Working Draft for Public Comment

U.S. COMMISSION ON
OCEAN POLICY

Toward a National Ocean Policy

Ocean Policy Topics and Related Issues

July 16, 2002

U.S. Commission on Ocean Policy

The U.S. Commission on Ocean Policy, authorized by Congress and appointed by the President, is charged with reviewing the effects of federal ocean-related laws and programs. The 16-member Commission will assess numerous challenging issues ranging from the stewardship of fisheries and marine life to the responsible development of offshore nonliving resources as well as the relationship among federal, state, and local governments and the private sector in carrying out ocean and coastal activities. The last congressionally authorized commission to review and make recommendations for a national ocean policy was established under the *Marine Resources and Engineering Development Act of 1966* and is commonly referred to as the Stratton Commission. The current U.S. Commission on Ocean Policy was created by the *Oceans Act of 2000.* The Commission is required to establish findings and make recommendations for reducing duplication, improving efficiency, enhancing cooperation and modifying the structure of Federal agencies involved in the world's oceans.

The Commissioners

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Purpose

To define a working strategy at the half-way point in the Ocean Commission's work that will enable the Commission to determine both scope and content of an integrated national ocean policy and to consider policy options to address key issue areas as required by the Oceans Act of 2000.

Background

The Commission's approach has been determined by the following actions taken since its first public meeting on September 17, 2001:

- Establishing four Commission working groups to segment consideration of relevant issues among the Commissioners (details available on the Web site).
- Drafting of issues papers for each working group to define issue responsibility (available on the Web site).
- Drafting of a document outlining elements of a national ocean policy, which sets broad objectives against which we will test our final product for its efficacy (available on the Web site).

Working Strategy for Final Report Production

- Based on the aggregation of testimony received after one national and six regional public meetings, the Commissioners identified a wide variety of issues (raised in part during testimony by 295 public witnesses) that may be considered as the Commission enters its deliberation stage this Fall. We recognize that these issues do not yet include those that may be raised by witnesses during the remaining planned public meetings. Additionally, the Commission may or may not address all of these issues as we close on the final product. Priorities will probably have to be set and some issues may not pass the threshold criteria for inclusion.
- With the posting of this document on the Web site we invite broad public review and comment on whether the questions listed in this document are the right ones, and whether they adequately capture the critical issues that should be addressed by the Commission. All public comments on this document must be submitted in writing. To submit a comment via e-mail, write to: mail@oceancommission.gov. To submit a comment via fax, send to: (202) 418-3475. Mail written comments to: Public Comment for the Record, c/o U.S. Commission on Ocean Policy, 1120 20th Street, NW (Suite 200 North), Washington, D.C. 20036.
- The Commission working groups and their assigned staff will now commence drafting working papers for future submission to the Commission as a whole for its consideration. This will be done in accordance with the Commission's milestone timetable (available on the Web site).

TOPIC 1: LIVING MARINE RESOURCES

Issues

1. What should be the overall policy objective for living marine resource management? Should fisheries, marine mammal and endangered species conservation and management be linked? If so, to what extent are they currently linked and what constraints exist (laws or policies) that restrict such linkage?
    a. Are biodiversity, the precautionary principle, and ecosystem management sufficiently defined to serve as clear management principles?
    b. If so, what are their definitions? Would they be applied as part of an overarching principle for management, or can they be useful in a day-to-day operational sense?
    c. If biodiversity were to be used as a management principle, are there important subsets to consider (e.g., apex predators, primary producers, etc)? How would these subsets be determined? How should a biodiversity management structure address them?
    d. In general, are stewardship policy objectives and definitions clear enough to be understood by the public?

2. What is/should be the measure of success or failure for management of living marine resources?
    a. Does it differ by type of species (e.g., exploited stocks/marine mammals/protected species/bycatch/highly migratory species)? If it does differ, should it?
    b. How do we ensure adequate data and knowledge are available to guide management of living marine resources? Is there a baseline from which to measure change?
    c. What is the proper balance between science and other factors (politics, socio-economics, emotion, morality) in judging the effectiveness of management of living marine resources? How should all these factors be included into objective assessments and decision-making processes?

3. How does our nation design and implement adequate ongoing, long term monitoring of the coastal and marine environments and the upland ecosystems to allow sustainable management of living marine resources?
    a. What types of monitoring are needed for sustaining ecosystem health?
    b. Who should be responsible for monitoring the coast, ocean, and atmosphere?
    c. Do we have an adequate baseline from which to measure whether change is occurring and the direction and magnitude of any such change? If not, how do we determine a baseline? Do we have adequate processes to determine the likely cause of such changes?
    d. Is information on these subjects available to managers and do they use it?
    e. What feedback mechanisms are there to ensure that the results of monitoring are reported and considered?
    f. Should action "triggers" be established that would require Federal, state, or other entities to take action upon discovery of certain conditions or their continuation over time?

4. What is the status of marine species (fisheries, marine mammals, forage and other prey species) managed by Federal or state governments, or via interstate fishery commissions for which adequate information is available?
    a. Stock assessment and status: Are there any patterns for stock assessment and status: regional, spatial, temporal, by gear type or boat size, by type of management regime (state/interstate/Federal/international), by single species vs. multiple-species management approaches?
    b. What is the status of stocks (fish and marine mammals) on which native populations depend?
    c. How do we address other living marine resources (e.g. algae, bacteria, and invertebrates) that are not presently "actively" managed?
    d. Is there an adequate process in place to track these patterns? Are there any proposed changes to improve this process?
    e. Could fisheries management and conservation be improved by focusing on a habitat rather than a species or even multi-species approach?
    f. What, if any, relationships exist between the population status of fishery target species and non-target (e.g., bycatch, forage) species?
    g. Why are so many of the principal stocks over-fished or depleted? Why is recovery so slow? Is it because of insufficient management actions?
    h. Why is there little progress on recovery of population size for marine mammals, sea turtles, and other endangered species?
    i. Should there be a backstop or default strategy to ensure conservation of resources if management plans are delayed or insufficient to meet the overall conservation standard?
    j. How do we answer these questions to help manage highly migratory species and resources contained within international waters?

