

# INTERNATIONAL SEDIMENT INITIATIVE

## NEWSLETTER

*Reporting ISI news to you quarterly*

No. 62 Apr. 18, 2022

### IN THIS ISSUE

#### News

- ✧ ISI Advisory Group online meeting convened to discuss ISI's role in IHP-IX (2022-2029) 1
- ✧ Welcome to Dr. Koen Verbist from UNESCO Headquarters, who will be coordinating ISI from the IHP secretariat 1
- ✧ New report: Is the solution to water crises hiding right under our feet? 1
- ✧ IWHR and UNESCO jointly organize a consultation workshop on Water Education in Cambodia 3
- ✧ The impact of two cascaded dams and land use change on the hydromorphology of the Lhasa River on the Qinghai-Tibet Plateau, China 3
- ✧ Global sediment production has increased by about 467% between 1950 and 2010 4
- ✧ Data from Mars rover Zhurong shows evidence of wind, and possibly water, erosion 5

#### Publications

- ✧ Papers Published in IJSR, Volume 37, No. 3, 2022 6
- ✧ Papers Published in IJSR, Volume 37, No. 2, 2022 7
- ✧ Contents of ISWCR (Vol. 10, No.1, 2022) 8
- ✧ UN World Water Development Report 2022 9

#### Coming Events

- ✧ The 14th International Conference on Hydrosience and Engineering (Turkey, May 26-27, 2022) 10
- ✧ The 39th IAHR World Congress (Spain, June 19-24, 2022) 10
- ✧ The 2022 International Symposium on Ecohydraulics (Nanjing, China, October 10-14, 2022) 10
- ✧ 1st IACRR International Conference on Coastal Reservoirs and Sustainable Water Management (Nanjing, China, October 17-20, 2022) 11
- ✧ River Flow 2022 (Online, Nov. 8-10, 2022) 11
- ✧ The 15th International Symposium on River Sedimentation (Florence, Italy, September 5-8, 2023) 11

### UNESCO “国际泥沙计划” 简报

#### 本期内容

#### 新闻

- ✧ ISI 顾问委员会召开线上会议讨论 ISI 在 IHP 第九阶段的作用 1
- ✧ 欢迎 UNESCO 总部 Koen Verbist 博士代表 IHP 秘书处协调 ISI 工作 1
- ✧ 新发布报告：水危机的解决方案是不是藏在脚下？ 1
- ✧ 中国水科院与 UNESCO 金边办公室召开《水知识读本》柬埔寨语版多利益相关方研讨会 3
- ✧ 拉萨河梯级水库蓄水运行对下游辫状河道的水文情势产生短暂的影响 3
- ✧ 全球产沙量在 1950 年至 2010 年间增加了约 467% 4
- ✧ 来自“祝融”号火星探测车的数据显示火星存在风蚀并可能水蚀的证据 5

#### 出版物

- ✧ 《国际泥沙研究》2022 年第 37 卷第 3 期论文目录 6
- ✧ 《国际泥沙研究》2022 年第 37 卷第 2 期论文目录 7
- ✧ 《国际水土保持研究》2022 年第 10 卷第 1 期论文目录 8
- ✧ 联合国 2022 年《世界水发展报告》 9

#### 会议信息

- ✧ 第十四届水科学与工程国际学术讨论会(土耳其, 2022 年 5 月 26-27 日) 10
- ✧ 第三十九届 IAHR 大会(西班牙, 2022 年 6 月 19-24 日) 10
- ✧ 2022 年生态水力学国际学术讨论会(南京, 2022 年 10 月 10-14 日) 10
- ✧ 第一届 IACRR 海洋水库及可持续水管理国际学术讨论会(南京, 2022 年 10 月 17-20 日) 11
- ✧ 河流流动 2022(线上, 2022 年 11 月 8-10 日) 11
- ✧ 第十五次河流泥沙国际学术讨论会(意大利佛罗伦萨, 2022 年 9 月 6-9 日) 11

## NEWS

### ISI Advisory Group online meeting convened to discuss ISI's role in IHP-IX (2022-2029)



On April 14, 2022, an ISI Advisory Group online meeting was organized using Microsoft Teams, to discuss ISI's role in IHP-IX (2022-2029). Participants from the Advisory Group in the meeting included Prof. Manfred Spreafico (ISI Advisory Group Chair), Prof. Des. Walling (ISI Advisory Group Member), Prof. Cheng Liu (ISI Technical Secretariat), and Dr. Anil Mishra & Dr. Koen Verbist representing UNESCO-IHP Secretariat. Dr. Ying Zhao from IRTCES and Ms. Paulina Marcela Ramirez Quevedo from UNESCO-IHP also participated in the meeting.

First, Dr. Koen Verbist, from IHP secretariat, who now coordinating ISI instead of Dr. Anil Mishra, and Dr. Ying Zhao, who is a new contact person from IRTCES, were welcomed. Prof. Cheng Liu provided a brief summary of ISI activities and the ISI Technical Secretariat within IRTCES. Dr. Koen Verbist reported on institutional developments related to the UNESCO IHP, the upcoming 25<sup>th</sup> IHP Council meeting and the new framework for the planning, implementation and monitoring of IHP Flagship Initiatives. Streamlining ISI to fit the new Flagship Programme guidelines, and ISI's role in IHP-IX (2022-2029) were discussed.

