

# The SPRUCE MOOSE



A publication of the SUNY College of Environmental Science and Forestry's  
Adirondack Ecological Center

Fall 2008

## **ESF Grad Students**

First to Show  
Global Warming  
Changes Breeding  
Bird Ranges

## **New Northern Forest Institute at AEC**

Partnership for  
Educational Outreach

## **Adirondack Milestone**

30 Years of  
Environmental  
Monitoring for Acid Rain

## Welcome Our New Educator



Annie Woods joined the AEC this past summer. She has a B.S. in biology from the University of Kentucky and an M.S. in environmental and forest biology from SUNY-ESF. Annie's academic interests include landscape ecology, disturbance ecology, and geographic information systems.

For her master's research, she studied how the biotic community in the Adirondack Park responds to anthropogenic disturbance, using the New York State Breeding Bird Atlas to create an Index of Biotic Integrity.

Annie's focus at the AEC includes outreach and research. She says she is excited to interact with students and provide them with the kind of experience at Huntington Wildlife Forest that sparked her own enthusiasm to study ecology. As a transplant from Kentucky, Annie enjoys experiencing the scenic beauty of the Adirondacks through hiking, swimming, and cross-country skiing. She also enjoys writing, drawing, and learning to play the bass guitar. We are pleased to have Annie join us!

## Growing the AEC Family



Rowan Kathryn Hai joined Paul, Stacy and Lauren Dec. 20, 2007. Both parents liked the name for its origins: Rowan, which means "little red one," is apt because their younger daughter has curly red hair. The rowan tree is a relative of the mountain ash and grows in northern Europe. Baby Rowan greets everyone she meets with a radiant smile. She adores her big sister, Lauren, enjoys standing up (with help) and provides a perfect audience for 3-year-old humor and antics.

### The SPRUCE MOOSE

The Spruce Moose is a publication of the Adirondack Ecological Center. The mission of the AEC is to provide an understanding of the Adirondack ecosystem through research. The AEC is located on Huntington Wildlife Forest, a 6,000-ha research facility in Newcomb, N.Y., operated by the SUNY College of Environmental Science and Forestry since 1932.

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## Sustainable Yield – a Gift of Land

Wondering what to do with a woodlot or other land you have sustained for years?

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*Future generations will benefit from your gift of land.*

To keep your land sustainably benefiting you and your world, forever, contact us at ESF College Foundation, Inc. 315-470-6683, [gifts@esf.edu](mailto:gifts@esf.edu), or visit

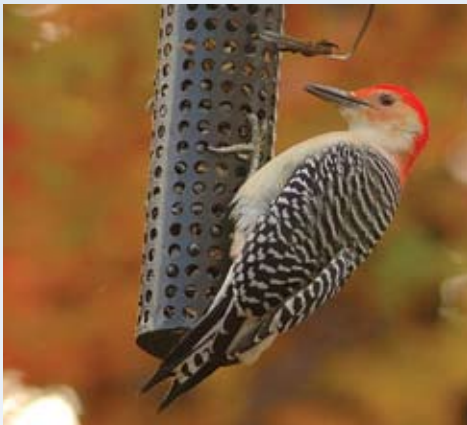
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# Breeding Bird Ranges Shift in Relation to Global Warming

## Three species, three responses



Warmer winters may have helped the Carolina wren move northward.



The red-bellied woodpecker is the most common woodpecker in the Southeast.



The tufted titmouse is often seen foraging in mixed-species flocks.

