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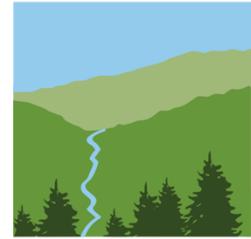
# STEM Education Resources

from the Hubbard Brook Research Foundation and  
USDA Forest Service

*Updated January 2022*

Long-term environmental monitoring and ecological research at the Hubbard Brook Experimental Forest in the White Mountains of New Hampshire offer rich opportunities for STEM learning. Here we share an outline of the current resources to support student engagement and learning related to earth and environmental science, STEM literacy, and STEM inquiry.

HUBBARD  
BROOK



RESEARCH  
FOUNDATION

## I. ZOOM-A-SCIENTIST PROGRAM

Bring a “real live scientist” into your classroom using the power of videoconferencing. The Hubbard Brook Research Foundation’s Zoom-a-Scientist program links environmental scientists with K-12 classrooms for live, interactive presentations about topics including salamander evolution, migratory birds, ice storms, forest ecology, and water cycle science.

## II. WATERVIZ

Waterviz is a set of online data visualization and sonification tools that can be used in classrooms to engage art, music, and science students with real data and concepts related to the water cycle. Hydrologic data captured at research stations in the experimental forest are transmitted to the internet and used to drive a computer model that calculates and displays all the components of the water cycle (evaporation, precipitation, streamflow, etc.) in real time. A set of middle-school lessons supports student learning. Lessons focusing on the sonification tools were specifically developed to support STEM learning for students with visual impairments.

<https://www.waterviz.org/>

## III. DATA LESSONS AND OTHER CLASSROOM RESOURCES

In addition to Waterviz, our education staff and educator partners have developed a treasure trove of STEM lessons and reference material for middle and high school classrooms. These resources allow students to interact with real data and learn about how researchers ask scientific questions and the methods they use to pursue the answers. We also have a children’s book and related classroom materials appropriate for elementary school classes. <https://hubbardbrook.org/education>

## IV. SCHOOLYARD SCIENCE

We are piloting a suite of activities we call “Hubbard Brook in a Box” that support teachers in engaging their students in hands-on inquiry projects in their school yards and neighborhoods. Track spring and fall phenology with your students and compare your data to the long-term records at Hubbard Brook! For more information, please email Amey Bailey: [amey.bailey@usda.gov](mailto:amey.bailey@usda.gov).

## V. FIELD TRIPS AND TOURS

We offer tours of the Hubbard Brook Experimental Forest\* to professional and student groups from May to October by appointment. Common tour themes include long-term data collection, acid rain, watersheds, and ecosystem science, though we can tailor the tours to the group’s interests and needs. We have funds available

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to cover the costs of bus transportation to the experimental forest for school systems without field trip budgets. Please email Brendan Leonardi to learn more: [bleonardi@hubbardbrookfoundation.org](mailto:bleonardi@hubbardbrookfoundation.org)

\*Please note that as per current USDA Forest Service/Northern Research Station policy, all buildings and facilities at the Hubbard Brook Experimental Forest are still closed to the public during the COVID-19 pandemic. The forest is open for visiting groups and all field trips and tours will be conducted entirely outdoors.

## CONTACT

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## STEM EDUCATION LINKS

<https://hubbardbrook.org/education> Education section of the Hubbard Brook website

<https://hubbardbrook.org/online-book> Hubbard Brook Online Book: A Synthesis of Scientific Research at Hubbard Brook (for advanced high school students and undergraduates)

<https://hubbardbrook.org/childrens-book-seeking-wolf-tree> Children's Book: *Seeking the Wolf Tree* by Natalie Cleavitt

<https://www.waterviz.org/> Data visualization and sonification tools for understanding hydrology and the water cycle through a combination of art and science

<https://hubbardbrook.org/field-trips-and-tours> Hubbard Brook Field Trips/Tours

## VIDEOS

<https://www.youtube.com/watch?v=q63KgaWjNGc> WMUR Highlight on Hubbard Brook Experimental Forest (Excellent general overview of Hubbard Brook)

<https://northernwoodlands.org/resilient-forest/part-3-the-birds-of-hubbard-brook> Northern Woodlands magazine video highlights continuous bird research at Hubbard Brook since 1969

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