



PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP -or- Program)

PRRIP Sediment Augmentation Data Synthesis Compilation Peer Review Candidate Report

Prepared by: Dr. Chadwin Smith, Executive Director's Office (EDO)

November 2023

1.0 Introduction and Background

The PRRIP seeks an independent peer review of the Sediment Augmentation Data Synthesis Compilation developed by the Program's Executive Director's Office (EDO). One of the Program's primary management uncertainties is the need for long-term sediment (sand) augmentation at the upper end of the Associated Habitat Reach (AHR) to offset a sediment deficit due to clearwater hydropower return flows. Stakeholders have long been concerned that incision and narrowing due to mining of sediment from the bed and banks of the channel downstream of the hydropower return will migrate downstream and impact habitat suitability for the Program's four target species (whooping crane, piping plover, interior least tern [now de-listed], and pallid sturgeon). Efforts to quantify the magnitude of the sediment deficit and develop augmentation methods began soon after Program initiation in 2007. By 2016, Program stakeholders reached consensus that the best next step in evaluating sediment augmentation would be implementation of a full-scale sediment augmentation experiment immediately downstream of the hydropower return. The full-scale augmentation experiment was initiated in 2017 with augmentation occurring annually from 2017 through 2021. In 2022, the Executive Director's Office began analysis of the effectiveness of sediment augmentation, producing multiple lines of evidence across a range of spatial and temporal scales. The Sediment Augmentation Data Synthesis Compilation is a roll-up of this multi-scalar analysis and is intended to provide a framework for the Program to assess the results of sediment augmentation so far and the implications for decision-making related to sediment augmentation throughout the remainder of the Program's First Increment Extension (2020-2032) and beyond.

The results of numerous analyses and multiples lines of evidence are organized into a four-chapter synthesis report. The Executive Summary provides a condensed and consolidated summary of the findings presented in the following chapters. Chapter 1 provides history and context including a summarization of modeling and research conducted during the First Increment of the Program. Chapter 2 is comprised of retrospective analyses of spatial and temporal patterns of incision prior to initiation of the sediment augmentation experiment. Chapter 3 focuses on two-dimensional longitudinal channel response to sediment augmentation. Chapter 4 is comprised of an analysis of volumetric change in the period prior to and during the sediment augmentation experiment. Pending internal feedback and the results of this peer review regarding the significance and relevance of methods and results presented in the Sediment Augmentation Data Synthesis Compilation, the intent is to prepare a manuscript for publication that incorporates parts of the overall report.

This Candidate Report was prepared by Dr. Chadwin Smith of the EDO to assist with the identification of prospective candidates for a three-person Peer Review Panel. Dr. Smith attempted to identify at least two (2) candidates for each position. This report summarizes the process used by Dr. Smith to identify potential peer review candidates and includes a Candidate Summary Chart noting areas of expertise for each candidate, a Candidate Summaries, and a current curriculum vitae (CV) for each candidate.



2.0 Identification of Peer Review Candidates

The PRRIP requested peer review candidates comprising the following areas of expertise: sediment augmentation and management; sediment transport data collection and modeling; and utilization of LiDAR and other tools to evaluate large datasets over time (including dealing with topographic change and uncertainty). The following is a brief summary of the process used by Dr. Smith to identify potential peer reviewers for the Sediment Augmentation Data Synthesis Compilation with a background in one or more of these broad categories of expertise:

Step 1 – Develop a Peer Review Scope of Work.

Dr. Smith developed a Scope of Work (**Attachment A**) for peer review of the Sediment Augmentation Data Synthesis Compilation in consultation with EDO staff and members of the Program’s Technical Advisory Committee (TAC). The Scope of Work includes background information on the Sediment Augmentation Data Synthesis Compilation, specific questions to be addressed by each peer reviewer, and a peer review ranking process.

Step 2 – Solicit peer review candidates.

Peer review candidates were solicited in the following manner:

- Dr. Smith’s personal expertise network.
- Recommendations from the PRRIP Executive Director and EDO staff.
- Recommendations from members of the PRRIP TAC.
- Candidates previously vetted by the PRRIP ISAC Selection Panel for consideration as an ISAC members for the open fluvial geomorphology seat on the ISAC in 2023.
- Identification of subject matter experts in government, academic, and industry fields from current publications on sediment augmentation, management, and evaluation (preferably in braided river systems); sediment transport data collection and modeling; and utilization of LiDAR and other tools to evaluate large datasets over time.
- Peer review candidates were contacted to determine their interest, availability, and willingness to serve. This contact was conducted electronically and by phone. Each candidate was provided with a copy of the Scope of Work and Dr. Smith discussed the anticipated peer review schedule, desired experience, and potential conflicts of interest with all candidates.

Step 3 – Obtain information from each peer review candidate.

Prospective candidates were asked to provide a short biographical statement and their most current CV (all CVs are attached in **Appendix B**; CVs for peer review candidates that were also previously candidates for the open fluvial geomorphology seat on the ISAC earlier in 2023 include a cover letter drafted for the ISAC selection process). All candidates indicated the peer review schedule was acceptable and that they would be able to sign the Program’s Certification Regarding Lobbying and the Program’s Peer Reviewer Conflict of Interest Form.



3.0 Peer Review Candidate Summary Chart

Table 1 identifies six (6) candidates for peer review of the PRRIP Sediment Augmentation Data Synthesis Compilation and four (4) additional individuals that were contacted about the opportunity but declined or did not reply to queries. Each list (Candidates and Non-Candidates) is presented in alphabetical order.

Name	Affiliation	Expertise Area			Status	Notes
		Sediment Augmentation, Management, & Evaluation (braided rivers)	Sediment Transport Data Collection & Modelling	LiDAR & Other Tools for Large Datasets; Topographic Change and Uncertainty		
James Brasington, Ph.D.	University of Canterbury (NZ)	X	X	X	Candidate	ISAC finalist (fluvial geomorphology)
Wes Lauer, Ph.D.	Seattle University		X	X	Candidate	ISAC finalist (fluvial geomorphology)
Mark Smith, Ph.D.	University of Leeds (UK)		X	X	Candidate	Recommended by Alan Kasprak, ISAC member
Mark Stone, Ph.D.	University of Nebraska-Lincoln	X	X		Candidate	ISAC finalist (fluvial geomorphology)
Enrica Viparelli, Ph.D.	University of South Carolina	X	X		Candidate	ISAC finalist (fluvial geomorphology)
Richard Williams, Ph.D.	University of Glasgow (Scotland)	X	X	X	Candidate	Recommended by Alan Kasprak, ISAC member
Scott Anderson	U.S. Geological Survey	Author of key paper on dealing with topographic change and uncertainty			n/a	No response
Sara Bangen	California Department of Fish and Wildlife	Recommended by Alan Kasprak, ISAC member			n/a	No response
Paul Grams, Ph.D.	U.S. Geological Survey	Recommended by Alan Kasprak, ISAC member			n/a	Positive response, needed to check with USGS Center Director, never replied
Damia Vericat, Ph.D.	University of Lleida (Spain)	Recommended by Alan Kasprak, ISAC member			n/a	No response



4.0 Peer Review Candidate Summaries

PRRIP Peer Review Candidate <i>Sediment Augmentation Data Synthesis Compilation</i> November 2023	
Name	James Brasington, Ph.D.
Title	Director, Waterways Centre & Professor of River Science
Affiliation	University of Canterbury & Lincoln University
Location	Christchurch, NZ
Phone	+64 3 369 0154
Email	james.brasington@canterbury.ac.nz
Education	Ph.D., 1998, University of Cambridge; hydrological and erosional consequences of land-use change in Nepal BSc, 1992, University of Bristol
Unique Expertise & Qualifications: Fluvial geomorphologist with extensive experience with braided rivers, large datasets, LiDAR, and the latest modelling tools. Educational and applied background in fluvial geomorphology and sediment. Experience working in multi-stakeholder collaborative settings. Very strong finalist candidate for the open fluvial geomorphology ISAC seat in 2023.	
Short Biography: James Brasington is Professor of River Science and Director of the Waterways Centre, a research partnership between the University of Canterbury and Lincoln University in Aotearoa, New Zealand. He gained his PhD from the University of Cambridge for research into the effects of land-use change on catchment hydrology and sediment yield in the Nepal Middle Hills. For the past 25 years he has developed an internationally recognized track-record for his contributions to fluvial geomorphology, focusing at the intersection of river morphodynamics, Earth observation, and geospatial science. He is well-known for advancing developments in remote sensing to quantify river structure and dynamics and his publication record has over 12,000 citations and an H-index of 42. This research spans a wide range of fluvial systems but focuses, in particular, on understanding the drivers of channel adjustment in high energy, sediment rich, braided rivers. He has a strong network of collaborators throughout Europe, North America, and Oceania and his work is deeply engaged with stakeholders from government, industry, and community groups. In his role at the Waterways Centre, he leads of team of 10 Faculty and post-doctoral researchers and a postgraduate community of over 20 scholars. He also leads a state-of-the-art airborne and terrestrial remote sensing facility at the University of Canterbury, operating topographic and bathymetric LiDAR sensors from manned rotary and fixed-wing platforms as well as boat-based multibeam and interferometric sonar systems.	



PRRIP Peer Review Candidate <i>Sediment Augmentation Data Synthesis Compilation</i> November 2023	
Name	J. Wesley Lauer, Ph.D.
Title	Professor
Affiliation	Department of Civil and Environmental Engineering Seattle University
Location	Seattle, WA
Phone	206-914-5524
Email	lauerj@seattleu.edu
Education	University of California, Berkeley Civil Engineering M. Eng., 1998 Ph.D., 2006, University of Minnesota, Civil Engineering M. Eng., 1998, University of California-Berkeley, Civil Engineering B.S.E., Walla Walla College, Civil Engineering
Unique Expertise & Qualifications: Background in fluvial geomorphology and engineering. Experience with modeling and working with large datasets over long timescales. Finalist candidate for the open fluvial geomorphology ISAC seat in 2023.	
Short Biography: Dr. Lauer's research focuses on geomorphic change in river systems over decadal and longer time scales. The work relies on remote sensing, computer simulations, and focused field measurements. Over the course of his career, Dr. Lauer has developed several computer applications intended to support this analysis. These include GIS-based tools for measuring channel migration and computer models for simulating geomorphic change in rivers (a specialization known as morphodynamic modeling). Dr. Lauer is also interested in the use of low-cost electronic sensors to support community-based hydrologic, geomorphic and ecological measurements. A recent research emphasis for Dr. Lauer in the Pacific Northwest has been on the Elwha River, Washington, where he has used morphodynamic modelling to simulate the response of that system to the historic construction and recent removal of two large dams. Other work has focused on the Minnesota River Basin, Minnesota, and on the Fly River, Papua New Guinea. Dr. Lauer has supervised numerous civil engineering and environmental science students at Seattle University on a wide range of undergraduate capstone projects. Applications of Dr. Lauer's research include evaluation of the sensitivity of river systems to changes in land use, climate, and water resources management (especially dams). The work also has applications in floodplain management and in the restoration/rehabilitation of degraded aquatic systems.	



PRRIP Peer Review Candidate <i>Sediment Augmentation Data Synthesis Compilation</i> November 2023	
Name	Mark Smith, Ph.D.
Title	Associate Professor in Water Research
Affiliation	School of Geography University of Leeds
Location	Leeds, UK
Phone	0113 34 31974
Email	m.w.smith@leeds.ac.uk
Education	Ph.D., 2009, Overland flow resistance and flood generation in semi-arid environments, Durham University, Department of Geography MSc.R., 2005, Influence of surface roughness on runoff generation and soil erosion in semi-arid environments, Durham University, Department of Geography B.Sc. (Hons), 2004, Geography (First Class), Durham University, Department of Geography
Unique Expertise & Qualifications: Expertise in geomorphology and hydrology. Extensive experience with earth surface forms and processes including in-depth modeling and working with topography and large datasets. Experience with gravel bed and sand bed rivers and sediment transport. <i>NOTE: Alan Kasprak of the ISAC suggested Dr. Williams would be able to generate a quality review in a timely manner.</i>	
Short Biography: Dr. Smith is a geomorphologist and hydrologist with a general interest in earth surface forms and processes, applied to a range of environments. I am interested in methods of three-dimensional surveying and parameterising numerically complex topographies both as part of hydraulic modelling and more generally within geomorphology, especially with a view to conducting spatially-distributed morphometric sediment budgets. In the UK, I apply these survey and modelling methods to address a number of management issues, from investigating upland peat erosion due to wildfires, to examining evidence that Natural Flood Management interventions reduce downstream flood peaks, to better parameterising roughness-resistance relationships in marginally-inundated gravel bed rivers, to examining the effects of Large Woody Dams on flow resistance and sediment transport, and to investigating the hydraulic and geomorphological effect of beavers. Beyond the UK, I have an interest in the relationship between hydrological processes and flooding in major African river systems and malaria transmission at both the catchment and continental scale.	



PRRIP Peer Review Candidate <i>Sediment Augmentation Data Synthesis Compilation</i> November 2023	
Name	Mark Stone, Ph.D.
Title	Department Head and Professor
Affiliation	Department of Biological Systems Engineering University of Nebraska – Lincoln (UNL)
Location	Lincoln, NE
Phone	402-472-1413
Email	mark.stone@unl.edu
Education	Ph.D., 2005, Civil and Environmental Engineering, Washington State University M.S., 2000, Civil and Environmental Engineering, Washington State University B.S., 1998, Biological Systems Engineering, University of Nebraska-Lincoln
Unique Expertise & Qualifications: Engineering background with strong experience with braided, sand bed rivers. Experience with modeling and working with interactions between sediment and vegetation. Finalist candidate for the open fluvial geomorphology ISAC seat in 2023.	
Short Biography: Dr. Stone, P.E., D.WRE is a professor and head of the Department of Biological Systems Engineering (BSE) at the University of Nebraska-Lincoln (UNL). His expertise is in the areas of ecological engineering, water resources, and socio-ecological systems resilience. Dr. Stone has extensive research and design experience associated with the interactions between flow, sediments, and vegetation in a range of environments including the Rio Grande (sand bed river), Rio Chama (gravel bed river), and Colorado River Delta and Estuary. He has also served as a scientific team member and modeler for the Colorado River Delta Program and the Lower Colorado River Multi-Species Conservation Program.	



PRRIP Peer Review Candidate <i>Sediment Augmentation Data Synthesis Compilation</i> November 2023	
Name	Enrica Viparelli, Ph.D.
Title	Professor
Affiliation	Department of Civil and Environmental Engineering College of Engineering and Computing University of South Carolina
Location	Columbia, SC
Phone	803-777-7086
Email	viparell@cec.sc.edu
Education	Ph.D., 2007, Engineering of Hydraulic, Transportation and Landscape Systems, University of Naples Federico II M.S., 2002, Environmental and Landscape Engineering, University of Naples Federico II
Unique Expertise & Qualifications: Expertise in fluvial geomorphology and engineering. Experience with gravel augmentation, sediment transport, modeling, and river morphodynamics. Finalist candidate for the open fluvial geomorphology ISAC seat in 2023.	
Short Biography: Dr. Viparelli received her Ph.D. from the University of Naples Federico II, Italy, with a thesis on the development of a procedure to store the grain size stratigraphy of an alluvial bed undergoing aggradation and degradation. This procedure was implemented in a numerical model to predict spawning gravel grain size distribution on the Trinity River, California, in response to coarse gravel augmentations associated with high flow releases from Lewiston Dam. Viparelli's doctoral research was conducted at the University of Illinois, Urbana-Champaign, with the supervision of Professor Gary Parker with whom she continued working as post-doctoral researcher for additional four years. During her post-doctoral study Viparelli participated in large, interdisciplinary research efforts to study the feasibility of the Mississippi River delta restoration with land building diversions, and to assess the consequences of intensive agriculture on channel geometry and sediment loads in the Minnesota River basin. Viparelli's main contribution to the project consisted in the formulation, implementation, validation and application of river and delta morphodynamic models. In December 2012 Viparelli joined the faculty of the Department of Civil and Environmental Engineering at the University of South Carolina at Columbia, where she received tenure and promotion to the rank of professor. At the University of South Carolina, Viparelli continued her work on transport, erosion, and deposition of non-uniform sediment with laboratory, field and numerical studies on contaminant and tracer dispersal, upper regime bedforms, self-formed channel morphodynamics, impacts of harbor development on coastal flooding, nourishments and longitudinal dams to mitigate erosion on the Dutch Rhine.	



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PRRIP Peer Review Candidate <i>Sediment Augmentation Data Synthesis Compilation</i> November 2023	
Name	Richard Williams, Ph.D.
Title	Professor of River Science
Affiliation	School of Geographical and Earth Science University of Glasgow
Location	Glasgow, Scotland
Phone	+44 (0)7812 555 768
Email	richard.williams@glasgow.ac.uk
Education	Ph.D., 2014, Numerical modelling of braided river morphodynamics, Aberystwyth University M.Res., 2005, Science of the Environment, Lancaster University B.A. (Hons), 2004, Geography, University of Cambridge
Unique Expertise & Qualifications: Background in geomorphology. Deep experience with remote sensing and other tools to evaluate topographical data. Experience with sediment transport, modeling, and using satellite imagery and other data to quantify river dynamics. <i>NOTE:</i> Alan Kasprak of the ISAC suggested Dr. Williams would be able to generate a quality review in a timely manner.	
Short Biography: I have led the application of a variety of ground-, air-, and space-based sensors to quantify river flows and landscape change. Recent research has focused upon generating reach- to catchment-scale repeat topographic surveys to enable the calibration and assessment of hydraulic and morphodynamic numerical models. I have also led research that has pioneered the use of archival satellite imagery to quantify national-scale river dynamics. I also use a variety of interdisciplinary techniques to gather data on riverscapes, including historical archives and citizen science. Research topics of ongoing and recent Master's and Doctoral students include river restoration and rewilding; landslide dynamics; rivers and vegetation; tropical rivers; natural flood risk management; quantifying flood dynamics; distributive fluvial systems; more-than-human encounters with rivers; and satellite remote sensing.	

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1 **Appendix A – PRRIP Sediment Augmentation Data Synthesis Compilation Peer**
2 **Review Scope of Work**
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PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP -or- Program)

Peer Review Scope of Work – Sediment Augmentation Data Synthesis Compilation

1) Document Introduction and Background

The Program seeks an independent peer review of the Sediment Augmentation Data Synthesis Compilation developed by the Program's Executive Director's Office (EDO). One of the Program's primary management uncertainties is the need for long-term sediment (sand) augmentation at the upper end of the Associated Habitat Reach (AHR) to offset a sediment deficit due to clearwater hydropower return flows. Stakeholders have long been concerned that incision and narrowing due to mining of sediment from the bed and banks of the channel downstream of the hydropower return will migrate downstream and impact habitat suitability for the Program's four target species (whooping crane, piping plover, interior least tern [now de-listed], and pallid sturgeon). Efforts to quantify the magnitude of the sediment deficit and develop augmentation methods began soon after Program initiation in 2007. By 2016, Program stakeholders reached consensus that the best next step in evaluating sediment augmentation would be implementation of a full-scale sediment augmentation experiment immediately downstream of the hydropower return. The full-scale augmentation experiment was initiated in 2017 with augmentation occurring annually from 2017 through 2021. In 2022, the Executive Director's Office began analysis of the effectiveness of sediment augmentation, producing multiple lines of evidence across a range of spatial and temporal scales. The Sediment Augmentation Data Synthesis Compilation is a roll-up of this multi-scalar analysis and is intended to provide a framework for the Program to assess the results of sediment augmentation so far and the implications for decision-making related to sediment augmentation throughout the remainder of the Program's First Increment Extension (2020-2032) and beyond.

Pending internal feedback and the results of this peer review regarding the significance and relevance of methods and results presented in the Sediment Augmentation Data Synthesis Compilation, the intent is to prepare a manuscript for publication that incorporates parts of the overall report.

The Sediment Augmentation Data Synthesis Compilation consists of 116 pages and is organized as follows:

- Cover Page, Preface, Table of Contents, List of Acronyms (7 pages)
- Executive Summary (4 pages)
- Chapter 1 – Sediment Augmentation: History and Context (16 pages)
- Chapter 2 – Evaluation of Trends in Incision Prior to Full-Scale Sediment Augmentation (28 pages)
- Chapter 3 – Evaluation of Longitudinal Change After Sediment Augmentation in the Central Platte River Valley, NE, USA (36 pages)
- Chapter 4 – Volume Change Analysis (25 pages)

The results of numerous analyses and multiples lines of evidence are organized into a four-chapter synthesis report. The Executive Summary provides a condensed and consolidated summary of the findings presented in the following chapters. Chapter 1 provides history and context including a summarization of modeling and research conducted during the First Increment of the Program. Chapter 2 is comprised of retrospective analyses of spatial and temporal patterns of incision prior to initiation of the sediment augmentation experiment. Chapter 3 focuses on two-dimensional longitudinal channel



response to sediment augmentation. Chapter 4 is comprised of an analysis of volumetric change in the period prior to and during the sediment augmentation experiment.

2) Description of Peer Review

The purpose of this review is to provide a formal, independent, external scientific peer review of the information presented in the Sediment Augmentation Data Synthesis Compilation. The peer review process, including all communication with the Peer Review Panel and development of the summary report from the individual peer reviews, will be coordinated by Dr. Chadwin Smith of the PRRIP EDO.

3) Methods and Scientific Standards

Factors to be addressed include the scientific merit of technical analyses and conclusions. The peer reviewers must ensure any scientific uncertainties are clearly identified and characterized, and the potential implications of these uncertainties for the technical conclusions drawn are clear. Peer reviewers are advised they are not to provide advice on policy. Rather, they should focus their review on identifying and characterizing scientific and technical uncertainties and the technical soundness of the Sediment Augmentation Data Synthesis Compilation.

4) Charge to the Panel

Each Peer Review Panel member will be tasked with reviewing the Sediment Augmentation Data Synthesis Compilation from their particular area of expertise following the PRRIP Scientific Peer Review Guidelines (Attachment A) and the specific directions contained in this Scope of Work. All Peer Reviewers must be prepared to sign (during the contracting phase) the PRRIP Certification Regarding Lobbying (Attachment B) and the PRRIP Conflict of Interest Form for Peer Reviewers (Attachment C). Peer reviewers will be asked to submit all comments, questions, and other communication in writing to ensure an appropriate record is built, and generally all communication with peer reviewers will be conducted via e-mail during the course of the review.

Reviewers must protect information and ensure that services consist of unbiased assessments. Until it is made public, no information from the Sediment Augmentation Data Synthesis Compilation may be released without express written permission from the EDO. Additionally, all peer review-related inquiries from outside sources must be forwarded to Dr. Smith of the EDO; reviewers should not communicate with those inquiring about the review.

Peer reviewers must consider and respond to the questions listed below, at a minimum, in their review:

General Questions:

1. Does the Sediment Augmentation Data Synthesis Compilation adequately address the overall objective – to synthesize multiple lines of evidence from the Program’s full-scale sediment augmentation experiment to assess overall results and provide useful information for decision-making related to future sediment augmentation management actions?
2. Do the authors draw reasonable and scientifically sound conclusions from the information presented? If not, please identify those that are not and the specifics of each situation.



3. Are there any seminal peer-reviewed scientific papers omitted from consideration that would contribute to alternate conclusions that are scientifically sound? Please identify any such papers including citations.
4. Are the statistical methods and modeling tools used valid and current, and are the associated results presented in a manner useful to Program decision-makers?
5. Are potential biases, errors, or uncertainties appropriately considered within the methods sections and then discussed in the results and conclusion sections?

Technical Questions:

6. LiDAR data was processed to remove non-random error to the degree possible. Accordingly, two- and three-dimensional change analyses did not utilize methods (e.g., thresholding) to quantify and/or account for error. Was that an appropriate approach? Would you suggest an alternative approach to quantifying and addressing error?
7. Is the method used to separate lateral erosion from bed aggradation/degradation appropriate? Would you suggest any alternative method be utilized?

5) Peer Review Rating & Recommendation

In addition to providing written comments, each reviewer will provide a separate comprehensive rating and recommendation utilizing the following format:

RATING

Please score each aspect of this set of chapters using the following rating system:

1 = Excellent; 2 = Very Good; 3 = Good; 4 = Fair; 5 = Poor

Category

Rating

Scientific soundness

Degree to which conclusions are supported by the data

Organization and clarity

Cohesiveness of conclusions

Conciseness

Important to objectives of the Program

RECOMMENDATION

(Check One)

Accept

Accept with revisions

Unacceptable

PLEASE NOTE: If a peer reviewer checks “Accept with Revisions” or “Unacceptable,” that reviewer **must explicitly state** what changes would be required to change the recommendation to “Accept.” This is a critical step in ensuring the Program understands potential fatal flaws or major areas of revision that must be addressed before finalizing these documents and seeking Governance Committee approval.



6) Peer Review and Peer Reviewer Identification

It is the intention of the PRRIP that each individual peer review will be shared with the other members of the Peer Review Panel; members of the PRRIP Governance Committee (GC); members of the PRRIP Executive Director's Office (EDO); members of relevant PRRIP Advisory Committees including the Technical Advisory Committee (TAC) and the Independent Scientific Advisory Committee (ISAC); and the public via a final package including, but not limited to, the peer reviewed and revised Sediment Augmentation Data Synthesis Compilation and the results of all individual peer reviews posted as a public document on the PRRIP website. *Individual Peer Reviewers may choose to remain anonymous unless they agree to share their identity and interact with (electronically and/or virtually) the other members of the PRRIP Peer Review Panel and/or relevant PRRIP entities including the TAC, ISAC, EDO, and GC.*

7) Available Documentation

Peer reviewers will be provided with the following information:

- This Peer Review Scope of Work, including the PRRIP Scientific Peer Review Guidelines.
- The Sediment Augmentation Data Synthesis Compilation.
- Access to all references cited in the Sediment Augmentation Data Synthesis Compilation.
- PRRIP Extension Science Plan.
- Additional information as requested by Peer Review Panel members – if a document is requested by one member, it will be transmitted to all members simultaneously.



8) Peer Review Schedule

The general the schedule below provides guidance for conducting a 60-day peer review of the PRRIP Sediment Augmentation Data Synthesis Compilation:

PRRIP Sediment Augmentation Data Synthesis Compilation Peer Review Process Tasks	Anticipated Completion Date
Task 1 (TAC) – Request Peer Review of Sediment Augmentation Data Synthesis Compilation <ul style="list-style-type: none">Review Scope of Work – add/subtract/edit specific questions for peer reviewers, overall Charge to PanelReview and approve Peer Review Panel (Smith [EDO] will work with Peer Reviewer Selection Panel to identify and recommend peer reviewers)Transmit peer review request and Peer Review Panel members to GC for review and appointment	November 2023
Task 2 (GC) – Approve Peer Review / Appoint Peer Review Panel Members	December 2023
Task 3 (Smith, EDO): Facilitate Peer Review <ul style="list-style-type: none">Secure signed contracts with all peer reviewersProvide access to all materials needed for review to each peer reviewerVirtual meeting with Peer Review Panel to coordinate review and answer clarifying questions	December 2023 (and throughout peer review process)
Task 4 (Peer Review Panel): Conduct Peer Review of Sediment Augmentation Data Synthesis Compilation <ul style="list-style-type: none">Smith (EDO) answers clarifying questions, as necessaryPeer reviewers provide written reviews to Smith (EDO)	February 29, 2024
Task 5 (Smith, EDO): Respond to Peer Review <ul style="list-style-type: none">Work with EDO Staff to implement suggested changes or explain why changes are either inappropriate or not feasible at this timeDevelop Peer Review Summary Report for TAC consideration, including written responses to each peer review comment and proposed changes/edits	March 2024
Task 6 (TAC): Evaluate Peer Review Summary Report <ul style="list-style-type: none">TAC meeting to discuss Peer Review Summary Report and proposed document changes/editsRecommend additional changes/edits and finalize for review by Peer Review Panel	April 2024
Task 7 (Peer Review Panel): Evaluate Peer Review Summary Report <ul style="list-style-type: none">As warranted, elicit Peer Review Panel reaction (via electronic responses and/or virtual meeting) to proposed changes/responses to Sediment Augmentation Data Synthesis Compilation indicating acceptance or rejection of changesSmith (EDO) coordinates	May 2024
Task 8 (TAC): Evaluate Reaction from Peer Review Panel <ul style="list-style-type: none">TAC meeting to discuss responses from Peer Review Panel and to recommend final changes to Sediment Augmentation Data Synthesis Compilation for GC considerationEDO makes final changes to Sediment Augmentation Data Synthesis CompilationSmith (EDO) prepares final Peer Review Package for GC	June-August 2024
Task 9 (Smith, EDO): Present final Peer Review Package to GC <ul style="list-style-type: none">Review, discuss, and approve revised Sediment Augmentation Data Synthesis CompilationFinal report with integrated changes and Peer Review Summary Report included posted as public document on PRRIP website	September 2024

The extent and content of peer review comments may necessitate more time on the part of the Program in terms of fully addressing all peer review comments. The goal is to seek final GC approval of the peer reviewed and revised Sediment Augmentation Data Synthesis Compilation in September 2024.



1 **ATTACHMENT A**

2 **PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP -or- Program)**

3 **PRRIP Scientific Peer Review Guidelines**

Appendix A – Peer Review Guidelines

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM

SCIENTIFIC PEER-REVIEW GUIDELINES

These guidelines have been developed to provide a general process for peer-review of scientific documents during the Platte River Recovery Implementation Program (Program). Peer-reviews conducted during the Program will be conducted in accordance with “INSTRUCTIONS TO PEER-REVIEWERS” (Attachment A).

WHAT IS PEER-REVIEW? Scientific peer-review is a process by which technical experts provide unbiased comments, suggestions, and evaluation of the science and technology of proposals, study plans, reports of data analyses, and other documents. Peer-review provides evaluation of the technical quality and relevancy of a document in meeting objectives or in addressing hypotheses. Peer-review usually involves obtaining comments from appropriate technical experts (“peers”) who have no financial, supervisory, or familial relationship to the authors of the work. Peer-review is not an administrative review, nor does peer-review address political or other non-scientific features of a project or document.

Peer-review typically involves review by several technical experts in the appropriate subject area. By obtaining multiple, independent technical opinions, the peer-review process provides a means of evaluating the scientific soundness of a product, further minimizing introduction of bias or conflict of interest. The process of peer-review ultimately cannot insure that a document or product is without fault.

Peer-review should be an efficient process so that monitoring, research, publications, and other work can proceed in a timely manner. This process should be streamlined and not create a bottleneck of bureaucracy, delaying appropriate publications, fieldwork, data analyses, or modeling.

WHY IS PEER-REVIEW NECESSARY? Peer-review serves to strengthen a document, whether it is a study plan, proposal, or report, in several ways. A review can provide suggestions for improvements of the work. Experts typically suggest better approaches, more efficient methods, innovative approaches to analysis, and supporting data or literature. A document or plan that has been viewed as being sound, through peer-review, achieves improved credibility in the eyes of the scientific community. Peer-review enhances the reliability of a document, having been examined by peer-scientists. Where proposals or study plans are developed to address specific needs, peer-review can insure that the project serves the specific objectives of the program.

WHEN WILL PEER-REVIEW BE USED? The process described in this document may be used for products (proposals, plans, models, data, reports, protocols, etc.) funded by the Program or for other products essential to meeting Program milestones, but lacking adequate review. All

products relied upon by the Program that influence management decision may be subjected to the following peer review process at the discretion of the Governance Committee with advice from the Technical Advisory Committee or other advisory committees. For some products, however, a high level of scientific quality may be maintained by existing quality control and administrative review procedures, and peer review will be unnecessary.

WHAT ARE THE PRIORITIES FOR PEER REVIEW? The first priority for peer review are items identified for peer review in the 1997 Cooperative Agreement Milestones, which include all water depletion/accretion impact analyses, and all habitat and species monitoring and research activities. Proposals and protocols for new research and monitoring activities necessary for meeting Program milestones will receive the second priority for peer review. Third priority will be given to recent reports of completed studies considered essential to meeting Program milestones. Already peer-reviewed products will receive the lowest priority for peer review. Priorities may change depending on issues.

PEER-REVIEW PROTOCOL

1. The Executive Director will administer the peer-review process for the Governance Committee. The duties of the Executive Director are as follows:
 - a) Assemble Master List of potential reviewers with assistance from the standing advisory committees (Technical, Land, Water).
 - b) Select reviewers for each work product to be reviewed, and obtain approval of selected reviewers by the Governance Committee.
 - c) Handle all correspondence with reviewers.
 - d) Compile and transmit all relevant materials from reviews to Panel members for decision-making.
 - e) Coordinate revision of work product if needed.
 - f) Prepare, obtain approval from the Governance Committee, and administer budget for reviews.
 - g) Ensure the review process works in a timely and efficient manner.
2. The Governance Committee and its recognized advisory committees (Technical, Land, Water) identify the need for peer-review as requirements for proposals, studies, or reports arise. The requesting committee identifies each need for peer-review to the Executive Director (see figure below).
3. The Executive Director will determine priorities for peer review in keeping with the guidelines noted above, and develop budgets for peer review for approval by the Governance Committee. A Peer Review Working Group consisting of one member of the Governance Committee and one member from each of the Governance Committee's standing advisory committees (Technical, Land, Water) or other group as identified will assist the Executive Director in this effort. Budgets and priorities will be subject to the approval by the Governance Committee and may change as the Program evolves.
4. Reviewers meeting the standards outlined in these guidelines will conduct the peer-review.

5. When peer review is appropriate the Executive Director, in consultation with the Peer Review Working Group, will select three peer-reviewers from scientific areas appropriate to the subject or discipline of each request. The reviewers will conduct independent peer-reviews and send reviews to the Executive Director. According to the specific needs of each peer-review task, the reviewers could complete review of a single or group of related proposals, plans, or reports. A statistician will participate as a fourth reviewer when the subject or discipline includes experimental design and/or statistical analyses.
6. A list of qualified and willing experts will be assembled in a number of technical topic areas; reviewers will be carefully selected from this list to ensure reviewers are the most appropriate based on the subject matter being reviewed. The Executive Director will maintain a file with the resume and credentials of each peer-reviewer.
7. Criteria for peer-reviewers include:
 - a) No conflict of interest for or against the project document or its authors based on financial interest in the product or author(s), familial relationship with the author(s), personal bias for or against the institution or author(s), professional connection to the institution or author(s), organizational affiliation, or potential to be influenced by lobbying or other political pressure to produce a certain result or more work in the area of this product.
 - b) Expertise appropriate for the theme of the project or document(s).
 - c) The ability to complete a technical review in a reasonable time, as determined by the requesting committee.
 - d) Individuals will be selected from a diversity of institutions, including state, federal, local government, and non-governmental organizations for each project, while avoiding members from the same institution or agency as the author(s).
8. The committee requesting review, in conjunction with the Peer Review Working Group, will approve the Peer-review Panel. Objections regarding individuals must relate to the criteria outlined in number 7. The Governance Committee will resolve all conflicts.
9. An attempt will be made to obtain voluntary participation on Peer-review Panels without cost to the Governance Committee. A stipend or honorarium will be offered for review when necessary. The Governance Committee will approve an annual budget for peer-reviews.
10. The requesting advisory committee will prepare specific guidance for each review task. Suggested guidance includes an outline of the specific need for peer-review, the milestones or objectives to be addressed by the work, and other specific criteria for the document.

11. Reviewers shall provide written comment on the document(s) under review. Reviews will be conducted similar to the system and methods used by the National Science Foundation and major scientific journals and in accordance with the Proposal, Protocol and Study Plan Review Guidelines and Report Review Guidelines (see Attachment A).

12. Upon completion of the reviews, the Executive Director will:

- a) Prepare a package of material including all reviews and any relevant material,
- b) Distribute all material to requesting committee for a determination of action,
- c) If appropriate work with the requesting committee and author to make any needed revisions,
- d) Maintain a file of peer-reviews for each document, and
- e) Provide a summary of items a-c to the Governance Committee for approval.

13. The peer-review process does not determine the approval or disapproval of the activity associated with the request (funding a study, use of data or analytical results, publication of a report, etc.). Peer reviews may not be definitive (i.e., there may be disagreement among reviewers). The Committee seeking the review may or may not have the authority to approve the review; however, at a minimum, it is responsible for transferring the review summary and document(s) to the Governance Committee, who will have final authority to approve the review.

DOCUMENTATION OF PEER-REVIEW CONDUCTED OUTSIDE THE PROGRAM

There will likely be cases where the Program will benefit from models, data, analyses, or conclusions drawn by projects developed in the past or ongoing, but supported by institutions outside the oversight of the Program. The committee requiring the information will determine the need for peer-review of these products.

There is no intent to duplicate the peer-review conducted by others. Scientific journals typically conduct their own peer-review. Most major journals have high-quality peer-review that is universally accepted. Scientists are encouraged to publish their findings in the peer-reviewed scientific literature whenever possible and appropriate. In most instances this level of peer review is considered adequate for the purposes of the Program.

