

WHAT'S UP?

THE NEWSLETTER OF THE INTERNATIONAL CANOPY NETWORK

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ICAN'S Canopy Passage to India

The annual meeting of the Association for Tropical Biology (ATB) was held in Bangalore, India on July 14-18, 2001. This was the first time that an ATB meeting was held in Asia, and its location attracted a strong presence of tropical scientists from India, Sri Lanka, and other Asian countries. The Ashoka Trust for Research in Ecology and the Environment (ATREE) co-sponsored the conference, fostering positive interactions of the over 300 scientists who participated.

Papers and posters concerning the forest canopy were highlighted at the conference. Nalini Nadkarni and Steve Yanoviak (The Evergreen State College) co-organized a symposium entitled *Tropical Canopy Biology*. Ten papers concerning canopy studies, ranging from bromeliad ecology to the geopolitics of canopy funding, were presented to an audience of 70-100 scientists.

Below is the roster of titles and speakers:

-Nalini Nadkarni, The Evergreen State College, Olympia, Washington USA. Introductory remarks on the tropical canopy symposium.

-Steve Yanoviak and Nalini M. Nadkarni, The Evergreen State College, Olympia, Washington USA. "*Arthropod diversity in non-vascular epiphytes of a neotropical cloud forest*".

-Kaberi Kar Gupta, Arizona State University, Phoenix, Arizona, USA. "*Importance of canopy continuity in conservation of slender loris (*Loris tardigradus*)*".

-Soubadra Devy, Ashoka Trust for Research in Ecology and the Environment, Bangalore, India. "*Interaction between social bees and their foodplants in a rainforest canopy of Western Ghats, India*".

-Dinah W. Davidson, University of Utah, Salt Lake City, Utah, USA. "*Bottom-up and top-down effects on canopy ants*".

-Talita Fontoura, Rio Pacheco Botanical Gardens, São Paulo, Brazil. "*Epiphytes and habitat fragmentation in the wet Atlantic rain forests of northeastern Brazil, a hotspot for biodiversity conservation*".

-Peter Hietz and W. Wanek, Vienna Agricultural Institute, Austria. "*Use of stable isotopes in canopy research*".

-Meg Lowman, H. Bruce Rinker, Mark Hunter, and Timothy Schowalter, Marie Selby Botanical Gardens, University of Georgia, Athens, Georgia, Oregon State University, USA. "*Canopy herbivory and soil processes in temperate and tropical forests*".

-Barbara Richardson, Edinborough, UK. "*Bromeliad invertebrate ecology in the Luquillo Experimental Forest, Puerto Rico*".

-Andrew Mitchell, Global Canopy Programme, Oxford, UK. "*Why does the world need a Global Canopy Programme?*"

In addition to the oral presentations, posters on the canopy topics were also displayed. These included a poster on ICAN's activities, the Canopy Database Project that is currently underway at The Evergreen State College, and the Global Canopy Program, under the directorship of Andrew Mitchell, from Oxford, U.K. (see What's Up?, 7:3).

Some of the canopy-related issues were brought into the post-Conference workshop on "Research Priorities in Tropical Biology", which was co-lead by Dr. Kamal Bawa (University of Massachusetts and ATREE), Dr. W. John Kress (Smithsonian Institution), and Nalini Nadkarni. This discussion will be expanded at the next ATB meeting, which will be held in Panama on July 29-Aug. 1, 2002.

Plans for another tropical canopy biology symposium at this meeting are currently in preparation. If you are interested in participating, contact Nalini Nadkarni.

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2001 Wind River Canopy Crane Research Facility's 7th Annual Science Conference: Destructive Sampling Management

The Wind River Canopy Crane Research Facility (WRCCRF) exists to facilitate research of a pristine 500 year-old-growth conifer stand. The minimization of impacts to the biota and environment of the site is critical to ongoing and future projects. To balance research and unavoidable impacts, we have developed a database that not only provides data on the state of the sampling universe accessible by the crane, but also quickly and accurately tracks the impact from each researcher visit.

