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# BLACK ROCK FOREST NEWS

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Spring 2008

The Black Rock Forest Consortium

Volume XVIII, No. 2

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## Small Grants Attract Scientists and Teachers to Forest

For 19 years, Black Rock Forest's [Small Grants Program](#) has helped scientists and educators from Consortium institutions start new projects, fund summer student research, and produce a wealth of publications and theses. This year, the seventh generously funded by the Stiefel Foundation, the Program awarded a total of \$26,308.07 to five research projects and one education project, bringing the total to 120 grants and more than \$450,000.

The grants span the breadth of Forest activities, from studies of bats, small mammals, and slave-making ants to investigations of tree physiology, solar power, and even cosmic impacts. Three projects intersect with Consortium research on urban-rural gradients and the future of oak forests.

### Urbanization

The multiyear urban-rural gradient study looks at the effect of urbanization on plant growth at sites ranging from the urban (Manhattan's Central Park) through the suburban and increasingly rural (Lamont-Doherty Earth Observatory and Black Rock Forest) to the completely rural (Catskill Mountains) (see "Field Season Yields Plant Growth Data," [Winter 2007](#)).

Dr. Natalie Boelman from [Lamont-Doherty](#) is using her grant to

study tree physiology along this gradient. Expanding on research showing differences in the growth of red oak (*Quercus rubra*) seedlings at the four sites, she will examine leaf pigment content (chlorophyll and carotenoids), atmospheric pollutants, and meteorological variables to determine whether warmer nighttime temperatures are enhancing photosynthetic rates, as Dr. Griffin hypothesizes, and the role of pollutants.

Dr. Boelman will use hyperspectral



Dr. Natalie Boelman using hyperspectral imaging to measure leaf pigment concentrations.

remote sensing, a technique which, unlike traditional labor-intensive and destructive methods, allows rapid, repeated measurements of pigment concentrations not only in individual leaves but also on landscape and ecosystem levels. The relative ease of this technique will allow her to concentrate on measuring atmospheric gas and particulate pollutant concentrations. "We suspect that, in addition to the 'urban heat island' effect (higher temperatures in cities, especially at night), atmospheric pollutants cause the physiological differences among saplings growing at increasing distance from New York City," she says.

Dr. Chanda Bennett, from the [Center for Biodiversity and Conservation](#) (CBC) of the American Museum

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## Oak Project Update

### Research Gears Up for Summer

Black Rock Forest's multiyear oak forest sustainability study is gearing up for an ambitious summer research season, thanks to generous grants from the Ralph E. Ogden Foundation, the Howard Phipps Foundation, and the Arthur Ross Foundation, among others. Activities will include experimental treatments of the study plots; tree and canopy measurements; analyses of leaf litter, soil chemicals and water, and soil respiration; and population surveys of small mammals, amphibians, litter insects, and ticks. Newly hired research associate Hannah Roth (see "Forest News in Brief," p. 7) is coordinating the field work, helping manage data, and assisting the researchers.

The research team includes Executive Director Dr. William Schuster, Dr. Kevin Griffin of [Lamont-Doherty Earth Observatory](#), Dr. Jerry Melillo of [The Ecosystems Center of the Marine Biological Laboratory](#), Dr. Shahid Naeem and Dr. Maria Uriarte from Columbia's [Department of Ecology, Evolution, and Environmental Biology](#), and colleagues from other institutions. It aims to predict, in advance, some of the cascades of impacts of the catastrophic loss of oaks, a key species group, on northeastern forests (see "What Will Happen to Our Forests if the Oaks Die?," [Spring 2006](#)).

Back in 2006, the researchers established a series of 18 study plots on the north slope of Black Rock Mountain; they will remove oaks from some and leave others as controls in order to experimentally mimic the loss of oaks and observe the effects in the immediate and longer term. They also set up a pilot study on four adjacent plots. This

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## 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.

