Each year, the Consortium for Ocean Leadership hosts a day-long public meeting, which facilitates ocean policy discussions with representatives from Congress, the federal agencies, industry, and the academic research community. This year’s forum was focused on the BP Deepwater Horizon Oil Spill in the Gulf of Mexico and offered a valuable opportunity to engage in dialogue with speakers on the three panels: Fate, Effects, and Implications of the Oil and Chemical Dispersants; Implications for Offshore Oil and Gas Regulations and Production; and Gulf Ecosystem Restoration.
Table of Contents

Nancy Sutley, Council on Environmental Quality ................................................................. 1
    Update on the National Ocean Policy

Senator Whitehouse .................................................................................................................. 2

Don Boesch, University of Maryland Center for Environmental Science ......................... 4
    Ocean Science & Engineering Implications: National Oil Spill Commission

Panel on the Fate, Effects and Implications of the Oil & Chemical Dispersants ............. 6
    David Conover, NSF ........................................................................................................ 6
        Deepwater Horizon Gulf of Mexico Oil Spill: NSF RAPID Response Research
    Chris Reddy, Woods Hole Oceanographic Institution ..................................................... 7
        Transport and Fate of Hydrocarbons and Dispersants: Water Column
    Michael Carron, Gulf of Mexico Research Initiative ......................................................... 8
        Gulf of Mexico Research Initiative
    Tara Rothschild, House Science, Space and Technology Committee ............................ 9

Marcia McNutt, USGS .......................................................................................................... 10
    Lessons from the Deepwater Horizon Oil Spill

Representative Castor ............................................................................................................ 12

Representative Woolsey ....................................................................................................... 13

Panel on Implications for Offshore Oil and Gas Regulations and Production .............. 14
    Kate Miller, Texas A&M University ............................................................................... 14
    Walter Cruickshank, BOEMRE ..................................................................................... 14
    Michael Kearns, National Ocean Industries Association .............................................. 15
    Catherine Hazlewood, Senate Commerce, Science & Transportation Committee ...... 16

Jane Lubchenco, NOAA ..................................................................................................... 18
    NOAA's Role in the Deepwater Horizon Oil Spill

Panel on Gulf Ecosystem Restoration ................................................................................. 22
    John Hankinson, Gulf Ecosystem Task Force .................................................................. 22
        The Gulf Coast Ecosystem Restoration Task Force
    Larry Robinson, NOAA ................................................................................................... 23
        An Ecosystem Approach to Management Using Large Marine Ecosystems
    Ann Jochens, Texas A&M University ............................................................................. 25
        Monitoring Restoration of the Gulf of Mexico
    Ana Unruh-Cohen, House Natural Resources Committee ........................................... 26
        Gulf Ecosystem Restoration
Table of Contents
(Continued)

Participant Profiles ........................................................................................................27
  Don Boesch ..................................................................................................................27
  Michael Carron .............................................................................................................27
  Representative Castor .................................................................................................28
  David Conover .............................................................................................................28
  Walter Cruickshank .....................................................................................................29
  John Hankinson ...........................................................................................................29
  Catherine Hazlewood .................................................................................................30
  Ann Jochens ................................................................................................................30
  Michael Kearns ...........................................................................................................31
  Jane Lubchenco ..........................................................................................................31
  Marcia McNutt ............................................................................................................32
  Kate Miller ..................................................................................................................33
  Shirley Pomponi .........................................................................................................33
  Nancy Rabalais ............................................................................................................34
  Christopher Reddy ......................................................................................................34
  Larry Robinson ...........................................................................................................35
  Tara Rothschild ...........................................................................................................35
  Nancy Sutley ................................................................................................................36
  Ana Unruh-Cohen .......................................................................................................37
  Senator Whitehouse ....................................................................................................37
  Representative Woolsey ..............................................................................................38
Featured Address: 
Update on the National Ocean Policy

Nancy Sutley – Chair, White House Council of Environmental Quality

Ms. Sutley provided an update on the National Ocean Policy (NOP), which was created by executive order in July of 2010 to adopt the recommendations of the Ocean Policy Task Force. The NOP emphasized that healthy oceans matter to our country, and all stakeholders need to be at the table and use the best available science to solve ocean issues. Our oceans are confronted by many challenges, including pollution and climate change, while we are using them more than ever for various activities, including recreation, research, energy, and food. Sutley pointed out that the oceans are vital to our economy, providing us with natural resources, tens of millions of jobs, and trillions of dollars per year, making it particularly important to confront these challenges.

The National Ocean Council, which Sutley co-chairs with Dr. John Holdren (Director of the White House Office of Science and Technology Policy), was formed to coordinate and advance the NOP. Sutley noted that the Council of Environmental Quality can bring environmental policy expertise to this council as well as aiding in the coordination aspect across all levels of government. She emphasized that the NOP will not change federal authority, but provide for increased coordination among the various agencies and stakeholders.

Coastal and Marine Spatial Planning (CMSP) was one of the NOP priorities that Sutley discussed in more detail. She pointed out that spatial planning has been happening on terrestrial public lands for decades, and we can apply many of the same ideas towards our oceans. We need to think about all of the activities that will be taking place, and make sure representatives from all of these uses come to the table early on to plan regional objectives and future development. Sutley noted that regional and local entities are particularly important to include, and that the NOC will be holding a workshop in the spring to coordinate with state and tribal entities on some of these issues. She pointed to Massachusetts as a region where CMSP is ahead of the curve, citing a recent project to reconfigure a shipping channel into Boston. This state serves as a good example of how being proactive and having cooperative planning can be beneficial to achieving positive outcomes for ocean projects.
Senator Sheldon Whitehouse – United States Senate, Rhode Island

Senator Whitehouse spoke about the critical importance of protecting and restoring the oceans and coasts that not only sustain our economy but provide us with food, jobs, recreation, and tourism. Whitehouse remarked that for too long humans have been takers, not caretakers, of our ocean and coastal resources. He firmly believes that to change this attitude, we need scientists and law-makers working together to raise awareness about our oceans and to take steps to protect their natural resources. Public discussions, like the Consortium for Ocean Leadership’s Policy Forum, can help bridge the culture divide between scientists and law-makers that can sometimes keep these two groups from working together productively.

Senator Whitehouse identified several key challenges facing our oceans, including Arctic ice melting, changing ocean carbon chemistry, toxic chemical accumulation in marine organisms, terrestrial runoff contributing to harmful algal blooms, closed fisheries, and dead zones. Whitehouse also discussed the recent BP oil spill in the Gulf of Mexico, which ranks as one of the worst environmental disasters in our nation’s history, and challenged us to learn from it in order to prevent future tragedies.

Senator Whitehouse highlighted legislation he introduced in response to the BP Oil Spill, including the Oil Spill Victims Redress Act and the Maritime Liability Fairness Act, to ensure that oil companies adequately compensate victims for the environmental harms that they cause. He stressed that regulatory agencies must remain independent and avoid succumbing to pressure and influence from the industries they are supposed to be overseeing. Already, due to this, the MMS was transformed into the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), and separated its leasing, permitting, and enforcement functions into three independent agencies in an effort to reduce the conflict of interest that inherently exists between these roles. Whether this is a meaningful or cosmetic change, Whitehouse noted, will depend on our vigilance.

Senator Whitehouse also pointed to fisheries closures and lost tourism revenue resulting from the BP oil spill as an example of how heavily coastal economies rely on healthy ocean ecosystems. The spill demonstrated how little we knew about the Gulf of Mexico ecosystem beforehand, and how essential basic scientific research is to assess restoration needs after natural and manmade ecosystem disruptions. Funding for basic
research is likely to decrease given the current budget climate. And yet the Senator believes that the need for investment in the study and protection of our ocean and coastal resources has never been greater.

In response to this need, Whitehouse discussed the National Endowment for the Oceans legislation that he introduced during the last session of Congress with Senators Snowe (R-ME), Rockefeller (D-WV), and Inouye (D-HI). The Endowment would provide steady funding and political focus to protect, restore, and research ocean and coastal ecosystems, making grants available to academic institutions, state and local governments, and non-profits. In addition, Senator Whitehouse explained that this kind of dedicated funding could provide the resources to achieve the policy priorities identified in the President’s National Ocean Policy.

Senator Whitehouse concluded his remarks with a challenge to those participating, noting that we have the potential to turn the Gulf spill into meaningful change, if only we are ready to act.
Dr. Boesch, one of the seven members of the National Commission on the BP Deepwater Horizon Oil Spill, talked about the Commission’s analyses of the spill and its recommendations regarding science and engineering. The Commission was created by executive order in late May 2010, and was charged with creating a report by January 12, 2011 on the root causes of the spill and recommendations for safeguarding against future disasters. The full report, as well as other reports, graphics, and animation can be accessed on their website: www.oilspillcommission.gov.

The Commission determined that the spill was a foreseeable and preventable disaster, caused by a series of mistakes by BP, as well as the contractors Halliburton and Transocean. Boesch also stated that even if the blow-out preventer was functional, it would not have prevented the explosion. It was concluded that there were systemic issues in the offshore oil industry, which should be rectified. Boesch noted that this finding of “systemic issues” has been particularly controversial, but that the Commission felt it was warranted based, in part, on the fact that containment and response plans for all companies were completely inadequate for deepwater Gulf of Mexico (GOM) drilling. For example, all plans listed walruses as potentially affected wildlife and a deceased scientist as an expert to contact in case of emergency.

