Climate Change and Future Land Use in the Adirondack Park

A Rapidly Changing World:

It is widely accepted within the scientific community that global climate change is underway and will have widespread ecological, economic and social impacts.[1] There is no real argument about whether or not we face climate change, but rather how much our natural landscapes and livelihoods will be affected by it. Individually, as Adirondack communities, and with our government agencies, we must act now to confront a changing climate that will affect the Adirondack Park and its people far into the future.

The temperature changes associated with climate change -- a more erratic but generally warmer climate year round in the Adirondack Park -- put at risk ecological processes, natural communities and native terrestrial and aquatic species in the Adirondacks. Changes are already being noted in migratory bird breeding areas moving further north and earlier budding of flowering plants; a situation that can disrupt pollination of plants and feeding patterns of birds, insects and other species. Cold water aquatic species are especially at risk. Many of these cold-blooded species are especially vulnerable during spawning and mating, so temperature fluctuations could affect population levels. Species of fish that are ecologically valuable and prized catches among anglers, including brook and lake trout, could drastically decline or be lost altogether if climate change is severe. Warmer climate pests and pathogens will make their way to the Adirondacks, which were once too cold to sustain them. Many extant species of flora and fauna will migrate northward or to higher elevations as the temperature increases. The sugar maple industry may very well no longer exist in New York within a few decades; agriculture may be disrupted by changing weather patterns; and recreation businesses based on winter snows will be in trouble.

Based on the 2001 Northeastern Regional Overview (NERO)[2] report for the U.S. Global Change Research Program, the Adirondacks could face a 5-10^{o} F increase in temperature over the next 50-100 years, and possibly a 20% increase in overall annual precipitation. The impacts of such a sudden change in climate are unknown, but scientists predict that the composition of our forests may shift to species currently extant in the southern Appalachians. Native communities of plants and animals will undergo significant alterations, with the probable loss of niche-sensitive species and expansion of more opportunistic pest species. The increase in precipitation will require the redesign of much of our built infrastructure as flooding overcomes highway culverts and bridges, and damages other built infrastructure in low-lying areas. The probable impacts of climate change should challenge us to re-think how we design and use our built environment, and

[1] Various reports thoroughly address this topic, including: 2007 Report of Intergovernmental Panel on Climate Change; November 2004 report "Observed Impacts of Global Climate Change in the U.S. prepared for the Pew Center on Global Climate Change; and 2001 New England Regional Assessment Group report, "Preparing for a Changing Climate: The potential Consequences of Climate Variability and Change", among others.

[2] Op cit., NERO

to innovate now for capital expenditures to guide those developments over the coming fifty years.

In addition to climate change, the Adirondacks face other anthropogenic threats, including acid precipitation and mercury contamination from coal-powered electric plants; the invasion of exotic terrestrial and aquatic species transported along road and waterways; and increasing fragmentation of the remaining working forests and farms due to inappropriate subdivision and development. These 'killer threats' to biotic diversity will exacerbate the ecological impacts of climate change on native species. In addition, altered disturbance regimes- with heightened fires, extreme rainfalls and floods, droughts, and micro-bursts- will cause further deterioration of the ecological norms we have known for so long.

Given the current trends in climate change and other killer threats, the big question we face is, what must we do today to ensure the ecological integrity and biological diversity of the Adirondack Park far into the future?

Climate change must be addressed primarily through deep reductions in CO_2 and other greenhouse gases (GHG), starting with legislative action by the U.S. Congress that either uses a carbon tax or a cap-and-trade approach that reduces CO_2 by at least by 80% from 1990 levels by the year 2050. To achieve such a significant reduction, the first steps must be taken without delay. Only by reducing air pollution, conserving energy, switching to renewable energy can we hope to stem global warming and maintain a reasonable quality of life.

The dilemma, however, is that even if we begin today to reduce CO_2 and other GHGs, the Earth will continue to warm over the coming decades.

What's to be done between now and some future date of relative stability on the natural landscape to mitigate the threat to the Park's species and ecosystems? First and foremost, we need to establish and protect large core wilderness areas hundreds of thousands of acres in size, as fully functioning ecosystems with a full range of native fauna and flora. Large core areas will be more resistant to invasive species and will offer opportunities to maintain important ecological processes and viable populations of wide-ranging and sensitive species. The proposed Bob Marshall Great Wilderness in the Oswegatchie watershed on the western side of the Park is one of the few remaining opportunities in the eastern U.S. to accomplish this goal.

