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Blowin' Down the Road:
Investigating Bilateral Causality Between Dust Storms
and Population Change in the Great Plains

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Abstract

Recently, the National Academy of Sciences concluded “it is clear that population and the environment are usually interrelated...” This interrelationship implies three possible causal models: 1) unidirectional causality from population to environment; 2) unidirectional causality from environment to population; or 3) feedback, or bilateral causality. The purpose of this paper is to determine the form of this anticipated interrelationship using annual county-level population estimates provided by the U.S. Census Bureau and annual counts of “dust storms” from weather stations situated throughout the U.S. Great Plains. In doing so, it also develops and implements a research design that incorporates macro- and micro-level features in a single application by extending methods (far removed from conventional demography) for pure time series analysis with multilevel regression models. The result is a method for causal modeling in pooled cross-sectional time series that produces, in this application, evidence of bilateral causality between population change and deleterious environmental conditions.

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