Adirondack Research Consortium
*Better Information for Better Decisions*

# 17th Annual Conference on the Adirondacks
# "Leveraging Resources to Sustain Communities"

## Selected Conference Abstracts

Concurrent Session 1.3:Presentation: ***Planning for a Sustainable Bolton Landing***

**Abstract**
The Bolton Landing Hamlet Sustainability Plan is a detailed blueprint to provide the hamlet of Bolton Landing the tools to grow in an economically sustainable manner, and in harmony with the special conditions of the Lake George Basin and the Adirondack Park. Funded through a Smart Growth Grant from the 2007-2008 Environmental Protection Fund, the Sustainability Plan consists of a comprehensive analysis of the Hamlet including an existing conditions analysis of parks and public spaces, the Lake Shore Drive streetscape, waterfront access, parking, affordable housing, infrastructure, and the potential for infill commercial development. Also included are a series of recommendations and detailed master plan outlining the steps necessary for implementation of the Plan. Bolton Landing has historically represented a model for a sustainable economy for small tourist-driven communities in the Adirondacks. However, the original streetscape, downtown, and public space improvements carried out by the Town are now nearly 20 years old and are in need of maintenance and upgrades. In addition, much of the stormwater, sewer, and water infrastructure is operating at near capacity. Bolton Landing is also experiencing issues such as retention of youth, rising land costs, a lack of workforce housing, and outside competition for tourist spending. Increased means for public and private investment in the hamlet bears a direct correlation to increased money spent by visitors. Increased spending results in additional revenues for the town to spend on upgraded infrastructure and public resources, as well as for private landowners and business owners to invest in property upgrades.

The Plan focuses on improving the long-term function and efficiency of land use, parking, streetscape, underutilized buildings and spaces, pedestrian circulation and linkages, infrastructure, visual quality, and condition and operation of public parks. The Plan also focuses on strengthening the downtown to put it in the best possible position to compete in today's tourism market, retain existing businesses, and create new businesses. It provides needed direction for future improvements and generates strategies that bring together best management practices, public policy, and private markets in new and effective ways. The steering committee developed a diversified public participation strategy to engage, inform and involve the citizen base. These methods included several public workshops and open houses, as well as the development of three newsletters that presented the project at different phases and announced public meetings and workshops. The opinions and ideas shared at the meeting were used by the steering committee to shape the mission statement and goals for the project and develop a wisely shared vision.

Moderator „**Jeff Anthony**, Principal, the LA Group, P.C.
Panel
**Ike Wolgin,** Owner, Lake George Kayak Company and Sustainability Committee member, Town of Bolton
**Hal Heusner**, Resident & Sustainability Committee Member, Town of Bolton
**Tracey Clothier**, Senior Planner, the LA Group, P.C.

Concurrent Session 1.5: **Studies on pH and Carbon**

## A Comparison of Contemporary Cloudwater pH to Pre-Industrial Values at Whiteface Mountain

James E. **Dukett**[1*], Nenad**Aleksic**[2], Nathan **Houck**[1], Philip **Snyder**[1], Paul **Casson**[1], and Michael **Cantwell**[1]

**Abstract**
Fossil fuel combustion, the oxidation of sulfur and nitrogen compounds to sulfuric ($H_2SO_4$) and nitric acids ($HNO_3$) in the atmosphere, produces elevated acidity concentrations in non-precipitating clouds. High elevation forested areas in the Adirondack Mountains have been impacted by the acidity levels of cloud water. Prior research suggests the pre-industrial pH of cloud water may range from 4.5 to 5.6 because of the cycles of carbon, nitrogen, and sulfur. The wind direction of clouds that pass over Whiteface Mountain varies from summer to summer. We have analyzed 3 major ions ($SO_4^{2-}$, $NO_3^-$, & $H^+$) found in cloud chemistry. We determined that cloud water acidity levels are related to wind direction crossing the Adirondacks. We show that these major ions are exhibiting decreasing trends in cloudwater concentrations. However, we note that recent acidity levels in clouds coming from the west to southwest continue to illustrate values of $SO_4^{2-}$ and $NO_3^-$ significantly above levels necessary to reach baseline pre-industrial pH values.

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**Arseneau**, Kristina M. A. [1]*, Lindsay M.**Brager**[1,2], and Brian F. **Cumming**[1]
Recent Evidence of Biological Recovery from Acidification: An Updated Paleolimnological Perspective.

