Science to Inform Implementation of the Minamata Convention: Altered Landscapes

Understanding the complexity of mercury cycling at a local level can guide international and regional efforts to manage and monitor human exposure to mercury and methylmercury (a more toxic form of mercury). For example, local changes in land management practices can change the amount of mercury and the fraction of mercury present as methylmercury in individual ecosystems. Landscape disturbances such as forestry, mining, and reservoir creation can alter mercury flows through ecosystems, and change the potential for methylmercury formation (see Figure).

What does the latest science say about the role of landscape alterations on mercury cycling?

- The fraction of mercury present as methylmercury in a given ecosystem can vary dramatically.
- This variation is affected by the abundance and activity of organisms that convert mercury to methylmercury, how much mercury these organisms have access to, and how fast methylmercury degrades.
- Changes to ecosystems can influence methylmercury production.
- Understanding how mercury moves through the environment can help managers target strategies that can reduce methylmercury.

How can land management influence methylmercury in biota?

**Land use changes that can lead to impacts on Hg such as...**

- Increasing impervious land surface cover, reducing mercury retention and increasing runoff
  - Using best practices in stormwater management

- Increased stream discharge from logging and fluxes of mercury to downstream water bodies
  - Implementing logging practices to reduce erosion and soil disturbance

- Increasing mercury levels in soils, water, and air from ASGM activities
  - Managing mining concessions

- Long-term mercury contamination from multiple sources, which creates variations in methylation potential
  - Monitored natural attenuation, dredging and excavation, *in situ* caps and chemical amendments

- Flooding of carbon-rich soils in newly formed reservoirs, which increases methylmercury production and bioaccumulation
  - Site selection and preparation, water level control, and/or water column aeration and destratification

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