### Welcome to Dr. Koen Verbist from UNESCO Headquarters, who will be coordinating ISI from the IHP secretariat



Dr. Koen Verbist is a Programme Specialist

working at the Intergovernmental Hydrological Programme (IHP) at UNESCO Headquarters in Paris, where he is responsible for supporting research programmes on Hydrological Systems, Climate Change and Adaptation, as well as supporting the implementation of the International Sediment Initiative (ISI) and the G-WADI Flagship Programme on water resources management in arid and semi-arid regions.

He has a background in soil erosion, sediment modelling and land restoration and obtained his PhD in 2011 at Ghent University, Belgium, on the improvement of water harvesting systems in drylands of Chile. He has co-authored several UNESCO publications on these topics, and has over 25 scientific papers in international journals, several related to soil erosion and land management.

He can be contacted via [k.verbist@unesco.org](mailto:k.verbist@unesco.org) and is active on [Linked-in](#) and [Research Gate](#).

### New report: Is the solution to water crises hiding right under our feet?



Groundwater accounts for 99% of all liquid freshwater on Earth. However, this natural resource is often poorly understood and consequently undervalued, mismanaged and even abused. According to the latest edition of the United Nations World Water Development Report published by UNESCO, the vast potential of groundwater, and the need to manage it sustainably, can no longer be overlooked.

On March 21, 2022, UNESCO on behalf of UN-Water is launching the latest edition of the United Nations World Water Development Report, titled "Groundwater: Making the invisible visible" at the opening ceremony of the 9th World Water Forum in Dakar, Senegal. The authors call on States to commit themselves to developing adequate and effective groundwater management and governance policies in order to address current and future water crises throughout the globe. Groundwater presently provides half of the

volume of water withdrawn for domestic use by the global population, including the drinking water for the vast majority of the rural population who do not get their water delivered to them via public or private supply systems, and around 25% of all water used for irrigation.

### **Huge social, economic and environmental benefits and opportunities**

The quality of groundwater is generally good, which means it can be used safely and affordably, without requiring advanced levels of treatment. Groundwater is often the most cost-effective way of providing a secure supply of water to rural villages.

Certain regions, such as Saharan Africa and the Middle East for example, hold substantial quantities of non-renewable groundwater supplies that can be extracted in order to maintain water security. However, consideration for future generations and for the economic, financial and environmental aspects of storage depletion should not be overlooked.

In Sub-Saharan Africa, the opportunities offered by the vast aquifers remain largely underexploited. Only 3% of farmland is equipped for irrigation, and only 5% of that area uses groundwater, compared to 59% and 57% respectively in North America and South Asia.

As the report points out, this low use is not due to a lack of renewable groundwater (which is often abundant), but rather by a lack of investments in infrastructure, institutions, trained professionals and knowledge of the resource. The development of groundwater could act as a catalyst for economic growth by increasing the extent of irrigated areas and therefore improving agricultural yields and crop diversity.

In terms of climate change adaptation, the capacity of aquifer systems to store seasonal or episodic surface water surpluses can be exploited to improve year-round freshwater availability, as aquifers incur substantially lower evaporative losses than surface reservoirs. For example, including groundwater storage and abstraction as part of urban water supply planning would add security and flexibility in cases of seasonal variation.

### **Unlocking groundwater's full potential – what needs to be done?**

#### **1. Collect data**

The report raises the issue of the lack of groundwater data and emphasizes that groundwater monitoring is often a 'neglected area'. To improve this, the acquisition of data and information, which is usually the responsibility of national (and local) groundwater agencies, could

be complemented by the private sector. Particularly, the oil, gas and mining industries already possess a great deal of data, information and knowledge on the composition of the deeper domains underground, including aquifers. As a matter of corporate social responsibility, private companies are highly encouraged to share these data and information with public sector professionals.

#### **2. Strengthen environmental regulations**

As groundwater pollution is practically irreversible, it must be avoided. Enforcement efforts and the prosecution of polluters, however, are often challenging due to groundwater's invisible nature. Preventing groundwater contamination requires suitable land use and appropriate environmental regulations, especially across aquifer recharge areas. It is imperative that governments assume their role as resource custodians in view of the common-good aspects of groundwater to ensure that access to – and profit from – groundwater are distributed equitably and that the resource remains available for future generations.

#### **3. Reinforce human, material and financial resources**

In many countries, the general lack of groundwater professionals among the staff of institutions and local and national government, as well as insufficient mandates, financing and support of groundwater departments or agencies, hamper effective groundwater management. The commitment of governments to build, support and maintain institutional capacity related to groundwater is crucial.

The United Nations World Water Development Report (WWDR), UN-Water's flagship publication on water and sanitation issues, focuses on a different theme every year. The report is published by UNESCO on behalf of UN-Water and its production is coordinated by the UNESCO World Water Assessment Programme. The report gives insight into the main trends concerning the state, use and management of freshwater and sanitation, based on work by members and partners of UN-Water. Launched in conjunction with World Water Day, the report provides decision-makers with knowledge and tools to formulate and implement sustainable water policies. It also offers best practice examples and in-depth analyses to stimulate ideas and actions for better stewardship in the water sector and beyond

The World Water Report:

<https://www.unesco.org/reports/wwdr/2022/en>

(Source: UNESCO)

## IWHR and UNESCO jointly organize a consultation workshop on Water Education in Cambodia



IWHR has been working with UNESCO Phnom Penh Office from 2021 to adapt the Water Education Series English version into a Khmer one for wider dissemination in local schools, aiming to promote water-related knowledge among school-age children.

To make the Khmer version an appropriate education material for young readers, the two sides co-organized a consultation workshop, which provided a platform for key experts and relevant stakeholders to openly discuss and finalize some main issues regarding the book.

