

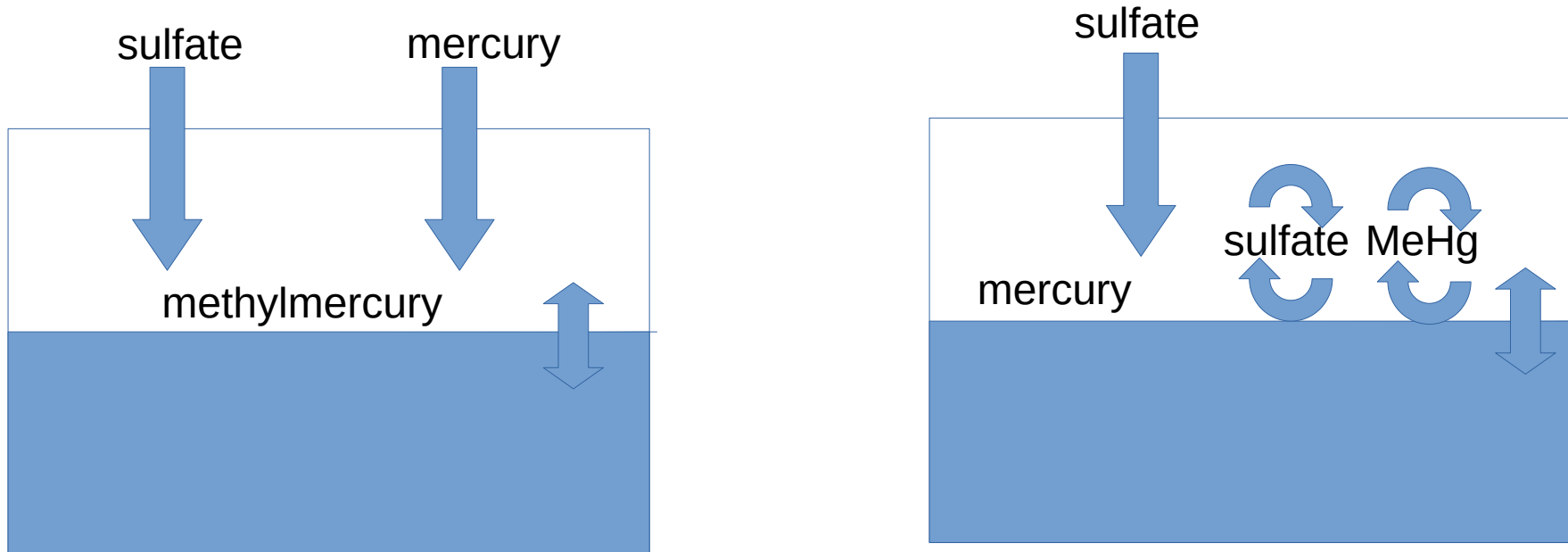
The source of Hg for MeHg production is mis-identified.

Hg in precipitation is not the largest source of Hg to watersheds.

- Atmospheric gaseous Hg assimilation by vegetation is the dominant source to watersheds by a dramatic margin (Obrist et al., 2017 and others).
- Hg deposited to watersheds in rain is not conveyed directly to streams.
- The only Hg in precipitation that is delivered to surface water directly is that which falls directly on lakes and streams. The rest is incorporated into soils and is slowly released to soil water, groundwater and runoff (Hintelmann et al., 2002).
- This **Hg is incorporated into soils** as organic matter. The large pool of legacy Hg is the main source of Hg to streams.
- An emphasis on precipitation draws our attention away from the indirect effects of project impacts like water table drawdown over 1000s of ac of wetland soils.

The supply of the “ingredients” required for MeHg production is mis-characterized.