## ESF graduate students find link between global warming and bird habitat ranges

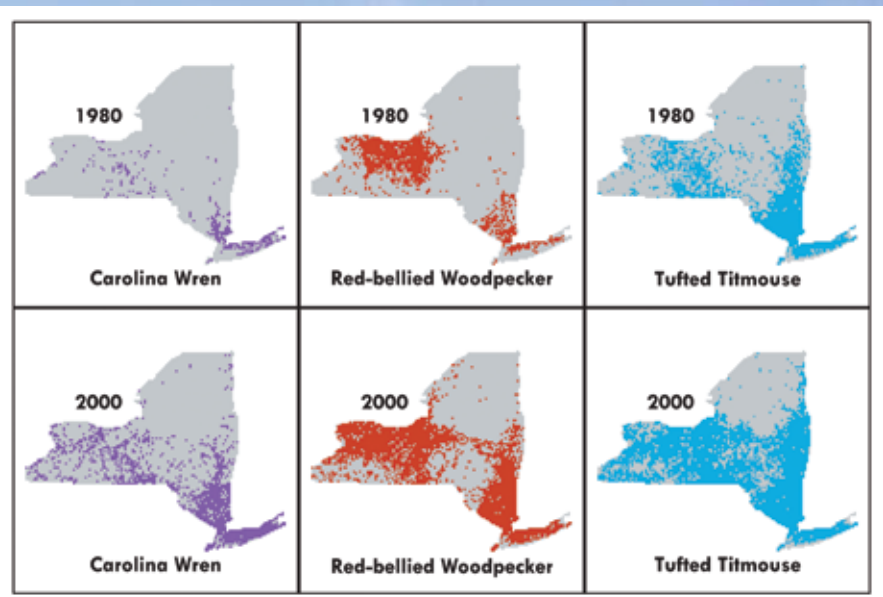
*Ben Zuckerberg and Annie Woods*

Scientists have shifted their debate on climate change and are no longer discussing whether or not it is occurring, but rather how wildlife populations are responding to these changing conditions. New York state, like many areas throughout the northeastern United States, has experienced a general increase in temperatures over the past 20 years that could have a major impact on the region's bird populations. Throughout the northeastern United States, regional temperatures have consistently risen since the late 1970's, resulting in an average warming of 0.3° C per decade.

Near the beginning of this warming period, the first New York State Breeding Bird Atlas (BBA) was conducted between 1980 and 1985. Twenty years later, between 2000 and 2005, New York became the first state in the country to complete a second Breeding Bird Atlas. These two surveys offer an excellent and unique opportunity to test how bird species may have been affected by regional climate change.

Warming of the northern hemisphere over the past half century has spurred research throughout the world, and atlases are playing a critical role in these investigations. In Great Britain and Finland, researchers used repeated bird atlases to document one of the first northward shifts in the northern range boundaries of southerly species, but did not find a similar pattern for northerly species. In New York state, climate change has been offered as a potential reason for the expanding ranges of several southerly species (Carolina wren, red-bellied woodpecker, and tufted titmouse) (see map). Simulation models suggest that, given future climate change scenarios, the Northeast will experience large changes in bird communities with whole-scale changes in distribution for a diversity of species.

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Breeding Bird Atlas comparisons for three birds show increased detections in New York.



# New Adirondack-based Institute Will Study Northern Forests

## Partnership Creates Educational Facility to be Based at AEC

The historic Masten House in Newcomb, Essex County, will be the site of a new leadership and training institute that focuses on the research and management of northern forests.

New York State Department of Environmental Conservation (DEC) Commissioner Pete Grannis, SUNY-ESF President Cornelius B. Murphy, Jr., and Open Space Institute (OSI) President Joe Martens joined other state and local officials in August at the AEC to announce the creation of the Northern Forest Institute for Conservation Education and Leadership Training. The facility will educate and train policy makers, business leaders and educators to guide future decisions and learn more about the 25,000,000 acres of forested land that blanket portions of four northeastern states. The institute will be operated by the AEC.

“This world-class educational facility will help DEC learn more about the forestry resources and challenges unique to our region, while also contributing significantly to local economies,” Grannis said. “By supporting the growth of public and private higher education with this and other initiatives in the Adirondacks, Governor David A. Paterson, DEC, and our partners are supporting the economic and environmental future of northern New York.”

Said Murphy: “We very much value our partnership with the New York DEC and the Open Space Institute in helping to develop the new leaders and stewards for our great northern forest. The Masten House will be a focal point for this effort.”

Martens pointed out that the Adirondacks and the rest of the northern forest holds enormous economic, educational and environmental potential. “OSI is proud of its role in making the Masten House available to SUNY-ESF to help realize this potential,” he said. “Thanks to Governor Paterson’s leadership and this remarkable public/private partnership, the Adirondacks are going to be the epicenter

of research and training related to the region’s economic and environmental well being.”

The northern forest extends from Lake Ontario at Tug Hill, across the Adirondacks to northern Vermont, New Hampshire and Maine. The institute’s location is adjacent to the Adirondack High Peaks region and includes the historic town of Adirondac, which has a rich industrial and cultural heritage.

The project is a cooperative effort that will enhance forest preserve and wildlands management research and contribute to the local economy. ESF will run the Northern Forest Institute (NFI) on a 46-acre portion of a property owned by OSI’s Open Space Conservancy and leased on a long-term basis to the college for \$1 per year. Establishment of the institute is being aided by a \$1 million grant from Empire State Development to OSI and \$125,000 from DEC to ESF. In addition, DEC has committed \$1.6 million over the next four years to ESF scientists who will conduct three research projects on visitor demand, experiences, and impacts, as well as a training program for DEC employees responsible for managing recreational visits to New York State forest preserve lands.

The NFI will focus on meeting the educational and research needs of professional audiences, including representatives of state agencies, business leaders, and educators. The institute will also serve the general public, particularly college and secondary school students.

