

# ENVIRONEWS

A Newsletter from the Environmental Science & Policy Cluster

June 2001



## W.M. Keck Environmental Field Lab

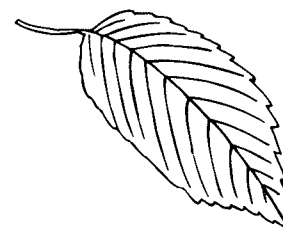
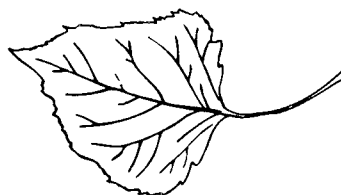
In December 1997 the W.M. Keck Foundation awarded the College a \$750 K challenge grant to construct an environmental field laboratory. After experiencing some construction delays, we are happy to report that the lab will be completed and ready for occupation in May 2001.

The WM Keck Lab will feature a teaching lab, dry lab, wet lab, computer lab, conference room and administration area.

Dr. Randy Chambers, director of the WM Keck Lab, arrived on campus in January and has been actively overseeing the completion of the lab. He shares his vision of the field lab's position at the College. "The WM Keck Environmental Field Lab will provide field and laboratory support for a college-wide initiative to enhance the curriculum in environmental science and environmental policy. By providing instructional and research opportunities across scholastic disciplines that make up the environmental programs on campus, the field lab will function as both a conceptual and practical focal point of interdisciplinary study."

When the lab opens this summer, a number of faculty and students will be using the facility to conduct research on the lake and the surrounding watershed. In the fall, two laboratory-based courses will be taught at the field lab, with more courses to follow in Spring 2002. Dr. Chambers states, "Our goal is to provide access to the science of environmental studies for students and faculty, for science and non-science majors, and for instructional and research purposes. In this fashion, we hope to foster integration of learning across the broad, interdisciplinary scope of the environmental studies program at the College."

The formal dedication of the lab will take place in September 2001.



## Dr. Randy Chambers Arrives at William & Mary

Dr. Randy Chambers, most recently from Fairfield University, arrived at William and Mary in January. Dr. Chambers holds the title of Associate Professor of Biology and Marine Science/Director of the WM Keck Environmental Field Laboratory. He will have teaching responsibilities both for main campus and VIMS students.

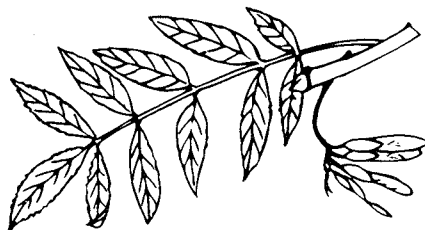
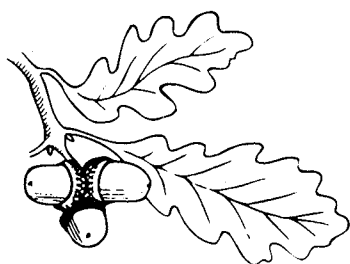
Dr. Chambers received his bachelor of arts in biology from Gettysburg College, his master of science in zoology from the University of Massachusetts-Amherst and his Ph.D. in environmental science from the University of Virginia. His primary area of research is wetland ecology and ecosystem dynamics of coastal watersheds. He is looking forward to performing extensive research on Lake Matoaka and the surrounding areas to establish a watershed history for this region.

Dr. Chambers views the primary pedagogical challenge of environmental studies programs is the development of comprehensive methods describing the dynamics of "natural" and "altered" environmental systems. However, the environmental data are derived from disparate sources in the sciences (e.g., biology, chemistry, geology, hydrology) and social sciences (e.g., economics, sociology, public policy, business administration), and the level of understanding of any one component of environmental systems will vary with the individual. For example, a student in geology may understand the chemical equilibrium of dissolved and particulate iron in freshwater streams, whereas a student in sociology may understand that water quality in the stream influences the density and types of housing projects around it. Both perspectives are important to describing the stream environment and its surrounding landscape; the trick is in finding ways to establish lines of communication and understanding among the multifarious perspectives that are inherent properties of environmental analysis.

