

# SUSA H. STONEDAHL

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## CURRENT POSITION

ST. AMBROSE UNIVERSITY, DAVENPORT, IA

***ASSISTANT PROFESSOR OF PHYSICS (2011-PRESENT)***

## EDUCATION

NORTHWESTERN UNIVERSITY, EVANSTON, IL

***Ph.D., Civil and Environmental Engineering (2011)***

*Program: Environmental Engineering & Science*

*Thesis: Investigation of the Effect of Multiple Scales of Topography on Hyporheic Exchange*

*Advisor: Aaron I. Packman*

***MS, Civil and Environmental Engineering (2004)***

CARLETON COLLEGE, NORTHFIELD, MN

***BA, Double Major: Physics and Mathematics (2003)***

Magna Cum Laude

Senior Physics Integrative Exercise (Thesis): Physics of Catfish

Senior Mathematics Integrative Exercise (Thesis): Aperiodic Tiling

Study Abroad (Graz, Austria)

## JOURNAL ARTICLES (REFEREED)

9. **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 Visual Experiments*. (105),e53285,doi:10.3791/53285
8. Pryshlak, T. T., Sawyer, A. H., **Stonedahl, S. H.**, and Soltanian, M. R., 2015, Multiscale hyporheic exchange through strongly heterogeneous sediments, *Water Resour. Res.*, 51, doi:10.1002/2015WR017293

7. **Stonedahl, S. H.**, Harvey, J. W., and Packman, A. I., 2013, Interactions between hyporheic flow produced by stream meanders, bars, and dunes, *Water Resour. Res.*, 49, doi:10.1002/wrcr.20400.
6. **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 Resour. Res.*, 48, 10, doi:10.1029/2011WR011582.
5. 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 a dynamic streambed, *J. Geophys. Res.*, 117, G00N11, doi:10.1029/2012JG002043.
4. **Stonedahl, S.H.**, Harvey, J.W., Wörman, A., Salehin, M., and Packman, A.I., 2010, A multiscale model for integrating hyporheic exchange from ripples to meanders, *Water Resources Research*, 46, W12539, doi:10.1029/2009WR008865.
3. Gaillard, J.-F., Chen, C., **Stonedahl, S.H.**, Lau, B.L.T., Keane, D.T, and Packman, A.I., 2008, Imaging of colloidal deposits in granular porous media by x-ray difference microtomography, *Geophysical Research Letters*, 34(18), L18404, doi:10.1029/2007GL030514 [Cover article and Editor's highlighted article].
2. 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, doi:10.1029/2007GL029426 [Editor's highlighted article].
1. 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, doi:10.1029/2006GL025747 [Editor's highlighted article].

\*Name changed from Stone to Stonedahl in 2007

## CONFERENCE PAPERS (PEER-REVIEWED)

2. Stonedahl, F. and **Stonedahl, S.H.**, 2012, Darwinian Rivers: Evolving Stream Topographies to Match Hyporheic Residence Time Distributions, *Proceedings of the 14<sup>th</sup> Annual Genetic and Evolutionary Computation Conference (GECCO '12)*. July 7-11 Philadelphia, PA
1. Stonedahl, F. and **Stonedahl, S.H.**, 2010, Heuristics for Sampling Repetitions in Noisy Landscapes with Fitness Caching, *Proceedings of the 12<sup>th</sup> Annual Conference of Genetic and Evolutionary Computation Conference (GECCO '10)*. July 7-11. Portland, OR

