

# A Multiplatform Inversion Estimation of Statewide and Regional Methane Emissions in California during 2014–2016

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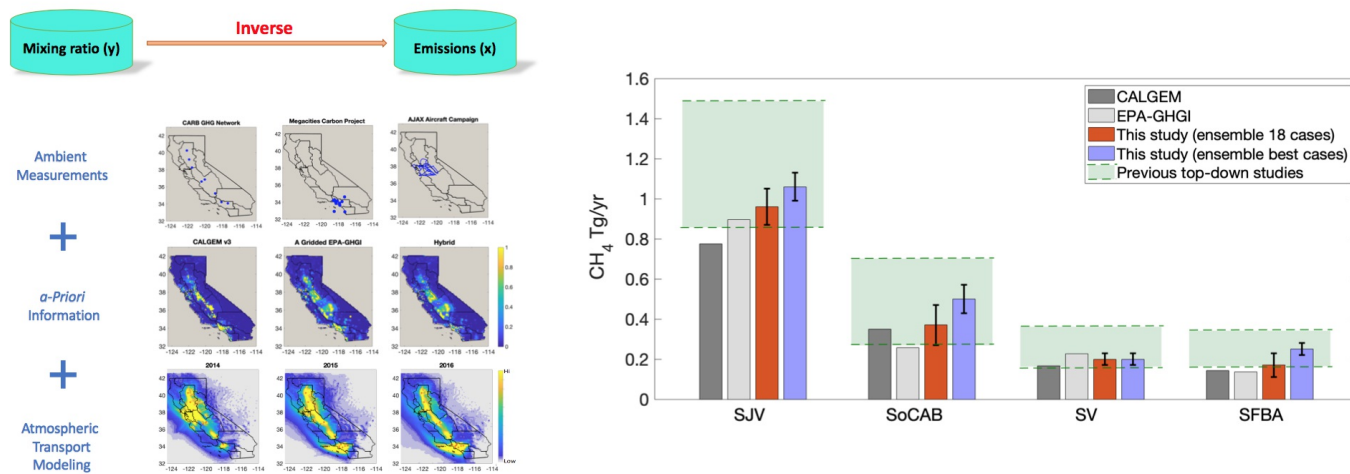
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California adopted the landmark Global Warming Solutions Act of 2006 to reduce Greenhouse Gas (GHG) emissions to the 1990 levels by 2020, and has also enacted several ambitious climate regulations to mitigate the global warming impacts of methane (CH<sub>4</sub>), such as Senate Bill No. 1383 which requires a 40% reduction in CH<sub>4</sub> emissions below 2013 levels by 2030. To achieve the ambitious emission reduction goals and implement real and efficient reduction policies, a thorough understanding of CH<sub>4</sub> emissions is important. In this study, we conducted a multiplatform inversion analysis for a multiyear evaluation of bottom-up CH<sub>4</sub> emissions inventories of California, based on atmospheric measurements from two tower networks and one aircraft campaign during the period. The tower networks were California Air Resources Board’s Statewide GHG Monitoring Network, and a regional-scale urban network in Los Angeles built by the Megacities Carbon Project. The aircraft measurements were conducted by NASA Ames in northern California. It is the first time that such an analysis has been conducted by using multiple measurement platforms and different prior inventories for multiple years to constrain CH<sub>4</sub> emissions in California. The rigorous inversion analysis has important policy implications for regulatory programs. It provides a multiyear evaluation of the emissions inventory using independent atmospheric measurements, investigates the utility of a complementary multiplatform approach in understanding spatial and temporal patterns of CH<sub>4</sub> emissions in the state, and identifies opportunities for the expansion and applications of the monitoring network.



**Figure 1.** Major components for the inversion analysis are shown in the left panel; inversion results by subregion are shown in the right panel.