Institutions and agencies may administer their own peer-review process for study plans and reports. In using the models, data, or conclusions (reports) from studies not funded by the Program, the appropriate advisory committee is responsible for determining if additional peer-review is necessary. In making the decision regarding the need for peer-review it may be helpful to document an institution's peer-review process for the project or report. With the assistance of the appropriate advisory committee, it may be useful to consider the following information on alternative peer-review processes when available:

- I. Title of Study / Project / Report:
- II. Type of Work: ☐ report ☐ study plan/proposal ☐ model ☐ other (specify)
- III. Principal Investigators: name, address, phone number, and e-mail
- IV. Source of financial support for project / report:

- V. Peer-Review Documentation
 - A. Names / Institutions of peer-reviewers (may have been anonymous)
 - B. Brief Description of the peer-review process:
 - C. Were revisions made to the project/report in response to reviewers' comments?

ATTACHMENT A

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM

INSTRUCTIONS TO PEER-REVIEWERS

Thank you for agreeing to review this product. The following is a summary of expectations for peer-review and the topics that we wish each peer-reviewer to address.

A. INDEPENDENCE OF A PEER-REVIEW

Peer-review must provide an unbiased opinion of the scientific quality of a product (proposal, report, data, map, etc.) by individuals who are independent from the authors and external to them and their institution. A review must be independent of various types of conflicts of interest with the author(s) and with the product under review. The Platte River Recovery Implementation Program (Program) places considerable reliance on the objectivity, integrity, and professionalism of each peer-reviewer to provide technical opinion of each product without bias or conflict of interest.

Please review each question about your bias or independence. Your peer-review will be anonymous to the author unless you choose to share it. Your review will be held in the file for the Program as documentation of the peer-review process for this product.

YOUR CONSIDERATIONS SHOULD INCLUDE THE FOLLOWING FACTORS THAT COULD LEAD TO BIAS OR CONFLICT OF INTEREST:

- financial interest in the product or the author(s);
- familial relationship with the author(s);
- bias, for personal reasons, for or against the author(s) or institutions of this product;
- professional connection (current or former: student or advisor, supervisor or supervised, employer, etc.) to the author(s) or the institution of this product;
- organizational affiliation (same agency, department, organization, business, etc.);
- impacts of lobbying or political pressure exerted by persons looking for a particular result or more work in the area of this product;

IF YOU FEEL THAT YOU CANNOT PROVIDE AN UNBIASED REVIEW, PLEASE DO NOT REVIEW THIS PRODUCT AND IMMEDIATELY RETURN THE DOCUMENT TO THE PROGRAM'S EXECUTIVE DIRECTOR.

B. PROPOSAL, PROTOCOL, AND STUDY PLAN REVIEW GUIDELINES

CONFIDENTIALITY - The enclosed product is a privileged communication. Please do not show it to anyone or discuss it, except to solicit assistance with a technical point. Your review and your recommendation should also be considered confidential.

TIMELINESS - In fairness to the author(s) and the needs of the Program, please return your review within ____ days. If it seems likely that you will be unable to meet this deadline, please return the product immediately or contact the Executive Director.

CONFLICTS OF INTEREST - Please review the “Independence of a Peer-review”. If you feel that you might have difficulty writing an objective review, please return this material immediately, without reviewing it. If your previous or present connection with the author(s) or their institution(s) might be construed as creating a conflict of interest, but no actual conflict exists, please discuss this issue in the cover letter that accompanies your review.

YOUR REVIEW SHOULD ADDRESS THE FOLLOWING:

Please provide comments on separate sheets of paper. Support your comments with specific evidence from the text.

Do the objectives/hypotheses appropriately address the needs that have been identified for the Program? Are they scientifically sound, testable, and appropriate given the type or precision of the data available?

Is the design of the study scientifically sound? Is it technically and statistically appropriate for addressing the goals and objectives of the project? Is the reasoning behind the design based on generally accepted scientific principles?

Are the methods and experimental design appropriate in scale, timing, geographic scope, and precision for addressing the objectives? Are the measurements appropriate for addressing objectives?

Are plans for data analysis sound and likely to address the objectives?

Are the authors and their institutions well qualified, with appropriate facilities, to conduct the work?

Are the proposed time frame, personnel, and budget appropriate for conducting the work?

Will the products meet the needs identified?

C. REPORT REVIEW GUIDELINES

CONFIDENTIALITY - The enclosed manuscript is a privileged communication. Please do not show it to anyone or discuss it, except to solicit assistance with a technical point. Your review and your recommendation should also be considered confidential.

TIMELINESS - In fairness to the author(s) and to the needs of the Program, please return your review within __ days. If it seems likely that you will be unable to meet this deadline, please return the manuscript immediately or contact the Executive Director.

CONFLICTS OF INTEREST - Please review the “Independence of a Peer-Review” above. If you feel you might have any difficulty writing an objective review, please return the manuscript immediately, un-reviewed. If your previous or present connection with the author(s) or an author’s institution might be construed as creating a conflict of interest, but no actual conflict exists, please discuss this issue in the cover letter that accompanies your review.

YOUR REVIEW SHOULD ADDRESS THE FOLLOWING:

What is the major contribution of this document? What are its major strengths and weaknesses, and its suitability for publication and/or use by the Program? Are conclusions based on sound scientific methods and reasoning? Please include both general and specific comments bearing on these questions and emphasize your most significant points.

General Comments:

1. Scientific soundness
2. Organization and clarity
3. Conciseness
4. Degree to which conclusions are supported by the data
5. Cohesiveness of conclusions

Specific Comments:

Please support your general comments with specific evidence and literature. You may write directly on the manuscript, but please summarize your handwritten remarks separately. Comment on any of the following matters that significantly affected your opinion of the manuscript:

1. Presentation: Is a tightly reasoned argument evident throughout? Does the manuscript wander from the central purpose?
2. Methods: Are they appropriate? Current? Described clearly and with sufficient detail so that someone else could repeat the work?
3. Data presentation: When results are stated in the text of the manuscript, can you easily verify them by examining tables and figures? Are any of the results counterintuitive? Are all tables and figures clearly labeled? Well planned? Too complex? Necessary?

4. Statistical design and analyses: Are they appropriate and correct? Can the reader readily discern which measurements or observations are independent of which other measurements or observations? Are replicates correctly identified? Are significance statements justified?
5. Conclusions: Has the author(s) drawn conclusions from insufficient evidence? Are the interpretations of the data logical, reasonable, and based on the application of relevant and generally accepted scientific principles? Has the author(s) overlooked alternative hypotheses?
6. Errors: Point out any errors in technique, fact, calculation, interpretation, or style.
7. Citations: Are all (and only) pertinent references cited? Are they provided for all assertions of fact not supported by the data in the manuscript?

D. FAIRNESS AND OBJECTIVITY

If the research reported in this paper is flawed, criticize the science, not the scientist. Harsh words in a review will cause the reader to doubt your objectivity; as a result, your criticisms will be rejected, even if they are correct!

Comments should show that:

1. You have read the entire manuscript carefully,
2. Your criticisms are objective and correct, and are not merely differences of opinion, and are intended to assist the author in improving the manuscript, and
3. You are qualified to provide an expert opinion about the research reported in this manuscript.

E. ANONYMITY

You may sign your review if you wish. If you choose to remain anonymous, avoid comments to the authors that may serve as clues to your identity, and do not use paper that bears the watermark of your institution.

RATING:

Please score each aspect of this manuscript using the following rating system: 1=excellent, 2=very good, 3=good, 4=fair, 5=poor.

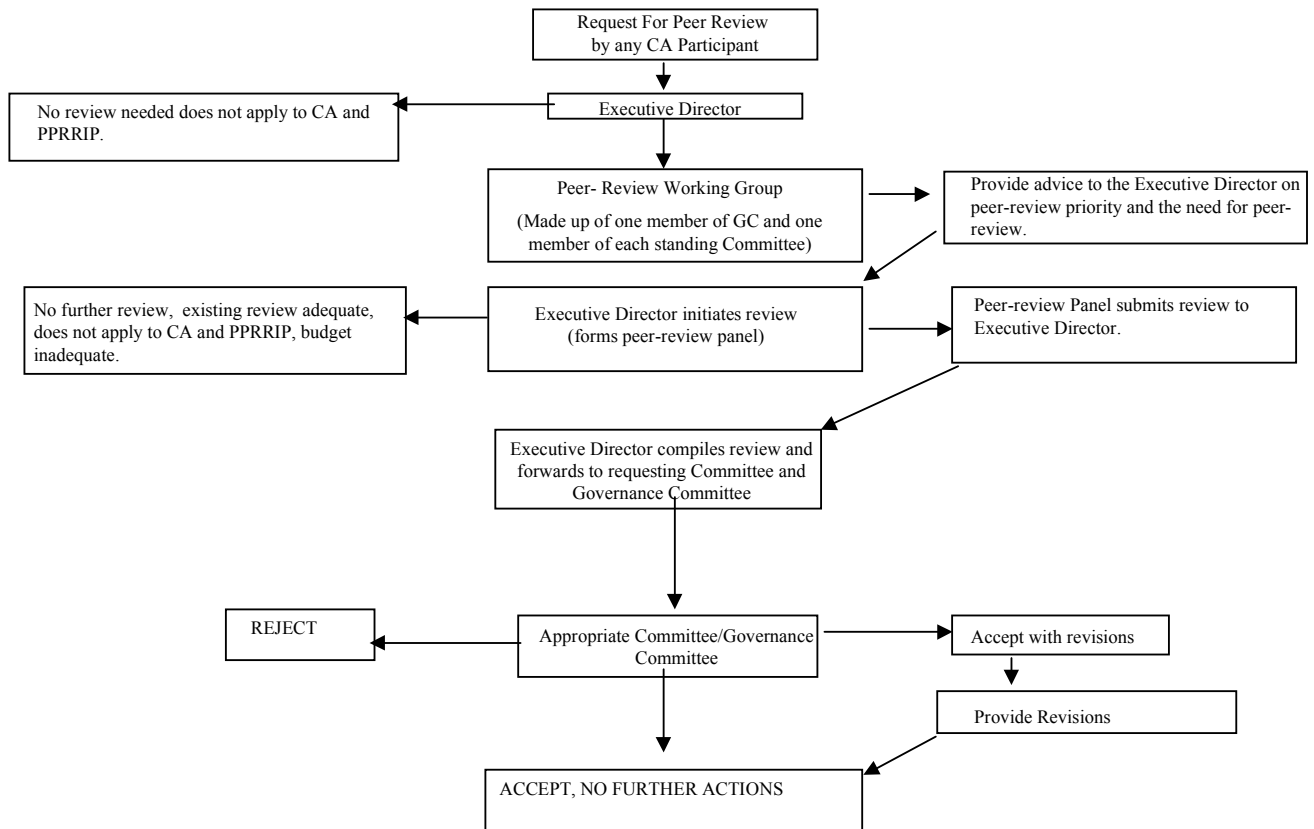
	Rating
Scientific soundness	_____
Degree to which conclusions are supported by the data	_____
Organization and clarity	_____
Cohesiveness of conclusions	_____
Conciseness	_____
Importance to objectives of the Program	_____
(For use by internal review panel only)	

RECOMMENDATION

(check one)

Accept	_____
Accept after revision	_____
Unacceptable	_____

**Peer-Review Sequence Platte River Cooperative Agreement (CA) and
Proposed Platte River Recovery Implementation Program (PPRRIP)**





ATTACHMENT B
PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP -or- Program)
Certification Regarding Lobbying

The undersigned certifies, on behalf of the Consultant, that to the best of his or her knowledge and belief:

1. No federal appropriated funds have been paid or will be paid, by or on behalf of the Consultant, to any person for influencing or attempting to influence an officer or employee of any federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, or the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.
2. No registrant under the Lobbying Disclosure Act of 1995 has made any lobbying contacts on behalf of the Consultant with respect to the federal grant or cooperative agreement under which the Consultant is receiving monies.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who makes an expenditure prohibited by Section 1 above or who fails to file or amend the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

FOR THE CONSULTANT:

CONSULTANT NAME

Date



ATTACHMENT C

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP -or- Program)

PRRIP Conflict of Interest Form – Peer Reviewers

The PRRIP developed guidance for Peer Reviewers regarding the avoidance of conflicts of interest in accordance with the Scientific Peer Review Guidelines (Adaptive Management Plan, Appendix A) contained in the PRRIP Final Program Document. PRRIP Peer Reviewers must provide an unbiased opinion of the scientific quality of a product (proposal, report, data, map, etc.) by individuals who are independent from the authors and external to them, the Program as a whole, and/or the authors' institution/entity. A review must be independent of various types of conflicts of interest with the author(s) and with the product under review. The PRRIP places considerable reliance on the objectivity, integrity, and professionalism of each Peer Reviewer to provide the technical opinion of each product without bias or conflict of interest.

When evaluating the potential for any conflicts of interest, all PRRIP Peer Reviewers should consider the following factors that could lead to bias or conflict of interest:

- Financial interest in the product or the author(s);
- Familial relationship with the author(s);
- Bias, for personal reasons, for or against the author(s) or institutions of this product;
- Professional connection (current or former: student or advisor, supervisor or supervised, employer, etc.) to the author(s) or the institution of this product;
- Organizational affiliation (same agency, department, organization, business, etc.);
- Impacts of lobbying or political pressure exerted by persons looking for a particular result or more work in the area of this product; and
- Has conducted, is conducting, or intends to conduct work for or on behalf of the Program, or work that directly overlaps with Program scientific and technical priorities, or work with the author(s), which could result in a Peer Reviewer commenting on her/his own work product(s).

As a proposed Peer Reviewer, I hereby state that I do not have any conflicts of interest with the PRRIP as outlined above and (if necessary) explained on the following page. I can serve effectively as a PRRIP Peer Reviewer without any financial, familial, personal, or professional bias and can complete an independent review of the PRRIP document as directed in the associated Scope of Work.

FOR THE CONSULTANT:

CONSULTANT NAME

Date



1 **Appendix B – PRRIP Sediment Augmentation Data Synthesis Compilation Peer**
2 **Review Candidate CVs**

Dr Chadwin Smith
Platte River Recovery Implementation Program
4111 4th Avenue, Suite 6
Kearney, NE 68845

Dear Dr Smith,

Re: Independent Scientific Advisory Committee; Fluvial Geomorphologist

I am writing to express my interest in the recently advertised open seat on the Independent Scientific Advisory Committee of the Platte River Recovery Implementation Program.

As you will see from my attached curriculum vitae, I am a fluvial geomorphologist with over 25 years' experience and longstanding interests in the structure, form and processes of braided rivers. Within this context, I have established an internationally-recognized track record for innovative research that aims to understand how these complex rivers adjust to environmental change and co-evolve with the ecological communities they support. My research is at the forefront of an emerging data-rich paradigm in river science. This couples developments in Earth observation and numerical modelling to transcend the conventional scale limits of process geomorphology and aims to unravel how sediment supply, flow and vegetation drive river form and adjustment at system-scales.

While my research is theoretically rooted, much of my recent work has sought to support regional programs of river rehabilitation and restoration by providing key science-led tools and insights to river and watershed managers and boards directly. In this context, I have worked as an advisor to local and national government (the NZ Ministry for the Environment, Waikato, Canterbury, Hawkes Bay and Otago Regional Councils, the Department for Conservation and NZ Fish and Game). This work has included a wide range of projects with diverse stakeholders, focusing for example on the impacts of flood harvesting and hydropeaking on sediment transport and riverbed sedimentology; quantifying the risks of changing channel capacity on flood and avulsion hazards; and modelling source-to-sink river sediment budgets to inform sediment mining and riparian asset management.

I am particularly interested in the approach pioneered in the PRRIP as the key environmental challenges resonate strongly with concerns over the condition of braided rivers in Aotearoa New Zealand (and elsewhere); many of which link directly to my current research agenda. For example, I am currently co-leading a project that seeks to understand how the effects of climate change, flow regulation and biological invasions shape the morphological trajectories of braided rivers and affect the population dynamics of native and exotic fish. This work involves the use of high-resolution, high-frequency remote sensing to parameterize and test numerical simulation models and support the development of long-term scenario assessments. Other allied research, focuses directly on the opportunities provided by new Earth observation datasets. Examples of this work include our research within the new NASA SWOT mission, where we are collaborating with the US Hydrology team to model flows and channel change in multichannel rivers, and another project where we are exploring data models derived from a new class of small-footprint, short-wave bathymetric lidar.

Furthermore, there are important parallels and contrasts between the range of approaches (i.e., the MCM vs SFM) to habitat restoration being explored on the Platte and many of our (albeit largely

gravel-bed) braided rivers in NZ. Developing a strong science-led foundation for adaptive management is clearly critical. However, in an environment that is changing rapidly, there is an equal demand to help communicate the uncertainty around that science in order to facilitate risk-based decision making and to support management reflect new data and emerging understanding. The committee structure of the PRRIP appears to address these needs directly, and I am keen not simply to participate in that process, but learn with you.

In addition to a broad perspective on river geomorphology, I bring a range of specific technical skills and knowledge that fits the focus of the advertised role and hopefully complements the formidable expertise of the ISAC. I have extensive experience in the design, acquisition and modelling of a wide range of Earth observation data and currently lead a remote sensing facility that incorporates state-of-the-art lidar (including topo-bathy green lidar), optical cameras and multibeam sonar, operating from helicopter, fixed wing and boat-based platforms. We use these tools to create a data-rich context to inform river management, acting both in response to extreme weather events (for example, am currently coordinating the national lidar and mapping response to Cyclone Gabrielle for the NZ National Emergency Management Agency) and to support the development of longer-term flow management plans. Together with my collaborators, we have also developed software to help river managers' better leverage these new and emerging data to provide information on changing flood capacity and habitat assemblages. My work has also pioneered the application of mobile bed hydrodynamic models to simulate the evolution of braided rivers under variable flow and to test these models using distributed, remotely sensed data.

I am very familiar and enjoy working within strongly interdisciplinary research teams and perhaps even more importantly, collaborating closely with a diverse array stakeholders that reveal the plurality of values and perspectives we bring to water across society. This work is often in highly contested spaces, involving tangata whenua (indigenous Māori tribes), groups from primary industry, local government and the third sector. I have also experience as an expert witness for both government and conservation groups. While, often challenging, this work continues to reinforce on me the importance of clear communication and the need to demarcate evidence and interpretation.

Finally, I should note that I am aware of the need for full participation in the ISAC. I travel frequently to the USA and Europe for work and see no barriers to my attending in-person meetings in the USA as well as contributing fully to Quarterly meetings and communicating with the Governance and other committees as needed.

I hope this short summary and my attached curriculum vitae provide you with an insight into the contribution I may be able to bring to the committee and underpin my excitement and motivation for applying. Should you need any further information, please do not hesitate to contact me.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'J. Brasington', with a small horizontal line above it.

Professor James Brasington
Director, Waterways Centre

PROFESSOR JAMES BRASINGTON

Director, Waterways Centre, University of Canterbury and Lincoln University, New Zealand

Email: james.brasington@canterbury.ac.nz

Direct Line: +64 3 369 0154

Mobile: +64 27 360 2742

PROFILE

- River scientist with over 25 years research experience
- PhD University of Cambridge; BSc (First Class) University of Bristol
- >10 years in leadership roles
- >\$15 m in external funding from national science bodies, government and industry in the last decade
- H-Index=41; Citations > 11,300
- NZ Performance Based Research Assessment, Quality Category A (Earth Sciences)
- Graduated 16 PhD students
- Honorary Visiting Professor, Queen Mary University of London;
- Internationally recognized for research in fluvial geomorphology and Earth observation

EDUCATIONAL HISTORY

1998	PhD University of Cambridge: Hydrological and erosional consequences of land-use change in Nepal
1992	BSc University of Bristol (First Class)
1991, 1992	University of Bristol, Faculty of Science Outstanding Achievement Prize
1993-1996	Emmanuel College, University of Cambridge, External Research Scholarship Prize
1993-1996	Natural Environmental Research Council Research Studentship

EMPLOYMENT HISTORY

2020-	Professor of River Science; Director Waterways Centre, University of Canterbury, NZ
2017-	Visiting Honorary Professor, Queen Mary University of London, UK
2017-19	Waikato Regional Council Chair of River Science, University of Waikato, NZ
2012-17	Professor of Physical Geography, Queen Mary University of London, UK
2011	Professor of Physical Geography, University of Canterbury, NZ
2007-10	Associate Professor, Institute Geography and Earth Science, University of Wales, Aberystwyth, UK
2000-07	Lecturer, Department of Geography, University of Cambridge, UK
2000-07	Fellow of Sidney Sussex College, Cambridge UK
1997-99	Lecturer, Department of Geography, University of Hull, UK

PROFESSIONAL EXPERIENCE

2023-	Advisor, National Emergency Management Agency – regional impacts of Cyclone Gabrielle
2023-	Expert Witness, NZ Fish and Game – effects of hydropeaking on river channel adjustment
2022-	Research and Technical Director, Vadis Geomatics
2021-22	Expert Witness, Otago Regional Council – effects of river bed aggradation on flood risk
2020-21	Technical Advisory Group, Ministry for the Environment – advances in freshwater monitoring
2019-20	Expert Witness, NZ Salmon Anglers Association – effects of flow regulation on sediment dynamics
2018-20	Advisor, Waikato Regional Council – Freshwater science portfolio

RESEARCH RECORD

My research is at the forefront of developments to understand the linkages between river form, process and ecology. This work spans a wide range of environments, from alpine and temperate (NZ, Nepal, UK), to Mediterranean (France, Spain, USA) and arid (Iraq), with a particular focus on multichannel (braided) river environments. My research integrates theoretical and applied themes and develops high resolution remote sensing and numerical modelling to explore how rivers and their ecosystems co-evolve under changing environmental conditions. A listing of selected relevant publications is provided below.

RESEARCH PROJECTS

I have been awarded >\$15 m in the last decade from competitive external funding sources that include international science funding agencies (MBIE, NZ; UKRI; Leverhulme Trust; NSF; EU Horizon, NASA-JPL); government departments, agencies, engineering and environmental consultancies. My projects typically involve interdisciplinary and international teams of researchers, drawing on expertise in freshwater ecology, sensor technologies and data science. Current key projects include:

SWOT Cal/Val	Surface Water and Ocean Topography Mission validating and modelling sensor retrievals using airborne and boat based topo-bathy lidar, PI, NASA-JPL, 2023-2024
Fish Futures	Modelling the effects of climate change on braided river habitats for native and exotic fish in New Zealand, PI, MBIE Endeavour, 2022-2026
Cyclone Gabrielle	Modelling the regional effects of extreme flooding and sedimentation from Cyclone Gabrielle, PI MBIE/NEMA, 2023-2024
Small-footprint Lidar	Optimizing the development of seamless topo-bathymetric models of complex river environments with small-footprint, shortwave lidar sensors, PI, MBIE Endeavour, 2021-2024
Multiscale Mapping	Development of multiscale, multimodal approaches to quantify changes in the morphology and riverbed characteristics of complex braided rivers using high resolution lidar and aerial imagery, PI, NZ DoC, 2020-2024
Works in Waterways	Development of a national guideline to manage the environmental impacts of civil engineering works in waterways, PI, MBIE Envirolink, 2022-2025

RESEARCH SUPERVISION AND COLLABORATION

- Supervised 16 students to the successful defence of their doctoral thesis and six postdoctoral researchers
- Currently supervise 4 PhD students, 4 MSc students, 3 postdoctoral researchers and one research technician
- Director, Graduate Programmes in Water Science & Management, University of Canterbury and Lincoln University
- Co-Director, EU Erasmus Mundus Joint Doctoral Programme SMART(2013-16)
- Management Board, UK NERC London Doctoral Training Partnership (2014-17)
- Key international collaborators include: Prof Joe Wheaton (Utah State); Prof Tamlin Pavelsky (UNC); Prof Damia Vericat (Uni. Lleida); Dr Colin Gleason (UMass); Prof Herve Piegay (Uni. Lyon).

COMMUNITY ROLES AND RESPONSIBILITIES

National and International Communities: RSNZ Review Panel; UK NERC Peer Review College; NERC Geophysical and Geodesy Steering Committee; NERC Technology Review Panel; NERC-MOES India-UK Sustainable Water Programme; British Society for Geomorphology Futures Taskforce; NERC Environmental e-Science;

Editorial positions: Water, 2019-; Progress in Physical Geography, 2017; Water Resources Research, 2009-13; Journal of Maps, 2013-17 ; Geomorphology, 2007;

International PhD Examiner: University of Tasmania; Aalto University; University of Trento; Turku University; Wageningen University; University British Columbia; Ben Gurion University; University of Stockholm; Macquarie University; multiple universities in the UK, including Oxford, Leeds, Durham and NZ, including Waikato and Auckland

Undergraduate External Assessor: University of Cambridge, Geography Tripos, 2014-2017.

PEER REVIEWED PUBLICATIONS

H-Index = 41; Citations; 11,341; 3 Web of Science ‘Highly Cited Articles’; 7 articles > 300 citations;

- Abell, J.M., Pingram, M.A., Özkundakci, D. et al. 2023. Large floodplain river restoration in New Zealand: synthesis and critical evaluation to inform restoration planning and research. Regional Environ Change 23, 18.
- Brierley, G. J., Hikuroa, D., Fuller, I. C., Tunnicliffe, J., Allen, K., Brasington, J., Friedrich, H., Hoyle, J., & Measures, R. 2022. Reanimating the strangled rivers of Aotearoa New Zealand. WIREs Water, e1624.
- Westerhoff, R., McDowell, R., Brasington, J. et al. 2022. Towards implementation of robust monitoring technologies alongside freshwater improvement policy in Aotearoa New Zealand. Environmental Science and Policy, 132,1-13.
- Batalla, R., Gibbons, G., Alcazar, J., Brasington, J., et al. 2021. Hydropeaked rivers need attention. Environmental Research Letters, 16, 021001.
- Walley, Y., Henshaw, A., Brasington, J. 2020. Topological structures of river networks and their regional-scale controls: a multivariate classification approach. Earth Surface Processes and Landforms, 45, 2869-2883.
- Reesink, A.J., Darby, S.E., Sear, D.A., Leyland, J., Richardson, K., Brasington, J. 2020. Mean flow and turbulence structure over forested floodplains: insights from controlled laboratory experiments. PLoS ONE, 15, e20229306
- Harvey, G., Henshaw, A., Brasington, J., England, J. 2019. Burrowing invasive non-native species: an unquantified erosion risk at aquatic margins. Reviews of Geophysics, doi.org/10.1029/2018RG000635
- Pinter, N., Brasington, J., Gurnell, A. et al. 2019. River research across borders: Internationalism and provincialism in the recent river-science literature. River Research and Applications, 35, 768-775, doi.org/10.1002/rra.3430
- Kasprak, A., Brasington, J., Hafen, K., Williams, R. D., and Wheaton, J. M. 2019. Modelling braided river morphodynamics using a particle travel length framework, Earth Surface Dynamics, 7, 247-274.
- Victoriano, A., Brasington, J., Guinau, M., Furdada, G., Cabre, M., Moysset, M. 2018. Geomorphic impact and assessment of flexible barriers using multi-temporal lidar data: the Portaine mountain catchment. Engineering Geology, 237, 168-180.
- Connor-Streich, G., Henshaw, A.J., Brasington, J., Bertoldi, W., Harvey, G.L. 2018. Let's get connected: A new graph theory-based approach and toolbox for understanding braided river morphodynamics. WIREs Water, 5:e1296. doi: 10.1002/wat2.1296
- Brasington, J. 2017. Modelling Fluvial Morphology. In, Muste et al. (eds.) Handbook of Experimental Hydraulics, 4, 2- 18, CRC Press, 985pp.
- Vericat, D., Wheaton, J.W., Brasington, J. 2017. The morphological approach to estimating bedload yield. In, Tsutsumi, D. and Laronne, J. (eds). Gravel Bed Rivers and Disasters. Wiley, 121-158.
- Rennie, C., Vericat, D., Williams, Brasington, J., Hicks, D.M. 2017. Monitoring bedload transport using aDcp bottom- track bias. In, Tsutsumi, D. and Laronne, J. (eds). Gravel Bed Rivers and Disasters. Wiley, 209-234.
- Williams, R., Brasington, J. and Hicks, D.M. 2016. Numerical modelling of braided river morphodynamics: review and future challenges. Geography Compass, 10, 102-127.
- Ridofi, M., Tubino, M., Bertoldi, W., Brasington, J. 2016. Analysis of reach-scale elevation distribution in braided rivers. Water Resources Research, 52, 5951-5970.
- Williams, R.D., Measures, R., Hicks, D.M., Brasington, J. 2016. Assessment of a numerical model to reproduce event- scale erosion and deposition distributions. Water Resources Research, 52, 6621-6642.
- Williams, R.D., Rennie, C.D., Brasington, J., Hicks, D.M., Vericat, D. 2015. Within-event spatially distributed bedload: linking fluvial sediment transport to morphological change. Journal of Geophysical Research: Earth Surface, 120 (3), 604-62.

- Westoby, M.J., Brasington, J., Glasser, N., Hambrey, M.J., Reynolds, J.M. and Hassan, M. 2015. Numerical modelling of Glacial Lake Outburst Floods using physically based dam-breach models, Earth Surface Dynamics, 3, 170-19.
- Javernick, L., Hicks, D.M., Measures, R., Caruso, B., Brasington, J. 2015. Numerical modelling of braided rivers with structure-from-motion derived terrain models. River Research and Applications, 32, 1071-1081.
- Javernick, L., Brasington, J. Caruso, B. 2014. Modelling the topography of shallow braided rivers using Structure- from-Motion photogrammetry, Geomorphology, 213, 166-182.
- Vericat, D., Smith, M.W., Brasington, J. 2014. Patterns of topographic change in sub-humid bandlands determined by high resolution multi-temporal topographic surveys. Catena, 120, 164-176.
- Westoby, M.J., Glasser, N., Brasington, J., Hambrey, M.J., Quincey, D.J. and Reynolds, J.M. 2014. Modelling outburst floods from moraine-dammed glacial lakes. Earth Science Reviews, 134, 137-159.
- Westoby, M.J., Glasser, N., Hambrey, M.J., Brasington, J. and Reynolds, J.M. 2014. Reconstructing historic Glacial Lake Outburst Floods through numerical modelling and geomorphological assessment: Extreme events in the Himalaya, Earth Surface Processes and Landforms, 39, 1675-1692.
- Cook, S.J., Quincey, D.J., Brasington, J. 2014. Geomorphology of the Rees Valley, Otago, New Zealand. Journal of Maps, 10, 136-150.
- Williams, R.D., Brasington, J., Hicks, D.M., Measures, R., Rennie, C.D., Vericat, D. 2013. Hydraulic validation of two- dimensional simulations of braided river flow with spatially continuous aDcp data. Water Resources Research, 49, 5183-5205
- Williams, R. D., Brasington, J., Vericat, D. and Hicks, D. M. 2013. Hyperscale terrain modelling of braided rivers: fusing mobile terrestrial laser scanning and optical bathymetric mapping. Earth Surface Processes and Landforms, 39, 167-183.
- Wheaton, J. M., Brasington, J., Darby, S. E., Kasprak, A., Sear, D., & Vericat, D. 2013. Morphodynamic signatures of braiding mechanisms. Journal of Geophysical Research: Earth Surface, 118, 759-779.
- Brasington, J., Vericat, D. and Rychkov, I. 2012. Modelling River Bed Morphology, Roughness and Surface Sedimentology using High Resolution Terrestrial Laser Scanning. Water Resources Research, 48, W11519.
- Westoby, M.J., Brasington, J., Glasser, N.F., Hambrey, M.J. and Reynolds, J.M. 2012. 'Structure-from-motion' photogrammetry: a low-cost, effective tool for geoscience applications. Geomorphology, 179, 300-314.
- Rychkov, I., Brasington, J. and Vericat, D. 2012. Computational and methodological aspects of terrestrial surface analysis based on point clouds. Computers and Geosciences, 42, 64-70.
- Williams, R.D., Brasington, J., Vericat, D., Hicks, D.M., Labrosse, F., Neal, M.N. 2011. Monitoring braided river change using terrestrial laser scanning and optical bathymetric mapping. In, Smith, M., Paron, P. and Griffiths, J. 2011. Geomorphological Mapping. Elsevier, pp. 508-529.
- Brasington, J., Rennie, C.D., Vericat, D., Williams, R., Goodsell, B., Hicks, D.M., Batalla, R. 2011. Monitoring braided river morphodynamics with an acoustic Doppler current profiler. Proceedings of the 34th World Congress of the International Association for Hydro-Environment Research and Engineering, 3396-3403. Engineers Australia.
- Brasington, J. 2010. From grain to floodplain: hyperscale models of braided rivers. Journal of Hydraulic Research, 48 (4): 52-53 Suppl. 4 2010.
- Brasington, J. and Vericat, D. 2010. Geomatics and Geomorphology: shining new light on riverscapes. Trabajos Geomorfología en España, 2008-2010. SEG, 167-170
- Wheaton, J., Brasington, J., Darby, S.E., Sear, D. 2010. Accounting for uncertainty in DEMs from repeated topographic survey: improved sediment budgets. Earth Surface Processes and Landforms, 35, 136-156.
- Wheaton, J., Brasington, J., Darby, S.E., Mertz, J., Pasternack, G.B., Sear, D., Vericat, D. 2010. Linking geomorphic changes to salmonid habitat and a scale relevant to fish. River Research and Applications, DOI: 10.1002/rra.1305.

- Antonarakis, A.S., Richards, K.S., Brasington, J., Bithell, M. and Muller, E. 2010. Determining LAI and leafy tree roughness using terrestrial lidar. Water Resources Research, 46, W06510.
- Antonarakis, A.S., Richards, K.S., Brasington, J., Bithell, M. and Muller, E. 2009. Leafless roughness of complex tree morphology using terrestrial lidar. Water Resources Research, 45, W10401.
- Vericat, D., Brasington, J., Cowie, M. and Wheaton, J. 2009. Accuracy assessment of aerial photographs acquired using lighter-than-air blimps. River Research and Applications, 15, 985-1000.
- Bithell, M. and Brasington, J. 2009. Integrating agent-based models of subsistence farming with individual-based forest models and dynamic models of water distribution. Environmental Modelling and Software, 24, 173-190.
- Hodge RA, Brasington J, Richards KS. 2009. Characterisation of grain-scale fluvial morphology using TLS. Earth Surface Processes and Landforms, 34, 954-968.
- Hodge RA, Brasington J, Richards KS. 2009. Analysing laser-scanned digital terrain models of gravel bed surfaces: linking morphology to sediment transport processes and hydraulics. Sedimentology, 56, 2024-2043.
- Rumsby, B.T., Brasington, J., Langham, J.A., et al. 2008. Monitoring and modelling particle and reach-scale morphological change in gravel bed rivers: applications and challenges, Geomorphology, 93, 40-54.
- Vericat, D., Brasington, J., Wheaton, J., Rychkov, I. 2008. Determinación de la rugosidad de lechos de gravamediante láser terrestre de alta resolución. Trabajos Geomorfología en España, 2006-2008. SEG, 167-170.
- Antonarakis A.S, Richards K.S, Brasington J. 2008. Retrieval of vegetative fluid resistance using airborne lidar. Journal Geophysical Research - Biogeosciences, 113, G02S07.
- Antonarakis A.S, Richards K.S, Brasington J. 2008. Object-based land cover classification using airborne LiDAR. Remote Sensing of Environment, 112, 2988-2998.
- Bithell, M., Brasington, J. and Richards, K.S. 2008. Discrete-element, individual-based and agent-based models: Tools for interdisciplinary geography? Geoforum, 39, 625-642.
- McMillan, H.K. and Brasington, J. 2008. End-to-end flood forecasting under uncertainty. Water Resources Research, 44, W03419.
- McMillan, H.K. and Brasington, J. 2007. Reduced Complexity Strategies for Modelling Urban Floodplain Inundation, Geomorphology, 90, 226-243.
- Brasington, J. and Richards, K. 2007. Reduced-complexity, physically-based geomorphological modelling for catchment and river management, Geomorphology, 90, 171-177.
- Hodge, R., Richards, K.S. and Brasington, J. 2007. A physically-based bedload transport model developed for 3D reach-scale cellular modelling, Geomorphology, 90, 244-262.
- Brasington, J., Langham, J. and Rumsby, B.T. 2003. Three-dimensional channel sediment budgets: methodological sensitivity of remote survey methods. Geomorphology, 53, 299-316.
- Brasington, J. and Smart, R. 2003. Close range photogrammetric monitoring of experimental drainage basin evolution. Earth32 Surface Processes and Landforms, 28, 231-247
- West, A.J., Bickle, M.J., Collins, R. and Brasington, J. 2002. A small catchment perspective on Himalayan Weathering: major cation fluxes. Geology, 30, 355-358.
- Brasington, J. 2002. Monitoring Marshland Degradation Using Multispectral Remote Sensed Imagery. In, Nicholson, E. and Clarke, P (Eds.). The Iraqi Marshes, Politicos, London, 147-164.
- Richards, K.S., Brasington, J. and Hughes, F.R.M. 2002. Geomorphic dynamics of floodplains: ecological implications. Freshwater Biology, 47, 559-579.
- Rumsby, B.T., Brasington, J. and McVey, R. 2001. High resolution fluvial archives in braided rivers. In, Maddy, D, Macklin, M.G. and Woodward, J. (Eds.), River Basin Sediment Systems: Archives of Environmental Change. Balkema, Rotterdam, 245-267

- Brasington, J., Langham, J.A. and Rumsby, B.T. 2001. Sensitivity of morphometric estimates of sediment transport in large gravel-bed rivers. Remote Sensing for Environmental Monitoring, 4545, 43-55.
- Brasington, J. and Richards, K. 2000. Turbidity and suspended sediment dynamics in the Nepal Middle Hills. Hydrological Processes, 14, 2259-2274.
- Brasington, J., Rumsby, B.T. and McVey, R. 2000. Monitoring and modelling morphological change in braided river systems using the Global Positioning System. Earth Surface Processes and Landforms, 25, 973-990
- Pedley, H.M., Hill, I., Denton, P. and Brasington, J. 2000. Three dimensional modelling of Holocene freshwater carbonates with ground penetrating radar. Sedimentology, 47, 721-738.
- Brasington, J., Middleton, R. and Frostick, 2000. Evaluating sediment transport dynamics using digital video image analysis. Earth Surface Processes and Landforms, 25, 191-196..
- Middleton, R., Brasington, J. and Frostick, 2000. Monitoring gravel framework dilation using a new digital particle tracking method. Computers and Geosciences, 26, 329-340.
- McVey, R.A. and Brasington, J. 2000. Spatially distributed uncertainty analysis in distributed hydrological modeling. In, Heuvelink, G. and Lemmens, M.J. Spatial Accuracy Assessment in Natural Resources and Environmental Science, Delft University Press, 473-480.
- Brasington, J., El-Hames, A. and Richards, K.S. 1999. Hydrological Modelling in Humid Tropical Catchments. In, T.Brown and R.Harper, Sustainable Management of Tropical Catchments. Chichester: Wiley, 313-336.
- Brasington, J. and Richards, K. 1998. Interactions between DTM scales and parameters for TOPMODEL. Computers and Geosciences, 24, 299-314.

