

May 9, 2002

ADM James D. Watkins (Retired), Chairman
U.S. Commission on Ocean Policy
1120-20th St., NW
Suite 200 North
Washington, D.C. 20036

Dear ADM Watkins:

Please know that I enjoyed providing ocean sciences education testimony to the U.S. Commission on Ocean Policy at its Gulf of Mexico Regional Meeting on May 7-8, 2002 in New Orleans, LA. I appreciate your gracious remarks about my educational presentation and I hope the information I provided will help the Commission in developing its recommendations for a coordinated and comprehensive national ocean policy.

In response to the three questions you asked in your April 10, 2002 letter, my responses are listed below:

- What is the best way to incorporate ocean education into the K-12 system; should ocean sciences be a separate curriculum or should ocean topics be incorporated into existing science curricula?

Water, in my opinion, is a wonderful medium through which to teach holistically within the K-12 system and water can easily be used as a focus within all the science disciplines. The “best way” to incorporate ocean sciences education within this Nation’s precollege curricula is through the use of case studies as examples within the existing *National Science Education Standards (NSES)* developed by the National Research Council in 1996. As you know, the *NSES* and *Benchmarks* (American Association for the Advancement of Science, 1993 which does contain examples of ocean sciences) are both used for curricular alignment within state and national standards. However, with the very limited use of the oceans or water in the NSES, precollege teachers won’t readily use materials not contained within this national framework. I do not believe ocean sciences should be a separate curriculum; I believe ocean topics can and should be incorporated with existing science curricula. This infusion of ocean sciences within the existing curriculum will occur only when the *NSES* are revised in 2005. In this vein, I am also of the opinion that professional organizations such as the National Marine Educators Association, the National Association of Science Teachers, the American Society Limnology and Oceanography, the American Association for the Advancement of Science, and the American Geophysical Union; agencies/departments such as the National Oceanic and Atmospheric Administration, the National Science Foundation, and U.S. Navy, and the National Aeronautics and Space Administration, Environmental Protection Agency, and the U.S. Department of Education; and groups developed to coordinate and promote ocean sciences research, education, and service such as the National Oceanographic Partnership Program, the Consortium for Oceanographic Research and Education, the Pew Commission and the Ocean Commission all need to collectively help the National Academy of Sciences better understand the need of

teaching this Nation's precollege students about water which cover approximately 71% of the Earth's surface. Now, in saying all of this, I also need to include the fact that our precollege teachers are the "key" to this enhancing science content for this country's students. So, we also need to understand that what our classroom teachers, in general, don't know is science. Therefore, this Nation needs to place a priority on Professional Development Programs for Precollege Teachers, particularly in math, science, and technology.

- This Commission is committed to forwarding the notion of a strong sense of stewardship for our oceans. We've heard a lot about changing demographics nationwide, and particularly in our coastal areas. How do you propose addressing language and cultural differences with regard to instilling a stewardship ethic in K-12 students?

I believe the answer to this question rests largely in helping families and the general public better understand the relevance of the oceans to their everyday lives....from perspectives of national security, transportation, economic development, sustainability (abiotic and biotic conservation and preservation), climate change, and human population and our impacts. I am also of the opinion aquariums, zoos, science centers, and museums serve a pivotal role in "bridging the gap" between scientists' research and the interpretation of those data relative to the importance of the oceans to our everyday lives. I would be remiss if I did not mention the media (print, video, and audio) also provide us a wealth of information in a very timely manner, so the "conveyors" of this information also need to understand the data they are reporting...based on "sound science." This commitment by the Ocean Commission in promoting a strong sense of stewardship for our oceans rests on the enhanced education of our public. This enhanced ocean ethic could serve as a "perfect mechanism" to implement "hands-on" ocean sciences for people of all ages...through informal education facilities' static and living exhibitry, to include community involvement in extended outreach events such as Earth Day, Fishing Rodeos, Seafood Festivals, Beach Clean-Ups, Adopt-A-Stream, Water Quality Monitoring, Marine Mammal Strandings, and other similar programs. Due to the fact that within the next 25 years, 70% of the population in this country will be living within 200 miles of a coastline should "set the stage" for this country's leadership to provide sustained fiscal support to develop and/or continue to implement programs which will empower its citizenry to make environmentally responsible resource decisions related to the fragility and the interconnectedness of all species on this planet.

