WASWAC

HOT NEWS

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WASWAC

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Welcome to Attend the IYFSWC IV in Sept. 21-24, 2024

Deputy President of WASWAC was elected as councilor of Governors of ICIMWB

Prof. Dr. SHR SADEGHI, the deputy president of our association, as the representative of WASWAC, attended the first meeting of the Governing Board of International Center for the Integrated Management of Watershed and Bio-Resource in Arid and Semi-Arid Regions (ICIMWB) that affiliated to United Nations Educational, Scientific and Cultural Organization (UNESCO), and was elected as a member of the Council of Governors of the center during the first meeting of the Governing Board of ICIMWB on April 24, 2024 in NRWMoI in Tehran, Iran.

The meeting was graced by the presence of key stakeholders, including the deputy minister and head of the NRWMoI, the deputy of Research, Education, and Extension of Agriculture of the Ministry of Jihad Agriculture, senior managers of the organization's headquarters, ambassadors, and representatives of member countries, and experts and managers of the provinces. This diverse group reviewed and approved the mid- and long-term programs and plans and the credits needed for ICIMWB in the current year. The meeting was finished by planting trees in the precinct of the NRWMoI.

Global Soil Erosion Map (GSERmap) Workshop Held Successfully

TIime & Venue

April 22-25, 2024 ,Northwest A&F University, China

Introduction

Exchange results of progresses of soil erosion mapping at the global, regional and country level, and to discuss the technical documents and work plan of Global Soil Erosion Mapping program .

Organization

This workshop is sponsored by Global Soil Partnership (GSP) of the FAO in collaboration with the World Association of Soil and Water Conservation (WASWAC), organized by the College of Soil and Water Conservation Science and Engineering, Northwest A&F University, and co-organized by the National Earth System Science Data Center-Loess Plateau subcenter.

The opening ceremony of the workshop was presided over by Professor Hao Feng, Director of College of Soil and Water Conservation Science and Engineering, Northwest A&F University. Mr. Lifeng Li, Secretary of the Global Soil Partnership (officer in charge), Director of the Land and Water Division, of FAO, Professor Duihu Ning, President of WASWAC, Professor Yulin Fang, Vice President of Northwest A&F University, and Ms. Isabel Luotto, International consultant (Soil Information/Data), Global Soil Partnership of FAO, expressed high respect and warm welcome to the participating experts and members of the working group, and also expressed strong support for the GSERmap work.

Mr. Lifeng Li, Secretary of the Global Soil Partnership (officer in charge), Director of the Land and Water Division, of FAO

During the workshop, Ms. Isabel Luotto, International consultant (Soil Information/Data), Global Soil Partnership of FAO, and Mr. Li Rui, Professor of Northwest Agriculture and Forestry University and Honorary President of World Association of Soil and Water Conservation, provided detailed presentations on the purpose, progress and plan of the GSERmap work, respectively. Professor Baoyuan Liu from Beijing Normal University and Northwest A&F University, Professor Wang Fei from Northwest A&F University and Professor David Lobb from University of Manitoba in Canada, presented the technical frameworks on global water erosion, wind erosion and tillage erosion, respectively. At the same time, Professor Richard Cruse from Iowa State University, USA, Professor Panos Panagos from Joint Research Centre of European Commission, Professor Pasquale Borrelli from Roma Tre University, ITALY, Professor Xihua Yang, Principal Scientist of NSW Department of Planning and Environment, Australia, and Professor Yun Xie from Beijing Normal University presented excellent academic reports on soil erosion research and mapping in various regions worldwide. The workshop also invited international experts in the field to conduct in-depth and extensive discussions across two round tables.

The successful convening of this effort will further promote the global soil erosion assessment and mapping, and is of great significance to soil and water conservation, regional ecological security and food security, and achieving the Sustainable Development Goals by 2030. It also promotes the discipline construction of soil and water conservation and desertification prevention, and contributes to our school's global leadership in the field of soil and water conservation research and education.

The International Sediment Initiative Advisory Board Meeting held in UNESCO Headquarters

Time & Venue

April 22-23, 2024, UNESCO headquarters, Paris, France

Theme

Discuss and finalize the new ISI strategy and its workplan for the implementation of ISI during IHP-IX

Main Content

During the opening session chaired by Dr. Anil Mishra, Mr. Abou Amani highly praised the achievements of ISI and the outstanding contributions of the retiring members of the ISI Advisory Group and Experts Group during IHP-VIII. ISI is expected to make an important contribution to the strategy of IHP-IX.

