



# WHAT'S UP?

THE NEWSLETTER OF THE INTERNATIONAL CANOPY NETWORK

NALINI NADKARNI, EDITOR

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## ATBC 2003 Meeting & Symposia

The annual meeting of the British Ecological Society and the Association for Tropical Biology and Conservation will be meeting in Aberdeen, U.K. on July 7-10, 2003. There will be at least two symposia that concern forest canopies, one on tropical forest canopy processes, the other on epiphytes as indicators of climate change.

### TROPICAL FOREST CANOPY PROCESSES

The canopies of tropical forests play important roles in ecosystem functions. Forest canopies are biologically significant as the main location for carbon assimilation and reproduction for many plant species. Because of this, there are substantial communities of animals, including herbivores and pollinators, which maintain functional integrity of forests. As the primary interface between forest and atmosphere, canopies also have a crucial biophysical role in the exchange of gases, including carbon dioxide and water vapor. The session will reflect advances in several aspects of canopy process that relate to forest function. Papers will emphasize the progress being made in canopy research now that many access and technological problems have been solved.

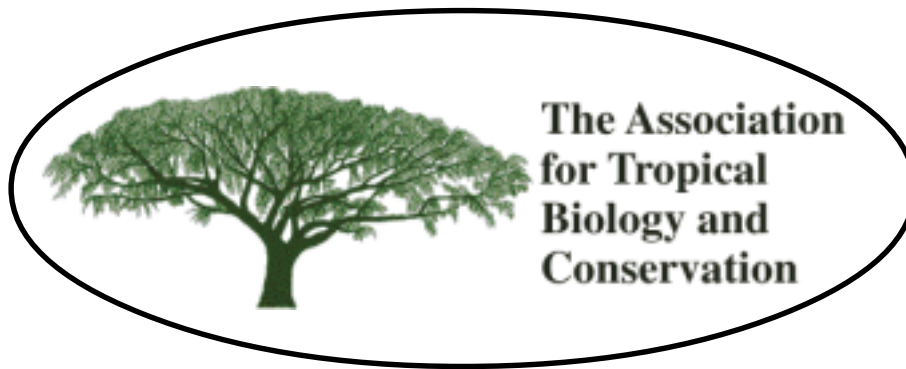
For further details of the canopy symposium, please contact the organizers directly: Martin Barker <m.barker@abdn.ac.uk> and Jörg Szarzynski <szarzynski@web.de>

### EPIPHYTES AS INDICATORS OF CLIMATE CHANGE

Epiphytes represent a considerable proportion of living biomass in tropical forests, with many cloud forest habitats under threat from a changing climate. Displaying a diverse array of morphological and physiological adaptations to temporary water deficits, and dependent on the extent of any dry season, epiphyte distribution within the forest canopy is also stratified and related to exposure. This symposium will discuss the environmental constraints to epiphyte habitat preference and determinants of individual niches, as well as exploring the potential for epiphytes to act as markers of climate change, with stable isotope signals representing past and present climates, and allowing future trajectories to be monitored. Thus, whether

anthropogenically induced effects are due locally to deforestation, or are coupled globally, epiphytes provide a dynamic system to monitor climate change. For further details of the canopy symposium, please contact the organizer directly: Howard Griffiths <hg230@cam.ac.uk>

Conference details, including registration, other symposia, and student support forms are available on the ATB website: <<<http://www.atbio.org/meetings.html>>>



# Looking it up: ICAN’S canopy citations and citations classics: providing access to academic progress in canopy studies

By Nalini M. Nadkarni, ICAN President  
The Evergreen State College

Two of the major missions of the International Canopy Network are to enhance communication among canopy researchers and to provide resources that help with academic studies. To fulfill that objective, the ICAN staff continually retrieve, organize, and disseminate scientific publications that relate to forest canopy studies.

We accomplish this by using the services of the International Scientific Information (ISI, Inc.), a Philadelphia-based company that assembles weekly compilations of the tables of contents of hundreds of scientific journals, grouped by subject (e.g., medicine, cell biology, ecological and environmental sciences). These are packaged for subscribers to this service on diskettes that arrive weekly (Current Contents on Diskette, CCOD). As “keeper of the canopy citations”, I go through each of these diskettes, identifying the titles of papers that indicate studies that concern forest canopies. I encounter such articles in 40-50 different journals, whose foci range from bryophyte taxonomy to global climate change.

