souss Region, Morocco (July 1999)
15. Identification of Global Environmental Early Warning Systems (July 1999)
16. Information on Global Fires for Decision-Makers (July 1999)
17. Use of GIS for Environmental Conflict Prevention and Resolution: Case Study for the Nile River Basin (March 1999)
18. Environmental Information, Assessment and Early Warning – A Report on Wildland Fires and the Environment: A Global Synthesis (January 1999)
19. Potential Early Modern Humans Dispersal in Africa: A GIS Model Based on Past Environmental Constraints (July 1999)
20. Last Glacial Maximum in Africa – Vegetation and extended Coastlines 20,000 years ago (July 1999)

Selected Maps and Posters





Selected Publications

GRID-Geneva/UNOPS (1999). A *GIS Database for the Regions of Gharm, Kulyab and Shartuz-Tajikistan.* Geneva: GRID-Geneva.

GRID-Geneva/UNITAR (1999). *Rapport de la Phase I: Développement du prototype GisWeb Afrique.* Geneva: GRID-Geneva.

GRIDs Geneva/Budapest/Arendal (1999). *Report of the Second European GRID Centres Meeting ~ Euro-GRID '99.*

GRID-Geneva (1999). *GRID-Geneva Quarterly Bulletin* (4 issues). Geneva: GRID-Geneva.

GRID-Geneva (1999). *GRID-Geneva Annual Report 1998.* Geneva: GRID-Geneva.

Contributions to UNEP Publications

UNEP (1999). *Global Environment Outlook 2000.* London: Earthscan.

UNEP/UNCHS (1999). *The Kosovo Conflict - Consequences for the Environment and Human Settlements* (also available in Albanian, French, and Serbian). Bellegarde: SADAG.

UNEP/UNCHS (May – September 1999). *Balkans Task Force Situation Reports* (23 issues). Geneva: GRID-Geneva.

Scientific and Conference Papers

Dao, H. "Global Population Mapping". Presentation for the Certificate of Geomatics, CUEH, February 1999.

Dao, H. "GRID-Geneva Development of Improved Global Human Population Datasets". Proceedings of the ECEH Meeting on the Establishment of a Harmonised Electronic Warehouse of Geo-referenced Environment and Health data, Bilthoven, Netherlands, April 1999.

Dao, H. "The GRID Network and Global/Regional GIS Databases for Transport-related Studies". Presentation at the UN/ECE Workshop on GIS in Transport, Geneva, November 1999.

Jaquet, J-M., Tassan, S., Barale, V. and Srabaji, M. (1999). "Baythymetric and bottom effects on CZCS chlorophyll-like pigment estimation: data from the Kerkennah Shelf (Tunisia)", In: International Journal of Remote Sensing, vol. 20, no. 7.

Peduzzi, P. "Change Detection Principles". Proceedings of the CEDARE Regional Workshop on the Use of Remote Sensing in EIS Applications, Rome, Italy, 21-23 July 1999.

Peduzzi, P. "Observation de la Terre : contrôle ou constat ?" Presentation at a conference on Earth Observation organized by Société de Physique et d'histoire naturelle au musée d'histoire naturelle de Genève, Switzerland, November 1999.

Peduzzi, P. "Les systèmes de pré-alerte, un accès parallèle à l'information ?" Presentation for students of the Institut Universitaire d'Etudes de Développment, Geneva, Switzerland, December 1999.

Publications about GRID-Geneva

The Swiss technical journal "*Mensuration Photogrammétrie Génie Rural*" (May 1999) which is published in French and German featured an article about GRID-Geneva and its activities.

An article in the German magazine "*Fokus*" (25 October 1999) gave extensive coverage to the activities of BTF and related GRID-Geneva satellite imagery analysis.

Conferences, Workshops and Missions

GRID-Geneva organised and/or actively partook in the activities of the following workshops, conferences and missions.

Major Conferences and Workshops Attended

UNEP Twentieth Governing Council Meeting
Nairobi, Kenya, 1-5 February

GRID-Geneva/UNITAR Expert Group Meeting on Establishing an Environmental Information System in Africa
Geneva, Switzerland, 3-4 March

Nile 2002 Conference
Cairo, Egypt, 15-19 March

Cities Environment Report on the Internet Meeting
Barcelona, Spain, 20-21 March

WHO Working Group Meeting on Establishment of an Electronic 'Warehouse' of Geo-referenced Environment and Health Data
Bilthoven, Netherlands, 15-16 April

