

# Laura A. Hempel

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## Education

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### Oregon State University (Graduate)

Sept. 2012-present

Corvallis, OR

- Geology PhD student, College of Earth, Ocean, and Atmospheric Sciences (CEOAS)
- Cumulative GPA: 3.98
- Focus on Fluvial Geomorphology under advisor Dr. Gordon Grant

### Dartmouth College (Undergraduate)

Graduated June 2012

Hanover, NH

- Bachelor of Arts in Earth Sciences, Bachelor of Arts in Environmental Studies
- Graduated *Summa Cum Laude*, cumulative GPA: 3.91, major GPA: 4.0
- Course work included: Hydrology, Fluvial Geomorphology, Stable Isotope Geochemistry, Mineralogy, Geomechanics, Structural Geology, Physics, Organic Chemistry, and Calculus
- Member of Varsity Track and Cross Country Teams

## Research Experience

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### Dissertation Research, Oregon State University

Sept. 2012-present

*Does the Hydrologic Regime control Channel Form in Gravel-bed Rivers?* Corvallis, OR

- An investigation of the degree to which the magnitude, timing, duration, and sequencing of critical flows shape stream channel form (e.g. bar form, spacing of pools and steps, frequency of wood debris, degree of armoring)
- Coordinated set of field observations, flume experiments, and numerical modeling will provide the empirical foundation

### Senior Honors Thesis, Dartmouth College

Aug. 2010-June 2012

*Hydrologic Controls of Mercury Deposition onto a Floodplain* Hanover, NH

- Investigated hydrologic and geomorphic controls on Hg-contamination distribution in channel and floodplain sediments, under advisor Dr. Carl Renshaw
- Compared floodplain contamination on a point-source contaminated river to a stream receiving only background level atmospheric Hg deposition

### NSF REU, Texas A&M University

May-Aug. 2011

*Soil CO<sub>2</sub> and CH<sub>4</sub> Fluxes in a Costa Rican Premontane Wet Forest* San Isidro, Costa Rica

- Worked with faculty advisor, Dr. Gunnar Schade, to quantify the variability and components of soil gas flux in a premontane wet forest
- Used static soil chambers to collect gas samples in the field, and analyzed samples using gas chromatograph and CO<sub>2</sub>-H<sub>2</sub>O infrared absorption gas analyzer

### Dean of Faculty Undergraduate Research Grant, Dartmouth College

Jan. –March 2011

*Reconstructing Holocene Climate Oscillations from Glacial Lake Sediments* Hanover, NH

- Examined parameters (e.g. loss on ignition, sediment grain size, and macrofossils for radiocarbon dating) of glacial lake sediment cores from Scoresby Sund, Greenland to recreate glacial fluctuations during the

late-Holocene under advisor Dr. Meredith Kelly

- Assisted an undergraduate class with collection and processing of sediment cores from a local pond
- Attended weekly lab meetings and present data as they became available

### **Dartmouth College Geology Field Program**

**Sept.-Nov., 2010**

*Geology Field Camp*

*Western US and Canada*

- Employed field techniques, geologic instruments, satellite imagery, and topographic maps, as well as core concepts from petrology, hydrology, limnology, and glaciology to interpret geologic features
- Completed mapping projects in classic geology areas including Big Horn Basin, WY; Grand Canyon, AZ; New World Mining District, WY; and Poleta Folds, CA

### **James O. Freedman Presidential Scholar, Dartmouth College**

**June 2010-June 2011**

*Bioaccumulation and trophic transfer of Nanoparticles; Arsenic concentration and speciation in infant food and formula*

*Hanover, NH*

- Worked in a trace elements lab under Dr. Brian Jackson to detect cadmium, zinc, and selenium quantum dots in *Daphnia Magna*, using ICP-MS and field flow fractionation-ICP-MS
- Ran closed-vessel digests on baby food products and juices to analyze samples for arsenic speciation using LC-ICP-MS