Sampling is allowed on a subset of the gondola-accessible trees. These total 293 trees within the crane circle, a 2.27 ha area delimited by the reach of the 85 m crane jib. The crane circle is part of a 4 ha permanent plot that has all trees mapped and tagged above 5 cm diameter, and is monitored for growth and mortality. Gondola-accessible trees were permanently designated "pristine" (no sampling) or "destructive" (open to sampling) through a random selection of one half of each



canopy species: Douglas-fir, Western Red Cedar, Western Hemlock, Grand Fir, and Silver Fir.

Sampling impacts are tracked at the branch level. After branches are selected for a study, metal tags are attached and the trolley (distance from tower),

hook (height) and azimuth are recorded. On later visits, standard data sheets are used that list sampling coordinates, branch tag numbers, and sample sizes, as well as notes on branch condition to ensure the timely "retirement" of old branches and the selection of new ones. Because these sheets

completely describe the current sampling scheme, writing in the field is limited to a check-off for each sample and notes, which produces an accurate and complete sampling record.

Sampling impact assessments are made by the arborealist (site scientist) in the gondola. The criterion used is the impact to branch architecture on a qualitative scale. When most lateral branchlets throughout the accessible area of the branch have been partially clipped, the branch is retired. Typically, an adjacent branch at the same coordinates is acceptable, and is then tagged. In this way, it is predicted that sampled branches will maintain vigor and recover branch architecture over time.

Impacts to date for all gondola accessible trees:

Species	Total	Pristine	Sampled	# of Twigs	Total Length (m)
W. red cedar	41	20	10	537	77.6
W. hemlock	146	71	21	1009	119.5
Douglas-fir	81	36	34	2867	255.7
Grand fir	15	8	5	175	44.8
Silver fir	10	5	1	1	1
All	293	140	73	4589	497.7

In the future, we will compare the amount of branch-clipping to green litterfall. We predict that it will be relatively small, given the winter branch-shedding and tree-fall that has been observed at the site. Epiphytes are also sampled at the site from non-pristine trees. Annual amounts are limited to a small percentage of the estimated standing crop.

David Shaw, Site Director, Wind River Canopy Crane, 1262 Hemlock Road, Carson, WA 98610; Phone: (509) 427-7028; Fax: (509) 427-7037; <dshaw@u.washington.edu>

Report on Wind River Canopy Crane 7th Annual Science Conference

The University of Washington's Wind River Canopy Crane Research Facility conducted its Annual Science Conference on June 20-22 at its field location just north of the Columbia River Gorge near Carson, Washington. Over 100 scientists, resource managers, teachers, and students from more than 20 educational institutions and resource agencies attended the three days of meetings, coming from as far away as Great Britain and Japan.

Scientists using the crane in their research are required to attend the Annual Science Meeting and report on their findings, as well as to listen to other reports on research at the crane site. This was the seventh meeting since the crane became operational in 1995. The canopy research facility is a

collaborative effort among the University of Washington, US Forest Service Pacific Northwest Research Station, and the Gifford Pinchot National Forest. UW College of Forest Resources' personnel operate large construction crane, which is located in a 500-year-old Douglas-fir-Western Hemlock forest. The crane is 86.9 m tall and provides access to 2.27 ha of forest canopy.

There were 36 formal scientific reports and many other presentations at the conference. A panel discussion involving scientists and forest managers was a new feature of the conference. Scientific reports at this meeting covered a broad range of topics about northwestern forest ecosystems, from the ecology of dwarf mistletoe, a parasitic plant that grows on western hemlock, to effects of defoliating insects.

The carbon cycle and role of forests in regulating greenhouse gases, especially carbon dioxide, was a major topic taking up over half of the entire meeting. Much of the research at the crane facility is funded by the U. S. Department of Energy's Western Global Environmental Change program. This research is focused on the carbon cycle of forests, including the conditions under which forests absorb and store more carbon than they release. The studies include comparisons of carbon uptake and storage in the old-growth stand with younger forests in the same area.

One notable trend in the research at the site is that more studies are being conducted in young managed forests (20- to 40-year-old) and mature (100- to 150-year old) stands on the Wind River Experimental Forest, in addition to 500-year-old forest at the crane site itself. One objective of this expansion is to make the scientific studies more relevant to the forest conditions that dominate much of the southern Washington Cascade Range.