Earthwatch Working Party Five Meeting
Geneva, Switzerland, 3-4 May

International Decade for Natural Disaster Reduction Forum: Partnerships for a safer world in the 21st Century
Geneva, Switzerland, 5-9 July

UNISPACE-III Conference
Vienna, Austria, 19-28 July

CEDARE Regional Workshop on the Use of Remote Sensing in EIS Applications
Rome, Italy, 21-23 July

Central and East European Regional GTOS Synthesis Meeting
Budapest, Hungary, 6-7 September

European GRID Centres' Meeting "Euro-GRID'99"
Budapest, Hungary, 7-8 September

Divisional Programme and Strategy Meeting of UNEP/DEIA&EW for 2000-2001 biennium
Nairobi, Kenya, 18-22 October

Workshop on Early Warning for Regions at High Risk, Centre for Human Ecology
Geneva, Switzerland, 28 October

Towards a Computerised Planet, Geneva Museum of Natural History
Geneva, Switzerland, 5-6 November

UN/ECE Workshop on GIS in Transport
Geneva, Switzerland, 15-16 November

GEO-3 "Start-up" Planning Meeting
Nairobi, Kenya, 15-19 November

Eighth Francophone Meeting on Remote Sensing
Lausanne, Switzerland, 22-25 November

Balkans Task Force Concluding Seminar
Geneva, Switzerland, 26 November

UNEP's European National Committees Meeting
Geneva, Switzerland, 2 December

Development of Environmental Monitoring Systems in the European Region, State Committee for Environmental Protection
Moscow, Russian Federation, 8-9 December

WCMC/UNEP Workshop on Forest Data
Cambridge, United Kingdom, 9-10 December

Other Missions Undertaken

Mission to Agadir on use of GIS for Waste Management
Agadir, Morocco, 16-23 April

Mission to FAO on early warning system development and technical cooperation activities
Rome, Italy, 23 April

Mission to the Gulf Region, Bahrain and Kuwait
The Gulf, 1-7 May

Mission to Global Fire Monitoring Centre
Freiburg, Germany, 20 May

Mission for project on "Capacity building mission on GIS and Remote Sensing in the Eastern Mediterranean"
Beirut, Lebanon, 5-9 July

GRID-Geneva Staff

GRID-Geneva Staff

Barbara Bierhuizen
GIS/Remote Sensing Analyst and Med. Capacity Building

Hy Dao
GIS Analyst and Meta-databases

Dominique Del Pietro
GIS Specialist and Graphics

Linda Duquesnoy
Administrative Assistant & Secretary

Frederic Jacot-Guillarmod
Consultant, GRID Meta-data Directory (MdD)

Jean-Michel Jaquet
Senior Researcher and Water-related activities

Heidi Krapf (at SAEFL, Bern)
Consultant on Alpine CDS and Alpine Indicators

Carlos Munoz
Consultant on GISWeb-Africa

Carolien ten Oever
GIS/Remote Sensing Analyst for Land Cover/ Biodiversity Mapping

Hassan Partow
Information Officer

Pascal Peduzzi
Remote Sensing Analyst, Early Warning issues

Jean-Philippe Richard
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Diana Rizzolio
Balkans Task Force (BTF) Information Officer

Frederic Vogel
Consultant, Geneva Canton CDS

Ron Witt
Manager and DEIA&EW Regional Coordinator

B. Zand
Systems Administrator and Research Analyst

Guest Researchers in 1999

Ms. Karine Bachmann
B.A. Geography, University of Geneva

Ms. Prisca Chapuis
B.A. Geography, University of Geneva

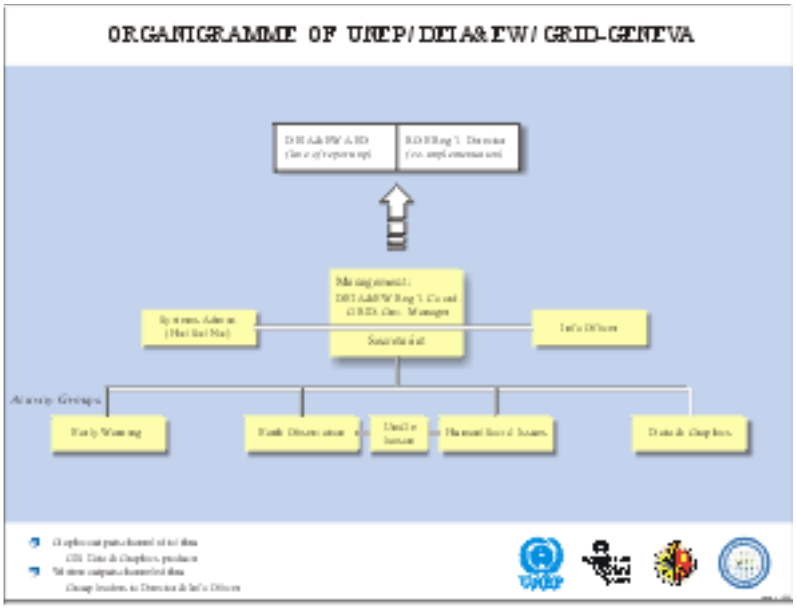
Mr. Damien Cataldi
Certificate of Geomatics, University of Geneva

