National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Attachment 9

Written Statement and Presentation of Dr. Terry Hazen

Senior Scientist, Head of the Ecology Department and DOE Distinguished Scientist, Earth Sciences Division, Lawrence Berkeley National Laboratory

Terry Hazen
Lawrence Berkeley National Lab

The biological effects and expected fate of the vast amount of oil in the Gulf of Mexico from the Deepwater Horizon blowout are unknown due to the depth and magnitude of this event. Here, we report that the dispersed hydrocarbon plume stimulated deep-sea indigenous γ- proteobacteria that are closely related to known petroleum-degraders. Hydrocarbon-degrading genes coincided with the concentration of various oil contaminants. Changes in hydrocarbon composition with distance from the source and incubation experiments with environmental isolates demonstrate faster then expected hydrocarbon biodegradation rates at 5°C. Based on these results, the potential exists for intrinsic bioremediation of the oil plume in the deep-water column without substantial oxygen drawdown.

LBNL Macondo Oil Leak Research Team

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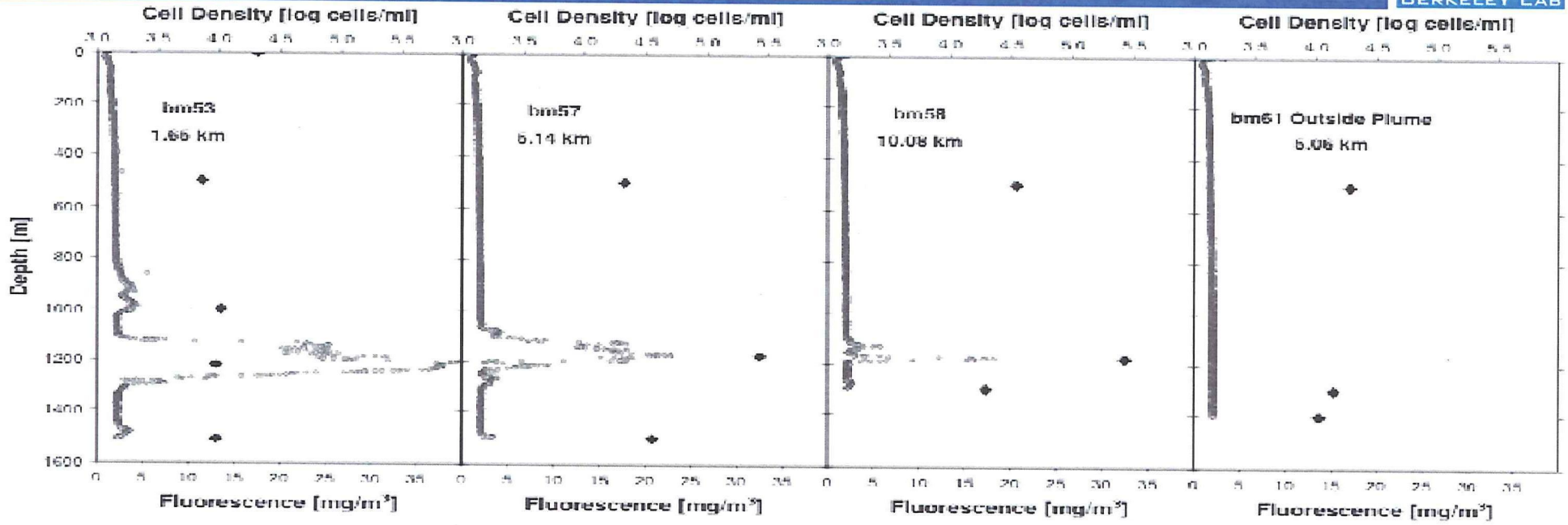
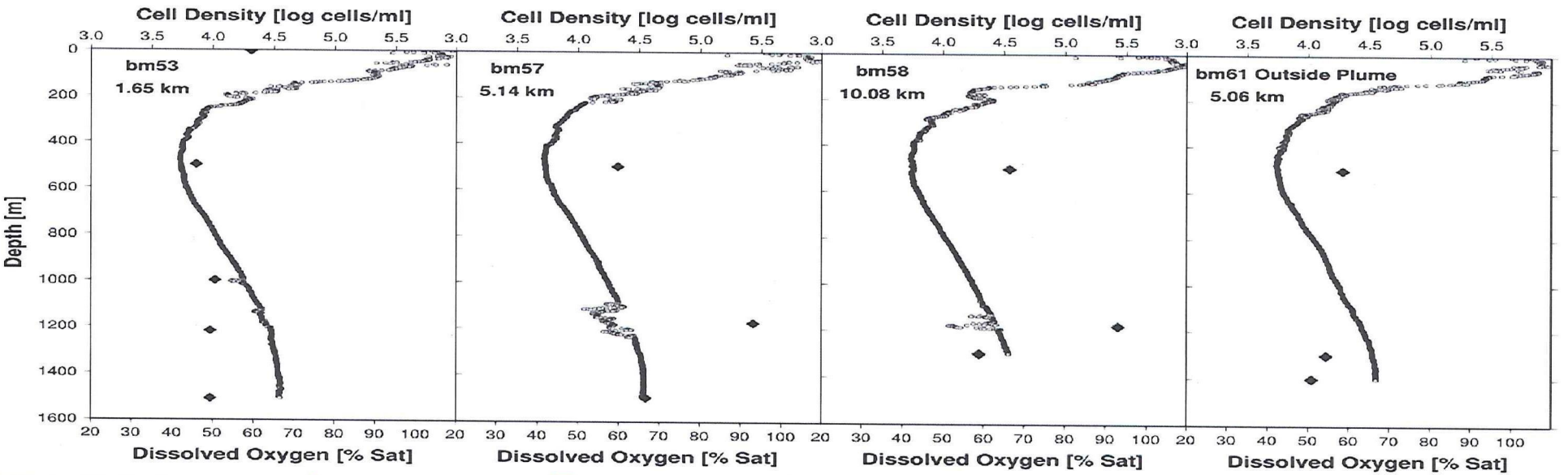
DOE JOINT GENOME INSTITUTE
US DEPARTMENT OF ENERGY
OFFICE OF SCIENCE

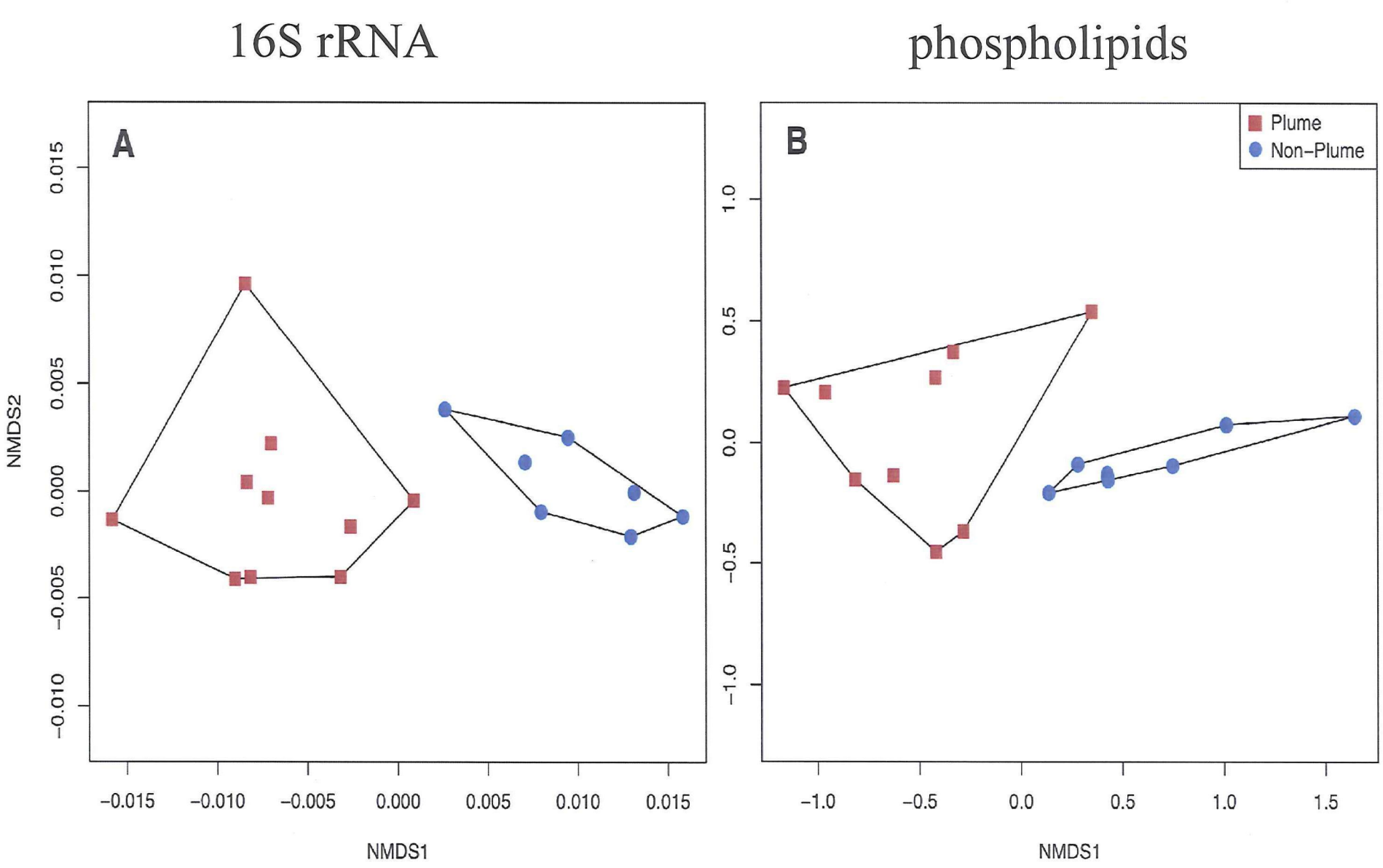
LAWRENCE BERKELEY NATIONAL LABORATORY

Characteristic depth profiles of cell density, fluorescence, and dissolved oxygen for distances from the source BM53, BM57, BM58 and one non-plume site BM61. (diamonds = cell density)

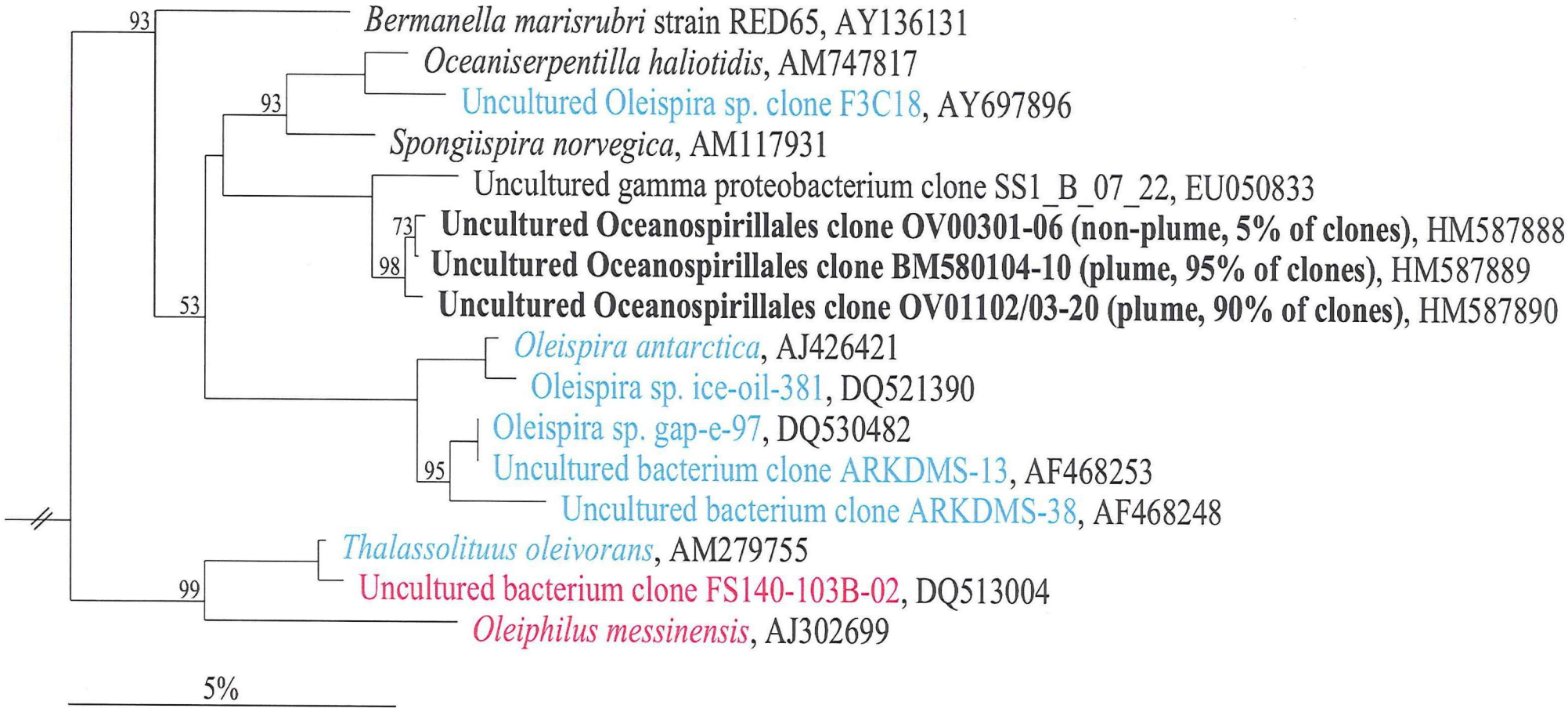




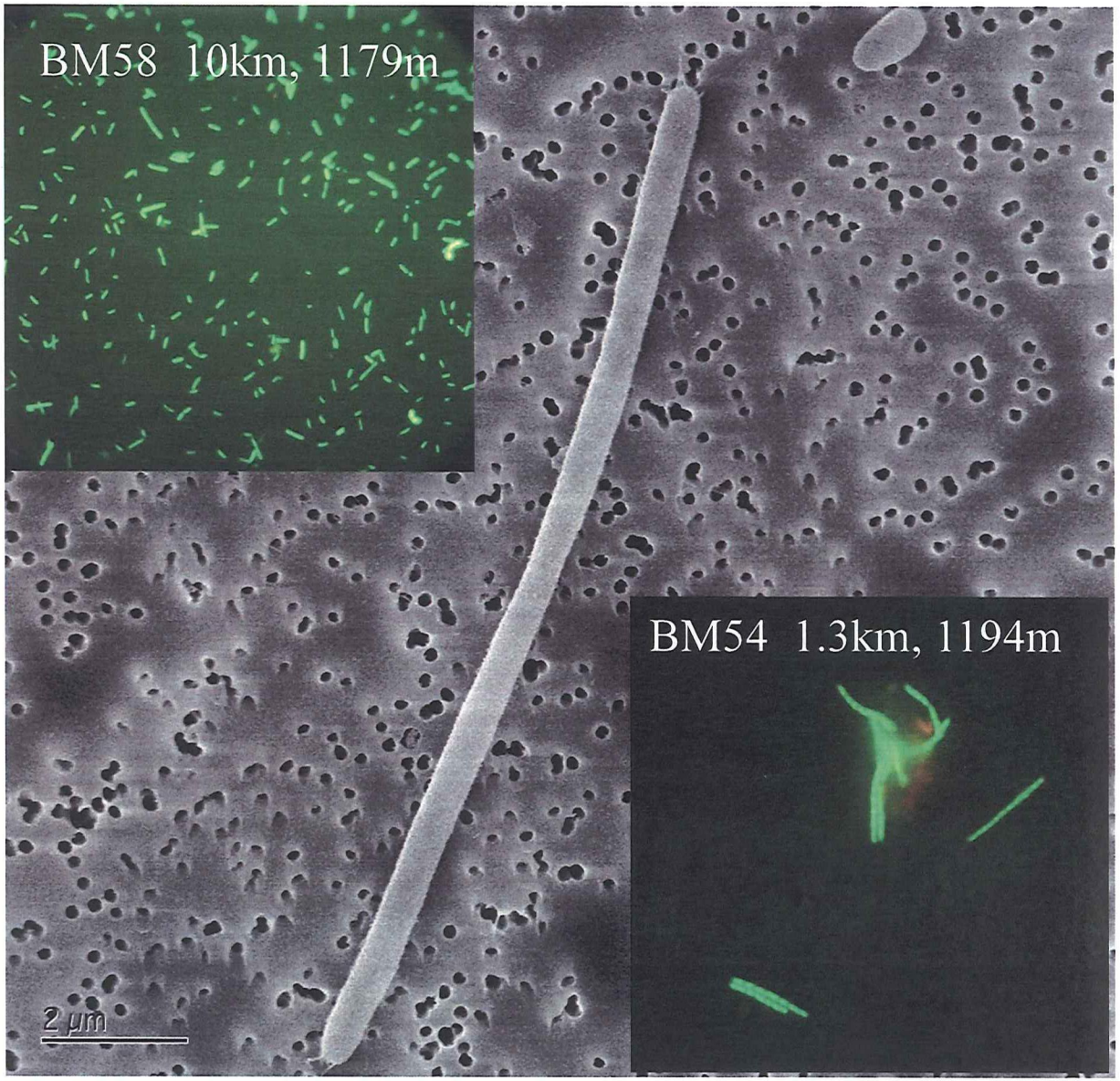
Microbial community analysis of deepwater plume and non-plume samples. Differences in composition of (A) 16S rRNA gene sequences measured by PhyloChip and (B) phospholipid fatty acids were analyzed using nonmetric multidimensional scaling ordination of Bray-Curtis distances (stress = 3.98 and 4.55, respectively). Plume and non-plume communities were significantly different as determined by permutational analysis of variance (p = 0.005 for both) and delineated with lines for clarity



