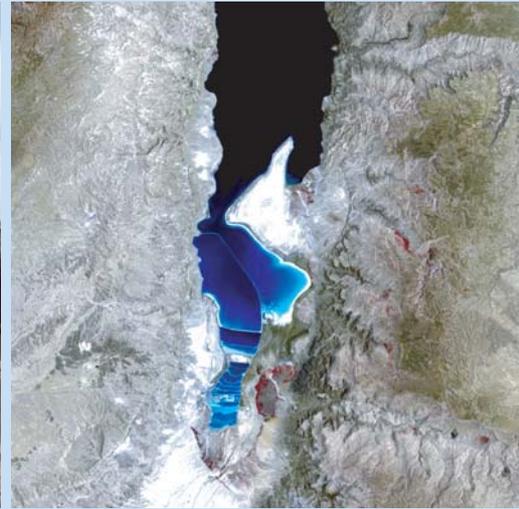
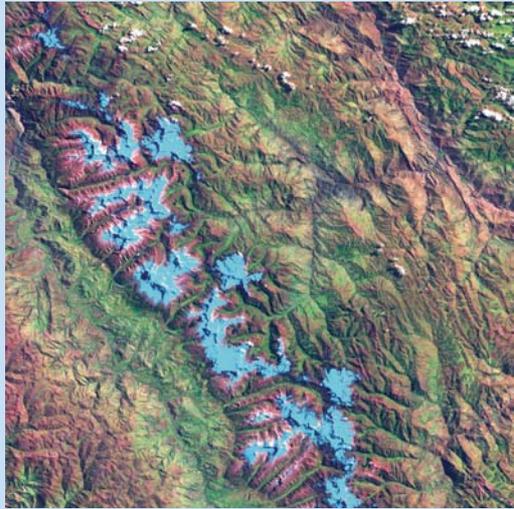




UNEP
DEWA~EUROPE/
GRID-GENEVA



Annual Report 2002



UNIVERSITÉ DE GENÈVE

The mission of the United Nations Environment Programme is 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.

Cover Images: Ice and snow-capped Cordillera Blanca (Landsat 5TM, August 1996); Roaming Iraqi Marsh Arab refugees lead their water buffalo herds along the banks of the Karun River (Hassan Partow, Iran, February 2002); Satellite imagery taken in 1973 depicting the decline of the dead sea.

DEWA~Europe/GRID-Geneva in 2002

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Message from UNEP Headquarters

As this report showcases, DEWA~Europe/GRID-Geneva is a major player feeding and strengthening UNEP's scientific base. Its state-of-the-art capabilities in delivering timely, high-quality environmental information have been a major asset in enabling UNEP to respond to a wide array of challenges. These have typically focused on providing regular integrated environmental assessments and early warning of emerging environmental problems and threats of a sectoral nature and at global, regional or national levels. In this connection, I would like to congratulate GRID-Geneva for taking the lead role in furnishing the underlying data needs of UNEP's landmark publication, the Global Environment Outlook series, *GEO-3*, which was launched in May 2002. In addition, GRID-Geneva has made an impressive effort to enhance the capacity of UNEP's partner institutions in the European region and worked closely with them to provide relevant and compatible information, and coordinate their inputs into *GEO-3* and the *Caucasus Environment Outlook* report.

DEWA~Europe/GRID-Geneva has also been at the forefront of UNEP's endeavour to provide innovative data access solutions through the Internet. Some of the key websites developed include the GEO Data Portal, thematic and regional portals for UNEP.Net (European, Socio-economic, Urban environment and soon, Early warning), the UN System-Wide Earthwatch website and the PREVIEW portal on a wide variety of natural disasters. These dynamic websites, some of which include an interactive analytic capability, are an invaluable resource for governments, key decision and policy-makers, civil society and the general public as they prepare to tackle cross-sectoral environmental problems.

It is also gratifying to see that GRID-Geneva has been able to assume additional responsibilities and provide pertinent technical backstopping to post-conflict environmental assessments, as in the case of Afghanistan and the Occupied Palestinian Territories. With its reputation of excellence, I am confident we can count on GRID-Geneva's cutting-edge services

and the dedication of its skilled staff, as UNEP embarks on new initiatives in 2003 emanating from the World Summit on Sustainable Development (WSSD) Plan of Implementation, the UN International Year of Freshwater, the Annual Statement on the Environment and the variety of environmental problems and threats that we are likely to face in the coming year.

The achievements of GRID-Geneva have been made possible by a model partnership between the Swiss Agency for the Environment, Forest and Landscape (SAEFL), the University of Geneva and UNEP. I would like to take this opportunity to thank the Government of Switzerland and Geneva Canton for their spirit of cooperation, visionary thinking and generous support. Such innovative partnerships will be crucial if we are to successfully wrestle with the urgent challenges highlighted at WSSD.



Dr. Klaus Toepfer

UNEP Executive Director

Greetings from the Swiss Environment Agency

Last year's international agenda was dominated by the World Summit on Sustainable Development (WSSD), which took place from August 26 to September 4th in Johannesburg. This Summit was a major event which brought together more heads of government and international organizations than any meeting before. It effectively focused the world's attention on the most critical issues we face as a global community: the protection of our environment as a basis for poverty eradication and sustainable development. At the WSSD, the global leaders adopted an ambitious political commitment with the WSSD Plan of Implementation. The other important result of the World Summit on Sustainable Development in Johannesburg was the adoption of partnership initiatives for sustainable development. These partnerships crystallize cooperative initiatives between governments, NGOs, and the private sector into concrete action for sustainable development.

The conclusion and launching of these partnership initiatives at the WSSD was seen by many as an innovative approach for triggering concrete action. GRID-Geneva has anticipated this partnership approach. In fact, the partnership between UNEP, the University of Geneva and the Swiss Agency for the Environment, Forests and Landscapes seems to have served as a model for many of the WSSD Partnerships, and what was innovative at Johannesburg has had a five-year tradition in Geneva. We are proud to be an example for partnerships between government, science and international organizations.

GRID-Geneva will play an important role during the International Year of Freshwater. It will support governments with timely and scientific information and encourage them, in collaboration with other partners, to agree on integrated sustainable management schemes to water ecosystems. This is a key pre-requisite for the adoption of a holistic ecosystem approach which ensures that water resources are used in a sustainable way, respecting the relevant ecosystems such as wetlands, forests and soils that capture, filter, store and distribute water.

GRID-Geneva's assessment activities for the Mesopotamian marshlands are an excellent example for providing crucial information to decision-makers and the general public.

We are looking forward to these new challenges and we wish only the best for our future collaboration.



Philippe Roch
Director
Swiss Federal Agency for the Environment,
Forests and Landscape (SAEFL)

About DEWA~Europe/GRID-Geneva

GRID-Geneva was established in 1985 as a pioneering centre of UNEP's Global Resource Information Database (GRID), and which presently has grown into a worldwide network of 15 environmental data centers. The principal role of GRID-Geneva is to underpin UNEP's assessment activities and its efforts to support global and regional environmental decision-making, by improving access to high-quality data about the state of the world's environment.

In December 2001, the initial GRID-Geneva "Partnership Agreement" between UNEP, with the Swiss Federal Agency for the Environment, Forests and Landscape (SAEFL) and the University of Geneva was renewed for another four years (2002 - 2005). One of GRID-Geneva's roles on behalf of the Partnership is to serve as the unique francophone centre for the global GRID network.

European Regional Coordination

The office is also responsible for coordinating the European programme of UNEP's Division of Early Warning and Assessment (DEWA) and serves as its main contact point with European (mostly Geneva-) based UN agencies, and with various regional institutions such as the European Environment Agency (EEA) and the European Commission's Joint Research Centre (EC/JRC). Its major tasks at the regional level include:

- ◆ facilitating environmental information networking activities between European GRID centres;
- ◆ support to environmental assessment and reporting including the Global Environment Outlook (GEO) process and related sub-regional and thematic reports;
- ◆ increasing access to environmental information through new systems and tools; such as the global environmental information network 'UNEP.Net'.
- ◆ In addition, the office also carries out capacity building activities, and collaborates on specific projects with sub-regional organisations in Central and Eastern Europe and the Mediterranean region.

Major Activities

The core tasks carried out by DEWA~Europe/GRID-Geneva are grouped in five broad areas. These include:

- ◆ provision of early warning on emerging environmental problems and threats, especially those of a transboundary nature;
- ◆ support to UNEP's assessment processes, including Global Environment Outlook (GEO);
- ◆ carrying out of case studies using GIS and remote sensing for the mapping, monitoring and sustainable use of natural resources;
- ◆ provision of technical expertise for GIS and meta-databases and website design and creation; and
- ◆ implementation of capacity building projects to develop and strengthen environmental information activities and systems of partner organisations.

Location

DEWA~Europe/GRID-Geneva is based at the International Environment House (IEH), in Geneva's Châtelaine suburb and within short distances from the Geneva city-centre and the main UN offices at the Palais des Nations. The Environment House gathers under a common roof a range of United Nations and non-governmental organisations active in the field of environment and sustainable development in Geneva, and aims to foster synergies and encourage partnerships between them.



International Environment House, Geneva.

Year in Review

The year 2002 turned out to be every bit as busy as anticipated, given a calendar that was heavy with events of significance for the environment. From UNEP and DEWA's perspective, the publication of the third Global Environment Outlook (GEO-3) and the World Summit for Sustainable Development (WSSD) in Johannesburg were probably the most significant occasions of the year. DEWA-Europe/GRID-Geneva was deeply involved in the first and also participated in the second. Another indicator of UNEP Headquarters' confidence in DEWA-Europe was the allocation of a new responsibility for the System-wide Earthwatch Secretariat to the office, along with related staff, in mid-2002.

The publication of GEO-3 in late May 2002 demonstrated most of all that this integrated environment assessment process in which DEWA-Europe/GRID-Geneva plays a major part has truly come of age, with the report published in all of the UN languages and launched at myriad locations around the globe from May into the mid-summer period. The role played by DEWA-Europe in coordinating preparation of the European regional inputs, as well as supporting the entire report through the on-line "GEO Data Portal" application, were underlined by Dr. Toepfer in the "European launch" of the GEO-3, which took place in Brussels on 22 May.