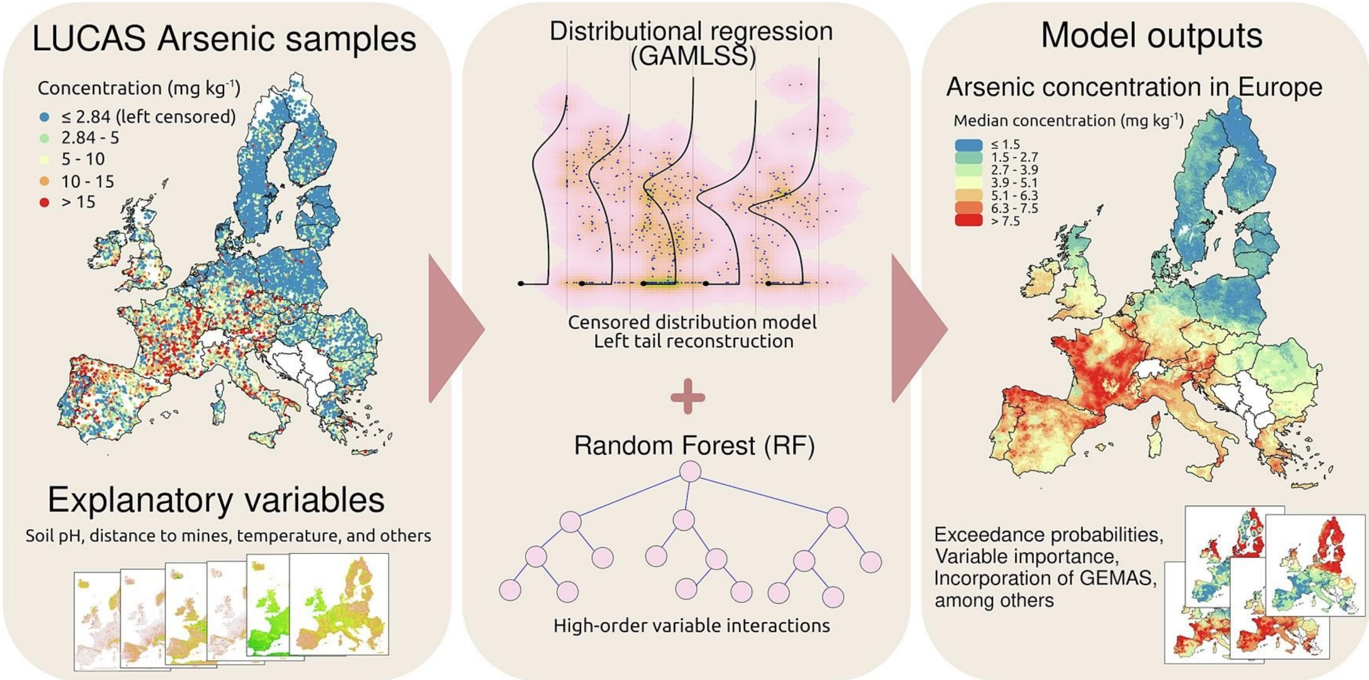
◇ Dr. Koen Verbist chaired the following sessions including: (1) A Review of the achievements of ISI work in IHP-VIII and an Introduction to Erosion and Sediment Transport and Management in river systems (ISI Thematic Priority 1); (2) Presentations from different Regional Groups (Group I Western European and North American States; Group III Latin American and Caribbean States; Group IV Asian and Pacific States; and Group Va Africa and Vb Arab States): Current Activities, Needs and Challenges of Sediments and Erosion; (3) An Introduction to Sediment-related Disaster Risk Reduction (Current Activities, Needs and Challenges); (4) An Introduction to Glacier-related sediment and erosion hazard management (Current Activities, Needs and Challenges); (5) Presentation of the draft new ISI Strategy (2022 to 2028), and brainstorming of overall objectives and the new ISI Strategy; (6) Brainstorming of the draft workplan for the ISI thematic priorities (1 - Erosion and Sediment Transport and Management in river systems; 2 - Sediment-related Disaster Risk Reduction; and 3: Glacier-related sediment and erosion hazard management); and (7) Brainstorming of the ISI governance structure.

◇ Prof. Hongling Shi and Prof. Cheng Liu briefly introduced IRTCES and its activities, reviewed the history of ISI and its achievements and the contributions of IRTCES acting as the ISI Technical Secretariat, presented the relevant activities of IRTCES planned for the coming 2 years, and proposed potential future new case studies and training workshops for discussion. Prof. Manfred Spreafico and Prof. Des Walling presented and commented on the success, experiences and lessons learned from previous ISI activities and their implications for the future.

◇ At the meeting, the Regional Coordinators and Thematic Coordinators were nominated, and the responsible focal points for the activities of the workplan for the implementation of the new ISI strategy during IHP-IX were decided.