Clone Library

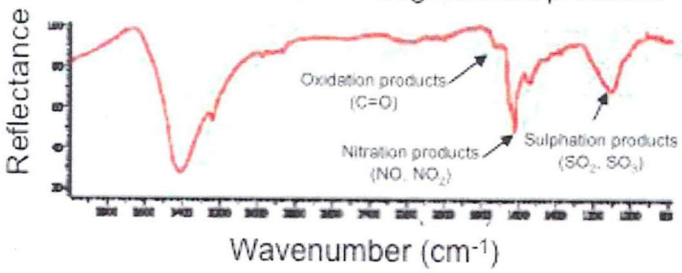


Dominant bacteria at 1099-1219 m, SEM and acridine orange stain inset with distance from wellhead

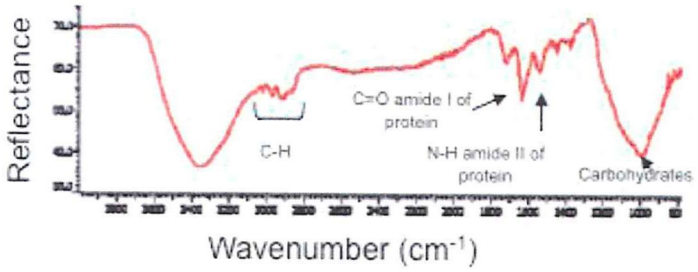


SR-FTIR analysis of Sample # OV01105

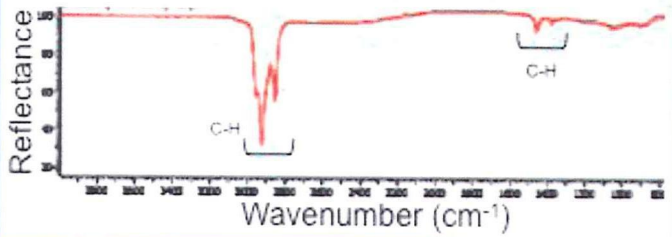
Floc riched in oil degradation products

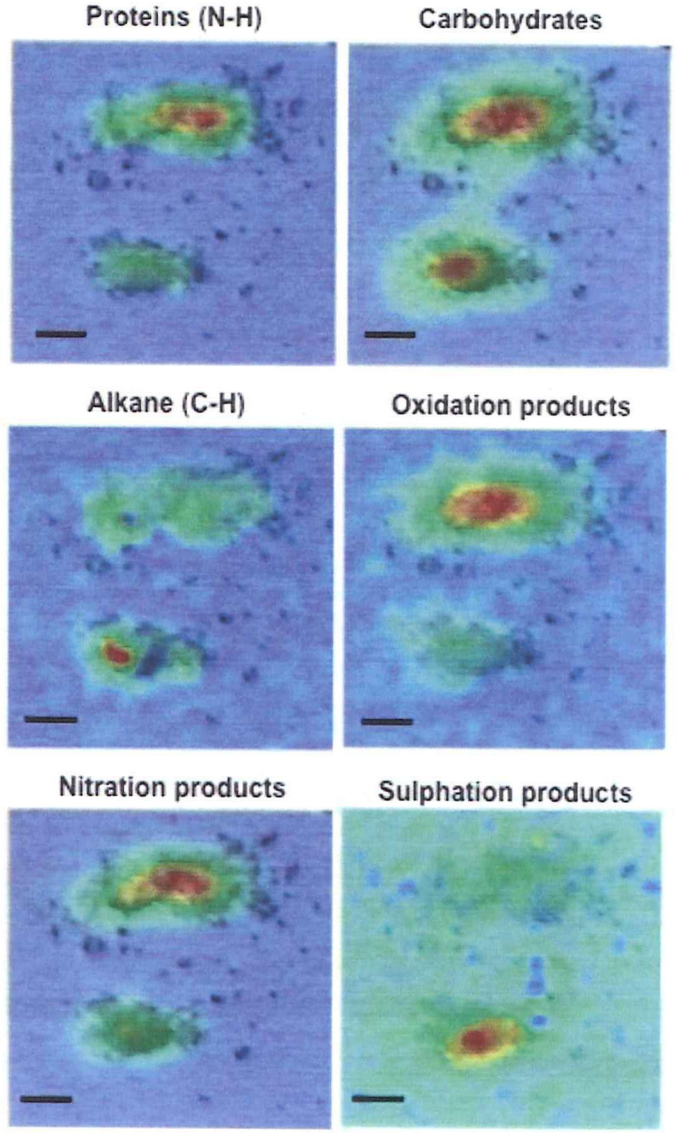


Microbe-rich floc with oil degradation products



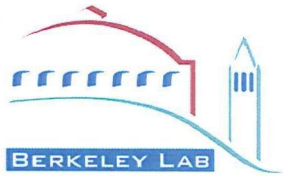
A typical spectrum of oil from MC252





Scale bars = 10 micrometers

MC-252 alkane half-life (days) from field and laboratory with currents of 2 - 5 days to move 10 km from source. The plume is constrained by bathymetric features but the width of plume can double over the distance of our study area (Camilli et al, 2010), our data also indicates that the vertical extent of the plume varies from 100 m at the source to 200 m at locations distant from the plume. The plume has a stable configuration but conservatively could expect dilution alone to represent up to half of the reported half-life in the plume data. Lab simulations are complementary.



		plume samples (2 d)	plume samples (5 d)	BP data (2 d)	BP data (5 d)	Mixed Consortia, 5°C	Micro-cosm water, 5°C
	Average	**2.4**	**6.1**	**1.2**	**2.9**	**3.5**	**2.2**
n-Tridecane	C13alk	1.6	4.0	1.4	3.5	3.1	2.1
n-Tetradecane	C14alk	1.5	3.8	1.4	3.4	3.5	2.3
Pentadecane	C15alk	1.5	3.8	1.0	2.4	3.6	2.1
n-hexadecane	C16alk	1.6	4.0	2.0	5.0	3.6	2.2
n-heptadecane	C17alk	1.7	4.3	1.1	2.8	3.6	2.3
Pristane	C19teralk	1.6	4.1	1.3	3.2	3.0	2.3
n-octadecane	C18alk	2.1	5.2	1.0	2.6	4.2	2.3
Phytane	C20teralk	1.8	4.6	1.4	3.4	3.6	2.3
n-Nonadecane	C19alk	2.1	5.4	1.0	2.6	3.6	2.3
eicosane	C20alk	3.2	7.9	1.0	2.5	3.7	2.3
Heneicosane	C21alk	3.7	9.3	1.9	4.7	3.5	2.6
n-Docosane	C22alk	3.8	9.5	1.0	2.5	3.7	2.2
tricosane	C23alk	3.7	9.2	1.0	2.5	3.6	2.2
tetracosane	C24alk	3.2	8.0	0.9	2.2	3.5	2.3
n-Pentacosane	C25alk	2.8	7.0	0.8	1.9	3.6	2.0
n-hexacosane	C26alk	3.1	7.8	0.6	1.6	3.1	1.7

National Commission on the

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Attachment 10

Document Submitted by Rear Admiral Mary Landry

Commander, Eighth Coast Guard District, U.S. Coast Guard

Contact Numbers

District Headquarters
(504) 589-6225

Sector New Orleans
(504) 846-6162

Sector Mobile
(251) 441-6211

Sector Houston/Galveston
(409) 766-5620

Sector Corpus Christi
(361) 939-6369

Sector Lower Mississippi River
(901) 544-3912

Sector Upper Mississippi River
(319) 524-7511

Sector Ohio Valley
(502) 779-5422

About the 8th

Seventeen of the top 40 busiest ports by tonnage are located in the Eighth District including two of the nation's busiest ports, New Orleans and Houston. More than two million barrels of oil and one million tons of cargo are imported daily.

There are more than 6,500 oil and gas producing wells, and 130 mobile offshore drilling units in the Gulf of Mexico. Five of the top seven fishing ports in the country are located in the district, accounting for nearly 40 percent of the catch for U.S. commercial fisherman.

The Eighth District is also home to four air stations; 15 search and rescue stations; 15 aids-to-navigation teams; and six vessel traffic services. Surface assets include two 210-foot medium endurance cutters; two PC-179 patrol boats; sixteen 87-foot patrol boats; 24 river tenders; one 225-foot buoy tender; and two 175-foot buoy tenders. There are also three Coast Guard Auxiliary regions in the Eighth District's area of responsibility: New Orleans, St. Louis, and Louisville, Ky.

In 2005, Hurricane Katrina cut a 900,000 square-mile swath of destruction along the Gulf Coast. Area units responded in force rescuing and evacuating more than 33,500 people during the hurricane response effort.

In 2008, Hurricane Ike struck the coast of Texas as the third costliest hurricane in U.S. history. Ike damaged or misplaced thousands of buoys prompting what many consider the largest Aids to Navigation operation ever.

U.S. Coast Guard Eighth District

Guardian
of the Heartland

Mission Facts and Figures

Search and Rescue

Annually:

- More than 9,000 cases
- 755 lives saved
- 3,914 mariners assisted
- $18 million in property saved

Law Enforcement

Annually:

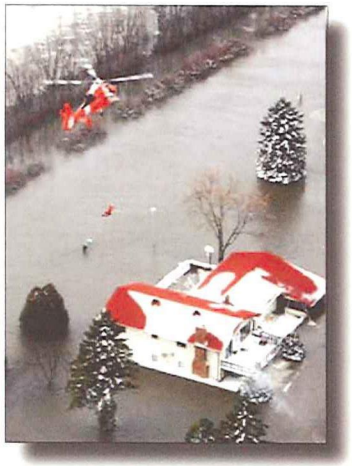
- More than 3,400 boardings
- More than 4,300 fishery enforcement boardings
- 89 illegal resident aliens interdicted
- 47 recreational BWI's cited
- 73 vessel terminations
- 6,300 pounds of drugs interdicted

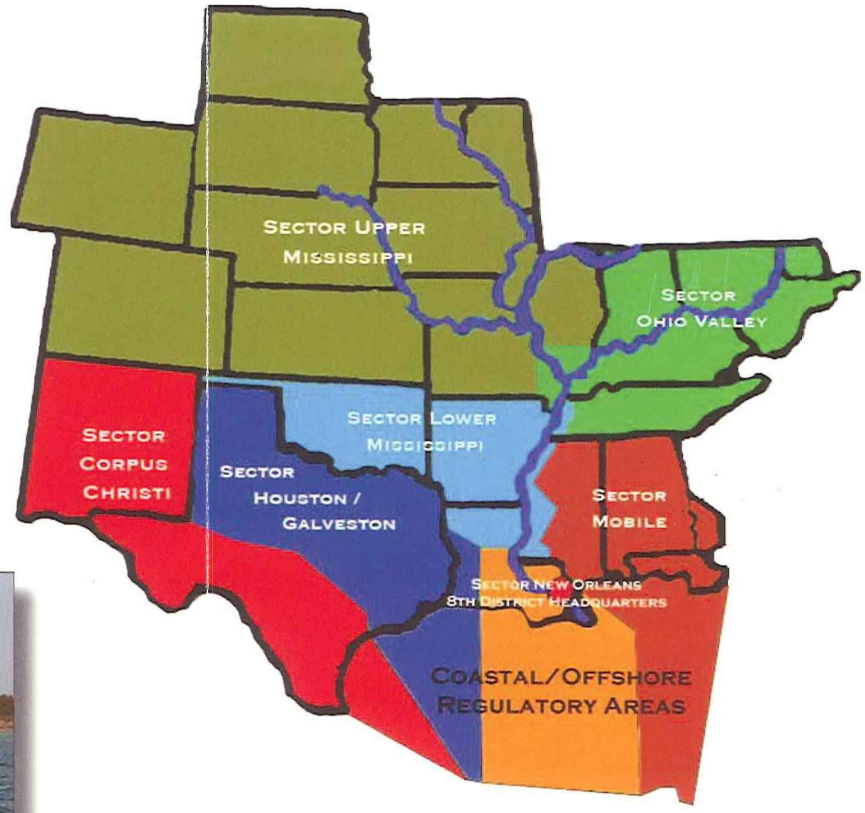
Aids to Navigation

- 47% Federal Aids to Navigation
- 53% U.S. Private Aids to Navigation
- 29% CG's ATON budget
- 1,863 buoys
- 7,208 fixed aids
- 14,358 private aids
- Nearly 13,000 western river buoys

Marine Safety

- 51% CG's pollution response
- 26% CG's maritime penalties
- 49% U.S. inspected vessels
- 28% of vessel arrivals
- 44% of vessel inspection activities
- 45% of casualty inspections
- Oversight of offshore oil industry





The Eighth Coast Guard District, headquartered in New Orleans, covers all or part of 26 states along the Gulf Coast and throughout the heartland of America with more than 1,200 miles of coastline, 10,300 miles of inland waterways from Florida to Mexico including the entire navigable length of the Mississippi, Ohio, Missouri, Illinois and Tennessee river systems. It stretches from the Appalachian Mountains and Chattahoochee River in the east, to the Rocky Mountains in the west, and from the U.S./Mexico border and the Gulf of Mexico to the Canadian border in North Dakota.

The Eighth District employs 4,000 active duty and reserve members, 4,600 Auxiliary members and 250 civilian employees.