At the same time, DEWA-Europe conceived and led the process for preparation of the first European sub-regional GEO report, the "Caucasus Environment Outlook (CEO)". A unique product serving to document the overall state of the Caucasus environment after years of conflict and neglect in that region of the planet, the assessment was prepared in its entirety by experts of the four countries which share it. The European process of collaboration among GRID centres was also given a boost by convening of the 5th meeting of European GRID centres "EuroGRID-5" in Tbilisi in mid-October 2002. A number of ecosystems-related environmental assessments were brought up-to-date (e.g. previous Mesopotamia marshlands study) or newly conceived (Lake Balaton, Hungary, vulnerability study).

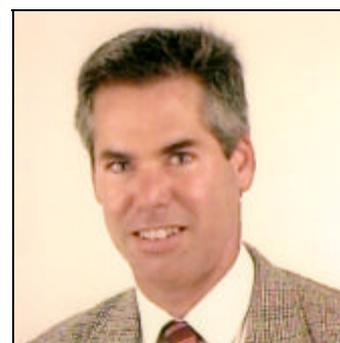
DEWA-Europe continued its robust expansion of early warning-related activities and studies with a number of partner agencies including UNDP's Bureau of Crisis Prevention and Recovery (BCPR). The "Global Risk Assessment and Vulnerability Indexing ~ Trends per Year (GRAVITY)" project was conceived to respond directly to UNDP's need for statistical data underpinning their publication of the World Vulnerability Report to appear by June 2003. The "Project for Risk Evaluation, Information and Early Warning (PREVIEW)" continued to respond to user needs for up-to-date data and related maps on a wide variety of natural disasters, and was even expanded

to include tropical cyclones and drought. As well, GRID-Geneva collaborated with the EU's Joint Research Centre (JRC-Ispra) in the preparation of the "Global Burnt Areas (GBA) 2000" data set and website showing fire-scarred areas.

GRID-Geneva was also ever-more active in the preparation of cartographic or database products for UNEP Divisions and external partners, including in particular UNEP's Post-Conflict Assessment Unit (PCAU). Mapping and remote sensing exercises were conducted for the Afghanistan assessment and the Occupied Palestinian Territories "desk study". Database expertise was also provided to the PCAU for the UN Compensation Commission (UNCC) environmental clean-up projects in countries of the Persian Gulf region.

Similar work carried over into a new project on "Environment and Security" led by UNEP/ROE along with partners UNDP and OSCE, where DEWA-Europe participates in the Steering Committee. GRID-Geneva is providing much of the cartographic support showing links between environmental problems and security issues in countries of SouthEastern Europe and Central Asia.

More in-depth explanations of these projects and others can be found in the following pages of this Annual Report. What should be more than clear from this review is that DEWA-Europe/GRID-Geneva is playing an increasingly active role in the realms of early warning and assessment through the internal conception of activities within UNEP, as well as through broader and deeper ties with key external UN system and other partner agencies and institutions.



Ron Witt

**DEWA Regional
Coordinator- Europe and
Manager GRID-Geneva**

Regional Coordination of European Inputs and Launch of GEO-3

DEWA-Europe/GRID-Geneva coordinated European inputs to the third edition of the Global Environment Outlook (GEO-3) report, UNEP's flagship publication presenting a comprehensive review and analyses of world-wide environmental conditions, trends and the policies available to address them. Overall strategic data support for the GEO process was also provided by DEWA-Europe, including access to a wide variety of global and regional "core data sets" through the GEO Data Portal. At the European level DEWA-Europe, in collaboration with the Regional Office for Europe, organised a series of regional meetings and multi-stakeholder consultations and maintained frequent contacts and exchanges with designated Collaborating Centres responsible for drafting specific sections of the report.

The major European ("EU") launch of GEO-3 took place in Brussels on 22 May 2002. The event was sponsored by the Belgian government, and M. Alvoet the Minister of Environment and E. Boutmans Secretary of State for Development Cooperation also took part. Following a brief press conference, the main event saw Dr. Toepfer giving an overview presentation of GEO-3, follow-up talks by M. Alvoet and M. Boutmans, and David Stanners speaking on behalf of the EEA. Dr. Toepfer's presentation was well-received and UNEP was widely praised by the other speakers for both the process leading to and the GEO-3 report itself. M. Boutmans announced the Belgian government's decision to provide UNEP with Euro 12 million funding over the coming four years. Also, the GEO Data Portal was mentioned in Dr. Toepfer's speech as the underlying basis for the GEO-3 report, and a briefing note on the same was included in the press kit provided at the event.

The report's launch was timed a few months in advance of the World Summit on Sustainable Development (WSSD), in order to help motivate world leaders, the civil and private sectors as well as the general public and to provide crucial input to the Summit's deliberations. Using the 1972 Stockholm Conference when UNEP was established as a benchmark year, the study takes a retrospective look at the environmental developments and policies of the past 30 years. It analyses positive achievements to restore the environment, highlighting improvements such as river and air quality in places like North America and Europe and a substantial increase in protected sites in Africa and South America. The international effort to repair the ozone layer, the Earth's protective shield, by reducing the production and consumption of chlorofluorocarbons is another notable success.

However overall, GEO-3 explains that there has been a steady decline in the environment, especially across large parts of the developing world. The report



The GEO-3 report is available in all of the six official languages of the United Nations and is fully downloadable from several Internet mirror sites including www.grid.unep.ch/geo/

concludes that people's vulnerability to natural hazards such as cyclones, floods and droughts is increasing. Using the most up-to-date scientific data available including historic and recent satellite imagery, the report makes a comprehensive assessment of the impact of the human footprint on the environment. Some examples of this footprint include the loss of half of the world's wetlands in the last century and severe water shortages affecting at least 80 countries.

Taking an innovative look at the next 30 years, the report uses scenario modelling to tell strongly contrasting but plausible stories of how the future may unfold. Four alternative ways in which society might proceed are explored. These are: (i) Markets First, where the industrialised world's values prevail through market-driven fixes; (ii) Policy First, where governments take strong action to reach specific goals; (iii) Security First, a world characterised by great disparities, inequality and conflict and (iv) Sustainability First, a world with closer collaboration between governments and citizens and more equitable values and institutions. What these scenarios teach is that different decisions can lead us towards very different futures and with the wrong decisions today, we could be living on a drastically degraded planet within thirty years.

GEO Data Portal Comes of Age

The Global Environment Outlook (GEO) Data Portal, initiated in 2000 with the help of many partner organizations, has been substantially expanded and improved during 2002. A new version was simultaneously released with the launch of the 3rd GEO report in May 2002.

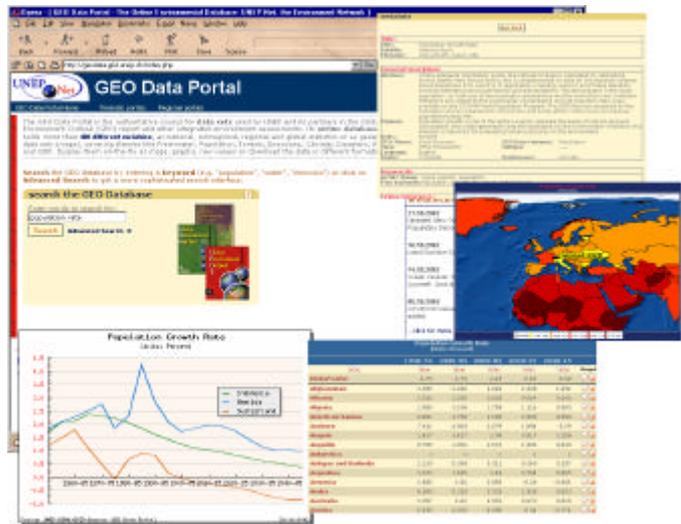
The GEO Data Portal has matured into a unique data and information application which responds to the needs of the GEO user community, and increasingly to other assessment activities of UNEP/DEWA and UN agencies, as well as scientific and civil society organizations. It has effectively become the standard data reference and access tool for the GEO assessment process, both for UNEP and its reporting partners.

The GEO Data Portal now holds hundreds of environmental and socio-economic statistical and geospatial data sets at global, regional and national levels. The source data have been obtained from a large number of recognised international primary sources, most notably UN and other affiliated inter-governmental organisations.

Apart from the basic service of making harmonized core data sets available to the GEO user community, additional functionality has been added to strengthen the analytical capacity of the network of GEO Collaborating Centres and other key partners. All data can be displayed, queried and explored on-line through maps, graphs and tables, and downloaded for further use if so desired.

The GEO Data Portal also featured at the World Summit on Sustainable Development (WSSD) in Johannesburg as part of a parallel event at the Ubuntu Village. The GEO Data Portal was one of the major attractions at the UNEP stand, and the many discussions and interactions with visitors concluded in stimulating and inspiring ideas for further development and use of the GEO Data Portal.

One idea that was taken up after Johannesburg, was to focus more on GEO-related regional and local data needs, in particular those of developing countries, while keeping overall integration and harmonization with the (global) GEO Data Portal. This direction follows the recommendations made at the "Global/regional data portals, standards and tools" meeting held in Geneva at the end of 2001. That is, although the GEO Data Portal does provide access to environmental and socio-economic data for all regions and countries of the world, tailored spin-off products and activities are needed to improve support in the regions themselves. This implies the development of dedicated regional GEO Data Portals, available in more languages, containing specific regional data, and running from servers and



The GEO Data Portal is accessible to the public at the following website: <http://geodata.grid.unep.ch/>

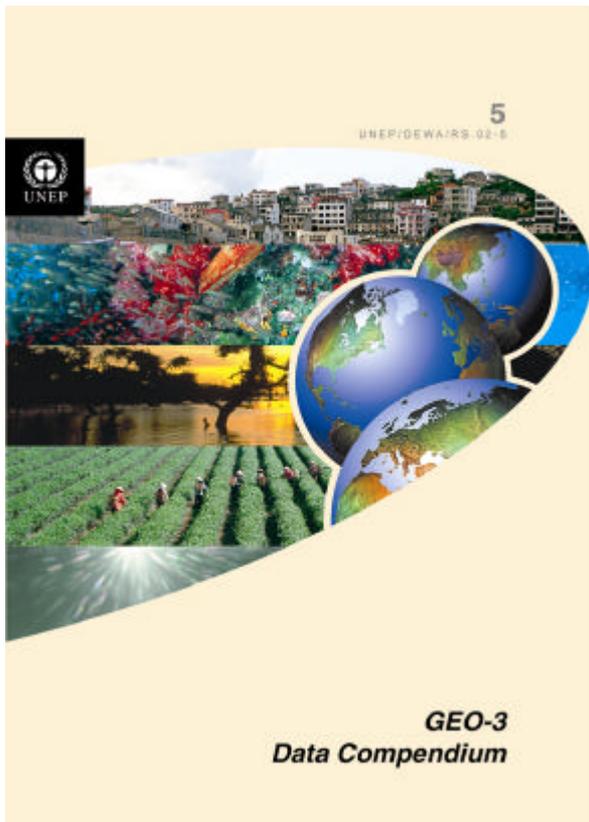
mirror sites within regions themselves. Additionally, off-line products such as CD-ROMs and printed compendia are envisioned, as well as training workshops with GEO Collaborating Centres and other key partners in the region.

