

S08-01 Modeling Mercury and Methylmercury Distribution in the Global Oceans

Elsie M. Sunderland¹, Robert P. Mason², David P. Krabbenhoft³, Daniel J. Jacob¹

1. Harvard University, School of Engineering and Applied Sciences, Cambridge MA USA

2. University of Connecticut, Department of Marine Sciences, Groton CT USA

3. United States Geological Survey, Middleton, WI USA

E-mail: ems@seas.harvard.edu

Marine fish are a major contributor to human methylmercury (MeHg) exposure. Understanding the relationship between changes in inorganic mercury (Hg) deposition and MeHg formation and distribution in seawater is needed to characterize availability to marine food webs. We present progress made in the development of a mechanistic simulation of Hg speciation and distribution across different ocean basins within the GEOS-Chem global biogeochemical modeling framework for Hg. As part of this work, we present mass budgets for methylated Hg species in different ocean regions. Because empirical data on methylated Hg concentrations in ocean are limited, we use an empirical relationship between methylated Hg concentrations and water column organic carbon remineralization rates derived from samples collected in the North Pacific to estimate the distribution of methylated Hg in other regions. We compare our results with previous global budgets and discuss implications for Hg concentration in pelagic marine fish harvested from different regions.

Keywords: Mercury; Methylmercury; Oceans; GEOS-Chem; Model