

Creation of Global Databases

A significant influence on the feasibility of global integrated assessment will be the routine collection and availability of data of adequate quality through monitoring systems and surveys, collected and analysed on a consistent basis. This note describes progress in the development of the Global Environment Outlook (GEO) Project which at this stage appears to offer the best prospect of meeting this need.

A few broad-brush conclusions appear to emerge from work on global databases so far:

- (i) In practice, even with GEO, it has simply not proven feasible to identify (let alone make available) each and every data set used for integrated environment assessment and underlying research around the world; the amount of data would be simply overwhelming.
- (ii) Although global, harmonised core data sets are improving, expanding and more easily accessible, there are still numerous inconsistencies and shortcomings. Most of these uncertainties have been highlighted in the main report.
- (iii) In particular, to date, little information is available for assessment of environmental impacts on human health and natural ecosystems and of societal responses to and effectiveness of environmental policy actions.

UNEP launched the Global Environment Outlook (GEO) Project in 1995. It consists of a global environmental assessment process that is cross-sectoral and participatory. It incorporates regional views and perceptions, and aims to build consensus on priority issues and actions through dialogue among policy-makers and scientists at regional and global levels.

The complex conversion, integration and moulding of raw data into meaningful information shows considerable shortcomings and uncertainties, while there is still little feedback and validation during this process among collectors, collators, analysts, disseminators and end-users.

The data sets need to be collated, tailored and made available to the partners for integrated environment assessment (IEA), most notably in the realm of UNEP's GEO. The four critical questions on data for IEA/GEO assessment and reporting can thus be identified as follows:

1. What information do we need?
2. What data do we have and what is missing?
3. How can we derive the necessary information from existing 'raw' data sets?
4. How do we organise, operate and improve data and information management in the real world?

The first years of the GEO assessment project have shown great strides in identifying the core data sets for IEA/GEO, as well as some of the most obvious gaps and shortcomings. The identification process largely focused on questions 1 and 2 and produced an extensive list of existing core data sets for global environment assessment, based on needs listed by various organisations.

There is also considerable overlap among different environment-related reporting programmes. This would imply the need to compile a generic, flexible core database, which can also serve other assessments than GEO. The sheer magnitude actually makes it very difficult for any single organisation to compile such an empirical base. Thus, in fact, this could and should be an UN-wide effort, which would benefit the assessment activities of UNEP, UNDP, FAO, CSD, IPCC, Convention Secretariats, UN Economic Commissions and possibly others.

The following table shows most of the databases compiled by the GEO project. The aim is to continue including databases which can be of importance for Environmental Integrated Assessment Studies.

