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INTERNATIONAL SEDIMENT INITIATIVE

NEWSLETTER

Reporting ISI news to you quarterly

No. 74 April 15, 2025

IN THIS ISSUE

News

Publications

Coming Events

UNESCO“国际泥沙计划”简报

本期内容

新闻

出版物

会议信息

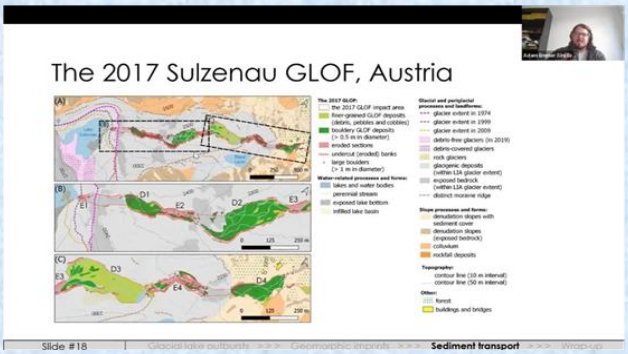
NEWS

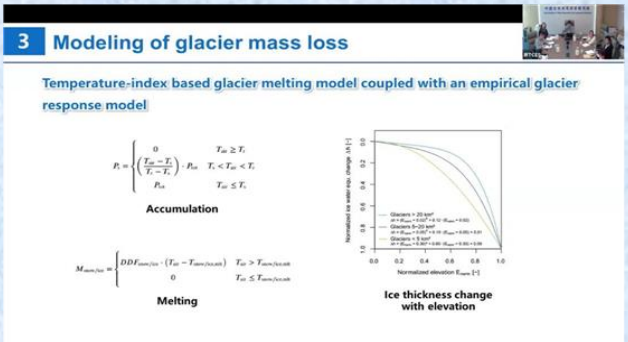
Webinar on Glacier Protection Successfully Held

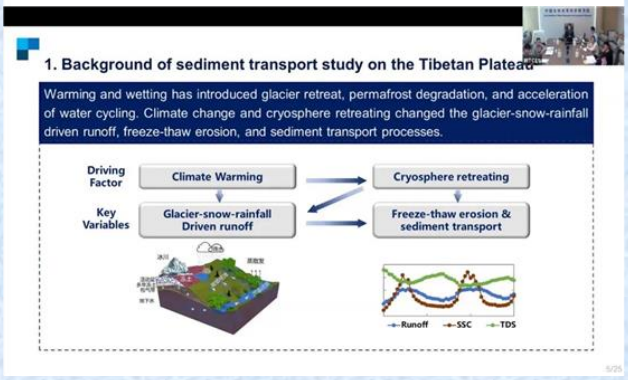
On March 21, 2025, to celebrate World Water Day and the inaugural World Glacier Day, the International Research and Training Center on Erosion and Sedimentation (IRTCES), together with the China Institute of Water Resources and Hydropower Research (IWHR), the UNESCO Regional Office for East Asia, and other partners, organized a Webinar on Glacier Protection. The theme of the event was "Glacial Sediment, Soil Erosion, and Hazard Management." Experts from IWHR, UNESCO East Asia, the Advisory Committee of the International Sediment Initiative (ISI) – IHP – UNESCO, the Institute of Tibetan Plateau Research (ITP-CAS), and the Institute of Geographic Sciences and Natural Resources Research (IGSNRR-CAS) participated in the webinar.

The webinar began with speeches by Ms. Ai Sugiura, Programme Specialist and Head of Natural Sciences, UNESCO Regional Office for East Asia; Prof. Vít Vilímek(Charles University in Prague);, Working Group leader of ISI Thematic Priority 3 (Glacier-related sediment, erosion and hazard management); and Mr. Zhang Jianli, Deputy Director of IRTCES. They highlighted that World Water Day 2025 focuses on glacier preservation and that March 21 will henceforth be observed as 'World Glacier Day', raising awareness of the critical role of glaciers in the climate system and the hydrological cycle, as well as the impacts of rapid glacial retreat. They also emphasized UNESCO's commitment to open science and data-sharing in glacier protection, shared the achievements of ISI in glacier-related research, and introduced the contributions of IWHR to glacier studies. They called for global action to strengthen glacier research and safeguard vital water resources for the future. The opening session was moderated by Prof. Wang Yujie, Director of the Division of International Cooperation, IWHR.

The keynote Speech session, chaired by Prof. Shi Hongling, Division Chief of IRTCES and Head of ISI's Global Secretariat, featured three presentations: 'Glacial Lakes, Outburst Floods, and Extreme Sediment Transport Events' – Dr. Adam Emmer, The Mountain Processes and Mountain Hazards Group, Institute of Geography and Regional Science, University of Graz, Austria; 'Variation of Riverine Runoff and Sediment Flux over the Tibetan Plateau Under Climate Change – Prof. Zhang Fan, ITP-CAS; and 'Remote Sensing and Modeling of Recent Glacier Mass Loss Hotspots in the Tibetan Plateau' – Dr. Li Xingdong, IWHR.







The Q/A and Discussion session was moderated by Professor Liu Cheng, former member of the ISI Advisory Group and Vice President of WASER. Dr. Yu Guo'an from IGSNRR-CAS, and the keynote speakers Dr. Emmer, Prof. Zhang, and Dr. Li participated in the discussion as panelists. Prof. Matjaz Mikos (Faculty of Civil and Geodetic Engineering, University of Ljubljana, UNESCO Chair in Water-Related Disaster Risk Reduction) was also engaged in the discussion. Key challenges in glacier-related sediment, erosion and hazard management were deeply discussed and addressed. The webinar concluded with consensus on the need for enhanced international cooperation to address glacier retreat and its impacts on water resources. Participants emphasized the importance of continued research and data sharing to support evidence-based policymaking for glacier preservation.