National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Attachment 11

Written Statement of Ken Salazar

Secretary of the Interior

STATEMENT OF KEN SALAZAR
SECRETARY OF THE INTERIOR
BEFORE THE
NATIONAL COMMISSION ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

SEPTEMBER 27, 2010

Chairman Graham, Chairman Reilly, and Members of the Commission, I want to thank you for holding this public meeting and for extending an invitation to me to testify about the Department of the Interior's ongoing improvements to the Outer Continental Shelf (OCS) oil and gas program, and actions taken in response to the *BP Deepwater Horizon* explosion and oil spill.

Introduction

From my first day as Secretary, we have focused on reform of the Department of the Interior. In the 5 months since the *Deepwater Horizon* rig exploded in the Gulf of Mexico, the Department has continued carrying out the most aggressive, advanced, and rapid offshore drilling reforms ever implemented.

We are building a program with a focus on worker and environmental safety, administered by an agency that has the authorities, resources, and support to provide strong and effective regulation and oversight. We have put industry on notice that they will be held to the highest standards in their oil and gas operations.

In support of that vision, we are changing the direction of OCS oil and gas development, and have committed to making our program the best in the world, a shining example of how oil and gas development in our oceans should proceed, and one for others to follow.

Our unrelenting focus since April 20, 2010, has been to stop the flow of oil; ensure that our great natural resources along the Gulf Coast are protected and restored; and carry out comprehensive reviews and investigations so that we understand what happened and can implement all necessary change. It is important, however, to recognize that ocean energy development goes beyond oil and gas development. We have been working hard since the beginning of the Administration to advance the President's vision for offshore renewable energy.

Toward that end, we cut through a jurisdictional dispute and finalized long-stalled regulations for offshore wind; approved the Cape Wind project; announced the establishment of a regional renewable energy office to coordinate and expedite the development of wind and other renewable energy resources on the Atlantic OCS; and entered into a Memorandum of Understanding with governors of East Coast states, formally establishing an Atlantic Offshore Wind Energy Consortium to promote the efficient, orderly, and responsible development of wind resources on the OCS through increased federal-state cooperation.

A New Era of Reform

Just two days after my confirmation, I held my first all-employee listening session and issued a memorandum to all employees outlining a set of high ethical standards that Department employees, both political and career, must follow. I also travelled to Denver, where I launched a major reform initiative within the Department that included, among other things, upgraded and strengthened ethics standards and enforcement throughout the Minerals Management Service (now the Bureau of Ocean Energy Management, Regulation and Enforcement, or BOEM) for all political and career employees.

We terminated the troubled Royalty-in-Kind program to reduce the likelihood of fraud or collusion with industry in connection with the collection of royalties, and pursued continued implementation of the recommendations to improve the royalty collection program that came from the Department's Inspector General, the Government Accountability Office, and a committee chaired by former Senators Bob Kerrey and Jake Garn.

In the fall of 2009, Interior asked the National Marine Board, an arm of the National Academy of Sciences, to examine how we could upgrade our inspection and safety program for offshore rigs, and we procured necessary increases in the MMS budget for fiscal years 2010 and 2011. I also recommended to Congress that year that it provide statutory organic legislation for the MMS because of the huge responsibilities of managing the OCS oil and gas leasing program and collecting and processing revenues from the program.

Then in March of this year the march of reform continued at the Department when we announced our proposed 2012-2017 offshore oil and gas program, reversing the plans of the previous administration and providing a new approach to oil and gas activities on the OCS aimed at

promoting the responsible, environmentally-sound, and scientifically-grounded development of oil and gas resources on the OCS. Our plan continued to place great emphasis on oil and gas production in the Western and Central Gulf of Mexico, and allowed us to gather additional information to make a sound decision on whether or not to proceed with exploring new areas such as the eastern Gulf of Mexico (more than 125 miles off of Florida) and the mid- and South Atlantic.

Through this proposal, we introduced a new emphasis on both science-based decision-making and public outreach. Before this announcement, I extended the opportunity for public comment for 180 days, gathering over 500,000 comments from around the country. We also canceled scheduled Beaufort and Chukchi lease sales in the Arctic, removed Bristol Bay altogether from leasing in both the current five-year plan and the next five-year plan, and removed the Pacific Coast and the Northeast entirely from any drilling under a new five-year plan. We made it clear that we will require full environmental analysis through an Environmental Impact Statement prior to any decision to lease in any additional areas, such as the mid- or south-Atlantic, and we launched a scientific evaluation, led by my Science Advisor and Director of the United States Geological Survey (USGS), Dr. Marcia McNutt, to analyze issues associated with drilling in the Arctic.

All of this was done, early on, in the nature of reforming the offshore program.

Aggressive and Responsive Reform

While the *Deepwater Horizon* explosion and spill focused our attention on the Gulf of Mexico, it further fueled our drive to reform. This tragedy has bolstered our resolve to develop the "gold standard" in offshore energy programs. As we await the results of the investigations into the cause of the explosion and spill, we have been reviewing and evaluating important aspects of the offshore program, from the planning stages to development, from top to bottom, and making key changes.

The reforms we have embarked on since April 20th are substantive and systemic. They address the failures that we have seen and the shortcomings that we have identified. We are creating a strong and independent agency with the resources, tools and authority it needs to hold offshore operators accountable to the law. We have raised the bar on industry's safety practices and

equipment. We are making companies that want to drill explain to us how they will deal with catastrophic blowouts and oil spills. And we have put science back in its rightful place in decisions about offshore oil and gas development. As the results of the ongoing investigations become available, we will continue to build on these reforms.

In a May 19 Secretarial Order, I initiated a restructuring of the MMS, separating the bureau's resource management, safety, environmental oversight, enforcement, and revenue collection responsibilities, and reassigning those functions to three new entities within the Department: the Bureau of Ocean Energy Management, the Bureau of Safety and Environmental Enforcement, and the Office of Natural Resources Revenue.

The plan balances the imperative to move quickly with the analysis and planning required to effectively achieve specifically-identified objectives. This reorganization will ensure that the programs and activities carried out are clearly defined and distinct from one another in order to eliminate both real and perceived conflicts within the organization.

The President and I appointed Michael Bromwich, a former Inspector General of the Department of Justice and an attorney in private practice, as Director of the BOEM to lead us through the reorganization, which will lay the foundation for the reforms we have underway. He will lead the changes in how the agency does business, implement the reforms that will raise the bar for safe and environmentally-sound offshore oil and gas operations, and help our Nation transition to a clean energy future.

In our initial response to the spill, we took aggressive actions on many fronts:

- immediate inspections of all deepwater oil and gas drilling operations in the Gulf of Mexico;
- issuing a safety notice to all rig operators in the Gulf;
- at the request of the President, developing and implementing the recommendations of a 30-day Safety Report to the President, including issuing notices to lessees on new safety requirements, developing new rules for safety and environmental protection, and issuing suspensions of deepwater drilling on the OCS to ensure that oil and gas companies implement adequate safety measures to reduce the risks associated with deepwater drilling operations;
- requiring operators to submit information in their exploration plans regarding blowout scenarios– reversing a long standing exemption that resulted from too much reliance on industry to self-regulate;

- notifying BP in writing that it is required to pay royalties on all oil captured from the leaking well and that it may also be responsible for royalties on any oil lost or wasted from the well if it is determined that such loss or wasted oil was due to negligence or regulatory violations that contributed to the tragedy;
- forming an Outer Continental Shelf Safety Oversight Board, consisting of Assistant Secretary for Land and Minerals Management Wilma A. Lewis, who serves as Chair; Assistant Secretary for Policy, Management and Budget Rhea Suh; and Acting Inspector General Mary Kendall, to identify, evaluate, and implement new safety requirements. The Board's recently-issued report, available at http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&PageID=43677, provides recommendations to strengthen permitting, inspections, enforcement and environmental stewardship;
- carrying out a series of fact-finding forums designed to collect information and views about deepwater drilling safety reforms, well containment, and oil spill response, which will be considered in evaluating whether to recommend any modifications to the scope or duration of the deepwater drilling suspensions announced in July; and
- issued, just last week, a Notice to Lessees requiring oil and gas companies in the Gulf of Mexico to set permanent plugs in nearly 3,500 nonproducing wells that are currently completed with a subsurface safety valve in place and dismantle about 650 oil and gas production platforms if they are no longer being used for exploration or production – these unused platforms are commonly known as "idle iron."

Such fundamental changes do not come easily and many of the changes we have made have been characterized as impediments and roadblocks to the development of domestic oil and gas resources. But this unprecedented disaster at the *Deepwater Horizon* facility has only strengthened our resolve. We believe that our reform efforts are crucial to ensuring that we carry out our responsibilities effectively in a manner that facilitates the balanced, responsible, and sustainable development of the resources entrusted to us.

Environmental Analysis

Following the explosion and spill, the Council on Environmental Quality, working closely with the Department, carried out a review of the Department's National Environmental Policy Act policies, practices, and procedures relating to decisions for OCS oil and gas exploration and development. The results of that review, released on August 16th, found that the bureau conducted numerous levels of extensive environmental reviews, relying on the "tiering" process – in which prior reviews should be incorporated into subsequent, site-specific analyses. The report, which can be found at http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&PageID=42036

offered several recommendations intended to promote a more robust and transparent implementation of NEPA practices.

BOEM has committed to using these recommendations as guideposts as it continues its reform and reorganization activities. At the same time, the Department announced that it will restrict the use of categorical exclusions for offshore oil and gas development to activities involving limited environmental risk while it undertakes a comprehensive review of its NEPA process and the use of categorical exclusions for exploration and drilling on the OCS. We also announced that we will conduct a new environmental analysis in the Gulf of Mexico that will help provide information to guide future leasing and development decisions there.

As we evaluate new areas for potential oil and gas exploration and development on the OCS, we will continue to work with other federal agencies to conduct a thorough process of environmental analysis and scientific study, gather public input and comment, and carefully examine the potential safety and spill risks.

Budget Reform

We are also working to strengthen the OCS program budget. The President's 2011 budget amendment, released on September 13, 2010, includes an additional $100 million for BOEM reform efforts, including funding for more inspectors. The amendment also proposes raising inspections fees from $10 million to $45 million. Our restructuring of the OCS program will require additional resources to implement the aggressive reforms we are pursuing, and these amendments will provide this necessary funding. We are currently hiring an additional 12 inspectors and taking other actions that are outlined in the 30-day report to the President. Our restructuring of a more robust OCS regulatory and enforcement program will dictate the need for engineering, technical, and other specialized staff.

The President's enacted supplemental request includes $29 million to fund near term resources for these activities. These funds are critically needed to bolster inspections of offshore oil and gas platforms, draft health, safety, and environmental protection regulations, develop the required enforcement measures for these new regulations and carry out environmental and engineering studies.

Scientific Expertise

The science resources available at the Department of the Interior are some of the most robust in the United States and include thousands of scientists in the United States Geological Survey (USGS), the United States Fish and Wildlife Service (FWS), the National Park Service (NPS) and the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEM). The various programs in the USGS and the science and research programs within BOEM also play key roles in providing scientific information concerning impacts from offshore energy and mineral exploration.

I mentioned earlier that I have chosen USGS Director Dr. Marcia McNutt as my Science Advisor. Director McNutt is a world-class scientist whose professional expertise and leadership qualities continue to be invaluable in guiding the USGS. She played a key role in the impressive government team that was instrumental in monitoring and in ensuring the successful killing of the Macondo well. In support of government efforts during the spill, the USGS provided a key role in estimating the oil flow rate of the well; providing geospatial support; providing sampling data for water, sediment, and biota as we work to establish baseline conditions of our resources; and in reviewing relevant scientific information. We will lean heavily on the scientific expertise of the USGS as we move forward with our offshore planning.

BOEM's Offshore Energy and Minerals Management Program manages research associated with renewable energy, oil and gas operational safety, and oil spill response. That program administers The National Oil Spill Response and Renewable Energy Test Facility, located in Leonardo, New Jersey, which provides oil spill response testing, training, and research opportunities to government, industry, academia, and private organizations on a reimbursable basis. BOEM also has an Environmental Studies Program that has a broad mandate, covering fields as diverse as oceanography, atmospheric sciences, and social sciences. Through this program, BOEM spends tens of millions of dollars collaborating with NOAA and other federal agencies, educational organizations, and private entities to carry out research and synthesize available environmental and social and economic science information to support decision-making related to development of offshore energy and mineral resources.

Impacts of and Response to the *Deepwater Horizon* Spill

The Gulf of Mexico is one of the world's most ecologically rich areas and provides habitat for a great diversity of fish, birds, mammals, reptiles and other wildlife. Many species of wildlife, including some that are threatened or endangered, live along the Gulf Coast and are being affected by the oil spill. The Department and its bureaus have responsibility for significant natural resources in the Gulf that have been affected by the spill, including National Wildlife Refuges, National Park units, migratory birds, and threatened and endangered species, such as manatees, and sea turtles.

While we do not yet know all of the long-term impacts of the spill, we do know that:

- Eleven rig workers died and 17 people were injured in the blowout and fire;
- Nearly five million barrels of oil were released over a period of nearly three months;
- Hundreds of miles of shoreline and wetlands in the Gulf of Mexico have been affected by the spill;
- The Gulf ecosystem could be affected, including marine plankton, fish and shellfish, birds, marine mammals, and other wildlife;
- A number of the refuges, parks, and seashores under the Department's jurisdiction have suffered spill-related impacts; and
- The spill has also had an impact on the economies of the Gulf States, including on fishing, shrimping, tourism, commercial retail, and other industries.

Last week, Admiral Thad Allen, Energy Secretary Steven Chu and I declared BP's Macondo well effectively dead. With that determination, oversight transitions from the National Incident Command to BOEM under a process laid out in the National Response Framework. The Department and BOEM will now oversee the decommissioning of the Macondo well and its associated relief wells.

Consistent with existing regulations, before proceeding with the decommissioning of the relief wells, BP will be required to submit to BOEM for approval an Application for Permit to Modify that outlines its procedures to permanently plug the relief wells, which will then be decommissioned according to the regulatory guidelines that require the setting of multiple cement plugs and testing of plugs.

I am proud of our government team which played such a key role in ensuring the successful killing of the Macondo well and who have been working essentially non-stop since April 20th.

I have viewed my job from day one to make sure that BP and other responsible parties were fully accountable. I established direct lines of communication with the BP CEO and other leaders, and traveled to Houston multiple times to ensure firsthand that BP was doing everything it could to address the spill. I pushed BP to provide daily readouts in writing, as well as daily calls, to review the actions it was taking in response to the spill and to discuss alternatives.

I worked with Admiral Allen and Secretary Chu to prepare and deliver explicit directions to BP to undertake specified containment activities. In some cases, we directed BP to take steps that BP otherwise may not have taken on its own.

To ensure that Gulf Coast communities would be made whole, Homeland Security Secretary Janet Napolitano and I pushed BP to confirm, in writing, that it would pay for all costs and damages regardless of whether the statutory liability cap contained in the Oil Pollution Act applies, and it did. I reached out to Energy Secretary Chu and facilitated his involvement in the response effort. Under his and my leadership, the United States Government science team was formed and embedded in the Houston BP spill mission control operation.

Immediately after the explosion and spill, top staff from my natural resource and science team were dispatched to the Gulf, including to the Incident Command centers, to assist in coordinating the response. This included Deputy Secretary David J. Hayes; Assistant Secretary for Fish and Wildlife and Parks, Tom Strickland; Director of the U.S. Geological Survey and Science Advisor, Dr. Marcia McNutt; Director of the National Park Service, Jon Jarvis; Acting Director of the U.S. Fish and Wildlife Service, Rowan Gould; and the Director of the Bureau of Land Management, Bob Abbey, among others. Over many months, these officials worked closely with personnel from BOEM and other bureaus in the Department to deal with the various issues raised by the spill, and provided experienced leadership in each of the command centers.

