#### atio Edu

Education:	
Ph.D. Environmental Engineering and Science, with Minor in Geology California Institute of Technology, Pasadena, California	1997
M.S. Environmental Engineering and Science California Institute of Technology, Pasadena, California	1992
B.S. Mechanical Engineering, with Minor in History, <i>cum laude</i> Washington University, St. Louis, Missouri	1991
Experience:	
<ul> <li>Northwestern University</li> <li>Director, Northwestern Center for Water Research</li> <li>Professor, Dept. of Civil and Environmental Engineering</li> <li>Associate Professor, Dept. of Civil and Environmental Engineering</li> <li>Assistant Professor, Dept. of Civil and Environmental Engineering</li> <li>Argonne National Laboratory</li> <li>Senior Fellow, Northwestern-Argonne Institute</li> <li>Water Lead, Manufacturing Science and Engineering Initiative</li> <li>Drexel University</li> <li>Assistant Professor, Dept. of Civil and Architectural Engineering</li> <li>California Institute of Technology</li> <li>Graduate Research Asst., Dept. of Environmental Engineering and Science</li> <li>Office of Naval Research Fellow</li> <li>McDonnell Douglas Corporation</li> <li>Engineering Co-op</li> </ul>	2015 – present 2010 – present 2004 – 2010 2000 – 2004 2015 – present 2018 – 2023 1997 – 2000 1994 – 1997 1991 – 1994
Visiting and Affiliate Appointments:	1907 1991
Fulbright Distinguished Chair, Politecnico di Torino, Italy Visiting Professor, Pontificia Universidad Católica de Chile Visiting Scientist, NIWA Christchurch, New Zealand Visiting Professor, Swedish University for Agricultural Sciences (SLU) Visiting Professor, Uppsala University, Sweden Research Associate, Philadelphia Academy of Natural Sciences	2013 2008 2007 2002 - 2003 2001 1999 - 2000
Honors and Awards:	
Chicago Council on Science and Technology Societal Impact Award (for DOE Community Research on Climate and Urban Science Urban Field Lab) Chicago Innovation Award (for Illinois Wastewater Surveillance System) AGU Fellow	2023 2022 2020
Fulbright Distinguished Chair Award	2013
Cole-Higgins Award for Excellence in Advising, Northwestern University Huber Research Prize, American Society of Civil Engineers	2012 2008

Chicago Council on Science and Technology Societal Impact Award	2023
(for DOE Community Research on Climate and Urban Science Urban Field Lab)	
Chicago Innovation Award (for Illinois Wastewater Surveillance System)	2022
AGU Fellow	2020
Fulbright Distinguished Chair Award	2013
Cole-Higgins Award for Excellence in Advising, Northwestern University	2012
Huber Research Prize, American Society of Civil Engineers	2008
Career Award, National Institutes of Health (NIAID K25)	2006
McCormick Faculty Excellence Award, Northwestern University	2006
Searle Junior Teaching Fellow, Northwestern University	2001-2002
Career Award, National Science Foundation	1999
Department of Defense Graduate Fellowship	1991-1994
Myers Fellowship (full scholarship), Washington University	1987-1991
Sigma Xi and Tau Beta Pi honor societies	

## **Professional Activity and Service**

### **Professional Affiliations:**

American Geophysical Union American Society of Civil Engineers International Association for Sediment Water Science

### **Professional Service:**

**Editorships** 

Water-Energy Nexus, Editorial Board (2017 – present) Limnology and Oceanography – Fluids and Environments, Associate Editor (2010 – 2014) Water Resources Research, Associate Editor (1999 – 2009) International Journal of Sediment Research, Editorial Board (2003 – 2020

### Society Leadership:

Smart Great Lakes Initiative, Leadership Team (2020 – present) Consortium of Universities for the Advancement of Hydrologic Science, Board of Directors (2009–2012) International Assoc. for Sediment Water Science, Board of Directors (2005–2014), Vice President (2011–2014)

Organization of Technical Conferences and Workshops (last two years)

Summit on Built Environment Surveillance Tested for Biological Hazards, June 2023
Seventh Annual Northwestern Symposium on Water in Israel and the Middle East, May 2023
Sixth Annual Northwestern Symposium on Water in Israel and the Middle East, May 2022
CLEAN 2022 Summit: Biological surveillance in the built environment, January 2022
Joint CoWERC Water-Energy Symposium and Fifth Annual Northwestern Symposium on Water in Israel and the Middle East, May 2021
Workshop on Transforming the Water and Wastewater Industry Through Artificial Intelligence, February 2021
Participation in Scientific Advisory Boards, Technical Committees, and Invited Workshops (last two years)
Chicago Climate Action Plan for People and Nature, Science Team (2023 – present)
Integrated Bioscience and Built Environment Consortium, Science Advisory Board (2021 – present)
Zuckerberg Institute for Water Research, Ben-Gurion University, Science Advisory Board (2019 – present)
Current Water Innovation, Science Advisory Board (2017 – present)

CUAHSI, Northwestern Representative (2002 – present)

NSF ERVA Visioning Workshop on Engineering Solutions for Water Security (2023)

UNESCO Megacities Alliance for Water and Climate Workshop, UN World Water Conference (2023)

State of Illinois, Illinois Coastal Water Quality Trends Analysis, Science Advisory Board (2020 - 2023)

Scientific Advisor, Illinois Wastewater Surveillance System, Illinois Dept. of Public Health (2021 – 2022)

### **Research**

### **Research Interests:**

My research focuses on water, sediments, and microorganisms, particularly the intersection of physical transport processes with biological and biogeochemical processes. I seek to understand the role of environmental interfaces in water system dynamics, including the surface-groundwater interface, fluid-particle interactions, and surface-attached microbial communities (biofilms). My work is highly collaborative and encompasses fluid mechanics, particle transport and morphodynamics, aquatic chemistry, microbiology, and public health. Important applications include water resources sustainability, nutrient and carbon cycling, contaminant transport, ecosystem degradation and restoration, waterborne disease transmission, and wastewater-based epidemiology.

### **Research Funding:**

### **Current Research Projects:**

BIRD/DOE US-Israel Energy Centers Program:

*Israel-U.S. Collaborative Water-Energy Research Center (CoWERC),* A.I. Packman and M. Herzberg, U.S.-Israel Energy Center EC-15, \$18,400,000, 2020-2025.

NSF:

NERC-NSFGEO SMARTWATER: Diagnosing controls of pollution hot spots and hot moments and their impact on catchment water quality, NSF award to A. Packman, NSF EAR- 2331932, \$499,997, 2023-2028

SCC-IRG Track 1: Strengthening Resilience of Ojibwe Nations Across Generations (STRONG), K. Marion Suiseeya, J. Hester, A. Packman, J. Gilbert, NSF CMMI 2233912, \$2,000,000, 2023-2026

*CPS: Medium: Batteryless Sensors Enabling Smart Green Infrastructure*, J. Hester, W. Miller, G. Wells, A. Packman, Q. Zhu, NSF CNS-2038853, \$1,200,000, 2021-2023.

*Structural Health Monitoring of Biofilms for Sustainable Reactive Nitrogen Management*, G. Wells, O. Balogun, A. Packman, NSF CBET-1937290, \$329,135, 2020-2023

#### DOE:

*Community Research on Climate and Urban Systems (CROCUS)*, M.C. Negri, D. Block, M. Potter, Y.L. Lin, G. Anderson, A. Packman, J. Wang, M. Berkelhammer, H.J. Fernando, \$25,000,000 (Independent award of \$1,192,600 to NU, PI/PD: A. Packman), 2022-2027

### Walder Foundation:

Catalyst Southwest: Integrating Nature-based Strategies into Net-Positive Water Solutions for Chicago, A. Packman, W. Miller, S. Young, C. O'Brien, J. Jenkins, J. Legge, F. Cortes, \$399.984 (\$145,000 to NU), 2022-2024.

Centers for Disease Control / Illinois and Chicago Departments of Public Health:

Illinois Wastewater Surveillance System, Illinois Department of Public Health, R. Poretsky, S. Gesing, S. Owens, A. Packman, \$16,600,000 (\$725,000 to NU), 2022-2024

Wastewater Sampling and Analysis System Services Agreement for Chicago Department of Public Health, R. Poretsky, S. Gesing, S. Owens, A. Packman \$4,500,958 (\$280,000 to NU), 2021-2024

European Commission (as program partner for advising, training courses, and research exchanges)

Plastic Underground - Integrated Cross-Sectoral Solutions to Micro- and Nanoplastic Pollution in Soil and Groundwater Ecosystems. HORIZON-MSCA-2021-DN-01-01, PI S. Krause / Univ. Birmingham, 2022-2027, €2.7M

#### Completed research projects (last two years)

#### NSF:

NSF/EAR-BSF: Coupled Sand and Clay Motion, Bed Morphodynamics, and Porewater Exchange, A.I. Packman, R. Schumer, S. Arnon, NSF EAR-1734300, \$701,572 total project budget. \$349,666 at NU. 2017-2022.

Convergence: RAISE: Systems Approaches for Vulnerability Evaluation and Urban Resilience (SAVEUR), A.I. Packman, S. Young, D. Horton, M.H. Garcia, S. Collis, NSF CBET-1848683, \$1,063,000, 2018 – 2022.

*Wastewater and stormwater modeling capability for SARS-CoV-2 wastewater surveillance, A.I. Packman, M.H. Garcia, NSF 1848683 (supplement), \$97,315, 2020 – 2022.* 

SCC-CIVIC-PG Track B: Strengthening Resilience of Ojibwe Nations across Generations (STRONG): Sovereignty, Food, Water, and Cultural (in)Security, K. Marion Suiseeya, A. Packman, J. Hester, P. Loew, J. Gilbert, NSF CNS-2044053, \$50,000, 2021-2022

### DOE:

*Viral Fate & Transport for COVID-19*, A.I. Packman, \$60,000, National Virtual Biotechnology Laboratory subcontract from Argonne National Laboratory, 2020-2021

#### Walder Foundation:

Chicago Prototype Coronavirus Assessment Network Node (PCANN), C. Catlett, R. Poretsky, S. Dorevitch, A. Packman, M.C. Negri, \$1,250,000, 2020-2022.

European Commission (as program partner for advising, training courses, and research exchanges)

HiFreq: Smart high-frequency environmental sensor networks for quantifying nonlinear hydrological process dynamics across spatial scales, Horizon 2020 MSCA-RISE, 734317, PI S. Krause / Univ. Birmingham, 2016-2021, £2.3M.

### **Publications**

#### **Cover Articles, Publication Highlights and Awards**

- Cover Image, *Environmental Science & Technology Letters*, "Significance of hyporheic exchange for predicting microplastic fate in rivers," Vol. 7, Issue 10, 2020
- FEMS Editor's Choice Award, "Soil hydrology drives ecological niche differentiation in a native prairie microbiome," *FEMS Microbiology Ecology*, Vol. 96, Issue 1, 2019. (Awarded to the best paper in the journal issue)
- WRR Editors' Choice Award 2019, "Turbulence links momentum and solute exchange in coarse-grained streambeds," *Water Resources Research*, Vol. 54, No. 5, 2018. (Awarded to not more than 1% of papers published in AGU journals in each calendar year).
- AGU Research Spotlight, *Water Resources Research*, "Turbulence links momentum and solute exchange in coarsegrained streambeds," Vol. 54, No. 5, 2018.
- Editor's Highlight, *Applied and Environmental Microbiology*, "Biomineralization and particle deposition distinctively mediate biofilm susceptibility to chlorine," Vol. 82, No. 10, 2016.
- Editor's Highlight, *Applied and Environmental Microbiology*, "Spatial patterns of carbonate biomineralization in biofilms," Vol. 81, No. 21, 2015.
- Editor's Highlight, *Water Resources Research*, "Agricultural chemical export dynamics in a watershed," Vol. 47, art. no. W00J02, 2011.
- Editor's Highlight, *Geophysical Research Letters*, "Particle deposition and clogging: Microstudies of colloids moving through pore spaces," Vol. 34, No. 18, 2007.
- Cover Image, *Geophysical Research Letters*, "Tomographic images of colloidal zirconia deposits within a porous medium composed of glass beads," Vol. 34, No. 18, 2007.
- Editor's Highlight, Geophysical Research Letters, "Fractal topography and groundwater flow," Vol. 34, No. 7, 2007.
- Cover Image, *Applied and Environmental Microbiology*, "Retention of *Cryptosporidium parvum* oocysts in a *Pseudomonas aeruginosa* biofilm resolved by confocal microscopy," Vol. 72, No. 9, 2006.
- Editor's Highlight, *Geophysical Research Letters*, "Using surface topography to predict groundwater flow patterns," Vol. 33, No. 7, 2006.

