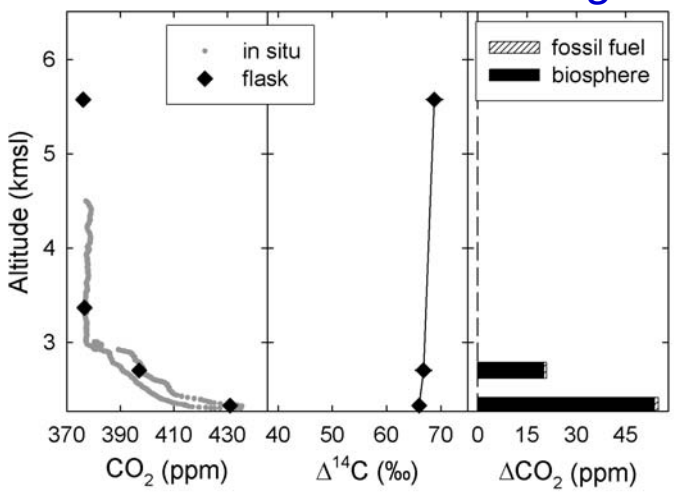
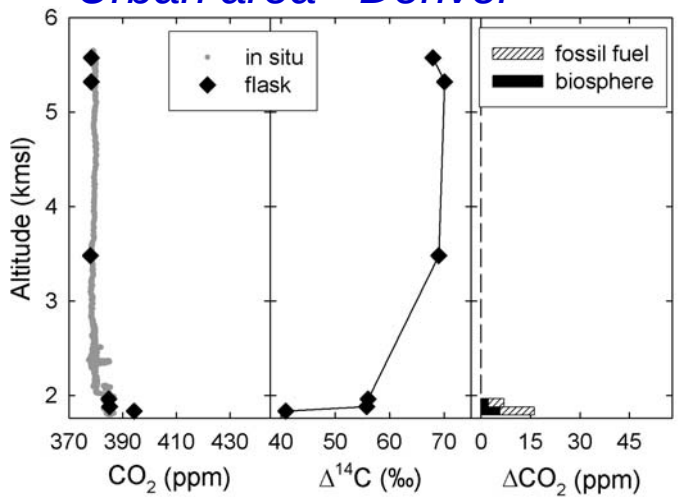
CO_2 Attribution During CALNEX(?)