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Selby Gardens hires ecologist to direct forest canopy research

H. Bruce Rinker has joined the staff of The Marie Selby Botanical Gardens in Sarasota, FL as Director of a new Canopy Ecology Division in the Research and Conservation Department. Selby Gardens was founded in 1975 to display and study epiphytes. With tropical rainforests, which are rich in epiphytes, being deforested at increasing rates, the need for treetop research becomes urgent.

This is where Rinker fits in. He will supervise ecology research projects, including upcoming fieldwork in forest

canopies of Puerto Rico, the Peruvian Amazon, Cuba, and Myakka River State Park, Florida. Selby Gardens took part in the design and construction of the new Canopy Walkway at Myakka and will conduct ecological research using this access to the treetops.

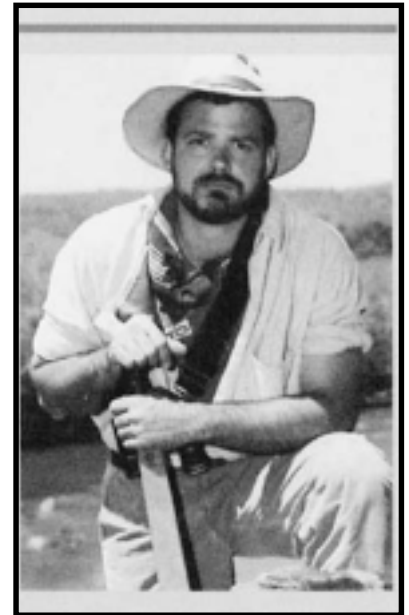
Rinker, an award-winning ecologist and science educator listed in *Who's Who among America's Teachers*, will coordinate Selby Gardens Research Seminars to inform the public about ongoing research and conservation work. Speakers for the current season have included Beth Kaplin (seed dispersal and African primates), Barbara Reynolds (canopy herbivory and temperate forests), David Jarzen (paleobotany), Giraldo Alayón García (arthropod diversity in Cuba), and Donald Perry (forest canopies and conservation).

A graduate of Virginia Tech's College of Forestry and Wildlife Resources, Rinker is completing a Ph.D. in environmental studies at Antioch New England Graduate School. He comes to Selby Gardens from Millbrook School in New York, where he chaired the Science Department and directed the school's forest canopy walkway and laboratory.

An editorial board member of *Selbyana*, the research journal of Selby Gardens, he writes articles and addresses audiences around the world. Fieldwork has taken him to the rainforests of Central and South America, Africa, and numerous other sites. He has taken part in the French-sponsored Radeau des Cîmes, which facilitates research on rainforests from above using dirigibles, treetop rafts, and sleds. A National Fellow of the Explorers Club and a Switzer Environmental Fellow, Rinker has been featured in canopy publications and on shows such as PBS's "Live from the Rain Forest."

For more information, visit: <<<http://www.selby.org>>>

MARIE SELBY
BOTANICAL
GARDENS



H. Bruce Rinker

The Canopy at Chestnut Hill:

A personal account of discovery, research, and education

I became interested in the canopy one cold, wintry Sunday morning when I looked up from the newspaper to see a woman swing out of a tree on the Travel Channel. She soon took the host's camera up into the tree and all I could see was the moss- and lichen-covered limbs as she climbed. I study tardigrades, a microinvertebrate that lives in moss and lichen—all I could see was glorious habitat. The climber was introduced as Dr. Nalini Nadkarni of The Evergreen State College. I went to my computer, found an e-mail address for Dr. Nadkarni, sent a message, and was answered within 10 minutes. Over the next several months, Dr. Nadkarni and her students helped me learn about the canopy. At her encouragement, I presented a poster about the tardigrades in the canopy at the 2nd International Canopy Conference at Selby Gardens in Sarasota, Florida.

Shortly thereafter, I accepted a position as Assistant Professor of Biology at Chestnut Hill College, a small Catholic women's college, in suburban Philadelphia. Our forty-acre campus is sandwiched between the city of Philadelphia's Fairmont Park and the Morris Arboretum of the University of Pennsylvania. We have a year-round stream, the Wissahickon, a small riparian zone along its shore, a bit of a bog we call a wetland, and a canopy of temperate eastern deciduous forest above. It is a good place to teach Environmental Science.

