

## TOPIC: *POLLUTION/WATER QUALITY*

### KEY ISSUE: *Ocean Pollution Sources; Point and Nonpoint*

#### ISSUES RAISED

- One of most pressing issues is marine debris: past 4 years 150 tons of nets and line removed from NW HI islands; debris is coming from elsewhere. (Colom-Agaran)
- Fundamental issue is water quality. (Etnoyer)
- 30 years after passage of Clean Water Act, U.S. coastal waters still have numerous critical water quality problems; although there have been improvements in water quality from point sources. Regulations of nonpoint source pollution generally only through TMDL approach; states and EPA need to proactively develop TMDLs and ensure implementation. Reducing stormwater and nonpoint runoff is nothing short of pathetic:
  - 1) Severely under-funded by two or three orders of magnitude or more;
  - 2) Effort to move urban stormwater into point source provisions of CWA without clear and meaningful water quality standards is ineffective;
  - 3) Federal enforcement on municipal stormwater non-existent;
  - 4) Lack of true regulatory and enforcement of CWA for nonpoint. (Gold)
- Another major source of pollution is contaminated sediments; no national strategy to clean up sediments. (Gold)
- Increased development with more nonpoint pollution and wastewater. Santa Barbara sewage treatment plant discharging a lot of solids. Goleta Sanitary District requesting another 5-year waiver to not fully treat waste. (Maassen)
- Nation's efforts to control point source discharges, sludge and wastes dumping successful. Pollution from nonpoint runoff and atmosphere largely unabated and new provisions in CWA and CZMA not effective. (Boesch)
- Nitrogen has emerged as most widespread and measurable effect of pollution on living resources and biodiversity in U.S. coastal waters; excess results in eutrophication. Two-thirds of surface area of estuaries and bays in U.S. suffers one or more symptoms of nutrient over-enrichment. (Boesch)
- Federal role in response to nonpoint huge; decides policies and funding. (Boesch)
- Effects of nutrient pollution on coastal zone are long lasting (e.g., destruction of seagrass, corals, etc.), the manifestations sometimes are ephemeral. (Boesch)
- Nutrient pollution one of most serious water quality problems in nation and is major threat to coastal water quality; leading cause of pollution of Iowa's surface water and groundwater. (Heathcote)
- Iowa has some of the most nutrient rich waters in the world, with significant amounts of nitrogen and phosphorous. Agriculture dominant source of water pollution in Iowa, including farm fields, livestock manure, and intense production of corn, soybeans, and hogs. Iowa must do something about its contribution to the Dead Zone in the Gulf. If we don't solve water quality problems in Iowa and upper Midwest we're not going to have an effect on hypoxia. Task force came up with adaptive management approach as best way. (Heathcote)
- There have been encouraging changes to the Farm Bill. In particular, increased conservation funding for new conservation security program. (Heathcote)

## *Ocean Pollution Sources; Point and Nonpoint (continued)*

- Need a different direction, not just implementing what is on the books. Need to really examine agriculture policy; some going on this year in Farm Bill. Whole infrastructure is geared towards commodity crop production; won't change that overnight. Reducing yield by limiting nitrogen application complicated by real economics of crops. (Heathcote)
- Answer to lowering concentration of livestock and diversifying farming not really size of operation but concentration of animals on the land; need better manure management and reuse. Attitude of farming community is changing; more trying to solve nutrient problem and talking about hypoxia; networks are forming like Clean Water Network that includes agricultural groups. (Heathcote)
- Second largest zone of hypoxia ("Dead Zone") in world is on continental shelf adjacent to outflows of Mississippi and Atchafalaya rivers. [detailed discussion about hypoxia in Gulf of Mexico is provided] federal interagency efforts include Integrated Assessment of Gulf of Mexico Hypoxia, Hypoxia Action Plan submitted to Congress and approved by federal, state, and tribal nations in October 2001. Plan outlines voluntary, incentive-based sub-basin strategies intended to sum to overall 30% reduction. Hypoxia Plan had to avoid using "R" regulatory word in order for agreement. No single strategy will account for most of nitrogen removal, but modified agricultural practices and restoring wetlands and riparian buffer strips within Mississippi basin will provide most nitrogen removal. Solving hypoxia problem in Gulf and improving water quality and habitat within Mississippi River basin will require 30% nitrogen load reduction. (Rabalais)
- Successful plans generally span geopolitical boundaries, e.g., Chesapeake Bay Agreement, NEPs, etc. (Rabalais)
- Great concern about Gulf of Mexico's dead zone. Need to have healthy Gulf ecosystem: start with chemical fertilizers and pesticides dumped into upper reaches of Mississippi River; we've started with the farmers, now focus on those who sell them fertilizer and pesticides. (King)
- Concerned about mercury in Gulf. [discussion of reports provided] (Kohl)
- Want help to tie concerns of the upper Mississippi River communities to regional community on lower Mississippi/Gulf origin; want a more cohesive and integrated view of Gulf of Mexico. (Sullivan)
- Impacts of land-based activities in coastal areas; nonpoint pollution: "Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution" (Alberts)
- Disposal of materials in the ocean:
  - 1) Despite laws and regulations, things are still happening that pose threat to marine life, e.g., entanglement, etc.;
  - 2) "Oil and the Sea" report out next spring;
  - 3) Recent report on dredging and long-term impacts from ocean disposal. (Alberts)
- Outstanding issues regarding water quality and pollution include reducing impact of nonpoint source pollution and minimizing the introduction of invasive species. (Bodman)
- Management of human activities related to ocean must account for the land-sea connection, including silt from clear cutting; agriculture-induced silt and pesticide run-off, over fertilization from excessive fertilizer and farm animal sewage; and human sewage. The air-sea connection includes transport and deposition of pollutants; changes in atmospheric chemistry; and warming. Transport in water through ship ballast carry species worldwide; direct exploitation (oil drilling; fishing). (Safina)
- Land and water connected; must engage and energize people who live in Mississippi watershed to deal successfully with coastal problem. (Wayland)
- Major challenge is nonpoint pollution. (Wayland)

