Joshua C. Galster
Dept. of Earth & Environmental Studies
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Interests: Geomorphology, surficial hydrology, GIS, human influences on surficial processes, interdisciplinary fluvial research, glacial geology, integrating research into the classroom.

Education:

2006 Ph.D. Lehigh University
Earth and Environmental Sciences Department, Frank J. Pazzaglia, advisor
Dissertation title: The connections between rivers and their watersheds over multiple scales.

2001 M.S. University of Vermont
Department of Geology, Andrea Lini, advisor
Thesis title: Quantifying the response rate of lake ecosystems to Holocene deglaciation through the use of stable isotopes.

1996 B.A. Carleton College
Geology Department, Julie Maxson, advisor
Senior Thesis Title: Popocatépetl volcano, central Mexico: A study of current lahar hazards from a historical perspective

Professional Experience:

2007 to present Assistant Professor Montclair State University
Department of Earth and Environmental Studies
Research: Surficial hydrology, identifying the source of excess stream sediments, human influence on watersheds.

2006 to 2007 Research Scientist Lehigh University
Earth and Environmental Sciences Department, Joan Ramage, collaborator
Research: Quantifying equilibrium line altitudes (ELAs) for paleoglaciers in Peru using remote sensing and GIS.

2001 to 2002 Environmental Health Specialist State of Idaho
Southeastern Idaho Health District
Responsibilities: Implementing plans for clean drinking water, proper waste disposal, inspecting restaurants, and training the public on environmental health issues

Teaching Experience:

Montclair State University
Physical Geology
Earth and the Environment
Fluvial Geography (Spring 2009)
Historical Geology
Hydrology

Lehigh University
Sedimentology and Stratigraphy

Research Experience:

Montclair State University:

- Investigated the influence of humans and climate on the discharges of large rivers from gauging station records.
- Automated the process of classifying land-use from monospectral aerial photographs.
- Modeled historic land-use change using cellular automata.
- Investigated the source of excess suspended sediment in streams using in-stream samples and radiogenic nuclides.
- Measured the effects of invasive species on stream baseflow.
- Analyzed discharge records to determine the change in flood frequency and baseflow in New Jersey.
- Quantified the changes in water quality, water quantity, and sediment transport due to the removal of a pair of small dams

Lehigh University:

- Mapped glacial moraines and calculated paleo-equlibrium line altitudes (ELAs) for Peruvian glaciers using satellite imagery and digital elevation models (DEMs).
- Generated high-resolution DEMs of channel reaches from geodetic surveys in order to compare stream morphologies across various land uses.
- Installed pressure sensors in rivers and developed rating curves to determine the discharge characteristics of the urban and rural watersheds.
- Georeferenced aerial photographs to determine the changes in stream width over time using a GIS.
- Installed automated water sampling devices to characterize water quality.
- Statistically analyzed the historic discharge records of six large rivers to determine the scaling of discharge with drainage area.
- Analyzed pollen samples from a lake core to determine the paleovegetation in the watershed.

University of Vermont:

- Cored lakes and performed sedimentologic and stable isotopic analyses on samples.
- Used stable isotopes (^{13}C and ^{15}N) and radiocarbon dating to determine the rate of ecosystem establishment following deglaciation.

Teaching Assistant Experience:

Methods of Water Quality Analysis
Soil Science: Earth's critical zone
Lehigh Field Camp
Environmental & Organismal Biology
Lehigh Earth Observatory

University of Vermont

Introductory Geology
Environmental Geology

Carleton College

Geomorphology
Environmental Geology

Grants (awarding institution in bold):

2008 American Chemical Society, co-I, "Biocatalytic Amine reduction: searching the soil for capable catalyst" ($19,507), pending
2008 National Fish and Wildlife Foundation, co-PI, "Effectiveness monitoring for Gruendyke and Seber Dam removals on the Musconetcong River" ($44,360), pending
2008 **Passaic River Institute**, co-I, "System dynamic model development for phosphorus concentrations and loads in Passaic River watershed due to impact of urbanization and land use change" ($4,922)
2008 G.R. Dodge Foundation, co-I, "Sustainability of recreational lakes in Morristown affected by sedimentation" ($29,500)
2008 **New Jersey Water Resources Research Institute**, PI, "Identifying the source of excess fine-grained sediments in New Jersey rivers using radionuclides" ($30,000)
2008 **Montclair State University**, co-PI, "Investigating land use change using cellular automata" ($3,000)

