
BLACK ROCK FOREST NEWS

Fall 2007

The Black Rock Forest Consortium

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Consortium Day: Stillman Award to Hudson Sloop Clearwater

This year's Consortium Day, held on June 10, was as lively as ever, with scientist walks and talks, student activities, a variety of displays, and green building tours. Highlights included the dedication of trees planted in honor of various people, the dedication of a bridge built by students, and the presentation of the annual E. G. Stillman Award to [Clearwater](#). The Consortium also gave a special award to Walter Millman, a former Newburgh Schools administrator who was instrumental in the early development of the Consortium and the creation of many innovative educational programs.

Some 200 representatives of Consortium institutions and friends of Black Rock Forest gathered to enjoy a day in the woods and learn about the achievements of the past year. Special guests included Cornwall-on-Hudson Mayor Joseph Gross; nearly all member institutions were represented.

Highlights

The day began with dedications of trees planted on Earth Day: a flowering dogwood (*Cornus florida*) in memory of Claire Kobel, mother of Forest Administrative Assistant Barbara

Brady; another flowering dogwood, given by Consortium Secretary Christie Van Kehrberg in honor of the marriage of Consortium Board Chairman Emeritus William T. Golden and Catherine Morrison; and a white pine (*Pinus strobus*) given by Forest staff and the Consortium in memory of Pat Yazgi, founder of Friends of Fishes, who was very important in the development of the Forest's trout program.

Later, students from the [Metropolitan Montessori School](#) dedicated a footbridge

they built over a stream that crosses a trail near the Upper Reservoir. The school made bridges a theme for its Upper Elementary students (4th-6th grades) last year. Working with teacher Laura Kelmanovitch, Forest Manager John Brady, and Jamie Kamlet, a Forest educator, the

6th grade researched bridges, selected a site, developed a design, built models and temporary bridges, and then constructed the permanent bridge. "The Bridge is holding up very well," notes Forest Executive Director Dr. William Schuster.

Each year, the Consortium presents its [E. G. Stillman Award](#), named after Forest founder Dr. Ernest G. Stillman, to people or or-

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Research Symposium

Focus on the Hudson Highlands

The 2006 Black Rock Forest Research Symposium expanded on the success of earlier symposia in several ways: it lasted two days (June 25 and 26), included researchers from around the Hudson Highlands in addition to those working in the Forest itself, and was cosponsored by the [Highlands Environmental Research Institute](#) (HENRI) of the [Palisades Interstate Park Commission](#) and the [US Forest Service, Northeastern Area State and Private Forestry](#).

Some 30 scientists gave talks on long-term biological studies, biological diversity, invasive species, mapping and monitoring, chemical cycling, earth science and the carbon cycle, and watershed studies, and nine posters were on display throughout the symposium. (A [substantially longer version of this article](#) and [abstracts](#) from the Symposium are available on the Forest web site; the abstracts include the names of presentation coauthors and the full titles of talks.)

Long-Term Studies

Thanks to the foresight of Dr. Ernest L. Stillman in designating Black Rock Forest as a research station in 1928, the Forest has tree growth records going back to the 1930s, other data from the 1970s and 1980s, and a great variety of both biotic and abiotic information that has been routinely gathered since the founding of the Consortium in 1989. This abundance of long-term data has proved very useful for scientists conducting research in and around the Forest.

Black Rock's Executive Director, Dr. William Schuster, discussed

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Scott Berwick and Anne Todd Osborn of Clearwater receiving the Stillman Award, with Dr. William Schuster and a painting of Pete Seeger by Terry Murray.

Black Rock Forest Consortium

Black Rock Forest News is published three times a year by the Black Rock Forest Consortium.

The Black Rock Forest Consortium is an alliance of public and private schools, colleges, universities, and scientific and cultural institutions engaged in research, education, and conservation in the 3835-acre Black Rock Forest in New York's Hudson Highlands.

The Black Rock Forest Consortium is a not-for-profit 501(c)(3) organization supported by membership dues, grants, and gifts.