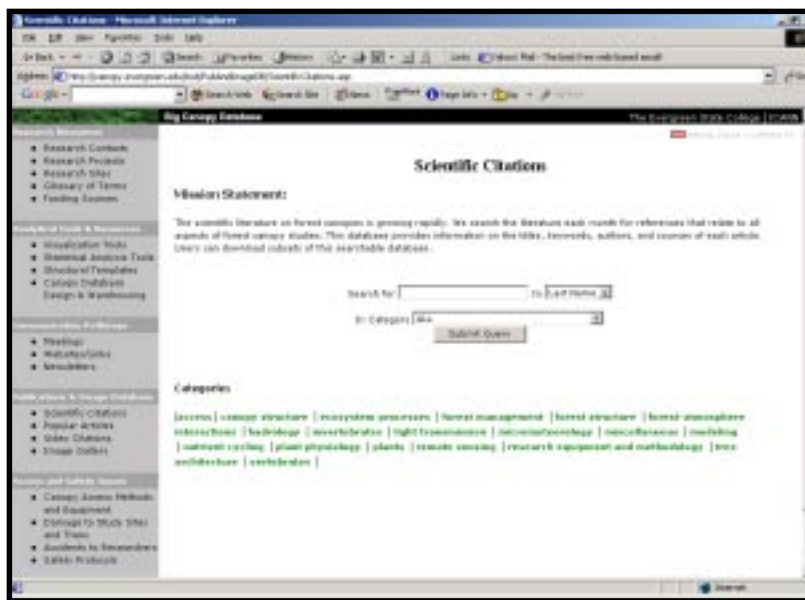
For each CCOD issue, I save the relevant citations and abstracts into a bibliographic database (Endnote). I also request hard-copy reprints from the authors, and the ones we receive (ca. 70% return rate) are labeled and filed by author in our files. Each citation is assigned to one of 18 categories, which function as keywords to search for and retrieve them in our citations database. That database is accessible to users via the ICAN website (<http://www.evergreen.edu/ican/ci->

tations). We currently have over 4200 citations in our database, about half of which have hard copies as well.

Since beginning this citation-searching project in 1995, the number of canopy-related publications that are produced each month has grown tremendously. A decade ago, I would garner 3-5 articles each month in a few ecological journals. In contrast, I now find scores of relevant articles in a wide variety of academic publications, from atmospheric chemistry to zoology.

In the fall of 2002, staff and students at the ICAN office began assembling lists of canopy citations that could be considered “classic”. There is no strict definition for classic citations, but criteria include citations that are cited often, referred to in many different contexts, and which are recommended to students in the field.

Other areas of science have published collections of classic citations (e.g., L. Real and J. Brown’s *Foundations of Ecology*; R. Chazdon and T. Whitmore’s *Foundations of Tropical Forest Biology*). Students can use these anthologies to get a ready handle on what they should read to be cognizant of the most pertinent findings in that field.



We solicited help in reviewing and selecting the classic citations by sending out invitations to senior researchers who have experience in each of the citations categories. Several responded positively for certain categories (e.g. canopy plants, canopy invertebrates), and have provided insights into which canopy citations should be given special attention. For several other categories (e.g., tree architecture, canopy structure), there were no researchers willing to help, and so I selected articles to construct tentative lists, with the expectation that

other researchers will help to review, edit, and augment these lists.

Below we provide an example of one of our lists. The category, canopy plants, is extremely broad, and encompasses vascular and non-vascular taxa; tropical, temperate and boreal regions; ecological, taxonomic, and physiological topics. Other categories for which we have gathered these citations classics include such topics as canopy animals; forest-atmospheric interactions; canopy structure; micrometeorology; plant physiology; research methods and instrumentation; and modeling.

A complete set of the citations lists will be circulated on our e-mail bulletin board in early June, 2003. We will also post these lists on our website, <<<http://www.evergreen.edu/ican>>>. We emphasize that these are fluid lists, and that modifications can easily be made. In the future, after our lists reach a stable point, we plan to scan in the articles themselves so that researchers, students, and others around the world will have access to the best science that canopy researchers have produced.

