

## • EVENT SUMMARY •



## The Forum On Earth Observations IV

### CLIMATE, ENERGY & NATIONAL SECURITY

Meeting the Environmental  
Information Challenge

June 9, 2010  
Washington DC

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### EVENT SUMMARY

*This summary of remarks, observations and recommendations is intended as a resource for policymakers working toward a national strategy on climate, energy and national security—strategies that, ideally, are informed by the expertise and experience of government, private sector and academic experts.*



The **Forum on Earth Observations series** is a unique platform that brings together a diverse group of senior-level government, industry, academic, and non-governmental organization stakeholders to elevate the critical issues related to improving the capture and delivery of Earth and environmental information; it provides the opportunity to assess the state of U.S. and non-U.S. environmental information capabilities and trends.

**It is well documented that climate change** can greatly impact a nation's economic prosperity and national security. If left unchecked, the global impacts of climate change could lead to economic stress; conflicts over food, water and other natural resources; and mass migration—all of which can result in destabilization. In the face of increasing environmental challenges, the need for information about our changing planet has never been greater, especially information that informs national and global policies.

**The fourth in the series, the 2010 Forum** focused on the nexus of climate, energy and national security by bringing together those that develop the tools to monitor the planet with those that need and use the information to manage it. With day 51 of the Deepwater Horizon disaster as backdrop, underscoring the fragility of our environment and the ripple effects of our decisions, the Forum highlighted the need for sustained, robust, accurate and openly available environmental data.



### ENVIRONMENTAL INFORMATION FOR SOUND DECISION-MAKING

**Tom Armstrong, Ph.D.**

Senior Advisor for Climate Change  
U.S. Department of the Interior

*“Earth observations from ground-based monitoring systems, aircraft and satellites will enable and empower sound decision-making and allow us to make cost-effective and societally and environmentally sound choices for ourselves and for future generations.”*

—Dr. Tom Armstrong



Dr. Tom Armstrong is responsible for the development of the Department of the Interior's climate change-related policies, organizational elements and budget strategies, and is now heading implementation of DOI Secretarial Order No. 3289. The U.S. Department of the Interior (DOI) is a key partner in Earth observations and the monitoring of our changing planet. It is not only a collector of in situ and space-based observations, but also an end user of the data—DOI is tasked with managing 20% of the nation's territory, as well as 1.76 billion underwater acres of the U.S. outer continental shelf.

The Forum on Earth Observations was pleased to have the perspective of Dr. Tom Armstrong who attended in place of DOI Deputy Secretary Hayes, who was called away at the last moment to testify on Capitol Hill regarding Deepwater Horizon. Dr. Armstrong provided conference participants with an overview of DOI's Earth obser-

vation activities, and the importance of environmental information for sound decision-making.

Dr. Armstrong highlighted the critical importance of maintaining and enhancing the health of our ecosystems, both on land and at sea. For this, he stressed, scientific information derived from ground-based, aircraft and satellite imagery will be key for the stewardship of our nation's lands.

Dr. Armstrong went on to discuss DOI's role in providing the science, information and expertise needed to manage the nation's lands and resources in response to emerging threats to ecosystems. In particular, it is through the panorama provided by the Landsat program that DOI has been able to observe and understand the environmental changes taking place. Landsat satellites have been observing the planet since 1972—"the longest continuous global record of the Earth's surface."<sup>1</sup>

With firsthand knowledge about the value of satellite data, and the awareness that satellite data is only valuable if it can be accessed, Dr. Armstrong discussed the new pricing policy within the Department: DOI now provides data free of charge via the Internet. As a result, demand for the data and its effective use in decision support has soared, both domestically and abroad.

As an added measure, through Secretarial Order No. 3289, DOI will establish a "Climate Change Response Council within the Office of the Secretary that will execute a coordinated department-wide strategy to increase scientific understanding of and development of effective adaptive management tools to address the impacts of climate change on our natural and cultural resources."<sup>2</sup> To this effect, DOI will set up 29 multidisciplinary climate centers across the country that will monitor climate variability and change. These centers will interface with both the public and private sectors, and will, as Dr. Armstrong specified, be involved in the "design and execution of science, modeling and decision-support frameworks."