Being new to the faculty, I was assigned freshman Zoology, an Environmental Seminar, and a class named Environmental Field Techniques. The latter traditionally included instruction in the theory and practice of water, air, and soil sampling, testing, and instrumentation, I included other field techniques such as orienteering, CPR, canoeing, camping, and canopy access.

In Sarasota, I learned to climb 10 meters up into a banyan tree, so I decided to introduce the students to the Single Rope Technique (SRT) for getting into the canopy. I found the "New Tribe" catalogue I had saved from Sarasota,

and e-mailed Tom and Sophia Ness, who guided me through an equipment order for two climbers. As I waited for the equipment to arrive I read like mad, and re-learned old knot and rope skills from my Montana mountain-climbing days.

We have a 20-foot stonewall on campus that proved as a perfect place to teach beginners. Not all students were enthusiastic, but by the end of the day, they were having fun. The activity drew a crowd, and half a dozen Sisters stopped to watch. Many commented how great it was that we were giving our students such experiences.

We have a large sycamore (*Platanus occidentalis*) on campus with many large horizontal branches. I brought in a professional arborist to trim out any dead wood before letting students climb. On a beautiful fall day with the leaves turning colors, we rigged our ropes and our students climbed into the sycamore. They had to climb the rope with the Jumars, sit on a major branch, change over to the figure "8", and rappel back to the ground. It was another day of challenge and personal accomplishment for each student. (Figure 1)

We use the videos "Tickle the Sky" (Bullfrog Films) to present the idea of climbing and "Rainforest: Heroes of the High Frontier" (National Geographic Society) to promote understanding of research in the treetops. We start every class by tying knots until they became second nature. We do not require students to pursue climbing, only that they try

it, understand it, and appreciate it as a useful technique to study an environment.

A surprise came when Don Polec of ABC-Channel 6 News showed up with a cameraman. Mr. Polec interviewed me and several students, taped some climbing, and then tried it himself. Three days later the school and the environmental program made the evening news.

During the summer of 2000, we took an Environmental Study class from Philadelphia through the Smokey Mountains, out across the southwest, up the California coast, and back across the Rockies. We camped out of a van for 33

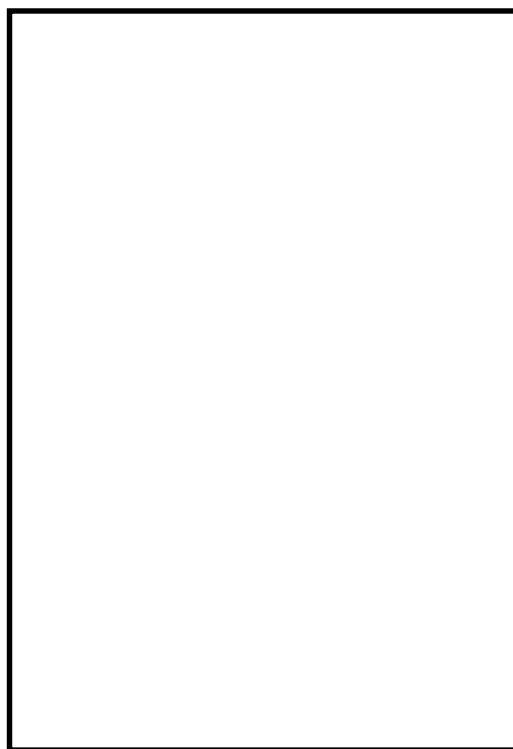


Figure 1.
Environmental students learning to
explore the canopy at Chestnut Hill College

days and covered 8750 miles, 22 states, and 17 national parks. The students saw, studied, and wrote about the cultures, history, and environments through which we passed. After our visit to the Mariposa Grove in Yosemite National Park, several students who had climbed with me the previous semester climbed a modest redwood near camp. (Figure 2)

This year, student Pamala McCully incorporated the canopy into her Senior Seminar Project and measured the microinvertebrates (including tardigrades) in the moss and lichens at different levels in oak and sycamore trees. Part of her project was conducted at our suburban campus, and part at a more pristine site 30 km away. She demonstrated differences in species diversity and density among the different levels, between the trees, and between the sites. We found the greatest densities at the highest levels in the canopy.