We welcome your input to this project, which you can provide in three ways. First, we invite you to send us your citations lists and hard-copy reprints, both lists of your own canopy citations and your own canopy-related publications. We will enter the former into our Endnote database and the latter into our files. Second, we value your alerting us to mistakes in the existing canopy citations database so that we can correct them. Third, we would appreciate feedback on the lists that are posted on our website – either suggesting additions or deletions on particular categories. You may provide this input to us by contacting David Franklin, International Canopy Network, 2103 Harrison Avenue NW, PMB 612, Olympia, WA 98502; <[canopy@evergreen.edu](mailto:canopy@evergreen.edu)>.

### CANOPY PLANTS

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Photo: Amber Neilson

## The Global Classroom project



The Global Classroom (GC) project seeks the protection of neotropical Costa Rican cloud/rain forests. It is used as a research center for students, researchers, and visitors.

The idea came about when Colin Garland, a native of Massachusetts, had the vision of securing land in the Monteverde, Costa Rica region around the mid-1990's, after having visited the Santa Elena Reserve with students. It took Colin years of fund-raising campaigns to finally gather enough support from U.S. contributors to secure approximately 100 acres (40 ha) of land near the town known as "Monte de Los Olivos" in the Monteverde region of Costa Rica, some 4 miles away from the town of Santa Elena. Farms surround the property, some covered totally with primary old-growth cloud/rainforests, others with partial pastures and forested areas.

In 1990, GC volunteers pulled together hundreds of students from New York, Massachusetts, Connecticut, and Vermont. They began a fundraising campaign to protect a piece of threatened rain forest in the mountains of Costa Rica. Nearly a decade later they reached their goal of \$65,000, enabling purchase and protection of the land. This helped to create the Aula Global Biological Reserve and educational center. Aula Global is home to the famous Resplendent Quetzal, the Three-Wattled Bellbird, and other endangered species. We are also proud to add to our list of inhabitants four species of cat, including the rare and endangered jaguar. Hundreds of other bird and mammal species use the canopy as their elevated highway.



The reserve is available to youth from all nations. Since 1990, the GC has touched over 2,000 young people from around the world. With the additional help of some famous actors, musicians, artists, and scores of local and international youth, we have demonstrated our commitment to rainforest preservation and raising international awareness of its im-

portance. Aula Global is living proof that if we work together, we can really make a difference.

Infrastructure consists of a wooden shelter built in 2002. Spring water is available, but there is no conventional electricity. Options for researchers include environmental impact study, human impact on land, present impact on the land by neighboring farms, soil studies, flora and fauna inventory and natural history, bird surveys, secondary successional forests, upland primary old growth forests as seed banks, and as a potential archaeological site. One petroglyph has already been found inside the property.

Contact: Colin Garland, Director, Global Classroom projects: <[globalcr@crocker.com](mailto:globalcr@crocker.com)>; <<<http://www.ravenadventures.com/preserve.html>>>.

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### ANNOUNCEMENTS/MEETINGS

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#### ESA Launches New Journal in February 2003

In February 2003, the Ecological Society of America (ESA) released its newest journal, *Frontiers in Ecology and the Environment*.

International in scope and interdisciplinary in approach, *Frontiers* focuses on current ecological issues and environmental challenges. Featuring peer-reviewed primary research and synthetic review articles, *Frontiers* will explore aspects of ecology, the environment, and related disciplines. The journal will cover global issues, cross disciplinary efforts, and new techniques and technologies.

Expanding into new realms, *Frontiers* will explore legal issues and provide breaking news on people, policies, and research from around the world. The premiere issue featured primary research on invasive species; reviews on the ecological effects of dam removal, ecosystem management, pacific salmon, and climate change; an explanation of wetland policy from the *Frontiers'* legal correspondent; and a provocative look at environmental issues by Pulitzer Prize-winning writer Katherine Ellison.

*Frontiers in Ecology and the Environment* will be published ten times a year in print and on-line. Members of the press may request a complimentary on-line subscription by contacting Annie Drinkard at <[annie@esa.org](mailto:annie@esa.org)>. Free to all ESA members, the journal is also available to institutions by subscription.

For more information on the journal, visit the *Frontiers* website: <<<http://www.frontiersinecology.org>>>.

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## CLIMATE CHANGE NEWS

According to the National Aeronautics and Space Administration (NASA), 2002 was the second warmest year on record. Some scientists and climate experts believe the data suggest that greenhouse gases are warming the Earth more quickly than had been expected.