Kenneth A. Schoetz, Acting Upstate Chairman for Empire State Development, said: “Today marks an important milestone in solidifying northern New York’s economic strength and vitality. Empire State Development is proud to support this project and its expansion of critical research and training related to the six-million-acre Adirondack Park and the entire northern forest area. This cutting-edge research facility establishes a gateway to the largest wilderness area in



## *'It's about making connections'*



*DEC Commissioner Alexander "Pete" Grannis and Open Space Institute President Joe Martens address the audience during the ceremony announcing the NFI partnership.*

the contiguous United States and will serve as an economic catalyst, further protecting open space and the historic Masten House.”

The eight-bedroom Masten House was built in 1905 near secluded Henderson Lake and was used as a corporate retreat by NL Industries, which operated a nearby mining site. Masten House is within the state historic district that encompasses the former town of Adirondac at the southern entrance to the High Peaks Wilderness area. The town was settled in 1826 and was home to one of the region’s first iron mines and early blast furnaces. The village was resettled in the late 19th century as the Tahawus Club. Then-Vice President Theodore Roosevelt was staying at Tahawus in 1901 when he learned that President William McKinley had taken a turn for the worse after being shot by an assassin.

NL Industries refurbished the Masten House in the 1990’s and in 2003, the Open Space Conservancy acquired the 10,050-acre Tahawus tract from the company. DEC acquired 6,813 acres outright earlier this year with funds from the state’s Environmental Protection Fund and is working to purchase a conservation easement on an additional 3,237 acres. The easement will enable public access while also contributing to the economy by continuing sustainable timber harvesting.

The institute will incorporate three facilities in the central Adirondacks. The Arbutus Great Camp and the Carriage House at the AEC, both donated to ESF by Archer and Anna Huntington in the 1930s, will provide housing and conference facilities. These buildings are several miles to the southwest of the Masten House, which will be renovated to also provide housing, conference space and facilities for educational programming. Complete development of the institute is expected to cost up to \$13.5 million.

Senator Betty Little said: “This is an exciting collaboration for the Adirondacks. The environmental and economic benefits of this new institute are very encouraging and the incorporation and highlighting of the 100-year-old Masten House into this project is a great feature. I congratulate those who are working so hard to make this a reality and I look forward to seeing this continue to develop in the months and years ahead.”

Assemblywoman Teresa Sayward commented: “I have been so impressed by the cooperation among all of these agencies with local governments, schools and the entire region. The shared exper-

tise on sensitive environmental and economic issues is truly priceless. I couldn’t be happier with these wonderful organizations for coming together to benefit our North Country communities.”

Town of Newcomb Supervisor George Canon asserted: “Today’s announcement by the State, SUNY ESF and OSI that a world-class institute will be created at the Masten House is great news for the Town of Newcomb. Finding a new use for this historic building will help tell the story of the founding and development of the Adirondacks, and the critical role this town has played in the state’s and country’s history. Bringing new jobs and economic vitality to town also demonstrates the state’s commitment to meeting the needs of the North Country.”

Dr. William F. Porter, AEC director said: “It’s about making connections between those who are in need of the information and those who do the science that generates the information. In the northern forest, it’s all about how you can simultaneously promote wilderness, and at the same time, grow the economy to provide the quality of life for the people who live there.”

In addition to the Open Space Institute and DEC, partners in the project include the Adirondack Park Agency, the Town of Newcomb, the Adirondack Museum, the Natural History Museum of the Adirondacks, and the Association for Protection of the Adirondacks.



# Happy Birthday, NY20!

A celebration of 30 years of continuous precipitation chemistry monitoring.

By Dudley Raynal and Myron Mitchell

This fall marked a milestone at Huntington Wildlife Forest: the 30th anniversary of participation in a national effort to learn more about precipitation chemistry and monitor long-term trends.

Thirty years ago — Oct. 31, 1978, to be exact — a small forest opening at HWF was designated NY20, the twentieth site to join the then-fledgling program now known as the National Atmospheric Deposition Program (NADP), National Trends Network (NTN). The HWF site has been operated by the Adirondack Ecological Center staff without interruption since its inception. The dataset represents one of the longest records of atmospheric deposition chemistry in the nation and contributes to the national assessment of geographical patterns and temporal trends of wet deposition chemistry.

With support from New York State Energy Research and Development Authority (NYSERDA), ESF has run the monitoring site with assistance from AEC staff, including Ray Masters, Charlotte Demers and Steve Signell, among others. Every Tuesday morning — that's 1,560 Tuesdays, over 30 years — a weeklong precipitation sample is collected and analyzed for water volume, pH and specific conductance. The sample is then sent to the network's central analytical laboratory at the Illinois State Water Survey for measurements of the concentrations of major cations and anions in solution. With precipitation amount, concentrations can be converted to deposition.

Over the years, the AEC staff has tended the Huntington Forest NADP site, making visits through all manner of weather conditions to maintain equipment and process precipitation samples collected in liquid or frozen form. They coordinated their activities and shared data with the NADP analytical laboratory staff as well as with research scientists at ESF and beyond. AEC site operators have won accolades and awards from NADP for their outstanding and dedicated



service. Without their enthusiastic engagement in this long-term monitoring project and the support of other researchers, this monumental undertaking would not have been possible.

