

Quantifying Canada's Methane Budget Using Atmospheric Methane Measurements and Modeling

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Environment Canada (EC) currently conducts high quality ground-based continuous observational programs for methane and other GHGs at 6 remote sites in Canada. Expansion of the Insitu program to 3 additional sites as part of the Canadian Carbon Program will occur in 2007. All measurement programs follow the strict measurement guidelines imposed by the World Meteorological Organization's Global Atmospheric Watch Program. This presentation will focus on estimating Canada's natural and anthropogenic emissions from an inversion study for 2004 using methane data records from NOAA's global flask and EC's continuous measurement networks along with gridded source patterns from EDGAR, the TM5-4DVAR atmospheric transport model and analyzed wind fields (ECMWF). Preliminary results indicate that the total anthropogenic methane source for Canada is ~20% higher than that reported from bottom-up inventory estimates, wetland regions in Canada released a magnitude similar in size to the anthropogenic CH₄ release and that emissions from fossil fuel production in Alberta and British Columbia are likely underestimated. This presentation will also include a brief overview of the Canadian measurement program and future directions.

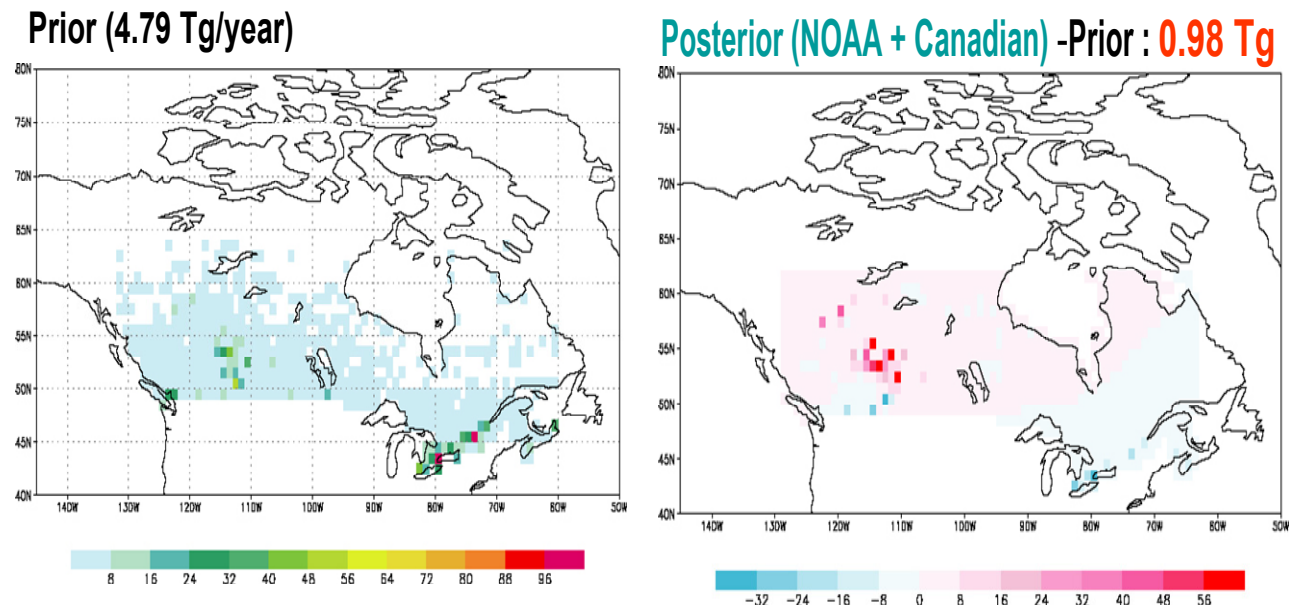


Figure 1. Gridded prior distribution and magnitude of Canada's anthropogenic (fossil fuels, ruminants and waste) emissions along with the change (posterior) after the inversion run. The adjustment to gridded priors shows that Canada's emissions are slightly overestimated in the East and underestimated by a factor of 2 in the West. We're speculating that methane emissions, primarily from open-pit mines are underestimated in Alberta and British Columbia.