Platte River Recovery Implementation Program
4111 4th Ave., Suite 6
Kearney, NE 68845

March 9, 2023

Attention: Chadwin Smith, Ph.D.

RE: Application for membership on PRRIP ISAC

Dear Dr. Smith,

Thank you for considering my application for membership on the Independent Scientific Advisory Committee (ISAC) for the Platte River Recovery Implementation Program (PRRIP). I believe my expertise in fluvial geomorphology, my experience on several scientific review committees, and my interest in environmental science education, both at Seattle University and at not-for-profit organizations, provides a background that will support the goals of the PRRIP.

I'm attaching a CV that provides a detailed description of my background. Here are a few highlights:

Expertise in fluvial geomorphology

My research focuses on geomorphic change in rivers over decadal and longer timescales. The work relies on numerical modeling and remote sensing analysis. I've participated in modeling and observational-based studies on sand-bed rivers such as the Minnesota River, the Fly River, Papua New Guinea, and, more recently, the gravel-bed Elwha River here in Washington State. I am particularly interested in the role that banks and bars play in modulating long-term bed material fluxes. Notably, several of my papers (publications J12, J14, and J18 in CV) document the adjustment of channel geometry through erosion and deposition of near-channel sedimentary deposits in response to long-term changes in hydrology within the Minnesota River basin.

Developer of numerical modeling code

As part of my research, I have developed computational tools for simulating reach-scale change and long-term adjustment in channel bankfull geometry and conveyance capacity in geomorphically dynamic river systems. The most recent code, Morphodynamics and Sediment Tracers in 1-D (MAST-1D), has been applied on the Ain River, France, the Elwha River, Washington (publications J16 and J19 in CV) and is currently being used as part of Seattle City Light's ongoing hydroelectric dam relicensing on the Skagit River, Washington. While these are gravel-bed systems, a version of MAST-1D has been adapted to simulate long-term change in channel geometry on a sand bed river, so I am familiar with the analysis that would be required to perform physically-based simulations of channel change in response to non-stationary hydrologic or sediment inputs on sand-bed systems.

Scientific review panel member

I have served as a scientific reviewer for several large projects, including as a member of the Seattle City Light Integrated Resources Planning (IRP) stakeholder group and as a technical expert on a panel convened by the Nicaraguan Academy of Science to review the Environmental and Social

Impact Report for a proposed interoceanic canal. The results of the canal-related review work are summarized in a publication in the journal *BioScience* (publication J17 in CV).

Use of Emerging Technologies in Scientific and Environmental Education

I have many years of experience teaching courses at Seattle University that address topics such as fluid mechanics, open channel flow, hydraulic and hydrologic modeling, and geomorphology. In addition, have developed several courses that focus on the application of emerging technologies in environmental science. These include a course in environmental sensors (first offered in 2017) and a course in remote imaging using unmanned aerial systems (first offered in 2022). Development of a module in the ENSC 2400 course led to a recent publication in *Environmental Monitoring and Technology* (publication 21 in CV) documenting the use of low-cost sensors for water quality monitoring. I have also contributed to an open-source textbook on this topic (available at <https://www.publicsensors.org/textbook/>).

While my experience does not focus directly on Platte River-related management issues, I believe my background makes me well qualified to provide an unbiased outside opinion regarding the science on this system. In addition, I think that my participation in scientific stakeholder groups in the Pacific Northwest (e.g., with the Skagit Climate Science Consortium, a self-organized group of researchers in the Skagit River basin, Washington) could provide a useful perspective about how science can be planned/organized at the scale of entire river basins and, just as importantly, how it can inform restoration planning. Finally, the work I've done over the years as a consulting engineer and geomorphologist (e.g. for Herrera Environmental Consultants) as well as my teaching and research in river hydraulics and geomorphology provide the expertise necessary to quickly review the background material that has been developed for the Platte system.

I have carefully considered the time commitment associated with the ISAC and believe I will have the capacity to fulfill the expectations associated with the position. I am available this summer to review PRRIP research. Furthermore, while my responsibilities to my academic department at Seattle University will remain a priority for me during the academic year, I have checked my teaching schedule and the calendar for our department's upcoming accreditation review and can commit to being available in person for the October and February meetings of the ISAC. Faculty engagement in applied scientific research greatly enhances the classroom experience for students, so I see work with organizations such as the PRRIP as a powerful mechanism for ensuring that my teaching remains relevant.

If you have any questions regarding any of my materials, please feel free to let me know. Thank you again for considering me as a member of the ISAC.

Sincerely,



John Wesley Lauer, Ph.D., PE

Curriculum Vita

J. Wesley Lauer

EDUCATION

Walla Walla College	Civil Engineering	B.S.E., 1996
University of California, Berkeley	Civil Engineering	M. Eng., 1998
University of Minnesota	Civil Engineering	Ph.D., 2006

APPOINTMENTS

Professor, Dept. of Civil and Environmental Engineering, Seattle University,
9/2006-present
Affiliated Faculty, Dept. of Oceanography, University of Washington
8/2009-present
Associate Geomorphologist, Herrera Environmental Consultants, Seattle,
Washington
5/2012—9/2013; periodically thereafter
Graduate Research Assistant, Saint Anthony Falls Laboratory, University of
Minnesota, 9/2002–8/2006
Graduate Teaching Assistant, Dept. of Civil Engineering, University of Minnesota,
9/2005–12/2005
Civil Engineer/Hydrologist, Questa Engineering Corporation, Richmond,
California, 6/1998–8/2002
Graduate Student Researcher, Department of Geology and Geophysics,
University of California, Berkeley, 1997–98
Technician, Environmental Systems Research Institute, Redlands, California,
6/1995–9/1995; 6/1996–8/1996

PROFESSIONAL REGISTRATION

Professional Civil Engineer—Washington (2008), 44893; California (2001),
C62512

TEACHING EXPERIENCE

Seattle University, Seattle, WA

CEEGR 3310, Fluid Mechanics
CEEGR 3350, Engineering Hydraulics
CEEGR 3370, Fluid Mechanics Lab
CEEGR/ENSC 3710, Water Resources I
CEEGR 4720, Water Resources II
ENSC 2400, Environmental Sensors
ENSC 3910, Aerial Imaging and Mapping with Unmanned Aerial Systems
ENSC/CEEGR 4870, Senior Synthesis/Senior Design
UCOR 3800, Global Landscape Dynamics
UCOR 3800, Confronting Climate Change

SCHOLARSHIP

Journal Publications

- Lauer, J.W.**, Klinger, P., O'Shea, S., Lee, S., (2022), Development and validation of an open-source four-pole electrical conductivity, temperature, depth sensor for in-situ water quality monitoring in an estuary. *Environmental Monitoring and Assessment* 195, Article number: 221 (2023). (J21)
- Sanyal, J., **Lauer, J.W.**, Kanae, S., (2021), Examining the downstream geomorphic impact of a large dam under climate change. *Catena* 196: 104850. DOI: 10.1016/j.catena.2020.104850. (J20)
- De Rego, K., Eaton, B., **Lauer, J.W.**, Hassan, M., (2020), A decadal-scale numerical model for wandering, cobble-bedded rivers subject to disturbance. *Earth Surface Processes and Landforms* 45: 912-927. DOI: 10.1002/esp.4784. (J19)
- Lauer, J.W.**, C. Echterling, C. Lenhart, P. Belmont, R. Rausch, (2017). Air-photo based change in channel width in the Minnesota River basin: Modes of adjustment and implications for sediment budget. *Geomorphology* 297, 170-184. (J18)
- Huete-Peréz, J.A., M. Ortega-Hegg, G.R. Urquhart, A.P. Covich, K. Vammen, B.E. Rittmann, J.C. Miranda, S. Espinoza-Corriols, A. Acevedo, M.L. Acosta, J.P. Gómez, M.T. Brett, M. Hanemann, A. Härer, J. Incer-Barquero, F.J. Joyce, **J.W. Lauer**, J.M. Maes, M.B. Tomson, A. Meyer, S. Montenegro-Guillén, W.L. Whitlow, J.L. Schnoor, P.J.J. Alvarez, (2016). Critical Uncertainties and Gaps in the Environmental- and Social-Impact Assessment of the Proposed Interoceanic Canal through Nicaragua. *BioScience* 66, 632-645. (J17)
- Lauer, J.W.**, E. Viparelli, H. Piégay, (2016). Morphodynamics and Sediment Tracers in 1-D (MAST-1D): 1-D sediment transport that includes exchange with an off-channel sediment reservoir. *Advances in Water Resources* 98: 135-149. (J16)
- Gnanapragasam, G., **J.W. Lauer**, J.P. Smith-Pardo, M. Marsolek, N. Canney, (2015). International civil engineering capstone projects - benefits, challenges and lessons learned. *International Journal of Engineering Education* 31(6B), 1869-1880. (J15)
- Schottler, S.P., J. Ulrich, P. Belmont, R. Moore, **J.W. Lauer**, D. R. Engstrom, J.E. Almendigner, (2014). Twentieth century agricultural drainage creates more erosive rivers. *Hydrological Processes* 28: 1951-1961. (J14)
- Viparelli, E., **J.W. Lauer**, P. Belmont, and G. Parker, (2013). "A numerical model to develop long-term sediment budgets using isotopic sediment fingerprints." *Computers and Geosciences* 53: 114-122. (J13)
- Belmont, P., K.B. Gran, S.P. Schottler, P.R. Wilcock, S.S. Day, C. Jennings, **J.W. Lauer**, E. Viparelli, J.K. Willenbring, D.R. Engstrom, and G. Parker, (2011). "Large shift in source of fine sediment in the Upper Mississippi River." *Environmental Science and Technology* 45, 8804-8810. (J12)
- Gran, K., P. Belmont, S.S. Day, N. Finnegan, C. Jennings, **J.W. Lauer**, and P. Wilcock, (2011). "Landscape evolution in South-Central Minnesota and the

- role of geomorphic history on modern erosional processes." *GSA Today* 21, 7-9. (J11)
- Parker, G., Y. Shimizu, G.V. Wilkerson, E.C. Eke., J.D. Abad, **J.W. Lauer**, C. Paola, W.E. Dietrich, and V.R. Voller, (2011). "A new framework for modeling the migration of meandering rivers." *Earth Surface Processes and Landforms* 36, 70-86. (J10)
- Lauer, J.W.**, and J. Willenbring, (2010). "Steady-state reach-scale theory for radioactive tracer concentration in a simple channel/floodplain system." *Journal of Geophysical Research* 115: F04018 (J9)
- Lauer, J.W.**, G. Parker, and W. Dietrich, (2008). "Response of the Strickland and Fly River confluence to postglacial sea level rise." *Journal of Geophysical Research* 113(1), F01S06, doi:10.1029/2006JF000626. (J8)
- Lauer, J.W.**, and G. Parker, (2008). "Modeling framework for sediment deposition, storage, and evacuation in the floodplain of a meandering river, part I: theory." *Water Resources Research* 44(4), W04425, doi:10.1029/2006WR005528. (J7)
- Lauer, J.W.**, and G. Parker, (2008). "Modeling framework for sediment deposition, storage, and evacuation in the floodplain of a meandering river, part II: application to the Clark Fork River, Montana." *Water Resources Research* 44(8), W08404, doi:10.1029/2006WR005529. (J6)
- Aalto, R., **J.W. Lauer**, and W. Dietrich, (2008). "Spatial and temporal dynamics of sediment accumulation and exchange along Strickland River floodplains (PNG), over decadal-to-centennial time scales" *Journal of Geophysical Research* 113(1), F01S04, doi:10.1029/2006JF000627. (J5)
- Swanson, K.M., E. Watson, W. E. Dietrich, S. Apte, **J.W. Lauer**, R. Aalto, M. Bera, A. Marshall, and M. Taylor, (2008). "Sediment load and floodplain deposition rates: Comparison of the Fly and Strickland rivers, Papua New Guinea." *Journal of Geophysical Research* 113(1), F01S03, doi: 10.1029/2006JF000623. (J4)
- Parker, G., T. Muto, Y. Akamatsu, W.E. Dietrich, and **J.W. Lauer**, (2008), "Unraveling the conundrum of river response to rising sea level from laboratory to field. Part I. Laboratory experiments." *Sedimentology* 55(6), 1643-1655. (J3)
- Parker, G., T. Muto, Y. Akamatsu, W.E. Dietrich, and **J.W. Lauer**, (2008), "Unraveling the conundrum of river response to rising sea level from laboratory to field. Part II. The Fly-Strickland River System, Papua New Guinea." *Sedimentology* 55(6), 1657-1686. (J2)
- Lauer, J.W.** and G. Parker, (2008). "Net local removal of floodplain sediment by river meander migration." *Geomorphology* 96(1-2), 123-149. (J1)

Book Chapters

- Cordero, M., A. García, N. Lacayo, J. Ramos, L. Yescas, E. Peña, **W. Lauer**, J. Archibald, (2018) World Bank model calibration project with SWAT methodology in Ochomogo River, Nicaragua (1st Stage). In: Matsumura-Tundisi, T. and J.G. Tundisi, eds. *Water Resources Management*, Editora Scienza, São Carlos. (BC3)
- Piégay, H., A. Alber, **J. W. Lauer**, A. Rollet, E. Wiederkehr, (2012). "Bio-physical characterization of fluvial corridors at reach to network scales." In:

Carbonneau, P., and H. Piégay, eds. *Remote Sensing of Rivers: Management and Actions*, Wiley, Chichester. (BC2)

Lauer, J.W., (2012). "The importance of off-channel sediment storage in 1-D morphodynamic modeling." In: Church, M., P. Biron, and A. Roy, eds., *Gravel Bed Rivers: Processes, Tools, Environments*, Wiley, Chichester. (BC1)

Published Conference Proceedings

Dauenhauer, P., **J.W. Lauer**, H. Louie, J.M. Sloughter, C. Lacrampe, E. Smith, J. Ohara, N. Sebhat. 2019. "Impact Assessment of Energy Kiosks in Rural Zambia," 2019 IEEE Global Humanitarian Technology Conference (GHTC), pp. 1-8, doi: 10.1109/GHTC46095.2019.9033068. (P6)

Grignard, A., G. Fantino, **J.W. Lauer**, A. Verpeaux, A. Drogoul, 2015. "Agent-based visualization: A simulation tool for the analysis of river morphosedimentary adjustments" B. Gaudou and J.S. Sichman (Eds.) Multi-Agent Based Simulation XVI, Istanbul, Turkey, May 5. Revised Selected Papers. (P5)

Lauer, J.W., C. Li, E. Viparelli, and H Piégay, 2014. "MAST-1D: A Size-Specific Sediment Transport and Tracer Model with Off-Channel Storage" ASCE World Water and Environmental Resources Congress, Portland, Oregon June 1-5. (P4)

Lauer, J.W. and G. Parker, 2005. "Response of a Simple Channel Network to Post-Glacial Sea Level Rise." Proceedings of the River, Coastal, and Estuarine Morphodynamics Conference, Urbana, IL. October 4-7. (P3)

Lauer, J.W. and G. Parker, 2005. "Net Transfer of Sediment from Floodplain to Channel on Three Southern US Rivers." ASCE World Water and Environmental Resources Congress, Anchorage, Alaska. May 15-19. (P2)

Lauer, J.W. and G. Parker, 2004. "Modeling Channel-Floodplain Co - evolution in Sand-Bed Streams." ASCE World Water and Environmental Resources Congress, Salt Lake City, June 28- July 1. (P1)

Invited Talks

Lauer, J.W., Echterling, C., Lenhart, C., Rausch, R., Belmont, P. (2017). "Channel width change as a potential sediment source, Minnesota river basin." Presented at American Geophysical Union, New Orleans, LA, 11-15 December.

Lauer, J.W. (2015). "Sediment sorting in channel-floodplain complexes: Modeling approach for coarse bed systems", Presented at Workshop on Modeling Mixed-Sediment River Morphodynamics, Delft, Netherlands, 27-29 May.

Lauer, J.W. (2013). "Numerical model for channel/floodplain exchange on a gravel bed river: relative importance of upstream and downstream boundaries and of lateral exchange", Abstract EP41D-01 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Lauer, J.W. (2013). "A Numerical Model for Sediment Tracer Movement through an Actively Evolving River-Floodplain System." Presented at Centre Européen de Recherche et d'Enseignement des Géosciences de

- l'Environnement (CEREGE), Aix-Marseille Université, Aix, France, 24 May.
- Lauer, J.W.** (2009), "The role of streambanks in floodplain sediment budgets" Geological Society of America Annual Meeting, Portland, OR, October 18-21.
- Lauer, J.W.** (2009), "Holocene morphodynamic evolution and sediment aging in the Fly River System, Papua New Guinea" Marine Geology and Geophysics Seminar, University of Washington, Seattle, May 11.
- Lauer, J.W.** (2009), "Modeled long-term response of the Clark Fork River floodplain to mine-related sediment loading", Geosciences seminar series, University of Montana, Missoula, April 13.
- Lauer, J.W.** (2008), "Modeling net downstream imbalances in fine sediment along meandering rivers", Fine Sediment and the Chesapeake Bay Watershed, Linthicum Heights, MD, September 16-17.
- Lauer, J.W.** (2008), "Net local removal of floodplain sediment by river meander migration" École normale supérieure, Lettres et sciences humaines, Lyon, France, September 2.

SERVICE ACTIVITIES

- Reviewer: *Geology, Advances in Water Resources, Aquatic Sciences, Ecological Applications, Sedimentology, Geomorphology, Earth Surfaces Processes and Landforms, Journal of Geophysical Research, Journal of Hydrology, Journal of Environmental Management, Science of the Total Environment, Water Resources Research*, U.S. Geological Survey, National Science Foundation
- Board member, Glacier Peak Institute (2016-present). Participate in monthly planning meetings and committee work for regional outdoor-education organization.
- Guest lecturer, Snohomish County Beach Watcher's Program (2018-present)
- Member, Skagit Climate Science Consortium (2021-present)
- Stakeholder representative, Seattle City Light Integrated Resources Planning group (2016-2022). Participated on advisory committee charged with evaluating resource adequacy over a 20-year timescale for Seattle's hydropower-intensive public utility.
- Faculty mentor, Seattle University Engineering Clubs. Have supervised trips to Thailand, Jamaica, and Zambia and local projects in the Pacific Northwest.
- ASCE Excellence in Water Resources Engineering Education task committee. Served as contributor and reviewer for a compendium on water resources teaching activities.
- Lecturer, NSF National Center for Earth Surface Dynamics sponsored short course on Low Slope Sand Bed Rivers, May 27-28, 2006

GRANTS and AWARDS

- Seattle University Bannan Chair of Engineering, 2015-2017
- Seattle University Global Engagement Grants, 2016, 2018
- Seattle University Center for Environmental Justice and Sustainability, 2014-2015 Faculty Fellowship

Seattle University Professional Development Grant, 2010
U.S. Department of Fish and Wildlife (as subcontract through Utah State University): Walker River, Nevada, Geomorphic Analysis
National Science Foundation Grant OCE 0742476, Collaborative Research: Geomorphodynamic Modulation of Biogeochemical Fluxes and Basin Stratigraphy of the Fly River, 2008-2011
Minnesota Pollution Control Agency, An Integrated Sediment Budget for the Le Sueur River basin, Minnesota, 2007-2010
Anderson Award, University of Minnesota, 2005

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RESEARCH

I am a geomorphologist and hydrologist with a general interest in **earth surface forms and processes**, applied to a range of environments. In particular, I have an interest in the relationship between hydrological processes and flooding in major African river systems and **malaria transmission** at both the catchment and continental scale. More generally, I am interested in methods of surveying and parameterising **numerically complex topographies** both as part of hydraulic modelling and more generally within geomorphology, especially with a view to conducting spatially-distributed morphometric sediment budgets. As such, my research takes place at the interface between fieldwork and modelling. I have extensive experience in the logistics of managing and conducting fieldwork in remote and challenging environments.

In the UK, I apply these survey and modelling methods to address a number of management issues, from investigating upland **peat erosion** due to wildfires, to examining evidence that **Natural Flood Management** interventions reduce downstream flood peaks, to better parameterising roughness-resistance relationships in marginally-inundated gravel bed rivers, to examining the effects of **Large Woody Dams** on flow resistance and sediment transport, and to investigating the hydraulic and geomorphological effect of **beavers**.

In addition, I have applied my interests in topographic survey and parameterisation of surface roughness to investigate surface melt processes on arctic, Alpine and tropical glaciers and ice caps. This includes examining melt rates on ice surfaces and calving fronts and **parameterising aerodynamic roughness height of melting ice** with a view to upscaling for spatially distributed melt modelling.

EDUCATION

2008–2010	Postgraduate Certificate in Teaching in Higher Education (PGCTHE) Aberystwyth University, Institute of Geography and Earth Sciences
2005 –2009	Ph.D. Overland flow resistance and flood generation in semi-arid environments. Durham University, Department of Geography Supervisors: Dr N.J. Cox, Dr L.J. Bracken. Examiners: Professor Stuart Lane and Professor John Wainwright
2004 – 2005	MSc.R. The influence of surface roughness on runoff generation and soil erosion in semi-arid environments. Durham University, Department of Geography
2001 – 2004	BSc. (Hons) Geography (First Class) Durham University, Department of Geography
1999 – 2001	A Levels: Geography (A), Maths with Mechanics (A), Physics (A), General Studies (A)

PROFESSIONAL EXPERIENCE

2016 -	<i>Associate Professor</i> , School of Geography, University of Leeds
2012 - 2016	<i>Lecturer in Water Research</i> , School of Geography, University of Leeds.
2008 - 2012	<i>Lecturer in Physical Geography</i> , Institute for Geography and Earth Sciences, Aberystwyth University, Wales.
2008 - 2008	<i>Part-time Temporary Lecturer</i> , Division of Geography, School of Applied Sciences, Northumbria University (contributed to <i>Fluvial Geomorphology</i> course).

PUBLICATIONS

Over 65 peer-reviewed publications including journal articles, book chapters and an authored book.

- [67] Carrivick, J.L., **Smith, M.W.**, Sutherland, J.L. and Grimes, M. 2023. Cooling glaciers in a warming climate since the Little Ice Age at Qaanaaq, northwest Kalaallit Nunaat (Greenland). *Earth Surface Processes & Landforms* doi.org/10.1002/esp.5638
- [66] Kingsbury-Smith, L.E., Willis, T.D., **Smith, M.W.**, Boisgontier, H., Turner, D., Hirst, J., Kirkby, M. and Klaar, M.J., 2023. Evaluating the effectiveness of land use management as a natural flood management intervention in reducing the impact of flooding for a UK upland catchment. *Hydrological Processes* p.e14863.
- [65] Carrivick, J.L., Boston, C.M., Sutherland, J.L., Pearce, D., Armstrong, H., Bjørk, A., Kjeldsen, K.K., Abermann, J., Oien, R.P., Grimes, M., James, W.H. and **Smith, M.W.** 2023. Mass loss of glaciers and ice caps across Greenland since the Little Ice Age. *Geophysical Research Letters* 50(10), p.e2023GL103950.
- [64] Taylor, L.S., Quincey, D.J. and **Smith, M.W.** 2023. Evaluation of low-cost Raspberry Pi sensors for structure-from-motion reconstructions of glacier calving fronts. *Natural Hazards and Earth System Sciences* 23(1), 329-341.
- [63] Willis, T.D.M., **Smith, M.W.**, Cross, D.E., Hardy, A.J., Ettrich, G.E., Malawo, H., Chalo, C., Sinkombo, M. and Thomas, C.J. 2022. Hydrodynamic modeling of inundation patterns of a large African floodplain indicates sensitivity to waterway restoration. *Water Resources Research* 58, e2021WR030107.
- [62] Lo, H.W., van Leeuwen, Z., Klaar, M., Woulds, C. and **Smith, M.W.** 2022. Geomorphic effects of natural flood management woody dams in upland streams. *River Research and Applications* 38, 1787-1802.
- [61] **Smith, M.W.**, Chambers, J. and Carrivick, J.L. 2022. UAVs in cryosphere research. In Eltner, A., Hoffmeister, D., Kaiser, A., Karrasch, P., Klingbeil, L., Stöcker, C. and Rovere, A. (eds). *UAVs for the Environmental Sciences*. WBG Academic: Darmstadt, p365-379.
- [60] Taylor, L.S., Quincey, D.J., **Smith, M.W.**, Potter, E.R., Castro, J. and Fyffe, C.L., 2022. Multi-Decadal Glacier Area and Mass Balance Change in the Southern Peruvian Andes. *Front. Earth Sci*, 10, p.863933.
- [59] Irvine-Fynn, T.D., Holt, T.O., James, T.D., **Smith, M.W.**, Rutter, N., Porter, P.R. and Hodson, A.J., 2022. Time-lapse photogrammetry reveals hydrological controls of fine-scale High-Arctic glacier surface roughness evolution. *Earth Surface Processes and Landforms*. <https://doi.org/10.1002/esp.5339>.
- [58] Trigg, M.A., Carr, A.B., **Smith, M.W.** and Tshimanga, R.M. 2022. Measuring Geomorphological Change on the Congo River Using Century-Old Navigation Charts. In Tshimanga, R.M., Moukandi N'kaya, G.D. and Alsdorf, D. *Congo Basin Hydrology, Climate, and Biogeochemistry: A Foundation for the Future*. American Geophysical Union Geophysical Monograph Series, 413-426.
- [57] Carr, A.B., Trigg, M.A., Tshimanga, R.M., **Smith, M.W.**, Borman, D.J. and Bates, P.D. 2022. Estimation of Bathymetry for Modeling Multi-thread Channel Hydraulics: Application to the Congo River Middle Reach. In Tshimanga, R.M., Moukandi N'kaya, G.D. and Alsdorf, D. *Congo Basin Hydrology, Climate, and Biogeochemistry: A Foundation for the Future*. American Geophysical Union Geophysical Monograph Series, p275-293.
- [56] Lawson, J.W., Fennell, M., **Smith, M.W.** and Bacon, K.L. 2021. Regeneration and growth in crowns and rhizome fragments of Japanese knotweed (*Reynoutria japonica*) and desiccation as a potential control strategy. *PeerJ* 9, e11783 doi:10.7717/peerj.11783
- [55] Lo, H.W., **Smith, M.W.**, Klaar, M. and Woulds, C., 2021. Potential secondary effects of in-stream wood structures installed for natural flood management: a conceptual model. *Wiley Interdisciplinary Reviews: Water*, 8(5), p.e1546.
- [54] Taylor, L.S., Quincey, D.J., **Smith, M.W.**, Baumhoer, C.A., McMillan, M. and Mansell, D.T., 2021. Remote sensing of the mountain cryosphere: Current capabilities and future opportunities for research. *Progress in Physical Geography: Earth and Environment*, doi:10.1177/03091333211023690.
- [53] Chambers, J.R., **Smith, M.W.**, Smith, T., Sailer, R., Quincey, D.J., Carrivick, J.L., Nicholson, L., Mertes, J., Stiperski, I. and James, M.R., 2021. Correcting for Systematic Underestimation of Topographic Glacier Aerodynamic Roughness Values from Hintereisferner, Austria. *Frontiers in Earth Science* 9, p.691195.
- [52] Giler-Ormaza, A., Carrivick, J.L. and **Smith, M.W.**, 2021. Using 2D-hydraulic modelling together with SfM and YouTube to estimate peak discharge. *Tecnología y Ciencias del Agua*, 12(3).

- [51] Cross, D., Thomas, C., McKeown, N., Siazuyu, V., Healey, A., Willis, T., Singini, D., Liywali, F., Silumesii, A., Sakala, J., **Smith, M.W.**, Macklin, M.G., Hardy, A.J. and Shaw, P.W. 2021. Geographically extensive larval surveys reveal an unexpected scarcity of primary vector mosquitoes in a region of persistent malaria transmission in western Zambia. *Parasites and Vectors* 14:91.
- [50] **Smith, M.W.**, Willis, T., Alfieri, L., James, W.H.M., Trigg, M.A., Yamazaki, D., Hardy, A.J., Bisselink, B., De Roo, A., Macklin, M.G. and Thomas, C.J., 2020. Incorporating hydrology into climate suitability models changes projections of malaria transmission in Africa. *Nature Communications*, 11 doi:10.1038/s41467-020-18239-5.
- [49] Llana, M., Batalla, R.J., **Smith, M.W.** and Vericat, D., 2020. Do badlands (always) control sediment yield? Evidence from a small intermittent catchment. *Catena* 198, doi.org/10.1016/j.catena.2020.105015
- [48] Smith, T., **Smith, M.W.**, Chambers, J., Sailer, R., Nicholson, L., Mertes, J., Quincey, D.J., Carrivick, J.L. and Stiperski, I. 2020. A scale-dependent model to represent changing aerodynamic roughness of ablating glacier ice based on repeat topographic surveys. *Journal of Glaciology* 66, 950-964.
- [47] Mallalieu, J., Carrivick, J.L., Quincey, D.J. and **Smith, M.W.** 2020. Calving seasonality associated with melt-undercutting and lake ice cover. *Geophysical Research Letters* 47, e2019GL086561, doi: 10.1029/2019GL086561
- [46] Llana, M., Vericat, D., **Smith, M.W.** and Martínez-Casasnovas. 2020. Geomorphic adjustments to multi-scale disturbances in a mountain river: A century of observations. *Catena* 192 doi:10.1016/j.catena.2020.104584
- [45] Llana, M., Vericat, D., **Smith, M.W.** and Wheaton, J.M. 2020. Geomorphic process signatures reshaping sub-humid Mediterranean badlands: 2. Application to 5-year dataset. *Earth Surface Processes and Landforms* 45, 1292-1310 doi: 10.1002/esp.4822
- [44] Llana, M., Vericat, D., **Smith, M.W.** and Wheaton, J.M. 2020. Geomorphic process signatures reshaping sub-humid Mediterranean badlands: 1. Methodological development based on High Resolution Topography. *Earth Surface Processes and Landforms* 45, 1335-1346 doi: 10.1002/esp.4821
- [43] Chambers, J.R., **Smith, M.W.**, Quincey, D.J., Carrivick, J.L., Ross, A.N. and James, M.R., 2019. Glacial aerodynamic roughness estimates: uncertainty, sensitivity and precision. *Journal of Geophysical Research: Earth Surface* 125, e2019JF005167 doi.org/10.1029/2019JF005167.
- [42] Wolstenholme, J.M., **Smith, M.W.**, Baird, A.J. and Sim, T.G. 2019. A new approach for measuring surface hydrological connectivity. *Hydrological Processes* 34, 538-552 doi:10.1002/hyp.13602
- [41] Carr, A.B., Trigg, M.A., Tshimanga, R.M., Borman, D.J., and **Smith, M.W.** 2019. Greater Water Surface Variability Revealed by New Congo River Field Data: Implications for Satellite Altimetry Measurements of Large Rivers. *Geophysical Research Letters* 46, 8093-8101 doi:10.1029/2019GL083720.
- [40] Hardy, A.J., Ettrich, G., Cross, D.E., Bunting, P., Liywali, F., Sakala, J., Silumesii, A., **Smith, M.W.**, Willis, T., and Thomas, C.J. 2019. Automatic detection of open and vegetated water bodies using Sentinel 1 to map malaria vector mosquito breeding habitats. *Remote Sensing* 11, 593. doi:10.3390/rs11050593.
- [39] Llana, M., Vericat, D., Cavalli, M., Crema, S. and **Smith, M.W.** 2019. The effects of land use and topographic changes on sediment connectivity in mountain catchments. *Science of the Total Environment* 660, 899-912 doi:10.1016/j.scitotenv.2018.12.479.
- [38] Carrivick, J.L., Boston, C.M., King, O., James, W.H.M., Quincey, D.J., **Smith, M.W.**, Grimes, M. and Evans, J. 2019. Accelerated volume loss in glacier ablation zones of NE Greenland Little Ice Age to present. *Geophysical Research Letters* 46, 1476-1484 doi:10.1029/2018GL081383
- [37] Li, C., Grayson, R., Smith, M.W. and Holden, J. 2019. Patterns and drivers of peat erosion determined from Structure-from-Motion photogrammetry at field plot and laboratory scales. *Earth Surface Processes & Landforms* 44, 1274-1294. doi: 10.1002/esp.4571
- [36] Carrivick, J.L. and **Smith, M.W.** 2019. Fluvial and aquatic applications of Structure from Motion photogrammetry and UAV/drone technology. *WIREs Water* 6(1): e1328 doi:10.1002/wat2.1328.
- [35] Morris, P.J., Swindles, G.T., Valdes, P.J., Ivanovic, R.F., Gregoire, L.J., **Smith, M.W.**, Tarasov, L., Haywood A.M. and Bacon K.L. 2018. Global peatland initiation driven by regionally asynchronous warming. *PNAS*, 115: 4,851–4,856. doi: 10.1073/pnas.1717838115.
- [34] **Smith, M.W.** and Warburton, J. 2018. Microtopography of bare peat: a conceptual model and objective classification from high-resolution topographic survey data. *Earth Surface Processes & Landforms* 43, 1557-1574 doi: 10.1002/esp.4336.

