

World Association for Sedimentation & Erosion Research – WASER

NEWSLETTER

Reporting WASER news to you regularly

2023 No. 1

(March 25, 2023)

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NEWS

Extended deadline for abstract submission for the 15th ISRS

The abstract submission deadline for the International Symposium on River Sedimentation has been extended until 31 March 2023. The Symposium will be hosted in Florence (Italy) from 5 - 8 September 2023.



The International Symposium on River Sedimentation (ISRS) is a triennial event initiated in 1980 by the Chinese Hydraulic Engineering Society (CHES) with the support of UNESCO. The objective of ISRS is to provide a forum for scientist, engineers, researchers and decision makers to exchange ideas, research results and advanced techniques, and to share their experiences and information on the study of sediment and its management. The International Research and Training Center on Erosion and Sedimentation (IRTCES) in Beijing is the permanent secretariat of ISRS. WASER (the World Association for Sediment and Erosion Research) was inaugurated at the 9th ISRS in 2004, and the ISRS has since served as the official symposium of WASER and the venue for its General Assembly.

The main theme of the 2023 symposium is 'Sustainable Sediment Management in a Changing Environment'.

Keynote speakers: Zhaoyin Wang, Marcelo Garcia, Junke Guo, Alain Recking and Enrica Viparelli.

Authors are invited to submit abstracts under the following topics:

- Sediment and pollutant transport;
- Morphodynamics;
- Ecohydraulics;
- Sediment related disasters and climate change;

- Reservoir sedimentation, interactions between sediment and hydraulic structures;
- Sustainable sediment management at the river-coastal basin scale;
- Social, economic & political issues related to sediment and water management.

Chief Editor of the IJSR, Prof. Hongwei Fang, honored with 2023 Hans Albert Einstein Award

Prof. Hongwei FANG, The Changjiang Chair Professor of the Department of Hydraulic Engineering at Tsinghua University, Beijing has been conferred with the prestigious 2023 Hans Albert Einstein Award from the American Society of Civil Engineers (ASCE) in recognition of his outstanding contributions to fluvial hydrodynamics. Citing Prof. Fang's contributions, the Award Committee noted that Prof. Fang has been awarded this recognition for 'for his outstanding experimental and numerical contributions to the role of turbulence on sediment dynamics and leadership role in development of echo-fluvial dynamics.' Prof. Fang, who is a chief editor of the International Journal of Sediment Research and an associate editor of Journal of Hydraulic Engineering ASCE, becomes the second from China to receive this award, after Prof. Zhaoyin WANG. Notably, he has also won the National Award of Science and Technology of China twice (2017, 2020) and has been awarded the Chinese Education Ministry Award of Science and Technology twice (2001, 2008).



Research reveals 'negative feedback' loop between warming and net exchange of carbon caused by erosion

In the study of human impact on the environment, there are few negative or stabilizing feedbacks on climate change.

A team of international scientists, including Professor Tim Quine from the University of Exeter, UK, has studied the effect that temperature has on the amount of carbon gained by and released from soils due to soil erosion. This pioneering new research has revealed a negative feedback loop between warming and the net exchange of carbon within the atmosphere caused by erosion.

As they store more carbon than the atmosphere and vegetation combined, soils offer unique and pivotal potential to mitigate global climate change through sequestration—the removal and storage of carbon. However, change in soils can also pose a threat to global warming as the carbon in these stores can be released back into the atmosphere.

Soil organic carbon (SOC) storage is controlled by the balance of the amount of carbon gained through plants, and lost through natural decomposition. It is known that both of these are affected by erosion and climate, however, the effect on the interaction between climate and erosion on SOC storage has remained unclear.

In the new study, the researchers used existing data from sites across the world, experiencing different climates, to show rising temperatures promote increased efficiency in replacing eroded carbon but also increasing decomposition of buried carbon. The combined effect of these two opposing trends with increase in temperature is found to be an increase in the erosion-induced carbon sink.