A start was made in the Latin American and Caribbean region (LAC) by means of a workshop organized by the UNEP/DEWA/LAC office in Mexico and hosted by the Observatorio del Desarrollo in San Jose, Costa Rica. The OdD is the UNEP/GEO Collaborating Centre for environmental data and indicators in the LAC region, and has been at the forefront of the GEO data process for several years. To broaden the perspective on GEO-related data activities in the region, various national representatives participated. The workshop discussed regional data needs for environmental reporting, and explored existing tools such as the global version of the GEO Data Portal and the GEO-LAC Data Toolbox CD-ROM. A prototype GEO-LAC Data Portal developed by GRID-Geneva was also presented at the workshop. Designed as a regional window for the GEO Data Portal, the prototype is to provide access to all LAC data sets, include options to add region-specific data and made available in the Spanish language. Similar activities are foreseen in the African region in 2003, which will build on existing data networks and tools in support of GEO and related reporting activities. Discussions with the Asia-Pacific, West Asia and possibly other regions will also be followed up or initiated.

The GEO-3 Data Compendium

Accompanying the launch of the GEO-3 main report in May 2002, a statistical compendium was released on CD-ROM, together with an electronic version of the GEO-3 report. The GEO-3 Data Compendium provides an all-round presentation of the major statistics underlying the integrated analysis of the environment at global and regional levels. In addition to substantially supporting the GEO process, the Data Compendium offers outside users access to background information and potentially serves the needs of other assessment programmes.

Supplementary to the CD-ROM, a printed Data Compendium was published and distributed in September, while a handful of advance display copies were already made available at the World Summit on Sustainable Development in Johannesburg.

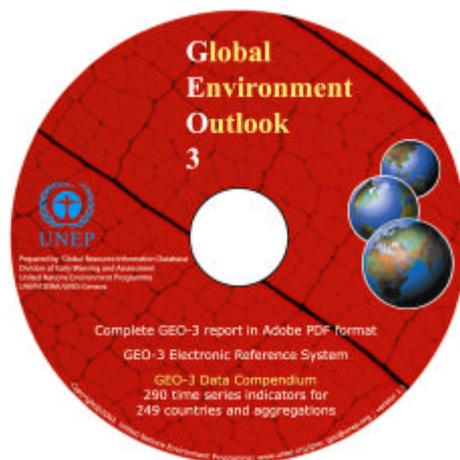


In addition to the CD-ROM and hardcopy versions, the Data Compendium is also available on the Internet at <http://geocompendium.grid.unep.ch>. Still, for additional and up-to-date statistical and geospatial data, readers are advised to consult the GEO Data Portal at: <http://geodata.grid.unep.ch>

The contents of the Data Compendium were extracted from the more extensive GEO Data Portal

at the time of publication of the GEO-3 report. The GEO Data Portal is the on-line, up-to-date and comprehensive reference data system for GEO assessment and reporting purposes, allowing users to explore data by means of maps, graphs and tables (see previous article). Thus, the dedicated GEO-3 Data Compendium represents a 'static' version of selected Data Portal statistics, specifically produced for the third GEO report.

In addition to providing data on major environmental issues, such as climate change, deforestation or biodiversity, the Compendium also deals with various aspects of society and economy, like economic growth, urbanization, energy use and life expectancy. Primary data have been collected from a wide variety of recognized international data sources among the UN system and other international organizations. Data sets are presented for GEO regions and sub-regions, as aggregated from national figures by DEWA~Europe/GRID-Geneva. National statistics are provided in cases where there were not enough country data available for aggregation at the regional levels. The CD-ROM gives access to the full Compendium tables; data for all years available and including all national statistics. The printed version presents a subset of these tables, with data often categorised by five-year periods.

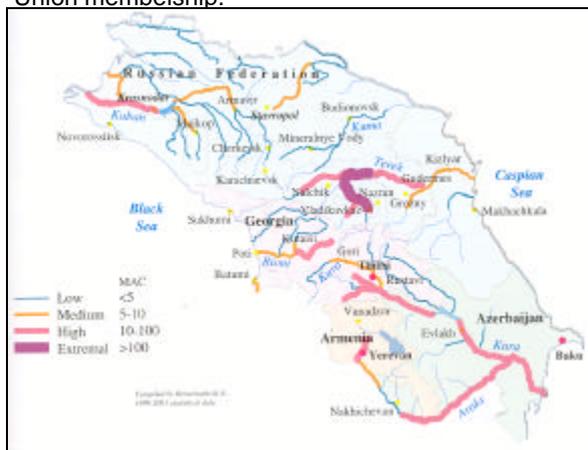


Caucasus Environment Outlook (CEO) Reporting Process

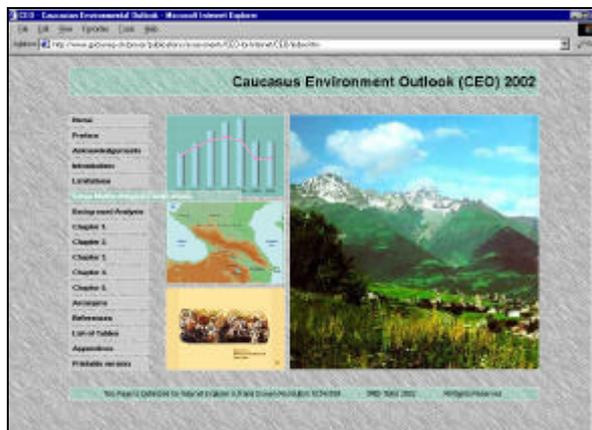
The first “Caucasus Environment Outlook” (CEO) report was launched in Tbilisi, Georgia, on 24 June, with the Georgian Minister of Environment Mrs. Nino Chkobodze and representatives from Caucasus countries and UNEP officiating at the ceremony. The CEO report, carried out within the framework of UNEP’s Global Environment Outlook process, was prepared by the GRID-Tbilisi office and involved a team of experts from the four Caucasus countries: Armenia, Azerbaijan, Georgia and Russia.

Stakeholder consultations with participants from the four governments, NGOs, academic and scientific bodies were held to enrich the analysis and foster regional ownership of the final product. UNEP’s DEWA-Europe and the Regional Office for Europe (ROE) coordinated and supervised the CEO report’s preparation, and provided overall guidance and editorial support throughout the process. Financial assistance for the CEO report was furnished by UNEP’s DEWA and ROE and the Swiss Agency for Environment, Forests and Landscape (SAEFL).

In terms of the report itself, the focus is on presenting an objective and accurate picture of the current state of the Caucasus environment and highlighting major environmental changes that have taken place in the last 30-year period since the Stockholm Conference in 1972. The analysis examines socio-economic “driving forces” impacting on the environment, and takes a special look at human vulnerability to environmental change. The regional environmental outlook for 2002-2032 is explored using scenarios. Two main scenarios highlight contrasting outcomes for the region, one based on the “Status Quo” and the other driven by a “Market World” resulting in transformations similar to those experienced in Eastern European candidate countries for European Union membership.



Polluted rivers in the Caucasus.



An on-line version of the CEO report is available at the GRID-Tbilisi website: <http://www.gridtb.org/>

Key issues on which the spotlight is directed include increasing air pollution from transport, water contamination by urban sources and environmental damage from armed conflict. On the positive side, there has been decreasing pressure on land due to a decline in intensive agriculture relying on heavy use of pesticides and fertilizers, a substantial increase in protected areas and overall preservation of the forest cover and biodiversity levels in the past 30 years. Emerging challenges include environmental impacts of new mega-projects particularly oil pipelines, transport networks linking Europe and Central Asia, and eventually increased pressures from tourism. Finally, the report provides a basis for targeted action by giving recommendations to address the root causes of environmental degradation, mitigate negative environmental trends and create regional monitoring and research facilities.

Copies of the highly informative report, containing as well many maps and graphics, may be obtained from UNEP/DEWA-Europe and ROE. It is also planned to publish Internet, Georgian and Russian language versions of the CEO report, as well as a summary version synthesizing the major findings.

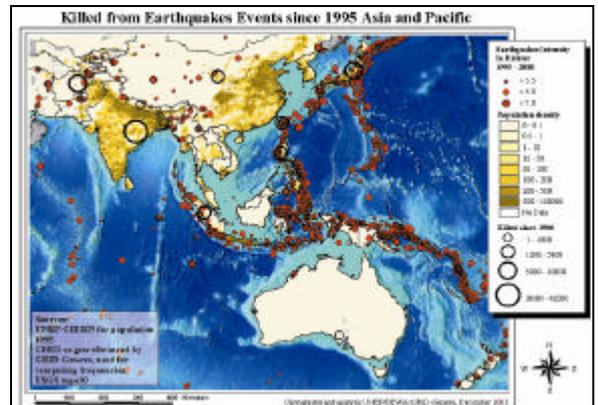
Expansion of Early Warning Activities

DEWA-Europe/GRID-Geneva's strategy on early warning is based on three categories of activity. The principal thrust is on scientific modelling and mapping of hazards, using spatial and statistical analysis to calculate impacts of rapid onset natural events, such as cyclones, floods or forest fires. Secondly, remote sensing assessment of human impacts on the environment is carried out for slow onset hazards related to environmental change. Appropriate and adequate information dissemination is the third tier of activity. The Internet has been a key tool in providing timely information, complemented with participation at conferences and workshops as well as by issuing technical reports and articles. Regular reporting on "hot topics" such as the forest fires status report, which used to constitute the core part of early warning activities between 1998 and 2000, has been overtaken by automated Internet updates to specialised organisations. This method provides a good overview of the situation, without requiring a major investment in human resources for the maintenance of this still very popular service.

Early warning activities at DEWA-Europe/GRID-Geneva in 2002 have considerably benefited from a strengthened multi-disciplinary approach involving experts from various fields, and by wider networking with external partners. During 2002, the Early Warning unit was involved in four major projects. These were: (i) development of a country risk and vulnerability index for UNDP's World Vulnerability Report. (ii) provision of inputs to the "Atlas of Global Change" project coordinated by GRID-Sioux Falls. This publication graphically illustrates the "human footprint" on the global environment as observed from space during the last three decades. (iii) several data sets on natural hazards were created such as the PREVIEW Global Cyclones Asymmetric Windspeed Profile. (iv) A collaborative project with the EU/Joint Research Centre to develop an interactive web mapping application: the Global Burnt Area of 2000.

