

May - June 2002
Issue 5

Newsletter of the IBOY

DIVERSITAS – International Biodiversity Observation Year 2001-2002

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Stickleback survey gains momentum

By David Marcogliese

Sticklebacks are among the most widely distributed fishes in the northern hemisphere. They are found in both the east and west hemispheres, in the Arctic, and in boreal-temperate regions. Many are euryhaline, occurring in marine coastal areas, brackish waters and fresh waters. As an assemblage of closely-related species, sticklebacks are an ideal model system with which to examine the distribution of parasites on a regional scale. In addition, there already exists some data on parasites found in sticklebacks from North America, United Kingdom, Europe, Russia, and Greenland. They also are tolerant of adverse conditions, and can be found in both perturbed and undisturbed habitats. Moreover, by spanning the freshwater-saltwater continuum, they provide a



Larval tapeworm *Schistocephalus solidus* in the threespine stickleback, *Gasterosteus aculeatus*, from Iceland.

Photo by Sigurdur Richter

unique model with which to evaluate ecological conditions and biodiversity in aquatic habitats.

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IBOY coral reef initiative improves science and supports conservation

By Terry Done

IBOY 2001-2 coincides with a critical time for the world's coral reefs – nature's flagship of marine biodiversity. It coincides with the unfolding of what appears to be the beginning of a second episode in four years of one of the world's most worrying environmental impacts on coral reefs. That impact goes under the shorthand of 'coral bleaching.'

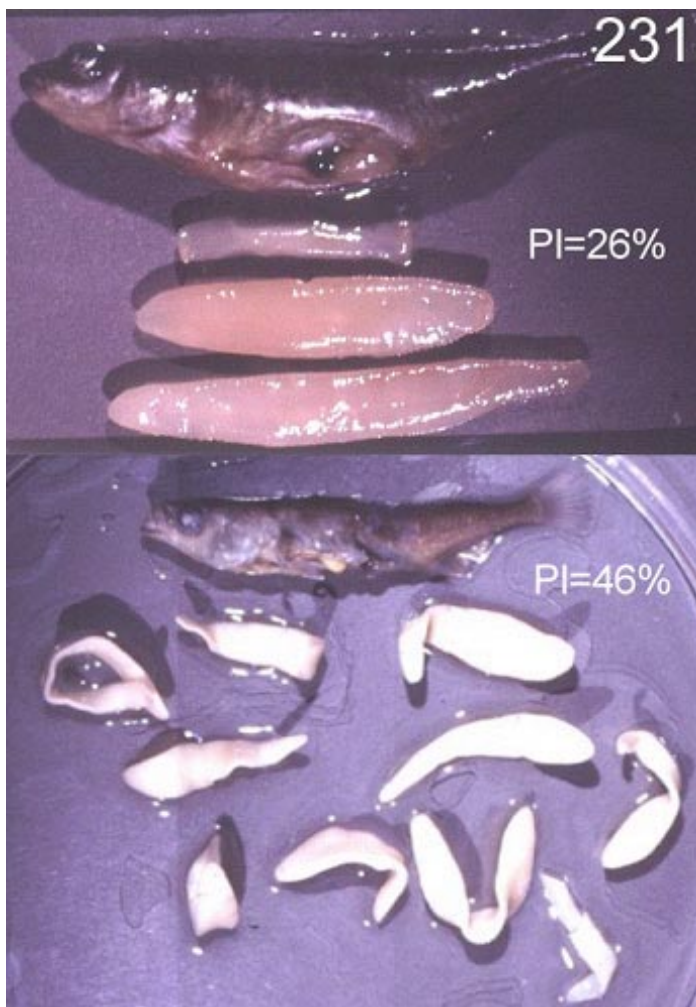
Coral polyps under extreme duress sometimes shed their millions of symbiotic zooxanthellae, and turn pale or even transparent, revealing their white limestone skeletons beneath: in short, they bleach. Their growth and reproduction can become seriously

impaired, and they can die *en masse*. The collateral damage to that vast reservoir of invertebrate and fish reef biodiversity that relies on living coral is little documented, but it is no doubt considerable. Solar bleaching of corals – that due to anomalously high solar heating and radiance - is particularly worrying. It has all the hallmarks of a symptom of global climate change, with all its implications of being beyond human control.

