*Draft*

# DIVERSITAS Science Plan

*This document is the draft of the new Science Plan for DIVERSITAS, the international programme of biodiversity science. DIVERSITAS is sponsored by ICSU, SCOPE, IUBS, IUMS and UNESCO, and belongs to a family of four global change programmes (IGBP, WCRP, IHDP and DIVERSITAS; see Annex 2 for a definition of acronyms). Three of these programmes (IGBP, IHDP and WCRP) have established a partnership, called the Earth System Science Partnership, to address global environmental problems, which DIVERSITAS has been invited to join.*

*DIVERSITAS recently held, from 31 August to 2 September 2001 in Paris, a meeting of a Task Force to review and redefine its mission and scientific objectives (see Annex 1 for Task Force Membership). This document is the result of this discussion, and of a consultation of the scientific community prior to this meeting. It is intended as a preliminary text to be submitted for discussion to the scientific community.*

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During the long history of life, Earth has experienced several periods of mass extinction. But the current extinction "crisis" differs from the previous ones in that it is occurring at an unprecedented rate, and is the direct result of human activities. Erosion of biodiversity occurs at various levels, from the genetic diversity of many natural and domesticated species to the diversity of our planet's ecosystems and landscapes, through the tremendous richness of species. Current human-induced rates of species extinction are estimated to be about 1,000 times greater than past background rates. Biodiversity loss is a matter of concern, not only because of the aesthetic, ethical or cultural values attached to biodiversity, but also because it could have numerous far-reaching, often unanticipated, consequences for our life-support system. The capacity of natural and managed ecosystems to deliver ecological services such as production of food and fibre, carbon storage, nutrient cycling and resistance to climate and other environmental changes, could be reduced. Assessing the causes and consequences of biodiversity changes, and establishing the bases for the conservation and sustainable use of biodiversity, are major scientific challenges of our time.

The past decade has seen the birth of the Convention on Biological Diversity, of many conservation programmes aimed at protecting biodiversity, as well as many national research programmes dedicated to developing biodiversity science. Scientific efforts, however, need international co-ordination to address the complex scientific questions posed by the loss and change of biodiversity globally. Many of these questions also require a research framework integrated across disciplines. DIVERSITAS aims to establish an international, multidisciplinary network of scientists working on biodiversity which will address the scientific priorities presented in this draft science plan.

## DIVERSITAS' general goals

The general goals of DIVERSITAS are:

- to promote integrative biodiversity science, linking biological, ecological and social disciplines in an effort to produce socially relevant new knowledge;
- to provide the scientific basis for an understanding of biodiversity loss, and to draw out the implications for policies for conservation and sustainable use of biodiversity.

DIVERSITAS will achieve these goals by synthesising existing scientific knowledge, identifying gaps and emerging issues of global importance, promoting new research initiatives, building bridges across countries and disciplines, investigating policy implications of biodiversity science, and communicating these to policy makers and international conventions.

**DIVERSITAS' structure**

DIVERSITAS will articulate its science plan around 3 Core Projects.

- Core Project 1, "Understanding, monitoring and predicting biodiversity changes", will assess (1) how biodiversity is changing, by contributing to the development of the scientific tools of biodiversity monitoring, (2) why it is changing, by investigating the socio-economic, ecological and evolutionary processes involved in species extinction and speciation, and (3) how it is expected to change, by developing the knowledge necessary to develop biodiversity scenarios for the future.

- Core Project 2, "Assessing impacts of biodiversity changes", will assess how biodiversity changes affect ecosystem functioning and thereby the provision of ecological goods and services of relevance to human societies. A particular emphasis, within the context of ecological services, will be placed on impacts of biodiversity changes on human and livestock health.

- Core Project 3, "Developing the science of conservation and sustainable use of biodiversity", will assess the effectiveness of current regulatory measures and incentives to protect biodiversity, investigate alternative social, political and economic motivators for biodiversity protection, and establish a scientific approach for optimising multiple usage of biodiversity, considering possible trade-offs between economic and environmental goals.

