Studies in Carbon and Meteorological Flux and Air Quality Concentration Measurements in the Baltimore Ecosystem Study

John Hom, David Nowak, Dan Golub, and Gordon Hiesler
USDA Forest Service, Northeastern Research Station
Sue Grimmond, Brian Parson, and Steve Scott
Indiana University, Bloomington, IN, USA

Abstract: We are using a permanent 40m lookout tower at Cub Hill, Maryland Department of Natural Resources, Forest Service, to conduct studies on carbon, water, and energy exchange for intact forest and vegetated areas as well as non-forested areas. The tower site will play a major role in the air quality and meteorological flux research for the Baltimore Ecosystem Study (BES). The urbanization flux site will provide new scientific research opportunities and will address these science needs:

- Characterize flux elevated levels of CO2, temperature, and nitrogen deposition in urban/substrb urban sites.
- Investigate the role of temporal cycle effect on the atmospheric composition of CO2, NOx, O3, and nitrogen depositions.
- Develop an urban emissions inventory for use in air quality models.
- How much carbon does the urbanization ecosystems sequester, and how does it compare with rural forested systems?
- Can we distinguish the effects of atmospheric fertilization (NOx) on carbon cycle and net primary productivity?
- What are the effects of climate variation, and the urban heat island effect on the carbon cycle and NOx cycle?
- What are the biological and ecological effects of increased CO2 and urbanization on ecosystem?