### Consortium Institutions

[American Museum of Natural History](#)  
[Barnard College](#)  
[Brooklyn Botanic Garden](#)  
[Browning School](#)  
[The Calhoun School](#)  
[Central Park Conservancy](#)  
[Columbia University](#)  
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[New York City Public School 311](#)  
[New York – New Jersey Trail Conference](#)  
[New York University](#)  
[The School at Columbia University](#)  
[The Spence School](#)  
[Storm King School](#)  
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### Consortium Staff

William Schuster, Ph.D., Executive Director  
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 Jack Caldwell, Operations Manager  
 Emily Cunningham, Development Director  
 Barbara Brady, Administrative Assistant  
 Matthew Munson, Data/Network Manager  
 Hannah Roth, Research Associate/  
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### Black Rock Forest News

Sibyl R. Golden, Editor  
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## Report from the Executive Director

As water runs over and through the earth's surface, it sustains all living organisms. We use it for many other purposes, including agriculture, industry, transportation, and energy. Water from rain and snow that does not go directly back to the atmosphere through evaporation and plant transpiration drains to basins and oceans, or sinks in to replenish groundwater. But earth's water is finite. As a powerful solvent, it dissolves nutrients and pollutants and can pick up a variety of organisms on its pathway. The challenge to our burgeoning human population is to preserve water quality and not waste it through poor management.

It seems we hear more than ever about water these days. It is the focus of the American Museum of Natural History's current [Water:H<sub>2</sub>O=Life](#) exhibit. [World Water Day](#) was March 22, and we are three years into the United Nations' designated [Water for Life decade](#). Major droughts in the western United States, Australia, and elsewhere have global impacts, and many around the world are reconsidering what long-term water sustainability will actually entail.

Lack of safe water and adequate sanitation is the largest source of human illness in the world. Two million people, mostly children, die every year of water-borne illness. Asia contains 36% of the world's water supply, but struggles to meet the water needs for 60% of the world's population. Global declines in water quality and quantity are causing extinctions of freshwater species and severe losses of biological diversity. Future conflicts over water seem likely.

Here at Black Rock Forest, we often consider water as we study and teach about forest growth and health, nutrient cycling, and populations of water-dependent organisms. Water is central to our brook trout reintroduction program. We are considering microhydro power in our energy management plans. And Forest streams play an important role in a new report on water quality in Orange County watersheds.

Watersheds are environmental integrators that can tell us about environmental health as we examine watershed chemical cycles and biota. It was through the study of whole

watersheds that [Gene Likens](#) (who will receive our [Stillman Award](#) this year) and his co-workers discovered acid rain. Just recently, wild, heritage-strain brook trout were found in a number of New Jersey headwaters – a very good indicator since brook trout require very high water quality. On the other hand, Robert Howarth and colleagues have shown that huge quantities of nitrogen are exported from streams in the Hudson River Basin, impoverishing terrestrial ecosystems while polluting aquatic systems.

Watershed understanding can make a big difference: can you say which stream drains the area you are in right now? And what larger watershed and even larger river basin that stream is part of? Most streams in the Black Rock Forest flow into sub-watersheds that are parts of the larger Moodna Creek watershed, itself part of the Lower Hudson portion of the larger Hudson River Basin.

[Orange County Water Authority's](#) recent report assessed water quality by monitoring stream biological community structure. There was a strong correlation of high scores (over 7.5 on a scale from 1 to 10) with forested areas. The three sampling areas in Black Rock Forest all had scores higher than 8. The report concluded that nutrient enrichment, including wastewater discharges from aging municipal treatment systems, was most often the source of detrimental impact. While forested upland tributaries tended to have high values and sites lower in the watershed low values, the data showed that downstream conditions can be ameliorated by additional inflow from unimpacted waters.

This report, and many others, recommend more government attention and planning and more citizen involvement. We can better protect our future, our children's future, and that of our ecosystems by understanding and assuming some responsibility for our watersheds and inter-watershed issues. So watch your watershed and demand thoughtful government and industry policies for water conservation and use. It is critical to all of our health. After all, water is a finite resource and we all live downstream. ■

— Dr. William Schuster

## *The Stars at Night . . . in Black Rock Forest*

There's a lot to be seen in Black Rock Forest – trees, pond life, animal tracks, birds, scenic vistas, and much more – but most visitors don't look much higher than the tops of the trees. In September, 32 11th and 12th grade students from [Dalton](#) took a close look at something else that it's difficult to see in an urban setting – the night sky.

The students, from Jessica Leiken's astronomy course and Kendall Truman's environmental science course (both electives), along with Ms. Leiken, Ms. Truman, and an additional teacher, Pete McNamara, arrived at the Forest in the late afternoon and entertained themselves until dinner. After dinner, the astronomy students walked the short distance to the Reservoir, where they observed constellations and a huge view of the night sky and presented research reports on astronomy in an-

cient cultures (including European, Mayan, Incan, Inuit, Native American, Egyptian, Indian, Japanese, Chinese, Aboriginal Australian, and Islamic).