When the IBOY concept was announced back in 1999, 2001-2 represented a not-too-distant potential turning point in the

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Stickleback (cont)



Larval tapeworm *Schistocephalus solidus* in the brook stickleback, *Culaea inconstans*.
Photo by Al Shostak

The IBOY project *Survey of Stickleback Parasites* continues to attract international attention. To date, there are 33 participants from 12 countries including Canada, Czech Republic, Denmark, Germany, Iceland, Japan, Lithuania, Norway, Russia, Ukraine, United Kingdom and United States. Many researchers contribute out of their own resources, and others are supported in part by organizations such as Parks Canada. Last March, the project was endorsed by the International Council for the Exploration of the Seas (ICES) Working Group on Pathology and Diseases of Marine Organisms when meeting in Copenhagen.

Various species of sticklebacks, principally *Gasterosteus aculeatus*, were collected from a variety of sites in Europe and North America during the summers of 2000-01. Fish were collected from different habitats, including those impacted by various stressors such as pollution, agriculture, and fishing, as well as more pristine habitats to compare parasite faunal composition and diversity between impacted and non-impacted areas. Sticklebacks have been collected at numerous sites in eastern and western Canada, western United States, Russia, Iceland, Germany, United Kingdom, Norway and the Faroe Islands. More collecting is planned for the summer of 2002, beginning in June, from both new and previously-sampled sites and regions.

Where biodiversity data exist, such as in National Parks, parasite diversity will be compared to diversity of other taxa. Distribution and abundance of individual species will be compared across sites and regions. Patterns of parasite species abundances and diversity will be evaluated in terms of environmental parameters and biogeographic theory to evaluate the roles of local versus regional determinants. Results will improve our predictive capabilities regarding the impacts of environmental stressors on biodiversity.

Many of the project participants will meet at a workshop scheduled to take place during the International Congress of Parasitology to be held August 4-9 in Vancouver, British Columbia, Canada. At this workshop, participants will discuss progress to date, examine data acquired to date, and discuss project planning and directions for the future.

Also at the International Congress of Parasitology, on August 9, a plenary session co-organized by Dr. David Marcogliese, will address "Biodiversity Implications for Parasitology." Associated sub-plenaries will address "Parasitology and Biodiversity in an age of Discovery" (August 6), "Biodiversity and Global Change" (August 7), and "The Changing Management of Wildlife Diseases" (August 9). For more information see <http://www.venuewest.com/icopa/scipgm.htm>.

More Information on the IBOY project *Survey of Stickleback Parasites* <http://www.nrel.colostate.edu/iboy/whatandwhere.html#stickleback>

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***AmphibiaWeb* launches watch list of extinct and threatened amphibians**

By David Wake

A new version of *AmphibiaWeb**, an on-line information system for amphibian conservation sponsored in part by IBOY, has recently been launched. The new *AmphibiaWeb*, maintained by the Museum of Vertebrate Zoology and the Digital Library Project of the University of California at Berkeley, has posted a "Watch List" of extinct and threatened amphibians (<http://elib.cs.berkeley.edu/aw/declines/extinct.html>) in order to increase communication among scientists and the public. Since the 1980's, 32 species of amphibians have gone extinct and another 26 species are listed as "missing in action" and likely to be added to the list soon. The "Watch List" also notes an additional 91 species as critically threatened and seeks help in identifying other potentially vulnerable amphibians.

AmphibiaWeb's dynamic on-line system is updated weekly, and, with the collaboration of the American Museum of Natural History, provides the most up to date list of amphibian species in the world. The new version of *AmphibiaWeb* showcases an innovative search tool that allows users to access data for amphibians from a clickable world map. A list of species is retrieved for each country searched, and species accounts, distribution maps and photographs also appear in an easy to access format.

Workshop in Ireland launches *Sacred Seas Project*

By John Smith

The Alliance of Religions and Conservation's (ARC) project to engage faith communities in marine and coastal conservation, the *Sacred Seas Project*, was launched at a workshop in Ireland last month. The workshop brought together members of faith communities from around Lough Strangford, NGO's, and local government representatives. They discussed local issues and also took a broad look at marine and coastal environments, and the particular relationships faith communities have with them.