In conclusion, Dr. Armstrong stressed that DOI will continue to work to assure the continuous, long-term availability of data essential to supporting U.S. national security concerns, national and international global carbon estimates, and mitigation and adaptation strategies. He emphasized that it is only with the most comprehensive and accurate information that resources can be successfully managed in the midst of this changing climate.

1. <http://landsat.gsfc.nasa.gov/about/>

2. U.S. Department of the Interior, Order 3289, page 2.





## UNDERSTANDING AMERICA'S CLIMATE CHOICES

### The Honorable Alan Mollohan (D-WV)

*Chair, Subcommittee on Commerce, Science and Related Agencies, Committee on Appropriations, U.S. House of Representatives*

*“While we cannot postpone choices until we have complete understanding of climate and energy technologies, we must have all the information we can get to guide our decisions—individual, corporate and governmental.”*

—Congressman Alan Mollohan



**A**s congressman of a coal-producing state before recently losing his reelection bid, Congressman Alan Mollohan has been in the precarious position of having to balance the impacts of our changing climate with the economic choices that can alter the prosperity and future of constituents. As chair of the Subcommittee on Commerce, Science, and Related Agencies, Congressman Mollohan called for a study that would outline America's climate choices.

**Congressman Mollohan** spoke to conference participants about the relationship between public policy and science, and the temptation policymakers face to, as he said, “ignore science, or suppress science, or even deliberately misuse science.” Although at the table from the inception of the climate bill with the hope of moderating its impact on the coal industry, in the

end he voted against its passing. Fully cognizant of the reality of climate change and the dangers it poses, as the policymaker of a coal state, his evaluation in the end had to factor whether the proposed solution was effective and realistic, and regionally equitable. He candidly admitted that “the politics of climate change lags the science.”

Despite his vote, Congressman Mollohan acknowledged that “we face critical choices on energy and climate—both will affect our national security for decades to come and both are intimately connected to our economic prosperity. While we cannot postpone choices until we have complete understanding of climate and energy technologies, we must have all the information we can get to guide our decisions—individual, corporate and governmental.”

It is with this in mind that Congressman Mollohan, through the Subcommittee on Commerce, Science and Related Agencies, funded and commissioned the America's Climate Choices study by the National Academies of Science. Because, as he said, action is needed, but only good information can guide good decisions.

Although a climate bill has yet to be passed, Congressman Mollohan did highlight several FY10 funding achievements:

- \$1.4 billion to NASA's overall Earth science program—this increase in funding will speed up the launch of two of the decadal missions by two years;
- \$2.4 billion for NOAA's National Environmental Satellite, Data and Information Service (NESDIS), which would allow NOAA to proceed as quickly as possible to prepare its Joint Polar Satellite System for a 2014 launch, without infringing on the funding of the geostationary satellites;
- \$25 million to the Economic Development Administration for climate change mitigation; and,
- \$14 million to the National Science Foundation (NSF) to begin the Ocean Observatories Initiative—also to include increased funding for R&D and the National Ecological Observatory Network (NEON).

In closing, Congressman Mollohan reminded participants that while the current economic environment is not without its challenges, the increases in observations, monitoring, and research and development show an awareness and commitment to the importance of understanding our changing planet.





### GLOBAL CHANGE, GLOBAL OPPORTUNITIES

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#### Jigar Shah

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CEO, Carbon War Room  
Founder and CEO, SunEdison

*“The vast majority of people are not data driven. ...It’s always some sort of visual perception that people take, some sort of childhood memory that they take to actually use to help make their decisions. We have to recognize that ...instead of trying to figure out how we actually convert everyone into a scientist.”*

—Jigar Shah, Carbon War Room



As an expert on energy project finance and working with entrenched stakeholders to embrace energy technology, Mr. Jigar Shah works with other entrepreneurs, policymakers and investors around the world to implement solutions that promote prosperity in a low-carbon economy. He is currently CEO of the Carbon War Room, a global nonprofit that works sector by sector to help eliminate the barriers to what he terms “logical decision-making” so that entrepreneurs can be successful.