Joined by the environmental science students, the group enjoyed a campfire and roasted marshmallows. Then, looking through the telescope they brought from Dalton, they were able to see the craters on the moon even though it was cloudy and observing conditions weren't ideal. "Everyone had a great time," said Ms. Leiken. "The students actually hoped we could go back in the spring, but the timing isn't going to work out."

This was Dalton's first astronomy trip to Black Rock, and Ms. Leiken has thought of ways to improve future visits. Since school had only been in session for a few weeks, the students hadn't yet learned a lot about astronomy; in the future, she would like to make sure students

have studied more of the constellations before going on the trip. She also would like to have more than one telescope available, and hopes to be able to see Jupiter or Saturn and maybe a bright galaxy.

"Due to its distance from the city, large unlit expanse, and open locations such as the Upper Reservoir and Stone House area, Black Rock Forest is a favorite location in our area for astronomy observations," notes Executive Director Dr. William Schuster. "Currently, Mars is high in the southwestern sky in the evening, Saturn is high in the southeast, and the Orion Nebula is readily visible. You can also watch the International Space Station pass over at about 8 PM. At any time of year, classes interested in astronomical observation at the Forest can contact the office for information about locations and what might be visible." ■

## *Get Ready for the Second Green Ride!*

It's time to start training for this year's [Green Ride](#)! Scheduled for Columbus Day Weekend, October 11-13, the Ride will once again treat bicyclists to an unforgettable trip along the Hudson River, up and over mountains, and through rolling farmland – all while raising money for Black Rock Forest and its educational programs. [Last year's inaugural ride](#) attracted 18 riders and raised nearly \$50,000 for the Forest.

This year's ride promises to be bigger and better. Sustainable Hudson Valley, a regional organization promoting environmental and community revitalization as key components of economic development, has signed on as an additional participant and beneficiary. Jim Bixler (a Cornwall resident and Friend of Black Rock Forest), Lisbeth Uribe (a teacher at [The School at Columbia](#)), and Scott Wood (an architect formerly with [FXFowle](#), the designers of the Forest's [green buildings](#)), all 2007 riders, have volunteered as co-chairs.

Mr. Bixler is setting up training rides, Ms. Uribe is helping other Consortium members with organizing and fundraising, and Mr. Wood will provide bike and training advice. In addition, the BlackRock global invest-

ment firm, which recently made a grant to the Forest for its School in the Forest program, will be involved in the Ride in some way, possibly by fielding a team of riders and possibly as a sponsor.

The Green Ride is organized by Marty Rosen, the creator of the successful Empire State AIDS Ride, who developed the idea with Carolyn Blackburn, whose son attends the [Amistad Dual Language School](#) (PS/IS 311, a Consortium member). Participants commit to raising at least \$1800 in contributions from friends, colleagues, and family; Ms. Rosen provides guidance on how to successfully solicit them. In addition, the Ride is fully supported, largely by volunteers, who provide everything

from signage to cooking and cleaning to entertainment.

Riders spend both nights in Black Rock's [award-winning green Forest Lodge](#). "I have never felt as well cared for in my life," said 2007 rider Dr. Martin Stute, a Barnard professor who both completed the Ride and played his guitar for the group on the second night in the Forest Lodge.

Speaking about the 2007 Ride, Dr. James Danoff-Burg said, "What was most memorable was having such great camaraderie with such wonderful people," adding that "the natural beauty of the Hudson River and the Hudson Valley more generally was eye-popping."

And Lisbeth Uribe said, "That a busy working mother of two elementary school students was able not only to complete the challenge of the Ride, but also to thoroughly enjoy the experience, is a testament to the wonderful support and camaraderie provided by the event organizers, volunteers, and bikers."

Want to join the fun? Visit the Green Ride at [www.thegreenride.org](http://www.thegreenride.org) or contact Emily Cunningham in the Forest office for more information. And, now that spring is here, take out your bicycle and start training! ■

### The 2007 Green Ride



## Student Research Spotlight: Below-Ground Carbon

In terrestrial ecosystems, soils are the largest component of the terrestrial carbon sink. Carbon is stored in soil, in root systems of plants, and in forest floor litter (leaves, twigs, acorns). In the autumn and throughout the growing season, carbon is transferred from above ground to the below-ground system through falling leaves. It is continually lost from the below-ground system through erosion and soil respiration (the release from the ground of carbon dioxide (CO<sub>2</sub>), a product of the bacterial breakdown of organic matter as well as plant and associated mycorrhizal processes).

