

A preliminary study of a DGT-labile trace metals distribution in the stratified Krka River estuary (Croatia)

Ana-Marija Blatarić¹, Cédric Garnier², Dario Omanović¹, Véronique Lenoble², Neven Cukrov¹, Stéphane Mounier², Jean-Louis Gonzalez³, and Ivanka Pižeta¹

¹ Ruđer Bošković Institute, Center for Marine and Environmental Research, PO Box 180, 10002 Zagreb, Croatia, ablatar@irb.hr

² Laboratoire PROTEE, Université du Sud Toulon – Var, BP 20132, 83957 La Garde, France

³ IFREMER, Département Biogéochimie et Ecotoxicologie, B.P.330 Zone Portuaire de Brégaillon, 83507 La Seyne/mer cedex, France

A preliminary study of the determination of DGT-labile trace metals in Šibenik bay in the well stratified Krka River estuary (Croatia) has been performed. Six depths (down to 8 m) were selected according to previously measured salinity gradient (Fig. 1). Three to five days deployment period of diffusive DGT devices was undertaken. At each depth, three DGT replicates were used and additional three devices were used for blank estimation. Salinity, temperature and pH vertical gradients at the deployment site were regularly recorded in average every 4 hours. Each day, grab samples were taken by scuba diving in order to determine total dissolved and ASV-labile metals. Metals accumulated in DGT complexing resin were measured by ICP-MS, while differential pulse anodic stripping voltammetry (DPASV) was used for determination of ASV-labile and total dissolved metal concentrations in water samples.

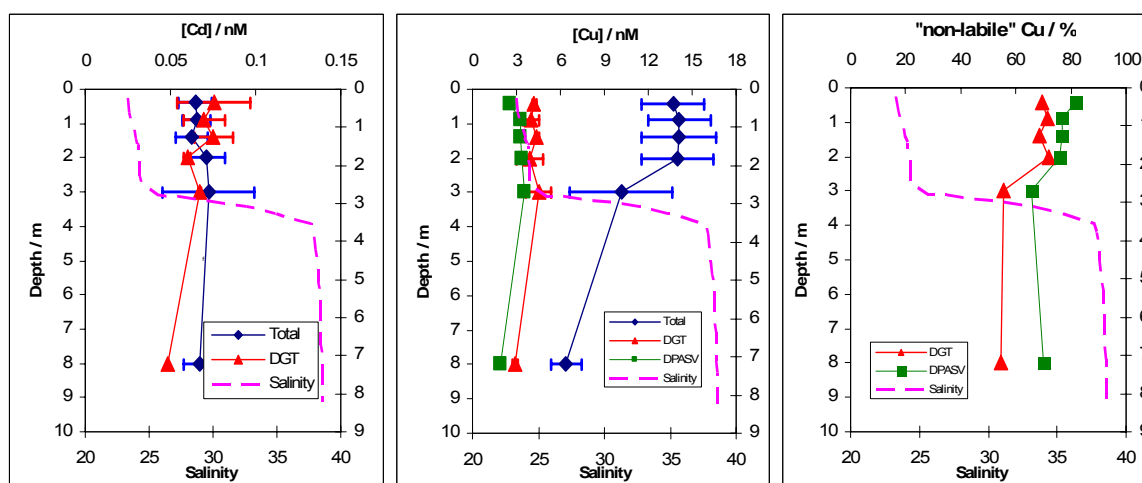


Fig 1. Vertical distribution of DGT-labile and total dissolved concentrations of cadmium and copper, and percentage of DGT and ASV non-labile copper (2008 field study).

Vertical profiles for measured DGT-labile metals (As, Cd, Co, Ni, Cu) showed relatively small variability with depth, indicating uniform distribution of DGT-labile metal species. However, an evident decrease of percentage of non-labile copper complexes in seawater layer was registered, consistent with the results obtained by anodic stripping voltammetry, even though absolute concentrations measured with both techniques were slightly different (Fig. 1). This result suggests an existence of ligands forming stronger copper complexes in brackish layer.

Preliminary data obtained in 2008 field-study will be supplemented by new set of data from summer 2009, on which more detailed discussion about depth/salinity profile variability will be based.