- [33] Quincey, D.J., **Smith, M.W.**, Rounce, D.R., Ross, A.N., King, O. and Watson, C.S., 2017. Evaluating morphological estimates of the aerodynamic roughness of debris covered glacier ice. *Earth Surface Processes and Landforms* 42, 2541-2553.
- [32] Swindles, G.T. Morris, P.J., Whitney, B., Galloway, J.M., Galka, M., Gallego-Sala, A., Macumber, A.L., Mullan, D., **Smith, M.W.**, Amesbury, M.J., Roland, T.P., Sanei, H., Patterson, R.T., Sanderson, N., Parry, L., Charman, D.J., Lopez, O., Valderamma, E., Watson, E.J., Ivanovic, R.F., Valdes, P.J., Turner, T.E. and L  hteenoja, O. 2017. Ecosystem state shifts during long-term development of an Amazonian peatland. *Global Change Biology* 24, 738-757. doi: 10.1111/gcb.13950
- [31] Watson, C.S., Quincey, D.J., **Smith, M.W.**, Carrivick, J.L., Rowan, A.V. and James, M.R. 2017. Quantifying ice cliff evolution with multi-temporal point clouds on the debris-covered Khumbu Glacier, Nepal. *Journal of Glaciology* 63, 823-837.
- [30] Mallalieu, J., Carrivick, J.L., Quincey, D.J., **Smith, M.W.** and James, W.H., 2017. An integrated Structure-from-Motion and time-lapse technique for quantifying ice-margin dynamics. *Journal of Glaciology* 63, 937-949. doi: 10.1017/jog.2017.48
- [29] Watson, C.S., Quincey, D.J., Carrivick, J.L., **Smith, M.W.**, Rowan, A.V. and Richardson, R., 2017. Heterogeneous water storage and thermal regime of supraglacial ponds on debris-covered glaciers. *Earth Surface Processes and Landforms* 43, 229-241. doi:10.1002/esp.4236
- [28] Pearson, E., **Smith, M.W.**, Klaar, M.J., Brown, L.E. 2017. Can high resolution 3D topographic surveys provide reliable grain size estimates in gravel bed rivers? *Geomorphology* 293, 143-155. doi: 10.1016/j.geomorph.2017.05.015
- [27] James, M.R., Robson, S. and **Smith, M.W.** 2017. 3-D uncertainty-based topographic change detection with structure-from-motion photogrammetry: precision maps for ground control and directly georeferenced surveys. *Earth Surface Processes and Landforms* 42, 1769-1788 doi: 10.1002/esp.4125.
- [26] Watson, C.S., Quincey, D.J., Carrivick, J.L. and **Smith, M.W.** 2017. Ice cliff dynamics in the Everest region of the Central Himalaya. *Geomorphology* 278, 238-251.
- [25] Carrivick, J.L., **Smith, M.W.** and Quincey, D.J. 2016. *Structure from Motion in the Geosciences*. New Analytical Methods in Earth and Environmental Science. Wiley Blackwell.
- [24] Watson, C.S., Quincey, D.J., Carrivick, J.L. and **Smith, M.W.** 2016. The dynamics of supraglacial water storage in the Everest region, central Himalaya. *Global and Planetary Change* 142, 14-27 doi:10.1016/j.gloplacha.2016.04.008.
- [23] **Smith, M.W.**, Quincey, D.J., Dixon, T., Bingham, R.G., Carrivick, J.L., Irvine-Fynn, T.D. and Rippin, D.M., 2016. Aerodynamic roughness of glacial ice surfaces derived from high resolution topographic data. *Journal of Geophysical Research: Earth Surface* 121, 748-766.
- [22] Swindles, G., Morris, P., Wheeler, J., **Smith, M.W.**, Bacon, K., Turner, T.E., Headley, A. and Galloway, J. 2016. Resilience of peatland ecosystem services over millennial timescales: evidence from a degraded British bog. *Journal of Ecology* 104, 621-636.
- [21] **Smith, M.W.**, Carrivick, J.L. and Quincey, D.J. 2015. Structure from Motion Photogrammetry in Physical Geography. *Progress in Physical Geography* 40(2) 247-275.
- [20] **Smith, M.W.** 2015. Section 2.1.5: Direct acquisition of elevation data: Terrestrial Laser Scanning. In: Cook, S.J., Clarke, L.E. & Nield, J.M. (Eds.) *Geomorphological Techniques* (Online Edition). British Society for Geomorphology; London, UK. ISSN: 2047-0371.
- [19] **Smith, M.W.** and Vericat, D. 2015. From experimental plots to experimental landscapes: topography, erosion and deposition in sub-humid badlands from Structure-from-Motion photogrammetry. *Earth Surface Processes & Landforms* 40, 1656-1671.
- [18] Carrivick, J.L., **Smith, M.W.**, Carrivick, D.M. 2015. High-resolution topography of the upper Tarfala valley. *GFF* 137: 4, 383-396.
- [17] Hardy, A.J., Mageni, Z., Dongus, S., Killeen, G.F., Macklin, M.G., Majambere, S., Ali, A.S., Msellem, M., Al-Mafazy, A.-W., **Smith, M.W.**, Thomas, C. 2015. Mapping hotspots of malaria transmission from pre-existing hydrology, geology and geomorphology data in the pre-elimination context of Zanzibar, United Republic of Tanzania. *Parasites & Vectors* 8: 41, doi:10.1186/s13071-015-0652-5.
- [16] **Smith, M.W.**, Carrivick, J.L., Hooke, J., Kirkby, M.J. 2014. Reconstructing Flash Flood Magnitudes Using 'Structure-from-Motion': a rapid assessment tool. *Journal of Hydrology* 519, 1914–1927.

- [15] Irvine-Fynn, T.D.L., Sanz-Ablanedo, E., Rutter, N., **Smith, M.W.**, Chandler, J.H. 2014. Measuring glacier surface roughness using plot-scale, close-range digital photogrammetry. *Journal of Glaciology* 60, 957–969.
- [14] **Smith, M.W.** 2014. Roughness in the Earth Sciences. *Earth Science Reviews* 136, 202–225. doi: 10.1016/j.earscirev.2014.05.016.
- [13] Vericat, D., **Smith, M.W.**, Brasington, J. 2014. Patterns of topographic change in sub-humid badlands determined by high resolution multi-temporal topographic surveys. *Catena* 120, 164–176.
- [12] Hardy, A.J., Gamarra, J.G.P., Cross, D.E., Macklin, M.G., **Smith, M.W.**, Kihonda, J., Killeen, G.F., Ling'ala, G.N. and Thomas, C.J. 2013. Habitat hydrology and geomorphology control the distribution of malaria vector larvae in rural Africa. *PLoS ONE* 8(12): e81931. doi:10.1371/journal.pone.0081931
- [11] **Smith, M.W.** and Vericat, D. 2013. Evaluating shallow-water bathymetry from through-water terrestrial laser scanning under a range of hydraulic and physical water quality conditions. *River Research and Applications* 30(7), 905-924 doi:10.1002/rra.2687.
- [10] **Smith, M.W.** 2013. Improving student engagement with employability: the project pitch assessment. *Planet* 26, 2–7.
- [9] Carrivick, J.L., **Smith, M.W.**, Quincey, D.J., Carver, S.J., 2013. Developments in budget remote sensing for the geosciences. *Geology Today* 29, (4) 138–143.
- [8] **Smith, M.W.**, Macklin, M.G. and Thomas, C.J. 2013. Hydrological and geomorphological controls of malaria transmission. *Earth Science Reviews* 116, 109–127.
- [7] Bracken, L.J., Wainwright, J., Ali, G.A., Tetzlaff, D., **Smith, M.W.**, Reaney, S.M., and Roy, A.G. 2013. Concepts of hydrological connectivity: research approaches, pathways and future agendas. *Earth Science Reviews* 119, 17–34.
- [6] **Smith, M.W.**, Polglase, G. and Parry, C. 2012. Construction of student groups using Belbin: supporting group work in environmental management. *Journal of Geography in Higher Education*. doi:10.1080/03098265.2012.692156
- [5] **Smith, M.W.**, Vericat, D. and Gibbins, C. 2012. Through-water terrestrial laser scanning of gravel beds at the patch scale. *Earth Surface Processes & Landforms* 37, 411–421. doi: 10.1002/esp.2254
- [4] **Smith, M.W.**, Cox, N.J. and Bracken, L.J. 2011. Terrestrial laser scanning soil surfaces: a field methodology to examine surface roughness and overland flow hydraulics. *Hydrological Processes* 25, 842–860. doi:10.1002/hyp.7871.
- [3] **Smith, M.W.**, Cox, N.J. and Bracken, L.J. 2011. Modeling depth distributions of overland flows. *Geomorphology* 125, 402–413. doi:10.1016/j.geomorph.2010.10.017
- [2] **Smith, M.W.**, Bracken, L.J. and Cox, N.J. 2010. Toward a dynamic representation of hydrological connectivity at the hillslope scale in semi-arid areas. *Water Resources Research* 46, W12540, doi:10.1029/2009WR008496.
- [1] **Smith, M.W.**, Cox, N.J. and Bracken, L.J. 2007. Applying flow resistance equations to overland flows. *Progress in Physical Geography* 31, 4, 363–387.

GRANTS

Secured 28 research grants with a combined value of over £4.5 Mn.

QR GCRF (PI) Scaling up hydrodynamic malaria suitability estimates. **Smith, M.W.**, Thomas, C.J., Silumesi, A. 2021 (£44,557)

QR GCRF (PI) Modelling Dynamic Healthcare Access owing to Seasonal Inundation. **Smith, M.W.**, Janes, C., Grepin, K., Thomas, C.J., Singini, D. 2021 (£10,033)

NERC Treescapes Grant (Co-I). Creative Adaptive Solutions for Treescapes of Rivers (CASTOR). 2021 (£2.5 Mn, FEC)

INTERACT Transnational Access grant. HeBoG: Reconstructing the late Holocene extent and behaviour of glaciers in north-west Greenland. Grimes, M., **Smith, M.W.**, Sutherland, J. 2020 (£10,750)

NERC Urgency Grant (Co-I) Sediment and contaminant delivery to upland reservoirs following severe wildfire. Warburton, J., Evans, M., Chiverrell, R., **Smith, M.W.** and Shuttleworth, E. Ref: NE/S011560/1. 2018 (£64,717 FEC)

Yorkshire iCASP Project. (Co-I). Modelling to evaluate the impacts of existing land management on downstream flooding and prioritise Natural Flood Management interventions in Calderdale. Klaar, M., **Smith, M.W.** and Kirkby, M.J. 2018 (£193,988).

INTERACT Transnational Access grant (PI). HINTERGLARE: Hinterisferner Glacial Aerodynamic Roughness Estimation. **Smith, M.W.**, Quincey, D.J. and Chambers, J. 2018 (£8383)

NERC Standard Grant (Co-I). FLOODMAL. Thomas, C.J., **Smith, M.W.**, Macklin, M.J., Hardy, A.J. Ref: NE/P013481/1. 2017 (£739,666, FEC).

INTERACT Transnational Access grant (PI). GLARE: Glacial Aerodynamic Roughness Estimation. **Smith, M.W.**, Quincey, D.J. and Carrivick, J.L. 2017 (£7020)

INTERACT Transnational Access grant (Co-I). ZAKSCAN: Geomorphological characterisation and activity analysis in the Zackenberg region. Evans, J., Carrivick, J.L., **Smith, M.W.**, Graham, D., Hodgkins, R. 2017 (£10,768)

ESA Data Grant (Co-I). Using open-source hydraulic flood modelling to predict the spatial-temporal distribution of malaria vector habitats in Western Zambia. Hardy, A.J., **Smith, M.W.**, Thomas, C.J. and Cross, D. 2016. (4300 km² PLEIADES 0.5 m acquisitions)

NERC Industrial CASE Studentship (Co-I) with Jeremy Benn Associates. Brown, L. and **Smith, M.W.** 2016. (equivalent to ~£80,000)

Spanish Ministry of Science (Participant). MORPHPEAK: Morpho-sedimentary dynamics in mountain rivers affected by hydro-peaking: effects on habitat and implications for management. 2016. (£100,000)

Geologists' Association Curry Fund (Co-I). 3D Earth Science Library – a new education & outreach initiative. Torvela, T. and **Smith, M.W.** 2015 (£870)

INTERACT Transnational Access grant (Co-I). TARSCAN: Geomorphological characterisation and activity analysis at Tarfala. Carrivick, J., Quincey, D.J., **Smith, M.W.** and Carrivick, D. 2014 (£4560)

The Royal Society South Africa-UK Scientific Seminar Scheme (Participant). Wetlands in drylands: past, present & future trends in ecosystem service provision. 2014 (£4985)

British Society for Geomorphology Early Career Researcher Award (PI) BadlandScan: Dynamic patterns of erosion and deposition in badlands from high resolution surveys: from experimental plots to experimental landscapes. **Smith, M.W.** 2012. (£3376)

Spanish Ministry of Science (Participant). MORPHSED: morphosedimentary dynamics in human-stressed fluvial systems. 2012 (£106,300)

NERC Standard Grant (Co-I). HYDROMAL: Hydro-dynamic drivers of malaria transmission hazard in Africa. Thomas, C.J., Macklin, M.J., **Smith, M.W.**, Gamarra, J.G. Ref: NE/H022740/1. 2010 (£630,000 FEC)

Aberystwyth University Learning & Teaching Strategy Implementation Fund. (PI) Recognising the value of team skills in the workplace: the Belbin scheme. **Smith, M.W.** 2010 (£4,000)

Aberystwyth University Staff Development Fund. Attendance at the GEES New Lecturers Workshop, Plymouth University. **Smith, M.W.** 2010 (£150)

Aberystwyth University Learning & Teaching Enhancement Fund (PI). Flipcams as cost effective tools to widen learning assessment, enhance student employability and improve pedagogic practice. **Smith, M.W.** 2010 (£1020)

Aberystwyth University Research Fund LWEC Theme (Co-I). Predicting the impact of environmental change on disease, transmission: hydrological and geomorphological determinants of malaria transmission in East Africa'. Thomas, C.J., Macklin, M.G. and **Smith, M.W.** 2009 (£7500)

Aberystwyth University Research Fund (PI) Predicting flow resistance from surface roughness on marginally-inundated gravel beds. **Smith, M.W.** 2009 (£6800)

Royal Society International Travel Grant 2009 (£1800)

Hatfield College Middle Common Room Research Fund 2007 & 2008 (£100)

British Society for Geomorphology (BSG) 2007 (£150)

Royal Society Dudley Stamp Memorial Fund 2007 (£500)

Durham Geography Graduates Association Postgraduate Grant 2006 (£410)

AWARDS

- Voted University of Leeds Geography BSc Teaching Star by undergraduate students (2013) and runner-up in both 2014 and 2015.
- Nominated for Aberystwyth Student Led Teaching Award 2012 for Employability Links/Transferrable Skills.
- Aberystwyth University Teaching Excellence Award 2011 (now Aberystwyth University Teaching and Learning Fellowship) (£1200)
- British Society for Geomorphology (BSG) Marjorie Sweeting Dissertation Prize (2005) for dissertation project entitled 'The combined influence of topographical factors and soil physical and chemical factors upon gully formation and morphology' based on fieldwork in the Rif Mountains of northern Morocco.

TEACHING EXPERIENCE

- **Associate Professor/ Lecturer** – University of Leeds (UoL).
Modules co-ordinated: Dynamic Landscapes (Level 1), Earth Surface Processes (Level 2), Careers in Geography (Level 2), Portugal Field class (Level 2), Work Placement (Level 3), Digital Worlds (Level 3), Year in Industry. Contribute to: UK Field class (Level 2), Research Placement (Level 3), Hydrological Monitoring & Modelling (Level 3). Previously contributed to: Malham fieldtrip (Level 1), Nature, Society and Environment (Level 1), Skills in Physical Geography (Level 2), Cairngorms fieldtrip (Level 2), New Zealand Fieldtrip (Level 3), Issues and Skills (MSc module).
- **Lecturer** - Aberystwyth University (AU).
Modules co-ordinated: Environmental Management (Level 2), Monitoring & Modelling Hydrological Systems (Level 3).
Contributed to: Crete Fieldtrip (Level 2), Geographical Data Acquisition, Analysis and Presentation (Level 1); Key Skills for Geographers (Level 1), Geography Tutorial (Level 2), Geography Dissertation (Level 2).
- **Lectured** at Northumbria University for *Fluvial Geomorphology* module (2008).
- **Academic tutor** at Leeds (2012-), Aberystwyth (2008-2012) and Durham University (2005-2008).
- **Pastoral tutor** at Leeds (2012-), Aberystwyth University (2009-2012) and Hatfield College, Durham (2006-2008).
- **Postgraduate supervision (33 students):**
MSc Scott Dawson (2013), Thomas Lockwood (2014), Luke Clay (2015), Andy Giler (2016), Ruth Robinson (2017), Martin Rodgers (2017), Ruth Green (2017), Hannah Bewley (2019), Thomas Burgess (2022).
MbR Eleanor Pearson (2015-2016), Joshua Wolstenholme (2017-2018), Thomas Smith (2017-2019), Jacob Lawson (2018-2019), Lorna Kingsbury-Smith (2018-2019), Elizabeth Mroz (2020-2021), Adam Hartley (2020-2021).
MPhil Zöe Kershaw (2009-2011)
PhD, Richard Williams (2010-2014), Joanna Matthews (2011-15), Cameron Watson (2014-2017), Manel Llana Hernando (2015-2019, graduated 'cum laude'), Andrew Carr (2016-2020), Zora van Leeuwen (2016-), Duncan Livesey (2017-2021), Joshua Chambers (2017-2021), Ho Wen Lo (2017-2021), Liam Taylor (2018-2022), Michael Grimes (2018-), Elizabeth Townsend (2020-), Daniel Colson (2020-), Elizabeth Mroz (2021-), Constance Harpur (2022-) and Rossana Minchel (2022-).

SELECTED PRESENTATIONS

- | | |
|--------------|--|
| January 2021 | Smith, M.W. Hydro-climatic drivers of malaria transmission. Resilience Engineering: Engineering Sustainability for Developing Disaster-Resilient and Smart-Shrinking Society. The Second University of Leeds – Kyoto University International Symposium (Virtual) |
| April 2020 | Willis, T., Smith, M.W. , Cross, D., Hardy, A., Ettrich, G., Malawo, H., Sinkombo, M., Chlao, C., Mroz, E. and Thomas, C. 2020. Uncertainty in the modelling of large-scale flood events in the Barotse floodplain, Zambia. EGU General Assembly (Virtual). |

- April 2019 Carr, A.B., Trigg, M.A., Tshimanga, R.M., Borman, D.J. and **Smith, M.W.**, 2019. Measuring Water Surface on the Congo River—What Does Field Data Reveal That Satellite Altimetry Cannot? EGU General Assembly, Vienna, Austria.
- March 2019 **Smith, M.W.** Why the Small Stuff Matters: dealing with 'roughness' in the Earth Sciences. Invited seminar: Durham University, UK.
- February 2019 **Smith, M.W.** Using Structure from Motion Photogrammetry to Monitor NFM Projects. Yorkshire NFM Community of Practitioners Workshop, Leeds, UK.
- September 2018 Carr, A.B., Trigg, M., Tshimanga, R., Borman, D., **Smith, M.W.** and Bates, P. Developing a Detailed Reach-Scale Digital Elevation Model of the Congo River's Main Stem Bathymetry. Chapman Conference on Hydrologic Research in the Congo Basin, Washington DC, USA.
- September 2018 Trigg, M., Carr, A., **Smith, M.W.**, Tshimanga, R., Tellman, B. and Schwarz, B. Updating century old Congo River navigation maps and revealing their geomorphological secrets (poster). Chapman Conference on Hydrologic Research in the Congo Basin, Washington DC, USA.
- September 2018 Llana, M., **Smith, M.W.** and Vericat, D., Levantamientos topográficos en superficies altamente erosionables a partir de structure from motion: el papel de la altitud de toma de fotografías en la calidad de la información topográfica. Universitat de les Illes Balears, Sociedad Española de Geomorfología, Palma, Spain.
- April 2018 James, M.R., Robson, S. and **Smith, M.W.** 3-D uncertainty-based change detection in point clouds derived from structure-from-motion photogrammetry. EGU General Assembly, Vienna, Austria.
- December 2017 Carr, A.B., Trigg, M., Tshimanga, R., Neal, J.C., Borman, D., **Smith, M.W.**, Bola, G., Kabuya, P., Mushie, C.A. and Tschumbu, C.L. High Resolution Modelling of the Congo River's Multi-Threaded Main Stem Hydraulics. AGU Fall Meeting, New Orleans, USA.
- April 2017 **Smith, M.W.** and Warburton, J., Microtopography of bare peat: an objective classification from high-resolution topographic survey data. EGU General Assembly, Vienna, Austria.
- April 2017 Morris, P.J., Swindles, G.T., Valdes, P.J., Ivanovic, R.F., Gregoire, L.J., **Smith, M.W.**, Tarasov, L., Haywood, A.M. and Bacon, K.L. Climatic triggers for peatland initiation. EGU General Assembly, Vienna, Austria.
- April 2017 Pearson, E., **Smith, M.W.**, Klaar, M. and Brown, L. Can high resolution topographic surveys provide reliable grain size estimates? EGU General Assembly, Vienna, Austria.
- April 2017 Swindles, G.T., Morris, P.J., Whitney, B., Galka, M., Galloway, J.M., Gallego-Sala, A., Macumber, A.L., Mullan, D., **Smith, M.W.**, Amesbury, M. and Roland, T., Holocene development of Amazonia's oldest peatland. EGU General Assembly, Vienna, Austria.
- April 2017 James, M.R., Robson, S. and **Smith, M.W.** 3-D uncertainty-based topographic change detection with structure-from-motion photogrammetry and precision maps. EGU General Assembly, Vienna, Austria.
- April 2017 Quincey, D., **Smith, M.W.**, Rounce, D., Ross, A., King, O. and Watson, S. Estimating the aerodynamic roughness of debris covered glacier ice (poster). EGU General Assembly, Vienna, Austria.
- April 2017 Llana, M., Cavalli, M., Vericat, D. and **Smith, M.W.** Assessing historical sediment connectivity in a mesoscale catchment using multi-temporal aerial photographs. EGU General Assembly, Vienna, Austria.
- April 2016 Westoby, M., Dunning, S., Allan, M., **Smith, M.W.**, Quincey, D., Carrivick, J. and Watson, C.S., 2016. From an 'ice-see' perspective: The current use, potential and

limitations of Structure-from-Motion photogrammetry for cryospheric applications. EGU General Assembly, Vienna, Austria.

- December 2015 Quincey, D.J., **Smith, M.W.**, Carrivick, J.L., Rippin, D.M. and Bingham, R.G., 2015, December. Characterising glacier-wide ice-surface roughness using a combined Structure-from-Motion and Terrestrial Laser Scanning approach. AGU Fall Meeting, San Francisco, USA.
- September 2015 Watson, C.S., Quincey, D.J., Carrivick, J., **Smith, M.W.** and Rowan, A. Ice cliff, supraglacial pond, and water storage dynamics in the Everest region of Nepal (poster). International Glaciological Society British Branch Meeting, Durham, UK.
- May 2015 **Smith, M.W.** Hydrological applications of Structure from Motion. BHS Pennine Group Meeting, Leeds, UK.
- April 2015 **Smith, M.W.** and Vericat, D. Erosion and deposition in badlands: from experimental plots to experimental landscapes. EGU General Assembly, Vienna, Austria.
- April 2015 Vericat, D., Ramos, E., Brasington, J., Monoz, E., Bejar, M., Gibbins, C., Batalla, R.J., Tena, A., **Smith, M.W.**, Wheaton, J. Multi-temporal topographic models in fluvial systems: are accuracies enough to change the temporal and spatial scales of our studies? EGU General Assembly, Vienna, Austria.
- October 2014 **Smith, M.W.** Geomorphology in High Definition. water@leeds Networking Event, Leeds, UK.
- September 2014 **Smith, M.W.** and Vericat, D. Erosion and deposition in badlands: from experimental plots to experimental landscapes. British Society for Geomorphology (BSG) Conference, Manchester.
- September 2014 Vericat, D., **Smith, M.W.**, Muñoz-Narciso, E. Automatic digital photogrammetry in geomorphology: data collection and quality at multiple spatial scales. Avances de la Geomorfología en España 2012-2014. XIII Reunion Nacional de Geomorfologia. Universidad de Extremadura, Càceres, 351-354.
- September 2014 Vericat, D., Batalla, R.J., Gibbins, C.N., Brasington, J., Tena, A., Béjar, M., Muñoz-Narciso, E., Ramos, E., Lobera, G., Buendía, C., López-Tarazón, J.A., **Smith, M.W.**, Wheaton, J., López, R., Verdú, J., Palau, A. Coupling channel morphology and ecological diversity in a gravel bed river: MorphSed conceptual approach and experimental design (Poster). Avances de la Geomorfología en España 2012-2014. XIII Reunion Nacional de Geomorfologia. Universidad de Extremadura, Càceres, 167-170.
- August 2014 **Smith, M.W.**, Carrivick, J., Carrivick, D. High definition models of the proglacial geomorphology of the Tarfala Valley, Sweden. Invited presentation. Stockholm University, Sweden.
- January 2014 Matthews, J.R., Brewer, P.A., Macklin, M.G., Pearson, P. and **Smith, M.W.** Understanding Sub-Catchment Raw Water Quality: Development of an Early Warning System. Institute of Water WRc Meeting (Safety In Numbers - Can Technology Provide Intake Protection?), Swindon, UK.
- January 2014 **Smith, M.W.** Hydrological and geomorphological controls of malaria transmission. NERC Impact Workshop: Ifakara Tanzania.
- January 2014 **Smith, M.W.** and Hardy, A.J. Hydromal: Hydrological modelling of malaria vector habitats. NERC Impact Workshop: Ifakara Tanzania.
- September 2013 Irvine-Fynn, T.D.L., Chandler, J.H., Holt, T.O., James, T.D., **Smith, M.W.**, Sanz-Ablanedo, E., Rutter, N.. Exploring high-resolution supraglacial topography using close range digital photogrammetry. IGSB, Loughborough University, UK.
- September 2013 Matthews, J.R., Brewer, P.A., Macklin, M.G., Pearson, P. and **Smith, M.W.** Investigating the trigger mechanisms for suspended sediment “red events” in the Brecon Beacons. BSG. Royal Holloway, University of London, UK.

August 2013	Kirkby, M.J., Hooke, J., Smith, M.W. , Barbera, G.G., Garcia-Pintado, J.G. and Bracken, L.J. Hydrological impacts of floods in SE Spain, September 2012 (poster). IAG: Paris, France.
July 2013	Matthews, J.R., Brewer, P.A., Macklin, M.G., Pearson, P., Smith, M.W. Trigger mechanisms for suspended sediment “red events” in the Brecon Beacons. (poster) BHS and Pennines Hydrological Group National Meeting and Workshop, UK.
April 2012	Smith, M.W. and Vericat, D. Evaluating through-water TLS under a range of flow and suspended sediment conditions (poster) EGU General Meeting, Vienna, Austria.
April 2012	Vericat, D., Smith, M.W. , Lopez-Tarazon, J.A., Tena, A., Brasington, J., Batalla, R.J. Monitoring topographic change in highly erodible landscapes by means of TLS. (poster) EGU General Meeting, Vienna, Austria
April 2012	Bracken, L.J., Wainwright, J., Ali, G.A., Tetzlaff, D., Smith, M.W. , Reaney, S.M., and Roy, A.G. Hydrological connectivity for catchment management: research approaches, pathways and future agendas. EGU General Meeting, Vienna, Austria.
December 2010	Smith, M.W. , Vericat, D. and Gibbins, C. Through-water TLS of gravel beds at the plot scale (poster) AGU Fall Meeting, San Francisco, USA.
July 2009	Smith, M.W. , Bracken, L.J., and Cox, N.J. Controls of surface roughness on overland flow resistance on semi-arid hillslopes. Invited oral presentation at the International Association of Geomorphologists (IAG) Conference, Melbourne, Australia.
July 2008	Smith, M.W. , Bracken, L.J., and Cox, N.J. Overland flow resistance and flood generation in semi-arid environments. British Society for Geomorphology (BSG) Conference, Exeter, UK.
July 2007	Smith, M.W. , Cox, N.J., and Bracken, L.J. Surface roughness and overland flow hydraulics. International Association of Geomorphologists (IAG) Regional Conference, Kota Kinabalu, Malaysia.
May 2007	Smith, M.W. , Bracken, L.J., and Cox, N.J. Flow concentration and connectivity of hillslopes in south-east Spain. (poster) American Geophysical Union (AGU) Joint Assembly, Acapulco, Mexico.
September 2006	Smith, M.W. , Cox, N.J., and Bracken, L.J. Investigating the influence of soil surface form on overland flow hydraulics. (poster) British Hydrological Society (BHS) National Hydrology Symposium, Durham, UK.

MEDIA

- [The One Show](#) BBC One 20th June 2023 – Broadcast. Featured discussing beavers and natural flood management, alongside UAV footage from research.
- Interviewed on the Breakfast Show on the [Voice of Islam](#) Radio Station, discussing: Heatwaves- risk of mosquito-borne infections increases (4th July 2023).
- Beaver monitoring project reported in [BBC News](#) (June 2023).
- **Paul Hudson's Weather Show** [BBC Radio Leeds](#) 27th April 2020 – Broadcast. Featured discussing beaver monitoring project in the North York Moors.
- **Smith, M.W.** and Thomas, C.J. 2020. Malaria: new map shows which areas will be at risk because of global warming. *The Conversation* August 28th 2020 <https://theconversation.com/malaria-new-map-shows-which-areas-will-be-at-risk-because-of-global-warming-144783>
- Featured on the University of Leeds Medium blog: ‘Mapping puddles to control malaria’: <https://medium.com/university-of-leeds/mapping-puddles-to-control-malaria-173adcdbb96f>
- Malaria research reported in [MalariaWorld](#), [AfricaTimes](#), [MailOnline](#), [YahooNews](#), [The World Economic Forum](#), [News Medical](#), [ScienceDaily](#), [UNDispatch](#), [SciDevNet](#), [Environment Journal](#), various [national outlets](#) in Africa and a feature in [Eos](#). Featured in a [Nature themed collection](#) to mark World Malaria Day 2022.

- Japanese knotweed research reported in [The Mirror](#), [MailOnline](#), [The Yorkshire Post](#), BBC Newcastle, [Silicon Republic](#), [Construction Manager](#), [Irish Farmers Journal](#), [Farming Independent](#), [Agriland](#), [Yorkshire Evening Post](#), [FR24News](#), [Today UK News](#), Newstalk, [Horticulture Week](#), [Galway Daily](#), [That's Farming](#), among others.

PROFESSIONAL SERVICE

- Member of the NERC Geophysical Equipment Facility Steering Committee (2019 -)
- Secretary of the Research Sub-Committee of the British Society for Geomorphology (2014 - 2017)
- Trustee of the Field Studies Council (2015 - 2017)
- Member of the Executive Committee of the British Society for Geomorphology (2014 - 2017)
- Ph.D. examiner for Richard Lyons (2012), Pengfei Li (2014), Simon DeSmet (2015), Elizabeth Watson (2016), Janet Richardson (2016), Kissandra Bynoe (2016), Pia Benaud (Exeter, 2017), Joe James (QMUL, 2017), Jayne Kamintzis (Aberystwyth, 2019), Clare Cooper (2020), Firas Alazem (Civ Eng, 2021), Chris Tomsett (Southampton, 2022) and Richard Fewster (2023).
- MbR examiner for Peter Gill (2017), Liam Taylor (2018), Eilidh Stott (2018, Glasgow), Ethan Lee (2019) and Sophie Tankard (2022).
- Co-convenor and Chair of Session at EGU (2015-2020): High resolution topography in the geosciences: methods and applications.
- Associate Editor of *Royal Society Open Science* (2019-2022)
- Associate Editor of Special Issue of *Earth Surface Dynamics* (2017): 4D reconstruction of earth surface processes: multi-temporal and multi-spatial high resolution topography.
- Journal reviewer for 23 journals: *Advances in Water Resources*, *Applied Geography*, *Arctic*, *Antarctic and Alpine Research*, *Arid Land Research & Management*, *Catena*, *Earth Surface Processes & Landforms*, *GeoHealth*, *Hydrological Processes*, *Hydrology and Earth System Sciences*, *Hydrology Research*, *International Journal of Environmental Research and Public Health*, *Journal of Flood Risk Management*, *Journal of Glaciology*, *Journal of Hydraulic Engineering*, *Journal of Soils and Sediments*, *Remote Sensing*, *River Research & Applications*, *Scientific Reports*, *The Cryosphere*, *The Photogrammetric Record*, *Trends in Parasitology*, *Water and Water Resources Research*.
- Grant reviewer for *US National Science Foundation*, *The Royal Society/Department for International Development*, *Czech Science Foundation*, *National Science Centre of Poland* and *Xi'an Jiaotong-Liverpool University*. Book proposal reviewer for *Cambridge University Press* and *Pearson*.
- Advised the UK Health Security Agency on the impact of climate change on waterborne disease in the UK (2023).

CONSULTANCY PROJECTS

2015	Brown, L., Smith, M.W. and Carrivick, J. River Cover restoration project. £2000.
2013	Holden, J., Chapman, P.J. Palmer, S.M., Parry, L.E., Baird, A.J., Wallage, Z.E., Wynne, H. and Smith, M.W. 2013. Catchment management batch: investigations into moorland burning, vegetation cover type, pipe blocking and intake clearance on raw water quality. Final report to Yorkshire Water Services, Project B5347, University of Leeds, Leeds.
2011	Brewer, P.A., Macklin, M.G., Smith, M.W. and Foulds, S. 2011. A proposed Management Plan for the consolidation and conservation of the remains of a 19th century mining complex at Middle Greenlaws level head and ore works: hydrological and geomorphological assessment. Commissioned by Countryside Consultants. Fluvio report 2011/04/72, 43 pp. (Period August 2011–December 20-11; £8,420).
2008	Assisted with a TLS, GPS & photographic survey of Whitby pier for Royal Haskoning.

ADMINISTRATIVE ROLES

- River Basin Processes & Management Research Cluster Leader (UoL) (2016-)
- School of Geography Year in Industry Tutor (UoL) (2015-)

- Member of Faculty of Environment Employability Working Group (UoL) (2014-)
- Member of Research Postgraduate Committee (UoL) (2012-2022)
- Member of water@Leeds Strategy Board (Next generation champion) (UoL) (2013-2016)
- Member of Faculty of Environment International Partnerships and Market Development Working Group (UoL) (2013-16)
- Director of Student Recruitment & Marketing (AU) (2011-2012)
- BSc Geography Scheme Leader (AU) (2011-2012)
- IGES Management Group (AU) (2010-2012)
- University Recruitment Committee (AU) (2010-2012)
- Assistant Director of Student Recruitment & Marketing (AU) (2010-2011)
- Undergraduate Admissions & Recruitment Officer (AU) (2008-2012)
- Entrance Scholarship Examiner (AU) (2010-2012)
- Deliver Visiting Day Institute Talk (AU) (2010-2012)
- IGES website management group (AU) (2009-2012)
- IGES Newsletter editor (AU) (2008-2011)

PROFESSIONAL MEMBERSHIPS

Fellow of the Higher Education Academy
Member of the British Society for Geomorphology

TECHNICAL SKILLS

Competent with GIS & Remote Sensing software (ArcGIS, ENVI, ERDAS, SAGA), UAVs (with Permission for Commercial Operation, PfCO), Terrestrial Laser Scanning and point cloud manipulation (MDL, Trimble, Riegl, Leica), Structure-from-Motion, GPS and TS survey methods (Leica), statistical analysis (Stata, Excel), basic programming (Stata, MATLAB, Python), graphics (Adobe Illustrator, Corel Draw), basic web design, installation of hydrological monitoring equipment (Starflow, Casella raingauges, Druk pressure transducers, In-situ trolls, Unidata evaporation pan) and flow velocity measurement (ECMs, ADVs).

INTERESTS & ADDITIONAL INFORMATION

- Full, clean driving license.
- First Aid at Work and First Aid in the Field qualified.
- Can speak and understand Spanish and Portuguese to an intermediate level.

REFERENCES

Prof. Stephen Tooth
Institute of Geography and Earth Sciences,
Llandinam Building, Penglais Campus,
Aberystwyth University
SY23 3DB
Email: set@aber.ac.uk

Prof. James Brasington
School of Geography,
Queen Mary,
University of London,
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Email: j.brasington@qmul.ac.uk

Dr Nicholas .J. Cox
Department of Geography,
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Hatfield College,
Durham University,
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Durham,
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Chadwin Smith, Ph.D.
Science Policy Coordinator
Platte River Recovery Implementation Program 4111 4th Ave., Suite 6
Kearney, NE 6884

March 9, 2023

Dear Dr. Smith,

I am writing to express my interest in serving on the Platte River Recovery Implementation Program (PRRIP) Independent Scientific Advisory Committee (ISAC) to fill the open seat in the area of fluvial geomorphology. Currently, I am a professor in the Department of Civil and Environmental Engineering at the University of New Mexico (UNM) and Director of the UNM Resilience Institute. However, in July, I will begin a new position as Department Head of Biological Systems Engineering at the University of Nebraska-Lincoln, my alma mater. I believe that I am well-suited to contribute to the mission of the PRRIP and ISAC.

In terms of my qualifications for this position, I hold both master's and PhD degrees in water resource engineering from Washington State University with emphases in ecohydrology, geomorphology, and stream restoration. I have over 20 years of relevant experience in habitat restoration and species recovery efforts. This includes authoring over 50 peer-reviewed publications, advising 12 PhD students and 30 masters students, serving as an associate editor for multiple journals, and serving as a panelist for multiple National Science Foundation (NSF), U.S. Department of Agriculture, and U.S. Environmental Protection Agency funding programs.

Over the past 14 years, I have been actively engaged in design and research efforts focused on the recovery of the Rio Grande Silvery Minnow and the Southwestern Willow Flycatcher. I have served as an alternate on the Middle Rio Grande Cooperative Program for the past six years, and as a member of the Rio Chama Flows Project for the past 12 years. Other relevant experiences include serving as a scientific team member and modeler for the Colorado River Delta Program (Sonoran Institute and The Nature Conservancy), and the Lower Colorado River Multi-Species Conservation Program, as well as being a lead scientist for the Clark County (Nevada) Multi-Species Conservation Program.

