

## Vision

Our oceans will undergo profound changes during the next 25-50 years as a result of overfishing and destructive fishing, habitat alteration, invasive species, land-based pollution, and overarching all of these climate change, acidification, and sea level rise due to increasing concentrations of CO<sub>2</sub> and other greenhouse gases.

Climate change will result in many physical and biological impacts, sea level will change as a result of ocean warming and melting glacial ice, and the acidification we are just beginning to observe will continue. Because of the long lifetime of CO<sub>2</sub> in the atmosphere, these changes will continue through the next century. While the magnitude of the changes can be affected by reducing CO<sub>2</sub> emissions, their impacts will need to be managed under whatever scenario materializes. We are faced with two major challenges from changes due to greenhouse gases:

- understanding the changes and how they will interact with stresses from resource exploitation, land use change and other manageable human impacts
- developing strategies to adapt to our changing oceans and to mitigate the impacts on society and economies

Bringing together leaders in ocean science, policy management and education with nonprofit and business interests, the 11<sup>th</sup> National Conference on Science Policy and the Environment: Our Changing Oceans will explore strategies to meet these challenges. In addition, the conference has the opportunity to highlight important ways that new management techniques like ecosystem-based management and marine spatial planning will need to consider the changes that we will see during the next decades.

The conference will have impact through:

- sharing the most current state of the science;
- linking science to policy where relevant;
- communicating key messages; and reframing issues;
- developing targeted and actionable recommendations; and,
- catalyzing long-term collaborations and initiatives

Targeted audiences for participation and communications:

- Participation in the conference process (scale is 1,000-1200) will include leaders from federal, state and local agencies; policy, research and educational institutions; businesses; the next generation of ocean leaders; and those who can significantly impact ocean and climate policy but do not yet recognize its impact on their communities.
- Communication targets will include Congress, federal agencies, key national stakeholder organizations and international bodies.

The conference will develop recommendations focused on achieving impact in the 12-16 months following the conference before the 2012 election cycle closes.

The recent interim report of the Interagency Ocean Policy Task Force highlights the challenges that will have to be addressed by future planning. These include climate change and ocean acidification. It is expected that these same themes will need to be addressed by the National Ocean Council (to be co-chaired by CEQ and OSTP) which is expected to be announced in late June. Several of these conferences themes are directly related to priority objectives for planning by the National Ocean Council, and we plan to use the conference to provide important input to the planning process.

# Strategy for Impact

## Background

NCSE has organized ten national conferences that have been successful in bringing brought different sectors together to develop strategies for improving research, education and decision-making.

NCSE also has expertise in convening smaller groups of carefully selected leaders to carry out more applied work to develop science-based solutions (e.g. the successful National Commission on Science for Sustainable Forestry, supported by the Doris Duke, Packard, Surdna, and National Forest Foundations.)

For the 2011 conference, we intend to bring into the event many elements of NCSE's ability to highlight use-inspired science and link science to policy to increase its impact.

## Opportunity

In comparison to prior conferences, the 2011 conference will have a more streamlined, guided planning process that dovetails with the opportunity for impacting ocean policy development being undertaken by the Obama administration's Interagency Ocean Policy Task Force and the National Ocean Council expected to be announced soon.

The Task Force's Interim Report, published in Fall 2009, calls for strengthening ocean policy through a number of improvements to ocean governance within the federal government, as well as improvements to the relationship between federal government and the other jurisdictions affecting the oceans and coasts. In addition, the Task Force suggests a number of themes for which strategic plans should be developed. These include:

- Four priority objectives:
  - Ecosystem-based management
  - Coastal and marine spatial planning
  - Inform decisions & improve understanding using sound science
  - Coordinate & support regional management across agencies
- Five areas of special focus:
  - Resiliency & adaptation to climate change & ocean acidification
  - Regional ecosystem protection & restoration
  - Water quality & sustainable practices on land
  - Changing conditions in the Arctic Ocean
  - Ocean, coastal & Great Lakes observations & infrastructure

To develop strategic plans, both scientific information (defined broadly to include the natural, physical, socio-economic and policy sciences) and management information will be needed. In thinking about the structure of our 2011 conference, we have decided to focus on the science needed to develop sound ocean policies in the face of climate change and acidification, but we realize that these have implications for all of the themes highlighted by the interim report.

