

Dr. Ellen Prager
Assistant Dean
Rosenstiel School of Marine and Atmospheric Science
University of Miami

Dear Admiral Watkins and Commission Members

Thank you for your thoughtful questions and comments on education and outreach following my testimony during your February visit to Florida. As Dr. Coleman requested I have investigated how much NASA invests in education activities. In the President's FY2002 budget, \$153 million was requested for academic programs, which includes education (\$71 M) and minority university research and education (\$82 M). In addition, there is also a strong description of their efforts in communication knowledge, which I interpret as being outreach. However, from the information available I was not able to ascertain the amount of funding put towards this goal. In summary, a conservative estimate is that NASA has annually requested over \$150 million for education specifically.

While a commission member made the point that in the scheme of things the \$10 to 20 million investment I recommended is not a lot, for the ocean education and outreach community these are big numbers, not enough, but relatively speaking, huge. It is my and many others hope that education and outreach will be one of the areas that the Commission can make history on, by providing a strong recommendation and helping our political representatives see both the need and the potential solutions. Investing in education and outreach now is an investment in the future scientific workforce, the ocean literacy of our nation's citizens, and the stewardship of this blue planet.

Answers to additional questions:

Examples where research has been integrated into education and outreach:

Though they are currently seeking a new sponsor, Our Ocean World (www.ouroceanworld.com) radio spot has successfully incorporated research into a 90-second daily radio spot about the oceans. As editorial partners, we suggested appropriate topics and edited the scripts for scientific accuracy. The spot was aired on over 200 stations nationwide and did an excellent job of incorporating research into outreach. Scientists from around the Nation were often interviewed about their latest findings as part of the spot and many of the topics came from peer-reviewed publications in magazines such as Science and Nature. I personally heard from many people who had heard and enjoyed the short pieces on NPR stations. Unfortunately after the tragic events of 9/11 the sponsor had to pull out due to economic difficulties. Because outreach efforts such as this do not fit a standard RFP in the federal government and other funds are limited, they have been searching for a new sponsor unsuccessfully for months.

The Jason Project run by Bob Ballard through the Jason Foundation is another example where research has been used in education. Through yearly expeditions and educational

materials the programs bring researchers, educators, and students together to explore a wide variety of topics.

(www.jasonproject.org)

There are also a significant number of excellent teacher training programs throughout the nation that encourage teachers to participate in ocean research. This is important because many of our K-12 teachers have never conducted research or actually studied science. So these types of programs help in two ways, 1) providing content knowledge about the oceans and 2) providing the teachers research experience and the confidence to teach about how science is done. At The Rosenstiel School we provide two teacher training programs in the summer. One focuses on providing teachers research experience and content knowledge in the marine sciences. The other program uses research and case studies that have been synthesized into educational modules to help teachers bring environmental science into the classroom through hands-on inquiry methods.

(www.rsmas.miami.edu/support/outreach/teacher-programs.html)

The Sea Education Association (SEA) in Woods Hole, MA is another example where research and the principles of research have been incorporated into education. Students enrolled in the SEA Semester program conduct a research project that includes sampling at sea and much of their work is based on the results of previous studies. SEA also has an exemplary teacher training program during the summer that is a shortened version of their semester long program. (www.sea.edu)

How do you justify putting education at the top of an ocean strategic plan?

Education is the foundation upon which this nation is built. It provides a strong workforce to remain competitive in the international arena and enables the nation to tackle the daunting problems that we face as populations escalate and the planet's resources decline. Education should be a priority in any strategic plan that focuses on the future of our Nation. Since the oceans are critical to that future, ocean education and outreach should be of the utmost importance in the ocean strategic plan.

It is through education that we will train the experts needed in ocean science, policy and management to implement the ocean strategic plan not just today, but well into the future. It is through education and outreach that we can mobilize our citizens to care about the sea and make oceans an important topic for political discussion and federal investment. It is through education and outreach that we will engage our politicians, the media, and the business community to support and recognize the importance of the ocean.

One may ask in fact why we do ocean research or plan for a global ocean observing system. The answer should be for their value to society. Yet it is often in part the education and outreach that enables the translation from research to that which can benefit the public. In short, without adequate education and outreach, an ocean strategic plan will fall short of its goals now and certainly in the years to come.