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Looking at Hg air-sea exchange from the marine side: A global model study.

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With 3000 to 4000 tons per year, the net evasion of Hg from the global ocean is a larger Hg source to the atmosphere than current primary anthropogenic emissions (2000 to 3000 t/a). As a result of the Minamata Convention, the anthropogenic Hg emissions will continue to decrease. Thus, the Mercury flux from air-sea exchange will become even more dominant role in the global Hg cycle in the forseeable future.

A better understanding of the ocean as a buffer for atmospheric Hg concentrations is therefore necessary to predict the immediate and long term impact of emission reductions on global Hg cycling and ultimately bio-accumulation under the Effectiveness evaluation of the Minamata Convention.

We present a global model study on Hg air-sea exchange based on the global unstructured grid ocean model ICON-O coupled to the marine Hg chemistry model MERCY. We investigate the sensitivity to air-sea exchange parametrizations and evaluate the limitations of Hg exchange under high wind conditions from the marine side. Eventually, we force the model with different atmospheric conditions to study the impact of a realistic high resolution marine model on global Hg cycling.