In addition to the three thematic core projects, a few integrated transversal networks, which embrace issues addressed in all the core projects, will be created around particular topics or ecosystems. Two such networks already exist, the Global Invasive Species Programme (GISP) and the Global Mountain Biodiversity Assessment (GMBA). A new transversal network, "Greening agriculture", is proposed here.

Lastly, IBOY, the International Biodiversity Observation Year, is an initiative of DIVERSITAS that spans the whole programme. It is a one-time event to celebrate biodiversity, which will last from 2001 to 2002.

# Core Project 1: Understanding, monitoring and predicting biodiversity changes

To understand and predict the consequences of changes in biodiversity for natural ecosystems and human societies, it is first necessary to know how much biodiversity there is on Earth, how it is changing, and why. Despite the growing interest in biodiversity during the last decades, our knowledge of the true diversity of life that inhabits our planet is still very limited and fragmentary. While large animals and plants are reasonably well known, only a small fraction of the existing small-sized organisms, such as bacteria, protists, microarthropods and insects, has been discovered and described by science. Many of these organisms probably fulfil important functions in biogeochemical cycles, from local to global scales. Even in those taxonomic groups and locations where diversity has been described, diversity is changing rapidly following increasing human activities, so that there is an important need to monitor and assess these changes.

Finally, a predictive biodiversity science requires an understanding of the factors that cause biodiversity changes. Changes in the nature and intensity of human activities are known to lie behind the accelerated loss of biodiversity both locally and globally. These changes reflect demographic, cultural, political and economic factors. They have reduced and restructured most habitats, changed the distribution and abundance of species to support economic production, altered biogeochemical cycles and the chemical composition of soils, water and atmosphere. We need to understand these changes and the way they interact with the complex ecological and evolutionary processes.

Core Project 1 will provide the basic knowledge that is required to assess the impacts of biodiversity changes (Core Project 2) and to develop strategies for the conservation and sustainable use of biodiversity (Core Project 3). It will contribute to assessing current biodiversity, develop the scientific bases for monitoring biodiversity changes, and provide critical knowledge on the processes that determine these changes, with a view to predicting future changes. Attention will be paid, however, to avoid duplication with already existing initiatives.

## Focus 1.1. Assessing current biodiversity

There are a large number of players on the scene of inventorying and classification of biodiversity, such as the Global Biodiversity Inventory Facility, the Global Taxonomy Initiative, Species 2000 and the Tree of Life. DIVERSITAS will continue to promote such international initiatives as it has done so in the past, but does not intend to co-ordinate them directly since they now have an independent existence.

The main objective of this focus will be to stimulate and develop research into new areas that require special attention. In particular, it will:

- foster research on phylogenetic groups and habitats that have been insufficiently studied, such as micro-organisms in soils and sediments, and in freshwater, marine and extreme environments;
- promote the integration of new methods, such as genomic approaches, in the study of these organisms;
- link the phylogeny and functional ecology of these organisms.

For example, efforts should be made to characterise the metabolism of the new lineages of micro-organisms that are being discovered in soils, sediments and marine environments, and to link their functional traits with their phylogeny. Phylogeny may then become an important

tool to predict their role in biogeochemical cycles, which may be considerable, particularly in the oceans. This focus will thereby provide results that can be used by Core Project 2.

### Focus 1.2. Monitoring biodiversity changes

Monitoring will be increasingly important for the signatories of the Convention on Biological Diversity when they report on the success of their conservation practices. New monitoring tools, such as remote sensing and molecular techniques, are needed to document biodiversity changes world-wide and evaluate the success of biodiversity conservation policies. For example, changes in ocean microbial communities could be monitored in time and space using molecular ecological techniques and correlated with physico-chemical conditions to increase our understanding of the microbial loop in marine ecosystems.

