

Baltimore Urban LTER Site

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The Baltimore Urban Long-Term Ecological Research (LTER) Site (Baltimore Ecosystem Study (BES), <http://beslter.org>) has been a component of the NSF LTER network since 1997. The Institute of Ecosystem Studies (IES, www.ecostudies.org) is the lead institution for BES, but the U.S. Forest Service is a major participant, physical facilities are headquartered at the University of Maryland Baltimore County (UMBC), and investigators from UMBC and many other institutions participate in the project.

BES research is centered in and around the Gwynns Falls watershed (76°30', 39°15'), which lies predominantly within the Piedmont physiographic province in Baltimore County and Baltimore City, Maryland. The watershed traverses a land use gradient from the urban core of Baltimore City, through older urban residential (1900-1950) areas, older suburban (1950-1980) zones in the middle reaches, and finally through rapidly suburbanizing areas and a rural/suburban fringe in the headwaters in Baltimore County. The Piedmont areas are underlain by igneous and metamorphic rocks and are dominated by highly weathered Ultisols. The natural forest vegetation of the area (currently approximately 20% of the watershed) consists mostly of tulip poplar and oak dominated forests. Long-term data collection efforts include an official LTER meteorological station, a network of 10 – 15 stream sites that have been sampled weekly, and a network of terrestrial long-term study sites that have been sampled monthly since 1998.

BES NEON installations would be located at the Cub Hill Tower Flux site, which is located 14 km from the Baltimore city center, just outside the Gwynns Falls (Figure).

Established by the U.S. Forest Service in 2001, Cub Hill is the first permanent urban carbon flux tower. Measurements include net CO₂ exchange, input and partitioning of radiation (net, solar, PAR, IR, UV), 3-D wind speed and direction, precipitation, relative humidity and air temperature. The north and south sides of the tower footprint provide marked contrasts between largely forested and suburban areas. Two streams that drain the tower footprint have been

sampled weekly since 2003. There have been numerous studies of soil, vegetation and hydrologic parameters in the mixed land use footprint of the tower.

