

World Association for Sedimentation & Erosion Research – WASER

NEWSLETTER

Reporting WASER news to you regularly

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(December 25, 2022)

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NEWS

The Seventh WASER Council Meeting held online

The Seventh Council Meeting of the World Association for Sedimentation and Erosion Research (WASER) was held online, using a combination of WeChat group meeting and E-mail exchanges, on December 5-6, 2022. The Council Meeting was attended by 22 Council members representing both the Sixth Council and the newly elected Seventh Council, as well as several observers. Prof. Zhaoyin Wang, the retiring President and Prof. Helmut Habersack, the new president, presided over the meeting for the first day and second day, respectively.

Three reports were presented at the meeting. These included the President's report by Prof. Zhaoyin Wang; the Treasurer's report by Prof. Cheng Liu; and a report on the work of the Secretariat during the period 2019-2022 and the work plan for 2022-2025 by Prof. Guangquan Liu. In addition, an overview of the forthcoming 15th ISRS (Florence, Italy, 2023) was presented by Prof. Luca Solari, and an overview of the 16th ISRS (Omaha, Nebraska, USA, 2025) was also presented. The new president Prof. Helmut Habersack made a presentation providing his thoughts on the future for WASER.

The meeting received the results of the poll for the election of members to the WASER Council for 2022-2025, and noted the appointment of additional Council members, including Co-opted Members Prof. Zhaoyin Wang, Prof. Giampaolo Di Silvio and Prof. Des Walling (Past Presidents) and Prof. Junke Guo (16th ISRS LOC), and Ex-officio Members Prof. Guangquan Liu (Secretary-General), Prof. Hongwei Fang (Editor-in-Chief IJSR) and Mr. Wensheng Zhang (Representative of Dept. of Hydrology, MWR).

The meeting also formally noted the award of Honorary Membership of WASER to Prof. Giampaolo Di Silvio, Prof. Chunhong Hu, and Prof. Zhaoyin Wang and the nomination by IRTCES of Prof. Guangquan Liu, as Secretary-General of WASER, of Prof. Hongling Shi as the new Treasurer and of Dr. Ying Zhao as the new Secretary.

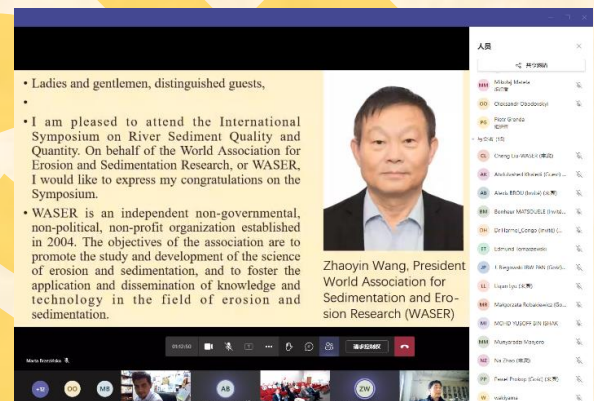
Issues related to the future development of the Association, recruiting of members, revised membership dues, the IJSR impact factor and the co-sponsoring of international conferences were also discussed.

International Symposium on River Sediment Quality and Quantity held in Bydgoszcz, Poland



The International Symposium on River Sediment Quality and Quantity, co-sponsored by IAHS, ICCE and WASER, was held from October 17-21, 2022 in Bydgoszcz, Poland. The symposium was organized by Kazimierz Wielki University.

Professor Zhaoyin Wang, the President of WASER, gave a speech at the opening ceremony on behalf of WASER.



Opening Ceremony speech (Prof. Zhaoyin Wang)

The conference consisted of five sessions, including 43 oral presentations. Some participants attended online.

- Oral Session 1: Sediment quantity – cascades, budgets, yields
- Oral Session 2: Sediment quality - geochemistry, nutrients, contaminants, emerging issues
- Oral Session 3: Sediment impacts on river channel hydromorphology and management
- Oral Session 4 – Introduction of the strategic activities for the development of waterways
- Oral Session 5 – Limitations for inland navigation

Action plan looks to safeguard the Yellow River's environment

The latest national action plan for protecting the Yellow River has laid out a host of measures on pollution control and prevention, ecological restoration, protection of biological diversity, and afforestation.

Analysts said the policy document, jointly released by 12 central government departments this month, will help tackle some of the most pressing issues facing the Yellow River Basin, including pollution from industry, urban areas, and the agricultural sector, and water shortages.

The Yellow River often called "the cradle of Chinese civilization", is the second-longest river in the country after the Yangtze River and runs through nine provincial regions, rising on the Tibetan Plateau and flowing into the Bohai Sea.

Lu Jun, deputy head of the Chinese Academy of Environmental Planning, said that the latest action plan has given greater priority to ensuring environmental and ecological security in the river basin area.