The Global Risk And Vulnerability Index, Trends per Year (GRAVITY)

In 2000, DEWA-Europe/GRID-Geneva was commissioned by the United Nations Development Program (UNDP), Bureau of Crisis Prevention and Recovery (BCPR) to develop a methodology that would allow for systematic examination of country vulnerability to natural hazards. Comparing earthquakes, floods, droughts and cyclones poses several challenges, as these hazards have different durations, spatial extent, impact force and speed of onset. During the first part of 2001, a feasibility study

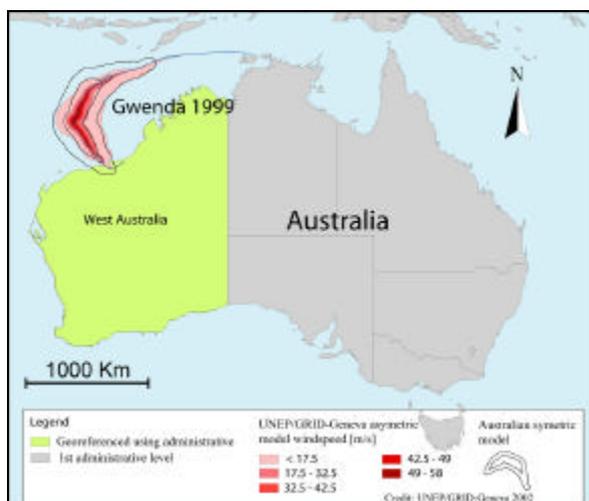


was conducted using existing global data coverage for both geophysical modelling purposes and socio-economic indicators. Subsequently, a multi-disciplinary team carried out follow-up spatial and statistical analysis, and results on cyclones, earthquakes and floods were produced in February 2002. The methodology applied for identifying vulnerability parameters and modelling of single hazard risks was deemed to be successful. Work is currently underway on drought vulnerability as well as development of a multiple risk index that can take into account the four major hazards for intra-country comparisons. The results of this research will be published in the World Vulnerability Report near mid-2003.

New Global Data Sets on Tropical Cyclones

As part of its Project for Risk Evaluation, Vulnerability, Information and Early Warning (PREVIEW), GRID-Geneva created a data set on tropical cyclones for the period 1980 to 2000. Known as the 'PREVIEW Global Cyclones Asymmetric Windspeed Profile', it comprises a series of annual spatial data sets showing cyclone tracks supplemented with information on their windspeed profile. Cyclone characteristics were computed using a mathematical model factoring pertinent data such as central pressure and wind speed, as recorded by nine centers affiliated with the World Meteorological Organisation (WMO).

National centres have typically recorded cyclone characteristics using various methods and units of measurement. The aim of the PREVIEW Global Cyclones Polylines Tracks is to provide users with a standardised version, with all units converted into the metric system and data presented in the same order and format. This task involved the normalisation of the different formats and units used by the various



Gwenda (1999), a comparison between a cyclone globally modelled by GRID-Geneva and observations carried out by the Bureau of Meteorology in Australia.

centres. A software programme was also developed to automate the standardisation procedure, as well as to process the 1,600 cyclone data sets and create the global coverage.

The newly-derived global coverage of cyclones will be used for various vulnerability assessments, including the calculation of physical exposure, which is a measure of the number of persons affected by tropical cyclones. It will also be used in a future UNEP project to assess 'Human Vulnerability to Environmental Change' by examining if warmer-than-usual temperatures are leading to higher frequency and intensity of cyclones, and by extension to a higher number of human casualties.

The global tropical cyclone data coverage as well as a method for quantifying cyclone impacts by integrating it with socio-economic data, was presented at the Fifth WMO International Workshop on Tropical Cyclones in Cairns, Australia, from 3 to 12 December 2002. This project has led to strengthened collaboration with internationally recognized climate experts and the WMO, and several new joint projects are under development. Data sets on both global cyclones tracks and asymmetric windspeed profiles can be downloaded from UNEP/GRID-Geneva websites.

Global Burnt Area 2000 Project

Over large regions of the globe, fires are known to contribute significantly to the release of gases and aerosols into the atmosphere, and to cause major disturbances to the vegetation cover. Biomass burning of anthropogenic origin contributes up to 50%, 40% and 16% of total emissions of carbon monoxide, carbon dioxide and methane respectively. Both the scientific community and policy-makers have expressed a need for reliable and quantitative information on the magnitude and spatial distribution of biomass burning for improved decision-making.

To address this critical data gap, the Global Burnt Area (GBA 2000) initiative was launched by the Global Vegetation Monitoring Unit of the European Union's Joint Research Centre, in partnership with six other organisations including UNEP/GRID-Geneva. A specific objective was set to monitor the global burnt area in the year 2000, using medium-resolution (1 km) satellite imagery acquired by the SPOT-Vegetation sensor and to quantify the area burnt in terms of vegetation cover type.

To facilitate data interpretation, an Internet Map Server (IMS) application was created by GRID-Geneva, allowing users to integrate burnt area maps with other sources of information such as country and park boundaries and land cover data. In this way, users can determine not only the number of fires and extent of affected areas, but also the type of burnt vegetation (grassland or forest) and damage to protected areas. This has been a successful collaboration with JRC and led to several scientific publications.



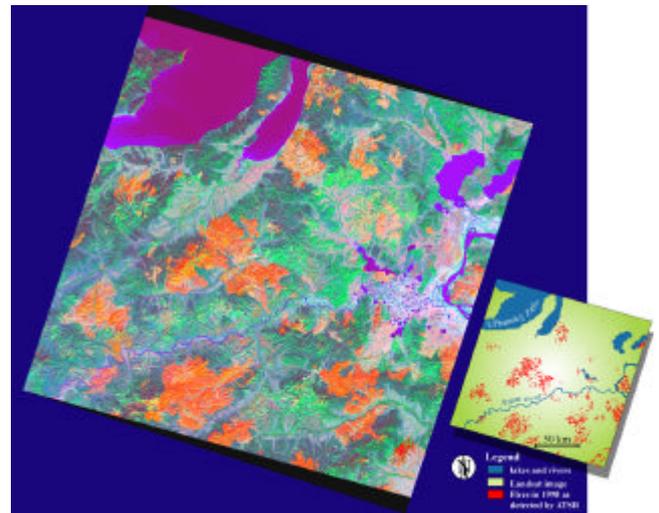
Burnt area data classified by month of observation in 2000 is available for direct download at the GRID-Geneva website.

Atlas of Global Change

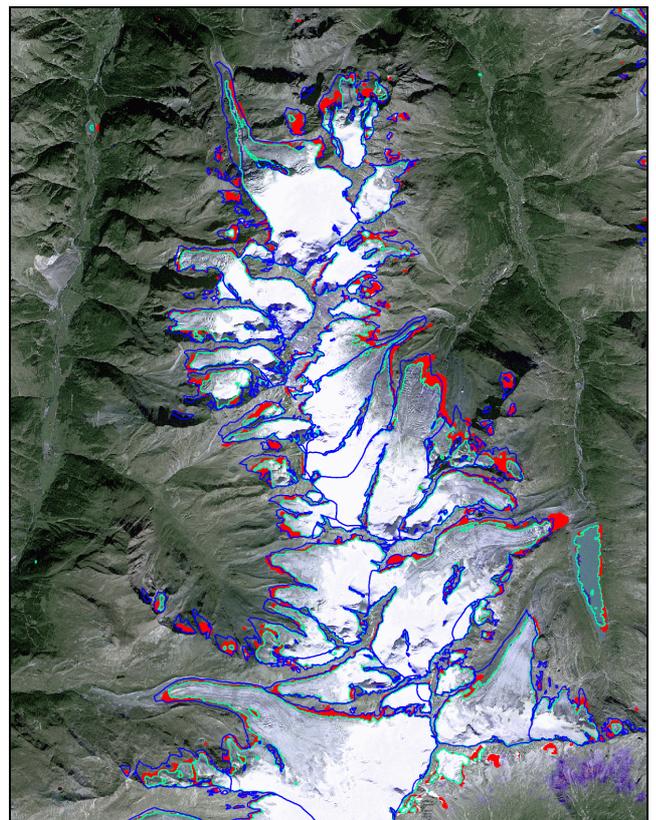
Drawing on the substantial archive of satellite imagery at the USGS EROS Data Centre, DEWA~North America/GRID-Sioux Falls decided to provide a glimpse of the “human footprint” on the global environment as seen from space. This led to the preparation of an “Atlas of Global Change” to illustrate some of the most dramatic environmental changes that have taken place since 1972, when the first earth observation satellite was placed in orbit. DEWA~Europe/GRID-Geneva also played a major role in preparing case studies for the Atlas. The 250-page large-format Atlas is scheduled for release in mid-2003 with a first edition of 70,000 copies. It includes a collection of one hundred sites, mainly those impacted by human activities but also some locations where environmental recovery has taken place.

The strength of the satellite-based approach stems from the hard facts showing past and actual conditions. Most of the imagery used is from NASA's Landsat series of satellites. The examples selected clearly reveal the scale of change, which is largely obvious even to the untrained eye. Case studies are supplemented with ground photos as well as summary explanations on the causes and consequences of the impacts. Issues presented focus on land cover changes such as deforestation and associated biodiversity losses, glacier retreats potentially due to climate change, urban sprawl, desiccation of lakes and wetlands as a result of mismanagement of water resources and dams and large forest fires.

DEWA~Europe/GRID-Geneva coordinated and prepared nearly a dozen sites for the Atlas. Several studies were carried out by partner organizations at the Universities of Geneva and Zurich and the Geneva Botanical Garden. Topics addressed ranged from deforestation in Côte d'Ivoire, glacier retreat in both Peru and Switzerland, dropping levels of the Dead Sea, forest fires in far eastern Russia, desiccation of Mesopotamian marshlands and Hamoun wetlands, date palm forest destruction along the Shatt al-Arab, and forest recovery in Eastern Europe's 'black triangle'. In addition to highlighting the role of remote sensing technology in monitoring of natural resources and environmental change detection, the Atlas should help raise awareness amongst the policy community and wider public about the scale and dynamics of global environmental change. Poster products based on Atlas case studies have also been prepared and presented in various international conferences. To ensure wide dissemination of results an on-line website catalogue of the one-hundred sites is also planned.



