

A Quantification of Methane Emissions from Oil and Natural Gas Extraction Regions in the U.S. and a Comparison to Previous Studies

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We present airborne measurements of methane (CH_4) and ethane (C_2H_6) taken aboard a NOAA WP-3D research aircraft over five regions of oil and natural gas extraction in March and April, 2015, as part of the Shale Oil and Natural Gas Nexus (SONGNEX) field study. The five regions are the (1) Haynesville, (2) Barnett, and (3) Eagle Ford regions in Texas, (4) the Denver-Julesburg region of Colorado, and (5) the Bakken region of North Dakota. From these measurements, we derive methane emission rates from these regions using the mass balance method. We then compare these emissions to those reported from previous studies, where applicable. Finally, we compare reported methane emissions from multiple regional-scale studies with inventory estimates of methane emissions from U.S. oil and natural gas production.

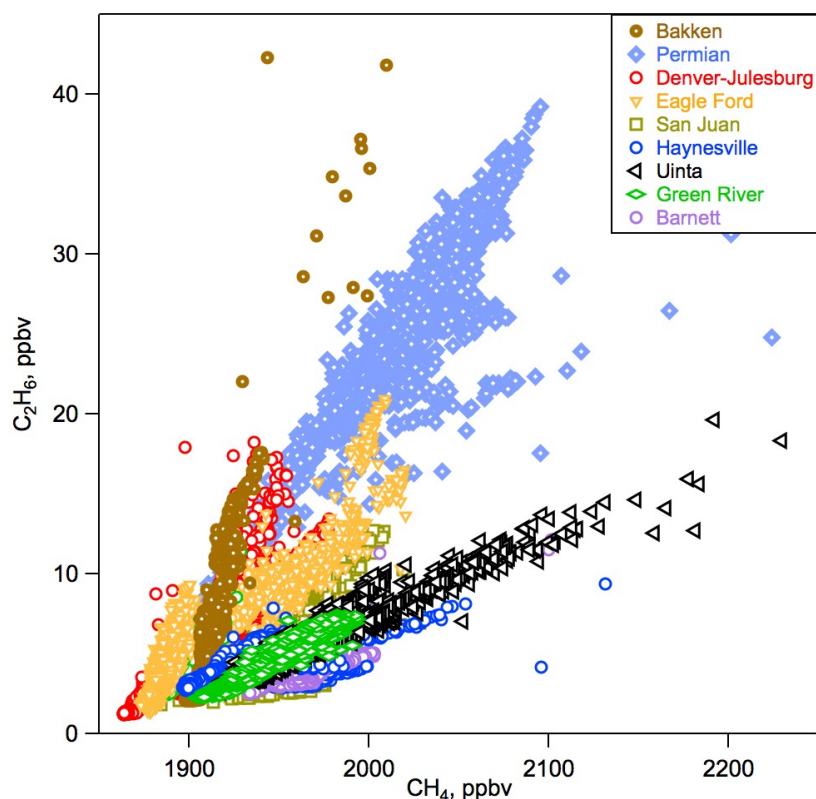


Figure 1. Measurements of ethane and methane from nine oil and natural gas extraction regions sampled during the SONGNEX field study. Note that the fields that produce "wetter" gas typically have greater atmospheric enhancements of ethane relative to methane.