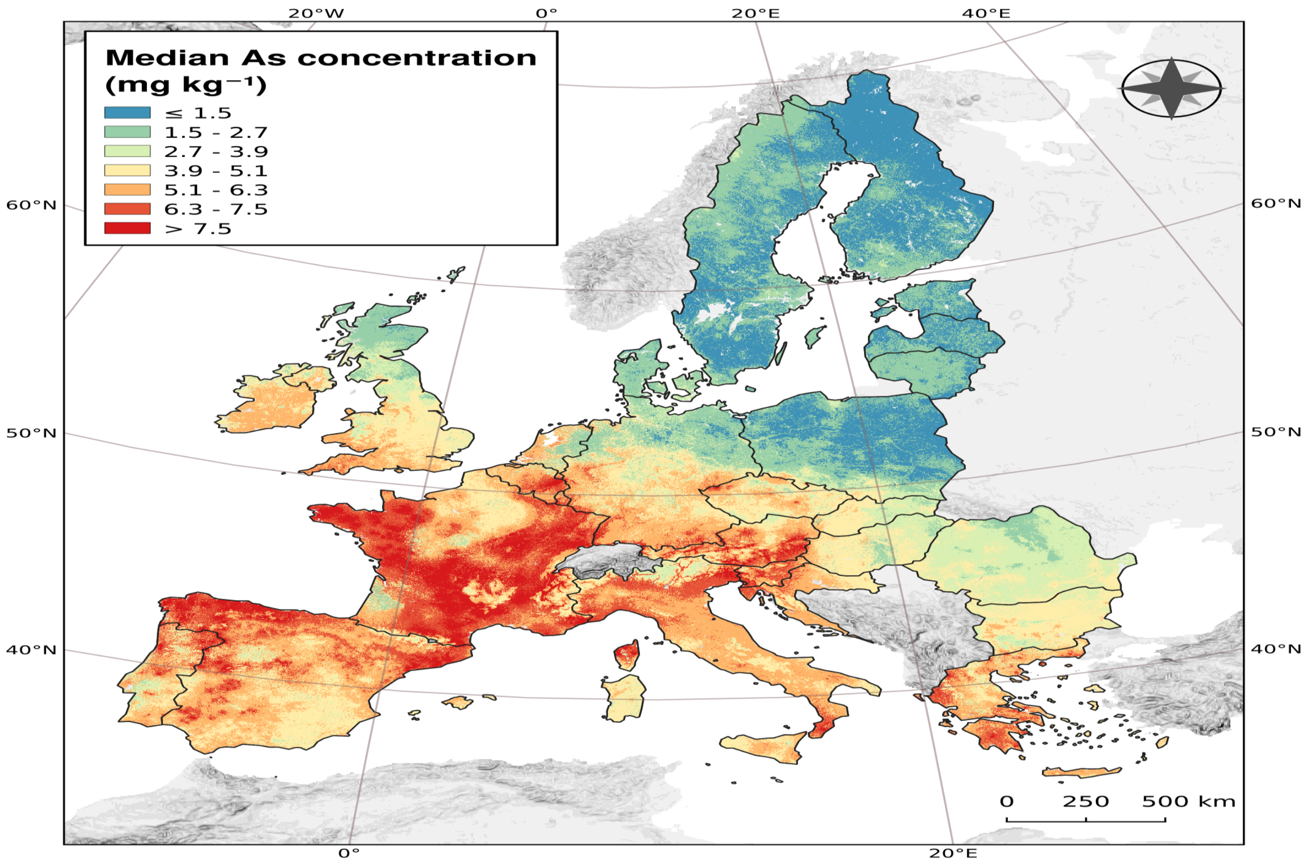
Details: *http://isi.irtces.org/isi/NewsEvents/news/webinfo/2024/04/1713247713965840.htm*

Arsenic in Topsoils



Data and methods: The LUCAS 2009/2012 database contains 21,682 samples, of which 329 do not have As data available. In the remaining 21,353 observations, 9,784 (i.e., 45.82 %) are below the LOQ of 2.84 mg kg−1. Such a censored nature of these As observations has several implications to the exploratory analysis and modeling procedures. For instance, the commonly used distribution moments, such as the mean and variance, can not be calculated to characterize the data, and quantiles have to be used as an alternative. In that case, the only quantiles that can be obtained are those that exceed the fraction of observations below the detection limit for a given subset of the data. To deal with such restriction, the exploratory analysis in this work consisted of reporting the empirical cumulative function for the As concentration.

Introduction: Arsenic (As) is a versatile heavy metalloid trace element extensively used in industrial applications. As is carcinogen, poses health risks through both inhalation and ingestion and is associated with an increased risk of liver, kidney, lung, and bladder tumors. In the agricultural context, the repeated application of arsenical products leads to elevated soil concentrations, which are also affected by environmental and management variables. Since exposure to As poses risks, effective assessment tools to support environmental and health policies are needed.