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Black Rock Forest News

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Report from the Executive Director

The latest, greatest invasive species threat in our area is mile-a-minute vine (MAM, *Polygonum perfoliatum*). For many land managers there is a sense of déjà vu. Fifteen years ago, when I arrived at Black Rock, our hemlock forests were in great shape. Then the non-native, invasive hemlock woolly adelgid arrived and now half of our hemlocks are dead. Fifteen years ago, our forest road-sides were characterized by a mix of native and non-native, light-loving plant species. Now, they have been overtaken by single-species swaths of introduced Japanese stilt grass. Increasingly, global human movements and trade have led to increasing rates of new species introductions, and one wonders how much we have learned.

Mile-a-minute vine, native to eastern Asia, can grow 6 inches or more in a day, climbing up and over other vegetation via sharp barbs on its leaves and stems, forming dense mats that smother other plants. It was introduced into a Pennsylvania nursery 55 years ago and has now spread from Virginia to Massachusetts. Aiding its success and dispersal are its self-pollination and its production of blue fruits that are eaten and dispersed by birds and other animals. The fruits also float and are dispersed in waterways. The seeds persist in soils for 5 years or more.

MAM vine can smother tree seedlings in forest openings, edges, and disturbed areas, threatening forest regeneration and reducing plant diversity. Wildlife species are subsequently impacted by reduced food and habitat. The plant is reminiscent of kudzu, another introduced East Asian vine, which has covered some 7 million acres in the Southeast since the late 1870s.

One thing we have learned is that fighting invasive species can sometimes be a waste of time, energy, and money. All the chemical spraying to control the introduced gypsy moth in the late 20th century did not stop its continuing spread. We know that species "invasions" have occurred throughout history and we cannot consider every species expanding into new territories to be "bad." After all, *Homo sapiens* is one of the most successful of all invasive species. And invasive species, once established, can sometimes produce environ-

mental benefits and support native species. Eric Kiviat, among others, has demonstrated, for example, that invasive common reed populations provide food and habitat for an extensive user community and can improve water quality.

Thus, should we do nothing and allow these changes to keep occurring? People often say, when I speak of risks to our dominant forest species, "others will take their place, so what does it matter?" It matters if we do not want an increasingly homogenized world. Losses of biological diversity cause consequences we may not realize for years. We *must* be concerned that a biologically impoverished world will have reduced ecosystem health and "services," such as provision of clean water, food, and natural products. This is vitally important and the reason that here at Black Rock Forest we are pursuing studies of what ecosystem services are truly at risk from species changes, and which are not. We have learned that some battles are important and worth fighting, and in other cases we should allow the "invaders" to move toward "naturalization."

Mile-a-minute vine has now been found in Cornwall and in other towns close to Black Rock Forest. Unlike the situation 15 years ago, New York State now has an established Invasive Plant Council (IPC). We have learned the importance of early action, and this IPC has developed Early Detection invasive species protocols for the state (<http://www.ipcnys.org>). The new "[Mile-a-Minute Project of the Hudson Valley](#)," supported by various agencies and volunteers, has mounted an early detection and response system for seven target counties. The ultimate goal is to eradicate the vine and halt its expansion in New York State.

Black Rock Forest is now a "MAM-vine-free-zone," and if the vine does show up we should be able to mobilize "weed buster" teams to help pull it out and keep it out. Will the knowledge we have gained in decades of experience with invasive species prove useful now in dealing with these situations? I hope so, but for the answer, check with us in another 15 years. ■

— Dr. William Schuster

Symposium (continued from page 1)

75 years of changes in the Forest, including forest density, tree basal area, and species composition, based on a series of long-term study plots. Since 1999, without any “obvious proximate cause,” canopy tree mortality has resulted in a 10% decline in basal area in the long-term plots. Regeneration is lagging for many canopy trees in large part because deer browsing prevents seedlings and saplings from growing. Species composition is changing too, with a shift towards more southern species, “consistent with an hypothesis that climatic warming has been altering tree ranges and distributions.”

Dr. Eric Kiviat of [Hudsonia](#) discussed management of long-term, abundant, and widespread invasive plants. He explained that they could provide a variety of ecosystem services and that their management could create opportunities for innovation, such as breaking up stands of invasive plants instead of attempting to eliminate them.

