Black Rock Forest, New York - www.blackrockforest.org

A 1500 ha (non-profit) preserve dedicated to scientific research, education, and conservation of the natural ecosystem that once covered this entire region.

Kim J. Brown, LDEO - Columbia
Forest Sensitivity Workshop, NH

Black Rock Investigators:
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Black Rock Forest, NY - Site Characteristics

Vegetation - Oak (formerly oak-chestnut), some mixed hardwoods, northern hardwoods, hemlock
734 stems ha^{-1}, 21 $m^2 ha^{-1}$ basal area

Soils - Hollis – Rock outcrop: moderately steep, well drained, medium textured soils over schist, granite, and gneiss.

Geology - *Bedrock*: Precambrian granite gneiss, granite, amphibolites, and iron ores (magnitite)
Surficial: Glacial till ranging from 0 to 10 m thickness

Land-use history - Lightly settled in the 1700's and 1800's, < 50% cleared for agriculture, woodlots repeatedly cut for fuel, regrowth beginning in late 1800's, stands <120 years old, became a forest experiment station in 1928.

Black Rock Forest, NY - Key research themes

I. What are the input-output budgets for critical chemical species at BRF?

Wet deposition only, 1980-1991

SO4: 10.1 kg/ha/yr

NO3: 4.7 kg/ha/yr

NH4: 1.9 kg/ha/yr

Dry deposition more difficult to obtain

Approach: SO_4 budget by difference

(assuming minimal SO_4 in biological pools)

[Dry SO_4] = Streamflow SO_4 flux-

[wet deposition SO_4]

Photo: BRF

Photo: K. Griffin

II. What are the interactions of BRF forest communities with ecosystem carbon, nutrient, and hydrologic budgets?

Studies of <u>carbon pools</u> (LDEO, NYU)

Paleo analyses of soil carbon storage

Carbon storage in tree boles, 1930-1999

Leaf area index + litter measures, 2000

Studies of <u>carbon fluxes</u> (LDEO)

1999 - Canopy photosynthesis in
Q. rubra, *Q. prinus*, *A. rubrum*

2000 - Canopy (leaf) and woody respiration in
Q. rubra, *Q. prinus*, *A. rubrum*

Soil respiration

Photos: K. Griffin

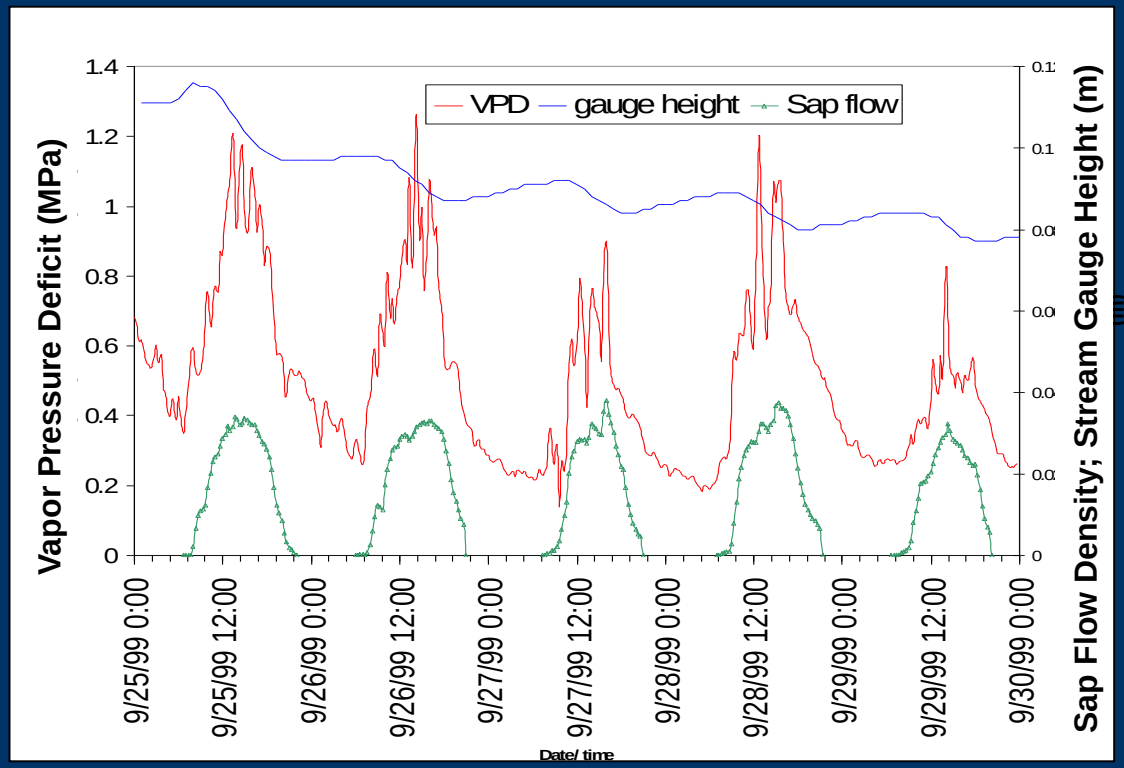
II. What are the interactions of BRF forest communities with ecosystem carbon, nutrient, and hydrologic budgets?

Measures of *Q. rubra* water usage, soil moisture, microclimate, stream flow

model

Quantify forest contribution to ecosystem water balance

Granier-type sap flow sensors



III. How have the plant and animal communities, and ecosystem processes, changed at BRF over various time scales?

Paleoecology studies: Pollen and macrofossil reconstructions of vegetation from cores from Sutherland pond and Cascade wetlands (LDEO, NYU)

Floristic inventory of Black Rock Forest and GIS mapping of plant resources (AMNH)

Hemlock decline *f*: woolly adelgid invasion (Fordham)

Invasive species: Quantification of invasive plants
Physiological investigations of plant construction costs (purple loosetrife, Japanese barberry) (LDEO)


Photo: J. Nagel

III. How have the plant and animal communities, and ecosystem processes, changed at BRF over various time scales?

Invertebrates

Spider biodiversity inventory at BRF (AMNH)

Road intensity and necrophage biodiversity (CERC -Columbia)

Woolly adelgid impacts on arthropod biodiversity (CERC)

Avian

Mixed species flock formation (CERC)

Mammals

Coyote demographics in New York (CERC)

Parasites and raccoon social structure (CERC)

Photos: Tree of Life

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Consortium members, including:
Colleges, universities, public and private K-12 schools, museums and botanical gardens