I will highlight a few of my recent research and educational projects to demonstrate my: high standards of scientific integrity, independence, and objectivity; ability to forge creative solutions to complex problems; and interest in and ability to work effectively in an interdisciplinary setting.

It is challenging to document high standards of scientific integrity, independence, and objectivity through a CV, but I will attempt to do so through a story. From 2010 to 2015, I was heavily involved in scientific studies surrounding a proposed flow diversion project on the Gila River in southwest New Mexico. My team conducted two studies supporting the process: one funded by the State of New Mexico, who were proponents of the project; and another supported by the New Mexico office of The Nature Conservancy, who opposed the project. In both studies, we concluded that the proposed diversion would have negative effects on

the aquatic and riparian components of the ecosystem. Despite significant political pressure to downplay potential impacts, including threats not to pay outstanding invoices, we stood by our results and published our studies in peer-reviewed literature. I also testified about our findings in front of the New Mexico State Legislature. Ultimately, the diversion project was rejected, and our invoices were eventually paid in full.

An example of my ability to forge creative solutions to complex problems comes from my current research in Patagonian Chile. My team is working with small family farms to accelerate climate change adaptation practices in the face of the ongoing Chilean megadrought. Our approach relies upon community-inspired adaptation approaches, including improved irrigation technologies, regenerative approaches to building soil health, and adoption of alternative crops. This project is the topic of my current Fulbright Fellowship to Chile. Another example is through my team's collaboration with the Native American Community Academy. We are blending Traditional Ecological Knowledge with cutting-edge modeling and remote sensing approaches to develop wildfire risk reduction strategies on their land in the Sandia Mountains near Albuquerque, NM.

My ability to work effectively in an interdisciplinary setting is best demonstrated through my experiences serving as the lead Principal Investigator and Director of the Intermountain West Transformation Network, a 5-year, \$15-million, NSF-supported research network ([#2115169](#)). The network involves 35 researchers representing 15 disciplines from eight universities, as well as approximately 50 non-academic partner organizations. With a shared aim of building resilient communities and ecosystems, our research network explores headwaters and wildfires, regional food-energy-water systems, and governance & wellbeing as central themes. In addition, I co-founded and co-lead the interdisciplinary, international, and cross-sectoral Transect of the Americas Research Network ('The Transect'), which is supported by two NSF grants ([#1826709](#) and [#1954188](#)). The Transect includes participants from 12 organizations in 10 countries along a longitudinal transect of the American cordillera, from Alberta, Canada to Patagonia.

In conclusion, I believe that my extensive experience in water resource engineering, fluvial geomorphology, and habitat restoration, combined with my ability to work collaboratively and creatively in an interdisciplinary setting, make me a strong candidate for the open seat on the PRRIP ISAC. I am excited about the opportunity to contribute to the mission of the program, and I look forward to discussing my qualifications further. Thank you for considering my application.

Sincerely,



Mark Stone, PhD, P.E. DWRE

Professor and Regent's Lecturer, Dept. of Civil, Construction, & Environmental Engineering
Associate Dean for Academic Affairs & Community Engagement, UNM School of Engineering
Director, UNM Resilience Institute and the Intermountain West Transformation Network
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Mark C. Stone, Ph.D., P.E., D.WRE

Department of Biological Systems Engineering
University of Nebraska – Lincoln (UNL)

Professional Appointments

2023-Present	Department Head and Professor, Department of Biological Systems Engineering, University of Nebraska – Lincoln (UNL)
2021-2023	Associate Dean for Academic Affairs and Community Engagement, University of New Mexico (UNM), School of Engineering
2021-2023	Professor, Department of Civil, Construction, and Environmental Engineering, UNM
2021-2022	Associate Chair for Undergraduate Studies, Department of Civil, Construction, and Environmental Engineering, UNM
2018-Present	Director, UNM Resilience Institute
2015-2021	Associate Professor and Regents' Lecturer, Department of Civil, Construction, and Environmental Engineering, UNM
2013-2016	Associate Chair for Graduate Studies, Department of Civil Engineering, UNM Associate Director, Water Resources Program, UNM
2009-2015	Assistant Professor, Department of Civil Engineering, UNM
2005-2009	Assistant Research Professor, Division of Hydrologic Sciences, Desert Research Institute
2002-2005	Graduate Research Assistant, Department of Civil and Environmental Engineering, Washington State University (WSU)
2000-2002	Water Resources Engineer, HDR Engineering Inc., Omaha, Nebraska
1999-2000	Graduate Research Assistant, Department of Civil and Environmental Engineering, WSU

Education

2005	Ph.D. Civil and Environmental Engineering, Washington State University
2000	M.S. Civil and Environmental Engineering, Washington State University
1998	B.S. Biological Systems Engineering, University of Nebraska - Lincoln

Registration and Certification

Professional Engineering License, State of New Mexico, #19990

Honors and Awards

2023	Fulbright Scholar - Chile
2022	New Mexico Alliance for Minority Participation Outstanding Mentor Award
2021	Harrison Faculty Excellence Award
2020	Paul Bartlett Re Peace Prize Career Achievement Award
2020	Robert Stamm Endowed Professor in Advanced Design and Construction Practices
2019	UNM School of Engineering Teaching Excellence Award
2018	UNM Regents' Lecturer
2018	Robert Stamm Award for Teaching Excellence
2015	Robert Stamm Award for Research Excellence
2014	National Science Foundation (NSF) CAREER Award
2013	Robert Stamm Award for Teaching Excellence
2012	Diplomate of Water Resources Engineering (D.WRE) in the American Academy of Water Resources Engineers UNM School of Engineering Outstanding Junior Faculty Teacher
2011	Robert Stamm Award for Teaching Excellence
2010	Sigma Xi Scientific Research Society

2009 U.S. Department of State, Bureau of International Information Programs Delegate
 2005 National Science Foundation Graduate Fellowship to Japan

Peer Reviewed Publications

1. Chaulagain, S.¹, Stone, M. C., Morrison, R.R.¹, Yang, L., Coonrod, J., & Villa, N. E. (2023). Determining the response of riparian vegetation and river morphology to drought using Google Earth Engine and machine learning. *Journal of Arid Environments*, 219, 105068.
2. Schoener, G.¹, Muñoz, E., Arumí, J. L., & Stone, M. C. (2022). Impacts of Climate Change Induced Sea Level Rise, Flow Increase and Vegetation Encroachment on Flood Hazard in the Biobío River, Chile. *Water*, 14(24), 4098.
3. Chaulagain, S.¹, Stone, M. C., Dombroski, D., Gillihan, T., Chen, L., & Zhang, S. (2022). An investigation into remote sensing techniques and field observations to model hydraulic roughness from riparian vegetation. *River Research and Applications*, 38(10), 1730-1745.
4. Stone, M. C., & Morrison, R.R.¹ (2021). Human Impacts on the Hydrology, Geomorphology, and Restoration Potential of Southwestern Rivers. *Standing between Life and Extinction: Ethics and Ecology of Conserving Aquatic Species in North American Deserts*, 239-254.
5. Jaramillo, L.V.¹, Stone, M. C., & Benson, M. H. (2021). Developing Factors for Socio-Ecological Resilience. In *Handbook of Disaster Risk Reduction for Resilience*, 387-416.
6. Schoener, G.¹, Stone, M. C., & Thomas, C. (2021). Comparison of Seven Simple Loss Models for Runoff Prediction at the Plot, Hillslope and Catchment Scale in the Semiarid Southwestern US. *Journal of Hydrology*, 126490.
7. Schoener, G.¹, & Stone, M. C. (2020). Monitoring soil moisture at the catchment scale—a novel approach combining antecedent precipitation index and radar-derived rainfall data. *Journal of Hydrology*, 125155.
8. Summers, B. M.¹, Horn, D. J. V., González-Pinzón, R., Bixby, R. J., Grace, M. R., Sherson, L. R., ... & Dahm, C. N. (2020). Long-term data reveal highly-variable metabolism and transitions in trophic status in a montane stream. *Freshwater Science*, 39(2), 000-000.
9. Chen, X., Chen, L.², Stone, M. C., & Acharya, K. (2020). Assessing Connectivity between the River Channel and Floodplains during High Flows Using Hydrodynamic Modeling and Particle Tracking Analysis. *Journal of Hydrology*, 124609.
10. Gregory, A.¹, Chen, C., Wu, R., Miller, S., Ahmad, S., Anderson, J. W., Stone, M.C.. (2020). Efficient Model-data Integration for Flexible Modeling, Parameter Analysis & Visualization, and Data Management. *Frontiers in Water*, 2, 2.
11. Byrne, C. F.¹, Stone, M. C., & Morrison, R. R. (2019). Scalable flux metrics at the channel-floodplain interface as indicators of lateral surface connectivity during flood events. *Water Resources Research*, 55(11), 9788-9807.
12. Schoener, G.¹, & Stone, M. C. (2019). Impact of antecedent soil moisture on runoff from a semiarid catchment. *Journal of Hydrology*, 569, 627-636.
13. Jaramillo, L.V.¹, Stone, M.C., and Morrison, R. R. 2018. An Indicator-Based Approach to Assessing Resilience of Socio-Hydrologic Systems in Nepal to Hydropower Development. *Journal of Hydrology*, 563:1111:1118.
14. Gregory, A.¹, Morrison, R.R.¹, and M.C. Stone. 2018. Assessing the Hydrogeomorphic Effects of Environmental Flows using Hydrodynamic Modeling. *Environmental Management*, 62:352-364.
15. Benson, M.H, Morrison, R.R.¹, Llewellyn, D, and M.C. Stone. 2018. Governing the Rio Grande: Challenges and Opportunities for New Mexico's Water Supply. *Water Governance*, 2018:99-114.
16. Stone, M.C., Byrne, C.F.¹, and R.R. Morrison¹. 2017. Evaluating the Impacts of Hydrologic Alterations on Floodplain Connectivity. *Ecohydrology*, 10(5).
17. Gunderson, L., Cosens, B.A., Fremier, A.K., Stone, M.C., and M.H. Benson. 2018. Regime shifts and panarchies in regional scale social-ecological water systems. *Ecology and Society*, 22(1):1-31.

18. Byrne, C.F.¹, Stormont, J.C., and M.C. Stone. 2017. Soil Water Balance Dynamics on Reclaimed Mine Land in the Southwestern United States. *Journal of Arid Environments*, 136:28-37.
19. Benson, M.H., Lippitt, C.D., Cosens, B., Stone, M.C., and V. Valentine. 2016. Five ways to support interdisciplinary work before tenure. *Journal of Environmental Studies and Sciences*, 6(2):260-267.
20. Harm Benson, M., Llewellyn, D., Morrison, R.R.¹ and M.C. Stone. 2015. Water Governance Challenges in New Mexico's Middle Rio Grande Valley: A Resilience Assessment. *Idaho Law Review*, 51:195.
21. Morrison, R.R.¹ and M.C. Stone. 2015. Evaluating the Impacts of Environmental Flow Alternatives on Reservoir and Recreational Operations Using System Dynamics Modeling. *Journal of the American Water Resources Association*, 51.1 (2015): 33-46, DOI: 10.1111/jawr.12231.
22. Morrison, R.R.¹ and M.C. Stone. 2015. Investigating Environmental Flows for Riparian Vegetation Recruitment Using System Dynamics Modelling. *River Research and Applications*, 31.4: 485-496, DOI: 10.1002/rra.2758.
23. Morrison, R.R.¹ and M.C. Stone. 2014. Spatially Implemented Bayesian Network Model to Assess Environmental Impacts of Water Management. *Water Resources Research*, 50(10), 8107-8124, DOI: 10.1002/2014WR015600.
24. Chen, L.², Stone, M.C., and Acharya, K. 2014. Using a Mechanical Approach to Quantify Flow Resistance by Submerged, Flexible Vegetation - a revisit of Kouwen's approach. *Advances in Water Resources*, 73:198-202. DOI: 10.1016/j.advwatres.2014.08.014
25. Webb, R.W.¹, Stormont, J.C., Stone, M.C., and B.M. Thomson. 2014. Characterizing the Unsaturated and Saturated Hydraulic Properties of Coal Combustion By-Products. *Journal of The American Society of Mining and Reclamation*, 3(1): 70-99.
26. Wang, Y., Chen, D.¹, Wong, D. Stone, M.C., Wei, Q., Liu, X. and S. Feng. 2013. Environmental Factors Affecting Drift Flux of Hydropsychidae Larvae in the Upper Yangtze River, China. *Environmental Management*, *Journal of Hydraulic Research*, 51(1): 19-32.
27. Morrison, R.R.¹, Stone, M.C. and D. Sada. 2013. Response of a Desert Springbrook to incremental Discharge Reductions, with Tipping Points of Non-Linear Environmental Change. *Journal of Arid Environments*, 99:5-13. DOI: 10.1016/j.jaridenv.2013.09.002.
28. Benson, M.H., Morrison, R.R.¹, and M.C. Stone. 2013. A Classification Framework for Running Adaptive Management Rapids. *Society and Ecology*, 18(3): 30. DOI: 10.5751/ES-05707-180330.
29. Naranjo, R.¹, Niswonger, R., Pohl, G. and M.C. Stone. 2013. Using Heat as a Tracer to Estimate Spatially Distributed Mean Residence Times in the Hyporheic Zone of a Riffle-Pool Sequence. *Water Resources Research*, 49.6: 3697-3711. DOI: 10.1002/wrcr.20306.
30. Chen, D.², Acharya, K. and M.C. Stone. 2013. Closure to Sensitivity Analysis of Non-Equilibrium Adaptation Parameters for Modeling Mining-Pit Migration. *Journal of Hydraulic Engineering*, 139(7):801. DOI: 10.1061/(ASCE)HY.1943-7900.0000727.
31. Stone, M., Stormont, J., Epp, E., and C.F. Byrne¹. 2013. Evaluation of Geomorphic Reclamation Performance and Models in the Southwestern United States. *American Society of Mining and Reclamation*, 366(1).
32. Almomani, F., Shawaqfah, M., and M.C. Stone. Evaluation of Anaerobic Digester Based Treatment and Biogas Production of Agricultural Solid Wastes. *Journal of Environmental Protection*, 4(04):309.
33. Naranjo, R.¹, Niswonger, R., Pohl, G., Stone, M.C., Davis, C. and W. McKay. 2012. The use of Multiobjective Calibration and Regional Sensitivity Analysis in Simulating Hyporheic Exchange. *Water Resources Research*, 48:W01538. DOI: 10.1029/2011WR011179.
34. Zhu, J., Stone, M.C., and W. Forsee¹. 2012. Analysis of Potential Impacts of Climate Change on Intensity–Duration–Frequency (IDF) Relationships for Six Regions in the United States. *Journal of Water and Climate Change*, 3(3):185-196. DOI: 10.2166/wcc.2012.045.
35. Stone, M.C., Goreham, J.O.¹, McKay, K., Chen, L.², and K. Acharya. 2011. Bending of Submerged Woody Riparian Vegetation as a Function of Hydraulic Flow Conditions. *River Research and Applications*, 9(2):195-205. DOI: 10.1002/rra.1592.

36. Chen, L., Stone, M.C., Acharya, K. and K. Steinhaus¹. 2011. Mechanical Analysis for Emergent Vegetation in Flowing Fluids. *Journal of Hydraulic Research*, 49(6):766-774. DOI: 10.1080/00221686.2011.621359.
37. Li, Y.², Acharya, K., and M.C. Stone. 2011. Spatiotemporal Patterns in Nutrient Loads, Nutrient Concentrations, and Algal Biomass in Lake Taihu, China. *Lake and Reservoir Management*, 27(4):298-309. DOI:10.1080/07438141.2011.610560.
38. Li, Y.², Acharya, K., Stone, M.C., and D. Chen². 2010. Modeling Water Ages and Thermal Structure of Lake Mead Under Changing Water Levels. *Lake and Reservoir Management*, 26:258-272. DOI: 10.1080/07438141.2010.541326.
39. Chen, D.², Stone, M.C., and Acharya, K. 2010. Sensitivity Analysis of Non-Equilibrium Adaptation Parameters for Modeling Mining-Pit Migration. *Journal of Hydraulic Engineering*, 136(10):806-811. DOI: 10.1061/(ASCE)HY.1943-7900.0000242.
40. Gautam, M.R.², Acharya, K., and M.C. Stone. 2010. Best Management Practices for Stormwater Management in the Desert Southwest. *Journal of Contemporary Water Research & Education*, 146:39-49. DOI: DOI: 10.1111/j.1936-704X.2010.00390.x.
41. Chen, L, Goreham, J.O.¹, and M.C. Stone. 2009. Impacts of Shear Stress on Saturated Hydraulic Conductivity of a Polyacrylamide Treated Soil. *Environmental Water Resources*, 2009(10).
42. Morrison, R.R.¹, Hotchkiss, R.H., Stone, M.C., Thurman, D., and A.R. Horner-Devine. 2009. Turbulence Characteristics of Flow in a Spiral Corrugated Culvert Fitted with Baffles and Implications for Fish Passage. *Ecological Engineering*, 35(3):381-392. DOI: 10.1016/j.ecoleng.2008.10.012.
43. Chen, L.², and M.C. Stone. 2008. Influence of Bed Material Size Heterogeneity on Bedload Transport Uncertainty. *Water Resources Research*, 44(1):W01405. DOI: 10.1029/2006WR005483.
44. Stone, M.C. and R.H. Hotchkiss. 2007. Evaluating Velocity Measurement Techniques in Shallow Streams. *Journal of Hydraulic Research*, 45(6): 752–762. DOI: 10.1080/00221686.2007.9521813.
45. Stone, M.C. and R.H. Hotchkiss. 2007. Turbulence Descriptions in Two Cobble-Bed River Reaches. *Journal of Hydraulic Engineering*, 133(12): 1367–1378. 10.1061/(ASCE)0733-9429.
46. Stone, M.C., Hotchkiss, R.H. and L.O. Mearns. 2003. Water Yield Responses to High and Low Spatial Resolution Climate Change Scenarios in the Missouri River Basin. *Geophysical Research Letters*, 30(4):1186. DOI: 10.1029/2002GL016122.
47. Stone, M.C., Hotchkiss, R.H., Hubbard, C.M., Fontaine, T.A., Mearns, L.O. and J.G. Arnold. 2001. Impacts of Climate Change on Missouri River Basin Water Yield. *Journal of the American Water Resources Association*, 37(5):1119. DOI: 10.1111/j.1752-1688.2001.tb03626.
48. Hotchkiss, R.H., Jorgensen, S.F., Stone, M.C. and T.A. Fontaine. 2000. Regulated River Modeling for Climate Change Impact Assessment: The Missouri River. *Journal of the American Water Resources Association*, 36(2):375. DOI: 10.1111/j.1752-1688.2000.tb04275.

1- Designates current or former student of Mark Stone

2- Designates current or former post-doc of Mark Stone

Book Chapters

1. Stone, M. C., & Morrison, R. R. (2020). 16 Human Impacts on the Hydrology, Geomorphology, and Restoration Potential of Southwestern Rivers. In *Standing between Life and Extinction*(pp. 239-254). University of Chicago Press.
2. Stone, M.C. 2019. Simplification of the rivers of the American Southwest and their habitats. *Standing Between Life and Extinction*. University of Chicago Press. In press.
3. Stone, M.C. and A.B. Stone. 2013. Social-Ecological Resilience and Climate Change. In *Encyclopedia of Climate Change Volume 1*. ABC-Clio, Santa Barbara, CA. ISBN: 1598847619.

Research and External Funding

- Total Funding: \$36,500,000

<i>Year</i>	<i>Project Title and Role</i>	<i>Funding Agency</i>	<i>Award (\$)</i>	<i>Duration (Months)</i>
2021	SRS RN: Transforming Rural-Urban Systems: Trajectories for Sustainability in the Intermountain West	National Science Foundation	15,000,000	60
2021	Co-PI, Low-Cost Efficient Wireless Intelligent Sensors (LEWIS) for Greater Preparedness and Resilience to Post-Wildfire Flooding in Native American Communities, Phase II	National Science Foundation	1,000,000	12
2021	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	102,000	12
2020	Co-PI, Low-Cost Efficient Wireless Intelligent Sensors (LEWIS) for Greater Preparedness and Resilience to Post-Wildfire Flooding in Native American Communities, Phase I	National Science Foundation	50,000	12
2020	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	101,000	12
2020	PI, Partnerships Along the Headwaters of the Americas for Young Scientists Program	National Science Foundation	600,000	36
2019	Co-PI, CREST Center for Water and the Environment, Phase II	National Science Foundation	5,000,000	60
2019	PI, Workshop for Exploring the Interconnections Between Resilient Urban and Rural Communities and Landscapes	National Science Foundation	50,000	12
2019	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	140,000	12
2018	PI, Research Network for the Resilience of Headwater Systems and Water Availability for Downstream Communities Across the Americas	National Science Foundation	500,000	36
2018	Co-PI, Developing Resilient Communities & Workforce Capacity in the “Hot Deserts” of North America	2018 ExxonMobil Competition for Study Abroad Innovations	25,000	12
2018	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	98,000	12
2017	PI, Environmental Flows Investigation for the Rio Chama, New Mexico	U.S. Bureau of Reclamation	70,000	24
2017	PI, Geomorphic Recovery of Watersheds from Wildfires in New Mexico	UNM, OVPR Investment Grant	20,000	12
2017	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	96,000	12
2016	Co-PI, The Next Generation of Evaporation Pans	U.S. Bureau of Reclamation	600,000	36

2016	PI, Developing Geospatial Sciences for Collaborative Research and Education	National Science Foundation	1,600,000	60
2016	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	94,000	12
2015	PI, Resilient Landscapes: Use of NEXRAD Doppler Radar Data to Assess Hydrologic Function During Watershed Restoration and Fire Management in The Valles Caldera National Preserve, New Mexico	National Parks Service	42,000	12
2015	Co-PI, Workshop: Toward Resilient Infrastructure Development with Favorable Socio-Environmental Impacts in Egypt	National Science Foundation	39,000	12
2015	PI, Hydrodynamic Modeling of the Rio Colorado Estuary	The Sonoran Institute	70,700	6
2015	PI, Watershed Disturbance and Restoration Impacts on Hydrologic Function: Model Calibration and Validation on a Landscape Scale	National Parks Service	60,000	12
2015	Co-PI, Central New Mexico Climate Change Scenario Planning Project	Ecosystems Management Inc	103,800	12
2015	PI, US-Nepal Research Planning Trip: Climate change and its impacts on rural communities in the Gandaki River Watershed, Nepal	National Science Foundation	30,820	12
2016	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	92,000	12
2014	Co-PI, CREST Center for Water and the Environment, Phase I	National Science Foundation	5,900,000	60
2014	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	80,000	12
2014	PI, An Investigation into Potential Impacts of Watershed Restoration on Hydrologic and Geomorphic Processes in the Rio Grande	New Mexico Interstate Stream Commission	25,000	12
2013	PI, Faculty Early Career Development (CAREER) Award	National Science Foundation	405,000	60
2013	Co-PI, Western Consortium for Watershed Analysis, Visualization, and Exploration	National Science Foundation	2,000,000	36
2013	PI, Open Channel Hydraulic Modeling to Support Engineering Design	Albuquerque Metropolitan Arroyo Flood Control Authority	80,000	12
2012	Co-PI, Hydrographic Inventory and Condition Assessment for El Palacio, NM	U.S. Bureau of Land Management	40,000	24
2012	PI, Hydrologic and Geomorphic Response of Peralta Canyon to the Las Conchas Fire	U.S. Bureau of Land Management	84,000	36
2012	PI, Gila Wetlands Vulnerability Study	New Mexico Interstate Stream Commission	318,000	24

2012	PI, Evaluating Geomorphic Reclamation of Coal Mines	Office of Surface Mining, U.S. Department of the Interior	200,000	24
2012	PI, Watershed Restoration Whitepaper for the Gila Watershed	New Mexico Interstate Stream Commission	25,000	7
2012	PI, Evaluation of Uncertainty in Climate Change Impact Studies	Los Alamos National Laboratory	82,000	24
2012	PI, Floodwave Propagation and Infiltration In Desert Regions: the Azraq Basin, Jordan	National Science Foundation	92,000	15
2011	Co-PI, Development of the Albuquerque Food-shed	U.S. Department of Agriculture	290,000	36
2011	PI, Improvement of Hydrodynamic Modeling Procedures to account for Floodplain Vegetation	U.S. Bureau of Reclamation	55,000	12
2010	PI, Investigating the Influence of Riparian Vegetation on Floods	National Science Foundation	174,595	36
2010	PI, Low Impact Development and Stormwater Best Management Practices for Arid Environments	Albuquerque Stormwater Quality Team	20,000	14
2010	PI, Enhanced Dust Production Forecasts Using Soil Moisture Models	New Mexico Space Grant (NASA EPSCoR)	36,907	24
2010	Co-PI, Analysis of Coal Combustion By-Products Disposal Practices at the San Juan Mine	New Mexico Division of Mining and Minerals	135,509	24
2010	Co-PI, Construct and Test A Scale Model Box Culvert Design	New Mexico Department of Transportation	26,958	24
2009	PI, Investigation of the Impacts of River Stage On Riparian Evapotranspiration	U.S. Bureau of Reclamation	45,000	24
2008	PI, Hydrodynamic Mixing of Lake Mead Under Dropping Water Surface Elevations	U.S. Geological Survey	88,000	12
2007	PI, Application of Two-Dimensional Hydrodynamic Models to Aid In Stream Restoration Assessments	U.S. Army Corps of Engineers	55,000	24
2007	PI, Incorporation of Hydrologic Capabilities Into Training Software	U.S. Department of Defense	57,000	12
2007	Co-PI, Walker Lake Ecological Forecasting Model	U.S. Bureau of Reclamation	120,000	21
2007	Co-PI, Clark County Multi-Species Conservation Program Science Advisor	U.S. Bureau of Land Management / Clark County, Nevada	57,000	24
2006	PI, Sediment Transport Guidance Document for Stream Restoration Projects	U.S. Army Corps of Engineers	57,000	12
2006	PI, Influence of Local Streambed Hydrodynamics on Benthic Macroinvertebrate Distributions	U.S. Army Corps of Engineers	60,000	12
2006	PI, Hydrodynamic and Limnological Monitoring of the Russian River Estuary	Sonoma County Water Agency	25,000	5
2006	PI, Evapotranspiration Estimates from Remote Sensing Data for Riparian Restoration	U.S. Bureau of Reclamation, Lower Colorado Region	25,000	12

2006	PI, Data Gap Analysis for the Humboldt River Basin	Humboldt River Basin Water Authority	65,000	6
2006	PI, Two-Dimensional Habitat Modeling for the Rio Grande Silvery Minnow	U.S. Army Corps of Engineers	120,000	24
2005	PI, Potential impacts of climate change on Truckee Meadows water resources	Truckee Meadows Water Authority, Reno, NV	60,000	7
2005	PI, Water resources stewardship plan for Death Valley National Park	U.S. National Park Service	47,000	14

Service Activities

Professional Memberships and Activities

- American Academy of Water Resources Engineers
- American Society of Civil Engineers - Environmental Water Resources Institute
- International Association for Hydro-Environment Engineering and Research
- International Society for River Science
- American Geophysical Union
- National Society of Professional Engineers

Reviewing Services

- Water Resources Research
- Geophysical Research Letters
- Journal of the American Water Resources Association
- Journal of Hydraulic Research
- Journal of Hydraulic Engineering
- Journal of Irrigation and Drainage Engineering
- Hydrological Processes
- Journal of Climate Change
- Journal of Applied Mathematics
- Journal of Coastal Conservation

Departmental and University Services

Committees	Six search committees for assistant professors in civil engineering 24 qualifying exam committees 20 comprehensive exam committees
2018-Present	UNM Global Education Advisory Board
2013-Present	Dept. of Civil Engineering Undergraduate Advisor (~12 students per semester)
2006-16-Present	Co-representative for UNM to the Middle Rio Grande Endangered Species Collaborative Program Executive Committee
2015-Present	Faculty Advisor for UNM4Nepal Student Club
2013-2016	Director of Graduate Programs for UNM Department of Civil Engineering
2013-2016	School of Engineering Academic Council
2013-2017	Associate Director of the UNM Water Resource Program
2013-2016	Strategic Planning Committee Chair for UNM Department of Civil Engineering
2012-2014	Mentor for National Science Foundation, The Science, Technology, Engineering, and Mathematics Talent Expansion Program
2010-2016	Faculty Advisor for UNM Chapter of Engineers Without Borders
2010-2015	Mentor for UNM Sevilleta Research Experience for Undergraduates Program

Professional Committees

2018	Panel member for National Science Foundation (Coupled Natural and Human Systems)
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2017	Panel member for National Science Foundation (National Research Traineeship)
2016-2017	Panel member for National Science Foundation (Graduate Research Fellowship)
2016	Local Arrangements Chair and Steering Committee Member: World Water & Environmental Resources Congress
2016	Panel member for National Science Foundation (Environmental Sustainability)
2015	Technical Co-Chair for American Water Resource Association's Annual Water Resources Conference
2012-2013	Panel member for National Science Foundation (Broadening Participation Research Initiation Grants in Engineering)
	Panel member for National Science Foundation (Environmental Sustainability)
	Steering Committee for the U.S. Commission on Irrigation and Drainage Annual Meeting
2010	Steering Committee for the Arid Climates Low Impact Development Conference
	Member of Blue Ribbon Panel on Stormwater Management, City of Albuquerque
	Panel Member – California Bay Delta Science Program
2008-2009	Faculty Senate representative for the DRI Division of Hydrologic Science
2007	Co-Convener of California-Nevada American Fisheries Society Bioengineering Symposium
2006-2009	Nevada System of Higher Education representative for Lake Mead Water Quality Forum

Outreach Activities

2010-Present	Chama River Flows Assessment Team
2016-Present	UNM Representative for The Consortium of Universities for the Advancement of Hydrologic Sciences
2013-Present	Project mentor for engineering design class at the Southwest Indian Polytechnic Institute
2009-Present	Participate in recruitment activities for the American Indian Science and Engineering Society
	Provide guest lectures for the UNM Summer Transportation Institute BRIDGE Program
	Host tours in the UNM Hydraulics Laboratory
	Host learning activities for UNM School of Engineering Open Houses, Senior Days, and the Department of Civil Engineering Lemon Lecture Series

Teaching and Mentorship

Summary

- Full courses taught at UNM – 38 (20 undergraduate and 15 graduate)
- Seminars or co-instructed classes at UNM – 14 (10 undergraduate and 4 graduate)
- PhD Students – 7 graduated at UNM, 4 current PhD students
- MS Students – 26 graduated at UNM, currently advising 8 MS students
- BS Students – 22 supervised at UNM, advising approximately 12 undergraduates per semester
- Diversity of my research group – 65% underrepresented minority (African American, Hispanic, or Native American); 60% female

Courses Taught

- Fluid Mechanics (12 times)
- Introduction to Civil Engineering (14 times)
- Open Channel Flow (5 times)
- Stream Restoration (5 times)
- Designing Resilient Communities (3 times)
- Resilience of European Infrastructure (2 times)
- Hydraulic Systems Design (3 times)
- Water Resources Field Methods (6 times)

- Civil Engineering Graduate Seminar (4 times)

Summer Institutes and Short Courses Taught

- Interdisciplinary Water Resources Modeling
- Watershed Hydrology and Monitoring
- The Albuquerque Food-Shed (Sponsored by a grant from US Department of Agriculture)
- Stream Restoration in Arid Climates
- Hydraulic modeling for flood risk reduction studies

Invited Lectures and Seminars

2019	Delft Technical University, Netherlands University of Chile, Santiago, Chile
2018	Delft Technical University, Netherlands University of Chile, Santiago, Chile Lobo Living Room, UNM Alumni Association
2017	Hohai University, Nanjing, China Deltares Research Institute, Delft, Netherlands
2016	Saitama University, Japan Hokkaido University, Japan Tottori University, Japan
2015	Delft Technical University, Netherlands
2014	UNM Department of Geography Seminar Series Jordan University of Science and Technology, Irbid, Jordan Al al-bait University, Jordan
2013	University of Arizona Chinese Academy of Science - Institute of Geographic Sciences Chinese Academy of Science - Institute of Hydrobiology Yangtze River Fisheries Research Institute
2012	Los Alamos National Laboratory New Mexico Society of Professional Engineers
2011	Los Alamos National Laboratory New Mexico Chapter of the American Water Resources Association U.S. Bureau of Reclamation Albuquerque Area Office Monthly Brownbag
2010	UNM Department of Earth and Planetary Sciences Seminar Northern New Mexico Chapter of the American Society of Civil Engineers
2009	Cairo University (Egypt)
2008	University of Nevada Las Vegas, Geosciences Seminar Institute for Civil Engineers Conference of the Americas Sandia National Laboratory Environmental Seminar Tottori University (Japan), Center for Arid Lands Research Seminar
2007	Hohai University (China), Center for Global Climate Change and Water Cycle Truckee River Symposium, Invited presentation on climate change impacts University of Minnesota, Saint Anthony Falls Laboratory Seminar
2006	Brigham Young University, Civil and Environmental Engineering Seminar

Pedagogical Training

2013-2014	UNM Culture and Teaching and Learning Faculty Development Project
2012	UNM Center for Teaching Excellence, Course Design Workshop
2010	American Ecological Society on Active Teaching Methods

Student and Post-Doc Advisement

- PhD Students Advised (7) – Ryan Morrison, Lijuan Jia, Colin Byrne, Jacob Collison, Paulina Lima, Betsy Summers, Lauren Jaramillo, Gerhard Schoener, Smriti Chaulagain
- Post-Doctoral Associates Advised (5) – Dong Chen (DRI, 2006-2007); Yiping Li (DRI, 2008-2010); Mahesh Gautam (DRI, 2008-2010); Jarai Mon (DRI, 2008); Ryan Morrison (UNM, 2014), Colin Byrne (UNM, 2016), Betsy Summers (UNM, 2020)
- Master's Students Advised (27) – Jeremy Dodds (UNLV, May 2007); John Goreham (UNLV, August 2009); Jeffrey Samson (May 2012); Abdou Harrisou Arou Bang'na Nassam (August 2012); Tyler Gillihan (May 2013); Kareem Saint-Lot (Co-Advised with J. Coonrod, May 2013); Jacob Collison (May 2013); Angela Gregory (July 2013); Kent Steinhaus (May 2014); Sofie Staufer (Oct 2014); Christopher Babis (Nov 2015); Zakia Afrin (April 2016); Jourdan Adair (June 2016); Chad Mickschl (Sept 2016); Breana Chavez (Oct 2016), Jennifer Van Osdel (Jan 2017), Noelani Villa (May 2018), Anjali Bean (July 2018), Robert Salazar (May 2019), Michaela Jones (May 2020), Aljaz Praznik (August 2020), Cassy McClintock (August 2020), Claudia Jimenez (December 2020), Christopher King (May 2021)
- Department of Civil Engineering Undergraduate Advising – Approximately 20 sophomore through senior level students every semester (2015-Present)
- Undergraduate Students Supervised/Employed (17) – Kent Steinhaus, Lauren Jaramillo, Kareem Saint-Lott, Alysha Toya, Jourdan Adair, Savannah Martinez, Myra Candelaria, Meghan Wilson, Grayson Vogel, Gabriella Kemm, Jared Romero, Fatima Quraishi, Claudia Jemenez, Stephen Ingles-Garcia, Antonia Nuñez, Niloo Abadi, Tammy Huynh, Kritan Subedi, Constanza Kremer, and Atlin Johnson

Other Scholarly Activities

Conference Papers, Presentations, and Posters

1. Chaulagain, S. & Stone, M. The response of riparian vegetation and river geomorphology due to extended drought and other external stressors. AGU Fall Meeting, New Orleans, LA, Dec. 13-17.
2. Collison, J. & Stone, M. The Collison Floating Evaporation Pan: Results from Lake Powell, Arizona and Cochiti Lake, New Mexico. AGU Fall Meeting, New Orleans, LA, Dec. 13-17.
3. Boll, J., Stone, M. C., Fremier, A. K., Padowski, J., Walsh-Dilley, M., & Scott, C. A. (2020, December). Resilience of Headwater Systems and Headwater Dependent Systems: Characterization and Data Needs Across the Transect of the Americas. In *AGU Fall Meeting Abstracts* (Vol. 2020, pp. H127-11).
4. Chaulagain, S., Stone, M. C., & Dombroski, D. (2020, December). An Investigation into Field and Remote Sensing Methods for the Estimation of Dynamic Hydraulic Roughness of Floodplains from Riparian Vegetation. In *AGU Fall Meeting Abstracts* (Vol. 2020, pp. H137-0001).
5. Caplan, T., Chaulagain, S., Stone, M. C., McKenna, C., & Byrne, C. F. (2020, December). A Resilience-Based Framework for Advancing Adaptive Management of Highly Regulated Rivers: A Case Study from the Middle Rio Grande, New Mexico (USA). In *AGU Fall Meeting Abstracts* (Vol. 2020, pp. H154-02).
6. Schoener, G., & Stone, M. C. (2020, July). Stressors, Ecosystem Services, and Restoration Strategies for a Central New Mexico Arroyo. In *International Low Impact Development Conference 2020* (pp. 115-129). Reston, VA: American Society of Civil Engineers.
7. Collison, J., Stone, M. C., & Llewellyn, D. (2019, December). The Collison Floating Evaporation Pan: An Accurate In-situ Open-Water Evaporation Monitoring Method. In *AGU Fall Meeting Abstracts* (Vol. 2019, pp. H53K-1911).
8. Stone, M.C. 2018. Restoring River-Floodplain Connectivity and Riparian Ecosystems 12th International Society on Ecohydraulics, Tokyo, Japan, August 2018. (Co-organized special session)
9. Stone, M.C., 2018. Building Resilience to Floods through Enhanced Flood Wave Attenuation. International Conference on Integrated Natural Disaster Management, Dead Sea, Jordan, March 2018.