James Beemer from the [US Military Academy](#) (USMA) at West Point provided an overview of the biodiversity of the Hudson Highlands, going back to studies by noted naturalist Edward A. Mearns, an army surgeon and Highland Falls native. Between 1878 and 1898, Dr. Mearns documented birds, mammals, reptiles, amphibians, and fishes over 20 square miles on both sides of the Hudson River. Dr. Beemer and colleagues have recently carried out similar surveys and found that “biodiversity has remained high and even increased.”

Forest Manager John Brady presented 35 years of population data for white-tailed deer (*Odocoileus virginianus*) within Black Rock Forest, correlating deer numbers with stresses such as drought, harsh winters, defoliation due to gypsy moth infestations, and (since 1996) with annual acorn crops. He also discussed deer management policies.

Two scientists discussed timber rattlesnakes (*Crotalus horridus*), a threatened species in New York. Around the state, according to Randy Stechert, a consultant for the [New York State Department of Environmental Conservation](#), populations are declining largely due to “escalating

human pressures”; he predicts that, within New York State, rattlesnakes will soon only be able to survive inside public lands. Dr. Edwin McGowan of the [Palisades Interstate Park Commission](#) studied predator-prey cycles involving acorns, a “keystone” food resource in oak forests, relying on long-term records of rattlesnake reproduction and acorn production. As predicted, a large acorn crop in year one led to more rodents in year two and thus more



The Forest benefited from the research assistance of several student interns this summer. Here, Giulia Scelzo, from Saint Stephen's School in Rome, and Teonilda Cruz from Barnard College (on a Barnard summer fellowship) prepare to lay out a plot for the North Slope oak forest study. The other interns were J. Ledlie Klosky from Cornwall Schools, Jake Kartiganer from Newburgh Schools, and Sara Lipshutz, a graduate of Clarkstown High School on her way to Swarthmore College (all partly supported by the Scholarship Intern Program of the Garden Club of Orange and Dutchess Counties), Marlene Robles from Mt. St. Mary's College in Newburgh, and Stephen Redden of St. Stephen's School in Rome.

snake foraging and mating, leading to more rattlesnake litters in year three.

Two researchers looked at bird populations. Alan Wells reported on birds in the marshes on Iona Island, a bird sanctuary off the west shore of the Hudson just south of the Bear Mountain Bridge. The study compared birds present in 2000-2004 with those documented in a 1986-1987 count. It revealed an increase in red-winged blackbirds (*Agelaius phoeniceus*) and a loss of marsh bird species, as well as vegetation shifts.

Dr. John Confer of [Ithaca College](#) studied golden-winged warblers (*Vermivora chrysoptera*). This is “one of the most rapidly declining vertebrates” in the eastern United States,

due to forest regrowth and to intrusion by the blue-winged warbler (*V. pinus*). However, in [Sterling Forest](#), golden-winged warblers continue to nest successfully in swamp forests and in an upland site restored to an early succession shrubland condition.

Biological Diversity

Dr. Catherine Burns of [WildMetro](#) is studying the impact of urbanization on small mammal diversity, including the influence of habitat and patch size. She and her colleagues found that smaller patches (which are more common in urban areas) support “higher densities of small mammals, but with a lower overall diversity” and that high densities of white-tailed deer negatively impact small mammal communities, probably through habitat alteration (the destruction of the understory, which provides cover).

Peter Warny of [Western Connecticut State University](#) gave a slide presentation on reptile and amphibian breeding sites along the east coast and discussed some efforts to provide habitats in which these animals can be conserved.

Between 1999 and 2003, Dr. Vladimir Ovtsharenko, from [Hostos Community College](#) (CUNY) and the [American Museum of Natural History](#) (with Andrei Tanasevitch from the All-Russian Research Institute for Nature Protection), identified some 300 species of spiders in the Forest, comprising 133 genera and 27 families. He established an online [database, field guide, and gallery](#) of spiders, an identification key, and a research collection of the Forest species at the Museum.

Sydne Record of [Harvard University](#) discussed a baseline inventory of ant species in the study plots for Black Rock's oak forest sustainability project (see “What Will Happen to Our Forests if the Oaks Die,” [Spring 2006](#)), noting that this project would offer an excellent opportunity to see how ants, which are “key indicators of ecological change,” might respond to “dramatic changes in vegetation structure in temperate forests.”