The team estimate a 7% increase in the global carbon sink caused by erosion on croplands, due to warming by 2100. These results reveal a negative feedback loop between climate change and erosion-induced disturbance to SOC cycling.

The study "Temperature effect on erosion-induced disturbances to soil organic carbon cycling" is published in *Nature Climate Change*.

Professor Quine said, "Through international multidisciplinary collaboration, our team have made progress in better understanding of the role of erosion in perturbing soil carbon dynamics and the interaction with warming. Despite the negative feedback, it is imperative that we continue to focus efforts on controlling soil erosion and rehabilitating soils for their many benefits for ecosystem service delivery."

More information: Zhengang Wang et al, Temperature effect on erosion-induced disturbances to soil organic carbon cycling, *Nature Climate Change* (2023). DOI: 10.1038/s41558-022-01562-8

(Source: <https://phys.org/>)

Warming-driven erosion and sediment transport in cold regions

Abstract: Rapid atmospheric warming since the mid-twentieth century has increased temperature-dependent erosion and sediment-transport processes in cold environments, affecting food, energy and water security. In this Review, we summarize landscape changes in cold environments and provide a global inventory of increases in erosion and sediment yield driven by cryosphere degradation. Anthropogenic climate change, deglaciation, and thermokarst disturbances are causing increased sediment mobilization and transport processes in glacierized and periglacierized basins. With continuous cryosphere degradation, sediment transport will continue to increase until reaching a maximum (peak sediment). Thereafter, transport is likely to shift from a temperature-dependent regime toward a rainfall-dependent regime roughly between 2100–2200. The timing of the regime shift would be regulated by changes in meltwater, erosive rainfall and landscape erodibility, and complicated by geomorphic feedbacks and connectivity. Further progress in integrating multisource sediment observations, developing physics-based sediment-transport models, and enhancing interdisciplinary and international scientific collaboration is needed to predict sediment dynamics in a warming world.

Key points

- A global inventory of cryosphere-degradation-driven increases in erosion and sediment yield is presented, with 76 locations from the high Arctic, European mountains, High Mountain Asia and Andes, and 18 Arctic permafrost-coastal sites.
- Sediment mobilization from glacierized basins is dominated by glacial and paraglacial erosion; transport efficiency is controlled by glaciohydrology and modulated by subglacial, proglacial and supraglacial storage and release, but is interrupted by glacial lakes and moraines.
- Degraded permafrost mainly mobilizes sediment by eroding thermokarst landscapes in high-latitude terrain and unstable rocky slopes in high-altitude terrain, which is sustained by exposing and melting ground ice

and sufficient water supply; transport efficiency is enhanced by hillslope-channel connectivity.

- The sediment-transport regime will shift in three stages, from a thermal-controlled regime to one jointly controlled by thermal and pluvial processes, and finally to a regime controlled by pluvial processes.
- Peak sediment yield will be reached with or after peak meltwater.
- Between the 1950s and 2010s, sediment fluxes have increased two- to eight-fold in many cold regions, and coastal erosion rates have more than doubled along many parts of Arctic permafrost coastlines.

More information: T. Zhang et al. Warming-driven erosion and sediment transport in cold regions. *Nat Rev Earth Environ* 3, 832–851 (2022). <https://doi.org/10.1038/s43017-022-00362-0>

(Source:<https://www.nature.com/articles/s43017-022-00362-0>)

Building a library of source samples for sediment fingerprinting – Potential and proof of concept

Purpose

Sediment fingerprinting of fluvial targets has proven useful to guide conservation management and prioritize sediment sources for Federal and State supported programs in the United States. However, the collection and analysis of source samples can make these studies unaffordable, especially when needed for multiple drainage basins. We investigate the potential use of source samples from a basin with similar physiography (using samples from one of a “pair” to evaluate samples from the other) or combined from multiple basins (a “library”).