- Florida's coastal environment is especially vulnerable to nonpoint pollution because extent of karst nature of the platforms allows great interaction between ground and surface waters, and low gradient of the land results in high water tables. [discussion of these issues is provided] (Chanton)
- Primary problems facing marine and coastal resources, not already addressed in comments to Commission, are associated with three types of anthropogenic alterations of Florida's aquifer system: 1) groundwater mining; 2) aquifer-injection of wastes; and, 3) so-called aquifer "storage" and "recovery." [discussion of each provided]
- Desalination of sea water is viable alternative to groundwater mining. Alternatives to waste injection exist: Vermont Law School; Use carrot and stick approach. [description provided]
- Alternatives exist to Florida's current unscientifically founded approach for replenishing the aquifer system; use pervious pavement; freeze federal funds for programs and support to Florida and all coastal states that are destroying natural recharge areas.
- EPA has exhibited no evidence that it comprehends nature of groundwater responses associated with aquifer-injection: should halt all groundwater injections until detailed studies have been conducted to determine adverse impacts to coastal and marine systems. Transfer EPA oversight to USGS. (Bacchus)
- Marine debris:
  - 1) Perceived as visual indicator of pollution;
  - 2) 80% from land-based sources.
- National Monitoring Program:
  - 1) Scientifically designed with 180 sites monitored monthly by volunteers;
  - 2) Designed to determine amount of debris decreasing and major sources;
  - 3) 5 year data in Gulf may show trends. (Schwartz)
- Oil Spill: Priority in Washington is to prevent spills by focusing on large vessels and marine facilities, while working with Coast Guard and stakeholders. (Shultz)
- Yes, the state would like to engage in inspections that go over and beyond the Coast Guard inspections. In the INTERTANKO decision, Washington State would enter in different standards of inspection than what the national standards are. Would like Congress to modify it: Congress would make the national standards, but they would allow states that have an effective program be able to have standards that could be more stringent or a little different than the Federal standard. This would relieve some of the burden on Congress. The Coast Guard, as we know, is being asked to do a great deal and this process would relieve some of their burden. (Shultz)
- The Puget Sound area has done a pretty good job at minimizing the amount of sewage being discharged, but the largest problem has been with British Columbia and Vancouver, both of which have dumped raw sewage into the straits. I do not know if there are any waivers but I will find that out. (Smitch)
- Principal justifications that states use for 301(h) waivers', including:
  - 1) The belief that current discharge of blended effluent (primary and secondary) is not harming the environment;
  - 2) The belief that secondary treatment provides no reliable or significant disinfection or risk reduction from a sanitary engineering perspective;
  - 3) The belief that monitoring requirements for facilities operating under 301(h) waivers are more stringent, and that removing the waiver would result in less frequent monitoring and thus fewer beach postings and advisories;
  - 4) The belief that nonpoint sources produce more significant impacts than point source discharges; and
  - 5) The belief that waste water treatment plant upgrades (to secondary treatment) are prohibitively expensive. [Further description provided.] (Evans, C)

## *Ocean Pollution Sources; Point and Nonpoint (continued)*

- Nonpoint source pollution entering the coastal zone is a problem of national scope needing national level solutions. Such programs are massively under-funded. (Hamilton)
- Pollution—aquaculture, and specifically farm salmon, is a form of pollution that threatens the economic and the fisheries of Alaska. Cruise ship pollution issues are not a small issue, but cruise ship pollution is one hundred percent preventable. (Ayers)
- Some good news: Oils spills have dropped over fifty percent since 1991; there has been 1.5 gallons of oil spilled per million gallons shipped; there have been no spills over one million dollars. These are not accidents, but have occurred through a lot of cooperation and new initiatives. (Berkowitz)
- The Gulf of Maine's challenges:
  - 1) The water quality of the Gulf of Maine is under tremendous pressure from population increases.
  - 2) The newest source of pollution in the Gulf of Maine is salmon aquaculture farming operations.
  - 3) The nightmare that looms over every ecosystem is a catastrophic event such as an oil tanker accident. (Shelly)
- Marine water pollution emanating from land based activities must be addressed at all levels of government as an integral part of ocean policy and include the full enforcement of the Clean Water Act. [discussion provided] (Delaney)
- The town of Falmouth has begun a project to manage nitrogen loading from septic systems and fertilizer usage in town that has diminished the water quality in the coastal embayment. [discussion provided] (Dow)
- "The Voyage of the Odyssey", an Ocean Alliance program, is aimed at quantifying a serious threat to ocean life from synthetic compounds known collectively as POPs (Persistent Organic Pollutants). Included are compounds such as DDT, DDE, PCBs, aldrin, endrin, dieldrin, dioxins, furans, etc. Their other name, Endocrine Disrupting Compounds (EDCs), describes their greatest threat to humans—that some of these compounds are hormone mimics which even at concentrations as low as a few parts per billion can upset fetal development, cause reproductive disorders and malformation of sex organs, compromise immune systems, do neural damage, and, in young children, diminish their ability to concentrate and learn. (Payne)
- Many countries around the world have recognized the environmental threat posed by the cargo and/or bunker oils and chemical cargoes remaining aboard shipwrecks located in their respective waters, and that the time had long since come when action must be taken to deal with those pollution threats. (Witte)
- The risk of a major pollution incident will exist as long as bunker and/or cargo oils or other petroleum and chemical cargoes are not properly removed from shipwrecks. Studies performed have demonstrated that among other possibilities plate perforation and oil escape can be expected from corrosive pitting, and that corrosion rates have been found to increase dramatically after the first twenty years of submersion. (Witte)
- Published accounts indicate that are as many as 28,500 barrels of lubricating oil remaining onboard the COIMBRA in eight cargo tanks that were not inspected during the 1967 survey, which was directed by President Johnson to determine how to best meet the national need to address the problem of oil pollution. (Witte)
- The threat to the environment that these wrecks represent is a most important issue for coastal and ocean protection; one of specific concern to the Northeast region of the United States as well. (Witte)
- The cost to the public of removing the oil from wreckages now, while it is still contained, is significantly less than the costs will be if the oil is allowed to escape into the environment with the attendant destruction of natural resources, aquatic mammals, and fishery habitats, and significant economic losses suffered by seaside communities. (Witte)

- The Environmental Committee of the Cruising Club of America has done research and funded experiments in waste systems for yachts so that with our new processes, the wastewater can be clean enough to meet environmental concerns. (Higginson)
- It does not make sense to us that regardless of how clean our wastewater is, discharge from yachts will not be allowed. (Higginson)
- Yachtsmen do not use their pump-out stations, because they are not pleasant. If more technology would be fostered to clean our wastewater in yachts, it would be a productive and useful approach to this problem. The industry, however, has not been interested because of the number of areas that have no discharge. (Higginson)
- One more complexity to add to the Commission's plate is the subject of mercury pollution of our shores. Mercury becomes concentrated in the food chain, as well as other nasty things that have already been discussed. Mercury comes from power plants burning coal and municipal solid waste incinerators. The amount of mercury that comes out is small, but it is lethal, and it gets brought up in the food chain. The top fish in the fish chain dies, falls to the bottom, rots, and the mercury gets right back into the system. [discussion provided] (Bradley)
- The two major human threats to Alaska oceans are pollution and destructive fishing practices. We will not totally solve these problems; our responsibility is to stop the preventable and develop the tools for the next generation to overcome challenges. (Ayers)
- Persistent Organic Pollutants (POPs) are of particular concern in Northern latitudes where internationally transported chemicals settle out in cold climates and remain in the food chain. [Further description provided.] (Ayers)
- Maritime commerce is a critical link in Alaska's economy, and the risks and consequences of maritime spill disasters are high. (Keeney)
- NOAA assists with maritime spills through prevention, preparedness, response, and restoration activities. [Further description provided.] (Keeney)
- A critical lesson of the Exxon Valdez disaster is that a framework must be in place before an event occurs in order to organize decision making; to understand appropriate response strategies; and to establish mechanisms for evaluating the environmental tradeoffs among different approaches and the implications of response strategies for restoration. [Further description provided.] (Keeney)
- One of the lessons learned from the Exxon Valdez spill and other incidents is that restoration is delayed when the focus is on establishing the monetary value of natural resource damages rather than on the costs of restoration. [Further description provided.] (Keeney)
- One of the NOAA programs deals with non-point source pollution in its coastal zone management program. The CZM program has placed a certain priority on states to put together enforceable programs that look at non-point source. Approximately a third of the states have programs in place, another third have programs within reach of being put in place and another third have a ways to go to put them in place. The EPA is a significant player in this arena, particularly when it comes to emission controls and atmospheric deposition. (Keeney)
- Once an oil spill occurs, the best we can hope for is to minimize the 'total negative impact' of the event on public health and safety, environmental degradation, property damage, and direct and indirect economic losses and cleanup costs, both public and private. (Ross)
- Oil spill response is the art of making difficult, time sensitive decisions with potentially major consequences and – all too often – making those decisions on less information than we would like to have. (Ross)

