

September 23, 2002

Admiral James D. Watkins, USN (Ret.)
Chairman, United States Commission on Ocean Policy
1120 20th Street, NW
Suite 200 North
Washington, D.C. 20036

Re: National Marine Educators Association's Recommendations to the
United States Commission on Ocean Policy

Dear Admiral Watkins:

On behalf of the National Marine Educators Association (NMEA), I would like to express our appreciation to the United States Commission on Ocean Policy (Commission) for its interest in and dedication to marine and ocean education in this country. The NMEA is a professional organization that delivers aquatic, marine, and ocean science education nationally and regionally through its 1,100 members and 17 state chapters. Our membership includes professionals with backgrounds in education, science, business, government, museums, aquariums, and marine research, and others interested in the study in and education about the world of water. For years now, the NMEA has joined a broad educational community in calling for the sciences community to come forward in full partnership with educators to improve ocean literacy for all, as is evidenced by numerous papers and reports¹ that identify broad needs for improving ocean literacy through marine education. As a direct result of these publications and other public testimonies by leaders in marine and ocean science education over the years, national conversations are now taking place about the critical nature of these partnerships. We proudly and very publicly applaud your efforts in helping advance these conversations at the national level.

As you are aware, there have been several forums in which the ideas and recommendations of the NMEA members have been sought over the past few years, including several regional meetings of the Commission. These ideas and recommendations have, not surprisingly, fallen into a very consistent pattern and represent the voice of many in leadership roles within our organization. We would like to present the Commission with our thoughts and recommendations for improving ocean education at the national level.

We use the term ‘ocean education’ here to include education that addresses the water continuum from freshwater to coastal, marine, open ocean, and the Great Lakes systems. The following recommendations were reviewed and enthusiastically endorsed by the NMEA Executive Committee and, we believe, represent the viewpoints of most of our Board and membership.

- **Ocean literacy among the general public** must increase. Ocean education must not only be targeted to the formal classroom learning environment, but it also needs to be directed to learners of all ages who seek, either through formal coursework, informal visits to museums or aquariums, or through the public media, to better understand our world of water. This includes Elderhostel programs for adults, summer camps for children, and programs targeted to public media that are compelling and immediately engage a wide range of stakeholders in learning more about our Ocean Planet.
- **Collaboration between the education and research communities** must increase if we are to effectively incorporate the excitement of ocean investigation, exploration, and monitoring into activities of formal classrooms, aquaria, museums, and public media throughout the country. This will require a change in the ‘culture’ of the research community so involvement of scientists in non-graduate education and outreach to the general public is valued and rewarded within the research and higher education communities. There must be institutional, peer, and financial support for scientists to engage in these kinds of activities. Scientists should also be encouraged to participate in professional development experiences in education that enhance their abilities to communicate effectively with different audiences. We strongly support expansion of the emerging national network of centers for collaboration among marine scientists and educators targeted at improving educational opportunities and outcomes for learners of all ages, as supported by the National Science Foundation Centers for Ocean Sciences Education Excellence (COSEE) initiative.
- **Professional development for in-service and pre-service teachers** in ocean education must be enhanced. Rich opportunities exist to form partnerships between formal classroom experiences, museums and aquariums, and institutions of higher learning throughout the country. This needs to be coupled with providing experiences with exemplary curriculum materials that are scientifically valid, engaging, and inquiry and standards-based. We must capitalize on the partnerships, seeking efforts to expand and enhance existing partnerships and form new ones, as mentioned above, to bring exceptional professional and curriculum development opportunities to the teaching community. Teachers are, in fact, ‘agents of change’ in the entire educational reform process. They are in the trenches where, quite frankly, the ‘rubber meets the road’ in education in this country.
- **Ocean science content must be incorporated into the National Science Education Standards and state education standards** to address what scientists and educators believe must be taught and learned at each grade level and to address education accountability issues that dictate national and many state education reform efforts throughout the country. This needs to be accomplished through a dedicated effort to

establish ocean sciences connections within the National Science Education Standards and demonstrating *with* teachers of all levels, *where* these connections are and *how* to integrate them into teaching and learning strategies in classrooms throughout the country. These connections should be relevant to the curricula used by teachers and since ocean science education is truly interdisciplinary, this will facilitate incorporation of ocean sciences into all science topics taught in classrooms. Work should begin now with the National Research Council to ensure that ocean sciences are woven into the standards and instructional and assessment examples when they are revised over the next few years. Efforts and funding should also be directed to ensure that ocean education content and examples are incorporated into state standards. This is one important potential role for the developing COSEE network.