Methods

Source samples from eight basins across six ecoregions were harvested from existing, published studies. Individual source samples were fingerprinted using a mixing model derived from source samples from other basins. The ability to identify source category was evaluated both as part of source verification and by classifying source samples as “targets.”

Results

Approximately half of the cropland samples were identified as targets, both as pairs and with the multi-basin source dataset, indicating that cropland samples could be shared for basins in similar ecoregions and be combined for larger

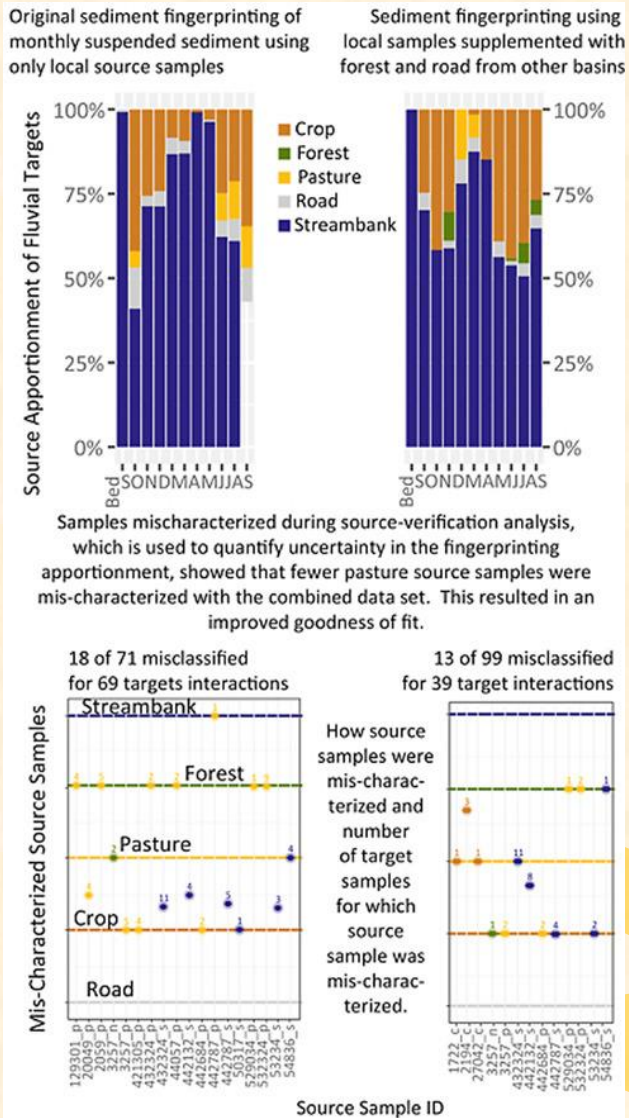
stream systems. Streambank samples were better identified with the multi-basin analysis relative to the pairs, and those from mixed land-use basins improved this differentiation except for samples from basins with a dominant land-use type. Inconsistent identification of pasture samples highlighted the need for local samples. Inconsistent identification of forest samples indicated that upland- and riparian-forest samples are distinct. Road samples were identified as both sources and targets, and other source types were rarely apportioned as road: these may have the best potential to supplement local source samples. This source-sample library was then used to improve the accuracy of sediment-source apportionment for a previously studied basin.

Conclusion

Ultimately, the source verification process already used in individual basin studies to evaluate the accuracy of sediment-fingerprinting apportionments was useful for determining how to supplement local source samples with those from other basins. This study shows that supplementing local source samples with those from basins with similar physiography has the potential to both improve fingerprinting accuracy and decrease the cost of this type of study.

Highlights

- Combined sediment-fingerprinting source samples (8 studies) to extend applicability.
- Successful identification of cropland indicates potential to share in similar ecoregions.
- Supplementing local streambank with that from other basins helped if mixed land use.
- Road samples readily identified among basins; forest and pasture more complex.
- Fingerprinting source-verification analysis guided inclusion of non-local samples.



in recent years, with a Yellow River protection law coming into effect from April 1, 2023.