Previous Black Rock Forest research has produced measurements of above-ground carbon storage, but not one study has thoroughly examined the below-ground component. The focus of my research was to establish a baseline estimate of the below-ground carbon allocation in six of the oak forest study plots [Ed. Note: See "Oak Project Update," p. 1].

Last summer, I measured growing season soil respiration, extracted soil cores to determine root biomass and soil carbon content, and collected forest floor litter layer samples. I then created a model to estimate the yearly soil respiration rate based on a dataset from Harvard Forest. I combined my data with measurements of above-ground litter input from 2006 to estimate the maximum amount of carbon allocated below ground.

The results indicate that up to 1.38 kg carbon (C)/m<sup>2</sup>/yr could be distributed below ground. The two largest fluxes in the carbon budget are soil respiration and above-ground litter fall. Compared to other northeastern deciduous forests, Black Rock exhibited one of the highest growing season soil respiration rates, which led to an overestimate of annual soil CO<sub>2</sub> efflux. Consequently, this estimate describes the maximum amount of carbon allocated below ground. Research in a similar forest revealed a large interannual variability

associated with soil respiration. The measured soil CO<sub>2</sub> efflux at Black Rock could represent interannual variation or a higher basal rate of soil respiration. Above-ground litter fall measurements agree with those from other oak-dominated forests.

A recent publication examining long term changes in plant composition, structure, and biomass at Black Rock estimated the total ecosystem carbon storage in 2000 to be 17.5 kg C/m<sup>2</sup>. Assuming this estimate is representative of today's processes, the equivalent of 7.9% of total ecosystem carbon is being pumped underground each year. The below-ground distribution is important in understanding the carbon budget of this forest and similar forests in the northeast. Shifts in allocation patterns have the potential to determine a forest's standing as a carbon source or sink, thus impacting the global carbon cycle. ■

*Jennifer Levy is a doctoral student in Columbia University's [Department of Earth and Environmental Science](#).*

### Oak Update (continued from page 1)

has enabled the scientists and their students to conduct baseline studies of plants, animals, and soil conditions before observing and measuring the changes resulting from the removal of oaks.

The scientists first observed changes in tree regeneration and plant species composition (see "Oak Forest Update," [Winter 2008](#)). Additionally, they have developed insights into some of the animals that live in oak forests, including a variety of little-studied faunal groups such as ants, spiders, and small mammals. This is important as baseline information, and will also be invaluable for comparative purposes as studies of the impacts of oak loss progress.

Dr. Aaron Ellison and his Harvard University colleagues recently published their ant survey in the journal [Environmental Entomology](#). Of some 38 ant species in the experimental study area, and some 58 in the Forest as a whole, three species, all ecological generalists, numerically dominate the ant fauna. The scientists point out that because Black Rock has been maintained as a research forest since the 1920s, "the ant assemblage is likely to

be as close to an equilibrium state as one could expect to find," hypothesize how oak loss might affect ant species composition and abundance, and note their results will allow them "to determine if and when such changes occur."

Dr. Vladimir Ovtsharenko and colleagues from the [American Museum of Natural History](#) have conducted [extensive surveys of Forest arachnids](#) (see "Small Grants," [Spring 2005](#)). They also examined spiders specifically associated with oaks, finding 21 species in nine families, including spiders that live on branches, twigs and leaves. Dr. Schuster notes that "changes in their abundance and diversity in response to vegetation change will be especially interesting because these will include cascading impacts: changes in one trophic level (plant producers) impacting the next trophic level (herbivorous insects) and them up the trophic web to the carnivorous arachnids."

Dr. Catherine Burns, formerly of [WildMetro](#) and now at the [University of Maine](#), working with Dr. Marina Cords of Columbia University, conducted baseline studies of small mammals over the past few years. They discovered that the study plots

were dominated by a single species, the white-footed mouse (*Peromyscus leucopus*). "The response of small mammals to vegetation change will be of interest," says Dr. Schuster, "because they feed at a variety of trophic levels and because some of them, especially mice, function as key reservoirs of the bacterium that causes Lyme disease."

In response to recent oak mortality and the potential for more losses, Black Rock Forest researchers are investigating the causes of oak loss to date, expanding the number of stands observed, and planting seedlings.