Since the implementation of the Clean Air Act Amendments, many Adirondack lakes have shown evidence of chemical recovery from acidification. A key question of concern is whether or not chemical recovery is encouraging biological recovery in acid-impacted areas. Assessing biological recovery is often difficult due to a lack of long-term monitoring data but paleolimnology can overcome this problem. Paleolimnology uses the physical and biological characteristics of lake sediments to infer lake histories. Biological proxies such as diatoms and chrysophytes can be correlated to environmental variables (i.e. pH). By quantifying changes in these proxies over time, paleolimnologists can assess changes in aquatic environments. The goal of this investigation was to use paleolimnological techniques to identify if biological recovery has followed chemical recovery in two Adirondack lakes: Big Moose Lake and South Lake. Changes in the chrysophyte and cladoceran species assemblages of both lakes were analyzed from ca. 1760-present in isotopically dated sediment cores. Long-term chemical monitoring data show that the lakes' present-day pH levels are approaching their chrysophyte-inferred pre-industrial pH values. Both lakes show recent (ca. mid-1990s) declines in acid-tolerant chrysophyte species, providing evidence of biological recovery from acidification. However, concurrent increases in colonial chrysophyte species suggest that the species assemblages are not returning to their pre-disturbance state. Cladocera remain unresponsive to pH recovery in both lakes. This study demonstrates that biological recovery is underway in the Adirondacks but that recovered species assemblages are unlikely to return to their pre-disturbance state due to other environmental stressors.

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Kristofer**Covey**1*, Joseph **Orefice**1

The Physiological Ecology Of Carbon Science In Forest Stands

In order to better understand the ways in which future forests will change and be changed by shifting climates, it is necessary to understand the underlying drivers of forest development and the ways these drivers are affected by changes in atmospheric carbon dioxide concentrations, temperature, precipitation, and nutrient levels. Successional forces lead to somewhat predictable changes in forest stands throughout the world. These changes can lead to corresponding shifts in the dynamics of carbon uptake, storage, and release. Many studies have attempted to elucidate the effects of changing climate conditions on forest ecosystem dynamics; however, the complexity of forest systems, long time horizons, and high costs associated with large-scale
research have limited the ability of scientists to make reliable predictions about future changes in forest carbon flux at the regional and global scales. Free Air Carbon Dioxide Enrichment (FACE) experiments are suggesting that forest net primary productivity, and thus carbon uptake, usually increases with atmospheric carbon dioxide. Experiments dealing with drought and temperature change are providing evidence that water availability may be the most important factor driving forest carbon dynamics. The constraints of field experiments force scientists to rely on multifactor models leading to results based on large assumptions. If predictions are made regarding stand level carbon within forest ecosystems, it is important to have an understanding of what scientific research has or has not established.

*Authors are listed alphabetically, not by seniority of authorship; the paper was co-authored equally.
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Concurrent Session 2.4 - **Invasive Species Management and Research**

**Description:**
This session will present current invasive species research relevant to the Adirondack region. Four speakers will each deliver 15 minute presentations with 3-5 minutes for Q & A.

**Moderator:** Hilary Smith, Director, Adirondack Park Invasive Plant Program

**Bio:**Hilary Smith directs the Adirondack Park Invasive Plant Program, a partnership program hosted by the Adirondack Chapter of The Nature Conservancy. Since 2002, Hilary has specialized in regional invasive species planning, monitoring, management, and education. She also serves on the New York Invasive Species Advisory Committee as the representative of the eight Partnerships for Regional Invasive Species Management (PRISMs) in New York State. Prior professional experience includes both research and environmental education in locations from Long Island Sound to Puget Sound. Hilary received her undergraduate degree in Biology from Hamilton College and her Master's in Biodiversity, Conservation, and Policy from the State University of New York at Albany.

**Speakers, affiliations, presentation titles:**
1. Hilary Smith, Director, Adirondack Park Invasive Plant Program
*Is restoration necessary following invasive plant removal? An assessment of three species in the Adirondack Park*
2. Daniel Kelting, Ph.D., Director, Adirondack Watershed Institute at Paul Smith's College
*Cost and effectiveness of hand harvesting to control the Eurasian watermilfoil population in Upper Saranac Lake*
3. Mark Malchoff, Aquatic Resources Specialist, Lake Champlain Sea Grant
*Spiny and fishhook waterfleas: their spread, ecological impacts and potential threat to Adirondack waters*