*Dr. Myron Mitchell discusses precipitation chemistry.*

Drs. Dudley Raynal and Myron Mitchell have served as NADP site supervisors and have been responsible for acquiring funding to support the analytical expenses. In addition to ESF and NY-SERDA, the project has been supported by the New York State Electric and Gas Corporation, Empire State Electric Energy Research Corporation and the U.S. Environmental Protection Agency.



*Dr. Dudley Raynal shows off the plaque honoring him for 30 years of involvement with NADP.*

In 1985-1986, Raynal served as chair of the NADP Technical Committee, the governing body of the program. In 1995, NADP expanded its sampling to include mercury deposition and the Huntington Forest joined that Mercury Deposition Network (MDN) in 1999 with research funding provided by Dr. Charles Driscoll of Syracuse University. In May 2002, a Clean Air Status and Trends Network (CASTNET) site was also installed. CASTNET is operated by the U.S. Environmental Protection Agency (EPA) and provides atmospheric data on the dry deposition component of total acidic deposition, ground-level ozone and other forms of atmospheric pollution.

## The History of Air Pollution

What led to the establishment of NY20? The answer to that question lies in concerns about air pollution and its ecological impact. Federal legislation establishing air pollution control standards dates to 1955 when Congress authorized the Air Pollution Control Act. Subsequently, the Clean Air Act of 1963 with amendments in following years expanded air pollution control programs, identified specific air quality standards and set compliance guidelines. The Clean Air Act of 1970 established progressively more strict ambient air quality standards and set limits on emissions from both stationary and mobile sources. This legislation also authorized research funding to elucidate patterns and dynamics of airborne pollutant emission and deposition.

Concern about the possible influences of “acid rain” on forest ecosystems prompted the sponsorship of the First International Symposium on Acid Precipitation and the Forest Ecosystem in 1975. The symposium set a national agenda for research on acidic deposition and called for establish-



*The Atmospheric Station at HWF.*

ment of a network for monitoring chemical constituents in precipitation. As a result, under the auspices of the U.S. Department of Agriculture, the NADP was created in 1978. The inclusion of an Adirondack Mountain site grew from a commitment by ESF scientists to determine

the actual and potential effects of acid rain on the pristine waters and forests of the region. Nationwide, the precipitation chemistry monitoring network quickly grew from 22 sites in the first year of operation to more than 250 stations today, distributed over most of the states and U.S. territories. Countless research articles have incorporated findings from the growing NADP database. Temporal trends in atmospheric deposition measured at Huntington Forest are accessible at the NADP web site (<http://nadp.sws.uiuc.edu/sites/siteinfo.asp?net=NTN&id=NY20>).

## What Do the Numbers Say?

Air pollutant emission controls have reduced atmospheric deposition of pollutants. The data indicate that the acidity of precipitation (expressed as annual volume-weighted pH) lessened from 4.29 in 1979 to 4.57 in 2006; sulfate deposition declined from a maximum of 24 kg/ha/yr to about 16 kg/ha/yr and nitrate deposition was reduced from 18 to 12 kg/ha/yr. Studies of the recovery of Adirondack ecosystems are ongoing.

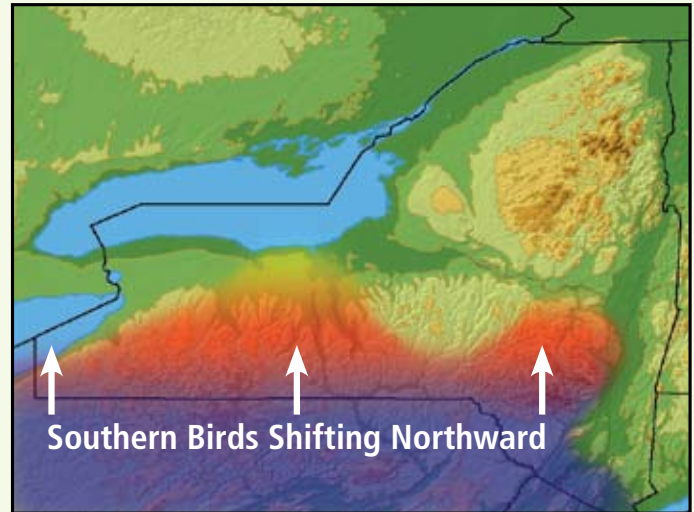
Additional tasks recommended by the initial symposium were to identify the sensitivity of ecosystem processes to acidic precipitation, initiate controlled experiments measuring the response of vegetation to acidic precipitation, and investigate the effects of acidic precipitation on soils, soil nutrient availability, and biological processes affecting soils. In 1978, aided by NYSERDA funding, ESF research scientists began comprehensive studies of atmospheric deposition effects, an effort that extends to present-day research. Numerous scientists and students from ESF and a host of other institutions and agencies have contributed to studies of influences of atmospheric deposition in the Adirondack Mountains and the publication output based on these studies that include Huntington Forest numbers more than 150 articles, book chapters and theses. The establishment and operation of the NADP monitoring site at Huntington Forest has been a strong magnet attracting research on atmospheric deposition research and biogeochemical and hydrological studies. We look ahead with anticipation that NADP monitoring and associated research efforts at Huntington Forest will continue well into the future.