Rural area – Kemmerling CO

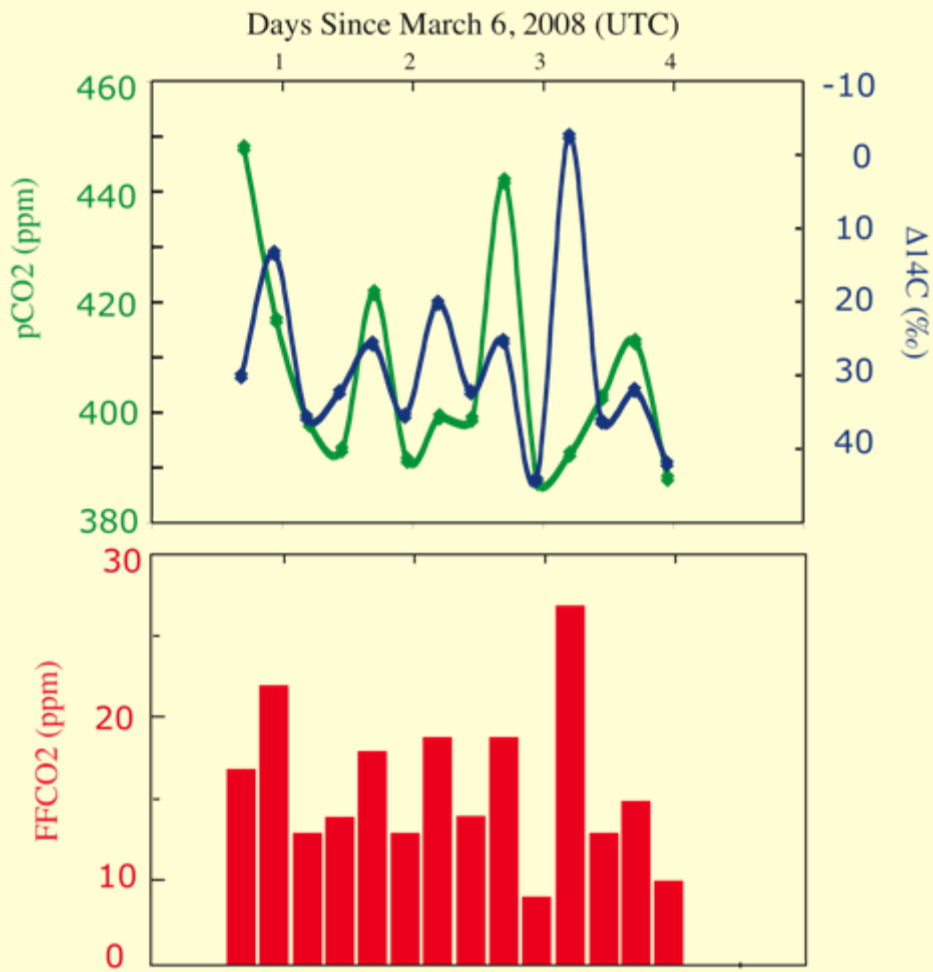


Urban area - Denver



Graven et al., in review Tellus

Walnut Grove (WGC)