Dr. PENG Jing, Vice President of IWHR, and Mr. Sardar Uma Alam, UNESCO Representative to Cambodia, delivered opening remarks for the workshop. Mr. Mok Sarom, Deputy Director General for Education, Mr. Nham Sinith, Deputy Director General for Policy and Planning, Ministry of Education, Youth and Sport, and Mr. Nget Sina, General Department of Environmental Knowledge and Education, Ministry of Environment attended the workshop. Representatives from UNICEF, academic institutes, international schools, NGOs and publishers joined the conversation and provided their input regarding the language and cultural problems in adaptation.

Dr. PENG Jing pointed out that the COVID-19 pandemic has exposed and aggravated the increasing shortage of water resources and the subsequent harm it brought to the world. Against such a backdrop, IWHR and UNESCO decided to further cooperate and adapt the Water Education Series from the Chinese original to a multilingual series, hopefully to impart a universal love for water and a sense of urgency to protect it.

Mr. Sardar Umar Alam acknowledged the value of the books in promoting water education and sustainable development, and expressed his gratitude for IWHR's considerable support to the publication of the Khmer version. The UNESCO Phnom Penh Office wishes to take forward the application of the Khmer version in class as supplementary materials so that more teachers

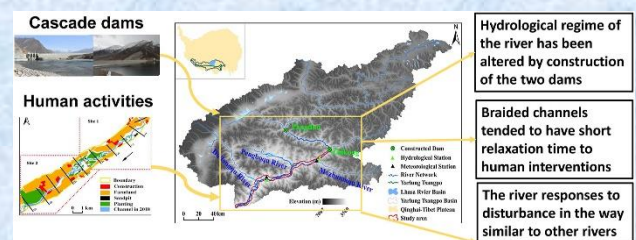
and students can benefit from it.

Mr. Mok Sarom provided his insights of improving the readability of the books and facilitating school dissemination in accordance with the Cambodian education system.

The participants conducted a group discussion about the language, target audience, translation of some technical terms and borrowed words, and the Cambodian water stories, proverbs, guessing words and songs that could be incorporated in the books. Valuable opinions were obtained from multiple stakeholders, including environment, education, culture, science, science publications, and citizen groups.

The Water Education Series jointly published by IWHR and UNESCO targets all age ranges of school students. The books aim to improve water literacy worldwide and share Chinese wisdom and solutions for achieving SDG 6 (Clean Water and Sanitation) and SDG 4 (Quality Education). IWHR is now working together with UNESCO to develop the versions of other UN official languages, like French and Spanish, and languages of China's neighboring countries like Khmer. (Source: IWHR)

## The impact of two cascaded dams and land use change on the hydromorphology of the Lhasa River on the Qinghai-Tibet Plateau, China



A recent article entitled 'Impacts of dams and land-use changes on hydromorphology of braided channels in the Lhasa River of the Qinghai-Tibet Plateau, China', published in the *International Journal of Sediment Research*, reported that the two cascaded dams only changed the flow regime of the immediately downstream braided reach.

**Abstract:** Among braided rivers developed on the Qinghai-Tibet Plateau of China at very high elevations (>3,500 m), the middle and lower reaches of the Lhasa River have been affected by comprehensive human activities mainly involving dam construction, urbanization, farming, afforestation, and mining. In the current study, the impacts of these human activities on hydrology and morphology of the four braided reaches downstream of a cascaded of two dams are investigated. The study period was divided into 1985–2006 (P1), 2006–2013 (P2), and 2013–2019 (P3), representing the natural and changed

flow regimes by dams. Using available daily discharge data at two stations within the four braided reaches, dam-induced hydrological alteration was analyzed based on the indicators of hydrologic alteration and range of variability approach and key discharge proxies were calculated. Remotely sensed images also were selected in the three periods and morphological metrics extracted from them were compared for the four reaches among these periods. Attenuated hydrological regimes were found for only two reaches. The total channel width ( $W_c$ ) and braiding intensity ( $BI_t$ ) followed different temporal trends among the four reaches. Annual average shift rates of the main channel in the four reaches were higher in the short (P2–P3) than in the long (P1–P2 and P1–P3) periods. The longitudinal changes of  $W_c$  and the number of channels did not have any identifiable trend among the four reaches. By linking the morphological changes to quantified spatial and temporal patterns of various human activities, it was found that (1) the two dams had insignificant impact on channel morphology, suggesting that the studied braided river might have a short relaxation time and (2) the evolutionary trajectories of morphological changes in most of the four reaches were similar, suggesting that temporal trends of morphological changes due to complex human activities are not affected by the different physiographic settings of the reaches. Continuous exploitation of the valley area requires comprehensive river management strategies for coordinating various human activities.

### Highlights

- The two cascaded dams only changed the flow regime of the immediately downstream braided reach.
- Channel morphology of the near-dam reach likely had a short relaxation time to recover from less intense disturbances.
- Urbanization and farming constrain the space available for the braided river to change.
- Historical trajectories of channel adjustment in response to human activities are similar among different braided reaches.

More information: You, Y., Li, Z., Gao, P., Hu, T. (2022). Impacts of dams and land-use changes on hydromorphology of braided channels in the Lhasa River of the Qinghai-Tibet Plateau, China, *International Journal of Sediment Research*, Vol. 37, No. 2, pp. 214-228.