Some key issues were recognized, and while it is expected to be a while before particular projects are drawn up in order to address these issues, what became clear at the meeting was the growing interest in marine environments. Although many faith communities only see the biodiversity of the seas in either film or television productions, or through sea-life or similar centers, increasing interest in these little understood environments can lead to pressure for greater protection. Further to this, faith communities as well as the wider community may engage in small-scale activities at the local level in much the same way they do with terrestrial environments.

Faith perspectives are particularly pertinent to marine conservation as almost all the major religions teach the

AmphibiaWeb has deep-link search capabilities, allowing users to quickly access information such as conservation status, museum databases and taxonomic name history for the world's amphibians.

The global decline of amphibians has raised concern that even species in protected habitats are threatened by the biodiversity crisis. Because of the international concern for the fate of amphibians, new field research has uncovered many previously unknown species, and the number of known species has increased dramatically. Since 1985 there has been a 35% increase in the numbers of described amphibian species, the greatest percentage increase by far for any group of vertebrates. The dynamic nature of *AmphibiaWeb* provides the global community with the most comprehensive, up to date, scientific information on the biology and conservation status of the world's amphibians.

* *AmphibiaWeb*: Information on amphibian biology and conservation. [web application]. 2002. Berkeley, California: *AmphibiaWeb*. Available: <http://amphibiaweb.org/>. (Accessed: 2002).

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need to understand and care for the unknown as readily as we are expected to care for better known local environments. Further to these theological connections, faiths have taught respect for the power of the sea and have often been involved in the social issues linked to those who had employment from the industries of the sea. Many churches in coastal areas have well developed liturgies that reflect on these environmental issues, as well as concerning the well being of those engaged in the dangerous and often economically unstable occupations associated with the oceans.

The *Sacred Seas Project* is looking to hold similar meetings to that held in Ireland throughout the UK, with the objective of greater levels of awareness and activity from faith communities towards marine and coastal environments.

More information on the IBOY Project *Sacred Gifts For a Living Planet*, of the World Wide Fund for Nature (WWF) and the Alliance of Religion and Conservation (ARC), see http://panda.org/livingplanet/sacred_gifts/ and http://www.nrel.colostate.edu/IBOY/how_conserve.html#sacred

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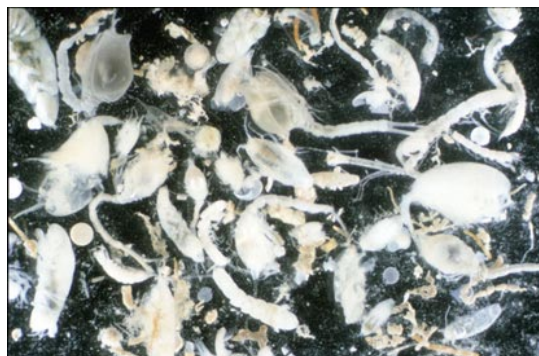
Edward O. Wilson

Harvard University

New information on deep-sea biodiversity emerging from *DIVA-1* expedition.

By J. Wolfgang Wägele

The participants of the DIVA 1 expedition (a survey of 700 km transect along the deep sea of the Angola Basin in the South Atlantic Ocean) came together on April 11, 2002 in Frankfurt, Germany to compare first results. Samples collected from abyssal plains of the Angola basin, i.e. deeper than 5,000 m, had been sorted by various institutes. Large animals (megafauna) such as fish and crabs were rare and with exception of some shrimps are mostly representatives of well-known species.