The Ministry said that it would step up pollution curbs with regards to industry, agriculture, urban and rural life, as well as mining in the river basin, and explore more regional-specific approaches for ecological conservation.

Instructions will be provided for local governments to implement the Yellow River protection law better, the ministry added.



This photo shows the Yellow River passing through Gansu province, where the Qinghai-Tibet Plateau and the Loess Plateau meet. [Photo by Tian Manchao/For China Daily]

(Source: Xinhua)

More information: Tanja N. Williamson, Faith Fitzpatrick, Rebecca Kreiling. Building a library of source samples for sediment fingerprinting – Potential and proof of concept, *Journal of Environmental Management* (2023). DOI: 10.1016/j.jenvman.2023.117254

(Source: <https://www.usgs.gov/publications/building-a-library-source-samples-sediment-fingerprinting-potential-and-proof-concept>)

China makes headway in ecological protection of the Yellow River

China has made remarkable progress in the ecological conservation of the Yellow River, the second-longest river in the country, official data shows.

In the Yellow River basin, the proportion of surface water rated at grade I to III in the country's five-tier water quality system reached 87.5 percent in 2022, an increase of 5.6 percentage points from a year earlier, according to the Ministry of Ecology and Environment.

Continued efforts have gone into ecological protection along this "mother river" of the country

PUBLICATIONS

Papers Published in the International Journal of Sediment Research Volume 38, No. 2, 2023

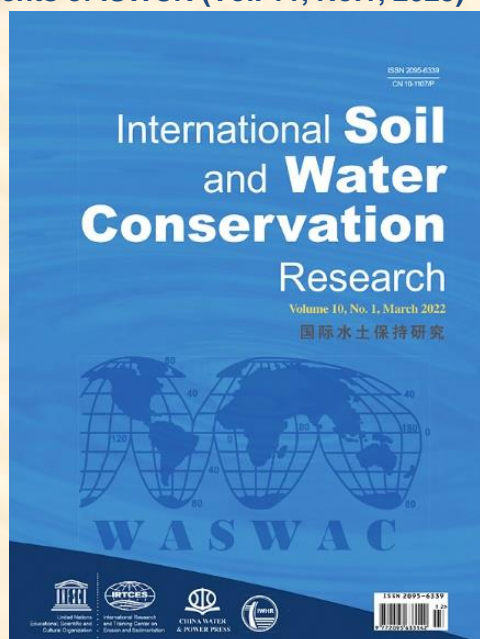


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Full papers are available at ScienceDirect:
<https://www.sciencedirect.com/journal/international-journal-of-sediment-research> with free access to the paper abstracts.

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Free full papers and open access are available at ScienceDirect :
<https://www.sciencedirect.com/journal/international-soil-and-water-conservation-research>.

COMING EVENTS

The 5th WASWAC World Conference (Olomouc, Czech Republic, June 19-23, 2023)

Date: June 19-23, 2023

Venue: Olomouc, Czech Republic

Summary: The topic of the 5th WASWAC World Conference is "Adaptation strategies for soil and water conservation in a changing world". The conference aims are:

- To analyse the present and future situation of soil and water conservation on a worldwide scale while taking local specifics into consideration.
- To analyse the effects of population growth, human activity and climate change on soil and water in the context of the demands of sustainable farming, water and food supply.
- To promote and increase collaboration between scientific organisations, policymakers, the general public and practitioners.
- To design goals, strategies and directions for conservation of soil and water as basic irreplaceable natural resources for current exploitation and the needs of future generations.