10. Miller, S.J., Gregory, A.E., Cadol, D., and M.C. Stone. 2017. Floodplain Vegetation Dynamics Modeling Using Coupled RiPCAS-DFLOW (CoRD): Jemez Canyon, Jemez River, New Mexico, American Geophysical Meeting, Fall Meeting, New Orleans, Louisiana, December, 2017.
11. Byrne, C.F. and M.C. Stone. Influences of Altered River Geomorphology on Channel-Floodplain Mass and Momentum Transfer. American Geophysical Meeting, Fall Meeting, New Orleans, Louisiana, December, 2017.
12. Jaramillo, L.V., Stone, M.C., and R.R. Morrison. 2017. Evaluating Vegetation Potential for Wildfire Impacted Watershed Using a Bayesian Network Modeling Approach. American Geophysical Meeting, Fall Meeting, New Orleans, Louisiana, December, 2017.
13. Hausner, M.B., Gains, D.B., Sada, D.W. and M.C. Stone. 2015. Physical Thresholds as Ecological Proxies in Aquatic Ecosystems. American Geophysical Meeting, Fall Meeting, San Francisco, California, December 2015.
14. Stone, M.C., Byrne, C., and R.R. Morrison. 2015. A numerical investigation of the impacts of river and floodplain restoration on the process of floodwave attenuation. American Geophysical Meeting, Fall Meeting, San Francisco, California, December 2015.
15. Samson, J. and M.C. Stone. 2014. A paired wetland investigation into the eco-hydrologic processes of two riparian wetlands along the Gila River, NM. World Water & Environmental Resources Congress, ASCE. Portland, OR, June 1-5.
16. Stone, M.C. 2013. Evaluating the impacts of river engineering on the ecosystem service of floodwave attenuation: The Gila River in New Mexico, USA. 3rd Biennial Symposium of the International Society for River Science. Beijing, China, August 5-9.
17. Morrison, R.R. and Stone, M.C. 2013. Implementing environmental flows in complex water resource systems. 3rd Biennial Symposium of the International Society for River Science. Beijing, China, August 5-9.
18. Stone, M.C., Stormont, J.C., Epp, E., Byrne, C., Rahman, S., Powell, R., Rider, W., and S. Perkins. 2013. Evaluation of ¹SEP Geomorphic Reclamation Performance and Models in the Southwestern U.S. 30th Annual Meeting of the American Society of Mining Reclamation. Laramie, Wyoming, June 1-7.
19. Bramlett, K., Stormont, J.C., and M.C. Stone. 2013. Infiltration in Reconstructed Channels. 30th Annual Meeting of the American Society of Mining Reclamation. Laramie, Wyoming, June 1-7.
20. Parker, C., Hart, K., Webb, R., Thomson, B., Stormont, J.C., and M.C. Stone. 2013. Coal Combustion By-Products Disposal Practices at a Surface Coal Mine in New Mexico: Leachate and Groundwater Quality Study by 30th Annual Meeting of the American Society of Mining Reclamation. Laramie, Wyoming, June 1-7.
21. Jia, L., Stone, M.C., and K. Benedict. 2012. Improved Dust Forecasts Through Running Soil Moisture Model in San Juan River Basin. World Water & Environmental Resources Congress. Albuquerque, NM,
22. Nassam, A.H., Stone, M.C., and L. Chen. 2012. Momentum and Mass Exchange between Main Channel and Floodplains in Open Channels with Submerged Vegetation. World Water & Environmental Resources Congress. Albuquerque, NM, May 20-24.
23. Stone, M.C., Harris, S., Harvey, M., Morrison, R.R., Gustina, G., and M.H. Benson. 2012. Flow Optimization for Geomorphic and Ecological Improvements in the Wild and Scenic Reach of the Rio Chama, New Mexico. World Water & Environmental Resources Congress. Albuquerque, NM, May 20-24.
24. Samson, J. and M.C. Stone. 2012. Quantifying the Contribution of Bank Storage Due to a Decrease in Stream. World Water & Environmental Resources Congress. Albuquerque, NM, May 20-24.
25. Jia, L., Stone, M.C., and M. Ye. 2012. Integrated Uncertainty Assessment in Evaluating Climate Change Impacts on Water Resources. World Water & Environmental Resources Congress. Albuquerque, NM, May 20-24.
26. Chen, L. and M.C. Stone. 2010. Theoretical Analyses for the Interaction between Vegetation Bending and Flow. World Water & Environmental Resources Congress. Providence, RI, May 16-20.

27. Jia, L., Stone, M.C., Pohll, G., and D. McGraw. 2010. Response of Riparian Evapotranspiration to Groundwater Fluctuations. World Water & Environmental Resources Congress. Providence, RI, May 16-20.
28. Stone, M.C., Chen, L., Smith, D.L., and R.A. Goodwin. 2009. Application of the Numerical Fish Surrogate to River Environments. 7th International Symposium on Ecohydraulics. IAHR. Concepcion, Chile, January 12-16.
29. Stone, M.C. and K. Acharya. 2008. Ecological Modeling of Walker Lake to Evaluate the Influence of Local and Global Environmental Change. Ninth International Conference on Dryland Development. Alexandria, Egypt, November 7-10.
30. Stone, M.C., Goreham, J., Chen, L., and A.B. Stone; 2008. Impacts of Shear Stress on Saturated Hydraulic Conductivity of a Polyacrylamide Treated Soil. World Water & Environmental Resources Congress, ASCE. Honolulu, Hawaii, May 12-16.
31. Chen, D., Acharya, K., and M.C. Stone. 2008. Simulating impact of sand and gravel mining on riverbed - an example of the Salt River, Phoenix. World Water & Environmental Resources Congress, ASCE. Honolulu, Hawaii, May 12-16.
32. Chen, L. and M.C. Stone. 2008. On the mass conservation of the four-point implicit scheme. World Water & Environmental Resources Congress, ASCE. Honolulu, Hawaii, May 12-16.
33. Chen, L. and M.C. Stone. 2007. Analysis of Unsteady Sediment Transport Modeling Approaches. Environmental Water Resources Institute-ASCE. Tampa, FL, May 14-18.
34. Stone, M.C., Acharya, K., Sada, D., and D. Henneberry; 2007. Influence of Near-Bed Flowfield Characteristics on Macroinvertebrate Community Composition. World Water & Environmental Resources Congress, ASCE. Tampa, Florida, May 14-18.
35. Stone, M.C. and R.H. Hotchkiss. 2005. Modeling the impacts of climate change on water resources: the influence of model scale. World Water and Environmental Resources Congress, Anchorage, Alaska, May 15-19.
36. Stone, M.C., Hotchkiss, R.H. and R. Morrison. 2005. Periphyton scour from hydraulic disturbances. World Water and Environmental Resources Congress, Anchorage, Alaska, May 15-19.
37. Stone, M.C., Tritico, H.M., Hotchkiss, R.H. and P. Flanagan. 2003. Turbulence characteristics in obstructed gravel bed flow. Engineering Mechanics Conference, Seattle, Washington, July 16-18.
38. Stone, M.C., Hotchkiss, R.H., Hubbard, C.M., and T.A. Fontaine. 1999. Modeling the impacts of global climate change on water resources. World Water and Environmental Resources Congress, Seattle, WA. Aug 8-12th.

Conference Presentations and Posters

1. Caplan, T., Stone, M.C., Oglesby, A. 2019. Rehabilitating channel-floodplain connectivity in highly regulated river systems: A case study from the Middle Rio Grande, New Mexico USA. 6th Symposium of the International Society for Freshwater Science, Vienna, Austria, Sept. 8-13.
2. Stone, M.C., Byrne, C.F., and Turner, D., 2019. An Investigation of Restoration Alternatives in the Colorado River Estuary. 6th Symposium of the International Society for Freshwater Science, Vienna, Austria, Sept. 8-13.
3. Jaramillo, L. V., Stone, M. C., Morrison, R. R., & Chaulagain, S. (2019, December). Bayesian Network Modeling Approach Assessing Floodplain Resilience of the Gila River, New Mexico, USA. In *AGU Fall Meeting 2019*. AGU.
4. Scott, C. A., Fremier, A. K., Padowski, J., Walsh-Dilley, M., Céleri, R., Arumi, J. L., ... & Stone, M. C. (2019, December). Headwater-Dependent Systems: Definition, Drivers of Change and Potential Futures. In *AGU Fall Meeting 2019*. AGU.
5. Collison, J., Stone, M. C., & Llewellyn, D. (2019, December). The Collison Floating Evaporation Pan: An Accurate In-situ Open-Water Evaporation Monitoring Method. In *AGU Fall Meeting 2019*. AGU.

6. Boll, J., Zhang, Y., Siirila-Woodburn, E. R., & Stone, M. C. (2019, December). Exploring Linkages Between Headwaters and Groundwaters for Human and Ecosystem Uses in a Changing Climate. In *AGU Fall Meeting 2019*. AGU.
7. Boll, J., Stone, M. C., Fremier, A. K., Padowski, J., Walsh-Dilley, M., & Scott, C. A. (2019, December). Resilience of headwater systems and water availability for downstream human and ecosystem uses across a Transect of the Americas. In *AGU Fall Meeting 2019*. AGU.
8. Bray, E. N., Morrison, R. R., & Stone, M. C. (2018, December). Process-based environmental flow science for a non-stationary world. In *AGU Fall Meeting Abstracts*.
9. Collison, J., Stone, M. C., & Llewellyn, D. (2018, December). The Collison Floating Evaporation Pan, the Next Generation of Evaporation Pans. In *AGU Fall Meeting Abstracts*.
10. Lima, P., Stone, M., Ortiz, E., & Breidenbach, A. (2017, December). Analysis rainfall trends in ecuadorian andean mountains over 3000 mand their effects in hydropower projects. In *V CONGRESO REDU* (p. 12).
11. Miller, S. J., Gregory, A. E., Turner, M. A., Chaulagain, S., Cadol, D., Stone, M. C., & Sheneman, L. (2017, December). Floodplain Vegetation Dynamics Modeling Using Coupled RiPCAS-DFLOW (CoRD): Jemez Canyon, Jemez River, New Mexico. In *AGU Fall Meeting Abstracts*.
12. Collison, J., Stone, M. C., & Llewellyn, D. (2018, December). The Collison Floating Evaporation Pan, the Next Generation of Evaporation Pans. In *AGU Fall Meeting Abstracts*.
13. Byrne, C. F., & Stone, M. C. (2017, December). Influences of Altered River Geomorphology on Channel-Floodplain Mass and Momentum Transfer. In *AGU Fall Meeting Abstracts*.
14. Byrne, C.F., and Stone, M.C. Modeling small-scale and large-scale flood wave processes as indicators of channel-floodplain connectivity. American Geophysical Union Fall Meeting. San Francisco, CA. December 12 – 16, 2016.
15. Stone, M.C. 2016. Evaluation of channel floodplain connectivity based on hydrodynamic simulations with D-Flow Flexible Mesh. Delft Software Days, Delft, NL, Nov 1-3.
16. Stone, M.C., Byrne, C., and R. Morrison. Assessment of Hydrologic and Geomorphic Alterations Using Floodplain Connectivity Metrics. Ecological Society of America, Fort Lauderdale, FL, August 6-11.
17. Stone, M.C. 2015. A numerical investigation of the impacts of river and floodplain restoration on the process of floodwave attenuation. American Geophysical Union Fall Meeting. San Francisco, California, December 14-18.
18. Jaramillo, L.V., Stone, M.C., and R.R. Morrison. 2015. Science-based policy for Himalayan Rivers of Nepal. Annual Meeting of the American Water Resources Association, Denver, CO, November 16-19.
19. Adair, J.B. and M.C. Stone. 2015. The influence of levee setback scenarios on flood wave attenuation. Biannual meeting of the International Society for River Science, La Crosse, WI, August 23-28, 2015.
20. Byrne, C.F. and M.C. Stone. 2015. Quantification of habitat restoration impacts on flood wave attenuation in the Middle Rio Grande. Biannual meeting of the International Society for River Science, La Crosse, WI, August 23-28, 2015.
21. Stone, M.C., Tullos, D., Acharya, K., and K. Chief. 2015. Resilience theory applied to water infrastructure projects. Ain Shams University Structural and Geotechnical Engineering International Conference, Cairo, Egypt, December 21-22, 2015.
22. Stone, M.C. 2014. Investigating impacts of proposed flow diversions on riparian processes in the Gila River, NM. New Mexico Chapter of ASCE, Albuquerque, NM, Sept 11-12.
23. Morrison, R.R. and M.C. Stone. 2014. Coupling two-dimensional hydrodynamic and Bayesian network modeling to assess environmental impacts of river management alternatives. Joint Aquatic Sciences Meeting. Portland, OR, May 18-23.
24. Dombroski, D., Greimann, B., Lai, Y., Huang, V., Fotherby, L., Stone, M.C., and L. Chen. 2013. Modeling Interactions of Flow and Vegetation for Improved Riverine System Management.

- American Water Resources Association Specialty Conference on Environmental Flows. Hartford, Connecticut, June 24-25.
25. Stone, M.C. 2013. Modeling the Channel/Floodplain Interface: The Influence of Riparian Vegetation on Mass and Momentum Exchange. American Geophysical Union Fall Meeting. San Francisco, California, December 9-13.
 26. Morrison, R.R., Stone, M.C., and D.W. Sada. 2013. Impacts of Discharge Reductions on Physical and Thermal Habitat Characteristics in a Desert Spring, Death Valley National Park, California, USA. American Geophysical Union Fall Meeting. San Francisco, California, December 9-13.
 27. Samson, J. and M.C. Stone. 2013. An Investigation into the Ecohydrology of Riparian Wetlands Along the Gila River, NM. San Francisco, California, December 9-13. American Geophysical Union Fall Meeting. San Francisco, California, December 9-13.
 28. Jia, L. and M.C. Stone. 2013. A framework of parameter uncertainty analysis based on hydro-catchments: Application of the VIC model to the Gila River basin. American Geophysical Union Fall Meeting. San Francisco, California, December 9-13.
 29. Naranjo, R., Pohll, G.M., Stone, M.C., Niswonger, G., and W.A. McKay. 2013. Using heat as a tracer to estimate spatially distributed mean residence times in the hyporheic zone. American Geophysical Union Fall Meeting. San Francisco, California, December 9-13.
 30. Webb, R., Stormont, J.C., Stone, M.C., Thomson, B., and K. Hart-Carstens. 2012. Characterizing and Modeling Water Movement Through of Coal Combustion Byproducts in Landfills. World Water & Environmental Resources Congress, ASCE. Albuquerque, NM.
 31. Parker, C., Webb, R., Thomson, B, Stormont, J, Stone, M.C., O'Hara, J, and C. Thomas. 2011. Analysis of Coal Combustion By-Products Disposal Practice in NM: Hydrologic & Water Quality Issues. American Water Resources Association Annual Meeting, Albuquerque, NM.
 32. Jia, L., Stone, M.C., and Benedict, K. 2011. Enhanced Dust Production Forecasts Using Soil Moisture Models in the Four Corners Areas. American Water Resources Association Annual Meeting, Albuquerque, NM.
 33. Webb, R., Stormont, J, Stone, M.C., and B. Thomson. 2011. Characterizing the Hydrologic Properties of Coal Combustion By-products. American Water Resources Association Annual Meeting, Albuquerque, NM.
 34. Samson, J. and M.C. Stone. 2011. Water storage potential within a riparian zone: The Middle Rio Grande. American Water Resources Association Annual Meeting, Albuquerque, NM.
 35. Stone, M.C. and D. Sada. 2010. Incremental Response of Desert Spring Systems to Reduce Discharge. American Society of Limnologists and Oceanographers Annual Meeting. Santa Fe, New Mexico.
 36. Acharya, K. and M.C. Stone. 2009. Urban non-point source pollution in arid and semi-arid regions: A case study of the Las Vegas Wash, Nevada. An International Perspective on Environmental and Water Resources. Environmental Water Resources Institute-ASCE. Bangkok, Thailand.
 37. McKay, S.K., Fischenich, C., Stone, M.C., Acharya, K., and J. Gorham¹. 2008. Stability and failure of vegetation in arid regions. American Water Resources Association Annual Water Resources Conference. New Orleans, Louisiana.
 38. Earman, S., Stone, M.C., and J. Zhu. 2008. Integration of climate change impacts into risk and uncertainty analysis. Floodplain Management Association 2008 Annual Conference. San Diego, CA.
 39. Shafer, D.S., Dubois, D.W., Etyemezian, V.R., Kavouras, I., Miller, J.J., Nikolich, G., and M.C. Stone. 2007. Fire as a Long-Term Stewardship Issue for Soils Contaminated with Radionuclides in the Western U.S. 11th International Conference on Environmental Remediation & Radioactive Waste Management (ICEM07). Bruges, Belgium.
 40. Stone, A., Vana Miller, D., Stone, M.C. and T. Fisk. 2007. Efficacy of the National Park Service's Water Resource Stewardship Report in the Western United States as a conflict prevention and management plan. Southwest Hydrology and Arizona Hydrological Society 2007 Regional Water Symposium. Tucson, Arizona.

41. Acharya, K., Stone, M.C., Fisk, T. and M.R. Bower. 2007. Food Web Analysis Of Endangered Devils Hole Pupfish: Is Food Availability Hurting Devils Hole Pupfish?. American Society of Limnology and Oceanography. Sante Fe, NM.
42. Chen, D., Acharya, K. and M.C. Stone. 2007. Two-dimensional Simulation of Mining Effect on Channel Geomorphology Change - an Example of the Salt River, Phoenix. Environmental Water Resources Institute-ASCE. Tampa, FL.
43. Chen, D., Zhang, Y., Duan, J.G., Stone, M.C. and K. Acharya. 2007. Two-dimensional Simulation of Hydrodynamic and Sediment Transport in a Gravel Bed Channel: The Salt River. World Water & Environmental Resources Congress. ASCE. Tempe, FL.
44. Morrison, R.R., Hotchkiss, R.H., and M.C. Stone. 2007. Turbulence Characteristics of Flow in a Full-Scale Spiral Corrugated Culvert Fitted with Sloped- and Slotted-Weir Baffles. Hydraulic Measurements and Experimental Methods Conference. ASCE: EWRI. Lake Placid, NY.
45. Chen, D., Stone, M.C. and K. Acharya. 2007. 2D simulation of hydrodynamic and sediment transport in an aggrading sand bed channel: an example of the Middle Rio Grande, New Mexico. Fifth International Symposium on Environmental Hydraulics. Tempe, Arizona.
46. Stone, M.C. and M.E. Barber. 2007. Hydraulic Diversity Created by Woody Debris in Agricultural Waterways. International Association of Hydraulic Research World Congress. IAHR. Venice, Italy.
47. Stone, M.C., Hotchkiss, R.H., and R.R. Morrison¹. 2006. Turbulence Observations in Cobble-Bed Rivers. Environmental Water Resources Institute-ASCE. Omaha, NE.
48. Stone, M.C. 2006. Fish Passage Technology Transfer: Lessons Learned in the Pacific Northwest. California-Nevada American Fisheries Society. San Luis Obispo, CA.
49. Stone, M.C. 2006. Two-dimensional habitat modeling for Silvery Minnow in the Rio Grande River. International Conference on Ecological Modeling. Yamaguchi, Japan. Aug 28-Sept 1.
50. Chen, D., Duan, J.G., Stone, M.C., and K. Acharya. 2006. Impacts of Fine Materials on Settling Velocity of Sand Sized Particles in sediment-laden flows. American Geophysical Union. San Francisco, CA.
51. Chen, D., Duan, J.G., Stone, M.C., and K. Acharya. 2006. Modified settling velocity formula for sand-size particles accounts for particle-to particle collisions. American Geophysical Union. San Francisco, CA.
52. Stone, M.C., Hotchkiss, R.H. and L.O. Mearns. 2003. High and low spatial resolution climate change scenarios for the Missouri River basin: water yield responses. American Meteorological Society Annual Meeting. Long Beach, CA. 02/ 6-9.
53. Tritico, H., Stone, M.C. and R.H. Hotchkiss. 2003. Turbulence characterization in the wake of an obstruction in a gravel bed river. ASCE: Hydraulic Measurements and Experimental Methods Conference. Estes Park, CO. 07/ 28-Aug 1.
54. Hotchkiss, R.H. Faber, D., Stone, M.C., Tritico, H.M. and P. Flanagan. 2002. Velocity measurements in vicinity of a removable spillway weir. American Fisheries Society Annual Meeting. Philadelphia, PA. 08/ 15-18th.
55. Stone, M.C., Tritico, H.M., Hotchkiss, R.H., Papanicolaou, A. and M.E. Barber. 2002. Characterizing turbulence in salmonid bearing streams to improve fish passage at hydroelectric dams. Hydrovision Annual Conference, Portland, OR.



Enrica Viparelli
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Columbia, March 4, 2023

Chadwin Smith, Ph.D.
Science Policy Coordinator
Platte River Recovery Implementation Program
4111 4th Ave., Suite 6
Kearney, NE 68845

Re: Application for ISAC member position

To the ISAC Member Selection Panel:

It is with sincere interest that I am submitting this application for consideration to serve as member of the Independent Scientific Advisory Committee (ISAC) of the Platte River Recovery Implementation Program. I have been involved as sediment transport and morphodynamic modeler in interdisciplinary river and coastal restoration efforts in the USA and abroad. These experiences convinced me of the importance to integrate hydraulic/sediment transport and ecological models to assess the impacts of different restoration approaches on ecosystem wellbeing. I hope to be given the opportunity to provide expert advice on fluvial geomorphology with a focus on sediment transport and morphology of alluvial rivers.

I completed my Master of Science in Environmental and Landscape Engineering at the University of Naples Federico II, Italy, in 2003 and I started my doctoral studies in 2004. During my doctorate I visited the University of Illinois at Urbana-Champaign in 2005-2007, where I performed research for my dissertation. From January 2008 to December 2011, I was a post-doc in the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign. In January 2012 I joined the faculty in the Department of Civil and Environmental Engineering at the University of South Carolina. I received tenure and promotion to Associate Professor in December 2017 and I was promoted to Professor in December 2022.

My doctoral research was centered on the study of transport, erosion and deposition of mix-size sediments. This basic research was applied to help in the design of coarse gravel augmentations associated with high flow releases on the Trinity River, California. Gravel augmentations were designed to improve the quality of the spawning gravel, which deteriorated due to flow regulation. In collaboration with a geomorphologist working for the Trinity River Restoration Program, I

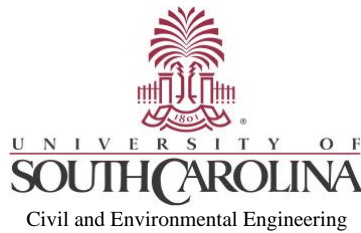


developed and tested a model of river morphodynamics predicting the spatiotemporal evolution of the spawning gravel grain size distribution (Viparelli et al., 2011).

As post-doc affiliated with the NSF funded National Center for Earth Surface Dynamics (NCED), I was involved in the multidisciplinary efforts to restore the Mississippi River delta with land-building diversions (Paola et al., 2011) and to develop sediment budgets using isotopic fingerprints in the Minnesota River basin. In collaboration with NCED geologists and ecologists, I realized that it was possible to integrate sediment transport and ecological models to predict the ecological succession on a prograding delta as a function of inundation frequency and salinity. The *Vegetated Delta Model* was presented at the 2011 World Environmental & Water Resources Congress of the American Society of Civil Engineers (Viparelli et al., 2011). In collaboration with NCED geologists I implemented a morphodynamic model to estimate the impacts of a land-building diversion on navigation and flood control on the downstream most 500 km of the Mississippi River, as well as how the land-building potential of a diversion project varied with diversion location (Nittrouer and Viparelli, 2014, Viparelli et al., 2015).

In collaboration with NCED-affiliated engineers and geoscientists, I developed a model track fate and transport of sand and muds with different isotopic fingerprints in the Minnesota River floodplain. The model explicitly accounted for the exchange of sediments between the river main channel and the floodplain and was able to track the presence of in-situ produced and meteoric cosmogenic nuclides (Viparelli et al., 2013). In 2016 the model was modified for applications to gravel bed rivers and was used to study the effects of the reduction in sediment supply downstream of dams on the Ain River, France (Lauer et al., 2016). Recently, this modeling framework was integrated with a physics-based model of bank migration to determine how bankfull channel geometry (width and depth) varies with valley geometry, hydrologic regime, sediment supply and caliber (Viparelli and Eke, 2021).

At the University of South Carolina my interest on river and coastal restoration has motivated collaborations with colleagues in the USA and abroad. Two graduate students and I modeled the impacts of flow regulation in the Missouri River basin with particular interest to the downstream most 1000 km of the Missouri River from Gavins Point Dam to the confluence with the Mississippi River (Chapter 2 in Sulaiman's PhD thesis <https://scholarcommons.sc.edu/etd/5007/>). In collaboration with colleagues at the Nile Research Institute, we explored the possibility of a combined river-delta restoration project for the Nile River, which is experiencing high rates of coastal erosion, ecosystem deterioration and agricultural problems associated with the lack of a flood season (Al-Zaidi et al., 2016 and PhD thesis <https://scholarcommons.sc.edu/etd/5003/>). In collaboration with Dr. Tal at Aix Marseille Universite' I participated in estimating the impacts of flow regulation on the ecosystem of the Buech River, France (publication in preparation), and on how channelization, flow regulation and hydropower generation modified the morphology/morphodynamics of the Rhone River, France. The work on the Buech River, performed in collaboration with the electric company EDF and local agencies, is of particular interest to me because results of morphodynamic modeling were used to inform a hydraulic model to predict the spatial distribution of flow velocities, critical parameter to assess the quality of the aquatic habitat with statistical habitat models. Funded collaborations with Prof. Blom, TU Delft,



Netherlands, focused on modeling impacts of sediment nourishments and longitudinal training walls on the Dutch Rhine River to mitigate widespread channel bed erosion (Czapiga et al., 2022a and 2022b). Recently prof. Blom and I have been involved in a multidisciplinary study of the impacts that flow regulation in the Karnalu River basin, Nepal, will have on the population of Himalayan tigers. Finally, detailed hydraulic modeling of floodplain inundation and drainage is in progress in collaboration with the Congaree National Park, SC, to characterize flow velocities and flow paths, as well as fate and transport of sediments and nutrients, in the Congaree River floodplain (Xu et al., 2020, 2021, van der Steeg et al., 2021, 2023).

In closing this letter, I would like the panel to know that, if selected, the University of South Carolina will allow me to serve as ISAC member and to participate to in person and remote meetings. The application package consists of my CV and this cover letter.

I thank the panel for considering my application and I am available to provide any additional information.

Sincerely,
Enrica Viparelli

CURRICULUM VITAE

Enrica Viparelli – August 2023
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APPOINTMENTS

January 2023 -

Professor, Department of Civil and Environmental Engineering, University of South Carolina, Columbia (UofSC).

January 2018 – December 2022 (5 years)

Tenured Associate Professor, Department of Civil and Environmental Engineering, University of South Carolina, Columbia (UofSC).

January 2012 – December 2017 (6 years)

Assistant Professor, Department of Civil and Environmental Engineering, University of South Carolina, Columbia.

EDUCATION

January 2008 – December 2011,

Post-doctoral research associate at the Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, advisor Professor Gary Parker.

November 2004 – November 2007,

Doctorate in Engineering of Hydraulic, Transportation and Landscape Systems, University of Naples Federico II. Thesis title: A procedure to store and access the stratigraphy of non-cohesive deposits and its validation with laboratory and field data

Advisor: Giacomo Rasulo; Co-advisor: Gary Parker.

The research work (i.e. the development of a numerical model and the laboratory experiments) was conducted at the Hydrosystems Laboratory, University of Illinois at Urbana – Champaign, November 2005 – December 2006; February 2007 – June 2007.

September 1998 - October 2002.

Laurea cum laude in Environmental and Landscape Engineering (MS equivalent).

Thesis title: Criterio di progettazione delle opere di protezione delle difese spondali, (Design criteria of riverbank protections), Department of Hydraulic and Environmental Engineering, University of Naples Federico II.

Advisor: Giacomo Rasulo.

AWARDS

2023 AGU Earth and Planetary Surface Processes *Marguerite T. Williams Award* (information under embargo until September 13, 2023, 6:00 PM CEST).

Aspire II The impact of harbor modification on coastal floods – the case of Charleston, SC, awarded by the University of South Carolina VPR for research, 2020, \$99,979.

CAREER: Quantifying the response of rivers and floodplains to changes in climate and land use, US National Science Foundation, 2018, \$697,553.

Aspire III, An annular flume to perform collaborative research on suspended transport of fine sediment, natural tracers and contaminants, awarded by the University of South Carolina VPR for research, 2016, \$99,140.

My proposal *Bedforms in gravel bed rivers* resulted in the award of a scholarship (April 2005- March 2007) sponsored by C.U.G.R.I. (Consorzio interUniversitario per la previsione e la prevenzione dei Grandi RISchi) which allowed me to pursue part of my graduate research at the University of Illinois.

Students of my research group received the following awards

- Ricardo R. Hernandez Moreira (\$1,000), data sharing contest, Graduate Student/Early Career AGU Travel Grant Contest (NSF-funded Sediment Experimentalists Network), <http://sedimentexperiments.blogspot.com/2015/11/november-newsletter.html>
- Bradley Huffman (\$500), data sharing contest, Graduate Student/Early Career AGU Travel Grant Contest (NSF-funded Sediment Experimentalists Network), <http://sedimentexperiments.blogspot.com/2015/11/november-newsletter.html>
- Sanaz Borhani (\$500), General Travel Grant to the Fall Meeting of the American Geophysical Union.
- Sanaz Borhani and Elena Bastianon, NSF-funded Community Surface Dynamics Modeling Systems (CSDMS) student scholarships to the CSDMS annual meeting
- The following students received a Travel Grant from the University of South Carolina (\$500): Ricardo R. Hernandez Moreira, Sanaz Borhani, Basim Al-Zaidi, Zeyad Sulaiman, Sadegh Jafarinik, Elena Bastianon and Mahsa Ahmadpoor.
- Sydeny Sanders, Brandon Fryson, Shilpkumar Patel, William Logan and Amanda Balkus were recipients of the McNair junior fellowship.
- Amanda Balkus, William Logan and Brandon Fryson received a travel grant from the Department of Civil and Environmental Engineering, University of South Carolina (\$500)
- Sydney Sanders, Brandon Fryson, Jeffrey Okeke and Christian Pellott were the recipients of the University of South Carolina SCAMP grants.
- Ricardo R. Hernandez Moreira, Sadegh Jafarinik, Sanaz Borhani, Basim Al-Zaidi, Zeyad Sulaiman, Elena Bastianon and Mahsa Ahmadpoor received the Eliatamby fellowship awarded by the Department of Civil and Environmental Engineering of the University of South Carolina.

RESEARCH INTERESTS

Sediment transport; river and coastal restoration; linked physical/hydrological/ecological modeling of river, delta and estuarine morphodynamics; transport of tracers and contaminants; submarine sedimentation processes; hydraulic engineering with particular focus on the design and analysis of hydraulic structures.

RESEARCH ACTIVITIES

1) Basic research

- a) numerical and experimental modeling of the spatial distribution of mix-size and/or mix-density sediments;
- b) submarine sedimentation processes;
- c) bedform dynamics;
- d) exchange of fine sediment (i.e. mud or wash load) between a river and its floodplain and implications for channel morphology;
- e) morphodynamics of alluvial and bedrock channels;
- f) probabilistic morphodynamic modeling;
- g) understanding and modeling feedback between of morphodynamic and ecological processes.

2) Applied research

- a) river, delta and estuarine morphodynamics;
- b) river and coastal restoration;
- c) fate and transport of both bed material (sand or gravel) and wash load (mud or sand and mud) from different sources;
- d) evolution of channel morphology as the bed and/or the floodplain experience aggradation and degradation;
- e) fate and transport of sediment tracers and contaminants, e.g. radionuclides and particulate matter;
- f) design and analysis of hydraulic networks and structures with physical and numerical models.

3) Multidisciplinary, site-specific projects

- a) International collaboration to study the impacts of flow regulation on the wellbeing of Himalayan tigers. International collaboration through TU Delft, Netherlands. Utrecht University, Netherlands, lead institution (2021 – present);
- b) Understanding the morphodynamics of a forested floodplain, Congaree River, South Carolina (2018 – present) – collaboration with Profs. Torres and Sullivan University of South Carolina at Columbia and Aiken;
- c) Understanding the impacts of flow regulation and sediment re-injections on an alpine, gravel bed river. The case of the Buech River, France (2017 – present) – collaboration with Prof. Tal, Aix Marseille, France;
- d) Understanding the impacts of hydroelectric plants on the morphology of the Rhone River, France (2019 – 2022) – collaboration with Prof. Tal, Aix Marseille, France;
- e) Understanding causes of channel bed degradation in engineered rivers, the case of the Rhine River, Netherlands (2016 – 2021) - collaboration with Prof. Blom, TU Delft, Netherlands, and agencies managing the Rhine River and the Elba River, Netherlands and Germany;
- f) Quantifying the impacts of flow regulation on the lowermost 1000 km of the Missouri River, USA (2013 – 2018) - collaboration with Prof. Blum, Kansas State University;
- g) Quantifying the impacts of controlled flow releases combined with sand augmentations on the long-term evolution of the Nile River and its delta, Egypt (2013 – 2018) - collaboration with Prof. Moussa, Nile Research Institute, Egypt;
- h) Modeling the effect of regulated flow regime downstream of dams on the long-term evolution of channel-floodplain complexes on the Ain River, France (2013 – 2016) – collaboration with Prof. Lauer, Seattle University, and Prof. Piegay, University of Lyon, France;
- i) Modeling the impacts of engineered, land-building diversions on the lowermost 500 km of the Mississippi River, Louisiana (2010 – 2015) – effort of the National Center for Earth Surface Dynamics started during my post-doc;
- j) Modeling the ecological succession on newly developed deltaic land, the case of Wax Lake Delta, Louisiana (2009 – 2012) – effort of the National Center for Earth Surface Dynamics started during my post-doc;
- k) Modeling channel-floodplain morphodynamics in the Minnesota River basin, Minnesota, to constrain the cause of an increase in sedimentation farther downstream using sediment fingerprints (2008 – 2013) – Minnesota Pollution Control Agency-funded effort with researchers at the University of Minnesota (Minneapolis and Duluth) and Johns Hopkins during my post-doc;
- l) Modeling the impacts of coarse sediment augmentations combined with high flow releases from the dams on the spawning gravel quality on the Trinity River, California (2007-2011) - effort of the National Center for Earth Surface Dynamics in collaboration with the Trinity River Restoration Program started during my doctoral studies.
- m) While in Italy, I was involved in a wide range of engineering problems with the C.U.G.R.I. (Consorzio interUniversitario per la previsione e la prevenzione dei Grandi RISchi), principal consultant of the City Council of Naples on water resources management. In particular, I have

been working with Prof. G. Rasulo on the design and the analysis of a) drop shafts, b) storm water systems, and c) irrigation and reclamation canals.

INFRASTRUCTURE DEVELOPMENT

Improvement of testing capabilities of the Hydraulics Laboratory at the University of South Carolina (USC) since 2012. I designed and supervised the construction of two head tanks with pumping system and supply lines, 5 flumes and the modification of a fifth facility. Improvement of lab safety and instrumentation. Preparation of a university aluminum boat to perform field work in rivers and shallow channels. So far, this boat has been used by three different research groups.

FUNDED RESEARCH

I have been involved in research projects funded in the USA and in the Netherlands for more than \$11 millions (\$11.4 millions of external funding). Funding to USC \$6.4M, external funding to USC \$6M.