#### Work Featured in Popular Press (Last two years)

- ABC News, "Biden's plan to remove lead water lines may benefit these states the most: The EPA has proposed removing all lead service lines within a decade," Mary Kekatos, December 6, 2023, https://abcnews.go.com/Health/bidens-plan-remove-lead-water-lines-benefit-states/story?id=105353270
- MWRD News, "International collaboration spurs MWRD-Northwestern University study to address contaminants in wastewater," August 7, 2023, <u>https://mwrd.org/international-collaboration-spurs-mwrd-northwestern-university-study-address-contaminants</u>
- Great Lakes Now / Detroit Public TV, "What are wetlands for, anyway?" Lisa John Rogers, July 10, 2023, https://www.greatlakesnow.org/2023/07/what-are-wetlands-for-anyway/
- Northwestern Now, "Preparing for the next disaster: New summits will explore radiological and biological risks to the built environment," Amanda Morris, April 24, 2023,

https://news.northwestern.edu/stories/2023/04/mitigating-radiological-risks-indoors/

- Northwestern Now, "In Israel, forging a path to a circular water economy," Rebecca Lindell, March 27, 2023, https://news.northwestern.edu/stories/2023/03/sustainable-water-management-israel/
- Northwestern Now, "Two Northwestern faculty-led teams celebrate 2022 Chicago Innovation Awards: Illinois Wastewater Surveillance System, Epicore Biosystems among 20 most innovative products and services," Win Reynolds, November 18, 2022, <u>https://news.northwestern.edu/stories/2022/11/northwestern-chicago-innovation-awards</u>
- Crain's Chicago Business, "Chicago Innovation Awards winners revealed: A self-sanitizing diaper changing table, a digital health platform, and an apparel brand that eases dressing for older adults get special honors in this year's awards." Corli Jay, November 16, 2022
- Chicago Tribune, "Argonne to deploy sensors to track climate change on a neighborhood level in Chicago," September 22, 2022, <u>https://www.chicagotribune.com/news/environment/ct-viz-argonne-science-lab-climate-change-20220922-cc6aougl7zgahn6mztiligxoha-photogallery.html</u>
- Chicago Tribune (front page), "Chicago mops up: Quick, heavy rains Sunday flood homes, businesses and roads," Madeline Buckley, Alice Yin, A.D. Quig and Jake Sheridan, September 12), 2022 (online) and September 13

(print), 2022, <u>https://www.chicagotribune.com/news/breaking/ct-chicago-flooding-weather-rain-sewers-20220912-3n4ilrr5hna7bj6irzwtwswy3m-story.html</u>

- Local News Today, "City integrated field labs to strengthen DOE leadership on climate modelling," Leonard Parker, September 7, 2022, <u>https://localtoday.news/il/city-integrated-field-labs-to-strengthen-doe-leadership-on-climate-modelling-34759.html</u>
- U.S. Department of Energy Office of Science, "Urban Integrated Field Laboratories Will Equitably Address a Critical Scientific Knowledge Gap," Asmeret Asefaw Berhe, September 7, 2022, <u>https://www.energy.gov/science/articles/urban-integrated-field-laboratories-will-equitably-address-critical-scientific</u>
- Crain's Chicago Business, "Chicago wins central role in federal climate change investment," Corli Jay, September 6, 2022, <u>https://www.chicagobusiness.com/climate/chicago-wins-federal-climate-change-investment</u>
- Business Wire, "Argonne to Lead Collaborative Study of Urban Climate Change in Chicago Region," September 06, 2022, <u>https://www.businesswire.com/news/home/20220906005050/en/Argonne-to-Lead-Collaborative-Study-of-Urban-Climate-Change-in-Chicago-Region</u>
- Northwestern Now, "Northwestern joins collaboration to study climate and urban science in Chicago: Researchers will use models to identify equitable climate and energy solutions," Amanda Morris, September 6, 2022, <u>https://news.northwestern.edu/stories/2022/09/northwestern-joins-collaboration-to-study-climate-and-urban-science-in-chicago/</u> Featured by DOE as a University Research News headline on the Office of Science homepage (www.energy.gov/science/office-science), September 20, 2022
- U.S. Department of Energy Office of Science, DOE Announces \$66 Million to Research the Impact of Climate Change on America's Urban Communities," September 6, 2022 <u>https://www.energy.gov/articles/doe-announces-66-million-research-impact-climate-change-americas-urban-communities</u>
- The Hill, "How flooding can lead to water crises like the one in Mississippi," Joseph Guzman, September 1, 2022, <u>https://thehill.com/changing-america/resilience/natural-disasters/3624384-how-flooding-can-lead-to-water-crises-like-the-one-in-mississippi/</u>
- USA Today, "Flooding broke open Jackson's water crisis, but it can't be disentangled from race, experts say," Nada Hassanein, August 31, 2022, <u>https://www.usatoday.com/story/news/nation/2022/08/31/jackson-mississippi-water-crisis-disinvestment/7940213001/</u>
- Doing Research, "Threats, innovation focus of water symposium," Matt Golosinkski, June 2022, researchcomm.northwestern.edu/archives/doing-research-2022.html
- The Durango Telegraph, "Microplastic Mountain: With plastics found in Colorado's snowpack, researchers ask: 'Is no place sacred?'", Jonathan Romeo, July 14, 2022, <u>https://www.durangotelegraph.com/news/top-stories/microplastic-mountain/</u>
- Northwestern Engineering Magazine, "Confronting Our Planet's Polymer Problem," Amanda Morris and Win Reynolds, Spring 2022, <u>https://www.mccormick.northwestern.edu/magazine/spring-2022/pdf/spring-2022.pdf</u>
- WGLT (Illinois Public Radio; National Public Radio affiliate), Interview on wastewater surveillance for COVID-19, Lyndsay Jones, April 18, 2022
- Healthline, "How Will We Know if a BA.2 Wave is Surging in the US?", Shawn Radcliffe, March 31, 2022, www.healthline.com/health-news/how-will-we-know-if-a-ba-2-wave-is-surging-in-the-us
- NSF Research news, "Protecting vulnerable urban areas from increasingly extreme weather", March 15, 2022, <u>https://www.nsf.gov/discoveries/disc\_summ.jsp?WT.mc\_id=USNSF\_1&cntn\_id=304663&utm\_medium=email</u> <u>&utm\_source=govdelivery</u>
- Popular Science, "How do we track COVID as people get tested less?", Kate Baggaley, March 11, 2022, www.popsci.com/health/new-covid-case-monitoring-tests/
- Northwestern Now, "COVID-19 wastewater surveillance 'is more important than ever," Amanda Morris, Feb. 25, 2022. <u>news.northwestern.edu/stories/2022/02/covid-19-wastewater-surveillance-is-more-important-than-ever/</u>
- National Public Radio, "As COVID-19 cases drop across the country, mandates are loosened", Allison Aubrey, Morning Edition, Feb. 14, 2022, <u>www.npr.org/2022/02/14/1080548597/as-covid-19-cases-drop-across-the-country-mandates-are-loosened</u>
- Discover Magazine, "Scientists Scour Sewage for Coronavirus Clues", Christian Elliott, Feb. 4, 2022, www.discovermagazine.com/health/scientists-scour-sewage-for-coronavirus-clues
- InfoTrak Network Radio, Interview with Chris Witting on microplastic pollution in rivers, Jan. 21, 2022.
- WBEZ Chicago Public Radio, Interview on microplastics pollution, Mark LaBien, Jan. 15, 2022.

- WBEZ Chicago Public Radio, "Experts say more 'smart' technology is needed in the Great Lakes to monitor climate change." Mark LaBien, Jan. 3, 2022, <u>https://www.wbez.org/stories/great-lakes-researchers-want-more-smart-technology/409e05be-b697-419a-89ab-c058ab7cbd5b</u>
- AFP video interview and print story "Living on the Great Lakes a dream threatened by climate change", Derek Henkle and Todd Rosenthal. The video is available at: <u>https://www.youtube.com/watch?v=kbnHW9Pv7qA</u> The print story was picked up by many media outlets, including:
  - msn.com, Nov. 6, 2021, <u>www.msn.com/en-us/travel/news/living-on-the-great-lakes-a-dream-threatened-by-climate-change/ar-AAQp8Fe</u>
  - Barron's, Nov. 6, 2021, Bob Chiarito, <u>www.barrons.com/news/living-on-the-great-lakes-a-dream-threatened-by-climate-change-01636249207</u>
  - France 24 International News, Nov. 7, 2021, <u>www.france24.com/en/live-news/20211107-living-on-the-great-lakes-a-dream-threatened-by-climate-change</u>
  - The Star, Nov. 13, 2021 (Saturday edition), <u>www.thestar.com.my/lifestyle/living/2021/11/13/living-on-the-great-lakes-a-dream-threatened-by-climate-change</u>

### Publication summary and citation information:

Peer-reviewed publications: 162 (including book chapters). Total publications: 178. ORCiD Identifier 0000-0003-3172-4549 Citation statistics (Dec. 2023):

H-index: 59, i10-index: 137 (Google Scholar).

Total citations:  $\sim$ 12,500. Average citations per peer reviewed publication:  $\sim$ 77.

### **Invited Commentaries and Articles in Popular Press:**

- 1. Packman, A. and Du Buclet, K.N., Oct. 11, 2021, Op-ed: Why we must make the Great Lakes 'smarter' to prepare for climate change, *Chicago Tribune*, www.chicagotribune.com/opinion/commentary/ct-opinion-smart-great-lakes-initiative-20211011-zlefd3m5kzbqrb2yfc5dlcsotq-story.html
- 2. Packman, A.I., 2019, Resilience is key to secure water supplies, *The Catalyst*, Issue 14, Spring 2019, www.bushcenter.org/catalyst/environment/packman-water.html
- Packman, A.I., 2018, Cape Town's "Day Zero" is a bellwether of global water crises, *Axios* Expert Voices, www.axios.com/cape-town-day-zero-bellwether-global-water-crises-44bffba6-1b3f-4bcf-89f0-7f17a9542fde.html
- 4. Packman, A.I., 2013, Building bacterial bridges, *Nature Geoscience*, 6, 682-683, DOI10.1038/ngeo1938.
- 5. Wuebbles, D. and Packman, A., June 6, 2012, Extraordinary extremes: Climate scientists explain our crazy weather, *Chicago Tribune*

#### **Book chapters:**

- Abrams, D., Angel, J., Kelly, W., Markus, M., McConkey, S., McIsaac, G., Packman, A., Wuebbles, D., Zhang, Z. Climate Change and Hydrology, in Wuebbles, D., J. Angel, K. Petersen, and A.M. Lemke, (Eds.), 2021, *An Assessment of the Impacts of Climate Change in Illinois*. The Nature Conservancy, Illinois, DOI 10.13012/B2IDB-1260194 V1
- Wuebbles, D., Cardinale, B., Cherkauer, K., Davidson-Arnott, R. Hellmann, J., Infante, D., Johnson, L., de Loe, R., Lofgren, B., Packman, A., Seglenieks, F., Sharma, A., Sohngen, B., Tiboris, M., Vimont, D., Wilson, R., Kunkel, K., Ballinger, A., 2019, *An assessment of the impacts of climate change on the Great Lakes*, Environmental Law and Policy Center, 1-70.
- Medina, M.A., Doneker, R.L., Grosso, N., Johns, D.M., Lung, W., Mohsen, M.F.N., Packman, A.I., and Roberts, P.J. 2004, Surface water-ground water interactions and modeling applications. In *Contaminated Ground Water and Sediment: Modeling for Management and Remediation*, C.C. Chien, M.A. Medina, Jr., G.F. Pinder, D.D. Reible, B.E. Sleep; and C. Zheng (eds.), CRC Press, 1-62.
- 4. Packman, A.I., and Bencala, K.E. 2000, Modeling methods in the study of surface-subsurface hydrologic interactions, in *Streams and Ground Waters*, J.B. Jones and P.J. Mulholland (eds.), Academic Press, 45-80.

### Papers published in peer-reviewed journals:

- Saavedra Cifuentes, E., Teitelbaum, Y., Arnon, S., Dallmann, J., Phillips, C.B., Packman, A.I., 2023. Turbulence-Driven Clogging of Hyporheic Zones by Fine Particle Filtration. *Geophysical Research Letters*, 50(20), e2023GL105002, DOI 10.1029/2023GL105002
- Lin Z.W., Shapiro, E.F., Barajas-Rodriguez, F.J., Gaisin, A., Ateia, M., Currie, J., Helbling, D.E., Gwinn, R., Packman, A.I., Dichtel, W.R., 2023, Trace Organic Contaminant Removal from Municipal Wastewater by Styrenic β-Cyclodextrin Polymers, *Environmental Science & Technology*, DOI 10.1021/acs.est.3c04233
- 3. Shimony, T., Teitelbaum, Y., Saavedra Cifuentes, E., Dallmann, J., Phillips, C.B., Packman, A.I., Arnon, S., 2023, Kaolinite Deposition Dynamics and Streambed Clogging During Bedform Migration under Losing and Gaining Flow Conditions, *Water Resources Research*, WRCR26843, DOI 10.1029/2023WR034792
- Hernandez Gonzalez, L.M., Rivera, V.R., Akosa, D., Phillips, C.B., Hatch, S.L., Miller, W.M., Packman, A.I., 2023, Road salt intrusion dynamics in an ex-urban native wetland complex, *PLoS Water*, 2(7), e0000148, DOI 10.1371/journal.pwat.0000148
- Tyler, S., Kent, J., Anderson, S., Brooks, P., Packman, A., Uijlenhoet, R., Western, A., Zeng, X., 2023, Reflections and Thoughts on the Future of Science from AGU Hydrology Section Fellows, *AGU Perspectives of Earth and Space Scientists*, 4(1), p.e2023CN000206, DOI 10.1029/2023CN000206
- 6. Risse-Buhl, U., Arnon, S., Bar-Zeev, E., Oprei, A., Packman, A.I., Maraver, I.P., Teitelbaum, Y., Mutz, M., 2023. Streambed migration frequency drives ecology and biogeochemistry across spatial scales. *WIREs Water*, e1632, DOI 10.1002/wat2.1632
- Teitelbaum, Y., Shimony, T., Saavedra Cifuentes, E., Dallmann, D., Phillips, C.B., Packman, A.I., Hansen, S.K., Arnon, S., 2022, A novel framework for simulating particle deposition with moving bedforms, *Geophysical Research Letters*, 49(4), e2021GL097223, DOI 10.1029/2021GL097223
- Khamis, K., Ouellet, V., Croghan, D., Hernandez Gonzalez, L.M., Packman, A.I., Hannah, D.M., Krause, S., 2023, The Autobot-WQ: A portable, low-cost autosampler to provide new insight into urban spatio-temporal water quality dynamics, *Frontiers in Built Environment*, 9, 1072757, DOI 10.3389/fbuil.2023.1072757 2023/4/13
- 9. Sun, H., Nie, S., Packman, A.I., Zhang, Y., Chen, D., Lu, C., Zheng, C., 2023, Application of Hausdorff fractal derivative to the determination of the vertical sediment concentration distribution, *International Journal of Sediment Research*, 38 (1), 12-23, DOI 10.1016/j.ijsrc.2022.07.007
- Krause, S., Abbott, B.W., Baranov, V., Bernal, S., Blaen, P., Datry, T., Drummond, J., Fleckenstein, J.H., Velez, J.G., Hannah, D.M. Knapp, J.L., Kurz, M., Lewandowski, J., Martí, E., Mendoza-Lera, C., Milner, A., Packman, A., Pinay, G., Ward, A.S., Zarnetzke, J.P., 2022. Organizational principles of hyporheic exchange flow and biogeochemical cycling in river networks across scales. *Water Resources Research*, 58, e2021WR029771, DOI 10.1029/2021WR029771
- Marion Suiseeya, K. R., O'Connell, M. G., Leoso, E., Defoe, M. S. B. N., Anderson, A., Bang, M., Beckman, P., Boyer, A.-M., Dunn, J., Gilbert, J., Hester, J., Horton, D. E., Jennings, D. B., Kebec, P., Loeb, N. C., Loew, P., Miller, W. M., Moffitt, K., Packman, A. I., Price, M.W., Redbird, B., Rogers, J., Sankaran, R., Schwoch, J., Silas, P., Twardowski, W., Zerega, N., 2022, Waking from paralysis: Revitalizing conceptions of climate knowledge and justice for more effective climate action. *The Annals of the American Academy of Political and Social Science*, 700(1), 166-182. DOI 10.1177/00027162221095495
- Ward, A.S., Packman, A., Bernal, S., Brekenfeld, N., Drummond, J., Graham, E., Hannah, D.M., Klaar, M., Krause, S., Kurz, M. and Li, A., 2022. Advancing river corridor science beyond disciplinary boundaries with an inductive approach to catalyze hypothesis generation. *Hydrological Processes*, p.e14540, DOI 10.1002/hyp.14540
- Drummond, J. D., Schneidewind, U., Li, A., Hoellein, T. J., Krause, S., Packman, A.I., 2022, Microplastic accumulation in riverbed sediment via hyporheic exchange from headwaters to mainstems, *Science Advances*, 8(2), DOI 10.1126/sciadv.abi9305
- Dallmann, J., Phillips, C. B., Teitelbaum, Y., Saavedra C., E., Sund, N., Schumer, R., Arnon, S., Packman, A.I., 2021, Bedform segregation and locking increase storage of natural and synthetic particles in rivers, *Nature Communications*, DOI 10.1038/s41467-021-27554-4
- 15. Lian, Y. P., Dallmann, J. Sonin, B., Roche, K.R., Packman, A.I., Liu, W.K., Wagner, G.J., 2021, Double averaging analysis applied to a large eddy simulation of coupled turbulent overlying and porewater flow, *Water Resources Research*, DOI 10.1029/2021WR029918
- Ouellet, V., K. Khamis, D. Croghan, L.M. Hernandez Gonzalez, V.A. Rivera, C.B. Phillips, A.I. Packman, W.M. Miller, R.G. Hawke, D. M. Hannah, S. Krause, 2021, Green roof vegetation management alters potential for water quality and temperature mitigation, *Ecohydrology*, 14(6), e2321, DOI 10.1002/eco.2321