As Director of the WM Keck Environmental Field Lab, Dr. Chambers plans to use the lab as a staging area for science curriculum across the College to provide these lines of communication. "We may begin with least common denominators for instruction in some courses, but we expect the students to find the 'most uncommon denominators' that are responsible for environmental change across spatial and temporal scales. For example, the WM Keck Lab will allow the economics major to measure in situ the long-term environmental benefits of an intact forest, for comparison with the short-term financial benefits of its harvest."

This spring Dr. Chambers submitted a Jeffress Trust research proposal to conduct a study of watershed-lake interaction in the College Woods-Lake Matoaka system. If funded, the work of coring lake sediments will require the services of faculty and students in biology and geology. The characterization of the watershed will require research in history, biology and geology, so the interdisciplinary aspects of environmental study will be applied in the proposed research. Similarly, a National Science Foundation proposal will be submitted this summer to establish a GIS center for watershed instruction and research across the environmental curriculum.

Dr. Chambers will reside in the City of Williamsburg. He and his wife, Beth, have two young daughters, Charlotte and Summer.



### **Five Students Receive Environmental Science & Policy Summer Research Scholarships**

The Environmental Science and Policy Cluster is pleased to announce the award of five summer research scholarships to William and Mary undergraduates this year. The students will perform research in a variety of areas, with two of the students assisting Dr. Chambers with his studies of Lake Matoaka. Below is a summary of the individual projects:

**Tom Chen**, Faculty Supervisor - Dr. Gary Rice, Chemistry

*Continued Evaluation of a Charge Coupled Detector (CCD) Array for Gas Chromatography Using Atomic Emission Detection*

This research will focus on enhancing the CCD's ability and sensitivity to detect halogenated compounds from the GC-HDD system. Special attention will focus on the quantitation of halogenated compounds by eliminating extraction procedures to isolate compounds from water matrices, which is a necessary step in current methodology for GC. The transfer or extraction process increases the likelihood of analyte loss or contamination which can lead to less accurate results. Other aspects of the HDD such as element selectivity and sensitivity will also be studied to hopefully improve and ultimately develop an efficient and accurate detector for element selective detector.

**Radhika Dave**, Faculty Supervisor - Dr. Randy Chambers, Biology

*Study of Turtle Population, Distribution and Species Diversity in Lake Matoaka*

Ms. Dave will be gathering data on turtle species density and population diversity in Lake Matoaka. The two arms of the lake have different pollution levels and this could influence the population density of the various turtle species. This research is based on the hypothesis that fewer turtles will use the more polluted arm of the lake. Throughout the summer, turtles will be trapped, identified and marked in both arms of the lake. The majority of the turtles will be painted turtles, but other less common species may be attracted to the baited traps. By marking the turtles, she will be able to determine which turtles are re-captures. With these data total population size can be estimated. Based on where the recaptures occur, geographic ranges of turtle use in the lake can be determined. Ms. Dave will gather basic data on turtle population size and distribution and determine to what extent habitat quality may influence these patterns.

## **Changes in ESPC Board**

Effective August 1, 2000, John Milliman, Professor of Physical Sciences at VIMS, succeeded Lynda Butler, Professor of Law, as Director for the Environmental Science and Policy Cluster. At this time, two members, Greg Capelli, Biology and Ralph Coppola, Education, completed their duty to the Board. New members Bob Archibald, Public Policy; Jill Burruss, Education; and Greg Hancock, Geology were added to the Board. Randy Chambers is also involved in his capacity as Director of the WM Keck Environmental Field Lab. Remaining members include Lynda Butler, Law; Gary Kreps, Associate Provost; Don Rahtz, Business; Gary Rice, Chemistry; and Dennis Taylor, VIMS.

## **New Special Interest Housing for Undergraduates**

In December 2000, the Cluster was approached by a group of students interested in creating a special interest house for students who are ecologically-minded. In February, the application was approved and next September 36 students will be housed in the first EcoHouse. The students will undertake a variety of projects including electrical and water use analysis and conservation, recycling, organic gardening and promoting ecological living to the rest of the campus. Randy Chambers has been named faculty advisor for the EcoHouse and their efforts will be financially supported by the Cluster. Keep your eyes and ears open for EcoHouse activities in the coming year.

