edited by DIANA PABST

Project 2061's *Benchmarks* Wins Broad Support

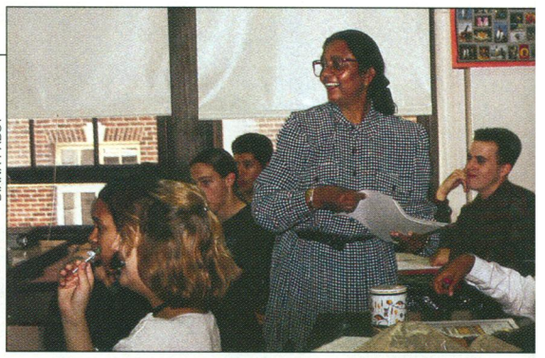
Ranjini Weerasooriya, a chemistry teacher at Philadelphia's Masterman School, is so good at her job Pennsylvania named her 1994 high school teacher of the year.

That talent made her a natural choice to help revise the city school district's high school science curriculum. Her assignment was to bring physics, chemistry, and physical science classes in line with "student learning outcomes"—requirements for attainment of certain knowledge and skills—mandated by the state legislature in 1993.

"I had done this already for my classes with *Benchmarks*. So I had a foundation and wasn't starting from scratch," says Weerasooriya. She was referring to *Benchmarks for Science Literacy*, a product of Project 2061, AAAS's long-term K–12 education reform effort, which aims to ensure that all high school graduates—not just a small elite—will be science literate.

Benchmarks is a set of guidelines that spells out what students should know and be able to do in science, math, and technology at the end of grades 2, 5, 8, and 12. Educators can use these "benchmarks" to design curricula that lead students toward the science literacy goals recommended in Project 2061's 1989 report *Science for All Americans*.

Philadelphia is one of six U.S. school districts where teams of teachers and administrators are serving as "R&D labs" for Project 2061. Weerasooriya had heard about the project from colleagues at science fairs. Now she's part of the Philadelphia team. "She called me for 2 years asking to be recruited when an opening occurred," says Malene Hilkowitz, director of the Philadelphia Project 2061 School-District Center, who also works in the school system's Office of Curriculum Support.



DIANA PABST

A+ performance. Project 2061 team member Ranjini Weerasooriya was Pennsylvania's high school teacher of the year in 1994.

Last year the Philadelphia team held *Benchmarks* workshops for more than 3000 teachers and education officials in Pennsylvania. Hilkowitz says interest is strong because the Project 2061 approach provides a strategy to help school districts meet the new state regulations. "*Benchmarks* makes learning outcomes very clear," she says.

Hilkowitz, who taught high school biology, says Project 2061 ideas have changed her own approach as an educator. She recalls stopping one day in the middle of a lesson: "I realized what I was

AAAS Meeting to Explore Effects of Population Growth on Biodiversity

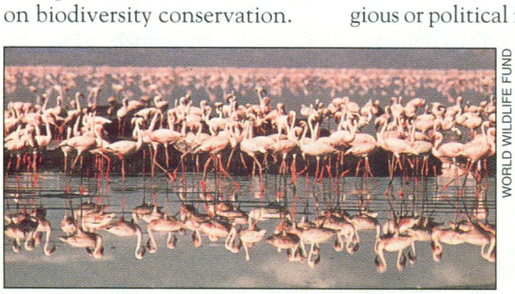
Lake Nakuru is home to so many flamingos the waters seem perennially edged in pink. Last year 200,000 visitors traveled to the lake in southwestern Kenya, known for its pristine beauty.

For people in the neighboring town of Nakuru, the lake has been an exclusive preserve of the rich, with little connection to their modest lives. "The lake is visited by the affluent and is the source of a tremendous amount of income. As long as the local people saw the flamingos return every year, they assumed everything was well at the lake," said Ramesh Thampy, project executant of the World Wide Fund for Nature's Lake Nakuru Conservation and Development Project.