### **Microbiology Lab Assistant, US Geological Survey**

**June 2009- Dec., 2010**

*A National U.S. Soil Survey for Human and Agricultural Pathogens*

*Tallahassee, FL*

- Extracted DNA from soil samples, ran gel electrophoresis, and qPCR reactions for *B. anthracis*, *F. tularensis*, and *Y. pestis* under advisor Dr. Dale Griffin, as part of a USEPA funded national soil survey
- Cultured bacteria and fungi from atmospheric dust samples
- Co-authored a USGS fact sheet on the human health effects of African dust events

### **Independent Student Research, Rickard High School**

**June-Sept., 2007**

*Causes and Trends of Environmental Pollution at Lake Munson*

*Tallahassee, FL*

- Designed and implemented project to examine water quality trends at Lake Munson, an agricultural-runoff polluted lake, still used for fishing and recreation
- Tested for nitrates, phosphates, sulfates, pH, dissolved carbon dioxide, and hardness over a one month period, and compared findings to long term data collected by Leon County
- Analyzed data and prepared a 5,000-word research paper for the International Baccalaureate Diploma Program

### **Water Quality Analyst, Leon County Waste Water Management**

**June-July, 2007**

*Summer Youth Employee*

*Tallahassee, FL*

- Compiled water quality databases, and analyzed lake water quality trends with *Excel*
- Attended water management meetings for Leon County and Dept. of Environmental Protection
- Assisted with water and soil sampling in lakes and riverbeds to determine whether pollutant concentrations exceeded EPA standards

## **Publications**

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- Levy, L. B., M. A. Kelly, T. V. Lowell, B. L. Hall, **L. A. Hempel**, W. M. Honsaker, A. R. Lusas, J. A. Howley, and Y. L. Axford (2013), Holocene fluctuations of Bregne ice cap, Scoresby Sund, east Greenland: a proxy for climate along the Greenland Ice Sheet margin, *Quaternary Science Reviews*, doi:10.1016/j.quascirev.2013.06.024.

## Conference Presentations

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- Hempel, LA**, Grant, GE, Hassan, MA, Eaton, BC, 2016. Hydrograph shape controls channel morphology and organization in a sand-gravel flume. *AGU Fall Meeting*, Oral, Abstract #EP53E-08
- Feehan, S, Ruggiero, P, **Hempel, LA**, Anderson, DL, Cohn, N, 2016. Characterizing feedbacks between environmental forcing and sediment characteristics in fluvial and coastal systems. *AGU Fall Meeting*, Poster, Abstract #EP23A-0935
- Grant, G.E., **Hempel, L.** and Lewis, S., 2016, Hydrologic control of channel morphology and organization in gravel-bed streams: field studies and flume experiments. Computational Methods in Water Resources, Toronto, Canada
- Hempel, LA**, Grant, GE, Grant, GE, and Lewis, S, 2015. Hydrologic regime controls pattern and architecture of woody debris in mountain streams. *AGU Fall Meeting*, Oral, Abstract #EP53E-08
- Grant, GE, Nolin, AW, Selker, JS, Lewis, S, **Hempel, LA**, Jefferson, A, Walter, C, Roques, C, 2015. No snow no flow: How montane stream networks respond to drought. *AGU Fall Meeting*, Oral, Abstract #H41M-08
- Lewis, S.L., Grant, G.E., Nolin, A.W., **Hempel, L.A.**, Jefferson, A.J., Selker, J.S, 2015. How low will they go? The response of headwater streams in the Oregon Cascades to the 2015 drought. Geological Society of America Annual Meeting, Abstract.
- Hempel, LA**, Grant, GE, and Lewis, S, Safeeq, M, 2014. Change in bedload transport frequency with climate warming in gravel-bed streams of the Oregon Cascades. *AGU Fall Meeting*, Poster, Abstract #EP33A-3619
- Safeeq, M, Grant, G, Lewis, S, Nolin, AW, **Hempel, LA**, Cooper, M, Tague, C, 2014. Integrated snow and hydrology modeling for climate change impact assessment in Oregon Cascades. *AGU Fall Meeting*, Poster, Abstract #H43J-1093
- Hempel, LA**, Grant, GE, and Lewis, S, 2014. A comparison of hydrology and channel hydraulics in headwater streams of the central Oregon Cascades. *Water Resources Symposium, Oregon State University* Oral Session III.
- Hempel, LA**, Grant, GE, and Lewis, S, 2013. A comparison of hydrology and channel hydraulics in headwater streams of the central Oregon Cascades. *AGU Fall Meeting*, Poster, Abstract #EP53B-0831
- Hempel, L.**, Grant, G.E., Lewis, S.L. 2013. Hydrology and channel hydraulics in headwater streams of the central Oregon Cascades. Summer Institute for Earth Surface Dynamics, University of Minnesota, Minneapolis, MN.
- Hempel, LA**, Jackson, B, Renshaw, CE, 2012. Mercury Accumulation and Redistribution on Near-Channel Floodplains. *AGU Fall Meeting*, Poster, Abstract #H53J-1674
- Hempel, LA**, Pfohl, A, Schade, G., 2011. Soil CO<sub>2</sub> and CH<sub>4</sub> fluxes in a Premontane Wet Forest. *AGU Fall Meeting*, Abstract #B11A-0459