<https://doi.org/10.1016/j.ijsrc.2021.07.003>

<https://www.sciencedirect.com/science/article/abs/pii/S1001627921000445>

### Global sediment production has increased by about 467% between 1950 and 2010

Sediment production (supply) from anthropogenic soil erosion, construction activities, mineral mining, aggregate mining, and sand and gravel mining from coasts and rivers, has increased by about 467% between 1950 and 2010, according to a recent review article entitled 'Earth's sediment cycle during the Anthropocene' published in *Nature Reviews Earth & Environment*.

**Abstract:** The global sediment cycle is a fundamental feature of the Earth system, balancing competing factors such as orogeny, physical–chemical erosion and human action. In this Review, values of the magnitudes of several sources and sinks within the cycle are suggested, although the record remains fragmented with uncertainties. Between 1950 and 2010, humans have transformed the mobilization, transport and sequestration of sediment, to the point where human action now dominates these fluxes at the global scale. Human activities have increased fluvial sediment delivery by 215% while simultaneously decreasing the amount of fluvial sediment that reaches the ocean by 49%, and societal consumption of sediment over the same period has increased by more than 2,500%. Global warming is also substantially affecting the global sediment cycle through temperature impacts (sediment production and transport, sea ice cover, glacial ice ablation and loss of permafrost), precipitation changes, desertification and wind intensities, forest fire extent and intensity, and acceleration of sea-level rise. With progressive improvements in global digital datasets and modelling, we should be able to obtain a comprehensive picture of the impacts of human activities and climate warming.

### Key points

- Sediment production (supply) from anthropogenic soil erosion, construction activities, mineral mining, aggregate mining, and sand and gravel mining from coasts and rivers, has increased by about 467% between 1950 and 2010.
- Sediment consumption in the Anthropocene, including from reservoir sequestration, highway development and coal and concrete consumption, has increased by about 2,550% between 1950 and 2010.
- Transport of sediment from land to the coastal ocean (via rivers, wind, coastal erosion, and ice loss) has decreased by 23% between 1950 and 2010, whereas transport of fluvial particulates including organic carbon has decreased by 49% over the same period; offsets include increases in sediment delivery

by icebergs and glacial melt.

- If it were not for sequestration of sediment behind dams, global rivers would have increased their particulate loads by 212% between 1950 and 2010.
- Anthropocene impacts on the marine sedimentary environment remain poorly characterized but, on the basis of the resuspension of seafloor sediment from trawling, dredging and land reclamation, anthropogenic transport seems to have increased by 780% between 1950 and 2010.
- The Earth's present Anthropocene sediment load (net land-to-sea sediment delivery and anthropogenic sediment production) exceeds 300 billion tons (Gt) per year, a mass flux that includes a small (<6%) contribution from natural processes.

More information: Syvitski, J., Ángel, J.R., Saito, Y. et al. Earth's sediment cycle during the Anthropocene. *Nat. Rev. Earth Environ.* (2022). <https://doi.org/10.1038/s43017-021-00253-w>

<https://www.nature.com/articles/s43017-021-00253-w>

#### **Data from Mars rover Zhurong shows evidence of wind, and possibly water, erosion**



A team of researchers affiliated with multiple institutions in China and one each from Canada and Germany, has studied data from the Chinese Mars rover Zhurong over its first 60 sols, showing evidence of wind erosion and possibly impacts from water erosion, as well. In their paper published in the journal *Nature Geoscience*, they discuss what they have found thus far.

China's Mars rover Zhurong has been on the surface of Mars since May of last year. During that time, it has rolled approximately 450 meters over the course of 60 Martian days (sols). Recently, the team working with Zhurong made the data from the rover public. In this new effort, the researchers have been studying the data sent back to learn more about what it has found.

Zhurong was deployed on the planet's Utopia

Planitia—a volcanic plain situated in the northern hemisphere. It is a site that some have suggested was likely once covered with water. Data from the rover's cameras showed that the part of the plain where Zhurong has been rolling along is generally quite flat, with very few boulders. And data from the wheels showed that the surface beneath the rover is covered with small, non-round rocks. Zhurong has also been collecting soil samples as it wanders—thus far, the composition of the soil in the area is similar to that collected by rovers on other parts of the planet.

Image data has also shown that the small rocks have etched grooves on them that appear to be due to wind erosion. They also found some evidence of flakiness in some of the rocks, possible evidence of water erosion.

The researchers also found evidence of mega-ripples on the surface—features formed by wind—similar to sand dunes on Earth. They found the ripples appeared as bright streaks when viewed from an orbiting craft. They theorize that the reason the ripples appear so bright is because they have been covered by a very thin layer of dust. If that turns out to be the case, they note, it would suggest that the wind that had formed the ripples was no longer present.

More information: Ding, L., Zhou, R., Yu, T. et al. Surface characteristics of the Zhurong Mars rover traverse at Utopia Planitia. *Nat. Geosci.* 15, 171–176 (2022). <https://doi.org/10.1038/s41561-022-00905-6>

<https://www.nature.com/articles/s41561-022-00905-6>

(by Bob Yirka , Phys.org: <https://phys.org/> )

## PUBLICATIONS

### Papers Published in the International Journal of Sediment Research Volume 37, No. 3, 2022



Volume 37, Issue 3  
Pages 287-410 (June 2022)

Detailed bed topography and sediment load measurements for two step down flows in a laboratory flume

Daniel Wren, Roger Kuhnle, Tate Mcalpin, David Abraham, Keaton Jones  
Pages 287-298

Spatio-temporal deposition profile of an experimentally produced turbidity current with a continuous suspension supply

Shun Nomura, Giovanni De Cesare, Mikito Furuichi, Yasushi Takeda, Hide Sakaguchi  
Pages 299-306