*Former NY20 Site Operator Ray Masters explains the sensitivity of mercury collection equipment to a group of scholars. Simply breathing near the sample might contaminate it with mercury from tooth fillings.*

# Birds Move Farther North

*Continued from page 3*



*SUNY-ESF researchers have documented a shift in the breeding ranges of several bird species.*

Despite these temperature changes and modeled predictions of bird community changes, no empirical studies have documented possible range shifts in response to climate change in the northeastern United States. The problem with identifying climate change as a force influencing bird distributions is that large range changes can be caused by other forces, such as land use practices or habitat loss.

Using the BBA, we documented latitudinal shifts for bird species over two decades. Of 139 species, 57 percent showed a movement northward in their mean latitude and 42.6 percent demonstrated a movement southward, indicating that more bird species had shifted the center of their range northward than southward.

Because shifts in species distributions in relation to climate change are generally more pronounced at range boundaries than range centers, we also investigated shifts in range boundaries while controlling for overall increases and decreases in distribution. We found a northward shift of 11.4 km (SE 3.1 km) in the southern range boundary of northerly species like the pine siskin, and a northward shift of 15.9 km (SE 8.5 km) in the northern range boundary of southerly species like the blue-winged warbler. This may be the most convincing data that species are responding to climate change in the Northeast. Because the range boundaries for many birds are in or near the Adirondacks, this region may be important to monitor for future bird distribution changes in response to climate change.

*Ben Zuckerberg has a Ph.D. and Annie Woods has an M.S. from the Department of Environmental and Forest Biology at ESF. Ben is an ecologist at the Cornell Lab of Ornithology and Annie is the AEC's new educator.*

*A paper about this study has been accepted for publication in Global Change Biology.*

# How will climate change affect the little plants beneath our feet?



by Kirsten Coe

Changes in our global climate threaten to alter ecosystem function and diversity in the Adirondack region. Within the next century, carbon dioxide levels are expected to nearly double, surface temperatures are likely to increase by 2-5 °C, and alterations in rainfall patterns will occur.

These factors, working singly and synergistically, will affect Adirondack plant communities in terms of physiology, biogeochemistry, ecology, and diversity. The bulk of current climate change research, however, is limited to higher plants.

Bryophytes (mosses and liverworts) are an essential component of Adirondack plant communities, where, often forming luxuriant forest floor carpets, they regulate soil moisture and temperature, influence nutrient availability, aid in seedling establishment, and contribute to biodiversity. Despite their important ecological role, little is known about how these plants will respond to predicted global changes.

I seek to understand the physiological and ecological response of bryophytes to global climate change. In particular, I am interested in the combined effect of increased temperatures and alterations in precipitation on photosynthetic performance and seasonal carbon balance of two common Adirondack species, millipede weed (*Bazzania trilobata*) and pincushion moss (*Leucobryum glaucum*).

The primary field site for this project is on the southern shore of Wolf Lake within Huntington Wildlife Forest, where these two species coexist below an overstory of eastern hemlock and red spruce. To examine the effect of increased temperature and changing rainfall, plots containing both species were established by inserting

four-inch polyvinyl chloride collars into bryophyte mats. Half the plots were covered with open-top passive greenhouses to raise the temperature inside by 2-3 °C.

Precipitation treatments include average rainfall (natural precipitation only); 50 percent of the average (rain-out shelters exclude natural rainfall and 50 percent of the natural amount is added by hand weekly); and 150 percent of the average (an extra 50 percent is added to plots). This design ensures bryophytes experience a large array of conditions, ranging from the most favorable (150 percent of the rainfall combined with ambient temperature) to the least favorable (50 percent of the rainfall combined with increased temperature). Following two growing seasons of these treatments, plots will be evaluated both in terms of photosynthetic performance (using laboratory gas exchange techniques) and species partitioning (i.e. has one of the two species grown more than the other under the given treatment?).

By examining the effect of multiple climate variables at once, this experiment will help answer important questions regarding the future of Adirondack bryophytes: What conditions of our future climate will be the most harmful physiologically? Will some species survive better than others? What will the impact of these changes be on the rest of the forest community? As for the answers to these questions, stay tuned!

Kirsten Coe is pursuing her Ph.D. at Cornell University in the Department of Ecology and Evolutionary Biology and can be reached at [kkc32@cornell.edu](mailto:kkc32@cornell.edu).