This year, another student, Colleen Mitchell, is expanding on Pam's design. She hopes to define the patterns of association of the animals within their three-dimensional habitat. Next summer, we plan to report results to the 3rd International Canopy Conference in Cairns, Australia.

This summer, my wife and I are leading 10 students on a trip to the Amazon rainforest. We will spend two days at the ACEER facility and visit the upper reaches of the canopy on what is advertised as the longest and highest canopy walkway in the world.

In addition to the travel, field experiences, and undergraduate research projects, we have integrated the concept into other levels of our curriculum. We introduce the canopy as an envi-

ronment in Zoology, Botany, and Ecology classes with readings, discussion and examples. My colleague, Dr. Bob Meyer, has expanded his Field and Forest course to become our Field, Forest, and Canopy course. We use the canopy bibliography found on the ICAN website (www.evergreen.edu/ican) to identify reading assignments for our seminar students.

We have been able to place the canopy alongside freshwater streams, estuaries, the coral reefs, the deep ocean, the arctic, the desert, and the rainforest as a major ecosystem in the minds of our students. Just as SCUBA has opened the continental shelf, climbing is opening the canopy and the exploration has just begun. We at Chestnut Hill are proud to be a part of the future.

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Figure 2.
Chestnut Hill students in a Redwood
in Yosemite National Park

ANNOUNCEMENT OF THE CANOPY CITATIONS DATABASE

A necessary ingredient to carrying out research efficiently is access to the relevant scientific literature. ICAN is proud to announce the Canopy Citations Database, with over 2300 citations on forest canopy studies. ICAN has been collecting citations for the past seven years and is now making the collection available to its members through the World Wide Web. The database is located at <<<http://www.evergreen.edu/canopycitations>>>.

Everyone is encouraged to add new citations to the database and to send reprints to the ICAN office. From the homepage, follow the "Add New Citations" link to the data entry form. Fill out all fields in the form and click the "New Citation" button. Citations will be verified and updated on a quarterly basis. If you have a large number of citations to add, you can send a tab delineated text file to <canopy@evergreen.edu> and they will be uploaded from our office.

ICAN currently has approximately 50% of the hard-copy reprints on file at its headquarters in Olympia, Washington. Citations can be searched for by author, year, title, or journal. Reprints of articles related to canopy studies can be mailed to the address on the back of this newsletter.

The database is a useful research tool and we encourage everyone to visit our site. However, membership in ICAN is required in order to fully access the database. If you are interested in subscribing to ICAN, visit our homepage at <<<http://www.evergreen.edu/ican>>> or fill out the form on the back of this newsletter.

LASERS IN THE JUNGLE: THE FOREST CANOPY DATABASE PROJECT

The forest canopy is of critical importance for a variety of life processes in our biosphere. Defined as “the combination of all leaves, twigs, and small branches in a stand of vegetation, including the air and interstices of the foliage”, elements of the forest canopy house the photosynthetic machinery of the forest, influence the exchange of energy and matter with the atmosphere, control the microclimate at various scales, and maintain habitat for wildlife (Parker 1995). Forest canopy studies bear directly upon three of the most pressing environmental issues of the new millennium: the maintenance of biodiversity, the stability of world climate, and the sustainability of forests.

Studies from multiple scientific disciplines constitute the field of canopy research, e.g., forest ecology, meteorology, zoology, geography, and conservation biology. Recent technological applications for access to the canopy such as the “canopy raft” and the canopy crane (Parker *et al.* 1992), have allowed researchers to record and interpret larger amounts of meaningful canopy data. In the last decade, a burgeoning of scientific interest in the canopy has occurred (Lowman & Wittman 1998). Interdisciplinary research groups are now coalescing to approach canopy questions from new and different spatial scales. Heightened public interest in biodiversity, global climate change, and tropical deforestation has generated books, symposia, popular articles, and films about the canopy (Lowman & Nadkarni 1995).

Both the types and amounts of canopy structure data are changing rapidly. In the past, scientists working alone with simple rope-climbing techniques generated studies that produced fairly small data sets. However, recent access innovations permit multiple teams of scientists to work within the same volume of the canopy. Canopy scientists have to deal with more data, new kinds of data, and the need to share data. Data collected by canopy research teams will be useful to other scientists (e.g., geographers, land use managers), just as data emanating from allied fields could aid forest canopy researchers.