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Dr. Jana Konečná, Research Institute for Soil and Water Conservation, Prague

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The 40th IAHR World Congress (Austria, Aug. 21-25, 2023)

Date: August 21-25, 2023

Venue: Vienna, Austria

Invitation: On behalf of the International Association for Hydro-environment Engineering and Research (IAHR) I am delighted to invite you to participate in the 40th IAHR World Congress to be held in Vienna, Austria, from August 21st to 25th, 2023. For more than seventy-five years, the biennial IAHR World Congresses have brought together leading experts to help address the world's pressing water environment engineering challenges. The event has traditionally provided researchers and decision makers the opportunity to share recent advances and experiences, identify emerging technology trends, and engage in lively debates that have positively impacted our world. Following the last IAHR Congress held in 2021 in Granada, Spain under the theme "From Snow to Sea", the main theme of the 40th IAHR World Congress will be "Rivers – Connecting Mountains and Coasts" focusing attention on the importance of considering the integral water cycle to address present and future challenges. Since its creation in 1935, IAHR is known as a leading international organization of engineers and professionals in fields related to the water environment. IAHR stimulates and promotes research and its application – by sharing new research paradigms and networks, setting industry standards, informing best water management practices, and nurturing young professionals. Through its powerful knowledge products and networks, IAHR makes important contributions to sustainable development in many ways. At the upcoming Congress, IAHR will unleash its new Strategic Plan and present exciting knowledge platforms and prominent speakers on global water environment issues including climate-induced changes to water resources, adaptive management, artificial intelligence (AI) and smart water management, Eco hydraulics, and policy forums. I, therefore, welcome you to join us and share with us your work.

I look forward to welcoming you to Vienna in August 2023! (Prof. Joseph Hun-wei Lee, IAHR President)

URL: <https://rivers.boku.ac.at/iahr/>

Vienna Water Conferences 2023: <https://rivers.boku.ac.at>

World's Large Rivers Conference 2023 (Austria, Aug. 21-25, 2023)

Date: August 21-25, 2023

Venue: Vienna, Austria

Invitation: This conference aims to provide a global forum for a wide-ranging discussion of key issues related to research on large rivers and their effective and sustainable management, involving both scientists and decision-makers. We kindly ask all interested authors to submit their work on the topics of Hydrology, Hydraulics & Hydroclimatic Impacts Sediment Transport & River Morphology River Pollution, Ecology & Restoration Integrated River Management. This time, a special focus will be on Rivers in a Changing World. The goal is to establish a scientific knowledge base and develop scientific reports on the status of large rivers for a better understanding of developments, synergies, and challenges in large river basins. So far, three status reports on large rivers have been developed (Danube, Mekong, and Niger) and up to 300 rivers should follow. Furthermore, the structure of the World's Large Rivers Initiative will be discussed at the World's Large Rivers conference in Vienna 2023! Special information: In honour and celebration of the 5th anniversary of the World's Large Rivers Conference, the 40th anniversary of the IAHR World Congress and the 30th anniversary of the Danube Conference, all three conferences will be held simultaneously in Vienna under the motto "Vienna Water Conferences 2023"! You can purchase a special combined ticket to attend all three outstanding events.

URL: <https://worldslargerivers.boku.ac.at>

Vienna Water Conferences 2023: <https://rivers.boku.ac.at>

The 15th International Symposium on River Sedimentation (Florence, Italy, Sept. 5-8, 2023)

Date: September 5-8, 2023

Venue: Florence, Italy

Organizer: University of Florence and University of Padua

Sponsors: International Research and Training Center on Erosion and Sedimentation (IRTCES); World Association for Erosion and Sediment Research (WASER)

Co-sponsors: International Association for Hydro-Environment Engineering and Research (IAHR)

Secretariat: University of Florence, Italy

Permanent Secretariat: IRTCES

Summary: The triennial International Symposium on River Sedimentation (ISRS) was initiated in 1980. Since its foundation, IRTCES has served as the permanent secretariat of ISRS. WASER was inaugurated at the 9th ISRS in 2004, and the ISRS has since become the official Symposium of WASER. The objective of the ISRS is to provide a forum for scientists, engineers, researchers and decision makers to exchange ideas, research results and technical advances, and to share experience and information relating to the study of sediment and its management.

