Sophie Bodek

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Education

Stanford University — Stanford, CA
Ph.D. Student in Civil & Environmental Engineering — *admitted* September 2022

- **Advisor:** Dr. Nicholas T. Ouellette

University of Delaware — Newark, DE
M.S., Geology — August 2020

- **Thesis:** *Is the White Clay Creek a Threshold Channel? Evaluating Bed Mobility of a Gravel-Bed River in Pennsylvania, U.S.A.*
- **Advisor:** Dr. James E. Pizzuto

University of Pennsylvania — Philadelphia, PA
B.A., Earth Sciences, Summa Cum Laude — May 2018
Concentration: Geology; Minor: Mathematics

- **Thesis:** *How Pebbles Round and Rocks Fragment: On Particle Shape Evolution According to Transport Mechanism*
- **Thesis Advisor:** Dr. Douglas J. Jerolmack

Professional Appointments

Ramboll U.S. Consulting, Inc. — Princeton, NJ
Consultant, Environment & Health Group — January 2021 - May 2022

Penn State Brandywine — Media, PA
Adjunct Instructor, Earth Sciences — August 2020 - May 2022

Publications

2021 **Bodek, S.** and Jerolmack, D.J. "Breaking down chipping and fragmentation in sediment transport: the control of material strength." *Earth Surface Dynamics, 9*, 1531–1543. doi.org/10.5194/esurf-9-1531-2021

2021 **Bodek, S.**, Pizzuto, J.E., McCarthy, K.E., Affinito, R.A. "Achieving Equilibrium as a Semi-Alluvial Channel: Anthropogenic, Bedrock, and Colluvial Controls on the White Clay Creek, PA, USA." *Journal of Geophysical Research: Earth Surface, 126*, e2020JF005920. doi.org/10.1029/2020JF005920

Honors, Awards, & Fellowships

2022 **Stanford Graduate Fellowship:** Named the Gabilan Fellow and awarded three years of funding for graduate study at Stanford University

2018 **Henry Darwin Rogers Award:** Awarded by the University of Pennsylvania Department of Earth and Environmental Science to a graduating senior for excellence in the study of Earth Science

2018 **DCHWS Scholarship:** Awarded by the Society of American Military Engineers (SAME) Philadelphia Post

2017 **Hayden Scholars Fellowship:** Summer funding for undergraduates at the University of Pennsylvania to pursue research projects in the Earth Sciences

2014-18 **Dean's List:** Designation for students at the University of Pennsylvania with a 3.7 or higher GPA

Research Experience

Graduate Researcher — September 2022 - *present*
Bob & Norma Street Environmental Fluid Mechanics Lab at Stanford University

- Developing flume experiments to investigate the effect of stress history on erodible beds.

Graduate Research Assistant — August 2018 - August 2020
University of Delaware Department of Earth Sciences, Pizzuto Lab

- Monitored fluvial environments in Pennsylvania and Delaware by deploying and surveying Radio Frequency Identification (RFID) tags, geomorphic mapping, and channel surveys.
- Developed a numerical model to predict changes in bed elevation and grain size distribution due to variations in sediment input.
- Studied floodplain and wetland stratigraphy at exposed banks and through soil samples. Characterized floodplain deposits at the Powder River, MT; and described legacy sediment deposits at the White Clay Creek, PA.

Undergraduate Researcher — February 2016 - May 2018
University of Pennsylvania Sediment Dynamics Laboratory

- Conducted experiments on attrition mechanisms in materials of differing strength by simulating transport using a rotating drum rock tumbler.
- Investigated the effect of moisture on threshold wind speeds and mechanical shear rates of sand through laboratory experiments and field work in the White Sands National Park, NM.

Teaching & Mentoring

Penn State Brandywine, *Adjunct Instructor*

- EARTH 111: *Water: Science and Society* – Spring 2022
- GEOG 3N: *Future of Food* – Fall 2021
- EARTH 100: *Environment Earth* – Fall 2020, Spring 2021

University of Delaware, *Teaching Assistant*

- GEOL 203: *Surficial Processes* – Spring 2020
- GEOL 467: *Geology of the Southwest* – Spring Break 2019 (Field Teaching Assistant)
- GEOL 107: *Geology of Dynamic Earth* – Fall 2018, Spring 2019

University of Pennsylvania, *Teaching Assistant*

- GEOL 130: *Oceanography* – Spring 2018
- GEOL 100: *Introduction to Geology* – Fall 2017

