



Emissions of CH₄ from natural gas production in the United States using aircraft-based observations

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New extraction technologies are making natural gas from shale and tight sand gas reservoirs in the United States (US) more accessible. As a result, the US has become the largest producer of natural gas in the world. This growth in natural gas production may result in increased leakage of methane, a potent greenhouse gas, offsetting the climate benefits of natural gas relative to other fossil fuels. Methane emissions from natural gas production are not well quantified because of the large variety of potential sources, the variability in production and operating practices, the uneven distribution of emitters, and a lack of verification of emission inventories with direct atmospheric measurements. Researchers at the NOAA Earth System Research Laboratory (ESRL) have used simple mass balance approaches in combination with isotopes and light alkanes to estimate emissions of CH₄ from several natural gas and oil plays across the US. We will summarize the results of the available aircraft and ground-based atmospheric emissions estimates to better understand the spatial and temporal distribution of these emissions in the US.