



Old-Growth Forests & Important Scientific Research

The importance of empirical data:
 Data collected from the environment (the *empire*) complements data generated from laboratory-style experiments. For empirical data sets, comparisons between *reference conditions* and *impaired conditions* are extremely important for determining the degree of impairment. **Which of the paired images to the right shows the contrast between reference conditions and impaired conditions?**



Advocates of Kanawha State Forest celebrate the induction of the Eastern Watersheds Old-Growth Forest into the national Old-Growth Forest Network.



Roger Hardway photo



(L) Citizen's monitored benthic macroinvertebrates in the Eastern Watersheds Old-growth Forest's Middlelick Branch (reference conditions produced a GLIMPSS bioscore of 80.60, **unimpaired-excellent**). (R) A toxic seep (pH of 4.37 is very acidic) drains from a permitted mountaintop removal mine in the neighboring watershed of Kanawha Fork, which scored only 25.75 (**impaired-moderately**).

What are reference conditions?
 Conditions representing the least-impaired state of nature, where natural processes function with little or no interference from human activities. Often, such conditions produce higher biological diversity when contrasted with more-impaired conditions. The Eastern Watersheds Old-Growth Forest has reference conditions for many types of environmental research, including birds, reptiles, amphibians, bats, botany, water quality, soil quality, air quality, and climatology. **In which image is a scientist taking measurements of the stream bottom for a hydrogeomorphological study? Which one shows an entomologist at work? Can you become a scientist?**



Forest canopy gaps provide good opportunities for catching insects for agency and college reference collections.



Bat biologists with All-Star Ecology consultants accepted volunteer help in setting up mist nets for nighttime bat surveys. After each night the team reviewed the acoustic and night-vision video recordings on a laptop computer.



Who uses this Forest for research?
 Colleges and High Schools, state and federal agencies that are mandated to enforce environmental laws, environmental consulting firms, and non-profit, charitable organizations. **One image shows volunteers and consultants working together on a research project. Can you pick out that image?**



(L) Physical dimensions, like thatweg depth and substrate particle size (rocks and gravels) are important for understanding stream hydrogeomorphology. (R) Old-growth trees have extensive root systems that keep soil in place along frequently flooding streams.



Roger Hardway photo



Jennifer Bauman Photos

Research shows that for purposes of rearing young, Kingfishers balance the need for eroded bank nest burrows with the need for abundant food-fish. A watershed with plenty of mature forest provides the right mix of minimal fish-choking sediment loads with infrequent erosion scars, like this one in Kanawha State Forest.

Who benefits from this research?
 We humans do and our fellow planet denizens also benefit. **Which image shows an animal who benefits from this research? Which one shows a whole lot of people who appreciate this Eastern Watershed Old-Growth Forest for its roles in science as well as its myriad other benefits? How can you show your appreciation for the Forest also?**