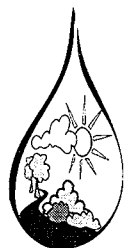
## **College Awarded Grant from Mellon Foundation**

This past January, the College received a three-year, \$300,000 grant from the Richard Mellon Foundation to plan and implement the redesign of the undergraduate Environmental Science and Policy Studies program. Among other things, this funding will allow us to 1) strengthen the policy studies component of the program, 2) create an ES/PS minor, 3) devise ways in which graduate students can be used as teaching fellows and research mentors, 4) increase the opportunities for undergraduate research, and 4) establish a dedicated faculty position with strengths in environmental studies and policy to direct the program.

This funding represents the third major influx of funds from private foundations, the Keck grant for construction of the Lake Matoaka Laboratory and the Canon support for our visiting scholars program being the other two. Collectively these grants represent more than \$1,000,000 that has been given to the College in support of our Environmental Science and Policy cluster.

## **Cluster Links with Business School on New Program**

One central component to our Environmental Science and Policy Studies major has been a seminar course in which students can integrate various disparate fields in achieving a global understanding of environmental processes and societal interactions. Todd Mooradian, Associate Professor in the Business School, has designed a Business School Course (B-492) entitled, "Seminar on Sustainable Commerce in Chesapeake Bay". This course, which will be open primarily to Juniors and Seniors, will draw on multidisciplinary approaches, including theories and frameworks from business, economics, law, and the sciences, to study the interrelationships between commerce and the environment. Activities may include traditional reading, lecture and discussion learning, but will also include fieldwork, original research and case writing, and the presentation of scholarship at a conference associated with the seminar. The topic for this seminar this coming fall semester will be, *Sustainable Commerce in the Chesapeake Bay: The Blue Crab Fishery*. Depending on the success of this first-offering, B-492 may well serve as the prototype of a seminar course required of all majors and minors in future years.



**Matthew Kirwan**, Faculty Supervisor - Dr. Gregory Hancock (Geology)  
*Origin and Evolution of High Elevation in Southern Appalachian Plateaus*

Many high elevation summits in the southern and central Appalachians are broad, flat plateaus. Their surfaces are covered with abundant rock fragments arranged into features normally restricted to exceptionally cold environments. Given the Appalachians current climate, it has been speculated that these features and the summit's topography are relicts from the last glacial period. By examining the surficial geology, the project will evaluate this explanation for their origin, calculate Pleistocene erosion rates, and determine if the summits are actively developing. New glacial period paleoclimatic interpretations may result, including the distribution of permafrost. The project will yield some indication of present and past geomorphic efficiency and determine the role of glacial cycles in changing the Appalachian landscape.

**Peter Maybarduk**, Faculty Supervisor - Dr. Abdollah Dashti (Anthropology)  
*Power, Perception and Action: Relations Between Cultures and Political Actors in Estado Delta Amacuro, Venezuela*

Peter will spend some of the time working from the office of Fundacion Tierra Viva, a Venezuelan sustainable development NGO. He will conduct interviews with Tucupita residents to help understand the Delta's social organization through their own eyes. For example, Tierra Viva describes itself as a community resource promoting the alliance of economic, social and environmental health. In the Delta they work primarily with the Warao, seeing them as both keepers of the Delta's biological wealth and as the primary victims of Delta politics. The Fundacion intends to, and generally does, treat the Warao with the utmost respect. But the relationship of aid between Tierra Viva and Warao communities itself implies a lack of confidence in Warao life. Five-hundred years of being "helped" by missionaries, anthropologists, political bodies, development interests and others has influenced and continues to depress Warao self-identity. Peter will analyze this construction of need and its roots in power dynamics, and then propose strategies for intervention.