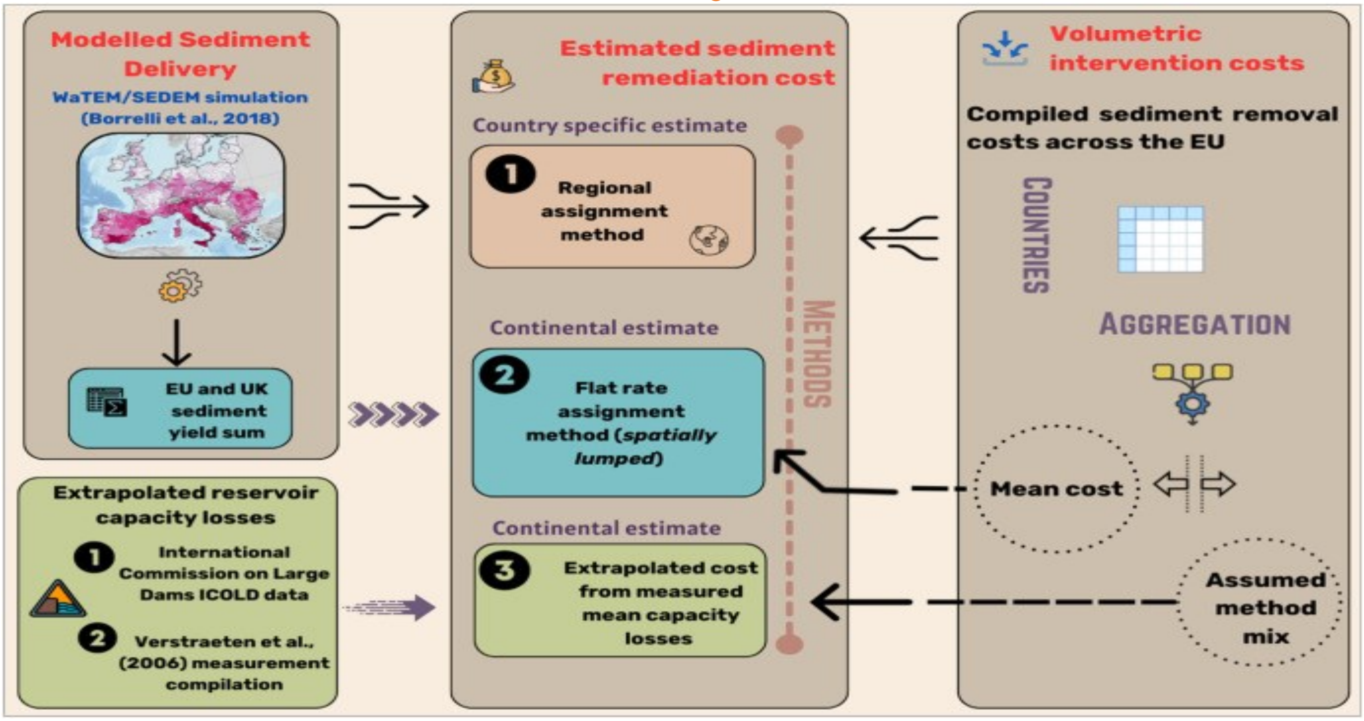


Results :

Figure shows the median As concentrations calculated with the fitted LUCAS model at the 250 m spatial resolution for Europe. The values range from 1.1 to 64.6 mg kg^{-1}, with arithmetic and geometric means of 4.1 and 3.5 mg kg^{-1}. The average value per country shows that Latvia, Estonia, Lithuania, Finland and Poland present the lowest averages, equal to 2.03, 2.10, 2.30, 2.41 and 2.68 mg kg^{-1}, respectively. Among the countries with the highest values, Luxembourg, Portugal, Slovenia, France and Austria present averages of 9.00, 9.00, 9.21, 9.71 and 9.74 mg kg^{-1}, respectively. The country-averaged As concentration points to the existence of three groups of countries: with lower (< 4 mg kg^{-1}), medium (4 - 7 mg kg^{-1}), and higher (> 7 mg kg^{-1}) As concentrations. The group of low values is geographically clustered, with the spatial distribution of Fig. 6 displaying a clear difference between the As concentrations in Northern Europe and the other regions. While the results of the comparison against the background concentration (Fig. 9) indicate that most of the As found may come from human contamination, the comparison against exceedance probabilities indicate that most of Europe has a relatively small risk of exceeding 45 mg kg^{-1}.