While the expected planning by the National Ocean Council provides a significant opportunity for the conference, there will be other opportunities and targets for impact that will be defined for specific themes. For example, we want to use the conference to provide effective input to state and local governments as they prepare for strategic planning for the oceans. Other targets may be international, for example, for the Arctic theme.

## Major Themes

The conference will focus on eight key themes for which targeted and actionable recommendations will be developed. Several of these themes need to be critical components of the strategic plans to be developed by the National Ocean Council, which is being proposed by the Interagency Task Force on Ocean Policy. We believe that our exploration of the following themes can contribute directly to the strategic plans that will be developed:

### 1. Oceans and carbon

The oceans contain most of the mobile carbon on the planet. They play a central role in CO<sub>2</sub> uptake that may be changing with time, and that uptake has changed the pH of the ocean.

- What are the trends in CO<sub>2</sub> exchange?
- How will changing climate affect the ocean?
- How will ecosystems be influenced by acidification?
- Can sequestration of carbon be enhanced?

### 2. Coastal change and the potential for adaptation

The changes in the open ocean influence the coasts in many ways. Sea level rise will challenge coastal infrastructure. Changes in the temperature and circulation of the open ocean have a powerful influence on the coastal ocean, bays and estuaries.

- While the oceans are interconnected, they will change differently in different places and at different rates. What do we know about the relationship between open ocean and coastal ocean change?
- Which of these changes present the greatest risks?
- What will we need to learn to evaluate adaptation strategies?

### 3. Oceans and living marine ecosystems

Marine ecosystems will change in response to climate change and acidification in addition to changes due to our fishing and other use of living marine resources. The 'feedbacks' theme will explore the two-way relationship between ecosystems and climate change – highlighting the ways that changes in the biota of the ocean (from microbes to apex predators) influence climate change and vice versa. These complex relationships will require that we use ecosystem-based management and marine spatial planning to ensure sustainable marine ecosystems.

- The primary productivity of the oceans is closely related to climate and CO<sub>2</sub> exchange. How will it change in the future?
- Can we unravel which changes in ecosystems are due to climate and acidification in contrast to fishing and pollution?
- We have learned that marine microbes play a critical role in ecosystems. What do we understand about the microbial ecology of the oceans and the role these microbes play in maintaining the stability of the oceans? What role will they play in a changing ocean?
- How does change due to climate and acidification influence management?

### 4. Oceans and human health

With increasing knowledge of environmental factors playing a role in infectious diseases, it has become clear that the oceans and atmosphere are critically intertwined and significantly impact the seasonality of infectious diseases of humans, animals, and plants. The result is demonstrable impact on public health, agriculture, and animal husbandry.

Climate impacts on human infectious diseases, examples of which are malaria, dengue, Lyme disease, Hanta virus, and many vector borne diseases, can be profound. An excellent model is provided by the waterborne diseases, cholera, rotavirus, and a variety of bacterial and viral pathogens.

Coastal waters impacted by terrestrial run-off and domestic/industrial waste discharges increasingly are tracked as the source of infections in humans via direct contact (recreation) or food borne (shellfish, coastal fishes, and crustaceans (shrimp and crabs). Understanding and monitoring environmental parameters using in situ sensors and remote sensors provide a critical tool in the 21<sup>st</sup> Century for public health.

### **5. How the oceans affect non-coastal regions: impacts on our economy?**

The oceans have a profound effect on non-coastal environments through their influence on climate as well as on their impact on food resources, transportation, and other resources. This theme will highlight those influences and provide insights into how to communicate these roles.

- What are the ecosystem goods and services provided by the oceans?
- What are the social and economic costs of ocean changes to our nation and economy?

### **6. Tipping points: how likely are they and how could we manage in the face of such changes?**

In addition to their concern about gradual changes in ocean chemistry, circulation, temperature, and sea level, oceanographers and climatologists are concerned about abrupt or non-linear changes. This theme will explore the potential for such tipping points in ocean processes.

- What kinds of tipping points are possible? Most likely?
- What data/indicators are available (if any) to let us know that we are nearing a tipping point?
- What challenges to management are there from tipping points?
- What models or tools could be used to manage in the face of potential tipping points?

