ly enough, concludes the report, which argues that environmental research "should be one of the highest priorities of the [NSF]," with additional funding for everything from more interdisciplinary research to objective reviews of data for policy-makers.

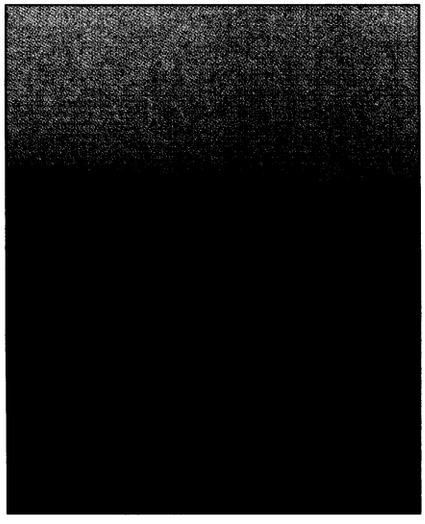
According to the panel, one area ripe for more funding is ecosystem services, a field that blends social sciences and environmental science to get a handle on the economic benefits of, say, preserving watersheds, which filter contaminants from drinking water. Also high on the agenda is research on environmental technologies, such as remote sensing of landscapes and DNA chips that can identify which genes a microbe needs to thrive in a particular environment. "There are really exciting opportunities for progress," Lubchenco says.

As the NSB did last year, the task force rejected the notion that NSF establish an institute or new directorate. Overseeing environmental research, it says, can be done by a "high-visibility, NSF-wide organizational focal point" that would "[identify] gaps, opportunities, and priorities" and have "budgetary authority." One possible model, says Lubchenco, is the agency's Office of Polar Programs.

Some environmental researchers believe that approach doesn't go far enough. Ecologist H. Ronald Pulliam of the University of Georgia, Athens, says the vaguely defined entity NSF envisions may not accomplish the "change in culture" that's needed, among other things, to prevent interdisciplinary studies from falling into the cracks between the agency's single-discipline review panels. "If it's just more money, I think that's the wrong approach," says Pulliam, who sits on the board of the Committee for the National Institute for the Environment, a Washington, D.C., nonprofit that advocates the establishment of an environmental institute within NSF.

The overarching concern, however, is whether Congress will go along with a $1 billion boost earmarked for environmental science. Howard Silver, who heads a lobby group called the Coalition for National Science Funding, says he is skeptical that such funding will materialize anytime soon. But he applauds the agency for "thinking big." As he says, "One can plant a seed."

–JOCELYN KAISER



CREDITS: (TOP) MUTSUMI Y. STONE; (BOTTOM) DANY KRIST/UNIPHOTO

New research horizon? An NSF boost for environmental science could benefit salt marshes.

ENDANGERED SPECIES

A Plan to Save Hawaii's Threatened Biodiversity

HONOLULU—Botanist Steve Perlman will gladly risk his life to help endangered species, shimmying to the top of a rare species of palm tree to pluck fruit with viable seeds, or rappelling down a cliff above pounding surf to dab pollen on a lonely dicot clinging to the rocks. But even such heroics aren't enough to stave off the danger looming over Hawaii's unique native habitats, now under siege from alien species and development. "We're fighting a losing battle," says Perlman, who works at the National Tropical Botanical Garden in Kauai. "It's depressing, especially when you witness an extinction that could have been prevented."

Countdown to extinction. New initiative hopes to save endangered Hawaiian species, such as this *Brighamia*.

Now researchers are hoping to turn the tide before the casualties become unbearable. At the Hawaii Conservation Conference here last week, an advisory group of government and university scientists and land managers unveiled a draft plan for a $200 million, 5-year initiative to preserve Hawaiian biodiversity. The plan, called Legacy 2000, gets a warm reception from conservationists. "I think it's dynamite," says William Everett, president of the Endangered Species Recovery Council in La Jolla, California. For the initiative's architects, however, the hard work has only just begun: They must find a way to pay for it. "It will have to be a manna-from-heaven situation," admits Robert Smith, manager of the U.S. Fish and Wildlife Service's (FWS's) Pacific Islands Ecoregion. The challenge, says Michael Buck, administrator of Hawaii's Department of Land and Natural Resources (DLNR), will be to convince people on the U.S. mainland that tackling Hawaii's ecological woes is just as important as, say, fixing the Everglades, a multibillion-dollar job that Florida and the federal government are about to embark on (*Science*, 9 July, p. 180).