Collected samples

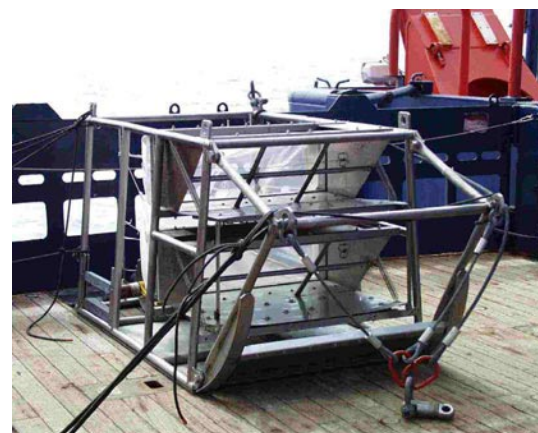
The fauna discovered in epibenthic-sledge samples was much richer. Most of these animals measure between 0.3 and 5 mm length. Dominating groups were polychaetes, peracarid crustaceans and bivalves. The specimens are currently being identified and described by specialists. One of the groups that had been neglected in the past are the Cumacea (Crustacea, Peracarida). Dr. Mühlenhardt-Siegel reported that she could discern 38 species of which 34 are new to science. Descriptions of several new isopod species are in press or already published, but it will take further 2 years before all species of this very speciose group will be described. It seems that some species of isopods found

in the Angola Basin also occur in the North Atlantic. This indicates that the species have the ability to disperse over long distances. It is, however, also possible that the specimens from the Angola Basin differ genetically, while the morphology is the same as in species from distant localities. Genetic methods will be used to search for cryptic species.

Polychaetes have been separated at family level and are currently being identified, four specialists are now working with this group. First estimates of abundances will be possible after final sorting of box corer samples, probably around June 2002. Sediment analyses revealed that the organic content of surface sediments is not as poor as it seemed to be at first sight. Details will be published soon.

More Information on *DIVA* see <http://www.ruhr-uni-bochum.de/spezzoo/diva1.html> and <http://www.nrel.colostate.edu/IBOY/whatandwhere.html#DIVA>

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Epibenthic-sledge used to collect samples

Visit the IBOY website

<http://www.nrel.colostate.edu/projects/iboy>

Coral Reef (cont)

life of global coral reefs for IBOY to document. In 1998-99, corals on hundreds of reefs around the world had endured, and in some cases, succumbed to, sea temperatures that were the hottest recorded in the 20th Century. By the time of IBOY, how well would the reefs have recovered after 3-4 years of hopefully more normal conditions? Would the slide in global reef health – caused by over fishing destructive fishing, pollution, and siltation – and now bleaching-related death of corals - have begun to turn around? IBOY’s coral reef project will contribute to the 2002 report “Status of the coral reefs of the world” to be produced by the Global Coral Reef Monitoring Network under guidance of editor Clive Wilkinson of the Australian Institute of Marine Science (AIMS). The Report will be released at the second International Tropical Ecosystem Management Symposium, Manila, The Philippines, November 2002.

The basis of the coral reef project is a questionnaire to researchers. It attempts to provide a better understanding of the patchiness in both incidence and severity of coral bleaching. Following the 1998 event, numerous astute observers noted several related but sometimes contradictory things: in large ocean areas that had been severely impacted, there were places of high coral survival: in areas with relatively minor impact at the regional scale, there were local places with major death of corals. Much of the Indian Ocean was an example of the former: the Great Barrier Reef was an example of the latter. The factors associated with high survival appeared to be related to features of geographic setting that tend to ameliorate heating through mixing, and light stress through shading (see Tables 1 and 2). However for each anecdotal account of high survival in such and such conditions, there were others of low survival. Clearly, there are issues of the species and genotypic composition of the target coral community, and of adaptation, acclimatization, and acclimation to be resolved. The questionnaire attempts to untangle some of these complex issues

(<http://www.reefbase.org/input/bleachingquestionnaire/index.asp>). The questionnaire is open until September 2002, after which the data will be analyzed at AIMS and the results will be circulated to respondents and published as part of the report “Status of the coral reefs of the world.”