- a) *Modeling dam and levee breach and the impact of hydraulic structures on channel routing and flood inundation*. Cooperative Institute for Research to Operations in Hydrology (CIROH), University of Alabama/NOAA. Role: Co-PI Awarded amount \$750,000 (2022-2025).
- b) *The Use of Biopolymers to strengthen earthen infrastructure*, US Army Corps of Engineers, Engineer Research and Development Center. Role: Co-PI. Awarded amount \$4,000,000 (2021-2025).
- c) *Save the Tiger! Save the grasslands! Save the water!* Netherlands Organisation for Scientific Research (NWO-STW), University of Utrecht, Netherlands, lead institution. Collaborative research performed at Delft University of Technology, Netherlands. Awarded amount \$3,290,000 (2021-2026).
- d) *SRNL Addendum: Deposition Velocity Measurements for Metal Tritide Particles*, Savannah River National Laboratory (SRNL). Role Co-PI. Awarded amount \$8,782 (2023).
- e) *Improvement to the ALGE Aqueous Contaminant Transport Model*, National Nuclear Security Administration, Office of Defense Nuclear Nonproliferation Research and Development. Savannah River National Laboratory leading institution. Role: PI. Awarded amount \$1,545,000, \$241,776 at USC (2020-2023).
- f) *Aspire II: The impact of harbor modification on coastal floods – the case of Charleston, SC*, University of South Carolina VPR for Research. Role: PI. Awarded amount \$99,979 (2020-2022).
- g) *CAREER: Quantifying the response of rivers and floodplains to changes in climate and land use*. Role: PI. NSF. total awarded \$574,553, REU supplements \$123,000. (2018-2023)
- h) *Experiments on the influence of suspended bed material at high shear stresses*, ExxonMobil Upstream Research Company. Role: PI. Awarded amount \$95,000 (2019-2021).
- i) *WATER2015 research proposal Long-term bed degradation in rivers: causes and mitigation* Netherlands Organisation for Scientific Research (NWO-STW). Awarded amount \$428,070. Research performed at Delft University of Technology, Netherlands (2016-2021)
- j) *Development of SRNL's ALGE3D code for use as national response asset*. Savannah River National Laboratory leading institution. Role: PI. Awarded amount \$400,000, \$49,991 at USC. (2018-2019).
- k) *Statistically based morphodynamic modeling of bedload transport, erosion and deposition: from the grain scale to the lab scale*. Army Research Office. Role: PI. USC lead institution. Awarded amount \$49,816, \$30,816 at USC (2016-2017).
- l) *ASPIRE 3: An annular flume to perform collaborative research on suspended transport of fine sediment, natural tracers and contaminants*. University of South Carolina VPR for Research. Role: PI. Awarded amount \$99,140 (2016-2017).

- m) *The internal structure of deposits emplaced under upper plane bed / sheet flow transport conditions: Laboratory experiments and numerical modeling*. NSF. Role: PI. Awarded amount \$201,723 (2013-2017)
- n) *Accelerated Simulation of Submarine Strata*. Shell International Exploration and Production Company. Role: Co-PI. Awarded amount \$182,399 (2013-2016).
- o) *Numerical Models for the Restoration of the Mississippi Delta*, Subaward Agreement from NCED (National Center for Earth Surface Dynamics, a NSF Science and Technology Center). Role: PI at USC. Awarded amount \$24,177 (2012).
- p) *ASPIRE 1: Integrated multi physics and statistical model of particle resuspension with application to environmental systems*. University of South Carolina VPR for Research. Role: Co-PI. Awarded amount \$12,797 (2016-2017).
- q) *Rapid Assessment of Bridge Scouring and Recovery Following Extreme Flood Events*. University of South Carolina VPR for Research. Role: Co-PI. Awarded amount \$27,183 (2015-2016).
- r) *Collection of perishable data from failed geosystems during a 1000-yr flood event: Dams*. University of South Carolina VPR for Research. Role: Co-PI. Awarded amount \$30,000 (2015-2016).
- s) *Collection of Perishable Data from Failed Geosystems During a 1000-yr Flood Event: Pipe Culverts*. University of South Carolina VPR for Research. Role: Co-PI. Awarded amount \$30,000 (2015-2016).
- t) *Collection and analysis of perishable data on failure of earth dams and their impact on water quality*. University of South Carolina VPR for Research. Role: Co-PI. Awarded amount \$29,833 (2015-2016).
- u) *Research Engagement Collaboratives Seed Grant Proposal "Coastal Health, Sustainability and Adaptation"*. University of South Carolina. Role: Co-PI. Awarded amount \$23,417 (2013).

TEACHING EXPERIENCE

At the University of South Carolina at Columbia

- a) I am mentoring one post-doctoral researcher in the Department of Civil and Environmental Engineering at the University of South Carolina (CEE);
- b) I am co-supervising one post-doctoral researcher with Profs. Yankovsky and Torres in the School of the Earth, Ocean and Environment (SEOE) at the University of South Carolina, and one post-doctoral researcher with Prof. Chaudhry in CEE;
- c) I am advising two PhD and five MS students in CEE;
- d) I am co-advising one MS student with Prof. Hoque in CEE;
- e) I am mentoring nine undergraduate students conducting research in CEE;
- f) I supervised two post-doctoral researchers, one from May 2012 to May 2013 and the other from August 2019 to April 2020 in CEE;
- g) I co-advised one post-doctoral researcher at Delft University of Technology (TU Delft), Netherlands, with Prof. Blom;
- h) I advised five PhD students, two MS student, and three ME students in CEE;
- i) I co-advised one PhD student and two MS students, advisors Profs. Imran and Hoque in CEE, one PhD student at TU Delft, Netherlands, advisor Prof. Blom, and one MS student at the University of Illinois Urbana-Champaign (UIUC), advisor Prof. Parker;
- j) I have mentored a total of 42 undergraduate students on different research projects in CEE. In this group, 27 students have been involved in research for two consecutive semesters or more (16 for more than one year), nine have pursued graduate studies;
- k) Within the group of 42 undergraduate students mentored in the performance of research, 18 students happened to be women, 10 African American, 2 Latino and 1 American Indian. In addition, 3 undergraduate students were the first in their families to go to college, 3 were at the Honors College and 16 pursued a graduate degree. Within the group of 18 graduate students

advised (15) and co-advised (3) in CEE, 7 happened to be women, 2 African American and 2 were the first in their families to go to college.

- l) I supervised four high school students during summer research experiences.
- m) I hosted four international visitors and two US visitors:
 - i. Prof. Gary Parker, University of Illinois at Urbana-Champaign (one week, 2012 and 2014, May 11- May 16, 2021, May 20 – May 24, 2023)
 - ii. Dr. Eke, Post-doctoral research associate at Utah State University (July-September 2015), and Regional Economist Idaho (May 11- May 15, 2021);
 - iii. Clement Delibes, MS student, Ecole Nationale Supérieure d'Electronique Informatique, Télécommunications, Mathématique et Mécanique de Bordeaux, France (summer 2016);
 - iv. Prof. Solari, Associate Professor at the University of Florence, Italy (February 2013 and 2015);
 - v. Prof. Blom, Associate Professor at TU Delft, Netherlands (December 2014), and
 - vi. Victor Chavarrias, PhD student at TU Delft working with Prof. Blom (October 2014).
- n) I taught the following undergraduate level courses:
 - i. *Introduction to Civil Engineering* in the Fall semester 2019;
 - ii. *Numerical Methods in Civil Engineering* in the Fall semesters 2020 and 2021;
 - iii. *Introduction to Water Resources Engineering* in the Fall semesters 2012, 2020 and 2021, in the Spring semesters 2013 and 2019;
 - iv. *Fluid Mechanics* in the Fall semesters 2013, 2017, 2018 and 2019, in the Spring semesters 2015, 2016 and 2017;
 - v. *River Basin Management* (new course introduced and co-taught with Dr. V. Samadi) Fall semester 2017;
 - vi. *Aqueducts and drainage systems* (new course) Spring semester 2018;
 - vii. *Introduction to Water Resources Engineering Laboratory* Spring semester 2014; and
 - viii. five sections of *Independent Study/Research in Civil and Environmental Engineering*.
- o) I taught the following graduate courses:
 - i. *Delta Morphodynamics* in the Spring semester 2013;
 - ii. *Large scale sediment transport modeling* in the Fall semester 2014;
 - iii. *Sediment transport and River Mechanics* in the Spring semesters 2015, 2016, 2020, co-taught with Prof. Parker in the Spring semester 2022;
 - iv. *Morphodynamic Modeling* in the Fall semester 2015 and in the Spring semester 2023;
 - v. seven different sections of the *Research in Civil Engineering*, i.e. independent study – six 3 credit hours sections and one 6 credit hours sections.
- p) I co-taught the *Sediment transport* course with Prof. Izumi at the Hokkaido Summer Institute, Hokkaido University, Japan, in 2020, 2021 and 2022 and I will teach it in July 2023.
- q) I taught a class on *Bedrock, bedrock-alluvium transitions, and fixed beds* in the Physics of River Systems Course at Delft, University of Technology, Netherlands.
- r) I will teach the mix undergraduate-graduate course *Open Channel Hydraulics* in the Fall semester 2023.

At the University of Illinois at Urbana-Champaign

- a) Occasional guest lecturer in a graduate class, *River Morphodynamics* and *Environmental Fluid Mechanics*.
- b) I supervised 6 undergraduate and 8 graduate students on a one-by-one basis during the performance of research.

At the University of Naples Federico II, Italy

- a) Teaching Assistant for a class on River Basin Management during my doctoral studies (November 2004 – November 2005; December 2006- February 2007, June 2007 – November 2007, i.e. when in Naples).
- b) Authorized from the University of Naples Federico II to participate in academic activities as a tutor, and to classes the Department of Hydraulic and Environmental Engineering.

SERVICE

- 1) Associate editor for the Journal of Geophysical Research – Earth Surface of the American Geophysical Union.
- 2) Board Member of the biannual Symposium on River, Coastal and Estuarine Morphodynamics (RCEM)
- 3) Reviewer for the following journals
Journal of Hydraulic Research; Computers & Geosciences; Geomorphology; Earth Surface Processes and Landforms; Water Resources Research; ASCE Journal of Hydraulic Engineering; International Journal of Sedimentary Research; Journal of Asian Earth Sciences; Journal of Geophysical Research; Journal of Hydrology; Geophysical Research Letters; Marine Geology; Geology; Earth Surface Dynamics (ESurf); PLOS ONE; Marine Geology; Journal of Mountain Science; Oxford University Press – book review; the Journal of Hydro-Environment Research; Journal of Sedimentary Research; Water.
- 4) Reviewer for the following funding agency
NSF, Army Research Office, American Chemical Society Petroleum Research Fund, MIUR
- 5) Participation to the National Science Foundation Panels Geomorphology and Land-use Dynamics, Environmental Sustainability, Sedimentary Geology and Paleobiology, Division of Earth Science, for the Postdoctoral Fellowship.
- 6) Participation in the organization of workshops and conference sessions
 - a) *The Digital River*, River Flow 2020 Master Class with Prof. Popescu.
 - b) Chair of the *Workshop on channel bed degradation*, TU Delft, Netherlands, January 2020.
 - c) American Geophysical Union Fall Meeting 2017, Session Title: Sorting by Particle Property and Other "Granular" Mechanisms and Their Influence on Earth and Planetary Surface Processes, Oral and Poster, Session Organizers and Conveners, Hill, K. M., Viparelli, E., Kaitna, R. and Frey, P.
 - d) *Advances in delta sedimentology and stratigraphy in ancient and modern settings*, 31st Meeting of the International Association of Sedimentologists, June 22-25, 2015, Krakow, Poland. Session Organizers and Conveners: I. Martini, E. Viparelli, and A. Blom.
 - e) *From abrading particles to river concavity*, workshop on modeling mixed-sediment river morphodynamics, 27-29 May 2015, Delft University of Technology, Netherlands. Organizers A. Blom and E. Viparelli.
 - f) American Geophysical Union Fall Meeting 2013, Session Title: *Morphodynamics Characteristics of Non-normal Flow Conditions*, Oral and Poster, Session Organizers and Conveners J.A. Nittrouer, and E. Viparelli.
 - g) ASCE EWRI 2014 Congress, Hydraulics & Waterways Track, Session Title: *Sediment Source Tracking*.

- 6) At the University of South Carolina at Columbia (i.e. since 2012)
- a) Chair of the Wellbeing Committee for Faculty and Staff in the Department of Civil and Environmental Engineering, August 2022 – present
 - b) Member of the Graduate Program Committee in the Department of Civil and Environmental Engineering, October 2013 - present.
 - c) Member of the Undergraduate Program Committee in the Department of Civil and Environmental Engineering, August 2012 – August 2020.
 - d) Member of 16 PhD Committees (I did not advise nor co-advise these students), 13 in the Department of Civil and Environmental Engineering, 2 in the Department of Mechanical Engineering, and one in the School of the Earth, Oceans and Environment at the University of South Carolina.
 - e) Member of 3 PhD Committees in the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign.
 - f) Member of 1 PhD committee in the Faculty of Engineering and Geosciences at Delft University of Technology, Delft, Netherlands.
 - g) Member of 1 MS committee and 3 ME committees in the Department of Civil and Environmental Engineering at the University of South Carolina (I did not advise nor co-advise these students).
 - h) Member of 2 MS committee in the Faculty of Engineering and Geosciences at Delft University of Technology, Delft, Netherlands.
 - i) PhD Opponent at the University of Stockholm, Sweden, 2017.
 - j) Faculty advisor for the ASCE student chapter, May 2014 – August 2020.
 - k) Organizer of the Departmental Seminar series in the Spring and Fall semesters 2014.
 - l) Instructor of Fluid Mechanics for the Fundamental of Engineering review class, Spring 2013 – Fall 2014, and Fall 2017.
- 7) At the University of Illinois at Urbana-Champaign (i.e. 2008 – 2011)
- As a postdoctoral researcher associated with the National Center for Earth-surface Dynamics (NSF Science and Technology Center, <http://nced.umn.edu>), I played an active role in selecting, modifying and supplying codes to the Community Surface Dynamics Modeling System (<http://csdms.colorado.edu>), which can be integrated into larger codes describing river/landscape evolution. To date I have supplied 27 System-compliant codes.

JOURNAL PAPERS AND BOOK CHAPTERS

In review

- 1) Hassan, M., Li, W., Viparelli, E., An, C. and Mitchell, A., Influence of sediment supply timing on bedload transport and bed surface texture during a single experimental hydrograph in gravel bed rivers. In review, *Water Resources Research*
- 2) Lei, Y., Hassan, M., Viparelli, E., Chartrand, S., An, C., Fu, X. & Hu, C., The effect of sediment supply on pool-riffle morphology. In review, *Water Resources Research*
- 3) Elalfy, E., Czapiga, M., Viparelli, E., Imran, J., & Chaudhry, M. H., Modeling breach evolution in non-cohesive earthen dams by overtopping. Submitted to the *Journal of Hydraulic Engineering*.

Published

- 1) Sanders, S., Jafarinik, S., Hernandez Moreira, R., Johnson, R., Balkus, A., Ahmadpoor, M., Fryson, B., McQueen, B., Fedele, J & Viparelli, E., Influence of sand supply and grain size on upper regime bedforms, *Journal of Geophysical Research: Earth Surface*. 128 (7), e e2022JF006820.
- 2) van der Steeg, S., Torres, R., Viparelli, E., Xu, H., Elias, E. & Sullivan, J. (2023). Circulation in a coastal plain floodplain, Congaree River, South Carolina, USA, *Water Resources Research*, 59, e2022WR032982.

- 3) Czapiga, M. J., Blom, A. & Viparelli, E. (2022). Efficacy of longitudinal training walls to mitigate riverbed erosion, *Water Resources Research*, 58, e2022WR033072.
- 4) Viparelli, E., Balkus, A., Vázquez-Tarrío, D., Hill, K. M., Tal., M. & Fedele, J. (2022). Streamwise and vertical dispersal of tracer stones in an equilibrium bed, *Water Resources Research*, 58, e2022WR033137
- 5) Czapiga, M J., Blom, A. and Viparelli, E., (2022), Sediment Nourishments to Mitigate Channel Bed Incision in Engineered Rivers, *Journal of Hydraulic Engineering*, 148 (6), 04022009.
- 6) Xu, H., Torres, R., van der Steeg, S., & Viparelli, E. (2021). Geomorphology of the Congaree River floodplain: implications for an inundation continuum. *Water Resources Research* 57 (12), e2020WR029456
- 7) Viparelli, E., & Eke E. (2021). Equilibrium of self-formed, single-thread, sand-bed rivers. *Geophysical Research Letters* 48 (20), e2021GL094591.
- 8) van der Steeg, S., Xu, H., Torres, R., Viparelli, E., Elias, E., Sullivan, J., Lakshmi, V., & Shelley, D. (2021). A novel approach for quantifying complexity in floodplain flows: Congaree River, South Carolina, USA. *Geophysical Research Letters* 48 (20), e2021GL094190
- 9) Sulaiman, Z., Viparelli, E., Torres, R., Yankovski, A., & Grego, J. (2021). The influence of tides on coastal plain channel geomorphology: the Altamaha River, Georgia, USA. *Journal of Geophysical Research: Earth Surface*, 126 (7), e2020JF005839
- 10) Bastianon, E., Viparelli, E., Cantelli, A., & Imran, J. (2021). 2D numerical simulation of the filling process of submarine minibasins: study of deposit architecture. *Journal of Sedimentary Research*, 91 (4), 399-414
- 11) Ylla Arbos, C., Blom, A., Viparelli, E., Reneerkens, M., Frings, R. M., & Schielen, R. M. J. (2021). River response to anthropogenic Modification: Channel Steepening and Gravel Front Fading in an Incising River. *Geophysical Research Letters*, 48, e2020GL091338.
- 12) Jafarinik, S., & Viparelli, E. (2020). Alluvial morphodynamics of low-slope bedrock reaches transporting non-uniform bed material. *Water Resources Research*, 56 (10), e2020WR027345
- 13) Xu, H., van der Steeg, S., Sullivan, J. Shelley, D., Cely, J., Viparelli, E., Lakshmi, V., & Torres, R. (2020). Intermittent Channel Systems of a Low-Relief, Low-Gradient Floodplain: Comparison of Automatic Extraction Methods. *Water Resources Research*, 56 (9), e2020WR027603.
- 14) Li, C., Viparelli, E., & Parker, G. (2020). Response of the Minnesota River to variant sediment loading. *Journal of Hydraulic Engineering*, 146 (9), 04020064.
- 15) Hernandez Moreira, R. R., Jafarinik, S., Sanders, S., Kendall, C. G. St. C., Parker, G., & Viparelli, E. (2020). Emplacement of massive deposits by sheet flow. *Sedimentology*, 67 (4), 1951-1972.
- 16) Jafarinik, S., Hernandez Moreira, R. R., & Viparelli, E. (2019). Alluvial Morphodynamics of Bedrock Reaches Transporting Mixed-Size Sand. Laboratory Experiments. *Journal of Geophysical Research: Earth Surface*, 124 (2), 3067-3089
- 17) Viparelli, E. Borhani, S., Torres, R., & Kendall, C. G. St. C. (2019). Equilibrium of tidal channels carrying non-uniform sand and interacting with the ocean. *Geomorphology*, 329, 1-16 **Invited**
- 18) Chavarrias, V., Blom, A., Orru', C., Martin-Vide, J. P., & Viparelli, E. (2018). A sand-gravel Gilbert delta subject to base level change. *Journal of Geophysical Research: Earth Surface*, 123 (5), 1160-1179.
- 19) Ohata, K., Naruse, H., Yokokawa, M., & Viparelli, E. (2017). New bedform phase diagrams and discriminant functions for formative conditions of bedforms in open-channel flows. *Journal of Geophysical Research: Earth Surface*, 122 (11), 2139-2158.
- 20) Blom, A., Chavarrias, V., Ferguson, R. I., & Viparelli, E. (2017). Advance, retreat, and halt of abrupt gravel-sand transitions in alluvial rivers. *Geophysical Research Letters*, 44 (19), 9751-9760.
- 21) Blom, A., Arkesteijn, L., Chavarrias, V., & Viparelli, E. (2017). The equilibrium alluvial river under variable flow, and its channel-forming discharge. *Journal of Geophysical Research: Earth Surface*, 122 (10), 1924-1948.

- 22) Tabrizi, A. A., LaRocque, L. A., Chaudhry, M. A., Imran, J., & Viparelli, E. (2017). Embankment failures during the historic 2015 October flood, South Carolina: Case Study. *Journal of Hydraulic Engineering*, 143 (8): 05017001.
- 23) Ismail, H., Viparelli, E., & Imran, J. (2016). Confluence of density currents over an erodible bed. *Journal of Geophysical Research: Earth Surface*, 121 (7), 1251–1272.
- 24) Blom, A., Viparelli, E., & Chavarrias, V. (2016). The graded alluvial river: profile concavity and downstream fining. *Geophysical Research Letters*, 43, 6285-6293.
- 25) Lauer, J. W., Viparelli, E., & Piegay, A. (2016). Morphodynamics and Sediment Tracers in 1-D (MAST-1D): 1-D sediment transport that includes exchange with an off-channel sediment reservoir. *Advances in Water Resources*, 93A, 135-149.
- 26) Li C., Czapiga, M., Eke E., Viparelli, E., & Parker G. (2016). Closure to ‘Variable Shields number model for river bankfull geometry: bankfull shear velocity is viscosity-dependent but grain size-independent’. *Journal of Hydraulic Research*, 53 (1), 36-48.
- 27) Viparelli, E., Solari, L., & Hill, K. M. (2015). Downstream lightening and upward heavying, experiments with sediments differing in density. *Sedimentology*, 62, 1384-1407.
- 28) Dale A., Casman, E., Lowry, G., Lead, J., Viparelli, E., & Baalousha, M. (2015). Modeling nanomaterial environmental fate in aquatic systems. *Environmental Science and Technology*, 49 (5), 2587-2593.
- 29) Viparelli, E., Nittrouer, J. A., & Parker, G. (2015). Modeling flow and sediment transport dynamics in the lowermost Mississippi River, Louisiana, USA, with an upstream alluvial-bedrock transition and a downstream bedrock-alluvial transition: implications for land-building using engineered diversions. *Journal of Geophysical Research: Earth Surface*, 120 (3), 534-563.
- 30) Zhang, L., Parker, G., Stark, C. S., Inoue, T., Viparelli, E., Fu, X. D., & Izumi, N. (2015). Macro-roughness model of bedrock-alluvial river morphodynamics. *Earth Surface Dynamics*, 3, 113 – 138.
- 31) Nittrouer, J. A., & Viparelli, E. (2014). Reply to ‘Is sand in the Mississippi River delta a sustainable resource?’. *Nature Geoscience*, 7, 852.
- 32) Eke, E., Czapiga, M., Viparelli, E., Imran, J., Sun, T., & Parker, G. (2014). Coevolution of width and sinuosity in meandering rivers. *Journal of Fluid Mechanics*, 760, 127-174.
- 33) Li C., Czapiga, M., Eke E., Viparelli, E., & Parker G. (2015). Variable Shields number model for river bankfull geometry: bankfull shear velocity is viscosity-dependent but grain size-independent. *Journal of Hydraulic Research*, 53 (1), 36-48.
- 34) Nittrouer J.A., & Viparelli, E. (2014). Sand as a stable and sustainable resource for nourishing the Mississippi River Delta. *Nature Geoscience*, 7 (5), 350-354.
- 35) Viparelli, E., Blom, A., Ferrer-Boix, C., & Kuprenas, R. (2014). Comparison between experimental and numerical stratigraphy emplaced by a prograding delta, *Earth Surface Dynamics*, 2, 323-338.
- 36) Viparelli, E., Lauer, W.J., Belmont, P., & Parker, G. (2013). A numerical model to develop long-term sediment budgets using isotopic sediment fingerprints. *Computers and Geoscience*, 53, 114-122.
- 37) Belmont, P., Gran, K.B., Schottler, S.P., Wilcock, P.R., Day, S.S., Jennings, C., Lauer, J.W., Viparelli, E., Willenbring, J.K., Engstrom, D.R., & Parker, G. (2011). Large shift in source of fine sediment in the Upper Mississippi River. *Environmental Science and Technology*, 45(20), 8804-8810.
- 38) Eke, E., Viparelli, E., & Parker, G. (2011). Field-scale numerical modeling of breaching as a mechanism for generating continuous turbidity currents. *Geosphere*, 7 (5), 1063-1076.
- 39) Paola C., Twilley, R.R., Edmonds, D.A., Kim, W., Mohrig, D., Parker, G., Viparelli, E., & Voller, V.R. (2011). Natural Processes in Delta Restoration. *Annual Review of Marine Science*, 3, 67–91.
- 40) Viparelli E., Gaeuman, D., Wilcock, P.R., & Parker, G. (2011). A model to predict the evolution of a gravel bed river under an imposed cyclic hydrograph and its application to the Trinity River. *Water Resources Research*, 47, W02533.

- 41) Viparelli E., Haydel, R., Salvaro, M., Wilcock, P.R., & Parker, G. (2010). Modeling of River Morphodynamics with creation/consumption of grain size stratigraphy. Part 1: Laboratory experiments. *Journal of Hydraulic Research*, 48 (6), 715-726.
- 42) Viparelli E., Sequeiros, O.E., Cantelli, A., Wilcock, P.R., & Parker, G. (2010). Modeling of River Morphodynamics with creation/consumption of grain size stratigraphy. Part 2: Numerical model. *Journal of Hydraulic Research*, 48 (6), 727-741.
- 43) Ganti V., Meerschaert, M.M., Foufoula-Georgiou, E., Viparelli, E., & Parker, G. (2010). Normal and Anomalous Diffusion of Gravel Tracer Particles in Rivers. *Journal of Geophysical Research*, 115, F00A12.
- 44) Sequeiros O.E., Cantelli, A., Viparelli, E., White, J.D.L., Garcia, M.H., & Parker, G. (2009). Modeling turbidity currents with non-uniform sediment and reverse buoyancy. *Water Resources Research*, Vol. 45, W06408.

INVITED SEMINARS/PRESENTATIONS

- 1) Role of bed level variability on tracer dispersal in an equilibrium bed. 15th International Symposium on River Sedimentation. Sept. 05-08, 2023, Florence, Italy. **Keynote**
- 2) *Measuring sediment fluxes between the Congaree River channel and its floodplain*. Preliminary results. Congaree National Park Research Symposium. January 6-7, 2022
- 3) *Bankfull geometry of self-formed, single thread, sand bed rivers*. 12th River, Coastal and Estuarine Morphodynamics Symposium. December 9, 2021. **Keynote**
- 4) Seminar at the Hydrosystems Laboratory, Department of Civil and Environmental Engineering, University of Illinois Urbana-Champaign, October 8, 2021, *Tracer dispersal in gravel bed rivers, an equilibrium sorting model*.
- 5) Seminar, Department of Civil and Environmental Engineering, University of South Carolina, March 3, 2021, *Streamwise and vertical dispersal of tracer stones in an equilibrium bed*.
- 6) American Geophysical Union Fall Meeting 2019, *Channel-floodplain response to changes in flow regime*
- 7) American Geophysical Union Fall Meeting 2019, *An attempt to model the internal structure of alluvial deposits in 1D*
- 8) American Geophysical Union Fall Meeting 2018, *An attempt to model the continuum of channel patterns in 1D*.
- 9) American Geophysical Union Fall Meeting 2017, *Massive units deposited by bedload transport in sheet flow mode*.
- 10) American Geophysical Union Fall Meeting 2017, *Coupling MAST-1D, a sediment routing model for channel-floodplain complexes, with channel migration relationships to predict reach-averaged river morphodynamics. Preliminary results*.
- 11) *Sorting patterns and bedform geometries downstream of a stable alluvial-bedrock transitions*, Sediment Experimentalists Meeting, May 18-19, 2017 Tsukuba University, Tsukuba, Japan.
- 12) Guest lecture in the River Morphodynamics class at the University of Illinois at Urbana Champaign, March 16, 2017, *Modeling transport of sediment and tracers in a channel-floodplain systems*.
- 13) Seminar at the Department of Geography, Planning and the Environment, Aix-Marseille Université, Marseille, France, December 2, 2016, *An introduction to 1D morphodynamic modeling*.
- 14) Seminar in the Department of Civil, Environmental and Geo-Engineering, University of Minnesota, Minneapolis, March 7, 2016, Title: *Modeling alluvial-bedrock and bedrock-alluvial transition in large, low slope sand bed rivers and implications for land-building in the Mississippi River delta*.
- 15) 8th International Gravel Bed River Workshop, 14-18 September, 2015, Disaster Prevention Research Institute, Kyoto University, Japan, Invited, Title: *Modeling stratigraphy-based GBR Morphodynamics*.

- 16) Seminar at the Hydrosystems Laboratory, Department of Civil and Environmental Engineering, University of Illinois Urbana-Champaign, March 6 2015, Title: *Modeling the long term evolution of the alluvial-bedrock and bedrock-alluvial transitions of the lowermost Mississippi River. Implications for land-building diversion projects.*
- 17) American Geophysical Union Fall Meeting 2014. *Downstream lightening and upward heavying, sorting of sediments of uniform grain size but differing in density.*
- 18) American Geophysical Union Fall Meeting 2014, *MAST-1D, a Model to Route Sediment and Tracers in Channel-Floodplain Complexes.*
- 19) M.S. Yalin Memorial Mini-Colloquium on Fluvial Eco-Hydraulics and Morphodynamics: new insights and challenges, November 28-29, 2013, Palermo, Italy. Invited, Title: *Modeling ecological succession on a delta top. Preliminary results on Wax Lake Delta, Louisiana, USA,*
- 20) Soil to Sea Geomorphology 2013, May 17-18 Johns Hopkins University, Baltimore, MD, Title: *Where is this sediment coming from? Where is that sediment going? Examples and future plans on sediment routing. Keynote*
- 21) Seminar in the Mechanical Engineering Department at the University of South Carolina, October 26, 2012, Title: *A mushy layer formulation to model sand transport in the Lowermost Mississippi River.*
- 22) Seminar at the National Oceanography Centre, Southampton, UK, July 13 2011, Title: *Laboratory experiments on linked submarine minibasins. Preliminary Results.*
- 23) Seminar in the Department of Civil and Environmental Engineering at the University of South Carolina, May 31, 2011, Title: *The inundation model, a tool of delta restoration to help in the prediction of the ecological succession on newly created deltaic land in coastal Louisiana.*
- 24) Seminar in the Department of Civil and Environmental Engineering at Queen's University, Canada, October 5 2010, Title: *The spawning gravel refresher, a tool to help in the design of gravel augmentations: Application to the Trinity River, California, USA.*
- 25) Seminar in the Department of Civil and Environmental Engineering at the University of South Carolina, August 10, 2010, Title: *Where is the sediment coming from? Basin-scale routing model for sediment/radionuclides in the lower Minnesota River.*
- 26) Seminar at the Hydrosystems Laboratory, University of Illinois at Urbana-Champaign, November 2009, Title: *A model to design gravel augmentations on the Trinity River in California.*

REFEREED CONFERENCE PAPERS

- 1) Viparelli, E., & Eke, E. (2020). Channel-floodplain response to changes in sediment supply and floodplain width. In Uijtewaald et al. Eds. *River Flow 2020* (Taylor & Francis 2020).
- 2) Al-Zaidi, B., Viparelli, E., & Moussa, A. (2016). Preliminary morphodynamic results on the impact of the High Aswan Dam on the Nile River, Egypt. In Constantinescu, Garcia and Hanes (eds.) *Proceedings River Flow 2016*, Taylor & Francis Group, London, ISBN 978-1-138-02913-2.
- 3) Parker, G., Fernandez, R., Viparelli, E., Stark, C.P., Zhang, L., Fu, X., Inoue, T., Izumi, N., & Shimizu, Y. (2013). Interaction between waves of alluviation and incision in mixed bedrock-alluvial rivers. 12th International Symposium on river Sedimentation, September 2-5, Kyoto, Japan.
- 4) Viparelli, E., Blom, A., & Parker, G. (2012). Modeling stratigraphy formed by prograding Gilbert deltas. In *River Flow 2012: Proceedings of the International Conference on Fluvial Hydraulics*, San Jose, Costa Rica, 5-7 September.
- 5) Yeh T., Cantelli, A., Viparelli, E., Blois, G., & Parker, G. (2011). Experimental study on linked submarine minibasins in case of non-uniform sediment: preliminary results. *Proceedings 7th IAHR Symposium on River, Coastal and Estuarine Morphodynamics, RCEM.*
- 6) Viparelli E., Blom, A., & Parker, G. (2011). Numerical prediction of the stratigraphy of bedload-dominated deltas: preliminary results. *Proceedings, 7th IAHR Symposium on River, Coastal and Estuarine Morphodynamics, RCEM.*

- 7) Viparelli E., Solari, L., & Parker, G. (2010). Indagine sperimentale sul trasporto e deposito di materiale con granulometria uniforme e diversa densità. *XXXII Convegno di Idraulica e Costruzioni Idrauliche*, Palermo, 14-17 Settembre (in Italian).
- 8) Ferrer-Boix C.G, Viparelli, E., Cantelli, A., Haydel, R.G, Parker, G., & Martin-Vide, J.P. (2010). Incision and width changes caused by dam removal. Experiments and data analysis. *Proceedings River Flow 2010*, Braunschweig, Germany, September 8-10.
- 9) Del Giudice G., Rasulo, G. & Viparelli, E. (2004). Corsi d'acqua alluvionati: criteri di stima dell'escavazione al piede delle opere di difesa longitudinali. *XXIX Convegno di Idraulica e Costruzioni Idrauliche*, Trento (in Italian).
- 10) Del Giudice G., Rasulo, G. & Viparelli, E. (2004). Bar height formulas to predict the maximum scour depth at riverbanks. *Proceedings, Second International Conference on Fluvial Hydraulics River Flow 2004*, Napoli.

NON-REFEREED CONFERENCE PAPERS

1. O'Donal, H., Czapiga, M., Elalfy, E., Viparelli, E. & Chaudhry, M. H. Effect of Dam Height on Breaching Due to Overtopping of Non-Cohesive Earthen Dams. *2023 World Environmental & Water Resources Congress*
2. Elalfy, E., Viparelli, E., Czapiga, M., Imran, J. & Chaudhry, M. H. A Case Study of dam failure during the historic October 2015 Flood in South Carolina *2023 World Environmental & Water Resources Congress*
3. Kendall, C.G., Moore, P., Viparelli, E., De Keyser, T.L., Alsharan, A., & Kloot, C. (2014). Analysis of Sequence Stratigraphic Models for the Jurassic Cretaceous Sedimentary Fill of the Intrashelf Basins of the Eastern Margin of the Arabian Plate. *Search and Discovery* Article #90189 adapted from poster presentation at AAPG Annual Convention and Exhibition, Houston, Texas, April 6-9.
4. Lauer, J. W., Li, C., Viparelli, E., & Piegay, H. (2014). MAST-1D: A size-specific sediment transport and tracer model with off-channel storage. *Proceedings World Environmental & Water Resources Congress*, Portland, Oregon, June 1-5.
5. Moore P., Kendall, C.G., & Viparelli, E. (2013). Sedpack A - A Qualitative Computer Simulation for Understanding Sequence Stratigraphy Modeling Concepts and Parameters. *Search and Discovery* article #90163 adapted from poster presentation at AAPG annual convention and exhibitions, 19-22 May, Pittsburgh, PA.
6. Viparelli, E., Yeh, T., Cantelli, A., Leslie, E., Robertson, A., & Parker, G. (2012). Stratigraphy of Linked Submarine Minibasins in Laboratory Experiments. *Search and Discovery* Article #40960 Adapted from poster presentation at AAPG Annual Convention and Exhibition, Long Beach, California, April 22-25.
7. Konsoer, K.M., Zinger, J.A., Hernandez, J., Viparelli, E., & Parker, G. (2012). Relations for bankfull hydraulic geometry of sinuous channels in submarine and subaerial settings. *Search and Discovery* Article #90142, APG Annual Convention and Exhibition, Long Beach, California, April 22-25.
8. Viparelli E., Shaw, J., Bevington, A., Meselhe, E., Mohrig, D., Twilley, R., & Parker, G. (2011). Inundation model as an aid for predicting ecological succession in newly created deltaic land associated with Mississippi River diversions: application to the Wax Lake Delta. *Proceedings, World Environmental & Water Resources Congress*, May 22- 26 - Palm Springs, CA.
9. Viparelli E., Blom, A., & Parker, G. (2011). Numerical prediction of the stratigraphy of bedload-dominated deltas: preliminary results. *Proceedings, 7th IAHR Symposium on River, Coastal and Estuarine Morphodynamics, RCEM*.
10. Abad, J.D., Cataño-Lopera, Y.A., Viparelli, E., & García, M.H. (2009). Flow structure and hydraulic capacity for drop shafts: application to Tunnel and Reservoir Plan (TARP) project, Chicago, Illinois. *33rd IAHR Congress: Water Engineering for a Sustainable Environment*, Vancouver, Canada, August.