The objective of this focus is to develop the scientific bases for monitoring biodiversity, as well as the tools of monitoring and the use of these tools. It also aims to promote the integration of biodiversity monitoring and monitoring tools into global networks of observatories that are under development by other programmes. This focus will:

- foster the development of new methodologies and protocols;
- collaborate with existing projects (e.g., ILTER, BIOTA, BIOMARE, MAB biosphere reserves, GTOS, DAPTF) to promote a global network of biodiversity observatories;
- integrate modern techniques into monitoring methods (e.g., genomics, remote sensing);
- facilitate data storage and handling in a suitable way to serve to the construction of models and scenarios of biodiversity changes, as developed in Focus 1.3.

### Focus 1.3. Understanding and predicting biodiversity changes

The major drivers of biodiversity loss are changes in the nature and intensity of resource use in both terrestrial and marine environments. The increasing integration of the global economy; together with consumption-led demand for land, mineral, water, fuels, fibres and food, has dramatically altered almost every ecosystem on the planet. These changes continue to fragment, restructure and expand the connections between almost all habitats. They have altered fundamental biogeochemical cycles, and with them the capacity to support the historic composition and abundance of species. Understanding the interaction between such social processes and the ecological processes they affect poses a major challenge to science. Our capacity to predict the dynamics of species gains and losses at local and regional scales depends on the development of the science of ecological changes in an increasingly tightly integrated world socio-economic system.

Land-use changes, resulting mainly from agricultural intensification, play a critical role in biodiversity changes. They involve the physical alteration, fragmentation and destruction of natural habitats as well as overexploitation, which are the most important causes of current species extinctions. More generally, they are an important determinant of the dynamics of species gain, loss and turnover over ecological time scales, and also affect evolutionary processes from gene flow to long-term speciation rates. These evolutionary implications have rarely been considered so far in conservation policies, and are only starting to receive some attention. Focusing on effects of land-use changes, therefore, has the potential to lay bridges across disciplines and to provide new insights into the dynamics and conservation of biodiversity. This focus will seek interaction with the IGBP/IHDP LUCC project on this issue.

A historical perspective would also help illuminate current trends. This focus will also cultivate links with the IBGP-PAGES programme to understand the historical processes that have shaped biodiversity as it exists today, including both natural processes and human actions. Assembling a network of scientists who document species gains, losses and changes over the last millennia as a result of human activities, for example, would be particularly useful.

The aim of this project is to improve our capacity to predict and hence to respond to biodiversity loss. The basic knowledge obtained will help identify the likely biodiversity effects of anthropogenic changes at different spatial and temporal scales, and the sensitivity of those effects to variation in climatic and economic conditions. This knowledge is essential if decision makers are to be able to assess the relative costs and benefits of different resource use options. It will support a range of decision-tools, including scenario building.

Accordingly, this Focus will:

- develop theoretical, experimental and empirical knowledge of the ecological and evolutionary processes that have shaped biological diversity in the past;
- develop an understanding of the impact of changes in the pattern and intensity of human resource use on ecological structure and processes, and the implications of this for biodiversity at multiple spatial and temporal scales;
- predict and evaluate the consequences of biodiversity change for the provision of ecological services, in order to support conservation and the sustainable use of biodiversity at the same spatial and temporal scales.

Collaboration with Foci 1.1 and 1.2 will provide relevant information on phylogeny-related species traits and documentation of current trends. This Focus in turn will provide Core Project 2 with critical knowledge to predict future impacts of biodiversity changes, and Core Project 3 with information on ecological and evolutionary constraints that may help devise better conservation strategies.