Nutrients and organic matter in the surface sediment of a submerged macrophyte zone in a eutrophic lake: Implications for lake management  
Jiancai Deng, Xin Lu, Weiping Hu, Zhihong Xu  
Pages 307-316

Approximate velocity for muloover mobile sediment bed induced by velocity-skewed waves and current  
Xin Chen, Minghong Chen, Jingkai Wu, Haifei Liu, Chen Yang  
Pages 317-327

Collar performance in bridge pier scour with debris accumulation  
Hossein Hamidifar, Seyed Mohammad Bagher Shahabi-Haghighi, Yee Meng Chiew  
Pages 328-334

Spatial distribution of trace elements associated with organic carbon along the Beiyun River basin,

Beijing, China  
Farhan Iftikhar, Shiliang Liu, Yongxiu Sun, Yixuan Liu, Muhammad Imran  
Pages 335-345

Sorption and desorption behavior of residual antidepressants and caffeine in fresh water sediment and sewage sludge

Ismael Laurindo Costa Junior, Christiane Schinneider Machado, Adelmo Lowe Pletsch, Yohandra Reyes Torres  
Pages 346-354

Spatial distribution and comparative evaluation of phosphorus release rate in benthic sediments of an estuary dam

Yongsik Song, Yong-Hoon Jeong, Chang-Min Shin, Dong-Heui Kwak  
Pages 355-369

The off-site implications of deforestation on sedimentation rates and pollution in Abkenar open water (Anzali Lagoon, Caspian Sea) using radionuclide techniques and sediment quality indices

Mohammadreza Gharibreza, Mohammad Zaman, Mahmood Arabkhedri, Shahriar Sobh-Zahedi  
Pages 370-382

Predictability performance enhancement for suspended sediment in rivers: Inspection of newly developed hybrid adaptive neuro-fuzzy system model

Rana Muhammad Adnan, Zaher Mundher Yaseen, Salim Heddami, Shamsuddin Shahid, Aboalghasem Sadeghi-Niaraki, Ozgur Kisi  
Pages 383-398

Flow-induced vegetation uprooting in a meandering bend: Experimental investigation

Donatella Termini, Alice Di Leonardo  
Pages 399-410

**Papers Published in the International Journal of Sediment Research Volume 37, No. 2, 2022**



Volume 37, Issue 2  
Pages 139-286 (April 2022)

Invisible face of COVID-19 pandemic on the freshwater environment: An impact assessment on the sediment quality of a cross boundary river basin in Turkey  
Cem Tokatlı  
Pages 139-150

Sediment transport mechanisms and selective removal of soil particles under unsteady-state conditions in a sheet erosion system  
Elham Sirjani, Majid Mahmoodabadi, Artemi Cerdà  
Pages 151-161

Theory of delayed response in river morphodynamics: Applicability and limitations  
Chenge An, Xudong Fu  
Pages 162-172

Distribution of heavy metals in water and sediment of an urban river in a developing country: A probabilistic risk assessment  
Mir Mohammad Ali, Saima Rahman, Md Saiful Islam, Md Refat Jahan Rakib, ... Khamphe Phoungthong  
Pages 173-187

Characteristics and variation law of wind-blown sand delivered to the Ningxia–Inner Mongolia reach of the Yellow River under a changing environment  
Zhichun Yue, Ximin Yuan, Lugan Cao, Fuchang Tian, ... Hongwu Zhang  
Pages 188-201

Trace elements migrating from tailings to rock varnish laminated sediments in an old mining region from Nelson, Nevada, USA  
Douglas B. Sims, Amanda C. Hudson, John E. Keller, Michael Strange, ... Sean Torres

Pages 202-213

Impacts of dams and land-use changes on hydromorphology of braided channels in the Lhasa River of the Qinghai-Tibet Plateau, China  
Yuchi You, Zhiwei Li, Peng Gao, Tiesong Hu

Process-based suspended sediment carrying capacity of silt-sand sediment in wave conditions  
Liqin Zuo, Dano Roelvink, Yongjun Lu, Guanghui Dong  
Pages 229-237

Quantifying the actual sediment load flux into Lake Baikal: A case study of the main tributary – The Selenga River (Russia)  
Tatiana Potemkina, Vladimir Potemkin  
Pages 238-247

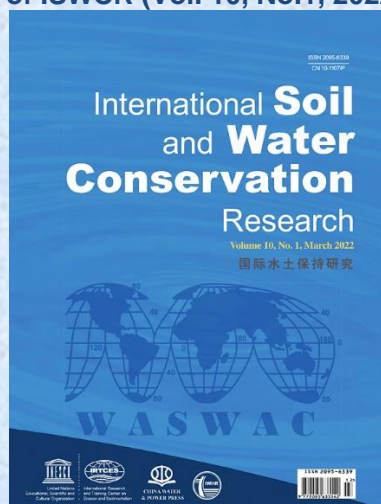
Implications of turbulent shear on clay floc break-up along the Atlantic estuary (Bouregreg), Morocco  
Krishnamoorthy Lakshmi Ammal Priya, Soufiane Haddout, Joan Cecilia Catubig Casila  
Pages 248-257

Porosity of bimodal and trimodal sediment mixtures  
Chamil Perera, Weiming Wu, Ian Knack  
Pages 258-271

Gravel excavation and geomorphic evolution of the mining affected river in the upstream reach of the Yangtze River, China  
Yi Xiao, Wenjie Li, Shengfa Yang  
Pages 272-286

