CONSORTIUM FOR Ocean Leadership

Ocean Science Priorities for the Obama Administration

The ocean is the lifeblood of the planet, covering 71 percent of the Earth's surface. Life on Earth is possible because the ocean produces most of the oxygen we breathe and much of the protein we eat; delivers fresh water through the atmosphere to our aquifers, our agricultural fields and our communities; and moderates the climate through the global transfer of heat. In fact, its heat capacity is 1,000 times larger than that of the entire atmosphere.

The fate and face of America are inextricably linked to the ocean and our vast coastline. The U.S. controls more land under the sea than above it, as its offshore exclusive economic zone is greater than the entire land area of the 50 states combined. Ocean dependent industries contribute approximately $150 billion to the U.S. economy annually. The ocean once was a great source of economic and national security for our nation. However, we can no longer rely on the ocean to protect us from enemy attack, from international competition or to serve as an unlimited source of seafood. Given the ocean's critical role in the climate system, the greatest challenges facing our nation are being driven by and transported via the ocean.

Climate change is placing significant stresses on our ocean and coastal resources. This has major implications for U.S. agriculture, transportation and commerce. Ocean currents and temperature influence drought and flooding across the nation; sea level rise and the demise of protective coral reefs are already threatening coastal infrastructure; and increasing acidification and temperature of ocean waters may drastically alter the marine food web and thus endanger fisheries and the source of the oxygen we breathe. These and other threats from a rapidly changing environment are increasing. In addition, an emerging ice-free Arctic during the summer has tremendous diplomatic and international implications with regards to opening new trade routes and natural resource development.

We are just beginning to grasp what the future holds, yet we have little understanding of our options to adapt. Fortunately, ocean research in academia and government agencies provides a unique opportunity to address the most pressing issues of our time while allowing our nation to improve international relations and increase our competitiveness in the global marketplace. With these opportunities in mind, Ocean Leadership recommends the following actions be taken by the Obama Administration.

VALUE SCIENCE AND TECHNOLOGICAL EXPERTISE

The federal government's stewardship of science is critical, yet has been called into question recently. Reports of science censoring by political appointees has eroded public confidence in the government and undermined the scientific enterprise. Furthermore, science funding has stagnated, despite passage of the America COMPETES Act. Given recent economic woes and the increased competition in the global marketplace, our world leadership in innovation is in jeopardy. Consequently, we recommend the Obama Administration take the following actions:

1. Reestablish the **Presidential Science Advisor** as a cabinet level post. This will send a clear signal that science is a priority and is essential for addressing the major challenges of our times. Given the wide scale impacts from climate change, we recommend that the Science Advisor have climate expertise or a background in environmental science;
2. Increase investment for **scientific research** through funding the National Science Foundation at levels proposed in the America COMPETES Act and include ocean and atmospheric research at NOAA, Earth science programs at NASA and marine and coastal programs at USGS as part of the initiative;
3. **Promote the free flow of results** from federal scientists so that our society and public officials are in a position to inform decision making through unimpeded lines of communication.

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UNDERSTAND, MITIGATE AND ADAPT TO CLIMATE CHANGE

The ocean plays the fundamental role in governing climate by storing and distributing heat, oxygen, water and carbon. However, the greatest uncertainties in understanding the climate system are in the ocean, where most of the heat in the Earth system is absorbed, stored, exchanged with the atmosphere and transferred globally through ocean currents. Changes in ocean salinity, temperature, heat uptake and release, ocean circulation and sea level rise are taking place, but are not well understood. These physical and chemical changes taking place in the ocean have tremendous implications for life on land and the biology of the ocean. In order to manage our ocean and coastal resources properly, we need accurate assessments of the ocean's past and present states, processes that influence climate, and reliable predictions of future climate change.

Considering that coastal counties produce more than half of the U.S. GDP and are facing the most extreme climate change induced events, the oceans need to be part of the climate change debate. Strategies for management and sequestration of carbon dioxide and other greenhouse gases must be informed by sound research. Specifically, new polices should dedicate a portion of revenue sources (e.g. cap and trade carbon credits) for ocean science activities to ensure that we have:

1. Support for **basic research** of air-sea and land-sea interactions, ocean acidification, ocean productivity, sea-level and other physical, chemical and biological parameters that are rapidly changing in the ocean as well as research on social and economic aspects of ocean resource use and management;
2. Quality global and regional ocean **monitoring data** through ocean observatories, satellites, research vessels, land-based facilities and remote sensors;
3. **Analysis, modeling and forecasting** capabilities to translate data gathered from ocean observatories into useful information and products for adaptation and mitigation objectives and policy initiatives.

ENHANCE ENERGY SECURITY

Our nation's energy policy is dependent upon foreign sources of oil and gas. Currently, about 30 percent of the nation's oil and 25 percent of its natural gas are produced from marine offshore areas. While offshore oil and gas production may increase with the lifting of the ban on outer continental shelf drilling, it will not be enough to meet our growing energy demands. Fortunately, the oceans also represent a tremendous potential resource for renewable energy that could substantially reduce our dependence on foreign sources of oil and reduce pollution and greenhouse gas emissions. For instance, it has been estimated that taking just 1/1000th the available energy from the Gulf Stream would supply Florida with 35 percent of its electrical needs.

We recommend that a portion of the revenues generated from royalties from offshore energy exploration and development be reinvested in an ocean trust fund dedicated for the following priorities:

1. **Renewable energy** research and technologies to begin harnessing the immense energy provided by ocean currents, tides, waves and thermal conversion;
2. **Ocean monitoring** systems to understand the current ocean processes and model the future states of ocean resources and identify and assess the impacts of climate change on our oceans and coasts;
3. **Adaptation and mitigation** strategies for ocean and coastal managers.

CONCLUSION

With more than half of the population living within 50 miles of our 90,000 miles of coastline, our nation's economy, security and quality of life are ocean-dependent. We strongly encourage the Obama Administration to value and advance ocean science and engineering to help secure our nation's sustainability and our world economic and military preeminence through technology development, commerce and diplomacy.