Twenty thousand square kilometers of forests were destroyed in the fires that ravaged Russia's Far East in 1998. In this Landsat image taken in June 2000, burnt areas showup in red, while standing forest and vegetation is green.



Changes in extent of glaciers from Landsat TM imagery in the "Mischabel" range, Switzerland. Glacier recession between 1985 and 1998 is depicted in red, 1998 glacier outlines are in green and digitized outlines from 1973 are

Monitoring the State of the Remaining Mesopotamian Marshlands

UNEP placed the spotlight on the destruction of the vast wetlands of southern Iraq and Iran in a report published in 2001 entitled *The Mesopotamian Marshlands: Demise of an Ecosystem*. Satellite-based assessment studies, carried out by DEWA/GRID-Geneva and covering a period from the early 1970s to 2000, showed that 90 per cent of what once was the largest wetland in the Middle East and Western Eurasia had disappeared mainly due to drainage schemes and upstream damming. The human and environmental impacts of ecosystem collapse have been disastrous; hundreds of thousands of Marsh Arabs were rendered homeless, fisheries collapsed and rare wildlife species are seriously threatened. By 2000, a one-thousand square kilometre marsh area known as Al-Hawizeh/Al-Azim marshes, straddling the Iran-Iraq border, was all that remained of the extensive wetland complex that originally covered an area of 20,000 square kilometres.

As the last existing marsh, UNEP regards the remaining Al-Hawizeh/Al-Azim marsh as a priority area requiring urgent conservation action. During 2002, DEWA/GRID-Geneva continued to regularly monitor changes in the state of Al-Hawizeh/Al-Azim marshes through satellite images and also succeeded for the first time to arrange, in cooperation with Iran's Department of Environment, a field visit to the sensitive border region with Iraq. Follow-up assessment aims to provide Iran and Iraq with timely and scientific information and encourage them, in collaboration with other riparian countries, to conserve what is left of the marshes.

A rapid assessment mission to the Al-Azim marsh in Iran was carried out in mid-February 2002 to appraise the situation on-the-spot. The scene of intense fighting between Iran and Iraq (1980-88), the wetland has been heavily damaged by military conflict and may be qualified as an "environmental disaster zone". The ongoing impoundment of the Karkheh dam, Iran's largest reservoir dam, which began in April 2001 has also sharply reduced water flows to the Al-Azim marsh. As their life support system was ruined, the marsh people and local fisherman abandoned the area, while the only signs of the previously teeming wildlife were the rare cormorant and ibis. Analysis of 2002 satellite imagery revealed that a further 325 square kilometres or a third of the remaining area had dried out since 2000. Unless urgent action is taken to rehabilitate the marshlands, this last vestige is likely to disappear within three to five years.

Iran reacted positively to this alarming situation with a limited release of water to the wetlands in March and



Iraqi Marsh Arab refugees roam with their water buffalo herds along the banks of the Karun River in Khuzestan, Iran.

April 2002 flooding the northern core part of the Al-Azim marsh. A long-term recovery plan is, however, needed. This will require a holistic river basin approach based on the ultimate goal of sustaining riverine ecology and in which all Tigris-Euphrates riparian countries share the rivers' waters in a coordinated and equitable manner. An integrated catchment plan would also give priority to allocating an adequate amount of water to the wetlands, while water releases from existing dams can be timed to mimic natural flow patterns and bring the marshlands back to life.

UNEP has also actively strived to raise awareness and inspire action about the Mesopotamian marshland disaster through the activities of the designated international instrument on wetlands, the Ramsar Convention. In addition to participating in sub-regional Ramsar workshops, DEWA/GRID-Geneva organised a side event presentation about the marshlands at the Convention's Conference of the Contracting Parties (COP8) in November 2002. Delegates from all the main Tigris-Euphrates basin countries attended the session, including Iraq, Iran, Syria and Turkey, and stimulating discussions ensued which highlighted the need for coordinated dialogue between the concerned countries. In this connection, it is noteworthy that in the regional group discussions for Asia, the representatives of Iran and Iraq indicated their readiness to cooperate in a trans-boundary wetland management scheme.

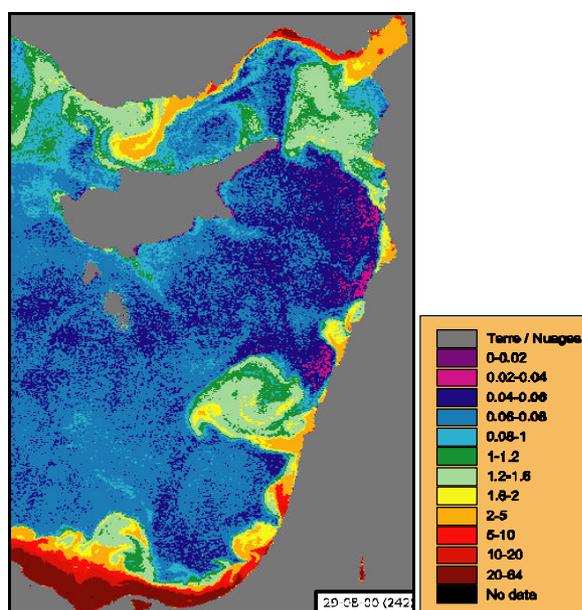
Monitoring Coastal Pollution in the Eastern Mediterranean

During 2002, DEWA-Europe/GRID-Geneva in collaboration with the Lebanese National Center for Remote Sensing (NCRS), continued its work to develop a Coastal Zone Information System for Lebanon (CZISL). Proliferation of poorly planned post-conflict reconstruction in Lebanon's coastal zone has been a major source of environmental stress, especially on coastal waters and habitats. Moreover, the situation is aggravated by the fact that only a fraction of the 2.3 million people living in coastal cities are served by wastewater treatment plants. As a result, about 300,000 cubic meters per day of raw sewage are discharged into the Mediterranean sea. Launched in 1998, the project aims to map these land-derived pollution sources along the Lebanese coast and to create an information system to assist coastal zone management.

The assessment and monitoring of land-derived pollution in coastal waters is usually carried out by ship cruises, collecting samples from a small number of stations. This procedure is relatively expensive, and does not yield a comprehensive "map" of polluting inputs and their subsequent spread in coastal waters. Satellite imagery offers an alternative way to map pollution patterns and their evolution through time. Several satellites are potentially available for that purpose, provided there is an operational methodology to interpret satellite image data into a "pollution map".

As part of the CZISL, imagery from several satellites is being examined to determine the effectiveness of this technology in monitoring marine pollution. The objective is to develop an operational methodology to interpret raw digital image data and produce easily understandable "pollution maps. Initially, only *Landsat TM* images were used, mostly because of their good spatial resolution. However, it was soon realised that the reflectance in the visible TM bands was somewhat distorted by a complex mixture of signals from the sea bottom, mineral turbidity, chlorophyll and even the sea surface itself (waves and slicks). To further decipher these images, there was a need for other sources of information.

Despite its coarser spatial resolution, *SeaWiFS* (Sea-viewing Wide Field-of-view Sensor) imagery has the crucial advantage of being designed to register sea colour on a daily basis, thus providing calibrated data on chlorophyll concentration. This green pigment is an essential constituent of phytoplankton, whose abundance is mostly dependent on nutrient availability (phosphate). Phytoplankton is nourished from either "natural" internal sea sources (cold water upwellings) or from anthropogenic land sources, such as sewage. With due precautions, satellite-derived chlorophyll maps can, therefore, be used as tracers for polluting inputs.



Map of chlorophyll concentration in Eastern Mediterranean on 29 August 2000, as computed from SeaWiFS imagery. Offshore areas show very low concentrations, in contrast with coastal plumes and gyres.

A total of 30 SeaWiFS images taken in 2000-2001 were compiled and processed. They reveal the general patterns of planktonic production in the Levantine basin, as well as their seasonal evolution. Spectacular gyres, coastal jets and plumes highlight the dynamism and complexity of the circulation patterns. From what is known of the physical oceanography in this basin, the large high-chlorophyll concentration patches seem to be essentially due to upwelling phenomena, bringing to the surface deeper waters rich in nutrients. Smaller features of high chlorophyll concentration are located permanently opposite some points on the coastline (e.g off Beirut). In this case, their presence is probably caused by land sources.

Preparation of a full water colour inventory for selected SeaWiFS images is currently underway. Establishing correlations with patterns observed by Landsat is very complex and varies with time, probably because of changing phytoplankton populations and sea conditions. DEWA-Europe/GRID-Geneva and the NCRS signed a Memorandum of Understanding to complete the last phase of the CZISL by end 2003, with the objective to develop a fully operational marine pollution mapping methodology complemented by fieldwork and other satellite data sources.

Lake Balaton Integrated Assessment

There has been growing concern in recent years about significant changes affecting Hungary's Lake Balaton, the largest in Central Europe. Amongst the more visible 'early warning' signs are chronically low and declining water levels. The causes and consequences of these changes are not fully understood by science, but the underlying assumption is that there are multiple local and global pressures at play, including possibly climate change. Concerned that these new stress signs merit greater deliberation, the International Institute for Sustainable Development (IISD), UNEP, and the Balaton Group, organised a joint workshop on September 9-10, 2002 in Csopak, Hungary, of leading Hungarian and international scientists to examine the interaction of socio-economic and environmental forces affecting the lake, its environs and its people.



A space view of Lake Balaton (Landsat, August 2000).

Overall, workshop participants agreed that due to a constellation of local and global pressures, Lake Balaton has entered a phase of critical vulnerabilities. In light of the serious uncertainties surrounding the Lake's future, participants agreed on the need to carry out a forward-looking integrated assessment that would identify sustainability problems potentially arising in the coming decades. Such an assessment would need to be developed through stakeholder consultations and designed to bear on the policy realm by proposing realistic preventive and adaptive strategies.

UNEP agreed to provide seed funding to assist setting up a small steering group to prepare a project concept proposal and mobilise resources for the complete assessment study. For DEWA, the importance of the Lake Balaton case study stems from its role as a high-profile pilot that could help build the scientific basis of its new 'Early Warning Strategy' and demonstrate the use of integrated, forward-looking analysis in formulating preventative plans.