- 17. Packman, A.I., Robinson, C.T., Lamouroux, N., 2021, Hydraulic drivers of populations, communities and ecosystem processes, *Journal of Ecohydraulics*, 6(2), 91-94, DOI 10.1080/24705357.2021.1951506
- Morrow, J., Packman, A., Martinez, K., Van Den Wymelenberg, K., Goeres, D.M., Farmer, D., Mitchell, J., Ng, L., Hazi, Y., Schoch-Spana, M., Quinn, S.C., Bahnfleth, W., Olsiewski, P., 2021, Critical capability needs for reduction of transmission of SARS-CoV-2 indoors, *Frontiers Bioengineering and Biotechnology*, DOI 10.3389/fbioe.2021.641599
- McClary-Gutierrez, J.S., Aanderud, Z.T., Al-faliti, M., Duvallet, C., Gonzalez, R., Guzman, J., Holm, R.H., Jahne, M., Kantor, R.S., Katsivelis, P., Gaardbo Kuhn, K., Langan, L.M., Mansfeldt, C., McLellan, S., Mendoza Grijalva, L.M., Murnane, K., Naughton, C.C., Packman, A.I., Paraskevopoulos, S., Radniecki, T.S., Roman, F.A., Shrestha, A., Stadler, L., Steele, J.A., Swalla, B.M., Vikesland, P., Wartell, B., Wilusz, C.J., Wong, J.C., Boehm, A.B., Halden, R.U., Bibby, K., Delgado Vela., J., 2021, Standardizing data reporting in the research community to enhance the utility of open data for SARS-CoV-2 wastewater surveillance, *Environmental Science: Water Research and Technology*, 7(9), 1545-1551, DOI 10.1039/D1EW00235J
- Teitelbaum, Y., Dallmann, J.D., Phillips, C. B., Packman, A.I., Schumer, R., Sund, N., Hanson, S.K., Arnon, S., 2021, Dynamics of hyporheic exchange flux and fine particle deposition under moving bedforms, *Water Resources Research*, 57(4), e2020WR028541 DOI 10.1029/2020WR028541
- Krause, S., Baranov, V., Nel, H., Drummond, J., Kukkola, A., Hoellein, T., Sanbrook Smith, G., Lewandowski, J., Bonet, B., Packman, A.I., Sadler, J., Inshyna, V., Allen, S., Allen, D., Simon, L., Mermillod-Blondin, F., Lynch, I., 2021, Gathering at the top? Environmental controls of microplastic uptake and biomagnification in aquatic food webs, *Environmental Pollution*, 268, 115750, DOI 10.1016/j.envpol.2020.115750
- 22. Li, A., Bernal, S., Kohler, B. Thomas, S.A., Martí, E., Packman, A.I., 2020. Residence time in hyporheic bioactive layers explains nitrate uptake in streams. *Water Resources Research*, e2020WR027646, DOI 10.1029/2020WR027646.
- Li, A., Drummond, J.D., Bowen, J.C., Cory, R.M., Kaplan, L.A., Packman, A.I., 2020, Effect of decreasing biological lability on dissolved organic matter dynamics in streams. *Water Resources Research*, 2020WR027918, DOI 10.1029/2020WR027918
- Drummond, J.D., Nel, H.A., Packman, A.I., Krause, S., 2020. Significance of hyporheic exchange for predicting microplastic fate in rivers, Environmental Science and Technology Letters, 7(10), 727-732, DOI DOI 10.1021/acs.estlett.0c00595 (Cover article)
- 25. Bogler, A., Packman, A., Furman, A., Gross, A., Kushmaro, A., Ronen, A., C., Dagot, Hill, C., Vaizel-Ohayon, D., Morgenroth, E., Bertuzzo, E., Wells, G., Raanan Kiperwas, H., Horn, H., Negev, I., Zucker, I., Bar-Or, I., Moran-Gilad, Balcazar, J.L., Bibby, K., Elimelech, M., Weisbrod, N., Nir, O., Sued, O., Gillor, O., Alvarez, P.J., Crameri, S., Arnon, S., Walker, S., Yaron, S., Nguyen, T.H., Berchenko, Y., Hu, Y., Ronen, Z., Bar-Zeev, E. 2020. Rethinking wastewater risks and monitoring in light of the COVID-19 pandemic, *Nature Sustainability*, DOI 10.1038/s41893-020-00605-2.
- Drummond, J.D., Wright-Stow, A., Franklin, P., Quinn, J., Packman, A.I., 2020, Fine particle transport dynamics in response to wood additions in a small agricultural stream, *Hydrological Processes*, DOI 10.1002/hyp.13874.
- Dallmann, J.D., Phillips, C.B., Teitelbaum, Y., Sund, N., Schumer, R., Arnon, S., Packman, A.I., 2020, Impacts of suspended clay particle deposition on sand-bed morphodynamics, Water Resources Research, 56, e2019WR027010, DOI 10.1029/2019WR027010.
- Venkataramanan, V., Lopez, D., McCuskey, D.J., Kiefus, D., McDonald, R.I., Miller, W.M., Packman, A.I. and Young, S.L., 2020, Knowledge, attitudes, intentions, and behavior related to green infrastructure for flood management: A systematic literature review, *Science of The Total Environment*, 720, 137606, DOI 10.1016/j.scitotenv.2020.137606.
- 29. Cil, M., Schabelski, J., Packman, A.I. Buscarnera, G., 2020, A miniaturized testing apparatus to study the chemo-mechanics of porous media, *Geotechnical Testing Journal*, 43(4), GTJ20190031, DOI 10.1520/GTJ20190031.
- Preziosi-Ribero, A., Packman, A.I., Escobar-Vargas, J.A., Phillips, C.B., Donado, L.D., Arnon, S., 2020, Fine sediment deposition and filtration under losing and gaining flow conditions: A particle-tracking model approach. Water Resources Research, 56(2), DOI 10.1029/2019WR026057
- 31. Phillips, C.B., Dallmann, J.D., Jerolmack D.J., Packman, A.I., 2019, Fine particle deposition, retention, and resuspension within a sand-bedded stream are determined by stream bed morphodynamics, *Water Resources Research*, 55(12), DOI 10.1029/2019WR025272

- 32. Drummond, J., Schmadel, N., Kelleher, C., Packman, A.I., Ward, A., 2019, Improving predictions of fine particle immobilization in streams, *Geophysical Research Letters*, 46(23), DOI 10.1029/2019GL085849
- 33. Ward, A., Kurz, M., Schmadel, N., Knapp, J., Blaen, P., Harman, K. Drummond, J., Hannah, D., Krause, S. Li, A., Marti, E., Milner, A., Neil, K., Miller, M., Plont, S., Packman, A., Wisnoski, N., Wondzell, S., Zarnetske, J., 2019, Solute transport and transformation in an intermittent, headwater mountain stream with diurnal discharge fluctuations, *Water*, Special Issue on Surface-Groundwater Interactions, 11(11), 2208, DOI 10.3390/w11112208
- 34. Ward, A. S., Wondzell, S. M., Schmadel, N. M., Herzog, S., Zarnetske, J. P., Baranov, V., Blaen, P. J., Brekenfeld, N., Chu, R., Derelle, R., Drummond, J., Fleckenstein, J. H., Garayburu-Caruso, V., Graham, E., Hannah, D., Harman, C. J., Hixson, J., Knapp, J. L. A., Krause, S., Kurz, M. J., Lewandowski, J., Li, A., Marti, E., Miller, M., Milner, A. M., Neil, K., Orsini, L., Packman, A. I., Plont, S., Renteria, L., Roche, K., Royer, T., Segura, C., Stegen, J., Toyoda, J., Wells, J., Wisnoski, N. I., 2019, Spatial and temporal variation in river corridor exchange across a 5th-order mountain stream network, *Hydrol. Earth Syst. Sci.*, 23, 5199–5225, DOI 10.5194/hess-23-5199-2019
- 35. Ward A.S., Zarnetske J.P., Baranov V., Blaen P.J., Brekenfeld N., Chu R., Derelle R., Drummond J., Fleckenstein J.H., Garayburu-Caruso V., Graham E., Hannah D., Harman C.J., Hixson J., Knapp J.L.A., Krause S., Kurz M.J., Lewandowski J., Li A., Marti E., Miller M., Milner A.M., Neil K., Orsini L., Packman A.I., Plont S., Renteria L., Roche K., Royer T., Schmaedel N.M., Segura C., Stegen J., Toyoda J., Wells J., Wisnoski N.I., Wondzell S.M. 2019. Co-located contemporaneous mapping of morphological, hydrological, chemical, and biological conditions in a 5th-order mountain stream network, Oregon, USA. *Earth System Science Data*, 11(4), 1567-1581, DOI 10.5194/essd-11-1567-2019
- 36. Griffin, J.S., Haug, L.A., Rivera, V.R., Hernandez Gonzalez, L.M., Kelly, J.J., Miller, W.M., Wells, G.F., Packman, A.I., 2019, Soil hydrology drives ecological niche differentiation in a native prairie microbiome, *FEMS Microbiology Ecology*, 93(10), fiz163, DOI 10.1093/femsec/fiz163.
- 37. Brewer TE, Aronson EL, Arogyaswamy K, Billings SA, Botthoff JK, Campbell AN, Dove NC, Fairbanks D, Gallery RE, Hart SC, Kaye J., King, G., Logan, G., Lohse, K.A., Maltz, M.R., Mayorga, E., O'Neill, C., Owens, S.M., Packman, A., Pett-Ridge, J. Plante, A.F., Richter, D.D., Silver, W.L., Yang, W.R., Fierer, N. 2019, Ecological and genomic attributes of novel bacterial taxa that thrive in subsurface soil horizons, *MBio*, 10(5), e01318-19, DOI 10.1128/mBio.01318-19.
- 38. Liou, H.-C., Sabba, F., Packman, A.I., Rosenthal, A., Wells, G., Balogun, O., 2019, Towards mechanical characterization of granular biofilms by optical coherence elastography measurements of circumferential elastic waves, *Soft Matter*, 15, 5562-5573, DOI 10.1039/C9SM00739C.
- 39. Venkataramanan, V. Lopez, D., Peters, D., McDonald, R., Miller, W., Packman, A.I., Young, S., 2019, A systematic literature review of the impacts of green infrastructure for stormwater and flood management on human health and well-being, *Journal of Environmental Management*, 246, 868-880, DOI 10.1016/j.jenvman.2019.05.028.
- 40. Roche, K. R., Li, A., Bolster, D., Wagner, G. J., Packman, A. I., 2019, Effects of turbulent hyporheic mixing on reach-scale transport, *Water Resources Research*, 55(5), 3603-4507, DOI 10.1029/2018WR023421
- 41. Hernandez Gonzalez, L.M., Rivera, V.R., Phillips, C.B., Haug, L.A., Hatch, S.L., Yeager, L., Chang, C., Alvarez, J., Gnaedinger, K.J., Miller, W.M., Packman, A.I., 2019, Characterization of soil profiles and elemental concentrations reveals deposition of heavy metals and phosphorus in a Chicago-area nature preserve, Gensburg Markham Prairie, *Journal of Soils and Sediments*, 19(5), DOI 10.1007/s11368-019-02315-5
- 42. Li, A., Aubeneau, A.F., King, T., Cory, R.M., Neilson, B.T., Kling, G.W., Bolster, D., Packman, A.I., 2019, Effects of vertical hydrodynamic mixing on photo-mineralization of dissolved organic carbon in Arctic surface waters, *Environmental Science Processes and Impacts*, 21, 748-760, DOI 10.1039/C8EM00455B.
- 43. Sherman, T., Richter, D., Packman, A.I., Roche, K.R., Bolster, D., 2019, A dual domain stochastic Lagrangian model for predicting transport in open channels with hyporheic exchange, *Advances in Water Resources*, 125, 57-67, DOI 10.1016/j.advwatres.2019.01.007
- 44. Lian, Y.P., Packman, A.I., Sonin, B., Wagner, G., Dallmann, J., Roche, K.R., Liu, W.K., Large eddy simulation of turbulent flow over and through a rough permeable bed, *Computers and Fluids*, 2019, 180, 128-138, DOI 10.1016/j.compfluid.2018.12.015.
- 45. Ward, A.S., Packman, A.I., 2019, Advancing our predictive understanding of river corridor exchange, *WIREs Water*, 6(1), e1327, DOI 10.1002/wat2.1327.