5. For how many stocks/populations do we have insufficient information on which to judge their status?
    a. Are there any regional patterns to the lack of sufficient information? Any other discernible patterns? If so, why? Is there a lack of Federal investment in some regions compared to other regions? Or is there inadequate Federal investment overall?
    b. Should we try to expend greater effort in collecting information on stocks for which the status is unknown or should we focus efforts on improving the precision of knowledge on the major components of a fishery or an ecosystem?
    c. What are the implications for management of any such information deficits?
    d. Are there currently unmanaged living resources that require attention (e.g., aquarium fish and invertebrate trade)?

6. What types of management structures, including examples from other countries, currently exist for management of domestic and international living marine resources?
    a. Are some more effective at maintaining the managed stocks in a sustained, abundant state? What is the pattern of success or failure over time and geography?

b. Are some management structures better at different aspects (e.g., stock status, citizen involvement, reaction time, participant involvement, bycatch/habitat) of fisheries management? Which factor(s) should be the priority?
c. What impacts on fisheries are caused by lack of funding for research, education, and monitoring?

7. Does the current living marine resource management structure suffer from conflicting mandates? If so, what are they, and what adverse consequences result from the conflicts?
   a. What are the institutional, regulatory, and statutory causes of these overlaps and conflicts?
   b. With regard to regulatory regimes, what are the appropriate incentives, deterrents, or combination of management tools necessary to enhance sustainable use of resources? Is the regulatory regime set up based on best available knowledge, even if the "precautionary principles" apply? Is the regime enforceable?
   c. Is "ecosystem management" of living marine resources a clearly defined term? If so, does it provide an effective management approach? Is ecosystem management currently being used to manage living marine resources? If so, what information and management capabilities are necessary to make it work? What would be the cost of moving from single species management to ecosystem management?
   d. What structural (i.e., agency) changes are needed to reduce or eliminate conflicting mandates?

8. What regulatory and/or statutory policy changes are needed to improve U.S. fisheries management?
   a. Why is it that the same Federal law appears to produce effective fishery management results in some areas and not in others?
   b. Are state/Federal jurisdictional boundaries causing ineffective fishery management? If so, how should this problem be addressed?
   c. Is the current management structure, which separates the functions of the fisheries councils and science and monitoring, appropriate and effective for management? Does it follow a stewardship ethic?
   d. In general, should conservation standards be set separate and apart from discussions of allocation among competing uses? Is there a benefit to separating organizationally fisheries assessment and allowable catch decision-making from fishery allocation and other management decision-making? If so, what are some preferred options for accomplishing this?
   e. What are the best practices used by the various fisheries councils and commissions that might be standardized for all? What practices should be eliminated for all?
   f. Are there models in other countries that may be used to improve U.S. management of living marine resources?

9. Should assigning living marine resource harvest privileges to individuals, groups of individuals, communities, or state and local governments be a part of U.S. fisheries management?

a. Under what circumstances are harvest right programs a useful tool for fishery management?
b. Do such programs require increased or decreased levels of enforcement at the local, state, regional, or Federal level?
c. Should there be a set of national, regional, or local criteria under which all future harvest privileges programs be implemented? What should be included in such criteria?
d. In current Individual Fishing Quotas-based fisheries, how has the Federal government ensured that IFQs are not viewed as private property, but only harvest privileges to a public resource? What other safeguards may be required?
e. On what basis should harvest privileges be assigned? Who should decide the allocation of initial harvest shares in any future IFQ program?

10. Is there sufficient credible science to support management decisions and is this science being used appropriately?
    a. What is the current process for incorporating the "Best Available Science" into the ocean management decision-making process? Do we know where we stand today in relation to the amount and quality of science in the support of management? Is there a plan that lays out where we need to be and by when?
    b. To what extent are current laws and regulations based on the "Best Available Science" that is backed up with credible data? To what extent is the "Best Available Science" ignored in development or implementation of U.S. laws and regulations?
    c. How should we manage ocean resources in situations where sufficient scientific information is not known?
    d. What is the current process for gathering additional scientific information or baseline surveys when current information is inadequate to support management decisions?
    e. How is new information incorporated into existing management regimes?

11. Does the U.S. have effective enforcement of stewardship regulations?
    a. How is enforcement of fishery and other marine environmental statutes and regulations currently conducted?
    b. How effective is this enforcement, and how do we know and measure how effective it is? Do fishers believe enforcement is fair, consistent, and substantial?
    c. How can the Federal government, states, and local jurisdictions work together to enforce stewardship rules within the nation's coastal and marine environments?
    d. Will the increased emphasis on security concerns following the terrorist attacks on September 11, 2002, result in a long-term decrease in fishery and marine environmental enforcement by the U. S. Coast Guard? If so, what changes will be necessary to offset decreased Coast Guard enforcement?
    e. Does the proposed transfer of the U.S. Coast Guard to a new Department of Homeland Security provide new opportunities to restructure enforcement in support of managing living resources? Which capabilities can be replaced by other agencies or by state enforcement personnel? Which capabilities can only be carried out by the Coast Guard? Is there statutory authority for other entities

besides the Coast Guard to carry out its current regime of enforcement responsibilities?

f. Does the collaboration of Coast Guard and other agency law enforcement work well within the Federal government? Are the prosecutorial arrangements adequate? Are the penalties for violators adequate deterrents? What statutory changes, if any, are needed?

g. Are laws simple and understandable enough such that enforcement can be effective and more affordable? Can we afford more enforcement? If not, how do we set priorities on the most critical issues? Does the public understand the laws enough such that unintentional violations are reduced and enforcement personnel can concentrate on intentional violators?