Dr. Shahid Naem, of Columbia University's [Department of Ecology, Evolution, and Environmental Biology](#), pointed out that one of the scientific roles of Black Rock Forest is

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Consortium (continued from page 1) ganizations that have provided environmental leadership and support for Black Rock Forest and its Hudson Highlands region. This year's award went to [Clearwater](#), the group that runs the Hudson Sloop Clearwater. Launched in 1969, the boat serves as a mobile classroom, laboratory, stage, and forum about the river and our environment, educating some 13,000 children and adults a year. Dr. Schuster presented the award to Anne Todd Osborn, President of the Clearwater's board, and Scott Berwick, the group's treasurer, who accepted it on behalf of the Clearwater and its founder, Pete Seeger. "The boat and organization have been important in bringing the Hudson River to a much healthier state today," said Dr. Schuster. "Our choice of Clearwater emphasizes the interconnection of the Hudson and the uplands that surround it." Guests heard a taped greeting from Mr. Seeger, and Mr. Berwick played a Pete Seeger song about the Hudson on his banjo and encouraged the group to sing along.

Scientist Talks

Five groups of researchers working at the Forest gave presentations about their work. Dr. Allan Frei from [Hunter College](#), Deanna Filosa (a graduate student at [John Jay College](#)), Dr. Schuster, and Dr. Anthony Carpi from John Jay College dis-

Walter Millman with William Schuster and award.



Metropolitan Montessori students dedicate the footbridge they built near the Upper Reservoir.

cussed their research quantifying mercury cycles in Black Rock Forest (see "Mercury Research Takes Off in the Forest," [Spring 2007](#)). The work is part of a larger effort to develop models for understanding regional and global cycles of mercury, a toxic chemical that affects human, animal, and environmental health.

Stepping into the woods, Dr. Amy Tuininga and Dr. J. D. Lewis of [Fordham University](#) gave a presentation on the effects of invasive species in temperate forests, focusing on the impact of the hemlock woolly adelgid (*Adelges tsugae*) on hemlocks and on fungi that live symbiotically with tree roots. Both the Fordham and the Hunter College/John Jay College groups are guest researchers at the Forest, paying facility use fees.

Using the tributary of Black Rock Brook near the Science Center as an example, [Barnard's](#) Dr. Martin Stute demonstrated hydrology methods in stream waters, including flow measurement and sampling techniques. Dr. Hilary Callahan, also from [Barnard](#), demonstrated her study of roots below ground, using a cooler she had set up near the Solar Pavilion to show how tiny the roots are and noting that they are difficult to study but critical to nutrient cycling. She received a Black Rock Forest Small Grant for this project (see "Six Small Grants," [Spring 2007](#)) and, recently, a National Science Foundation grant.

In the Science Center, Dr. Dallas Abbott of Lamont-Doherty Earth Observatory gave a presentation on the evidence of asteroid impacts visible in pond sediments from the Forest (see "Is There Cosmic Debris in Black Rock Forest," [Winter 2007](#)). Her colleague, Dr. Dee Breger, illustrated the talk with dramatic colored slides she had created of minerals in the sediments related to asteroid impacts.

Fun for All

Children and their parents enjoyed the brook trout presentation and release at Mailley's Mill Bridge with Forest Manager John Brady and [Cornwall Schools](#) teacher Doreen Gleason; the amphibian and reptile walk along the stream to the Upper Reservoir, led by Mr. Brady and Data Manager Matt Munson; and a search for "critters" with Education Coordinators Joyce and Norman Baron, who also led the group in Hudson River songs.

Throughout the day, visitors could find out about the Green Ride, a three-day bike ride to raise money for Black Rock Forest and other environmental organizations (see "Forest News in Brief," p. 7); browse the new Forest web site; study research posters created by scientists and students working in the Forest; and learn about the brook trout program with Forest staff and teachers Donna Qualey ([Newburgh Schools](#)) and Doreen Gleason ([Cornwall Schools](#)) (see "Brookies at Black Rock," [Spring 2003](#)).