Mentoring

- Leanna Stackhouse, *University of Delaware Geology Major*: Undergraduate Research Assistant, Summer 2019

Invited Talks

Franklin & Marshall Department of Earth and Environment Lite Lunch, 2 April 2022: *Lessons from the White Clay Creek: Anthropogenic, Bedrock, and Colluvial Controls on Mid-Atlantic River Systems.*

Conference Abstracts

Bodek, S., Pizzuto, J.E., McCarthy, K.M., Affinito, R. "Getting Beyond the Bankfull Shield's Parameter: A Continuum of Threshold Channel Types Illustrated by the White Clay Creek, PA, a Bedrock-Alluvial River with Cohesive Banks." *American Geophysical Union (AGU) Fall Meeting*, Online, 1-17 December 2020, Talk.

Pizzuto, J.E., Aalto, R., **Bodek, S.**, Karwan, D.L., Marquard, J., O'Neal, M., Sturchio, N.C. "Quaternary–Present Sediment Transport and Geomorphology of the White Clay Creek: Insights from Geomorphic Mapping and Radionuclides." *Geological Society of American (GSA) Northeastern Section Meeting*, Cancelled due to Covid-19. doi.org/10.1130/abs/2020SE-345266

Bodek, S. and Pizzuto, J.E. "Is the White Clay Creek a Threshold Channel? Evaluating Bed Mobility at a Gravel-Bed River in Pennsylvania, U.S.A." *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, 9-13 December 2019, Poster. doi.org/10.1002/essoar.10502277.1

Pizzuto, J.E. and **Bodek, S.** "The Hydraulic Geometry of the Christina River Basin – Revisiting Classic Contributions By Leopold and Wolman." *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, 9-13 December 2019, Talk.

Bodek, S. and Jerolmack, D.J. "How pebbles round and rocks fragment: particle shape evolution according to transport mechanism." *American Geophysical Union (AGU) Fall Meeting*, Washington, D.C., 10-14 December 2018, Poster.

Qian, F., Lee, D.B., **Bodek, S.**, Roberts, S., Topping, T.T., Robele, Y., Koditschek, D.E., Jerolmack, D.J. "Determination of erosion thresholds and aeolian dune stabilization mechanisms via robotic shear strength measurements." *American Geophysical Union (AGU) Fall Meeting*, New Orleans, LA, 11-15 December 2017, Poster.

Departmental Service

Student-Faculty Liaison, *University of Delaware Department of Earth Sciences* 2018 - 2020

- Attended faculty meetings and facilitated communication between faculty members and graduate students.

Undergraduate Advisory Board, *Penn Department of Earth and Environmental Science (EES)* 2017 - 2018

- Encouraged undergraduate involvement in the EES Department by planning and promoting educational, social, and career-related events.

Vice President & Co-Founder, *University of Pennsylvania Geology Society* 2016 - 2018

- Promoted the geosciences at the University of Pennsylvania by planning field trips and participating in university-wide sustainability initiatives.

Outreach & Events

2021 **Panelist** – Penn EES Department Undergraduate Advisory Board Alumni Career Panel
2017 **Organizer** – *Chalk the Walk!* Penn Geology Society public art and education exhibit
2017 **Organizer** – Penn Geology Society coastal geomorphology field trip to New Jersey beaches
2017 **Organizer** – Penn Geology Society field trip to Wissahickon Park, Pennsylvania
2016-18 **Presenter** – Student Sustainability Association at Penn GreenFest
2016 **Organizer** – Penn Geology Society field trip to Palisades Park, New Jersey

Memberships & Affiliations

American Geophysical Union (AGU)

Phi Beta Kappa

Skills & Trainings

Programming • Proficient in Python; familiar with MATLAB, R, Java, and Fortran; LaTeX

Software • Adobe Creative Suite (Photoshop, Illustrator, InDesign), ImageJ/Fiji

Field Work • Surveying stream cross-sections and profiles (total station, automatic level, RTK GPS), soil coring and characterization, conducting pebble counts

Laboratory • Sediment transport flume experiments, sediment grain size analysis

Teaching Assistant Workshops • Held by University of Pennsylvania Center for Teaching and Learning (CTL) and University of Delaware Center for Teaching and Assessment of Learning (CTAL)

Bystander Intervention Training • Workshop organized by ADVANCEGeo Partnership at the University of Delaware