# Public Comments on the U.S. Commission on Ocean Policy's Preliminary Report

## *Topic Area: Sediments*

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U.S. Commission on Ocean Policy
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Dear Commissioners:

We write to you as members of a science research community engaged in the study of coastal sedimentary systems including beaches and dunes, estuaries, barrier islands, reefs, and continental and insular shelves. Although only the signatories of this letter are responsible for its content, we believe we represent a much larger community of university and college professors, private consultants, federal researchers, and natural resource scientists at local levels. This larger community has, in the past, endorsed similar sentiments as contained herein in several federally-sponsored planning documents and conference reports as authored by ourselves and others (see references).

In general, the goal of our community is to improve the understanding of sediment movement and storage within coastal environments. This knowledge is essential to reducing exposure to coastal hazards along U.S. shorelines as well as enhancing natural resource conservation efforts at all agency levels.

We commend the Commission for its strong recognition of the natural connections between watersheds, coastal environments, and oceans and the need to address these linked environments as a system. Too often coastal management policies fail to recognize these linkages largely because lines of jurisdiction run parallel to shorelines, while natural processes run perpendicular. Lines of jurisdiction need to be made transparent to natural pathways of energy and material exchange such as those embodied in watersheds, estuaries, and wave-dominated environments.

We have carefully reviewed the content and recommendations of the commission report and strongly agree with your interest in supporting system-based science within the coastal zone. However, as a community with a long history of research experience ranging from fundamental to applied investigations, we recognize several areas of weakness in the existing national research scene that, lacking remedy, will prevent the achievement of your desired goals. Further, a review of your recommendations reveals a lack of adequate solutions to repair these weaknesses. That is, we endorse your interest in integrating coastal research across natural systems, but our experience tells us that your recommendations will fall short of achieving these ends.

The following list offers a brief description of each problem and a generalized recommendation for your consideration.

1) **Affirm Geological Framework of Coastal Systems** Coastal environments are the product of natural changes that have accumulated over decades, centuries, and millennia. These changes are recorded in the sedimentary record preserved on submerged shelves, and in reefs, beaches, barriers islands, wetlands, and other coastal environments. These sedimentary records constitute part of the geological framework of the coastal zone [1]. Indeed, coastal change is a product of several processes including, global sea-level change, localized land-level change, excesses or deficiencies in sediment, and changes in waves and currents. These processes are often governed by, and their history recorded within, the geological framework of the coast. Modern coastal environments cannot be understood solely on the basis of modern processes. Without geological framework studies, important knowledge regarding how environments change through time will fail to be considered when designing optimal coastal and watershed management (Chapter 9), hazard management (Chapter 10), sediment management (Chapter 12), and reef management (Chapter 21) programs. In truth, many conservation programs and management policies do not provide adequate solutions, often because they lack a scientific basis derived from geological framework studies. We recommend that geological framework studies be included as a necessary component of science investigations in these areas.

2) **Emphasize Sea-Level Rise** We feel that the importance of global sea-level rise as a driver of coastal change, has not been adequately emphasized in the commission report. Although the issue of climate change remains politically contentious, numerous scientific reports indicate that sea level will continue to rise in the future [2]. The impacts of continued, possibly accelerated sea-level rise will be far reaching, first increasing the susceptibility of low-lying coastal communities to damage during coastal storms, increasing the local vulnerability of coasts presently dominated by tectonic uplift, and eventually causing rapid landward migration and/or submergence of barrier islands and other low-lying coastal environments.

   Given that the last evaluation of U.S. ocean policy was undertaken 30 years ago, the current evaluation and the changes stemming from it need to prepare us to move into the next three decades and beyond. Under global scenarios of sea-level rise, this means not only preventing unwise development in hazard-prone zones, but also working to anticipate the effects of sea level rise on coastal communities and developing flexible coastal policies that will allow us to prepare for the future expansion of hazard-prone areas under rising sea levels. For these reasons, we recommend that sea-level rise and its impacts figure more prominently in the discussions and recommendations of the report, especially with respect to managing coasts (Chapter 9), protecting people and property from coastal hazards (Chapter 10), and advancing ocean and coastal research (Chapter 25).