Peter will also interview the National Guard, whose high-powered gunboats rip downriver past dugout canoes and thatched roof houses and illustrate the absurd discrepancies in Delta life. While visiting the capital city of Tucupita, he will interview academics and the staff of church mission schools about their relationships with the Warao and one another. In July and August, he will be in Jubasujuru, where he will listen to conversations about politicians and creoles. From the journal he has maintained since the project began last year, Peter will begin to piece together the social organization between groups in the Delta Amacuro. He will also complete a genealogy of power in the Delta which will trace the links from earlier political and ideological forces to their current heirs.

**Kristen Murphy**, Faculty Supervisor - Dr. Randy Chambers (Biology)  
*Abundance and Distribution of Salamanders in the Lake Matoaka Region in Relation to Degree of Habitat Disturbance*

Kristen will be spending the summer determining the distribution and abundance of salamander species in the Lake Matoaka watershed. More specifically, she will use a paired watershed approach to ascertain whether differences in salamander abundances in the College Woods region surrounding the lake are associated with the effects of environmental disturbance. The area provides a wonderful setting for this type of study, since the east side of the watershed extends right into the developed parts of campus, while the west side has a large wooded buffer. To sample the salamanders, I will be using a modified version of the North American Amphibian Monitoring Protocol, which involves the use



of artificial covers made of wood that are placed on the ground to attract salamanders. She will couple the sampling with tests of water quality at the sampling sites. She chose salamanders in particular because of their vulnerability to pollution, which makes them excellent indicators of water and environment quality. In addition, little is known of the salamander populations in the College Woods, and this will shed light on their current situation.

### **Third Canon Scholar Visits William and Mary**

When Orrin Pilkey looks at the coastal shoreline, he sees what is not there--what is slipping away on the heels of over-development and over-population. The geologist who pioneered the coastal management discipline three decades ago brought this perspective to the College as the 2001 Canon Visiting Scholar. Supported by Canon Virginia and sponsored by the Environmental Science and Policy Cluster, Pilkey's Feb. 19-24 campus visit included the geologist meeting with students, traveling to VIMS, presenting lectures at various departments and delivering one public lecture, "Beaches, Barrier Islands and Human Activities." He concluded his visit by taking a large group of students and faculty to the Outer Banks for a field study.

Pilkey is director of the Program for the Study of Developed Shorelines at Duke University's Nicholas School of the Environment, where his research focuses primarily on barrier island coasts. During today's unprecedented migration to the water's edge, both the country's fragile coastal environment and its die-hard residents are falling victim to severe weather and ever-rising sea level. "The [price we pay] will only get higher as the migration to the coast continues. Yet, the risks don't seem to dampen the human urge to live near the beach," Pilkey told a USA Today reporter last year.

Most recently, Pilkey and his research team have studied the Colombian Pacific Coast barrier island chain to determine how barrier islands evolve in tectonically active areas completely away from the influence of humans.

An outspoken environmentalist who advocates development that accommodates the changing nature of the shore, Pilkey has long criticized construction and engineering tactics that cause erosion and other irreversible coastal damage. Called the "deepest thinker we have about the complex relationship with the shoreline," Pilkey has rebuked sea wall construction, claiming that sea walls facilitate the development of ecologically sensitive land for economic gain. He has weighed in on such controversies as the decision to move the Cape Hatteras Lighthouse and efforts to stabilize Oregon inlet.

A graduate of Washington State College, Pilkey received a master's degree in geology from the University of Montana and a doctorate in geology from Florida State University. Affiliated with Duke University since 1965, Pilkey has also taught at the University of Puerto Rico and regularly conducted research with the U.S. Geological Survey in Woods Hole, Mass. He is the author of more than 20 books and 200 technical articles and has been recognized with awards from the American Geological Institute and the National Association for Geology Teachers.

"Canon Virginia Inc. is very proud to be a part of the Visiting Scholar Program," says Rick Hammond, senior director of the company's human resources/general affairs. "For a number of years, Canon has been an environmental advocate, and this program is just one way we can bring environmental concerns, programs and issues to the public."

*\*excerpted from an article by Amy Ruth, William & Mary News, February 16, 2001 edition*