**Malchoff**, Mark H[1,2*] and Timothy B. **Mihuc**[1]

Invasive Waterfleas and Implications for Adirondack/Champlain Waterways

The first Adirondack occurrence of spiny water flea (*Bythotrepheslongimanus [formerly cederstroemi])*, was documented in October 2008 when this aquatic invasive zooplankter was found in Great Sacandaga Lake (GSL) located in Fulton and Saratoga counties. This finding apparently represents only the second inland lake colonization of spiny water flea (SWF) in NY, following its establishment in the Allegheny Reservoir in 2004. Prior to 2004, its NY distribution was limited to Lakes Erie and Ontario. Another member of the Cercopagidae family, the invasive fishhook waterflea (*Cercopagispengoi)* is also found in New York's Great Lakes, though not yet in the Adirondacks. SWF and fishhook waterflea (FHWF) are known to spread to new water bodies through both natural and anthropogenic mechanisms. Large numbers of inland lakes in Ontario, Canada (SWF) and the NY Finger Lakes (FHWF) have now been colonized. Recreational boating/fishing activities and gear (bait buckets, live wells, anchor lines, downrigger cables) likely present important avenues of spread. In addition, SWF could spread downstream to Lake Champlain via the Sacandaga River, Hudson River, Glens Falls Feeder Canal, and Champlain Canal. A feasibility study to prevent the spread of SWF via this route has recently been published by the USFWS. We will summarize these findings, review the ecological impacts of SWF and FHWF, review spread prevention measures, and discuss the threats to the Adirondacks posed by these invasive cladocerans.

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4. Christopher T. Martine, Ph.D., Assistant Professor, Dept. Biological Sciences and Curator, SUNY Plattsburgh Herbarium
*A model-based approach to predicting future plant invasions in the Northeast.*

Concurrent Session 2.5 – **Forest Management:**

**Canham**, Charles D.[1*]

Northern Forest Biomass Resources: Myth, Reality and Uncertainty.

There is a great deal of interest in northern forest resources from the perspective of both carbon sequestration and as a source for renewable energy. Crafting sound policies to promote both of these goals requires a realistic and accurate assessment of the status and utilization of northern forests, and models that can project the consequences of alternate development proposals. The models that forest ecologists and ecosystem scientists use for these purposes typically assume that the northern forest landscape consists of a mosaic of even-aged forests dating from earlier clearcuts or catastrophic disturbance. As a corollary, it is often assumed that the landscape is dominated by maturing stands with limited potential for future biomass increment or carbon storage. Data from the Forest Inventory and Analysis network of the US Forest Service present a very different picture of the northern forest landscape. Contrary to conventional wisdom, the landscape as a whole is currently dominated by stands with a very wide range of biomass, and the average aboveground tree biomass is only roughly half of what is predicted at steady state. Relatively light partial harvesting (removing < 30% of biomass) is the dominant form of logging. While Maine has seen removals significantly exceed net growth during the past decade, net growth significantly exceeds removals in NY, VT, and NH. A simple simulation model indicates that outside of Maine, where current harvest levels are already unsustainable, there is potential for both continued carbon sequestration as forests mature, and some level of increased harvest for biomass energy.

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**Neugarten**, Rachel A.[1]; Steven A. **Wolf**[1], and Rich C. **Stedman**[1]

Forest At Work: A Case Study Of Conservation And Sustainable Forestry.

Major selloffs of industrial timberlands in the past two decades have prompted concerns about forest conversion and fragmentation, the loss of traditional forestry livelihoods, decreasing recreation access, and the transformation of rural communities. Large-scale "working forest" agreements involving conservation organizations, public agencies, and timberland investors have emerged as a significant new strategy for protecting intact forest landscapes and the ecological, social and economic benefits they provide. The sustainability of this novel approach to conservation and resource management is unknown. One such agreement is being developed for the former Finch Pruyn lands, 161,000 acres of forest lands in the Adirondack region of New York State. We analyzed criteria and indicators that could be used to understand ecological and socioeconomic implications of the agreement over time. We derived potential criteria and indicators from the literature on sustainable forest management and community well-being, as well as interviews with 36 relevant actors in the region. We compared potential criteria and indicators to actual management goals and monitoring plans. We found that the terms of the agreement align with proposed criteria for sustainable forest management, such as maintaining large, intact forest systems and providing recreation opportunities. Other goals, such as meeting basic financial objectives of the landowner and supporting community development projects, are important for socioeconomic sustainability. Current plans for monitoring include periodic ecological inventories and annual audits of forestry practices. Addition of socioeconomic monitoring could help reflect the balance of ecological and human benefits the agreement is seeking to provide.