Where possible, core areas should consist of entire watersheds, extending from the highest point to the ocean, and permitting altitudinal and latitudinal migrations of species. In addition to the Oswegatchie back-country, the High Peaks and southwestern Adirondacks still afford opportunities for protecting large core reserves.

Clearly, the Adirondack Park does not extend to the ocean, but we need to take a long-term view and begin to restore the habitat connectivity that once existed throughout the

wetland complexes and riparian corridors of the five great river drainages of the Adirondacks to permit the migration of aquatic, terrestrial and airborne species along natural pathways. As a western anchor for habitat connectivity across the Northern Appalachian/Acadian ecoregion, the Adirondack Park needs strong wild connections with the Tughill Plateau to the west, Green Mountains to the east, Algonquin Park to the northwest, and along the Richelieu River to the northeast.

In addition to stabilizing current ecosystem characteristics, benefits of reconnecting and restoring riparian corridors will be carbon sequestration, flood control and water quality improvements, passive recreation opportunities, and, a 'cooling of the capillaries' – reducing the temperatures of the waterways, allowing cold-water species to survive.

As climate change forces species to adapt, they will attempt to migrate to suitable habitats. Unfortunately, so much of our northeastern U.S. and southern Canada landscapes are built up with cities, suburbs, highways, farms, dams, and other obstacles on the land that native flora and fauna have little chance of moving northward or upward to escape climate change. As we plan for the future, we need a landscape that is permeable to the movement of creatures, from the smallest salamanders and turtles, to the largest moose and mountain lions. And lest we forget, human populations will also be undergoing significant adaptations in their social and economic activities at the same time.

<u>A Need for Better Governance and Policy</u>:
Climate change will be one of the overarching drivers for the future of governance within the Adirondack Park. Far-reaching steps need to be taken quickly to reform ways that state agencies deal with the Park, so that they become responsive in addressing the pressing priorities of climate change mitigation and adaptation. The current condition of government in the Adirondack Park should alarm us all.
The Adirondack Park Agency, the smallest agency in the state, is charged with undertaking comprehensive land use and development planning, supporting and enabling local planning, regulating all private land uses in the Park, and ultimately approving the Department of Environmental Conservation (DEC) actions on the Forest Preserve. Created in 1973, the APA Act, first adopted in 1971, and amended with the Adirondack Park Land Use and Development Plan in 1973, was applauded as one of the toughest land use planning actions in our nation. Thirty years later, political pressure, technological changes, and demographic trends have left the APA and its Act inadequate to protect the ecological integrity of the Adirondack Park. Participants in the environment and economic development debate know that the agency is in dire need of reform due to the lack of protection for the backcountry, shorelines, and scenic uplands, and a barely understandable tangle of development regulations. In its current state, the APA is ill-equipped to deal with the land use planning implications of climate change.

Add to the mix the Department of Environmental Conservation, which splits the Park into two regions. The DEC has a mandate to conserve the Forest Preserve's lands, waters and wildlife, while at the same time providing for public recreation, which has intensified to include many motorized uses such as snowmobiles, ATVs, motorboats and jet skis.

Currently the DEC is pushing through individual Unit Management Plans (UMPs) with little attention paid to ecosystem-based management principles, adjacent lands or the killer threats already mentioned.

Now, consider the mandates of other state agencies, such as the Department of Transportation (DOT) and Economic Development Agency (EDA), which overlap their many regions in ways that don't correspond to the Park boundaries and essentially ignore the Park as a unique ecological assemblage.

Finally, place elected county, town and village governments into the scene. What do you get? Confusion on a large landscape scale, with deeply imbedded state and local bureaucracies reluctant or unable to change due to legislative mandates, agencies without clear priorities, multiple layers of state and local regulations, little or no enforcement, and a frustrated citizenry worried about their economic future.

The Future of the Adirondack Park in a Rapidly Changing World:
Given what we know about the big killer threats, and our current governance frameworks, what can we do today to mitigate those threats on the physical landscape, especially from global climate change?