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

## Contents of ISWCR (Vol. 10, No.1, 2022)



Volume 10, Issue 1  
Pages 1-160 (March 2022)

An updated isoerodent map of the conterminous United States

Ryan P. McGehee, Dennis C. Flanagan, Puneet Srivastava, Bernard A. Engel, ... Mark A. Nearing  
Pages 1-16

Monitoring gully erosion in the European Union: A novel approach based on the Land Use/Cover Area frame survey (LUCAS)

Pasquale Borrelli, Jean Poesen, Matthias Vanmaercke, Cristiano Ballabio, ... Panos Panagos  
Pages 17-28

Unpaved road erosion after heavy storms in mountain areas of northern China

Chunmei Wang, Baoyuan Liu, Qinke Yang, Guowei Pang, ... Enheng Wang  
Pages 29-37

Determination of rill erodibility and critical shear stress of saturated purple soil slopes

Dandan Li, Xiaoyan Chen, Zhen Han, Xiaojie Gu, Yanhai Li  
Pages 38-45

Erosion risk assessment: A contribution for conservation priority area identification in the sub-basin of Lake Tana, north-western Ethiopia

Daniel Asfaw Bekele, Getachew Workineh Gella, Mulualet Asfaw Ejigu  
Pages 46-61

Mapping soil erodibility in southeast China at 250 m resolution: Using environmental variables and random forest regression with limited samples

Zhiyuan Tian, Feng Liu, Yin Liang, Xuchao Zhu  
Pages 62-74  
Download PDFArticle preview

Tillage and crop management impacts on soil loss and crop yields in northwestern Ethiopia

Fekremariam Asargew Mihretie, Atsushi Tsunekawa, Nigussie Haregeweyn, Enyew Adgo, ... Mulatu Liyew Berihun  
Pages 75-85

Effects of a check dam system on the runoff generation and concentration processes of a catchment on the Loess Plateau

Shuilong Yuan, Zhanbin Li, Li Chen, Peng Li, ... kunxia Yu  
Pages 86-98

A new definition of soil to promote soil awareness, sustainability, security and governance

Carmelo Dazzi, Giuseppe Lo Papa  
Pages 99-108

Land surface roughness impacted by typical vegetation restoration projects on aeolian sandy lands in the Yarlung Zangbo River valley, southern Tibetan plateau

Baojun Zhang, Donghong Xiong, Yongfa Tang, Lin Liu  
Pages 109-118

Soil properties characterization for land-use planning and soil management in watersheds under family farming

José Miguel Reichert, Paulo Ivonir Gubiani, Danilo Rheinheimer dos Santos, Dalvan José Reinert, ... Sandro José Giacomini  
Pages 119-128

Organic manure input and straw cover improved the community structure of nitrogen cycle function microorganism driven by water erosion

Yulong Shi, Qingwen Zhang, Xingren Liu, Xuekai Jing, ... Li Zheng  
Pages 129-142

Changes in hydrologic components from a mid-sized plots induced by rill erosion due to cyanobacterization

Atefeh Jafarpour, Seyed Hamidreza Sadeghi, Behrouz Zarei Darki, Mehdi Homaei  
Pages 143-148

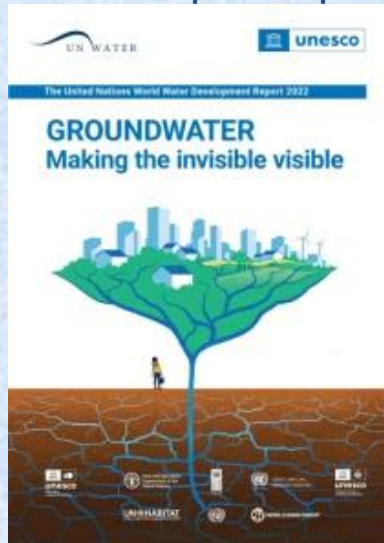
A detailed reconstruction of changes in the factors and parameters of soil erosion over the past 250 years in the forest zone of European Russia (Moscow region)

Andrey Zhidkin, Daria Fomicheva, Nadezhda Ivanova, Tomáš Dostál, ... Josef Krása  
Pages 149-160

Free full papers and open access are available at ScienceDirect :

<https://www.sciencedirect.com/journal/international-soil-and-water-conservation-research>.

## UN World Water Development Report 2022



The United Nations World Water Development Report 2022: Groundwater: Making the invisible visible

The 2022 edition of the United Nations World Water Development Report (UN WWDR 2022) entitled 'Groundwater: Making the invisible visible' describes the challenges and opportunities associated with the development, management and governance of groundwater across the world.

Corporate author: UNESCO World Water Assessment Programme

ISBN: 978-92-3-100507-7

Collation: 225 pages

Language: English

Also available in: French

Year of publication: 2022

Webpages:

<https://www.unesco.org/reports/wwdr/2022/en>

Available in the UNESCO Digital Library:

<https://unesdoc.unesco.org/ark:/48223/pf00003807>

21

## COMING EVENTS

### The 14th International Conference on Hydrosience and Engineering (Turkey, May 26-27, 2022)

**Date:** May 26-27, 2022

**Venue:** Cesme, Turkey

**Invitation:** We are pleased to announce that 14th International Conference on Hydrosience & Engineering, ICHE 2022, will be held on May 26-27, 2022 through face-to-face sessions at IZTECH, Urla, Turkey.

Due to the health and safety concerns, and prospective uncertainties regarding the global travel situation, we had to postpone ICHE 2022 conference which was originally planned in September, 2020.