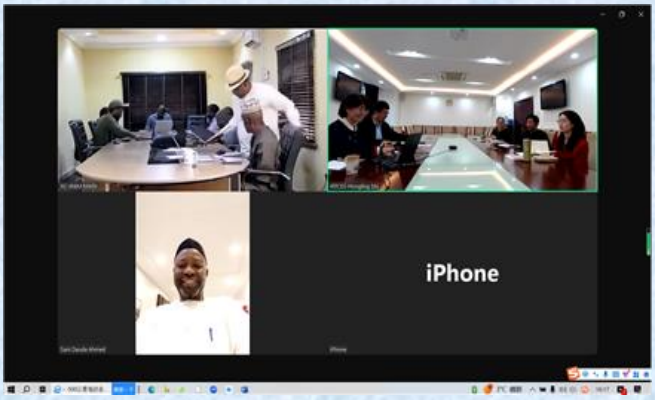
A Joint Webinar of Sediment Management for Sustainable Hydropower and Water Security held by IRTCES and RC-IRBM

On February 21, a joint webinar with the overarching theme of 'Sediment Management for Sustainable Hydropower and Water Security' was successfully held. The webinar was co-organized by the International Research and Training Center on Erosion and Sedimentation (IRTCES) in China and the Regional Centre for Integrated River Basin Management (RC-IRBM) in Nigeria. This workshop marked the first official collaborative exchange between the two UNESCO Category II Centers following the signing of a Memorandum of Understanding in September 2024.

The webinar brought together a total of 14 participants from IRTCES and RC-IRBM to discuss key issues such as sediment management, sustainable hydropower development, and water security. The meeting was co-chaired by Prof. Shi Hongling, Division Chief of IRTCES, and Prof. Omogbemi O. Yaya, Director of RC-IRBM.

Dr. Martin Eduvie from the Nigerian National Water Resources Institute (NWRI) introduced the goals and mission of the Institute. Dr. Sani Dauda Ahmed from RC-IRBM shared the latest research progress on sustainable watershed management practices in Nigeria. Mr. Adedotun Salami from NWRI presented research on reservoir sedimentation studies in Nigeria, while Engineer Julius Onemano discussed the results of flood and erosion assessments in the country. Porf. Zhang Jianli, Deputy Director of IRTCES, provided an overview of the China Institute of Water Resources and Hydropower Research (IWHR) and IRTCES, including their organizational structure and research focus. Prof. Shi Hongling delivered a comparative analysis on variations in runoff and sediment load of the typical rivers worldwide. Prof. Liu Cheng shared key experiences of sediment management drawn from several large rivers around the world, and Dr. Zhao Ying introduced the global data collection and publishing platform for erosion and sedimentation.

Following the presentations, the two sides explored future collaboration and next steps, such as strengthening cooperation through expert exchanges, training programs, and international student projects. The webinar concluded with summaries by Prof. Shi Hongling and Prof. Yaya. Against the backdrop of increasing global water resource demands, sediment management is a critical component for ensuring sustainable hydropower development and water security. This workshop aimed to share cutting-edge research and practical experience in sediment management through academic exchanges and international cooperation, enhancing the capacity of both sides in water resource management and river basin governance, and contributing wisdom and strength to achieving global sustainable development goals.



International Sediment Initiative representation at the UNESCO Transforming Knowledge for Africa's Future Forum, Addis Ababa, 30 September - 2 October 2024, Addis Ababa, Federal Democratic Republic of Ethiopia.

Advisory board members Dr Omogbemi Omoloju Yaya (National Water Resources Institute, Nigeria) and Prof. William Blake (University of Plymouth) represented ISI at the UNESCO Transforming Knowledge for Africa's Future Forum, Addis Ababa, which had the primary aim to strengthen interdisciplinary and collaborative research capacity in Africa, including through more inclusive and effective South-South and South-South-North research partnerships. Prof. Blake spoke in a plenary panel session on 'Strengthening Collaborative Research Partnerships and Networks' that explored strategies to re-balance knowledge and research partnerships for mutual learning and sustainable development. Dr Yaya represented ISI in a session on 'Research Cooperation and Capacity Development in Water' and the wider role of the Intergovernmental Hydrological Programme in Africa.

New UK-Nigeria cooperation for sustainable land and water management through Climate Smart Agriculture.

ISI Advisory Board members Prof. William Blake (UK) and Dr Omogbemi Omoloju Yaya (Nigeria) received funding from Innovate UK to develop partnerships relating to the ISI primary aim to support the global agenda for sustainable integrated land and water resources management through sound [soil and] sediment management. Working within the Climate-Smart Agriculture Partnerships: UK-Brazil-Africa programme, activities aimed to develop an interdisciplinary/cross-sectoral network that: (1) capably fuses farmer/sector-led, laboratory and sensor technology assessment tools with indigenous/local knowledge to create a new holistic approach to soil health assessment that (2) enables equitable transition to CSA with wider co-benefits for downstream water security and aquatic ecosystem services by reducing sediment pollution.

A multisectoral workshop held in Abuja, Nigeria in December focussed on Challenges and barriers to Climate Smart Agriculture in Nigeria and Ghana to lay the groundwork for future research cooperation between Nigeria and UK ISI counterparts, and wider networks in West Africa, to resolve complex management challenges along the soil-sediment continuum. Catalysed by this ISI collaboration, the Nigerian Minister of Water Resources and Sanitation, Prof. Joseph Utsev, reaffirmed the Federal Government's commitment to advancing climate-smart agriculture research to be facilitated through a strategic partnership between the National Water Resources Institute, Nigeria, and the University of Plymouth, United Kingdom.

Photo caption: Dr Yaya and Prof. Blake at the Abuja workshop (top) and visit to the Federal Ministry with members of their interdisciplinary research teams.