## Core Project 2: Assessing impacts of biodiversity changes

The potential impacts of biodiversity loss on the functioning of ecosystems and of the biosphere are currently receiving increasing attention, for two main reasons. First, little was known about the causal relationships between biological diversity and ecosystem processes until recently, despite numerous observational studies. Second, if biodiversity did affect ecosystem functioning, it could have important indirect impacts on the provision of ecosystem goods and services upon which human societies depend, such as production of food and fibre, carbon storage, soil fertility, nutrient cycling and resistance to climate and other environmental changes. Recent experimental and theoretical studies have provided evidence that this may indeed be the case. This considerably strengthens the need to further assess how biodiversity changes will affect human societies in the long term through the provision of ecological goods and services.

Core Project 2 will actively promote the development of research in this area, building on the existing collaboration between DIVERSITAS and IGBP-GCTE. It will investigate how the biodiversity changes studied and predicted in Core Project 1 affect ecosystem functioning and ecosystem services, thereby influencing strategies for the conservation and sustainable use of biodiversity (Core Project 3). It will further develop a particular focus on the impacts of biodiversity changes on human and livestock health.

### Focus 2.1. Impacts of biodiversity changes on ecosystem functioning and ecosystem services

Our current knowledge on the impacts of biodiversity loss on ecosystem functioning comes mainly from recent theory and experiments on plant-based processes in temperate grasslands and laboratory microcosms. To reach greater generality and predictive ability, it is now vital to extend this knowledge to other organisms (animals, micro-organisms), other trophic levels (herbivores, predators, decomposers) and other ecosystems (forest, tropical, freshwater and marine ecosystems), in which environmental constraints and ecological processes may be vastly different from those explored so far.

Emphasis should also be progressively shifted from the small scale typically considered in recent experiments to larger spatial and temporal scales, at which management decisions and human-induced biodiversity changes take place. As mentioned in Focus 1.3, land-use changes are currently the most important driver of biodiversity changes, a trend likely to be reinforced in the future by the increasing pressure exerted on land use due to demographic and economic changes in human societies. Therefore the knowledge developed in Focus 1.3 on the impacts of land-use changes on biodiversity should be used to assess the impacts of realistic scenarios of biodiversity loss induced by land-use changes on ecosystem processes at landscape scales.

Lastly, it is important to go beyond a basic science assessment of the effects of biodiversity changes on ecosystem functioning, and include impacts on ecosystem goods and services of societal relevance, which few studies have done so far. The development of research in the area of ecosystem goods and services will add a missing socio-economic perspective to current research into the relationship between biodiversity and ecosystem functioning, and require collaboration with Core Project 3.

Thus, the priorities for this focus will be:

- to extend current knowledge on plant-based processes in temperate grasslands to other organisms, other trophic levels and other ecosystems;
- to assess impacts of biodiversity changes at larger temporal and spatial scales in interaction with other environmental changes, in particular land-use changes;
- to extend current research beyond a basic science perspective and focus on impacts on the provision of ecosystem goods and services of relevance to human societies.

**Focus 2.2. Impacts of biodiversity on human and livestock health**

A topic of great societal relevance in this area concerns the potential impacts of biodiversity changes on human and livestock health. This focus will develop an ecological context for health, and in particular an understanding of the ecological bases for infectious diseases, including emerging diseases. Historically, approaches to the study of emerging diseases in humans and livestock have focused on treating infectious agents and producing medicines to combat them. These approaches have not generally placed infectious agents (virus, parasites, microbes) in their ecological context, nor examined the complex factors leading to emergence of diseases. For example, changes in land use with accompanying decreases in local and regional species diversity entail the simplification and homogenisation of the landscape in which diseases might spread with greater ease. What is the impact of climate change, deforestation, invasive species or habitat fragmentation at the regional level on the occurrence and rate of transmission of infectious diseases? If such relations could be shown, they would be very important when accounting ecosystem services and assessing the importance of preserving biodiversity and ecosystem functioning. The ultimate goal of this ecological approach is to contribute to developing a broader, predictive science of infectious diseases.

