

Pattern and Process in Atmospheric Deposition in Heterogeneous Urban Environments

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There have been two parallel approaches to studying atmospheric particulate matter (PM) within the discipline of environmental science. The regulatory approach asks the question, "How much is in the air?" while the biogeochemical approach asks, "How much deposits on terrestrial surfaces?" Both approaches emphasize long term, regional trends and patterns, with the result that we know relatively little about patterns and processes occurring in cities and especially near roads and highways which define the urban matrix. Cities have long been recognized as hotspots for producing and processing PM and importantly, where an increasing majority of our population lives. We present a series of case studies using brief monitoring campaigns to illustrate the importance of local, short-term events in determining the loading rates of atmospheric pollutants and the role these play in biogeochemistry and human health and wellbeing. There is an emerging opportunity for synergy between regulatory and basic research monitoring efforts that will allow us to address complex questions of the interacting dynamics of human and ecological systems.

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