# On the Trail of Mercury in the Upper Hudson River Watershed

By Douglas Burns and Karen Murray

Mercury contamination of fish, loons, ospreys, and other aquatic-feeding animals continues to cause concern in New York, especially in the Adirondacks where the problem is most acute. Recent evidence in the Northeast has even shown mercury contamination in birds and other animals that feed only on land, so the problem now exists in terrestrial ecosystems, as well as in the water.

Much of the knowledge of mercury cycling processes has been advanced by studies carried out at the Huntington Wildlife Forest (HWF) by Dr. Charles Driscoll of Syracuse University and colleagues who have studied the Arbutus Lake watershed, where high concentrations of the toxic methyl form of mercury have been measured in lake and stream water. HWF is also the site of a station where samples of rain and snow are analyzed for mercury concentration as part of the National Mercury Deposition Network, and where mercury in gaseous and particle deposition has been measured by Tom Holsen and colleagues from Clarkson University.

Despite all that has been learned about the mercury cycle in the past 10 to 20 years, there are still many gaps in information, especially regarding details of the mercury cycle in stream and riverine ecosystems. Gaps include understanding how long mercury is stored in various ecosystem reservoirs, such as soils, before being transported to streams and lakes, and how long atmospherically deposited mercury remains available for biological uptake and accumulation through the aquatic food web. HWF and the surrounding area are ideally suited for additional mercury research to address these issues.

Scientists from the U.S. Geological Survey (USGS) have been studying mercury in flowing waters as part of the National Water Quality Assessment program since 2002. As part of these investigations, a new round of studies was begun in 2006 with a focus on the mercury cycle and bioaccumulation in small watersheds in the Upper Hudson River basin of New York and the Edisto River basin of South Carolina. A primary question addressed in this study: How do biological, chemical, and other environmental characteristics govern the methylation, transport, and bioaccumulation of mercury in streams? One goal of this work is to develop computer models that describe the movement of mercury through surrounding ecosystems and into the waters. The Hudson River basin study emphasizes the Fishing Brook watershed immediately west of HWF in the town of Long Lake (the outlet of HWF's Arbutus Lake is a tributary of Fishing Brook).



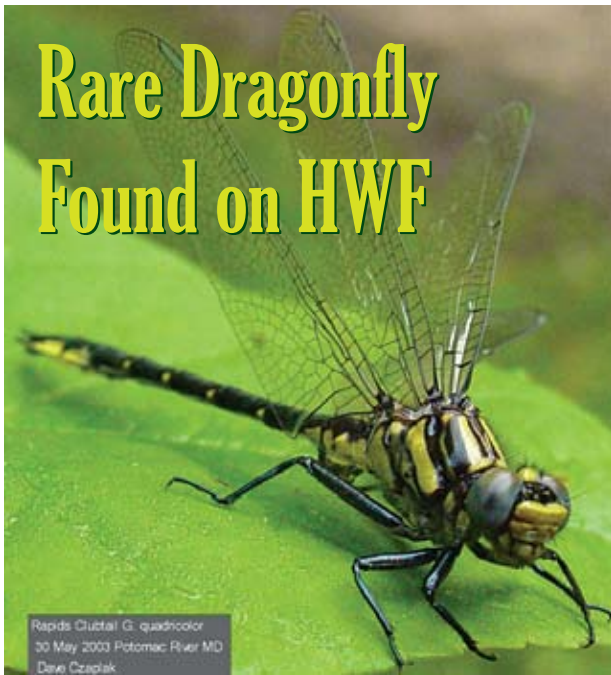
John Byrnes of USGS measures stream discharge in a tributary of Fishing Brook.

The multidisciplinary nature of the study brings hydrologists, aquatic biologists, geochemists, and others from USGS Water Science Centers in New York, South Carolina, and elsewhere to the Adirondacks to collect samples of aquatic organisms, ground water, stream water, and streambed sediments for analysis of mercury and related constituents. Through several seasons, we have been collecting organisms representing various feeding strategies, life histories, and food web positions for analysis of total mercury, methyl mercury, and stable isotopes. In addition to collecting predatory fishes such as smallmouth bass and brook trout, we collect omnivorous “forage” fishes, such as common shiners; predatory invertebrates, such as dragonflies and damselflies; and consumer invertebrates, such as flathead mayflies and northern casemaker caddisflies. Our findings on how mercury cycles from the atmosphere through the terrestrial and aquatic ecosystem and into the aquatic food web can ultimately be linked with those of other scientists who are studying mercury bioaccumulation in a variety of organisms such as songbirds (Biodiversity Research Institute) and loons (Adirondack Cooperative Loon Program).

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Jakob Schelker downloads data from the USGS stream gage that records the discharge of Fishing Brook at County Line Flow.