Formed over the last 5 million years from volcanic eruptions, the main Hawaiian islands once had a breathtaking variety of species—many found nowhere else on Earth—that evolved from a few hardy pioneers. But in only 1500 years or so of human habitation, Hawaii has lost two-thirds of its native forests and hundreds of species. According to FWS, Hawaii has more species on the federal endangered list—297—than any other state. Major culprits in this decline are habitat loss and alien species, such as weeds and feral pigs, that prey on the natives or flourish in the absence of predators. But although a decade-long slump in tourism revenue has resulted in scant state support for conservation programs, not all the news is bad. Managers are making inroads against a particularly nasty invasive plant called *Miconia*, and conservation programs are beginning to involve Hawaiians of Polynesian descent, boosting popular support for such measures.

Hoping to parlay these successes into an ambitious program to protect more species across larger swaths of land, a panel composed of representatives from several federal and state agencies and the University of Hawaii, Manoa—the major players that manage or study Hawaiian species—drafted Legacy 2000. Highlights of the initiative include calls for $5 million a year for community-based conservation, $3 million a year for academic research on Hawaiian ecosystems, and $4 million a year for a slate of programs to find Hawaii's rarest species, bolster endangered species through captive propagation, and create a plant germ plasm storage network.

Few scientists would quibble with those goals. But some experts point out an additional vital step: Hawaii must do a better job of interdicting species that slip across its borders. "One of the major threats to endangered species is the hemorrhaging of alien species into the state," says DLNR's Fred Kraus. Legacy 2000 does have some provisions that target alien species, particularly stepped-up inspections of flights from Guam and elsewhere that may be carrying the brown tree snake. A particular problem, Kraus says, is that Hawaii now bars importation of only a few kinds of noxious plants. Regulations to close this loophole, Kraus says, are "sorely needed."

Smith and other managers plan to incor-

porate comments they have received at the conference into the proposal, then gear up to mount a major effort to sell it to potential funders in Congress, nonprofit foundations, and the private sector. The clock is ticking. "This is a pretty scary time for us," says Buck, whose department manages more than half the state's land. "If we don't get the resources" to protect the native ecosystems before more species are lost, he says, "we may never get another chance." –RICHARD STONE

SPACE SCIENCE

U.N. Plans Its Future In Space

At a meeting in Vienna last week, the 188 member states of the United Nations adopted a declaration on space and human development—their first in 17 years—that emphasizes the importance of space science and technology for improving human health, studying the environment, and helping sustainable development and disaster management. Although the declaration does not commit any country to a specific course of action, it provides a road map for cooperation among the U.N.'s member nations as well as technical and political recommendations for future space activities. Delegates also approved a voluntary fund to pay for the action plan that accompanies the declaration and suggested that countries be allowed loans from the World Bank to enable them to use the international space station.

"What the UNISPACE III meeting has given us is the bible for the U.N.'s involvement in space and human development for the next 10 to 15 years," says Hans Haubold of the U.N.'s committee on the peaceful use of outer space. Adds U. R. Rao, former head of the Indian Space Agency, who presided over the meeting, the delegates "listened to the needs of the developing as well as industrialized countries."

Most of the conference focused on the application of space technology to environmental issues. If member states act on the decisions made, possible spin-offs could include the establishment of a global, space-based system for disaster management and special funds for regional remote-sensing centers. It also called for a reduction in the growing swarms of space debris circling Earth and in the electromagnetic pollution that makes both ground-based astronomy and communication with spacecraft difficult.

