



HUBBARD BROOK RESEARCH FOUNDATION

*Promoting the understanding and
stewardship of forest ecosystems through
scientific research and monitoring,
policy outreach, and education*

A REPORT FOR 2014



LETTER FROM HUBBARD BROOK

Hubbard Brook scientists understand that the implications of their work extend far beyond the academic community.



Since 1963, scientists at the Hubbard Brook Ecosystem Study in New Hampshire have worked diligently to solve the mysteries of forest ecology. Outcomes include the discovery of acid rain; the link between clearcutting and nitrogen pollution in streams; the natural and anthropogenic agents of change in bird populations; and the effects of lead and salt pollution on surface water. And yet the significance of these results is apparent only against the backdrop of the long-term record. Regular measurements of air and soil temperature, stream water chemistry and flow, and precipitation create a multidimensional profile of the forest and its day-to-day functions. Rendered in meticulous detail, over the course of decades, the long-term record provides the framework for understanding and manipulating ecosystem processes. This history of innovative scientific study and continuous long-term monitoring has influenced policies and land-management practices far beyond the boundaries of the 8,000-acre Hubbard Brook Experimental Forest.

In today's world of shrinking research budgets and stubborn skepticism over the causes and consequences of climate change, it's crucial that supporters of science proudly proclaim the relevance of long-term ecological research. Hubbard Brook scientists do this through a range of public-outreach and education programs that bring user-friendly science to a wide variety of audiences. For example, Hubbard Brook climate change experts engage in dialogues with members of the snowmobiling community, sharing information about the emerging winter landscape. Undergraduates and middle-school teachers conduct their own projects, working closely with mentors from major research institutions to learn field methods and techniques for studying forest and aquatic ecosystems. Scientists who have studied migratory birds for decades meet with land managers and policy-makers to design tools that protect species from multiple environmental stresses including climate change, fragmentation, and mercury. Hubbard Brook scientists understand that the implications of their work extend far beyond the academic community. Changes in our regional climate and landscape are apparent in our backyards, woods and fields, and along our streams, trails, and lakeshores. In fact, Hubbard Brook research is relevant to everyone who cares deeply about the future health of our natural world.

Please take a few moments to read about the recent accomplishments of the Hubbard Brook Research Foundation, which exists to support the important work at Hubbard Brook.

Sincerely,

David Sleeper
Executive Director
May 2015



This report is dedicated to Dr. Tom Siccama and Phyllis Likens, who passed away in 2014. Both made important contributions to the Hubbard Brook Ecosystem Study, and it is with admiration, respect, and gratitude that we join their friends, family, students, and colleagues in celebrating the lives of these two beloved and influential members of the Hubbard Brook community.

Founded in 1993, the Hubbard Brook Research Foundation (HBRF) works to sustain and enhance the Hubbard Brook Ecosystem Study in New Hampshire, in partnership with the USDA Forest Service/Northern Research Station, the National Science Foundation's Long-Term Ecological Research Network (LTER), the Hubbard Brook Consortium, and many colleges, universities, and other research institutions.

Our goals are:

- To sustain and expand long-term ecological monitoring and research at the Hubbard Brook Experimental Forest.
- To bridge the gap between ecosystem science and public policy by enhancing the exchange of information among scientists, policy-makers, and land managers.
- To foster public understanding of the functions of ecosystems and their importance to society.

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HUBBARD BROOK CONSORTIUM

The Hubbard Brook Consortium is a group of research and educational institutions that supports the work at Hubbard Brook, with special emphasis on field research opportunities for undergraduates, facilities, and public outreach events. Consortium members include the Cary Institute of Ecosystem Studies, Cornell University, Dartmouth College, Plymouth State University, Syracuse University, USDA Forest Service/Northern Research Station, and Wellesley College.

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Operated by the USDA Forest Service
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SCIENCE AND POLICY

HBRF's public-outreach strategies bridge the gap between the scientists who study forests and the people who inhabit them. We believe that effective public engagement programs lead to better science, better public understanding of research results, and better solutions to environmental challenges.



Science Policy Exchange

Hubbard Brook scientists and HBRF staff have been actively involved in the Science Policy Exchange (SPE), a collaborative that HBRF helped to launch in 2012 with representatives from six world-class research institutions and four LTER sites. SPE is dedicated to increasing the influence of science on environmental policy, conservation, and natural resource management. A current project, entitled *Co-benefits of Carbon Standards*, quantifies and communicates the environmental and human health benefits of reducing carbon emissions from power plants. Recent progress includes two public reports in 2014, targeted outreach to federal and state policy-makers, and broad media coverage, including in the *Washington Post*.