### **7. White Arctic/Blue Arctic**

The region of most profound climate change is the poles. The ice-covered Arctic Ocean – the white Arctic - and the region surrounding it are already changing remarkably and climatologists predict that we may see an ice-free Arctic Ocean during the summer in a few decades -- the blue Arctic. While climatologists are alarmed by this possibility, others seek opportunities for use of resources and as a transportation route.

- What does science tell us about the future of the Arctic?
- How would issues about the future – white or blue – be resolved?
- What models and monitoring data will be required to support an emerging management regime that would allow for sustainable use of the Arctic?
- How can use of the Arctic and its resources be managed in the face of these possibilities?

### **8. Exploring to understand change**

We generally think of exploring the oceans by looking at new areas. But exploring change in the oceans requires exploring the oceans in time as well as space.

- How can we use existing data and tools to explore change?
- What new measurements and observing systems will be necessary to explore change?
- How can we use existing data more effectively to detect and understand change and to use these insights for management?
- What role do models play in exploring change and management?
- What data systems already exist, what else is needed to provide all stakeholders with access to the information required to manage the oceans in the face of change?

## Leadership

The success of the conference will be rooted in its leadership, the partnerships they form, and the leaders that they engage. The Conference Planning Committee includes:



### **Margaret Leinen (Conference Chair) CEO, Climate Response Fund**

- Assistant Director for Geosciences at the National Science Foundation, 2000-2007.
- Dean, Graduate School of Oceanography and Vice Provost for Marine and Environmental Programs, University of Rhode Island.
- Past President of Oceanography Society, Fellow of AAAS and Geological Society of America.
- Oceanographer, biogeochemist, paleoceanographer and science administrator



### **Jim Buizer, Arizona State University**

- Executive Director for Strategic Institutional Advancement, Office of the President.
- Executive Director, Office of Sustainability Initiatives, 2003-2007
- Past Director, Climate and Societal Interactions Office, NOAA
- Expert in science-to-action interface



### **Rita Colwell, University of Maryland and The Johns Hopkins University**

- Distinguished University Professor, Center for Bioinformatics and Computational Biology, University of Maryland, College Park,
- Developing new international center for the study of infectious diseases, water, and health at Johns Hopkins
- Director, National Science Foundation, 1998-2004
- President of the University of Maryland Biotechnology Institute, 1991-1998.
- Chairman of Canon U.S. Life Sciences, Inc.
- Environmental microbiologist and scientific administrator



### **Astrid Merget, Executive Vice Chancellor/Provost, Louisiana State University**

- Former Dean, School of Public and Environmental Affairs, Indiana University.
- Director of the School of Public Policy and Management, Ohio State University.
- Associate Dean, School of Citizenship and Public Affairs, Syracuse University
- Senior executive positions U.S. Department of Health and Human Services and Department of Housing and Urban Development.
- Fellow of the National Academy of Public Administration
- Expert in public finance, public administration and non-profit management.



### **Tony Michaels: Proteus Environmental Technologies, LLC**

- Co-Founder and a Managing Director of Proteus Environmental Technologies
- Operating Advisor, Pegasus Capital Advisors
- Founding Director, Wrigley Institute for Environmental Studies, University of Southern California 1996 - 2008
- Bermuda Biological Station for Research
- Past President, National Association of Marine Labs, Council of Environmental Deans and Director and help found Consortium for Ocean Leadership
- Commercializing transformative environmental science, ocean biology and biogeochemistry environmental communication