### Climate Legislation

Senators John McCain (R-AZ) and Joseph Lieberman (D-CT) announced legislation to control carbon dioxide emissions, setting the stage for a confrontation with President Bush and the Senate's Republican majority over global warming. While McCain chairs the Senate Commerce Committee, which has been active on the issue, the legislation faces an uphill battle if it is referred to the Senate Environment and Public Works Committee.

British Prime Minister Tony Blair unveiled his ambitious plans to combat global warming, saying the Kyoto treaty to reduce greenhouse gas emissions did not go far enough. Blair vowed Britain would seek to reduce its carbon dioxide emissions by 60% by 2050. Blair criticized President Bush for contending that regulations to combat global warming would slow economic growth.

In the US, a new report indicated that the President's plan to address global warming might be inadequate. While the federal government has taken a good first step toward better understanding and responding to climate change by drafting a strategic plan that contains new research initiatives, the plan lacks a clear guiding vision and does not sufficiently meet the needs of decision-makers who must deal with the effects of climate change, says a new report from the National Academy of Science's National Research Council. The committee that wrote the report also noted that the president's fiscal 2004 budget request appears to leave funding relatively unchanged for the U.S. Climate Change Science Program, despite the important new initiatives called for in the plan.

*From The Scout Report, Copyright Internet Scout Project 1994-2003. <<<http://scout.cs.wisc.edu/>>>*

### Senate Environment and Public Works Clean Air and Climate Change

**Subcommittee Chairman George Voinovich (R-OH)** said that an amendment is in the works that addresses carbon sequestration. A Senate GOP source added that the plan will have bipartisan support by following the path of Sen. Ron Wyden (D-OR), who during last month's committee markup floated an amendment establishing a "Forest Car-

bon Program" under which states, forest land owners, local governments and private entities would receive federal funding to restore forestland and maintain forest conservation. The GOP source added that agricultural, oil and geologic sequestration issues are also at play for the amendment. Senate Energy and Natural Resources Committee ranking member Jeff Bingaman (D-NM) is aiming to introduce the mandatory registry amendment when the climate change debate picks up later this month.

### Kyoto Protocol

The Canadian House of Commons Tuesday voted on party lines to ratify the Kyoto Protocol on greenhouse gas emissions. The Senate is expected to endorse the treaty soon. The vote, not required, gave Prime Minister Jean Chrétien the public endorsement he had sought for his government to ratify the pact before the end of the year. With a vote by the House of Commons backing ratification of the Kyoto Protocol, the Canadian government now faces the challenging task of developing a plan with provincial governments and industry to cut greenhouse gas emissions. More than 80 countries have now ratified the treaty, which sets binding greenhouse-gas emissions targets for developed nations. The pact goes into effect once it is ratified by 55 countries responsible for at least 55% of emissions in 1990. That threshold will be reached once Russia has ratified the pact — something Russian officials have said would happen.

(continued on page 8)

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## CONTRIBUTE TO WHAT'S UP?

The International Canopy Network (ICAN) is currently seeking articles and information for the upcoming issue of What's Up?, set for publication in September, 2003. ICAN accepts articles, meeting and workshop announcements, related website addresses, and citations. Contributions can be sent via e-mail attachment, fax, or snail mail. Articles up to 1500 words are accepted (WORD format preferred) and graphics are welcomed. The deadline for submissions is August 15, 2003. For further information or to send contributions, please contact the ICAN office:

*David Franklin, Outreach Coordinator/Editorial Assistant; 2103 Harrison Avenue NW, PMB 612, Olympia, WA 98502; (360) 866-6788; <[canopy@evergreen.edu](mailto:canopy@evergreen.edu)>*

Have you recently moved or changed your e-mail address? If so, please let us know so we can keep your records current. E-mail your new information to <[canopy@evergreen.edu](mailto:canopy@evergreen.edu)>.