## *Ocean Pollution Sources; Point and Nonpoint (continued)*

- The legislative foundation for oil spill response is found primarily in the Clean Water Act and the Oil Pollution Act of 1990 (OPA '90), requiring the preparation of a National Contingency Plan, various Regional Response Plans, and robust Area Contingency Plans. [Further description provided.] (Ross)
- In the U.S., the onus of conducting planning and response to an oil spill lies on the owners whose businesses create the potential for spills (the Responsible Party); as a result a response contractor industry has grown up. [Further description provided.] (Ross)
- The basic organizational model used by the Coast Guard is the Incident Command System (ICS), containing a multiple decision-maker structure that includes the Responsible Party. [Further description provided.] (Ross)
- Among the issues the Coast Guard and other members of the response community are grappling with are the difficulties of maintaining a viable commercial response community in the face of declining accident rates. (Ross)
- The National Response System, while not problem free, is a significantly better and stronger system than existed prior to the Exxon Valdez. OPA '90 deserves much of the credit for the improvements that we have seen. (Ross)
- Until the Coast Guard receives the necessary resources it will rob Peter to pay Paul a bit—which is nothing new for the Coast Guard. (Ross)
- The methods that are appropriate for point sources, whether it's an industrial facility or a tank ship, are not appropriate or suitable for non-point sources. EPA has a storm water runoff program (for petroleum hydrocarbons that enter the sea from storm drain runoff, etc.). That EPA program has not been well funded. (Ross)
- The area of marine emergency planning and response will get better. The national strike force, the Coast Guard strike teams are elements that are critical for response to hazardous chemical events. The Coast Guard ran site safety at ground zero in New York. The Coast Guard strike teams ran site safety for the Anthrax response in Washington, New Jersey, and Florida. The Coast Guard is a national asset and the capabilities and skills to deal with oil, chemical spills, and whether they're industrial accidents or transportation accidents or deliberate criminal events are skills directly transferable. The solution is not to split the Coast Guard up or to put it in this department versus that department. The solution is to provide the Coast Guard with resources they need to do all of the things needed for the American people. [discussion provided]. (Ross)
- There are a number of informal working relationships, for planning events for example, that exist between the Coast Guard and NOAA in the response arena. There are no existing effective mechanisms for a new initiative to require across agency funding. There is no knowledge of budget coordination mechanism at a high level. (Ross)
- For oil spill prevention and response, The Oil Spill Recovery Institute has industry, Coast Guard, Federal and state agencies, and the public involved in helping to implement these technologies to make better decisions in the future. (Thomas)
- The Oil Spill Recovery Institute has been putting core money into the Prince William Sound Science Center and it's run between \$300,000 and \$600,000 a year. People have been able to receive grants through the competitive bidding process and have been able to either double to triple that kind of funding. So, the whole effort to build a bioregional program and have a regional host is really inexpensive and when one looks at the kind of information that comes out of it, it is apparent that we cannot afford to NOT have this kind of regional emphasis in the future. (Thomas)
- Both the new Federal and state law protect only Alaskan waters; they do not bring vessel discharges under the NPEDS permitting requirements or the technology force and requirements of the Clean Water Act. (Balliet)

- Since the Exxon Valdez spilled oil (and not chemicals), not enough urgency in prevention and preparedness has been directed at the marine transportation of bulk chemicals. [Further description provided.] (Utlely)
- Most chemical carriers still do not have written response plans that would assist in protecting the public and minimizing the environmental impact during a major incident. (Utlely)
- Another area of increasing concern in the U.S. is our inland waterway network. Almost 37 million tons of chemical fertilizers are moved in and around the U.S. every year with approximately 50% in operation on the Mississippi River. (Utlely)
- Under the Clean Water Act, only the EPA has the authority to designate a chemical as a “hazardous substance”, but that list has not been updated since 1979. (Utlely)
- Of the 782 internationally recognized noxious liquid substances, only 134 appear on the EPA’s list of hazardous substances. Yet, in the Coast Guards’ view, these 134 cargoes do not necessarily represent those cargoes posing the greatest threat to the marine environment. (Utlely)
- The current active regulatory paradigm ignores modern science and frustrates the sustainable oceans policy. Specifically between 300 and 200 miles it remains legal under the Clean Water Act to dump toxic drilling and production wastes into our fisheries and marine habitats. EPA has banned the discharge of drilling muds, cuttings, produced waters, and chemical additives in all coastal waters in the U.S. except for Cook Inlet. The discharge rules remain firmly fixed in the archaic notion that dilution is the solution to pollution. Now a growing body of apt scientific evidence is telling us what common sense already knew, that our fragile marine ecosystems are susceptible to toxic pollution. [discussion provided] (Shavelson)
- Toxic chemicals have profoundly affected Great Lakes ecosystems. These chemicals accumulate through food webs and have affected the health of humans and animals including bald eagles, osprey, mink, and lake trout. Species like Lake Erie’s blue pike is extinct, in part, as the result of pollution. (Hartwig)
- Nonpoint source pollution is the most pervasive source of water pollution in the United States today. Much of our NPS pollution today is the result of past activities. However, many of our biggest future challenges lie in preventing new problems that are resulting from the continued development and growth of our coastal communities. (Wayland)
- Description of the National Nonpoint Source Pollution Program is provided. (Wayland)
- Opportunities to abate nonpoint source pollution include State Coastal Nonpoint Source Pollution Control Programs, watershed-based planning and TMDL’s. (Wayland)
- Two major sources of funding, in addition to Section 319 funds, warrant special attention: Farm Bill and State Revolving Loan Fund. (Wayland)
- Left unaddressed, nonpoint source pollution could actually erode away the gains made by controlling point sources of pollution. (Wayland)
- Serious threats are posed by nonpoint source pollution to coastal and ocean waters. Nonpoint source pollution, including nutrients, toxins and pathogens that run off farms, city streets and suburban areas, presents the most significant pollution threat. (Chasis)
- Nitrate has been identified as a contributing factor to the Hypoxia Zone in the Gulf of Mexico, with where I live, being identified as a major contributor of that nitrate. Nitrate comes from many sources; industry, agriculture, background, urban areas, and septic systems. In the last 10 years the amount of nitrogen used in the Raccoon River watershed has decreased, the amount of crop removed has increased, but the levels of nitrate in the Raccoon River have also increased. (Bardole)
- One of the greatest impediments to change is an elderly, and/or absentee landlord. Most of these landlords want income from their investment, the land. (Bardole)