Data set name	Source	Time period	Geographical Coverage	Spatial Resolution
Agriculture, forestry, fishery				
AGROSTAT1992	FAO	1961-1990	world	Countries
Animal Stocks European Union	Eurostat	1977-1995	Europe/EU	NUTS-0/1
Crop areas European Union	Eurostat	1975-1995	Europe/EU	NUTS-0/1
FAOSTAT1995	FAO	1961-1993	World	Countries
Growing season Database Europe	RIVM	1992	Europe	Thematic areas, 10'' x 10''
Historical agricultural indicators (HYDE)	RIVM	1890-1990	world	Countries, regions
International fertilizer statistics	IFA	1971-1994	world	Countries
Time series State of food and agriculture world (SOFA'94)	FAO	1961-1993	world	countries
World fishery production (FISHSTAT-PC)	FAO	1950-1994	world	Countries
Climate				
Climate database Europe	CEC	1930-1987	Pan-Europe/EU	stations
CLIMATE global database (temp., precip., evapo., cloudiness)	RIVM	1931-1960	world	0.5° x 0.5°
IIASAClimate Database	IIASA	1991	world	0.5° x 0.5°
Monthly surface air temperature and Precipitation world	NCAR	1920-1980	World	0.5° x 0.5°
Observational Data Sets (ODS) of weather stations	ECMWF	1980-1989	World	Stations
Precipitation excess Europe	RIVM	1991	Europe/EU	0.5° x 0.5°
Wind Vector Grids in Europe	KNMI	1983-1996	Pan-Europe	Stations
Demography, health				
Demographics of the republics Former Soviet Union (FirstBookDIS) 1992	New World Demographics	1950-1990	CIS	sub-national
Global Mortality Database	WHO	1950-1995	world	countries
Global population density	NASA, Harvard University, UNEP	1984, 1085	World	1° x 1°
Global population density and totals	NCGIA	1994	world	5'' x 5''
Gridded population Data world per country	CIR/CIESIN	1971-2005	World	20'' x 30'' 5'' x 7.5''
Health for all, Europe	WHO	1970-1990	Europe	countries
Health for all, global indicators	WHO	1983-1994	world	Countries
Historical population indicators (HYDE)	RIVM	1890-1990	world	Various
International Data Base (global demographic and socioeconomic data)	CIR	1950-2050	World	Countries,provinces
Mortality for sub-national administrative units of Europe	Eurostat	1980-1990	Europe/EU	NUTS-2
OECD-CREDES Health Data programme	AEA	1960-1990	OECD	Countries
Population density Africa	UNEP	1991	Africa	5'' x 5''
Population density China	NGS	1987	China	sub-national
Population density Europe	RIVM	1989-1992	Pan-Europe	10'' x 10''
Sub-national boundaries and population of Latin America, US, Europe, Africa, CIS	CIAT,ESRI, Eurostat, UNEP, NWD	1971-1990	Latin America	sub-national
World cities population database WCPD	UNEP	1990	world	Places
World cities populations	Bartholomew	1991	world	places
World population prospects: the 1992 revision	UN-DESIPA	1950-2025	world	countries
World population prospects: the 1994 revision	UN-DESIPA	1950-2050	world	countries

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Economy				
Africa Development Indicators	World Bank	1970-1994	Africa	Countries
Historical economic indicators (HYDE)	RIVM	1890-1990	world	Countries, regions
Time series European Union: Eurostat-CD, Panorama of EU-Industry	Eurostat	1983-1993	Europe/EU	NUTS-2
Trade Analysis System PC-TAS	UNCTAD/ITC/GATT	1990-1994	OECD	countries
World Debt Tables 1993-94	World bank	1970-1993	world	countries
Environment				
Acid deposition In Europe	RIVM	1989	Europe/EU	Thematic areas
Agricultural waste burning	RIVM	1991	world	1° x 1°
Air Quality in major European cities	RIVM	1985-1992	Pan-Europe	places
AIRBASE Air Pollution Information System	CEC	1968-1995	EU, Pan-Europe	stations
Aluminium concentrations in ground water in Europe	RIVM	1990	Pan-Europe	10° x 10°
Areas with saline seepage in the European Union	RIVM	1996	Pan-Europe	Thematic areas
Biomass burning	Max Planck Institute	1975-1980	world	1° x 1°, 5° x 5°
CORINAIR	CITEPA	1985, 1990	Europe/EU	NUTS-1/2/4
Critical loads/levels in Europe	RIVM	1996	Pan-Europe	150 x 150 km
EDACS: European Deposition Maps of Acidifying Components on a small scale	RIVM	1989, 1993	Pan-Europe	10° x 10°
EDGAR: Emission Database for Global	RIVM	1971-1992	world	1° x 1°
Endangered ecosystems Europe	RIVM	1992	Pan-Europe	Thematic areas, 10° x 10°
Environmental statistical database (IEDS)	UN-ECE	1980-1992	OECD	countries
Erosion database Europe	ISRIC	1992	Pan-Europe	Thematic areas, 10° x 10°
European Air Quality Maps	RIVM	1989-1990	Pan-Europe	50 x 50 km
Forest soil Ecosystems database	SC-DLO	1992	Pan-Europe	0.5° x 1°
Global assessment of human induced soil degradation (GLASOD)	UNEP/ISRIC	1991	world	Thematic areas
Global distribution, characteristics, methane emission natural wetlands	NCAR	1986	world	1° x 1°
Global ecosystems database	USDOC/NGDC/EPA	1992	world	10° x 10°
Global ecosystems database 1992, 1994	NOAA-NGDC/ERL/EPA	1992-1994	world	10° x 10°
Global environmental research data (Global Grass CD II)	US-ACE	1993	world	5° x 5°
Global ozone data (TOMS)	NASA	1978-1991	world	1° x 1°
Groundwater nitrate Concentration Europe	RIVM	1992	Europe	Thematic areas
Groundwater resources in the EC	RIVM	1992	Europe	Thematic areas
Halons and Methyl chloroform production and emission data	ICI	1960-1992	world	Thematic areas
Holdridge Life Zone classification	IIASA/RIVM	1931-1960	world	0.5° x 0.5°
Hydrogeology Africa (RIVM)	UNDP	1994	Africa	Thematic areas
Landfills in Europe	Eurostat	1991	Europe/EU	NUTS-2
LOTOS emission database 1986	TNO	1986	Pan-Europe	1° x 2°
Methane emission from animals	NCAR	1984	world	1° x 1°
NASA global distribution of aircraft emissions	NASA	1990	world	1° x 1°
Nitrogen excretion by various categories of animals	RIVM	1985	World	1° x 1°
Nitrogen loads Europe	RIVM	1991	Europe/EU	various