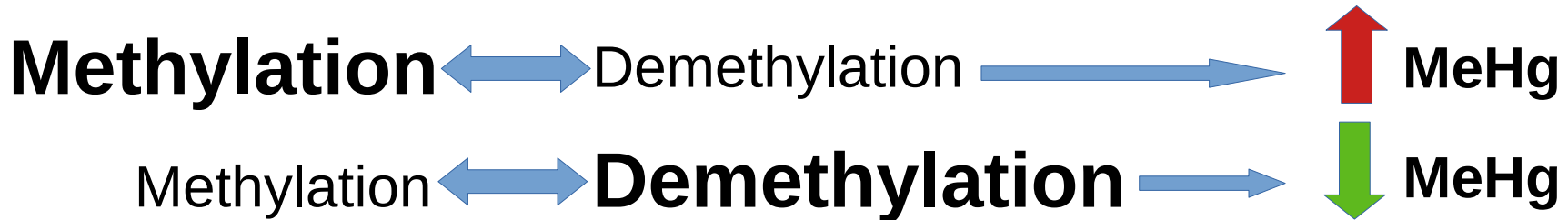
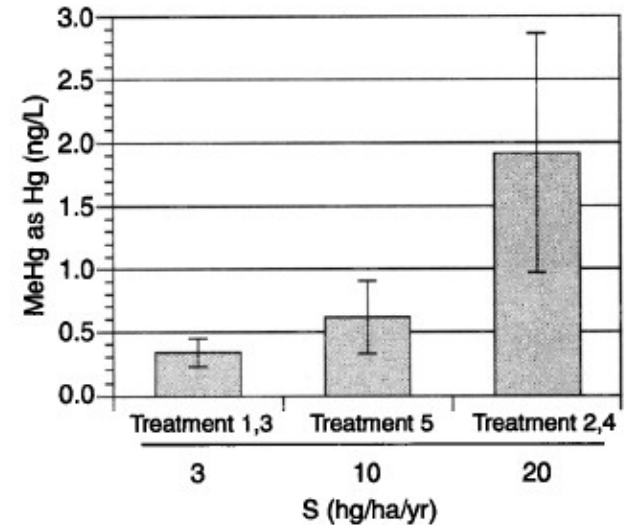
Methylation in wetland soils is largely the conversion of in-place mercury to methylmercury in the presence of organic matter and additional sulfate.



Demethylation is not a process that will offset increases in methylation.

Concentrations of methylmercury **are the result of** the balance of methylation and demethylation process.

- Methylation and demethylation are competitive **processes** that have rates, that result in a **net** concentration of MeHg.
- All experimental data that was presented yesterday are concentrations of MeHg, that account for both processes.
- Demethylation is not a compensatory process that can ultimately be argued as a mechanism for MeHg removal.
- If methylation is favoured (like when sulfate is added, then MeHg concentrations increase).



Demethylation is not a process that will offset increases in methylation.

Methylmercury Declines in a Boreal Peatland When Experimental Sulfate Deposition Decreases

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“The finding that most of the MeHg lost ... was likely due to in situ demethylation rather than export from the system implies that the majority of the MeHg produced in response to elevated sulfate deposition may not be transported to downstream aquatic systems.”

From submission by Council and Simpson, May 2, 2022 and presentation.

The finding that most of the MeHg lost **from the recovery treatment** was likely due to in situ demethylation rather than export from the system implies that the majority of the MeHg produced in response to elevated sulfate deposition may not be transported to downstream aquatic systems. This is supported by the finding that peat and porewater MeHg increased by $\sim 4\times$ in response to a $4\times$ increase in sulfate deposition but **MeHg flux from the wetland in the first year of this study only increased by $2\times$.**

1) The location and processes associated with MeHg formation in peats was mis-represented

1) The pool of

- The accumulation of gaseous Hg to vegetation is the dominant source by a dramatic margin (Obrist et al., 2017 and others).
- This Hg is incorporated into soils as organic matter. The large pool of legacy Hg is the source of Hg to streams. It is not the annual deposition of Hg in precipitation.
- The only Hg in rain that is directly transported by surface waters is that which falls directly on river and lake surfaces. Prorating Hg in precipitation over entire watershed areas, assuming direct conveyance to streams, and comparing to project capture is a