# GLOBAL CANOPY PROGRAMME UPDATE

## Global Investments in Forest Canopy Research

By Andrew Mitchell, Director and Katherine Secoy, Programme Co-ordinator

To date, no reliable figures exist for the global investment in forest canopy research. Estimates vary from US\$10 million to US\$ 30 million. In response to a request from the GCP Steering Committee, we began surveying the major canopy access facilities around the world, including canopy cranes, balloons, and walkways, to determine the global investment in forest canopy research. Our aim is to identify the national and international investments, including both infrastructure and annual costs, currently being made in canopy science and education. We intend to use this information to leverage further investments from national and international donors to benefit the canopy research community. In particular, this will be important for the development of a global strategy as outlined in the "20:20 vision for Canopy Research, featured in the March 2003 "What's Up?".

To date, the main facilities that have responded to our questionnaire survey are the 11 canopy crane sites. The questionnaire is comprised of several components, including the cost of building the facility, annual operating costs, the value of the research grants that use the access facility, and the annual costs that are devoted to supporting education or training at the site.

Since 1990, the total global investment in forest canopy research at these sites amounts to US\$38,143,435 (Figs. 1-2). This is likely to be an underestimate, as data from tower and walkway sites have not yet been included, nor has the value of the FLUXNET sites, which number some 200 towers. The value time of individual researchers operating solely with climbing ropes should also be included, but is hard to quantify. Of the total investment, approximately \$23.5 million in research grants to use these facilities is also likely to be an underestimate, as not all facilities had records of the grant value of research at their sites. It is disappointing to see that less than 5% of the total is spent on education and training,

Although these figures are a preliminary estimate, it seems at least \$40 million has been invested in canopy research at major access facilities since 1990, which totals just over \$3 million per year.

Investments in canopy research facilities are substantial and growing. While these figures may seem high for ecological fields, they are dwarfed by research investments in the physical sciences. Between 1994 and 1999, the European Science Foundation spent approximately US\$ 330,000 on Tropical Canopy Research, while simultaneously was considering expenditures of \$50 million on a Telsa High Magnetic field magnet and almost \$1 billion on a project investigating neutrinos (Mitchell, 2001). To leverage canopy research to the scale of the physical sciences, we must demonstrate significant and relevant outcomes from such investment and better lobby funding sources.

The significance of future forest canopy research cannot be underestimated when one considers the importance of understanding the role of the whole forest, from canopy to soil, in the maintenance of local and global environmental conditions. Carbon sequestration, cloud formation, the balance of biodiversity, clean water provision, timber quantity and quality, pest and disease control, food, fiber and medicine are just some of the environmental benefits canopies provide. This will also be affected by a projected rise in CO<sub>2</sub> from the current 350 ppm to potentially over 700 ppm. Additionally, forest canopies are rapidly fragmenting. For the cost of just one X-ray Cyclotron, we could create a global network for canopy science three times the extent of what exists today, and likely deliver results of far more immediate and critical use.

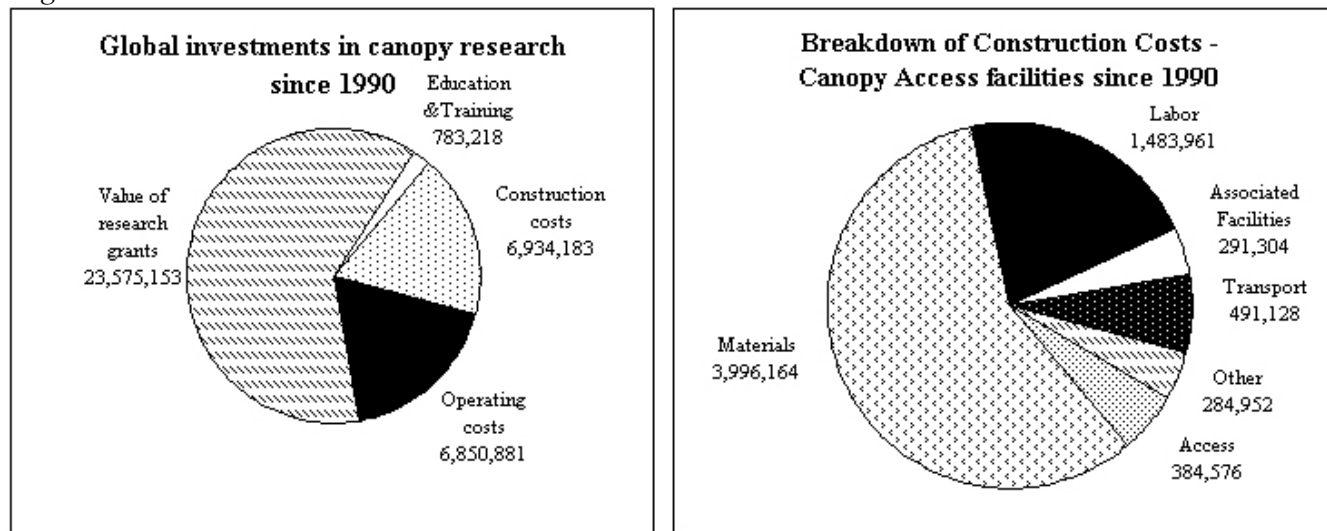
If you have information that you would like to contribute to this survey, please contact Katherine Secoy at <k.secoy@globalcanopy.org>.