Awards:
2006 Department nominee for Lehigh U. Stout dissertation prize
2006 Best poster, Lehigh U. graduate student symposium
2005 K.N. Weaver Award, Northeastern Section GSA
2005 Graduate Student Research Grant, GSA
2005 Best Oral Presentation, Lehigh U. graduate student symposium
2000 Outstanding Graduate Teaching Fellow, U. of Vermont
1999 SUGR/Fame Award, U. of Vermont
1996 Cum Laude, Carleton College

Invited Talks:
2008 U. of Delaware, "Measuring the change in stream width due to historic land-use change"
2008 Montclair St., "The regional impacts of climate change"
2007 Montclair St., "The fundamental connection between watersheds and their rivers"
2007 Earlham College "The fundamental connection between watersheds and rivers"
2006 PSU Altoona, "Using hypsometry to categorize watersheds"
2006 SUNY New Paltz, "Measuring the impact of watershed urbanization on channel widths using aerial photographs
2006 Lehigh U., "Watershed Applications of GIS"
2006 Lehigh U., "Remote sensing before NASA: Using historic documents to extend remote sensing's record"
2006 Lehigh Valley Watershed Conference, "GIS mapping for watershed planning"
2005 Kutztown U., "Land Use change as reflected in channel morphology"

Professional Service and Development:

2008	Member, Science and Math Computer Users Group, Montclair St.
2007 to present	Reviewer for Journal of Environmental Geoscience, Journal of Environmental Management
2008	Participant, On the Cutting Edge: "Making the Case for Tenure: A Workshop for Early Career Faculty"
2008	Co-chair, Theme Session on "Influence of humans on the geomorphology, hydrology, and sediment transport of fluvial systems", Northeastern GSA
2006	Participant, Council on Undergraduate Research: "Developing an Undergraduate Research Program"
2005 to 2006	Department Representative to Lehigh Graduate Student Senate
2005	Participant: Preparing for an Academic Career in the Geosciences
2004 to 2005	Graduate student symposium coordinator: Lehigh U.

2003 to 2004	Graduate student/faculty liaison: Lehigh U.
2002 to 2003	Graduate student Laboratory Safety Coordinator: Lehigh U.

Professional Affiliations:

Geological Society of America
American Geophysical Union
American Water Resources Association
American Association of Geographers

Collaborators:

Kirk Barrett	Passaic River Institute	Montclair St.
Josh Wyrick	Dept. of Civil and Environmental Engineering	Rowan U.
Huan Feng	Dept. of Earth & Environmental Studies	Montclair St.
Dirk Vanderklein	Dept. of Biology and Molecular Biology	Montclair St.
Jon Cutler	Dept. of Mathematical Sciences	Montclair St.
Nina Goodey	Dept. of Chemistry and Biochemistry	Montclair St.
Frank Pazzaglia	Earth and Environmental Science Dept.	Lehigh U.
Joan Ramage	Earth and Environmental Science Dept.	Lehigh U.

Peer-reviewed publications:

Galster, J. C., Barrett, K., Slaff, E., Xeflide, S., Justus, F., 2009, Is flooding getting worse? Historical analysis of flood flow frequencies in the New Jersey, *in prep*.

Galster, J.C., 2009, Testing the linear relationship between peak annual river discharge and drainage area using long-term USGS river gauging records, in James, A.J., Rathburn, S., Wittecar, R. eds., Management and Restoration of Fluvial Systems with Broad Historical Changes and Human Impacts: Geological society of America Special Paper, *in press.*

Galster, J. C., Pazzaglia, F. J., Germanoski, D., 2008, Measuring the impact of urbanization on two watersheds using historic aerial photographs and modern surveys: Journal of the American Water Resources Association, v. 44, p. 948-960.

Galster, J.C., 2007, Natural and anthropogenic influences on the scaling of discharge with drainage area for large rivers: Geosphere,v. 3, p. 260-271.

Galster, J. C., Pazzaglia, F. J., Hargreaves, B. R., Morris, D. P., Peters, S. C., and Weisman, R. N., 2007, Land use effects on watershed hydrology: The scaling of discharge with drainage area: REPLY, Geology online forum, p. e127.

