

### 3. Urban Mosaics: The Chemical, Physical, and Ecological Characteristics of Urban Soils

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Urban soils provide an array of ecosystem services to inhabitants of cities and towns. Urbanization affects soils and their capacity to provide ecosystem services directly through disturbance and management (e.g., irrigation), and indirectly through changes in the environment (e.g., heat island effect and pollution) to form a mosaic of soil conditions. In the Baltimore Ecosystem Study (BES), we utilized the urban mosaic to conduct a series of “natural experiments” to investigate and compare the direct and indirect effects of urbanization on soil properties and biogeochemical responses at neighborhood, citywide, and metropolitan scales. In addition, we compared these results to those obtained from other metropolitan areas to assess the effects at regional and global scales and to assess the generality of these results. From these investigations we conclude that 1) urban effects on soils occur at multiple scales, 2) management effects are greater than environment effects, 3) urban landscapes are biologically active (e.g., nitrogen and carbon dynamics) in pervious areas and have a high potential for carbon storage and nitrogen retention, 4) the importance of urban and native factors depend on the property being measured, and 5) city comparisons support in part the *Biotic Homogenization* and *Urban Ecosystem Convergence Hypothesis*.

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