

# Susa H. Stonedahl

Note: until 9/8/2007 my last name was Stone

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## Education

### Northwestern University, Evanston, IL

*MS, Environmental Engineering (2004)*

Overall GPA: 3.67/4.00

### Carleton College, Northfield, MN

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

Overall GPA: 3.70/4.00

- Magna Cum Laude
- Senior Mathematics Integrative Exercise (Thesis): *Aperiodic Tiling*
- Senior Physics Integrative Exercise (Thesis): *Physics of Catfish*
- Study Abroad (Graz, Austria)

## Experience

<u>Northwestern Environmental Engineering Department</u>	<u>Evanston, IL</u>
Graduate Research Assistant	9/03-Present
Collaborative Research Experience (SLU, Uppsala, Sweden)	Summer 2003
REU (Research Experience for Undergraduates)	Summer 2002
<u>UW-Milwaukee Physics Department</u>	<u>Milwaukee, WI</u>
REU	Summer 2001

## Awards/Achievements/Scholarships

Murphy Fellowship	2003-2004
Magna Cum Laude	2003
Inducted into Sigma Xi	2003
National Merit Scholarship	1999-2003
Lutheran Brotherhood Scholarship	1999-2003

## Journal Articles

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].

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].

Gaillard, J.-F., Chen, C., Stonedahl, S.H., Lau, B.L.T., Keane, D.T, and Packman, A.I., Imaging of colloidal deposits in granular porous media by x-ray difference micro-tomography, *Geophysical Research Letters*, 34(18), L18404, doi:10.1029/2007GL030514 [Cover article and Editor's highlighted article].

### **Conference Publications/Presentations**

Stone, 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 Fall Meeting 2007, American Geophysical Union.

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 Earths crust Fall Meeting 2007, American Geophysical Union.

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. H43C-0513, Fall Meeting 2005, American Geophysical Union.

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, AGU Fall Meeting, San Francisco

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, Malmo, Sweden

Stone, S., Heil, T. E., Dahl, A.L., Peltier, E., Gaillard, J.-F.(2002) : Quantitative fluorescence imaging of an arsenic hyper-accumulating fern, 25th Annual Midwest Environmental Chemistry Workshop, Chicago Illinois

### **Teaching Experience**

Math Olympiad Instructor (Evanston Home-Schooled Chapter)	9/06-Present
Serts(Science and Engineering Research and Teaching Synthesis)	2006, 2007
Environmental Engineering Grader(Northwestern University)	intermittent
Mathematics Tutor (Carleton College)	9/00-6/03
Calculus Prefect (Carleton College)	1/02-6/02
Mathematics Grader(Carleton College)	9/02-6/03

### **Service**

CEEGAB(Civil and environmental engineering graduate advisory board)	2004-Present
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## **Research Experiences**

### Research at Maple Creek near Nickerson, NE Fall 2006

We chose Maple Creek as a research site because it has almost entirely fine sand sediments, was a workable size for our personnel and equipment, and included a USGS recording flow gauge. We conducted a solute tracer experiment and measured key topographical features at Maple Creek. We measured velocity and depth cross sections as well as hydraulic conductivity. Conditions at this site were ideal for measuring hydraulic conductivity *in situ*, which is important to making *a priori* estimates of hyporheic exchange. We also collected cores of streambed sediments, which were used for laboratory solute injections and additional hydraulic conductivity tests. Each column was also sliced for grain size analysis. Results from these measurements help to confirm the *in situ* hydraulic conductivity findings, and provide information on spatial variability in hydrogeologic properties, including variation with depth in the streambed. We also hired a mapping company to perform LiDAR (Light Detection And Ranging) providing order to obtain a detailed map of the stream bottom topography. Although we have not yet received the LiDAR data files, the LiDAR stream images clearly captured the streambed topography.

### Research at Sugar Creek near Kentland, IN Fall 2004

My group conducted a solute tracer experiment, recorded key topographical features, and measured velocity and hydraulic conductivity values of the field site. We are in the process of analyzing this site using a spectral based pumping model.

### Research in Ekeby Wetland in Eskilstuna, Sweden Summer 2003

This was my first graduate research experience as well as a collaborative international research project involving faculty and students from Northwestern and SLU, the Swedish University of Agricultural Sciences. We conducted research at the Ekeby Wetland, which is part of the wastewater treatment system for the town of Eskilstuna, Sweden. The specific goal of our research was to understand the relationship between the flow rate, solute retention, and the type of vegetation at different points of the distribution canal. My part in the planning and physical labor of this project is inseparable from the contributions of everyone else due to the nature of fieldwork.

### Northwestern REU(Research Experience for Undergraduates) Summer 2002

This REU was in the environmental engineering department. The goal of my research that summer was to determine the concentrations and form of arsenic in various areas of the pinnae of the *Pteris vittata*, a fern, which hyperaccumulates arsenic. I spent time on the REU collecting data with a group at the Argonne National Laboratory's Advanced Photon Source(APS) on the bending magnet beamline of the DuPont-Northwestern-Dow Collaborative Access Team. Most of my time on the REU was spent analyzing the collected data with an entering graduate student.

### UW-Milwaukee REU Summer 2001

This REU experience was in the physics department. During my time there I worked on EXAFS (Extended X-ray absorption fine structure) analysis of Hafnium Compounds and the calibration and usage of a profilometer on thin films. The purpose of the EXAFS research was to determine the interatomic distances between the elements of the compounds.