### *Ocean Pollution Sources; Point and Nonpoint (continued)*

- In today's large confinement operations, much of their problems are point source. The problem is large confinements being placed too close together and therefore having more crop nutrients than can be economically spread. (Bardole)
- Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution, provided a detailed analysis of the scientific and management issues posed by nutrient pollution and outlined the key elements of a nationwide strategy to address the problem. Oil in the Sea III: Inputs, Fates, and Effects suggests that oil may need to join nutrients, pesticides, and mercury on the list of non-point source pollution threats to the coastal environment. (Walker)
- Chronic low-level releases associated with the consumption of petroleum account for 70 percent of total and may pose significant risks to the sensitive estuarine environments where these inputs most often enter the marine environment. Volumetrically the most significant anthropogenic source of petroleum entering the marine environment is land-based, non-point source pollution. (Walker)
- Non-point source nutrient pollution—no single policy approach will be appropriate in all cases. (Walker)
- Oil in the sea each year off North America: natural seepage of crude oil from geologic formations below the seafloor to the marine environment is estimated to exceed 47 million gallons; activities associated with oil and gas exploration or production introduce on average an estimated 880,000 gallons; transportation of crude oil or refined products (including refining and distribution activities) results in the release on average of an estimated 2.7 million gallons; and an estimated 25 million gallons are input from diffuse sources. (Walker)
- The severity of nutrient problems and the importance of the coastal areas at risk led the National Academies to call for the development and implementation of a National Nutrient Management Strategy, which as proposed in Clean Coastal Waters would coordinate local, state, regional, and national efforts to combat nutrient over-enrichment in coastal areas, with the goal of seeing significant and measurable improvement in the environmental quality of impaired coastal ecosystems. (Walker)
- The realization that nonpoint sources of nutrients, specifically nitrogen (N) and phosphorus (P) from agricultural lands represent a significant water quality issue is relatively recent. (Keeney)
- Policy and agricultural technology has not kept pace with the science of water quality. Agricultural lands are not managed in general to reduce nonpoint nutrient sources, and there are few if any rewards and incentives for doing so. Farm policy rather has continued to emphasize and reward production, especially of row crops, which are by far the largest contributors of nutrients. (Keeney)
- The farming community is suspicious of efforts to control nonpoint source pollution. Hence non-point source control has low political weight at state and national levels, and tends to be a "cause" for environmental groups rather than a responsibility of farm operators and landowners. Little if any rewards accrue for control of offsite pollution. (Keeney)
- A new concept, the working landscape, is emerging in Europe and the United States. Working Landscapes looks at ways to couple voluntary, incentive-based policies with landowner innovation and private enterprise. (Keeney)
- The Conservation Security Program of the 2002 Farm Bill offers many stewardship options that if properly used and adequately funded can be a positive step toward a new agriculture. (Keeney)
- Ballast exchange will become mandatory with the new NISA bill. (Harkins)
- Dept. of Agriculture has been working very closely with EPA on TMDLs as well as the animal feeding operation rules that they had proposed. (Knight)

- We've made good progress in over 30 years on direct sources of pollution, on point sources. But over the last 30 years, what's happened is we've had increased pollution from nonpoint sources. (Panetta)
- With advent of improved testing, estimates of sediment contamination increased dramatically. Sediment contamination in harbors, estuaries, coastal waters, and at dumpsites, must be recognized as a pollution issue of consequence to the marine environment. (Zipf)
- Discussion is provided of the extent and severity of contaminated sediment in U.S. coastal and ocean waters. (Zipf)
- Discussion is provided of threats to fisheries and shellfisheries from exposure to contaminated sediments. (Zipf)
- Discussion is provided of the New York-New Jersey region: A case study in remediating ocean contamination and treating and reusing contaminated sediments. (Zipf)
- Discussion of background and current issues for nonpoint and marine debris. (Rufe)
- Findings, goals and objectives for marine and estuarine pollution. (CSO)

## **PRESENTER RECOMMENDATIONS**

- Marine Debris:
  - 1) Work with IMO to establish additional policies focusing on dumping or discarding fishing gear.
  - 2) Establish international committee to work with net manufacturers to develop methods of tagging nets to identify fishers discarding gear.
  - 3) Establish international bounty program to buy back discarded nets; national incentives program for new methods to recycle and/or reuse them for other products. (Colom-Agaran)
- Encourage responsible local and municipal wastewater management and water quality monitoring programs. (Etnoyer)
- Clean Water Act - 301(h) Waivers: Amend the Clean Water Act to remove the 301(h) waiver program. (Werny)
- Reduce the impact of stormwater runoff on coastal waters:
  - 1) Limit urban development along shorelines, particularly impervious cover;
  - 2) Preserve and construct wetland and riparian buffers and submerged aquatic vegetation;
  - 3) Limit use of fertilizers, herbicides and insecticides on lawns and landscaping.
  - 4) Encourage best management practices in agriculture;
  - 5) Educate the public regarding the ecological values of natural landscapes. (Chanton)
- Need national contaminated sediment regulatory program including: sediment quality standards based on chemistry and toxicity; requirements for dredging and disposal in an environmentally sound manner. USACOE should include program with maintenance dredging. (Gold)
- New approaches to reduce diffuse source pollution of nation's coastal waters must be key facet of a new U.S. ocean policy. National ocean policy in the 21st century must reach out and influence national agricultural policy, energy policy, transportation policy and land use policy. For example, U. of Maryland convened Common Ground Summit involving agriculture and marine scientists. (Boesch)
- There are a variety of ways to deal with nonpoint pollution: restoration; better education of homeowners. To protect what is there: buffers, better site design principles for development, etc. (Max)
- Adopt policies that encourage diversification of agriculture landscape:
  - 1) Short term: add new crops to corn and soybean rotation, especially perennial crops like alfalfa and grass;