A major highlight of the action plan is its call for steps to cap the development of steel, coal chemical, petrochemical, and nonferrous metals industries in river basin areas to prevent the discharge of pollutants, he said.

The development of urban environmental infrastructure is another policy priority, as the action plan called for cities and townships located on the river and its major tributaries to ensure full coverage by sewer networks in urban areas.

The action plan set the goal of increasing forest coverage in the river basin area to 21.58 percent, restoring 700,000 hectares of natural forests, and eliminating bodies of black, odorous water in the region.

The action plan also rolls out a host of measures for environmental protection in the river basin. A number of National Parks will be created to enhance the protection of natural forests and wetlands and improve water conservation around the river.

The reduction of soil erosion will be prioritized in the middle reaches of the river, including steps to stop the inflow of sand into the river to alleviate the problem of sedimentation affecting the lower reaches.

To strengthen the protection of biodiversity in the region, the plan included measures for creating better habitats for wildlife and for building up monitoring networks for endangered species. The restoration of migration channels and habitats for

fish stocks in the upper reaches of the river was also highlighted.

Lu said that protecting the Yellow River ecology would require coordinated efforts between regions to tackle shared problems, including joint efforts to improve water quality, restore the river ecosystem and respond to climate change.



(Source: China Daily)

Scientists dig into sediments for clues on carbon storage

Marine scientist Matthew Costa is used to digging into research—literally. Over the course of his PhD program at UC San Diego's Scripps Institution of Oceanography, Costa frequently muddied his hands while collecting more than 100 sediment cores from mangrove forests across Latin America.



Researchers Ismael Mascarenas, Juan José Cota-Nieto, and Matthew Costa drive a sediment corer into the flooded mangrove forest floor to collect a sample in the Galapagos Islands. Photo credit: Octavio Aburto-Oropeza

He and other researchers have turned their attention to these sediment cores to better understand how mangrove ecosystems sequester carbon dioxide, a planet-warming greenhouse gas. This work can then inform local and global efforts that aim to use and restore such ocean and coastal "blue carbon" ecosystems as a possible solution in the fight against climate change.

A special issue of the journal *Limnology and*

Oceanography, published Nov. 30, details new research led by Costa, who graduated from Scripps in 2019. In the paper, he and several co-authors from Scripps Oceanography, UC Riverside, and other research organizations describe their work examining mangrove sediment carbon stocks across regions.

While aquatic ecosystems have the ability to trap tons of carbon for thousands of years, little is known about the factors that control how much carbon is stored in one particular region over another. To uncover this mystery, Costa and colleagues sampled sediments from 80 sites across diverse mangrove environments, including the arid Baja Peninsula of Mexico, the volcanic Galapagos Islands, and the geologically and climatically distinct Caribbean and Pacific coasts of Panama.

One of their key findings was that variation in maximum sediment depth—ranging from seven to 427 centimeters (2.8 to 168 inches) across sites—largely explained variation in carbon stocks in those areas. These results underscore the importance of using measurements of sediment depth to estimate carbon stock.



A sediment core collected at Kendall-Frost Mission Bay Marsh Reserve. Photo: Erik Jepsen/UC San Diego

“There’s a lot of local variation in how much carbon is buried beneath those mangroves, and the most important contributor to that variation is just how deep the sediment goes,” said Costa, now a postdoctoral researcher at Northeastern University and a visiting scholar at Scripps Oceanography. “Some studies ignore this variable, but it’s essential to understanding both the history of how these sites attained these carbon stocks and where we should place the highest priority in protecting and managing them to keep mitigating climate change.”

In measuring carbon storage, researchers typically look at carbon density—how much carbon is in the sediment per unit volume—and then scale that up to quantify how much sediment there is in an area. Costa noted that many studies just make those measurements based on the first half meter

or so of sediment, and then scale up.

But in analyzing sediment cores in diverse and remote environments in Latin America, the research team exposed the enormous variation in sediment depths across each area. For example, within the different regions, such as the Galapagos, they found a “huge amount” of variation in sediment depth within sites that were only a few miles apart.

Costa said this research is significant as the team has added to the range of environments in which there are now data on carbon storage in mangroves. By increasing these local measurements, the research community can better map out estimates of carbon storage across study sites, and in turn help inform habitat protection efforts.

Study co-author Paula Ezcurra said this research is unique in that it utilizes datasets of belowground carbon in mangrove sediments across vastly different settings.

“The results highlight that although we’re looking at similar ecosystems—i.e. coastal mangrove forests in Latin America—there exists a wide range of climatic and geological conditions under which mangrove forests can thrive,” said Ezcurra, a former researcher at Scripps Oceanography who is now the science program manager at the Climate Science Alliance. “These differences affect each forest’s ability to sequester and store organic carbon in their soils—something we know to be beneficial in the mitigation of climate change and reduction of atmospheric carbon.”