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Nitrogen pollution in Europe	RIVM	1991	Europe/EU	Thematic areas
Pesticides loads Europe in soils and ground water	Eurostat/FAO/RIVM	1991	Pan-Europe	countries, 10" x 10"
Production and Emission data on CFCs and HCFCs	AFEAS	1931-1991	world	places
Protected areas Africa	UNEP	1989	Africa	Thematic areas
Risk map of European nuclear power plants	RIVM	1992	Pan-Europe	0.5° x 1°
Road traffic: Fuel consumption and emissions	TNO	1990	world	countries
SO2 Concentrations Europe	RIVM	1992	Europe/EU	5" x 5"
Socioeconomic impacts Study environmental problems (SEIS)	RIVM	1994	India	country
Soil Organic Matter Map of Europe	RIVM	1993	Europe/EU	10" x 10"
Soil Water Holding capacity	NASA	1990	world	1° x 1°
Total Ozone Mapping Spectrometer (TOMS)	NASA	1978-1991	world	1° x 1.25°
Tropospheric Ozone Research (TOR)	Eurotrac/EMEP	1988-1995	Pan-Europe	Stations
Wetlands Africa	ESRI	1993	Africa	Thematic areas
Wetlands in the European Communities	CEC	1991	Europe/EU	Thematic areas
World ecosystems (Olson)	NOAA	1970-1989	world	0.5° x 0.5°
World wilderness areas	UNEP	1989	world	Thematic areas
WSL global Distribution of aircraft emissions at 5 x 5 degree	WSL	1989-1990	world	5° x 5°
Industry, Energy				
BP Statistical Review of world energy	BP	1965-1993	world	Countries
Energy Statistics and energy balances	IEA	1960-1992	OECD	Countries
Historical energy/emissions Indicators (HYDE)	RIVM	1890-1990	world	countries, regions
Historical Industrial Indicators (HYDE)	RIVM	1890-1990	world	countries, regions
IISI Steel Production and consumption statistics	ISI	1983-1992	OECD	Countries
Industrial areas in the EU	RIVM	1992	Europe/EU	Thematic areas
UN Energy statistics and population database	UNSTAT	1950-1991	world	Countries
UN-ECE Buildings Statistics	UN-ECE	1980-1990	world	Countries
UNSO Commodity Production Statistics	Aristotle University	1970-1990	world	Countries
Land cover				
Experimental calibrated Global vegetation index ECGVI 1994	NOAA	1985-1991	world	10" x 10"
Global distribution of rice paddies	RIVM	1994	world	1° x 1°
Global distribution of wetlands	Max Planck Institute	1988	World	2.5° x 2.5°
Global Soils for climate research (Zobler)	NGDC		world	1° x 1°
Global vegetation database (Matthews)	NASA/GISS	1992	world	1° x 1°
Historical land cover indicators (HYDE)	RIVM	1890-1990	world	Various
Monthly Generalized Global vegetation index	NOAA	1985-1988	world	10" x 10"
Natural Vegetation of the European Communities	CEC	1989	Europe/EU	Areas
Normalized Difference Vegetation index (NDVI)	NOAA	1983-1984	world	1° x 1°
Pan-European 10 Minutes land use database	RIVM	1975-1990	Pan-Europe	10" x 10"
Pan-European Land Use statistical database	RIVM	1985-1990	Pan-Europe	Various
Pan-European Land Use vector database	RIVM	1975-1985	Pan-Europe	Thematic areas

