

# WHAT'S UP?

## THE NEWSLETTER OF THE INTERNATIONAL CANOPY NETWORK

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### Forest Science Dialogues: Forging a New Model of Science-Society Engagement

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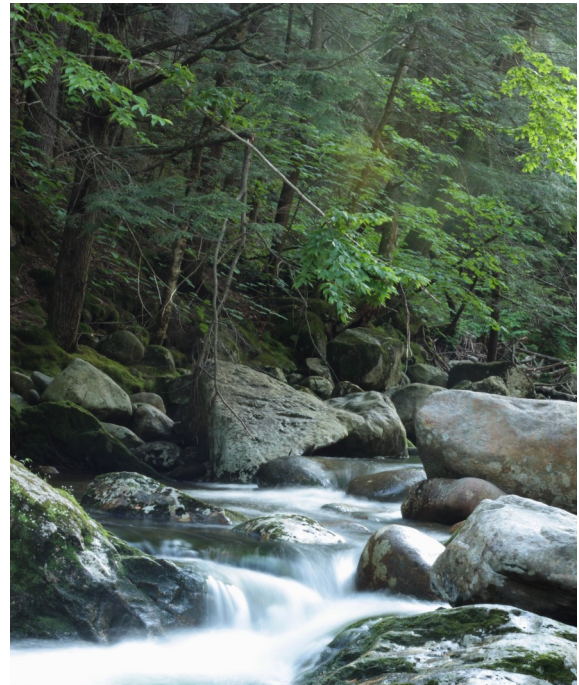
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For more than half a century, scientists at the Hubbard Brook Experimental Forest, a 3,037-hectare, bowl-shaped valley in the White Mountains of New Hampshire, have grappled with the complexities of how forests function. Their research has contributed greatly to our understanding of nature, including how forests are affected by both human-caused and natural disturbances such as climate change, clear cutting, air and water pollution, and ice storms.

The Hubbard Brook Ecosystem Study (HBES) is perhaps best known for its hallmark small-watershed approach: the use of first-order watersheds to study element flux and cycling as indicators of ecosystem processes. This innovative approach to long-term ecological research has since been replicated throughout the world. What is less widely known about Hubbard Brook is that in step with the decades of ecologic and hydrologic research, scientists and practitioners have also pushed their work beyond the scientific enterprise, into the fields of science communication, education, and public engagement.

The Hubbard Brook Research Foundation (HBRF) is an independent nonprofit organization founded in 1993 with two charges: to support the long-term HBES, and to build bridges between ecosystem science and society. HBRF programming includes an ongoing policy-oriented program called Science Links, the annual Research Experience for Undergraduates, the Research Experience for Teachers program, and the development of K-12 curricular materials based on Hubbard Brook datasets.

In 2014, with support from the National Science Foundation, the HBRF embarked on a new initiative called Forest Science Dialogues. Its goal is to develop and test a



A roaring stream in the Hubbard Brook Experimental Forest in the White Mountains of New Hampshire, USA

model of engagement between citizens and scientists: to bring together people who live in and rely on the forests of the northeastern United States with the scientists who study that local ecosystem.

The Forest Science Dialogues model focuses on a process of mutual learning through equitable dialogue. Instead of the unidirectional flow of information in a typical science communication program, with scientists positioned as experts opposite a lay audience, Forest Sci-

## Canopy Connections

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The Pacific Northwest is home to magnificent old-growth forests. However, many local children have never had the opportunity to explore and learn about this enchanting ecosystem firsthand. In response, the Environmental Leadership Program (ELP), housed in the Environmental Studies Program at the University of Oregon (UO), has worked in partnership with the H.J. Andrews Experimental Forest (HJA) and the Pacific Tree Climbing Institute (PTCI) to offer the Canopy Connections project.

Canopy Connections is designed for middle school students and entails a pre-trip lesson and a day-long field trip – with a climb into the canopy of an old-growth tree and activities to explore the understory. Our aim is to create a transformative experience that instills a life-long love for exploring and protecting wild places and perhaps inspires a career in the natural sciences or environmental humanities.

The site is located on the McKenzie River in the HJA about an hour east of Eugene. The mission of HJA is to “support research on forests, streams, watersheds, and to foster a strong collaboration among ecosystem science, education, natural resource management, and the humanities” (<http://andrewsforest.oregonstate.edu/>). The PTCI, a local family-owned business, coordinates all the climbing activities. The ELP undergraduate students develop and implement the curriculum materials. Implementation includes facilitating the pre-trip lesson in classrooms in April and leading full-day field trips at HJA in May. Each year, we facilitate eight

field trips with an average of 24 students each. Since 2009, we’ve worked with 1,140 children.

The ELP is a community-based learning program with a mission to provide undergraduates with an integrative capstone experience and graduate students with project management experience, while engaging with the community to respond to local environmental challenges. Through the Canopy Connection project, UO students gain 20 weeks of hands-on experience with the development and implementation of an EE program. They witness first-hand how the integration of experiential learning can build environmental literacy. We have two goals: 1) to provide high-quality programs for local youth that strengthen their connection to the place they live and inspires stewardship, and 2) to provide UO students experience in curriculum development and implementation, with a focus on experiential, place-based, inquiry-based methods. Although the specifics of the curriculum are left up to the ELP teams to develop, all teams are required to: 1) incorporate an interdisciplinary approach, 2) include multi-cultural perspectives, 3) use experiential, inquiry-based methods, 4) promote civic engagement and stewardship, and 5) articulate assessment strategies.



Two students and two ELP facilitators in a tree as part of the Canopy Connections program in 2013 (photo credit: Woodard)



Students building a debris shelter as part of the Canopy Connections program in 2009 (photo credit: Lynch)





Students climbing a tree with an ELP facilitator as part of the Canopy Connections program in 2010 (photo credit: PTCI)

Every year, the canopy climb includes quiet time at the top, where students are challenged to use all their senses and then document what it smells/looks/sounds/feels like to be in the canopy. One year, students recorded temperature data as they climbed which led into a discussion of microhabitats. Another year, students found clues as they climbed as part of a larger quest. Canopy Connections is now in its seventh year. We have developed annual overarching themes for our field trips.

In 2011, the theme was using the arts to foster a greater understanding of forest ecology. The ELP team incorporated music, creative writing and sculpture to help the children build a personal connection to the forest.

In 2012, "Plants and People" provided the framework, and we focused on inspiring curiosity about the ecological and cultural importance of native plants. Field activities included field observations, cedar bark dyeing and Douglas-fir tea tasting .

In 2013, we focused on watersheds, and participants learned how to read topographic maps and built model watersheds. In 2014, the team focused on "Students as Scientists" and highlighted some of the long-term ecological research and writing that is occurring at HJA. Activities included biodiversity scavenger hunts and collecting riparian microhabitat data, learning about "Leave No Trace" principles, and building shelters.

#### **Acknowledgments**

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