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Carbon Stored in Human Settlements of the USA

G. Churkina (1, 2), Daniel Brown (1), Gregory Keoleian(1)

1. School of Natural Resources and Environment, University of Michigan, Ann Arbor, USA, (2) Now at Max Planck Institute for Biogeochemistry, Jena, Germany (churkina@bgc-jena.mpg.de / Fax: +49 3641-577300 / Phone: +49 3641-576355)

Future and current changes in storage of carbon on land can enhance or offset the rise of carbon dioxide in the atmosphere. Although storage of carbon has been estimated for different ecosystems of the world it has never been estimated for human settlements. Estimates of complete carbon storage in urban system are lacking, because this system includes natural and anthropogenic components traditionally studied in different scientific fields. Here, we estimate carbon storage in urban areas within the United States, defined to encompass a range of observed settlement densities, and its changes from 1950 to 2000. We include natural and anthropogenic components of urban areas in our estimates. The natural component includes carbon storage in urban soil and vegetation. The anthropogenic component encompasses carbon stored long term in buildings, furniture, cars, and waste. We show that carbon storage attributed to urban areas is not negligible and has been continuously increasing. The underlying reasons of this increase are population growth combined with decreasing housing density and the enlargement of house size. We observe an emergence of a new ecosystem we know very little about. The study suggests that urban areas should receive continued attention in efforts to accurately account for carbon uptake and storage in terrestrial systems.