To ascertain the causes of oak mortality, they are surveying mosses, lichens, and fungi on or around the bases and trunks of dead and unhealthy trees, analyzing the conditions of tree canopies, and bringing in forest pathologists. To include more of the Forest and a wider group of forest types in the research, they are monitoring some of the study plots used by Dr. J. D. Lewis of [Fordham University](#). Finally, they will compare growth patterns of some 180 oak seedlings from local acorns planted in a fenced plot with those of an identical planting in Milford, Pennsylvania. ■

**Small Grants** (continued from page 1) of Natural History, is investigating the community composition and diversity of bats in the New York City area, using Black Rock Forest as a rural comparison to more urban city parks. Like the Consortium's urban-rural gradient study of plant growth, this project focuses on the impact of urbanization. Dr. Bennett notes that bats "play pivotal roles in maintaining the overall health of ecosystems" as dispersers of pollen and seeds, fertilizing agents, and predators, and "are sensitive to environmental change" since they have "specific microhabitat requirements which may not be met in a human-altered landscape."

Rather than trapping and physically handling the bats, Dr. Bennett and her colleagues will use acoustic technology to monitor echolocation calls of free-flying bats. They will follow a methodology developed by the Indicator Bats Program (iBats, [www.ibats.org.uk](http://www.ibats.org.uk)). Monthly from May through October in Central Park and Black Rock Forest, and once or twice over the summer in three other city parks, the researchers will drive the bat-detection device over transects covering most of the habitats found in each park; the recorded echolocation calls will ultimately be digitized as sonograms using BatSound software. The researchers hope this will be the "launching point for a long-term bat-monitoring program."

### Oaks and Mammals

Dr. Jenna Lawrence and Dr. Kate McFadden from Columbia University's [Department of Ecology, Evolution, and Environmental Biology](#) are investigating the impact of the possible loss of oak species on small mammal diversity and abundance. Oaks, a foundation species group on which many animals and other plants depend, are increasingly threatened in northeastern forests. Using the Forest's experimental study plots with oaks removed to mimic the effect of a sudden loss of oaks, the Consortium's multiyear oak forest sustainability study aims to understand how such a catastrophic loss would cascade through the broader environment and impact ecosystem health and services (see "Oak Project Update," p. 1). "Many small mammal species depend on oaks as an important source of food and habitat," explains Dr. McFadden.

Supervised by the scientists, graduate student Stephanie Seto will conduct the research for her master's thesis for Columbia's [Conservation Biology program](#). Using live traps, she will catch, mark, measure, and release mice, voles, chipmunks, squirrels, shrews, and jumping mice in plots without oaks and control plots with oaks. The work builds on small mammal studies by Dr. Catherine Burns and colleagues from [Wild-Metro](#). In addition to determining species composition and abundance, the study will include vegetation and insect surveys; changes in vegetation can lead to changes in insect composition, another food source for some small mammals, contributing, says Dr. McFadden, to "a better understanding of the complex trophic interactions between plant and animal species in eastern forest ecosystems."

### Social Parasites

Coevolution between social parasites and their hosts is the focus of Dr. Christine Johnson's project. A scientist at the [American Museum of Natural History](#), she studies the evolutionary relationship between slave-making ants, a specialized social parasite that raids colonies of other ant species to obtain broods that will become a workforce, and their host species (the ones that are raided). The strength of reciprocal selection, the "evolutionary arms race" between parasite and host, varies among populations due to different numbers of slave-maker and host species. Dr. Johnson hypothesizes that the Forest is a coevolutionary "hot spot" for the slave-making ant *Protomagnathus americanus* and its host species *Temnothorax curvispinosus* because there is only one parasite species and a single dominant host species.

To test this hypothesis, Dr. Johnson will conduct a field experiment in the Forest by creating study enclosures that contain host colonies and different numbers of parasite colonies (none, one, or two). This will allow her to assess how the host populations respond in the absence of the parasite, the impact of the parasite on the host, and the relationship between interactions within parasite colonies and those between hosts and parasites. She will compare her results with those she obtained in central Ohio where two slave-making ant species competed for access to the

host species. "My work is among the first to examine the effect of competition, as well as within-parasite interactions, on parasite-host coevolution in social insects," she explains.