The day culminated with the traditional buffet of delicious food (from Market-on-Hudson), accompanied as usual by much camaraderie among the guests; the awards and an update on Forest activities from Dr. Schuster; and green building tours led by Operations Manager Jack Caldwell and Simon Gruber of the Hudson Valley Regional Council. ■

Dr. Hilary Callahan demonstrating her research on roots.



Symposium (continued from page 3)

“serving as a living laboratory to test leading theories in ecology, evolution, and environmental biology.” In this area, his lab is currently conducting five research projects, examining ecosystem function and the role of biological diversity, plant biodiversity, microbial biodiversity, and faunal biodiversity, as well as trait-based modeling of ecosystem functioning. He noted that these studies, collectively, are providing evidence that “naturally diverse habitats may be more resilient and provide greater magnitudes of ecosystem functioning than the more depauperate systems they are being replaced with.” He also hailed the Forest as not only “a place for testing theory, but also a place that will provide unprecedented insights into the science of ecology and the environmental value of forests of the northeastern United States.”

Invasive Species

How will increased urbanization and the “heat islands” it creates affect the spread of invasive plants, and why is there a “disproportionate abundance of invasive plants in urban compared to more rural areas?” Dr. J.D. Lewis of [Fordham University](#) and researchers from the Forest, [Columbia University](#), and the [Central Park Conservancy](#) are examining this topic as part of the Forest’s ongoing study of native plant performance along an urbanization gradient, which aims to estimate the “ecological footprint” of New York City on surrounding areas (see “Impact of Cities on Plant Growth,” Winter 2006, and “Urban-Rural Gradient: Field Season Yields Plant Growth Data,” Winter 2007). This part of the project examined growth, seed production, and offspring vigor of cocklebur (*Xanthium strumarium* L.), an annual invasive plant, at four sites from Central Park in New York City to the Catskill Mountains. Dr. Lewis reported that seedlings emerged earlier at the more urban sites and that seedlings grown from urban seeds grew larger in the greenhouse than seedlings grown from rural seeds.

One reason exotic species thrive is that native species often do not recognize them as a food source. Over two years, and at multiple sites, Dr. Lindsay R. Milbrath of the [United States Department of Agriculture’s \(USDA\) Agriculture Research Service](#)

surveyed insects and mites on two species of exotic, invasive, swallow-worts (perennial vines related to milkweed). He found only eight generalist species: they were not abundant and fed only on leaves and stems (not internally), thus causing little damage to the plants.

Dr. Schuster discussed current threats to oak forests, including Black Rock, noting that long-term data show that “canopy tree mortality has increased substantially” in the past several years, and that the causes go beyond proximal factors to “widespread tree stress” on sites with poorer soil. All major tree species are also threatened by one or more pests or pathogens: for oaks, a dominant or “foundation” species, these include the possibility of sudden oak death, caused by the pathogen *Phytophthora ramorum* spreading from the western US to the east coast.

As a foundation species, oaks provide key ecosystem services. A team of scientists, including Dr. Schuster and researchers from Columbia University and the [Ecosystems Center of the Marine Biological Laboratory](#), is conducting a multiyear study at Black Rock Forest to determine some of the cascades of impacts of the loss of this key species group to our northeastern forests (see “What Will Happen to Our Forests if the Oaks Die?,” [Spring 2006](#)).

Dr. David Mellor, from [Rutgers University](#), described a collaborative project with the [New York-New Jersey Trail Conference](#) and [Palisades Interstate Park Commission](#) to use hikers and other nonscientist volunteers to identify and survey invasive plants in Harriman and Ringwood State Parks. The researchers evaluated the ability of volunteers to collect useful and meaningful data and the effect of conducting the survey on the participants’ knowledge of and attitude towards invasive plants and the role of scientists and the scientific method in solving ecological problems.

Mapping and Monitoring

Dr. John Mickelson of the [Center for International Earth Science Information Network](#) (CIESIN) at Columbia University, the lead partner for the [US Geological Service](#) (USGS) [National Biological Information Infrastructure](#) (NBII) [Northeast Information Node](#) (NIN), presented an overview of geospatial research efforts to

understand potential shifts in the natural vegetation of the Hudson River region. His goal is to understand place-specific trends in plant communities over time, including composition, structure, function, and integrity, using baseline information and historical information to compare past vegetation patterns to projected future changes, including those that climate change might create.

