



Public Lands Foundation

Climate Change and the National System of Public Lands

Executive Summary

The preponderance of evidence indicates that significant changes in climate are occurring. However, the causes of these changes and what changes should be made in public land management are less clear and there are still many questions remaining to be answered.

Whether climate changes are human-influenced or natural, the Bureau of Land Management's (BLM) focus should be to understand the impacts of climate change and to manage these impacts by continuing and expanding the implementation of adaptive management practices on the National System of Public Lands. More needs to be done to re-establish baselines for judging changes in natural resource conditions; ensure collaborative, continuous, scientifically valid monitoring; obtain the tools, training and authorities needed to address impacts of changes in natural resource conditions; increase cooperation among agencies, states, counties, public land users and organizations; and manage using a "whole system approach."

Background

At the 22nd Annual Meeting of the Public Lands Foundation (PLF) in September 2009, PLF invited representatives of government agencies, conservation organizations, and the energy industry to Billings, Montana to discuss the implications of climate change on the National System of Public Lands. Speakers and panelists presented a variety of climate change evidence and recommendations.

From these presentations, it is clear that we are in a period of significant climate change and the warming of the Earth's climate system is unequivocal as is now evident from observations of global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.

Studies indicate that in the western United States, the wet areas are getting wetter and the dry areas are getting dryer. It is getting warmer and getting warmer faster. More precipitation is coming as rain, peak flows occur earlier in the year, and there is less snow pack. This means that the snow pack water supply, which much of the western United States has depended on for much of the last century, is being diminished. More rain and less snow cause more frequent winter floods and more wildfires cause more sediment in the streams, both resulting in destruction of stream habitat. There will be "up in elevation and northward" shifts of many species. There will be changes in forest

composition, and mismatches between plants and migrating species. And, we can anticipate mega-droughts, longer fire seasons and species extirpations.

It is estimated that with each one degree Centigrade average annual increase in air temperature, a 12 percent loss in sagebrush habitat will occur. Impacts of climate change on wildlife include changes in distribution, loss of species, gains in species, changes in behavior and changes in survival.

Climate change will alter seasonal events for outdoor recreational users. Higher temperatures will increase recreation use in the Spring and Fall. Increased wildfires and camping restrictions will impact camping. Changes in forest cover and wildlife habitat will reduce wildlife viewing opportunities. Lower stream flows will reduce fishing and water sports. And, decreased snowfall and snow seasons will cause loss of jobs and property values in communities dependent on winter sports.

The effect of climate change on wildlife habitat, combined with the requirements of the Endangered Species Act, could cause major and indirect impacts on where and how mineral resources can be developed. Habitat for sage grouse, pika and raptors were cited as examples.

What is not so clear is why the Earth's climate system is warming. Climate changes have been cyclic. Some ice core data show that atmospheric increases in carbon dioxide (CO₂) occur after climate warming, rather than before, indicating that greenhouse gases may be the result, rather than the cause of climate change. Most research, however, supports the idea that warming has a man-made component. For example, there is a strong correlation between increasing CO₂ levels in the atmosphere and increases in global temperatures. Existing carbon sinks (oil and gas fields, coal, tar sands, forests) have been exploited for energy production, releasing carbon into the atmosphere.

Surveys of land management agency employees indicate that, while most recognize that something is happening, they do not know what is causing it, and climate change is not real to many people.

Climate change, regardless of the causes, is having and will have impacts on the public lands and resources that must be taken into account in plans, actions and decisions about these lands and their uses. This requires adaptive management—the scientific approach to flexible natural resources management—and adaptive management requires monitoring, which, to be effective and efficient, must be coordinated and cooperatively carried out on a regular basis by federal and state agencies and other public and private interests. Areas of particular importance include wildland fire management; vegetative changes, including invasive species; non-renewable and renewable energy development and transmission; and water resources.

The Department of the Interior issued Secretarial Order No. 3289 on climate change and renewable energy on September 14, 2009, and is working on adaptive management guidance for both the Department and BLM. The President's Council on Environmental Quality has released draft NEPA guidance on climate change and greenhouse gas emissions. BLM is developing a technology transfer process to assure that best management practices, adaptive management strategies, decision support tools, and research results are incorporated in BLM training and management programs.

Discussion

The past is not a good guide to the future. There are disagreements over the cause of climate change, but there is recognition of warming trends, and agencies and organizations are beginning to plan for dealing with the changes in climate. Baselines for judging the condition of natural resources need to be re-established. And, a national and global strategy needs to be developed to deal with the changes in climate.

Leadership needs to set the stage by giving employees time to learn and understand more about climate change, by providing more training within disciplines, and by conveying the importance of being ready to make adaptive changes. Tools, training, and authorities necessary for a more adaptive management approach to climate change should be provided.

Shifts in species distribution are occurring and are expected to increase under future climate change scenarios. Invasive species in particular will be a very important element in landscape conservation partnerships, because the new fire regimes expected due to the synergistic effects of climate warming and fire will create an invasive species surge on top of the invasive species problems already being faced.

It is expected that climate change, while not directly a cause of fire occurrence, will be a factor contributing to more aggressive fire spread. For example, climatic warming will create a denser vegetative cover, leading to higher fuel loads and more intense fires.