### Cosmic Impacts?

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

The grant will enable Perri Gerard-Little to finish her Columbia University senior thesis. Using the scanning electron microscope to measure so-called "nickel-rich splashes" on grains in the sediment core, she will see if this provides information related to distance from the source impact. Dr. Abbott hopes this work will help her obtain funding to drill large-diameter cores in Sutherland Pond, which will improve her ability to identify and date individual impact events and contribute material for further paleoecological studies.

### Solar Power

Bonnie Finkenour, from Newburgh's [New Windsor School](#), is taking educational advantage of the Forest's [solar panel system](#) which, over the past two years, has produced more than one-third of the total energy used by the Center for Science and Education (see "One Year of Solar Energy for Forest Buildings," [Winter 2007](#)). She will donate the curricula and the educational materials she purchases to the Forest so other Consortium members can use them too. The activities include measuring the angle and intensity of the sun's rays, using photocells to power a light bulb and run a propeller, and making and racing photon solar cars. Fifth grade teacher Linda Mangan and her students will test the activities and will demonstrate some of their projects on Consortium Day (see "Forest News in Brief," p. 7). ■

## Current Research at the Forest

The Black Rock Forest Consortium is committed to encouraging collaboration among member institutions and also between researchers and students. To help members learn what other members are doing and explore opportunities for collaboration, we here present a list of current research projects at the Forest, along with contact information. ■

**Distribution, Assemblage, and Activity of Bats in a Temperate Urban Landscape.** Chanda Bennett ([American Museum of Natural History](#)). *Contact: Chanda Bennett.*

**Oak Forest Sustainability and Response to Canopy Disturbance.** William Schuster ([Black Rock Forest](#)), Shahid Naeem and Maria Uriarte ([Columbia University](#)), Kevin Griffin ([Lamont-Doherty Earth Observatory](#) of Columbia University), and Jerry Melillo ([The Ecosystems Center](#), Marine Biological Laboratory). *Contact William Schuster.*

**Cycling of Mercury in Terrestrial Environments.** Allan Frei ([Hunter College](#), City University of New York), Anthony Carpi ([John Jay College](#), City University of New York), David Evers ([Biodiversity Research Institute](#)), and Roger Claybrook ([US Mercury Deposition Network](#)). *Contact Anthony Carpi.*

**Native Plant Performance along an Urbanization Gradient.** Kevin Griffin and Natalie Boelman ([Lamont-Doherty Earth Observatory](#)), William Schuster ([Black Rock Forest](#)), Matthew Brown ([Central Park Conservancy](#)), and J. D. Lewis ([Fordham University](#)). *Contact Kevin Griffin.*

**Ecology of Slave-Maker Ants and Their Hosts: The Effect of Geographic Variation in Parasite and Host Range on Co-Evolutionary Trajectories.** Christine A. Johnson ([American Museum of Natural History](#)). *Contact: Christine A. Johnson*

**Functional Ecology of Complex Plastic Traits in Forest Trees: Pilot Studies of Reproductive and Root Traits.** Hilary S. Callahan ([Barnard College](#)) and Louise Comas ([Pennsylvania State University](#)). *Contact: Hilary S. Callahan.*

**The Autotrophic Contribution to Soil Respiration by *Quercus* and Its Associated Mycorrhizal Fungi in Black Rock Forest: An Assessment for the Ecosystem Consequence of Foundation Taxon Loss Project.** Kevin Griffin ([Lamont-Doherty Earth Observatory](#)). *Contact: Kevin Griffin*

**Land-Atmosphere Coupling at Black Rock Forest: The Role of Snow, Vegetation, and Soil Thermodynamics.** Gavin Gong ([Department of Earth and Environmental Engineering](#), Columbia University), Jason Smerdon ([Lamont-Doherty Earth Observatory](#)), and Jessie Cherry ([University of Alaska](#)). *Contact: Jason Smerdon.*

**Effects of Host Defoliation and Distribution on Spatial Patterns in Ectomycorrhizal Fungi.** J. D. Lewis ([Fordham University](#)). *Contact: J.D. Lewis.*

**The Tamarack Pond Core as a Rosetta Stone for Impact Events: Correlation to Known Ejecta Layers.** Dallas Abbott ([Lamont-Doherty Earth Observatory](#)). *Contact: Dallas Abbott.*

**Long-Term Study (77+ years) of Tree Population Dynamics and Carbon Storage.** William Schuster ([Black Rock Forest](#)). *Contact: William Schuster.*

