

BLACKROCK FOREST NEWS

Black Rock Forest, 65 Reservoir Road, Cornwall, NY 12518

Limits of CO₂ Absorption by Plants

hile our planet's forests are a moderating force that can help counteract some of the effects of climate change, research concluded last year at Black Rock Forest gives new understanding of what the limits may be for CO₂ absorption by plants and trees.

The study, led by Kevin Griffin, Ph.D., the outgoing president of the Black Rock Forest board, shows that plants actually emit more carbon dioxide into the atmosphere than previously believed as temperatures rise.

Plants and trees store carbon dioxide during photosynthesis, but the new research — published last year in the prestigious *Nature Communications* journal — shows that when plants "exhale," or respire, they emit around 30 percent more CO_2 than scientists had previously predicted.

This means that as the planet warms, elevated respiration levels worldwide may reduce Earth's ability to absorb the emissions created by burning fossil fuels, Griffin said.

"Plant respiration is an essential metabolic pathway that provides the energy and building blocks that plants need to grow and survive, but the process also releases CO_2 to the atmosphere. For nearly 20 years my students, collaborators and I have been studying this process in Black Rock Forest and elsewhere, and we now have enough measurements to begin to identify global trends, and make modeled predictions of future responses to climate change," said Griffin, a professor at the Lamont-*(continued on page 3)*



Benefit Raises \$355,000 for Conservation Science

Horiza di la concentrated in cities.

Ingenuity was also a theme for Black Rock Forest's board and benefit committee. Working with our supporters, they set a fundraising record while creating a new fund for conservation science in honor of our fantastically dedicated board chair, David N. Redden. Thanks to the efforts of so many, Black Rock Forest welcomed a record crowd of 260 supporters and secured \$355,000 in gifts and pledges to launch the David Redden Conservation Science Fund.

As part of its longstanding commit-(continued on page 3)

TOP: From left to right: Dr. Ruth DeFries, Columbia University; Dr. Kevin Griffin, Black Rock Forest board president; David N. Redden, Black Rock Forest board chair and benefit co-chair; Jeannette Redden, Palisades Interstate Park Commission board member and benefit co-chair.



Fall leaves over Aleck Meadow at Black Rock Forest. Photo © Steve J. Sherman

Report from the Executive Director



Black Rock Forest has recently reached several important milestones. As I write this, we are completing a very successful capital campaign that will help ensure our future. The campaign established a quasi-endowment of more than \$6 million. We owe this achievement to the generosity and confidence shown by many people, including our board and staff, our

member institutions, and our Friends of the Forest.

Simultaneously, we have reached the target needed to endow a permanent postdoctoral fellowship program in forest ecology. This ensures continuation of the Forest as a place for rigorous scientific research, as has been its tradition since the 1930s. We do not know what issues in forest ecology will be most important 10 or 50 years from now, but we do know that young Ph.D's. will be addressing them in Black Rock Forest.

The campaign's success will also allow us to add a Master Educator to our staff. The Master Educator will be the primary liaison for the institutional members of Black Rock Forest and will work closely with research and conservation staff at the forest to bring state-of-the-art programming to our many constituents.

In another, somewhat bittersweet, occasion that has many of us reflecting on milestones and transitions, John Brady has stepped back from many decades of full-time service as our Forest Manager. Fortunately, his son Matthew Brady has successfully completed his training period and seamlessly made the transition to be our new Forest Manager. We are fortunate to have John still with us in a new role as part-time Forest Historian.

More milestones lie just ahead. Thanks to the generosity of many, we have a new fund to support conservation science named in honor of our illustrious chairman, David Redden. We are also completing work on the second and final phase of the Visitor Access Pathway, aiming for a spring ribbon cutting. We look forward to continuing across these thresholds with all of you, and exploring new ways to advance our mission of *increasing scientific understanding of the natural world*.

— William Schuster

Celebrating a Transition: From Forest Manager to Forest Historian

The day, reminiscing like a dream. Left paralyzing numbness to my mind and body. To personally know everyone in a crowded room is a first, never to be forgotten. Addressing gathered friends and family was intended. But, after being humbled by beloved speakers the mental state of "lockdown" prevailed.

Being informed of recognition day weeks before and aware of a verbal response would be inevitable. Then off to

the woods, where such thoughts become reality. The Chatfield Place, Spy Rock, Glycerine Hollow and many others are destinations of history, beauty and pondering. Visits to the Stillman and Golden memorial stones never fail to inspire. These founding fathers created our forest opportunities of today and have brought us together. We meet in Black Rock Forest and talk about the forest if we are not.

My plan, if the forest trees are a calming friendly influence, surely talking to all of you as a forest would be easy. That won't fly. Doug Spaulding would smile and say "It's not your fault you grew up in the 60's...tree hugger."

OK fair enough, if you know me than you know my dogs. Four decades there have been seven, all children, loving and obedient forest protectors. We all know Brizbee the black lab and border collie mix, always at my side like all the oth-



Photo: Brienne Cliadakis

We know each other through the trees and animals of the Forest, a good place to be.

There are many more adventures at Black Rock Forest ahead.