12. Should the U.S. upgrade and better implement a marine aquaculture program?
    a. What is the appropriate role for the Federal government in open-water marine aquaculture? Research? Promotion and incentives? Setting and enforcing environmental standards? Developing a straightforward and predictable regulatory regime?
    b. What are the pros and cons of aquaculture? How does the U.S. balance issues of population genetics, invasive species, pollution, nutritional value, and economic impact on other fisheries with benefits generated by aquaculture?
    c. Should there be a lead Federal agency for aquaculture? If so, which agency?
    d. Should the Federal government be involved in the promotion of marine aquaculture?
    e. How can local opposition to siting be addressed?
    f. Are offshore aquaculture parks or zones effective techniques to foster an expanded, sustainable role for aquaculture? Are they a prerequisite?
    g. How should the U.S. manage fresh water vis-à-vis marine aquaculture?
    h. Are the present guidelines for a stewardship ethic, contained in the provisions of the Code of Conduct for Responsible Fisheries of the Food and Agriculture Organization of the United Nations (FAO), adequate and can we influence the international aquaculture industry to adhere to these guidelines?

13. How should our nation address stocks that exist in transit through international waters? How should we seek U.S. involvement in managing living resources in international or foreign waters (e.g., longlining, drift netting, purse-seining, whaling, indiscriminate reef fishing for aquarium trade)

14. How should we address overcapitalization?
    a. Should the U.S. compensate existing fishing interests to dispose of excess obsolete fishing equipment? How should such compensation be funded?
    b. Is the problem of reinvestment of government compensation into new and more effective technologies a real or perceived problem?

15. What is the role of traditional fishing practices?
    a. When should fisheries management be based on traditional fishing practices?

b. Should fishing rights be limited to families/concerns that can demonstrate historical or traditional dependence on a fishery?

16. What is an effective definition of Essential Fish Habitat (EFH)?
    a. Should a hierarchy of EFH levels be developed with each higher level requiring greater protection?
    b. Should we consider establishment of a consultation process such as exists for endangered species for evaluating impacts or potential impacts upon the more critical EFHs?
    c. Is EFH, as currently defined, a workable approach? Are there better alternatives that will result in protection for truly "essential" habitat?

17. How should the U.S. address the problem of marine invasive species?

18. How should the U.S. manage its coral reef resources?
    a. Do we understand the factors leading to the dramatic decline in the health of coral reefs in U.S. waters? Are these the same factors leading to declines around the globe?
    b. Do we understand the impacts of shifts in the ecology of these marine systems?
    c. Are other sensitive marine communities experiencing similar dramatic changes?

19. What is the impact of changes in global climate on living marine resources?
    a. Can the U.S. define strategies to better integrate results from global climate research efforts with local and regional living marine resource management?

20. Does the U.S. currently have a coordinated approach to design, implementation, and day-to-day management of Marine Protected Areas (MPAs)?
    a. Is such an approach needed, and if so, why?
    b. What regulatory, enforcement, educational structures need to be in place to ensure the initial and continued success and protection of an MPA?
    c. What problems are caused by the current approach of having various entities with authority to protect marine areas for different reasons?
    d. What statutory authorities exist to allow implementation of MPAs in Federal and state waters? How can MPAs be incorporated into existing management schemes, such as fisheries, fossil fuel and mineral production, and coastal zone management plans?
    e. What are the concerns associated with MPAs in relation to freedom of the seas in U.S., international, and foreign waters?
    f. Does UNCLOS/customary international law allow for MPAs on the high seas?
    g. Should MPAs be defined narrowly or broadly?
    h. Are there any other "ocean zoning concepts" that are authorized under Federal law? Should there be others?

21. What is the current distribution of MPAs?
    a. Under what authorities were these MPAs created?

b. What agencies have responsibility over these MPAs? Should a single agency be responsible for all MPAs? Why?
c. By what processes were the MPAs created? How was the public involved? Is there a preferred alternative for the process for creating MPAs?

22. For what purposes have MPAs been shown to be effective?
    a. For what purposes can MPAs be used?
    b. For what purposes should MPAs NOT be used?
    c. What type and level of enforcement is required for MPAs to be effective?
    d. Is the state of scientific knowledge adequate to properly design an MPA once a specific purpose has been identified?
    e. How should ecosystem management be incorporated into the design of a single MPA? A system of MPAs?
23. What should be the role of the Federal government in the marine biotechnology sector?
    a. Are there unique issues with regard to biotechnology in the marine environment vs. terrestrial biotechnology that warrant special attention by the Commission?
    b. What are the potential benefits and problems if the Federal government enhances investment in biotechnology?
    c. Is the current regulatory and statutory regime related to biotechnology adequate to properly oversee safe and economically feasible development in this sector?

TOPIC 2: POLLUTION/WATER QUALITY

Issues

1. What are the principal sources of coastal and marine pollution in the U.S. (point source, nonpoint source, nutrients, and atmospheric deposition), and what is the estimated contribution of each to marine water pollution?
    a. What are the major temporal and spatial trends of improvement or continued degradation by region and source?
    b. Are there regional and local patterns of marine water quality degradation with unknown sources?
    c. With regard to the marine environment, which pollutants, or types of pollutants, should be of greatest concern to the nation? Why? What specific impacts are pollutants having in the marine environment and what are the economic and human costs associated with these impacts?
    d. Are there particular ocean or estuarine areas where such pollution is a particular problem? Where are they and what is the nature of the problem?
    e. What is the level of contribution made by atmospheric pollution to marine waters and what are the constituents of greatest concern (e.g., mercury and nutrients)?
    f. What are the impacts of pollution by foreign countries on natural resources in local and international waters? Can these sources affect our nation's living marine resources or human health, now or in the future?
    g. What is the proper balance between reducing point and nonpoint source pollution via a technological approach (expensive, requires extensive engineering) vs. implementing strict laws and regulations on ocean users (cheaper, but more bureaucratic)?