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**The Carbon Warm Room (CWR)** was co-founded by Sir Richard Branson, who as Mr. Shah explained, believes that 50% of all global carbon emissions can be profitably offset with today’s technology. The goal: to harness the power of

entrepreneurs and entrepreneurial thinking to unlock market-driven solutions to climate change by focusing on incremental costs with an economic argument to get businesses to change their behaviors. To illustrate this, Mr. Shaw gave an anecdotal example of a recent CWR project—shipping fuel usage and how carbon offsets can be the next greatest economic opportunity:

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*The shipping industry has seen great technological advancements in the last 35–40 years (e.g., low-friction paint, upgraded propeller designs, etc.). However, there has been no mechanism in place that forces the implementation of these advancements. In addition, there had never been a miles-per-gallon rating on ships; there was no public data on fuel efficiency for ships. With the aid of GPS, CWR was able to successfully rate the miles-per-gallon on ships. This information was then brought to companies that depend on shipping (e.g., Walmart).*

*By choosing fuel-efficient ships, companies can save millions on fuel costs that are passed on to them. Ships that don’t make the upgrades to maximize the miles-per-gallon get less business. Mr. Shah went on to explain that this information was then brought to the banking sector, allowing banks to make more profitable purchases by choosing ships with lower fuel costs. By changing the economics of shipping fuel costs, CWR was able to alter purchasing power and industry behavior, and, as Mr. Shah pointed out, realize a successful market-driven solution without need for a federal law.*

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Mr. Shah went on to say that while the majority of people are aware of the impact of climate change, the real challenge is translating that knowledge to action. The average person is not data driven, he argued, and therefore communicating the facts in ways that prompt actions with long-term, positive impacts on the climate will take time and persistence. We, as a global population, need to be challenged to be the best that we can be, he said.



## NEW DEMANDS FOR ENVIRONMENTAL INFORMATION

### Monica Medina

*Principal Deputy Undersecretary for Oceans and Atmosphere, NOAA, U.S. Department of Commerce*

*"In whatever way we progress forward toward clean energy, it's certain that Earth observations, and the useful products and services that support an energy strategy, will be essential."*

—Monica Medina, U.S. Department of Commerce



Throughout her career, which has included positions with the Pew Environment Group, the U.S. Office of the International Fund for Animal Welfare, the Clinton administration and on Capitol Hill, Ms. Monica Medina has seen the systematic increase in demand for environmental information as new information gathering and technology solutions have created a more diverse base of end users.

**Ms. Medina** told conference participants that with the tragedy in the Gulf, NOAA was feverishly harnessing all of its efforts to inform and educate the government's response to the oil spill. She mentioned that this disaster might just be the catalyst needed to make lasting changes in our country and the way the nation thinks about energy.

In this new century there will be two emerging challenges, according to Ms. Medina: "ensuring that greenhouse gas (GHG) management strategies yield their anticipated results; and ensuring

maximum efficiency of the renewable energy strategies that we employ over the long term." But, how will we know if the efforts are successful? Are concentrations declining or increasing? As she stressed, monitoring and verification are the key to decisions and strategies that will have long-lasting impact. An annual report from NOAA shows that in the past several decades, GHG in the atmosphere continues to increase exponentially.



Monica Medina, NOAA; Nancy Colleton, IGES; and Jigar Shah, CWR.

As the situation continues to worsen, Ms. Medina stressed, if NOAA is to provide the kind of information that is required to successfully reduce emissions, manage offsets, participate in carbon trading, and promote and manage energy investments, then the information must be available on a regional level, and must be accurate and verifiable since critical decisions, with critical consequences, will be made on the basis of this information.

The challenge as she sees it, however, is to not only provide the most useful information, but to also ensure that users (the public, businesses, policymakers, state and local governments, etc.) can locate, access and understand the data in a timely manner. With this in mind, as Ms. Medina explained, NOAA is working to establish a Climate Service within NOAA that will serve as a resource for an increasingly diverse end user community that depends on climate change information for decision-making.