— John Brady, Forest Historian

After 39 years as the Forest Manager, John Brady is celebrating his transition to part-time work at Black Rock Forest in a new role as Forest Historian. Above are John's reflections on a private ceremony held to honor him in June. Stay in touch with John by reaching him at the main office, or at **jbrady@blackrockforest.org**.

the forest for a decade. Do you remember Dakota, queen of these woods, Makiya, my first Alaskan Malamute, defender of the forest. Can you go back to Woodchuck, the black lab, fun for kids in the back of the truck? If you remember bear, the Malamute/Black Lab mix, you are a piece of history yourself. To know Cha-Cha the lab, you must be my brother or sister.

ers, endless energy for fun. My

Hudson before her, the bravest

of companions and symbol for

Benefit for Conservation Science (continued from page 1) ment to conservation, Black Rock Forest presented the E.G. Stillman Award for philanthropy in science, conservation and education to Marjorie L. Hart, the former chair of Scenic Hudson, and Gurnee F. Hart, the founding chair of Cambridge in America. Ned Sullivan, president of Scenic Hudson, presented the Stillman Award on behalf of Black Rock Forest and spoke movingly of the Harts' many contributions to the region.

The 2018 benefit luncheon was co-chaired by David and

Jeannette Redden and Valerie Colas-Ohrstrom. We thank Black Rock Forest's institutional members, board, benefit committee, and Friends of the Forest for making the event such a success.

Beginning this fall, the David Redden Conservation Science Fund will advance conservation studies in the region through programs and studies approved by the board's Conservation Committee. Goals include meeting information needs identified by regional land trusts and conservation organizations, training of the next generation of conservation scientists, and outreach

to disseminate the findings of key research projects.



ABOVE: David Redden, Black Rock Forest board chair, celebrating with family and friends

Limits of CO₂ Absorption by Plants (continued from page 1) Doherty Earth Observatory of Columbia University.

Working with colleagues in the United Kingdom and Australia, Griffin compared his findings, using more than 4,000 measurements of carbon dioxide respiration from plants across the globe.

gives acceptance remarks

What could the long-term impact be if plants and trees among the planet's greatest "carbon sinks" - don't have the balancing effect that we believed they did?

"The study shows that as global temperatures increase, the amount of carbon dioxide released through plant respiration will increase significantly," said Professor Owen Atkin from the Research School of Biology at the Australian National University. "Currently, around 25 percent of carbon emissions from the use of fossil fuels is being taken up and stored by plants, which is good, as it helps reduce the concentration of greenhouse gases in the atmosphere. Our work suggests that this positive contribution of plants may decline in the future as they begin to respire more as the world warms."

Griffin, Mary Heskel, and a team of Columbia students sampled leaves from the multiple deciduous tree species of Black Rock Forest.

"Black Rock Forest's size, biological diversity and relatively undisturbed nature, along with its 90-plus year history as a research station, make it useful to represent North America's eastern deciduous forest in global-scale studies," said Bill Schuster, executive director of Black Rock Forest.

Griffin's study utilized plant respiration data from more than 100 other sites, from hot deserts in Australia to the deciduous and boreal forests of North America and Europe, the arctic tundra in Alaska, and the tropical forests of South America, Asia, Africa and northern Australia.

"[W]e now have enough measurements to begin to identify global trends, and make modeled predictions of future responses to climate change."

— Dr. Kevin Griffin, Lamont-Doherty Earth Observatory, Columbia University

The next phase of the team's work is to gather information on the growth respiration of leaves, which will provide two more important clues: how much additional energy is needed and how much CO₂ is released when new leaves are added each year.

"We are now one step closer to more accurately modeling carbon exchange in ecosystems across the world," said Dr. Mary Heskel, now a postdoctoral scholar at the Ecosystems Center, Marine Biological Laboratory in Woods Hole, MA. "The study provides the most informed picture to date of current and future carbon release from plants in terrestrial systems." &



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Inside This Issue

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Forest News in Brief



Welcome Matt Brady, our new Forest Manager. Matt comes to us with a Bachelor's degree in Wood Product Engineering and a Forestry concentration from SUNY ESF

(Environmental Science and Forestry), Syracuse. He has started putting his skills to work focusing on safety, access, trail and road maintenance, research aid, volunteer programs, fire prevention, shop & sawmill operations, work with bordering neighbors on boundaries as well as work with town water departments on access and maintenance. If you see Matt out on the trails, introduce yourself!



Welcome to Aaron Culotta, Education Intern. Aaron graduated from SUNY Cobleskill in May with a Bachelor of Technology degree in Wildlife Management. He is interning at Black Rock Forest thanks to a partnership with the Student Conservation Association. Aaron works with educators to develop forest content and lesson plans, assists student groups and Summer Science Camp instructors, and supports researchers. Aaron graduated from Haldane High School and New Visions Environmental Science and Sustainability Academy in Cold Spring.



Coyote Bridge was built by sixth graders at Metropolitan Montessori School, supported by their teachers and Forest staff. It crosses the diversion between the White Oak tree and Two Gates. Thanks to Metropolitan Montessori students for their volunteer work on this and other forest projects! Photo: James Kamlet



For information and to RSVP for hikes,

contact Brienne Cliadakis at bcliadakis@blackrockforest.org.

Fall Hikes – Save the Date!

Sunday, September 16: <mark>Sketch & Hike</mark>

Join us as we draw forest flora and fauna and learn to keep a field journal like the naturalists of the past, 10 AM - 1 PM. Hike Leader: Emilie Wolf, Science Chair, The Browning School.

Sunday, October 21: Ecology Hike for Friends of the Forest

Join Executive Director Bill Schuster for an ecology hike at peak leaf, 10 AM - 1 PM.