**Small Mammal Response to Oak Removal.** Jenna Lawrence and Kate McFadden ([Department of Ecology, Evolution and Environmental Biology](#), Columbia University). *Contact: Jenna Lawrence.*

**Moss-Microarthropod Community Response and Recovery from Environmental Disturbances at Black Rock Forest.** Shahid Naeem and Claire Jouseau ([Department of Ecology, Evolution, and Environmental Biology](#), Columbia University). *Contact: Shahid Naeem.*

**Insect and Arachnid Diversity of Black Rock Forest.** Vladimir I. Ovtsharenko ([American Museum of Natural History](#)). *Contact: Vladimir Ovtsharenko.* ■

## Donate, Reserve Online

Visitors to the Black Rock Forest web site, [www.blackrockforest.org](http://www.blackrockforest.org), can now donate and reserve space in the Forest Lodge online, thanks to partnerships with two outside providers.

By clicking on the Support link in the Donate box on the Forest's home page, contributors go first to the [Friends of the Forest](#) page. Once they've selected the amount they would like to donate, they are taken to a secure web site run by [NYCharities.org](#), an organization dedicated to increasing donations to New York not-for-profits by providing a safe, easy web portal. The NYCharities system allows donors to specify how much information they want to provide to Black Rock Forest, whether they want to make the gift in honor or in memory of someone, and whether their employer will match the contribution.

To reserve space in the Forest Lodge online, click on the Lodge Logistics link on the Forest's home page. This takes you to the [Planning and Reserving Your Forest Visit](#) page. From there, click first on [Availability Calendar](#). This takes you to a calendar hosted by [AvailabilityOnline](#), a secure web-based booking service, where you can check whether there is space in the Lodge on the nights you would like to stay there. When you have determined which dates are free, click on the Request a Reservation button.

Once on the [Reservation Form page](#), fill it out with the information requested. Please note that you will need to provide details about your organization in one of the "more information" boxes because the AvailabilityOnline system is primarily designed for bed-and-breakfasts, and Operations Manager Jack Caldwell adapted it to fit the Forest's needs. The site allows you to specify what equipment and staff support your group will need and to link directly to forms and information on the Black Rock Forest web site.

After you submit your reservation request, you will get an e-mail confirming that the Forest has received it. Forest staff will confirm your reservation when you submit all necessary forms and pay the 20% deposit. ■

## Join Us! Become a Friend of Black Rock Forest!

New Member or  Renewal

- |  |                  |
|--|------------------|
| <input type="checkbox"/> American Chestnut | \$10,000 or more |
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| <input type="checkbox"/> Tamarack          | \$500            |
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My company will match my gift.  
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Please send me information concerning:  
 Gifts of land/real estate       Memorial gifts

I would like to volunteer to help with the following:  
\_\_\_\_\_

Please make checks payable to the Black Rock Forest Consortium and mail with this coupon to: Black Rock Forest, 129 Continental Road, Cornwall NY 12518-2119. *All contributions are tax-deductible; the Consortium is a 501(c)(3) organization. Thank you!*

### Forest News in Brief

**Join Us for Consortium Day.** This year's [Consortium Day](#) is June 8, from 12 to 5 PM. All Consortium members and Friends of the Forest are invited to a day of fun and camaraderie, including scientific talks, educational demonstrations, a silent auction of art produced in the Forest, and the presentation of the annual [Stillman Award](#) to Dr. Gene Likens, founder of the [Institute of Ecosystem Studies](#), co-founder of the Hubbard Brook Ecosystem Study, co-discoverer of acid rain, and recipient of the 2001 National Medal of Science and the 2003 Blue Planet Award.

**Gifts in Honor of William T. Golden.** Since Consortium founder [William T. Golden](#) died last October 7 (see article in the [Winter 2008](#) issue), many friends have made generous gifts to the Consortium in his memory. To date, these include John Blenninger, Sally Boasberg, John and Barbara Brady, Mary Clutter, Anne Eristoff (Howard Phipps Foundation), Michael Gellert, Catherine Morrison Golden, Eugene Gorman, Ralph and Doris Hansmann, Frances Degen Horowitz, Bonnie Kaiser, Helene Kaplan, David Killen, Allan Mayefsky, Barbara Oliver, Caryn and Jim Magid, Janet Ross (Arthur Ross Foundation), Sara Lee Schupf, Peter Stern (Ralph Ogden Foundation), Beth and David Shaw, Joshua Steiner and Antoinette Delruelle, Renee Weiss, and Audubon New York. Unless designated otherwise, these and other funds given in his memory will be set aside for a future project. Thank you to all.

