ground colors her view of GPB or that she opposes the program. "I am a Stanford graduate," says the chief scientist, who received a B.A. in English there before attending graduate school at Caltech. "I received my Ph.D. in physics, not astronomy, and in my heart I am deeply attached to the issues that physics poses. Since I was a little girl I wanted to be a nuclear physicist."

Now GPB's fate lies squarely in the hands of the Fitch panel. Most panel members declined to discuss the study, but sources close to them say the majority are sympathetic to the program—particularly because its charter does not call for the group to compare GPB with astrophysics missions. "The report from the academy is going to be positive, and Goldin won't have any way to withstand Congress' desire to put [funds] back," predicts one NASA manager.

If that's so, Goldin will be ready: On 9 February he ordered his managers to find ways to factor in GPB's $50 million without increasing the agency's overall 1996 budget, according to other sources. Only a small portion—under $10 million—would come out of the hide of astrophysics programs, they add. Mineta says he will abide by the Fitch panel recommendations, but he is confident GPB will come through with flying colors. But Representative Anna Eshoo (D–CA), who represents Palo Alto and also backs the program, is less sanguine, as GPB is not in NASA's formal budget request. "It's hard to be optimistic about the future of the program in Congress," she said last week.

She may be underestimating Everitt. And now that he knows his way around Washington, he clearly relishes the challenge of a political fight. "It's a chess game, sort of like the one in Alice in Wonderland except played with real people," Everitt says.

Even so, he doesn't recommend that young scientists book the next plane to National Airport in the hope of advancing their programs. "I worked on GPB for 15 years before I once visited Washington" to lobby Congress, Everitt insists. "First you have to have your technical and scientific act together. And don't blithely assume that the world owes you $500 million. It doesn't."

Love him or hate him, it's hard to deny that Everitt's act, both scientific and political, is first-rate. "He's such a delight," says Representative Mineta. "And he is one heck of a salesman."

–Andrew Lawler

ECOLOGY

NRC Urges Sea Change in Marine Studies

Ecologists and conservationists have succeeded in making biodiversity a household word, largely by focusing attention on a few land ecosystems such as the tropical rain forests. But 70% of the Earth is covered by water, and so far the marine environment has been virtually ignored—a situation that ought to change, according to a National Research Council (NRC) report published this week. The report, entitled "Understanding Marine Biodiversity," outlines a research agenda for exploring the understudied biodiversity of the oceans. "It's time to step up to the problems of marine biodiversity as we did 20 years ago in the tropical ecosystems," says James Carlton of Williams College and Mystic Seaport museum in Mystic, Connecticut, who is co-chair of the report.

Other biologists point out that overfishing, pollution, and other human activities have already damaged economically important coastal areas and fishing stocks. "It's important at a minimum to inventory and assess marine stocks and the biodiversity of the oceans—if only to assure the sustainability of one of the world's major food sources, seafood," says Rita Colwell, president of the Maryland Biotechnology Institute. (She is also president of *Science*'s publisher, the American Association for the Advancement of Science.) Many biologists acknowledge that a big boost in spending isn't likely. But the report says the field could also benefit from a new emphasis on systematics and a shift in focus away from isolated bays or reefs to whole regions of the ocean.

The report's authors found plenty of warning signs that the oceans are in trouble. Take Chesapeake Bay. One hundred years ago it supported vast reefs of oysters, which were capable of filtering all the water in the bay every week. Today, overharvesting, local pollution, and disease have decimated the population so that the surviving oysters require a year to filter the bay's water. The shift has cascading effects up the food chain, because the amount of organic matter in the water column, nutrient dynamics, and light levels have all been dramatically altered. The report is peppered with other examples, from declining Caribbean reefs to exhausted fisheries on Georges Bank.

In spite of such warning signs, few marine extinctions have been documented (*Science*, 18 February 1994, p. 918). But then, scientists have only just begun to explore the diversity of life in the sea. While terrestrial biologists often discover new species, genera, or even families, the oceans have been so poorly investigated that marine scientists find entire new phyla. The report cites one group of tiny algae, the prochlorophytes, which were not discovered until the mid-1980s, but are now known to contribute up to 40% of the primary productivity of some areas of the ocean.

"It's time to step up to the problems of marine biodiversity. ..."

—James Carlton

To shore up the effort, the report gives strong support to a chronically weak discipline—the systematics of marine organisms. "People have been afraid to put systematics in their grant proposals because they feared it was perceived as old hat. We're asking them to come out of the closet," says Cheryl Ann Butman of Woods Hole Oceanographic Institution, the other co-chair of the initiative.

But the report also notes that understanding marine systems requires more than just systematics. In the past, ecologists have tended to zoom in on one piece of marine habitat, studying competitive interactions in a patch of rocky intertidal real estate, for example, or predation on part of a single coral reef, says Phil Taylor, program director for biological oceanography at the National Science Foundation (NSF). The new report reflects a growing consensus that researchers must explore the larger scale factors that control diversity, because far-flung regions of the ocean are tightly linked by water flow. For example, to study the settlement of young oysters and other mollusks in Chesapeake Bay, it's also necessary to study the health of nearby areas, such as Delaware Bay, as larvae travel freely between them.

The report's message is winning support from terrestrial biodiversity experts, such as E. O. Wilson of Harvard University, who says he welcomes the entrance of marine animals "onto center stage in biodiversity studies." But the recommended large-scale research costs money, and although the report calls for "major new funding," few researchers are optimistic about their prospects right now.

Still, the initiative itself was sponsored by the federal agencies that fund the bulk of marine research—NSF, the Office of Naval Research, the National Oceanic and Atmospheric Administration, and the Department of Energy, as well as the National Biological Service. Even if big new grants must wait, the new research priorities are likely to appear in the funding patterns of these agencies, says Taylor. One way or another, fish, clams, reefs, and whales may join trees and birds in the biodiversity spotlight.

–Elizabeth Culotta