Historically, canopy scientists have been notorious for independent ways of taking, storing, and analyzing data. In 1993, our team of forest canopy ecologists and computer scientists received a planning grant from the National Science Foundation’s (NSF) Database Activities Program. The project brought together forest canopy researchers, quantitative scientists, and computer scientists to work towards establishing methods to collect, store, display, analyze, and interpret three-dimensional (3-D) spatial data relating to tree crowns

and forest canopies. We created a self-sustaining non-profit organization, the International Canopy Network (ICAN) to assure that network activity would continue beyond the life of the NSF grant (Nadkarni *et al.* 1995). Over 750 forest canopy researchers from 62 countries now subscribe to the e-mail bulletin board and quarterly newsletter. Regional, national, and international meetings, workshops and symposia on canopy topics are regularly organized.

We also conducted a survey of over 350 canopy researchers and evaluated potentially applicable information models and software tools used in allied fields (Nadkarni & Parker 1994). We organized a multidisciplinary workshop for canopy scientists and database/computer scientists. These activities: 1) identified important questions under study in the emerging field of canopy research; 2) formulated a number of key forest structure-function relationships that are currently poorly understood due to lack of database tools, and 3) generated common ground for joint research by canopy researchers and database scientists.

The conclusion of both the survey and the workshop was that understanding forest canopy biota and processes was not limited by canopy access (as we had anticipated), but rather by two characteristics of canopy data: 1) lack of quantitative tools that allow canopy researchers to analyze the complex three-dimensional spatial data associated with forest canopy studies, and 2) lack of harmonized data sets – forest



canopy researchers have tended to collect data in non-comparable formats. Although canopy datasets are increasing in number and variety, they tend to be anecdotal and descriptive and are not readily combined with others to expose general patterns or rules. Much of this is because canopy researchers heretofore have been preoccupied with detailed descriptions of particular environment, stand, process, and study objective. Few projects have common methodologies or data formats, so their resulting observations are not easily shared and compared.

At the brink of the new millennium, then, the study of the canopy of forest ecosystems is being held back by the lack of data management tools. The relative youth of the field—with its lack of entrenched methods, legacy datasets, and conflicting camps of competing groups—provides a unique opportunity for integrating data management and analysis tools into the research process. The sociology of the discipline is conducive to sharing data; researchers appear openly communicative and supportive of each others' work. Thus, the forest canopy studies serve as an excellent arena to generate database tools that could also serve other fields of ecology and science.

In this Commentary, we describe one fundamental part of the development of the field canopy studies, the Forest Canopy Database Project. In 1998, we were awarded a grant from NSF's Database Activities Program to develop a database and database tools to enhance the ability of researchers in one emerging and interdisciplinary field—forest canopy studies—to collect, analyze, link, and archive data. This capability will speed the development of the field to more efficiently address both intellectually stimulating and environ-

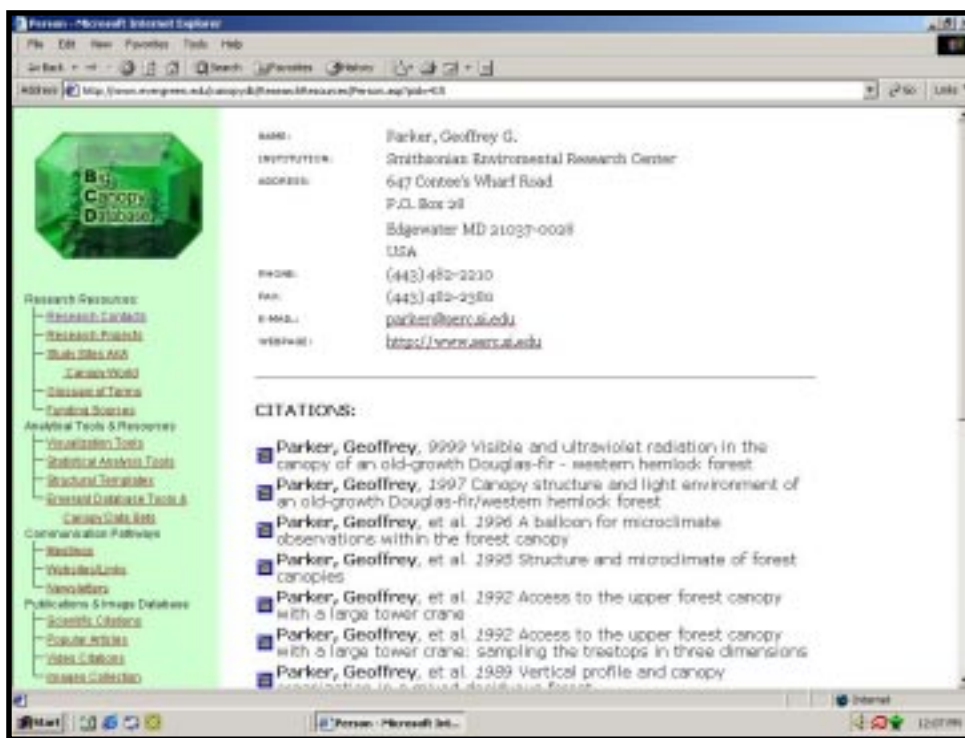
mentally pressing questions of interest to academics, policy-makers, and the general public. We anticipate that the database and tools can serve as an exemplar for other interdisciplinary and emerging fields of science.