Dr. Inga P. LaPuma of [Rutgers University](#) discussed techniques for combining a ground-based forest inventory and satellite (Landsat) remote sensing to statistically model the impact of development on forest biomass in the Highlands region of New Jersey between 1995 and 2002.

Robert Kakerbeck, a forestry technician in the Natural Resources Division at the [US Military Academy](#) (USMA) at West Point, presented an overview of the ecological communities found there, based on a 1993 field survey. He noted that the rugged topography and the impact of fires, military training, and logging have created complex combinations of communities, including microcommunities. Christopher Pray, also of the USMA Natural Resources Division, reported on mapping and monitoring the vernal pools on the military reservation and the flora and fauna in them.

Chemical Cycling

Dr. Josslyn Shapiro studied the cycles of a variety of chemicals in the Cascade Brook watershed as part of her doctoral research at [Columbia University](#) (see “Precipitation, Stream Chemistry Key to Ecosystem Processes,” [Winter 2005](#)), including inputs to the ecosystem through precipitation and dry deposition and outputs through stream flow; Dr. Schuster presented her report. Dr. Shapiro and her colleagues discovered that there is more chloride (Cl⁻) in the system than would be predicted and that this excess comes primarily from a process called sea-salt dechlorination in which sulfuric and nitric acids that are in the atmosphere as a result of human activities interact with sea salt aerosols. She also determined that precipitation deposition of sulfate (SO₄²⁻), hydrogen ion (H⁺), and nitrate (NO₃⁻) has been decreasing since 1981 as a result of regional and national air pollution controls.

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Symposium (continued from page 5)

Black Rock Forest has become a regional center for research on mercury, a toxic chemical that affects human, animal, and environmental health (see "Mercury Research Takes Off in Forest," [Spring 2007](#)). Dr. Allan Frei, from [Hunter College](#), part of the City University of New York (CUNY), reported on research he and colleagues are conducting to quantify the mercury cycle in the Forest, including enabling the Forest to join the national [Mercury Deposition Network](#) by establishing a monitoring station for wet deposition. They will also measure dry deposition and emissions of mercury from soil and snow surfaces. Their goals include understanding the mechanisms of mercury cycling and incorporating field and lab results into models that will allow them to improve regional and global estimates of the mercury cycle under different climate and policy scenarios.

Dr. David Evers, of the [BioDiversity Research Institute](#), presented his research on mercury in terrestrial wildlife, including forest-dwelling songbirds. He measured concentrations of methylmercury (the biologically available form of mercury) in wildlife at 40 different sites in the northeast, including Black Rock Forest, and found mercury concentrations in many insectivores higher than those in birds that eat fish, although different species seemed to have different levels of sensitivity.

Earth Science/Carbon Cycle

Dr. Jini Gilchrist of [Rutgers University](#) and colleagues conducted a geochemical study of metal pollutants leaching into the water, sediment, and soil from an abandoned 19th century sulfur mine in Putnam County. They found very acidic water that contained very high concentrations of metals, including rare earth elements and some radioactive elements (uranium and thallium), in some cases at levels exceeding Environmental Protection Agency standards. "The sulfurous mine soil makes the landscape inhospitable for vegetation even 125 years since cessation of mining operations."

Another Rutgers scientist, Dr. Alec Gates, provided an overview of the geologic history of the Highlands, starting with the collision of two "proto-continent," one with sedimentary rocks and one with volcanic

rocks, more than 10⁹ years ago and continuing through a multitude of other geologic events, including several episodes of mountain building and fracture, covering by sedimentary rock, and glaciation.

Dr. Dallas Abbott from [Lamont-Doherty Earth Observatory](#) discussed the presence of impact ejecta – oceanic and terrestrial debris dispersed when a comet or asteroid hits the ocean floor with sufficient force – in a sediment core taken from Tamarack Pond (see "Is There Cosmic Debris in Black Rock Forest?," [Winter 2007](#)). As part of her global search for evidence of multiple large oceanic impacts on earth, she has identified marine microfossils in several layers of the Forest core, as well as minerals and metals that are consistent with impact ejecta, and has correlated the dates of these layers with known impact events around the world.