# Core Project 3: Developing the science of conservation and sustainable use of biodiversity

The primary driver of biodiversity changes is human activity. Effective solutions for the sustainable management of biodiversity therefore lay in understanding how individuals and societies value that biodiversity, especially those who have ownership of, and who directly utilise, living resources and the biogeochemical systems on which they depend. Many of the present international conventions and directives, national policies and local regulatory tools have not resulted in the sustainable management of biodiversity because they do not recognise and deal with the underlying motivations of individuals and states (see, e.g., the global failure of marine fisheries policies).

There has been considerable progress in understanding the more proximate mechanisms generating biodiversity changes, such as land-use changes, habitat fragmentation, pollution, invasive species (Core Project 1), as well as the effects of such changes on ecosystem processes, goods and services (Core Project 2), but incorporating such values into strategies which provide incentives for the sustainable use of biodiversity requires the integration of a much broader range of natural, social, political and economic sciences. Establishing such an interdisciplinary community of like-minded researchers is a primary aim of DIVERSITAS under Core Project 3. The task will be challenging and most likely require the establishment of a new discipline to occupy the vacant ground between the traditional sciences. This core project will seek advice from and collaboration with IHDP.

## Focus 3.1. Evaluation of the effectiveness of protective measures and incentives for achieving the conservation and sustainable use of biodiversity

This focus has two short-term objectives (3.1.1, 3.1.2) and a longer-term project (3.1.3).

3.1.1. *Effectiveness of current protective measures and regulations*

Policies to protect biodiversity have been in place since the 1950's, but they clearly vary in their effectiveness. At present, policy makers have few analyses from past experience from which to draw lessons in devising more effective policies. Whilst there is a plethora of claims concerning the virtues of particular policy types, this is not matched by a rigorous scientific evaluation of those claims.

This project will:

- analyse international, national, local and non-governmental biodiversity protection policies;
- identify existing databases on resource and indicator species relevant to those policies to evaluate the success of those policies in achieving their stated aims;
- develop comparative analyses of biodiversity policies to establish their effectiveness in different contexts and develop new areas in policy science which enable a creative response to unanticipated issues of global change.

3.1.2. *Establishing the scientific basis for applying the precautionary principle*

The precautionary approach has been used in the context of discussions on climate change and the Rio declaration concerning the actions which should have been taken in the face of uncertainty. However, the approach needs to be more precise and placed on a rigorous

scientific footing if it is to be used operationally. A basic concern is whether the precautionary principle can be sustained by biological and ecological arguments. Specifically, the scientific community needs to provide guidelines about what information is needed to apply the principle, when care needs to be exercised (e.g. identify situations where non-linearities in biodiversity change make the precautionary principle particularly important) and when ignoring caution leads to biodiversity change. A major objective of this project is the identification of formal risk-assessment tools required to objectively and rigorously apply the principle in different contexts.

3.1.3. *Biodiversity changes: social, political and economic motivators*

If current strategies are inadequate, which is often the case, we need to understand why. Interdisciplinary teams of researchers from the ecological, social and economic sciences are needed to clarify which causes are most important under different conditions. These include:

- individual values, feelings, and education;
- effects of local societies and cultures on individual behaviour;
- legal and regulatory measures, including local, federal, and international policies;
- economic incentives for the conservation and sustainable use of biodiversity.

For any given region, the goals of this research are to determine which of the above factors can be modified to stem the loss of biodiversity, and to seek novel solutions that promote more sustainable practices. For example, modest shifts in government subsidies and/or market forces (e.g., carbon credits) could have major effects on the economic and land-use decisions made by farmers, ranchers, and foresters, which in turn could lead to changes in biodiversity. As part of this project, the effects of globalisation and free-trade agreements on national biodiversity plans should also be investigated. Additional efforts could focus on biodiversity that is especially difficult to manage and/or preserve, such as populations of marine species or migratory birds.