- Liou, H.-C., Sabba, F., Packman, A.I., Wells, G., Balogun, O., 2019, Nondestructive characterization of soft materials and biofilms by measurement of guided elastic wave propagation using Optical Coherence Elastography, *Soft Matter*, 15(4), 575-586, DOI 10.1039/C8SM01902A
- Xie, M., Alsina, M.A., Yuen, J., Gaillard, J-F, Packman, A.I., 2019, Effects of long-term resuspension on the mobility and chemical speciation of Zn in contaminated sediments, *Journal of Hazardous Materials*, 364, 300-308, DOI j.jhazmat.2018.10.043.
- 48. Magliozzi, C., Coro, G., Grabowski, R.C., Packman, A.I., Krause, S., 2019, A multiscale statistical method to identify potential areas of hyporheic exchange for river restoration planning, *Environmental Modeling and Software*, 111, 311-323, DOI 10.1016/j.envsoft.2018.09.006.
- 49. Magliozzi, C., Grabowski, R., Packman, A.I., Krause, S., 2018, Toward a conceptual framework of hyporheic exchange across spatial scales, *Hydrology and Earth Systems Science*, 22, 6163-6185, DOI 10.5194/hess-22-6163-2018.
- Sharma, A., Hamlet, A.F., Fernando, H.J.S., Catlett, C.E., Horton, D.E., Kotamarthi, V.R., Kristovich, D.A.R, Packman, A.I., Tank, J.L., Wuebbles, D.J., 2018, The need for an integrated land-lake-atmospheric modeling system, exemplified by North America's Great Lakes region, *Earth's Future*, 6(10), 1366-1379 DOI 10.1029/2018EF000870.
- Rosenthal, A. F., Griffin, J. S., Wagner, M., Packman, A. I., Balogun, O., Wells, G. F. 2018. Morphological analysis of pore size and connectivity in a thick mixed-culture biofilm. *Biotechnology and Bioengineering*, 115(9), 2268-2279, DOI10.1002/bit.26729
- 52. Fox, A., Packman, A.I., Boano, F., Phillips, C.B., Arnon, S., 2018, Interactions between suspended kaolinite deposition and hyporheic exchange flux under losing and gaining flow conditions. *Geophysical Research Letters*, 45(9), DOI10.1029/2018GL077951
- 53. Pan, S.-Y., Snyder, S.W., Packman, A.I., Lin, Y.J., Chiang, P.-C., 2018, Cooling water use in thermoelectric power generation and its associated challenges for addressing water-energy nexus, *Water Energy Nexus*, DOI10.1016/j.wen.2018.04.002.
- 54. Roche K.R., Blois, G., Best, J.L., Christensen, K. Aubeneau, A.F., Packman, A.I., 2018, Turbulence links momentum and solute exchange in coarse-grained streambeds, *Water Resources Research*, 54(5), 3225-3242, DOI10.1029/2017WR021992 (Received 2018 Editor's Choice Award from AGU)
- 55. Drummond, J.D., Larsen, L.G., González-Pinzón, R., Packman, A.I., Harvey, J.W., 2018, Less fine particle retention in a restored versus unrestored urban stream: Balance between hyporheic exchange, resuspension and immobilization, *Journal of Geophysical Research Biogeosciences*, 123(4), 1425-1439, DOI10.1029/2017JG004212.
- 56. Drummond, J.D., Boano, F., Atwill, E.R., Li, X., Harter, T., Packman, A.I., 2018, *Cryptosporidium* oocyst persistence in agricultural streams: A mobile-immobile model framework assessment, *Scientific Reports*, 8, 4603, DOI10.1038/s41598-018-22784-x
- 57. Waller, S.A., Packman, A.I., Hausner, M., 2018, Comparison of biofilm cell quantification methods for drinking water distribution systems, *Journal of Microbiological Methods*, 144, 8-21, DOI10.1016/j.mimet.2017.10.013
- 58. Aquino, T., Roche, K.R, Aubeneau, A., Xie, M., Packman, A.I., and Bolster, D., 2017, A process-based model for bioturbation-induced mixing, *Scientific Reports*, 7, 14287, DOI10.1038/s41598-017-14705-1
- 59. Griffin, J.S., N. Lu, N. Sangwan, A. Li, M. Dsouza, A. J. Stumpf, T. Sevilla, A. Culotti, L.L. Keefer, J.J. Kelly, J.A. Gilbert, G.F. Wells, A.I. Packman, 2017, Microbial diversity in an intensively managed landscape is structured by landscape connectivity, *FEMS Microbiology Ecology*, 93(10), fix120, DOI 10.1093/femsec/fix120
- 60. Li, A., Aubeneau, A.F., Bolster, D., Tank, J.L., Packman, A.I., 2017, Covariation in patterns of hyporheic flow and metabolism enhances reach-scale nitrogen removal, *Water Resources Research*, 53, 6927-6944, DOI10.1002/2016WR019949
- 61. Xie, M., Wang, N., Gaillard, J-F, Packman, A.I., 2017, Interplay between flow and bioturbation enhances metal efflux from low-permeability sediments, *Journal of Hazardous Materials*, 341, 304–312, DOI10.1016/j.jhazmat.2017.08.002
- 62. Cil, M., Xie, M., Packman, A.I., and Buscarnera, G., 2017, Solute mixing regulates heterogeneity of mineral precipitation in porous media, *Geophysical Research Letters*, 44, DOI10.1002/2017GL073999

- 63. Drummond, J.D., Harvey, J.W., Larsen, L.G., González-Pinzón, R., Packman, A.I., 2017, Fine particle retention within stream storage areas at base flow and in response to a storm event, *Water Resources Research*, 53, DOI10.1002/2016WR020202
- 64. Petrovich, M., Wu, C.Y., Rosenthal, A., Chen, K.F., Packman, A.I., Wells, G.F., 2017, *Nitrosomonas europaea* biofilm formation is enhanced by *Pseudomonas aeruginosa*, *FEMS Microbiology Ecology* 93 (5), DOI10.1093/femsec/fix047
- 65. Caruso, A., Boano, F., Ridolfi, L., Chopp, D.L., and Packman, A.I., 2017, Biofilm-induced bioclogging produces sharp interfaces in hyporheic flow, redox conditions, and microbial community structure, *Geophysical Research Letters*, GRL55934, DOI10.1002/2017GL073651
- 66. Kelly, J. F., D. Bolster, M.M. Meerschaert, J. D. Drummond, and A. I. Packman, 2017, FracFit: A robust parameter estimation tool for fractional calculus models, *Water Resources Research*, 53, DOI10.1002/2016WR019748
- 67. Roche, K.R., Drummond, J.D., Boano, F., Packman, A.I., Battin, T.J., Hunter, W.R., 2017, Benthic biofilm controls on fine particle dynamics in streams, *Water Resources Research*, 52, DOI10.1002/2016WR019041
- Li, X. Lu, N., Brady, H., Packman, A.I., 2016, Biomineralization regulates the formation of *Proteus mirabilis* and *Pseudomonas aeruginosa* dual-species biofilms, *FEMS Microbiology Ecology*, 92(12), fiw189, DOI 10.1093/femsec/fiw189
- 69. Roche, K.R, Aubeneau, A., Xie, M., Aquino, T., Bolster, D., and Packman, A.I., 2016, An integrated experimental and modeling approach to predict sediment mixing from benthic burrowing behavior, *Environmental Science and Technology*, 50(18), 10047-10054, DOI 10.1021/acs.est.6b01704
- 70. Xie, M., Gaillard, J.F., and Packman, A.I., 2016, Hydrodynamic forcing mobilizes Cu in low-permeability estuarine sediments, *Environmental Science and Technology*, 50(9), 4615-4623, DOI10.1021/acs.est.5b04576
- Li, X., Lu, N., Brady, H.R., and Packman, A.I., 2016, Ureolytic biomineralization reduces *Proteus mirabilis* biofilm susceptibility to ciprofloxacin, *Antimicrobial Agents and Chemotherapy*, 60(5), 2993-3000, DOI10.1128/AAC.00203-16
- 72. Li, X. Chopp, D.L., Russin, W.A., Brannon, P.T., Parsek, M.R., and Packman, A.I., 2016, *In situ* biomineralization and particle deposition distinctively mediate biofilm susceptibility to chlorine, *Applied and Environmental Microbiology*, 82(10), DOI10.1128/AEM.03954-15. [Editor's highlighted article]
- 73. Battin, T.J., Besemer, K., Bengtsson, M., Romani, A., Packman, A.I., 2016, The ecology and biogeochemistry of stream biofilms, *Nature Reviews Microbiology*, 14(4), 251-263, DOI10.1038/nrmicro.2016.15
- 74. Aubeneau, A.F., Martin R.L., Jerolmack D.J., and Packman, A.I., 2015, Fractal patterns in riverbed morphology produce fractal scaling of water storage times, *Geophysical Research Letters*, 42(13), 5309-5315, DOI10.1002/2015GL064155
- 75. Culotti, A., and Packman, A.I., 2015, *Pseudomonas aeruginosa* facilitates *Campylobacter jejuni* growth in biofilms under oxic flow conditions, *FEMS Microbiology Ecology*, 91(12), DOI10.1093/femsec/fiv136
- 76. Stonedahl, S.H., Roche, K.R., Stonedahl, F., and Packman, A.I., 2015, Visualizing hyporheic flow through bedforms using dye experiments and simulation, *Journal of Visualized Experiments*, 105, e53285, DOI10.3791/53285. e-publication with embedded video; 4,697 page views (as of July 2019)
- 77. Li, X. Chopp, D.L., Russin, W.A., Brannon, P.T., Parsek, M.R., Packman, A.I., 2015, Spatial patterns of carbonate biomineralization in biofilms, *Applied and Environmental Microbiology*, 81, 7403–7410, DOI10.1128/AEM.01585-15 [Editor's highlighted article]
- 78. Drummond, J.D., Davies-Colley, R.J., Stott, R., Sukias, J.P., Nagels, J.W., Sharp, A., and Packman, A.I., 2015, Microbial transport, retention, and inactivation in streams a combined experimental and stochastic modeling approach, *Environmental Science and Technology*, 49(13), 7825–7833, DOI10.1021/acs.est.5b01414
- 79. Xie, M., Jarrett, B.A., Cadoux, C., Fetters, K.J., Burton Jr., G.A., Gaillard, J-F, Packman, A.I., 2015, Coupled effects of hydrodynamics and biogeochemistry on the mobility and bioavailability of Zn in highly contaminated sediments, *Environmental Science and Technology*, 49(9), 5346–5353, DOI10.1021/acs.est.5b00416
- Li, X., Song, J.L., Culotti A., Zhang, W., Chopp, D.L. Packman, A.I., 2015, Methods for characterizing the codevelopment of biofilm and habitat heterogeneity, *Journal of Visualized Experiments*, (97), e52602, DOI10.3791/52602. e-publication with embedded video; 3,850 page views (as of July 2019).

- Aubeneau, A.F., Drummond, J.D., Schumer, R., Bolster, D., Tank, J.L., Packman, A.I., 2015, Effects of benthic and hyporheic reactive transport on breakthrough curves, *Freshwater Science*, 34(1), 301-315, DOI10.1086/680037
- 82. Larned, S.T., Gooseff, M.N, Packman, A.I., Rugel, K., and Wondzell, S.M., 2015, Surface water-groundwater interactions: Current research directions, *Freshwater Science*, 34(1), 92-98, DOI10.1086/679491
- Fan, Y., Richard, S., Bristol, S., Peters, S., Ingebritsen, S., Moosdorf, N., Packman, A., Gleeson, T., Zaslavsky, I., Peckham, S., Murdoch, L. Fienen, M., Cardiff, M., Tarboton, D., Jones, N., Hooper, R., Arrigo, J., Gochis, D., Olson, J., Wolock, D., 2015, DigitalCrust: A 4D data system of material properties for transforming research on crustal fluid flow, *Geofluids*, 15(1-2), 372-379, DOI10.1111/gfl.12114
- Drummond, J. D., Davies-Colley, R. J., Stott, R., Sukias, J. P., Nagels, J. W., Sharp, A., Packman, A.I., 2014, Retention and remobilization dynamics of fine particles and microorganisms in pastoral streams, *Water Research*, 66, 459-472, DOI10.1016/j.watres.2014.08.025
- 85. Culotti, A.C., Packman, A.I., 2014, *Pseudomonas aeruginosa* promotes *Escherichia coli* biofilm formation in nutrient-limited medium, *PLoS One*, 9(9):e107186. DOI10.1371/journal.pone.0107186
- Boano, F., Harvey, J.W., Marion, A., Packman, A.I., Revelli, R., Ridolfi, L., and Wörman, A, 2014, Hyporheic flow and transport processes: Mechanisms, models, and biogeochemical implications, *Reviews of Geophysics*, 52, DOI10.1002/2012RG000417
- 87. Drummond, J.D., Aubeneau, A.F., Packman, A.I., 2014, Stochastic modeling of fine particle dynamics in rivers, *Water Resources Research*, 50(5), 4341–4356, DOI10.1002/2013WR014665
- Kelly, J.J., Minalt, N., Culotti, A., Pryor, M. and Packman, A., 2014, Temporal variations in the abundance and composition of biofilm communities colonizing drinking water distribution pipes, *PLoS One*, 9(5): e98542. DOI10.1371/journal.pone.0098542
- 89. Song, J.L, Au, K.H., Huynh, K.T., Zhang, W., Packman, A.I., 2013, Biofilm responses to smooth flow fields and chemical gradients in novel microfluidic flow cells, *Biotechnology and Bioengineering*, 111(3), 597-607.
- 90. Stonedahl, S.H., Harvey, J.W., and Packman, A.I., 2013, Interactions between hyporheic flow produced by stream meanders, bars, and dunes, *Water Resources Research*, 9, 5450–5461, DOI10.1002/wrcr.20400
- 91. Shogan, B., Smith, D., Packman, A., Kelley, S., Landon, E., Bhangar, S., Vora, G., Jones, R., Keegan, K., Stephens, B., Ramos, T., Kirkup, B., Levin, H., Rosenthal, M., Foxman, B., Chang, E., Siegel, J., Cobey, S., An, G., Alverdy, J., Olsiewski, P., Martin, M., Marrs, R., Hernandez, M., Christley, S., Morowitz, M., Weber, S. The Hospital Microbiome Project: Meeting Report for the 2nd Hospital Microbiome Project, Chicago, USA, January 15th, 2013. Standards in Genomic Sciences, North America, 8, Jul. 2013. Available at: <a href="http://www.standardsingenomics.org/index.php/sigen/article/view/sigs.4187859/946">http://www.standardsingenomics.org/index.php/sigen/article/view/sigs.4187859/946</a>>
- Tseng, B.S., Zhang, W., Quach, T.P., Harrison, J.J., Song, J.L., Chopp, D.L., Packman, A.I., Parsek, M.R., 2013, The extracellular matrix protects *Pseudomonas aeruginosa* biofilms by limiting the penetration of tobramycin, *Environmental Microbiology*, 15(10), 2865-2878, DOI10.1111/1462-2920.12155
- 93. Patil, S., Covino, T., Packman, A.I., McGlynn, B., Drummond, J.D., Payn, R., and Schumer, R., 2013, Intrastream variability in tracer breakthrough curves: Controls on solute retention behavior, *Journal of Geophysical Research-Earth Surface*, 118(2), 413–422, DOI10.1029/2012JF002455
- 94. Zhang, W., Sileika, T., Packman, A.I, 2013, Effects of fluid flow conditions on interactions between species in biofilms, *FEMS Microbiology Ecology*, 84(2), 344-354, DOI 10.1111/1574-6941.12066
- 95. Bradford, S.A., Morales, V.L., Zhang, W., Harvey, R.W., Packman, A.I., Mohanram, A., and Welty, C., 2013, Transport and fate of microbial pathogens in agricultural settings, *Critical Reviews in Environmental Science and Technology*, 43, 775–893, DOI 10.1080/10643389.2012.7104
- 96. Harvey, J.W., Drummond, J.D., Martin, R.L., McPhillips, L.E., Packman, A.I., Jerolmack, D.J., Stonedahl, S.H., Aubeneau, A.F., Sawyer, A.H., Larsen, L.G., and Tobias, C.R., 2012, Hydrogeomorphology of the hyporheic zone: Stream solute and fine particle interactions with mobile bedforms and floods, *Journal of Geophysical Research-Biogeosciences*, 117, G00N11, DOI10.1029/2012JG002043
- 97. Park, Y., Atwill, E.R., Lingling, H., Packman, A., and Harter, T., 2012, Deposition of *Cryptosporidium parvum* oocysts in porous media: A synthesis of attachment efficiencies measured under varying environmental conditions, *Environmental Science and Technology*, 46(17), 9491-9500, DOI 10.1021/es300564w

