



Observations of greenhouse gas and short-lived pollutants in the Baltimore Washington area: Quantification and mitigation

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For the past five years, we have been measuring greenhouse gases CO₂, and CH₄ along with a suite of pollutants related to photochemical smog (O₃, NO₂, VOCs, CO) and particulate matter (SO₂ (sulfate precursor), & aerosol optical properties) from a research aircraft. These complement a network of tower-based monitors and provide input to a variety of models used to determine emissions. Initial findings include identification of landfills and leakage from the natural gas delivery system as major local sources of CH₄, as well as substantial upwind sources such as oil and gas operations in the Marcellus shale play. Quantification of emissions and flux is complicated by uncertainties in background concentrations and mesoscale dynamics. Comparison of short-lived species has shed light on the efficiency of combustion and pollution control as well as the temperature dependence of emissions. Ratios of CO:CO₂, for example, are consistent with emissions inventories and verify the high efficiency catalytic converters.