**Focus 3.2. Establish scientific approaches for optimising multiple uses of biodiversity, considering possible trade-offs between economic and environmental goals**

Societies make choices regarding land management, such as the conversion of a natural system to a production system, or the incremental changes of production regime, which have a major influence on biodiversity and ecosystem services. These services are generally not taken into account, and trade offs are not assessed. This focus will develop the science required to optimise multiple usage of biodiversity, which include consideration of immediate profits, longer-term profits ("economic sustainability"), benefits of ecological goods and services, and the recreational/cultural value of scenic areas and native species. Modelling the sustainable use of biodiversity in this way could facilitate adaptive management plans that respond to changing economic and ecological factors.

This type of approach could be taken to determine how biodiversity can be enhanced in human-dominated environments on land and at sea. This focus could develop studies for agricultural landscapes, forests, rangeland, and fisheries, as well as studies of the impacts of intensive vs. decentralised animal production systems (chicken, pigs, aquaculture) on the conservation and sustainable use of biological diversity.

As a first case study, DIVERSITAS will develop a transversal network on agricultural goods and services ("greening agriculture"), which will consider trade-offs between economic and environmental goals (see next section).

## Future Foci

In addition to these two foci, DIVERSITAS would be interested, in the future, in developing particular aspects of conservation and restoration related to biodiversity. Conservation and restoration ecology are relatively young fields that are central to the mission of DIVERSITAS. In conservation ecology, many new approaches have proved useful, especially research on metapopulation dynamics, reserve design, and the use of DNA markers to understand processes like migration, colonisation, founder effects, inbreeding, and hybridisation. Further studies along these lines will be extremely useful for managers and decision makers.

In the field of restoration ecology, many efforts focus on regaining basic ecosystem services such as erosion control and improved water quality, but this may or may not entail restoring or at least improving biological diversity. For example, restored or artificial wetlands often have low biodiversity. Given the importance of biodiversity to many human endeavours, further research is needed to understand how various restoration methods affect biodiversity. A future DIVERSITAS project could encourage research on the methods and economics of restoring biodiversity in various habitats and regions.

# Transversal research networks

In addition to the three thematic core projects, a few integrated transversal networks, which embrace issues addressed in all the core projects will be developed around particular topics or ecosystems. Two such networks already exist, the Global Invasive Species Programme (GISP), and the Global Mountain Biodiversity Assessment (GMBA). A new transversal network, “greening agriculture”, is proposed.

## Global Invasive Species programme (GISP)

The Global Invasive Species Program (GISP) is a partnership among specialists on invasive alien species (IAS) dedicated to minimizing the spread and impact of invasive alien species (IAS) in a timely and effective manner. These specialists include scientists, lawyers, environmentalists, educators, policy makers, economists, and resources managers from multiple sectors, worldwide. GISP was established in 1997, following a UN Conference on Alien Species held in Trondheim, Norway that clearly pointed to the need for greater effort to raise awareness of IAS problems and to develop and share best practices for prevention and management.

The Scientific Committee for Problems of the Environment (SCOPE), along with partners from the United Nations Environment Program (UNEP), The World Conservation Union (IUCN), and CAB International (CABI), initiated the collaboration required to address this issue and continue to engage with new partners in an innovative program dedicated to addressing the threats of invasive alien species with a holistic approach. GISP joined DIVERSITAS in 1998. The mission of GISP is to assist governments, international organizations, and other institutions in their efforts to minimize the spread and impact of invasive alien species.

GISP is now in its second phase, whose goals are to develop new tools, evaluate best management practices, articulate a new global strategy and action plan to help nations come to grips with the problems of biological invasions. Promoting empowerment of local, national and multinational communities to draw on the best available tools to improve pest prevention and control systems immediately and to identify priorities for the development of new tools to achieve longer term success.