## Advisory Group

- Susan Avery, Director of Woods Hole Oceanographic Institution
- Don Boesch, President, University of MD Center for Environmental Science
- Scott Burns, Walton Foundation
- Bob Corell, Director, Global Change Program, Heinz Center
- Frank Cushing, National Group; former staff director of House Appropriations
- Jeff Dozier, UC Santa Barbara
- John Farrell, U.S. Arctic Research Commission
- Paul Gaffney, Monmouth University (Retired Admiral)
- Bob Gagosian, Consortium for Ocean Leadership
- Mary Gant, Program Analyst, NIEHS
- Mary Glackin, NOAA
- Barry Gold, Gordon and Betty Moore Foundation
- Lynn Zeitlin Hale, Director, Global Marine Initiative, The Nature Conservancy
- Frank Herr, Head, Ocean Battlespace Sensing Department, Office of Naval Research
- \*Ed Hill, Director of the UK National Oceanographic Center
- Paul Holthus, founding Executive Director, World Ocean Council
- Suzette Kimball/John Haines USGS
- Heather Ludemann, Packard Foundation
- Geraldine Knatz, Executive Director, Port of L.A.
- Jack Kaye, Earth Sciences, NASA
- Nancy Knowlton, Smithsonian Natural History Museum
- Barbara Knuth, Vice Provost and Dean of the Cornell Graduate School
- Ed Miles, University of Washington (or Paul Berkman, Oxford and Santa Barbara)
- Patrick Monfort, University of Montpellier
- Elliot Norse, MCBI
- Anna Palmisano, Department of Energy
- Claire Parkinson, NASA
- Ramsay Ravenel, Grantham Foundation for the Protection of the Environment
- Andy Rosenberg, Conservation International & Pew Ocean Commissioners
- Jerry Schubel, Director, Long Beach Aquarium of the Pacific
- \*Jim Simon, VP, Oceana (Mike Hirshfield)
- Robin Smith, Manager, Environment, Marine and Coast, ESRI
- Mark Spalding, The Ocean Foundation
- \*Vikki Spruill, Ocean Conservancy
- Phil Taylor, National Science Foundation
- Terry Tamminen, former Secretary of CA EPA, founder of Santa Monica Baykeeper, advisor to Wal-Mart on Sustainability, author
- \*Alan Thornhill, Science Advisor of Minerals Management Service
- Wes Tunnell, Harte Research Inst for the Gulf of Mexico Studies, Texas A&M, Corpus Christi
- Norbert Untersteiner, University of Washington
- Steve Weisberg, Director of Southern California Coastal Water Research Project and Chair, CA Ocean Science Trust
- Richard West, former Oceanographer/Navigator of the Navy and President/CEO Emeritus of CORE (Consortium for Oceanographic Research and Education), Vice President of JOI
- \*Mary Beth West, IUCN
- \*Kevin Ranker, State Senator, Washington State

**\* not yet confirmed their participation**

## Draft Conference Agenda

### Wednesday, January 19, 2011 – Oil and Oceans Symposium

- 8:00 am**      **Registration, Continental Breakfast, Oceans Exhibition and Scientific Poster presentations open**
- 8:50 am**      **Opening and Introduction to *Oil and Oceans* Symposium**
- 9:00 am**      **Keynote Address** – William Reilly and Bob Graham (Invited)
- 10:00 am**      **Plenary 1: Planning and Preparedness Issues**  
Moderator: Richard Harris, National Public Radio (Invited)  
Panelist 1: Michael Bromwich, Bureau of Ocean Energy Management, Regulation and Enforcement (Invited)
- 11:05 am**      **Plenary 2: Best Practices – Human Errors and Reactions**  
Moderator: Ray Suarez, PBS NewsHour (Invited)
- 12:10 pm**      **Lunch**
- 1:15 pm**      **Keynote Address** – Secretary of the Navy, Ray Mabus (Invited)
- 1:50 pm**      **Plenary 3: Restoration (Impacts, research agenda, protocol for monitoring)**  
Moderator: Aaron Brown, Wide Angle, PBS (Invited)  
Panelist 1: Governor Bobby Jindal (LA)
- 2:55 pm**      **Plenary 4: Economics/Valuations**  
Moderator: Oliver Morton or Vijay Vaitheeswaran, Economist (Invited)
- 4:00 pm**      **Plenary 5: Visions for the Future**  
Moderator, Ira Flatow, Science Friday, National Public Radio (Invited)
- 5:05 pm**      **Concluding Keynote: A Vision for the Future** – Secretary Ken Salazar (Invited)

### Thursday, January 20, 2011 – Our Changing Oceans Conference

- 8:00 am**      **Registration & Continental Breakfast**  
**Opening and Introduction:** Dr. Margaret Leinen, CEO, Climate Response Fund
- 8:45 am**      **Keynote Address:** Hon. Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator
- 9:15 am**      **Plenary 1: The Changing Oceans Will Touch Our Lives No Matter Where We Live**  
Moderator: Dr. Tony Michaels, Director, Proteus Environmental Technologies, LLC
- 10:15 am**      **Plenary 2: The Carbon Challenge – More than Climate, More than Gradual Changes**  
Moderator: Dr. Margaret Leinen, CEO, Climate Response Fund
- 11:15 am**      **Plenary 3: The Changing Oceans and Human Health**  
Moderator: Dr. Rita Colwell, Distinguished Professor, University of Maryland, College Park  
Panelist 1: Dr. Linda Birnbaum, National Institute for Environmental Health and Health Sciences (Invited)  
Panelist 2: Dr. Don Anderson, Woods Hole Oceanographic Institution