Ms. Medina strongly advocated for regional-scale data that is accurate, reliable and allows for regional strategies, such as NOAA's Carbon Tracker, released a few years ago and now used as the metric against which all other standards are compared. She concluded that NOAA is looking forward to working with its partners to help bring analyses and information to policy-relevant levels.







PANEL 1

**Responding to the Urgency of Climate Change—The New Information Demands and the Melting Arctic**

**A** rapidly changing Arctic has immediate implications, which are becoming increasingly more pronounced. With new passages opening, and new access to resources, the geopolitical pressures resulting from climate change in the Arctic cannot be ignored. The sense of urgency for data, diplomacy and cooperation has never been greater. In addition, the Deepwater Horizon disaster highlights the fragility of our environment and the short- and long-term consequences if not better managed and carefully monitored.



*“The Arctic presents growing environmental, security and economic challenges for the 21st century. As we shape a security strategy for this era, we need to be mindful of both the challenges and opportunities of a changing Arctic and ensure that national actions are consistent with enhancing international security and protecting this fragile ecosystem. Having better information and observations about the Arctic to guide future decision-making is essential.”*

—Sherri Goodman, CNA

This panel of experts provided not only a geopolitical overview of the implications of a melting Arctic, but also stressed some key points important to managing this new frontier. Moder-

ated by Sherri Goodman, senior vice president, general counsel and board secretary of CNA, panelists included:



- **Julie Gourley**, Senior Arctic Official of the United States, Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Department of State
- **Robert Huebert, Ph.D.**, Associate Professor, Department of Political Science, and Associate Director, The Centre for Military and Strategic Studies, University of Calgary
- **Martin Jeffries, Ph.D.**, Program Director, Arctic Observing Network, Division of Arctic Sciences, Office of Polar Programs, National Science Foundation
- **Rear Admiral David W. Titley, Ph.D.**, Oceanographer and Navigator of the Navy; Director, Task Force Climate Change, U.S. Navy

**PANEL RECOMMENDATIONS AND OBSERVATIONS**

- **Understanding the Arctic.** The Arctic is not a vacuum, isolated from the rest of the world. It has a significant influence on the rest of the globe, and the opposite is true as well; it is significantly influenced by processes occurring outside the Arctic. By having a better understanding of the Arctic environmental system, we’re in a better position to predict future changes in the system and what the consequences of those changes might be, both regionally and globally.
- **Data Availability.** Making data more freely and openly available is going to lead to better science, better research, better understanding, and ultimately to better policy decisions. Without adequate observations, it is impossible to pursue scientific research into the Arctic’s environmental system changes.
- **Observations Are Vital.** Long-term, science-driven observations are vital for research. The Arctic is a very data-sparse region, and





Shaw Thacher, C2C News Services; and Wayne Chen, WT Chen and Company.



the changes taking place are happening much more quickly than policymakers and decision-makers are able to respond.

■ **Modeling to Manage.** Improvements in modeling will help to better understand the Arctic's complex system, including how the physical, the biological and the human systems work, and how they couple with the rest of the globe. By better understanding the systems through computer modeling and other forms of scientific research, the causes of those changes that are occurring can be identified, and effective adaptation and mitigation strategies can be proposed and implemented. The Navy, Air Force, NOAA and DOE are very interested in designing the 21st-century, next-generation forecasting system. That forecasting system must include observations and modeling.

■ **UN Convention on the Law of the Sea.** The Arctic is not only an environmental concern;

it is a strategic challenge. The geopolitical transformation becomes even more complicated when it interfaces with science. The opening of passages combined with expectations of great economic wealth has led to a growing geopolitical shift within the Arctic region in the last five to seven years. In this geopolitical theater, the U.S. must ratify the UN Convention on the Law of the Sea. It is still the principal international legal instrument that all the Arctic countries see as the central agency for ensuring a peaceful development of relations. As long as the U.S. remains outside the Convention, there will be serious geopolitical problems.