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Plenary Panel Session 2 - **Reconnecting Children and Nature: What a Nationwide Movement Means for the Adirondacks, the State, and the Overall Quality of Life of our Children**

**Moderator, Honorable Teresa Sayward:** opening and framing comments

**Overview of issue:**
Paul B.Hai, Co-founder, Children in Nature New York (CiNNY), Program coordinator, SUNY-ESF's Northern Forest Institute - National trends in health, access to nature, secondary schools, organized youth sports, Federal legislation, national movement, state initiatives, NYS initiatives, Adirondack impacts

**Statewide approach to creating and maintaining access to nature:**
Carol Ash Commisioner, NYS Office of Parks, Recreationand Historic Preservation - The role of parks and OPRHP in providing access to nature for citizens of NYS - The importance and scope of the NYS' commitment to parks - The importance of state parks in relation to the built environment of NYS population centers - Policy, resources, threats and opportunities

**Statewide approach to raising awareness of and combating associated health concerns**
Bruce Hathaway, Healthier Communities Program Advisor; New York State Department of Health, Bureau of Community Chronic Disease Prevention - The role of DOH in addressing the suite of health related concerns tied to inactivity and poor diet - NYS DOH's commitment to reversing current trends - Linkages and connections to federal and other state programs - Policy, resources, threats and opportunities

**Regional grassroots efforts; impacts, tracking and results**
Margot Gold Executive Director; North Country Healthy Heart Network Inc. - Grass roots programming (Eat Well Play Hard) - Community connections and partnerships - Statistics, tracking and future and future planning

Concurrent Session 2.1 – **Central Adirondack Laboratory for Environmental Studies** (CALES)

**Dan Josephson and Ron Smith**

**Abstract:** The Central Adirondack Arts and Sciences Advocacy, Inc. (CAASA) is a non-profit 501(c)(3) organization incorporated in 2001. CAASA's mission is "to foster understanding and caring stewardship of the unique Adirondack environment through research, education and exposition". CAASA was established to promote and facilitate environmental education and research in the central Adirondack Mountain region in Old Forge, New York - "The Gateway to the Central Adirondacks". CAASA provides support for education and research to conserve, maintain, protect, and restore the natural resources of the Adirondack region for the environmental, cultural, and economic benefit of residents and visitors to the region. Current CAASA activities include:

- Working in partnership with the Arts Guild of Old Forge, Town of Webb, Upstate Institute at Colgate University, and Central Adirondack Partnership for the 21st Century to establish a facility for environmental education and research – the Central Adirondack Laboratory for Environmental Studies (CALES).
- Providing guidance and support for development of the Eco-Gallery at the new Old Forge Arts Center building. The Eco-Gallery is a nature interpretive center for the public and educational groups.

We will present a status report on the CALES project and solicit feedback from conference attendees regarding:

- Potential use of the facility for research and education
- Suggestions for facility features and educational programming

More information can be found at our web site: **www.caasa-cales.org**

Concurrent Session 3.4 - **Studies on Lake Champlain**

**Danville**, Scott C. 1*, Raymond, **Johnson**, N.1

Historical Atmospheric Temperatures Analysis of Lake Champlain Region 116 years of daily high and low temperature data from the United States National Weather Service in Burlington, Vermont were analyzed to determine trends in the temperature data. Analyses were made of 3, 5, 10, and 25 year running averages for data from 1892 to 2008. An increase in average temperature of 0.6552º F for the 116 year period indicates a linear trend in regional average temperatures correlating to trends in global temperature rise as reported in the 2007 Intergovernmental Panel on Climate Change Report for a concurrent period of 105 years. Heating degree day, cooling degree day, and growing degree day calculations of the temperature data were also made to allow for analyses of variation from linear trends indicating regional and global anthropogenic influences. Linear modeling of these various degree days indicates increases accordant with the 116 year period average temperatures. Correlation of historical complete freezing data (closing data) of Lake Champlain was made to determine correlation to average temperature and indications of possible variants to average temperature indicating influences of additional environmental and hydrological factors on the lake's complete closing dates. Recent episodes of no closing dates of Lake Champlain show concordance to trends in average air temperatures in the Lake Champlain region.

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**Stager,** J. Curt*[1] and **Thill,** Mary[2]

Recent and Future Climate Change in the Champlain Basin.