*Ocean Pollution Sources; Point and Nonpoint (continued)*

- 2) Move away from concentration of livestock in large confinement facilities back into smaller diversified farms;
  - 3) Long term: need to completely reshape agriculture focus away from grain to wider diversity of food and fiber, including fruits and vegetables. Will need more incentives, not just subsidies for commodity crops. (Heathcote)
- Improve farm management including applying fertilizer at right time in right amount:
    - 1) All farms should be required to develop nutrient management plans with nitrogen and phosphorous budgets for inputs and outputs, and accounting of all nutrient losses;
    - 2) Provide incentives for demonstrated efficiency in nutrient use through record keeping and monitoring of air and water. (Heathcote)
  - Must put back natural wetland and riparian filters to reduce nitrogen pollution. (Heathcote)
  - Need to move forward with funding and implementation of Hypoxia Action Plan agreed upon in 2000. (Heathcote)
  - Incentive-based programs to take land out of production are needed. Need to educate farmers that they don't necessarily need to risk crops if they make small adjustments in nitrogen use. (Rabalais)
  - Farm runoff (vegetable and livestock) top priority for pollution issues. (Safina)
  - Recommend additional sediment contamination research to document mercury and other heavy metals occurrences around oil and gas platforms. (Kohl)
  - Reduce nonpoint pollution by implementing strong nutrient standards, coupled with market-based incentives for compliance (i.e., small-scale nutrient stripping wastewater treatment technologies). (Hopkins)
  - Reduce the polluted runoff that enters coastal waters from streets, agricultural lands, construction sites, and other sources. Enhance the efforts to control pollution from sewage treatment plants, stormwater systems, and industrial plants. (Danson)
  - Groundwater protection:
    - 1) Homes in coastal areas should be connected to central sewer system;
    - 2) Onsite sewage systems (septic systems) don't work well in karst or high water table areas;
    - 3) Where onsite systems must be used, advanced secondary levels of treatment are preferred to aerobic units;
    - 4) Agriculture must develop and use best management practices to reduce fertilizer usage, animal waste from chicken houses and concentrated animal feedlots. (Chanton)
  - Reduce the impact of groundwater on coastal waters:
    - 1) Increase setbacks of septic systems from shoreline to 50m (from 23m);
    - 2) Raise septic system drainfields to 1m above water table; grandfathered systems should be upgraded. (Chanton)
  - Marine Debris:
    - 1) Encourage FAO and IMO to work together to address fishing debris;
    - 2) Assist in bringing MARPOL special areas into force;
    - 3) Implement Wider Caribbean Initiative on solid waste;
    - 4) Funding for net removal, monitoring, education, prevention, mitigation;
    - 5) Revive MERP or similar program.
    - 6) Increase agency involvement;
    - 7) Establish interagency coordinating committee. (Schwartz)
  - Reduce plastic and other marine debris. (Hopkins)

- Oil Spills:
  - 1) Should urge the Federal government to provide matching funds to support a dedicated rescue tug at Neah Bay.
  - 2) Coast Guard and DOJ should provide additional resources to address the intentional and illegal dumping of oil. [discussion provided]
  - 3) Recent U.S. Supreme Court decision has made it critical that the Federal government delegate appropriate inspection authority to states that have well-funded and effective oil spill prevention and response programs. [discussion provided] (Shultz)
- Enforce the Clean Water Act: agriculture and urban nonpoint; Wastewater treatment 301 (h) waivers are a problem [discussion provided] (Hayes)
- Abolish 301 (h) waivers from CWA. (Hayes)
- Amend the Clean Water Act to remove the 301(h) waiver program. (Evans, C.)
- Congress and the President should commit to the Clean Water Act's primary goal of ending the discharge of pollutants in fishable and swimmable waters:
  - 1) Need adequate funding for enforcement and effective oversight by EPA.
  - 2) Phase out "mixing zones".
  - 3) Require that urban run-off meet water quality standards and support monitoring and enforcement.
  - 4) Enforce the law with meaningful penalties that spur compliance, and permit fees that reflect the cost of effective permit programs.
  - 5) The "fund" in Superfund must be reauthorized. (Fletcher)
- Catastrophic oil spills need to be prevented: need Federal funding for a tug at Neah Bay. (Fletcher)
- Many of the impacts to our oceans come from pollutants washing off the land. The Commission should recommend that sections of the Clean Water Act that deal with non-point source pollution be significantly strengthened. (Revell)
- Support legislation that controls, monitors, and enforces the regulation of sewage off of cruise ships, which are simply floating cities. (Ayers)
- Give agricultural interests in eastern Washington an opportunity to be heard. Too often, ocean policy ignores extreme upland landowners. (Brautigan)
- Congress should provide financial assistance for state and local governments implementing the Clean Water Act. [details provided] (Shultz)
- Federal and state governments must fully implement the provisions of the Clean Water Act and embark on a comprehensive and accelerated effort to clean up impaired coastal waters; U.S. EPA should expeditiously complete "aquatic animal production" effluent guidelines; U.S. Coast Guard programs must be upgraded and expanded; international mechanisms to improve coordination and management should be expanded. (Shelly)
- Federal resources need to be made available to deal with the shortage of wastewater disposal infrastructure in coastal areas that have experienced rapid population growth in recent times, since localities lack the financial resources to address this problem. (Dow)
- One of the best ways to study EDC concentrations in the seas is to analyze the fats of whales—especially predators like sperm whales. Bearing in mind that the U.S. government forbids the sale of fish containing more than two parts per million of PCBs, and that anything with more than 50 parts per million is classified as a toxic waste, killer whales have been found with 400 parts per million of PCBs. [discussion and more examples provided]. (Payne)
- The U.S. must address the threat to the ocean environment posed by the aging population of shipwrecks located off its coasts. (Witte)

*Ocean Pollution Sources; Point and Nonpoint (continued)*

- Congress and the Administration should provide the U.S. Coast Guard with both the mandate and the financial support that it will need to address and eliminate the threat of wreck related oil pollution. (Witte)
- Set or consider having the Federal government set national standards for the release of wastewater from yachts and to apply those standards rather than just a straight no-discharge zone. (Higginson)
- Minimize pollution and contaminants. (Clarke)
- Remove marine debris. (Clarke)
- The U.S. Senate should immediately ratify the POPs treaty (Jefford's Bill) for the twelve listed POPs and ensure an efficient, effective process for adding new chemicals to the treaty. (Ayers)
- The Clean Water Act should be amended to prohibit POPs and persistent bioaccumulative toxins in mixing zones. (Ayers)
- Continue to improve cooperation among trustees and responsible parties involved in spill planning and response. (Keeney)
- Streamline the claims process through the National Pollution Funds Center. (Keeney)
- Institutionalize state Natural Resource Damage Assessment (NRDA) programs and forge stronger partnerships with other trustees; improve efforts to transfer NOAA's expertise to other natural resource trustees. (Keeney)
- Support advanced research and development on the increasingly complex fate and effects of multiple contaminants and the efforts to restore the affected resources. (Keeney)
- Support a more institutionalized regional approach to risk reduction and prevention that focuses on partnerships among industry, government, and communities to identify and respond to specific threats to marine safety – and the resources needed to respond to those threats. (Keeney)
- Establish an expanded role for NOAA in marine transportation system improvements that would better utilize its expertise on waterways management and port development activities in collaboration with the Coast Guard and the Army Corps of Engineers, and regionally and locally with state and community agencies and industry. (Keeney)
- Place new emphasis on training and preparedness to address deficiencies and the new challenges we face from ageing infrastructure, increased vessel traffic, and threats of terrorist attack on vulnerable energy facilities. (Keeney)
- Institutionalize an on-going research and development program within an oil spill research institute, including continued research and development on the fate and effects of multiple contaminants on the restoration of natural resources. (Keeney)
- Support efforts to develop faster and more efficient ways to assess injuries and for planning and implementing restoration. (Keeney)
- Expand incentives for industry, agencies, and other partners to encourage more cooperative approaches to assessing damage and implementing restoration. (Keeney)
- Ensure that the level of funding in the Oil Spill Liability Trust Fund is sufficient to respond effectively to spills of national significance and to allow the fund to be used to support prevention and preparedness activities. (Keeney)
- Recommend national legislation to reduce and regulate all cruise ship discharges to improve water quality, protect public health and safeguard sensitive marine ecosystems. (Balliet)
- Urge Commission to require mandatory reporting and improved monitoring inspection. (Balliet)

