Control ID: 40557
Final ID:
Submitted On: June 6th 2017 7:21:49 AM
SESSION TRACK: Integrated Environmental Assessment and Management
REQUESTED SESSION: Integrated Understanding of Biogeochemical Cycling of Mercury around Ocean Environmen... [Noriyuki Suzuki]
REVIEWER COMMENTS:
Noriyuki Suzuki: [No Comments]
Kohji Marumoto: [No Comments]
REVIEWER RECOMMENDATIONS:
Noriyuki Suzuki: [No Recommendation]
Kohji Marumoto: [No Recommendation]
REQUESTED PRESENTATION TYPE: Platform
Student Presentation Award:
TITLE: Mercury sources and budgets in the upper ocean: Results from the global multimedia model FATE-Hg
AUTHORS/INSTITUTIONS: Toru Kawai, Takeo Sakurai, Noriyuki Suzuki, National Institute for Environmental Studies / Center for Health and Environmental Risk Research
PRESENTER (E-MAIL ONLY): kawai.toru@nies.go.jp
AGREE TO BE RECORDED: TRUE
ABSTRACT BODY: To evaluate the effectiveness of international efforts to reduce anthropogenic emissions, it is important to understand the changes in mercury concentrations in a region that result from emission reductions in a foreign source region. A new global multimedia model, the Finely-Advanced Transboundary Environmental model for mercury (FATE-Hg), was developed and applied to estimate mercury sources and budgets in the global oceans. The principal characteristic of this model is that it is based on a coupled atmosphere-ocean transport model, and calculates 3D non-steady physical transport in both the atmosphere and the ocean. Additionally, it considers methylated mercury production in the water column followed by biotransfer from lower (i.e., particle organic matter) to higher (i.e., fish) order marine consumers. We defined eight continental source regions and 19 ocean receptor areas (FAO major fishing areas), and estimated the source-receptor (S-R) relationships using the emission sensitivity method. From the results of S-R analyses, East Asia was the dominant source region in the Northern Hemisphere, with the exception of the Mediterranean and with a maximum contribution of 55% in the Northwest Pacific. Conversely, in the Southern Hemisphere, contributions from Australia and Oceania, South America, and Africa generally dominated. Sources of mercury in higher order marine consumers (e.g., tuna, bonito, and billfish) caught in several different countries were estimated using the results of S-R analyses and FAO global fishery statistical data. The results provide useful information on how to reduce mercury exposure in people in the countries analyzed.
KEYWORDS: Multimedia