Freshwater Information System

Responding to the need for better access to fragmented data on freshwater resources management, a number of web-based information services were initiated and further developed in 2002. The consortium for the Water Resources and Wetlands e-Atlas held a meeting in March, focusing on timely access to water resources data of relevance to policy and management issues, with information presented in the form of dynamic maps, vital graphics, statistics and text in order to explain the complex issues involved. In the context of UNEP.Net and the Global Environment Outlook, information portals for Freshwater and GEO core data sets have been developed. A prototype of a global River Basin Information System (RBIS) was developed by the University of New Hampshire (UNH) for UNEP, to identify impacts and challenges of global change within selected, key watersheds of the world. A workshop on the RBIS initiative was held at UNEP in Nairobi in February. DEWA-Europe/GRID-Geneva was actively involved in these activities throughout the year.

For UNESCO's International Hydrological Programme, UNH developed a first version of the Data Synthesis System for World Water Resources, focusing on Africa, to analyze the changing nature of water in relation to human needs and activities at the global, regional and 'case study' scales. Other water-related information systems include the Basin Data Explorer developed by UNH/GRDC (Global Runoff Data Centre), as well as Digital Atlas of Freshwater Quality of UNEP/GEMS-Water.

These various activities and initiatives are leading to new ideas and plans for improved Internet-based data and information services at the level of river basin ecosystems for 2003 and beyond, through harmonization and/or integration of existing projects, prototypes and portals.



RBIS is available on-line at:
<http://www.watsys.sr.unh.edu/rbis-unep/>

UNEP.Net: the United Nations Environment Network

The UNEP.Net system was initiated in 2001 to support integrated environmental assessment processes, most notably UNEP's Global Environmental Outlook (GEO) series. Comprising a network of information portals on major environmental issues at global and regional levels, it systematically links and presents vital graphics with core data sets and background material for efficient reporting and sound decision-making. Using state-of-the-art Internet technology, the suite of integrated thematic and regional information sites was expanded during 2002 with portals for the European and Latin America and Caribbean regions, as well as global portals for Mountains ecosystems and Socio-economic information. These websites give users access to authoritative information from recognized global and regional sources for improved environmental reporting and management.

DEWA-Europe/GRID-Geneva is responsible for a substantial part of UNEP.Net development, launching the European Portal in September and the Socio-economic in November 2002. Prototypes of other portals such as those for the Urban Environment and for Early Warning & Environmental Vulnerability have been developed, and are scheduled for publication in 2003. Support has also been provided to overall UNEP.Net activities such as the meta-database and design template, as well as to certain portals development such as in West Asia. The GEO Data Portal has also been updated and better integrated in UNEP.Net, allowing other portals to efficiently draw maps and graphics on-the-fly in a harmonized fashion.



UNEP's European Portal can be accessed at : <http://europe.unep.net> or through <http://www.unep.net>



The UNEP.Net system can be accessed at: <http://www.unep.net>.

The **European Portal** aims to provide on-line authoritative information on the environmental situation throughout the pan-European geographic region, while highlighting key issues in specific problematic areas such as water pollution, over-fishing or transport flows. The European Portal benefits considerably from the work of the European Environment Agency (EEA) in Copenhagen, as well as from other partners in the region. The EEA has long-standing experience in environment assessment, reporting and networking in Europe, as witnessed by numerous authoritative publications and information systems that cover the European environmental situation. The other major partners for the European Portal are UNEP's Regional Office for Europe, the Regional Environment Centre for Central and Eastern Europe and GRID-Arendal in Norway.

The **Socio-economic portal** (socioeconomic.unep.net) was developed to provide the GEO and related environment assessment community with access to major information sources for relevant 'driving forces' of environmental change, such as population growth, economic development and consumption patterns. Information on social and cultural aspects, as well as human health and environmental policies is also provided. All this reflects the growing notion of the need for 'integrated' assessment – addressing not only the state-of-the-environment but also root causes in society and impacts on man and nature – as well as that of sustainable development with a focus on relations between environment and development. The Socio-economic Portal benefits considerably from the work of various international agencies such as the World Bank, the UN Statistical and Population Divisions, CIESIN, FAO, ILO, UNDP, UNESCO, WHO, WRI and WTO

Earthwatch: Co-ordinating UN Environmental Observation Activities

The United Nations System-wide Earthwatch mechanism is a broad UN initiative to coordinate, harmonize and catalyze environmental observation activities among all UN agencies in support of integrated assessment and reporting. Through Earthwatch, UN agencies work together on global environmental issues, by exchanging and sharing environmental data and information. UNEP provides the Earthwatch secretariat.

Within UNEP, the Earthwatch coordination function is being led by the Assessment Branch of the Division of Early Warning and Assessment at UNEP Headquarters in Nairobi, while DEWA-Europe/GRID-Geneva runs the Earthwatch Support Unit with a programme officer, a webmaster and a secretary (all as part-time functions).

The Support Unit is responsible for the day-to-day substantive and operational aspects such as data exchange, website supervision, input for GEO and preparation of Earthwatch meetings.

Following the 7th Earthwatch Working Party meeting in December 2001, the Earthwatch website has undergone significant changes during 2002. A questionnaire was also prepared for updating information on each and every Earthwatch focal point and partner. Earthwatch counts about 70 representatives among 50 UN agencies and conventions.

The Earthwatch website is updated on a regular basis, giving access to the latest UN news, publications and databases on the global environment. The URL has been changed to "earthwatch.unep.ch", while the website is now also hosted on the UN Headquarters server in New York (www.un.org/earthwatch/) by courtesy of the UN Division of Sustainable Development, being the Co-

Task Manager for Agenda-21's Chapter 40 on "Information for Decision Making" and Earthwatch' lead partner.

The next plenary Earthwatch meeting is scheduled to take place in the Spring of 2003, with a focus on contributions of Earthwatch to the follow-up of the World Summit on Sustainable Development, the UN Millennium Development Goals as well as the follow-up of decision 22/1.I.A by UNEP's Governing Council on strengthening its scientific base by improving the ability to monitor and assess global environmental change. Related to this will be discussion of collaboration in the area of environmental and socio-economic databases and information systems.



The Earthwatch website (<http://earthwatch.unep.ch/>) provides an updated overview of the latest environmental within the UN system.

Catalogue of Data Sources

Alpine CDS

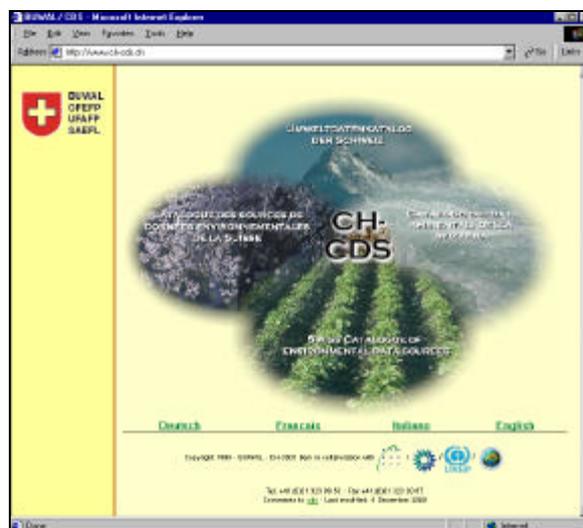
The Alpine Catalogue of Data Sources (Alpine-CDS) is a wide-ranging reference tool for environmental information about the Alps. It provides key meta-data about Alpine institutions and their data holdings. The Alpine-CDS has been jointly developed by the System for Observation of and Information on the Alps (SOIA) and SAEFL with full technical support from GRID-Geneva.

In 2002, several dynamic functions were added to the SOIA website. These improvements allow users to easily consult latest developments within SOIA and to obtain contact information for the various network members. As for the Alpine-CDS, a major overhaul allowed for its completion by mid-2002. Swiss data holdings were updated based on the latest version of the Swiss-CDS, and Monaco was also able to upload its meta-data. In addition, an important database from Liechtenstein as well as meta-data from Italy were incorporated. By the end of 2002, the Alpine-CDS held approximately 3,500 addresses and 2,850 meta-data references.

A progress report on SOIA activities was presented by GRID-Geneva at the ninth meeting of the SOIA working group in early July. During the seventh Alpine Conference held in Merano, Italy on 19 November 2002, the Austrian city of Innsbruck was chosen to host the Convention's permanent secretariat with the support of a scientific and technical bureau located in Bolzano, Italy. As this transitional phase is eventually concluded, the outlook for SOIA activities at GRID-Geneva should become clearer in 2003.



New functions have been added to the SOIA website in 2002 which can be consulted at: <http://www.soia.int>



The Swiss CDS (www.ch-cds.ch) is a major resource on Switzerland's environment.

Swiss CDS

The Swiss Catalogue of Data Sources (CH-CDS) provides reference information on Swiss environmental organisations and data collections. Developed by SAEFL with technical support from GRID-Geneva, this electronic catalogue is meant to facilitate access to Swiss environmental information sources and data sets. It also responds to Switzerland's obligations under the Aarhus Convention on strengthening public access to information.

The Swiss CDS project underwent major transformations in 2002. SAEFL's Environmental Observation unit, which is responsible for overseeing the project, was fundamentally restructured during the first quarter of 2002. A new project leader was appointed and important strategic decisions were made by the project Steering Committee. One of the key proposals envisages the development of an entirely new application that is compatible with the CDS, but which is also interoperable with relevant international standards set by the Dublin Core and ISO 19115, as well as with several other SAEFL projects. This state-of-the-art application, enabling on-line querying of the Swiss CDS via the Internet as well as real-time updates, is to be launched in summer 2003. Another major thrust of the new strategy focuses on enhanced communication and networking amongst partners.

Updated in the first quarter of 2002, the Swiss CDS now holds 3,550 objects and 2,450 addresses. An average of 800 visitors per month consulted the Swiss CDS website in 2002. As for utilisation of the CDS application itself, more than 25,000 information

CEROI-Geneva

The "Cities Environment Report on the Internet" (CEROI) for Geneva was launched as a joint initiative in 1998 by the City and Canton of Geneva authorities and GRID-Geneva. It is an integral part of an international project, CEROI.NET, involving over twenty cities from all regions of the world that are intent on placing at the disposal of their citizenry a report on the quality of their urban environment. A set of core indicators informs visitors of environmental improvements or deteriorations that have occurred, and allows users to compare the quality of their city environment to that of other cities. CEROI is also a practical tool for the implementation of Agenda 21 at the local level.