The lake's guardians, however, are worried about effects of the town's soaring population, which grew from 50,000 to 300,000 in the past two decades. Two sewage plants were built, but the quality of sewage and urban runoff into the lake is a concern.

With the help of government educational programs, the residents have begun to understand the need for policies that will protect the lake, Thampy says. "The realization has begun to dawn on us that our life-styles have an impact on the lake. Hopefully, the upcoming AAAS meeting will shed some light on the science necessary to deal with these kinds of issues."

Thampy will tell his story to a group of scientists and policy-makers gathering in Washington, D.C., next month at the invitation of AAAS's Directorate for International Programs to discuss the impact of population growth and related factors on biodiversity conservation.



WORLD WILDLIFE FUND

Feathered shoreline. Flamingos are a major wildlife attraction at Kenya's Lake Nakuru.

"We will look at all aspects of human population pressures that contribute to the loss of biodiversity in protected areas," says Victoria Dompka, director of AAAS's newly expanded Population and Sustainable Development Program, which is convening the meeting. The group will devise recommendations for scientific research priorities that are policy-driven, and the report will be disseminated worldwide.

Dompka says the need for the meeting became apparent at the United Nations International Conference on Population and Development (ICPD) in Cairo last year. "It highlighted how the population and environment debate can be obscured by religious or political issues," she says. "We want to concentrate on the science and policy components and lend some scientific grounding to this topic." The United Nations Population Fund and the Turner Foundation are partially funding the AAAS meeting, to be chaired by Dr. Fred Sai of Ghana, former chair of ICPD.

Thampy from Kenya and experts from India, Indonesia, Ecuador, Colombia, and the United States will describe population pressures on biodiversity and protected sites in their countries and the science and policy issues they face. The group will discuss how these cases relate to similar cases around the world.

This will be important to Thampy, who hopes to obtain information on how policy-makers in Kenya can protect the 188-square-kilometer park amid mounting population and consumption pressures.

For now, he says, the park is safe. The town's sewage treatment plants are being expanded, offering the lake a measure of protection. "But in 5 to 10 years, we will be back to square one. Only if we can get more support for our cause will the necessary measures be taken to protect the lake."

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giving them was facts, but what they needed to understand was concepts—the relationships between structures and functions of cell components. ... You don't just give them a vocabulary. You must give them a framework on which to hang facts and information."

Project 2061 emphasizes the progression of students' knowledge of science over 13 years of schooling. So teachers from all grade levels attend *Benchmarks* workshops together, then incorporate the ideas into lesson plans tailored to the age and ability of their students, but with a long-term science literacy goal in mind.

Ken Rovine, a science teacher at Hill Elementary School, and Carla Glover, who teaches science to special education students at Frederick Douglass Elementary School, attended a *Benchmarks* workshop last summer, then organized one for 300 colleagues. Glover used the learning goals to design a unit focusing on the rainforest. "I'm amazed at how much the kids have picked up since we started," she says. "Before, benchmarks or standards weren't expected before grade 4 or 5. That's too late. We're starting them on the way earlier."

At Masterman, a school for acadmically talented students, Weerasooriya teaches advanced placement chemistry. But she also takes to heart Project 2061's goal of science literacy for all. She organizes open lab sessions for students in other classes "who are scared of science" and holds science workshops for parents and people in the community.

Weerasooriya—a native of Sri Lanka whose students call her "Doc"—joined the Philadelphia schools 7 years ago after completing her doctorate at Temple University, with tuition assistance. "I decided to teach in city schools as a way of expressing gratitude for the education I got in this country," she says. "That's why I wanted to be an outstanding teacher."

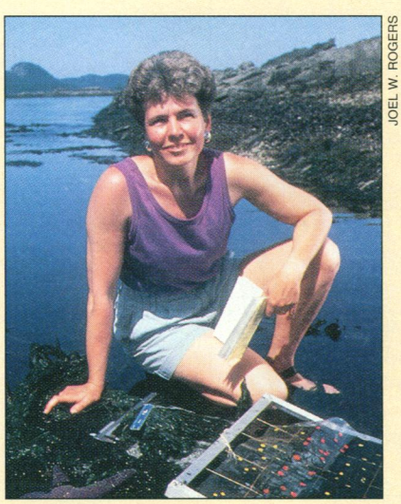
For more information about Project 2061 and *Benchmarks*, call Mary Koppal at 202-326-6643.