## PRESENTATIONS/POSTERS/OTHER PUBLICATIONS

30. **Stonedahl, S.H.**, 2016, Spinning the Web of Halloween Physics. 2016 American Association of Physics Teachers (Iowa Section), University of Iowa, November 15, 2016 Iowa City, IA
29. Sward, A, Stonedahl, F., **Stonedahl, S. H.**, 2016, Gotta catch 'em all: Pursuit curves for accelerating prey. MathFest. August 3-6, 2016 Columbus, OH.
28. **Stonedahl, S. H.**, Gibson, C., Reiter, C., Stonedahl, F., Sawyer, A. H., 2015, Impact of Spatial Permeability Distribution Characteristics on Hyporheic Flow Using a Physical System and Simulations. Abstract H31K-02, American Geophysical Union Fall Meeting, December 16, 2015 San Francisco, CA
27. **Stonedahl, S.H.**, Reiter, C, and Stonedahl, F., 2015, Introducing Computer Programming into a Projectile Motion Lab. 2015 American Association of Physics Teachers (Iowa Section), Central Academy, November 7, 2015 Des Moines, IA
26. **Stonedahl, S.H.** and Stonedahl, F., 2015, Puzzles and proofs: an adventure in logic, linear algebra, and graph theory. Mathematics and Computer Science Seminar, Augustana College, May 14, 2015 Rock Island, IL [Invited presentation]
25. **Stonedahl, S. H.**, 2015, The Hyporheic Game [educational board game]. <https://www.thegamecrafter.com/games/the-hyporheic-game>
24. Pryshlak, T.T., Sawyer, A. H., **Stonedahl, S.H.**, Soltanian, M. R., 2014, Understanding the effects of permeability heterogeneity and connectivity on surface water-groundwater exchange using multiscale models. Abstract H31B-0592, American Geophysical Union Fall Meeting, December 17, 2014 San Francisco, CA
23. **Stonedahl, S.H.**, Stonedahl, F., Lohberg, M.M., Lusk, K. and Miller, M. 2013, Photogrammetric Method and Software for Stream Planform Identification. Abstract H43E-1506, American Geophysical Union Fall Meeting, December 12, 2013 San Francisco, CA
22. **Stonedahl, S.H.**, Cooper, D. G., Everingham, J. M., Kraciun, M. K. and Stonedahl, F., 2012, Quantifying the impact on hyporheic flow of assuming homogenous hydraulic conductivity distributions within permeameters. Abstract H13I-06, American Geophysical Union Fall Meeting, December 3, 2012 San Francisco, CA
21. **Stonedahl, S.H.**, 2012, Exploring Hyporheic Exchange Using a Multi-Scale Three-Dimensional Model. Department of Geoscience Seminar, University of Iowa, March 2, 2012 Iowa City, IA [Invited presentation]
20. **Stonedahl, S.H.**, 2011, Impact of Groundwater Discharge on Hyporheic Exchange Flow using a Multi-scale Model. Abstract H44D-02, American Geophysical Union Fall Meeting, December 7, 2011 San Francisco, CA [Invited presentation]

19. **Stonedahl, S.H.**, 2011, How does River Topography Affect Hyporheic Exchange? The CAS and Creativity Circles (RCC), St. Ambrose University, October 28, 2011 Davenport, IA [Invited presentation]
18. **Stonedahl, S.H.** and Stonedahl, F. (2011) Think-Tac-Toe: When are puzzles solvable? In the Recreational Mathematics: New Problems and New Solutions contributed papers session at the MAA MathFest. August 5-6, 2011 Lexington, KY.
17. **Stonedahl, S.H.**, Harvey, J.W., and Packman, A.I. 2011, Complex Interactions of Topographic Scales Affecting Hyporheic Exchange in Fluvial Systems, *NICO Complexity Conference*, Northwestern University, Evanston, IL
16. **Stonedahl, S.H.**, 2011, Ripples to Meanders: A Multi-Scale Three-Dimensional Hyporheic Exchange Model. Physics and Geoscience Seminar, Skidmore College, February 10, 2011 Saratoga Springs, NY [Invited presentation]
15. **Stonedahl, S.H.**, 2011, Ripples to Meanders: A Multi-Scale Three-Dimensional Hyporheic Exchange Model. Civil, Construction, and Environmental Engineering Seminar, North Carolina State University, January 13, 2011 Raleigh, NC [Invited presentation]
14. **Stonedahl, S.H.**, 2011, Ripples to Meanders: A Multi-Scale Three-Dimensional Hyporheic Exchange Model. Environmental Engineering and Science Seminar, Northwestern University, January 7, 2011 Evanston, IL [Invited presentation]
13. Aubeneau, A. F., **Stonedahl, S. H.**, Harvey, J. W., Packman, A. I., 2010, Improved Modeling of Hyporheic Exchange Using CTRW: First Application to Field Data, ASLO/NABS
12. McPhillips, L.E., Harvey, J.W., Packman, A.I., Tobias, C.R., Jerolmack, D.J., Bohlke, J.K., Henry, E.J., Larsen, L.G., Aubeneau, A., Drummond, J., Duerenberger, K., Hucks-Sawyer, A., Lettrich, M., Martin, R., Maglio, M., Mroczkowski, S., and **Stonedahl, S.**, 2010, Hydrogeomorphic drivers of stream ecological processes: the 2009 Clear Run, NC studies, ASLO/NABS
11. **Stonedahl, S.H.** and Stonedahl, F., 2009. Quantifying Fitness Landscapes' Robustness to Noise and Uncertainty. NICO's Complexity Conference, Northwestern University, Evanston, IL
10. Packman, A. I., Harvey, J. W., Wörman, A., Cardenas, M. B., Schumer, R., Jerolmack, D. J., Tank, J. L., and **Stonedahl S. H.**, 2009, Multi-scale surface-groundwater interactions: processes and implications, AGU Joint Assembly, Toronto, Ontario
9. **Stonedahl, S.H.**, Harvey, J.W., Wörman, A., Packman, A.I., 2007, Modeling hyporheic exchange in flumes and streams using a spectral scaling based pumping model. Eos Trans. AGU, 88(52), Fall Meet. Suppl., Abstract H11-1542
8. Wörman, A., Marklund, L., Packman, A.I., Harvey, J.W. and **Stonedahl, S.H.**, 2007, Fractal scaling for surface water-subsurface water interaction through the earth's crust. Eos Trans. AGU, 88(52), Fall Meet. Suppl., Abstract U52A-02