The purpose of the questionnaire has itself evolved, and we now intend to use it as one source of information in a global research and monitoring program on coral bleaching to support a conservation initiative of The Nature Conservancy and Conservation International called ‘Transforming Coral Reef Conservation in the 21st Century.’ It is planned that the results of the questionnaire will guide a more directed field biology program that attempts to characterize ecological study sites according to both the level of hazard to which they are exposed, and the biodiversity profile of the living assemblage present (e.g. habitat attributes such as slope, depth, aspect, stratification, orientation; community attributes such as composition and size frequency distributions; genotypic attributes of indicator coral species). The work, which will be complemented by remote sensing and oceanographic modeling of hazard, will feed into the core action of the TNC-CI conservation program: the identification of locations for new or better managed Marine Protected Areas that would minimize, or at least, spread the risk of coral bleaching and coral death in a warming 21st Century. IBOY is thus playing a part not only in improving understanding about a serious problem for coral reefs, it is also guiding its solution.

More information on the IBOY Project *Recovery of Coral Reef Biodiversity Following Bleaching* see http://www.nrel.colostate.edu/iboy/how_changing.html#reef

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Table 1. Agreed list of factors that may correlate with coral bleaching resistance

Physical factors that reduce temperature stress	Physical factors that enhance water movement and flush toxins	Physical factors that decrease light stress	Physical factors that correlate with bleaching tolerance
<ul style="list-style-type: none"> ▪ Exchange (warm water replaced with cooler oceanic water) ▪ Upwelling ▪ Areas adjacent to cooler deep water ▪ Wind-driven mixing 	<ul style="list-style-type: none"> ▪ Fast currents ▪ Topography (peninsulars, points, narrow channels) ▪ High wave energy ▪ Tidal range ▪ Wind 	<ul style="list-style-type: none"> ▪ Shade (high island shadow, reef structural complexity) ▪ Aspect relative to sun ▪ Steep slope ▪ Turbidity ▪ Cloud cover 	<ul style="list-style-type: none"> ▪ Temperature variability ▪ Emergence at low tide ▪ Stable salinity

Table 2. Agreed list of factors that may correlate with coral bleaching resilience (i.e. rate and fidelity of bounce back after being damaged)

<ul style="list-style-type: none"> ▪ Reef connectivity by currents ▪ Availability and abundance of recruits and recruitment success ▪ Broad range of coral colony size and species distributions ▪ Areas of greatest remaining coral cover 	<ul style="list-style-type: none"> ▪ Diverse community of organisms to prepare substratum for coral settlement (e.g. herbivorous fishes)
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Publications and Presentations

April 24 – May 6, 2002 Bogota, Colombia**April 25 – May 5, 2002 Santo Domingo, Dominican Republic****Caroní Parks CD-ROM represents Venezuela at international book fairs**

The Award winning CD-ROM *Venezuelan Guayana Nature in the Caroní River Parks* is representing Venezuela in two International Book Fairs: the XVI Feria Internacional del Libro de Bogotá, Colombia (<http://www.feriadellibro.com>) and the V Feria Internacional del Libro de Santo Domingo, Dominican Republic (<http://www.feriadellibro.org.do>). The CD-ROM will be showcased in an interactive kiosk.

More information on the IBOY project *Venezuelan Guayana Nature in the Caroní River Parks* see http://www.nrel.colostate.edu/iboy/southa_ap.html#caroni

Contact: Mr. Frederico Alberto Prieto Martinez, Carrera Cadiz, Res, Los Olivo, Torre Norte PH-61, Los Olivos, Boliva, Ciudad Guayana 8015, Venezuela; Phone: (58) 286 9616596; Email: multimedia@telcel.net.ve

May 9, 2002, Cambridge MA, USA**Declining amphibians: on the verge of an environmental catastrophe**

Dr. James Hanken, Chair of the Board of Directors of the *Declining Amphibians Population Task Force* will present this public lecture at the Harvard Museum of Natural History. The lecture will discuss the natural history of amphibians, from frogs to salamanders, and the latest science-based information on the reasons for their declining populations world-wide. The lecture is part of a series of events at the Harvard Museum of Natural History through May that are a contribution to the US *Biodiversity Month*.