2. Do we have clear national standards for abatement of marine pollution, especially from chronic point and nonpoint sources? If not, what default strategy is needed?
    a. Why is the timeline for pollution abatement so long? Is it primarily a financial issue or a technical problem or is it primarily political?
    b. Do the laws and mandates interact well for different sources of pollution to provide comprehensive management? Are there conflicting mandates or interactions among agencies that lead to undesired pollution outcomes?
    c. Are there adequate enforcement mechanisms for pollution control requirements?

3. What percentage of sewer and water treatment plants are operating at the primary, secondary, and tertiary levels?
    a. How much pollution of the marine environment would be reduced if primary plants implemented secondary or tertiary treatment? What would be the cost?
    b. Are EPA waivers and variances for secondary and tertiary treatment offered too frequently or easily?
    c. What is the current limit of technology in reducing/eliminating nutrient and contaminant content in sewer and water treatment facilities releases?

4. Can we improve recreational boater, passenger ferry, cruise, and shipping infrastructure to minimize point and non-point sources of pollution?

5. Which Federal agencies currently have programs addressing nonpoint source pollution affecting the marine environment?
    a. To what extent have they produced measurable reduction of nonpoint pollution?
    b. Are agencies consistent in their approaches?
    c. How are these Federal agencies coordinating their various programs?
    d. Does the Clean Water Act address the issue of nonpoint source (NPS) pollution adequately, and if not, what improvements are necessary?
    e. What incentives might be considered to help upland and agricultural interests better contribute to protection and restoration of the coastal ocean environment?

6. How can we develop and implement a strategy to adequately study and monitor ocean and coastal waters to understand pollution trends and impacts on the health of the marine ecosystem at local and global scales?
    a. Do existing programs measure the right parameters; address the causal interrelationships; or monitor, analyze, and predict environmental changes resulting from pollution before they become severely problematic or irreversible? Do they provide a sound scientific basis for the development and implementation of relevant laws and regulations?
    b. What should we do to ensure that the nation has a clear picture of the overall quality of its coastal and marine environments, where and what the problems are, and what to do about them?
    c. What additional tools, if any, do federal agencies need for wetlands monitoring and enforcement?

7. The U.S. Army Corps of Engineers is principally a public works agency, probably the primary one having impacts on waterways, harbors, and the coastal marine environment.
    a. Is it appropriate that the Corps also be the principal Federal agency responsible for permitting environmental perturbations and monitoring and enforcement of permit conditions? Should the permitting responsibilities be moved to an environmental agency (e.g., EPA) and the Corps' responsibility limited to engineering and construction?
    b. Should responsibility for delineation of wetlands be moved to an environmental agency or agencies?
    c. Can we enhance the Corps' stewardship role?

8. Should the Coast Guard or EPA be the principal Federal agency responsible for ballast water discharges? Should ballast water discharges be handled as point source discharges under the Clean Water Act? How will coordination between the Coast Guard and EPA be impacted if the Coast Guard is transferred to the proposed Department of Homeland Security?

9. What are the impacts of trans-boundary movements of pollutants on coastal waters and the marine environment? Should there be additional investigation of trans-boundary pollution and its effects? Is there a need for long term planning to significantly reduce both water borne and air borne pollutants? If so, should these investigatory and long term

planning functions be assigned to an existing agency or should some other entity or process be created to deal with these issues?

10. What are the causes of harmful algal blooms (HABs)?
    a. Is the apparent rise in frequency merely correlated to better monitoring in the ocean, or is the rise in frequency a real phenomenon?
    b. What changes are necessary to reduce the frequency of HABs?
    c. What can we do to manage, monitor, or predict HABs? Can we develop an effective warning system?

11. What are broad and fine scale connections between human health and the oceans in areas such as nutrition, pollution/contaminants, natural toxicants (e.g. HABs, shellfish poisoning), natural product-derived pharmaceuticals, disease—of both human and natural origin—(e.g., hepatitis, *vibrio vulnifius*), or injury (e.g., bites, stings, cuts)?
11. What do we need to know about these connections to manage, prevent, or exploit them?

12. What are the sources, types, and quantities of marine debris currently being deposited into the U.S. marine environment? How much marine debris is derived from "orphaned facilities"? What are the impacts of marine debris on the environment? What regimes are currently in place to deal with marine debris? Is there a need to develop better monitoring and management of marine debris? If so, what alternatives should be considered?

13. What are the causes and effects of changing salinity levels in coastal and estuarine environments? Are existing monitoring and management regimes adequately dealing with the issues created by changes in salinity levels? If not, what new initiatives can most effectively address salinity levels and related issues?

TOPIC 3: GOVERNANCE

Issues

1. What would a comprehensive national ocean policy, as directed by Congress in the Oceans Act of 2000, look like? What does "comprehensive policy" really mean? Why is it important? How does it differ from what we have now?
    a. What are the existing laws that govern land and water use in coastal and marine areas and how do they overlap?
    b. How are they inconsistent? How are they complimentary? How are they mutually reinforcing?