7. Packman, A.I. , Chen, C., **Stonedahl, S.H.**, Cortis, A., Harvey, J.W., Wörman, A., Boano, F., Ridolfi, L., Revelli, L. , Linking surface topography, subsurface structure, and solute transport in rivers, Stochastic Transport and Emergent Scaling in Earth-surface Processes, 4-7 November 2007, Incline Village, Nevada
6. **Stone\* , S.H.**, 2006, Predicting hyporheic exchange in streams on the basis of a priori estimates of stream physical characteristics. Environmental Engineering and Science Seminar, Northwestern University, February 22, 2006 Evanston, IL [Invited presentation]
5. **Stone\* ,S.H.**, Harvey, J.W., Packman, A.I., Wörman, A., 2005, Predicting hyporheic exchange of water and solutes in streams on the basis of a priori estimates of stream physical characteristics, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract H43C-0513
4. **Stone\* , S**, Cheng, C., Keane, D.T., Gaillard, J.-F. , and Packman, A.I. , 2004, Use of 3D x-ray microtomography to observe the structure of colloidal zirconia deposits in sand columns, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract H33A-0456
3. **Stone\* , S.H.**, Heil. T., Dahl. A.L., Gaillard, J.-F., Quintana, J.P.G. , 2003, Polycapillary Optics for Micro-XRF and Spatially Resolved XAS, *APS User Activity Reports 2002*, Vol.4
2. **Stone\* , S.**, Heil, T., Dahl, A.L., Gaillard, J.-F., and Quintana, J.P.G., 2003, Polycapillary Optics for Micro-XRF and Spatially Resolved XAS, XAFS-XII Conference, Malmö, Sweden.
1. **Stone\* , S.**, Heil, T. E., Dahl, A.L., Peltier, E., and Gaillard, J.-F., 2002, Quantitative fluorescence imaging of an arsenic hyper-accumulating fern, 25th Annual Midwest Environmental Chemistry Workshop, Chicago, IL.