For more information about GISp, please visit: http://jasper.stanford-edu/gisp/

## Global Mountain Biodiversity Assessment (GMBA)

Mountains of the world are hotspots of biological diversity. The compression of thermal life zones and the fragmentation of the landscape into a multitude of microhabitats, each inhabited by a suite of specialists, creates this extremely high diversity. Biological diversity is considered essential for the persistent functioning and integrity of mountain ecosystems and this dependency is likely to increase as environmental conditions change. Steep terrain and mountain climate in combination with severe land use pressure cause mountain ecosystems to rank among the most endangered landscapes worldwide.

The Global Mountain Biodiversity Assessment, launched in 2000, synthesizes knowledge on the ethical, ecological, economic, and aesthetical values of high mountain biodiversity, in order to tackle issues of societal relevance such as mountain biological diversity and land use management (fire, grazing and erosion). Workshops include biologists, social scientists as well as local land use managers. The GMBA has the following objectives:

- to document and synthesize knowledge on the biological richness of the mountains of the world and its change through direct and indirect human influences ('global change');
- to investigate the mechanisms which create and maintain mountain biodiversity and the functional consequences in both, natural and rural high elevation terrain;
- to stimulate new research activities with a comparative emphasis and of large scale scope ;
- to shape a corporate identity of the global scientific community on mountain biodiversity.

For more information about the GMBA, please visit: http://www.unibas.ch/gmba

**Greening agriculture**

This transversal network will focus on agricultural systems. It will promote research on how contrasting land-use patterns affect biodiversity, ecological economics, and standard economic gains. Consider a landscape in which native species are largely confined to a few discrete nature preserves that are separated by large areas of intensively farmed crops. This could be contrasted with a landscape in which small, interconnected patches of natural and semi-natural habitat are scattered throughout. In the latter case, patches that are suitable for native species occur over large areas of private land that has multiple uses and is farmed less intensively. Questions to be addressed include:

- What are the economic costs and benefits of each system for farmers, and how might these factors be modified to include ecological economics?
- How should remnant patches of forest or grassland be configured to provide farmers with ecological services such as soil conservation, pollination, and reduction of pest populations?
- What types of natural biological diversity does each type of landscape support, and how sustainable is each system in terms of the conservation of biodiversity?
- How does the agricultural biodiversity of cropping systems and crop species, including GMOs, affect natural biodiversity?
- What is the optimal size and distribution of natural and semi-natural patches for conserving biodiversity in a given region?
- What economic incentives can be used to increase the amount of biodiversity that can be maintained on privately owned farmland?

Data are directly relevant to possible changes in the european common agricultural policy, and possibly elsewhere, towards a "greener agriculture".

# IBOY (International Biodiversity Observation Year) 2001-2002

IBOY, an initiative of DIVERSITAS, is a window in time (2001-2002) in which scientists and educators across the world are joining forces to increase communication of important science-based information about biodiversity to a broad audience. IBOY focuses global attention on the Earth's biodiversity, its contributions to ecosystems and society, and the voyages of discovery that are revealing its treasures through science, exploration, art, and education. IBOY does not have the same status as the 3 core projects, and is meant as a one time event to communicate and educate about biodiversity science, which will end at the end of 2002.

At the center of IBOY is a diverse portfolio of over 90 projects, including over 45 network projects, taking place across more than 140 countries. Each of the projects has a peak of activity and will deliver products during 2001 and 2002. The IBOY projects are providing important information about biodiversity including:

- What biodiversity do we have and where is it?
  For example biodiversity in deep-sea chemosynthetic communities, exploration and conservation of anchialine fauna, inventory of caterpillars in Costa Rica ;
- How is biodiversity changing?
  For example, the Committee on Recently Extinct Organisms (CREO);
- What goods and services does biodiversity provide?
  For example, conserving and increasing use of neglected and underutilized crop species
- How can we conserve biodiversity?
  For example, DNA banks for endangered species.

For more information about IBOY: please visit: http://www.nrel.colostate.edu/IBOY/