Changes in global fluvial sediment concentrations and fluxes between 1985 and 2020

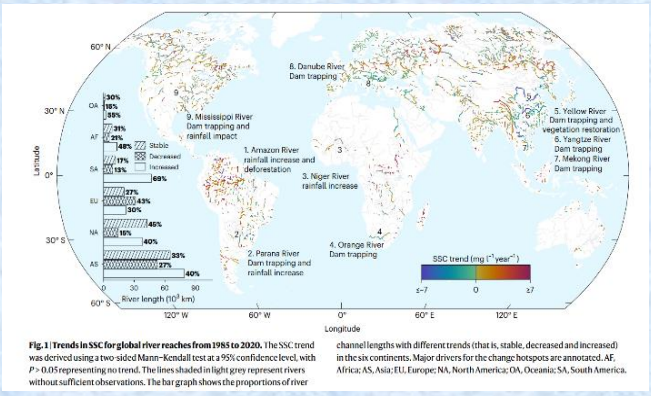


Fig. 1 | Trends in SSC for global river reaches from 1985 to 2020. The SSC trend was derived using a two-sided Mann–Kendall test at a 95% confidence level, with $P > 0.05$ representing no trend. The lines shaded in light grey represent rivers without sufficient observations. The bar graph shows the proportions of river channel lengths with different trends (that is, stable, decreased and increased) in the six continents. Major drivers for the change hotspots are annotated. AF, Africa; AS, Asia; EU, Europe; NA, North America; OA, Oceania; SA, South America.

Abstract

Fluvial sediment transport, a key pathway for global biogeochemical cycling, has changed markedly in the Anthropocene. However, disaggregating the compound effects of anthropogenic stresses on fluvial sediment transport at the global scale remains a challenge. Here, the suspended sediment concentrations for global river channels were mapped based on satellite observations between 1985 and 2020, and long-term changes in land–ocean sediment transfer were estimated. Significant ($P < 0.05$) changes in suspended sediment concentrations were identified in 67.8% (3.2×105 km) of the examined river channel length, with 43.4% (2.05×105 km) exhibiting a significant increasing trend, driven mainly by rising rainfall erosion and climate warming. Consequently, a global net increase (+0.58 Gt year1) in land–ocean sediment flux has been observed over the past four decades, despite sediment trapping by recently constructed dams, mostly in Asia. This study provided a new baseline for source-to-sink fluvial transport in the Anthropocene, that can inform global water resource management and delta management and protection.

CITATION

Sun, X., Tian, L., Fang, H. et al. Changes in global fluvial sediment concentrations and fluxes between 1985 and 2020.Nat Sustain 8, 142–151 (2025).

DOI

https://doi.org/10.1038/s41893-024-01476-7

Scientists discover dynamic microbial life in coastal sediments

Bigelow Laboratory Senior Research Scientist David Emerson collects samples from Edgecomb Eddy on the Maine coast of the USA. Credit: Fritz Freudenberger, Bigelow Laboratory for Ocean Sciences.

Bigelow Laboratory scientists have advanced an exciting method for linking the activity of individual microbes to their unique genetic code, providing the first application of the approach to sediments. Their findings were recently published in The ISME Journal.

The method combines single cell genomics and flow cytometry to quantify individual rates of respiration for different taxa. It revealed that low-oxygen sediments from the Maine coast host a diverse microbial community that appears to thrive in an environment where they're regularly subject to disruption from rapid temperature changes, tides, and more.

"Marine sediments are important ecosystems for active chemical cycling, and some of the most microbially diverse communities found on Earth live there," said Melody Lindsay, a research scientist at Bigelow Laboratory who led the study. "It was a natural—and fascinating—place to advance our method for illuminating microbial activity using single-cell respiration rates."

The paper features researchers from Bigelow Laboratory's Single Cell Genomics Center and Center for Aquatic Cytometry, as well as several undergraduate interns who aided with field sampling and laboratory experiments.

Shallow coastal sediments help control the flow of energy and nutrients from land to ocean. Because oxygen penetrates only a few millimeters below the surface, microbes living in this environment tend to rely on chemical processes other than respiring, or "breathing," oxygen to survive. Yet, disturbances like sedimentation and burrowing animals regularly introduce oxygen and organic matter into the

subsurface environment. The team aimed to understand the impact of this mixing and physical disruption.

"We know the abundance and diversity of ocean sediment microbes is much greater than in the water column above, but we know far less about their actual functions and activities," said Senior Research Scientist David Emerson, a co-author on the paper. "This method provides a powerful way to reveal new knowledge about a vast, and vastly understudied, part of the marine environment."

Though scientists have traditionally measured the rates of chemical turnover and other processes for the microbial community as a whole, this larger effort is revolutionizing understanding of activity at the individual level—and how that links to genomic potential.

The revolutionary new method was developed by Bigelow Laboratory from a $6 million grant from the National Science Foundation. In 2022, the researchers first applied the method to the surface ocean, showing how a tiny proportion of microbes consume most of the oxygen. Last year, they tested it with samples from an aquifer deep below Death Valley, illustrating the applicability of the method in low-biomass environments with limited oxygen.

For the current study, the team once again used flow cytometry, staining cells with a chemical called RedoxSensor Green. The intensity at which stained cells light up under a laser correlates with the rate at which those cells are respiring. The DNA of each individual cell was then sequenced to understand the relationship between its activity rate and what it's programmed to do. This combined technique enables researchers to get a snapshot of the microbial biodiversity and determine which species are the most abundant and active.

Eliza Goodell, an undergraduate intern from Oberlin College, pulls out a sediment core from Edgecomb Eddy. Credit: Melody lindsay, Bigelow, Laboratory for Ocean Sciences

"The Single Cell Genomics Center is the world's first facility capable of large-scale studies of microbial genomes and activities at the ultimate resolution in biology: individual cells," said Ramunas Stepanauaskas, the director of the center and a co-author on the study. "It is exciting that this unique technology enabled us to shed light on these important ecological processes and truly amazing biological diversity in an environment that is so abundant yet so underexplored."

To test the ability of microbes to adapt to disruption, which was a new aspect of the project, the team added different amounts of oxygen and laminarin, an abundant carbohydrate produced by brown algae and some phytoplankton common along Maine's coast.