Outdoor recreation is a major economic industry in the West. Rural communities are key stakeholders in BLM's outdoor recreation programs. Climate change has the potential to modify the public preferences for outdoor recreation, particularly on the timing of visitation. The operation of the outdoor recreation program will require periodic adjustments and flexibility.

Policies need to address water resource needs to sustain urban areas, agriculture and maintain ecosystems and their associated services. And, a "whole system approach" needs to be taken in dealing with the impacts of climate change on vegetation. Planning for a hotter and dryer and increasingly water-limited future is needed.

Management may need to reframe its objectives to reduce resistance to change within agencies and organizations, and promote resilience to change to help ecosystems respond to the climate changes that are occurring. They need to realign management to reflect current and future dynamics in natural resource conditions, and they need to develop place-based adaptive management strategies.

An economically viable domestic source of minerals is critical to our economy, and the impacts of statutory and regulatory provisions for habitat protections need to be carefully considered before implementation.

Oil, gas and coal will continue to be the mainstays of the United States energy portfolio for some time, even though they are producing greenhouse gases that are contributing to climate changes. The capability to capture and store carbon dioxide in geologic formations could have a significant role in mitigating carbon dioxide emissions, which are a key factor in climate change. However, the challenges of geologic carbon sequestration are complex and significant, and many difficult questions remain. BLM

needs to anticipate that public lands may have a role in carbon dioxide sequestration (biological and geological).

Also, renewable energy sources—solar, wind and hydropower—are seen by many as the answer to the impacts caused by non-renewable energy resources development. However, additional technology development, storage and distribution of renewable energy will take time, and climate changes will have potentially significant impacts on the amount and timing of reservoir and aquifer recharge, sun light and cloud cover. These changes, in turn, could have significant impact on the efficiency and future ideal location of dams operating for hydropower, turbines dedicated for wind energy, and arrays for solar power, and could require new and costly energy transportation systems.

Managers must be prepared to make adaptive changes in response to the dynamics of natural resource conditions as the pace of those changes becomes more and more evident. And, Americans, public land users and the public in general must be aware of, understand and respond to those changes as well.

Partnering of science with land management at the landscape scale should strengthen the incorporation of adaptive strategies to climate change. These partnerships should work towards understanding the impacts of climate change on large-scale ecosystems, and on adaptive management strategies needed for managing these systems; and they should respond to and mitigate these climate changes at a landscape scale. Partners may include other federal agencies, public and private organizations, local, state, and tribal governments from across the land, water, and wildlife management spectrum.

The impacts of climate change must be understood, and implementation of adaptive management tactics and strategies must begin to manage these impacts on the natural resources and ecosystems with which BLM is charged. It will take considerable effort, including data collection and monitoring by BLM to assess climate change and place it in perspective with the many programs BLM conducts and issues it faces.

Addressing and acting on climate change must become a priority for BLM, based upon sound data. Climate change will affect the resources and resource uses that BLM is charged with managing, and BLM management decisions and resource uses may affect climate change. Some of these changes may be beneficial, and some will be adverse. Climate change means that the past will no longer be as useful a basis for prediction of the future as it has been.

BLM managers and staff must prepare themselves to deal with the impacts of climate change on natural resources and public uses through internal and interagency training, and experimenting with adaptive management practices.

BLM has been a leader in landscape scale restoration in the Great Basin since 1999 through its development and implementation of the Great Basin Restoration Initiative. This Initiative could serve as a model approach for the landscape conservation cooperatives that are called for in Secretarial Order No. 3289, and it should be applied in other areas throughout the West.

PLF recognizes the great challenges posed by climate change for the National System of Public Lands and BLM. At this point, there is limited policy guidance in dealing with climate change; however, as knowledge of climate change processes matures, BLM's

ability to address it is expected to evolve and improve. Not all the answers, not even all the questions, are yet known. BLM has used a Toolbox approach effectively on other issues, and climate change may call for the same. Simple solutions are unlikely to be found. The uncertainties with climate change will require staying flexible and maintaining the option of mid-course correction. Adapting to climate change will call for encouraging innovation and taking calculated risks.

PLF recognizes that BLM and the Department of the Interior are moving to incorporate constant consideration of climate change into their decisions and actions and PLF is supportive of that effort.

PLF Position

1. Secretarial Order No. 3289 on climate change and renewable energy and other related efforts recently undertaken by the Department and BLM provide a good start for addressing changes in climate.
2. Baselines need to be re-established for judging changes in the condition of natural resources, and collaborative, scientifically valid monitoring needs to be done on a continuous basis.
3. Federal land managers and staff need the tools, training and authorities to deal with the impacts of climate change on natural resources and public uses of the National System of Public Lands and to take a more adaptive management approach to climate change.
4. Resource Management Plans need to be re-evaluated in light of the impacts of climate change.
5. Wildfire protection policies and procedures need to be modified and restoration plans need to be revised in light of trends in climate change.
6. Development of solar and wind renewable energy and transmission facilities on the public lands need to be facilitated where appropriate.
7. Cooperation among agencies on the potential role of the public lands for carbon sequestration and biological sequestration needs to continue and be encouraged. Land restoration and healthy lands initiatives must be integrated with carbon storage.
8. A “whole system approach” is needed for managing wildlife habitat and vegetation, which also should consider the Nation’s need for energy resources from many of these same lands.

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