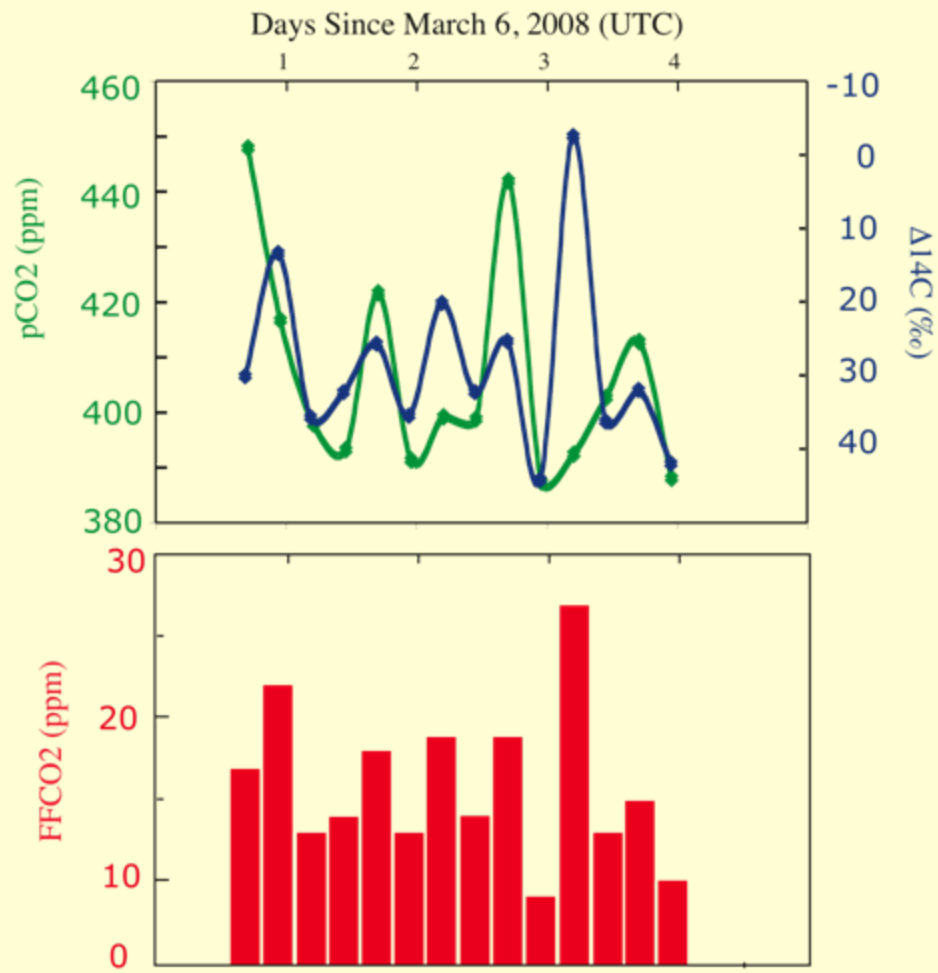


Fossil Fuel CO2 relative to Mauna Loa

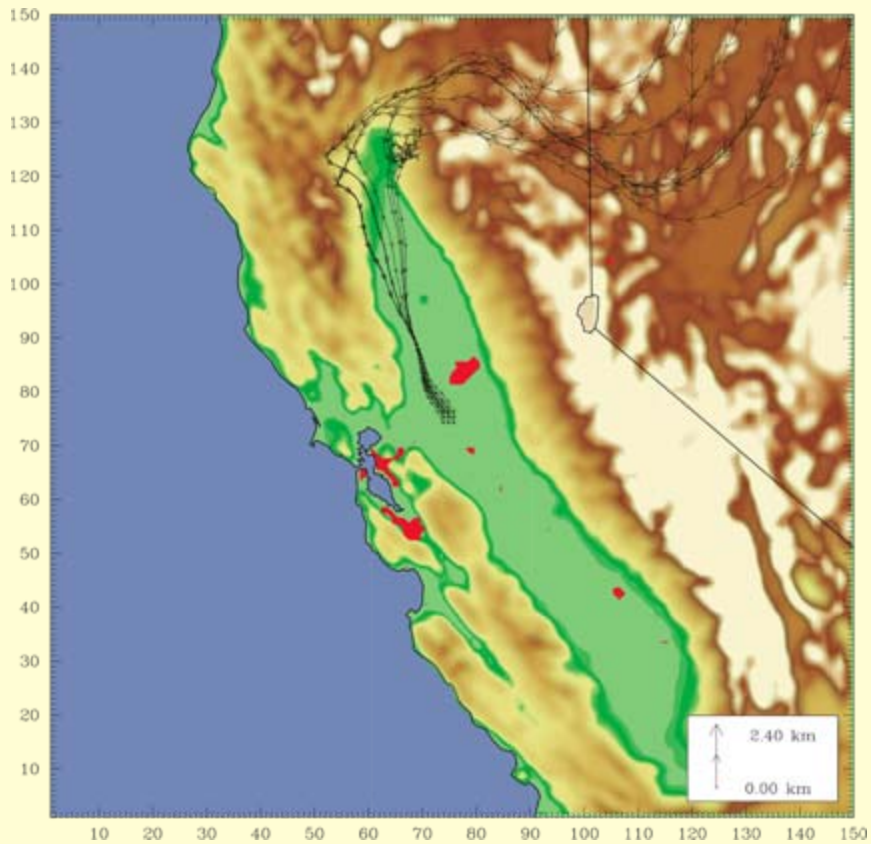
WGC in collaboration w. M. Fischer (LBL)