"By perturbing the system in a manner that has real-world relevance, we can determine the effects of, say, a worm burying into the sediment bringing oxygen or seaweed degrading at the bottom of a mudflat," Lindsay said.

The findings demonstrate that sulfate-reducers from the Chloroflexota phylum were by far the most active cells in the sediments, though not the most abundant. The researchers also found that adding even small concentrations of oxygen and laminarin stimulated respiration. Chloroflexota cells are metabolically diverse, capable of using both oxygen and other chemical processes. That "genetic flexibility," Lindsay suggested, may explain why they dominate.

"We went in with the hypothesis that oxygen would poison everything, but it turns out that cells are good at withstanding it and even taking advantage of it," Lindsay said. "It suggests that the microbial community living in this capricious environment is more resilient than initially thought."

The findings underscore the incredible range of microorganisms living in these extreme environments — and the value of a cell-by-cell approach for interrogating that diversity.

To that end, the team is currently working to expand their understanding of Maine's coastal sediments. Using "kickstarter" funding from Bigelow Laboratory, they have begun examining deeper samples from the same study sites using the same experimental design, to observe how the microbial community changes with depth.

At the same time, they are continuing to refine the method for increasingly extreme environments, applying it to sediment collected through the International Ocean Discovery Program more than a kilometer below the Mid-Atlantic ridge, an

environment which hosts orders of magnitude fewer cells.

"The advantage of this single-cell approach, enabled by the Center for Aquatic Cytometry and Single Cell Genomics Center, is we can target low-biomass environments where there are so few cells it would be impossible to make a measurement otherwise," Lindsay said. "My dream is to get a flow cytometer on a mission like NASA's Europa lander, so we can use this technique to detect possible metabolic activity on other worlds."

(Source:https://phys.org/news/2025-03-scientists-dynamic-microbial-life-coastal.html)

Soil and sediment: Underestimated heroes locking away the majority of CO_2, study reveals

LONDON, March 23 — Soil, river sediment and dead vegetation lock away more planet-warming CO_2 caused by humanity than trees, said a new study published Thursday, challenging long-held assumptions about how Earth stores carbon.

The discovery would be “crucial for shaping future climate” policies for reducing greenhouse gas emissions and improving the capture and storage of carbon dioxide from the atmosphere, the study’s authors said.

About one-third of CO_2 released by human activities is stored in land-based carbon sinks like forests, which along with oceans help slow global warming by absorbing excess heat-trapping emissions.

But forests are under threat, and their capacity to soak up CO_2 has been diminished due to global warming, disease, wildfires and large-scaled land clearing.

Recent studies have shown that Earth’s carbon stocks are increasing, but how this is spread across land-based ecosystems has been less clear.

A major uncertainty has been the distribution between living vegetation like trees and other plants, and non-living matter like decaying wood and soil.

The authors said that understanding this in greater detail was vital because ecosystems face different environmental threats, and boast differing capacities to lock away carbon.

To address this question, an international team of scientists conducted a comprehensive assessment of global changes in carbon stored in woody vegetation between 1992 and 2019.

This study, published in Science, revealed that most of the CO_2 accumulated over that period was locked away as non-living organic matter in soil, deadwood, and reservoirs like dams and landfills.

“Most terrestrial carbon gains are sequestered as non-living matter and thus are more persistent than previously appreciated,” the study said.

“These pools persist far longer than living biomass, suggesting that terrestrial carbon storage may be more stable over time than previously assumed,” said a statement accompanying the study’s release.

These findings contrast sharply with earlier studies that estimated living matter accounted for roughly 70 per cent of the carbon stored on land.

Some parts of the Amazon, due to climate change and deforestation, have shifted from being a sink to source of CO_2, while other landscapes under pressure are also transforming.

After storing carbon dioxide in frozen soil for thousands of years, the Arctic tundra has changed to being an overall source of CO_2 emissions as the region warms up and is torched by wildfire. — ETX Studio

(Source:https://www.cryptifiimanagement.com/news/1636.html)

Using large boulders as indicators of glacial lake outburst flood magnitude in data-sparse regions

Glacial lake outburst floods (floods originating from glacial lakes; GLOFs) can involve large volumes of water and so can be characterized by extreme erosion and sediment transport potential. A recent study published in the journal NHESS, explores the potential of using large GLOF-transported boulders to derive information about the hydrodynamics of a GLOF in a remote and ungauged catchment. On 12th February 2023, the complex GLOF process chain was triggered by a 1.1×106 m3 – 1.5×106 m3 landslide into lake Rasac in the Peruvian Andes. The resulting displacement wave overtopped and partly eroded the moraine dam and rushed downstream into the valley. While steeper parts of the valley directly downstream of the lake predominantly experienced erosion, flatter parts of the valley further downstream experienced

deposition of transported material. The striking elements in the otherwise fine- to medium-coarse-grained deposited material are five very large boulders (each exceeding 3.5 m in diameter). High resolution optical remote sensing images revealed that these boulders must have been transported during the GLOF. Using hydrodynamics analysis, we concluded that flow velocities >5 m s−1 must have been reached in the case of translational motion and >10 m s−1 in the case of rotational motion. While direct observations of GLOF dynamics are rare, our study illustrates how flood-deposited material can help to reveal basic information about flood hydrodynamics and magnitude.

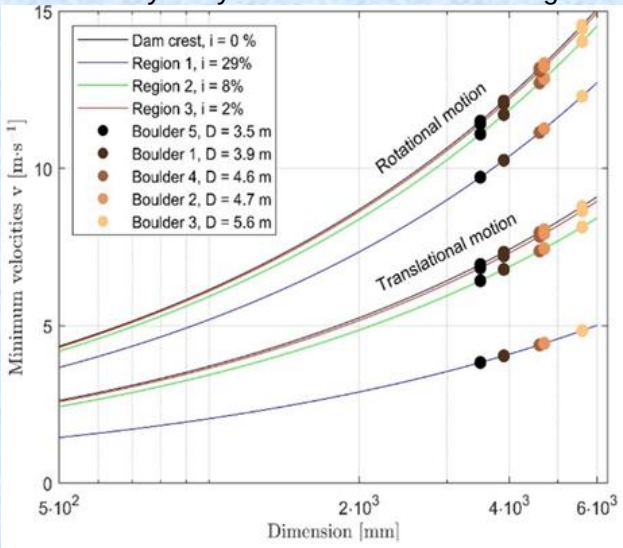


Figure: The relationship between the dimensions of deposited boulders and the minimum flow velocity required to move them (author: Jan Hrebrina).

