

Saturday, June 15th Session 1B (15-1B)

Oral introduction: 13:20-14:30, Poster viewing: 14:30-15:30 Chair: SEI Kazunari
15-1B-13

Application of diffusive gradient in thin films (DGT) and a chemical equilibrium model for assessing bioavailability levels of trace metal in effluent-affected rivers

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Toxicity of metals to aquatic organisms depends on their bioavailability. In this study, some rivers affected by effluents from waste water treatment plants (WWTPs) and metal industries were chosen as sampling area, and diffusive gradients in thin films (DGT) method combined with model prediction using WHAM 7.0 were deployed to assess bioavailable levels of some metals (Ni, Cu, Zn, and Pb). At most sites downstream of a WWTP, bioavailable concentrations measured by DGT (or estimated by WHAM 7.0) of metals increased. As for rivers affected by metal industry effluent, bioavailable metals measured by DGT (or estimated by WHAM 7.0) were higher than that in rivers affected by the WWTP effluent. This may be due to the lower ratios of metal/DOC in the rivers impacted by the WWTP effluent than those impacted by metal industry effluent. The fractions of DGT-labile metals in dissolved concentrations were also lower in WWTP impacted rivers. The obtained results showed that DGT measurement (or WHAM 7.0 estimation) has a good potential for estimating bioavailability and water quality in effluent-impacted rivers.