More information about the IBOY Project *Declining Amphibian Population Task Force (DAPTF)* see <http://www.open.ac.uk/daptf/index.htm> and http://www.nrel.colostate.edu/IBOY/how_changing.html#daptf

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Dr. Timothy Halliday, The Open University, Biology Department, Walton Hall, Milton Keynes, MK7 6AA, UK. Tel: (+44) 1908 653831; Fax: (+44) 1908 654167; Email: T.R.Halliday@open.ac.uk

Meetings

May 6, 2002, Bonn, Germany**Bioinformatics for migratory animals: future possibilities of data integration**

The *Global Register of Migratory Species (GROMS)* has now been published as a book with the database on CD-ROM. From 2003 on, the database will be handed over to the Bonn secretariat of the Convention on Migratory Species and will potentially be maintained by a consortium consisting of Bonn University, The German Centre for Documentation and Information in Agriculture (ZADI), and the UNEP-World Conservation Monitoring Centre.

To avoid duplication of efforts, and to ensure an optimal data exchange, the *GROMS* will liaise with all other bioinformatics projects relevant for migratory species, either by direct data exchange, or connecting resources using web technologies. To discuss options for these

linkages, Bonn University and the Secretariat of the Convention on Migratory Species, will host a meeting at Bonn University, May 6, 2002.

More information on the IBOY Project *Global Register of Migratory Species (GROMS)* see <http://www.biologie.uni-freiburg.de/data/riede/groms.html> and http://www.nrel.colostate.edu/IBOY/how_changing.html#groms

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Dr. Clas Naumann, Zoological Research Institute and Museum, Alexander Koenig, Adenauerallee 160, 53133 Bonn, Germany. Phone: (49) 228 9122200; Fax: (49) 228 3122202; Email: C.Naumann.zfmk@uni-bonn.de

May 30 – June 1, 2002, New York City, USA

Assembling the Tree of Life: Science, Relevance and Challenges

The American Museum of Natural History and Yale University will convene *Assembling the Tree of Life: Science, Relevance, and Challenges*, the first major scientific forum in decades to address the "Tree of Life," the pattern of relationships that links all Earth's species. An international group of scientists will summarize our current understanding of life's history using a wide range of data, from genomic to morphological. In addition, plenary speakers will explore the meaning and importance of the Tree of Life for society, from human health to developmental biology, comparative biology to environmental problem-solving.

Assembling the Tree of Life: Science, Relevance, and Challenges is co-sponsored by the American Museum of Natural History and Yale University, with additional

April 29 – May 3, 2002, Rome, Italy

First Meeting of the 'Condition and Trends' Working Group of the Millennium Assessment

May 3-5, 2002, Rome, Italy

Data and Indicators Workshop of the Millennium Assessment

May 27 - 31, 2002, Delhi, India

First Meeting of the 'Response Options' Working Group of the Millennium Assessment

June 10 - 14, 2002, Smithsonian Tropical Research Institute, Panama

First Meeting of the 'Sub-Global Assessments' Working Group of the Millennium Assessment

May 27 – June 7, 2002, Bali, Indonesia

Millennium Assessment side event at Prepcom IV for the World Summit on Sustainable Development

In May and June, the co-chairs of the 'Condition and Trends,' 'Response Options,' and 'Sub-Global Assessments' working groups of the *Millennium Ecosystem Assessment (MA)* will convene the first of their working-group meetings. Each meeting will bring together for the first time the individuals who have accepted an invitation to serve as Convening Lead Author for a chapter of the assessment report. The participants will discuss certain topics as small groups, and engage in plenary discussions concerning overarching issues addressed by the assessment report. For each working group, the objectives for the meeting are to further develop and refine the outline for the assessment report, identify individuals for Lead Author roles, and either begin, or develop, a strategy for drafting the report.

The Data and Indicators workshop is being held to further advance the selection of datasets and indicators that will be used by the MA. Participants will define the specific data and indicator development work that will be conducted through 2002-2003 as part of the MA. The

support from the International Union of Biological Sciences (IUBS). The conference is an initiative of the IBOY.

More information on the symposium, including registration, see: http://www.amnh.org/programs/conference/tree_of_life/

More information on the IBOY Project *Assembling the Tree of Life* see <http://www.nrel.colostate.edu/IBOY/whatandwhere.html#treeoflife>

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workshop objectives include: agreeing on a set of priority indicators and datasets for the MA; agreeing on a workplan for preparing these datasets and indicators (for those where additional work is needed); and establishing protocols and standards for sharing and exchange of information during the course of the MA.

