

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN CROATIA
MAY 2014 – JUNE 2015

The Croatian GEOTRACES activities were related to: 1) improvement of electrochemical methods, which in combination with ICPMS, are used for trace metals speciation (including interaction with organic matter and sulfur species), determination and quantification (mostly Zn, Cd, Pb, Cu, Fe, Ni, Co); 2) development of an automated system for determination of trace metals in natural waters (Voltammetric AutoAnalyser - Volt-AA) and solid (gold wire) micro sensors for on-site and in-situ metal analysis in seawater, 3) assessment of metal bioavailability in aquatic environment using passive samplers for metals (DGT) and cytosolic metal levels in tissues of aquatic organisms, 4) development of electroanalytical methods (amperometry) for chalcogenide nanoparticles determination in natural waters, 5) characterization of marine aerosols regarding presence of organic matter, sulfur species and trace metals.

Meetings

Organization of the open workshop and symposium within SCOR 139 working group ‘Organic Ligands – A Key Control on Trace Metal Biogeochemistry in the Ocean’ in Sibenik, Croatia, April 2015.

Active participation in the COST Actions ES1205, ES1302 and TD1105, and SCOR WG 139 and 145.

Selected Publications

- Pižeta, Ivanka; Sander, Sylvia; Hudson, Robert; Omanović, Dario; Baars, Oliver; Barbeau, Katherine; Buck, Kristen; Bundy, Randelle; Carrasco, Gonzalo; Croot, Peter; Garnier, Cédric; Gerringa, Loes; Gledhill, Martha; Hirose, Katsumi; Kondo, Yoshiko; Laglera, Luis; Nuester, Jochen; Rijkenberg, Micha; Takeda, Shigenobu; Twining, Benjamin; Wells, Mona. Interpretation of complexometric titration data: An intercomparison of methods for estimating models of trace metal complexation by natural organic ligands. // *Marine chemistry*. 173 (2015) 3-24.
- Omanović, Dario; Garnier, Cédric; Pižeta, Ivanka. ProMCC: an all-in-one tool for trace metal complexation studies. *Marine chemistry*. 173 (2015) 25-39.
- Bura-Nakić E, Marguš M, Jurašin D, Milanović I, Ciglencecki I, (2015) Chronoamperometric study of elemental sulfur (S) nanoparticles (NPs) in NaCl water solution: new methodology for S NPs sizing and detection, *Geochem.Transaction*. 16:1, DOI: 10.1186/s12932-015-0016-2.
- E. Bura-Nakić, M. Marguš, I. Milanović, D. Jurašin, I. Ciglencecki. The development of electrochemical methods for determining nanoparticles in the environment. Part II: Chronoamperometric study of FeS in sodium chloride solutions, *Environ. Chem*. 11 (2014) 187
- M. Marguš, N. Batina, I. Ciglencecki, The development of electrochemical methods for determining nanoparticles in the environment. Part I: Voltammetry and in-situ ES-STM study of FeS in sodium chloride solutions. *Environ. Chem*. 11 (2014) 181.
- I. Milanović, D. Krznarić, E. Bura-Nakić, I. Ciglencecki, Deposition and dissolution of metal sulfide layers at a Hg electrode surface in seawater electrolyte conditions. *Environ. Chem*. 11 (2014) 167.
- Strmečki, Slađana; Dautović, Jelena; Plavšić, Marta. Constant current chronopotentiometric stripping characterization of organic matter in seawater from the northern Adriatic, Croatia. // *Environmental chemistry*. 11 (2014), 2; 158-166.

- Vukosav, Petra; Mlakar, Marina. Speciation of biochemically important iron complexes with amino acids: L-aspartic acid and L- aspartic acid - glycine mixture. // *Electrochimica acta*. 139(2014) , 1; 29-35 (članak, znanstveni).
- Vukosav, Petra; Mlakar, Marina; Cukrov, Neven; Kwokal, Željko; Pižeta, Ivanka; Pavlus, Natalija; Špoljarić, Ivanka; Vurnek, Maja; Brozinčević, Andrijana; Omanović, Dario. Heavy metal contents in water, sediment and fish in a karst aquatic ecosystem of the Plitvice Lakes National Park (Croatia). *Environmental science and pollution research international*. 21 (2014) , 5; 3826-3839 (članak, znanstveni).
- Dautović, Jelena; Fiket, Željka; Barešić, Jadranka; Ahel, Marijan; Mikac, Nevenka. Sources, distribution and behavior of major and trace elements in a complex karst lake system. *Aquatic geochemistry*. 20 (2014) , 1; 19-38 (članak, znanstveni).

New equipment

- Automated Low-Volume Aerosol Sampling Device, SEQ 47/50-CD-RN (150 000,00 Kn) bought in the frame of HRZZ project 1205 „The Sulphur and Carbon dynamics in the Sea- and Fresh-water EnviRonmEnt“
- Cell culture climate chamber bought in the frame of HRZZ project 8607 “Appearance and interaction of biologically important organic molecules and micronutrient metals in marine ecosystem under environmental stress”

New projects supported by the Croatian Ministry of Science, Education and Sport and Croatian Science Foundation (CSF)

- 2014-2018 CSF project: “Appearance and interaction of biologically important organic molecules and micronutrient metals in marine ecosystem under environmental stress”
- 2014-2018 CSF project: „The Sulphur and Carbon dynamics in the Sea- and Fresh-water EnviRonment“
- 2014-2018 CSF project: „Transport and Chemodynamics of Trace Elements in Freshwater and Coastal Sedimentary Systems,“
- NEWFELLPRO project 2014-2017 “Using lakes to develop isotopic tools for understanding ocean redox through Earth history”

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