Recommendations by the Commission fell into eight key areas, including improving the safety of offshore operations; safeguarding the environment; strengthening oil spill response, planning, and capacity; advancing well-containment cap-abilities; overcoming impacts of the spill and restoring the GOM; ensuring financial responsibility; promoting Congressional engagement to ensure responsible drilling; and moving to frontier areas.

Boesch noted that issues had arisen due to the shift from primarily shallow wells to more deep and ultra-deep wells over the past several decades (Figure 1). The industry changed quickly, and regulatory agencies had not kept up. Deepwater wells pose different problems that shallow wells, due to the fact that the reservoirs are larger, the geology is more complex, and the formations are more highly pressurized. There is also inadequate investment in understanding the operating environment for deepwater drilling,
as seen in the fact that no one even knew the direction and speed that we should expect water to flow at the base of the Macondo well.

Boesch also highlighted the need for a competent Chief Scientist to lead an Environmental Science Office at the Bureau of Ocean Energy Management (BOEM). Such an office would conduct National Environmental Policy Act (NEPA) reviews and work with other government agencies and departments to provide scientific data and review decision making, monitoring impacts, and damage assessment, among other activities. A GOM Observing System, building on the existing GOM Coastal Ocean Observing System, would also help to increase infrastructure and data monitoring in the GOM. Additional resources should be provided for research and development related to safety, containment, and spill response. Such R&D should involve input from the scientific community, examine source control and containment technologies, provide for ways to accurately measure flow rate and spill volume, as well as critically examine the full consequences of dispersant use.

It is also important to assess long-term impacts of the spill. Sources of such information could include research supported by National Science Foundation (NSF) RAPID Grants, monitoring that occurred during the spill, the BP-funded GOM Research Initiative, and the BOEM Environmental Studies Program. In addition to simply dealing with the impacts of the oil spill, Boesch noted that we also need to include other long-term problems of the GOM, including land loss, hypoxia, and hurricanes. The Commission recommended a Gulf Coast Ecosystem Restoration Council to deal with this comprehensive restoration, funded with 80 percent of Clean Water Act penalties collected as a result of the spill.

Boesch ended by highlighting the Commission’s recommendations for Arctic drilling. It concluded that the Arctic is very different from the GOM, with additional issues in that the ecosystem is sensitive, the area is remote, and ice is present. However, some aspects may be less troublesome, as the area of interest is generally shallower than the deepwater GOM. The Commission concluded that more scientific information would be needed to assess the potential for safe drilling in the Arctic.
Panel 1: Fate, Effects, and Implications of the Oil and Chemical Dispersants

David Conover, Ph.D. – Director, Division of Ocean Sciences, National Science Foundation

Dr. Conover discussed NSF’s response to the oil spill through their Rapid Response Research Grants. This program, which was started in 2009, gave NSF authorization to make decisions on funding requests with only internal review instead of the entire grant-review process. The awards were given in a matter of days so that research efforts could begin immediately. Conover highlighted the quick turnaround time in the scientific process from these awards, with the first proposal submitted about a month after the April 20 spill, and the first award given out by the end of May. Rapid grants awards in response to the Gulf oil spill totaled almost $20 million through 171 awards, with more than $5 million in total ship costs. The Ocean Sciences Division (OCE) received 443 requests for Rapid Response grants, with 64 awarded totaling $7.3 million.

These awards provided 224 ship days focused on the oil spill response, and less than a year later, a diversity of publications are already rolling out. The first publication from Rapid Grant research came out in August, a turnaround time of about four months for the whole scientific process. Conover also noted that about 45 percent of the Rapid Grants for the oil spill went to Gulf Coast states, focusing on research efforts by scientists in the affected region (Figure 2). More long term funding by NSF will have to be made through the normal external review process, as Rapid Grants are not renewable as Rapid Grants.

Conover emphasized the importance of the scientific community’s involvement in the response effort through providing data that was immediately available for management decisions. NSF’s Rapid Response program made such support from scientists possible.
Dr. Reddy recounted his experiences as a scientist and responder to the Gulf oil spill as a NSF RAPID grant recipient and academic liaison in the Unified Command Center (oil spill headquarters). Reddy first discussed the chemistry of oil and dispersants, noting that both of these substances are actually a distinct combination of compounds. Reddy’s NSF-funded work focused on quantifying the abundance and distribution of hydrocarbons and dispersants in the water column (specifically if they occurred in plumes), examining the biological and other processes which are occurring in these plumes, and attempting to create a mass balance for the system.

Reddy discussed his research cruises and the collaborative nature of the research occurring between all scientists (federal, industry, and academic). He outlined the different types of sensors used to collect data on subsurface plumes, including rosettes and the autonomous underwater vehicle Sentry. Reddy also was part of the effort to use an isobaric gas-tight sampler to collect oil as it spewed from the well (Figure 3), obtaining a sample of a true endmember of the oil and gas.

He also recounted his time as an Academic Liaison at Unified Area Command, which he said was the most rewarding time of his career to see the other side of the firefight. He made the comparison that the teams of people at the Unified Area Command were firefighters trying to put out a house fire, while scientists are hovering around, asking them to move, in order to collect the water as it runs off the curb. During this experience, he gained a better understanding of the type of information that politicians and constituents want during times of emergency. Reddy was also able to supply Unified Area Command with expertise and the ability to contact other scientists with desired skills and locate needed equipment. He strongly recommended that academia be made available during future emergencies to aid in similar efforts.

Reddy outlined the difficulties ahead for the Gulf ecosystem recovery. He explained that recovery is often thought of as a binary condition, like a broken leg, but actually it is far more complicated, with multiple injuries all requiring a different healing process.

“We cannot put the Gulf of Mexico in a MRI,” he noted, when describing difficulties trying to diagnose the condition of the Gulf and how to proceed with recovery efforts. “We must be vigilant and continue to pursue good science to understand what has occurred and the type of recovery needed. This will require a huge sampling effort, even with all of the work that has been done since the spill occurred.”
Michael Carron, Ph.D. – Director, Gulf of Mexico Research Initiative

Dr. Carron provided background information on the goals and purpose of the Gulf of Mexico Research Initiative (GRI) as well as GRI’s year one funding and future funding opportunities. GRI is the entity created by BP in 2010 to help dispense $500 million over a 10 year period for research investigating the impacts of the Deepwater Horizon oil spill. The mission of GRI is to “improve society’s ability to understand and mitigate the impacts of hydrocarbon pollution and stressors of the marine environment, with an emphasis on conditions found in the Gulf of Mexico.” The goals of GRI are to improve the long-term environmental health of the Gulf of Mexico (GOM), as well as increase the overall scientific and research capacity in the GOM. Carron reviewed the key provisions of the GRI in terms of distribution of funding. This money will be distributed using a peer evaluation process, focused on proposals for sampling, modeling, and studies rather than for infrastructure acquisition. Ultimately, the goal is for research to be published in peer-reviewed scientific journals without any interference or requirements from BP. The five research themes on which GRI hopes to concentrate are: (1) Physical distribution, dispersion, and dilution of petroleum, its constituents, and any dispersants applied under the action of physical oceanographic processes, air-sea interactions, and tropical storms; (2) Chemical evolution and biological degradation of the petroleum/dispersant systems and subsequent interaction with coastal, open ocean, and deep-water ecosystems; (3) Environmental effects of the petroleum/dispersant system on the sea floor, water column, coastal waters, shallow water habitats, wetlands, organisms, and beach sediments, as well as the science of ecosystem recovery; (4) Technology developments for improved response, mitigation, detection, characterization, and remediation associated with oil spills and accompanying releases of gas; and (5) Fundamental scientific research integrating results from the other four themes in the context of public health.

Last year, GRI gave out $40 million of Fast Track Block Grants to five different institutions (Louisiana State University, Florida Institute of Oceanography, Northern Gulf Institute, Alabama Marine Environmental Sciences Consortium, and National Institutes of Health) (Figure 4). There is still $460 million to be awarded, and GRI is preparing a request for proposals to dispense the second year of funding. Carron suggested that those interested in submitting proposals could be working now to become familiar with the research themes and the evaluation process (National Science Board Proposal evaluation process and National Academy of Sciences Code of Conduct), as well as networking with other academic institutions to identify collaborative opportunities.
Ms. Rothschild provided the legislative perspective on the fates and effects of the oil and dispersants. She began by reviewing previous oil spill legislation and the responsibility of the House Science, Space, and Technology Committee. The Oil Pollution Act (OPA) of 1990 was passed in response to the Exxon Valdez oil spill, of which the Committee has jurisdiction over the research and development portion. The research and development plan required by OPA was last updated in 1997, and since then has fallen off of the radar, as there seemed to be no immediate need for additional changes. In June of 2009, Representative Lynn Woolsey (D-CA) introduced H.R. 2693 in response to the San Francisco Oil Spill. However, it did not pass out of the Energy and Environment subcommittee for further consideration.

