ENVR 400 Seminar

Space/Time Modeling of Hydrogen Sulfide from Hog CAFOs in Eastern North Carolina

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Abstract

The state of North Carolina saw a large increase in the number of industrial hog operations or confined animal feeding operations (CAFOs) during the 1980s and 1990s. The vast majority of these swine farms were placed in areas of Eastern North Carolina that are typically poorer with high minority populations. Communities near these facilities report a number of public health problems including bad odors, polluted air, contaminated surface and ground water, and resulting health problems. Hydrogen Sulfide (H2S), believed to be produced by the spraying of hog waste on adjacent fields, is one of many chemicals of concern at these sites. An exposure assessment of atmospheric H2S was conducted in one such affected community. Data collection included active samplers that recorded instantaneous measurements of H2S at 15-minute intervals and passive samplers that collected average measurements during a period of 2-weeks. The more expensive active samplers were necessary to characterize the high temporal variability while the more numerous passive samplers capture the spatial variability since H2S from hogs is characterized by very low values followed by spikes in concentration when the waste is sprayed. The space/time exposure maps produced from this research can be used to investigate epidemiological associations with previously collected space/time health data.