Details: *https://esdac.jrc.ec.europa.eu/themes/arsenic-topsoils*

Sediments Removal Costs



Spatial Coverage: analysis European Union 28 Member States

Description : For the entire EU and UK, the cost of removing an estimated 135 million m³ of accumulated sediments produced by water erosion is estimated at roughly 2.3 (±0.9) billion € per year. When applying a method that considers all types of soil loss processes, a simplistic extrapolation puts the sediment inputs at an order of magnitude higher (>1 billion m³), but the removal cost (per m³) may be less due to application of less costly techniques in silted dams. With a conservative estimation, the removal of sediments from EU dams may cost at least 5–8 billion € per year..

Time Reference : 2010

Format: XLS

Input data : Sediment losses data. (You can download the sediment amount distributed in 6,000 catchments)

More Information : Sediment transport using WaTEM/SEDEM

Release Date : 21/3/2024

Soil erosion is both a major driver and consequence of land degradation with significant on-site and off-site costs which are critical to understand and quantify. One major cost of soil erosion originates from the sediments delivered to aquatic systems (e.g., rivers, lakes, and seas), which may generate a broad array of environmental and economic impacts. As part of the EU Soil Observatory (EUSO) working group on soil erosion, we provide a

Methodology	Processes	Estimated sediments (m^3)	Annual costs for sediment removal
Continental flat rate assignment for the entire EU	Soil loss by water erosion	135 (±10) million	2.3 (±0.2) billion € (mechanical dredging)
Regional assignment rate	Soil loss by water erosion	135 (±10) million	2.3 (±0.9) billion € (mechanical dredging)
Extrapolated potential reservoir capacity losses	All soil loss processes (water erosion, gully erosion, badlands, bank erosion, landslides, piping, quarrying, etc.).	1000–1670 million	5-8 billion € (hydraulic flushing)
			10-18 billion € (mixed dredging-flushing)
			16-27 billion € (mechanical dredging)

comprehensive assessment of the existing costs of sediment removal from European Union (EU) catchments due to water erosion. These quantifications combine continental average and regionally explicit sediment accumulation rates with published remediation costs, integrating numerous figures reported in the grey literature. The cost of removing an estimated 135 million m3 of accumulated sediments due to water erosion only is likely exceeding 2.3 billion euro (€) annually in the EU and UK, with large regional differences between countries. Considering the sediment delivered through all soil loss processes (gullies, landslides, quarrying, among others) through extrapolating measured reservoir capacity losses, the sediment accumulation in the circa 5000 EU large reservoirs exceeds 1 billion m3 with a potential cost of removal ranging between 5 and 8 billion € annually. These estimates, although not accounting for already implemented catchment mitigation measures, provide insights into one of the off-site costs of soil erosion at both the continental scale as well as the regional differences in economic burden. The provided estimates contribute to support policies such as the Soil Monitoring Law, the Zero Pollution Action Plan, the Farm to Fork strategy and the Water Framework Directive.

Reference: Panagos, P., et al. 2024. Understanding the cost of soil erosion: An assessment of the sediment removal costs from the reservoirs of the European Union. Journal of Cleaner Production, 434: 140183.

Details: *https://esdac.jrc.ec.europa.eu/content/sediments-removal-costs*

Soil erosion in the United States: Present and future (2020–2050)

