Geophysical Research Abstracts
Vol. 20, EGU2018-12913, 2018
EGU General Assembly 2018

Factors controlling distribution of methylmercury in temperate reservoirs ecosystem in South Korea

Seam Noh (1), Young-hee Kim (1), Hyuk Kim (1), Seok-min Yu (1), Kwang-su Park (1), Kwang-seol Seok (1), and Seunghee Han (2)

(1) National Institute of Environmental Research, Chemicals Research Division, Republic of Korea, (2) Gwangju Institute of Science and Technology, School of Environmental Science and Engineering, Republic of Korea

The methylmercury (MeHg) concentrations in water and fish, water quality parameters (e.g., pH, suspended particles, total phosphorus, sulfate, and chlorophyll-a), and compositions of dissolved organic matter (DOM) were analyzed to understand the main processes responsible for MeHg distribution and bioaccumulation in 14 temperate reservoirs in South Korea. Multiple tools, including Pearson correlation, a self-organizing map, principal component analysis, empirical equations, and parallel factor analysis of excitation-emission matrix fluorescence spectroscopy, were applied in the statistical modeling of MeHg. The results showed that algal biomass was a key predictor of the distribution of MeHg in water. The creation of sub-oxic conditions and the supply of sulfate subsequent to the algal decomposition seemed to support enhanced MeHg in the bloom reservoirs. Furthermore, MeHg concentration in reservoir water showed strong positive correlation with autochthonous DOM production, which in turn depends on the amount of algal production. On the contrary, MeHg accumulation in fish showed a negative correlation with the amount of algal biomass than MeHg in water that may be a result of particle dilution of MeHg in surface waters. This study revealed that algal bloom can increase MeHg in water, but decrease MeHg in fish at the same time. We suggest that the algal biomass is a key predictor of the variance of MeHg in reservoirs ecosystem in South Korea.