After the Macondo well blow-out, two hearings were held looking at the oil spill response and drilling technologies. The Science and Technology again took up H.R. 2693, however in a much different format. The new version attempted to change the current structure from more than 13 agencies involved in offshore oil drilling and spill response to only four (EPA, NOAA, USCG, and DOI). This bill also required regular updates on the implementation plan, greater interagency coordination, examination of containment technologies, and broadening research. H.R. 2693 was passed in the House during the 111th Congress, but did not move forward in the Senate. Rothschild concluded with the current status of the Committee’s activities in terms of oil spill legislation. She noted that oil spill research and development legislation will likely to be considered in the 112th Congress.
Featured Address:  
Lessons from the Deepwater Horizon Oil Spill

Marcia McNutt, Ph.D. – Director, U.S. Geological Survey, Department of Interior

Dr. McNutt talked about lessons learned from the Deepwater Horizon Oil Spill. She focused on her involvement with the response efforts, not on official administration policies. She projected a map from June 3, 2010, which corresponded to the height of the oil spill. The map showed the projected movement of oil throughout the GOM based on a NOAA model, demonstrating the potential threat of the oil to the Florida Keys and entrainment in the Loop Current. The USGS invoked the International Charter, which expanded the amount of available satellite data to help with tracking the oil and obtain the best possible situational awareness.

McNutt highlighted some initiatives that worked in the Deepwater Horizon oil spill response and the applied lessons from the Exxon Valdez and Santa Barbara oil spills. Some of these included the fact that impacts and recovery need to be considered on a decadal scale and also onshore/offshore and multiple ecosystem levels should be coupled and not assessed as independent systems. Also, natural environmental variation may confound recovery, which emphasized the need for pre-spill data to be utilized. Additionally, it is important to work across government, industry, and academia. However, such collaborations may also present some issues, as standards for safety and equipment logistics may vary between different sectors, and such issues need to be understood and mitigated prior to an emergency, instead of during.

Next, McNutt talked about some areas in which we still need improvement. One issue was relying too heavily on the recovery plan of the Exxon Valdez (where a set amount of oil was released) without enough scenario planning for other types of spills (i.e., an unconstrained spill). McNutt also pointed out that the current oil spill response plan did not envision long-term engagement between academia, government, and the industry, and thus, little to no formal guidance was provided on how they should interact on various issues. One example of this occurred as the well was shut in for the well integrity test. The team was trying to temporarily cap the well, and then, based on the resulting pressure, determine if the well had maintained integrity and could remain shut in, or if it was leaking and would have to be reopened. The pressure obtained fell in an intermediate range, where there were several different possibilities: a leaking well or a highly depleted well. However, for various legal reasons, BP did not want to release the information from the well integrity test outside of the group in Houston. One of the other scientists managed to take a picture on his cell phone (Figure 5) and send it to an expert in Menlo Park for further analysis. This outside expert determined that the shape of the well shut-in curve indicated a well that was depleted but had maintained integrity, and
that the well could remain capped. McNutt also spoke about issues with the oil budget the government released, and the initial backlash from the scientific community because there was not time to peer-review it before release. She suggested that a fast-track mechanism for peer-review during times of crisis might help to avoid such disagreements in the future.

McNutt concluded with three main suggestions for future efforts in oil spill response. The first is that scenario planning should be developed for future disasters. She also suggested more opportunities for using academic tools on industry and government platforms so that the first time is not during an emergency. Finally, a rapid review mechanism should be developed for science in the midst of a crisis.
Representative Castor discussed the role of her state, Florida, in the response efforts to the oil spill, as well as her hopes for legislation to arise from this disaster. She noted that the University of South Florida, which she represents, was heavily involved in the response efforts and reacted immediately to the disaster. She emphasized that we need scientists to be paying attention and questioning the government and industry to make sure that information presented is correct.

Castor talked about her time spent last year on the Energy and Commerce Committee after the spill. They worked hard to make sure BP supported science and recovery efforts. BP’s initial proposal involved a six month to one year grant process, which would have created a long lag in the funding, but the Committee was able to convince BP that money needed to be dispensed immediately so that scientists could be involved in sampling during this critical time.

Castor stated that BP needs to get their research program moving. States should be preparing claims to BP for state reimbursement for lost tax revenue from the spill. We are also waiting to see how much the fines and penalties will be for BP under the Clean Water Act. This amount could be anywhere between $4.5-21 billion, depending on the final amount of oil spilled and if negligence was involved in the disaster. Castor stated that we need to follow through with President Obama’s recommendation to designate 80 percent of these funds for research and restoration in the Gulf.

Castor discussed H.R. 480, the Gulf of Mexico Economic and Environmental Restoration Act of 2011, a bill she is sponsoring, which would implement recommendations made by Navy Secretary Ray Mabus and the President’s Oil Spill Commission. Castor’s bill would direct 80 percent of the Clean Water Act fines to be paid by BP to the states hit hardest by the disaster. H.R. 480 also directs funding to bolster the seafood and tourism industries, as well as vital academic research and ocean monitoring activities. Castor highlighted the importance of devoting resources to new energy solutions and decreasing our dependence on oil.

Castor noted that oil spill research and Gulf restoration might be one of the few sectors that will see new money this year. Representatives Castor and Scalise (R-LA) are forming a Bipartisan Gulf Coast Caucus to work on these matters, as well as those relating to hurricanes, expansion of the Panama Canal, and other issues. She concluded by stating that the BP blowout has served as a wake-up call. Florida does not have an industrialized coastline, and she will fight to keep the oil rigs off of the Florida Coast. She also emphasized the need to pass legislation dealing with the use of BP’s fines, to ensure that restoration efforts are funded.
Representative Woolsey discussed her legislative efforts to minimize the negative impacts of offshore oil spills. She emphasized the importance of applying lessons learned in the Gulf Coast disaster and other spills. After an oil spill occurred in the San Francisco Bay in 2007, Woolsey noted the confusion about who was in charge of the response and what types of technologies were available to assess and clean up the mess. She introduced a bill, the Oil Pollution Research and Development Program Reauthorization Act, which would strengthen coordination among the 14 different agencies involved in response efforts. The bill would also increase funding for research and development of oil spill response, mitigation, and prevention technologies. During the response to the San Francisco Bay spill, local officials were still using the same types of technologies that were used in the wake of the Exxon Valdez spill back in 1989.

Woolsey noted that many of the same problems that plagued the San Francisco Bay spill response were present in the wake of the Deepwater Horizon explosion. She discussed new legislation that has been introduced, based on the recommendations of President Obama’s Oil Spill Commission’s report, to prevent another spill of the same magnitude as the Gulf coast spill. While it is impossible to drill risk-free, industry and the Federal government must do everything possible to minimize the risk.

Woolsey supports putting some areas of the United States’ coastline entirely off limits to oil drilling, including areas in her home district, Marin and Sonoma counties in California. She has introduced H.R. 192 to expand two marine sanctuaries off the coast of northern California. These waters are some of the most biologically abundant and diverse in the world, and are home to many species of birds, sea lions, seals, whales, and fish. Thousands of jobs depend on this ecosystem, including fishermen and those involved in tourism. Woolsey concluded by stating that our oceans are a national treasure, a cultural asset that must be protected for future generations.
Panel 2: Implications for Offshore Oil and Gas Regulations and Production

Kate Miller, Ph.D. – Dean, College of Geosciences; Professor, Geology and Geophysics, Texas A&M University

Dr. Miller opened the panel by providing an academic perspective on this topic. She noted that residents on the Gulf coast are aware of the connection with the environment and economy, and how oil and gas relates to these issues. It is necessary to strike a balance in sustaining the GOM with our need for oil and gas, as it provides about half of our domestic oil. Miller also pointed out that oil is a natural part of the GOM, with natural seeps accounting for the release of 1.2 million barrels per year, and additional oil added as part of surface river drainage. In terms of implications for future oil and gas production, Miller stated that we need to make sure that it is a resilient and sustainable part of the GOM. We also need to become involved in the international arena, as we share the GOM with Mexico and many island nations in the Caribbean. It is important to interact with these countries to make sure we are working together for the good of the GOM.

Miller concluded by discussing the need to consider factors in addition to oil exploration, to determine if the GOM has reached a tipping point. Habitat loss, nutrients, overfishing, and coastal expansion are all also taking a toll on the GOM. In general, this can provide an opportunity for cooperation and collaboration among Gulf coast scientists and others.

Walter Cruickshank, Ph.D. – Deputy Director, Bureau of Ocean Energy Management, Regulation and Enforcement, U.S. Department of Interior

Dr. Cruickshank concentrated his presentation on the role of the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) in the oil industry and how they are responding to the Deepwater Horizon oil spill. The agency is carefully analyzing all of the events leading up to the explosion, as well as its own structure and need for regulatory reforms. After the spill, it was immediately apparent that there were shortcomings in regulation and they were ill equipped to deal with the spill. A reorganization of BOEMRE has already started, and they will implement improved
standards for drilling, safety, and equipment, leading to well-equipped and professional regulation and a safe environment.

BOEMRE will implement new rules. One of these is a “drilling safety rule,” which will provide for new standards for well design and well control equipment, such as blowout preventers. The other is a “workplace safety rule,” which will hopefully eliminate human errors. In the Fall of 2011, they will be evaluating if each operator can access and deploy sub-sea containment resources should there be a loss of well control. Cruickshank noted that many rapid changes are occurring, and that BOEMRE is trying very hard to communicate new expectations, including holding meetings to answer questions from various parties. The sub-sea containment issue is a major change, and not until recently has the industry been able to prove that they had the equipment in place to respond to an event and contain it. BOEMRE intends to implement more safety measures regarding ROV capabilities, blowout preventers, workplace safety rules (including third party audits), and improving standards for oil spill response.

