Major Discoveries at Hubbard Brook

- Acid rain was first identified in North America at Hubbard Brook in the mid-1960's and later shown to result from long-range transport from power plants. Long-term measurements also documented a marked reduction of calcium levels in soils and vegetation, primarily due to leaching losses associated with acid deposition. Hubbard Brook research influenced national and international acid rain polices, including the 1990 Clean Air Act Amendments.

- The Study validated the small watershed-ecosystem approach as a powerful scientific tool in tackling problems at the landscape-scale of complexity (ecological, hydrological, biogeochemical). The Hubbard Brook Ecosystem Study has been emulated at more than a dozen sites throughout the world.

- The Study confirmed that natural and anthropogenic disturbances disrupt nitrogen and other nutrient cycles in terrestrial ecosystems.

- Highway construction and subsequent road salting caused increased in chloride concentrations in Mirror Lake and Hubbard Brook, demonstrating land-disturbance effects an adjoining lake and stream ecosystems.

- Long term declines in lead emissions associated with elimination of leaded fuels nationwide have corresponded to the marked decreases of lead in precipitation and in the chemical makeup of the forest floor at local scales.

- Studies of bird populations have demonstrated that food limitation, climate, and changes in forest structure account for most dramatic changes in the abundances of neotropical migrant birds, indicating that breeding season events are critical for maintaining these populations.

Fast Facts about the Hubbard Brook Ecosystem Study

- The Hubbard Brook Ecosystem Study was started on June 1, 1963.
- The Hubbard Brook Experimental Forest, located within the White Mountain National Forest in Woodstock, NH, is an oblong basin about 5 miles long by 3.1 miles wide; total of 7,754 acres.
- The main Hubbard Brook is about 8 miles long; there are about 16 major (perennial tributaries) and about 373 total miles of perennial and ephemeral stream channel length within the valley.
- The pH of the first rainwater sample collected was 3.70 (24 July 1963); it required 18 years of continuous monitoring to establish that the acidity of precipitation was decreasing.
- Mirror Lake (37 acres; average depth, 19 feet) is among the most studied lakes in the world, with 8,181 water samples taken; more than 850 species have been identified in the lake.
- The total number of birds banded is 13,943. The number of black-throated blue warblers banded (the signature bird studied) is 8,817; 5,638 as nestlings. The number of bird species observed within the Hubbard Brook valley is 124.
- 20,163 routine stream water samples and 5,251 routine precipitation samples have been collected at Hubbard Brook. 96,900 snow tubes have been measured.
- There are an estimated 1.85 million adult trees in the Hubbard Brook Valley; approximately 57,000 (3%) of them have been tagged and are re-measured on 2, 5, or 10 year cycles.
- Since 1963, more than 1,420 scientific publications, 11 books, and 100 Ph.D. theses have been produced from the research at Hubbard Brook.
- Hundreds of principal investigators, field technicians, and students have worked at Hubbard Brook since the Study was started in 1963. Currently 31 scientists are active at Hubbard Brook, representing 20 academic and research organizations. Approximately 75 scientists, including many of whom are leaders in academia or the conservation sphere, compose the Hubbard Brook Committee of Scientists.

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