To date, the computer database has taken two pathways. The first piece is our web-based centralized "Big Canopy Database". This database holds information, field data, and images of use to canopy researchers, educators, and conservationists, including lists of researcher contacts, research projects, study area descriptions, images, canopy-dwelling taxa, visualization and analysis programs, meetings, training programs, equipment and safety descriptions, and scientific and popular citations. A prototype is available for viewing at: www.evergreen.edu/canopydb

The second piece is a web-based program called "Emerald", that will allow canopy researchers to search for and download field data submitted by other researchers, design field databases and download them for their own use, and to document and archive their own databases. The system thus builds new databases from database components that "fit" canopy data. We term these components "templates".

"Emerald" currently contains datasets from six different canopy projects (www.evergreen.edu/emerald) To submit data to the database, a researcher from each study works directly with a database technician to provide metadata and to structure his/her data to fit one or more existing field data templates, or to generate a new template for novel data types. We anticipate that after some number of studies are entered, a finite number of data templates will be available, and re-

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A screen shot of the BCD-After typing in a researcher's name, his/her contact information and citations are displayed

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searchers joining the database will find what they need within the program, obviating the need for an intermediary. The current Emerald prototype is implemented in SQLServer, Microsoft's Active Server Pages (ASP) and HTML. We are currently building a second prototype using MS SQL Server and Enhydra, a JAVA application server.

Our efforts to create a database for the canopy research community will help push forward this emerging field of science. We also believe that our efforts could be viewed as a model for other emerging areas of ecology where data-linking and data-sharing can be effective in integrating results from different studies. We seek input from researchers in the field of canopy studies to contribute to the database, and from those outside the field who may have insights into making this process efficient and productive.

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ANNOUNCEMENTS/MEETINGS

The German Society for Tropical Ecology- 15th Annual Meeting

20-23 February 2002, University of Göttingen, Germany

The scientific program will consist of keynote lectures by Nalini Nadkarni (Ecology of the Monteverde Cloud Forest), Sampurno Bruijnzeel (Hydrology of Tropical Montane Forests) and John Proctor (Mineral Nutrition of Tropical Rain Forests). The main themes of the conference are "tropical montane forests", "nutrient cycling in tropical ecosystems", and "animal-plant interactions". The meeting is co-hosted by the Center for Biodiversity and Ecology of the University of Göttingen, Germany. For information, visit the conference website at <<<http://www.gwdg.de/~gtoc2002>>>

Climate meetings

In an attempt to save the Kyoto Protocol on greenhouse gas emissions, Dutch Environment Minister and head the United Nations talks on global warming

Jan Pronk, hosted sessions in advance of the resumption of international talks on climate. Representatives of dozens of governments joined Pronk in the Netherlands to review proposals in preparation for the meetings. According to European Union Environment Commissioner Margot Wallstrom, the success of the July talks, to be held in Bonn, Germany, depends on the participation of Japan, and on US reaction to countries participating in the summit.