Cruickshank outlined some of the changes occurring in BOEMRE’s structure. He stated that the former Minerals Management Service had too many conflicting missions regarding the oil industry. They are creating three new entities with different missions and providing them with the resources necessary to fulfill those missions. The offshore oil program will become two entities, which will separate resource management functions from safety and enforcement functions. Cruickshank hopes that this will allow for more budgetary autonomy and encourage proper environmental analyses to be conducted. He also highlighted that BOEMRE is launching recruitment tours to hire new scientists.

Cruickshank concluded by stating that regulators must evolve as industry evolves. He also hopes to continue dialog with industry, environmental organizations, and other stakeholders to provide the best solution.

**Michael Kearns – Director of External Affairs, National Ocean Industries Association**

Mr. Kearns briefly overviewed the membership of the National Ocean Industries Association (NOIA), pointing out that less than 20 percent of its members are oil and gas producers. The rest are involved with other aspects of the industry, including offshore service companies and a small but growing number of renewable energy firms.
Kearns articulated the importance of offshore energy to our economy and energy portfolio. The Outer Continental Shelf (OCS) contributes 25 percent of the nation’s oil and gas production and provides 100,000-200,000 jobs directly and indirectly. He stated that after the income tax, royalty fees, and rental payments for oil and gas, development on federal lands are the largest source of income for our federal government. Kearns also discussed the safety record of the OCS oil industry. Despite the spill in 2010, he noted that there had been very few major accidents over the past 40-50 years, and that the industry generally had a strong safety record. He also cited a National Academies Oil and the Sea study from 2003, which said that only 1 percent of the oil in the ocean is from offshore oil and gas drilling, and that most is actually from terrestrial runoff. Kearns said that the industry wants to be an active corporate citizen in cleaning up what happened and making sure it does not happen again, as seen by the fact that all offshore oil companies helped the response effort.

Kearns also discussed concerns of the industry, the first of which was the recent moratorium on offshore drilling and the slow pace of restarting permitting now that the moratorium has been lifted. The industry is concerned about the remainder of the current five year leasing plan, which ends in 2012, as well as the five year plan to follow it. They hope for some return to regularity, as well as additional acreage to be available for production during the new plan. Regulatory uncertainty is an issue for the industry, as well as potential coastal and marine spatial planning. Spatial planning could be good but it is unclear how it will operate and if the industry will have a voice in development of a plan. Industry is also concerned about the number of future challenges to environmental assessments. Kearns cited that already 23,000 jobs had been lost to the moratorium and that there had been an 18-24 month loss in development momentum. By 2017, he stated, this could lead to a reduction in GOM oil production, and it already looks like 2011 offshore production will be lower than 2010.

As a final point, Kearns talked about the role of science. He emphasized that strong science is needed to make decisions, and that the slow pace of science is challenging for the industry. Kearns also stated that the industry is always looking for new ways to partner with the scientific and oceanographic community.

Catherine Hazlewood – Oceans Counsel, Majority Staff, Senate Committee on Commerce, Science, and Transportation

Ms. Hazlewood’s opening remarks touched on the Senate Committee on Commerce, Science, and Transportation’s response to the Deepwater Horizon spill, and
outlined what Committee Chairman Rockefeller (D-WV) and Members hope to accomplish with legislation in the 112th Congress. Hazlewood noted that a year ago, in the context of deliberations over broad climate and energy legislative packages, Congress and the Administration contemplated the expansion of offshore oil and gas development, including exploration in ever-deeper waters in the GOM and moving forward with studies in new areas of the Arctic. The Gulf spill, ongoing response, and long-term restoration needs have presented many on the Hill with a new perspective on the costs and risks associated with offshore development. And yet, Hazlewood stated, no energy source is without its risks, benefits, and impacts. With each energy policy decision, whether it be the appropriate siting for solar panels, or the remediation of oil after a spill, it is important to maintain a balance between energy needs and attenuating impacts to the environment and human health. For instance, the Arctic has the potential for extraordinary domestic energy production, yet a spill would be disastrous in this remote location, as we do not have the infrastructure (such as ice breakers) to support response efforts.

Hazlewood stated that the Committee supported the Administration’s temporary moratorium on deepwater exploration after the Deepwater Horizon spill, as it gave the nation time to regroup, explore what went wrong, and try to ensure that this would not happen again. However, Hazlewood indicated that the majority of Committee Members believe strongly that broader statutory changes are required. Chairman Rockefeller (D-WV) introduced two bills in the weeks following the Gulf disaster. The Chairman’s first priority was to ensure that the families of those left behind by the tragedy were taken care of. He introduced the Deepwater Horizon Survivors Fairness Act to fix loopholes in federal law so that victims’ families may receive the same compensation available to survivors of those injured or killed on land. Senator Rockefeller also introduced the Securing Health for Ocean Resources and Environment (SHORE) Act. The bill would ensure NOAA, U.S. Coast Guard, and coastal states and communities have the resources that they need to better prevent and respond to oil spills. The legislation would also put in place mechanisms to help ensure the long term recovery of the GOM. Finally, with leadership from Senator Begich (D-Alaska), the legislation would incorporate provisions [sponsored by Senator Begich] to guide research to improve oil spill prevention, response, and recovery in the Arctic. The Senate Commerce Committee is currently working to redraft the SHORE Act for reintroduction this Congress, and would appreciate hearing the scientific community’s perspective on the bill, particularly to ensure there are appropriate mechanisms in the bill to promote swift use of the best available science, data, and technology. Hazlewood also sought input regarding the longer term restoration needs in the Gulf, noting Senator Nelson’s (D-FL) efforts to keep fisheries and coastal economies healthy.
Featured Address:
NOAA’s Role in the Deepwater Horizon Oil Spill:
Protecting Oceans, Coasts, and Fisheries

Jane Lubchenco, Ph.D. – Administrator,
National Oceanic and Atmospheric Administration,
U.S. Department of Commerce

Dr. Lubchenco focused on the National Oceanic and Atmospheric Administration’s (NOAA) role in the response to the oil spill, as well as their integration of science into decision-making, using slides to illustrate her points. Lubchenco noted that NOAA is designated by Congress as the lead agency for oil spills in marine and coastal environments, and that every year they respond to around 150 spills. The Deepwater Horizon spill, however, was far from typical. Within two hours of receiving the call from the U.S. Coast Guard, NOAA produced the first oil trajectories. NOAA utilized all available platforms (including satellites, planes, ships, buoys, gliders, and the web) and worked to integrate the resulting information and knowledge and make it available to response managers and the public. She quoted National Incident Commander, Admiral Thad Allen’s characterization of the spill as ‘omnidirectional and indeterminate’ to emphasize the ongoing and diverse types of observations required to accurately respond to and assess the spill. Lubchenco noted that science underpinned all of NOAA’s diverse responsibilities: conduct and share science, keep seafood safe, protect wildlife and habitats, assess damage, and restore the natural resources that were injured.

Lubchenco emphasized that performing science is always challenging, but it is especially challenging during a crisis. The need for information is urgent and immediate, and responders are operating under a public microscope, often leading to intense scrutiny and imperfect filtering of information through the media. To gain expertise, Unified Command entrained individuals both inside and outside NOAA that had responded to the Exxon Valdez spill. She discussed the lessons learned from the Exxon Valdez spill that helped to inform the response to the Deepwater Horizon incident. One lesson was to make sure that clean-up techniques would do more good than harm. For instance, it is counter-productive to have hundreds of people cleaning up oil by hand in a sensitive marsh ecosystem, during which grasses would be trampled and oil driven deeper into the sediment. It is also important to assess the impacts of oil on juvenile organisms, as well as adults. However, Lubchenco recognized that the Exxon Valdez does not make a good comparison to Deepwater Horizon for many aspects of the response, given that Exxon Valdez occurred in a cold environment, near the surface, and with a very different type and known quantity of oil.

During Deepwater Horizon, NOAA played an important role in tracking, reporting and forecasting the location of the surface oil so the response effort could be maximally effective and potential impacts to fisheries determined. NOAA also worked with the FDA to devise protocols to test seafood to ensure that fish and shellfish on dinner plates were not contaminated by oil or dispersants. NOAA closed fisheries when
oil was or was expected to be present, then reopened areas only after extensive testing indicated the seafood was not contaminated.

Lubchenco discussed the need to understand the dynamics of the Loop Current in order to anticipate whether the oil would be entrained in the current and potentially impact Florida’s southwestern coast or even leave the Gulf. In addition to tracking the oil on the surface, NOAA worked with external research partners to track and monitor the location of oil below the surface.

Lubchenco emphasized that partnerships were a key part of the national response to the spill. Many scientists from other federal agencies, state agencies, academic institutions and independent researchers participated in the response. This allowed for a diversity of sampling platforms, including UNOLS, NOAA and contract vessels. Lubchenco credited Ocean Leadership (OL) and NSF with helping to expand many of these interactions and partnerships, extending opportunities beyond existing partnerships NOAA had with a variety of researchers. OL, NSF and the Office of Science and Technology Policy helped facilitate meetings with the scientific community, and NSF Rapid Grants enabled academic scientists’ involvement in the response. NOAA ended up working with scientists from 22 external institutions during the spill response. Despite these good collaborations, she noted that in the future, additional communication vehicles should be utilized to provide an ongoing mechanism for communication between federal agencies and the scientific community. For example, Lubchenco said there should be more regular calls with scientists, similar to the daily calls that occurred with state governors and Congressional offices to share information.