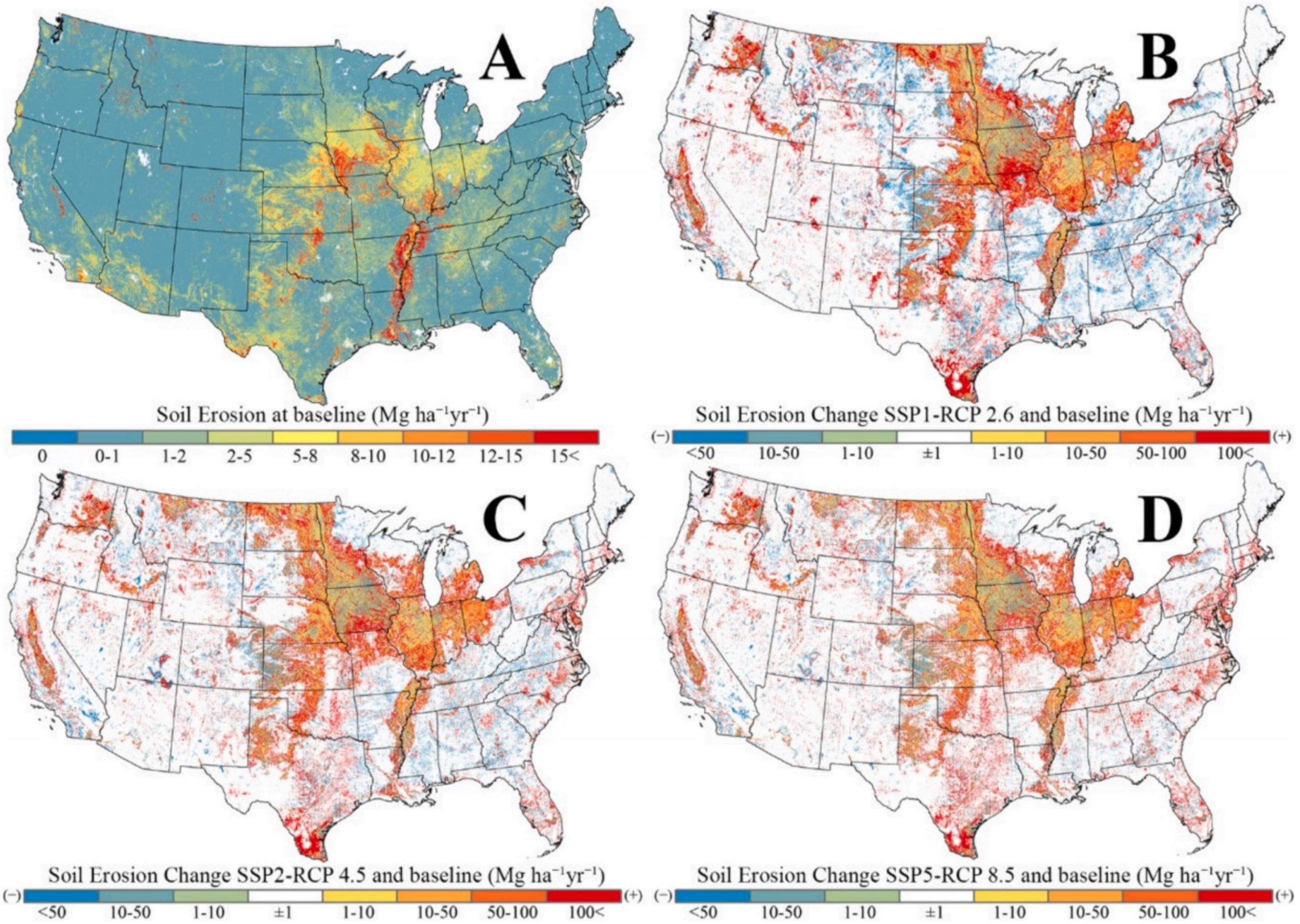


Figure 1 (A) Soil erosion estimates in baseline, soil erosion changes between baseline and scenario of (B) SSP1-RCP2.6, (C) SSP2-RCP4.5, (D) SSP5-RCP8.5 without rainfall erosivity projection (rainfall erosivity of baseline) at 30 m resolution.

Description : For The G2 erosion model which is integrated with Machine Learning (ML) and Remote Sensing (RS) techniques were used to estimate soil erosion based on gauge observations of long-term precipitation, and climate and land use land cover (LULC) scenarios. The baseline model (2020) estimated soil erosion rates of 2.32 Mg ha^{-1} yr^{-1} under current conservation agriculture practices (CPs). Maintaining current CPs, future scenarios predict an 8 % to 21 % increase in soil erosion under different combinations of SSP-RCP climate and LULC change scenarios. The findings can help policy makers for future conservation planning on maintaining soil fertility, mitigating environmental impacts, and promoting food security.