■ **Strengthening the Council.** Driven by the effects of climate change, the geopolitical pressures in the Arctic are increasing at a faster rate than anticipated. The cooperation and effectiveness of the Arctic Council have never been more important; the Council needs to be strengthened to better support these growing global pressures. It needs to find better ways to integrate the recommendations that come out of assessments into the domestic policies of the member countries. It has to better integrate science with policy.

■ **Combating Skepticism.** Having credible inter-annual, seasonal and decadal forecasts is an effective way to combat skepticism. Graphically depicting climate as a smooth, upward slanting line opens up the climate community to unnecessary criticism. Varied forecasts will demonstrate the intricacies of climate patterns and restore public faith in forecasts, eliminating distracting debates that impede progress.

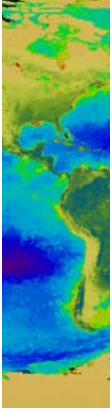


*“The Arctic is a strategic challenge. And, while it’s sometimes easy to kick strategic challenges down the road, when you do that, they frequently turn into crises. When they turn into crises you tend to both get the wrong answer and spend a hell of a lot of money in doing so. The time to act is now.”*

— Rear Admiral David Titley, U.S. Navy







## PANEL 2

### Monitoring Carbon

Accurate monitoring of carbon and other greenhouse gases, potentially through an integrated global climate monitoring and information system, is critical to managing and adapting to climate change, and key to any domestic or international limitations on emissions or carbon trading system. The demand for information on carbon is likely to increase dramatically, and likely to come from an increasingly diverse set of users, from both the public and private sectors, that depend on the data for strategic, political and economic decisions.



*“We have short-circuited the Earth’s geological carbon cycle by burning millions of years of stored carbon in just a few hundred years, and we’re rapidly heating our planet as a result.”*

—Phil DeCola, Sigma Space Corporation

This panel of experts, which included both government and private sector representatives, looked at carbon monitoring and the increasing demand for accurate and timely carbon data. Moderated by **Dr. Phil DeCola**, chief science officer, Sigma Space Corporation, panelists included:

- **David J. Dean, Ph.D.**, Senior Advisor, Office of the Undersecretary for Science, Department of Energy
- **Jack A. Kaye, Ph.D.**, Associate Director for Research, Earth Science Division, Science Mission Directorate, NASA

- **Ralph Keeling, Ph.D.**, Director, CO<sub>2</sub> Program, Scripps Institution of Oceanography
- **Michael Woelk**, President and Chief Executive Officer, Picarro



### PANEL RECOMMENDATIONS AND OBSERVATIONS

■ **Science, Research, and Monitoring are Interdependent.** When the science itself, or the product to society, hinges on something changing over decades, a clear distinction between routine monitoring and science/research cannot be made; they need to be part of an integral package in order to effectively understand long-term measurements. Monitoring, verification methodology, and policy and program development are interdependent and therefore must be approached holistically. Many tools are available—nearly all are necessary, but none alone are sufficient.

■ **First Steps Toward a Carbon Information System: Requirements and Design.** In order to determine the requirements for a carbon information system, we must first define and answer well-posed questions such as: 1) What policy is being considered? 2) What action is being proposed and what data is needed to decide on and implement the action? and 3) What is an acceptable level of uncertainty for the information being delivered? With that in mind, the U.S. government should establish a sustained interagency task force charged with requirement definition and optimal design of a carbon information system (with scientific steering provided by USGCRP). The task force should include systems engineers, physical scientists, social scientists and decision-makers, and should engage end users.

■ **Pilot Projects.** Implement a suite of focused interagency-supported and high-payoff pilot projects on several core thrusts that are





Phil Ardanuy and Don Blick, Raytheon.



Melinda Marquis, NOAA.

aligned with elements of a carbon information system defined by sectors and regions. These pilot projects should explore the implications of the relative mix of observations and models, spatial and temporal resolution, coverage and acceptable levels of uncertainty. One such project might focus on the synthesis of data, models and the evaluation of inventories, and reconciling the differences among them—which is important for long-term capital markets.