3) **Establish NSF Coastal Science Program** Coastal scientific research has not been strongly supported through the National Science Foundation. Despite recommendations in planning documents [3], conference reports [4], and special research symposia [5], coastal research within the NSF struggles without a clear

home. For instance, beach and estuarine studies are often criticized as either localized problems lacking relevance to global issues or considered to be applied science that does not warrant NSF funding. In either case it is not apparent whether researchers should submit to Ocean- or Earth-based research directorates. Most NSF program managers believe coastal studies belong in the National Oceanic and Atmospheric Administration, the U.S. Geological Survey, or the U.S. Army Corps of Engineers. It remains unclear to us why coastal systems are less deserving of NSF support than, say, the deep ocean, or volcanic systems. Because of the enormous value of coastal environments to the American public, we recommend that the NSF establish a clear program in coastal science studies and that a stated goal of such a program should be the improved understanding of geological, biological, physical, and chemical aspects of coastal environments as a basis for enhancing management programs.

4) **Enhance NOAA Partnerships With Local Researchers** NOAA sponsors hundreds of millions of dollars of coastal research annually. Yet, aside from Coastal Zone Management support to state programs, the agency is widely known for not involving the local research community including academic and local government workers. This springs primarily from a complicated system of grants-making offices and programs that are poorly coordinated and poorly advertised externally, and a history of internal program building and marketing at the expense of genuine involvement of external partners. NOAA has recently streamlined its announcements of grants opportunities. This is an important step, yet the level of external funding falls woefully short of community needs, and, importantly, does not incorporate any external peer review system. For instance, NASA strongly profits from a science board made of external researchers that guide the agency mission. NOAA has no such body. We recommend the re-alignment of funding mechanisms within NOAA to more strongly foster research partnerships specifically through the direct involvement of academic and local scientists so that important research dollars are shared among the scientific community to produce results that are regionally and locally relevant.

5) **Advance Forecasting of Coastal Change** An understanding of regional sedimentary systems will provide the scientific basis for improving societal responses to coastal change, including land-use and resource management, mitigation planning, vulnerability assessment, and hazard reduction. Long-term (decadal and longer) coastal planning requires long-term prediction of coastal change and the incorporation of future sea-level rise in planning scenarios. However, our ability to forecast coastal changes remains imprecise and until scientists are able to forecast coastal change with some level of confidence, there is little hope that serious long-term coastal planning and management will occur [5]. We recommend that the commission highlight the need for improved coastal forecasting as a fundamental tool for managing the future of global change and sea-level rise that will impact our shorelines.

6) **Improve USGS, FEMA, USACE Coordination – Increase USGS Regional Studies** We note the importance of coordination among the Federal Emergency Management Agency, the USACE, and the USGS. For example, Chapter 10 indicates that FEMA requires accurate and consistent coastal hazard information. With the

participation of academic and local scientists, FEMA has completed a study to incorporate coastal erosion rate information into the National Flood Insurance Program, which led to generation of the Heinz Report ([6] *The Hidden Cost of Coastal Hazards*). We also note that Chapter 12 highlights a planned USACE study that will examine "why, where, and to what extent U.S. shorelines erode or accrete" (p. 143) (as far as we know this project remains in its infancy). A third effort, undertaken by the USGS, has already made significant headway on the task of determining where and why U.S. shorelines are eroding and accreting, yet their effort, The National Assessment of Coastal Hazards, and recent online product, *The National Assessment of Shoreline Change: Part I, Historical Shoreline Changes and Associated Land Loss along the U.S. Gulf of Mexico* (http://pubs.usgs.gov/of/2004/1043/), are not mentioned in the Commission Report.

Based on these observations we make three suggestions:

- Discuss the needs of FEMA, present the USACE project, and present the USGS study in Chapter 10 of the report since all three of these government agencies will be conducting, or are conducting, similar studies.
- Given that the USGS project is not only funded, but underway and producing excellent results, highlight this project and the resulting products, in the report.
- We recommend a significant increase in funding to the Coastal and Marine Geology Program of the USGS specifically to expand on their cooperative programs for regional coastal sedimentary systems studies. Funding increases are needed not only to support existing and future studies, but also to synthesize the results of regional studies to advance the knowledge, modeling tools, and predictive capacities for coastal evolution on the decadal to century scale.

Importantly, the report should include a recommendation to prevent the duplication of effort and expense that will occur if the FEMA, the USACE, and the USGS projects are undertaken independently. This is not simply a short-term issue since coastal hazard studies will likely continue into the future. We contend that FEMA and USACE should work with scientists at the USGS to facilitate the generation of hazard products that will serve multiple governmental purposes and that USGS data form the basis for these products.

7) **Expand Coastal Systems Research and Local Partnerships** We highly commend the Commission for recognizing a need for doubling federal ocean and coastal research over the next five years. We agree with the Commission that regional-scale interdisciplinary research programs need more emphasis. Without restructuring the way in which coastal science is funded, coastal research will continue to be fragmented by existing jurisdictional lines and programmatic constraints of the federal agencies. We encourage the Commission to more strongly endorse system-based research so that the science can better support the need for improved understanding and management of the land-ocean interface. We restate the need for realignment of external grants-making programs within federal agencies to take advantage of valuable knowledge and skills in the academic and local research community.