We deployed over 1,000 employees to the Gulf Coast to direct actions to contain the spill; clean up affected coastal and marine areas under our jurisdiction; provide expert assistance in wildlife rehabilitation efforts; and assist Gulf Coast residents with information related to the claims process, health and safety information, volunteer opportunities, and general information on the efforts being carried out in the region.

The Department's agencies in the unified response had several shared goals, including protection of sensitive resources, distribution of accurate information for visitors regarding safe recreation, recovery of wildlife, and safety of all personnel and visitors. The U.S. Fish and Wildlife Service was the lead federal agency for Wildlife Operations for the spill. Personnel from our bureaus in the Gulf, including FWS and the National Park Service, as well as USGS staff, assisted in field operations that included deployment and maintenance of millions of feet of containment boom, with the goal of protecting the most sensitive areas of marsh and other vital habitats along the Gulf coast. These dedicated and hardworking staff also conducted beach surveys to monitor sea turtle nests and developing protocols for cleanup crews should we discover oiled nests; engaged in multiple overflights of affected or potentially affected areas to aid in establishing a baseline for documenting and quantifying impacts and predicting effects in the future, and to survey for birds, manatees and other wildlife along the coasts of Louisiana, Mississippi, Alabama, and western Florida.

FWS and NPS staff continue to be deployed for reconnaissance and recovery operations and wildlife rescue missions. As part of ongoing efforts to protect wildlife and wildlife habitats from the impacts of the oil spill, FWS and NPS cleanup crews continued shoreline cleanup operations, for example, at Gulf Islands National Seashore and at FWS refuges in the Gulf. Tons of oil debris are being removed from these locations. As of early last week, approximately 110 miles of Gulf Coast shoreline had experienced moderate to heavy oil impacts—approximately 99 miles in Louisiana, nine miles in Mississippi and two miles in Florida, and about 500 miles of shoreline had experienced light to trace oil impacts, with about 226 miles in Louisiana, 90 miles in Mississippi, 60 miles in Alabama, and 114 miles in Florida. Millions of feet of boom, thousands of vessels, and over one hundred helicopters and aircraft were used during the response effort, with tens of thousands of personnel mobilized for the clean-up. Updated information continues to be posted at: http://www.restorethegulf.gov/index.shtm

Restoration Activities

We appreciate your focus on restoration of the Gulf of Mexico in the wake of this tragedy. As the President has made clear, a long-term plan is needed to restore this unique coastal region from the effects of this tragedy, just the latest blow to befall the people and environment of this very special place. The Administration has been moving forward on this issue, and the President has asked

Secretary of the Navy Ray Mabus to develop a long-term Gulf Coast Recovery Plan that will include input by states, local communities, tribes, fishermen, businesses, conservationists, and other Gulf residents. Development of that plan is nearing completion.

The Department, whose trust lands and resources were among those most affected by the spill, and other resource managers continue to address the immediate effects of this unprecedented spill. Response efforts and the natural resource damage assessment and restoration (NRDAR) process under the Oil Pollution Act began immediately. Departmental bureaus with management responsibility in the region, along with other federal and state government agencies, support the Natural Resource Damage Trustee Council.

Interior staff has been conducting natural resource damage pre-assessments for baseline data that will help us hold BP and other parties responsible for natural resource damages and help fund restoration of these vital ecosystems. Assessments are also underway to quantify impacts to numerous species – some of which are threatened or endangered – and to identify appropriate restoration actions for affected areas along thousands of miles of shoreline and hundreds of thousands of acres of sensitive and critical wetland habitats in wildlife refuges and national parks along the Gulf Coast. The Department also established a Coordination Team, with members from the FWS, the NPS, the BLM, the Bureau of Indian Affairs, the USGS, and the Solicitor's Office that is currently working to implement and further develop a long-range plan for coordinating spill-related NRDAR activities within the Department and is assessing ways of identifying and implementing shorter-term NRDAR restoration projects as appropriate.

In mid-August I led a team of top Administration officials to meet with the trustees overseeing the natural resource damage assessments for the Gulf of Mexico to discuss the on-going response efforts to the oil spill and to reiterate the Administration's commitment to long-term Gulf Coast restoration and recovery.

While the nature and extent of injuries to natural resources, especially in the marine environment, remains uncertain and the full impact of the oil spill likely will not be known for some time, we are continuing to work hard to ensure that our natural resources are made whole and that the responsible parties pay for the cleanup.

Arctic OCS Development Issues

Finally, you asked me to discuss the challenges associated with offshore development in the Arctic. Alaska's energy resources are vital to our nation's economy and to the State's future, but we must be thoughtful and responsible in developing those resources. The Department has therefore taken a cautious, science-based approach to determining which areas on the Alaska OCS may, or may not, be appropriate for oil and gas leasing.

Previous analysis by the MMS estimated that the Beaufort Sea, off northern Alaska, holds about eight billion barrels of technically recoverable oil and the Chukchi Sea, off the State's northwestern coast, holds about 15 billion technically recoverable barrels. Safe and environmentally responsible recovery of this oil could supply domestic energy to meet a portion of demand and would provide jobs for Alaskan workers.

However, a large-volume spill offshore in Alaska would have devastating impacts on subsistence activities and resources; marine mammals and birds; ocean and coastal environments; and local communities. The arctic environment also presents logistical challenges different than those experienced in the Gulf of Mexico. These include:

- Clean-up efforts may have to be conducted in broken ice and solid ice conditions;
- A large contingent of oil spill response personnel may need to be supported in a very remote location for an extended period of time;
- Response crews may have to work in the severe weather conditions of the Arctic; and
- The U.S. Coast Guard does not currently have a port in the Arctic, potentially complicating coordination efforts should a spill occur.

Taking these challenges into consideration, we determined that it was necessary to gather additional scientific information about resources, risks, and environmental sensitivities before making decisions about potential future lease sales in frontier areas, such as the Arctic OCS. For this reason, in March we cancelled the remaining four lease sales in the 2007-2012 program that the Bush Administration had scheduled for the Chukchi and Beaufort Seas in the Arctic. President Obama also withdrew Bristol Bay, an area proposed for leasing by the previous Administration, from consideration for oil and gas development through 2017, and we cancelled a corresponding lease sale that had been scheduled in that area for 2011. Fisheries, tourism, and environmental values in Alaska's Bristol Bay make the area a national treasure and inappropriate for oil and gas drilling.

There are 487 leases in the Chukchi Sea; all issued in Sale 193 in 2008. In the Beaufort Sea there are 186 active leases; more than 90 percent of them issued in the two most recent sales – Sale 195 (in 2005) and Sale 202 (in 2007). Shell, which has leases in both the Beaufort and Chukchi Seas in the Arctic, had sought to begin drilling five exploratory wells in those areas this summer. We announced in May that Applications for Permits to Drill those five wells will not be considered for 2010, pending further consideration of the implications of the Gulf disaster.

I mentioned earlier the importance of USGS's work in leading a scientific analysis of issues associated with Arctic development. The USGS's broad range of expertise in geography, geology, hydrology, biology, and data integration is sought after and used by other federal agencies, states, local communities, and others, as well. Utilizing this expertise, and the leadership of my science advisor and USGS Director, Dr. Marcia McNutt, I directed the USGS to conduct an initial, independent evaluation of science needs in the region, summarizing what information is available, where knowledge gaps exist, and what research is needed to mitigate risks.

This evaluation will help us better understand the resilience of Arctic coastal and marine ecosystems to potential OCS resource extraction activities, along with spill risks and spill response capabilities. The review includes studies conducted by the Department of Commerce, the National Science Foundation, and other science organizations, to examine the effects of exploration activities on marine mammals; determine where knowledge gaps exist and what research is needed for an effective and reliable oil spill response in ice-covered regions; evaluate what is known about the cumulative effects of energy extraction on ecosystems and other resources of interest; and review how future changes in climate conditions may either mitigate or compound the effects of Arctic energy development.

The BOEM also has an active science program, with world-class scientists contracting for and overseeing critical scientific work. Funding from the bureau has supported studies of all aspects needed for a thorough understanding of the complex nature of the Alaskan OCS. BOEM is currently conducting numerous studies of wildlife ecology in the Arctic, including for polar bears, whales, and fish and bird populations, and will carry out dozens of technical assessments of mechanical containment and skimming equipment and techniques to clean up spilled oil in

ice-covered waters; sea ice and sea floor mapping and wind and current research as well as metrological and oceanic trends to identify the safest time windows to transport and set equipment.

Conclusion

This Administration, and the Department, will continue its relentless response to the *Deepwater Horizon* explosion and spill. It is my goal for the Department of the Interior, with the help of this Commission, to create the gold standard for worker safety and environmental protection in oil and gas production in the oceans of America. These standards will serve as a model for the world so that other nations too can learn from the tragedy of the Deepwater Horizon oil spill.

Thank you, Mr. Chairmen, and members of the Commission, for giving me the opportunity to appear before you today, and for your selfless service on this important national agenda for the United States.

National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Attachment 12

Written Statement of Mark Begich

U.S. Senator, Alaska

Draft 3

Senator Mark Begich remarks
To National Commission on BP Deepwater Horizon Oil Spill
3:30 p.m.; Sept. 27, 2010: Washington Marriott Wardman Park

Chairmen Graham and Reilly, and to all members of the commission.

Thank you for this opportunity to testify about your important mission to our nation – investigating the causes of the Deepwater Horizon spill and recommending actions to get America's oil and gas industry back on track.

A special greeting to our own Fran Ulmer, who has served our state with distinction and is now making us proud at the national level with her service on this commission. Fran: great to see you here.

Until the accident you are investigating, Alaskans lived through the worst oil spill in the nation's history.

From Easter weekend 1989 when that supertanker ran aground on a well-marked reef to the insulting Supreme Court decision two years ago, the Exxon Valdez disaster has been a nightmare for thousands of Alaskans.

Eleven-million gallons – enough oil to stretch from Cape Cod to North Carolina's Outer Banks – gushed into one of Alaska's most spectacular, sensitive and productive areas. Now 21 years later, scars to Alaska's environment and to Alaska's people remain.

Thousands of Alaskans – sadly fewer each year – were only recently partly compensated for the damage to their lives and livelihoods.

Last month, I traveled to the Gulf to personally witness the devastation and clean-up from the Deepwater Horizon spill. I thanked those working long hours under tough conditions to clean up the spill, including many Alaskans.

I also have met with some of the families of the 11 workers killed when the rig exploded.

As we assess the lessons learned from both these accidents, one truth rises above all others: We must be committed to paying the price of vigilance, because the price of complacency is too high.

In the aftermath of the Exxon Valdez, Alaskans led the way for tougher national laws and oil transportation procedures, including double-hulled tankers, tractor tugs escorts and better citizen oversight of the oil industry.

In the aftermath of Deepwater Horizon, I urge this commission to propose additional actions which federal and local governments should take to guard against another such fatal tragedy.

As the top of my list is providing the tools to guarantee that those affected by oil spills are justly and promptly compensated.

In Alaska's case, Exxon fought the legitimate claims of Alaskans for nearly two decades until the Supreme Court shamefully reduced the company's punitive liability to just 10 percent of the original court's five-billion-dollar judgment.

I have introduced legislation to do exactly this by increasing the financial liability for oil companies and requiring any company responsible for an oil spill to establish an independent escrow account to compensate those affected by a spill.

The current 75-million-dollar liability cap must be raised and I recommend no cap for deepwater wells like the Deepwater Horizon. Taxpayers shouldn't be on the hook for oil company mistakes.

My other main message to you is help put America's oil and gas industry back on track. About two-thirds of the oil and gas this nation consumes comes from foreign countries, some of whom simply don't like us and would use our energy payments to do us harm.

My own state of Alaska, long America's energy storehouse, is ready and willing to help. We have billions of barrels of oil and trillions of cubic feet of natural gas on land and off-shore poised for development.

Of course, Alaskans firmly believe these energy resources must be developed responsibly, to protect our environment and the people and wildlife which thrive on it.

I know my friend, Mayor Itta, will address this in his remarks.

Unfortunately, the Obama administration's moratorium on deepwater development in the Gulf of Mexico has had collateral damage in Alaska, shutting down planned exploration in the Chukchi and Beaufort seas this season.

I've asked my friend, Secretary Salazar - who you just heard from - and President Obama, to provide a clear timeline and process within the next 60 days, so that energy development in Alaska has a clear path forward.

To encourage responsible domestic energy development, I have introduced numerous bills designed to provide the regulatory tools and the resources. These include:

- **Better Arctic science;**
- **New Coast Guard facilities in the Far North;**
- **New requirements to NOAA and the Coast Guard to prevent and respond to oil spills;**
- **A louder voice for residents in development decisions affecting them;**
- **Revenue sharing with the states and communities affected by energy development.**

Finally, I've worked with my colleagues to forge a compromise that would protect taxpayers while keeping responsible American companies in the OCS by allowing those operators to pool their liability and collectively pay for damages from oil spills.

With that, Mr. Chairman, I do not envy the task before you. But your mission – helping prevent another Exxon Valdez or Deepwater Horizon and reigniting our domestic energy industry - are vital for our nation.

I pledge to do my part in the Senate to implement your recommendations.

National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Attachment 13

Written Statement and Presentation of Pete Slaiby

Vice President for Exploration and Production, Shell Alaska

September 27, 2010

Arctic Panel before the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling

Shell in Alaska

Good afternoon, my name is Pete Slaiby and I am the Vice President of Shell's Alaska operations. I want to thank the Commission for convening this Arctic Panel and allowing us to share Shell's program for offshore exploration in Alaska's Outer Continental Shelf (OCS).

Shell has a long history in Alaska that dates back nearly 60 years. Shell was one of the original explorers in Alaska, including on the North Slope where Prudhoe Bay was eventually discovered. Even in the early years Shell was known as a company that had expertise in the offshore. Ultimately, that would become our legacy in Alaska. Shell pioneered Alaska's Cook Inlet in the 1960's despite harsh forces of nature some considered too rugged to overcome. The platforms Shell installed in 1964 were sold in 1998 but they are still producing today. Shell drilled the majority of the wells in the Beaufort Sea in the 1980s and 1990s and drilled 4 of the 5 exploration wells drilled in the Chukchi Sea.

Shell re-entered Alaska in 2005 after purchasing OCS leases in the Beaufort Sea, and in 2007 Shell purchased additional acreage in the Beaufort Sea. Today, Shell owns or holds an equity position in 137 Beaufort Sea lease blocks. In February 2008, Shell became the major leaseholder in the Chukchi Sea following Lease Sale 193 in which Shell bid a record $2.1 billion for 275 lease blocks. Since re-entering Alaska, Shell has spent over $3.5 billion attempting to drill again in the Alaska OCS.

World Class Potential in the Alaska offshore

Conservative estimates from the Bureau of Ocean Energy Management, Regulation and Environment (BOEMRE, formerly the Minerals Management Service) place roughly 25 billion barrels of oil and over 120 TCF of gas in the Alaska OCS. Against the backdrop of the roughly 16 billion barrels of oil that have been produced over the last 30 years on Alaska's North Slope, that kind of materiality is impressive not just for Shell and Alaska, but the entire Nation as we consider the associated jobs and energy security that could come as a result of offshore domestic production.

Clearly, the Alaska offshore is important to the United States. The US currently imports over 60 percent of its oil – that's 12 million barrels a day and in monetary terms it equals roughly $400-600 billion a year - the largest cash transfer in the history of the modern world.