Bringing Science to Bear in Solving Environmental Problems

Editor's note: Jane Lubchenco, the new president-elect of AAAS, has been on sabbatical in New Zealand. Some quotes here are from a profile by Pat Filip in The Oregon Stater *alumni magazine.*

Jane Lubchenco sees her research specialty—rocky intertidal communities—as an excellent window for viewing many of the central issues in ecology. "Rocky shores are wonderful model systems, as well as beautiful places," says the marine ecologist and distinguished professor of zoology at Oregon State University, who works on rocky shores in Oregon and around the world.

Her research interests include conservation biology, biodiversity, ecological causes and impacts of global change, and sustainable ecological systems. Her research on seaweeds, plant-herbivore interactions, and biodiversity is widely cited. She has two "citation classic" papers.



JOEL W. ROGERS

On the job. Jane Lubchenco working at Washington's San Juan Islands.

The scientific understanding and the broad perspective she has gained as an ecologist make Lubchenco concerned about our stewardship of the world and its resources. "We are changing our planet faster than our ability to understand or undo many of the critical changes," she says. Moreover, "the unprecedented rates and nature of these changes make it difficult to predict their consequences." That concern has motivated her to pursue many activities to help address serious environmental problems.

In 1991, as vice president of the Ecological Society of America, she led efforts by the group that resulted in the Sustainable Biosphere Initiative, which articulated the relevance of basic ecological research to environmental problems, recommended research priorities, and stressed the need for ecological expertise in environmental decision-making. Several federal agencies changed budget priorities in response to it, and the group forged some strong links with the current administration, she says.

Recently, Lubchenco used funds from two major awards—a MacArthur Fellowship and a Pew Scholarship in Conservation and the Environment—to launch the international Sustainable Biosphere Project, a scientific program to propose environmentally sound policy and management options for seven regions of the world. Sponsored by the Scientific Committee on Problems of the Environment (SCOPE) of the International Council of Scientific Unions, the program is aimed at formulating more sustainable natural resource practices and policies.

"As scientists, we have to become more active in addressing environmental issues, influencing policy, and educating the public," Lubchenco says. AAAS is uniquely qualified to do that, she adds, because of the caliber and dedication of its members, its organizational capabilities, its media relations, and its ability to represent the full range of science. She believes AAAS should focus on activities "most likely to make a difference in improving the wise management of our planet."

"The exponential growth of the human population, our unsustainable use of resources and generation of wastes, increasing poverty, inequity, and social injustice will have increasingly serious consequences," she says. "We must bring the full power of science to bear in solving these problems."

One intent during her AAAS tenure is to build more efficient mechanisms for making scientific information available to policymakers, resource managers, and the public. "All too often, our nation's policies do not take advantage of the current scientific understanding." Also, "we must provide better training in communication skills for scientists," says Lubchenco, who has collaborated on educational films for PBS and National Geographic Society.

Another interest is promoting creative options for scientists who want to combine career and family. Two decades ago, in a novel arrangement, Lubchenco and her marine ecologist husband Bruce Menge relinquished full-time academic jobs elsewhere to split an assistant professorship at Oregon State University, so they could raise children without sacrificing research and teaching. They were seeking, they wrote in *BioScience* in 1993, not the "mommy track" or the "fast track" but the "sane track." A role model was Lubchenco's mother, a pediatrician who practiced part-time when her six daughters were young. Both gradually assumed full-time positions and are now tenured professors. Lubchenco was chair of the zoology department for 3 years.

The couple still spend much time with their sons, 16 and 13. The entire family went to New Zealand, where Lubchenco and Menge collaborated on a research project.