**12:15 pm Lunch on your own**

**Breakout Sessions (concurrent)**

**These sessions will each develop science-based policy recommendations to improve and transform the science and management of oceans in the 21<sup>st</sup> century.** Each will involve a combination of brief opening comments from invited experts in the field and facilitated participant group discussion to develop a set of 8 – 12 recommendations to the Obama Administration, Congress, state and local government, and key stakeholders in business, non-profit organizations, and research and academic institutions. Sessions will be organized around the following topics:

**1:30**

- Oceans and carbon
- Coastal change and potential for adaptation
- Oceans and living marine ecosystems
- Oceans and human health
- Non-coastal regions & economy
- Tipping points
- White Arctic/Blue Arctic
- Exploring to understand change

**5:30**

**NCSE Lifetime Achievement Awards:**

Dr. Sylvia Earle, President, Deep Search International and Founder, Mission Blue

**6:00 pm**

**11<sup>th</sup> John H. Chafee Memorial Lecture:** Julie Packard, President, Monterey Bay Aquarium (invited)

**7:00**

**Chafee Memorial Gala Reception**

**Friday, January 21, 2011 – Our Changing Oceans Conference**

**8:00 am**

**Continental Breakfast**

**Introduction:** Hon. Richard Benedick, U.S. Ambassador (ret.), Battelle Pacific Northwest National Laboratory

**8:45 am**

**Keynote Address: Global Governance of the Oceans - the archetypical commons**

Wendy Watson-Wright, Executive Secretary, Intergovernmental Oceanographic Commission and Assistant Director General, UNESCO

**9:15 am**

**Plenary 4: The Changing Arctic Ocean – the canary for the planet**

Moderator: Andrew Revkin, New York Times

Panelist 1: Maria Otero, State Department (Invited)

Panelist 2: Dr. Robert Correll, Director, Global Change Program, Heinz Center

Panelist 3: Sheila Watt-Cloutier, former Chair, Inuit Circumpolar Council (Invited)

Panelist 4: Richard Glenn, Arctic Slope Regional Corporation (Invited)

**10:15 am**

**Symposia 1 (Concurrent Sessions)**

**These sessions are designed to provide focused discussion on critical cross-cutting topics.** Symposia are mini-plenaries comprised of presentations by 3-5 experts to provide insightful perspectives on a topical issue, followed by moderated discussion among the speakers and a question and answer and open discussion with session attendees. Sessions will be organized around the following eight themes:

- Session 1A. Oceans and carbon
- Session 2A. Coasts and adaptation
- Session 3A. Living marine ecosystems

- Session 4A. Oceans Human health
- Session 5A. Blue Economy
- Session 6A. Tipping points
- Session 7A. White Arctic/Blue Arctic
- Session 8A. Exploring to understand change

**11:45 am** **Buffet Lunch featuring Oceans 2030: Youth Outlook Contest & Awards Ceremony and Student mentoring tables**

**1:15 pm** **Symposia 2 (Concurrent Sessions)**

- Session 1B. Oceans and Carbon
- Session 2B. Coasts and adaptation
- Session 3B. Living marine ecosystems
- Session 4B. Oceans and Human health
- Session 5B. Blue Economy
- Session 6B. Tipping points
- Session 7B. White Arctic/Blue Arctic
- Session 8B. Exploring to understand change

**3:15 pm** **Plenary 5: Leveraging Our Adoration of the Sea**

- Panelist 1: Philippe Cousteau, CEO, EarthEcho International (Invited)
- Panelist 2: Ted Danson, Board Member, Oceana (Invited)
- Panelist 3: Representative Sam Farr (Invited)
- Panelist 4: San Waterston, Board Member, Oceana (Invited)

Media coverage by Ira Flatow, Host of National Public Radio's Science Friday  
National Public Radio

**4:30 pm** **Adjourn**