2. What should be the guiding principle(s) for ocean governance?

3. What are the appropriate roles for Federal, state, local, and tribal governments in ocean governance? Do we need to consider a national approach, which may vary by region based on key criterion (geography, volume of activities, etc.), or a regional approach to ocean governance?

4. Can our current legal, regulatory, and management mechanisms be modified to improve governance of ocean resources and activities? Do we need an organic statute to provide guidance to Federal agencies on their roles and responsibilities?
    a. How should the Federal government organize itself to more effectively respond to issues related to:
        i. management of fisheries resources
        ii. design, implementation, and management of marine protected areas?
        iii. reducing the negative impact of pollution in the marine environment?
        iv. use and management of nonliving marine resources?
        v. development and support of ocean and coastal science programs?
        vi. development and support of marine technology?
        vii. marine related commerce and transportation?

5. Do we need a more coordinated approach to the management of our ocean resources? Why? What would be the roles for the Federal, state, tribal, and local governments?

6. Is there a need to incorporate tools/approaches/strategies of regimes (current or proposed) that govern single issues into an approach that can address more than one set of issues?

7. Are there useful models, either existing or proposed, for improving our existing approach to resource use, protection, and management?

8. Do we need to improve U.S. leadership and cooperation with other nations and organizations to further international ocean policy? If so, how would this be accomplished?

TOPIC 4: COASTAL ZONE MANAGEMENT

Issues

1. Has the Coastal Zone Management Act (CZMA) been successful in meeting its stated objectives? Is it an appropriate model for effective coastal zone management? If not, are there other models that are more effective?

2. What should be the guiding principle(s) for coastal zone management?

3. What are the appropriate roles for Federal, state, local, and tribal governments in managing the coastal zone? What are the proper jurisdictional boundaries or areas of influence for each?

4. Should the Federal government identify emerging coastal issues that are in the national interest and, if so, what should be its response if state coastal zone management plans do not adequately address those issues?

5. With regard to coastal zone management, are there federal or federal-state policy conflicts that should be reconciled? For example, are the Coastal Zone Management Act and the Outer Continental Shelf Lands Act (OCSLA) compatible? If not, how should they be made compatible? What other coastal zone policies should be made compatible and how?

6. Should the CZMA framework be extended seaward? How far offshore should state interests extend? Should the relative roles for Federal/state/tribal/local governments vary with distances seaward?

7. What should the Federal government's role be in addressing pressures caused by increasing populations and development activities in the coastal zone?
    a. Is the CZMA the appropriate tool for managing these issues? If so, how should it be used? If not, do we need a new Federal program to guide land and water use policies and practices in the coastal zone to address these issues?
    b. Are there unprotected coastal areas that are of unique environmental, ecological, or cultural importance or of particular beauty that are in danger of being forever damaged by development? If so, where are they and how should they be protected?
    c. Are land based designated use areas such as wildlife refuges and sanctuaries, state and national parks and forests, recreational and wilderness areas useful models for managing coastal/marine areas?
    d. What should Federal policy be regarding support and subsidies for coastal zone development, such as flood insurance and beach renourishment?
    e. What awards, incentives, or disincentives tied to federal funds for roads, sewer lines, and other infrastructure could be used to help manage coastal growth and its impact on ocean resources?
    f. What is the best method for ensuring that the public's right to access to the coast be preserved? Is this an issue for the Federal government?

8. How should point and nonpoint pollution in the coastal zone be addressed? Are there conflicts among various Federal programs that have been created to address coastal nonpoint source pollution, such as CZMA section 6217, CWA section 319, and USDA's Environmental Quality Initiatives Program? If so, how should they be resolved?

9. How should habitat protection and restoration in the coastal zone be addressed?

10. What should be the national and/or regional policy regarding programs such as Federal flood insurance, building codes, and disaster response, relief, and mitigation, all of which address the impact of natural hazards on life and property in the coastal zone?

11. Is there a need for a national and/or regional policy that addresses coastal/marine tourism and recreation? Is a federal marine recreation and tourism organization needed? If so, why? What would be its objectives?

12. How can government stimulate the involvement of people directly affected by deteriorating watersheds that affect ocean resources and water quality in order to commit them to necessary change?

13. What science and technology information is needed by coastal resource managers? Do they have access to the information they need? Do they use the information they have? How can information needs be identified?

14. Can the economic contribution of coastal and ocean resources be accurately assessed? If so, how should this information be used?

TOPIC 5: NONLIVING MARINE RESOURCES

Issues

1. Which existing nonliving marine resource activities should be regulated by the Federal government? Which should not? Which Federal agency should be responsible for regulation of which activity?

2. Should the Federal government have a new regime for promoting and investing in ocean uses and activities?

3. Which new or emerging ocean uses and activities should be regulated and how? Which should not? How should Federal revenues derived from current and future development of offshore nonliving marine resources be assessed, distributed, and used?

4. What are the principal environmental concerns or risks associated with current and future nonliving marine resource activities (e.g., energy production, marine minerals mining, fiber optic cable or operational gear placement, desalinization)?

5. Who should be responsible for performing environmental risk assessments associated with extraction activities and what role should this information play in the site selection and approval process?

6. What international issues need to be addressed when developing domestic policy regarding new and existing nonliving marine resource use and activities? What should be the role of the U.S. in the development of policy regarding these uses and activities in the international arena?

TOPIC 6: RESEARCH, EXPLORATION, AND MONITORING

Overarching Issues

1. What should be the national strategy for ocean and coastal science programs that provide information necessary for understanding our sea floor, managing our marine resources, and protecting human life and property from natural and anthropogenic hazards?
    a. What actions should the U.S. take to ensure its world leadership status in ocean science?
    b. How can Federal science efforts be better integrated and more effective?
    c. Has Federal funding for marine science maintained parity with funding for other Federal science programs? Has it kept pace with inflation? Are there economies of scales that could be attained via reorganization or new coordination mechanisms?
    d. What should be the role of the National Academies of Science (NAS), and how can we ensure the relevant NAS boards are effective in defining strategies to address to ocean concerns? How should the NAS be involved?