Reference:

Mitchell, A.W. 2001. "Canopy science: time to shape up". *Plant Ecology* 153: 5-11.

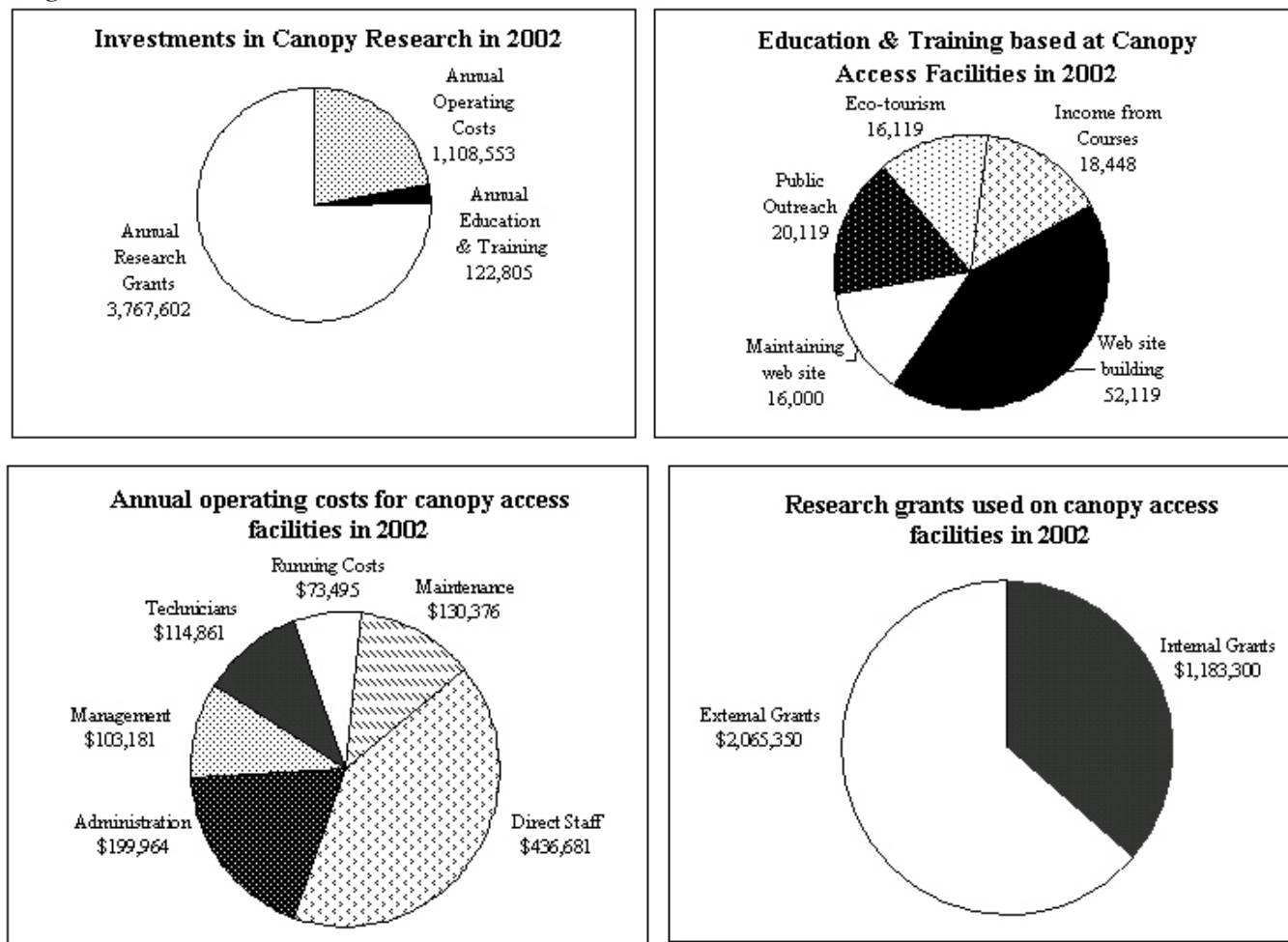
**Investments since 1990**

Fig. 1



**Investments in 2002**

Fig. 2



(continued from page 5)