·Levy, L., **Hempel, LA**, Kelly, M.A., Lowell, T.V., Hall, B.L., 2011. Holocene Fluctuations of the Bregne Ice Cap, Scoresby Sund, eastern Greenland. *AGU Fall Meeting*, Abstract #PP31A-1846

## Professional Affiliations

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Sigma Xi	2012-present
Phi Beta Kappa	2012-present
American Geophysical Union	2011-present

## Awards and Recognition

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Upham Geology Prize	2012
John Ebers '61 Award- Most Outstanding Undergraduate	2012
Dartmouth Class of 1950 Student-Athlete Community Service Award	2012
Rufus Choate Scholar	2011
Lenker Award for Earth Sciences	2011
Francis L. Town Scientific Prize for Environmental Studies	2011
Athletic Director Varsity Athlete Honor-roll	2008-2012

## Funding

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<i>CUAHSI Pathfinder Fellowship</i>	2015
· Source: CUAHSI research grant; \$3,000	
<i>NSF Graduate Research Fellowship</i>	2013-2017
· Source: National Science Foundation; \$32,000/year	
<i>Provost's Distinguished Graduate Fellowship</i>	2012
· Research fellowship at Oregon State University offered to "students of the highest quality"	
· Source: Oregon State University; \$30,000/year	
<i>Andrew W. Mellon Grant</i>	2011
·Funding intended for "student-initiated research project directly related to an environmental issue/problem" and used toward senior thesis research	
· Source: Dean of Faculty Undergraduate Research Office at Dartmouth College; \$1,000	
<i>John Lindsley Fund</i>	2011
· Grant funding provided for senior thesis research	
· Source: Dean of Faculty Undergraduate Research Office at Dartmouth College; \$1,500	
<i>James O. Freedman Senior Thesis Award</i>	2011
· Award to previous participants of James O. Freedman Presidential Scholars program for travel to a scientific conference	
· Source: Dartmouth College; \$300	

- NSF REU* 2011
- Funding for undergraduates to participate in research
  - Source: Texas A&M University; \$5,000
- Stiffler Family Undergraduate Research Grant* 2011
- Full-time leave term research grant to support students working directly with faculty mentor
  - Source: Dean of Faculty Undergraduate Research Office at Dartmouth College; \$3,500
- James O. Freedman Presidential Scholars Program* 2010-2011
- Stipend for Dartmouth Juniors in the top 40% of their class to work as research assistants with Dartmouth faculty
  - Source: Dartmouth College; \$1,500