- Urge the Commission to recommend legislation to reduce and regulate all cruise ship discharges, to implement national affluent standards for cruise ships and remove regulatory exemptions on gray water and ballast water. (Balliet)
- Urge that the Justice Department should seek more aggressive penalties by cruise ship companies to deter future criminal conduct and aggressively pursue enforcement cases against foreign flag vessels. (Balliet)
- Urge the Coast Guard to increase enforcement, ideally with an increase in Federal funding, implement surprise inspections, expand the scope and frequency of inspection and utilize on-board observers. Aggressively pursue enforcement cases against these foreign flag vessels. (Balliet)
- Request help from Congress for national legislation. (Balliet)
- We need to be proactive and establish a strategy upon which laws and policies meet future risks and not just respond to past events. Put another way, we need to instill “risk-based decision making” as the process by which to examine emerging sources and trends that could contribute to oil and chemical pollution in U.S. waters over the next 10 years or longer. [Further description provided.] (Utley)
- Mandate system redundancy on all new oil tankers in U.S. waters, by amending OPA '90 to require redundant steering and propulsion systems and bow thrusters, in addition to the existing double-hull requirements. [Further description provided.] (Steiner)
- Close the loophole on toxic oil and gas dumping. (Shavelson)
- Urge Commission to help find creative ways to direct our managing Federal agencies involved with the Arctic Ocean activities to deal with the failings of responsible parties in spill response. Such creative mechanism may include moratoriums of offshore production or mitigation impact funds available to the local people. (Snyder)
- I would suggest for your consideration the growing concern over the bacteriological quality of Great Lakes beaches. Illinois, as in other Great Lakes states, has seen an increase in the number of days that our public beaches have had to close because they did not meet minimum standards. (Vonnahme)
- Chemical Pollution:
  - 1) Full implementation of best land use management practices in all watersheds to reduce nonpoint source chemical and nutrient pollution and minimize erosion;
  - 2) Sustained and increased efforts to minimize point source and air and water pollution of the Great Lakes basin and the Nation, by reviewing the protectiveness of water quality standards and revising those standards to achieve full protectiveness of aquatic and terrestrial species;
  - 3) Increased effort to clean up contaminated sediments in Great Lakes bays, harbors, and estuaries, especially at the 43 most highly degraded areas in the Great Lakes Basin which have been designated by the International Joint Commission as Areas of Concern, and at Superfund sites and other contaminated sites on the shoreline and in the Basin; and
  - 4) Closer and more timely coordination and cooperation among the various natural resource management and cleanup agencies to identify sources and effects of pollution, and achieve relevant and effective cleanups and environmental restorations. (Hartwig)
- Current law needs to be strengthened to better control nonpoint pollution: EPA should enforce the existing TMDL regulations under the Clean Water Act so that governments and the public know where the pollution is coming from, how much there is, and what limits are needed to protect water quality standards; EPA should require states to develop ambient water quality standards for nutrients in order to better control the sources of nutrient pollution, assess compliance and measure progress; NOAA and EPA should target funding to those states that develop and implement coastal nonpoint pollution control programs to meet federal standards;

*Ocean Pollution Sources; Point and Nonpoint (continued)*

- The Agriculture Department should target funding under the 2002 Farm bill (in particular, the Environmental Quality Incentives Program, EQIP) 1) to reward states that are performing well in controlling nutrient runoff as well as other pollutants, and 2) to encourage projects, such as implementation of BMPs on cropland and animal feedlots, that have the greatest water quality benefits, such as reducing fertilizer runoff; and EPA and the Corps should abandon any efforts to change the existing definition of “waters of the United States” so as not to limit protections for wetlands. (Chasis)
- Recommend the following elements be incorporated into a much enhanced national policy to control nonpoint sources of pollution: Utilization of best management practices (BMPs) to control/reduce polluted runoff should be required rather than voluntary (as is too often the case now); EPA should set baseline standards for BMPs, as it has done with effluent guidelines for point sources; significant federal funding should go to implementation of clean-up programs for nonpoint pollution; and wetlands, which are an important filter for polluted runoff, need to be protected and restored. (Chasis)
- Current law needs to be implemented more effectively; Sections 303, 319, 402(p) and 404 of the Clean Water Act and Section 6217 of the Coastal Zone Management Act. (Chasis)
- Congress should take the following specific steps to implement this national policy: Increase funding under the State Revolving Fund, section 319 of the Clean Water Act and Section 6217 of the Coastal Zone Management Act for implementation of nonpoint pollution control programs; State Revolving Loan Fund eligibility should be explicitly expanded to put urban runoff projects on a par with traditional sewage treatment plants; make polluted runoff control programs enforceable; link implementation of best management practices and state nonpoint control programs with access to federal funds in a meaningful way; amend Section 6217 to provide meaningful sanctions and disincentives for states that do not develop or implement approved coastal nonpoint programs; amend Section 303 to strengthen the mandate for control of nonpoint pollution as part of state implementation of TMDLs; amend Section 319 of the Clean Water Act to require states to implement enforceable management measures to address nonpoint pollution sources, including for upstream sources that contribute to downstream coastal water quality impairments; close loopholes in the wetlands provisions of the CWA to clarify coverage of so-called “isolated” wetlands and reform the Army Corps’s oversight of that program to really achieve “no net loss” or transfer the whole program to EPA; require that as a condition of receipt of crop subsidies and other federal farm aid farmers implement BMPs that will reduce runoff of nitrogen and other nutrients. (Chasis)
- I believe the solution is written whole farm plans. These plans must be based on Best Management Practices that work for the soils and weather conditions expected where he farms. (Bardole)
- The federal government through CRP, WRP, and EQIP is providing large sources of money to install and maintain good practices. This is very positive and I would not change these programs. (Bardole)
- The federal government must adequately fund the USDA so the Farm Service Agency and Natural Resources & Conservation Service can have the staff they need to implement these programs and enforce conservation compliance. (Bardole)
- Broadly applicable approaches for addressing non-point source pollution include: accessible data, information, and expertise; expand Federal leadership in the setting and obtaining of nationwide goals; expand monitoring capabilities; conduct periodic comprehensive assessments of coastal environmental quality; develop a susceptibility classification scheme; and, expand and target atmospheric research. (Walker)