By Stacy McNulty

Summer is the ideal time to observe odonates, those dazzling, winged aerial hunters searching for insect prey. The rapids clubtail (*Gomphus quadricolor*) is camouflaged in black, green and yellow and is found near cold, rocky streams. The swelling at the end of the abdomen gives a clubtail its name. The species is globally rare but is found throughout the Northeastern United States.

In early June 2006, students captured a male adult near the Military Pond/Rianu Meadow area of southern Huntington Wildlife Forest (HWF). The specimen was preserved and sent to the New York Natural Heritage Program for confirmation and inclusion into the statewide database compiled by the New York Dragonfly and Damselfly Survey.

Erin White, a NYNHP zoologist, was pleased with the HWF find. White said the rapids clubtail previously had been seen at about 10 sites across New York. In addition to the 2006 record for Essex County, it was verified in 2007 on the Oswegatchie River, and there are two other Adirondack records that have not yet been confirmed. The NYNHP hopes to revisit several other sites with records from the 1990s and better determine its current statewide status.

A conservation guide for the rapids clubtail is available online at <http://www.acris.nynhp.org/guide.php?id=8192>.

The New York survey concluded field sampling in 2008 and will publish the survey results. To date, 42 species have been identified at HWF. With the abundance of wetland and habitat types present, it is likely that there are many more species yet to be discovered.



By Charlotte Demers

Long-term data collection provides an in-depth window into population fluctuations and is critical to understanding ecological relationships. An example is the “Perfect Storm” of summer 2007.

Ecologists at the AEC saw a substantial increase in the number of small mammals in the region. Beginning in August, the mouse explosion was a topic of conversation for homeowners, campers, and seasonal residents. Some families reported trapping more than 100 mice at their homes, and mouse traps in local hardware stores were quickly depleted. The Associated Press and the local PBS TV station (Plattsburgh, N.Y.) sent reporters and photographers to Newcomb to record small mammal research in action on HWF.

How did this population boom of *Peromyscus* spp. (white-footed and deer mice) happen? The previous fall was extremely successful for trees and shrub seed production. It was the largest beechnut crop recorded on HWF in 20 years. Small mammals, with their short generation time and large reproductive rates responded very quickly – deer mice can have six litters a year! Abundant food was coupled with low predator numbers and favorable weather conditions (a short winter, a dry spring, and a moist early summer). These factors helped during critical periods such as winter survival and brood rearing. In summer 2007, we experienced the largest small mammal catch in the last 16 years – 120 *Peromyscus* at three sites (average 17 mice/acre).

After last summer, the cyclical nature of these biological processes ceased to favor the mice. Poor seed production in fall 2007, increased predator abundance (e.g., weasels, owls) and a long, wet winter likely caused small mammal numbers to plummet. For summer 2008 we predicted a crash in small mammal numbers that was borne out: only eight *Peromyscus* were captured (about 1 mouse/acre). Vole and shrew populations were way down as well. The most abundant small mammal was the woodland jumping mouse, which competes with *Peromyscus* for food.

Mice are a key prey item, and also are a vector for Lyme Disease among others, so increases in the population can have serious effects on both wildlife and humans. When the conditions are right, we may yet again experience a “Perfect Storm” of mice.



# The Sage Apprenticeship: A Dream Job for a 5-Year-Old at Heart



By James Stickles

“I can’t believe I’m getting paid to do this!” was my first thought as Charlotte Demers and I checked duck nest boxes on my first day of work as the Sage Apprentice. Of course, if one finds a job that encompasses all joyful aspects of life and can get paid to do it, then one hardly ever has to work a day in one’s life. The Sage Apprenticeship was that type of job.

As a child, I spent countless hours exploring the outdoor world. I would hunt, fish, and attempt to catch critters including frogs, snakes, and insects. I am now older, but my lifestyle has not changed at all. However, the methods of capture have changed and the toys got a lot more expensive and more fun to play with!

As a deer hunter, I once thought the adrenaline rush when a deer came into shooting range was pretty intense. However, that was before I was involved in a chronic wasting disease (CWD) project headed by master’s candidate Matt Smith. A deer would come barreling out of a Stevenson trap into the net and former graduate student Zak Danks and I would take it down in a split second, pinning it to the ground for up to five minutes as it tried to kick us and break free. Now that was an intense adrenaline rush!

I spent numerous hours conducting radio telemetry, small mammal and grouse trapping and loon surveys, checking salamander bricks, catching dragonflies, and recording data for deer exclosures. I was even a forester for a day. I was able to observe otters, black bears, bald eagles, American martens, and ermine along with many other fascinating creatures. I think the best sightings were not that of wildlife, but of scenery. The sun setting into the mountains on a cool, calm summer evening when a mirror-like Rich Lake reflected the warming colors of the clouds always sent a chill up my spine.