- 98. Zhang, Y., Meerschaert, M.M., and Packman, A.I., 2012, Linking fluvial bed sediment transport across scales, *Geophysical Research Letters*, 39, L20404, DOI10.1029/2012GL053476
- 99. Stonedahl, S.H., Harvey, J.W., Detty, J., Aubeneau, A., and Packman, A.I., 2012, Physical controls and predictability of stream hyporheic flow evaluated with a multi-scale model, *Water Resources Research*, 48, W10513, DOI10.1029/2011WR011582
- 100. Drummond, J.D., Covino, T.P., Aubeneau, A.F., Leong, D., Patil, S., Schumer, R., and Packman, A.I., 2012, Effects of solute breakthrough curve tail truncation on residence time estimates: A synthesis of solute tracer injection studies, *Journal of Geophysical Research-Biogeosciences*, 117, art. no. G00N08, DOI10.1029/2012JG002019
- 101. Cullis, J., Gillis, C., Bothwell, M., Kilroy, C., Packman, A.I., and Hassan, M., 2012, A conceptual model for the growth, persistence, and blooming behavior of the benthic mat-forming diatom *Didymosphenia geminata* in oligotrophic streams, *Journal of Geophysical Research-Biogeosciences*, 117, art. no. G00N03, DOI 10.1029/2011JG001891
- 102. Zhang, W., Sileika, T., Chen, C., Liu, Y., and Packman, A.I., 2011, A novel planar flow cell for studies of biofilm heterogeneity and flow-biofilm interactions, *Biotechnology and Bioengineering*, 108(11):2571-82. DOI 10.1002/bit.2323
- 103. Liu, Y., Zhang, W., Sileika, T., Warta, R., Cianciotto, N.P., and Packman, A.I., 2011, Disinfection of bacterial biofilms in pilot-scale cooling tower systems, *Biofouling*, 27(4):393-402.
- 104. Thompson, S.E., Harman, C. J., Schumer, R., Wilson, J.S., Basu, N.B., Brooks, P.D., Donner, S.D., Hassan, M.A., Packman, A I., Rao, P.S.C., Troch, P.A., and Sivapalan, M., 2011, Patterns, puzzles and people: Implementing hydrologic synthesis, *Hydrological Processes*, 25, 3256–3266.
- 105. Guan, K., Thompson, S.E., Harman, C.J., Basu, N.B., Rao, P.S.C., Sivapalan, M., Packman, A.I., and Kalita, P.K., 2011, Spatio-temporal scaling of hydrological and agrochemical export dynamics in a tile-drained Midwestern watershed, 47, W00J02, *Water Resources Research*, DOI10.1029/2010WR009997 [Editor's highlighted article].
- 106. Larned, S.T., Packman, A.I., Plew, D.R., and Vopel, K., 2011, Interactions between the mat-forming alga *Didymosphenia geminata* and its hydrodynamic environment, *Limnology and Oceanography: Fluids and Environments*, 1, 4–22, DOI 10.1215/21573698-1152081 [selected as lead article for new journal.]
- 107. Stonedahl, S.H., Harvey, J.W., Wörman, A., Salehin, M., and Packman, A.I., 2010, A multi-scale model for integrating hyporheic exchange from ripples to meanders, *Water Resources Research*, 46, W12539, DOI10.1029/2009WR008865.
- 108. Chen, C., Packman, A.I., Zhang, D., and Gaillard, J.-F., 2010, A multi-scale investigation of coupled interfacial transport, pore fluid flow, and fine particle deposition in a sediment bed, *Water Resources Research*, 46, W11560, DOI10.1029/2009WR009018.
- 109. Arnon, S., Marx, L.P., Searcy, K.E., and Packman, A.I., 2010, Effects of overlying velocity, particle size and biofilm growth on stream-subsurface exchange of particles, *Hydrological Processes*, 24(1), 108-114, DOI10.1002/hyp.7490.
- 110. Chen, C., Lau, B. L. T., Gaillard, J.-F., and Packman, A.I., 2009, Temporal evolution of pore geometry, fluid flow, and solute transport resulting from colloid deposition, *Water Resources Research*, 45, W06416, DOI10.1029/2008WR007252.
- 111. Chen, C., Packman, A. I., and Gaillard, J.-F., 2009, Using X-ray micro-tomography and pore-scale modeling to quantify sediment mixing and fluid flow in a developing streambed, *Geophysical Research Letters*, 36, L08403, DOI10.1029/2009GL037157.
- 112. Liu, Y., Zhang, W., Sileika, T., Warta, R., Cianciotto, N.P., and Packman, A.I., 2009, Role of bacterial adhesion in the microbial ecology of biofilms in cooling tower systems, *Biofouling*, 25:3, 241-253, DOI 10.1080/08927010802713414.
- 113. Chen, C., Packman, A. I., and Gaillard, J.-F. 2008, Pore-scale analysis of permeability reduction resulting from colloid deposition, *Geophysical Research Letters*, 35, L07404, DOI10.1029/2007GL033077.
- 114. Battin, T.J., Kaplan, L.A., Findlay, S., Hopkinson, C.S., Marti, E., Packman, A.I., Newbold, J.D., and Sabater, F., 2008, Biophysical controls on organic carbon fluxes in fluvial networks, *Nature Geoscience*, 1, 95-100, DOI10.1038/ngeo101.

- 115. Marion A., Packman, A.I., Zaramella, M., and Botticin, A., 2008, Hyporheic flow in stratified beds, *Water Resources Research*, 44, W09433, DOI10.1029/2007WR006079.
- 116. Cardenas, M.B., Harvey, J.W., Packman, A.I., and Scott, D.T., 2008, Ground-based thermography of fluvial systems at low and high discharge reveals potential complex thermal heterogeneity driven by flow variation and bioroughness, *Hydrological Processes*, 22(7), 980-986, DOI10.1002/hyp.6996.
- 117. Wörman, A., Packman, A.I., Marklund, L., Harvey, J.W., and Stone, S.H., 2007, Fractal topography and subsurface water flows from fluvial bedforms to the continental shield, *Geophysical Research Letters*, 34(7), L07402, DOI10.1029/2007GL029426 [Editor's highlighted article].
- 118. Boano, F., Packman, A.I., Cortis, A., Revelli, R., and Ridolfi, L., 2007, A continuous time random walk approach to the stream transport of solutes, *Water Resources Research*, 43, W10425, DOI10.1029/2007WR006062.
- 119. Gaillard, J.-F., Chen, C., Stonedahl, S.H., Lau, B.L.T., Keane, D.T, and Packman, A.I., 2007, Imaging of colloidal deposits in granular porous media by x-ray difference micro-tomography, *Geophysical Research Letters*, 34(18), L18404, DOI10.1029/2007GL030514 [Cover article and Editor's highlighted article].
- 120. Arnon, S., Gray, K.A., and Packman, A.I., 2007, Biophysicochemical process coupling controls nitrogen utilization by benthic biofilms, *Limnology and Oceanography*, 52(4), 2007, 1665-1671.
- 121. Arnon, S., Peterson, C.G., Gray, K.A., and Packman, A.I., 2007, Influence of flow conditions and system geometry on nitrate utilization by benthic biofilms: Implications for nutrient mitigation, *Environmental Science & Technology*, 41(23), 8142-8148, DOI10.1021/es0710048.
- 122. Ren, J., and Packman, A.I., 2007, Changes in fine sediment size distributions due to interactions with streambed sediments, *Sedimentary Geology*, 202, 529-537, DOI10.1016/j.sedgeo.2007.03.021.
- 123. Arnon, S., Packman, A.I., Peterson, C.G., and Gray, K.A., 2007, Effects of overlying velocity on periphyton structure and denitrification, *JGR-Biogeosciences*, 112, G01002, DOI10.1029/2006JG000235.
- 124. Ryan, R.J., Packman, A.I., and Kilham, S.S., 2007, Relating phosphorus uptake to changes in transient storage and streambed sediment characteristics in headwater tributaries of Valley Creek, an urbanizing watershed, *Journal of Hydrology*, 336(3-4), 444-457.
- 125. Searcy, K.E., Packman, A.I., Atwill, E.R., and Harter, T., 2006, Capture and retention of *Cryptosporidium* parvum oocysts by *Pseudomonas aeruginosa* biofilms, *Applied and Environmental Microbiology*, 72(9), DOI10.1128/AEM.00344-06, 6242-6247 [Cover article].
- 126. Cortis, A., Harter, T., Hou, L., Atwill, E.R., Packman, A.I., and Green, P.G., 2006, Transport of *Cryptosporidium parvum* in porous media: Long-term elution experiments and continuous time random walk filtration modeling, *Water Resources Research*, 42, W12S13, DOI10.1029/2006WR004897.
- 127. Packman, A.I., Marion, A., Zaramella, M., Chen, C., Gaillard, J-F, and Keane, D., 2006, Development of layered sediment structure and its effects on pore water transport and hyporheic exchange, *Water, Air, and Soil Pollution: Focus*, 6(5-6), DOI10.1007/s11267-006-9057-y.
- 128. Ryan, R.J., and Packman, A.I., 2006, Changes in streambed sediment characteristics and solute transport in the headwaters of Valley Creek, an urbanizing watershed, *Journal of Hydrology*, 323(1-4), 74-91, DOI10.1016/j.jhydrol.2005.06.042.
- 129. Searcy, K.E., Packman, A.I., Atwill, E.R., and Harter, T., 2006, Deposition of *Cryptosporidium* oocysts by stream-subsurface exchange, *Applied and Environmental Microbiology*, 72(3), 1810-1816.
- 130. Wörman, A., Packman, A.I., Marklund, L., Harvey, J.W., and Stone, S.H., 2006, Exact three-dimensional spectral solution to surface-groundwater interactions with arbitrary surface topography, *Geophysical Research Letters*, 33(7), L07402, DOI10.1029/2006GL025747 [Editor's highlighted article].
- 131. Zaramella, M., Marion, A. and Packman, A.I., 2006, Applicability of the Transient Storage Model to the hyporheic exchange of metals and colloids, *Journal of Contaminant Hydrology*, 84(1-2), 21-35.
- 132. Wörman, A., Kløve, B., Wachniew, P., Czupryński, P., and Packman, A., 2005, Tracer test in Hobøl Creek, Norway, under different flow conditions, *Acta Geophysica Polonica*, 53(4), 517-526.
- 133. Rehg, K.J., Packman, A.I., and Ren, J. 2005, Effects of suspended sediment characteristics and bed sediment transport on streambed clogging, *Hydrological Processes*, 19(2), 413-427.