- I recommend that the conservation provisions of the 2002 farm bill be adequately funded and that the federal government, specifically the NRCS, be urged to apply these programs in targeted areas of the upper Midwest that would be most likely to reduce nitrogen output. These programs, and allied state federal and university rural development efforts should use the working landscapes concept as they are developed and initiated. (Keeney)
- We are strongly advocating the establishment of a quantitative Ballast Water Treatment performance standard; protocols for testing, verifying and reporting on BWT technologies; and a program to help promote shipboard testing and operation of promising BWT technologies. (Collins)
- There needs to be a body for enforcement of ballast water controls on ships in Great Lakes. (Jimenez)
- We need to strengthen the Clean Water Act and try to deal with the non-point sources of pollution. (Panetta)
- Ocean Water Quality Protection—five recommendations presented. (Eichenberg)
- Cruise Ship Pollution—four recommendations presented. (Eichenberg)
- Locate and identify contaminated sediments: A nation-wide ecosystem-based approach should be adopted that monitors sediments that threaten marine life. Levels of contaminants that are causing adverse impacts should proactively trigger regulatory and remediation action. A system for identifying and assessing contaminant levels found in biota should also be implemented. (Zipf)
- Reduce contaminated sediments in the ecological system: EPA should analyze its national contaminated sediment site survey, and the national listing of fish advisories and bans, to identify contaminated sediment sites that require priority removal or clean-up/remediation as a way to eliminate fish advisories or bans. (Zipf)
- Remediate areas and sediments that are harmful to marine life: EPA could develop a Memorandum of Agreement with the Corps, or the EPA could develop guidance, that would place the use of environmentally sound decontamination, treatment, remediation, and reuse technologies as the preferred approach to managing contaminated sediments. EPA, through its ability to review dredging permits and through its ability to establish remediation standards, could create a management hierarchy that would place the remediation, reuse, treatment and decontamination approaches at the top. (Zipf)
- Devise funding strategies to support the identification, reduction, and remediation of contaminated sediments: Amend the Water Resources Development Act to increase the Federal portion of the project cost-share if decontamination technologies or treatment technologies are proposed as part of the project's operations. (Zipf)
- Protect existing methods for addressing contaminated sediments from weakening changes. (Zipf)
- Recommendations are provided. (Allen)
- Recommendations are provided. (Rufe)
- Marine and estuarine pollution recommendations (three specific recommendations) (CSO)

## TOPIC: *POLLUTION/WATER QUALITY*

---

### KEY ISSUE: *Monitoring*

#### ISSUES RAISED

- Concern is how we monitor coastal waters; regional monitoring programs have not been adopted nationally. (Gold)
- Concerned about the longevity of the monitoring systems; has experienced a 25 percent cut in on-going monitoring. (Newton)
- Much of the Corps monitoring is contracted through the USGS and NOAA, etc. (Griffin)
- Discussion of background and current issues for beach water quality. (Rufe)

#### PRESENTER RECOMMENDATIONS

- Need standardized information, especially beach monitoring. (Gold)
- Establish national system for beach water quality; consistent standards, monitoring, and notification procedures. (Nichols)
- Oil in the Sea III recommends that federal agencies work to develop and implement a system for monitoring input of petroleum to the marine environment from land-based sources via rivers and storm- and wastewater facilities. (Walker)
- Clean Coastal Waters recommended that USGS monitoring should be expanded with the objective of assessing nutrient inputs to estuaries and monitoring how these change over time. (Walker)
- Monitoring efforts must move beyond fecal coliform counts and dissolved oxygen or simple “oil and grease” measurements to routinely and consistently monitor for dissolved nitrogen and phosphorus, TPH, PAH, and other known compounds of concern. (Walker)
- Beach Protection—three recommendations presented. (Eichenberg)
- Recommendations presented. (Rufe)

## TOPIC: *POLLUTION/WATER QUALITY*

### KEY ISSUE: *Land-Sea-Air Interface*

#### ISSUES RAISED

- Mission of NIEHS: develop science base to prevent contribution of the environment to human illness or disease. How massive quantities of toxic agents polluting environment contribute to diseases and disorders a matter of concern. Ocean influences on human health range from threats to public health associated with climatic events such as El Nino to benefits from marine bioprospecting for new drugs. Harmful algal blooms most notorious marine hazard to man and animal; toxic materials produced. [areas of future research provided]. Vector and water-borne diseases still a leading cause of death among children from all nations; many can be conveyed by sea water, plants or animals in sea water. (Dearry)
- Every drop of Rio Grande and Rio Colorado is allocated; occasionally these rivers never get to the sea, when they do they dump wastes, toxins, metals, etc., into oceans. Reasons:
  - 1) No one takes responsibility for oceans or monitors border waters;
  - 2) What reaches oceans far exceed U.S. standards because infrastructure of border region inadequate;
  - 3) Governance focused on other issues; IBWC, NAFTA-CEC, etc.;
  - 4) Requires multi-disciplinary expertise; multi-media input on impact of pollutants, etc. (Van Schoik)
- Areas of low oxygen (hypoxia) and degraded water quality from excess nutrients delivered to estuaries and coastal areas are of concern throughout U.S. Factors leading to degraded waters begin elsewhere in watersheds and airsheds that deliver nutrients from point, and mostly non-point sources. Oceans, coastal seas, and estuaries are intimately linked to the land and air that border them and deliver water, sediments, nutrients and pollutants. (Rabalais)
- Healthy oceans mean healthy fish populations, healthy fisheries, healthy wildlife that feed on fish, healthy tourism that watches that wildlife, healthy sportfishing industry that thrives on those healthy fisheries—a healthy ecosystem for a healthy America. (McCaffrey)
- Acknowledge that the oceans are dependent on the beaches and estuaries—the marine environment does not stop at the water's edge. (Revell)
- There are intimate biological connections between human activities far inland and the health of our nearshore oceans, and these impacts can and do cumulatively affect ocean health far out to sea, and eventually worldwide. (Spain)
- Global warming is the issue overriding on all other issues dealing with the world's oceans. Unless this nation leads the world in a realistic, progressive, and common sense response to global warming, all of the issues that the industries are dealing with will mean nothing because the need for science on global warming is overwhelming. (Hinsley)
- The White House issued a report last week under the White House auspices, which found global warming to be significantly caused by human activity and that it will have very significant impacts on America continentally. (Hinsley)
- The Executive branch of the U.S. government has decided that the response will be one of adaptation rather than confrontation. Your scientists will tell you that a policy of adaptation is a policy of failure when it comes to the management of the ocean's resources, and that this has the capacity to dramatically change the role of the oceans. (Hinsley)
- Estuaries and inland waters are strongly linked to the ocean. Climate variation is intimately entwined. Estuaries have a “triple whammy” in terms of their influence from climate: 1) influence from local weather; 2) influence from the ocean; 3) influence from the watershed. (Newton)