If you haven't submitted an abstract yet, you can directly submit an extended abstract/full paper to participate ICHE 2022 by December 15, 2021.

We look forward to seeing you in İzmir. Until then, we hope that you stay safe and well.

ICHE 2022 LOC

**URL:** <https://www.iche2020.org/>

**Contact**

info@iche2022.org

### The 39th IAHR World Congress (Spain, June 19-24, 2022)

**Date:** June 19-24, 2022

**Venue:** Granada, Spain

**Invitation:** On behalf of the Congress Organising Group (COG) of the 39th IAHR World Congress and the International Association for Hydro-Environment Engineering and Research (IAHR), we are delighted to invite you to join the 39th IAHR World Congress in 2022 in Granada, Spain.

Spain is a leading country in Hydro-Environment Engineering, strongly involved with IAHR. We are also a hub for Europe, Asia, Africa and the Americas, a gateway to the world. Customs procedures for coming to Spain are very easy for the majority of countries around the world, with no visa needed for over 100 nationalities. Granada has superb transportation connections – there are more than 70 international flights (destinations) from Malaga Airport and over 200 through the Madrid and Barcelona Airports – and incredible accessibility from all parts of the world.

Granada is unique: there are few places in the world where one can see so many hydro-environment engineering processes in such a small area: snow, desert, pristine rivers, spectacular reservoirs, and traditional cultural techniques alongside ultra-modern technologies. Granada is a modern city but with an impressive historical legacy. Not too large, nor too small; very well connected and affordable for everybody.

The University of Granada is the leader in Europe in international student exchanges and has vast experience organizing large-scale events. The Granada Congress Centre with its unique auditorium capable of welcoming 2.000 delegates and its modern audio-visual facilities offers a state of the art conference experience in the heart of the city. PCO Kenes Spain has the experience, knowledge and reliability that the IAHR World Congress needs.

This Congress will bring together the enthusiasm of a whole country to organize a high-level event in the field of water. For us it's not just another event, but the event of the year. The central theme of the Congress will be "From

Snow to Sea", linking past with present and focusing attention on the importance of considering the integral water cycle to address present and future challenges.

Specific topics including Human-water relationships, Snow, river and sediment management, Environmental hydraulics and urban water cycle, Hydraulic structures, Water resources management, valuing and resilience, Computational and experimental methods, Coasts, estuaries and shelves and Extreme events: from droughts to floods will be covered in regular sessions. Special Sessions will also be organized in collaboration with worldwide experts in the different fields.

The Congress will provide a platform for science and practice to meet. A lively exhibition alongside the congress will present the latest developments in equipment, software and instrumentation as well as enhance relevant achievements from practice. Workshops and training events will be offered as well throughout the event. (Prof. Joseph Hun-wei Lee, IAHR President)

**URL:** <https://iahrworldcongress.org/>

**Contact**

Congress Secretariat

+34 913612600

Llámamos iaahr2022@kenes.com

### The 2022 International Symposium on Ecohydraulics (Nanjing, China, October 10-14, 2022)

**Date:** October 10-14, 2022

**Venue:** Nanjing, China

**Invitation:** On behalf of the International Association for Hydro-Environment Engineering and Research and the local organizing committee, we cordially invite you to the 14th International Symposium on Ecohydraulics that will be held from October 10th to 14th 2022 in Nanjing, China, an ancient capital of ten dynasties in Chinese history, boasting numerous historic sites, splendid cultural heritage, beautiful cityscape and sceneries.

Ecohydraulics is a rapidly developing inter-discipline of ecology and hydraulics brought about by the ever-growing concern of aquatic and riparian ecology. Since its first edition in 1994, the International Symposia on Ecohydraulics have provided platforms for scientists and engineers worldwide to discuss cutting-edge scientific progress, compared and evaluated state-of-the-art technical methods, and recommended them to the end-users.

ISE 2022 covers a wide spectrum of topics related to ecohydraulics in theory and in practice, including the hydrological, hydraulic, morphodynamic, structural, ecologic, biologic, and technical aspects of the discipline. Six high-profile keynote speeches will be presented. We are expecting you to present at the symposium and share the latest advancement of your research with the international scientific community. Both oral and poster presentations are welcome. A special issue of Environmental Science & Ecotechnology focusing on this conference will be published. Traditionally, ISE features an ECoENet pre-conference workshop which helps early career researchers (ECR) working in ecohydraulics find opportunities and overcome challenges. Starting from the current edition, ISE plans to provide an interactive lecture of a helpful technical tool applied in one of these three topics (1) fieldwork, (2) lab experiments (3) numerical simulation, and rotate among them in the future. (ZHANG

Jianyun, Yangtze Institute for Conservation & Development, China, Nanjing Hydraulic Research Institute, China)

**URL:** <https://ise2022.org/>

**Contact**

ISE2022 Secretariat  
sec@ise2022.org  
+86-25-85828956

### 1st IACRR International Conference on Coastal Reservoirs and Sustainable Water Management (Nanjing, China, October 17-20, 2022)

**Date:** October 17-20, 2022

**Venue:** Nanjing, China

**Summary:** The 1st International Conference on Coastal Reservoirs and Sustainable Water Management will be held by Hohai University in Nanjing (China) in November 6th-9th, 2023. Coastal reservoirs could provide a solution to the water problems of many coastal cities, but their successful development faces various 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 provide students an opportunity to discuss with renowned and well-established researchers and professionals in this field.

