

**DR. KIERAN B.J. DUNNE | CURRICULUM VITAE | October 20, 2021**

**RESEARCH:** geomorphology, hydrology, sediment transport, morphodynamics.

**PROFESSIONAL APPOINTMENTS:**

- 09/2021-present *National Science Foundation Earth Sciences Postdoctoral Fellow*, California Institute of Technology  
Division of Geological and Planetary Sciences. Pasadena, CA.
- 08/2019-08/2021: *Postdoctoral Fellow*, Rice University  
Department of Earth, Environmental, and Planetary Sciences. Houston, TX.
- 06/2013-06/2015: *Geophysical Risk Analyst*, Aon  
Aon Analytics: Research & Innovation. Singapore.

**EDUCATION:**

- 2015-2019: University of Pennsylvania, Doctor of Philosophy in Earth and Environmental Science (Philadelphia, PA).
  - Dissertation: *A Sticky Pursuit of the Threshold Channel: The effect of cohesion on alluvial river channel geometry*
- 2012-2013: Cornell University, Master of Engineering in Civil and Environmental Engineering. (Ithaca, NY)
- 2008-2012: Cornell University, Bachelor of Arts in Geophysics. (Ithaca, NY)

**PUBLICATIONS:**

- in review **Dunne, K.B.J.**, Dee, S.G, Reinders, J., Muñoz, S.E., and Nittrouer, J.A. "Enhanced probability of catastrophic Mississippi River floods under high emissions scenarios." *Geophysical Research Letters*.  
Preprint available upon request
- in review **Dunne, K.B.J.**, Arratia, P.E., Jerolmack, D.J. "A new method for in-situ measurement of the erosion threshold of river channels." *Earth Surface Processes and Landforms*.  
Preprint available: <https://doi.org/10.31223/osf.io/rqcep>
- in review Phillips, C.B., Masteller, C.C., Slater, L.J., **Dunne, K.B.J.**, Francalanci, S., Lanzoni, S., Merritts, D.J., Lajeunesse, E., Jerolmack, D.J. "The importance of threshold in alluvial river channel geometry and dynamics." *Nature Reviews Earth and Environment*.  
Preprint available: <https://eartharxiv.org/repository/view/2400/>
- accepted Osborn, R., Dillon, B., Tran, D., Abolfazli, E., **Dunne, K.B.J.**, Nittrouer, J.A., Strom, K.B. "FlocARAZI: An in-situ image-based particle sizing instrument capable of estimating SSC and distinguishing sand from flocs." *Journal of Geophysical Research - Earth Surface*.
- in prep **Dunne, K.B.J.**, Abolfazli, E., Osborn, R., Strom, K.B., Nittrouer, J.A. "On the Hydrodynamically-Driven Deposition of Mud in River Systems"
- 2020 **Dunne, K.B.J.** and Jerolmack, D.J. "What sets river width?" *Science Advances*.  
<https://doi.org/10.1126/sciadv.abc1505>
- 2018 **Dunne, K.B.J.** and Jerolmack, D.J. "Evidence of, and a proposed explanation for, bimodal transport states in alluvial rivers." *Earth Surface Dynamics*.  
<https://doi.org/10.5194/esurf-6-583-2018>
- 2016 Dunne, T., Malmon, D.V., **Dunne, K.B.J.** "Limits on the morphogenetic role of rain splash transport in hillslope evolution." *Journal of Geophysical Research: Earth Surface*.  
<https://doi.org/10.1002/2015JF003737>
- 2016 Terry, T.P., **Dunne, K.B.J.**, Jankaew, K. "Prehistorical frequency of highenergy marine inundation events driven by typhoons in the Bay of Bangkok (Thailand), interpreted from coastal carbonate boulders." *Earth Surface Processes and Landforms*.  
<https://doi.org/10.1002/esp.3873>
- 2015 Terry, T.P., Jankaew, K., **Dunne, K.B.J.** "Coastal vulnerability to typhoon inundation in the Bay of Bangkok, Thailand? Evidence from carbonate boulder deposits on Ko Larn island." *Estuarine, Coastal and Shelf Science*.  
<https://doi.org/10.1016/j.ecss.2015.05.028>

## **GRANTS AND FELLOWSHIPS**

- National Science Foundation, Division of Earth Sciences Postdoctoral Fellowship, \$174,000, 2021-2023
- GAPS Research Student Travel Grant Recipient, University of Pennsylvania, 2017
- Benjamin Franklin Fellowship, University of Pennsylvania, 2015-2017