- 134. Searcy, K.E., Packman, A.I., Atwill, E.R., and Harter, T., 2005, Association of *Cryptosporidium parvum* with suspended particles: Impact on oocyst sedimentation, *Applied and Environmental Microbiology*, 71(2), 1072-1078.
- 135. Ren, J., and Packman, A.I., 2005, Coupled stream-subsurface exchange of colloidal hematite and dissolved zinc, copper and phosphate, *Environmental Science & Technology*, 39(17), 6387-6394.
- 136. Salehin, M., Packman, A.I., and M. Paradis, 2004, Hyporheic exchange with heterogeneous streambeds: Modeling and laboratory experiments, *Water Resources Research*, 40(11), W11504, DOI10.1029/2003WR002567.
- 137. Ren, J., and Packman, A.I., 2004, Stream-subsurface exchange of zinc in the presence of silica and kaolinite colloids, *Environmental Science & Technology*, 38(24), 6571-6581.
- 138. Packman, A.I., Salehin, M., and Zaramella, M. 2004, Hyporheic exchange with gravel beds: Basic hydrodynamic interactions and bedform-induced advective flows, *Journal of Hydraulic Engineering*, 130(7), 647-656.
- Ren, J., and Packman, A.I. 2004, Modeling of simultaneous exchange of colloids and sorbing contaminants between streams and streambeds, *Environmental Science & Technology*, 38(1), DOI10.1021/es034852l, 2901-2911.
- 140. Packman, A.I., and Jerolmack, D. 2004, The role of physicochemical process in controlling sediment transport and deposition in turbidity currents, *Marine Geology*, 204(1-2), DOI10.1016/S0025-3227(03)00359-1, 1-9.
- 141. Ryan, R.J., Packman, A.I., and Welty, C. 2004, Estimation of solute transport and storage parameters in a stream with anthropogenically produced unsteady flow and industrial bromide input, *Water Resources Research*, 40(1), W01602, DOI10.1029/2003WR002458.
- 142. Packman, A.I., and MacKay, J. S. (2003). Interplay of stream-subsurface exchange, clay particle deposition, and streambed evolution. *Water Resources Research*, 39(4), DOI 10.1029/2002WR001432.
- 143. Packman, A.I., Battin, T.J., and Newbold, J.D. 2003, Coupling of hydrodynamical, biological, and geochemical processes in streambeds, *Archives of Hydro-Engineering & Environmental Mechanics*, 50(2), 107-123.
- 144. Salehin, M., Packman, A.I., and Wörman, A. 2003, Comparison of hyporheic exchange in vegetated and unvegetated reaches of a small agricultural stream in Sweden: Seasonal variation and anthropogenic manipulation, *Advances in Water Resources*, 26(9), 951-964, DOI 10.1016/S0309-1708(03)00084-8.
- 145. Zaramella, M., Packman, A.I., and Marion, A. 2003, Application of the Transient Storage Model to analyze advective hyporheic exchange with deep and shallow sediment beds, *Water Resources Research*, 39(7), DOI10.1029/2002WR001344.
- 146. Ren, J., and Packman, A.I. 2003, Stream-subsurface exchange, suspended sediment transport, and the coupled transport of colloids and contaminants in streambeds, *International Journal of Sediment Research*, 18(2), 199-207.
- 147. Packman, A.I., and Salehin, M. 2003, Relative roles of stream flow and sedimentary conditions in controlling hyporheic exchange, *Hydrobiologia*, 494, 291-297.
- 148. Marion, A., Zaramella, M., and Packman, A.I. 2003, Parameter estimation of the Transient Storage Model for stream-subsurface exchange, *Journal of Environmental Engineering*, 129(5), 456-463.
- 149. Marion, A., Bellinello, M., Guymer, I., and Packman, A.I. 2002, Effect of bed form geometry on the penetration of passive solutes into a stream bed, *Water Resources Research*, 38(10), 1209, DOI10.129/2001WR000264.
- 150. Ren, J., and Packman, A.I. 2002, Effects of particle size and background water composition on streamsubsurface exchange of colloids, *Journal of Environmental Engineering*, 128(7), 624-634.
- 151. Wörman, A., Packman, A.I., Johansson, H., and Jonsson, K. 2002, Effect of flow-induced exchange in hyporheic zones on longitudinal transport of solutes in streams and rivers, *Water Resources Research*, 38(1), 1001, DOI10.129/2001WR000769.
- 152. Ren, J., Packman, A.I., and Welty, C. 2001, Analysis of an observed relationship between colloid collision efficiency and mean collector grain size, *Colloids and Surfaces (a)*, 191(1-2), 133-144.
- 153. Packman, A.I., and Brooks, N.H. 2001, Hyporheic exchange of solutes and colloids with moving bedforms, *Water Resources Research*, 37(10), 2591-2605.

- 154. Ren, J., Packman, A.I., and Welty, C. 2000, Correlation of colloid collision efficiency with hydraulic conductivity of silica sands, *Water Resources Research*, 36(9), 2493-2500.
- 155. Packman, A.I., Brooks, N.H., and Morgan, J.J. 2000, A physicochemical model for colloid exchange between a stream and a sand streambed with bed forms, *Water Resources Research*, 36(8), 2351-2361.
- 156. Packman, A.I., Brooks, N.H., and Morgan, J.J. 2000, Kaolinite exchange between a stream and streambed: Laboratory experiments and validation of a colloid transport model, *Water Resources Research*, 36(8), 2363-2372.
- 157. Packman, A.I., Brooks, N.H., and Morgan, J.J. 1997, Experimental techniques for laboratory investigation of clay colloid transport and filtration in a stream with a sand bed, *Water, Air, and Soil Pollution*, 99, 113-122.
- 158. Packman, A.I., and Brooks, N.H. 1995, Colloidal particle exchange between stream and stream bed in a laboratory flume, *Marine and Freshwater Research*, 46, 233-6.

### **Conference Proceedings and Other Publications:**

- 1. Luo, H., Collis, S.M, Crisologo, I.A., Horton, D.E., Packman, A., Garcia, M.H., 2022, Prediction of urban flooding risks using high-resolution modeling and hybrid rainfall Data, *Proceedings of the 39th IAHR World Congress, Granada, Spain, June 2022.*
- 2. Urban Water Resources Research Council Pathogens in Wet Weather Flows Technical Committee, 2014, *Pathogens in Urban Stormwater Systems*, ASCE Technical Committee Report, 268 pp.
- 3. Packman, A.I., Larned, S., Plew, D., and Vopel, K., 2008, Modification of river hydraulics by the invasive diatom *Didymosphenia geminata*, *Proceedings of the ASCE/EWRI World Water and Environmental Resources Congress, Honolulu, May 2008.*
- 4. Stott, R., Davies-Colley, R., Nagels, J. and Packman, A., 2007, Flume studies of uptake of faecal microbes and turbidity in gravel streambeds, *Proceedings of the 11th International IWA Conference on Diffuse Pollution, Brazil, August, 2007.*
- 5. Matos, J.E.R., Welty, C., and Packman, A.I. 2003, Stream-groundwater interactions: The influence of aquifer heterogeneity and stream meandering on 2-D and 3-D hyporheic exchange flows, *Proceedings of MODFLOW and More 2003: Understanding through Modeling, Golden, Colorado, Sept. 17-19, 2003.*
- 6. Packman, A.I, and Ren, J. 2003, Multi-phase contaminant transport in sediment beds. *Proceedings of the ASCE/EWRI World Water and Environmental Resources Congress, Philadelphia, June 22-26, 2003.*
- 7. Packman, A.I., Battin, T.J., and Newbold, J.D. 2002, Challenges in Ecohydraulics: Biophysicochemical processes at the stream-subsurface interface. *Proceedings of the 5<sup>th</sup> International Conference on Hydroscience and Engineering, Warsaw, Poland, Sept. 18-20, 2002.*
- 8. Packman, A.I. 2001, Re-examination of the wash load concept: Role of physicochemical processes, *Proceedings of the ASCE/EWRI World Water and Environmental Resources Congress, Orlando, May 20-24, 2001.*
- 9. Jerolmack, D., and Packman, A.I. 2001, Sedimentation and subsurface particle capture in a stream-side flume with a gravel bed, *Journal of Undergraduate Study and Independent Research*, 1(1), 22-26.
- 10. Packman, A.I., Mackay, J.S., and Newbold, J.D. 2000, Variations in organic particle deposition rate and streamsubsurface exchange due to silt accumulation in a gravel bed, *Proceedings of the ASCE/EWRI Joint Conference on Water Resources Engineering and Water Resources Planning and Management, Minneapolis, July 30 - Aug.* 2, 2000.
- 11. Packman, A.I. 1999, Scaling bedform-driven exchange between a stream and a finite stream bed, *Proceedings of the XXVIII IAHR Congress, Graz, Austria, August, 1999.*

### **Presentations**

### **Presentation Awards**

The Peter Gilbert Award for Excellence in Innovation and Biofilm Control, A.I. Packman, W. Zhang, T. Sileika, Y. Liu, and C. Chen, Interplay between environmental gradients and biofilm growth, 5th ASM Conference on Biofilms, 2009.

### **Keynote and Plenary Presentations:**

Great Lakes Shoreline Resilience: A Science-Policy Confluence Conference, Chicago, Illinois, October 2022. 13th International Symposium on Ecohydraulics, Lyon, France, May/November 2020.

Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology, and Geochemistry, Andover NH, June 2019.

International Conference on Groundwater, Bogota, Colombia, August 2017.

ISSM Ninth International Symposium on Subsurface Microbiology, Pacific Grove, California, October 2014.

XXVII Nordic Hydrological Conference - Nordic Water 2012, Oulu, Finland, August 2012.

Sixth International Symposium on Ecohydraulics, Christchurch, New Zealand, February 2007.

Second Iowa Workshop on Large Rivers, Contaminated Sediments: Fate and Transport, Lucille A. Carver Mississippi Riverside Environmental Research Station, Fairport, Iowa, October 2004.

Kerner von Marilaun Workshop: Long Term Development in Fluvial Ecology, Nov. 2003.

Gordon Conference on Permeable Sediments, Bates College, Lewiston, Maine, June 2003.

Savannah River Site Workshop, Department of Energy, Office of Science, March 2003.

AWRA Specialty Conference, Water Quality Monitoring and Modeling, San Antonio, April 2001.

### **Invited Presentations**

Saint Anthony Falls Laboratory, University of Minnesota, April 2022

Second Annual U.S.- Israel Energy Center Event, Binational Industrial Research and Development Foundation, April 2022 (virtual)

The Nature Conservancy, Illinois Science Advisory Committee meeting, December 2021 (virtual)

Mazarine Ventures, University Research & Technology Roundtable: Water and Wastewater, June 2021 (virtual) AIChE, 3rd Annual Water Conference, December, 2020 (virtual)

European Society of Clinical Microbiology and Infectious Diseases (ESCMID), Conference on Coronavirus Disease, September, 2020 (virtual)

Telluride Science Research Center workshop, Water: Grand Challenges for Molecular Science and Engineering, Telluride, CO, June 2019

ELPC Science-Policy Confluence Conference: Climate Change Impacts on the Great Lakes, Chicago, Mar. 2019 International Conference on Integrated and Innovative Solutions for Circular Economy, Taipei, October 2018. Array of Things Workshop, Argonne National Lab, August 2018.

University of Birmingham, Institute for Global Impact, Birmingham, UK, July 2018.

Institute for Urban Ecology, Chinese Academy of Sciences, June, 2018.

14<sup>th</sup> Sustainable Water Environment Conference, Xiamen, China, June 2018.

Indiana University, November, 2017.

City of Taipei Department of Public Works and Department of Information Technology, August, 2017.

Workshop on Sustainable Water Environment, National Taiwan University, August, 2017.

HydroEco 2017: The 7th International Conference on Hydrology and Ecology, Birmingham, UK, June 2017.

Asia Belmont Forum Food-Energy-Water Nexus Workshop, Taipei, Taiwan, February 2017.

University of California, Irvine, December 2016.

APLU CEO/CICEP Joint Summer Meeting, Fourth Annual Innovation and Economic Prosperity Universities Workshop. Presentation and Panel Discussion: Rethinking Higher Education in the New World of Global Workforce Training, Chicago, July 2016.

The Nature Conservancy, Urban Conservation Retreat, Chicago, May 2016.

Midwest Food-Energy-Water Systems Spoke. Midwest Regional Big Data Hub All-Hands Meeting. Rosemont, IL, March 2016.

International Conference on Hydro-Biogeochemical Processes, Coupling, and Impact, Wuhan, October 2015.

Tsinghua University, Department of Hydraulic Engineering, October 2015.

Helmholtz Center for Environmental Research – UFZ, Leipzig, June 2015.

HypoTrain Marie Curie ITN, Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB), Berlin, June 2015. Society for Freshwater Sciences Annual Meeting, Milwaukee, May 2015.

University of California, Davis, March 2015.

Argonne National Laboratory, February 2015.

University of Pennsylvania, January 2015.

M. Gordon Wolman Seminar, Johns Hopkins University, January 2015.

Royal Institute of Technology (KTH), Sweden, September 2014.

Virginia Tech, September 2014.

Joint Aquatic Sciences Meeting, Portland, May 2014.

AGU Fall Meeting, San Francisco, December 2013.

CIESS Distinguished Speaker, University of Texas, October 2013.

International Workshop on Observation and Modeling of Ecohydrological Processes in Inland River Basins, Beijing, July, 2013.

Digital Crust: A Joint NSF EarthCube and USGS Powell Synthesis Center Workshop, Jan. 2013.

AGU Fall Meeting, San Francisco, December 2012.

University of Notre Dame, Department of Civil & Environmental Engineering & Earth Sciences, October 2012.

University of Illinois, Department of Civil and Environmental Engineering, August 2012.

Ecotoxicity Technical Advisory Panel, July 2012.

Workshop on the Physics of Bacterial Communities, Nieuwland Lectureship Series, University of Notre Dame and Argonne National Laboratory, June 2012.

University of Illinois-Chicago, Urban Water Infrastructure, Policy, and Infectious Diseases Seminar Series, March 2012.

3<sup>rd</sup> Workshop on stochastic transport and emergent scaling in earth-surface processes, Lake Tahoe, Oct. 2011.

EGU General Assembly, Vienna, April 2011.

AGU Fall Meeting, San Francisco, December 2010.

Illinois Science and Technology Leadership Seminar Series (presentation to Illinois congressional delegation and science committee staff), Washington, D.C., October, 2010.

ASLO/NABS Joint Meeting, Santa Fe, June 2010.

AGU Fall Meeting, San Francisco, December 2009.

AGU-CGU Joint Assembly, Toronto, May 2009.

Washington University, Department of Energy, Environmental and Chemical Engineering, February 2009.

University of Washington, Department of Microbiology, August, 2008.

Technical Meeting on Sediment Conclusion Testing, EU REACH program, Copenhagen, Denmark, June, 2008.

Universidad Tarapacá de Arica, Faculty of Sciences, Arica, Chile, April, 2008.

Pontificia Universidad Católica de Chile, Department of Hydraulic and Environmental Engineering, Santiago, Chile, March, 2008.

University of Nevada-Reno, Hydrologic Sciences Program, February, 2008.