During the EnviroInfo Conference held in Vienna in September 2002, various presenters cited CEROI as a model process. Amongst the notable issues highlighted, was the clear and comprehensive presentation of the multiple factors influencing environmental conditions in urban settings and the means available to the public to affect change, such as the section on "What can I do?" Typically, a CEROI portal is organised around three key questions: (i) What are the key environmental problems facing the city?; (ii) What are the activities



For more information please consult:
www.ville-ge.ch/ceroi/

that impact on the environment?; and (iii) What resources are available to solve these environmental problems? Subsequently, each environmental theme is addressed using the Driving force-Pressure-State-Impact-Response (DPSIR) model. The assessment is concluded with a description of the roles and actions that can be assumed by citizens to improve environmental conditions.

In 2002, GRID-Geneva collaborated with partner organisations in revamping the CEROI Geneva portal to render it more user-friendly, and the website look and structure is now more closely aligned with the model proposed by CEROI.NET. A prototype of the new portal was presented during the RIO+10 exhibition organised jointly by the City and Canton of Geneva in 2002. The new CEROI Geneva website is scheduled to be launched in early 2003.

Environmental Information System for the Geneva Region

Over the years, the Canton of Geneva has made substantial investments to protect and enhance its environment. Creation of a reliable information system on the local environment has been acknowledged by the authorities to be a key goal. The SIEnG website, developed by the Department of Interior, Agriculture and Environment and Energy (DIAEE) in collaboration with GRID-Geneva in 2000, was conceived with this need in mind. The SIEnG comprises a suite of tools and applications allowing various local authorities responsible for the environment sector to collect and share information and knowledge for improved decision-making. The information system, based on a dynamic website, allows SIEnG partners responsible for various sectors to update and exchange information in real-time. GRID-Geneva continues to provide SIEnG users with regular technical advice and support on meta-data and Internet technology issues.

As part of its involvement in SIEnG activities, GRID-Geneva participated in the preparation of the first conference on the "e-environment" which was held at the European Centre for Nuclear Research (CERN) in Geneva, Switzerland in March 2002. The meeting provided a valuable forum, bringing together for the first time different regional actors involved in environmental information system projects. In light of the success encountered, a follow-up meeting is scheduled to take place in 2004.

Environment and Security Initiative

DEWA-Europe/GRID-Geneva is participating in a new initiative led by UNEP's Regional Office for Europe (ROE) under the theme of "Environment and Security", and which was launched in mid-2002. The general purpose of this project, being carried out in collaboration with UNDP and the Organisation for Security and Cooperation in Europe (OSCE), is to identify linkages between major environmental concerns within European sub-regions and countries, and existing or potential security problems that impact on people and states.

DEWA-Europe/GRID-Geneva is supporting this initiative at both the conceptual, management and technical levels. This includes taking part in the project's steering committee meetings and workshops, and through preparation of digital cartographic products, which demonstrate existing environmental concerns and issues, as well as relevant policy measures. The project and its activities are initially focussed on two sub-regions, SouthEastern Europe (SEE) and Central Asia. A series of workshops are envisioned, the first of which was held with SEE countries on 3-4 December 2002 in Belgrade, Yugoslavia.



A sample of the maps produced by GRID-Geneva for the "Environment and Security" initiative

GRID-Geneva prepared a suite of maps covering the entire SEE sub-region which were discussed at the Belgrade workshop including: 1) political and infrastructural basemap; 2) land cover classification; 3) biodiversity-rich sites/protected areas and ecological zones; 4) major industrial, power facilities and other sites; and lastly 5) trans-boundary environmental agreements. These preliminary maps will be revised based on workshop deliberations and displayed at the upcoming Kyiv Ministerial Conference on the Environment (May 2003), where "Environment and Security" is the major theme. Another series of maps is being prepared for Central Asia.

Caucasus IEA Training Workshop

The workshop on "Integrated Environment Assessment (IEA): methods, processes and supporting tools" was jointly organised by DEWA-Europe through the European GRID network (with GRIDs-Arendal and Tbilisi) from 14-16 October at the *Internet Café* in Tbilisi, Georgia. Some 20 persons from Armenia, Azerbaijan and Georgia participated, predominantly from their Ministries of Environment and/or Natural Resources, as well as several NGOs from the region.

The purpose of the workshop was to familiarise the participants with on-line tools and methods for accessing and using relevant environmental and other types of data. Trainers for the course came from three GRID centres (Arendal, Geneva and Tbilisi), with each presenting different "modules". These included: an introduction to common and alternative IEAs and SoE reports; where to find such documents on the Internet; access to and use of on-line databases; graphical presentation/mapping as an additional means of communication; and some typical products. In addition, country delegations prepared a report on an environmental theme of their choice and presented it to the workshop, as a practical exercise in communicating information.



Hands-on training was provided to Caucasus government representatives during the IEA workshop in Tbilisi

The participants were largely satisfied with the results of the IEA Training Workshop, as a final evaluation showed, and expressed their desire for further, similar training in the future. Therefore it is planned, as part of DEWA's capacity building activities in the future, to develop more in-depth courses, which can be given in each of the Caucasus countries in 2003.

GRID-Geneva Advisory Board

Composed of representatives from SAEFL, the University of Geneva and UNEP, the GRID-Geneva Partnership Advisory Board convened twice during 2002 to review progress in the implementation of the programme of work and status in all areas, including staffing plans, budget and project activities. Overall, the Board endorsed the expanded portfolio assumed by GRID-Geneva as an integral part of its assessment and early warning mandate, and indicated satisfaction with its role in providing important services and strengthening cooperation amongst partner agencies.

Advisory Board Members

Mr. Dan van Ravensway Claasen, Deputy Director, DEWA/UNEP
(alternate representative: Mr. Arthur Lyon Dahl, Director, Coral Reef Unit)

Prof. Charles Hussy, Director, Geography Department/University of Geneva

Dr. Franz Perrez, Head, Global Affairs Section, International Affairs Division, SAEFL

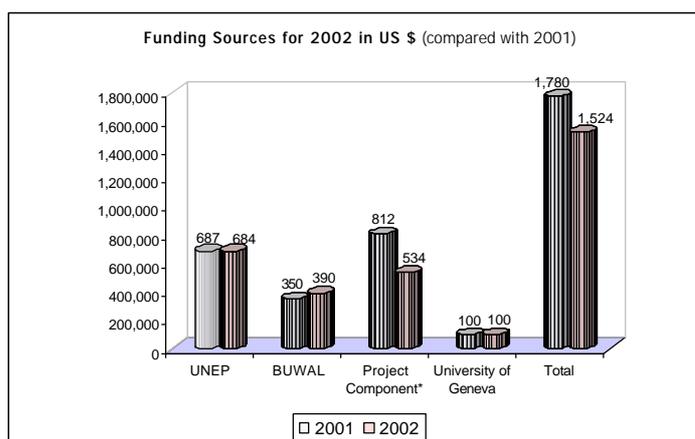
Mr. Markus Wuest, Head, Environmental Monitoring Section, SAEFL

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

Prof. Walter Wildi, Director, University of Geneva/Institut Forel

GRID-Geneva Budget Expenditure 2002

Operating Costs	US \$
Personnel	1,259,000
Infrastructure (hardware/software/networks)	104,500
Miscellaneous (communications/travel/other)	86,500
Total	1,450,000
Balance Sheet	
Total Payments	1,524,000
Total Disbursements	1,450,000
Net Financial Status (as of 01/01/03)	74,000



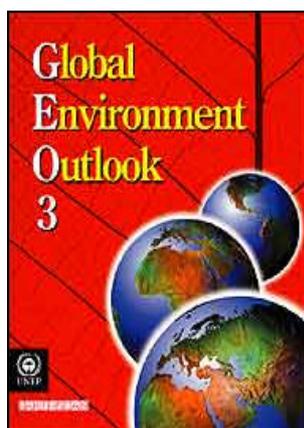
* Project Component: US \$258,000 from UNEP; US \$276,000 from BUWAL and others.

Selected Outputs

Publications

Global Environment Outlook 3 Past, present and future perspectives

Earthscan Publications Ltd, London, 2002

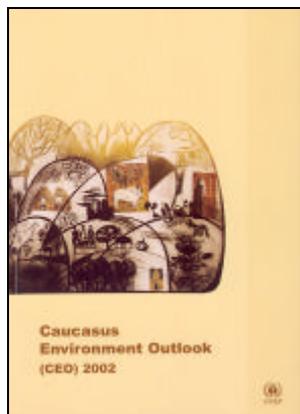


UNEP's flagship report on the state of the global environment, GEO-3, tracks and analyses important environmental issues over the period 1972-2002. Continuing the global and regional focus of previous GEO reports, GEO-3 presents the 30-year retrospective analysis of environmental conditions and trends, and associated policy responses under nine

key themes ranging from land and forests to urban areas and disasters. A special focus on human vulnerability to environmental change highlights the increasing risks and impacts on people. The outlook section of the report, spanning the next 30 years, is presented through scenarios. This innovative approach reveals salutary lessons for all who strive towards a more desirable future.

Caucasus Environment Outlook 2002, New Media Tbilisi, Georgia, 2002

Prepared as part of UNEP's Global Environment Outlook series, the sub-regional Caucasus Environment Outlook report provides an objective and accurate picture of the current state of the Caucasus environment, highlighting major environmental changes that have taken place in the last 30-year period.



The analysis singles out ongoing socio-economic "driving forces" impacting on the environment and takes a special look at human vulnerability to environmental change. The regional environmental outlook between 2002-2032 is explored using scenarios.