Benefits to Alaska and the Nation

Shell believes the OCS could prove to be the next chapter in Alaska's oil and gas history and an economic multiplier for decades to come. A recent economic study estimates a build-up of offshore activity could create an annual average of 35-thousand direct and indirect jobs a year for up to 50 years. That equates to $72 billion in payroll. If the Alaska OCS proves material, it could

go a long way in extending the life of the diminishing throughput of the Trans-Alaska Pipeline (TAPS) and underpin the capital and capacity needed to make an Alaska gas pipeline a reality. The entire Arctic will play a critical role in the world's energy development as noted in a 2008 United States Geological Survey study that estimated a tally of, "mean estimates for each province indicates that 90 billion barrels of oil, 1,669 trillion cubic feet of natural gas, and 44 billion barrels of natural gas liquids may remain to be found in the Arctic, of which approximately 84 percent is expected to occur in offshore areas." (USGS 2008 -Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle). While global economies continue to depend on hydrocarbons to power future opportunities, the Arctic's prominence is clear. Alaska's OCS can play a major role in America's energy future.

Finding Common Ground

Respect for the people, the sea, the animals and the environment is integral to the way we do business. We are committed to operating safely and responsibly and will continue to meet or exceed regulatory requirements. Since 1973, federal agencies and industry have performed more than 5000 environmental studies to better understand the Alaskan OCS and coastal environment at a cost of over a half-billion dollars. While more science would be needed to move into the development and production stages, the baseline science already completed is more than adequate to move forward with exploratory drilling.

A great deal of the science Shell is pursing today is a result of an ongoing dialogue with North Slope stakeholders who have a vested interest in understanding more about the Arctic ecosystem. Over the last four years, Shell has engaged in nearly 400 meetings with stakeholders to better understand their concerns and to hear their suggestions on how they believe best to operate in the Arctic. This has been a discussion where listening on the part of Shell has been the most important element in the dialogue. Not only has Shell committed to cease exploration drilling during traditional whale hunts, Shell also cut its initial drilling program in half after concerns were raised that the company was moving, "too fast, too much and too soon." With open water season limited to approximately 3.5 months each year, execution of permits and coordination of vessel mobilization are paramount to a successful exploration endeavor.

Oil Spill Response

Oil spill prevention and response is of the highest priority for Shell. Since we originally began planning for exploration drilling in 2007 we have taken unprecedented steps to ensure we can operate safely and responsibly in the Arctic. We recognized even then that any low probability and high impact events warrant this kind of consideration. In addition, our entire industry has committed itself to learning lessons from BP's Deepwater Horizon tragedy - including here in Alaska where well control and oil spill containment remain paramount. Our ethos of drilling in the Arctic is based on preventing any incident that could lead to a pollution event. We remain confident in our multi-layer prevention measures and world-class, three-tier, oil spill response capability. These robust plans have always centered on a massive response at the source to limit the extent of any spill. In Alaska, that includes advancing the engineering of a containment system designed to improve our ability to capture hydrocarbons at the source in the extremely unlikely event of a blowout.

Regulatory Challenges

There are several regulatory agencies making sure the offshore is developed in a responsible way with each of these agencies having a say in our plans of exploration. If they don't approve it, we don't drill. It's critical that these agencies have the required resources to process permits in a timely manner, both Shell's and others. At this time, they do not have adequate personnel efficiently review and issue these critical permits.

Since our re-entry in Alaska, Shell has invested over 3.5 billion dollars and five years to design and build the exploration drilling program and to secure federal and state permits. Our Alaska program has had the most thorough regulatory review of any offshore project in history. Yet, Shell has not been permitted to drill a single exploration well due to delays in permitting and legal challenges of the federal government-issued permits. There is effectively a "de facto" drilling moratorium in the Alaska OCS that must be resolved.

We also ask that the Commission address the suspension on exploration in the Alaska OCS where water depth ranges from 100 to 200 feet. The safety and technological risks found to apply to deepwater drilling simply do not apply to Alaska. We also request that Secretary Salazar (1) re-issue the 5-Year Plan for 2007-2012 as directed by the DC Circuit Court to remove the cloud of uncertainty for the Alaska OCS and (2) promptly address the remand from the Alaska Federal District Court in the challenge to Chukchi Lease Sale 193.

Alaska's OCS is not expressly covered by the President's six-month moratorium on deepwater drilling but Shell's planned 2010 exploration drilling on Alaska's OCS was nonetheless cancelled by the President. This decision cost $130 in Alaska. Hundreds of jobs were either lost or not created as a result, many in the North Slope Borough and North West Arctic Borough. The delay of drilling causes value destruction and jeopardizes the project and the portfolio.

Next Steps

To date, our Alaska project represents over a $3.5 billion investment. If allowed to go forward, Shell will invest billions more. With only limited time remaining on some of our ten-year leases, we have serious concerns that these will expire before commerciality is proven unless the current "de facto" moratorium and regulatory uncertainty is resolved.

Of equal concern to Shell is the erosion of investment value in both OCS areas as our lease terms are whittled away. The federal government has failed to direct a suspension of operations (SOO) in Alaska as a result of the President's suspension that would stop the clock on our 10-year lease terms.

If Shell is not able or decides not to pursue the largest oil and gas basin remaining off the coast of the US, after having made an investment of billions, we expect such a decision will compound and affirm a number of concerns about future domestic energy development and impacts to:

- the future of OCS oil and gas development in the US;
- loss of jobs and impact on the economy;
- future of the TAPS;
- lack of clarity on US oil and gas policy; and
- the failure of the US permitting process.

Since the President's announcement on May 27 that no exploration drilling would occur in 2010 in Alaska, we have received no guidance on the regulatory path forward for Alaska's OCS. This highlights Shell's concern that the regulatory framework will create a "de facto" moratorium going forward – with critical negative impacts to much needed OCS production, the oil and gas industry, its suppliers, and regional economies that will have far greater impact than the 6-month suspension.

We are hopeful that we will be able to drill in 2011 but decisions from the Administration will need to be made in the coming months to make this commitment possible. Shell is and has been ready to explore Alaska's OCS and make a new energy heartland for America, while creating the jobs and energy security this new prospect would surely bring.

Shell Beaufort and Chukchi Sea Program: Arctic Panel Discussion

Pete Slaiby

Vice President, Shell Alaska

September 27, 2010

2011 Proposed Operations

- Drill two offshore wells during brief open water drilling season (July-October)
- Shallow hazards surveying (future drill site clearance)
- Ecological science data gathering (offshore and onshore)
- Offshore ice gouge surveying & geotech soil sampling to support needed infrastructure technology
- Marine mammal monitoring supporting operations

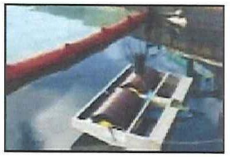
The Noble Discoverer anchored in Dutch Harbor, Alaska in 2007

Shell Three-Tier Oil Spill Response

Offshore

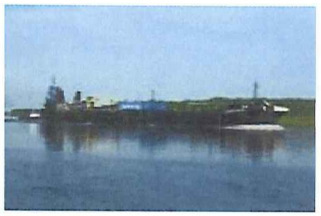
Vessels
- OSRV (Nanuq)
- Arctic Tanker
- Work boats
- Vessel of Opportunity

Skimmers & Pumps



Booms

Nearshore



Vessels
- Barge
- Work boats
- Skimming vessel
- Mini barges

Skimmers & Pumps

Booms

Misc Equipment
- Decon connex
- Workshop/Tool connex

Onshore

Vessels
- landing craft and utility vessels

Booms

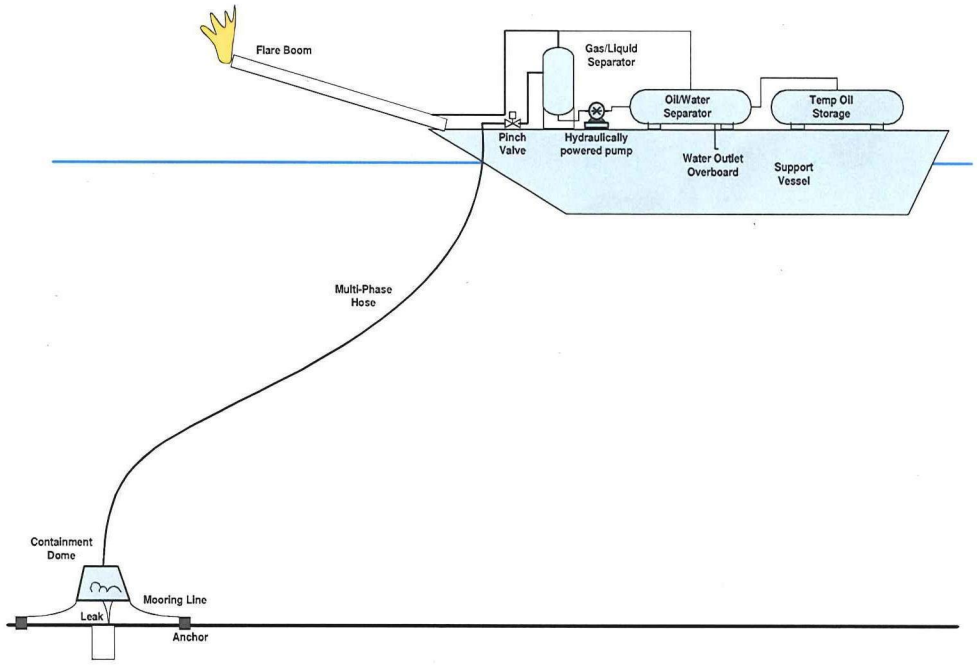
Misc Equipment
- Storage and tools

Oil Spill Contingency Plan Support

- State and Federal Standards reviewed and approved
- World class Contingency Plan reviewed by BOEM, EPA, US Coast Guard, FWS, NMFS, North Slope Borough and upheld in court(s)
- Worst Case Discharge Scenario for 2011 significantly lower than required Response Planning Standard
- Shell response capabilities exceed required Response Planning Standard
- SINTEF (oil in ice research) study and trials

Proposed Sub-sea Containment System Development

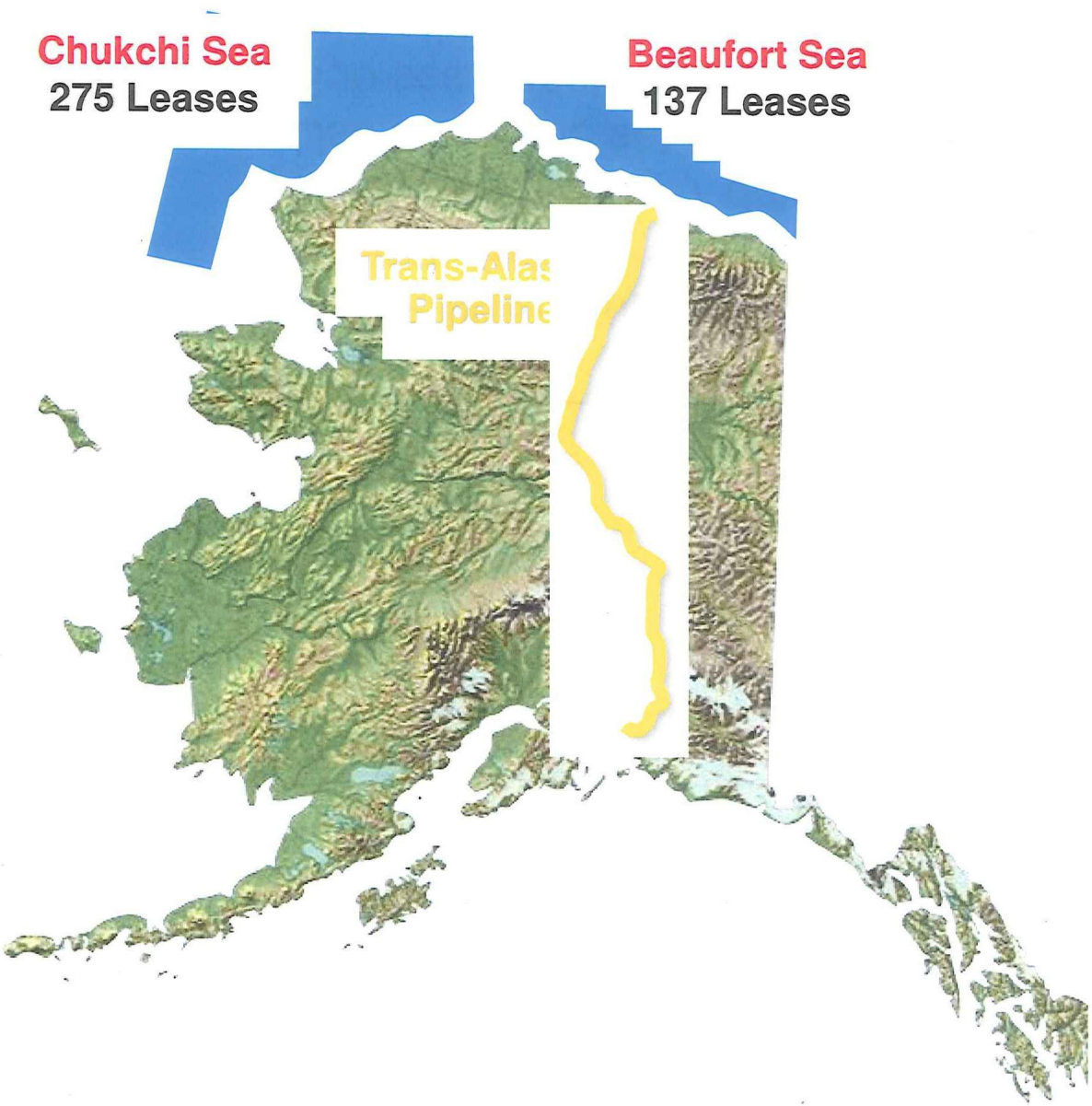
- Submitted new commitments to BOEM May (5th) 2010
- System to capture and recover hydrocarbons from well control incident
- Leveraging GOM DW Industry Solution
- Will be ready for 2011 Season
- Available for on site deployment



- **Post BP Macondo Additions**
  - Second rig relief well capability
  - BOP testing every 7 days instead
  - Use of second set of shear rams
  - Sub-sea remote operating panel relocation
  - ROV/Diver options on/near site

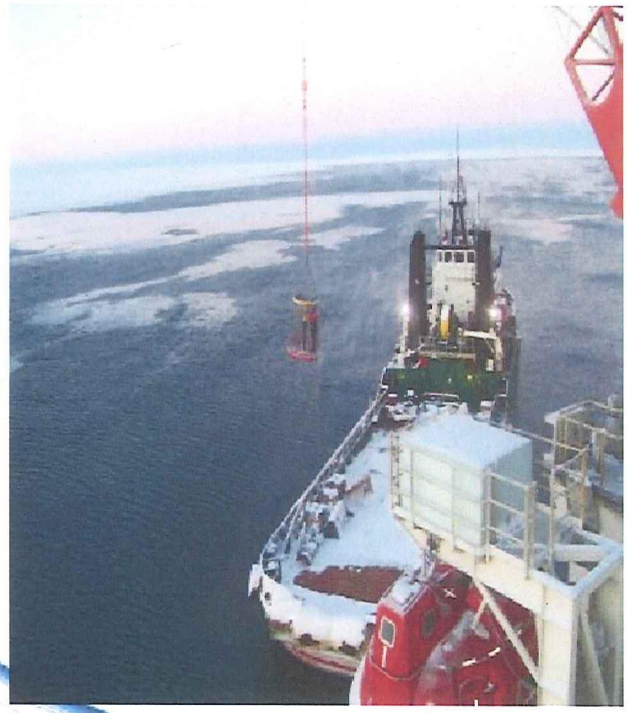
Shell – Size of the Prize

- Conservative estimates: 25 billion barrels of oil and 120 TCF of gas in Alaska Arctic (MMS mean estimate)
- Most material OCS hydrocarbon outside of Deepwater GOM OCS
- Exceeds east/west coast OCS resources combined
- National economic benefits
- Hundreds of millions with Alaskans /offshore service providers
- 137 Beaufort leases - $84M; 275 Chukchi leases - $2.1 Billion; Total investment to date: $3.5 billion



Baseline Science Supports Exploration in Alaska

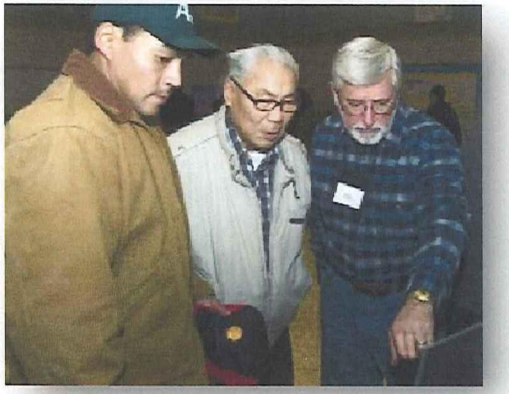
- **$500 Million and growing (Shell $50M)**
  - 5000 independent scientific studies since1973
  - 5 years of marine mammal monitoring
  - Tagging studies – walrus and seals
  - First air quality station in OCS – Beaufort
  - Ongoing offshore, nearshore, and onshore ecological characterization studies
  - Traditional knowledge studies
  - Health impact assessments
- **Up to $5 million annual science initiative with North Slope Borough**



Stakeholder Solutions

- Finding common ground with the people of the North Slope
- Over 400 meetings with stakeholders since 2006
- Incorporating feedback: air permit, discharge, drilling blackouts during whaling in Beaufort Sea
- Revised program reflects our social performance goal:

"Minimize impacts to people and the environment where we work"



National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Attachment 14

Written Statement of Edward Itta

Mayor of North Slope Borough, Alaska

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Mayor's Testimony
National Oil Spill Commission
— by Videoconference
Monday, September 27, 2010
Washington, D.C. - 3:00 p.m.