Reference

Emmer, A., Vilca, O., Salazar Checa, C., Li, S., Cook, S., Pummer, E., Hrebrina, J., and Haeberli, W.: Causes, consequences and implications of the 2023 landslide-induced Lake Rasac glacial lake outburst flood (GLOF), Cordillera Huayhuash, Peru, Nat. Hazards Earth Syst. Sci., 25, 1207–1228, https://doi.org/10.5194/nhess-25-1207-2025, 2025.

Adam Emmer (Uni Graz, Austria; ISI Priority 3 Thematic Coordinator)

Jan Hrebrina (NTNU, Norway)

EU Horizon project on Nature-Based Solutions for Demonstrating Climate-Resilient Critical Infrastructure (NATURE-DEMO)

A HORIZON Innovation project funded by the European Union under Grant Agreement No. 101157448 started on May 1, 2024 and will run until April 30, 2028. The project's Raison d'être is: "As climate disruptions become more frequent and intense, the resilience of Europe's infrastructure is crucial as it supports economic flows, human well-being, and social stability throughout the continent. However, this challenge provides a historic opportunity to revolutionize infrastructure by integrating it with nature. It covers critical sectors (e.g., transport and energy) and engages an alliance of infrastructure owners, scientists from industry and academia, and public authorities."

The project aims at 5 objectives focusing on nature-based Solutions (NbS):

1. Identify and Parameterize NbS for Protecting Critical Infrastructure
2. Develop a Multi-Scale Decision Support Tool Integrating NbS with Digital Inference
3. Demonstrate the Effectiveness of NbS in Increasing Climate-Resilience of Critical Infrastructure
4. Mainstream NbS for Resilient, Climate-Proof Infrastructure
5. Increase NbS Climate Resilience and Adaptation Capacity of Involved Regions, Authorities, and Communities

Among natural hazards that are included into the projects are climatological, meteorological, hydrological, landslide, and snow hazards. Sediments, their movement from sources to sinks within the erosion and sedimentation cycle are an inherent part of beforementioned hazards, especially hydrological ones, and will therefore be incorporated into the project. Sediments will be especially studied as they are impacting water infrastructure as a special type of critical infrastructure to be climate-resilient itself, and that also helps to make other types of critical infrastructure climate-resilient and safe under climate changes.

There are 23 project partners from 13 European countries – 8 partners are from UNESCO Group I – Western Europe and North America, and 5 partners are from Group II – Eastern Europe partners.

More details about the project are available on the project's web pages.

Reference:

https://nature-demo.eu/

Matjaž Mikoš (University of Ljubljana, Slovenia; ISI Group II: Eastern European States Regional Coordinator & Thematic Priority 2 Sediment-related Disaster Risk Reduction WG Co-Leader)

Pan-European Landslide Risk Assessment

Landslides pose critical challenges to human lives and infrastructure across European diverse topographies. The paper “Pan-European landslide risk assessment: From theory to practice” presents a comprehensive examination of landslide processes on a continental scale, highlighting both theoretical frameworks and practical applications. By uniting diverse landslide datasets from multiple national geological surveys, the authors compile over one million slope failure records. These data underscore how discrepancies in mapping practices can generate biases, thereby emphasizing the importance of robust statistical modelling.

A key methodological innovation lies in the use of slope units, which cluster terrain into geomorphologically meaningful subdivisions. This approach significantly refines susceptibility analyses, mitigating issues linked to irregular inventory quality. The authors fuse susceptibility data with exposure indices, quantifying elements such as buildings, farmland, and population distribution. Vulnerability - representing the potential damage to these elements - completes the framework, enabling risk estimation at the continental scale. Notably, the study accounts for variability in mapped landslide extents and leverages sophisticated statistical tools to address spatial biases.

The final findings depict Europe’s most landslide-prone areas, along with estimates of annual economic losses under worst-case vulnerability assumptions. Impacts on population are also explored, highlighting regions where people are at risk during both daytime and nighttime. To extend practical utility, the authors share an online interactive platform, allowing policymakers, urban planners, and the public to examine local landslide risk metrics.

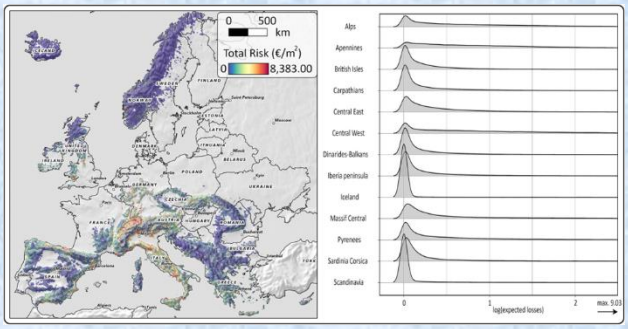


Figure: The left panel shows the cartographic representation of expected economic losses across the European landscape. The right panel reports the distribution of losses for each mountain domain on a logarithmic scale.

Reference

Caleca F., Lombardo L., Steger S., Tanyas H., Raspini F., Dahal A., Nefros C., Mărgărint M.C., Drouin V., Jemec-Auflič M., Novellino A., Tonini M., Loche M., Casagli N., Tofani V. (2025) ‘Pan-European landslide risk assessment: From theory to practice’, Reviews of Geophysics, 63, e2023RG000825. https://doi.org/10.1029/2023RG000825.