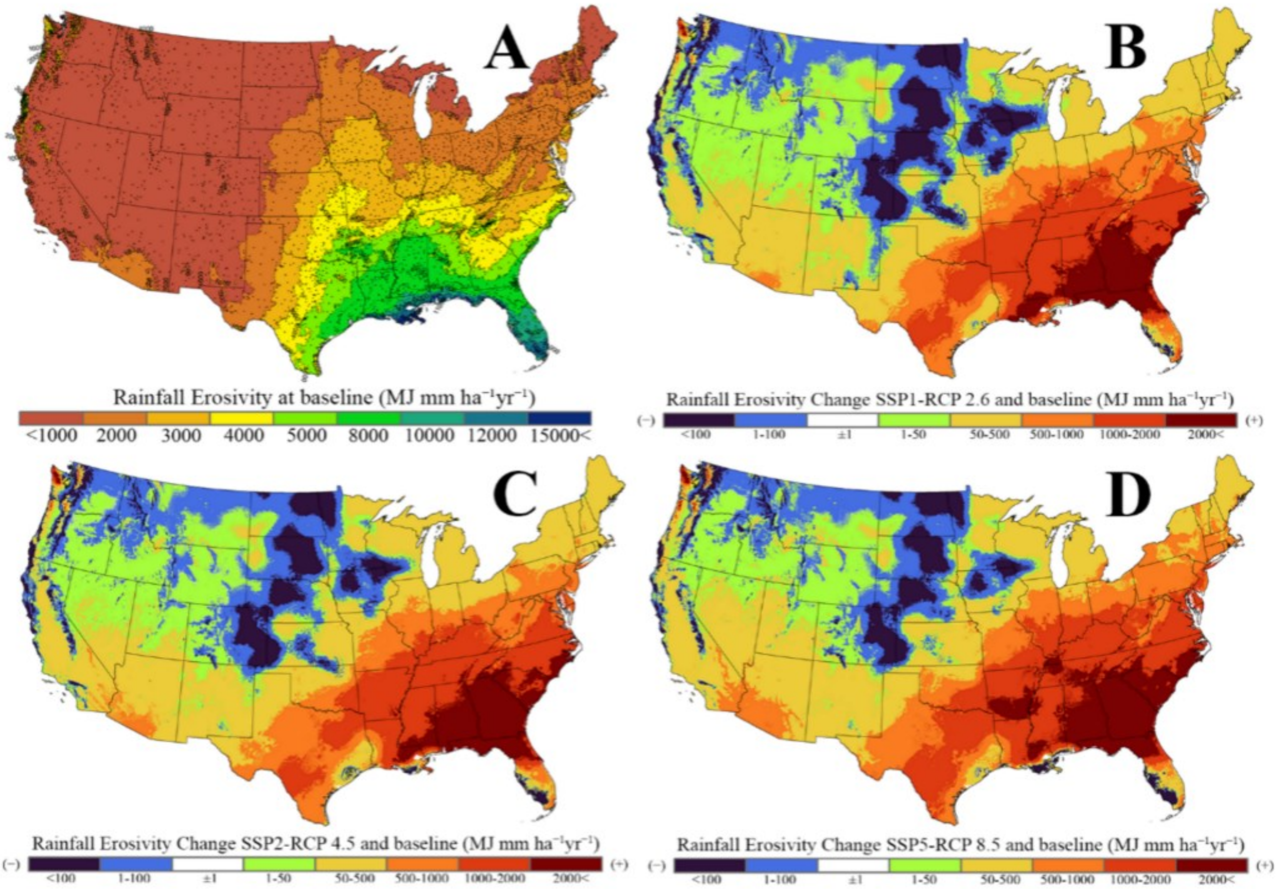


Figure 2 Annual rainfall erosivity estimates (MJ $mm^{-1} ha^{-1} yr^{-1}$) at 30 arc-seconds (A) values between 1979 and 2013 estimated by integrated DL and GPR model, changes in rainfall erosivity between baseline and scenario of, (B) SSP1-RCP2.6, (C) SSP2-RCP4.5, and (D) SSP5-RCP8.5, based on average values of 13 GCMs of the AdaptWest dataset version 1.1 (Table S3).

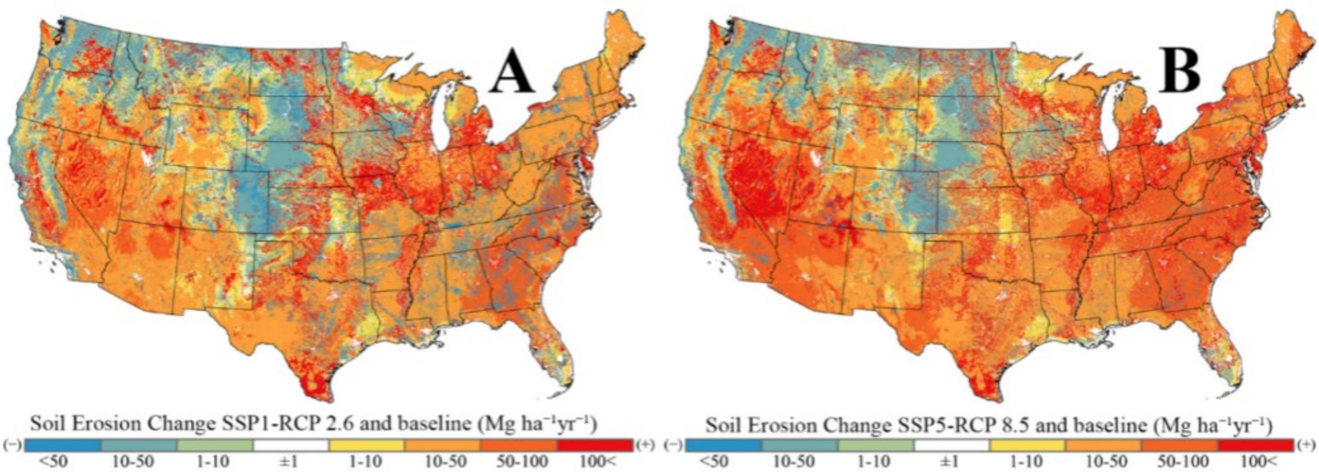


Fig. 3. Soil erosion changes between baseline and scenarios of (A) SSP1-RCP2.6, and (B) SSP5-RCP8.5 at 30 m resolution.