Addressing assertions that the federal government was not forthcoming with information, Lubchenco pointed out the significant and historic effort made by NOAA and other federal agencies to share scientific information broadly, in an open and transparent fashion. She cited 5 examples.

(1) NOAA shared information as quickly as possible through its website and a plethora of meetings with various stakeholders. NOAA posted data online as soon as they were quality assured and quality checked. NOAA also urged all scientists to share data as soon as they had verified the data’s accuracy and to stick to verifiable findings, not speculation. Continuing with that philosophy, NOAA has now created a DWH archive on its website wherein all DWH data, records and photos are deposited and accessible.

(2) NOAA proposed that the federal government make public key portions of a GIS tool called ERMA (Environmental Response Management Application), which was developed by the University of New Hampshire and NOAA to guide response efforts. NOAA believed that the public might also find the information valuable and led the interagency efforts to convert ERMA to a website that could withstand significant public traffic. The first day ERMA went public as Geoplatform.gov, it received 3.4 million hits following a CNN story announcing its availability.

(3) NOAA led the creation of an interagency scientific and technical analysis group (called the Joint Analysis Group or JAG, operating under the Unified Command structure) who produced reports on a variety of topics such as changes in dissolved oxygen in space and in time. These reports capture data collected by multiple agencies and other partners and synthesized them into a cohesive picture to inform response as well as scientific and public understanding.
(4) The oil budget calculator was developed by federal agencies as another response tool, one intended to help prioritize and inform efforts to burn, skim, boom and capture oil. Federal agencies realized that information from the calculator would be useful to share with the public. The oil budget document was the result – another commitment to share as much information as possible as soon as agencies were convinced it was accurate. The full peer-reviewed documentation of the oil budget report, released in November, by and large supported the initial calculations released in August.

(5) NOAA proposed to the Natural Resource Damage Assessment (NRDA) Trustee Council that data taken as part of the pre-assessment phase be made publicly available, unlike the prior decision to keep all parts of the NRDA process outside the public domain. In July the NRDA Trustee Council voted to do just that.

Lubchenco explained that NRDA is a scientific and legal process to assess damages and compensate the Public for injuries to natural resources, the loss of the ecological services they provide, and the public’s loss of use of those resources. She noted that this process is intended to only address impacts directly resulting from the spill, and not historical degradation of the environment, such as from hypoxia, overfishing or invasive species. The NRDA process has three phases (Figure 6): (1) Pre-assessment Phase to evaluate contamination, (2) Injury Assessment Phase to determine the quantity of injury, and (3) Restoration Phase to compensate for loss of resources. NOAA and the co-trustees are currently at the end of the Pre-assessment Phase and have started on the Injury Determination Phase. She noted that NOAA will continue to be actively engaged in the NRDA process and in restoration efforts beyond NRDA, for example as part of the long term Gulf Coast Ecosystem Restoration Task Force. This later effort, led by Administrator Lisa Jackson, is separate from, but will supplement the restoration that occurs through the NRDA process.

Lubchenco concluded her presentation by talking about lessons learned and opportunities presented by this spill. She cited 3 lessons learned:

(1) The first was the importance of preexisting relationships and partnerships that can be rapidly activated when needed. NOAA’s existing partnerships with many academics were invaluable. There was not a pre-existing mechanism for broad scale communications directly with the scientific community, so new vehicles for that communication needed to be created.

(2) Another lesson learned concerns the limitations of existing knowledge about a large marine ecosystem such as the Gulf of Mexico. Although existing data and information were incorporated into response and assessment efforts, and although much
new information was obtained during the spill, significant gaps in knowledge became obvious. An example of new knowledge gained included improved understanding of the loop current. Gaps that were exposed included understanding the dynamics of near-shore (inner shelf) circulation. She emphasized that to both respond to disasters and to improve management, every large marine ecosystem should have a comprehensive, integrated monitoring, research and communication effort underway.

(3) An obvious lesson learned was the need to advance knowledge about clean-up of oil spills. For the most part, the methodologies used in Deepwater Horizon were not significantly different from those used during the Exxon Valdez spill. She noted the President’s Budget for 2012 included a request for funds for NOAA to begin to fill this gap.

Lubchenco summarized her remarks by saying (1) especially in view of the magnitude and unprecedented nature of the spill, the overall response effort was impressive; (2) extraordinary efforts were made to use, create and communicate scientific knowledge to inform the response effort; (3) there are also many things that could be improved; (4) NOAA and other agencies remain fully engaged in the ongoing assessment and response efforts; (5) the Administration is committed to holding the responsible parties accountable and restoring the Gulf to health.
Panel 3: Gulf Ecosystem Restoration

John Hankinson – Executive Director, Gulf Coast Ecosystem Restoration Task Force

Hankinson primarily discussed the role and background of the Gulf Coast Ecosystem Restoration Task Force. He first pointed out how important the GOM is to the United States, with it contributing about 1/3 of the seafood production in the continental U.S., more than 90 percent of offshore crude oil and natural gas, and tens of billions of dollars to the economy through tourism, commercial, and recreational fisheries. He noted that the oil spill was catastrophic for the GOM, but it is only one of a series of acute and chronic stressors for the GOM, including changes in sediment input, land and habitat loss, nutrient input and water quality issues, sea level rise, climate change, barrier island loss, alterations in freshwater input, and coastal vulnerability to severe storms.

The Gulf Ecosystem Restoration Task Force was established by executive order on October 5, 2010. The Task Force is chaired by the EPA Administrator, Lisa Jackson, and includes representatives from the state and federal levels. Hankinson noted that tribal representation may also be included in the future. The responsibilities of the task force are: (1) to establish a GOM Regional Ecosystem Restoration Strategy, (2) to coordinate intergovernmental efforts for restoration, (3) to support the Natural Resource Damage Assessment (NRDA) by recommending restoration projects, (4) to engage stakeholders, (5) to coordinate the science in support of ecosystem restoration, and (6) coordinate to encourage health and economic benefits of ecosystem restoration.

Within one year of the executive order, the Task Force needs to have developed the GOM Regional Ecosystem Restoration Strategy. This strategy should: (1) define restoration goals and progress milestones, (2) take into account existing research and restoration efforts in the region, (3) identify policy areas where coordinated intergovernmental action is needed, (4) propose new programs or actions needed to implement elements of the Strategy, and (5) identify monitoring, research, and scientific assessments needed to support decision making for restoration efforts, as well as evaluate existing monitoring programs and identify gaps in current data collection.

Hankinson outlined the five principles articulated in the Mabus report proposed to guide restoration efforts. These principles are: (1) coastal wetland and barrier shoreline habitats are healthy and resilient; (2) fisheries are healthy, diverse, and sustainable; (3) coastal communities are adaptive and resilient; (4) a more sustainable storm buffer exists; and (5) inland habitats, watersheds, and off-shore waters are healthy and well-managed.
He noted that for their efforts, ecosystem restoration relates to activities meant to enhance the health and resilience of the Gulf coast ecosystem, measured in terms of physical, biological or chemical properties of the ecosystem, the services it provides, and its ability to support the economies, communities, and cultures of the region. It includes protecting and conserving ecosystems so that they can mitigate storms, other disasters, and climate change, as well as support economies. It also includes activities relating to the recovery of the ecosystem as it increases its health, integrity, and sustainability.

Hankinson concluded by talking about the development strategy, which will build on existing restoration efforts in the Gulf. They will also be engaging various stakeholders, including the research community. They hope to integrate inputs into a robust, action-driven, science-based implementation strategy that will guide Gulf-wide ecosystem restoration efforts.

---

**Larry Robinson, Ph.D. – Assistant Secretary of Commerce for Conservation and Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce**

Dr. Robinson concentrated his remarks on NOAA’s priorities and focus areas as a member of the Gulf Coast Ecosystem Restoration Task Force. He first talked about the use of Large Marine Ecosystem (LME) management approach, which is a comprehensive approach to include all of the Gulf resources, such as offshore or blue water resources, fisheries, critical habitats, threatened and endangered species, and deep benthic communities. NOAA wants to ensure that restoration efforts include plans that increase resiliency and sustainability of the LME. To accomplish this, it is necessary to include experts working in the LME from government as well as academic institutions, NGOs, and the private sector.

Robinson discussed the three different themes under which NOAA is trying to engage GOM restoration. These included: (1) Designing, implementing, and maintaining a long term ecosystem research, monitoring, and assessment program for the GOM to inform management decisions about the state of the ecosystem and related societal impacts; (2) Expanding and enhancing predictive models for the GOM; and (3) Promoting improvement or development of technologies to prepare for future events.

Robinson noted that science forms the foundation of NOAA’s work. They will also ensure that restoration efforts take a LME approach, maintain an open and transparent process, seek input from all affected stakeholders (including international entities as appropriate), and develop a governance structure that allows for effective adaptive management strategies to be employed.