The MA is planning to host a side event during the proceedings of Prepcom IV for the World Summit on Sustainable Development (WSSD) in Bali, Indonesia. The goal of the side event is to raise awareness of the MA among delegates, and will likely provide an overview of the process and opportunity for discussion. Speakers for the side-event are yet to be confirmed.

More information on the IBOY Project *Millennium Ecosystem Assessment* <http://www.millenniumassessment.org> and http://www.nrel.colostate.edu/IBOY/goods_services.html#millenium

Contact: Ms. Valerie Thompson, Millennium Assessment Secretariat – WRI Office, 10 G Street N.E., Washington, DC 20002, USA. Tel: (+1) 202 729 7794, Fax: (+1) 202 729 7610; Email: info@millenniumassessment.org

Funding Opportunities

The Equator Initiative – a new award for biodiversity conservation

The Equator Initiative will recognize five local initiatives or activities that exemplify extraordinary achievement in reducing poverty through the conservation and sustainable use of biodiversity in the equatorial belt. The Equator Initiative has been designed to support the World Summit on Sustainable Development (WSSD) and the Convention on Biodiversity.

The first Equator Initiative awards will be presented at the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa from 26 August to 4 September 2002. Each of the five recipient initiatives will receive a monetary award of US\$30,000, a certificate of recognition, a trophy, and will be represented at the World Summit. For more information, including information on the nomination process see www.undp.org/equatorinitiative/

Nominations may be submitted in English, French,

Portuguese and Spanish. Nominations may be submitted directly on-line, via e-mail, fax or mail. Self-nominations will be accepted.

Completed nominations should be submitted no later than 15 May 2002 to:

The Equator Initiative is a partnership of the United Nations Development Program, BrasilConnects, the Government of Canada, the International Development Research Centre (IDRC), IUCN - The World Conservation Union, the Television Trust for the Environment (TVE), and the UN Foundation.

More Information on the IBOY Project *Television Trust for the Environment: Earth Report* can be found at <http://www.nrel.colostate.edu/iboy/whatandwhere.html#biodivfilm>

Contact: Mr. Robert Lamb, Television Trust for the Environment, Prince Albert Road, Regents Park, London NW1 4RY, UK. Tel: (+44) 171 586 5526; Fax: (+44)171 586 4866; Email: robert.lamb@tve.org.uk

From the Secretariat

May 9, 2002, Washington DC, USA

IBOY's Biodiversity Month Seminar on Biodiversity Research for Sustainable Development

As part of the first US Biodiversity Month, the Ecological Society of America and the US National Committee on DIVERSITAS are co-hosting *IBOY's Biodiversity Month Seminar on Biodiversity Research for Sustainable Development* at the National Academy of Sciences, Washington, DC, May 9, 2002. Prominent scientists will describe state of the art scientific knowledge on biodiversity and its significance for sustainable development of sectors such as fisheries, land use and agriculture. The seminar aims to stimulate information exchange and discussion among a broad constituency interested in sustainable development, and to be especially relevant to parties preparing for the United Nations World Summit on Sustainable Development in Johannesburg September 2002.

Dr. Andrew Dobson, Chair of USNC DIVERSITAS and member of the IBOY Steering Committee, will moderate and open the seminar. Dr. Jonathon Margolis from the US Department of State will present an overview of the Department's initiatives relevant to sustainable development and the WSSD. Dr. Jonathon Foley from the Center for Sustainability and the Global Environment at

the University of Wisconsin will present a seminar entitled "Understanding Changes in Land Use and Land Cover Across the Globe: Bringing Together Ground-Based and Space-Based Data." Dr. Andrew Rosenberg from the University of New Hampshire will discuss marine sustainability in his seminar "Coming to Grips with the Exploitation of Living Ocean Resources". The role of biodiversity in sustainable agriculture will be discussed in "Population genetic characterization and geographical mapping as a foundation for management of agricultural biodiversity" by Dr. Richard Harwood from Michigan State University. There will be time at the end of the seminar for discussion. More information on the seminars is at the http://www.nrel.colostate.edu/projects/iboy/biomonth/event_s/143.html

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About IBOY



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