2. Is the governmental and institutional framework for funding and managing the nation's ocean science programs adequate, efficient, and sufficiently cost-effective to meet whatever the needs of the next 25 to 30 years may be? If not, what would be an optimum framework?

3. What policies does the U.S. need to develop for distribution of data and information generated under sponsorship of the Federal government?

4. Is there an adequate and ongoing process to examine information that may be transitioned from military to civilian programs?

Research Issues

1. What is the appropriate research role for the Federal government with regard to that of the states, academia, and the private sector?

2. What process should the Federal government have for identifying and prioritizing research programs necessary to support and carry out a viable national ocean policy?

3. What science and level of Federal investment in marine research is needed to address existing information needs for managing, understanding, and protecting coastal and ocean resources and for protecting human health and property?

4. What research is needed to be able to model and predict environmental conditions, especially changes and perturbations resulting from natural and anthropogenic influences? To understand and model ocean-atmosphere coupling?

5. Should the U.S. expand its research efforts into the role of the oceans in climate change?

a. Does the U.S. have effective programs and national leadership to determine the roles of the open ocean, continental margins, coastal zones, and estuarine areas in global and climate change? If not, what needs to be done?
b. What can the U.S. do to strengthen international coordination and cooperation on global climate change research? Is the World Meteorological Organization (WMO) a good model to follow?
c. What agency/agencies should lead an enhanced climate change research program and why?

6. What should be the national research strategy for addressing large scale new or proposed research and development efforts?

7. How can we better understand the inputs, fate, and effects of contaminants/pollutants in the marine environment?
    a. What should be the areas for highest research priority?
    b. What level of fiscal support would be required to support such research?

8. Should civilian Federal agencies be encouraged to foster long term (3-5 years) ocean and coastal research programs as the Department of Defense does?

9. Do we understand cumulative effects of natural and human-induced changes on coastal and ocean resources and ecosystems? If not, what research efforts are required to build this knowledge base?

Exploration Issues

1. What should be the long term U.S. effort in ocean exploration?
    a. Why, what would be the benefits for the nation?
    b. What should be our strategy for implementing an exploration program?
    c. What level of resources should be committed to ocean exploration over what time period?
    d. Should there be a single lead agency for U.S. ocean exploration?
    e. What should be the priority areas for ocean exploration and how should priorities be set? For example,
        i. Arctic Ocean?
        ii. Southern Hemisphere?
        iii. Exploration and mapping of the EEZ with emphasis on the least known areas, in particular the western Pacific around the Territorial Trust Areas?
        iv. Regions just seaward of the EEZ, especially areas where discoveries could lead to extension of the EEZ into deeper waters?
        v. Regions containing evidence of human history and occupations?
        vi. The EEZ first and then what other areas?
        vii. The deep ocean?

2. How should the U.S. seek international partners in its ocean exploration effort?

3. What is the role of ocean exploration versus that of ocean research? Is there an appropriate approach where the two will benefit each other?

4. What are the educational and public relations opportunities and how can they best be used to excite the public and policy makers?

Monitoring Issues

1. Are current environmental monitoring efforts adequate to meet national, regional, state, and local needs? Is there consensus on what parameters should be monitored? Are there uniform standards and protocols for monitoring across Federal agencies? For state and local governments?

2. Are Federal environmental monitoring programs adequate—in terms of parameters measured and spatial and temporal coverage—to allow scientifically credible and timely assessments of environmental health? Are they integrated across agencies? Are they integrated with state and local government monitoring programs?

3. Is there, or should there be, a common database into which all Federal environmental monitoring data are entered? Should such a database include state and local government data as well?

4. Should the Federal government, working in concert with the states and academia, periodically produce a standard, but comprehensive, report card on the status of the Nation's marine, coastal and estuarine environments and resources?

TOPIC 7: EDUCATION

Issues

1. What is the current status of ocean science education in the U.S.?

2. What are the personnel requirements for governmental agencies, disciplines, or the industrial sector that the U.S. needs to address over the next 10-30 years?

3. Given that education is still primarily a state and local responsibility in the U.S., what is the proper role of the Federal government in ocean science education? What is the role of state/local governments and nongovernmental entities?

4. What types of partnerships among the levels of governments currently exist or are needed?
    a. Is there a need to improve the quality and/or quantity of ocean science education? If so, how? Is a specific plan/framework needed to assess this?
    b. Are the current formal and informal education programs increasing ocean sciences content knowledge or cognitive achievement? What is the best way to assess this?
    c. Is there a common focus in ocean science education? Should there be? If so, what?
    d. Are the various individual ocean education programs effective on their own or should they be coordinated in an effort in increase impact? How should they be coordinated? Should there be coordination between the rapidly growing plethora of informal education offices within the various agencies of the Federal government?
    e. Are there programs that are more effective than others and should they be used as models? Which ones and why are they more effective?
    f. Should greater emphasis and funding be given to pre-college marine educational programs, including those that give students actual field experience and put them in contact with researchers and research institutions?
    g. Is the U.S. pursuing opportunities to provide international leadership in ocean-related areas through education and training? If not, should we? What is the best way to do this?
    h. Is the U.S. pursuing effective opportunities to increase minority participation in marine sciences?