Clearly, to address global climate change, which is essentially an air pollution problem, we need national legislation that requires deep cuts in carbon dioxide and other greenhouse gases. The Clean Air Act and subsequent amendments that put into effect a cap and trade approach to address acid rain offers a successful market based approach. New York State, as a major energy consumer, has an opportunity to follow California's recent example by placing caps on CO_2 emissions, and to also move the Regional Greenhouse Gas Initiative (RGGI) to a cap and trade approach, or a carbon tax.

At the Adirondack Park level, we need to encourage innovation and "smart growth' approaches to addressing the future of the region in this rapidly changing world. Here are some ideas:

1. Comprehensive regional planning: Environmental strategies to address the 'killer threats' should be the primary consideration for the future of the Park, but with local communities and their economic development integrated into those strategies. We need to strengthen comprehensive planning from the local community level and extend across the entire Park to address climate change and also to 'brand' the Park's unique natural, cultural and historic assets for its future sustainable development. Development activities that would cumulatively lead to irreversible and irreparable degradation of the ecological integrity and biological diversity of the Park should be prohibited.

2. Land use management: Ecosystem management principles, policies and practices should be implemented by all agencies with mandates to act within the Park. Contiguous Forest Preserve units should be combined and managed holistically along with adjacent private lands, rather than the current piecemeal approach to

unit management planning. Entire watersheds should be used as the basic ecological unit for land use planning until finer filters can be applied.

3. Core wilderness areas: To mitigate the effects of climate change, we will need increased protection and expansion of large core areas with sufficient habitat to assure the long-term survival of viable populations of all native species, as well as options to restore extirpated species.

4. Regional habitat connectivity: We should start now to extend beyond the 'blue line' borders of the Park and establish buffer zones and wildlife migration corridors between remaining natural areas to permit native species to adjust to the coming impacts of climate change. These same linear natural open spaces can be used to sequester carbon, control flooding, remove contaminants from water bodies, and provide non-motorized recreation opportunities. Initially focus should be placed on restoring river corridors and flood plains and enhancing known migration routes. Stronger efforts will be needed to reconnect previously linked landscapes from the Adirondacks west to the Tughill Plateau , northwest to Algonquin Provincial Park in Ontario; along Lake Champlain and the Richelieu River to the north; east to Vermont's Green Mountains, and south along the Hudson River valley.

5. Permeable transportation corridors: It is time to re-think and re-design major transportation corridors, such as interstate routes 87 and 81, and other major state routes, to prevent the spread of invasive species, as well as to permit sufficient and durable wildlife migratory routes along flyways, wetlands, water courses and other terrestrial pathways. Adding wildlife overpasses and underpasses, as well as lowering highway speed limits are all considerations that should be addressed.

6. Sustainable economic development: Economic incentives need to be created for carbon sequestration, energy conservation and renewable energy sources, as well as increased capital investments in the forest products industries to produce carbon neutral biomass energy generation, ethanol, and related products. Incentives could also be provided to restore Champlain Valley organic agriculture and local distribution networks, reducing dependence on food supplies transported from far way places. By restoring an Adirondack style of architecture with local designs, materials, and labor, we can reduce transportation costs and create employment. Smart growth approaches can be used to concentrate housing and utilities infrastructure within local villages and hamlets, provide affordable broad-band access and enable people to live and work in the same place, but compete globally.

7. Improved governance and policy framework: To accomplish these actions, there should be renewed consideration of the proposal made over a decade ago to create an Adirondack Park Authority with both public and private lands under its management and to establish an Adirondack Park Service to manage the public lands of the Forest Preserve. As a minimum, the Park should be consolidated

under one DEC administrative unit for all lands within the boundary. Consolidate duplicative County, Town and Village public services; start with departments of public works and school districts. Also needed is tax reform. Meaningful local participation is required to get the future institutional arrangements right.

8. Urgent need for action: New York State can partner with the Two Countries/One Forest initiative for the Northern Appalachian/Acadian ecoregion; the Northern Forest Sustainable Economic Development Initiative (similar to an Appalachian Commission for the four-state north country), and others to raise public awareness about the need for change and to elicit innovative ideas and actions for our elected officials to enact. The Adirondack Research Consortium can help guide us by setting a research agenda to answer the pressing questions relating to climate change, connectivity, and sustainability –the questions of how we might sustain the natural and human communities of the Park through the turbulent times ahead.

What we do now will impact our grandchildren and their grandchildren. I suggest that we get underway. Thank you.