Contacts

Nicola Casagli (University of Florence, UNESCO Chair in Prevention and sustainable management of geo-hydrological hazards, Italy, Thematic Priority 2: Sediment-related Disaster Risk Reduction, WG Co-Leader)

PUBLICATIONS

Contents of *International Journal of Sediment Research* (Volume 40, No. 1, 2025)

Pages 1-208 (February 2025)

Flash floods on the northern coast of the Black Sea: Formation and characteristics
Ludmila Kuksina, Pelagiya Belyakova, Valentin Golosov, Ekaterina Zhdanova, ... Artem Gurinov
Pages 192-207

International Journal of Sediment Research (Volume 40, No. 2, 2025)

Pages 209-384 (April 2025)

Flow patterns in shallow rectangular reservoirs with open channel inlet or pipe flow inlet at various depths: An experimental study
El Mehdi Chagdali, Kamal El Kadi Abderrezzak, Sébastien Erpicum, Cédric Goeury, ... Benjamin Dewals
Pages 209-221

Mechanisms of debris-flow volume growth by eroding highly-consolidated landslide dams
Pu Li, Kaiheng Hu, Lan Ning
Pages 222-240

Relation between bank erosion and bed incision in the braided reach of the Lower Yellow River undergoing channel degradation
Junqiang Xia, Yifei Cheng, Meirong Zhou, Xin Yu, ... Zhengbing Wang
Pages 241-252

The use of InVEST-SDR model to evaluate soil erosion and sedimentation in the closer catchment of a proposed tropical reservoir in Sri Lanka
Hulan Badde Gedara Dilshan Madubhashana Padminda Ekanayaka, Nimal Shantha Abeysingha, Tusita Amarasekara, Ram Lakhan Ray, Dinithi Kusalani Samarathunga
Pages 253-268

Grain-size parameters and diatom records as indicators of environmental changes along the southern Brazilian coastal plain
Cristiane Bahi dos Santos, Iran Stallivière Corrêa, Jair Weschenfelder, Jeffery Robert Stone
Pages 269-285

Impact of emergent vegetation on three-dimensional turbulent flow properties and bed morphology in a partially vegetated channel
Pritam Kumar, Anurag Sharma
Pages 286-311

Sediment nitrogen form occurrence associated with its ecological risk in the Yangtze River Delta plain-river network
Xinghua He, Zihan Zhao, Yanqin Zhang, Zucong Cai, Yanhua Wang
Pages 312-321

Impact of different types of sediment-filled check dam systems on runoff erosion dynamics in a Loess Plateau watershed
Ganggang Ke, Shengdong Cheng, Zhanbin Li, Tian Wang, ... Yunzhe Zhen
Pages 322-332

Effect of submerged vegetation on hydraulic resistance of ice-covered flows
Sanaz Sediqi, Jueyi Sui, Guowei Li
Pages 348-368

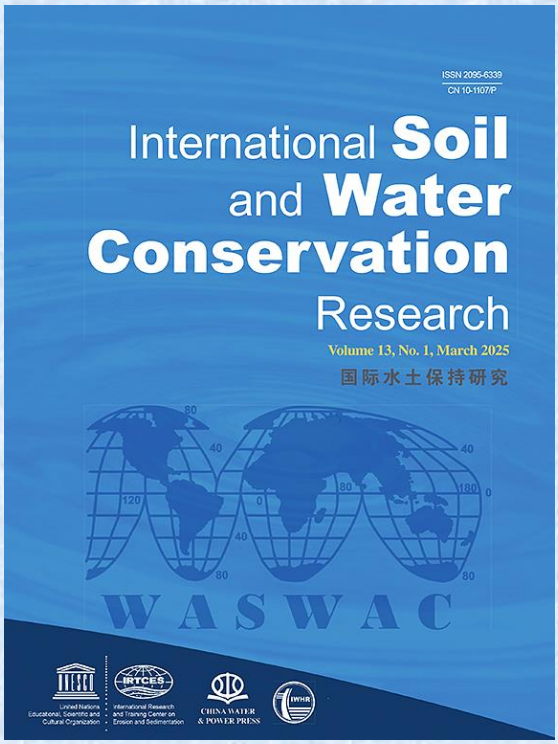
Particle size and settling velocity of bed and suspended sediments for mud-sand beds
Leo van Rijn, Luitze Perk, Bas van Maren, Andy Manning
Pages 369-382

Fluvial Hydrodynamics - Solutions Manual, Subhasish Dey, Sk Zeeshan Ali. Springer (2024), 294, ISBN 978-3-031-25736-0
Hong-wei Fang
Pages 383-384

Quantification of bedload transport in the Hungarian Danube using multiple analysis methods
Sándor Baranya
Pages 1015-1026

Full papers are available at ScienceDirect: https://www.sciencedirect.com/journal/international-journal-of-sediment-research with free access.

Contents of *International Soil and Water Conservation Research* (Vol. 13, No.1, 2025)



Pages 1-216(March 2025)

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

COMING EVENTS

The 28th ICOLD Congress & 93rd Annual Meeting (China, May 16-23, 2025)

Date: May 16-23, 2025
Venue: Chengdu, China

Theme： Common Challenges, Shared Future, Better Dams
Topics:
T1: Precautionary management of dams and river basin under climate change
T2: Multifunctional development of dams and reservoirs
T3: Technologies for dam construction under complex (extreme) conditions
T4: Digital technology applied in dams and digital river basins
T5: The role of dams in achieving the goal of reducing carbon dioxide emissions

URL: https://www.icold-cigb2025.com/
Contact:
Email:icoldcigb2025@outlook.com;icoldcigb2025@iwhr.com

The 41st IAHR World Congress "Innovative Water Engineering for Sustainable Development" (Singapore, June 22-27, 2025)