Mr. Yaniss Guigoz
Certificate of Geomatics, University of Geneva

Ms. Katrina Isaxon
Göteborg Municipal Council, Sweden

Mr. Zine El-Morjani
Ph.D. Geology, University of Geneva

Mr. Nicolas Ray
Ph.D. Biology, University of Geneva



GRID–Geneva Advisory Board

The GRID-Geneva Partnership Advisory Board, which is composed of representatives from SAEFL, the University of Geneva and UNEP, convened three times during the course of the year. One main highlight of these meetings was the unanimous approval of GRID-Geneva's strategy document for the period 2000-2003 in November 1999. Other key issues addressed included the review of a proposed "pricing policy" for GRID-Geneva's products and services, and advising on the long-term role of the office in early warning and emergency preparedness and response activities in light of the Balkans Task Force experience.

Advisory Board Members

Mr. Dan van Claasen, Officer-in-Charge, DEIA&EW
(alternate representative: Mr. Arthur Lyon Dahl, Deputy Director and Coordinator, UN System-wide Earthwatch, UNEP/DEIA&EW)

Ms. Monika Linn Locher, Head, Global Affairs Section, International Affairs Division, BUWAL

Prof. András November, University of Geneva/IUED

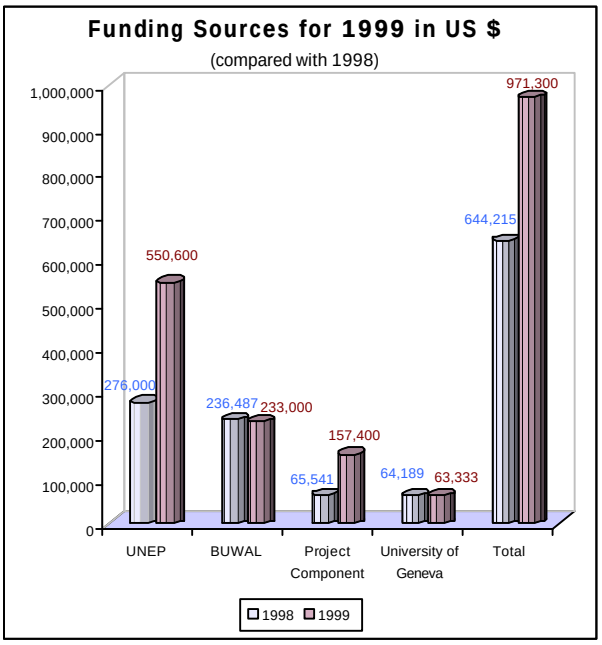
Mr. Nicholas Perritaz, Head of Section, Research and Monitoring of the Environment, BUWAL (replaced Mr. Peter Grolimund 3/99)

Mr. Frits Schlingemann, Director and Regional Representative, UNEP/ROE
(alternate representative: Ms. Francoise Belmont, Deputy Director, UNEP/ROE)

Prof. Walter Wildi, University of Geneva/Institut Forel

GRID-Geneva Budget Expenditure 1999

Operational Costs	**US $**
Personnel	841,000
Infrastructure (hardware/software/networks)	34,000
Miscellaneous (communications/travel/other)	52,200
Overhead Charges	24,000
Balance Sheet	
Total Payments	971,300
Total Disbursements	951,200
Net Financial Status (as of 01/11/99)	20,100



