**S1** **Protocol.** **Details on protocol for mercury and selenium analyses and references for supplementary information section.**

1. **Water sample collection**

Ultra clean protocols for trace metals [1] were employed to collect water. In each reservoir, water was collected on one occasion at the near shore station (littoral zone) and open water station (pelagic zone) at 0.5 m from the sediment surface where THg and MeHg concentrations were potentially higher [2]. Water was collected with a peristaltic pump and acid-washed Teflon tubing. Triplicates of filtered and unfiltered water samples for THg and MeHg were collected and stored in 125 mL amber glass bottles that had been pre-washed with acid and thoroughly rinsed with ultrapure water (Milli-Q: > 18 Mohm cm-1) and placed in double ziplock bags for transport to the field. Filtration was done onboard using a Whatman syringe filter of 0.45 µm pore size. All bottles were rinsed three times with dam water prior to water collection. All aqueous mercury samples were preserved at pH 2 with ultra high purity hydrochloric acid (VWR) (0.5%, v/v) and kept in a field cooler and refrigerated (+ 4 °C) upon return to laboratory until analysis. Samples for ancillary chemical analyses were also collected at the same depth. Filtered water was collected in two separate 30 mL Nalgene HDPE bottles. One was acidified using hydrochloric acid (0.5%, v/v) for major cations [potassium (K+), calcium (Ca2+), sodium (Na+) and magnesium (Mg2+)], the second was left unacidified for analysis of anions [chloride (Cl-), nitrite-nitrate (NO3-), sulphate (SO42-)]. For dissolved organic carbon (DOC) analyses, water samples were filtered on 0.45 µm Whatman filters and collected in glass bottles (pre-heated at 550 °C during 1h). Filtered water samples for selenium analysis were collected in 30 mL Nalgene HDPE bottle samples and preserved with 1% v/v EDTA [3].

1. **Water analyses**
	1. **THg analysis**

THg analysis in water samples (filtered and unfiltered) was performed by cold vapor atomic fluorescence spectrometer (CVAFS, Tekran 2600, Tekran Instruments Corporation, Knoxville, TN, USA) following U.S. Environmental Protection Agency (U.S. EPA) method 1631. Briefly, 50 mL of sample was digested with 200 µL of BrCl, and excess of BrCl was neutralized with 50 *μ*L of hydroxylamine. Samples were then reduced with stannous chloride (SnCl2,3% w/v) prior to analysis. The detection limit for this analysis was 0.13 ng THg/L and the mean relative recovery was 104 ± 5 % (n=5). The coefficient of variation (standard deviation/mean) for field triplicate determinations was 2%.

* 1. **Methylmercury analysis.**

Water samples (50 mL) for MeHg were acid-distilled to remove matrix interferences, then derivatized by aqueous-phase ethylation with NaB(C2H5)4, purged on Tenax (Tenax Corporation, Baltimore, MD, USA), separated by gas chromatography and quantified with a Tekran 2500 CVAFS (Tekran Instruments Corporation) based on the method of Bloom [4]. Field and procedural blanks contained less than 1 ± 1 pg MeHg and revealed no contamination during sampling, filtration, distillation, and analysis. Analytical accuracy was checked by analysis of TORT-2 (S2 Table)

* 1. **Selenium analysis**

Selenium determination protocol is the same as in Ouédraogo and Amyot [5]. Prior to total selenium analysis in water samples, 4 mL of water samples were digested in acid mixture of HCl (4 mL) and HNO3 (0.48 mL) to allow the reduction of Se (VI) to Se (IV). NaBH4 (1.1 % m/v in 0.1M NaOH v/v) was added to the digested samples to producehydrides and the levels of TSe were determined by Hydride Generation Atomic Fluorescence Spectrometry (HG-AFS, PSA 10.055, Millenium Excalibur; PS Analytical, Orpington, Kent, UK). For TSe determination in solid samples (fish, zooplankton, gastropods and bivalves), 20 to 50 mg of solid tissues were submitted to microwave digestion with a mixture of HNO3 and H2O2 based on a method developed by Corns et al. [6] in order to extract elements from solid matrix. An aliquot was then taken and underwent the same steps as for aqueous samples.

The analytical quality was controlled by using certified reference materials DORM-3 and TORT-2 from the National Research Council of Canada (S2 Table). Efficacy of Se (VI) conversion to Se (IV) was checked by using a solution of Se (VI) which was analyzed together with the samples. Procedural blanks were 21 ± 8 ng.L-1 (n=8). The method detection limit (MDL) was 22 ng L-1(aqueous Se) and 0.022 µg/g dry weight (d.w.) for solid samples. Se (VI) (200 ng.L-1) conversion to Se (IV) averaged 109 % ± 9.

* 1. **Other physico-chemical analyses**

Anions (Cl-, SO42-, NO3-) were analysed by ion chromatography using a DIONEX-DX500 (MDLs: 1 µmol L-1 for the three ions). Cations (Ca2+, Mg2+, K+ and Na+) were analysed by atomic absorption spectrometry with MDLs of 0.5, 0.1, 0.5 and 0.5 µmol L-1, respectively.

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