Modeling assessment of transport and deposition patterns of anthropogenic mercury air emissions in the United States and Canada.

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In December 1997, the U.S. Environmental Protection Agency submitted its mercury study report to Congress, which included a modeling assessment of the long-range transport and deposition of mercury from various residential and industrial sources within the United States, based on numerical simulations of elemental mercury gas, divalent mercury gas and particulate mercury, using a special version of the Regional Lagrangian Model of Air Pollution (RELMAP). Observations of the deposition of total precipitated mercury at several locations within the U.S. were compared to the modeling results in order to evaluate the accuracy of the RELMAP simulations. However, the lack of Canadian mercury emissions data in the RELMAP modeling limited the usefulness of this model evaluation at locations near the Canadian border. An inventory of Canadian mercury emissions obtained from Environment Canada has now been added to the RELMAP mercury modeling, and the previous simulations and evaluation of modeled wet deposition have been repeated. The results indicate that emissions of mercury from Canada, as represented by the new inventory, do not significantly impact simulated wet deposition over the United States, nor the general results of the previous model evaluation. Analyses of the simulated transport and deposition patterns of mercury emissions from both the United States and Canada are presented, along with the simulated fraction of total mercury wet deposition, separately attributable to sources within each nation.

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