Robinson also outlined NOAA’s Ecosystem Approach to Management (EAM) (Figure 7), which does not consider individual species or management issues, but incorporates a wider range of ecological, environmental, and human factors regarding resource use and protection. Integrated ecosystem assessments (IEAs), which develop a formal synthesis and analysis of information on relevant natural and socio-economic factors in relation to specified ecosystem management goals, are a critical science-support element of the EAM strategy. These involve and inform citizens, industry, scientists, research managers, and policy makers.
Robinson then discussed NOAA’s expectations for the outcomes of this restoration effort. They hoped this plan would allow for development and implementation of a long-term, sustained, integrated observing system which would be able to serve as an early warning system by detecting changes in the status and trends of the ecosystem. NOAA also wants increased understanding of the processes governing the GOM ecosystem and causes of change in the ecosystem, including natural variation, human forcing, and interactions between the two. Promotion of modeling research and increased predictive capability was also a priority. Additionally, Robinson hoped for identification and development of effective mechanisms for managing, communicating, and maintaining integrated and synthesized data to make this information available to various stakeholders.

Robinson also discussed the National Resource Damage Assessment (NRDA) process, of which NOAA is one of three federal trustees. The trustees are working to help identify and quantify the short- and long-term impacts of the spill on natural resources. NRDA data collection will serve as a scientific foundation for Gulf restoration efforts in order to help the Gulf communities and economies move along a path toward recovery. Robinson noted that NRDA trustees will soon begin their formal restoration planning, which allows for public participation. There will be public meetings in each of the five Gulf states to help facilitate this participation. He also emphasized the importance for Congress to direct Clean Water Act penalties to a dedicated fund for GOM restoration and recovery.

Robinson concluded his presentation by discussing the importance of the oceans in general, and the GOM specifically, to our nation. He noted that while NOAA and the other members of the Gulf Coast Ecosystem Task Force have extensive scientific expertise within the Gulf, they are also relying on scientists affiliated with academic and other institutions to be involved in this process. Success will depend on broad public participation and engagement in these efforts. Robinson also pointed out that the Deepwater Horizon spill has reinforced that human lives, livelihoods, and cultures are closely tied to ocean and coastal ecosystem health, and that environmental stewardship is good business.
Dr. Jochens discussed the work of the Gulf of Mexico Coastal Ocean Observing System (GCOOS) Regional Association (GCOOS-RA) to build a sustained, integrated, operational ocean observing system for the GOM as part of the U.S. Integrated Ocean Observing System (IOOS). She emphasized that building such a system is critical for monitoring the condition of the GOM, including its ecosystem and how it might be changing. Jochens noted that the GCOOS is being built using assets from many different organizations, e.g., academics, industry, and federal/state/local governments.

Jochens showed the coverage of real-time meteorological and ocean current observations presently available from GCOOS partners. For meteorological data, most come from NOAA buoys as well as from oil and gas platforms. Current measurements (Figure 8) are mostly from platforms controlled by state, academic, or private entities. Jochens noted that the oil and gas industry measures ocean current profiles from their deepwater platforms; these data initially were contributed to IOOS based on a mandate from the MMS. The data sets go to NOAA’s National Data Buoy Center (NDBC), where the quality of measurements is assessed, and then data are released. The availability of all these integrated monitoring data is only possible due to the IOOS principle of free sharing of data from many different institutions.

Because of the work to build the IOOS and GCOOS, these measurements were immediately available to responders at the time of the Deepwater Horizon Oil Spill. They provided critical real-time data on surface and subsurface currents, as well as winds that were used in the NOAA oil trajectory forecasts. Additional data critical for monitoring where the oil was going came through the assistance of the 11 IOOS regional associations, of which GCOOS is one that is working with NOAA and other federal agencies to build up the nation-wide IOOS system. The IOOS community provided substantial observing resources, in the form of gliders, to locate and track the deep, subsurface oil plume that developed during the spill.

Observation systems required for the Gulf restoration process will need to include a variety of measurements: e.g., currents, dissolved oxygen, chlorophyll, hydrocarbon tracers, and megafauna. To monitor the restoration, these systems should be sustained for an extended period of years and collected in near real-time. Jochens stated that the GCOOS is envisioned as an observing system to achieve such monitoring. She urged that resources be applied to enhance the GCOOS as part of the restoration effort, including specific plans for some monitoring assets to be sustained for the long-term.
Ana Unruh-Cohen, Ph.D. – Democratic Deputy Staff Director, House Committee on Natural Resources

Dr. Unruh-Cohen provided perspective on past and future legislation with respect to Gulf restoration efforts. She began by noting that the House Natural Resources Committee had just heard from USGS Director Marcia McNutt that it is difficult to perform science during an emergency. The Ranking Member of the committee, Rep. Ed Markey (D-MA), is looking for ways to bolster the use of science in the restoration processes and also provide for better preparation should there be another emergency. She grew up on the Texas Gulf Coast and experienced oil spills when she was younger. Unruh-Cohen understands that these events are major and create long-term impacts.

Unruh-Cohen discussed the CLEAR Act (HR 3534), which was introduced in response to the Deepwater Horizon oil spill during the last Congressional session. She summarized parts of the legislation, including Title VIII, which provided for a GOM Restoration Program, a Task Force (including governors and appropriate federal agencies), and a restoration plan. We are currently seeing the Administration move forward on Task Force formation (the Gulf Coast Restoration Task Force), but Mr. Markey still feels that it is important to have legislation to support their efforts.

On the House floor, two more sections were added to the CLEAR Act. Title V formed a Citizen’s Advisory Council, composed of local residents and stakeholders, to provide recommendations to the GOM Restoration Task Force. It also set up a GOM Long Term Environmental Monitoring and Research Program, a GOM Emergency Migratory Species Alternative Habitat Program, and a GOM Restoration Account. The account would be funded by a civil penalty of $200 million for each one million barrels discharged from an offshore facility and the money would be used by the Task Force for their recommended activities. Title VI was amended to clarify that the ORCA funding is subject to the availability of appropriations. Ultimately, the CLEAR Act was passed by the House, but did not pass in the Senate.

Unruh-Cohen went on to talk about legislation during this Congress. With the moratorium lifted and offshore permits being issued once more, she is hopeful that support can be generated for legislation. Democrats have introduced legislation (HR 501), which would implement the recommendations of the Oil Spill Commission (Figure 9). The coordination and planning aspects are identical to those in HR 3534. The restoration section provides for a Gulf Coast Ecosystem Restoration Fund comprised of 80 percent of Clean Water Act penalties from the spill. It also calls for creation of a Gulf Coast Ecosystem Restoration Task Force as well as Coastal Restoration Plans from each of the States.

Figure 9: Some provisions of HR 501.
**Participant Profiles**

**Don Boesch**

Donald F. Boesch is a Professor and President of the University of Maryland Center for Environmental Science. He also serves as Vice Chancellor for Environmental Sustainability for the University System of Maryland. He earned his B.S. from Tulane University and Ph.D. from the College of William and Mary. Prior to coming to Maryland in 1990, Don held faculty positions in Virginia and Louisiana.

A biological oceanographer who has conducted research on coastal and continental shelf ecosystems through the United States and in China and Australia, Don has spent much of his career conducting or leading research related to the restoration of two great American coastal ecosystems, the Chesapeake Bay, and the Mississippi Delta. In recent years, he has worked to understand the potential impacts of climate change and how to adapt to them. Don is the Chair of the National Research Council’s Ocean Studies Board and serves as a member of the National Academies’ Committee on America’s Climate Choices. He was one of the seven members of the National Commission on the BP Deepwater Horizon Oil Spill and the Future of Offshore Drilling.

**Michael Carron**

Dr. Michael Carron is the Director of the Gulf of Mexico Research Initiative, the entity created by BP and the Gulf States governors’ Gulf of Mexico Alliance to help dispense its research dollars investigating the impacts of the Deepwater Horizon oil spill. His previous position was Director of the Northern Gulf Institute (NGI). During his time at NGI, Michael has helped to develop the Institute's Science, Education and Research Management Plan, served as a member of NOAA's Gulf of Mexico Regional Collaboration Team, the Governor's Gulf of Mexico Alliance Priority Issue Team for Nutrients, helped develop the proposed Coastal Zone Management Act and developed multi-institution teams to perform research in the Northern Gulf region. Michael graduated from the U.S. Naval Academy in 1968 with a B.S. in Oceanography. He earned his M.A. and Ph.D. in Marine Science from the College of William and Mary, and completed an M.A. in National
Security and Strategic Studies at the Naval War College. He began his career at the U.S. Naval Oceanographic Office, where he focused on oceanographic surveying, and eventually became the Chief Scientist and headed the overall scientific program. From 2002-2006, Michael worked with the NATO Undersea Research Center to investigate the effect of SONAR and other man-made noises on marine mammals.

Representative Kathy Castor

Kathy Castor is a third-term representative for Florida’s 11th Congressional district, which includes parts of the Tampa Bay area along Florida’s Gulf Coast. Castor is a member of the House Budget Committee and the Committee on Armed Services. Castor has introduced “H.R. 480, Gulf of Mexico Economic and Environmental Restoration Act of 2011” to provide for restoration of environment and economy of the Gulf Coast after the BP Deepwater Horizon disaster. She is also opposed to new drilling off of Florida’s coast, as it can pose a threat to the economy, jobs, and the environment of the state. Castor received her Bachelor’s from Emory University and her Law degree from Florida State University College of Law. Prior to election to Congress, Castor served as a Hillsborough County Commissioner, and was chair of the Hillsborough County Environmental Protection Commission. She was named as the 2005 “Woman of the Year” in government by the Tampa Bay Business Journal.

