Updated Estimates of California's Urban and Rural Methane Emissions

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We present updated atmospheric inversion estimates of California's total CH_4 emissions for 3 months (June-August) in summer 2012. Measurements include data from 9 sites covering urban and rural areas of California's South Coast Air Basin, Central Valley, San Francisco Bay Area, and North Coast. We use Bayesian inversions to estimate the CH_4 emissions from discrete regions of California by combining the local CH_4 measurements, background CH_4, 0.1 degree prior model emission maps (one specific to California and one global), and predicted CH_4 signals from the Weather Research and Forecasting/Stochastic Time-Inverted Langrangian Transport atmospheric transport model. We quantify site-specific model-measurement uncertainties due to: 1) transport using meteorological data from a network of atmospheric profilers and *in situ* sensors, 2) background using oceanic and aircraft observations, and 3) prior emissions using the spread results obtained with the two different maps. Bayesian inverse modeling using the network of measurements constrains a majority (>90%) of California's emissions. Here, we update the emission estimates and uncertainties and compare our results with previous studies covering smaller areas and time periods.
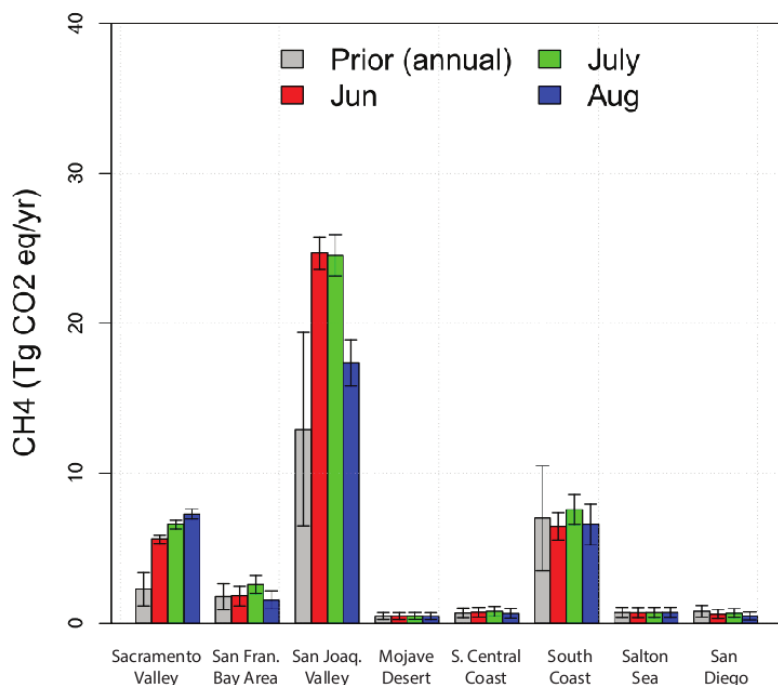

Figure 1. CH_4 emissions by region for California showing prior (annual average), and posterior estimates (June, July, August) from the inversion of network data.