■ **Observations Are Vital.** One key aspect remains undisputed: observations are key to monitoring and verification. Without data on a national, regional and international basis, it is impossible to confirm compliance or assess mitigation and adaptation strategies. A carbon flux monitoring system would be similar to existing weather services, both using surface- and space-based observations, and forward and inverse models for forecast and reanalysis. This only addresses carbon fluxes—carbon stocks (e.g., offsets) are related but separate. Measuring biosphere parameters (biomass, NPP), other gases, (CO, etc), and isotopic ratios ( $^{14}\text{C}/\text{C}$ )

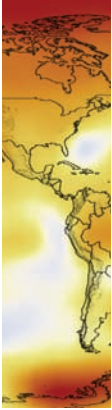
will be needed to decouple anthropogenic from natural activity. Maintaining existing observation assets and timely deployment of planned assets are essential to avoiding gaps between the amount, types, resolution and accuracy of available data compared to what is required by end users.

- **Private Sector Involvement.** Something as complex as climate change will require not only complex solutions, but the collective brain trust of public and private entities. The private sector is going to have to dive in, in the right places, in the right ways. In addition, as the price of carbon increases, the demand for finer accounting of emissions will come into play and probably drive some point sources to use continuous emissions monitors—because it will be in their financial interest to do so. (As soon as carbon emissions have a price tag, private industry will have a direct stake in accurate accounting, because it will influence the bottom line.)
- **Government Infrastructure Stability.** The private sector needs for there to be legal and policy framework stability—currently lacking and in much demand—that creates the appropriate business environment for long-term investment.
- **Geospatially-Resolved Information.** Geospatially-resolved observations are needed to track emissions from “hot” spots—or regions out of compliance with regulations or treaties. The observing system should allow resolving emissions locally, regionally, and internationally. Knowing which parts of the world are not in compliance allows for entities to focus their assets on that particular region/problem. Within the U.S., for example, such capability would be critical to an agency such as EPA.



Rear Admiral David Titley, U.S. Navy; and Ron Birk, Northrop Grumann.





PANEL 3

**Supporting a Broader U.S. Climate and Energy Strategy**

**O**ur changing environment is increasingly constraining the natural resources available. Energy demands and climate changes are likely heading toward an irreversible tipping point. A national, broad climate and energy policy must be examined to better navigate the future.



A panel of experts was convened to look at the challenges posed by climate change and evolving energy demands to our way of life, the implications for national security and a way forward. Moderated by **Dr. Jim Lewis**, director and senior fellow, Technology and Public Policy Programs at CSIS, panelists included:

- **Jim Ludes, Ph.D.**, Executive Director, American Security Project (ASP)
- **Melinda C. Marquis, Ph.D.**, Renewable Energy Project Manager, Earth Systems Research Laboratory, NOAA
- **Neil E. Rondorf**, Vice President, Maritime Renewables, Science Applications International Corporation (SAIC)
- **T.W. Scott**, Vice President, Mission Operations and Services, Raytheon Intelligence and Information Systems
- **Compton (Jim) Tucker, Ph.D.**, Co-Chair, Observations Working Group, U.S. Global Change Research Program



**PANEL RECOMMENDATIONS AND OBSERVATIONS**

- **The Future Is Innovation.** It is currently estimated that to meet the projected global energy demands in the next 50 years, one nuclear power plant will have to be built every single day. While energy efficiency and conservation efforts could reduce U.S. emissions 50% by 2030, adaptation alone is not enough. A move toward innovative approaches will be needed to meet the increasing demand.
- **Cultural, Political and Economic Shift.** In the U.S., energy is an artificially controlled commodity. Renewable energy alternatives cannot effectively compete on cost with the current commodities-based system, which makes it difficult to bring new technologies into that environment. In order to take advantage of renewable technologies in the U.S., there needs to be a cultural, policy and economic shift. A range of new policies to encourage the development of renewable energy must be put in place, and technological advances are required to match the current distribution, demand and supply structures.
- **The Enterprise Approach.** Climate and energy are not being dealt with on an enterprise level in the U.S. There is no scientifically based, operational system to support the development and verification of proposed climate policies and alternatives. How can one verify if these alternatives are working? How can one ascertain if the efforts are doing more harm than good? This chain model is only as strong as its weakest link. All the links must be adequately addressed: observations,





models, decision support, governance, socio-economic impacts, and finally our individual actions (adaptation and mitigation).