## **AWARDS & HONORS**

- Binghamton Geomorphology Symposium Travel Grant Awardee, 2018
- Summer Institute of Earth Surface Dynamics Attendee, University of Minnesota, 2018
- Grad Ben Talks Winner: Natural Sciences Division, University of Pennsylvania, 2018

## **SERVICE:**

### *Leadership (Service to Scientific Community)*

- Social Media Committee Member. AGU Earth and Planetary Surface Processes Executive Committee. 2018-Present.
- Session Chair/Convener. Flow, Transport, and Morphology: Linkages Between Erosion, Transport, Deposition, and Morphology Across Scales, AGU 2020.
- Student Committee President. AGU Earth and Planetary Surface Processes Executive Committee. 2017-2018.
- Student Committee Member. AGU Earth and Planetary Surface Processes Executive Committee. 2016-2017.

### *STEM Outreach*

- Speaker, Open Labs Science Café 2018, University of Pennsylvania, Philadelphia, PA.
- Speaker, FIRST LEGO League 2018 Kickoff Event, University of Pennsylvania, Philadelphia, PA.
- Science Volunteer, Philadelphia Science Festival 2018, Pennovation Center, Philadelphia, PA.
- Speaker, Nerd Nite Philly Pub Talk Series 2017 "The Physical Mechanisms behind the Most Romantic Riverwalk", Philadelphia, PA.
- Science Volunteer, Philadelphia Science Festival 2017, Franklin Institute, Philadelphia, PA.
- Skype-a-Scientist (K-12, multiple time participant), 2017-Present.

### *Media*

- Grad BEN Talks 2018: "Mud and the Shape of Rivers." <https://vimeo.com/258174497>

## **TEACHING & MENTORING:**

### *Teaching:*

- Graduate Teaching Assistant – Introduction to Geology (GEOL 100), Fall 2016, University of Pennsylvania
- Graduate Teaching Assistant – Earth and Life Through Time (GEOL 125), Spring 2016, University of Pennsylvania
- Graduate Field Teaching Assistant – Earth Surface Processes (GEOL 305) class trip to White Sands, NM, Spring 2017 (1 week), University of Pennsylvania

*Mentoring:*

- Sarah Haber (University of Pennsylvania, Earth and Environmental Science), Masters Student Researcher, 2018-2019.
- Phillip Choi (University of Pennsylvania, Earth and Environmental Science), Undergraduate Research Assistant, 2019.
- Nina McKay (Bowdoin College, Earth Science), Undergraduate Research Assistant, 2018.
- Kristen Tilley (University of Pennsylvania, Systems Engineering), Undergraduate Research Assistant, 2018.
- Jiyeux Seok (University of Pennsylvania, Chemical Engineering), Undergraduate Research Assistant, 2017.
- Lisa Heintzelman (Aon, Singapore), Analytics Intern, 2014.
- Guna Sekharan (Aon, Singapore), Analytics Intern, 2014.
- Eubin Hahn (Aon, Singapore), Analytics Intern, 2013.

**INVITED TALKS & SEMINARS:**

- Caltech Division of Geological and Planetary Sciences Geoclub Seminar Series, October 21<sup>st</sup>, 2021. "Geological and Hydroclimatic Controls on Fluvial Morphology and Alluvial Environments."
- Penn State Geosciences Colloquium, April 1<sup>st</sup>, 2021. "Geological and Hydroclimatic Controls on Alluvial Morphology and Sedimentary Environments."
- Rice University Department of Earth, Environmental, and Planetary Sciences Graduate Interdisciplinary Earth Science Symposia, April 4<sup>th</sup>, 2020. "What Sets River Width?"
- UC Santa Barbara Earth Science Department Colloquium, February 4<sup>th</sup>, 2020. "What sets the Width of a River Channel?"
- UT Austin Jackson School of Geosciences Soft Rock Seminar, September 30<sup>th</sup>, 2019. "What Sets the Width of a River Channel?"
- Philadelphia Geological Society, March 21<sup>st</sup>, 2019. "Mud and the Shape of Rivers."