Language and cultural differences for K-12 students must be addressed with sustained fiscal resources in employing personnel with fluency in various languages within our precollege schools, churches, after-school programs, and informal centers...as well as through curricular development in producing resource materials used to teach our children about the importance of the oceans to their lives. The need for an increased awareness and understanding of water and the oceans "should not tied" to ethnicity, geographic area, economic status, or age. This increased awareness and understanding the oceans is critical to our survival as a species on this "watery" planet.

- What specific steps should the Commission take to integrate scientific research with people's needs? I agree with your general view provided during the hearing that education is the cornerstone of this connection. However, are thee other practical and policy steps that we need to take within other areas of a governance structure?

If I had a “crystal ball,” I would like to “see” federal agencies involved in ocean sciences (research, education, and outreach) share their missions and develop common foci, so “wheels are not re-invented” with one agency not knowing what is “being done” within its own agency, nor do agencies generally know what types of programs are being developed and implemented within other agencies. I believe NOPP, NSF, NOAA, and CORE are “doing a better job” in coordinating “what is happening” in ocean sciences research, education, and outreach.....but, this coordinated “partnering” has only begun within the last decade, therefore, we must continue implementing these efforts with sustained funding. I also encourage the Ocean Commission to emulate NASA as a model for promoting the oceans as well as NASA has promoted space. We, in the ocean community, MUST do a better job in having our citizenry know as much about what is under the oceans’ surface as we know about space. I also believe scientists, in general, are not adequate interpreters of their own research findings relative to the importance of those data...in a language the general public or precollege students and teachers can understand. So, the partnerships which NOPP, NSF, the U.S. Navy, NOAA, and NASA currently have and those that are being developed for implementation need the Ocean Commission’s “stamp of approval”.....if the Commission “embraces” the programmatic concepts such as the Centers for Ocean Sciences Education Excellence (COSEE); the Ocean Exploration Program; the LINK Symposium; having research proposals contain an educational component (developed by formal/informal educators); having consistency in course requirements for preservice teachers within institutions of higher learning within this country; promoting partnerships with informal facilities such as aquariums, science centers, and museums; and developing community college vocational curricula for ocean related careers; and promoting increased numbers of students and ethnicities within the ocean sciences. I would also like for the agencies listed above to determine how we can become more involved with the U.S. Department of Education’s efforts nationally and on the state level. We could all be more effective in the research, education, and outreach process if we work more closely together. Since March 7-8, 2002, I have tried to determine more specifically the mission of the U.S. Department of Education at the state level and I have ascertained student achievement, student performance (testing of students, based on the use of *Standards*), professional development programs for teachers (accountability of teachers), free- and reduced-lunch status of children, needs for gifted and special education children...and more are all part of mission of State Departments of Education, as well as the U.S. Department of Education. Therefore, I also believe IF we, in the ocean community, wish to have a significant role in the education of precollege students and teachers, based on “sound science,” then we have to “step up to the plate” and share with the U.S. Department of Education the oceans’ importance in this process. I also encourage the Ocean Commission, as part of the governance structure, to become actively involved in President Bush’s, “No Child Left Behind” Math and Science Partnership Program which is currently being implemented by NSF.....for again, this is an area in which we can use the oceans to teach math and science to precollege students and teachers of all ethnicities, as well as improve the math and science being taught by two- and four-year colleges and university faculty members.

Please know that I have enjoyed sharing responses with you to these three questions. Should you have comments or concerns, please do not hesitate in letting me know at 228-374-5550 or at sharon.walker@usm.edu.

Sincerely,

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