

To: Gina McCarthy, Assistant Administrator for Air and Radiation, U.S. Environmental Protection Agency
From: Noelle E. Selin, Massachusetts Institute of Technology
Re: Mercury in the U.S. Environment
Date: September, 2011

Recent modeling work in my group at the Massachusetts Institute of Technology has provided important information about the source of mercury deposition to U.S. ecosystems. Mercury is a toxic pollutant. Human exposure to mercury, which can accumulate in fish as methylmercury, can cause developmental delays and neurological damage, especially in the offspring of women exposed to methylmercury during pregnancy.

We used a global atmospheric model, GEOS-Chem, to simulate how much U.S. deposition comes from domestic sources. The model is a global-scale simulation of the emissions, chemical reactions, and transport of mercury in the environment. Information on emissions is drawn from the latest U.S. EPA and United Nations Environment Programme inventories. Model results have been published in the peer-reviewed literature, and the model was used in the development of the 2008 Clean Air Mercury Rule and the 2008 United Nations Global Atmospheric Mercury Assessment.

We conducted two model simulations: one with all sources, and one with all domestic sources removed. By calculating the difference in mercury deposition between these two simulations, we can then identify the percent of U.S. mercury deposition that comes from domestic sources. We present this result in Figure 1. We conclude from this analysis that in order to cut mercury deposition in all areas of the U.S., both domestic and international controls are required. Up to 60% of deposition in the Northeast U.S. comes from domestic sources (such as coal-fired power plants). This means that reducing mercury deposition in the Northeast U.S. will require domestic action. However, on average, 80% of deposition across the U.S. comes from sources outside our borders. Thus, reducing deposition nationwide will depend on international action.

I urge you to take these results in consideration during your review of the upcoming Mercury and Air Toxics Standards (scheduled to be issued in November), as well as the ongoing negotiations for a global mercury treaty under the United Nations Environment Programme, which will next meet in Nairobi in October.

% Deposition from North American Sources

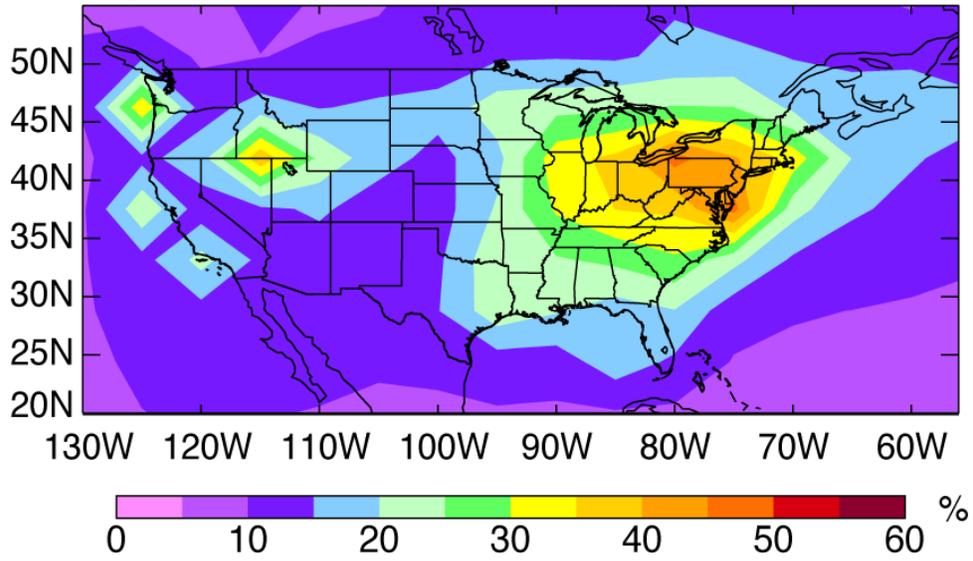


Figure 1. Percent of mercury deposition to the U.S. from domestic sources, from the GEOS-Chem model.

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