Understanding Emission Sources

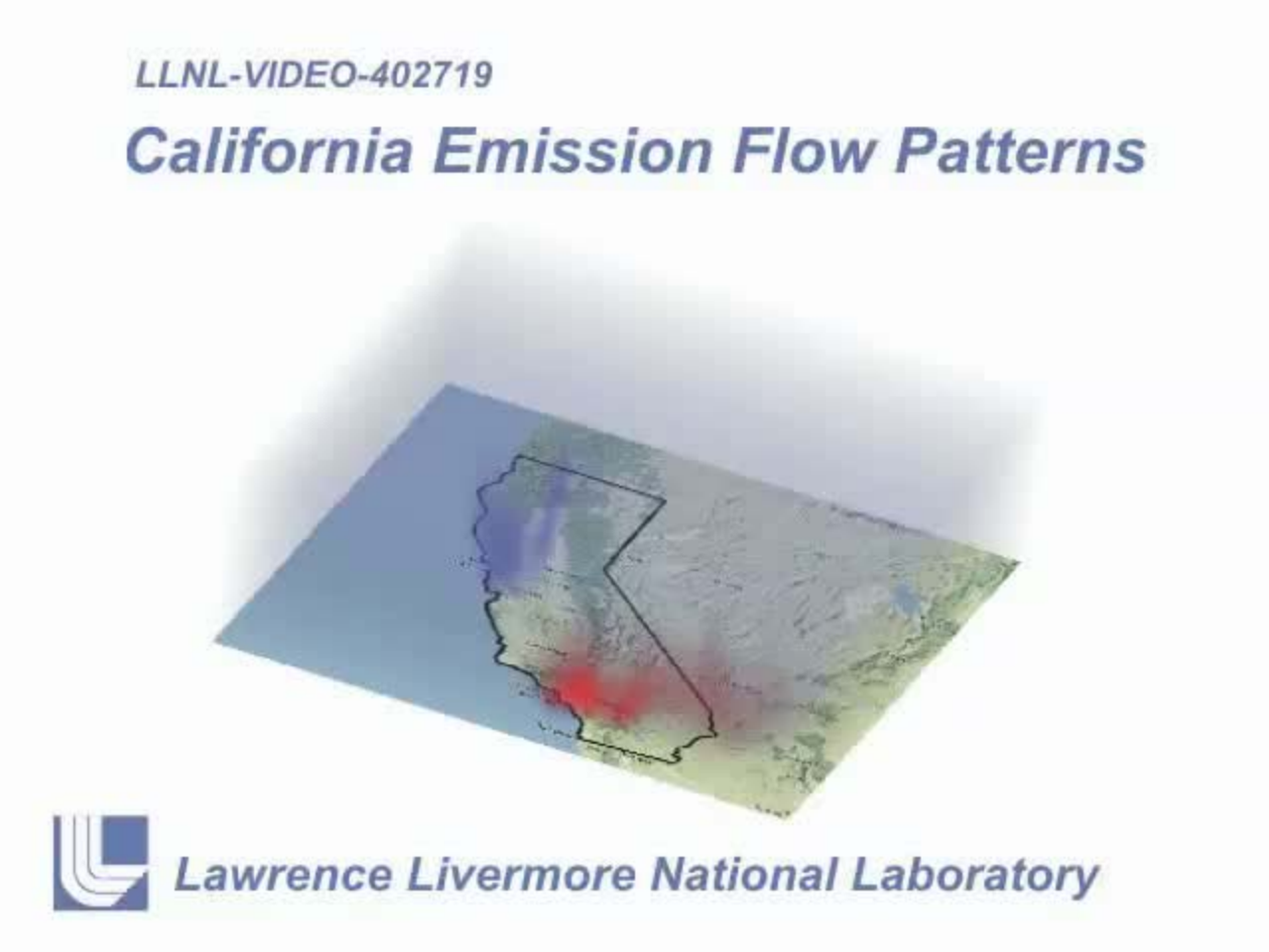
Walnut Grove (WGC)



Simple back trajectory



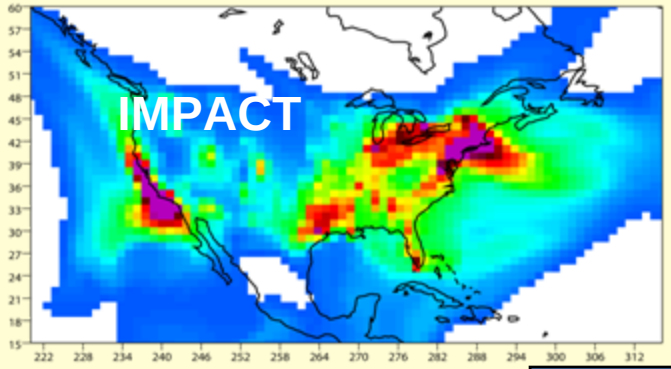
Complex Atmospheric Dynamics



Other modeling capabilities for urban to regional modeling including atmospheric chemistry (WRF-CHEM) and ensemble averaging using different initial conditions and PBL parameterizations.