### Congress 'Globalization, localization, and tropical forest management in the 21<sup>st</sup> century'

Announcement & Call For Papers and Posters

22-23 October 2003

Roeterseiland, Amsterdam, the Netherlands

The congress will focus on two aspects of globalization with potential impact on forest management and the lives of forest-dependent people and communities living on the forest fringe. First is the international trade of forest products and related processes such as the certification of timber and non-timber forest products, WTO, CITES, and strategies to combat illegal logging. The second centers on climate change and developments around the Kyoto protocol, such as the Clean Development Mechanism, Joint Implementation, and the trade of CO<sub>2</sub> emissions.

The two-day congress program will include plenary sessions, regional and thematic workshops, and a poster session. Keynote speakers and scientists will be invited to make presentations at plenary sessions. Proposals can be submitted for plenary sessions (invited papers), symposia and workshop sessions (invited and voluntary papers), and poster sessions (voluntary presentations).

Registration information, and information on paper and poster submission, is available at the websites <<<http://gpf.fmg.uva.nl/agids>>> and <<<http://www.tropenbos.org>>>.

Contact: Dr. Mirjam A.F. Ros-Tonen, Amsterdam Research Institute for Global Issues and Development Studies (AGIDS), University of Amsterdam, Nieuwe Prinsengracht 130, 1018 VZ Amsterdam, the Netherlands; Phone: +31 20 5254179 (Wednesday only)/ +31 30 2935389; Fax: +31 30 2936247; <[m.ros@frw.uva.nl](mailto:m.ros@frw.uva.nl)>.

### International Conference on Eco-Restoration

Dehradun and New Delhi (India)

14-21 October 2003

Organized by National Institute of Ecology (NIE) jointly with Indian Council of Forestry Research and Education (ICFRE), Dehradun

#### Call for papers

Researchers from all countries are invited to contribute papers for presentation at the conference. Contributions should be original in nature and should not have been published or presented at another conference earlier. The abstracts, not exceeding 500 words, should be informative and should reflect the contents of the contribution. The authors should declare that the paper offered for the conference is not under publication in any journal, has not been submitted for an-

other conference, and includes new observations or new interpretations of previously published results. Abstracts should be submitted by email before 15 July 2003 to: <[conference03@nieindia.org](mailto:conference03@nieindia.org)>; visit the website for specific abstract format. Registration fee until 15 August 2003: US\$ 250; after 15 August 2003: US\$ 300. The registration fee will cover the following: Conference kit with a book of abstracts of presentations, opening reception, conference dinner, lunch and refreshments during the meeting, and the cost of mid-conference excursion.

## PUBLICATIONS

### Changing the landscape of international foreign policy

The International Tropical Timber Organization (ITTO) has been a successful experiment in international negotiations and has much more to contribute towards the sustainable management of tropical forests, according to a new book by Professor Duncan Poore.

*Changing Landscapes*, which is published by Earthscan, reviews the evolution of policies for the sustainable use of tropical forests through a history of ITTO. It provides an introduction to the ecological, historical and socioeconomic trends that have influenced contemporary forest management and explores the complex political forces that have shaped the trade in tropical timber and its regulation.

The book also traces the origins of the International Tropical Timber Agreement (ITTA) and shows how it gave rise to a unique inter-governmental organization, perhaps the first of its kind to promote both the development of a natural resource and its conservation. The book gives a candid analysis of the Organization's performance in both its formulation of policy and its efforts to implement such policies in the forest.

The future of many tropical forests remains uncertain, says Poore. One of the main reasons is that the sustainable management of natural tropical forests is often not competitive as a land use; therefore, the forests are often cleared for more profitable uses.