5. Is there a need for a nationally coordinated effort or agenda to enhance and promote ocean science education? If so:
    a. What needs to be done to establish such an effort? What are the impediments?
    b. What would the effort consist of?
    c. How would it be implemented, supported, and maintained?
    d. Upon which existing or planned models (e.g., COSEE) could we build?
    e. What can be done to provide leadership and visibility for ocean science education?

f. What investment plan is needed to maintain a viable ocean-related science education infrastructure?
g. What government structure (Federal, state, and local) needs to be put in place to provide for coordinated and adequate support of ocean science education?

6. To what extent should ocean science be reflected in the national science education standards and what assistance do educators need to meet these standards?
   a. What, if anything, needs to be done to attain this level of representation in the national standards?
   b. What process should be used to establish ocean science standards of knowledge?
   c. How should ocean science knowledge be incorporated into K-12 curricula?
   d. What impediments do educators encounter when teaching ocean science?
   e. Are existing teacher professional development programs for in-service teachers and teacher training programs for pre-service teachers adequate? If not, what needs to be done to enhance the programs?
   f. What is the best mechanism for "educating the educators" on ocean science?
   g. How can we develop more ocean-related resources and materials that align with national science standards and that are more widely available to and useful for educators?
   h. What can be done to bridge the gap between researchers and educators?
   i. What can the ocean community learn from the success of the space community in reaching students and educators?

7. What level of ocean literacy should the general public have?
   a. What constitutes "ocean literacy" and what criteria should be used to determine this?
   b. How can the U.S. strengthen the stewardship ethic of the general public, industry, and government?
   c. Are existing public education efforts adequate to meet public education needs? If not, what should be done?
   d. Beyond simply providing information, what can be done to engage the public in ocean issues and keep them engaged?
   e. How can we develop a public that actively contributes to the management and resolution of ocean-related problems and issues?
   f. How can we incorporate the idea of leadership development for the future and a serious commitment to the development and funding of a multidisciplinary public information program?

8. What needs to be done to ensure that ocean science and policy work force needs are being met now, and will be met in the future?
   a. How should the present institutional framework be adjusted so it is adequate to meet the work force needs, i.e., to educate and retain the necessary pool of technicians and scientists needed to conduct and sustain a high quality national program of ocean science and technology?
   b. What social science information and manpower will be needed in the future?
   c. What specialties are emerging to handle "ecosystem" and "sustaining" themes?

d. Is there a need for oceanographers and marine affairs specialists or rather for physicists, geologists, lawyers, economists, etc. who can apply their expertise to the ocean environment? What should be done to address this need?
e. Is there adequate infrastructure to address our nation's needs in non-traditional careers such as maritime law, marine affairs, seafood technology, recreation, naval architecture, etc.?
f. What can be done to attract a diversity of quality students, especially minorities and women, to undergraduate and graduate ocean and coastal programs?
g. How can we improve ocean-related career education information (including the distribution thereof)?
h. What mechanisms can be employed to highlight ocean scientists as career role models?

9. What is the current status of professional education/development and mid-career skill enhancement for ocean science professionals?
   a. Do adequate programs exist? If not, what needs to be done to ensure that professionals have and maintain the skills and information needed throughout their careers?
   b. What skill sets and level of training will ocean and coastal managers need in the future? What opportunities exist for development of sabbatical-type opportunities in Federal and state ocean agencies to provide opportunities for practicing scientists and technicians to get into the classroom e.g. a "scientist in residence" type program?

TOPIC 8: TECHNOLOGY AND MARINE OPERATIONS

Technology Issues

1. Is the U.S. still the world leader in ocean technology development? If not, why? What policies and actions need to be put in place to regain that lead?

2. What should be the relative roles of the Federal government, states, academia, and the private sector in the development of new ocean technologies?

3. What new technologies/tools are needed to significantly enhance our ability to better understand and monitor coastal and ocean dynamics, ocean oscillation events, ocean-atmosphere interactions, global climate change, coastal hazards and effects of human activities—especially cumulative effects on the marine environment?
    a. Are sufficient funds being invested in new technology development?
    b. Where should efforts be focused for technology development?
    c. What specific or new technologies are needed to accelerate research and exploration?
    d. What biological sensors—at scales ranging from micro to macro—need to be developed and what should be the priorities for development of such sensors?
    e. What new technologies and tools need to be developed to minimize loss and abandonment of fishing gear and to enable the location and removal of such gear?

4. What actions need to be taken to ensure development, implementation, and long term maintenance of a coordinated and integrated national ocean observing and prediction system?
    a. How can existing and planned local and regional systems be integrated?
    b. Where should responsibility for a national ocean and coastal observing and prediction system reside? A single agency? The National Oceanographic Partnership Program (NOPP)?
    c. What are the respective roles of the Federal, state and local governments, private industry, academia, and the public in the design, operation, and use of a national ocean observing and prediction system?
    d. Is there an existing model upon which we can build?
    e. Is there an optimum model for international cooperation?

5. What computer capability and other infrastructure is required to collect, assimilate, analyze, and model the increasing stream of real-time data from the myriad of coastal and ocean sensing systems and to create timely, customized data products for a wide range of users?
    a. What are the obstacles to data sharing for the common good?
    b. What needs to be done to integrate Federal agencies' data management capabilities?
    c. What is the best way to address data standardization and protocol issues?

6. What steps should be taken to facilitate and foster technology transfer among the various sectors of the ocean community?

7. What satellite sensor systems are required for future ocean observation to enable the U.S. to better monitor the oceans and coastal zone? What investments are necessary? What programs exist for researchers to access and use satellite data? Is there, or should there be, a single lead agency for environmental satellite systems?

8. Are the short and long term strategies for development of space-based observation and communication systems adequate?
   a. Is U.S. investment in the satellite sensor systems required for future ocean observation requirements?
   b. How can we integrate the capabilities of the various agencies involved in space-based technologies? What satellite sensor systems are needed to enable the U.S. to better monitor the oceans and coastal zone?
   c. What level of funding will be required?
   d. Is there, or should there be, a single lead agency for environmental satellite systems?