- **Observations Are Key.** With respect to climate, the paradigm must be one of research *and* operations because climate requires consistent observational data over tens of years, and it requires many scientists working together in a public, private and academic partnership to make sure that observations are accurate. The usefulness of climate research often depends on being able to zoom into national and regional levels; in some cases there is no substitute for high-resolution commercial satellite data. Observations must be continued for many purposes, but especially in terms of our national security and how it is linked to climate.
- **Partnerships.** Industry must be part of the solution. Efforts must include industry's best practices to operationally focus the Earth observations community toward incrementally improving the response to environmental problems.
- **Political Will and National Strategy.** In the U.S. today, neither the resources nor the policies are in place to facilitate a cohesive, strategic, innovative way forward. What this nation lacks is the political will and the decision process to say 'we are going to solve this problem!' Instead, industry goes one way and different agencies follow their own paths. The knowledge, skills and expertise that exist in the U.S. must be tapped, with all efforts pointing in the same or complementary direction.
- **National Climate Service.** The idea of a centralized entity, a national climate service, to coordinate the various, disparate efforts taking place throughout the country is the most ideal approach to managing the problems associated with climate change and energy. This entity would have a defined mission, and would be held accountable and tasked to operationalize the problem of climate coordination, manage and coordinate the data, and create a national strategy.
- **A Matter of National Security.** The effects of climate change are not just an environmental problem. The environmental and economic impacts are arguably the principal national security challenge facing the U.S. today.

## MOVING FORWARD WITH NATIONAL PRIORITIES



Morgan



Ohlemacher

Alliance members **Steve Moran**, director of business development, Space and Environmental Mission Solutions for Raytheon Intelligence and Information Systems, and **Richard Ohlemacher**, manager, Aerospace Civil Systems, Northrop Grumman, provided some brief remarks on the growth and evolution of the Alliance for Earth Observations from its inception to today's broad and diverse membership. They concluded with these key summary points from the day's program:

**Observations are key to modeling, management and adaptation strategies.** They are an essential component to climate change solutions and must be robust, accurate and openly available.

**To date there have been insurmountable challenges at the nexus of politics and science.** This crossroads must be better managed in order to successfully balance the political and economic implications of decisions on climate.

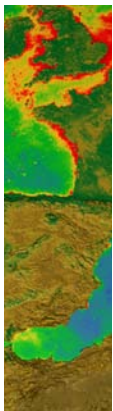
**The Arctic is not just an environmental concern;** it is a geopolitical and strategic challenge that cannot be ignored.

**Climate change must be addressed holistically.** The Earth observations chain is only as strong as its weakest link; therefore all links must be addressed and strengthened. An enterprise approach is key.

**Climate change cannot be solved or managed in a vacuum;** it will require public-private partnerships to come up with the best and most efficient solutions.

**A balance between measuring and monitoring for science/research** and for applicable approaches like commodities trading must be achieved. Observations must be aligned with inventory.





## WELCOME REMARKS AND INTRODUCTIONS

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### Raymond (Ray) L. Kolibaba

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*Vice President, Civil Strategic Initiatives  
Northrop Grumman*



Mr. Ray Kolibaba, a former U.S. Air Force satellite and acquisitions officer, is well-known throughout the information systems (IS) community having held high-level positions at such companies as the Geodynamics Corporation and Raytheon, where he served as vice president of Space Systems. At Northrop Grumman since 2006, Mr. Kolibaba continues to focus on understanding the needs of the company's customers and maintaining valuable partnerships with those customers.

Ray Kolibaba provided brief welcome remarks to the attendees of the fourth Forum on Earth Observations™, and noted that Northrop Grumman was not only a founding member of the Alliance, but also proud to be a sponsor of this important event. Mr. Kolibaba explained that Northrop Grumman's corporate philosophy is that climate and energy are far more than just environmental concerns—they are key to our national security and, as such, Northrop Grumman stands ready to tackle the challenges they pose.