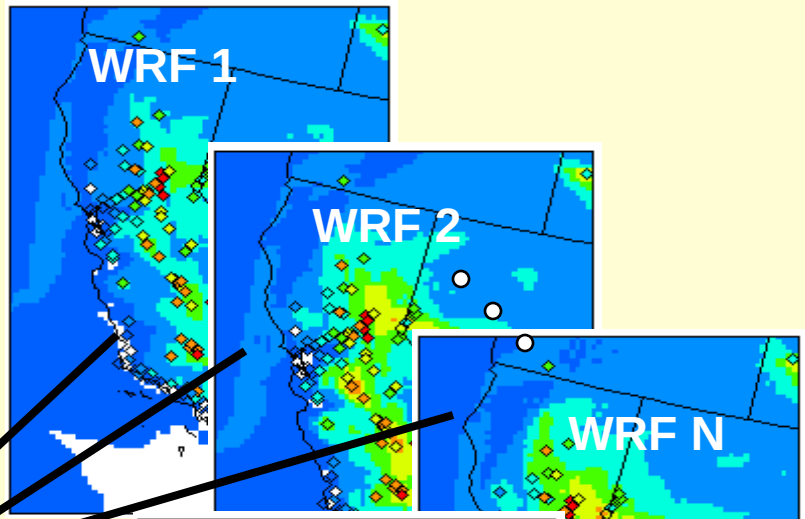
Predictive models and data are coupled with Bayesian inference

Global dispersion simulation



Boundary Conditions

Library of regional dispersion simulations

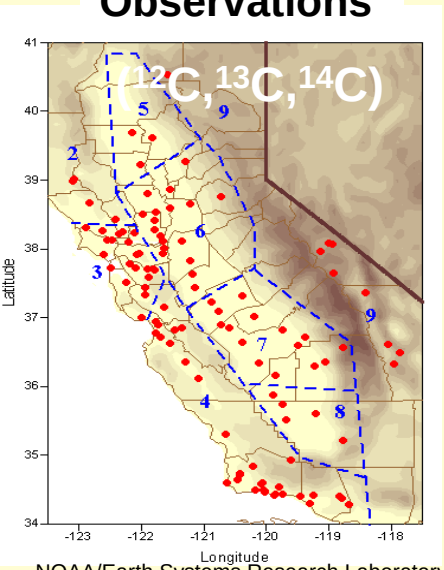


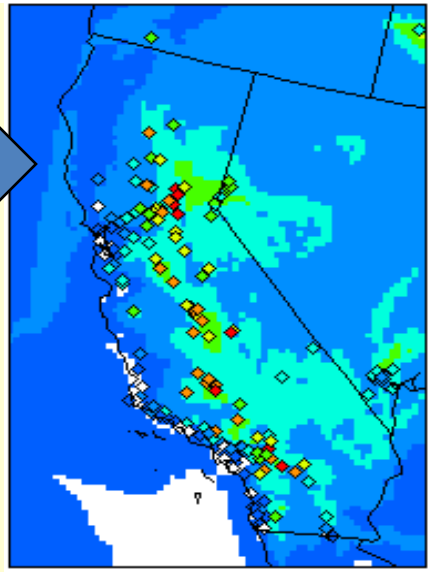
Update likelihood
(until convergence to posterior distribution)