Cartographic and Poster Products

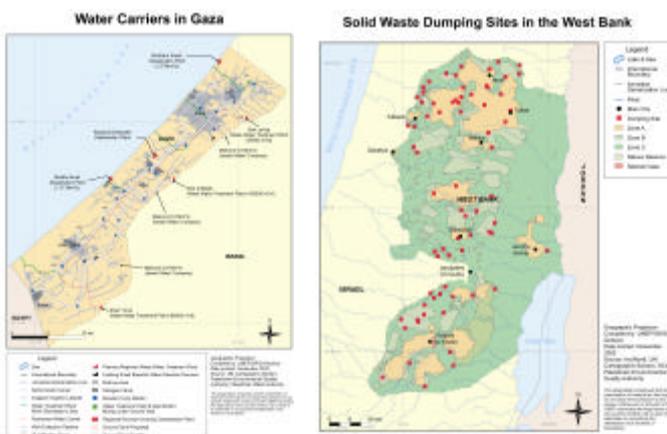
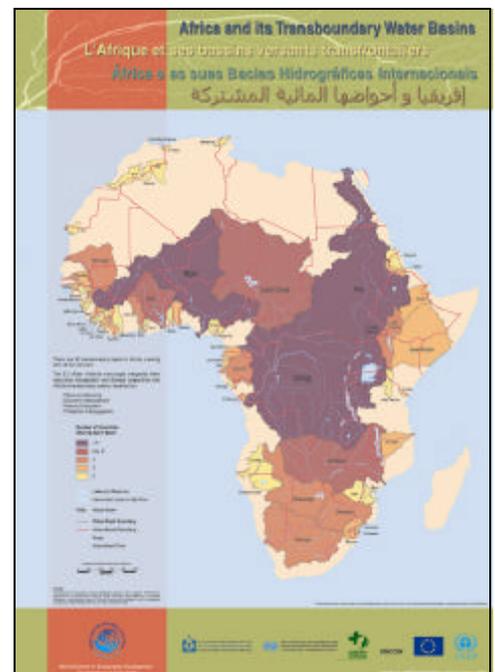
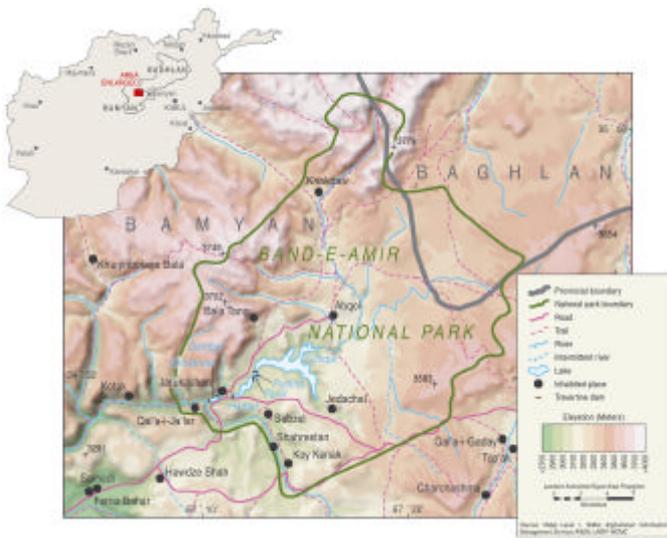
Maps

1. DHV Worldwide
2. EBARA Worldwide
3. ONDEO Worldwide
4. Political maps of Europe (1972-2002)
5. Status of National Biosafety Frameworks
6. Base Map of Southeastern Europe
7. Biodiversity Zones and Protected Areas of Southeastern Europe
8. Major Industrial and Power Facilities in Southeastern Europe
9. Land Cover Map of Southeastern Europe
10. Transboundary & Regional Environmental Cooperation in Southeastern Europe
11. Afghanistan Administrative Boundaries and Main Cities
12. Sites Visited by UNEP Field Teams in Afghanistan
13. Existing and Proposed Protected Areas in Afghanistan
14. Band-e-Amir National Park, Afghanistan
15. UNEP in the European Region (revision 2002)
16. A suite of 16 maps of the Occupied Palestinian Territories covering watersheds, well distribution, water carriers, aquifers, hydrological vulnerability of groundwater to pollution, solid waste dumping sites, industrial sites and nature reserves.

Posters

17. Geo Data Portal
18. Africa and its Transboundary Water Basins

Of Africa's 59 trans-boundary basins, covering 60% of the continent, two countries share twenty-nine basins and the rest are shared by more than two. To highlight the transcendence of water over political boundaries and the need for greater cooperation at the watershed level, GRID-Geneva created a poster map entitled "Africa and its Trans-boundary Water Basins". The poster map was launched by partner organisations, the International Water Secretariat and Green Cross International, as part of the European Union "Initiative on Water" at the WaterDome in Johannesburg, South Africa. In addition to the poster exhibition, thousands of copies were handed out to participants and a large-scale jigsaw version of the map was available for visitors to engage in international water issues in a more leisurely manner.



Conferences, Workshops and Missions

During 2002, DEWA-Europe/GRID-Geneva organised and/or participated in the following workshops, conferences and missions:

EC/ESA, Global Monitoring for Environment and Security Information Day, Brussels, Belgium, 16 January

UNOOSA, Inter-Agency Meeting on Outer Space Activities, Rome, Italy, 22-25 January

UNEP/DEWA, River Basin Information Systems Initiative, Nairobi, Kenya, 13-14 February

Ramsar Convention, West and Central Asian Sub-Regional Meeting, Tehran, Iran, and field mission to Khuzestan wetlands, 3-15 February

CRFG/SAEFL/DIAEE, "E-Environment", Geneva, Switzerland, 15 March

EU/JRC, Global Land Cover (GLC) 2000 "First Results", 18-22 March

UNEP/ROE & DEWA-Europe/GRID-Tbilisi, Sub-regional Consultation on Caucasus Environment Outlook report, Tbilisi, Georgia, 9-12 April

UNEP/GRID-Geneva, Ninth Partnership Advisory Board Meeting, Geneva, 29 April

ESA/ESRIN, UNEP Mission to European Space Agency, Frascati, Italy, 9-10 May

UNEP/GEF, Third Meeting of the Steering Group - Regionally Based Assessment of Persistent Toxic Substances Project, Montreal, Canada, 22-23 May

UNEP/Georgian Ministry of Environment, Launch of Caucasus Environment Outlook report, 24 June

SOIA, Ninth Meeting of the System for Observation and Information on the Alps (SOIA), Monaco, 1-2 July

ESRI International User Conference, San Diego, California, USA, 8-12 July

Mandat International, World Civil Society Forum, Geneva, 14-19 July

UN World Summit on Sustainable Development, Johannesburg, South Africa, 26 August- 4 September

UNECE/CEP, 3rd session of the Ad-hoc Working Group on Environmental Monitoring, Geneva, Switzerland, 29-30 August

SAEFL, Workshop 2002 Swiss Environmental CDS, Bern, Switzerland, 4 September

UNEP/DEWA-Europe/IISD/INRIC, Workshop on Lake Balaton's Past, Present and Future, Csopak, Hungary, 9-10 September

UNEP/ROE, First Steering Committee Meeting on Environmental Security, Geneva, Switzerland, 12 September

ISCGM, 9th Meeting of the International Steering Committee for Global Mapping, Budapest, Hungary, 20 September

International Society for Environmental Protection, EnviroInfo 2002, Vienna, Austria, 25-28 September
EEA, Conference on International Co-operation on Environmental Reporting and Information Management, Copenhagen, Denmark, 26-27 September

Ramsar Convention, Middle East Sub-Regional Meeting, Beirut, Lebanon, and mission to Lebanese National Centre of Remote Sensing, 7-11 October

GRID-Tbilisi, 5th Euro-GRID Centers Meeting, Tbilisi, Georgia, 10-12 October

UNEP/GRID, Workshop on Integrated Environment Assessment, Tbilisi, Georgia, 14-16 October

ISDR, Third Meeting of ISDR Working Group, Geneva, Switzerland, 23 October

UNEP/GRID-Geneva, Ninth Partnership Advisory Board Meeting, Versoix, Switzerland, 31 October

Columbia University, Workshop on Assessment of High-Risk Disaster Hotspots, New York, USA, 6-8 November

Ramsar Convention, Eight Conference of the Contracting Parties, Valencia, Spain, 18-26 November

UNEP/DEWA-LAC, GEO Data Portal Workshop, San José, Costa Rica, 25-30 November

UNIDR, Conference on Outer Space and Global Security, Geneva, Switzerland, 26-27 November

UNECE, Working Group on Environmental Monitoring, Geneva, Switzerland, 28-29 November

UNEP/ROE, Workshop on "Environment and Security", Belgrade, Yugoslavia, 2-5 December

WMO, Fifth International Workshop on Tropical Cyclones, Cairns, Australia, 3-12 December

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Mount Blanc Glacial Retreat

Nicole Strub
Atlas of Global Change

Acronyms

Alpine-CDS - Alpine Catalogue of Data Sources
BCPR - Bureau of Crisis Prevention and Recovery (UNDP)
CC - Collaborating Centre
CD-ROM - Compact Disc - Read Only Memory
CDS - Catalogue of Data Sources
CEO - Caucasus Environment Outlook
CEROI - Cities Environment Reports on the Internet
CERN - European Centre for Nuclear Research
CH-CDS - Swiss Catalogue of Data Sources
CZISL - Coastal Zone Information System for Lebanon
DEWA - Division of Early Warning and Assessment (UNEP)
DIAEE - Department of Interior, Agriculture, Environment and Energy (Canton of Geneva)
EEA - European Environment Agency
ESA - European Space Agency
ESRI - Environmental Systems Research Institute
FAO - Food and Agriculture Organisation of the United Nations
GBA - Global Burnt Areas
Geneva-CDS - Geneva Catalogue of Data Sources
GEO - Global Environment Outlook
GIS - Geographic Information System
GRAVITY - Global Risk and Vulnerability Indexing Trends per Year
GRID - Global Resource Information Database (UNEP)
IEA - Integrated Environmental Assessment
IEH - International Environment House
IISD - International Institute for Sustainable Development
ILO - International Labour Organisation
IMS - Internet Map Server/Solutions
ISCGM - International Steering Committee for Global Mapping
ISDR - International Strategy for Disaster Reduction
JRC - Joint Research Centre (of the European Commission)
LAC - Regional Office for Latin America and Caribbean (UNEP)
MdD - Meta-data Directory
NASA - National Aeronautics and Space Administration (U.S.A.)
NCRS - National Centre for Remote Sensing (Lebanon)
OSCE - Organisation for Environment and Security in Europe
OCHA - Office for the Coordination of Humanitarian Affairs (U.N.)
PCAU - Post Conflict Assessment Unit
PREVIEW - Project for Risk Evaluation, Information and Early Warning
RBIS - River Basin Information System
ROE - Regional Office for Europe (UNEP)
SAEFL - Swiss Agency for the Environment, Forests and Landscape (BUWAL/OFEFP)
SEE - SouthEastern Europe
SIEnG - Information System for Environment and Energy of the Geneva Region
SOIA - System for Observation of and Information on the Alps
UN - United Nations
UNCC - United Nations Compensation Commission
UNDP - United Nations Development Programme
UNECE - United Nations Economic Commission for Europe
UNEP - United Nations Environment Programme
UNESCO - United Nations Educational, Scientific and Cultural Organisation
UNIDR - United Nations Institute for Disarmament Research
UNOOSA - United Nations Office for Outer Space Affairs
USGS - United States Geological Survey/Earth Resources Observation Systems
WHO - World Health Organisation
WMO - World Meteorological Organisation
WRI - World Resources Institute
WSSD - World Summit on Sustainable Development
WTO - World Trade Organisation

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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World Environment Day • 5 June 2003

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