8) **Recognize Scientific Basis for Regional Sediment Management** We recommend that the content of Chapter 12 be expanded to include a broader view of coastal sedimentary systems. The report presently refers to sediment and shoreline management only from an operational and engineering perspective. We believe this perspective is too limiting and does not adequately identify the scientific basis needed to support long-term coastal planning and management. Similarly, this perspective does not adequately consider the appropriate temporal and spatial scales over which sediment flux occurs, nor does it consider an adequate range of natural and human-induced influences that affect sediment flux throughout a coastal system.

We suggest that Recommendation 12-1 acknowledge that a scientific understanding of coastal sedimentary systems should form the basis for regional sediment management.

In Chapter 12, the section on "Moving Toward Regional Sediment Management at USACE" there is a statement that "*coastal processes operate at regional scales with time frames of up to 250 years and geographic extents of dozens of miles from a project location*." Coastal processes are not at all limited by these time and space scales. Although it is commendable that the USACE is beginning to recognize a larger framework in which they need to manage their projects, this in no way should confine the scope at which coastal sedimentary systems are researched, understood, and managed.

We support Recommendation 12-4 that specifically encourages the relevant federal agencies to co-develop a strategy for improved assessment, monitoring, research, and technology to enhance sediment management. However, it is not clear that the USACE should be exclusively charged with evaluating the cumulative, regional impacts of their projects. We agree that the monitoring and studies should be performed but we see a role for independent science teams to perform these evaluations.

We agree with the report that "*scientific, technological, and institutional hurdles remain to implementing truly regional sediment management*". As we have stated throughout this letter, we believe that a fundamental hurdle includes our ability to obtain funding for the kind of coastal sedimentary systems science that is required to support regional coastal management. In turn, effective regional sediment management is hindered through lack of understanding and prediction of the long-term evolution of coastal sedimentary systems. These fundamental hurdles are among the reasons that we advocate for adjusting the programmatic area of NSF to include coastal research, increasing funding for the USGS for regional coastal system studies, and improving NOAA external grants opportunities. We also support increased funding to the USACE Coastal Hydraulics Laboratory specifically for the integration of research with geological framework studies to more completely address regional and long-term effects of coastal structures, facilities and projects on coastal sedimentary systems.

We sincerely congratulate the Commission on this far-reaching report. We hope that you will consider and incorporate our comments in a spirit of cooperation. We believe that our recommendations are in complete alignment with the guiding principals and vision of the Commission for a new national ocean policy. Thank you for providing this opportunity to comment.

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**References**

[1] National Research Council, 2000. Basic Research Opportunities in the Earth Sciences, National Academy Press, Washington D.C., 107 pp.

[2] U.S. Environmental Protection Agency – Sea Level Rise Reports. http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsSeaLevelRiseIndex.html

[3] FUMAGES Chapter 4. Dynamics on the shelf and shoreface and its imprint on the seafloor and sediment column –Particle transport to melt-water pulses, 12 authors, available at: http://www.joi-odp.org/FUMAGES/FUMAGES.html

[4] Fletcher, C., Anderson, J., Crook, K.A.W., Kaminsky, G., Larcombe, P., Murray-Wallace, C.V., Sanson, F., Scott, D.B., Riggs, S., Sallenger, A., Shennan, I., Thieler, E.R., and Wehmiller, J.F. 2000. Coastal sedimentary research examines critical issues of national and global priority, EOS, Transactions, American Geophysical Union, Vol. 81, No. 17, pp. 181, 186. See also related publication at: http://www7.nationalacademies.org/besr/coastal_change.html

Research in the Sedimentary Geology of the Coastal Zone and Inner Shelf, A Pre-Conference Report from the University of Hawaii "The Non-Steady State of the Inner Shelf and Shoreline: Coastal change on the time scale of decades to millennia" November 9-12, 1999. http://imina.soest.hawaii.edu/Coastal_Conf/PDF/NSF.PDF

[5] Report on Forecasting Coastal Change at Decadal and Longer Time Scales, community workshop sponsored by the Geology and Paleontology Program, EAR/NSF, November 2000, Rice University, 7 pp. http://www.geo.nsf.gov/ear/programs/NSF%20Coasta%20REVlsed.doc

[6] The Federal Emergency Management Agency, 2000, Heinz Center, Evaluation of Erosion Hazards, 18 pp. http://www.heinzcenter.org