Direct solution or Stochastic sampling of emission rates

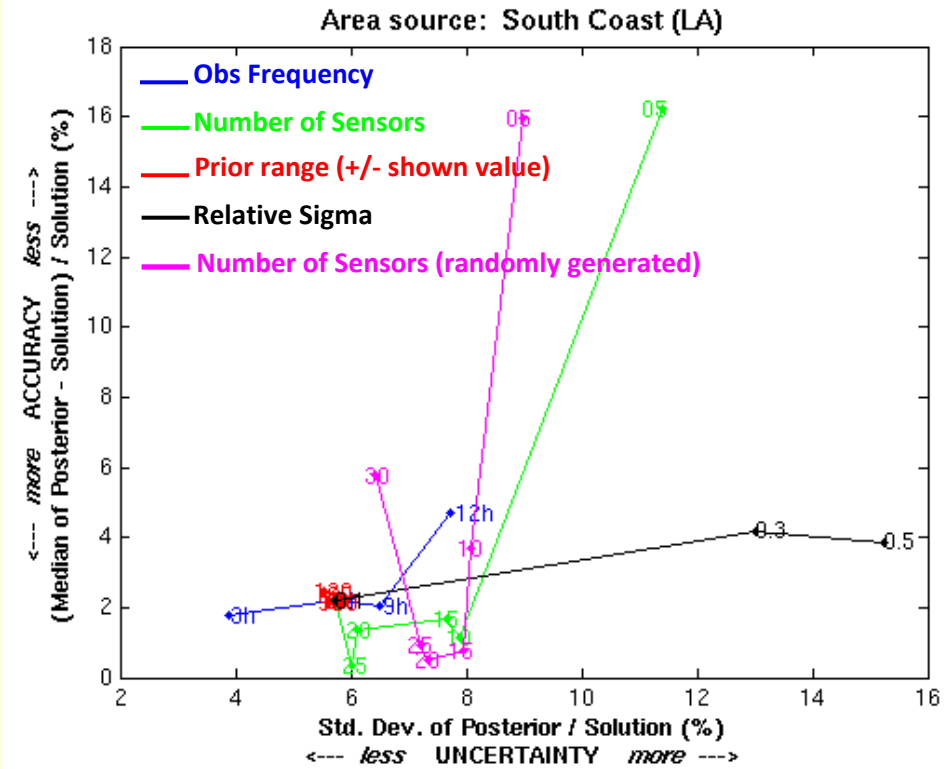
Bayesian Inference
$P(e|d)=P(d|e)P(e)/P(d)$

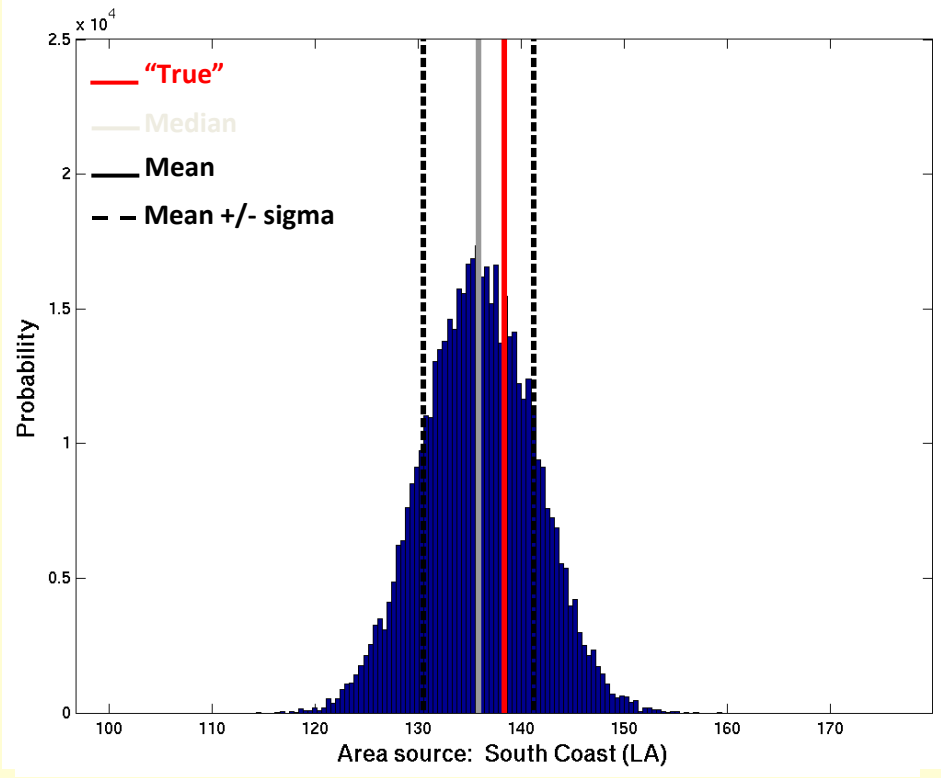
Observations





“Metro -LA” -- posterior distribution and sensitivity analysis of reconstruction accuracy and uncertainty of fossil fuel CO2 emissions





Uncertainty vs Accuracy

Posterior Distribution