Weather records from the United States Historical Climatology Network show that mean annual temperatures in the Champlain Basin have risen significantly since the mid-1970s, with the most significant warming occurring in summer and autumn. Total annual precipitation increased by 3 inches during the early 1970s but has displayed no significant overall change since then. These findings are consistent with those obtained elsewhere in northern New York and Vermont, and they help to explain why the dates of autumn freeze-up are changing more dramatically on North Country lakes than spring ice-out dates. By downscaling projections generated by 16 global climate models to address future climate changes in the Champlain Basin at 12x12 km resolution through "ClimateWizard," we find that future mean annual temperatures are likely to rise by 1–11°F by century's end, and total annual precipitation could increase by as much as 10-15%, depending on the model and carbon emissions scenario used. However, projected seasonal changes in precipitation are too variable among the models to provide reliable predictions. In light of these results and drawing on the accumulated knowledge of scientists and natural resource professionals who study and manage species and ecosystems in the Champlain Basin, we outline some of the likely effects of future climate changes on aquatic organisms and habitats in the basin, and suggest how natural resource professionals can prepare for them. This work was funded by the Adirondack and Vermont chapters of The Nature Conservancy.

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**Simonin,** Paul W.*[1], Donna L. **Parrish**[2], Lars G. **Rudstam**[1], Patrick J. **Sullivan**[1], Bernard **Pientka**[3]

A Comparison of Native Rainbow Smelt versus Nonnative Alewife in Lake Champlain

The abundance and distribution of rainbow smelt (*Osmerusmordax*) and alewife (*Alosapseudoharengus*) in Lake Champlain was studied in relation to their physical environment. Rainbow smelt are native to Lake Champlain and have been the primary prey of numerous species including salmonids and walleye (*Sander vitreus*), the primary sport fish in the lake. However, alewife recently became established, and have the potential to dramatically alter the Lake Champlain ecosystem. We found that adult and young alewife concentrated in the warmest possible water (15-23 °C), adult rainbow smelt at hypolimnion temperatures of 4-6 °C, and young rainbow smelt at 10-15 °C. In the main lake, young rainbow smelt were first observed June, whereas young alewife not until late July. Early hatching allows fish to grow to a larger size at the end of the growing season, thereby increasing the probability of over-winter survival. However, early-hatching was not advantageous for rainbow smelt in the two years studied, because when adult smelt are abundant, as they were in these years, springtime cannibalism is a major source of young fish mortality. Alewife may alter these historic hatch-date selection forces by increasing summer young fish mortality rates when adult alewife and larval fish of both species overlap spatially. Quantifying these dynamics helps us comprehend, and manage, effects of nonnative species like alewife.

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Consurrent Session 3.5 – **Management Strategies of the Future**

Jorie M. **Favreau**[1*] and Celia **Evans**[2]

The Adirondacks as an Educational Laboratory for Science Education at the Baccalaureate Level

Paul Smith's College has a strong emphasis on, and culture of, experiential education in natural resources as well as the institutional resources (ex., 14,000 acres of forested land) to deliver that education. Currently, in order to teach course content and the process of science through experience, we integrate our professional research on snowshoe hare ecology into our science curriculum. Students who are vested in learning outcomes and who take ownership of the goals of their projects, especially through inquiry based learning, tend to comprehend and retain material better than students who follow a pre-determined exercise. The process is a tiered progression that mirrors the students' academic development. This is accomplished by integrating research into a 200 level general ecology course, two upper level courses (Animal Behavior and Winter Ecology) and the 400 level senior thesis research projects. Expectations, guidance, and levels of participation at these levels are clearly different as is the structure and content in each course. We will report on the process of delivering actual ecological research as an inquiry-based experience as well as the challenges and successes of incorporating research into courses at various levels in the baccalaureate curricula. Our results focus on the students' motivation in the process of scientific inquiry as well as their perceptions of the value of learning scientific methods through the hare project. We offer insights into applications of natural resource research into the baccalaureate and high school classrooms.

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Concurrent Session 4.2 – **Sustainability**

**Ayling**, William A.

Sustainability 101

Sustainability continues to be discussed as a necessary goal, but the pathway toward sustainability is often vague. The definitions of sustainability commonly cited define the mission, but not the path. Even environmental management systems fall short in this regard. A basic framework that describes the scientific underpinnings of sustainability will be presented. The framework incorporates the existing concepts and tools of environmental management to help organizations develop a pathway toward sustainability that can properly prioritize alternatives. This is *Sustainability 101*, what organizations and individuals need to know to develop and implement a successful sustainability program. The approach discussed will also be useful for organizations that have hit stumbling blocks and need to reevaluate their path forward.

