Adapting a Nation to an Ever Changing Ocean

By: Erica M Dalman

“How inappropriate to call this planet ‘Earth’, when it is clearly ‘Ocean.’” - Arthur C. Clarke.

Oceans cover more than 70 percent of the Earth’s surface, totaling 1,338,000,000 cubic kilometers. Whether directly or indirectly, oceans affect our daily lives. The weather and climate experienced on land is directly tied to the oceans; storm systems and life-sustaining precipitation are directly fueled by warm ocean water. Even more basic, worldwide about one billion people depend on seafood for protein. For the nation as a whole, the oceans and Great Lakes are a major economic engine, contributing 2.3 million jobs, $108 billion to the gross domestic product, and $7.9 trillion to the U.S. economy. The Great Lakes boast 5,500 miles of coastline and generate $17 billion in economic output from recreational fishing alone. Additionally, the oceans hold about $8 trillion in oil and gas reserves. Though the oceans and Great Lakes are of great economic benefit, they also bring potential for great economic losses. Hazards such as hurricanes, coastal storms, tsunamis, floods and coastal erosion are recurring threats to coastal communities. The 2005 hurricane season, which included hurricanes Katrina and Rita, resulted in direct losses of about $200 billion. Whether because of the benefit they bring or the need to mitigate losses, it is critical to understand the growing importance of the oceans and Great Lakes.

The oceans, Great Lakes, and coastal regions are changing more rapidly than societies may be able to adapt. Changes in ocean chemistry, changes in sea level, changes in ice sheets and changes in coastlines are forcing communities to change the ways they use the oceans, the coasts and the Great Lakes. The changes in the oceans can have subtle effects on human activities, yet it is important to recognize them. One such activity is maritime trade, which has doubled over the past 50 years. As water temperatures rise, the cargo shipping season becomes longer, which should bring concomitant economic benefits. However, warmer lake temperatures result in decreased lake ice and increased evaporation rates, lowering water levels and actually reducing the amount that cargo ships can carry and consequently the volume of goods that can be traded. As the oceans, coasts, and Great Lakes continue to change, it is important to establish a proactive, rather than reactive, ocean policy.

The protection and proper management of the Earth’s oceans and lakes is vital not only for the ecosystems they support, but for society and, ultimately, the health of the planet. Within the past year, the United States has taken action to promote greater preservation of the oceans, Great Lakes and coasts. In July 2010, the National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes was established under Executive Order #13547 signed by President Obama. This National Ocean Policy (NOP) comes at a critical time; the global population is growing exponentially and with it comes a greater demand for ocean resources and a greater need for thoughtful management and conservation of ocean resources and coastlines.

The recognition of the power and importance of the oceans and Great Lakes is not new for the U.S. government. In 1969, the Stratton Commission published a report, Our Nation and The Sea: A Plan for National Action. This was the beginning of a long journey of evaluating the government’s role in caring for the oceans. Decades later, the Oceans Act of 2000 (P.L 106-256) established “a commission to make recommendations for a coordinated and comprehensive national ocean policy.” The U.S. Commission on Ocean Policy was formed in 2001 and published a report, An Ocean Blueprint for the 21st Century, in December 2004. These previous efforts have contributed to the enactment of the NOP in 2010.

The goals of the NOP are to improve ecosystem-based management; implement coastal and marine spatial planning (CMSP); and inform government decisions. The NOP sets out priorities to increase resiliency and adaptation to climate change, especially ocean acidification; ensure regional ecosystem protection and restoration; improve water quality and sustainable practices on land. Additionally, it seeks to broaden our understanding of changing conditions in the Arctic; and improving ocean, coastal, and Great Lakes observations, mapping and infrastructure. The detailed strategic action plans of the NOP are currently being developed; however, research and management of these resources is already occurring within the geoscience community and beyond. For example, the U.S. Geological Survey (USGS) conducts research on carbon cycling and climate change as well as coastal hazards. The National Marine Sanctuary, under the National Oceanic and Atmospheric Administration (NOAA), has sought to create awareness of the oceans’ needs. The unique role of the NOP is to coordinate and increase the efficiency of all the federal and private research and innovation into one portal.

The NOP is using a breadth of tools and agencies to determine and implement its action plans. Among these tools in which geoscientists are involved, for improving ocean, coastal, and Great Lakes observations, mapping and infrastructure, is the U.S. Integrated Ocean Observing System (IOOS). The IOOS, comprised of regional and national associations, was developed after President Obama signed the Integrated Coastal Ocean Observation System (ICOOS) Act in March of 2009. Furthermore, geoscientists play an integral role in the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE). Since the enactment of the ocean policy, BOEMRE and the NOAA have begun coordinating their efforts regarding offshore energy development. As the government seeks to increase its offshore oil and gas drilling, geoscientists must be ready to provide expertise. Recent oil
spills and controversy regarding the oil and gas industry will require greater communication between scientists and government. The NOP provides a framework for coordination and collaboration between government agencies, such as BOEMRE and NOAA, and a portal for greater communication between the geoscience community and the government.

As stated by the United Nations Environment Program director, “The world can no longer afford to delay restoring the health and wealth of the oceans. The half-billion people who depend on a healthy fishing industry, and the one billion who rely on fish as a primary source of protein, cannot wait another 20 years for the international community to act.” The immense value, whether economic, life sustaining or weather related, of the oceans, coasts, and Great Lakes cannot be ignored. The current administration is not the first to acknowledge the importance of our oceans, coasts, and Great Lakes, yet their importance in only growing. Research and observations show the oceans are changing, requiring a greater understanding of how these changes will affect our nation and its global economy. The tides are right for a more integrated approach on oceans, coasts, and the Great Lakes. If implemented effectively, the NOP can have a profound effect on the nation’s stewardship of these critical resources. Geoscientists will be important players in this team effort, as their expertise is needed to explore, extract and preserve the oceans, seafloor, coasts and Great Lakes.

Developing Alaska’s Oil and Gas Resources: How Should the U.S. Proceed?

By: Lauren Herwehe

For the past half century, lawmakers have disagreed over when and where to allow oil drilling in Alaska—a several hundred billion dollar question with no simple answer. In the wake of the largest oil spill in the history of the United States the debate has become hotter than ever. The BP oil spill stalled oil and gas development in Alaska, particularly in the offshore, and policymakers are grappling with how to advance development. On one hand, Alaska has one of the most fragile, unique, and diverse ecosystems in the country—a vulnerable environment that could easily be devastated by hasty development. On the other, further developing Alaska’s oil resources could reduce reliance on imports, reduce oil prices, spur economic growth and provide government revenues. Furthermore, experts say that slower flow in the Trans-Alaska Pipeline System (TAPS) in recent years is leading to more corrosion and clogs, decreasing the lifespan of the pipeline. It is critical that lawmakers reach a compromise that facilitates economic growth while protecting the environment. This compromise must be supported by a comprehensive policy that accounts for the challenges posed by the harsh Arctic environment, implements lessons learned from the BP and Exxon Valdez oil spills, addresses concerns about the permit process, and provides a firm course of action for the coastal plain of the Arctic National Wildlife Refuge (ANWR).

There is no question that the oil and gas resources within Alaska are enormous. With an estimated 27 billion barrels of oil and 132 trillion cubic feet of natural gas, Alaska’s Outer Continental Shelf (OCS), including the Beaufort and Chukchi Seas, Cook Inlet, and the North Aleutian Basin, provides the second largest oil reserve potential in the U.S., superseded only by the Gulf of Mexico. Set aside as an emergency oil sup-