**High School Internship Program.** In July, twelve high school students from Newburgh, Cornwall, and several New York City schools will attend Black Rock Forest's

first [Field Ecology Research Internship](#) program. For two weeks, they will live in the Forest Lodge, learn about forest ecology and investigative methodologies, work directly on research studies, and have fun. Dr. Terry Maenza-Gmelch of Barnard College is the lead instructor, along with Angelica Patterson, a Barnard research assistant.

**Grants for Trout Lab.** The Forest has received \$45,000 from New York State to help complete the aquatic laboratory in the basement of the Forest Lodge, thanks to the efforts of State Senator William Larkin, along with another \$5000 from the [Hudson River Improvement Fund](#).

**Hannah Roth Joins Forest Staff.** [Hannah Roth](#) is the Consortium's new Research Associate/Environmental Educator. A 2006 Barnard College graduate, she has held two summer internships in Black Rock Forest.

**Field Station Meeting in Forest.** In September, the Forest will host the 2008 annual meeting of the [Organization of Biological Field Stations](#), whose membership includes some 300 field stations from around the United States, Canada, the Caribbean, and Central and South America.

**Invasive Species.** The Lower Hudson PRISM (Partnership for Regional Invasive Species Management) met in March in the Forest. Made up of environmental organizations, state agencies, and other groups (the Forest is a partner organization), the PRISM raises awareness about invasive species and how to manage them; members commit to preventing, detecting, monitoring, and eradicating invasive species on their property. A web site and a region-wide invasive management event are planned. ■

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**Consortium Day**  
**June 8**  
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### ***Report from the Forest Manager***

March 12, 2008. I have just coaxed a heavy boulder onto the rock sled. The tractor pulls it on its way, 300 feet to the intersection of Chatfield and Sutherland Roads, its new home. The modest boulder will now serve as a remembrance to the founder of the Black Rock Forest Consortium, [William T. Golden](#).

The view from this spot naturally commands thought. This area of the Forest is remote and wild. Tracks of fox, coyote, otter, beaver, and bear are regularly seen in the nearby Sutherland wetlands. Sutherland Pond is one of the oldest and highest in the Hudson Highlands. Not seen from the boulder, but less than 100 feet away, is a stone quarry. This solid rock quarry supplied the Chatfield House with building material during the 1830s. One hundred years later, the rock quarry was the site of the old rock crusher which supplied gravel to the roads of Black Rock.

The boulder marks the beginning of the Split Rock Trail, leading to one of the grandest views from this Forest. The view has a primeval sense, as Native Americans saw it, with the

ancient Sutherland Pond below partially surrounded by climax forest. Beyond the forested mountains is now a small glint of the Manhattan skyline 50 miles away. This point, Split Rock, is the crown of the newly named Golden Ridge. The ridge extends a mile northeast to Continental Road, with views of Sphagnum Pond to the south and the Catskill Mountains to the north. This forested land is of great integrity, strong for native plants and animals.

Golden Ridge is traversed by the Stillman Trail, linking these two men to each other and the future. Dr. Ernest Stillman, who created Black Rock Forest, shared this land by providing much needed local employment from 1920 to 1950, and provided the Cornwall water supply located within its boundaries. This previous owner of Black Rock Forest envisioned a model forest, reclaiming native forests on cut-over lands and demonstrating the early lessons of forestry.

Back at the boulder, a sitting stone set near it is a place for pondering. Hikers and students will stop at the boulder and read. How will I

explain to school children who William T. Golden was? After pondering myself, I will smile and say he enjoyed the Forest, often in the company of a horse. He was much like your favorite uncle, I will say. Uncle Bill. Always glad to see you, always fun to be around, stretching the rules a little bit, poking fun with a big grin. A sincere listener with advice that will make you think.

To the older visitor I may say one of Bill's "visionary enchantments" was the Black Rock Forest. How, at the right time and place, he formed the Black Rock Forest Consortium. Bill's vision of collaborative education and research has enriched the Forest, enabling it to move forward with a knowledgeable pace.

I have worked the woods long enough to sense the great power and energy of the Forest. Bill Golden knew of its potential, first learning, then creating, always sharing.

"Study first – then act," a brief quote by Bill to the National Science Foundation during its formative years, few words with volumes of thought. ■

— John Brady