Kenneth A. **Strike**1,Lorraine**Duvale**

The Adirondack Regional Assessment: A Preliminary Appraisal

The recently released Adirondack Regional Assessment report provides a wealth of data about the Adirondack Park. While the report itself draws only modest conclusions as to the meaning of its demographic and economic characterizations, it has been used by others to support the claim that a principal cause of the Adirondack's economic woes is the extensive public ownership of or control over land and the regulatory environment that governs private lands. This thesis which we name the "Blame the Park" hypothesis has been used to support policies including the cessation of the purchase of additional land by New York State and the weakening of the APA.

An alternative hypothesis is that the comparatively weak economy that characterizes Adirondack communities is a consequence of factors such as the decline and mechanization of extraction industries, remoteness, low population density, and inadequate transportation - factors that characterize many rural communities. In this paper we compare the Adirondacks with similar regions in New York and elsewhere. These comparisons provide little support for the Blame the Park hypothesis and suggest that the Park is more of an economic asset than a liability. We conclude with a list of questions that need to be addressed by those who want to secure the economic future of Adirondack communities.

**Plumley**, Daniel R.*, and **Harring**, Sid.**

Seeing the Park for Its Forests – Achieving an Integrated Forest Sustainability Vision

Achieving the true promise of the Adirondack Park protected area model requires leading vision for parkwide integration of forest conservation, preservation and stewardship looking ahead generations. For over a century, the People of New York State, government and conservationists alike have equated protection of the Park with progress advancing acquisition of full fee-title lands to be transferred into the Forest Preserve. Today, however, the Adirondack Park and its Forest Preserve core stands as part of a potentially far richer global model of empowering integrated private land stewardship with a "forever wild" legacy and future for critical forest, alpine, water, wetland, wildlife habitat and recreational resources unparalleled in size and complexity in the coterminous United States. Advancing integrative thinking for the park from the critical standpoint of private forest lands and landowners is the principle goal of Protect the Adirondack! Forest Stewardship Council (FSC) certification program already involving over 33 landowners and some 20,000 acres of the park's private, non-industrial forest lands. The authors, based on their 35 plus combined years of direct stewardship, advocacy and life in the Adirondacks, explore the challenges and opportunities for park-wide forest integration, stewardship and sustainability enhancement in the scope of the PROTECT FSC program, certification practices for industrial timberlands and their inter-woven present and future reality with the intermingling predominate lands of the New York State Forest Preserve. Their findings illuminate pathway options for a park wide forest sustainability vision including: policies for advancing collaborative landowner and community benefit returns through accreditation; enhanced home-grown market strength and value-added "true green" business opportunities from value enhanced forest products, to carbon sequestration and markets to wildlife, water and recreation; enhanced planning and ecological integrity linkages between private and state lands; regional park branding options and trans-regional, international opportunities and new partnerships for promoting the global values of the Adirondack Park.

*Director, Conservation Programs, Protect the Adirondacks!
**Private Adirondack Forest Landowner, FSC Forest, Member, Protect the Adirondacks!

Concurrent Session 4.3 – **Adirondack Coyotes, Beaver, and Wilderness Mapping**

**Rounsville Jr.**, Thomas F.[1*], James **Wolfe**[2*], Matthew **Pelletier**[2], and Ron **Oakerson**[4]

Mitochondrial DNA Haplotype Comparison of Western New York and Adirondack Coyotes

The coyote is a species that only recently migrated to New York but is now firmly established, often as the keystone predator in some locations. Eastern coyotes are known to be much larger than their western relatives since eastern coyotes are considered to be a wolf-coyote hybrid. A hair snare survey, specifically designed to maximize coyote capture rate while reducing other species by-catch, was conducted in Allegany County New York to collect DNA samples from free range coyotes of the local population. DNA was then isolated from these hair samples and mitochondrial DNA fragments were amplified using the PCR technique. The mitochondrial DNA sequences from collected samples were then compared to the sequences of Adirondack coyotes to determine genetic relatedness of the two and an evaluation of wolf

gene integration into the genomes of coyotes at both localities. The comparison of these mitochondrial DNA fragments allows for a better understanding of how coyotes entered western New York and the Adirondacks as well as the extent to which the eastern coyote has hybridized with wolves on the edge of the range of the wolf. This study presents the results of the genetic analysis as well as a novel method for non-invasive hair snare surveys that specializes in collection of canid hair samples.