ABSTRACTS

- 1) Viparelli, E., Fedele, J. and Sanders, S. Progression from lower to upper regime and from downstream to upstream migrating bedforms in fluvial and deep-water experiments. 13th Symposium on River Coastal and Estuarine Morphodynamics (RCEM 2023), September 25-28, Urbana, Illinois, USA
- 2) Czapiga, M. J., Kim, M., Kim, W. and Viparelli, E. Longterm modelling of ecological succession and mud capture in a fluvially-dominant river delta. 13th Symposium on River Coastal and Estuarine Morphodynamics (RCEM 2023), September 25-28, Urbana, Illinois, USA
- 3) Fryson, B., Harrison, G., Caspino, W., K. Yunus, Glover, E., Cantelli, A. & Viparelli, E. (2022) Effect of sediment quantity and caliber on braided channel geometry. EP55D-0848 Fall Meeting, American Geophysical Union.
- 4) Czapiga, M. J, Dykstra, S. L., Parker, G. & Viparelli, E. (2022) Basin controls on the channel morphodynamics of juvenile river deltas. EP52D-0788 Fall Meeting, American Geophysical Union.
- 5) Van der Steeg, S., Haiqing, X., Torres, R. & Viparelli, E. The controls on surface-water circulation in a low gradient river floodplain: Congaree River, South Carolina, USA. Submitted to the 2022 AGU Fall Meeting
- 6) Dykstra, S. L., Viparelli, E., Szot, O., Talke, S., Yankovsky, A. & Torres, R. (2022) Water Level Trend Variability from Tidal Oscillations, Charleston Harbor, USA. GC25F-0752 Fall Meeting, American Geophysical Union.
- 7) Logan, W., Benitez-Nelson, N., Ahmadpoor, M., Torres, R. & Viparelli, E. (2022) Quantitative Geomorphology of the Congaree River Throughout the Last Century. EP42C-1634 Fall Meeting, American Geophysical Union.
- 8) Ahmadpoor, M., White, S., Logan, W., Torres, R., Johnson, R., Fryson, B. & Viparelli, E. (2022). Bedrock Control on Channel Sinuosity: Congaree River, South Carolina, USA. EP55D-0844 Fall Meeting, American Geophysical Union.
- 9) Balkus, A. & Viparelli, E. (2022) Streamwise and Vertical Dispersal of Tracer Stones from a Continuously Supplied Source. EP55D-0845 Fall Meeting, American Geophysical Union.
- 10) Viparelli, E., Ahmadpoor, M., van der Steeg, S., Xu, H., Sullivan, J., Shelley, D., & Torres, R. (2022). Measuring sediment fluxes between the Congaree River channel and its floodplain. Preliminary results. Congaree National Park Research Symposium, January 6-7. **Invited**.
- 11) Viparelli, E., Balkus, A., Vazquez Tarrío, D., Fedele, J., Hill, K. M., & Tal, M. (2021). Analytical solution for tracer stone dispersal in bedload dominated rivers. EP43A-03, Fall Meeting, American Geophysical Union.
- 12) Balkus, A., & Viparelli, E. (2021). Modeling tracer stone dispersal with continuously supplied tracers. EP45B-1524, Fall Meeting, American Geophysical Union.
- 13) Sanders, S., Johnson, R., McQueen, B., Balkus, A., Fryson, B., Jafarinik, S., Hernandez-Moreira, R. R., Fedele, J., & Viparelli, E. (2021). Evolution of upper regime bedforms with grain size and sediment supply. EP55F-1177, Fall Meeting, American Geophysical Union.
- 14) Ahmadpoor, M., van der Steeg, S., Xu, H., Logan, W., Torres, R., Sullivan, J., & Viparelli, E. (2021). Overbank deposition rates and grain sizes in the Congaree River floodplain, SC. EP35B-118, Fall Meeting, American Geophysical Union.
- 15) Czapiga, M., Blom, A., & Viparelli, E. (2021). Mitigating long-term channel bed erosion in engineered rivers. EP45D-1545, Fall Meeting, American Geophysical Union.
- 16) van der Steeg, S., Xu, H., Torres, R., Viparelli, E., Chassereau Sullivan J., & Lakshimi, V. (2021). Complexity in floodplain flows, Congaree River, South Carolina, USA. EP53A-02, Fall Meeting, American Geophysical Union.
- 17) Xu, H., Torres, R., van der Steeg, S., & Viparelli, E. (2021). Geomorphology and inundation continuum of the Congaree River floodplain. EP55E-1155, Fall Meeting, American Geophysical Union.

- 18) Dykstra, S., Torres, R., Yankovsky, A., & Viparelli, E. (2021). The role of dams on tides and storm surge, Charleston Harbor. EP55E-1149, Fall Meeting, American Geophysical Union.
- 19) Xu, H., van der Steeg, S., Torres, R., & Viparelli, E. (2020). Intermittent channel systems of a low-relief and low-gradient (LRLG) fluvial-tidal floodplain. H154-10, Fall Meeting, American Geophysical Union.
- 20) van der Steeg, S., Xu, H., Torres, R., & Viparelli, E. (2020). Controls on floodplain inundation. EP008-03, Fall Meeting, American Geophysical Union.
- 21) Eke, E., & Viparelli, E. (2020). Floodplain and channel dynamics in a meandering river bend. EP005-07, Fall Meeting, American Geophysical Union.
- 22) van der Steeg, S., Xu, H., Torres, R., Sullivan, J., Lakshimi, V., & Viparelli, E. (2019). Validation of a floodplain circulation model: The Congaree River & Floodplain. EP53G-2261, Fall Meeting, American Geophysical Union.
- 23) Xu, H., van der Steeg, S., Torres, R., Sullivan, J., & Viparelli, E. (2019). Floodplain flow directions and the origins of floodplain channels. EP53G-2263, Fall Meeting, American Geophysical Union.
- 24) Viparelli, E., & Eke, E. (2019). Channel-floodplain response to changes in flow regime. EP43B-07 Fall Meeting, American Geophysical Union. **Invited.**
- 25) Jafarinik, S., Coutaz, J., Tal, M., & Viparelli, E. (2019). Immediate impacts and sustainability of sediment augmentations on an alpine gravel bed river: results from 1D morphodynamic modeling of the lower Buech River, SE France. EP51E-2141, Fall Meeting, American Geophysical Union.
- 26) Viparelli, E., & Jafarinik, S. (2019). An attempt to model the internal structure of alluvial deposits in 1D. EP51B-01, Fall Meeting American Geophysical Union. **Invited.**
- 27) Blom, A., & Viparelli, E. (2019). Quasi-equilibrium and equilibrium in fluvial channel geometry: The presence of multiple stable equilibrium states. 14th International Symposium on River Sedimentation, September 16-19, Chengdu, China. **Invited Plenary report.**
- 28) Charchi Aghdam, A., Viparelli, E., & Farouk, T. (2019). Implementing a shallow water mathematical modeling approach for simulating plasma interaction in multiphase configuration. APS Gaseous Electronics Conference 2019, abstract id.FT1.038
- 29) Tal, M., Jafarinik, S., Coutaz, J., & Viparelli, E. (2019). 1D morphodynamic modelling to evaluate decadal scale impacts of a sediment reinjection on an alpine gravel-bed river (the Buech River, SE France). Recontres SHF 2019; Changement global et morphodynamique des rivières, des bassins versants à la mer.
- 30) Siele, M., Blom, A., & Viparelli, E. (2019). Causes of channel bed degradation in engineered rivers: application to a schematic river. 11th River, Coastal and Estuarine Morphodynamics symposium.
- 31) Czapiga, M. J., Rudolph, M., Viparelli, E., & Blom, A. (2019). Evaluation of mitigation measures for channel bed degradation in highly-engineered rivers. 11th River, Coastal and Estuarine Morphodynamics symposium, RCEM.
- 32) Czapiga, M. J., Rudolph, M., Viparelli, E., & Blom, A. (2019). Towards Best Practices for Mitigation of Channel Degradation. NRC Days 2019: Land of Rivers – Utrecht, Netherlands, January 31- February 1.
- 33) Viparelli, E., Eke, E. C., & Banks, D. (2018). An attempt to model the continuum of channel patterns in 1D. EP31A-01, Fall Meeting American Geophysical Union. **Invited.**
- 34) Xu, H., van der Steeg, S., Torres, R., Sullivan, J., Lakshimi, V. & Viparelli, E. (2018). Analyses of low-gradient floodplain topography and floodplain-surface channels by automatic LiDAR DEM processing, EP33D-2456, Fall Meeting American Geophysical Union.
- 35) Sulaiman, Z., Viparelli, E. & Torres, R. (2018). Changes in channel characteristics associated with the river transport capacity along the fluvial-tidal transition zone, EP13D-2123, Fall Meeting American Geophysical Union.
- 36) van der Steeg, S., Xu, H., Torres, R., Lakshimi, V., Sullivan, J. & Viparelli, E. (2018). Through-bank flooding of floodplains, EP52C-19, Fall Meeting American Geophysical Union.

- 37) Borhani, S. & Viparelli, E. (2018). Modeling tracer dispersal during channel bed aggradation and degradation, EP41B-2657, Fall Meeting American Geophysical Union.
- 38) Siele, M., Blom, A., & Viparelli, E. (2018). Time scales of degradational response of engineered channels to changes in the upstream controls and channel width. River Flow 2018, Lyon-Villeurbanne, France, September 5-8.
- 39) Hill, K. M., Ghasemi, A., Borhani, S., & Viparelli, E. (2018). Use of discrete element modeling for a physics-based link between bed surface variability and particle entrainment statistics. European Geosciences Union (EGU2018-11760).
- 40) Blom, A., Emmanouil, A., Siele, M., & Viparelli, E. (2018). Transient response regarding bed elevation and surface texture in the Rhine River. European Geosciences Union (EGU2018-2745).
- 41) Al-Zaidi, B., Moussa, A., & Viparelli, E. (2017). Modeling the impact of controlled flow and sediment releases for the restoration of the Nile Delta, Egypt. EP21B-1852, Fall Meeting, American Geophysical Union.
- 42) Viparelli, E., Eke, E., & Lauer, W. J. (2017). Coupling MAST-1D, a sediment routing model for channel-floodplain complexes, with channel migration relationships to predict reach-averaged river morphodynamics. Preliminary Results. EP33G-03, Fall Meeting, American Geophysical Union. **Invited.**
- 43) Borhani, S., Ghasemi, A., Hill, K. M., & Viparelli, E. (2017). Statistically Based Morphodynamic Modeling of Tracer Slowdown. EP43E-1917, Fall Meeting, American Geophysical Union.
- 44) Ghasemi, A., Borhani, S., Viparelli, E. & Hill, K. M. (2017). Discrete element method modeling of bedload transport: towards a physics-based link between bed surface variability and particle entrainment statistics, EP43E-1739, Fall Meeting, American Geophysical Union.
- 45) Viparelli, E., Hernandez Moreira, R. R., Jafarinik, S., Sanders, S., Huffman, B., Parker, G., & Kendall, C. G. St. C. (2017). Massive units deposited by bedload transport in sheet flow mode. EP53F-02, Fall Meeting, American Geophysical Union. **Invited.**
- 46) Bastianon, E., Viparelli, E., Cantelli, A., & Imran, J. (2017). 3D Numerical Investigation of the Role of the Slope in the 'Fill-and-Spill' process in Submarine Minibasins. EP-41E-08, Fall Meeting, American Geophysical Union.
- 47) Blom, A., Arkesteijn, L., Chavarrias, V., & Viparelli, E. (2017). Response of the Alluvial River through Adjustments of Slope, Surface Texture and Width. EP-31E-06, Fall Meeting, American Geophysical Union.
- 48) Viparelli, E., Hernandez Moreira, R. R., Huffman, B., & Kendall, C. G. St. C. (2017). Experimental study of upper regime bedforms and the associated modes of bedload transport. JpGU-AGU Joint Meeting.
- 49) Emmanouli, A., Blom, A., Viparelli, E., & Frings, R. (2017). Long-term bed degradation in rivers: set-up for research. NCR days information 2017, Wageningen, Netherlands
- 50) Siele, M., Blom, A., Frings, R., & Viparelli, E. (2017). Long-term bed degradation in rivers: causes. NCR days information 2017, Wageningen, Netherlands.
- 51) Blum, M., Viparelli, E., Sulaiman, Z., & Pettit, B. S. (2016). Bed degradation and sediment export from the Missouri River after dam construction and river training: significance to Lower Mississippi River sediment loads. EP31B-0935, Fall Meeting, American Geophysical Union.
- 52) Blom, A., Arkesteijn, L., & Viparelli, E. (2016). The graded alluvial river: variable flow and the dominant discharge. EP53G-04, Fall Meeting, American Geophysical Union.
- 53) Al-Zaidi, B., Moussa, A., & Viparelli, E. (2016). Modeling the impact of controlled flow and sediment releases for the restoration of the Nile River-Delta system, Egypt. EP31B-0937, Fall Meeting, American Geophysical Union.
- 54) Sulaiman, Z., Blum, M., Leaphart, G., & Viparelli, E. (2016). Numerical simulation of Missouri River bed evolution downstream of Gavins Point Dam. EP31B-0936, Fall Meeting, American Geophysical Union.

- 55) Huffman, B., Vougaris, G., Cahl, D., Rekleitis, I., Viparelli, E., & Ziehl, P. (2016). Rapid Assessment of Bridge Scouring Following Extreme Flood Events. SC Floods Conference, University of South Carolina, Columbia, November 18.
- 56) Viparelli, E., Hernandez Moreira, R. R., & Blom, A. (2016). Vertically continuous mass conservation in morphodynamic modeling of upper regime. CSDMS Meeting 2016: Capturing Climate Change Sustainability, Boulder, Colorado, May 17-19. **Invited.**
- 57) Blom, A., Viparelli, E., & Chavarrias, V. (2016). Equilibrium, quasi-equilibrium and transient river longitudinal profiles. CMG 2016: 31st IUGG Conference on mathematical geophysics. Geophysics from mathematics to experiments, June 6-10, Paris, France.
- 58) Sulaiman, Z., & Viparelli E. (2016). Can we quantify the changes in channel bankfull geometry of river reaches that are not in equilibrium? 2016 World Environmental and Water Resources Congress, Palm Beach, Florida, May 22-26.
- 59) Borhani, S., Mahjabeen, N., Rankey, E., Abdo, K., Kendall, C. G. St. C., Imran, J., & Viparelli, E. (2015). The Role of Sea Level Rise and in Situ Carbonate Accumulation on the Morphodynamic Evolution of a Carbonate Tidal Channel. The Case of the Bahamas Islands. EP23B-0970 Fall Meeting, American Geophysical Union.
- 60) Bastianon, E., Viparelli, E., Cantelli, A., & Imran, J. (2015). The Role of Slope in the Fill and Spill Process of Linked Submarine Minibasins. Model Validation and Numerical Runs at Laboratory Scale. EP41D-07, Fall Meeting, American Geophysical Union.
- 61) Jafarinik, S., & Viparelli, E. (2015). Stable patterns of downstream fining and coarsening in mixed bedrock-alluvial rivers. EP51A-0893, Fall Meeting, American Geophysical Union.
- 62) Hernandez Moreira, R. R., Huffman, B., Vautin, D., & Viparelli, E. (2015). Changes in Bedform Shape at the Transition Between Upper Plane-Bed and Sheet-Flow Bedload Transport Regimes. EP21B-0892, Fall Meeting, American Geophysical Union.
- 63) Viparelli, E., Hernandez Moreira, R. R., & Blom, A. (2015). Modeling the transition between upper plane bed regime and sheet flow without an active layer formulation. Preliminary results. EP54A-05, Fall Meeting, American Geophysical Union. **Invited.**
- 64) Blom, A., Viparelli, E., Chavarrias, V. (2015). Gravel wedge progradation in sand-gravel laboratory experiments: New insights on the gravel-sand transition. EP13C-03, Fall Meeting, American Geophysical Union.
- 65) Viparelli, E., & Blum, M. (2015). Can we predict the response of large sand bed rivers to changes in flow and sediment supply? The case of the Missouri River. EP53D-02, Fall Meeting, American Geophysical.
- 66) Goodwin, K., Johnson, J., & Viparelli, E. (2015). A numerical model of armor development in flash flood-dominated channels: sensitivity to sediment supply, hydrograph shape and base flow. H51E-1412, Fall Meeting, American Geophysical Union.
- 67) Zhang, L., Parker, G., Stark, C., Inoue, T., Viparelli, E., Fu, X., & Izumi, N. (2015). The formation of incisional boundary layers in bedrock-alluvial rivers subjected to spatiotemporally varying alluvial transport. EP53B-1020, Fall Meeting, American Geophysical Union.
- 68) Blom, A., Viparelli, E., & Chavarrias, V. (2015). The role of size-selective transport and abrasion in river profile concavity and downstream fining under alluvial and equilibrium conditions. 8th International Gravel Bed River Workshop.
- 69) Borhani, S., Abdo, K., Kendall, C.G., Imran, J. and Viparelli, E. (2015). Modeling the equilibrium of a carbonate tidal channel. Preliminary results. Submitted to the Annual Convention of the American Association of Petroleum Geology, Control ID 2100158.
- 70) Jafarinik, S., & Viparelli, E. (2015). Stable patterns of downstream fining and downstream coarsening in mixed bedrock-alluvial rivers. *From abrading particles to river concavity*, workshop on modeling mixed-sediment river morphodynamics, 27-29 May, UT Delft, Netherlands.
- 71) Hernandez Moreira, R. R., Huffman, B. J., Vautin, D. & Viparelli, E. (2015). Unexpected “sorting” of uniform material under conditions of upper plane-bed bedload transport regime.

- From abrading particles to river concavity*, workshop on modeling mixed-sediment river morphodynamics, 27-29 May, TU Delft, Netherlands.
- 72) Viparelli, E., Hill, K. M., & Borhani, S. (2015). Numerical modeling of downstream lightening: preliminary comparison between numerical predictions and laboratory data. *From abrading particles to river concavity*, workshop on modeling mixed-sediment river morphodynamics, 27-29 May, UT Delft, Netherlands.
 - 73) Blom, A., Viparelli, E., & Chavarrias, V. (2015). The role of size-selective transport and abrasion in river profile concavity and downstream fining. *From abrading particles to river concavity*, workshop on modeling mixed-sediment river morphodynamics, 27-29 May, UT Delft, Netherlands.
 - 74) Chavarrias, V., Viparelli, E., & Blom, A. (2014). Size Stratification in a Laboratory Gilbert Delta Due to a Varying Base Level: Measurement, and Numerical Modelling. EP53C-3669, Fall Meeting, American Geophysical Union.
 - 75) Viparelli, E., Solari, L., & Hill, K. (2014). Downstream lightening and upward heavying, sorting of sediments of uniform grain size but differing in density. EP52A-01, Fall Meeting, American Geophysical Union. **Invited.**
 - 76) Viparelli, E., Lauer, J. W., & Belmont, P. (2014). MAST-1D, a Model to Route Sediment and Tracers in Channel-Floodplain Complexes. EP44A-01, Fall Meeting, American Geophysical Union. **Invited.**
 - 77) Hernandez Moreira, R. R., Vautin, D., Mathews, S.L., Kuprenas, R. & Viparelli, E. (2014). Preliminary results on sediment sorting under intense bedload transport. EP53C-3671, Fall Meeting, American Geophysical Union.
 - 78) Goodwin, K., Johnson, J., & Viparelli, E. (2014). Modeling the importance of base flow in an unarmored and ephemerally flowing river channel, Applied to the Negev Desert Channels. EP53C-3674, Fall Meeting, American Geophysical Union.
 - 79) Chavarrias, V., Stecca, G., Viparelli, E., & Blom, A. (2014). Ellipticity in modelling mixed sediment river morphodynamics. Netherlands Centre for River studies (NCR) Days 2014, Twente, Netherlands.
 - 80) Chavarrias, V., Blom, A., Orru', C., Viparelli, E., & Martin-Vide, J.P. (2014). *Streamwise variation in stratigraphy in a Gilbert Delta due to varying base level: flume experiments and modeling*. River Flow 2014, International Conference on Fluvial Hydraulics, September 3-5, Lousanne, Switzerland.
 - 81) Tabrizi, A., Viparelli, E., LaRocque, L.A., Chaudhry, M.H., & Imran, J., (2014). *Experimental Investigation on the Erodibility of Cohesive Levees*, Accepted, River Flow 2014, International Conference on Fluvial Hydraulics, September 3-5, Lousanne, Switzerland.
 - 82) Ezz, H., & Viparelli, E. (2014). *Modeling delta growth with plunging turbidity currents in Lake Nasser, Egypt and Sudan*, Accepted, River Flow 2014, International Conference on Fluvial Hydraulics, September 3-5, Lousanne, Switzerland.
 - 83) Lauer, J. W., Viparelli, E., & Piegay, H. (2014). A 1-D, Size Specific Numerical Model for Gravel Transport That Includes Sediment Exchange with a Floodplain. Control ID 10126 European Geosciences Union, General Assembly, Vienna, April 27 - May 2.
 - 84) Chavarrias, V., Orru', C., Viparelli, E., Martin-Vide, J.P., & Blom, A. (2014). Size stratification in a Gilbert delta due to a varying base level: flume experiments. Control ID 15595 European Geosciences Union, General Assembly, Vienna, April 27 - May 2.
 - 85) Parker, G., Zhang, L., Stark, C.P., Viparelli, E., & Fu, X. (2013) Modelling incision in mixed bedrock-alluvial rivers: the role of sediment waves. EP24B-08, Fall Meeting, American Geophysical Union. **Invited.**
 - 86) Ismail, H., Viparelli, E., Ezz, H. & Imran, J. (2013). Hydraulic and Morphodynamic Characteristics of Submarine Channel Confluences. OS53B-1695, Fall Meeting, American Geophysical Union.

- 87) Nittrouer, J. A., & Viparelli, E. (2013). Sand transport in the lower Mississippi River does not yield to dams: Applications for building deltaic land in Louisiana. EP33D-07, Fall Meeting, American Geophysical Union.
- 88) Czapiga, M., Li, C., Viparelli, E., Eke, E., & Parker, G. (2013). Modeling of 1-D Deltaic Progradation with a Self-Formed Channel and Floodplain: Implications of a New Slope-Dependent Formative Shields Number. EP31A-0828, Fall Meeting, American Geophysical Union.
- 89) Viparelli, E., Czapiga, M., Li, C., Shaw, J., & Parker, G. (2013). Modeling delta growth and channel geometry on Wax Lake Delta, Louisiana. Preliminary results. EP33D-03, Fall Meeting, American Geophysical Union.
- 90) Johnson, J.P.L., Aronovitz, A., Kim, W., Funderburg, J., & Viparelli E. (2013). Can short-term gravel augmentation lead to long-term bed coarsening? 10th international Conference on Fluvial Sedimentology, Leeds, UK, 14-19 July.
- 91) Viparelli, E., Blom, A., & Ferrer-Boix, C. (2013). Comparison between experimental and numerical stratigraphy emplaced by prograding bedforms with a downstream slip face. 8th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2013, Santander, Spain, June 9-13.
- 92) Nittrouer, J.A., Viparelli, E., Best, J.L., & Parker, G. (2013). Grain size variations and bed rock exposure in the lower Mississippi River. 8th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2013, Santander, Spain, June 9-13.
- 93) Eke, E., Parker, G., Viparelli, E., Czapiga, M., Asahi, K., & Shimizu, Y. (2013). Coevolution of width and sinuosity in migrating meandering rivers. 8th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2013, Santander, Spain, June 9-13.
- 94) Chavarrias, V., Blom, A., Orru', C., & Viparelli, E. (2013). Laboratory experiment of a mixed-sediment Gilbert delta under varying base level. 8th Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2013, Santander, Spain, June 9-13.
- 95) Ezz, H., & Viparelli, E. (2013). 1D Numerical modeling of sand-mud delta, application to Lake Nasser, Egypt and Sudan. SEDHYD 2014 Joint Conference, 10th Federal Interagency Sedimentation Conference, and 5th Federal Interagency Hydrologic Modeling Conference, Reno, Nevada, March 23-27.
- 96) Viparelli, E., Nittrouer, J.A., Mohrig, D.C., & Parker, G. (2012) Numerical model of the lowermost Mississippi River as an alluvial-bedrock reach: preliminary results. EP34A-07, Fall Meeting, American Geophysical Union.
- 97) Ezz, H., Viparelli, E., Moussa, A., & Parker, G. (2012). Modeling delta growth concurrently with self-formed channels. Preliminary results on Lake Nasser Delta, Sudan and Egypt. EP31A-0805, Fall Meeting, American Geophysical Union.
- 98) Hager, C., Viparelli, E., & Nittrouer, J.A. (2012). Preliminary characterization of the lowermost Mississippi River floodplain sediment and implications for the restoration of the Mississippi Delta. GSA Annual Meeting, Charlotte, North Carolina, 4-7 November.
- 99) Ezz, H., Cantelli, A., Viparelli, E., & Imran, J. (2012). The effect of flow stripping on submarine levee construction and stratigraphy. GSA Annual Meeting, Charlotte, North Carolina, 4-7 November.
- 100) Ismail H., Viparelli, E., & Imran, J. (2012). Hydraulic and morphodynamic behavior of turbidity current confluence. GSA Annual Meeting, Charlotte, North Carolina, 4-7 November.
- 101) Viparelli E., Yeh, T., Cantelli, A., Leslie, E., & Parker, G. (2011) Transport and deposition in linked submarine minibasins: preliminary experimental results. GSA Annual Meeting and Exposition, 9-12 October, Minneapolis, Minnesota.
- 102) Lauer J. W., Viparelli, E., Belmont, P., & Parker, G. (2011). A numerical model for sediment tracer movement through and actively evolving river-floodplain system. World Environmental & Water Resources Congress, May 22- 26 - Palm Springs, CA.

- 103) Belmont P., Viparelli, E., Lauer, W.J., & Parker, G. (2009). A Morphodynamic Routing Model of the Maple River, Minnesota. EP32A-02, Fall Meeting, American Geophysical Union. **Invited.**
- 104) Viparelli, E., Montero, J., Leman, A. & Parker, G. (2009). First experimental results on downstream “lightening”, the selective deposition of heavier particles in a sediment mixture of uniform size. EP33A-0602, Fall Meeting, American Geophysical Union.
- 105) Jennings, C. E., Belmont, P., Blumentritt, D., Day, S.S., Engstrom, D.R., Gran, K.B., Johnson, A.L., Lauer, W.J., Parker, G., Schottler, S., Viparelli, E., & Wilcock, P.R. (2009). Mapping to inform modeling of turbidity in agricultural watersheds of the Minnesota basin. Geological Society of America, Annual Meeting, Portland, October.
- 106) Belmont, P., Viparelli, E., Lauer, W.J., & Day, S.S. (2009). Channel-floodplain sediment exchange in a meandering and actively incising river. Geological Society of America, Annual Meeting, Portland, October.
- 107) Belmont, P., Wilcock, P.R., Parker, G., Gran, K., Jennings, C., Perg, L., Lauer, W.J., Viparelli, E., Day, S.S., and Johnson, A., 2008, *Watershed Context for a Sediment Routing Model in the Le Sueur River, Southern Minnesota*, paper 283-8, Geological Society of America, Annual Meeting, Houston, October.
- 108) Belmont, P., Viparelli, E., Parker, G., Lauer, W.J., Jennings, C., Gran, K., Wilcock, P.R., and Melesse, A., 2008, *Parameterization of a complex landscape for a sediment routing model of the Le Sueur River, southern Minnesota*, abstract H33K-02 American Geophysical Union, Fall Meeting.
- 109) Parker, G., Belmont, P., Gran, K., Jennings, C., Lauer, J.W., Perg, L., Viparelli, E., Wilcock, P.R., 2008, *Effect on rivers of massive changes in hydrologic regime due to human intervention*. European Geosciences Union General Assembly, Vienna, Austria.
- 110) Viparelli E., Sequeiros, O.E., Cantelli, A., and Parker, G., 2007, *A numerical model to store and access the stratigraphy of non-cohesive sediment as an alluvial bed aggrades and degrades in a flume*, Proceedings, 5th IAHR Symposium on River, Coastal and Estuarine Morphodynamics, 17 – 21 September.
- 111) Del Giudice G., Rasulo, G. & Viparelli, E. (2005). *Influenza dei bacini naturali sulle reti di drenaggio urbano: primi risultati sul sistema fognario della città di Napoli*, 1° Congresso di Idraulica Urbana, Acqua e città, Sorrento, Settembre.

TECHNICAL REPORT

Gran, K., Belmont, P., Day, S.S., Jennings, C., Lauer, J.W., Viparelli, E., Wilcock, P.R., Parker, G., *An Integrated Sediment Budget for the Le Sueur River Basin*, Final Report, June 2011, Minnesota Pollution Control Agency (MPCA).

Prof Richard Williams BA(Hons) MRes CSci CEnv C.WEM MCIWEM FHEA

1. Contact Details:

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2. Career History

Professor of River Science, University of Glasgow, 2022-
Director of Research, School of Geographical & Earth Sciences, University of Glasgow, 2022-
Senior Lecturer, School of Geographical & Earth Sciences, University of Glasgow, 2019-2022
Lecturer, School of Geographical & Earth Sciences, University of Glasgow, 2015-2019
Honorary Senior Associate, CBEC eco-engineering, 2017-present
Lecturer, Department of Geography & Earth Sciences, Aberystwyth University 2013-15
PhD Student, Department of Geography, Aberystwyth University, 2009-2014
Research Assistant, Department of Geography, Aberystwyth University, 2009-2011
Analyst, JBA Consulting, Skipton, North Yorkshire, 2005-2009

3. Educational Record and Awards

2014 PhD "Numerical modelling of braided river morphodynamics", Aberystwyth University
2005 MRes Science of the Environment, Lancaster University
2004 BA (Hons) Geography, University of Cambridge

4. Service

2021- Accreditation Board, Chartered Institute of Water and Environmental Management
2010-23 Secretary, British Society for Geomorphology
2020- Member, NERC Peer Review College

5. Research Interests

My research interests lie in the fields of fluvial geomorphology, remote sensing, river management, geospatial science and numerical modelling. My research focuses upon enhancing and applying novel geomatics and remote sensing methods to gain insight into river morphodynamics, including the dynamics of flooding and the impact of mining. Such data also provide innovative parameterisations for hydro- and morpho-dynamic numerical models, and spatially-temporally explicit metrics for model assessment. My research supports fundamental insights into river catchment dynamics and the controls on river planform, and provides evidence for scientifically informed management of flood conveyance, infrastructure, river restoration, contaminated sediments and habitat.

6. Research Supervision

2021- Dr Laura Quick, , Post-Doctoral Researcher, University of Glasgow (funded by NERC)
2019- Dr Rich Boothroyd, Post-Doctoral Researcher, University of Glasgow (funded by NERC)
2019-20 Dr Doug Mitchell, Post-Doctoral Researcher, University of Glasgow (funded by SFC)
2018 Dr Crystal Smiley, Post-Doctoral Researcher, University of Glasgow (funded by SFC)
2018 Dr Lizzie Dingle, Research Associate, University of Glasgow (funded by SFC)
2017-8 Dr George Maniatis, Post-Doctoral Researcher, University of Glasgow (funded by NERC)
Completed research students: 2x PhD (co-supervisor); 1x MPhil; 2x MSc(Res)
Current research students: 4x PhD (first supervisor); 6x PhD (second supervisor)

7. Selected Relevant Research Grants

NERC/PCIEERD. £1.55M. Philippine Mining at the National to Catchment Scale: from Legacy Impacts to Sustainable Futures: Project and Partnership Development. Co-PI with Eslava.
ESRC. £200k. Mainstreaming climate resilience in Philippine flood risk management. PI. (ODA cut)
NERC. £216k. Sounding out the river: a new system for monitoring bedload mobilisation and transport. Co-I with Naylor (Edinburgh).

NERC. £40k. Sediment cascades: integrating hazards & mitigation strategies. Philippines hydrometeorological hazards integration project. PI.

SFC GCRF. £57k. Training in nature based river management solutions: learning, practicing and evaluating. 2019-20. PI with Laurie.

NERC-PCIEERD. £639k. 2018-2021. Catchment susceptibility to hydrometeorological events: sediment flux & geomorphic change as drivers of flood risk in the Philippines. PI with Hoey.

NERC CASE Studentship. £94,292. Assessing the geomorphological effectiveness of river restoration using multi-stage channels (with partner SEPA). 2018-2022. PI with Hoey.

SFC GCRF. £32,830. River channel change in the Philippines. 2017-8. PI with Hoey and Barrett.

SFC GCRF. £46,776. Visualising Violence in Malawi. 2017-8. Co-I with Dixon.

NERC Environmental Risks to Infrastructure Innovation Programme (ERIIP), ODA Fund £28,291. River instability and infrastructure in Indonesia and the Philippines. 2017. PI with Hoey.

CREW. £214k. National Coastal Change Assessment 2: Enhancing the evidence base and our ability to adapt. 2017-2019. Co-I with Hansom.

NERC ERIIP: £89,707. Decision support framework to incorporate river bank stability in pipeline crossing risk assessment (with Scottish Water). 2017. PI with Hoey.

Royal Academy of Engineering Industrial Secondment to CBEC Engineering: £27,084. *Engineering river freedom for resilience*. September 2016-August 2017. PI.

NERC Urgency Grant: £64,597. *Quantifying the Delivery & Dispersal of Landslide-Derived Sediment to the Dart River, New Zealand*. March 2014 – May 2015. Co-I with Brasington.

8. Selected Publications

- Boothroyd, R. J. et al. (2023) National-scale geodatabase of catchment characteristics in the Philippines for river management applications. **PLoS ONE**. doi:10.1371/journal.pone.0281933
- Tolentino, P. et al. (2022) River Styles & stream power analysis reveal diversity of fluvial morphology in a Philippine catchment. **Geoscience Letters**, doi:10.1186/s40562-022-00211-4)
- Boothroyd R, et al. National-scale assessment of decadal river migration at bridge infrastructure in the Philippines. **Science of The Total Environment**, doi:/10.1016/j.scitotenv.2020.144460.
- Prasojo, O. et al. (2022) Slope break and avulsion locations scale consistently in global deltas. **Geophysical Research Letters**, doi: 10.1029/2021GL093656.
- Boothroyd R, R Williams, T Hoey, B Barrett, O Prasojo. 2021. Applications of Google Earth Engine in fluvial geomorphology for detecting river change. **WIRES Water**. doi:10.1002/wat2.1496
- Williams R et al. 2020. Let the river erode! Enabling lateral migration increases geomorphic unit diversity. **Science of Total Environment**. doi:10.1016/j.scitotenv.2020.136817
- Williams RD, Reid H and Brierley G. 2019. Stuck at the bar: larger-than-average grain lag deposits & the spectrum of particle mobility. **JGR: Earth Surface**. doi: 10.1029/2019JF005137
- Byrne, P. et al. 2018. Water quality impacts and river system recovery following the 2014 Mount Polley mine tailings dam spill, British Columbia, Canada, **Applied Geochemistry**. doi: 10.1016/j.apgeochem.2018.01.012.
- Hudson-Edwards, K et al. 2019. Origin and fate of vanadium in the Hazeltine Creek catchment following the 2014 Mount Polley mine tailings spill. **Environmental Science & Technology**, doi:10.1021/acs.est.8b06391
- Fryirs K, J Wheaton, S Bizzi, R Williams and G Brierley. 2019. To plug-in or not to plug-in? Geomorphic analysis of rivers using the River Styles Framework in an era of big data acquisition and automation. **Wiley Interdisciplinary Reviews: Water**. doi:10.1002/wat2.1372
- Maniatis G, R Williams, T Hoey, J Hicks and W Carroll. 2019. A decision support tool for assessing risks to above-ground river pipeline crossings. **Proceedings of the ICE: Water Management**. doi: 10.1680/jwama.18.00054
- Dingle, E.H., Paringit, E.C., Tolentino, P.L.M., Williams, R.D. , Hoey, T.B. , Barrett, B. , Long, H., Smiley, C. and Stott, E. 2019. Decadal-scale morphological adjustment of a lowland tropical river. **Geomorphology**. doi:10.1016/j.geomorph.2019.01.022.
- Williams, R.D., Rennie, C.D., Brasington, J., Hicks, D.M., and Vericat, D. 2015. Linking the spatial distribution of bed load transport to morphological change during high-flow events in a shallow braided river. **JGR: Earth Surface**. doi:10.1002/2014JF003346.
- Williams, R.D., Brasington, J., Vericat, D., and Hicks, M. 2014. Hyperscale terrain modelling of braided rivers: fusing mobile terrestrial laser scanning and optical bathymetric mapping. **Earth Surface Processes and Landforms**. doi:10.1002/esp.3437.