David Conover

Dr. David O. Conover was appointed as the Director for the Division of Ocean Sciences at the National Science Foundation in 2010. Ocean Sciences is the largest division at NSF, and David oversees several major international programs, such as the Integrated Ocean Drilling Program (IODP), the Ocean Observatory Initiative (OOI) and core programs within Ocean Sciences. David earned his B.S. in Biology from Eckerd College in 1975. He completed his M.S. (1979) and Ph.D. (1982) in Fisheries Biology at the University of Massachusetts, Amherst. From 2003 to 2010, David was the Dean of the School of Marine and Atmospheric Sciences at Stony Brook University. He had been a Professor at Stony Brook University. He also served as the Mote Eminent Scholar Chair in Fisheries Ecology at the Department of Biological Sciences, Florida
State University during 1997-1998. During his time at Stony Brook, David led activities which expanded the undergraduate program as well as the geosciences aspect of the University. He has worked with the legislative branch of the government at both state and federal levels, and has been a valued member of numerous boards of Directors and advisory panels.

Walter Cruickshank

Walter D. Cruickshank is the Deputy Director of the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), which has taken over the responsibilities of the Minerals Management Service (MMS). He has held this position since 2002. Walter assists the BOEMRE Director in administering programs which ensure effective management of outer continental shelf energy and mineral resources, including environmentally safe exploration, development, and production of oil, natural gas and renewable energies. Walter received his Bachelor’s degree in Geological Sciences from Cornell University, and his Ph.D. from Pennsylvania State University in Mineral Economics. Walter has worked in the Department of the Interior for over 25 years. From 1997 to 2002, he served as the Associate Director for Policy and Management improvement for MMS, in which he supervised strategic planning, the administrative appeals process, management reforms, and conducted various policy and program analyses. He also was involved in the development and implementation of the President’s National Energy Policy within the Department of the Interior. In 2002, Walter received the Presidential Rank Award of Meritorious Executive, given to high-performing senior career employees for “sustained extraordinary accomplishment.”

John Hankinson

John H. Hankinson is the Executive Director of the Gulf Coast Ecosystem Restoration Task Force, a state/federal entity established by President Obama last October to pursue ecosystem restoration on the Gulf Coast. John is a Florida native who has worked for 30 years on environmental issues in the private, public, and non-profit sectors. He has brought together industry, government and stakeholder groups to form partnerships to restore ecosystems across the southeast. He has worked with the National Estuary Program in the Gulf of Mexico, and directed development and implementation of a
water quality protection plan for the Florida Keys National Marine Sanctuary. He also oversaw restoration and protection of the St. Johns River System in Florida. John served as a Regional Administrator of the EPA from 1994-2001. Prior to his appointment as executive Director, John was an environment and conservation lands consultant, and advised on land conservation, strategic land use in decision making, and constructive environmental management and policy projects.

---

**Catherine Hazlewood**

Catherine Hazlewood is the Oceans Counsel for the Majority Staff of the Senate Committee on Commerce, Science, and Transportation chaired by Senator Rockefeller. In her service, Catherine is responsible for the Committee’s portfolio relating to ocean policy and governance, coastal management, ecosystems and habitat, water quality, offshore development and impacts, weather and atmospheric issues and oversight of the National Oceanic and Atmospheric Administration. Prior to coming to the Hill, Catherine directed several legislative and regulatory campaigns at The Nature Conservancy, the largest environmental charitable organization in the world. Catherine has also worked at The Ocean Conservancy, the United Nations and the Commission on Environmental Law of the IUCN (World Conservation Union). Catherine has previously been appointed to several international, federal and state advisory bodies, and has served as a lecturer on ocean policy and law for the American Law Institute and the American Bar Association. Catherine received her Bachelor’s degree from the University of Wisconsin - Madison, and her J.D. from Pace University School of Law in New York where she served as the Editor-in-Chief of the Environmental Law Review.

---

**Ann Jochens**

Dr. Ann Jochens is a Research Scientist in Oceanography at Texas A&M University. She came to physical oceanography as a mathematician and attorney with extensive experience in environmental, safety, and permitting in the oil and gas and minerals industries. For over 20 years, Ann has been a Principal Investigator on major studies of the circulation and water properties over the Texas, Louisiana, Mississippi, Alabama, and Florida shelf, slope, and in the deep waters of the Gulf of Mexico. She was Program Manager for the Gulf of Mexico Sperm Whale Seismic Study, and participated in the World Ocean Circulation Experiment. Ann earned her
B.S. (1974) in Mathematics and Statistics at Southern Methodist University, her J.D. (1977) with a Background Specialty in Ocean Law from the University of Oregon, and her M.S. (1989) and Ph.D. (1997) in Oceanography from Texas A&M University. Since 2005, Ann has been the Regional Coordinator and currently is the PI for the Gulf of Mexico Coastal Ocean Observing System Regional Association (GCOOS-RA) that is working to build a sustained, integrated, operational ocean observing system for the Gulf of Mexico as part of the U.S. Integrated Ocean Observing System.

Michael Kearns

Michael Kearns is the Director of External Affairs at the National Ocean Industries Association (NOIA). NOIA is the only national trade association representing all segments of the offshore energy industry. The NOIA membership comprises nearly 300 companies engaged in activities ranging from drilling to producing, engineering to marine and air transport, offshore construction to equipment manufacture and supply, geophysical surveying to diving, and ocean-based renewable energy to finance. Michael works as an advocate on behalf of NOIA and its member companies before Congress and the Administration, seeking laws, regulations and policies that will support and enhance reliable access to the nation's valuable offshore hydrocarbon resources in order that they may be developed, produced and supplied in an environmentally responsible manner.

Prior to joining NOIA, Michael was a member of the staff of the Congressionally-created U.S. Commission on Ocean Policy, where he served as Special Assistant to the Executive Director and Assistant Project Manager. Michael has also worked at the Center for Strategic and International Studies and at the Advisory Board Company.

Michael graduated from Georgetown University’s College of Arts and Sciences in 1993 with a degree in Government and History.

Jane Lubchenco

Dr. Jane Lubchenco is the ninth and first woman Administrator of NOAA and Under Secretary of Commerce for Oceans and Atmosphere. Nominated by President Obama in December of 2008, she was confirmed by the US Senate in March 2009. She is a marine ecologist and environmental scientist by training, with expertise in oceans, climate change, and interactions between the environment and human well-being. She received her B.A. in Biology from Colorado College, her M.S. in Zoology from the University of Washington, and her Ph.D. in Ecology from Harvard University. Her academic career began at Harvard University.
(1975-1977) and continued at Oregon State University (1977-2009) until her present appointment. She has served as President for the American Association for Advancement of Science (AAAS), the International Council for Science, and the Ecological Society of America, and was a board member for the National Science Board for ten years. She served on several commissions, including the Pew Oceans Commission, the Joint Oceans Commission Initiative, the Aspen Institute Arctic Commission and the Council of Advisors for Google Ocean. Dr. Lubchenco is one of the “most highly cited” ecologists in the world, eight of her publications are recognized as “Science Citation Classics.” She is an elected member of the National Academy of Sciences, the American Academy of Arts and Sciences, the American Philosophical Society, the Royal Society, and the Academy of Sciences for the Developing World, Europe, and Chile. Dr. Lubchenco has received numerous awards, and has most recently been named “2010 Newsmaker of the Year” by the scientific journal *Nature*. Dr. Lubchenco has also co-founded three organizations (The Leopold Leadership Program, the Communication Partnership for Science and the Sea (COMPASS), and Climate Central) that aim to communicate scientific knowledge to the public, policy makers, media, and industry.

Marcia McNutt

Marcia McNutt is Director of the U.S. Geological Survey and is responsible for leading the Nation’s largest water, earth, biological science, and civilian mapping agency in its mission to provide the scientific data that enable decision makers to create sound policies for a changing world.

She is a member of the National Academy of Sciences, the American Philosophical Society, and the American Academy of Arts and Sciences. She was awarded by the American Geophysical Union the MacELwane Medal in 1988 for research accomplishments by a young scientist and the Maurice Ewing Medal in 2007 for her significant contributions to deep-sea exploration. She holds honorary doctoral degrees from the University of Minnesota, Colorado College, and Monmouth University.

Dr. McNutt received a bachelor’s in Physics from Colorado College and a doctorate in Earth Sciences from Scripps Institution of Oceanography.
Kate Miller

Dr. Kate C. Miller is currently the Dean of the College of Geosciences and Professor of Geology and Geophysics at Texas A&M University, a position held since 2009. She received her bachelor’s degree from Princeton University in 1982, her Masters from Stanford University in 1988, and her Ph.D. also from Stanford in 1991. From 1982-1986, Kate worked as a geoscientist for Amoco Production Company in New Orleans. After she received her doctorate in 1991, Kate took a job at the University of Texas at El Paso as a Research Specialist. At UTEP, Kate worked her way up to become the Chair of the Department of Geological Sciences in 1999. She maintained this position until 2004, when she became the Associate Dean for the College of Science. In addition to teaching and conducting geophysical research, Kate led a number of grants related to recruitment and retention of minorities in the geosciences and math and science education, during her time at UTEP. Among these efforts were the Pathways program (related to the NSF OEDG Program) and the Math and Science Teachers (MasT) Academy, which focused on future secondary education math and science teachers. Kate’s current research focuses on the application of active source seismology to the origin and evolution of the continental lithosphere. She has also been involved in using active source techniques to better understand earthquakes and other environmental hazards.

