



National Leadership Summit on Natural Resources & Climate Change

Discussion Group Topics

Group 1: Forest and Agricultural Lands

Chair: William Hohenstein, Director, Global Change Program Office, U.S. Department of Agriculture

Efforts to reduce greenhouse gas emissions and U.S. dependence on imported oil will put new pressures on forest and agricultural lands to serve as carbon sinks and to provide bioenergy feedstocks. At the same time, global warming and its effects on water resources may change where agriculture is most productive and how farm and forest lands should be managed.

One example: Researchers led by the Scripps Institute have reported that climate change is the most important factor behind a four-fold increase in the average number of large wildfires in the Western United States since 1970. The average fire season has grown more than two months longer, while fires have become more frequent, longer-burning and harder to extinguish, destroying 6.5 times more land than in the 1970s.

What contribution can forests and farmland make to sequestering greenhouse gas emissions and reducing them by replacing fossil fuels with biofuels? The Princeton University Carbon Mitigation Initiative (CMI) has identified several "wedges", or areas of existing technology, that if intensively employed could each result in 1 billion tons per year of greenhouse gas emission reductions by 2055. Seven wedges could stabilize the global climate.

The CMI estimates that to achieve one wedge, bioenergy crops would require 1/6th of the world's cropland. "Bioengineering to increase the efficiency of plant photosynthesis and use of crop residues could reduce that land demand," CMI researchers conclude, "but large-scale production of plant-based biofuels will always be a land-intensive proposition."

Using forests and farmland as carbon sinks could each achieve another wedge, the CMI team estimates, but that strategy also is constrained by land area. "For example, halting

global deforestation and increasing the current rate of forest planting by a factor of 2 would only store enough carbon to provide one wedge of the stabilization triangle," the CMI team says. "Similarly, conservation tillage would have to be used on all soils worldwide to cut emissions by one wedge."

Question 1: It is December 2008. The President-elect asks you to recommend changes in federal policies, programs and regulations that will lead to more effective management and conservation of forests and farmland, given the most likely impacts of climate change. What are your top 3-5 recommendations?

Question 2: Congress is considering legislation to establish market mechanisms that encourage the use of agricultural and forest lands as carbon sinks by making it more profitable to store carbon than to harvest trees. How can this market best function? How can sequestration be verified?

Question 3: The Farm Bill is expected to come up soon for reauthorization. What proposals should Congress consider to ensure that the Bill adequately addresses the role of agriculture in climate stabilization?

Question 4: What specific actions should we take to improve collaboration between the many agencies and organizations working on forest and farmland issues related to climate change?

Group 2: Biodiversity and Wildlife Habitat

Chair: Barry Gold, Director of the Marine Conservation Program, Gordon and Betty Moore Foundation

In July, 2006, 19 leading specialists declared that the Earth is on the brink of a "major biodiversity crisis" with the destruction of ecosystems and climate change causing species to die out 100 to 1,000 times faster than the natural rate. Climate change alone is expected to bring 15-36% of species to the brink of extinction within the next 50 years, the specialists said. They called for the creation of a new international science panel to recommend solutions, including action by governments.

James Hansen, Director of the NASA Goddard Institute for Space Studies, reports:

During the past 30 years the lines marking the regions in which a given average temperature prevails ("isotherms") have been moving poleward at a rate of about 35 miles per decade. That is the size of a county in Iowa. Each decade the range of a given species is moving one row of counties northward...If we continue on this path, a large fraction of the species on Earth, as many as 50 percent or more, may become extinct.

The marine ecosystem also is at risk. The Marine Conservation Program at the Gordon and Betty Moore Foundation notes that more than 90% of Earth's living biomass is in the oceans and more than a billion people rely on fish as their main protein source.

"Coral bleaching, rising sea levels, changing species distributions — global warming and climate change already have a marked affect on the oceans," reports the World Wildlife Fund. "Strategies are needed to deal with these phenomena and to reduce other pressures on marine habitats already stressed by rising water temperatures and levels."

Question 1: It is December 2008. The President-elect asks you to recommend changes in federal policies, programs and regulations that will lead to more effective protection of the nation's biodiversity and wildlife habitat, given the most likely impacts of climate change. What are your top 3-5 recommendations?

Question 2: Congress is considering a bill to provide States with funds for mitigating the impacts of climate change on wildlife habitat. The bill contains no specific guidance to States on what actions are needed. How should States put these funds to best use?

Question 3: What specific actions should we take to increase collaboration between the many organizations working on habitat and biodiversity issues related to climate change?