Data set name	Source	Time period	Geographical Coverage	Spatial Resolution
Soil database for Europe	RIVM	1993	Europe/EU	10" x 10"
Soil map of the European Communities	CEC	1985	Europe/EU	Thematic areas
Soil map of the world	FAO/UNESCO	1974, 1994	world	Thematic areas
Vegetation map of Brazil 1988	USGS/EDC	1988	Brazil	Thematic areas
Vegetation, Land Use and seasonal albedo	NCAR	1950-79	world	1° x 1°
World Soils for Global Climate Modelling (Zobler)	NASA	1974-1981	world	1° x 1°
Broad data sets				
Global socioeconomic indicators (World bank, 1994, 1995)	World Bank	1962-1992	world	countries
Global topographic database: digital chart of the world (DCW) 1992, 1993	ESRI	1993	world	various
Human Development Report database 1994-1995 (UNDP)	RIVM	1992	world	Countries
Social indicators of development 1993-1994	World Bank	1965-1992	world	countries
World development indicators (WDI) 1994	World Bank	1970-1992	World	countries
World resources database 1992-1993	WRI	1970-1993	world	countries
World Tables 1993, 1994	World Bank	1970-1992	world	countries
Global topographic database: ArcWorld I: 3M1992	ESRI	1992	world	various
Support information				
Chemical Evaluation Search and Retrieval System (CESARS)	Mich.Dep. of Nat.Resources	1983-1995	world	---
CHEMINFO	Mich.Dep. of Nat.Resources	1983-1995	world	---
Delta Study	IIASA	1950-1988	Rhine Basin	catchment
Development activity information world (DAI) 1994, 1996	IDRC	1930-2013	world	world
ECOTOX aquatic ecotoxicological database	RIVM	1993-1994	world	---
European emission sources	RIVM	1980-1994	Pan-Europe	0.5° x 1°
Global elevation map ETOPO-5	NOAA/NGDC	1986	world	
Global Relief Data	NOAA/NGDC	1980-1990	world	various
Global river basins database	RIVM	1996	world	catchments
Global Topographic Grids	RIVM	1996	world	various
Hydrogeology Europe (RIVM)	RIVM	1993	Pan-Europe	Thematic areas
Major Settlements Pan-Europe	CEC/EEA	1989	Pan-Europe	places
Maps 'n' Facts (PC Globe). World Edition, Version 1.0	Broderbund Software	1989-1991	world	countries
Monthly river discharge of major rivers	GRDC	1996	world	stations
River Basin Ganges, Bramaputra	RIVM	1994	India	catchments
River Basin Rhine, Meuse	RIVM	1995	Pan-Europe	catchment
River Basins Africa	UNEP	1984	Africa	catchments
River Basins Europe	RIVM/Eurostat	1994	Pan-Europe	catchments
River Basins world (GGHYDRO)	Trent University	1994	world	catchments, 1° x 1°
River Basins world (Global Grass)	Rutgers University	1993	world	catchments, 5" x 5"
RTECS - Registry of toxic effects of Chemical Substances	NIOSH	1983-1996	world	---
Topographic index of world places (Times World Index)	Bartholomew	1991	world	places
UNCED Earth Summit Rio de Janeiro 1992/ Agenda-21/Treaties	IDRC	1972-1992	world	world
World boundary databank WBDII 1972	DMA/ESRI/UNEP	1972	world	various
World boundary databank WBDII 1972 - PC version	UNEP	1993	world	various
Worldwide digital terrain data (TerrainBase)	NGDC	1994	world	various