Preface: Proceedings of the 14th IASWS international conference

Paolo Porto^{1,2} • Vito Ferro³

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The 14th IASWS International Symposium on Interactions between Sediment and Water was held in Taormina, Italy, from 17 to 22 June, 2017. The International Association for Sediment Water Science (IASWS) brings together a wide range of researchers from different disciplines and seeks to promote, encourage, and recognize excellence in scientific research related to sediments and their interactions with water and biota in fluvial, lacustrine, and marine systems, with particular reference to problems of environmental concern.

The symposium that began in Amsterdam, Netherlands (1976), has continued on a 3-year cycle, meeting in Canada (1981), Switzerland (1984), Australia (1987), Sweden (1990), the USA (1993), Italy (1996), China (1999), Canada (2002), Slovenia (2005), Australia (2008), England (2011), and South Africa (2014). The 15th IASWS symposium is intended to be held in Gramado, Brazil, in 2020.

These tri-annual symposiums provide a forum for interdisciplinary discussions with the aim of better integrating knowledge of the biological, physical, and chemical processes between sediments and water. The scale of the meeting is such that the exchange of ideas, techniques, and approaches is fostered encouraging this integration and enabling future collaboration. For more details on the history of IASWS, see Peticrew (2009).

The conference held in Taormina brought together 60 international delegates from 20 countries including earth scientists, biologists, hydrologists, chemists, and environmental engineers whose interests pertain to sediment-water interactions in all aquatic systems. Student participation was supported by

sponsorship from IASWS; in total, 10 students presented papers. Excluding keynote papers, a total of 40 oral papers and 22 poster papers were presented at the conference. Oral presentations and posters addressed five main themes incorporating the physical, chemical, biological, and/or management aspects of lacustrine, riverine, estuarine, and/or marine sediment:

- Sediment-water linkages in terrestrial and aquatic environments: monitoring and modeling soil erosion and sediment yields at multiple scales using traditional approaches and tracer technologies
- The role of sediment from source to sinks: hillslope and river processes
- The role of sediment within disturbed catchments and river basins
- Sediment-water linkages in estuarine and marine environments: evaluating change in freshwater and saline habitats
- Sediment-water and biological linkages in terrestrial and aquatic environments

Dr. Mark A. Nearing, USDA-ARS Southwest Watershed Research Center, Tucson, AZ, introduced the first theme with his keynote speech on “Soil erosion and sediment studies: Walnut Gulch Experimental Watershed, Arizona – est. 1953.” The second keynote speaker was Prof. Mario Lenzi, University of Padua, Padua, Italy, who introduced the second theme with his speech on “Large wood storage, mobility and the relevance of hillslope processes in forested river catchments.” Prof. Ellen L. Peticrew, University of Northern British Columbia, Prince George, British Columbia, Canada, our third keynote speaker, pointed to the findings from research conducted at a field station downstream of a mining catastrophe with her talk on “Dumped In My Back Yard (DIMBY): Perspectives of the Mount Polley Mine tailings impoundment breach from the Quesnel River Research Centre, a downstream field station.” The fourth keynote speaker was Prof. Kate Spencer, School of Geography, Queen Mary, University of London, UK, who introduced the

✉ Paolo Porto
paolo.porto@unirc.it

¹ Department of Agro-Forestry and Environmental Sciences and Technologies, University Mediterranea, 89124 Reggio Calabria, Italy

² CNR– Istituto per i Sistemi Agrari e Forestali per il Mediterraneo, Sezione Ecologia e Idrologia Forestale, 87036 Rende (Cs), Italy

³ Department of Agricultural and Forestry Sciences, University of Palermo, Viale delle Scienze, 90128 Palermo, Italy

issues related to sediment-water linkages in estuarine environments, through her talk on “New insights into the composition and behaviour of suspended particulate matter.” The final keynote speaker was Prof. Artemi Cerdà, Department of Geography, Valencia University, Valencia, Spain, who addressed the biological linkages issues in terrestrial ecosystems through a talk on “Forest fires control the fate of the water and sediment delivery.”

Papers included in this Special Issue represent all conference themes and gave important messages for catchment managers and policy makers. Two papers represent the theme of “Sediment-water linkages in terrestrial and aquatic environments: monitoring and modelling of soil erosion and sediment yields.” Bagarello et al. (2018) described a simple, empirical approach to predict soil erosion at the plot scale. Their work is based on datasets obtained in three experimental sites established in central and South Italy and makes use of an advanced version of the USLE-MM approach to model soil erosion at the event scale. The paper demonstrated that a more general use of this model is possible if runoff measurements are taken into account. Altieri et al. (2018) proposed a methodological approach based on ^{137}Cs measurements to establish the role of silvicultural systems and forest cover in preventing soil erosion at the hillslope scale. This contribution gives important messages for forest planners and catchment managers in order to identify the role of forested areas in sediment production. The ability of tracer technologies, particularly ^{137}Cs , to predict soil erosion rates is confirmed.