### *Land-Sea-Air Interface (continued)*

- Limnology is the study of inland waters. This would not appear to be appropriate to the subject of ocean policy but it is. (Jumars)
- Water exchanges with the ocean through groundwater on land. It exchanges through rivers. Ammonia comes into the coastal ocean from things like hog feed lots and fixed nitrogen comes through the atmosphere from rain deposition of ammonia. There are many examples of connections. (Jumars)
- Harmful algal blooms (HABs) are an expanding problem in the coastal zone. The number of HABs and the economic costs of their impacts have increased considerably in the past 30 years. (Anderson)
- HABs impact public health, fisheries, aquaculture, tourism, and coastal aesthetics. More specifically, HAB impacts include various types of shellfish and fish poisonings, brown tides and other noxious blooms, fish and other faunal mortalities, pfiesteria, macroalgal blooms, and fresh-water toxins. (Anderson)
- There are a variety of potential reasons for the increasing incidence of HABs, including species dispersal or introduction via natural currents and storms; better scientific investigation and reporting; increased aquaculture; dispersal by human activities; and pollution (especially nutrient enrichment). [Further description provided.] (Anderson)
- States are monitoring HABs effectively and fatalities or illnesses are rare, however state agencies are struggling with the increasing frequency of HABs in an era of tighter budgets. (Anderson)
- A coordinated National HAB Program has been formulated and partially implemented. (Anderson)
- The process to develop the algal bloom research agenda included all stakeholders—scientists as well as industry, managers from various states, shellfish industry people, etc. A report was produced and distributed, but nothing much came of it. It was at that time Congress came in and told a number of agencies they should cooperate on marine issues. An interagency task force meeting was held where the program managers got together and found common areas within our program that they could support. Working groups were held to put priorities under each topic, but this resulted in too many priorities. People were asked to focus on four or five priority topics rather than on individual priorities. The result was to have cross-section partners who sold the idea together. (Anderson)
- Two broad issues that have had dramatic ecosystem-wide effects in Narragansett Bay and other estuaries are nutrient pollution and climate change:
  - 1) Nitrogen that causes massive algae blooms has increased in the Bay by five-fold since records have been kept in the area. Additionally, nitrogen levels are expected to continue to increase exponentially.
  - 2) Regarding climate change, over the past two decades, the average spring water temperature of Narragansett Bay has increased by about 3.4 degrees Fahrenheit. Though it may not seem like much, small temperature changes can have big effects on what can live in the water. For example because of the warm winter and excess nitrogen non-stinging comb jellyfish were found in the thousands. They are able to grow unchecked and their population has exploded due to the increased water temperature and an abundance of the plankton to eat. (Spalding)
- There is a phenomenon that exists on the coast of Alaska known as the Alaska coastal current. It is a coastal current that hugs the coast of Alaska and has its origins with the Columbia River down in Washington state and is comprised of all the fresh water inlets from British Columbia up through the coast. This fresh water lens lies on top of the ocean and hugs the coast and it's from 100 to 500 feet deep. It travels north at two to two and a half knots. The cruise ships utilize this in order to gain two and a half knots and save on oil, etc. Yet this coastal river has a lower salinity than the surrounding oceans and therefore has the capacity for carrying pollutants and materials that are dumped into it without significant dilution. These are then deposited on the shores. (Sensmeier)

- Global change is a concern for Great Lakes. (Vonnahme)
- NRCS has the lead for the US Government in developing new guidelines for reporting agriculture greenhouse gas offsets. The President has directed USDA to identify new targeted incentives for sequestration. As a result, we will be looking for opportunities as we implement new and expanded conservation programs to further greenhouse gas sequestration. (Knight)
- Interactions and feedbacks among freshwater flow, water quality and coastal ecosystem dynamics must be better understood in order to predict the response of these systems to future changes in landward forcing functions. (Jumars)

## **PRESENTER RECOMMENDATIONS**

- Apply principles of conservation design and begin all ocean protection measures well upstream on land. (Van Schoik)
- Transboundary environmental impacts should be assessed, minimized and mitigated. (Van Schoik)
- Begin reversing the process of climate change. [discussion provided] (Hayes)
- Oceans begin in the watersheds. Ocean protection policies must take this fact into account. The health of the ocean resources is directly related to human activities in our watersheds. (Spain)
- Any comprehensive ocean protection policy must address the continuing influx of industrial and agricultural chemicals, in vast amounts, that wash into our estuaries and contaminate our nearshore environments and ocean ecosystems, threatening the nation's fisheries and human food chains. (Spain)
- There are airshed issues that need to be addressed that are beyond the scope of local/state managers and must be addressed at a national level. Atmospheric nitrogen deposition is only one example, but one should also consider mercury deposition which has led to fish health advisories for fish consumption in our local freshwater ponds. Acid rain has led to low pH levels in freshwater ponds. (Dow)
- Make recommendations on the land-use impacts on the ocean and marine habitat. (Nelson)
- The Commission should take the connection between the ocean and human health into consideration because it is beginning to be understood that epidemiology is really but a subset of ecology. We're finding that climate does play a major role in many infectious diseases, and that the oceans play a role in determining climate. We've found that something as simple as sea surface temperature actually controls the cholera epidemics that occur twice a year in massive amounts on Bangladesh. Algal toxins create a serious problem—60,000 individuals in the U.S. alone. There is a lot to do and the Commission should take this all into account. (Colwell)
- Sustain and enhance support for the National HAB Program. (Anderson)
- Implement programs on prevention, control, and mitigation, and on oceans and human health. (Anderson)
- Encourage interagency partnerships. [Further description provided.] (Anderson)
- Support methods and instrument development for land- and mooring-based cell and toxin detection and bloom forecasting. [Further description provided.] (Anderson)
- Incorporate HAB monitoring into a U.S. Ocean Observing System. (Anderson)
- Support long-term water quality and HAB monitoring in coastal waters. (Anderson)
- Implement agriculture and land use policies that reduce point and nonpoint source loadings to coastal waters. (Anderson)

*Land-Sea-Air Interface (continued)*

- Enact legislation to reduce U.S. carbon emissions to mitigate effects of global warming. [Further description provided.] (Steiner)
- A cross-agency initiative modeled after the Climate Change research Initiative, or a single agency grant competition for studying these interactions, would be the first step in fostering collaboration between terrestrial, freshwater and marine scientists. (Jumars)
- More emphasis must be placed on linking land-use and the management of aquatic systems. Future policy must integrate information and activities from watershed to the oceans. (Allen)