Additional SPE work focuses on 1) synthesizing and sharing data related to the ecological

and economic impacts of forest pests and pathogens and 2) assessing "green infrastructure" designs that address stormwater runoff and water pollution, among other environmental issues.

www.science-policy-exchange.org



Forest Science Dialogues

The goal of this two-year pilot program funded by the National Science Foundation is to develop and test mechanisms for generating productive, two-way dialogue between ecosystem scientists and community members in the Northern Forest region. We initiated the project in May 2014 with the addition of project principal investigator Sarah Garlick to our staff. In October, we held a workshop for Hubbard Brook researchers on the theory and techniques of modern Public Engagement with Science. This was followed by a two-day "needs assessment" roundtable event for leaders of the Hubbard Brook Ecosystem Study and stakeholder groups from around the region to determine key topics for future engagement activities.





EDUCATION

The theme for the 2014 **Research Experience for Undergraduates (REU)** program was “Investigating and Communicating Change in Ecosystems.” HBRF hosted 10 undergraduates who, with guidance from scientist mentor teams, conducted independent projects on topics including hydrology, population ecology, biogeochemistry, and animal behavior. The students also participated in weekly science communication workshops and enjoyed both structured and informal interactions with principal investigators, field technicians, science teachers, and graduate students.

Three teachers participated in our **Research Experience for Teachers (RET)** program, which provides authentic research and investigative opportunities for NH teachers over the course of the summer. The program enables educators to develop first-hand research experience, enriching their teaching and enhancing the culture of inquiry in their classrooms.

The **New Hampshire Education and Environment Team (NHEET)**, of which HBRF is a member, completed the third and final year of a Building Vertical Science Literacy initiative. The goal was to train, advise, and support approximately 30 teachers working in two different New Hampshire school districts in order to improve science content and skills related to ecological literacy and field investigations in grade K-8 classrooms.

HBRF’s education programs are supported by the NSF LTER Program and the USDA Forest Service.

*“This course will change the way I teach all subjects.
I now feel a commitment to teach my students about our
responsibility to understand and care for our environment.”*

FUN FACT

We estimate that approximately **5,000 students** were served through HBRF’s online data-based lessons in 2014.

► **These typed lyrics were recently found in a cache of long-forgotten files at Pleasant View Farm. Although yet to be identified, the author was a Yale University student enrolled in a Terrestrial Ecosystems course taught by Herb Bormann and Tom Siccama in the late 1970s.**

The Mean Moosilauke Blues

Monday morning, we went to class
Bormann said, get off your ...
We gotta climb, really climb Moosilauke soon
And if we see a virgin stand, what’re we gonna do?

So we climbed all night and we climbed all day
What did we see along the way?
We saw a birch, a spruce, a fir or two
We saw a beech but it wasn’t blue
And when we reached the top, we knew just what to do
(we turned blue)

Well we knew all the species and we knew all the rocks
We woulda done more but we had wet socks
We had the blues, the mean Moosilauke blues.
The big, bad, tall Moosilauke blues.

Well just as we were about to quit
Big bad Tom said, “Dig a pit!”
We got the blues, mean Moosilauke blues
We got the A1, the B2, the C Moosilauke blues.

When you’re up, you gotta come down
And coming down is a LONG way down
When you got the blues, the mean Moosilauke blues
The big, bad, tall Moosilauke blues.

When we got down Lenny honked the horn
We’d all been regrettin the day we were born
We had the blues, the mean Moosilauke blues
So we got on the bus, the big Moosilauke bus.

Then Herb said, “Well, this is Yale
We better buy some Black Horse Ale
To cure the blues, the mean Moosilauke blues.”
We drank it all up, we knew just what to do...

When we got back we were hungry as hell
So Henrietta cooked and it was swell
It cured the blues, those mean Moosilauke blues,
It cured the big, bad, tall Moosilauke blues.

Thought we were leaving but we got took
'Coz we wound up at Hubbard Brook
We had the blues, the mean Moosilauke blues.

Well, the moral of our story if you can't guess...
Climbs with Herb and Tom are a nutrient stress
You get the blues, the mean Moosilauke blues
But when you get to the top, you know just what to do.