Acronyms

Alpine-CDS – Alpine Catalogue of Data Sources
BTF – Balkans Task Force
CEDARE – Centre for Environment and Development in the Arab Region and Europe
CD-ROM - Compact Disc **-** Read Only Memory
CDS - Catalogue of Data Sources
CEE - Central and Eastern Europe
CEROI - Cities Environment Report On the Internet
DEIA&EW - Division of Environmental Information, Assessment and Early Warning
DIAEE – Department of Interior, Agriculture, Environment and Energy (Canton of Geneva)
EEA - European Environment Agency
EWS – Early Warning Systems
GCMD - Global Change Master Directory (of NASA)
Geneva-CDS - Geneva Catalogue of Data Sources
GEO - Global Environmental Outlook
GIS - Geographic Information System
GRID - Global Resource Information Database
GSFC - Goddard Space Flight Centre (U.S. NASA)
GTOS - Global Terrestrial Observing System
IEH - International Environment House
IUED - Graduate Institute of Development Studies (Switzerland)
JRC - Joint Research Centre (of the European Commission)
MdD - Meta-data Directory (of UNEP/GRID)
NASA - National Aeronautics and Space Administration (U.S.A.)
OCHA - Office for the Coordination of Humanitarian Affairs (U.N.)
ROE - Regional Office for Europe (UNEP)
SAEFL - Swiss Agency for the Environment, Forests and Landscape (BUWAL/OFEFP)
SoE – State of the Environment
SOIA - System for Observation of and Information on the Alps
UN - United Nations
UNCHS – United Nations Conference on Human Settlements (Habitat)
UNFIP – United Nations Fund for International Partnerships
UNEP - United Nations Environment Programme
UNOPS - United Nations Office for Project Services
WWW - World Wide Web

The UNEP/GRID Network

To learn more about GRID activities in your region, please contact the Coordinator of GRID or the GRID Centre(s) nearest to you:

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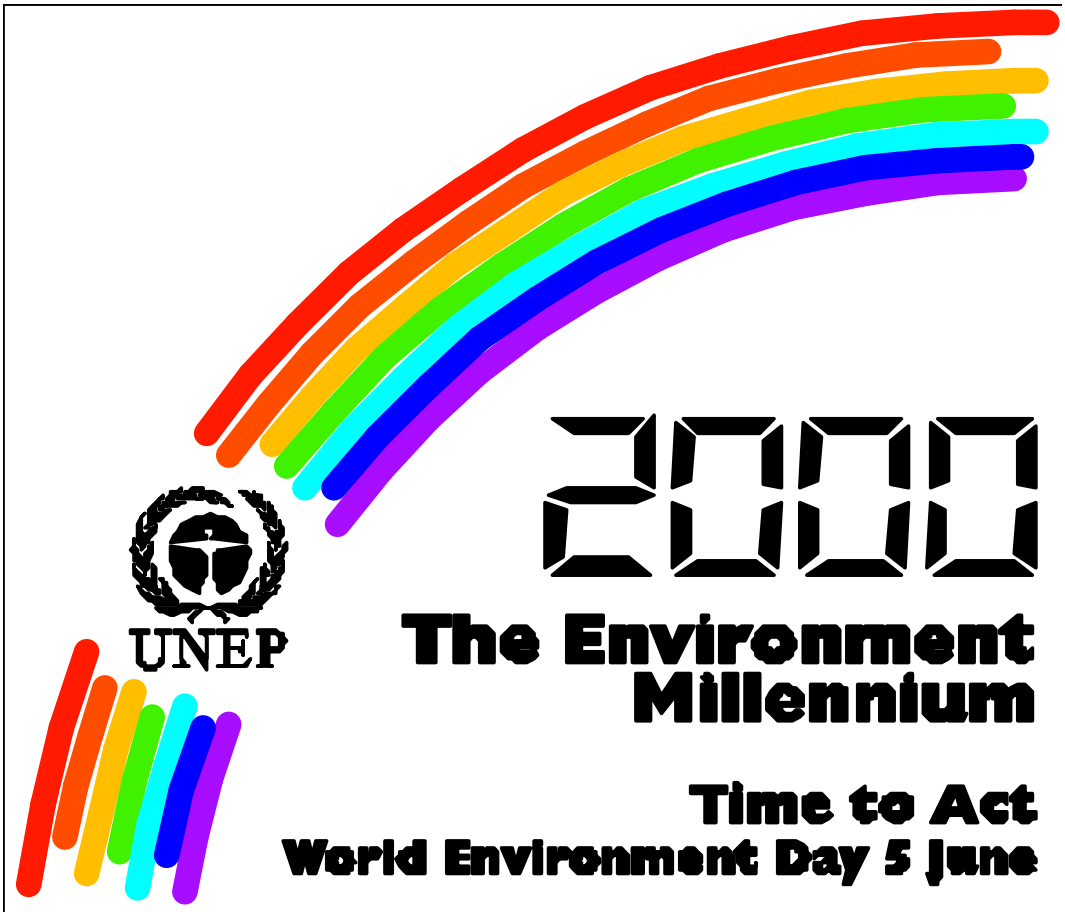

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