Date: June 22 - 27, 2025
Venue: Singapore
Organizers: IAHR, Singapore's National Water Agency, National University of Singapore, Nanyang Technological University
Summary: The International Association for Hydro-Environment Engineering and Research (IAHR) World Congress is a biennial event that brings together the latest technical and scientific knowledge, practice, trends, and innovations of the global hydro-environment community. Themed “Innovative Water Engineering for Sustainable Development”, the 41st IAHR World Congress in Singapore will focus on the importance of innovative water engineering towards meeting the Sustainable Development Goals (SDGs) and targets related to water resources. Held amid the International Decade for Action on “Water for Sustainable Development” 2018–2028, by the UN, the Congress will showcase the role of expert knowledge by the water engineering community to the implementation of innovation solutions to meet the SDGs, and share insights on research, technology and innovations that will create significant impact to tackle global challenges such as climate change and sea level rise.
Theme: Innovative Water Engineering for Sustainable Development
Topics:
1. Coastal Flooding and Protection
2. River and Sediment Engineering
3. Eco- and Environmental Hydraulics
4. Hydraulic Structures
5. Integrated Water Resources Management
6. Urban Water Management
7. Flood and Drought Management
8. Groundwater Management
9. Remote Sensing and Field Measurements
10. Computational and Experimental methods
11. Data-Driven Methods and Machine Learning (Hydroinformatics)
12. Digital water
13. Nature-based solutions

Climate mitigation and adaptation
UCL: https://2025.iahr.org/
Email: fulvia_wong@pub.gov.sg

The 16th International Symposium on the Interactions between Sediments and Water (France, June 30–July 4, 2025)

Date: June 30 - July 4, 2025
Venue: Le Touquet, France
Website: https://iasws2025.univ-lille.fr/
Main conference topics:
1. Assessing and restoring disturbed catchments
2. Biogeochemistry in the hyporheic zone
3. Biogenic influences on sediment–water interactions from micro to macro scale
4. Carbon budgets and blue carbon ecosystems
5. Coastline, coastal erosion and solutions
6. Emerging contaminants in sediments
7. Extreme events and environments (droughts, floods, wildfires etc.)
8. Modelling suspended particles and aquatic sediments
9. Rewilding and restoration of coastal areas
10. Sediment management
11. Sediment-associated nutrients and contaminant processes
12. Water quality and organic matter along the watershed–river–sea continuum
13. Other topics related to sediment–water interactions

The 16th International Symposium on River Sedimentation (USA, August 4-7, 2025)

Date: August 4-7, 2025
Venue: Omaha, Nebraska, United States
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 related to the study of sediment and its management.
Organizer: University of Nebraska-Lincoln
Sponsors: World Association for Sedimentation and Erosion Research (WASER), International Research and Training Center on Erosion and Sedimentation (IRTCES)
Co-Sponsors: International Association for Hydro-Environment Engineering and Research (IAHR).....(to be invited)
Secretariat: University of Nebraska-Lincoln
Permanent Secretariat: IRTCES

Theme: Centennial of Modern Sediment Transport Mechanics
Topics:
1. Fundamentals for sediment transport (boundary layer flow, fluvial hydraulics, and hydrology)
2. Fundamentals of sediment transport (bed forms, bed load, and suspended load)
3. Experimental and computational sediment transport and fluvial processes
4. Watershed erosion and sedimentation
5. River erosion and sedimentation (case studies)
6. Scours abound hydraulic structures (case studies)
7. Reservoir sedimentation
8. Estuarine and coastal sediment transport
9. Seabed sediment transport
10. Environmental and ecological sediments with climate changes
URL: https://www.isrs2025.org/
Organization & Contacts:
Prof. Junke (Drinker) Guo
Department of Civil and Environmental Engineering
University of Nebraska—Lincoln
jguo2@unl.edu

The 6th WASWAC World Conference (Morocco, September 15-17, 2025)

Date: September 15-17, 2025
Venue: Rabat, Morocco
Summary: The World Association for Soil and Water Conservation (WASWAC), in collaboration with the Institut National de la Recherche Agronomique (INRA), is organizing the 6th WASWAC World Conference on Resilient Landscapes: Innovations and Traditions in Climate-Adaptive Soil and Water Conservation (RISE-SWC), scheduled from 15 to 17 September 2025 in Rabat, Morocco. The conference will provide an exchange platform for soil and water resources conservation on a global scale, fostering collaboration among scientists, experts, policymakers, and practitioners from around the world. The RISE-SWC conference will explore cutting-edge strategies in the context of climate change and propose practical solutions to provide strong support for addressing global climate change challenges. Participants will engage in discussions on innovative practices, integrating traditional wisdom with modern technologies, and addressing social and economic challenges. The conference aims to propose actionable solutions that can strengthen global efforts to combat climate change impacts on soil and water systems, support sustainable development, and promote technological and scientific advancements in these critical fields.
Organizer: The World Association of Soil and Water Conservation (WASWAC), Institut National de la Recherche Agronomique (INRA)
Theme and Topics: Resilient Landscapes: Innovations and Traditions in Climate-Adaptive Soil and Water Conservation (RISE-SWC)
Sub-themes:
1. Impact of climate change on soil erosion and coping strategies
2. The role of water resources management in addressing climate change
3. Challenges and opportunities of land use planning and management in the context of climate change
4. Integration of traditional wisdom and modern technology in soil and water management
5. Social and economic considerations in soil and water management
6. Strategic shifts in soil and water conservation practices and technologies to address climate change
7. Monitoring and early warning mechanisms in soil and water management
8. Soil and water conservation in production and construction projects
Important dates:
Abstract submission begin: January 1, 2025
Last date of abstract submission: May 30, 2025
Intimation of acceptance of abstracts: June 30, 2025
Registration fee payment begin: January 1, 2025
Contacts:
The WASWAC Secretariat:
YANG Songdi: waswac@vip.163.com
DU Pengfei: waswac@foxmail.com
The Conference Secretariat:
Benabdelouahab Tarik: tarik.benabdelouahab@inra.ma
Conference updates:
www.waswac.org.cn and www.inra.org.ma

River Flow 2026---
The 13th International Conference on Fluvial Hydraulics (Greece, June 29-July 3, 2026)

