



## **GMOS Project: Long-term Air Mercury Monitoring at Listvyanka Station, Siberia**

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The GMOS (Global Mercury Observation System) project has the overall goal to develop a coordinated observing system to monitor mercury on a global scale to assess its emissions to atmosphere, transport, atmospheric chemistry, and deposition processes. To date, more than 40 ground-based stations constitute the monitoring network covering many regions where little to no observational data were available before GMOS. One of such new points has been founded on the base of the Listvyanka monitoring station located at a shore of Lake Baikal, Siberia, far away from the existing mercury monitoring sites in Asia. Long-term air mercury monitoring started in October 2011. The station is part of the EANET network whereby numerous parameters of the air pollution, wet and dry deposition, as well as condition of the terrestrial and aquatic environment are measured. Lumex RA-915AM mercury monitor is used for the continuous air mercury monitoring in compliance with the unified GMOS standard operational procedures.

The long-term monitoring shows trend to decreasing of average annual Hg concentration through 6-years of observation and obvious seasonal variation of the background gaseous elemental mercury (GEM) concentration in air, which increases in the cold season (November – February) with average of 1.48 ng/m<sup>3</sup> and decreases in the warm season (June – September) with average of 1.22 ng/m<sup>3</sup>. The same character of the seasonal variation is observed for particulate bound mercury (PBM) having average concentration of 15 and 7.8 pg/m<sup>3</sup> correspondingly. Data processing reveals a moderate, statistically significant, diurnal cycle of the mercury concentration both in the warm and cold seasons with a lower level at night and higher level at daytime.

Local short-term mercury concentration rises are associated mainly with the wind carrying air from industrial areas of Irkutsk and Angarsk cities where several big coal-fired power plants are located. These power plants are the main sources of the elevated acid gases and mercury concentrations in air measured at the Listvyanka site. A positive correlation between mercury, SO<sub>2</sub> and NO<sub>x</sub> concentrations is observed both in the short-term variations and in the monthly average concentrations, whereas correlation between the mercury and ozone concentrations is negative due to the O<sub>3</sub> depletion in the power plant's plume.

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