The paper by Golosov et al. (2018) is the only contribution that covers the theme of “The role of sediment from source to sink.” Their paper analyzes the temporal trend of soil erosion in two agricultural catchments located in European Russia for two different time windows. The work promotes the use of traditional modeling to investigate soil erosion rates at the hillslope scale in combination with the ^{137}Cs technique based on measurements carried out in the valley bottom and accounting for sedimentation rates.

The theme of “The role of sediment within disturbed catchments and river basins” is addressed by two papers. The study by Marković et al. (2018) investigated the accumulation and mobility of As, Cd, Cr, Cu, Ni, Pb, and Zn in the Sava River riparian zone with sampling sites located in Slovenia, Croatia, and Serbia. Their work, based on the use of statistical methods such as the principal component analysis (PCA) and multiple linear regression analysis (MLRA) in soil and sediments, provides important messages on the ecological risk caused by potentially toxic elements (PTE) in riverine environments. The paper by Erenturk et al. (2018) reports the concentration of major (Si, Al, Fe, Mg, Ca, K, Na, Mn, Ti), rare earth (Tb, Yb, Eu, Dy, Tm), and toxic elements (As, Cr, Co, Cu, Ni, Pb, and Zn) dated from Neolithic Era, Early Byzantine Era, and Byzantine Era. The results, based on sediment samples taken from the ancient Theodosius Harbour (Istanbul), identified the

effect of industrialization on the level of environmental pollution and provided a useful database for future investigations in this field.

The theme of “Sediment-water linkages in estuarine and marine environments: evaluating change in freshwater and saline habitats” is addressed by two papers. The contribution by Beldowski et al. (2018) explored the seasonal changes of mercury speciation in sediments in the coastal area of the Gulf of Gdańsk (Poland). The overall results suggested that although mercury emissions to the environment have decreased in recent years, local weather conditions, which may be intensified by climate change, seriously affect the bioavailability of past mercury deposits in coastal sediments. The findings of this paper can be extended to the whole Baltic Sea that should be considered as more susceptible to ongoing climate changes than the open seas and mercury transformations connected with that process. The paper by Cieślakiewicz et al. (2018) discussed the problems related to the assessment of the potential for dredged material dispersal from dumping sites in the Gulf of Gdańsk (Poland). The main purpose of this contribution was to determine whether wind, waves, and currents can induce transport of sediment from offshore dumping sites located at intermediate depths in the southern Baltic. The paper addressed an important message related to the decision-making process associated with the designation of an optimal dumping site location which will render the dredged material re-usable for beneficial purposes.

The last theme of the conference was on “Sediment-water and biological linkages in terrestrial and aquatic environments” and it is covered by two contributions. The paper by McLean et al. (2018), based on a laboratory study carried out in an annular flume in Ontario, Canada, examines the effect of particle processing by dreissenids, more particularly *Dreissena polymorpha* and *Dreissena bugensis*, both non-indigenous zebra mussels, on the nature (grain size distribution, settling velocity, porosity, and density) and transport properties (critical shear stress for erosion, erosion rates, and bed stability) of suspended particulate matter in lakes. The results established that biostabilization of surficial lake-bottom sediments impacted by mussel biodeposits may increase bed stability and reduce the export of particulate matter to the offshore environment. The paper by Greenwood et al. (2018) gave an important overview on the behavior of the invasive plant Himalayan Balsam (*Impatiens glandulifera*) in river systems. The work is based on two case studies in Switzerland and the UK and synthesizes the latest findings about the influence of this plant on soil erosion and sedimentation processes.

Taken together, the nine papers included in this volume provide a clear demonstration of the existence of multiple perspectives associated with sediment-water linkages. We hope that this special issue makes a useful contribution to people that operate in these research fields and that they will

enjoy the papers and appreciate our efforts in organizing the conference and putting this collection of papers together.

This special issue also includes a brief obituary to Dr. Ed Ongley. Ed was a pioneering figure in research on fine-grained sediment in aquatic systems and wrote several important papers on this topic. In addition, he was actively involved with the development of IASWS and thus it is fitting that we honor his contribution to IASWS and his research on sediment-water interactions.

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