## STUDENT PRESENTATIONS AND POSTERS

7. Reiter, C., Gibson, C, and **Stonedahl, S. H.**, 2016, Investigating the Flow of Water Through Heterogeneous Sediments. Butler Undergraduate Research Conference, April 8, 2016 Indianapolis, IN
6. Gibson, C., Reiter, C, and **Stonedahl, S. H.**, 2015, Investigating the Flow of Water Through Heterogeneous Sediments. Upper Mississippi River Conference, October 15, 2015 Davenport, IA
5. Borg, K. T., **Stonedahl, S. H** , Stonedahl, F., 2014, Unique Solvability of Certain Grid-based Logic Puzzles. Sixth Annual Illinois-Iowa ACS Undergraduate Research Conference, November 15, 2014 Davenport, IA
4. Godfrey, M. and **Stonedahl, S. H.** 2014, Investigating the Effect of Noisy Permeability Distributions on Hyporheic Flow. National Conference on Undergraduate Research, April 4, 2014 Lexington, KY

3. Lohberg, M., Lusk, K., Miller, D., Stonedahl, F. and **Stonedahl, S. H.** 2013, Investigating Methods of Stream Planform Identification. Abstract ED33D-0794, American Geophysical Union Fall Meeting, December 11, 2013 San Francisco, CA
2. Lusk, K., Lohberg, M., Miller, D., Stonedahl, F., and **Stonedahl, S. H.**, 2013, Investigating Photogrammetric Methods for Stream Planform Identification. Fifth Annual Illinois-Iowa ACS Undergraduate Research Conference, November 16, 2013 Davenport, IA
1. Cooper, D. G., Everingham, J. M., Kraciun, M. K., and **Stonedahl, S. H.**, 2013, Investigating the Falling-Head Hydraulic Conductivity Field Test in a Laboratory Setting. St. Ambrose University Undergraduate Scholars Conference, April 26, 2013 Davenport, IA

## TEACHING EXPERIENCE

### ST. AMBROSE UNIVERSITY

Assistant Professor

8/11-Present

- PHYSICS 203 College Physics 1 Fall 2011-2016
- PHYSICS 203L College Physics 1 Lab Fall 2011-2016
- PHYSICS 253 Electricity and Magnetism Spring 2012-2016
- PHYSICS 253L Electricity and Magnetism Lab Spring 2012-2016
- PHYSICS 204 College Physics 2 Spring 2012-2016
- ENV Studies Capstone Project Spring 2015
- ENGR 320 Research Topics Fall 2014, Fall 2016

### NORTHWESTERN UNIVERSITY

McCormick Tech Tutor (Teaching Assistant position)

9/09-6/10

Teaching Assistant

- PHYSICS 130-1 Classical Mechanics Summer 2008
- PHYSICS 130-2 Electricity and Magnetism Summer 2008

EES Teaching Experience

Spring 2006

SERTS (Science and Engineering Research and Teaching Synthesis)

Spring 2006 & 2007

Grader (Northwestern University)

- GEN\_ENG 205-1 Engineering Analysis I Fall 2010

- CIV\_ENG 340 Fluid Mechanics II Spring 2009
- CIV\_ENG 440 Environmental Transport Processes Fall 2008
- CIV\_ENG 260 Fundamentals of Environmental Engineering Spring 2006 & 2007
- CIV\_ENG 360 Environmental Impact Evaluation Spring 2005

#### **CARLETON COLLEGE**

Mathematics Tutor (Math Skills Center) 9/00-6/03  
 Calculus Prefect 1/02-6/02  
 Grader (Mathematics Department) 9/02-6/03

#### **NORTH SHORE HOME EDUCATORS**

MATHCOUNTS Instructor/Coach 9/08-5/11  
 Team ranked 5<sup>th</sup> place in the state of Illinois 2011  
 STAMPS Instructor (Summer Training in Mathematical Problem Solving) Summer 2010  
 Math Olympiad Instructor 9/06-6/09

#### **ACADEMIC TUTORING CENTERS**

Physics/Math/ACT Tutor (Highland Park) 9/08-6/10

## **EXPERIENCE**

#### **ST. AMBROSE UNIV. (DAVENPORT, IA)**

St. Ambrose Summer Research Institute Faculty Advisor Summer '16,'15,'13,'12

#### **NORTHWESTERN UNIV., CIVIL AND ENVIRONMENTAL ENGINEERING (EVANSTON, IL)**

Graduate Research Assistant 9/03-6/11  
 Collaborative Research Experience (SLU, Uppsala, Sweden) Summer 2003  
 Research Experience for Undergraduates Participant Summer 2002