9. How can telecommunication technology be used to increase efficiency of ocean research and exploration?

Marine Operations Issues

1. How can the Federal government best integrate marine operations across the various ocean agencies? With state agencies, academia, and private institutions?
   a. Are there economies and efficiencies that could be realized?

2. What is the current state of U.S. ocean science facilities?
   a. Are the existing and planned facilities adequate to meet the objectives of a coordinated and comprehensive national ocean policy?
   b. Is there sufficient and effective communication/coordination/cooperation among the broad range of U.S. marine laboratories or is this an area where substantial enhancement is needed?

3. Would a Federal marine operations oversight board enhance coordination among agencies and among projects/programs? Is the Federal Oceanographic Fleet Committee a good model upon which to build?

4. What lessons can the operational oceanographic community learn from the nation's (public and private) operational weather forecasting experience?

5. What type of standards should be developed to ensure sensors, data, and products are interoperable and useable by all Federal, state, regional, and local agencies, as well as private industry?

6. What mechanism(s) are available to the government to ensure ocean and coastal data are accessible to all interested users?

7. What structure should the Federal government adopt to ensure there is an "end-to-end" process accounting for operational requirements, applied R&D, ocean data collection and assimilation, prediction, and application to end-users' needs? If this is not a Federal issue, what organization(s) should do this?

8. What prioritization process (if any) should take place to determine the allocation of R&D, procurement, and operational monies in support of operational oceanography?

9. As the science advances, how should the oceanographic community "grow" the users of their products and increase "user pull" for their services? How should users be trained in the capabilities and limitations of operational oceanographic products?

10. What is the role(s) of the Federal government in marine mapping and charting?
    a. What spatial resolutions are needed for different requirements?
    b. Is the technology available and/or installed to adequately address mapping and charting requirements?
    c. What is the role of industry and academia in meeting Federal requirements?
    d. How are requirements prioritized?
    e. How can we assure that the data collected by different agencies are compatible?
    f. How can we ensure that data are as accessible as possible and presented in a way that is meaningful for a variety of users?

11. What steps should the Federal government take to better work and life at sea?

Marine Related Commerce and Transportation Issues

1. What financial resources are needed to support marine-related commerce and transportation in the United States?

2. What is the economic value and impact of marine commerce and transportation to the nation, regions, states, and local governments?

3. Should the U.S. develop an integrated national maritime transportation strategy that considers sea, land, and air routes in the modernization of its marine commerce and transportation infrastructure, selects key ports for expansion, and protects coastal and marine resources? What should such a policy include?
    a. What are the lessons learned to date? What models work?
    b. Should there be national or regional planning entities to assess national needs for ports? What should they be? What is the Federal interest? How is it currently funded and managed?
    c. Is an objective body with national oversight over port development needed? How should the U.S. address the basic question of what numbers and kinds of ports the nation needs?

4. What type of taxes or fees are currently imposed on port users and how are the proceeds used?

5. What is the best way to ensure that future port development has minimal and mitigatable impacts on the environment, both natural and human?
    a. What are the environmental impacts and concerns of marine operations by sector—commercial, recreational, freight/pax, fishing industry, etc?
    b. How can the impacts of port development, management, expansion, rehabilitation, and ancillary activities on the surrounding coastal communities and marine environments best be managed?
    c. What activities should the Federal government be prepared to take to implement mandatory ballast water management? Should such activities be managed within a regional or national context?
    d. What incentives should be made available to encourage ship builders, owners, and operators to research, develop, and implement technologies that will meet national and international standards to minimize the impact of biological and chemical contamination occasioned by ballast water discharge?
    e. What best practices and management strategies exist today that can enable the minimization of habitat loss due to onshore infrastructure development, dredging of harbors and channels, and vessel and human activities?
    f. What protocols exist or can be put in place for beneficial uses of dredge spoil? What financial incentives might be implemented?
    g. What steps are required to improve both vessel waste disposal and air quality practices?

6. What automated navigational and information systems will be needed for the future?

TOPIC 9: INVESTMENT AND FEDERAL GOVERNMENTAL ORGANIZATION

Issues

1. What options for Federal government structure may be required to carry out the integrated recommendations of the Commission?
    a. Is the current Congressional structure and Federal ocean agency structure suited to current and projected needs of the nation?
    b. Are agency missions articulated clearly to minimize duplication of effort and optimize Federal effort, and are they being addressed adequately and in the way envisioned by establishing authorities?
    c. What governmental structure will enable meaningful cross-agency policy and budgetary integration to take place?
        i. What specific functions require high-level integration?
        ii. What models can be considered to enable high-level, multi-agency policy and budgetary integration?
        iii. What authorities are necessary to ensure integration on a sustained basis?
        iv. What approaches to regional coordination should be considered and how are they implemented?

2. How can the Federal budget process, with respect to ocean and coastal programs, integrate across multiple Federal agencies?
    a. How may the U.S. government investment in ocean and coastal programs be consistently and transparently expressed in a manner that best enables cross-agency and multi-agency management and cooperation and best informs related constituencies and the general public?
    b. How should stakeholders be involved in the Federal budget planning process?
    c. How should Federal agency budget requirements and priorities be set?
    d. How can the budget process accommodate multi-year investment requirements?
    e. What mechanisms will promote multi-agency funding of large projects?

3. What cost impacts are associated with implementing the Commission's recommendations?
    a. How will the proposed new expenditures be funded?
    b. Are sources of funding other than general appropriations available?

4. How will a comprehensive oceans policy receive periodic review and adjustment in the future?

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OCEAN POLICY

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