## Mentoring and Teaching Experience

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- Undergraduate Thesis Advisor** 2016-present  
*Oregon State University* Corvallis, OR
- Advise undergraduate Scott Feehan on his thesis, "Sediment response to varying hydrographs"
  - Under my direction, student won an Undergraduate Research, Innovation, Scholarship and Creativity grant for his work
- Graduate Student Committee, Vice Chair** May 2013-present  
*Oregon State University* Corvallis, OR
- Vice president of SAC, a student group that acts as a liaison between the students and the Deans to voice student concerns within the College of Earth, Ocean, and Atmospheric Sciences
  - Serve as the student representative on the Strategic Planning and Hiring Committee
  - Maintain SAC's webpage and social media
- Hydrophiles Service Learning Committee** Sept. 2012-2015  
*Oregon State University* Corvallis, OR
- Help find, plan, organize, publicize, and run water-related outreach events as a member of the service learning committee within Hydrophiles, a water-related student group at OSU
  - Maintain and update Service Learning webpage on Hydrophiles website
- Girls on the Run Head Coach** March 2010-June 2012  
*Dothan Brook Elementary, Grades 3-5* Hartford, VT
- Run semi-weekly practices in the spring that combine fitness and self-esteem enhancing exercises to empower and educate young girls, and to encourage positive emotional, social, and physical development
  - Program culminates in a state-wide *Girls on the Run* 5K event
- Clearinghouse Tutor** June 2010-September 2011  
*Academic Skills Center, Dartmouth College* Hanover, NH
- Peer tutor to varsity athletes in subjects of science and math
  - Meet for 3 hrs/week to review problem tests and help students study for exams
- Howard Hughes Medical Institute Science Mentor** Jan.-March 2011

*Montshire Museum and Samuel Morey Elementary* *Lake Morey, VT*  
· Team-taught a series of six interactive 90-minute science classes using a kit aligned with state science standards at the 4<sup>th</sup> grade level; trained by professional science educators

**America Reads Tutor** **Oct. 2008-June 2010**  
*Tucker Foundation, Dartmouth College* *Lake Morey, VT*  
· Assist 3<sup>rd</sup> grade students on an individual basis with reading and math in the classroom  
· Foster learning in a supportive and energetic environment

**Women in Science Peer Mentor** **Sept.-June 2009**  
*WISP, Dartmouth College* *Hanover, NH*  
· Mentored to two underclass women majoring in science during their first year at Dartmouth  
· Gave advice on classes, majors, and research based on personal experience

**Volunteer Camp Counselor** **May-June 2007**  
*Camp "All That," Mary Brogan Museum of Art and Science* *Tallahassee, FL*  
· Supervised third grade level summer camp group and lead projects on science-related topics

## Other Experience

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**NSF GRFP Panelist** **Oct. 2014**  
*Oregon State University* *Corvallis, OR*  
· Provided advise and edited essays as a graduate student panelist at a workshop for students applying to the NSF GRFP

**Student Athlete Advisory Committee (SAAC) Executive Board** **Jan. 2011-June 2013**  
*Dartmouth College* *Hanover, NH*  
· Track and Cross Country executive board representative to voice the student-athlete perspective within the Dartmouth College Athletic Department and NCAA  
· Meet bi-monthly with SAAC representatives and athletic department staff to improve athletic programs and facilities  
· Plan and run SAAC-sponsored events and termly community service projects

**Undergraduate Student Committee for Candidate Selection** **Jan.-Feb., 2011**  
*Earth Sciences Department, Dartmouth College* *Hanover, NH*  
· Provide female undergraduate voice to assess prospective candidates for a junior faculty low-temperature geochemist position  
· Attend candidate's teaching and research talks, attend lunch with candidate and other members of student committee, and evaluate candidate's performance in a presentation to Earth Science faculty