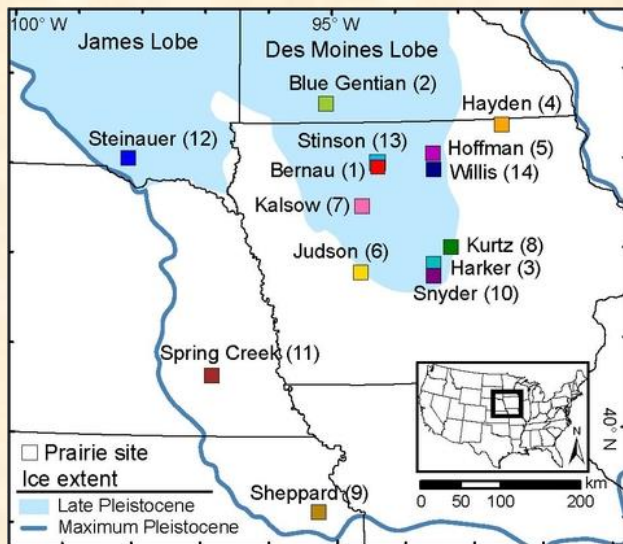
(Source: UC San Diego, <https://today.ucsd.edu/>)

Soil in Midwestern US is eroding 10 to 1,000 times faster than it forms

In a discovery that has repercussions for everything from domestic agricultural policy to global food security and the plans to mitigate climate change, researchers at the University of Massachusetts recently announced that the rate of soil erosion in the Midwestern US is 10 to 1,000 times greater than pre-agricultural erosion rates. These newly discovered pre-agricultural rates, which reflect the rate at which soils form, are orders of magnitude lower than the upper allowable limit of erosion set by the U.S. Department of Agriculture (USDA).

The study, which appears in the journal *Geology*, makes use of a rare element, beryllium-10, or ^{10}Be , that occurs when stars in the Milky Way explode and send high-energy particles,

called cosmic rays, rocketing toward Earth. When this galactic shrapnel slams into the Earth's crust, it splits oxygen in the soil apart, leaving tiny trace amounts of ^{10}Be , which can be used to precisely determine average erosion rates over the span of thousands to millions of years.



Locations of the study sites. Blue shading shows the extent of glaciation during the late Pleistocene. The blue line indicates maximum Pleistocene ice extent. Credit: Quarrier et al., 10.1130/G50667.1

"We went to fourteen small patches of remnant native prairie that still exist in Iowa, Minnesota, South Dakota, Nebraska and Kansas, and used a hand auger to collect deep soil cores, in material that dates back to the last Ice Age," says Isaac Larsen, Professor of Geosciences at UMass Amherst and the paper's senior author. "We brought this soil back to our lab at UMass, sifted it to isolate individual sand grains, removed everything that wasn't quartz, and then ran these few spoonfuls through a chemical purification process to separate out the ^{10}Be -- which was just enough to fit on the head of a pin."

This sample was then sent to a lab which counted the individual ^{10}Be atoms, from which Larsen and his colleagues calculated a precise rate of erosion, stretching from the present day all the way back to the last Ice Age, about 12,000 years ago.

"For the first time, we know what the natural rates of erosion are in the Midwest," says Caroline Quarrier, the paper's lead author and who completed this research as part of her master's thesis at UMass Amherst. "And because we now know the rate of erosion before Euro-American settlement, we can see exactly how much modern agriculture has accelerated the process."

The numbers are not encouraging. "Our median pre-agricultural erosion rate across all the sites we sampled is 0.04 mm per year," says Larsen. Any modern-day erosion rate higher than that number means that soil is disappearing faster than it is accumulating.

Unfortunately, the USDA's current limit for erosion is 1 mm per year -- twenty-five times greater than the average rate Larsen's team found. And some sites are experiencing far greater erosion, disappearing at 1,000 times the natural rate. This means that the USDA's current guidelines will inevitably lead to rapid loss of topsoil.

Not only is the topsoil crucial for U.S. agriculture -- the annual cost of diminished agricultural productivity and environmental degradation due to erosion is estimated to be tens of billion dollars per year -- as well as world-wide food security, but most climate-mitigation plans rely heavily on storing carbon in the soil.



Caroline Quarrier (r) and Brendon Quirk preparing to extract a soil sample from Stinson Prairie, Iowa

Yet, there's no reason to despair. "There are agricultural practices, such as no-till farming, that we know how to do and we know greatly reduce erosion," says Quarrier. "The key is to reduce our current erosion rates to natural levels," adds Larsen.

