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

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
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](http://www.nrel.colostate.edu/iboy/whatandwhere.html#stickleback)

**Contact:** Dr. David Marcogliese, St. Lawrence Centre, Environment Canada, 105 McGill St., 7th Floor, Montreal, Quebec, H2Y 2E7, Canada. Tel: (+1) 514 283 6499; Fax: (+1) 514 496 7398; Email: david.marcogliese@ec.gc.ca

---

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

---

**Newsletter of the IBOY**

---

**Stickleback (cont)**
**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.

**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.


**Contact:** Dr. David Wake, Museum of Vertebrate Zoology, 3101 Valley Life Sciences Building, University of California, Berkeley, CA, USA. 94720-3160, USA. Tel: (+1) 510 642 3567; Fax: (+1) 510 643 8238; Email: wakelab@uclink4.berkeley.edu

---

**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 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

**Contact:** Mr. John Smith, Alliance of Religion and Conservation, 3 Wynnstay Grove, Fallowfield, Manchester, M14 6XG, UK. Fax: (44) 161 248 5736; Email: john@icorec.wnet.co.uk
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.

Epibenthic-sledge used to collect samples

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

Contact: Dr. J. Wolfgang Wägele, Gebaude ND 05/755, 44780 Bochum, Germany. Tel: (+49) (0) 234 32 24998 + 24563; Fax: (+49) (0) 234 32 14114; Email:...
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 overfishing, 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 though mixing, and light stress through shading (see Tables 1 and 2). However for each anecdotal account of high survival in such and such shading (see Tables 1 and 2). However for each 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

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

Contact: Dr. Terry Done, Australian Institute of Marine Science, PMB #3 Mail Centre, Townsville QLD 4810, Australia. Tel: (+61) 747 534 344; Fax: (+61) 747 725 852; Email: tdone@aims.gov.au Dr. John Ogden, Florida Institute of Oceanography, 830 First St. South, St. Petersburg, FL 33701, USA. Tel: (+1) 727 553 1100; Fax: (+1) 727 553 1109; Email: jogden@marine.usf.edu

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

<table>
<thead>
<tr>
<th>Physical factors that reduce temperature stress</th>
<th>Physical factors that enhance water movement and flush toxins</th>
<th>Physical factors that decrease light stress</th>
<th>Physical factors that correlate with bleaching tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange (warm water replaced with cooler oceanic water)</td>
<td>Fast currents</td>
<td>Shade (high island shadow, reef structural complexity)</td>
<td>Temperature variability</td>
</tr>
<tr>
<td>Upwelling</td>
<td>Tomography (peninsulas, points, narrow channels)</td>
<td>Aspect relative to sun</td>
<td>Emergence at low tide</td>
</tr>
<tr>
<td>Areas adjacent to cooler deep water</td>
<td>High wave energy</td>
<td>Steep slope</td>
<td>Stable salinity</td>
</tr>
<tr>
<td>Wind-driven mixing</td>
<td>Tidal range</td>
<td>Turbidity</td>
<td></td>
</tr>
</tbody>
</table>

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

- 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
- Diverse community of organisms to prepare substratum for coral settlement (e.g. herbivorous fishes)
April 24 – May 6, 2002 Bogota, Colombia
April 25 – May 5, 2002 Santo Domingo, Dominican Republic

Caroni Parks CD-ROM represents Venezuela at international book fairs

The Award winning CD-ROM Venezuelan Guayana Nature in the Caroni 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.

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.

Meetings
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 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

Contact: Dr. Joel Cracraft, Dept. of Ornithology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024, USA. Tel: (+1) 212 769 5000, Fax: (+1) 212-769-5633, Email: jlc@amnh.org
Dr. Michael Donoghue, Dept. of Ecology and Evolutionary Biology, Yale University, P.O. Box 208106, New Haven, CT 06520-8106, USA, Tel: (1) 203 432 2074, Fax: (1) 203 432 5167, Email: michael.donoghue@yale.edu

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 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 MA and its side event at Prepcom IV, see: 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
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

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/events/143.html

Contact: For more information on this and other activities of the IBOY Secretariat, Gina Adams, Program Director, DIVERSITAS-IBOY, Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO 80523-1499, USA. Tel: (+1) 970 491 1984, Fax: (+1) 970 491 3945, Email: gadams@nrel.colostate.edu
The IBOY is an initiative of DIVERSITAS. Intellectual sponsorship is provided by the International Union of Biological Sciences (IUBS), International Union of Microbiological Societies (IUMS), Scientific Committee on Problems of the Environment (SCOPE), and the United Nations Educational, Scientific and Cultural Organization (UNESCO). IBOY has been endorsed by the Sixteenth International Botanical Congress (IBC) and the Second World Conservation Congress of the World Conservation Union (IUCN). The Fifth Conference of the Parties to the Convention of Biological Diversity (CBD) invited parties to participate in the IBOY. Financial sponsorship of IBOY is provided by the US National Science Foundation (NSF) (under Grant No. DEB-0122141), the International Council for Science (ICSU), Center for Applied Biodiversity Science at Conservation International (CABS), the International Group of Funding Agencies (IGFA), DIVERSITAS, and two anonymous US foundations. We acknowledge the support of the US National Committee for DIVERSITAS and the Board on International Scientific Organizations of the National Research Council.