Result:

PRESENT SOIL EROSION: Combined croplands with other vegetated lands (e.g., forest, hay, pastureland, grassland, and shrubland) covering 75 % of the United States lands, were responsible for 90 % (~1.93 Pg yr^{-1}) of the soil erosion in the CONUS. Except for Woznicki et al. (2020) most previous studies ignored soil erosion from non-croplands.

FUTURE SOIL EROSION: Overall soil erosion could increase by 7.8 % in the CONUS (reaching 2.50 Mg ha^{-1} yr^{-1}) . On a continental scale, average rainfall erosivity will increase by 24 % (SSP1-RCP 2.6), 27 %(SSP2-RCP 4.5), and 31 % (SSP5-RCP 8.5), with increasing trends in the eastern and southeastern United States and decreasing trends in the northwestern, in the northwestern, north, and southern regions (Fig. 2B-D). Rainfall erosivity as a major driver will therefore change dramatically by 2050 regardless of the LULC scenarios. Further investigation revealed that lower (vs. higher) elevations would be subject to greater rainfall erosivity. Further analysis revealed that the eastern and southeastern United States would experience a tremendous increase (more than twice) in soil erosion within both the worst (SSP5-RCP 8.5) and the best (SSP1-RCP 2.6) case scenarios. While the western United States showed some deviations from the baseline, soil erosion in the northern regions would be reduced by 2050.

Conclusions:

Our findings demonstrate that not only will overall soil erosion rates increase, but they will also shift spatially from northern and southern regions to new hotspots in the eastern and southeastern United States. While climate factors exerted the most significant influence on soil erosion, LULC shifts also contributed to this phenomenon. When the worst-case future scenario (SSP5-RCP 8.5) is combined with current soil erosion practices, the greatest increase in soil erosion is estimated to be 21 % higher than the baseline estimation of approximately 2.32 Mg ha^{-1} yr^{-1}. The G2 model can be used to evaluate the effect of climate change and LULC alterations on soil erosion field scales (30 m).

China and Europe Cooperate for Water Security in the Future

The past 12 years have been a fruitful period that saw China and Europe roll out more than a dozen joint studies in various fields such as basin management, ecological restoration, facilities for rural water resources management and food security, water and urbanization, water and energy.

CHINA EUROPE Water Platform

China and Europe after a sustained, pragmatic, and in-depth cooperation on water governance, have both made significant contributions to cope with the world's escalating water security challenges, an official with the Ministry of Water Resources said.

In an exclusive interview with China Daily, Xu Jing, deputy director general of the ministry's Department of International Cooperation, Science, and Technology, depicted a long history of close and friendly cooperation in water resources management between China and European countries.

Since the launch of the China-EU River Basin Management Program in 2007, China and Europe have carried out in-depth research and extensive exchanges in river basin management, flood prevention and mitigation, groundwater management and measures responding to climate change.

Xu noted the establishment of the China-Europe Water Platform in 2012 as an important event that marked the beginning of a significant leap forward for the two sides in promoting eco-friendly cooperation in the water resources governance sector.

The two sides have conducted rich pragmatic activities, with focuses on policy exchange, scientific research, and business exchanges, the official noted.

The past 12 years have been a fruitful period that saw China and Europe roll out more than a dozen joint studies in various fields such as basin management, ecological restoration, facilities for rural water resources management and food security, water and urbanization, water and energy.

Under the China-EU Partnership Instrument Program from 2018 to last year, the two sides jointly carried out a batch of concrete projects, she said, citing a pilot venture for ecological restoration in the Nanxi River in Zhejiang province as an example. Borrowing experiences in remediating the Rhine, Danube and Mondego rivers in Europe, experts from China and Europe jointly developed a plan for the conservation of a rare migratory fish species in the river.

China and France renewed the cooperation memorandum of understanding on water resources management in 2018.Xu said China and Europe have reached consensus to embark on a new phase of cooperation with a three-year China-EU Cooperation on Water Project, and a draft overall work plan for the project has been prepared.

The two sides plan to further enhance joint research and technical exchanges in various fields, including basin management, information technology, groundwater recharge, and water recycling, and organize more study tours in these regards.

China and Europe will actively utilize the opportunities presented at important international conferences in 2024 to promote the achievements in China-Europe cooperation on water resources management as they make efforts to contribute their strength to global water governance.

Details: *https://www.chinadaily.com.cn/a/202405/06/WS66381539a31082fc043c54e7.html*

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