Poore therefore proposes a model called 'adaptive management', in which the forests are managed as accumulating capital assets that can be tapped when there is a need to raise capital or where there is a special market opportunity.



"A prerequisite will be secure tenure, which might be by governments, companies, private individuals or local communities," he says.

Professor Poore urges forest negotiators to heed the lessons learned from the ITTO experience, particularly since negotiations are about to commence on a successor agreement to the ITTA.

"Intergovernmental bodies ... are often criticized for being bureaucratic, expensive and ineffective, yet the rapid trend towards globalization means that they will play an increasing, and important, role in shaping the world's future. New models for the way such bodies should work are, I believe, desperately needed. ITTO was first devised to address a specific concern but it has evolved into something much broader; in the process, negotiators have created something new, and the lessons to be drawn from it are many."

Professor Poore served as scientific director and later as chief executive of the International Union for the Conservation of Nature and Natural Resources (IUCN), and also as director of the Commonwealth Forestry Institute at Oxford and as Professor of Botany at the University of Malaya.

*Changing Landscapes: the Development of the International Tropical Timber Organization and its Influence on Tropical Forest Management is published by Earthscan Publications Ltd. It can be ordered from: Earthscan, 120 Pentonville Road, London, N1 9JN, UK; Fax: 44 (0)20 7278 1142; <earthinfo@earthscan.co.uk>; <www.earthscan.co.uk>.*

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## WEBSITES

**CAB International and CABI Publishing is pleased to announce the release of two new forestry resources:**

### Forestry Compendium

Developed and funded through a consortium of donor agencies and technical bodies, this unique comprehensive resource offers quick and easy access to world-wide information on forestry. Select which species to plant, find out the facts about your selected species, find out suppliers of a chosen species, create your own lecture notes, reports or fact sheets, Record your own information in the database and share it with other users. Visit: <<<http://www.cabicompendium.org/jc>>>.

### ForestScience.info

ForestScience.info contains comprehensive coverage of the world's scientific literature in forestry and related disciplines dating back to 1939. The ForestScience.info database con-

tains over 600,000 research summaries, with over 20,000 new research summaries added each year. ForestScience.info also includes the latest research summaries, enabling forestry professionals to keep up-to-date with current research.

Full details and a free trial are available at <<<http://www.forestscience.info>>>.

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## JOBS

### Students needed for canopy biodiversity research in the Great Smoky Mountains National Park

We are currently seeking students to become involved in aspects of an ongoing research project. The objectives of the project are: 1) to complete the first comprehensive survey and inventory of tree canopy biodiversity for cryptogams (Myxomycetes, macrofungi, mosses, liverworts, lichens, ferns), and, added later, tardigrades, insects, and mollusks in the Great Smoky Mountains National Park (GSMNP); 2) collect these targeted groups of organisms above three meters on a vertical transect to the treetops; 3) assemble a multidisciplinary research team of experts who will collect, identify and curate this diverse group of organisms; 4) compare the assemblages of tree canopy targeted organisms with those of ground sites; 5) search for new species in all of the targeted groups of organisms; and 6) involve volunteers, park interns, students, and project personnel in park interpretive exhibitions, news media coverage, and publication of articles in popular magazines that will send a powerful conservation message for biodiversity.

Students are involved in an adventure phase, laboratory phase, and publication phase. All students enroll in Special Problems in Biology, keep a daily diary of their experiences, and are given writing assignments upon return to Central Missouri State University. Most students who have participated have gone on to graduate school for their Ph.Ds.

Limited financial support is available through several grants. Graduate assistantships are available based on academic credentials and availability of funds. If this project sounds like something you might be interested in as part of your undergraduate or master's degree, contact Dr. Harold Keller at the address below.

*Professor Harold W. Keller, Ph.D., Department of Biology, 118 W.C. Morris Building, Central Missouri State University, Warrensburg, MO 64093; Phone: (660) 543-4823; Fax: (660) 543-4355; <keller@cmsul.cmsu.edu>.*

## RECENT CITATIONS IN CANOPY SCIENCE

[Ed. note: Since there is no central journal on canopy science, it is useful to publish citations on canopy studies in the recent literature. Some of the papers listed below were obtained from ICAN subscribers sending in reprints; most were discovered through weekly literature searches on Current Contents on Diskette (CCOD).

### CANOPY STRUCTURE

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