- **Minority representation and participation in the ocean community** must increase if we are to change the demographic composition of this community to reflect the changing demographics of our country. We must work to actively and aggressively engage diverse populations in ocean education opportunities in culturally meaningful ways. Making ocean-related fields attractive as career options to traditionally underrepresented groups will require a long-term, systemic effort. This must begin early in the education of young children, addressing cultural issues that may impede their participation, and clearly demonstrating cultural connections to their heritage and daily lives so that a career in an ocean-related field is seen as viable, socially responsible, and financially rewarding. Field trip experiences, after school programs, summer camps and mentoring by peers are examples of the kinds of programs that hold promise for engaging underrepresented youth in ocean education. Scholarships, fellowships, and paid work experiences provide financial incentives for minority students to gain experience in ocean-related fields and should also be expanded.
- **Ocean education and outreach must be effectively coordinated and promoted at the national level.** A mechanism to more effectively coordinate ocean education and outreach throughout the Federal government and facilitate related activities among institutions of higher learning, non-governmental organizations, state and local governments, and business and industry should be established. National coordination might be facilitated through a consortium of government agencies involved with ocean education or, through a new national office for ocean education and outreach, whatever arrangement would make the most efficient and effective use of resources.

The recommendations stated above address longstanding national needs that must be implemented on a national scale. These needs will continue to be unaddressed in ocean education, and science and technology education in general, if we continue to rely on funding that is not sustained and dedicated to these needs. The NMEA recommends sustained funding for ocean education at a level that is at least ten times greater than current funding levels. Although it is difficult to determine precisely how much is currently directed at ocean education in our country annually through federal agencies and grant programs, it is certainly not enough and probably falls below \$20M. We estimate that at least \$200M is needed annually to fully support a national network of

ocean science education centers and a variety of granting programs specifically designed to address the needs and recommendations described above. Local or regional centers of excellence could support and enable efficient and effective use of this funding. Increased funding should also be directed toward sustained and systemic efforts to improve student learning and achievement in science and mathematics through ocean sciences, use of new technologies in learning environments, and development of curricula, as needed, based on what education research tells us about effective teaching and student learning. Increased funds should also be directed at providing students and teachers with meaningful experiences in ocean fields, with particular emphasis on providing opportunities for traditionally underrepresented groups. It is also important to provide sustained support for tried and tested ocean education programs that have proven effective.

We would like to suggest a few ways to increase support for ocean education. One approach would be to require that ocean science research initiatives at the federal level commit a percentage (say 10%) of total grant funds to support ocean science education and outreach. Overhead rates for universities could also be limited for those projects and programs that focus on ocean science education and outreach. This would result in greater flexibility in administering grants and stronger program impact by directing more of the dollars invested directly to the education program.

In closing, improving ocean literacy in the United States calls for the development of a national vision for ocean education. This will result in a comprehensive strategic plan that includes multiple Federal agencies, state governments, non-governmental organizations, school systems, and institutions of higher learning. Successful implementation of a long-range plan requires adequate levels of sustained support from multiple sources. This support is not only financially based, but also includes support for mechanisms that enable the transfer of critical knowledge about our ocean planet among a diverse group of stakeholders, with the ultimate goal of developing human capital. Ocean education, or education in general for that matter, cannot depend upon a single source of support, and there must be support at the national level. It is only through the systemic, sustained approaches that have been presented here that we will engage all stakeholders so that ocean literacy ultimately becomes part of a continuum of lifelong learning for all Americans.

Thank you for considering our recommendations related to ocean education. We wish you and your fellow Commission members all the best in your momentous and very important efforts to prepare ocean policy recommendations that will guide our Nation over the next several decades.

Sincerely,

Wendy B. Allen, President
National Marine Educators Association

¹ Consortium for Oceanographic Research & Education, 2001. "Position Paper on K-12 Education." www.COREocean.org.

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