For the carbon cycle component of the session, Christopher Burdette, a senior in Columbia's [Department of Ecology, Evolution, and Environmental Biology](#) who is working with Dr. Kevin Griffin of [Lamont-Doherty Earth Observatory](#) and other Columbia scientists, presented their work inventorying coarse woody debris (CWD, standing dead trees and large branches and stems that have fallen to the ground) and analyzing its decomposition on the 18 study plots of the long-term oak forest study (see "What Will Happen to Our Forests if the Oaks Die?," [Spring 2006](#)). He noted that CWD is important because it is the least studied component of the forest carbon cycle, can remain in the ecosystem for centuries, provides a pool of slowly released nutrients, and creates a habitat for other organisms.

Watershed Studies

Alexander Smith of the New York State [Department of Environmental Protection](#) (DEC) kicked off the session with a presentation on biological monitoring of the water quality of the state's streams and rivers, using benthic macroinvertebrate communities.

Dr. Allison Chatrchyan from Cornell University's [Dutchess County Cooperative Extension](#) spoke on behalf of the [Fishkill Creek Watershed Committee](#), a volunteer group that works to protect the natural environment of the approximately 190 square miles drained by the Fishkill Creek and its

tributaries. Working in collaboration with many state, regional, and county organizations, the Watershed Committee has engaged in environmental planning, identified and investigated impaired sites along Fishkill Creek, and created management strategies.

Simon Gruber, a consultant to the [Orange County Water Authority](#), described some of its projects, including county-wide stream biomonitoring, development of a management plan for the Moodna Creek watershed, and a demonstration decentralized wastewater management project in the Greenwood Lake watershed.

Posters

Nine posters were on display throughout the Symposium, covering topics from forest respiration to snow research to community structure to glacial geology to mercury to water quality. (Again, all collaborators are listed in the Symposium [Abstracts](#), and more details are provided in a [longer version of this article](#) posted on the Forest web site.) Poster authors included Jennifer Levy, a graduate student in Columbia's [Department of Earth and Environmental Science](#); Chengyuan Xu, who recently received his doctorate from [Columbia](#); Dr. Allan Frei of Hunter College; Jason Sircely, a graduate student in the [Department of Ecology, Evolution, and Environmental Biology](#) (E3B) at Columbia; Ellen Trimarco, another E3B graduate student; Rebecca Steinberg, a [Barnard College](#) student; Deanna Filosa, a [John Jay College](#) doctoral student; and J. Kelly Nolan of [Watershed Assessment Associates](#).

"This symposium provided a snapshot of much of the environmental research currently underway in the Highlands region," notes Dr. Schuster. "The sponsors hope that it will facilitate meaningful interchange, potentially lead to new collaborations, and facilitate increased environmental understanding of the region."

Editor's Note

The list of research projects that usually appears on this page is not included because this article on the Symposium discusses most of the research currently taking place in the Forest. The list will appear in the next issue and is available in the [Research section](#) on the Forest web site.

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Forest News in Brief

Support the Green Ride! Over the Columbus Day weekend (October 6-8), some two dozen intrepid bicyclists rode 260 miles from New York City to the Catskills and back to raise money for the environment, this year specifically for Black Rock Forest (the Open Space Institute is also a participant). Forest Executive Director Dr. William Schuster and Consortium Treasurer Bill Kelly were joined by riders from Columbia University, Barnard College, Spence School, the School at Columbia, Newburgh Schools, PS 311, and the Friends of the Forest. Each rider raised at least \$1800, and nine people volunteered to help with the event. *You can still help support these dedicated riders!* Visit the Green Ride's web site at www.thegreenride.org before October 31 and download a donation form; be sure to specify you are supporting Team Black Rock Forest. The Ride was organized by Marty Rosen, founder of the successful Empire State AIDS Ride.