Good afternoon, and thank you for this opportunity to give a local perspective on oil spill response and prevention in what may be the next large offshore oil province in America — the waters off the northern coast of Alaska.

My name is Edward Saggan Itta. I am a hunter and a whaler. I am also the mayor of the North Slope Borough, which is the regional government covering the entire northern coastal area of the state.

Most people know very little about America's Arctic, and some are surprised to learn that it is not just an empty expanse of frozen tundra and icy waters. There are people here, the Inupiat Eskimos who have inhabited this area for thousands of years. Our health and our survival have always depended on what the land and the sea give to us in the form of bowhead whales, caribou and other large coastal and marine mammals. In this respect, we do not differentiate ourselves from the physical world we live in. The fate of the ocean is our fate.

In recent years, people have become increasingly interested in the Arctic, because it is a heat sink for global climate change. We are seeing the effects of this warming in some dramatic ways — particularly in the ice pack, which is melting at an alarming rate. To the extent that this affects our marine mammals or their habitat, it affects us.

The retreat of the sea ice is also opening vast new and promising areas to oil exploration. Some groups have been quick to point out certain differences between the Gulf of Mexico and the Arctic OCS, implying that the Arctic is less hazardous. Conditions in the Arctic ***are*** different, but in many ways they are far more daunting. Some lessons of the Gulf disaster will apply and some won't, but the Arctic possesses a distinct set of challenges that can only be addressed by Arctic-specific rules and precautions.

We do not have the deep water challenge of the Gulf, but for most of the year we experience conditions of extreme cold, as well as several months of round-the-clock darkness. During this time, the ocean freezes and in the shoulder seasons the ice breaks up and moves around in various forms. So extreme cold and extended darkness are two of the unique challenges up here that must be considered separately from the challenges in any other U.S. waters.

We are also vastly removed from sources of assistance that are taken for granted in other U.S. waters. There is no port up here, large or small. The nearest Coast Guard station is more than 800 hundred miles away. When I saw the pictures of hundreds of vessels joining the Gulf spill response, I was impressed. But I knew that this scale of disaster response could never happen in the Arctic. We lack the basic infrastructure to support it, and we are not even connected by road to the rest of Alaska. If the plan is to push forward with Arctic oil and gas activity, you should know that responding to a small spill will be hard enough; responding to a massive spill is impossible.

So our concerns are a little different, and they beg for a different kind of preparation. For example, federal laws and regulations governing offshore operations are geared toward Lower 48 waters. Up here, everything revolves around the constraints of the season when the ice recedes – the "open water season." The current permitting cycle tends to compress comment and review periods in order to meet deadlines and still deploy drilling assets during the limited open water season.

Perhaps a more dynamic permitting system under OCSLA would help. In any event, we need Arctic-specific provisions in the law to address issues that are unique to our conditions.

A few years ago, in a moment of frustration I uttered the words, "too much, too soon, too fast." That's how it feels when we have five-year schedules with lease sales stacked on top of other lease sales. Why not spread out the sales within the schedule? The Arctic frontier needs a more gradual lease sale process. The Interior Department is currently conducting a data gap analysis to identify basic characteristics of the region that we don't yet know. A more deliberate lease schedule would allow us all to incorporate new knowledge into technology and mitigation. We also need to slow down and measure the impacts as we move out into the ocean. The current plan is a race against the clock when it's not necessary or productive.

Successful oil production in the Arctic OCS must include a federal requirement for pipelines to shore. The last thing we need is tanker traffic through Arctic ice, where a spill would be a total disaster.

Pipelines to shore under the sea floor are less likely to spill. This is one preventive measure that warrants federal action.

The Arctic OCS needs a leasing, exploration and production regime that is tailored to the extreme conditions in which we live. I urge you to keep this in mind as you recommend revisions to the legal and regulatory framework for the nation's OCS program.

Thank you very much.

National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

Attachment 15

Written Statement of Dr. Dennis Takahasi-Kelso

Executive Vice President, Ocean Conservancy

National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling

Written Testimony of Dennis Takahashi Kelso, Ph.D.
Ocean Conservancy
September 22, 2010

Co-chairman Graham, Co-chairman Reilly, and Members of the Commission, thank you for the invitation to participate in today's hearing. My name is Dennis Takahashi Kelso, and I am Executive Vice President of Ocean Conservancy, a national marine conservation organization that has promoted healthy and diverse ocean ecosystems since its founding in 1972. Ocean Conservancy is supported by more than 500,000 members and volunteers, and our headquarters is in Washington, DC. I am based in Santa Cruz, California.

I have worked on natural resource conservation issues for more than 30 years, much of that time in Alaska. Most relevant to the Commission's work and today's hearing, I was Alaska Commissioner of Environmental Conservation when the *Exxon Valdez* ran aground in Prince William Sound; I was responsible for ensuring that the state's clean-up standards were met. For two years, I worked on the oil spill response in the field or on policy reforms to strengthen oil spill prevention and response capability. As commissioner, I was also responsible for enforcement of state environmental pollution standards for oil and gas activities in Alaska's oil and gas fields, including the North Slope. Prior to becoming Commissioner of Environmental Conservation, I served for seven years as Deputy Commissioner of Fish And Game and as Director of the Division of Subsistence Hunting and Fishing—roles in which I worked extensively with rural communities in Alaska's Arctic.

Since the first weeks of the BP disaster, I have worked with Ocean Conservancy's restoration and recovery team to provide technical assistance to community representatives, state officials, non-profit organizations, fishing groups, and others affected by the spill. The ecosystems of Prince William Sound and the Gulf of Mexico are very different, as are the characteristics of the *Exxon Valdez* and BP spills. Nevertheless, observations from previous spills are often useful, and they can help produce more informed decisions about prevention and response preparedness.

My testimony addresses the challenges of spill response in the Arctic, the need to prepare for worst-case spills, and the limits of available science in the Arctic.[1]

The BP disaster in the Gulf of Mexico demonstrated how difficult it is to recover spilled oil from the marine environment, even where infrastructure is extensive and the environment relatively mild. By contrast, when an oil spill occurs in the waters of the Arctic Outer Continental Shelf (OCS), spill recovery efforts will likely confront severe cold, seasonal sea ice, darkness, lack of infrastructure, and extreme distance from major population centers. The extreme conditions and special challenges of the Arctic make it unlikely that the response to a major discharge of oil would remove more than a small fraction of the spill, and impacts for the Arctic marine ecosystem and the people who rely upon it would be very serious.

[1] I would like to thank the Pew Environment Group's Arctic Program for working closely with Ocean Conservancy and for providing much of the data and information included in my testimony.

The BP *Deepwater Horizon* disaster also highlighted the dangers of failing to engage in worst-case oil spill planning and of assuming that a period of relative safety is predictive of future risk. When making decisions that involve potential events—in this case, major oil spills— in which the resulting hazard would be very severe, it is critical to take seriously the potential for disaster. This remains the case even if the probability is low that the events will occur, because, as we have seen with both the *Exxon Valdez* and the BP *Deepwater Horizon* disaster, low probability does not mean no probability. It is therefore vital to be prepared to address the results of oil exposure or effects if a major spill occurs. In the Arctic, the government has not engaged in worst-case planning when preparing its environmental analyses pursuant to the National Environmental Policy Act (NEPA), and operators have downplayed the potential risks in their spill contingency plans. More rigorous preparation and planning are essential.

Finally, problems associated with oil spill recovery in the Arctic are compounded by the lack of up-to-date scientific data and analysis about the Arctic environment, including fundamental gaps in our understanding of how this productive and vulnerable ecosystem functions. We need additional information about the Arctic marine environment so that we can make informed decisions about whether to allow oil and gas activities to go forward in the Arctic OCS, and if so, how we can best prepare for oil spills in this challenging environment.

The remainder of my testimony explores in more detail the following three issues:

(1) major challenges the Arctic poses for oil spill prevention and response on the OCS;
(2) lessons from both the *Exxon Valdez* and the BP *Deepwater Horizon* spills for spill prevention and response preparedness; and
(3) limitations of the available science on Arctic marine ecosystems and questions that must be answered before the federal government can make responsible choices about proposed oil and gas drilling.

I. Challenges of Spill Prevention and Response in the Arctic OCS.

The Arctic OCS bristles with an array of demanding physical conditions. This environment is subject to sea ice, seasonal darkness, high winds, extended periods of heavy fog, sub-zero temperatures, and week-long storms that approach hurricane strength. These characteristics not only heighten the risk of an oil spill, but limit the effectiveness of spill cleanup technologies in Arctic waters.

A. Importance of the Arctic Ocean to Local Communities.

The Arctic has sustained human communities for thousands of years, and many Arctic residents have depended, and continue to depend, on intact marine ecosystems (NMFS 2009). Along the coasts of the Chukchi and Beaufort Seas, certain villages hunt bowhead whales as part of their seasonal round of subsistence activities. These communities view the whale hunt as a centerpiece of their culture; they prepare for the hunt year-round, and share and celebrate successful hunts. Arctic peoples also depend on other ocean resources, such as fish, walrus, seals, and seabirds, to support their subsistence way of life (Wolfe and Magdanz 1993). Communities along the Arctic coast depend upon mixed subsistence and cash-based economies;

for many of these communities, wild foods from the sea are essential to community viability. For many residents of the Arctic, there is a direct connection between the continued health of the marine environment and the health of their food supply and culture (NRC 2003). As a consequence, decisions about the risks and hazards associated with oil and gas development in the Chukchi and Beaufort Seas are profoundly important to residents of Arctic coastal villages.

B. The Physical Environment of the Arctic OCS.

Unlike other areas of the OCS, sea ice is present in the Arctic for many months of the year, typically from October to June. Open water season usually lasts three to four months, and even then, scattered sea ice may be present in the water. As ice forms in the fall, it may form slush-like "frazil" or "grease," which gradually thickens. Pack ice generally forms by late October. It can be multi-year ice up to 10 meters thick or relatively thin, first-year ice. Sea ice is a dynamic environment. Its movement can form ridges and rubble on the ice surface, and it can scrape and scour the seafloor. In the spring and fall, ice conditions may be highly variable depending on location and are subject to rapid change.

In addition to the problems posed by sea ice, the Arctic's environmental and weather conditions are often severe. The Arctic is subject to sub-freezing temperatures for much of the year, including extreme cold in the winter. Although the Arctic summer features daylight that is constant or near-constant, daylight dwindles rapidly in the fall; and the winter months are characterized by extended periods of darkness. During the winter, visibility can be limited by a combination of short or nonexistent daylight, low sun angle, very light snowfall, occasional wind-blown snow, and low hanging fog over leads (areas of open water in fields of sea ice) and other open water areas. Cold air over open water in cold winter conditions becomes saturated almost immediately because of its low water-vapor capacity. Even in the warmer months, low-stratus clouds and advection fog are common; Point Barrow averages 12 days of fog per month from May through September. In addition, Arctic waters can generate powerful storm surges in nearshore regions, especially north of Point Lay. Storms can generate surges up to 10 feet during the ice-free period from July to October.

C. Challenges to Oil Spill Response in the Arctic.

The extreme environmental conditions in the Arctic limit the effectiveness of spill response technologies. Although operators have adapted certain types of response equipment for use in cold or ice-infested waters, there have been no significant breakthroughs in oil spill response technologies that greatly enhance the capacity to recover an oil spill when sea ice is present. The National Research Council's (NRC) assessment is still apt: "No current cleanup methods remove more than a small fraction of oil spilled in marine waters, especially in the presence of broken ice." (NRC 2003).

Arctic environmental conditions raise significant questions about mechanical recovery of spilled oil, *in-situ* burning, dispersant use, tracking and locating spilled oil, and spilled oil's effects on the environment. The Arctic's remote location and lack of infrastructure also present obstacles to operators' ability to respond effectively to a large oil spill. In addition, the lack of rigorous,

transparent field trials in the Arctic means that spill response technologies are largely untested and unproven in real-world conditions.

(1) Limitations of mechanical recovery of oil in the Arctic OCS.

Existing mechanical oil spill response technologies do not work well in the presence of sea ice, even at relatively low ice concentrations. Conventional open water mechanical recovery technologies operate at significantly lowered efficiencies when sea ice is present (Abdelnour and Comfort 2001). The presence of sea ice interferes with the ability of response equipment to contain and recover oil. Oil tends to disperse and mix into the ice, making it necessary to separate the oil from the ice in order to clean up the spill.

Sea ice in its various forms affects the functionality of booms and skimmers, the primary components of mechanical recovery. Ice conditions ranging from 30 to 70 percent coverage may present the biggest challenge to mechanical response, because conventional booms are likely to be ineffective; but ice conditions are not sufficient to afford natural containment of spills (Evers *et al.* 2006, Glover and Dickens 1999).

Sea ice may reduce the effectiveness of containment booms by interfering with the boom position, allowing oil to entrain or travel under the boom, or causing the boom to tear or separate. Most skimmers operate at a significantly reduced efficiency, or not at all, when sea ice pieces are present within the oil slick. Some skimmers may be effective in sea ice with large ice leads, but they shut down quickly as ice forms in the leads. Sea ice may also reduce skimmers' efficiency in recovering oil by lowering the rate at which skimmers come into contact with pooled oil or by increasing the time needed to position the skimmer for optimum recovery (Abdelnour and Comfort 2001, Fingas 2004). Marine operations in sea ice are vulnerable to rapid changes in weather and ice conditions, and significant down time often occurs due to the movement of ice in response to wind conditions and sea state (Dickens and Buist 1999). Sea ice also affects vessel operations and may limit or preclude the ability to operate certain classes of vessels.