**CONFERENCE PRESENTATIONS:**

- American Geophysical Union (AGU) Fall Meeting, Dec. 2020. Poster: Field Investigation of Cohesive Sediment Flocculation and Sedimentation Across the Fluvial to Marine Transition.
- American Geophysical Union (AGU) Fall Meeting, Dec. 2019, San Francisco, CA. Poster: Predicting Alluvial River Planform Morphology from Threshold Channel Theory.
- Wolman Club Meeting, May 2019, Lancaster, PA. Poster: Modelling Alluvial River Channel Morphology from Threshold Channel Theory.
- American Geophysical Union (AGU) Fall Meeting, Dec. 2018, Washington, D.C. Talk: Field Investigation of the Influence of Bank-Toe Critical Shear Stress on Suspension River Hydraulic Geometry.
- Binghamton Geomorphology Symposium, Oct. 2018, Syracuse, NY. Poster: Field Investigation of the Influence of Bank-Toe Critical Shear Stress on Suspension River Hydraulic Geometry.
- Wolman Club Meeting, May 2018, Baltimore, MD. Poster: A New Method for In-Situ Measurement of Cohesive Sediment Erodibility.
- American Geophysical Union (AGU) Fall Meeting, Dec. 2017, New Orleans, LA. Poster: Channel Bank Cohesion and the Maintenance of Suspension Rivers.
- Geological Society of America (GSA) Annual Meeting, Oct. 2017, Seattle, WA. Poster: Field Investigation of the Influence of Bank Toe Cohesion on Suspension River.
- Amtrak Club Meeting, May 2017, State College, PA. Poster: Evidence of, and a Proposed Explanation for, Observed Bi-stability in Alluvial Rivers.
- American Geophysical Union (AGU) Fall Meeting, Dec. 2016, San Francisco, CA. Poster: Evidence of, and a Proposed Explanation for, Observed Bi-stability in Alluvial Rivers.
- R<sup>2</sup>E<sup>2</sup>DS Meeting, May 2016, Reston, VA. Poster: Connecting Meteorology and Atmospheric Stability to Sand-Transporting Winds in a Dune Field.
- American Geophysical Union (AGU) Fall Meeting, Dec. 2015, San Francisco, CA. Poster: Limits on the morphological role of rainsplash transport in hillslope evolution.

#### **ADDITIONAL WORK EXPERIENCE:**

- Catastrophe Management Intern: Aon (Singapore) June 2012 - August 2012
- Undergraduate Research Assistant: to Rowena Lohman (Department of Earth and Atmospheric Sciences, Cornell University), 2011-2012.
- Undergraduate Research Assistant: to Charles Nittrouer (School of Oceanography, University of Washington), June 2011 - August 2011.
- Undergraduate Research Assistant: to Charles Nittrouer (School of Oceanography, University of Washington), June 2010 - August 2010.
- Undergraduate Research Assistant: to Hunter Lenihan (Bren School of Environmental Science and Management, University of California, Santa Barbara), June 2009 - August 2009.

**COMPUTATIONAL PROFICIENCY:** Python, Matlab, Arduino, ArcGIS, LaTeX

**AFFILIATIONS:** American Geophysical Union, Geological Society of America

#### **MISCELLANEOUS:**

- Certifications: PADI Open Water Scuba
- Languages: English (native), Mandarin Chinese (elementary)
- Citizenships: USA, UK

#### **REFERENCES**

- **Dr. Douglas Jerolmack** (Ph.D. Advisor)  
Professor, University of Pennsylvania  
Department of Earth and Environmental Science  
Department of Mechanical Engineering and Applied Mechanics  
Email: sediment@sas.upenn.edu  
Phone: (215) 746-2823  
Address: 251 Hayden Hall, 240 South 33rd Street, Philadelphia, PA 19104
- **Dr. Sylvia Dee** (Collaborator)  
Assistant Professor, Rice University  
Department of Earth, Environmental, and Planetary Sciences  
Email: sylvia.dee@rice.edu  
Phone: (713) 348-4889  
Address: MS-126, 6100 Main Street, Houston, TX 77005
- **Dr. Jeffrey Nittrouer** (Former Postdoc Advisor)  
Associate Professor, Texas Tech University  
Department of Geosciences  
Email: jeffrey.nittrouer@ttu.edu  
Phone: (713) 348-4886  
Address: Department of Geosciences, Mail Stop 1053, Texas Tech University, Lubbock, TX 79409
- **Dr. Michael Lamb** (Postdoc Advisor)  
Professor, California Institute of Technology  
Division of Geological and Planetary Sciences  
Email: mpl@caltech.edu  
Phone: (626) 395-6387  
Address: 272 Arms Laboratory, Pasadena, CA, 91106
- **Dr. Kyle Strom** (Collaborator)  
Associate Professor, Virginia Polytechnic Institute and State University  
Department of Civil and Environmental Engineering  
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Address: 750 Drillfield Drive, 200 Patton Hall, Blacksburg, VA 24061