Workshop on Stochastic Transport and Emergent Scaling in Earth-surface Processes, Lake Tahoe, Nov. 2007.

Universidad de Chile, Department of Hydraulic and Environmental Engineering, Santiago, Chile, June 2007.

Stanford University, Department of Civil and Environmental Engineering, March 2007.

New Zealand National Institute of Water and Atmospheric Research (NIWA), National Centre for Water Resources, Christchurch, New Zealand, January 2007.

Geological Society of America, Annual Meeting, Philadelphia, Pennsylvania, October 2006.

University of Illinois, Department of Civil and Environmental Engineering, October 2006.

University of California, Davis, Department of Land, Air, and Water Resources, May 2006.

Massachusetts Institute of Technology, Department of Civil and Environmental Engineering, April 2006.

Tsinghua University, Department of Hydraulic Engineering, Beijing, China, March 2006.

Southwest Jiaotong University, School of Civil Engineering and School of Environmental Science and Engineering, Chengdu, China, March 2006.

University of Notre Dame, Department of Civil Engineering and Geological Sciences, March 2006.

Pontificia Universidad Católica de Chile, Department of Hydraulic and Environmental Engineering, Santiago, Chile, October 2005.

Geological Society of America, Annual Meeting, Salt Lake City, October 2005.

UNESCO Workshop on Groundwater-Surface Water Interactions and Nutrient Behavior in River Corridors, University of Oxford, UK, September 2005.

AGU-NABS Joint Assembly, New Orleans, May 2005.

University of Arizona, Department of Hydrology and Water Resources, February 2005

Oregon State University, University Hydrology Seminar Series, April 2003.

5<sup>th</sup> International Conference on Hydroscience and Engineering, Warsaw, Poland, September 2002.

Swedish University for Agricultural Sciences (SLU), Dept. of Biometry and Informatics, September 2002.

U.S.-Chinese Joint Workshop on Sediment Transport and Environmental Studies, Milwaukee, July 2002.

AGU Spring Meeting, Washington, D.C., May 2002.

University of Wisconsin, Environmental Chemistry and Technology Program, February 2002.

Uppsala University, Sweden, Department of Earth Sciences, September 2001.

EPA National Exposure Research Lab, Athens, Georgia, June 2001.

Georgia Institute of Technology, School of Civil and Environmental Engineering, October 2000.

DuPont Workshop on Modeling and Management of Emerging Environmental Issues, July 2000.

University of Arizona, Department of Hydrology and Water Resources, March 2000.

Purdue University, School of Civil Engineering, March 2000.

Northwestern University, Department of Civil and Environmental Engineering, February 2000.

University of Texas, Department of Civil Engineering, February 2000.

Temple University, Department of Geology, February 2000.

DuPont Corporate Remediation Group, Wilmington, November 1999.

University of Delaware, Department of Geology, October 1999.

University of Colorado, Dept. of Civil, Environmental, and Architectural Engineering, April 1999

U.S. Geological Survey, Trenton District Office, September 1997.

### **Conference Presentations (last two years):**

- Hydraulic and Biochemical Optimization of Soil-Aquifer Systems Impacted by Bioclogging, E Saavedra Cifuentes, N Weisbrod, A Furman, AI Packman, AGU Fall Meeting 2023
- Pilot Testing of Novel Cyclodextrin Based Polymer Adsorbents for Removal of Trace Organic Contaminants from Wastewater, E. Shapiro, ZW Lin, A Packman, W Dichtel, F Barajas, AGU Fall Meeting 2023
- Stormwater Storage and Ecological Resilience of Restored Urban Prairies, C O'Brien, J Jenkins, V Rivera, L Maria Hernandez Gonzalez, K Gnaedinger, E Pfeiffer, W Miller, A Packman, S Tripp, M Lopez-Salazar, AGU Fall Meeting 2023
- Evaluating the Ability of Wastewater Surveillance Data to Inform Predictive Disease Models Using Structural and Practical Identifiability Analysis, M Warns, K Plaisier Leisman, S Diao, G Chen, D Morton, J Gerardin, A Packman, N Mangan, AGU Fall Meeting 2023
- Relating SARS-CoV-2 RNA Measured in Wastewater Treatment Plants in Illinois to COVID-19 Public Health Data, K Plaisier Leisman, A Gokcan, M Warns, A Horton, C Owen, M Pierce, L Clements, C Catlett, A Tiwari, A Shrestha, R Poretsky, A Packman, N Mangan, AGU Fall Meeting 2023
- Opportunities And Challenges in Measuring and Modeling the Chicago Earth System, SM Collis, C Negri, P Beckman, R Sankaran, C Cattlet, A Packman, M Garcia, H Luo, J Wang, H Tan, G Anderson, M Berkelhammer, SW Nesbitt, DA Hence, TJ Wagner, J Wang, 103rd AMS Annual Meeting 2023
- Modeling Unsaturated Flow and Bioclogging to Optimize SAT Operation Strategies, E Saavedra Cifuentes, AI Packman, A Furman, I Arad, N Weisbrod, AGU Fall Meeting 2022
- Modeling Unsaturated Flow and Bioclogging to Optimize SAT Operation Strategies, E Saavedra Cifuentes, AI Packman, A Furman, I Arad, N Weisbrod, AGU Fall Meeting 2022
- Identifying stormwater inputs and their impacts on soil and habitat quality of restored urban prairies, C O'Brien, J Jenkins, VA Rivera, LM Hernandez Gonzalez, J Gurneau, E Pfeiffer, KJ Gnaedinger, WM Miller, AI Packman, AGU Fall Meeting 2022
- Using Cyclodextrin Polymers to Remove PFAS and Trace Organic Contaminants from Municipal Wastewater, ZW Lin, E Shapiro, AI Packman, W Dichtel, AGU Fall Meeting 2022
- Rapid Small-Scale Column Testing for Evaluation of Pollutant Removal Efficiency by Cyclodextrin Polymer, E Shapiro, ZW Lin, AI Packman, W Dichtel, AGU Fall Meeting 2022
- In Situ Sensing of Manoomin (Wild Rice) Habitat to Create a Voice for Plant Relatives, J Gurneau, C O'Brien, VA Rivera, A Curtis, M O'Connell, A Cottrell, N Tillison, J Gilbert, J Coleman, R Sankaran, J Hester, WM Miller, AI Packman, AGU Fall Meeting 2022
- Quantifying Head and Hyporheic Fluxes in Moving Bedforms with variable size and shape, S Arnon, Y Teitelbaum, T Shimony, E Saavedra Cifuentes, AI Packman, SK Hansen, AGU Fall Meeting 2022
- Relating SARS-CoV-2 RNA Measured in Chicago-area Wastewater Treatment Plants and Cook County COVID-19 Public Health Data, K Leisman, M Warns, A Tiwari, C Owen, C Catlett, R Poretsky, A Shrestha, AI Packman, N Mangan, AGU Fall Meeting 2022
- Exploring the environmental and social benefits of vacant land redevelopment: a partnership between educators, NGOs, and scientists, C O'Brien, J Jenkins, VA Rivera, J Gurneau, R Jones, S Young, EL Cabonargi, WM Miller, P Guilianelli, AI Packman, SE Ippel, AGU Fall Meeting 2022

- Pandemic Intelligence: Linking Wastewater Infrastructure, Microbial Ecology, and Hydrological Time-Series Analysis to Provide Population-Level Information for COVID-19 Response, AI Packman, R Poretsky, S Owens, CE Catlett, M Grippo, A Tiwari, A Shrestha, S Dorevitch, C Owen, L Clements, M Pierce, AGU Fall Meeting 2022
- Prediction of urban flooding risks using high-resolution modeling and hybrid rainfall data, H Luo, SM Collis, IA Crisologo, DE Horton, A Packman, MH Garcia, 39th IAHR World Congress 2022.
- Identifying anthropogenic impacts on water temperature in urban rivers, C OBrien, WM Miller, AI Packman, Frontiers in Hydrology Meeting 2022
- A novel framework for simulating flow and transport processes during bedforms movement, S Arnon, Y Teitelbaum, T Shimony, E Cifuentes, J Dallmann, C Phillips, A Packman, S Hansen, EGU General Assembly 2022
- Estimating head induced by moving bedforms using dye tracer tests and modeling, Y Teitelbaum, T Shimony, E Saavedra Cifuentes, A Packman, S Arnon, S Hansen, EGU General Assembly 2022
- Kaolinite deposition and clogging of moving streambeds under losing and gaining flow conditions, T Shimony, E Saavedra Cifuentes, A Packman, Y Teitelbaum, S Arnon, EGU General Assembly 2022
- Turbulence Drives Hyporheic Exchange and Fine Particle Deposition across the Entire Riverbed Surface., Edwin Saavedra Cifuentes, Jonathan Dallmann, Colin B. Phillips, Yoni Teitelbaum, Shai Arnon, Nicole L. Sund, Rina Schumer, Aaron I. Packman, and Gregory Wagner, AGU Fall Meeting, December 2021
- Comparison of stormwater dynamics and storage capacity among urban prairies of varying ecological quality, Colleen O'Brien, Jennifer Jenkins, Vivien A. Rivera, Liliana Maria Hernandez Gonzalez, Karl J. Gnaedinger, Jordan Gurneau, William M. Miller, and Aaron I. Packman, AGU Fall Meeting, December 2021
- Internal Spatio-temporal Dynamics of Greenspaces Influence Connectivity to Urban Landscapes, Vivien A. Rivera, Liliana Maria Hernandez Gonzalez, Colleen O'Brien William M. Miller, and Aaron I. Packman, AGU Fall Meeting, December 2021
- Dynamic streambed patches Impact of sediment migration on the ecology and biogeochemistry of benthic and hyporheic communities, Ute Risse-Buhl, Shai Arnon, Edo Bar-Zeev, Anna Oprei, Aaron I. Packman, Ignacio Peralta-Maravar, Anne Robertson, Yoni Teitelbaum, Michael Mutz, 12th Symposium for European Freshwater Sciences, July 2021.
- Residence Time in Hyporheic Bioactive Layers Explains Nutrient Uptake in Streams, Eugènia Martí, Angang Li, Susana Bernal, Brady Kohler, Steven A. Thomas, and Aaron I. Packman, EGU General Assembly, May 2021.
- Streambeds in motion Impact of sediment migration on the ecology and biogeochemistry of benthic and hyporheic communities. Ute Risse-Buhl, Shai Arnon, Edo Bar-Zeev, Anna Oprei, Aaron I. Packman, Ignacio Peralta-Maravar, Anne Robertson, Yoni Teitelbaum, Michael Mutz, Society for Freshwater Science Annual Meeting, May 2021.

#### **Teaching and Mentoring**

#### **Teaching Philosophy:**

My core teaching philosophy encompasses two main elements:

<u>Technical skills should always be developed in the context of important problems and systems</u>. This not only provides a framework for integrating skills and experiences, thereby improving learning and retention of the primary material, but also provides a strong motivation for learning, contributes to development of problem-solving capability beyond the primary material, and fosters a broad technical background and familiarity with current societal issues.

Every aspect of every course should be a learning opportunity. Transmitting factual information and analytical methodology is straightforward, but broader skills are often de-emphasized in conventional courses. I use assignments such as laboratory exercises, student-led discussions, group projects, and case studies to supplement conventional assessment tools such as examinations and homework assignments. This approach trains students to critically evaluate diverse problems, to work in teams, to develop communication skills, to exercise laboratory skills, and to acquire practical, hand-on experience with realistic environmental problems.

#### **Courses Taught at Northwestern University:**

GEN ENG 205-2 Engineering Analysis II (Freshman Level) CIV ENV 260 Fundamentals of Environmental Engineering (Sophomore Level) CIV ENV 261 Environmental Engineering Analysis (Junior Level) CIV ENV 364 Ecohydrology (Undergraduate/Graduate)

CIV ENV 395 Water in Arid Lands (Undergraduate/Graduate Seminar Course) CIV ENV 440 Environmental Transport Processes (Graduate) CIV ENV 448 Biophysicochemical Processes in Environmental Systems (Graduate) CIV ENV 516 Seminar in Environmental Engineering (Graduate)

#### **Courses Taught at Drexel University:**

tDEC 100 Freshman Seminar CIVE 340 Municipal Water Facilities (Junior Level) CIVE 360 Water Quality (Junior Level) CIVE 430 Introduction to Hydrology (Junior/Senior Level) CIVE 767 Surface Water Mixing Processes (Graduate) CIVE 768 Sediment and Contaminant Transport (Graduate)

#### **Short Courses:**

Global Engineering Trek: Water in Israel, Sept. 2018, Sept. 2019

Surface-groundwater Interactions, Politecnico di Torino, May 7 – 24, 2013.

Solute transport and nutrient dynamics from the cellular scale to the river network scale, NSF Hydrologic Synthesis Summer Institute, University of British Columbia, June 24 – August 10, 2010.

Harmful algal blooms in rivers: Invasion and blooming behavior of *Didymosphenia geminata*, NSF Hydrologic Synthesis Summer Institute, University of British Columbia, June 24 – August 10, 2010.

Environmental Transport Processes: Physical phenomena and biogeochemical dynamics in fluvial systems, Pontificia Universidad Católica de Chile, March 6 - 28, 2008.

#### **Research and Thesis Supervision:**

### Current Graduate students (6 Ph.D.):

- 1. J. Noriega, Ph.D. in Civil and Environmental Engineering, Design and efficacy of nature-based solutions in mediating urban watershed hydrology.
- 2. J. Gurneau, Ph.D. in Civil and Environmental Engineering, Hydrologic conditions, water quality, and ecological impacts in Great Lakes tributary watersheds
- 3. E. Saavedra Cifuentes, Ph.D. in Civil and Environmental Engineering, Fine particle dynamics and bioclogging in surface-groundwater interactions.
- 4. C. O'Brien, Ph.D. in Civil and Environmental Engineering, Water storage dynamics in green infrastructure.
- 5. E. Shapiro, Ph.D. in Civil and Environmental Engineering, Design, performance, and regenerability of reactors for PFAS removal from wastewater to support safe water reuse.
- 6. M. Warns, Ph.D. in Engineering Sciences and Applied Mathematics, Probabilistic simulation and estimation of infectious disease prevalence and distribution from wastewater surveillance data.