#### **Univ. Wisconsin-Milwaukee Physics (Milwaukee, WI)**

Research Experience for Undergraduates Participant Summer 2001

## PROFESSIONAL DEVELOPMENT

Society of Women Engineers 2015 Region H Conference, March 6-8, 2015, Notre Dame University, South Bend, IN

Seven Rivers Undergraduate Research Symposium, November 8, 2013, Viterbo University, LaCrosse, WI

ACS Focus Forum on Adult Education and the Liberal Arts Including Blended Learning, October 10-12, 2013, Rollins College, Orlando, FL

Promoting Undergraduate Research at Liberal Arts Colleges: A one-day conference to share best practices, April 6, 2013, Augustana College, Rock Island, IL

Engineering, Sustainability, and the Geosciences, March 6-8, 2013, Colorado School of Mines, Golden, CO

Second Annual All Iowa SWE Conference: Blending Communications with Technology, April 14, 2012, Davenport, IA

## *PROFESSIONAL SERVICE, LEADERSHIP, AND OUTREACH*

Sigma Xi President elect (John Deere Chapter)	2016-Present
Undergraduate Summer Research Assistant Director (SAU)	2015-Present
Stoffel Fund for Excellence Committee (SAU)	2016-Present
Augustana Invitational Robotics Challenge team mentor (SAU)	2016
Women in Science and Engineering Club co-mentor (SAU)	2014-Present
Mechanical Engineering Search Committee (double search, SAU)	2014
Administrator Evaluation Committee (SAU)	2015
Faculty Development Committee (chair 16-17)(SAU)	2015-Present
Soil and Water Conservation Boy scout Merit Badge Counselor	2014
NCUR 2014 Moderator	2014
Academic Support Committee (chair 13-14)( SAU)	2012-2014
AGU Fall Meeting Outstanding Student Paper Awards judge	2013, 2015
STEM at the Iowa State Fair Exhibitor	2014, 2013, 2012
Introduce a girl to engineering(SAU)	'15, '14, '13
Quad Cities First Lego League Regional Qualifier Referee	2012
Illinois Math and Science Education Program (IMSEP) STEM night Exhibitor	2012
Rock Island Region Community STEM Festival Exhibitor	2012



iExploreSTEM Exhibitor (SHL & IMSEP Coralville, IA)	2011
Program Design Etopia Production of QED (Northwestern)	2010
Demonstrated at Career Day for Girls (Northwestern)	2006, 2009-2011
Demonstrated at Take Our Daughters to Work Day (Northwestern)	2007, 2009, 2011
Demonstrated for the Meaningful Science Consortium (Northwestern)	2011
Demonstrated at Communiversity Day (Northwestern)	2009
CEGS (Civil and Environmental Graduate Society) Board Member	2006-2008
CEEGAB (Civil and Environmental Engineering Graduate Advisory Board)	2004-2005

## AWARDS/ACHIEVEMENTS/SCHOLARSHIPS

Stoffel Fund for Excellence (20K to spend over 5 years)	2016-Present
Augustana Invitational Robot Competition 1st Place Coach	2016
“On the Spot” Award-SAU	2014
McCormick Student Art Fair: Commedia Dell’arte Award	2011
Northwestern ASCE Popsicle Stick Bridge Design Competition Winner	2010
Quest HPC Development Allocation (25,000 CPUs)	2010
Murphy Fellowship	2003-2004
Inducted into Sigma Xi	2003
National Merit Scholarship	1999-2003
Lutheran Brotherhood Scholarship	1999-2003

## PROFESSIONAL AFFILIATIONS AND REVIEWING

<i>NSF Grants: Hydrologic Sciences Program</i>	Proposal Reviewer
<i>Nature Geoscience</i>	Journal Reviewer
<i>NCUR Proceedings</i>	Journal Reviewer
<i>Geophysical Research Letters</i>	Journal Reviewer
<i>Groundwater</i>	Journal Reviewer
<i>Hydrology and Earth System Sciences</i>	Journal Reviewer
<i>Journal of Hydrology</i>	Journal Reviewer
<i>Water</i>	Journal Reviewer
<i>Water Resources Research</i>	Journal Reviewer
American Geophysical Union (AGU)	Member
Sigma Xi	Member