

Determining the NYC Atmospheric CO₂ Dome from ¹⁴C in Tree Rings

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We propose to determine the level of atmospheric CO₂ enrichment in NYC over the last 100 years by comparing the ¹⁴C content of wood of trees growing east of the city (predominately down wind) to trees growing at Black Rock Forest. This information will play a key role in the development of a larger research program to examine the effects of urbanization on ecosystem functioning. As a result of human activities the climate and biogeophysical environment of urban regions is often substantially different from that of surrounding rural areas. The rapid growth of urban areas is likely to have large consequences for ecosystem function/services, and the human communities dependent on these services, in both cities and surrounding rural regions through perturbations to ecosystem productivity, biogeochemical cycles, and biodiversity (Pickett et al, 2001; McKinney, 2002, Gregg et al, 2003). Information on the 'ecological footprint', the spatial extent of urban effects on ecosystems outside of the city, is critical to achieving a sustainable city. As one of the largest mega-cities, New York City is an ideal setting to conduct the proposed study of the effects of urbanization on ecosystem function.