



## Arctic source for elevated atmospheric mercury (Hg<sup>0</sup>) in the western Bering Sea in the summer of 2013.

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Abstract: Measurements of gaseous elemental mercury (Hg<sup>0</sup>) in the marine boundary layer of the western Bering Sea were performed using an automatic mercury analyzer RA 915+ (Ltd. "Lumex", St. Petersburg, Russia) aboard the Russian research vessel Academician M.A. Lavrentev from 3 to 20 August 2013. Hg<sup>0</sup> concentrations varied from 0.3 to 2.1ng/m<sup>3</sup> (n=4783); the average value (1.1±0.3ng/m<sup>3</sup>) was lower than both the background range of the Northern Hemisphere (1.5-1.7ng/m<sup>3</sup>) and average values previously observed in the Bering Sea, and corresponded to the background concentrations of the Southern Hemisphere (1.1-1.3ng/m<sup>3</sup>). Maximum Hg<sup>0</sup> concentrations were observed within air masses that came from the lower troposphere of the central Arctic. Under these conditions, Hg<sup>0</sup> ranged between 1.1 and 2.1ng/m<sup>3</sup> with an average of 1.5±0.2ng/m<sup>3</sup> (n=1183). Except for these periods, Hg<sup>0</sup> concentrations during the rest of the study varied from 0.3 to 1.8ng/m<sup>3</sup>, with an average value of 1.0±0.2ng/m<sup>3</sup> (n=3600). Our results support the hypothesis that, in the summer, air masses from the central Arctic Ocean can be an exporter of mercury to lower latitudes. Perhaps the atmospheric transport of elevated concentrations of Hg<sup>0</sup> into lower latitudes may have implications for the biologic and economic health of important fisheries, such as the Bering Sea.

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