Hohai University, founded in 1915, has the largest number of researchers studying water-related problems in the world and has gained worldwide reputation for its focus on water. Hohai is a state key university under the direct administration of the Ministry of Education of China. The university has been collaborating closely with various academic organizations including the International Association for Hydro-Environment Engineering and Research (IAHR). Seven colleges at Hohai are relevant to the topic of coastal reservoirs, including the College of Environment, College of Hydrology and Water Resources, College of Water Conservancy and Hydropower Engineering, College of Harbor, Coastal and Offshore Engineering, College of Oceanography, College of Civil and Transportation Engineering, and College of Mechanics and Materials. Professor Hongwu Tang, the Chair of the University Council and the Founding-chair of the China Chapter of the International Association for Coastal Reservoir Research (IACRR), cordially invites you to attend the conference.

**URL:** <http://www.iacrr2020.com/>

**Contact**

Chunhui Lu: [clu@hhu.edu.cn](mailto:clu@hhu.edu.cn)  
Guangqiu Jin: [jingq@hhu.edu.cn](mailto:jingq@hhu.edu.cn)  
Chi Zhang: [zhangchi@hhu.edu.cn](mailto:zhangchi@hhu.edu.cn)  
Consultation mailbox: [iccr@hhu.edu.cn](mailto:iccr@hhu.edu.cn)

### River Flow 2022 (Online, Nov. 8-10, 2022)

**Date:** Nov. 8-10, 2022

**Venue:** Online

**Invitation:** Welcome to River Flow 2022, the 11th International Conference on Fluvial Hydraulics. Organized since 2002 under the auspices of the Fluvial Hydraulics Committee of the International Association for Hydro-Environment Engineering and Research (IAHR), the River Flow Conference Series has become the main international event focusing on fluvial hydraulics and river engineering.

River Flow 2022 will be a unique occasion to present and discuss the latest experimental, theoretical and computational findings on fundamental river flow and transport processes, river morphology and morphodynamics. The conference will as well cover issues related, but not limited to: the effects of hydraulic structures on flow regime, river morphology and ecology; sustainable river engineering practices (including stream restoration and re-naturalization); and effects of climate change including extreme flood events. Given the present uncertainty related to COVID-19, the conference will be held virtually.

Following on the tradition and success of previous editions of River Flow conferences, River Flow 2022 will feature a day devoted to Master Classes for young researchers, daily keynote lectures, ample time for the presentation and discussion of accepted contributions (full papers and extended abstracts), and the presentation of the Stephen E. Coleman Award distinguishing the best paper first authored by a young researcher.

**URL:** <https://www.rf2022.com/>

**Contacts:**

The LOC of River Flow 2022

➡ Follow us on Twitter: @riverflow2022

[riverflow2022.org@queensu.ca](mailto:riverflow2022.org@queensu.ca)

### 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).....(to be invited)

**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 (tentative)

The symposium topics include (tentative):

1. Sediment transport
2. Reservoir sedimentation
3. River morphodynamics
4. Coastal morphodynamics
5. Ecomorphodynamics
6. Sediment related disaster
7. Plastic in river and coastal systems
8. Interaction between sediment dynamics and hydraulic structures
9. Integrated Sediment Management at the River Basin Scale

10. Social, economic & political problems related to sediment and water management

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

**Organisation & 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](mailto:info@isrs2022.it)



**INTERNATIONAL SEDIMENT INITIATIVE (ISI)**  
**Intergovernmental Hydrological**  
**Programme (IHP)**  
**UNESCO**

**ORGANISATION: UNESCO**

Abou Amani	UNESCO, Paris
(to be confirmed)	UNESCO, Beijing
Koen Verbist	UNESCO, Paris

**ISI URL:** <http://www.irtces.org/isi/>

**ISI GOVERNANCE**

**Advisory Group**

Manfred Spreafico (Chairperson)	Switzerland
Cheng Liu	China
Anil Mishra	UNESCO
Desmond E. Walling	UK

**Expert Group**

Abdalla Abdelsalam Ahmed	Sudan
Farhad Yazdandoost	Iran
Gerrit Basson	South Africa
Giampaolo Di Silvio	Italy
Gil Mahé	France
Helmut Habersack	Austria
Johannes Cullman	WMO
Rollin H. Hotchkiss	USA
Valentin Golosov	Russia
Zhao-Yin Wang	China
José Alberto Zúñiga	Costa Rica
Thomas Hoffmann	Germany

**ISI TECHNICAL SECRETARIAT**

International Research and Training Center on  
 Erosion and Sedimentation (IRTCES)  
 under the auspices of UNESCO  
 P.O. Box 366, 20 Chegongzhuang West Rd.  
 Beijing, 100048, China  
 Fax: +86-10-68411174  
<http://www.irtces.org/>

**Secretary-General:**

Hu, Chunhong China

**Contact**

Liu, Cheng	China
Zhao, Ying	China

**Newsletter Layout and Production:**

ISI Technical Secretariat  
 The ISI Newsletter is sent quarterly to ISI Governance  
 members and interested experts. Please send your  
 contributions to the ISI Chairperson at  
[manfred.spreafico@hispeed.ch](mailto:manfred.spreafico@hispeed.ch) or ISI technical  
 Secretariat at [chliu@iwhr.com](mailto:chliu@iwhr.com)

**Editor:** Dr. Liu Cheng

P.O. Box 366, 20 Chegongzhuang West Rd.  
 Beijing, 100048, China  
 Fax: +86-10-68411174  
 E-mail: [chliu@iwhr.com](mailto:chliu@iwhr.com)

**Advisor:** Prof. Des. E. Walling



Jiudu River in Beijing, China (by Yaojuan Yang)