Institute of Ecosystem Studies (IES)

Site Name: Institute of Ecosystem Studies (IES)
Domain: Northeast
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Web Page: www.ecostudies.org
Location: 41° 50' N; -73° 45' W

Since 1983 IES has been collecting high quality environmental data in our rapidly developing area centered at the 850-ha Cary Arboretum in the Hudson River Valley near Millbrook, NY, 110 km north of New York City. Most of the arboretum is dominated by approximateily 80 year old oak, hickory, maple and pine forests on Dystrochrept soils. IES environmental monitoring of physical variables includes air, precipitation and stream chemistry as well as meteorological, solar radiation and physical stream parameters. Biological variables include forest growth and change, abundance of deer and browsing activity, gypsy moths, small mammals and birds.

Physical facilities include state-of-the-art laboratories for organic and inorganic chemical analyses, a full scientific reference library, a computer lab for use by and visitors, a 150-seat auditorium, 1,370 m_2 of greenhouse space, cold storage facilities, and carpentry and mechanical shops. Dormitory facilities are available to house visitors and students while in residence. Three renovated farmhouses can accommodate visiting scientists and their families on extended stays.

IES is a classic “urban fringe site,” one that facilitates research on “riding the wave of suburbanization”. Population in the mid-Hudson River Valley region has grown by 13% over the last 25 years, while urban and suburban land cover has grown by 30%. IES long-term monitoring has chronicled the changes in environmental (air, water, organisms) connectivity associated with this wave.

Climate theme. Temperature, relative humidity, wind and solar radiation have been measured at IES since 1987. The U.S. Climate Reference Network (USCRN) program began making air temperature, relative humidity, surface temperature, precipitation, wind speed and solar radiation measurements at IES since October 2004.

Invasives species theme. Gypsy moths (GM), the most important defoliator of eastern U.S. oak forests have been monitored at IES since the early 1980’s including a 25-yr data record on egg mass densities and degree of canopy defoliation. We also monitor the role of the *Entomophaga* fungal disease in GM mortality.

IES scientists discovered, and have continued to study, important connections between acorn production, mouse and deer population sizes and the number of blacklegged ticks infected with *Borrelia burgdorferi*, the bacterium that causes Lyme disease. These connections are strongly affected by human induced environmental changes, such as habitat fragmentation, which can inadvertently increase disease risk by reducing both predators and biodiversity. Ongoing monitoring includes measurements of acorns, small mammals and ticks, with analysis to sort out the different biotic and abiotic (e.g., climate) drivers on these connections.

Land use theme. Precipitation samples have been collected since 1984 from the wet side of an automatic wet-dry collector and are analyzed for pH, SO_{4}^{-2}, NO_{3}^{-}, NH_{4}^{+}, PO_{4}^{-3}, Cl^{-}, Na^{+}, Ca^{+2}, Mg^{+2}, and K^{+}

helping people understand the ecosystems upon which we all depend and in which we all live. ELI is conducting research about what people know and how they learn about ecosystems. Building on this foundation in scholarship, ELI is developing programs and resources for three audiences: 1) educators in schools from elementary through college and in non-school settings; 2) future and practicing scientists; and 3) the general public, including decision makers and natural resource managers.