– Attribution a mystery



FACILITIES

HBRF's facilities include housing, classroom, laboratory space, and storage for a diverse group of principal investigators, field technicians, and students who travel to Hubbard Brook to conduct research. In conjunction with the Forest Service's Robert S. Pierce Ecosystem Laboratory, Hubbard Brook facilities are commensurate with the world-class nature and collaborative spirit of the Hubbard Brook Ecosystem Study itself.

During the 2014 field season, HBRF hosted more than 100 visiting scientists, students, and technicians over the course of the summer and provided lab or sample-processing space for five separate research teams. The majority of visitors are undergraduates, particularly at Pleasant View Farm, home base for the Research Experience for Undergraduates (REU) program. Scientist groups included avian researchers, the long-term vegetation monitoring crew, salamander researchers, and a group investigating nitrogen cycling. There was much interaction among research groups, and the Monday potluck tradition continues to be well attended. The facilities at Hubbard Brook remain a place where students consistently work hard, learn a lot, and have plenty of fun.

During off-peak seasons, HBRF hosted retreats for Dartmouth College alumni, participants in the Forest Science Dialogues program, the Science Policy Exchange, and a USDA Forest Service tree-climbing workshop.



Stay at Hubbard Brook

Bring your organization for a private eco-retreat to Hubbard Brook. Lodging is available at both Pleasant View Farm and the private cottages on Mirror Lake. HBRF facilities are available for short-term rentals in the fall. With advance planning, educational tours of the Hubbard Brook Experimental Forest can be arranged.



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Steven Hamburg and Sarah Barker
Gene and Phyllis Likens

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¹ In honor of F. Herbert Bormann

² In honor of Robert S. Pierce

³ In honor of Phyllis Likens

⁴ In honor of Tom Siccama



HUBBARD BROOK RESEARCH FOUNDATION

December 31, 2014 and 2013

ASSETS	2014	2013
Current Assets		
Cash and cash equivalents	\$ 127,237	\$ 88,036
Accounts receivable	\$ 7,345	\$ 19,340
Grants & pledges receivable	\$ 43,832	\$ 62,538
Prepaid expenses	\$ 2,772	\$ 1,171
Total current assets	\$ 181,186	\$ 171,085
Property and equipment		
Buildings and improvements	\$ 1,937,002	\$ 1,929,421
Equipment	\$ 68,683	\$ 68,683
Land	\$ 470,200	\$ 470,200
	\$ 2,475,885	\$ 2,468,304
Less accumulated depreciation	\$ 695,891	\$ 634,262
Total property and equipment	\$ 1,779,994	\$ 1,834,042
Long-term grants and pledges receivable	\$ -	\$ 2,000
Total Assets	\$ 1,961,180	\$ 2,007,127

LIABILITIES AND NET ASSETS

Current liabilities		
Accounts payable and accrued liabilities	\$ 25,808	\$ 15,964
Deferred income	\$ 61,777	\$ 54,691
Total current liabilities	\$ 87,585	\$ 70,655
Note payable	\$ 437,720	\$ 484,369
Total Liabilities	\$ 525,305	\$ 555,024
Net Assets		
Unrestricted	\$ 1,319,236	\$ 1,340,972
Temporarily restricted	\$ 116,639	\$ 111,131
Total net assets	\$ 1,435,875	\$ 1,452,103
Total liabilities and net assets	\$ 1,961,180	\$ 2,007,127

STATEMENT OF ACTIVITIES AND CHANGES IN NET ASSETS

Revenue and support		
Contributions and grants	\$ 487,201	\$ 432,365
Rental income	\$ 113,713	\$ 90,800
HBRF consortium dues	\$ 77,500	\$ 67,500
Other income	\$ 10,938	\$ 19,463
Total revenues and support	\$ 689,352	\$ 610,128
Expenses		
Program costs:		
Facilities	\$ 213,129	\$ 205,664
Education	\$ 326,856	\$ 225,497
Total program expenses	\$ 539,985	\$ 431,161
Supporting services expense		
Management and general	\$ 149,082	\$ 188,854
Fundraising	\$ 16,513	\$ 9,217
Total supporting services	\$ 165,595	\$ 198,071
Total expenses	\$ 705,580	\$ 629,232
Change in net assets	\$ (16,228)	\$ (19,104)
Net assets, beginning of year	\$ 1,452,103	\$ 1,471,207
Net assets, end of year	\$ 1,435,875	\$ 1,452,103

Note: These schedules should not be confused with HBRF's 2014 audited financial statements. That report, including footnotes and the auditor's opinion, is available upon request or may be found on the HBRF website.