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**Harrison**, Anna M.[1*], John C. **Stella**[1], and Stacy **McNulty**[2]
The Influence Of Landscape Factors On Long-Term Beaver Occupancy

The recovery of beaver (*Castor canadensis*) populations since the cessation of widespread trapping in the early 20th century represents an important non-equilibrium disturbance process in northern forests. Beaver not only alter ecosystems by impounding water and creating ponds, but also by removing woody vegetation from the surrounding terrestrial ecosystems, which changes forest community structure. The duration of beaver occupancy is determined by natural landscape and forest suitability and it is enhanced by the habitat alterations made by beaver to the landscape. The magnitude of beaver impacts on the landscape, and conversely, the landscape and habitat factors that sustain their long-term populations, cannot be fully understood with short-term (<5 yrs) records of beaver occupancy in forests communities that change over decadal scales. Using a multi-decadal dataset (30 yrs) we established predictors of beaver occupancy, theorizing that long-term occupancy at a site is a function of the landscape's capacity to support suitable beaver habitat (e.g. topography and hydrology), the site-specific costs required for dam construction and maintenance, and the forest composition (food quality and quantity). We used linear modeling to evaluate these influences on the frequency of beaver occupancy at 14 pond and wetland sites in the central Adirondack Mountains, New York. The best model for predicting the frequency of beaver occupancy at a site included beaver forage area, total dam volume, and hardwood stand basal area within the forage area. Habitat size, forest composition, and beaver effort all determine the frequency of beaver occupancy at a specific site location.

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**Abigail Larkin**

Wilderness Perception Mapping In The Adirondack Park, NY

Wilderness is legally defined on national and state levels, yet the concept of wilderness is furtherdefined by individual perceptions. Wilderness Perception Mapping (WPM) is a technique thatelicits individual wilderness perceptions through a questionnaire survey, generates a statisticalprofile of respondents, and represents these profiles spatially in a geographic information system(GIS). This technique was previously applied to nationally protected and managed wildernessareas in New Zealand and Colorado. The Adirondack Park represents a novel environment forthe application of WPM within 6 million acres of mixed public and private lands that serve avariety of stakeholders. During the summer of 2009 a total of 207 surveys were collected fromresidents, seasonal residents, and visitors (stakeholder groups) at recreational sites and towncenters in Old Forge, Lake Placid, Lake George, and Newcomb (sample sites) using waiting androaming methods. Respondents were characterized into four classes along the

Wilderness PurismScale and the wilderness perceptions of each class are then mapped by excluding undesirablefeatures from the landscape based on survey results. Statistical analyses indicate a significant difference between stakeholder's wilderness perceptions but no significant difference betweenwilderness perceptions at the four sample sites. The final products include maps of perceivedwilderness based on the four purism classes for specific management units and the largerAdirondack Park to compare with units in the Park zoned as wilderness. WPM can be used toidentify differences between perceived and designated wilderness areas to improve wildernessmanagement and conservation efforts within the Park.

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Concurrent Session 4.4 Energy Efficiency and Savings Initiatives

**Brownell, Bruce**

PASSIVE SOLAR BUILDINGS, 33 HOMES IN THE ADIRONDACK PARK
CONTRIBUTION TO OUR ENVIRONMENT

ACROSS THE LAST 40 YEARS, A.A.E HAS DESIGNED AND ENGINEERED 33 HIGHLY INSULATED (PERFORMANCE R38 ENVELOPE) PASSIVE SOLAR HOMES IN THE ADIRONDACK PARK. THESE HOMES HAVE AN AIR INTEGRATED, HEAVY MASS SYSTEM THAT SERVES AS A THERMAL FLYWHEEL THAT CAN ALSO STORE "OFF-PEAK" HEATING OR COOLING. THESE STRUCTURES DO NOT HAVE A FURNACE AND WILL NEVER FREEZE IF LEFT ALONE IN THE WINTER BUT DO NEED A SMALL AMOUNT OF "BACK-UP" HEATING AND COOLING. MOST ARE HEATED WITH 2 FACE CORDS OF WOOD PER WINTER BURNED IN 60-70 SEPARATE FIRES. WOOD IS SOLAR ENERGY COLLECTED ACROSS 70 YEARS THAT WE USE IN 70 MINUTES.

ECONOMIC AND SOCIAL IMPACT TO OUR ENVIRONMENT OF THE ADIRONDACK PARK

IF WE CONSIDER ONE AVERAGE 2000 SQ. FT. HOME FOR THE LAST HEATING SEASON:
CONSERVATIVELY ENERGY SAVINGS ARE:

- 800 GAL OIL @ $3.50/GAL = $2800.00 NOT SPENT ON IMPORTED FUELS
- ECONOMISTS TELL US MONEY SPENT TURNS SIX TIMES PER YEAR SO THIS IS 6 X $2800.00 OR $16,800.00 CONTRIBUTION TO THE LOCAL ECONOMY WITH 80% OF IT RETURNING STATE SALES TAXES AT 4%; 80% X 16,800.00 X .04= $537.60. LOCAL ECONOMIES @ 3% GET $403.20
- DON'T HAVE THE POLLUTION DUMPED DOWNWIND FROM 800GAL OF OIL @ 22.38 LBS. $CO_2$ /GAL = 18,700 LBS. NOT EMITTED (9.3T)
- AAE HOUSES DO NOT NEED HUMIDIFIERS AS THEIR INSULATION SHELL IS HUMIDITY PROOF. DEHUMIDIFIERS RANGE FROM 360-800 WATTS IN SIZE. AVERAGE HOME USE: 40 DAYS X 24 HOURS X 600 WATTS = 576,000 WATTS @ 0.15¢KWH = $86.40 SAVED. SINCE THE DEHUMIDIFIER IS A HEATER, WE MUST OFFSET ITS OUTPUT WITH A/C. IF WE ASSUME A ½ OFFSET ITS 81 TON HRS. OR 101, 250 WATTS @ 0.15¢ / KWH = $15.15. THE TWO SAVINGS REPRESENT 576 + 101 = 677 KWH REDUCTION/ HOUSE SUMMER. Realizing many park homes do not have A/C.

OUR 33 HOMES (FROM 1400-5500 SQ. FT.) SINCE 1968 COLLECTIVELY EQUAL OVER 738 HOUSE YEARS. USING THE ABOVE FIGURES THEY HAVE CONTRIBUTED:
SAVINGS FROM 738 HOUSE YEARS:

738 HOUSE YEARS Average oil price 40 years = $1.30/gallon

@ 800 GAL OIL/YEAR 590,400 GAL OIL NOT USED

@ $6240 CONTRIBUTION OF* $4,605,000 TO LOCAL ECONOMY

@ 80% X 4% SALES TAX $147,364 TO STATE

@ 80% X 3% SALES TAX $110,520 TO LOCAL AREAS

@ 18,700 LBS. (9.3T) $CO_2$ 6863 TONS NOT EMITTED

@ 677 KWH/SUMMER 499,626 KWH SAVINGS TO GRID

@ PEAK @0.15¢= $74,900 NOT SPENT

* 800 X $1.30X6 *This is the future!*

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**Poster: New Technology for Baseline Limnological Study of Adirondack Lakes**

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Lake studies typically are labor and time intensive. Remote sensing technology is changing how limnology is done. Houghton College students have been studying Star Lake in the northwestern Adirondack Park since 2001. Intensive studies during summer have shown Star Lake has had good water clarity (Secchi depths of 4-8 m) and as a typical dimictic lake, the lake shows stratification during each summer (as measured since 2001) with a metalimnetic oxygen maximum at 9 m and an anoxic hypolimnion. Total phosphorus levels in winter 2003 and 2005 and summers 2007 and 2008 showed extremely low levels (< 5 ppb) in the epilimnion and higher amounts (up to 30 ppb) in the hypolimnion, especially during late summer. Amounts of nitrate as measured during summer 2007 and 2008 are in the moderate range for ALSC lakes, with a peak (up to 200 pbb) noted in the lower metalimnion. Total phosphorus as measured in fall 2008 and spring 2009 confirmed the oligotrophic status of Star Lake. We recently deployed a YSI 6800 sonde for continuous sampling of temperature, oxygen, conductivity, pH, and chlorophyll a. This technology allows for multiple sampling over a longer period of time. We report our results for November/December 2009 and show how these remote sampling techniques can be used for greater understanding of daily and seasonal fluctuations in chemical and physical characteristics.

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**Poster Abstract: Renewable Energy Environment of Northern New York**

The Northern Forest Center will provide a visual index of the renewable energy environment of northern New York, with a focus on woody biomass. The index breaks down projects by scale and stage of existence and illustrates the drivers affecting the project viability. These drivers include the following categories: public policy, financing, education, infrastructure, and community benefits. The Northern Forest Center, founded in 1997, works to strengthen communities, revitalize the economy and conserve the landscape of the Northern Forest of Maine, New Hampshire, Vermont, and New York. The Center and the North Country Council co-managed the Sustainable Economy Initiative, led by a four-state steering committee appointed jointly by the four governors. For two years, the group worked to understand the shared challenges facing Northern Forest communities, identify the region's assets and opportunities, and agree on a shared vision and strategy for revitalizing the Northern Forest economy and sustaining the long-term health of its people and lands. This index responds to the SEI report recommendation for addressing economic needs by harnessing renewable energy in the Northern Forest.

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