The presence of sea ice significantly reduces oil recovery efficiency, even in as little as 10 percent ice coverage. During a series of mechanical recovery equipment trials in sea ice on the North Slope in 2000, a barge-based skimming system was demonstrated to be somewhat effective in ice conditions up to 30 percent, but only if ice management systems—boats moving ahead of the recovery system and moving ice out of the recovery vessel's path—were deployed to reduce the amount of ice present at the skimmer to 10 percent or lower. Sea ice caused considerable strain on containment boom during the North Slope trials, and boom failure was a common problem (Robertson and DeCola 2001). The North Slope trials demonstrated that the maximum operating limits for the barge-based recovery system in sea ice conditions was zero to one percent in fall ice, 10 percent in spring ice without ice management, and 30 percent in spring ice conditions with extensive ice management (NRC 2003).

In addition to limits imposed by sea ice, mechanical oil recovery equipment is also hampered by environmental conditions such as visibility, darkness, sea state, and temperature. Cold weather conditions can complicate mechanical recovery, causing efficiency losses for both personnel and

equipment. In addition, oil spilled at the end of the open water season might become entrapped in newly forming sea ice and not be available for clean up and removal for many months.

(2) Limitations of *in-situ* burning in the Arctic OCS.

Responders used *in-situ* burning when responding to the BP *Deepwater Horizon* spill in the Gulf of Mexico, and *in-situ* burning has been proposed for use in the Arctic, as well. However, *in-situ* burning may not work in certain sea ice conditions. Ice conditions in the 30 to 70 percent range are the "most difficult from an *in-situ* burning perspective" (Evers 2006). At these ice concentrations, natural containment of the oil by ice is less likely, and it is usually impossible to deploy containment boom. At higher ice concentrations, where spilled oil may be contained by ice, other logistical challenges—such as difficulties in tracking the slicks, igniting them, and recovering the residue—may pose obstacles to the use of *in-situ* burning. Even if it is successful, *in-situ* burning creates toxic smoke and residues, the environmental impacts of which are unknown. Burn residues may be difficult to recover, could be ingested by fish, birds, and marine mammals, or may foul gills, feathers, fur, or baleen.

Burning oil confined by open leads in the ice—also called polynyas—may present particular problems. Polynyas are particularly important to Arctic wildlife including various marine mammals and migratory birds. They are a major source of nutrients in the Arctic and are considered to be of vital importance to the entire marine food web, including marine mammals (Stirling 1997). To the extent that spill responders conduct *in-situ* burns by concentrating oil in polynyas, those burns could have detrimental effects on the animals that use the polynyas, or they could have more widespread effects.

(3) Limitations of dispersant use in the Arctic OCS.

Considerable debate surrounds the efficacy of chemical dispersants in Arctic marine waters, and there are even more unknowns about their potential toxicity to Arctic marine life. The use of dispersants in Arctic waters presents a special set of considerations and concerns because low water temperatures, variations in salinity, and the presence of sea ice can all impact dispersant effectiveness. Researchers at the National Marine Fisheries Service's Auke Bay Laboratory in Juneau, Alaska concluded that "at the combinations of temperature and salinity most common in the estuaries and marine waters of Alaska, effectiveness of dispersants was less than 10 percent." They caution, however, that these results are based on laboratory studies performed at low mixing energy, which is the energy required to mix dispersants with surface oil so that they may work as intended (Moles *et al.* 2002).

A review of dispersant use in oil spill response conducted by the National Research Council recommends additional studies to understand the physical and chemical interactions of oil, dispersants, and ice before dispersants can be considered a mature technology for use in sea ice (Ocean Studies Board, NRC 2005). Similarly, a report on oil spill response technology in ice-covered waters recommends additional study into the potential use of dispersants in sea ice, including the potential use of icebreaking vessels to add mixing energy (OSRI and ARC 2004).

Like other oil recovery techniques, the use of dispersants is limited by environmental conditions and weather. Aerial application of dispersants requires low winds and good visibility; dispersants cannot be applied during periods of darkness, which sharply limits their potential effectiveness during much of the Arctic year.

There are many questions about the toxicity of chemical dispersants, and the effect of dispersants in marine ecosystems. Chemical dispersion of oil has been shown to enhance oil uptake and bioaccumulation (Wolfe *et al.* 1997). Chemically dispersed oil has been demonstrated to be more toxic to some marine organisms than untreated oil (Fuller and Bonner 2001, Singer *et al.* 1998, Gulec and Holdway 1997). Researchers have also found that the undispersed oil residue that is left behind following a dispersant application may be more toxic than untreated oil (Lindstrom *et al.* 1999). Direct exposure to misapplied dispersant can harm birds and mammals (NRC 1989). No studies to date consider the toxicity of dispersed oil to marine mammals, either directly or through uptake of contaminated food. Similarly, we do not understand the extent to which the use of dispersants applied at the surface or subsurface may affect the benthic environment, which is critical to many Arctic species including gray whales, walruses, diving ducks, and bearded seals. Although scientific studies have not yet examined the impact of dispersant use in the Arctic, the information gaps are worrisome, because the Arctic may be slower to recover from exposure to toxic chemicals than other OCS areas.

(4) Limitations of tracking and locating spilled oil in Arctic OCS.

Oil trapped under ice could move hundreds of miles over the course of a few months. Computer models cannot predict the movement of oil in sea ice, so accurate oil spill trajectories cannot be produced.

Through much of the winter, the Arctic is dark, and it is more difficult for planes and boats to operate. As a result, it is nearly impossible to track spilled oil during much of the year with currently available techniques. Even in the summer, visibility is often limited by fog. Ice can prevent vessels from entering the spill area, making it difficult to encounter and track oil. One potential new tracking technology, the use of tethered balloons to carry monitoring equipment aloft, suffered a set-back when the balloon failed after just one demonstration (OSRI 2009).

Remote sensing techniques are being improved and refined to detect oil under and among sea ice, but these techniques are not yet mature. Because the Arctic experiences few cloud-free days, high-resolution all-weather imagery is necessary for consistent operational support. The use of ground penetrating radar, laser fluorosensors, and other technologies is experimental when applied to tracking oil under or mixed in the ice.

(5) Ecological issues related to spills and spill response in the Arctic OCS.

In addition to posing challenges to the recovery and tracking of spilled oil, Arctic environmental conditions create unique ecological concerns, as well. Oil persists longer in Arctic conditions because it evaporates more slowly or may be trapped in or under ice, and is thus less accessible to bacterial degradation. Studies conducted after the *Exxon Valdez* oil spill, which occurred in a less extreme, sub-Arctic environment, demonstrated the persistence of substantially non-

degraded oil in heavily oiled, low-energy areas of Prince William Sound; subsurface oil was documented 20 years after the spill (Michel and Esler 2010, EVOSTC 2009).

Oil spill impacts in the Arctic Ocean will be influenced by the location and timing of the spill, as well as by ice and weather conditions. Even a moderate-sized spill in an area where sensitive or threatened species are concentrated could have devastating effects. As noted above, polynyas may be particularly important in Arctic marine ecosystems; concentrating oil in these open-water areas so that it can be burned or removed with skimmers may have unforeseen food web impacts, and may increase the likelihood that marine mammals will contact the oil as they come to the surface to breathe. Migratory birds resting or feeding in leads or polynyas would be highly vulnerable to any contact with oil on their plumage. In the Arctic, population recovery after an incident may be slowed because many Arctic species have relatively long life spans and slower generational turnover (AMAP 1998).

(6) Field trials have not demonstrated success in real-world conditions.

There have been a limited number of spill-response field trials in Arctic conditions. During the 2000 spring and fall ice seasons in the Beaufort Sea, responders conducted a series of field exercises in sea ice to assess the limits of oil spill recovery systems when sea ice was present. The results showed that key components of the oil spill response systems failed at sea ice concentrations as low as 10 percent. If any part of the recovery system—personnel, vessels, boom, skimmers—fails, the entire recovery system is limited. Such limitations can reduce effectiveness or preclude operations altogether.

More recently, there has been good work done in research and development of oil spill response technologies for use in Arctic conditions under the Joint Industry Program (JIP). The usefulness of this work is limited, however, because the JIP process was not transparent; there was no public participation in or review of the interim or final findings, and there was no independent peer review of the technical reports. Moreover, the JIP field trials were necessarily conducted under tightly controlled conditions. Responders knew exactly when and where the oil would be spilled, response equipment was pre-positioned, and the response experiments were planned in advance. This would not be the case in a real spill event, where implementation of response technologies would likely encounter logistical hurdles, and where adverse environmental conditions could limit the effectiveness of or preclude response efforts.

Additional field trials are needed to establish realistic operating limits for existing oil spill response systems in the Arctic Ocean and to correlate these operating limits to typical on-scene conditions. Through such field trials, we can gain a more complete understanding of the frequency with which Arctic environmental conditions might be too severe to allow for effective oil spill cleanup.

(7) Challenges associated with lack of infrastructure in the Arctic OCS.

In addition to environmental factors, spill response in the Arctic will be complicated by the region's remote location and limited infrastructure. There are no major ports on the U.S. Arctic coastline. The nearest major port (Unalaska, in the Aleutian Islands) is 1,300 nautical miles from

Point Barrow. Only limited docking facilities exist along the U.S. Arctic coast, and shallow water depths along the shoreline make vessel access difficult. There are eight main communities in the North Slope region: Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, Point Lay, and Wainwright. They are not connected to each other, or to the rest of the state, by road. Likewise, the few major airstrips that could handle cargo aircraft are not connected to highways or docks. No Coast Guard vessels are based in the Beaufort or Chukchi seas, and the nearest U.S. Coast Guard base is 1,000 miles away. To the extent that a spill event requires responders to bring in personnel or equipment that is not immediately available on-scene, the lack of infrastructure in the Arctic will give rise to logistical difficulties that could slow or stop effective response efforts.

II. The Need for Worst-Case Scenarios for Spill Prevention and Response Preparedness.

Both the *Exxon Valdez* and the BP *Deepwater Horizon* disasters demonstrate the importance of preparing for an extreme spill event and implementing response plans if a major spill occurs. More fundamentally, however, both accidents underscore how crucial it is to take seriously the hazard that would result if the risk—even when any single event has a low probability of occurring—matures into an actual spill. In the case of the *Exxon Valdez*, some of the safeguards for vessel transit from the Valdez Marine Terminal had been systematically or inadvertently reduced or eliminated, thereby increasing the vulnerability of the oil transport system to an accident. On the response capacity side of the ledger, Exxon had prepared, and the State of Alaska had approved, an oil spill contingency plan for a tanker discharge of more than 100,000 barrels. When the tanker ran aground and the extreme spill occurred, however, the company's designated responder failed to implement the approved contingency plan. As a result, much of the opportunity to recover oil from the water was lost.

Without speculating about the factors that contributed to the BP *Deepwater Horizon* disaster—matters that the Commission is evaluating—the information released by BP and the federal government suggest that neither took seriously the severity of the hazard associated with what they regarded as a low-probability event. The likely result was that key decisions were made without serious recognition of the implications posed by a potential accident, adequate prevention measures were not taken, and, when the extreme case occurred, response was delayed and opportunities to reduce damage were lost. These failures point to the need for more rigorous requirements for worst-case scenario analyses.

A proper worst-case scenario will inform operators and regulators as to the potential consequences of accidents, mechanical failures, or human errors in OCS oil and gas operations. This information is necessary to make informed decisions about whether oil and gas operations are appropriate in a given area, and, if so, under what circumstances or limitations. Worst-case scenarios allow regulators and operators to plan for, and prepare the equipment and personnel necessary to respond to, the most severe spills.

Despite their importance, now underscored by the BP spill, worst-case scenarios have not been part of the National Environmental Policy Act (NEPA) process. For example, in the Arctic, the Minerals Management Service (MMS) failed to consider seriously the implications of a major

spill when it prepared environmental assessments for Shell Oil's 2010 exploration plans in the Chukchi and Beaufort Seas. MMS opined that "[a] very large spill from a well-control incident is not a reasonably foreseeable event in connection with the OCS exploration activities set forth in Shell's EP [exploration plan], and therefore, this EA does not analyze the impacts of such a worst-case scenario" (MMS 2009a at A2and 2009b at A1). Instead of analyzing a potential blowout scenario, the EA for Shell's 2010 exploration plan for the Chukchi Sea dismissed the possibility of a major spill and reviewed instead the effects of a small, 48-barrel fuel transfer spill (MMS 2009b at 31).

For the people and the ecosystem of the Arctic, the harm from the hazard are potentially so large that NEPA reviews should undertake careful and full consideration of very severe spill events. In other words, NEPA documents should include worst case scenario analyses. Among other things, including such analyses in the NEPA process would give the public the opportunity to review and comment on spill response capabilities, and could facilitate consultation with natural resource trustees and other agencies with roles in oil spill prevention and response.

Outside the NEPA context, current law does require OCS operators to have "a plan for responding, to the maximum extent practicable, to a worst case discharge." 33 U.S.C. § 1321(j)(5)(A)(i). Spill plans must "identify, and ensure . . . the availability of, private personnel and equipment necessary to remove to the maximum extent practicable a worst case discharge (including a discharge resulting from fire or explosion), and to mitigate or prevent a substantial threat of such a discharge." (33 U.S.C. § 1321(j)(5)(D)(iii)). However, neither the statutory language nor the implementing regulations require OCS operators to demonstrate that their spill response plan will work, and there is no requirement that the government verify the assumptions on which the operator bases its description of the worst-case discharge. As a result, these "worst-case" scenario requirements fall short.

Indeed, the "worst-case scenarios" contained in contingency plans for Arctic OCS oil and gas exploration have not lived up to their name. For example, Shell's Chukchi Sea contingency plan contained a vague and poorly supported blowout scenario that assumed consistent and favorable weather for the entire 30 days of the response, ignoring both the federal standard for adverse weather and the practical reality that the U.S. Arctic OCS would likely experience some combination of low visibility, high winds, or major storms during the 30-day scenario time frame. The plan's worst-case spill scenario has never been tested or exercised in the field under actual environmental conditions.

III. Status of Arctic Marine Science and Critical Knowledge Gaps

The U.S. Arctic Research Commission (2005) observed that "[t]he Arctic Ocean is the least well known ocean on the planet. We know more about the topography of the planets Venus and Mars than we do about the bathymetry of the Arctic Ocean" (USARC 2005 at 6-7). Our understanding of Arctic ecology is also limited by incomplete knowledge of species and ecosystem interactions, conditions that are made more complex because the region is under considerable strain due to global climate change.

Recognizing these gaps, in March 2010, Secretary Salazar directed the USGS to conduct an initial evaluation of science needs in the Arctic. Specifically, Secretary Salazar asked the USGS to complete "a special review of information that is known about the Beaufort and Chukchi seas, including studies conducted by the National Oceanic and Atmospheric Administration, the National Science Foundation and other science organizations" (DOI 2010). The USGS report will (1) examine the effects of exploration activities on marine mammals; (2) determine what research is needed for an effective and reliable oil spill response in ice-covered regions; (3) evaluate what is known about the cumulative effects of energy extraction on ecosystems and other resources of interest; and (4) review how future changes in climate conditions may either mitigate or compound the impacts from Arctic energy development.

The USGS report is a good first step, but this limited review will not be able to identify fully all the important knowledge gaps about Arctic marine ecosystems, and it certainly will not remedy those information gaps. Ocean Conservancy continues to believe that there should be a comprehensive review by an independent entity, such as the National Research Council. Ocean Conservancy has called for an NRC review for more than two years; the USGS review will lay ground but is not a substitute for independent assessment.