First Development Director Hired. The Consortium is delighted to have hired Emily Waff Cunningham as its first development director. Emily earned both a BA and an MA in English literature from Stanford University, and completed additional coursework at Columbia, Oxford, and the Sorbonne. She has been a successful fundraiser for 15 years, including serving as Vice President of Development for Planned Parenthood in Chicago and Director of Major Gifts for Human Rights Watch. Most recently, she was Managing Director for the New York Sun Works Center for Sustainable Engineering, the group that successfully launched the Science Barge this past June. She

is excited to be able to mesh her passion for environmental causes with her talent for raising money. Please join us in welcoming Emily to the Forest!

Paul Winter to Include Sounds from the Forest in New CD. Renowned saxophonist Paul Winter, who participated in a benefit for Black Rock last fall (see "Month of Art and Music at Forest," [Winter 2007](#)), visited the Forest for two days in August to plan his forthcoming "Hudson River Suite" CD. He is interested in recording nature sounds from the Forest and around the Hudson Valley, and also plans to record music in the Forest's Aleck Meadow area because he found its acoustics excellent. The CD and accompanying educational materials, including Black Rock information, will be released to coincide with the celebration of the 400th anniversary of Henry Hudson's first sail up the Hudson River in 2009.

Mile-A-Minute Vine Invades the Hudson Valley. A highly aggressive, non-native invasive plant, *Polygonum perfoliatum*, dubbed Mile-A-Minute vine for its ability to grow up to 6 inches in a day and 20 feet in a year, is spreading rapidly. It is extensive in Rockland County and has entered Orange County, including Cornwall, although it has not yet been found in the Forest itself. An ad-hoc working group supported by the [Hudson River National Estuarine Research Reserve](#) is mounting an early detection and rapid response system, including designating areas such as the Forest as "weed free zones." A longer article will appear in the next issue of this newsletter.

Hunter College Joins Consortium. More next issue. ■

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Report from the Forest Manager

The roads and trails of Black Rock have a noble history. The 24 miles of roads and 18 miles of trails have created access to ancient geological landscapes and the very forgiving Hudson Highland forests. Roads and trails need destinations, their reasons for being built. Trails form over time when people travel the same path to water, food, wood, and the occasional beautiful vista. Similar to deer trails, generally following contours of the land, trails are the easiest way to get there.

Black Rock Forest's roads date back to the American Revolution. Continental Road, which bisects the Forest north-south, was built by Washington's Continental Army. Work details encamped at the New Windsor Cantonment and elsewhere constructed a road over the mountains to and from West Point. After the Revolutionary War, the road became a main thoroughfare for the people of Cornwall and the West Point area. Much of the original road has been altered by progress, but Black Rock's 2.5-mile portion has always been true to its earthen foundation.

The mid-1800s saw the only homesteads built along this road. The Chatfield House and Joe Hulse Place were located at the highest portion of the route and were both abandoned by 1911.

During the Stillman era (1910-1950), the wagon trails spurring off from Continental Road were improved. Road building was labor intensive. Small machinery and dynamite were available, but the age-old method of man, horse, and donkey labor was the best for cutting trees and coaxing stumps out of the ground. The cleared earth was covered by a stone foundation, accurately placed by hand and horse-drawn stone sleds; this was covered with local soils and crushed stone from small quarries at Aleck Meadow and the Sutherland Pond area.

Creating access for lumber wagons and early foresters, these roads initiated the beginnings of modern forestry. They also found new destinations, the developing reservoir system. From the 1880s to the 1930s, the Village of Cornwall's water needs were addressed by the construction of

five reservoirs in the Black Rock Forest watershed. Roads were built to each, and to Jim's Pond (Highland Falls water supply) and the only natural pond, Sutherland.

Few residents still remember Continental Road as a public road. Early in the 20th century, gates were placed at all intersections with it, preventing travelers from entering the maze of roads in the privately owned Forest. Portions were officially condemned in the 1970s and public vehicle access was stopped. Currently open to authorized vehicle travel is the one-mile portion of road from the Joe Hulse Place to Bog Meadow.

The destinations of Forest roads have changed through time. From Army movements to wood harvesting to the reservoir system to present day research and education, these Forest roads have held their integrity. I have deeply respected the energies brought forth to lay the foundations of these earthen roads while maintaining them over the past 25 years, as they have become part of the landscape, much like the deer trails. ■

— John Brady