Shirley Pomponi

Dr. Shirley Pomponi is Executive Director of the NOAA Cooperative Institute for Ocean Exploration, Research, and Technology at Harbor Branch Oceanographic Institute, Florida Atlantic University, in Fort Pierce, Florida. She received her Ph.D. in Biological Oceanography from the University of Miami. Her research focuses on marine biotechnology, in general, and the discovery and development of marine-derived drugs, in particular. She has authored or co-authored more than 100 scientific publications and is co-inventor on several patents. She has led numerous research expeditions worldwide and has made more than 300 dives in Harbor Branch’s Johnson-Sea-Link submersibles. In July-August 2010, in response to the Deepwater Horizon oil spill, Dr. Pomponi led a 30 day Cooperative Institute expedition to conduct baseline assessments of the health of corals and sponges in mesophotic and deep reef environments on the west Florida shelf (www.cioert.org). Dr. Pomponi is a member of the Board of Trustees of the Consortium for Ocean Leadership, President of the Southern
Nancy Rabalais

Nancy N. Rabalais, Ph.D., is a Professor and Executive Director at the Louisiana Universities Marine Consortium in Cocodrie LA. Dr. Rabalais' research interests include the dynamics of hypoxic environments, interactions of large rivers with the coastal ocean, estuarine and coastal eutrophication, and science policy. Dr. Rabalais is currently serving as a Member of the NRC Committee on the Mississippi River and the Clean Water Act and the Committee on the Effects of the Deepwater Horizon Mississippi Canyon-252 Oil Spill on Ecosystem Services in the Gulf of Mexico, and recently the NRC Committees on the Evolution of the National Oceanographic Research Fleet and Review of Water and Environmental Research Systems (WATERS) Network. She is an elected member of the Board of Trustees for the Consortium on Ocean Leadership, the Council for the University National-Oceanographic Laboratory System, Vice Chair of the National Sea Grant Advisory Board, President Elect of the Southern Association of Marine Labs, and Member of the Board of Directors for GCOOS the Gulf of Mexico Coastal Ocean Observing System. Dr. Rabalais received her Ph.D. in Zoology from The University of Texas at Austin in 1983.

Christopher Reddy

Dr. Christopher M. Reddy is a Senior Scientist in Marine Chemistry and Geochemistry at the Woods Hole Oceanographic Institution (WHOI). He is also the Director of the Coastal Ocean Institute at WHOI. Chris received his B.S. in Chemistry from Rhode Island College in 1992, and his Ph.D. in Chemical Oceanography in 1997 from the University of Rhode Island Graduate School of Oceanography. After completing his Ph.D., Chris took a post-doctoral position at WHOI, and has worked there ever since. Chris has won many honors and awards, including Kavli Fellow Awards in 2009 and 2010 from the U.S. National Academy of Sciences. Chris’ research looks at the
sources, transport, and fate of organic contaminants in coastal and oceanic waters. His current work examines the short- and long-term fate of petroleum hydrocarbons in marine systems. Chris is currently studying natural oil seeps and several oil spills, including one that occurred four decades ago, as well as the Deepwater Horizon spill.

**Larry Robinson**

Dr. Larry Robinson was appointed as the Assistant Secretary of Commerce for Conservation and Management at the National Oceanic and Atmospheric Administration in May, 2010. Prior to his appointment, Dr. Robinson served as the Vice President for Research at Florida A&M University (FAMU). Since 2001 he served as Director of the National Oceanic and Atmospheric Administration’s Environmental Cooperative Science Center housed at FAMU. Dr. Robinson graduated *summa cum laude* with a bachelor’s degree in chemistry from Memphis State University in 1979, and earned a doctorate in nuclear chemistry from Washington University in St. Louis in 1984. From 1997 to 2003, Dr. Robinson was the director of FAMU’s Environmental Sciences Institute where he led efforts to establish B.S. and Ph.D. degree programs in 1998 and 1999, respectively. He served as FAMU’s Provost and Vice President for Academic Affairs starting in 2003 before returning to the faculty ranks in 2005. In 2007, he was called upon by the FAMU Board of Trustees to serve as interim Chief Executive Officer for the University. Also in 2007, he became the first African American to serve as Science Advisor to the United States Department of Agriculture’s Cooperative State Research, Education, and Extension Service (CSREES) where he served until 2009. In 2008, he was selected to serve on the Oceans Research and Resources Advisory Panel (ORRAP) and as a founding member of the National Science Foundation’s National Ecological Observatory Network (NEON) Science Technology Education Advisory Committee. Previously, Dr. Robinson served as a research scientist and group leader at Oak Ridge National Laboratory (ORNL) during the period 1984 – 1997. His research interests include environmental chemistry, the application of nuclear methods to detect trace elements in environmental matrices, and environmental policy and management.

**Tara Rothschild**

Tara Rothschild is a Senior Professional Staff member on the Energy and Environment Subcommittee of the House Science, Space, and Technology Committee. Her policy portfolio covers environmental research and development, including NOAA and EPA, but also includes Federal climate science, marine research, and water R&D. Prior to coming to work for Chairman Hall (then Ranking Member) in 2007, Tara was the Environment, Energy and Climate Legislative Assistant for U.S.

Tara has a BA in Environment, Science, and Policy and International Relations, and a MA in Environment, Science, and Policy from Clark University in Worcester, MA. Since 2007, she has been pursuing a MS in Environmental Engineering from Johns Hopkins University.

Nancy Sutley

Nancy Sutley is the Chair of the White House Council on Environmental Quality (CEQ). In her role as Chair, she serves as the principal environmental policy adviser to the President. The Council on Environmental Quality coordinates Federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives. In addition, CEQ oversees Federal agency implementation of the environmental impact assessment process and oversees the Office of the Federal Environmental Executive, which works to promote sustainable environmental stewardship throughout the Federal Government.

Prior to her appointment, Sutley was the Deputy Mayor for Energy and Environment for the city of Los Angeles, California. She represented Los Angeles on the Board of Directors for the Metropolitan Water District of Southern California and served on the California State Water Resources Control Board from 2003-2005. Sutley also worked for California Governor Gray Davis as Energy Advisor, managing state and federal regulations, legislative affairs, finances, and press relations. She served as Deputy Secretary for policy and intergovernmental relations in the California EPA from 1999-2003. She advised on water and air pollution policy, and established budget and legislative priorities. During the administration of President William J. Clinton, Sutley worked for the EPA as a Senior Policy Advisor to the Regional Administrator in San Francisco and special assistant to the Administrator in Washington, D.C.

Sutley received her Bachelors degree from Cornell University and her Masters in Public Policy from Harvard University.
Ana Unruh Cohen

Dr. Ana Unruh Cohen is the Democratic Deputy Staff Director of the House Committee on Natural Resources. Prior to her current position, Ana was part of the House Select Committee on Energy Independence and Global Warming for three years, serving first as Senior Policy Advisor, and then as Deputy Staff Director. Ana earned her Bachelor’s degree from Trinity University in 1996, and holds a Ph.D. in Geochemistry from Oxford University. After her doctorate, she accepted a science and technology fellowship through the American Association for the Advancement of Science (AAAS), which brought her to Capitol Hill. After her fellowship, she became a legislative assistant for Representative Ed Markey (D-MA). Between her time working for Rep. Markey and her tenure on the House Select Committee, Ana was the Director of Environmental Policy at the Center for American Progress, a nonpartisan research and educational institution.

Senator Sheldon Whitehouse

U.S. Senator Sheldon Whitehouse (D-R.I.) is a member of the Senate Environment and Public Works (EPW), Budget, Judiciary, and Health Education, Labor, and Pensions (HELP) Committees. Whitehouse has established a strong record on environmental conservation and protection since he was elected in 2006, and is especially active in addressing global climate change and its threat to ocean and coastal ecosystems. He introduced the National Endowment for the Oceans Act to establish a dedicated funding source for ocean and coastal research and restoration efforts. Whitehouse has also been a champion for coastal and estuarine habitats, successfully fighting to reauthorize the Estuary Restoration Act (ERA) in 2007, leading efforts to secure annual funding for EPA’s National Estuaries Program (NEP), and introducing legislation to reauthorize the NEP in 2010. He has also been a leader in efforts to defend the Clean Air Act, to support the growing renewable energy industry, and to increase environmental and worker safety protections in offshore oil drilling. As chair of the Environment and Public Works Oversight Subcommittee, Senator Whitehouse has examined the Gulf oil spill response efforts, scientific integrity, and threats to native wildlife species.
Representative Lynn Woolsey

Congresswoman Lynn Woolsey is a 10th term representative from California’s 6th District, which includes Marin County and most of Sonoma County, just north of San Francisco. Woolsey serves on the House Committee on Education and the Workforce and is ranking member of the Subcommittee on Workforce Protections. She also sits on the House Committee on Science, Space, and Technology and its Subcommittee on Energy and the Environment. Her work on this committee focuses on reducing America’s dependence on fossil fuels and promoting the use of clean, efficient energy sources. She is also one of Congress’ most visible leaders on issues affecting our oceans. One of her top legislative priorities is her bill that would add the Sonoma coastline to the National Marine Sanctuary Program in order to protect it from oil and gas drilling.