Galster, J. C., Pazzaglia, F. J., Hargreaves, B. R., Morris, D. P., Peters, S. C., and Weisman, R. N., 2006, Land use effects on watershed hydrology: The scaling of discharge with drainage area: Geology, v. 34, p. 713-716.

Conference abstracts (*student authors):

Galster, J. C., Barrett, K., *Slaff, E., *Xeflide, S., *Justus, F., 2008, Is flooding getting worse in northern new Jersey? An analysis of temporal trends in flood frequency and magnitude: New Jersey Association for Floodplain Management, v. 4.Galster, J. C., Barrett, K., Feng, H., *Bujalski, N., *Lopes, J., 2008, Identifying the source of fine-grained sediment using radionuclides, Geological Association of New Jersey, v. 25.

Galster, J. C., Barrett, K., *Slaff, E., *Xeflide, S., *Justus, F., 2008, Is flooding getting worse? Historical analysis of flood flow frequencies in the Passaic Basin and New Jersey: Third Passaic River Symposium, Passaic River Institute, v. 3.

Barrett, K., **Galster**, J. C., *Xeflide, S., 2008, Baseflow trends in NJ streams and correlation with imperviousness: Third Passaic River Symposium, Passaic River Institute, v. 3.

*Scherr, R., Vanderklein, D., **Galster**, J. C., 2008, The impact of Japanese knotweed on stream baseflow in Bonsal Preserve, Montclair, NJ: Third Passaic River Symposium, Passaic River Institute, v. 3.

Galster, J. C., Barrett, K., Feng, H., *Bujalski, N., Lopes, J., 2008, Characterizing the source of fine-grained sediments in New Jersey rivers using radionuclides: Geological Society of America Abstracts with Programs, v. 40, p. 194.

Galster, J. C., Barrett, K., 2008, Identifying the source of excess fine-grained sediments in New Jersey rivers using radionuclides: NEGSA Abstracts with Programs, v. 40.

Galster, J.C., Pazzaglia, F. J., Germanoski, D., 2007, Measuring the erosion of river channel widths impacted by watershed urbanization using historic aerial photographs and modern surveys: Eos Transactions AGU, v. 88, Fall Meeting Supplement, Abstract H41D-0768.

Galster, J. C., 2007, The anthropogenic and climatic effects on the scaling of discharge and drainage area for multiple watersheds from USGS discharge records: Geological Society of America Abstracts with Programs, v. 39, No. 6, p. 244.

Galster, J.C., *McFadden, E., Ramage, J.M., Rodbell, D.T., 2006, The Spatial Variation of Modern and LLGM Reconstructed ELAs in the Cordilleras Raura and Huayhuash, Peru: Eos Transactions AGU, v. 87 (52), Fall Meeting Supplement, Abstract H11B-1257.

Galster, J. C., Pazzaglia, F. J., Germanoski, D., 2006, Measuring the impact of urbanization on two watersheds using historic aerial photographs: implications for restoration efforts: Geological Society of America Abstracts with Programs, v. 38, No. 7, p. 187.

Galster, J. C. and Pazzaglia, F. J., 2005, Quantifying the effects of urbanization on two watersheds: How does discharge scale with drainage area in an urban area?: Geological Society of America Abstracts with Programs, v. 37, No. 7, p. 454.

Galster, J. C. and Pazzaglia, F. J., 2004, Linking increased urbanization to changes in stream morphology and pool-riffle: Geological Society of America Abstracts with Programs, v. 36, No. 2, p. 144.

*Bosley, A.C., Bierman, P.R., Noren, A., and **Galster**, J., 2001, Identification of paleoclimatic cycles during the Holocene using grain size analysis of sediments cored from Lake Morey in Fairlee, VT: NEGSA Abstracts with Programs, v. 33, p. 85.

Lini, A., **Galster**, J.C, Howse, R., and Lord, A., 2001, Isotopic records in post-glacial lake sediments; implications for biota and landscape evolution: NEGSA Abstracts with Programs, v. 33, p. 57.

Noren, A.J., Bierman, P.R., and **Galster**, J.C., 2001, A 13,000-year regional record of Holocene storms from terrigenous lake sediment, northeastern USA: NEGSA Abstracts with Programs, v. 33, p. 57.

Galster, J.C., