

Atmospheric Fate and Transport of Agricultural Dust and Ammonia

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Agricultural fugitive dust and odor are significant sources of localized air pollution in the semi-arid southern Great Plains. Daily episodes of ground-level fugitive dust emissions from the cattle feedlots associated with increased cattle activity in the early evenings are routinely observed, while consistently high ammonia is observed throughout the day. Here we present measurements of aerosol size distributions and concentrations of gas and particulate phase ammonia species collected at a feedlot in Texas during summers of 2006, 2007 and 2008. A GRIMM sequential mobility particle sizer and GRIMM 1.108 aerosol spectrometer were used to determine aerosol size distributions in the range of 10 nm to 20 μm aerodynamic diameter at the downwind and upwind edges of the facility. Using aqueous scrubbers, simultaneous measurements of both gas phase and total ammonia species present in the gas and particle phases were also collected. In addition to the continuous measurements at the edges of the facility, coincident aerosol and ammonia measurements were obtained at an additional site further downwind (~3.5 km). Taken together our measurements will be used to quantify aerosol and ammonia dispersion and transport. Relationships between the fate and transport of the aerosols and ammonia will be discussed.