Studies on carbon flux and carbon dioxide concentrations in a forested region in suburban Baltimore

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Purpose & Objectives:
The purpose of this study is to characterize the carbon fluxes and carbon dioxide concentrations from a highly vegetated suburban area of Baltimore. This will provide several realizations of carbon sequestration to suburban ecosystems, areastraditionally called "non-forest" regions. The Cub Hill site is located 14 km from the Baltimore city center to the west suburbs.

Science questions and goals:
1. Can we characterize fluxes of CO2, H2O, and energy fluxes from suburban eddy correlation sites?
2. What effect does proximity to Baltimore city center have on carbon and energy fluxes?
3. How do carbon fluxes change due to land use change near the tower site?
4. How do urban carbon fluxes change during the work week?

Results and Accomplishments:
1. The flux tower showed C cycling and other gas and energy fluxes due to anthropogenic activity and vegetation changes.
2. The ten level profile system for CO2 and H2O concentrations was initiated in February 2001 on an existing fire lookout tower. The mean concentration at 40 m is 386 ppm, in contrast to 511 ppm in the city center.
3. The patches of forests and vegetation cover at Cub Hill have a substantial impact on the amount of carbon sequestration in "non-forest" regions. These patches of residential and urban vegetation serve to capture carbon dioxide and sequester it from the atmosphere.

The ten level profile system for CO2 and H2O concentrations was initiated in February 2001. An eddy correlation system for carbon, water, and energy fluxes started in late May 2001; however, data were not collected continuously until September 2001. The study was concluded in September 2002. The ten level profile system for CO2 and H2O concentrations was initiated in February 2001 on an existing fire lookout tower. The mean concentration at 40 m is 386 ppm, in contrast to 511 ppm in the city center. The ten level profile system for CO2 and H2O concentrations was initiated in February 2001 on an existing fire lookout tower.

Results of our CO2 profile system showed a diurnal cycle associated with energy use and the workweek in summer. Winter cycling of CO2 concentrations is observed, while summer cycling of CO2 concentrations is influenced by anthropogenic activity and vegetation changes.

From this suburban tower, we were able to show seasonal and work week cycles of CO2 concentration that are influenced by anthropogenic activity and vegetation changes. Carbon uptake rates were similar to a natural deciduous forest due to the high tree cover of 36%. Uptake showed two dominant vegetation responses: seasonal deciduous canopy and grass/meadow cover which has a longer growing season. Carbon uptake rates were similar to a natural deciduous forest due to the high tree cover in the residential area. 36% tree cover. Uptake showed two dominant vegetation responses: seasonal deciduous canopy with "grasslands" understory. Carbon uptake rates were similar to a natural deciduous forest due to the high tree cover in the residential area. 36% tree cover. Uptake showed two dominant vegetation responses: seasonal deciduous canopy with "grasslands" understory. Carbon uptake rates were similar to a natural deciduous forest due to the high tree cover in the residential area. 36% tree cover. Uptake showed two dominant vegetation responses: seasonal deciduous canopy with "grasslands" understory. Carbon uptake rates were similar to a natural deciduous forest due to the high tree cover in the residential area. 36% tree cover. Uptake showed two dominant vegetation responses: seasonal deciduous canopy with "grasslands" understory. Carbon uptake rates were similar to a natural deciduous forest due to the high tree cover in the residential area. 36% tree cover. Uptake showed two dominant vegetation responses: seasonal deciduous canopy with "grasslands" understory.

Conclusions:
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