### Former Ph.D. students (18 Ph.D.):

- 1. L. Hernandez Gonzalez, Ph.D. in Civil and Environmental Engineering, 2021, Anthropogenic impacts, stormwater runoff dynamics and opportunities for upscaling multifunctional urban green spaces using high-frequency sensing.
- 2. J. Dallmann, Ph.D. in Mechanical Engineering, 2021, Across scales: An examination of the impacts of turbulence and mobile bedforms on hyporheic exchange.
- 3. A. Li, Ph.D. in Civil and Environmental Engineering, 2019, Modeling the effects of river-groundwater processes on carbon and nutrient dynamics.
- 4. K. Roche, Ph.D. in Civil and Environmental Engineering, 2017, Turbulent coupling between free-surface and porewaters flows.
- 5. M. Xie, Ph.D. in Civil and Environmental Engineering, 2016, Coupled effects of flow, biogeochemistry, and bioturbation on mobility and efflux of metals from low-permeability sediments.
- 6. X. Li, Ph.D. in Civil and Environmental Engineering, 2016, Feedbacks between biofilms and biomineralization.
- 7. J. Drummond, Ph.D. in Chemical and Biological Engineering, 2015, Fine particle transport and retention in streams: Particulate organic carbon dynamics and pathogen transmission.
- 8. A. Culotti, Ph.D. in Civil and Environmental Engineering, 2014, Environmental biofilms: A reservoir for pathogens in water distribution systems.

- 9. J. Song, Ph.D. in Chemical and Biological Engineering, 2014, Spatiotemporal patterns of biofilm growth, fluid flow and particle retention in *Pseudomonas aeruginosa* biofilms.
- 10. A. Aubeneau, Ph.D. in Civil and Environmental Engineering, 2013, Surface-groundwater mixing in rivers.
- 11. S. Stonedahl, Ph.D. in Civil and Environmental Engineering, 2011, Investigation of the effect of multiple scales of topography on hyporheic exchange.
- 12. W. Zhang, Ph.D. in Civil and Environmental Engineering, 2011, Biofilm heterogeneity and flow-biofilm interactions investigated using a novel planar flow cell.
- 13. S. Waller, Ph.D. in Civil and Environmental Engineering, 2011, co-advised with Martina Hausner), Assessing biofilms in drinking water distribution systems.
- 14. C. Chen, Ph.D. in Civil and Environmental Engineering, 2008, co-advised with Jean-François Gaillard), Porescale investigation of colloid deposition, changing pore geometry, fluid flow, and solute transport in porous media.
- 15. K. Searcy, Ph.D. in Civil and Environmental Engineering, 2005, Transport of *Cryptosporidium parvum* in surface waters: Interactions with suspended sediments, bed sediments, and biofilms.
- 16. M. Salehin, Ph.D. in Civil and Environmental Engineering, 2004, Hydrodynamics of hyporheic exchange for complex natural streambed topography, channel geometry, and sediment structure.
- 17. J. Ren, Ph.D. in Civil and Environmental Engineering, 2003, Exchange of adsorbing contaminants between streams and streambeds in the presence of colloidal particles.
- 18. R. Ryan, Ph.D. in Environmental Engineering, 2004, Drexel University, The impact of urbanization on the transient storage characteristics, phosphorus uptake dynamics and community metabolism of Valley Creek.

### M.S. graduates (14):

- 1. M. Marni, M.S. in Civil and Environmental Engineering, 2018, Specific-ion removal for cooling water reuse.
- 2. L. Ayala, M.S. in Civil and Environmental Engineering, 2017, Microbial biogeography of an urban prairie.
- 3. A. Li, M.S. in Civil and Environmental Engineering, 2016, Fine particle dynamics in rivers.
- 4. C. Duan, M.S. in Civil and Environmental Engineering, 2016, Effects of buoyancy on turbulent hyporheic exchange.
- 5. K.-F. Chen, M.S. in Biotechnology, 2015, Spatial patterns of aerobic and anaerobic metabolism in biofilms.
- 6. K. Huynh, M.S. in Mechanical Engineering, 2014, Visualizing dissolved oxygen concentrations on submerged surfaces using pressure-sensitive paint.
- 7. N. Chiangwong, M.S. in Civil and Environmental Engineering, 2013, co-advised with David Chopp), Image processing and analysis of 3D biofilm data.
- 8. A. Iyer, M.S. in Biotechnology, 2013, Microbial community metabolic efficiency under flow complexity.
- 9. A. Ambekar, M.S. in Biotechnology, 2013, Linking biomineralization and community metabolism in *Proteus mirabilis* catheter biofilm infections.
- 10. M. Barnes, M.S. in Biotechnology, 2009, co-advised with Nicholas Cianciotto, Persistence and survival of *Legionella pneumophila* in biofilms.
- 11. R. Rajbanshi, M.S. in Civil and Environmental Engineering, 2008, Imaging fine particle interactions with bacterial biofilms in flow cells.
- 12. J. Miceli, M.S. in Civil and Environmental Engineering and Masters of Project Management, 2006, Biofilm growth in cooling towers.
- 13. L. Marx, B.S./M.S. in Civil and Environmental Engineering, 2006, Deposition, retention, and resuspension of fine particles in benthic biofilms.
- 14. J. MacKay, B.S./M.S. in Civil Engineering, 2001. Drexel University, Linking stream-subsurface interactions, streambed structure, and fine particle dynamics in rivers.

### **Post-Doctoral Researchers (10):**

- 1. K. Leisman (2021-2022), Data analysis and normalization for SARS-CoV-2, influenza, and RSV wastewater surveillance.
- 2. V. Venkataramanan, (2017-2021), Benefits of urban green infrastructure on water insecurity.
- 3. C. Phillips (2016-2020), Anomalous fine particles dynamics and surface-groundwater exchange processes.
- 4. N. Lv (2014-2016), Microbial dynamics in watersheds.
- 5. J. Drummond (2015-2016), Stochastic modeling of river-groundwater interactions.
- 6. W. Zhang (2011-2013), Relationships between environmental heterogeneity and biofilm heterogeneity.

- 7. S. Waller (2011), Microarray analysis of microbial communities in drinking water distribution biofilms.
- 8. Y. Liu (2007-2008), Biofilm adhesion, growth, and control on industrial and environmental surfaces.
- 9. B. Lau (2005-2007), Association of *Cryptosporidium parvum* with benthic biofilms.
- 10. S. Arnon (2004-2006), Pore water fluxes, periphyton structure, and denitrification in streams and wetlands.

### Visiting Scholars (20):

- 1. A. Tiwari, University of Illinois Chicago, 2021-present, Vulnerability-based SARS-CoV-2 wastewater surveillance.
- 2. H.L. Choi, National Seoul University, 2019, Integrated systems for wastewater reuse.
- 3. P.C. Chen, National Taiwan University, 2019, Electrochemical deionization for water reuse.
- 4. J. Gurneau, Northeastern Illinois University, 2018-2019, Ecohydrological characterization of an urban prairie nature preserve.
- 5. D. Croghan, University of Birmingham, 2018-2019, High-frequency monitoring of water flow, temperature, and dissolved organic carbon in urban waterways.
- 6. A. Preziosi-Ribero, Fulbright Fellow, Universidad Nacional de Colombia, 2016-2017), Stochastic modeling of fine particle dynamics in rivers with groundwater recharge and discharge.
- 7. G. Martinez (University of Puerto Rico at Mayagüez, 2017), Soil and water quality monitoring of an urban prairie
- 8. M. Boehm (Bucknell University, 2015), Monitoring of water, carbon, and nutrients in urban agriculture.
- 9. L. Hernández-Gonzalez (University of Puerto Rico at Mayagüez, 2014), Porewater exchange of nutrients and contaminants.
- 10. Y. Bai (Southwest Jiaotong University, Chengdu, China, 2012 2014), Coupling between pore fluid flow and carbonate precipitation/dissolution.
- 11. C. Vidali (Politecnico di Torino, 2013), Biogeochemical dynamics and clogging in river bedforms (Laurea thesis).
- 12. A. Vega, Loyola Marymount University, 2013, Contaminant fluxes in sediments.
- 13. Q. Le, Tokyo Institute of Technology, 2013, Nutrient interactions with suspended sediments and biofilms.
- 14. M. Xie, Southwest Jiaotong University, Chengdu, China, 2011 2013, Physical, chemical, and biological factors influencing contaminant fluxes and bioavailability in sediments.
- 15. D. Peng, Southwest Jiaotong Univ., 2008 2010, Arsenic distributions in sediments of the rivers of northern Chile.
- 16. F. Boano, Politecnico di Torino, 2006, A continuous-time random walk model for solute transport in rivers.
- 17. G. Singer, Univ. Vienna, 2005, Relating morphological heterogeneity to microbial heterogeneity in streambeds.
- 18. D. Giuliani, Univ. Padova, 2003, Solute transport in structured streambeds (Laurea thesis).
- 19. M. Zaramella, Univ. Padova, 2001, Theoretical evaluation of the principal parameters of the transient storage model for hyporheic exchange (Laurea thesis).
- 20. D. Jerolmack, MIT, 2001, Physicochemical processes in turbidity currents.

### **Undergraduate Research Supervised (53):**

Northwestern University: M. Weiss (2022), M. Gass (2021), H. Waxman (2019), V. Huang (2019), J. Gurneau (2018-2019), M. Payne (2018), M. Zuckerman (2017-2018), D. Packman (2016-2018), L. Ayala (2016-2017), G. Martinez (2017), A. Bartholow (2017), K. Chen (2017), J. Vega-Perkins (2016-2017), C. Kauzlaric (2016-2017), J. Pradhan, (2016), A. Hadzic (2015-2016), B. Bizrat (2015-2016), A. Acosta (2015-2016), C. MacArthur (2015-2016), L. Hernandez Gonzalez (2014-2015), H. Brady (2014-2015), T. Sevilla (2014-2015), M. Baker (2012-2015), K. Huynh (2012-2014), Z. Allen (2014), R. Scholes (2013-2014), D. Russman (2012-2014), M. Wagner (2012-2013), E. Zhuang (2012-2013), B. Gibbons (2011-2013), A. Salus (2010-2013), K. Au (2011-2013), P. House (2011-2012), K. Tsang (2011), K. Simonson (2010-2011), A. Cheema (2011), E. Herberg (2008-2011), M. El Natour (2008-2010), G. Kim (2008-2010), L. Rossi (2008-2010), J. Chhun (2008-2009), A. Rahman (2008-2009), K. Ruehlow (2008-2009), T. Sileika (2007-2009), L. MacDonald (2007-2008), M. Pakula (2007-2008), A. Jones (2007), J. Kessler (2006), L. Marx (2004-2005), K. Rehg (2002-2003), L. Pigion (2003), M. Paradis (2002).

Drexel University: D. Jerolmack (1999-2000), J. MacKay (1999-2000).

### **Student Awards Supervised:**

V. Rivera, DOE Graduate Student Research Fellowship, 2018, Data Fusion and Machine Learning for Analysis of Soil Saturation in Urban Landscapes

L. Hernández-Gonzalez, NSF Graduate Research Fellowship, 2016, Multifunctional green infrastructure for urban water management, biodiversity conservation, and food production.

K. Roche, A. Aubeneau, A. Li, and A. Packman, Outstanding Student Paper Award, AGU Fall meeting, San Francisco, December, 2015. Turbulent hyporheic exchange in permeable sediments.

J.D. Drummond, Fulbright Fellowship for research at Centre d'Estudis Avançats de Blanes, Spain, 2014.

K. Roche, CUAHSI Pathfinder Fellowship, The response of benthic (river bottom) and hyporheic biofilms to varying hydrodynamic conditions, for collaborative research at WasserCluster Lunz and the University of Vienna, Austria, 2014.

K. Huynh and A.I. Packman, Best Poster and Best Overall Presentation for Math, Computer Sciences, Engineering, and Physics. Chicago-Area Undergraduate Research Symposium, April 2014, Visualizing groundwater flow and oxygen distributions with pressure-sensitive paints.

A. Culotti and A.I. Packman, Student Presentation Award: Best Student Presentation, Watercon 2014, Illinois Section AWWA and Illinois Water Environment Association, Springfield, Mar. 2014. Retention, survival and growth of *E. coli* and *C. jejuni* in dual-species biofilms with *P. aeruginosa* under nutrient-limited conditions.

K. Huynh and A.I. Packman, Student Presentation Award, Watercon 2014, Illinois Section AWWA and Illinois Water Environment Association, Springfield, Mar. 2014, Visualizing groundwater flow with pressure sensitive paints.

K. Roche, NSF Graduate Research Fellowship, 2013, Role of turbulence in oxygen and nutrient availability in benthic biofilms.

A.C. Culotti, A.I. Packman, and W. Zhang, Student Presentation Award, Canadian Water Network workshop: Assessing pathogen fate, transport and risk in natural & engineered water treatment, Banff, Sept., 2012. Characterizing the deposition, colonization and growth of planktonic bacteria on environmental biofilms under simulated drinking water conditions and imposed environmental gradients.

J.D. Drummond, EPA STAR Graduate Research Fellowship, 2011, Reducing human health risks from waterborne diseases.

J. Shi, B. Jarrett, S. McNulty, S. Letuchy, K. Tsang, P. Pastén, G. Pizarro, and A. Packman, American Water Works Association Fresh Ideas Poster Competition, 1<sup>st</sup> prize in Drinking Water, Watercon 2011. Illinois Section AWWA and Illinois Water Environment Association, The Thirst Project: Arsenic and boron removal from the Lluta River, Chile.

J. D. Cullis, C. Gillis, M. Bothwell, C. Kilroy, A.I. Packman, and M.A. Hassan. Outstanding Student Presentation Award, 2010 AGU Fall Meeting. A conceptual model for the growth, persistence, and blooming behavior of the benthic mat-forming diatom *Didymosphenia geminata*.

S. Waller, M. Pryor, W. Soucie, A. Packman, and M. Hauser, Student Presentation Award: Best Student Presentation, 2008 AWWA Illinois Section Meeting, Assessing and managing biofilms in drinking water distribution systems.

C. Chen, A.I. Packman, D.T. Keane, J.-F. Gaillard, and B. Lau, Outstanding Student Presentation Award, 2006 AGU Fall Meeting. Use of 3D X-ray computed microtomography to observe *in situ* sediment structure and colloidal zirconia deposits at the pore scale.