But basic science was not ignored: The gathering gave its blessing to several space science and astronomy proposals, including networking small telescopes in developing countries and building an orbiting world space observatory. Both of these sprang from a series of workshops organized jointly by the U.N. and the European Space Agency (ESA) that aim to improve astronomical research and education in the Third World. Each workshop, held in a developing country, brings local scientists together with the top international researchers in their field.

Now that the concept of a world space observatory has the meeting's endorsement, possible participants will have to decide what sort of observatory they want and how to build and pay for it. It will most likely be a 1.5- to 2-meter ultraviolet telescope, says ESA's Willem Wamsteker, a former project scientist for the International Ultraviolet Explorer, who helped organize the workshops. None of the major space agencies have plans for an ultraviolet space telescope, so Wamsteker argues that such an instrument would be both scientifically important to all nations as well as a technical challenge for developing nations.

U.N.'S PROPOSED VARIABLE STAR NETWORK

Optical telescopes (all less than 0.5-meter aperture)	
Sri Lanka	
Colombia	
Honduras	
Jordan	
Egypt	
Philippines	
Paraguay	
Radio telescopes	
Colombia	5.5 meters
Jordan	32 meters*
Egypt	10 meters

* Under construction

The Vienna meeting also endorsed a plan to coordinate observations of variable stars by networking together existing small telescopes in places as far afield as Paraguay and Sri Lanka. Variable stars are a good target, according to Haubold, a professor of theoretical astrophysics, most recently at the University of Vienna, because they provide information about star structure and evolution and because there are many left that need cataloging. Such studies would also provide useful training in countries that do not have a strong tradition of modern astronomy. The participants are now discussing their ideas with the American Association of Variable Star Observers, and more concrete technical plans for turning these individual telescopes into a coordinated global network will be finalized at a meeting in Toulouse, France, next June.

–HELEN GAVAGHAN

Helen Gavaghan is a writer in Hebden Bridge, U.K.

SYNCHROTRON RADIATION

France Takes Share in British Synchrotron

France has all but abandoned its plans to build a new, state-of-the-art synchrotron facility, called SOLEIL, which had been on the drawing board for 8 years. Earlier this week, the French government announced that it will instead invest heavily in a new synchrotron to be built in the United Kingdom, together with the British government and the Wellcome Trust, a London-based charity. That decision makes it unlikely that plans for SOLEIL will be realized, France's science minister Claude Allègre told *Science*. French scientists, who favored having their own facility on French soil, are disappointed.

Materials scientists and biologists use synchrotrons to determine a compound's atomic structure from diffraction patterns produced when x-rays scatter off its internal atoms. SOLEIL, a 106-meter-diameter ring whose location in France was yet to be decided, would have given French scientists their own third-generation x-ray source. But Allègre had hinted several times that, with several other European synchrotrons to become available in the next decade, the $180 million project would be redundant. Instead, he has now opted to become a partner in DIAMOND, a new synchrotron ring to be constructed in Britain. The French and British governments and the Wellcome Trust will each donate $57 million over the next 7 years to build the machine, plus $10 million to $13 million yearly to operate it. Each will get an equal share of the facility's beamlines.

Allègre says his decision was inspired by the need to further European scientific cooperation. "Of course, there are financial reasons [as well], but they are second to my wish to build a European [scientific] community," Allègre says. "I will not approve large French projects anymore, my priorities are European instruments." France's participation in DIAMOND, added to its use of the European Synchrotron Radiation Facility (ESRF) in Grenoble and LURE, an older x-ray source in Orsay, will guarantee the country's researchers access to x-ray beams, Allègre asserts.

But French scientists disagree, arguing that the decision may stifle future research projects. Besides, says Yves Petroff, former director-general of ESRF and a member of SOLEIL's scientific council, using several European facilities will drive up travel and other costs and may be more expensive than SOLEIL would have been. "This decision has been taken only by the minister, and the scientific community has not been involved," says Petroff. "We have been kept completely outside of it." –ALEXANDER HELLEMANS

Alexander Hellemans is a writer in Naples, Italy.