Symposium Theme and Topics:

The theme of the symposium is Sustainable Sediment Management in a changing Environment

The symposium topics include:

1. Sediment and pollutant transport;
2. Morphodynamics;
3. Ecohydraulics;
4. Sediment related disaster and climate change;
5. Reservoir sedimentation, interactions between sediment and hydraulic structures;
6. Sustainable sediment management at the river- coastal basin scale;
7. Social, economic & political issues related to sediment and water management

URL: <https://www.isrs2022.it/>

Organization & Contacts:

Organized by the Department of Civil and Environmental Engineering, University of Florence, Italy

Organizing Committee Co-Chairs

Stefano Lanzoni, Department of Civil, Environmental and Architectural Engineering, University of Padova, Italy

Luca Solari, Department of Civil and Environmental Engineering, University of Florence, Italy

Contacts

Costanza Carbonari, Department of Civil and Environmental Engineering, University of Florence, info@isrs2022.it

The 13th Symposium on River, Coastal, and Estuarine Morphodynamics (Urbana, USA, September 25-28, 2023)

Date: September 25-28, 2023

Venue: Urbana, USA

Summary: The first RCEM Symposium was held in Genova, Italy, in 1999. Since then, the RCEM community has come together every two years to mark the progress in the field of morphodynamics. After going virtual in 2021, RCEM2023 will be the second time the Symposium is held in the United States. RCEM 2023 will be held at the University of Illinois at Urbana-Champaign. UIUC is the flagship campus of the University of Illinois System.

UIUC counts with 15 Colleges and Instructional Units. It hosts an Undergraduate student population of near 34K domestic students and, 5k international students, with a Graduate student population of near 16K students.

RCEM at UIUC will count with the support of faculty and students from multiple departments, from Civil & Environmental Engineering, Geography & Geographic Information Science, Geology, Atmospheric Sciences, Mechanical Science & Engineering and partner institutions located in Urbana-Champaign.

The Conference will take place at the Illini Union, our iconic I-shaped building which has been a resource to the entire campus community since its opening in 1941.

Deadline for abstract submission is March 3rd, 2023.

Abstracts should be a single page.

URL: <https://rcem.cee.illinois.edu/>

Contacts:

E-mail: tinoco@illinois.edu

The 1st IAHR and 4th CAE International Conference on Global Water Security and Sustainable Development

Date: October 30-November 3, 2023

Venue: Nanjing, China

Summary: The 1st IAHR and 4th CAE International Conference on Global Water Security and Sustainable Development will be held by the Yangtze Institute for Conservation and Development, Hohai University and Nanjing

Hydraulic Research Institute in Nanjing (China) from October 30th to November 3rd, 2023. The successful development of global water security faces significant challenges. These challenges require close cooperation between scientists, engineers, water resources managers and policy makers. In this regard, the conference will provide a forum bringing together participants from academia, consulting firms, local, provincial and national government agencies, and offering them an opportunity to interact in an informal and relaxed environment. The conference will also provide students with an opportunity to discuss their interests with renowned and well-established researchers and professionals in this field.

Themes:

1. Hydro-environmental Modelling and Assessment:
2. Hydro-biological Processes:
3. Hydro-morphological Processes:
4. Groundwater Transport Processes:
5. Groundwater Transport Processes:
6. Nature-Based Solutions:
7. Disaster Risk Reduction and Resilience:
8. Climate Change and Population Growth Impacts:
9. Digital Water Transformation:
10. Data Technologies:
11. Design of Storage Facilities, Coastal Basins and Desalination Plants:
12. Agricultural and Aquaculture Developments:
13. Water-Food-Energy Nexus:
14. Water Transfer and Governance:
15. Externalities of Engineering:

URL: <https://icgws2023.iahr.org/en/web/index/266>

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