More information: Caroline L. Quarrier, Jeffrey S. Kwang, Brendon J. Quirk, Evan A. Thaler, Isaac J. Larsen. Pre-agricultural soil erosion rates in the midwestern United States. *Geology*, 2022;

<https://doi.org/10.1130/G50667.1>

PUBLICATIONS

Papers Published in the International Journal of Sediment Research Volume 37, No. 6, 2022

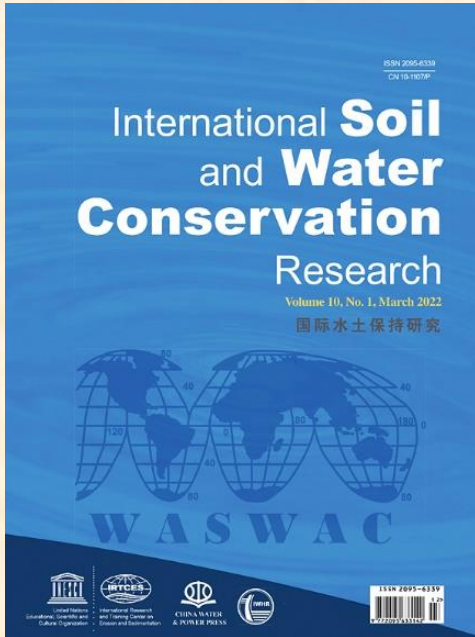


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13. Morphologic evolution of bifurcated reaches in a macrotidal estuary with mountain streams
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Full papers are available at ScienceDirect:
<https://www.sciencedirect.com/journal/international-journal-of-sediment-research> with free access to the paper abstracts.

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Free full papers and open access are available at ScienceDirect :

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

COMING EVENTS

The 9th International Conference on Flood Management (Tsukuba, Japan, February 18-22, 2023)

Date: February 18-22, 2023

Venue: Tsukuba, Japan

Invitation: We are pleased to invite you to the 9th International Conference on Flood Management (ICFM9), held in Tsukuba, Japan, on February 18-22, 2023.

ICFM provides a unique opportunity for various experts and policymakers around the world to discuss and exchange ideas and experiences about a broad range of flood-related issues. Till this year, we have successfully held eight conferences across the globe (with the 8th being held online). The local hosts of ICFM9 are the International Centre for Water Hazard and Risk Management (ICHARM) and the Public Works Research Institute (PWRI) of Japan. The central theme of ICFM9 is River Basin Disaster Resilience and Sustainability by All - Integrated Flood Management in the Post COVID-19 Era. Abstract submission for ICFM9 is now open through the conference website <https://www.icfm9.jp>. The deadline for submitting abstracts (not to exceed 1,000 characters including spaces) is February 28, 2022. Detailed conference information and important dates are available on the conference website.

Plenary Sessions:

1. International Flood Initiative (IFI)
2. Integrated Flood Management under/after the COVID-19 Pandemic
3. Climate Change Adaptation: IPCC/AR6 and Actions to be Taken
4. River Basin Disaster Resilience and Sustainability by All

Themes for Submissions:

1. Lessons Learnt from the Recent Flood & Sediment Disasters towards Better Understanding and Actions
2. Data Integration, Modelling, Forecasting and Early Warning
3. Assessment of Changing Global Risks and their impacts on flooding
4. Flood & Sediment Disaster Counter Measures: Structural and Non-structural Approaches
5. Flood & Sediment Disaster Resilience: Shock Absorption, Response and Transformation
6. Flooding Governance and Finance
7. Education and Capacity Building for Effective Flood Management
8. Interlinkage between Flood & Sediment Disaster Resilience and the SDGs: Interdisciplinary and Transdisciplinary Approaches
9. Compound flooding disasters
10. Systems approach to management of floods

URL: <https://www.icfm.world/ICFM-Conferences/ICFM9>

Contact

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

Date: June 19-23, 2023

Venue: Olomouc, Czech Republic

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

- To analyse the present and future situation of soil and water conservation on a worldwide scale while taking local specifics into consideration.

- To analyse the effects of population growth, human activity and climate change on soil and water in the context of the demands of sustainable farming, water and food supply.

- To promote and increase collaboration between scientific organisations, policymakers, the general public and practitioners.

- To design goals, strategies and directions for conservation of soil and water as basic irreplaceable natural resources for current exploitation and the needs of future generations.

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The 39th IAHR World Congress (Austria, Aug. 21-25, 2023)

Date: August 21-25, 2023

Venue: Vienna, Austria

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

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

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

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

Date: August 21-25, 2023

Venue: Vienna, Austria

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

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

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

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

Date: September 5-8, 2023

Venue: Florence, Italy

Organizer: University of Florence and University of Padua

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

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

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

Date: September 25-28, 2023

Venue: Urbana, USA

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

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

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

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

Deadline for abstract submission is March 3rd, 2023.

Abstracts should be a single page.

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

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E-mail: tinoco@illinois.edu

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