Group 3: Water Resources

Chair: Mark Schaefer, CEO, Global Environment and Technology Foundation

Climatologists predict substantial changes in precipitation patterns in the United States as a result of climate change, ranging from reduced snow pack and increased drought in some regions, to excessive rainfall and severe storms in others. For example, the California Department of Water Resources reports that the mathematical modeling of four scenarios showed that climate change could significantly impact that State's water situation in many ways, including:

- More rain and less snow, impacting the reliability of water supplies reliability and hydropower generation;
- More variable precipitation and extreme weather events, such as floods and droughts - the latter resulting in more energy-intensive groundwater pumping
- Rising sea levels that would increase pressure on Delta levees and compound saltwater intrusion into Delta water supplies and coastal aquifers
- Higher water temperatures, possibly affecting listed fish species;

"In spite of the politics, we are seeing the wide acceptance of the notion that something is changing with the weather," says Paul Brown, President of the Public Services Group at CDM. "What are the implications on our engineered (water) systems? The public looks to us to rise to the occasion — not necessarily with bigger and bolder structural solutions

(although these are no doubt part of the answer) but with fundamental re-thinking of the relationships between human settlements and natural ecosystems — a challenge beyond any we have undertaken to date"

Changing precipitation patterns may also have a significant impact on water-related recreational industries. In Colorado, for example, where the ski industry provides more than 3,000 jobs and \$2 billion annually in revenue, several major ski companies are purchasing wind power and other clean energy resources to do their part in minimizing climate changes that are predicted to reduce the region's snowfall.

Question 1: It is December 2008. The President-elect asks you to recommend changes in federal policies, programs and regulations that will lead to more effective management of the nation's water resources, given the most likely impacts of climate change. What are your top 3-5 recommendations?

Question 2: What specific changes are needed in land use and urban water infrastructure to prepare for and adapt to the combined impacts of growth and global warming on water resources?

Question 3: Identify 3-5 policies, programs and/or market mechanisms that should be established or modified at the state and local levels to help water developers and managers make these adjustments.

Group 4: Making Sustainable Choices

Chair: John Holdren, President of the American Association for the Advancement of Science; Director of the Woods Hole Research Center; Teresa and John Heinz Professor of Environmental Policy and Director of the Program on Science, Technology and Public Policy at the Kennedy School of Government, Harvard University.

One of the challenges of climate protection is to ensure that our responses don't undermine the nation's sustainability by prolonging or creating new damage to the economy, the environment or our quality of life.

For example, clean coal technology is cited as a way to reduce carbon emissions, but legitimate concerns remain about the impacts of coal mining on the land. Joe Lovett of the Appalachian Center notes that mountaintop removal for coal extraction has buried more than 1,200 miles of previously free-flowing streams and caused the loss of more than 1 million acres of hardwood forests. Yet 150 new coal-fired power plants have been proposed by U.S. energy companies, prospectively increasing the country's demand for coal by 30 percent.

Capturing methane from landfills is one way to reduce greenhouse gas emissions while providing a new source of energy — a dual benefit. But landfills raise issues about land use, groundwater contamination, etc. Would it be better to reduce, or virtually eliminate the need for landfills, with better recycling programs and waste-to-energy technologies?

The push to produce energy from ethanol and other farm-based crops and wastes will help the United States reduce both greenhouse gas emissions and our dependence on imported oil, while creating new income for farmers and rural areas. But it is in the long-term interest of the country to ensure that bio-farming is done in ways that protect the land and are consistent with the principles of sustainable agriculture.

In traditional cost-benefit analysis, many sustainable options are undervalued because their benefits are difficult to quantify, while the costs of unsustainable options often are externalized. Life-cycle costing and full-cost accounting are improvements on past practice, but they remain handicapped by the same factors.

In one attempt to quantify the value of natural resources, the Millennium Ecological Assessment identified an array of "ecosystem services" that natural systems provide to support human well-being. According to the World Health Organization, approximately 60% of the benefits that the global ecosystem provides to support life on Earth (such as fresh water, clean air and a relatively stable climate) are being degraded or used unsustainably. Scientists warn that harmful consequences of this degradation to human health are already being felt and could grow significantly worse over the next 50 years, in part as a result of climate change.

Is the need to stabilize the climate so urgent that we should employ all options without regard to sustainability? If not, how should we "score" our options to identify those that produce the most timely climate benefits with the fewest undesirable consequences?

Question 1: It is February 2009. The President is preparing an aggressive Federal response to climate change. During the campaign, the President pledged to the public that he/she would choose Federal actions that produce the highest reductions in greenhouse gas emissions with lowest net costs to the nation's environment, economy, security, social equity and other factors critical to our long-term sustainability. The President appoints all of you to a Special Task Force to recommend a way to "score" Federal action options based on their net impact on the nation's welfare. What existing or new "scoring" tools do you recommend to help the President prioritize the Administration's efforts?

Question 2: What criteria should all sectors of U.S. society – government, businesses, investors, etc. – use to prioritize their options for responding to climate change?

Question 3: What new collaborations are needed, within the U.S. and within the international community, to identify, promote and implement the most sustainable approaches to climate stabilization and adaptation?