He outlined a number of steps taken by the company that illustrate its commitment to making a difference and to raising climate change awareness and visibility.

Mr. Kolibaba also explained that how data is processed and translated into actionable information is just as important as how much data is collected. In his estimation we are “data rich but information poor.”<sup>1</sup> Apart from the need to have open data, it needs to be converted into models that address the most pressing climate issues. Most importantly, he stressed that “climate change will not be solved behind closed doors.”<sup>2</sup> Rather, he said, a complex problem like climate change will require strong collaboration and partnerships among the private sector, academia and government, and that Northrop Grumman is prepared to play a key role in climate change solutions.



## SPEAKER

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### Wouter J. Veening

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*Co-Founder and President  
Institute for Environmental Security  
(The Hague, Brussels)*

Mr. Wouter Veening, who also serves as the chairman of the Environment and Security Working Group of the IUCN Commission on Education and Communication (CEC), has had a long, distinguished career dealing with the importance of biodiversity conservation in development assistance programs.

1-2. Speaking remarks, Ray Kolibaba, Forum on Earth Observations IV.



He currently focuses on the policy and legal responses to the security risks resulting from environmental degradation around the world—factors which inhibit the conditions for peace and sustainable development.



Mr. Veening's remarks provided Forum participants with a European perspective on climate change. While both Europeans and Americans understand that climate change must be addressed, there are marked differences in the approaches each takes. For example, Europeans see the need for binding, international agreements that will help to protect the biosphere; they think of the Earth as a global public good. Americans are more apprehensive about entering into binding agreements and put "blind faith," as he called it, into solving the problem through technology, focusing less on the need to change behaviors. He recounted the comment made by President Bush Sr. at the 1992 UN Conference in Rio where he stated: "The American way of life is not up for negotiation."

These different approaches are also evident in the way treaties are seen and ratified. In Europe the Member States first ratify the treaty, then implement it through national (or EU) legislation. In the U.S., domestic legislation must first be in place before signing on to an international treaty. Nonetheless, Mr. Veening said he found the predominant view among Forum participants was that the U.S. should ratify the Convention of the Law of the Sea—an issue raised during a Forum panel on the Arctic—and that he hoped that message will be communicated

to the Administration for action. He said he hoped the same will be done for the Convention on Biological Diversity—especially as this year (2010) is the International Year of Biodiversity.

Mr. Veening also made note of the U.S. leadership's forward thinking in linking climate change and national (and global) security, as reflected in the CNA report of April 2007, "National Security and the Threat of Climate Change." Many other publications since have discussed this important point, which has influenced the European perspective. As Mr. Veening explained, this linkage is of great interest to his Institute for Environmental Security, which has been in discussions with NATO to make this a featured point in NATO's New Strategic Concept.

Mr. Veening also explained that he saw the Copenhagen Accord not as a failure, but as a small success. Although not legally binding, it does reflect a global consensus that the average rise in global temperature should be limited to below two degrees Celsius, and potentially to below 1.5 degrees. The Copenhagen Accord also agreed to assist developing countries with getting on a sustainable energy path, and in dealing with the inevitable global impacts of climate change.

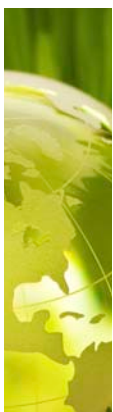


Despite their differences, one thing does unite both Europe and the U.S. when it comes to climate change—the need for critical data, or as Mr. Veening referred to it, "satellite-based intelligence." He went on to say that the importance of observations must continue to be articulated to policy makers. In conclusion, Mr. Veening urged that "the worlds of science, politics and education have to be brought together," and said he was pleased to have participated in an event such as the Forum that plays a pivotal role in ongoing discussions toward climate change solutions.





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## Scenes from Forum IV



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This report was written and edited by Judith Carrodegua and Dan Stillman.

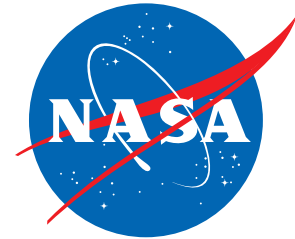
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