Wildlife biology and forestry are difficult fields to get into. People certainly do not do it for the money. Advanced college degrees and work experience are mandatory, and both come at a cost. People get into these fields because it is what they love to do. I looked up to Stacy McNulty and Demers as mentors, whose strong passion for the outdoors has helped preserve their youthful outlook. Bruce Breitmeyer and Mike Gooden were no different as they both had a genuine interest in their forest-based work. Then there was Paul Hai, whose high energy would permeate the entire office, and Steve Signell, a master map maker with a light-hearted sense of humor. They were, the best staff I have ever worked with, and I look forward to working with them again in the future. Thank you all for a spectacular first job!

*Jim Stickles has a Bachelor’s degree in EFB from ESF and was the Sage Apprentice in 2007.*

## On the Trail of Mercury

*Continued from page 9*



*Elizabeth Nystrom of USGS uses an Acoustic Doppler Current Profiler to measure discharge in Fishing Brook at County Line Flow.*

When not collecting samples, we are involved in compiling, analyzing and interpreting the resulting data. Although it is too early in this process to have conclusive results, we are clearly seeing the value of the Adirondacks as a “natural laboratory” for understanding the mercury cycle. Uncovering more of the details of mercury cycling in an Adirondack watershed will contribute to the development of improved criteria and standards for protecting human and wildlife health, and will help determine appropriate strategies for defining and achieving safe mercury emission levels.

The USGS study has benefited by being granted access to the study area by The Nature Conservancy and Finch, Pruyn, and Company, and by being able to utilize the facilities of the Adirondack Ecological Center. USGS researchers have also benefited from interactions with others conducting research at the HWE, Driscoll and Dr. Myron Mitchell (SUNY-ESF) and their teams. Data collection for the USGS study will continue through 2009, and publications related to the study are expected to be written during 2010-11, with all publications completed by 2012.

*Readers who are interested in more details of the study can contact Douglas Burns ([daburns@usgs.gov](mailto:daburns@usgs.gov)) or Karen Murray ([krmurray@usgs.gov](mailto:krmurray@usgs.gov)) at the U.S. Geological Survey office in Troy, N.Y., or check the USGS mercury study web site at: <http://water.usgs.gov/nawqa/mercury/> and follow the link to the Hudson study.*

# Something New Under the Sun



*By Paul Hai*

On Saturday, August 23, something remarkable happened at Huntington's Rich Lake beach. As the sun cleared the white pines and reached down to the long beach below Goodnow Mountain, it shone on six Adirondack Guide boats bridging the sand and the calm lake. It shone, too, on 14 people enjoying those boats. Five of the boats had come across more than a century to reach the beach that morning, while



the people, a mix of boat owners and fans, came from as far away as Buffalo, N.Y., and Connecticut.

This was the first Caleb Chase guide boat reunion. Why Caleb Chase? And why a reunion? As many readers are aware from previous articles, it started in 2003 when I found an old guide boat in the rafters of the saw mill. An ostensible "repair estimate" trip to Rob Frenette, a guide boat builder in Tupper Lake, revealed the boat was likely built by Caleb Chase. That name only rang a bell as one of the homestead owners in Newcomb from whom Archer Huntington purchased land to create his 15,000-acre estate.

In the ensuing years, and through many conversations with guide boat owners and enthusiasts alike, it has become clear Caleb Chase was far more than just a homeowner on what would become Huntington Forest. He is one of, if not the, seminal guide boat builder of the Adirondacks. Guide boats are as iconic to the Adirondacks as loons. This rugged region is the birthplace of the unique and versatile craft. And Caleb Chase's workshop above Rich Lake was the birthplace of these boats shining in the clear morning light of late summer.

The majority of the boats were local, including Roland Stearns' two boats visiting from Blue Mountain Lake, Tom Bissell's from Long

Lake and Joanna Donk's from Newcomb. Gordon Fisher of Long Lake brought a stunning boat he built from Caleb Chase lines, and Todd Parmington, a boat restorer, and ESF alum (ERM '79) brought a Chase boat recently restored in his Buffalo workshop.

While Roland was unable to join us, he was generous (and trusting) enough to let his boats come to the party unchaperoned. The other boat owners were joined on the beach by Dr. Stephen Sulavik of Connecticut, an author and guide boat expert; his grandson, Martin Peters; Shari and Terry Chase from Fort Ann, N.Y., a relative of Caleb's; Rosine and Peter Lemon, a Chase boat owner and photographer from Long Lake; Mike Gooden (ESF forester and avid historian); and guide-boat-lover-in-training Lauren Hai.

We enjoyed a round-robin of rowing, taking out each of the boats for a row before reconvening on the beach for a picnic lunch.

Since the boats are owned by people across the region, it is safe to say this is the first time these boats, built between 1870 and 1890, have floated together on the lake where Chase built them. We sincerely hope it won't be the last.