The reality is that year-round baseline data remain very limited in many key areas for many key species and are simply not sufficient for evaluating risks and how oil spills may impact Arctic species, habitats, and ecology over the short- and long-terms. Knowledge gaps that impede our understanding of environmental conditions, species composition, distribution and abundance, and ecological interactions are matched by the inadequacy of our insight into potential impacts that ecosystem changes would cause for the human communities who rely on the Arctic Ocean for subsistence.

Fundamentally, what is missing is a sufficient understanding of the fundamental climate-oceanographic processes of the region and the ecology, distributions, and populations of key species in the U.S. Arctic Ocean. Many important knowledge gaps must be addressed and analyzed if we are to understand sufficiently the hazards and the implications for OCS policy decisions. The following list provides some examples:

- How do the effects of climate change and industrial activity interact and are the effects cumulative? NEPA requires an understanding of cumulative impacts and the greatest effect may be those impacts that result from interactions between climate change and industrial activity. We need greater understanding of these combined effects before committing vast areas of the Arctic OCS to industrial activity.
- Where will Pacific walrus be during summer? In 2007, 2009, and 2010, walrus hauled out on land in large numbers in northern Alaska. Prior to 2007, walrus spent summers on sea ice in the Chukchi Sea. Without knowing where walrus will be, infrastructure and activity cannot be positioned to avoid incidental takes and other impacts, as required by the Marine Mammal Protection Act and other federal laws and regulations.
- How can negative social and cultural impacts be avoided? Industrial development can disrupt traditional practices, interfere with cultural norms, and lead to social dislocation. Proper planning can help minimize such problems, but requires detailed understanding of local cultures and societies as well as the involvement of local communities in all phases of

decision-making. The processes for such involvement have not yet been devised and tested for offshore oil and gas in U.S. Arctic waters.

- What trajectories would spilled oil follow? The general atmospheric and circulation patterns of the Chukchi and Beaufort Seas have been mapped, but patterns and variability at the scale of an oil spill are not well known and are difficult to predict based on current understanding. Without that knowledge, the placement of response equipment and the ability to respond promptly are hindered, reducing the ability to contain and recover spilled oil. Furthermore, there is insufficient information or monitoring capacity to project fine scale trajectories of spilled oil in real time during a spill event, making it difficult or impossible to respond quickly and protect critical wildlife habitat areas, such as Kasegaluk Lagoon or Ledyard Bay.
- Which areas in the Chukchi and Beaufort Seas are crucial for various life stages of marine mammals? Satellite telemetry has shown that the movements of bowhead whales, beluga whales, walrus, spotted seals, ringed seals, bearded seals, and polar bears are more complex and variable than previously anticipated. Without an understanding of which areas are crucial and why, it is impossible to identify critical areas that must be avoided by development and protected in the event of oil spills.
- How will the distribution of species of concern, including ESA candidate or listed species, shift due to climate change? Species currently in the Chukchi and Beaufort Seas may shift their ranges and key habitat areas. Species from the Bering Sea and farther south may move northwards, possibly requiring new areas or types of protection in the Chukchi and Beaufort Seas. The ability to predict such shifts is necessary to evaluate the life-cycle impacts of offshore development and infrastructure.
- How can quantitative risk and impact assessments be conducted? There is insufficient information about the distribution and productivity of plankton, benthic organisms, fishes, the response of marine mammals to noise, ecological changes likely to be caused by sea ice loss, and other basic environmental parameters to support quantitative evaluation of potential and actual impacts from offshore activity, including oil spills. Without such information, risk and damage assessments are reduced to speculation or experts' opinions and recovery from an oil spill or other accident cannot be determined. Lack of adequate baseline information was the primary impediment to assessing ecological damage from the *Exxon Valdez* oil spill.
- How have distributions of marine birds changed since the pelagic surveys conducted in the mid-1970s to mid-1980s in the Outer Continental Shelf Environmental Assessment Program (OCSEAP)? For birds at sea, these data are now at least 25 years out of date, and much has changed during that time. Previous data point to the importance of areas now under lease in the Chukchi Sea, and current information is needed in order to evaluate potential impacts.
- What are the distributions and life histories of species that are critical in marine food webs and how will loss of sea ice influence these species? Many marine birds and mammals rely on species like Arctic cod, yet there is a paucity of even basic knowledge about them. Some of these same species, such as Arctic cisco, are also very important for subsistence in coastal communities (ABR, Inc. 2007). According to the environmental assessment in the recent Arctic Fishery Management Plan, sampling of fish and shellfish species is extremely limited, with only a small area of the Beaufort Sea off Barrow sampled adequately within the last 18 years. Some areas have never been sampled to determine even basic abundance estimates.

These are just examples of the gaps in knowledge that remain for U.S. Arctic waters. Permitting large-scale oil and gas activities without a fundamental understanding of the composition and

functioning of the marine ecosystem may lead to unintentional ecosystem damage or even catastrophic failures. The risk of such adverse interactions is heightened by rapid environmental change in the Arctic.

More time is needed to build on the work of the USGS, conduct a thorough and independent gap analysis, and develop a comprehensive, integrated science plan to generate the knowledge required for sound management decisions that are in accordance with existing federal laws and policies and are responsive to public concerns.

IV. Conclusion and Recommendations

The Arctic OCS supports productive ecological and human communities in a direct, sustainable relationship that requires a healthy ocean environment. Decisions about oil and gas development should be based upon a thorough understanding of the Arctic marine ecosystem and its wildlife populations, a comprehensive assessment of the ecosystem services upon which people depend, and an honest evaluation of the risks and hazards to the ecosystem and its uses. As a prerequisite to any Arctic OCS decisions, the gaps in our understanding of the physical and biological processes in the U.S. Arctic must be filled by well designed, comprehensive scientific studies. In addition, the people most exposed to the risk must have a meaningful opportunity to contribute to the data about Arctic ecosystems and uses as well as to participate in the decision and planning processes. In reaching a decision about whether to allow oil and gas leasing and development, it is essential to include rigorous analysis of prevention measures and spill response planning for a worst-case scenario discharge of hydrocarbons. The importance of that approach to oil and gas development is underscored by the challenging conditions in the Arctic OCS and the experiences with both the BP and *Exxon Valdez* disasters. The history of Arctic OCS leasing does not demonstrate such a thorough and science-based approach.

The President's newly announced National Ocean Policy offers a way to change the nation's approach to Arctic OCS sustainability and management. Integrating OCS oil and gas planning into a strategic action plan for the Arctic and a regional Coastal and Marine Spatial Planning process offers a real chance to make the necessary course correction before risks and potential hazards are arbitrarily imposed on the Arctic ecosystem and its human communities. To help achieve that goal, Ocean Conservancy urges the Commission to consider the following specific recommendations:

(1) **Planning and preparation for Arctic spill response must be more rigorous.** Spill response plans should be required to include a response gap analysis to identify the conditions under which effective spill response is precluded. Response plans should include true, realistic worst-case scenarios. Worst-case discharge amounts should be based on the maximum spill size that could occur from exploration or production operations, calculated using the highest possible flow rates for a well. They should also factor in the time required to stop the blowout—often measured in months. Given the limitations imposed by Arctic conditions, response plans must address realistically an operator's capacity and capability to clean up spilled oil. Government approval of spill response plans should be based upon demonstrated capabilities verified through field exercises, unannounced drills, and audits. The plan review and approval process for all

OCS oil spill response plans should include an opportunity for public review and comment, and should include consultation among agencies with roles in oil spill prevention and response as well as natural resource trustees.

(2) **There must be additional scientific research on Arctic marine ecosystems, uses of marine resources by people, and oil spill response in Arctic conditions.** Building on the USGS science review, an independent entity, such as the National Research Council, should conduct a comprehensive gap analysis. Once the gap analysis is complete, an integrated scientific research program should be designed and implemented to develop sufficient understanding of the fundamental climate-oceanographic processes of the region and the ecology, distributions, and populations of key species in the U.S. Arctic Ocean. Researchers should conduct Arctic-specific oil spill and spill response research, including the effects of Arctic-specific conditions on spilled oil, mechanical recovery techniques, dispersants, and other response options. Arctic-specific models should be developed to predict worst-case spills for specific projects. There should be increased funding for scientific and spill-response research in the Arctic.

(3) **Arctic oil and gas activities should be integrated into the new National Ocean Council planning processes designed to help ensure protection, maintenance, and restoration of ocean and coastal ecosystems.** The new National Ocean Council (NOC) will develop a strategic plan to address changing conditions in the Arctic. This plan is an important opportunity to address more holistically oil and gas issues in the Beaufort and Chukchi Seas. Interagency coordination and decision-making would allow other expert agencies to have increased input on, or authority over, decisions about oil and gas activities. Similarly, the NOC's Coastal and Marine Spatial Planning process will assemble baseline data that facilitate science-based management, and will help identify future use or management problems to promote smarter, more sustainable uses. To be viable, both planning processes must seek out and incorporate local information and traditional ecological knowledge when assembling baseline information about Arctic ecosystems and environments.

(4) **Additional oil and gas activities in the Chukchi and Beaufort Seas should not be planned or approved until more information is available and flaws in the OCS oil and gas process have been addressed.** Specifically, there should be no additional activity in the Arctic until the following corrective measures have been implemented: comprehensive, meaningful legislation is enacted to reform the OCS Lands Act and laws governing oil spill prevention and response; critical science gaps are filled; oil spill prevention and response capabilities are in place and have been demonstrated to work effectively in the Arctic marine environment; the NOC has completed a strategic action plan for the region; and government regulators have prepared comprehensive, updated environmental analyses for proposed activities.

The nation has an opportunity to reach sustainable outcomes in the Arctic OCS, but it requires a time-out from the current short-sighted, single-purpose approach to oil and gas decision-making, as well as a serious commitment to making the process more integrated and open. Only in that

way will the fragmented, data-deficient process that has previously been used to make OCS decisions be corrected so that we reach no-regrets outcomes for America's Arctic.

References:

Abdelnour, R. & Comfort, G. (2001). Application of ice booms for oil spill cleanup in ice infested waters. Fleet Technology Limited. Kanata, Ontario. April.

ABR, Inc. et al. (2007). Variation in the abundance of Arctic cisco in the Colville River: analysis of existing data and local knowledge, Vols. I and II, Prepared for the U.S. Department of the Interior, Minerals Management Service Alaska OCS Region, Anchorage, AK. Technical Report No. MMS 2007-042.

Arctic Monitoring and Assessment Programme (AMAP). (1998). AMAP Assessment Report: Arctic Pollution Issues. Arctic Council Report.

Department of the Interior (DOI) (2010). Secretary Salazar unveils Arctic studies initiative that will inform oil and gas decisions for Beaufort and Chukchi seas (Apr. 13, 2010).

Dickins, D. & Buist, I. (1999). Countermeasures for ice-covered waters. Pure Applied Chemistry Vol. 71, No. 1. pp. 173-191.

Evers, Karl-Ulrich et al. (2006). Oil spill contingency planning in the Arctic—Recommendations. Arctic Operational Platform (ARCOP).

Exxon Valdez Oil Spill Trustee Council (EVOSTC) (2009). Legacy of an oil spill: 20 years after Exxon Valdez.

Fingas, M. (2004). Weather windows for oil spill countermeasures. Report to Prince William Sound Regional Citizens' Advisory Council.

Fuller, C. & Bonner, J.S. (2001). Comparative toxicology of oil, dispersant and dispersed oil to Texas marine species. Proceedings of the 2001 International Oil Spill Conference: pp. 1243-1241.

Glover, N. & Dickins, D. (1999). Oil spill response preparedness in the Alaska Beaufort Sea. Reprint of material presented in 1996 Symposium on Oil Spill Prevention and Response and 1999 International Oil Spill Conference.

Gulec, I., & Holdway, D.A. (1997). Toxicity of dispersant, oil, and dispersed oil to two marine organisms. Proceedings of the 1997 International Oil Spill Conference: pp. 1,010-1,011.

Lindstrom, J.E., White, D.M. & Braddock, J.F. (1999). Biodegradation of dispersed oil using Corexit 9500. A report produced for the Alaska Department of Environmental Conservation Division of Spill Prevention and Response. 30 June.

Michel, J. & Esler, D. (2010). Summary of lingering oil studies funded by the Exxon Valdez Oil Spill Trustee Council.

Minerals Management Service (MMS) (2009a), Shell Offshore Inc. 2010 Outer Continental Shelf Lease Exploration Plan for Camden Bay, Alaska, Beaufort Sea Leases (Oct. 2009).

Minerals Management Service (MMS) (2009b) Shell Gulf of Mexico, Inc. 2010 Exploration Drilling Program, Burger, Crackerjack, and SW Shoebill Prospects Chukchi Sea Outer Continental Shelf (Dec. 2009).

Moles, A., Holland, L., & Short, J. (2002). Effectiveness of Corexit 9527 and 9500 in dispersing fresh, weathered, and emulsion of Alaska North Slope crude oil under sub arctic conditions. Spill Science and Technology Bulletin. Volume 71, Nos 1/2: pp. 27-33.

National Marine Fisheries Service (NMFS), Secretarial Review Draft Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis for the Arctic Fishery Management Plan and Amendment 29 to the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs, 202 (April 2009).

National Research Council (NRC). (2003). Board on Environmental Studies and Toxicology and Polar Research (BESTPR). Cumulative environmental effects of oil and gas activities on Alaska's North Slope. The National Academies Press. Washington, DC.

National Research Council (NRC). (1989). Using oil dispersants on the sea. The National Academies Press. Washington, DC.

Ocean Studies Board, NRC. (2005). Oil spill dispersants: efficacy and effects. Committee on Understanding Oil Spills: Efficacy and Effects. National Research Council. National Academies Press, Washington, DC.

Prince William Sound Oil Spill Recovery Institute (OSRI) (2009). Annual Report.

Prince William Sound Oil Spill Recovery Institute and U.S. Arctic Research Commission (OSRI and ARC) (2004). Advancing oil spill response in ice covered waters.

Robertson, T. & DeCola, E. (2001). Joint agency evaluation of the spring and fall 2000 North Slope broken ice exercises. Prepared for Alaska Department of Environmental Conservation, U.S. Department of the Interior Minerals Management Service, North Slope Borough, U.S. Coast Guard, and Alaska Department of Natural Resources. Anchorage, Alaska.

Singer, M.M., George, S., Lee, I., Jacobson, S., Weetman, L.L., Blondina, G., Tjeerdema, R.S. Aurand, D. & Sowby,.M.L. (1998). Effects of dispersant treatment on the acute aquatic toxicity of petroleum hydrocarbons. Archives of Environmental Contamination and Toxicology. Vol. 34: 177-187.

Stirling, I. (1997). The importance of polynyas, ice edges, and leads to marine mammals and birds. Journal of Marine Systems 10.

U.S. Arctic Research Commission (USARC) (2005). Report on goals and objectives for Arctic research 2005.

Wolfe, M.F., Schwartz, G., Singaram, S., Mielbrecht, E., Tjeerdema, R. & Sowby, M. (1997). Influence of dispersants on trophic transfer of petroleum hydrocarbons in a marine food chain. Proceedings of the 20th Arctic and Marine Oil Spill Program Technical Seminar: pp. 1,215-1,226.

Wolfe, Robert J. and James Magdanz, The sharing, distribution, and exchange of wild resources in Alaska: a compendium of materials presented to the Alaska Board of Fisheries, Alaska Department of Fish and Game, Division of Subsistence, 1993.