

Preface

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1 The Piran symposium

With its natural beauty, points of historical and cultural interest, and its advantageous geographical location in the Gulf of Trieste (northern Adriatic Sea), Piran (Slovenia) was an ideal location for the 22nd International Symposium on Environmental Biogeochemistry (ISEB). The Gulf of Trieste and the northern Adriatic Sea in general has been the subject of intensive marine biogeochemical investigations over the last 50 years making it a scientifically relevant site for an ISEB meeting. For more than 30 years, the ISEB has been devoted to the development of scientific knowledge, application, and training in the broader field of environmental biogeochemistry. Since the first symposium in Logan, Utah, USA, in 1973 (Ehrlich 2004), the ISEB has always strived to bring together scientists from a range of disciplines with interests and this 22nd Symposium “*Dynamics of Biogeochemical Systems: Processes and Modeling*” explored issues relating to biogeochemistry in various fields including soil science, microbial ecology and marine, and lacustrine and atmospheric research. The sessions were organized around nine themes which integrated the following topics:

1. The marine and coastal environment
2. Surface and groundwater systems
3. Soils

4. Climate change
5. Microbial biogeochemistry
6. Nanoparticles and colloids
7. Isotopes in biogeochemical processes
8. Biogeochemistry of pollutants
9. Archaeological biogeochemistry.

Research on marine, coastal and freshwater sediments was important occurring themes in this symposium. The programme included two special sessions: GMOS and GEOTRACES (marine and coastal environments); and GLOBAQUA (surface and groundwater systems). In addition, the SOIL session was devoted to the International Year of Soils (IYS), and the main purpose of which is to raise global awareness of the importance of soils for food security and agriculture, as well as in mitigating climate change, alleviating poverty, and to promote sustainable development. The 2015 I.E. Symposium brought together 120 scientists from a large number of disciplinary backgrounds from 23 countries from around the world. Six key sessions were planned to link symposium themes starting with the following. invited speakers: (i) N. Pirrone, CNR—Institute for Atmospheric Pollution, Rome, “Understanding the global patterns of the mercury cycle and its importance in supporting the Minamata convention”; (ii) G. Henderson, University of Oxford, “The GEOTRACES programme: quantifying the cycles of trace elements in the global ocean”; (iii) G.J. Herndl, University of Vienna, “Dissolved organic matter and microbes in coastal seas: current knowledge and future challenges”; (iv) T. Barkay, Rutgers University, New Jersey, “Mercury stable isotope fractionation during microbial transformations of mercury: can they add to knowledge on the role of microbes in mercury biogeochemistry”; (v) D. Barcelo, Catalan Institute for Water Research (ICRA), “Fate, effects and management of emerging contaminants and risks in river catchment under

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Fig. 1 The 2015 ISEB Symposium participants in the Škocjanske Caves, Slovenia

water scarcity: the GLOBAQUA project”; and (vi) J.D. van Elsas, University of Groningen, “Biogeochemical drivers of microbial succession in a soil chronosequences”. In total, 54 oral and 54 poster presentations were delivered over the 4 days. Besides an intensive scientific programme, the Organizing Committee organized a packed 5-day schedule with excursions and social activities for participants and accompanying guests including the visits to Sečovlje Salinas, Lipica, Škocjan Caves (Fig. 1), Hrastovlje, and the Marine Biological Station NIB in Piran.

2 ISEB and the journal of soils and sediments

Major topics addressed by the 22nd ISEB Symposium, including the geomicrobiology and geochemistry of soils and sediments in freshwaters and marine systems, are also the subject of the proposed special issue of the Journal of Soils and Sediments (JSS). The issue contains the collection of 16 publications, which addressed the most recent advances and challenges in these fields. Six published papers are dealing with soils focusing on organic matter composition in rice-paddy soils (Cheng et al. 2017) and degradation of organic matter in Andisol and Inceptisol paddy soils (Tang et al. 2017), morphology of fly-ash contaminated soil (Weber et al. 2017), the relationship between soil properties and plant community in a lagoon (Antisari et al. 2017), methane transformation in a drained wetland soil (Jerman et al. 2017),

and the sources of soil CO₂ above a subterranean cave (Krajnc et al. 2017). Five published papers consider biogeochemical processes in freshwater sediments focusing on metals in sediments of several areas, including the largest mercury mine district in Almaden area (Garcia-Ordiales et al. 2017), in the Zrmanja River estuary (Fiket et al. 2017) and in the Sava River (Vidmar et al. 2017), as well as the characteristics of ammonia oxidizers in aquaculture ponds (Zhou et al. 2017) and the effect of sediment grain size on heterotrophic respiration (Mori et al. 2017). Five papers are devoted to marine sediments comprising hydrocarbons in coastal area (Bajt 2017), microbial mercury transformation processes (Hines et al. 2017), historical deposition of trace elements in saltmarshes (Covell et al. 2017) and the accumulation of metal(loid)s in halophytes (Petranich et al. 2017), and the characteristics of microbial mats in a marine mangrove (Gontharet et al. 2017).

We hope that this volume makes a useful contribution to all of those dealing with biogeochemistry processes in soils and sediments in different ecosystems and will be accepted with the same interest and enthusiasm as was shown by participants at the 22nd ISEB Symposium. Our special thanks go to Phil Owens (the journal’s editor-in-chief) for offering valuable suggestions for improvements and guidance through the editorial process and Moira Ledger for her technical and editorial assistance. The authors would also like to thank all of the reviewers for their time and comments that improved the quality of the published papers.

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