Date: June 29-July 3, 2026
Venue: Thessaloniki, Greece
Summary: Since its inception in 2002, under the esteemed Fluvial Hydraulics Committee of the International Association for Hydro-Environment Engineering and Research (IAHR), the River Flow Conference Series has proudly stood as a premier global platform for the exchange of pioneering research and best practices in fluvial hydraulics and river engineering.
RiverFlow 2026 invites you to be part of a dynamic assembly of professionals, scholars, and industry practitioners in a vibrant forum dedicated to exploring the cutting-edge experimental, theoretical, and computational advances in river hydraulics and sediment transport processes, covering a wide range of themes spanning the areas of hydro-environment, geosciences and eco-bio-geomorphology.
Organizers: IAHR, Aristotle University of Thessaloniki, Division of Hydraulics and Environmental Engineering
Theme: Steering the future of hydro-environment research and practice
Topics:
1. Fundamental Flow Processes
2. Sediment Transport Dynamics and River Evolution Processes
3. Flow and Sediment Transport Through Hydraulic Structures
4. Eco-Hydraulics and River Re-naturalization
5. Pollutant Transport Processes
6. River Systems and Resilience Under a Changing Climate
7. Integrated River Basin Management

Contacts:
RiverFlow2026@civil.auth.gr
URL: https://riverflow2026.web.auth.gr/

The 9th International Conference on Estuaries and Coasts (China, December, 2026)

Date: December, 2026
Venue: Qinzhou, China
Organizers: Qinzhou Municipal People's Government, Department of Water Resources of Guangxi Zhuang Autonomous Region, Department of Transport of Guangxi Zhuang Autonomous Region

Sponsors: International Research and Training Center on Erosion and Sediment Research (IRTCES);
Co-sponsors: World Association for Erosion and Sediment Research (WASER), China Institute of Water Resources and Hydropower Research (IWHR); International Association for Hydro-Environment Engineering and Research (IAHR); Guangxi University; Guangxi Normal University; Beibu Gulf University, Pinglu Canal Group Co., Ltd

Summary: The International Conference on Estuaries and Coasts (ICEC) is a triennial event initiated by the International Research and Training Center on Erosion and Sedimentation (IRTCES). Eight such conferences have now been held in Hangzhou and Guangzhou, China; Sendai, Japan; Hanoi, Vietnam; Muscat, Oman, Caen, France, Shanghai, China and Canada in 2003, 2006, 2009, 2012, 2015, 2018, 2021 and 2024. With support from related international associations, and with the participation of experts and scholars worldwide, the ICEC has attracted wide attention and has become an important and popular event. The ICEC provides an opportunity for scientists, engineers, researchers and decision-makers to exchange ideas, research results and advanced techniques, and develop collaboration and friendships. The 9th International Conference on Estuaries and Coasts (ICEC 2026) will be held in Qinzhou, China during December, 2026. The ICEC 2026 will provide a venue for intellectual and enlightening discussions of ideas. The conference program will be broad with topics.

Theme:
Estuaries and Coasts under Modern Civilizations

Topics of the Conference:
1. Hydrodynamics and Sediment Transport in Estuaries and Coastal Zones: Fundamentals and Modeling
2. Monitoring, Early Warning and Forecasting of Estuarial and Coastal Hazards
3. Eco-environment Protection in Estuaries and Coastal Zones
4. Climate Change, Human Activities and Their Impacts on Estuaries and Coasts
5. Canal Constructions in Estuaries and Coastal Zones
6. Integrated and Intelligent Management of Estuaries and Coastal Zones
7. Morphological Evolutions of Estuaries, Coasts and Deltas
8. History, Culture, Socioeconomics and Policy on Estuaries and Coasts
9. Impacts of Watershed Developments on Estuaries and Coastal Zones

URL: https://ICEC2026.scimeeting.cn

The 11th International Symposium on Environmental Hydraulics (ISEH 2027) (USA, June 1-4, 2027)

Date: June 1-4, 2027
Venue: The University of Iowa, Iowa City, IA USA
Invitation: We are pleased to announce that the 11th International Symposium on Environmental Hydraulics (ISEH) will be held in Iowa City, IA, USA on the 1st – 4th June 2027. Sponsored by the International Association of Hydro-Environment Engineering and Research (IAHR), the 11th ISEH will build on the success of previous ISEH symposia in bringing together international experts to present and discuss new research and technical innovations in various areas of environmental fluid dynamics research.
The symposium will be held within the University of Iowa campus, providing an ideal setting in which to share knowledge and to meet old and new friends.
The symposium will focus on the latest advances in experimental and computational methods that can be used to deepen our understanding and capacity to predict flow and the associated fluid-driven ecological processes, anthropogenic influences (e.g., heat, dissolved and suspended organic/inorganic material), sediment transport and morphodynamic processes in rivers, coastal regions and reservoirs. We hope the ISEH symposium will provide a productive platform for fruitful scientific discussions, opportunities for younger scientists and practitioners to interact and exchange ideas with established researchers and spark new collaborations among participants. In particular, cross-fertilization among research groups, emergence of new concepts and approaches, and interdisciplinary interactions are expected to be highlights of the ISEH symposium.
We very much look forward to welcoming you in Iowa City.
(Prof. George Constantinescu, Symposium Chair)

URL: https://iseh.conference.uiowa.edu/
Contact
ISEH Conference
College of Engineering
Iowa City, Iowa 52242
Email: iseh-2027@uiowa.edu
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unesco
Intergovernmental Hydrological Programme

International Sediment Initiative

unesco
International Research and Training Center on Erosion and Sedimentation

INTERNATIONAL SEDIMENT INITIATIVE (ISI)

Intergovernmental Hydrological Programme (IHP)
UNESCO

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UNESCO IHP SECRETARIAT

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(to be confirmed)	UNESCO, Beijing
Koen Verbist	UNESCO, Paris
Siying Tan	UNESCO, Paris

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Zhao, Ying	China

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ISI URL: http://www.irtces.org/isi/

IRTCES: International Research and Training Center on Erosion and Sedimentation (IRTCES) under the auspices of UNESCO

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