

MARINE BIOLOGY

Marine Census Scrambles to Fund a Second Phase With Expanded Focus

Last year, the \$650 million Census of Marine Life (CoML) finished up a decade of work with a bang. This massive effort, involving 2700 scientists from 80 countries, led to thousands of research papers, the discovery of 6700 new species, and a comprehensive database of marine biodiversity (*Science*, 6 August 2010, p. 622).

But will there be an encore? A dozen CoML scientists, hopeful of continuing the momentum that brought together the once-fragmented marine biology community, have put together a new research agenda, called “Life in a Changing Ocean,” that goes beyond simply describing and counting marine species and determining their distributions. It calls for studies that track how marine biodiversity is changing through time, data that should prove useful for policymakers. “The next phase needs to think about using CoML phase one as baseline data,” says CoML scientist Yoshihisa Shirayama, executive director of the Japan Agency for Marine-Earth Science and Technology in Yokosuka City.

Yet the glue that held together the census’s 540 projects—including fish-tagging operations, deep-sea dives, and coastal and polar surveys—is about to dry up. The Alfred P. Sloan Foundation, which has provided \$75 million for CoML research projects and for a coordinating umbrella group, has decided it won’t fund phase two. “I want to pass the baton,” says Sloan’s Jesse Ausubel, an environmental scientist who helped set CoML’s original agenda (*Science*, 2 June 2000, p. 1575).

Sloan support continues only through October, and so far none of the other foundations approached have offered to take up the baton, says Paul Snelgrove, a marine biologist at Memorial University of Newfoundland, St. Johns, in Canada, who is coordinating phase two planning. “Time is tight and it’s worrisome.” Some organizations have asked for more details, so Snelgrove and his colleagues are scrambling to put together an expanded research proposal that they plan to present to their peers at the Second World Conference on Marine Biodiversity late September in Aberdeen, U.K.

There’s plenty the first census didn’t accomplish: An estimated 750,000 marine species—not counting the microbes—remain undescribed, few numbers exist about the abundance of many specific marine organisms, and the distribution of species is unknown for the Indian and parts of the Atlantic and Pacific oceans. But Snelgrove and others say they want more than just a bigger, better census.

The new initiative calls for determining which marine organisms contribute to the overall function



Keeping tabs. Standardized tools (*inset*) make possible the comparison of coastal surveys across time and places.

of the ecosystem, their so-called ecosystem services, and how those services are changing as human impact on the oceans increases. For example, how does pollution alter the species mix and in turn affect nutrient cycling or carbon burial?

A second focus would be to provide the information that marine and coastal planners need to ensure the protection of overall marine biodiversity—and not just the conservation of a few charismatic species. And the new phase should encourage management strategies that maintain a healthy ocean in the face of increased fishing, oil drilling, and other human activities.

Key to all this is using molecular and other techniques to track changes in biodiversity over time. Many long-standing marine programs track shifts in ocean currents, temperature, and other physical characteristics of the sea, but “really, where rubber hits the road,

is how the biology is changing,” says Boris Worm, a marine ecologist at Dalhousie University in Halifax, Canada. “This is the critical missing piece.”

Thanks to CoML, some monitoring is under way, such as a multicountry project that is examining near-shore biodiversity with standardized methods across 40 sites in South America. That survey just received \$215,000 to continue for the next 2 years, and Snelgrove’s co-chair, Patricia Miloslavich of the University of Simón Bolívar in Caracas, hopes a CoML phase two will raise \$6 million for 10 3-year coastal or marine surveys worldwide.

CoML’s greatest accomplishment, Worm and others say, was that it united the marine biology community for such surveys and showed that big, collaborative science was possible in this field. With the new research agenda, Worm says, “the idea is to build on that momentum, but make it more applicable to the society at large.”

The original project was so successful that the CoML Scientific Steering Committee just won the \$510,000 International Cosmos Prize (see p. 680). Yet that prize money is far too little to keep CoML’s management structure going for phase two. “This is the difficult part, to get that money that will keep us together,” Miloslavich says. She estimates that at least \$1 million per year for the next 3 years is

needed to maintain the CoML secretariat.

If funds are not forthcoming, “my guess is that then everybody would go back largely to working in their own little world,” Worm says. Yet others are more optimistic. “It doesn’t take funding to keep in touch,” says CoML founder J. Frederick Grassle of Rutgers University in New Brunswick, New Jersey. “A lot of the projects are continuing one way or another.”

Miloslavich looks at the Cosmos Prize as a harbinger of support to come. “It’s an encouragement that [we] are on the right track,” she says. Given all the public attention now paid to oceans in part because of CoML’s results—there’s even a syndicated comic strip series that featured the census—“I would expect the community to pitch in,” Worm agrees. “It would be sad to think that all the wonderful things people said about the census was just lip service.”

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