Japanese Prime Minister Junichiro Koizumi told President Bush that Japan would not agree to implement the Kyoto Protocol on greenhouse gas emissions without US participation. In Argentina, the House of Representatives recently approved the ratification of the Kyoto Protocol. Although Argentina approved the protocol, none of the 39 industrialized nations, some of the heaviest polluters, has yet to ratify the treaty.

WEBSITES

National Forests Websites

Provided by the USDA Forest Service, this site is a handy portal to the official websites of the 155 National Forest Lands and 20 National Grasslands across the country. Visitors may browse the listing via an interactive map by name, state, or region. There is also a Forest phone directory. Additional information on the Forest Service is accessed from: <<<http://www.fs.fed.us/links/forests.html>>>

From The Scout Report, Copyright Internet Scout Project 1994-2000. <<<http://scout.cs.wisc.edu/>>>.

The Sound Science Initiative (SSI)

Since 1995, the Sound Science Initiative (SSI) has been an effective e-mail-based vehicle for scientists to respond to and influence fast-breaking media and policy developments on environmental issues of global significance, with a special focus on climate change and loss of biological diversity. Our goal is to make it easy for busy scientists to stay informed about and help raise public literacy and shape environmental policy on some of the most critical global environmental issues of our times.

SSI's primary *modus operandi* is the "action alert". This is where SSI staff identify a media or policy opportunity, alert appropriate network members via e-mail, and suggest effective actions scientists can take.

For more information, visit: <<<http://www.ucsusa.org/resources/ssi.html>>>

EarthTrends

Provided by the World Resources Institute (WRI) with assistance from several sponsors, EarthTrends is an environmental information portal, offering searchable databases, data tables, country profiles, maps, and feature articles in ten topical sections. These include Coastal and Marine Ecosystems, Climate and Atmosphere, Agriculture and Food, and Forests and Grasslands, among others. The databases may be searched by country, region, variable, and year. Data tables and country profiles are provided in .pdf format. This fast-loading site is an excellent source of authoritative environmental information for teachers, students, and interested users. Visit <<<http://earthtrends.wri.org/>>>.

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PUBLICATIONS OF INTEREST

Climate Change Science: An Analysis of Some Key Questions

This new report from the National Academy's National Research Council was produced in response to a request from the Bush administration. Written by a distinguished committee, the report attempts to summarize our current understanding of global climate change and examine what the future may hold for the 21st century and the extent to which warming may be attributable to human activity. The report argues for a great deal more systematic research to address current uncertainties in climate-change science. Users may read the full text of the report in Open Book format at the

National Academy Press site. Visit <<http://www.nap.edu/catalog/10139.html?onpi_newsdoc06062001>>.

From The Scout Report, Copyright Internet Scout Project 1994-2000. <<<http://scout.cs.wisc.edu/>>>.

UN Report: Closed Canopy Forests Face Extinction

It will take a miracle and concerted international effort to save the healthy forests left in the world from obliteration, a landmark study from the United Nations says. Most will disappear within decades, impairing the planet's ability to protect water, wildlife, the carbon cycle and even human life, the study, released yesterday in Nairobi, concludes. Canada, with its expanse of virgin boreal forest, plays a key role in preserving these crucial planetary systems. The report calls for this country and the other 14 national stewards of the world's most important forests to agree to take care of them. "Short of a miraculous transformation in the attitude of people and governments, the Earth's remaining closed-canopy forests and associated biodiversity are destined to disappear in the coming decades," says the study's foreword, written by Klaus Toepfer, the executive director of the United Nations Environment Program. The study is the first comprehensive global snapshot of how much forest cover is left on Earth. Scientists examined satellite photographs of all the world's forests, figured out how many had enough density to support wildlife, then examined pressures that could destroy those ecosystems. From the Toronto Globe and Mail.

Here is the direct link to the .pdf of the report:
<<<ftp://www.na.unep.net/pub/closedforest/closedforest.pdf>>>

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 December, 2001. 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 (.jpg format preferred). The deadline for submissions is November 15, 2001. For further information, please contact the ICAN office:

David Franklin, Outreach Coordinator/Editorial Assistant;
(360) 866-6788; <canopy@evergreen.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 monthly literature searches (AGRICOLA, CAB, and FORESTRY ABSTRACTS).

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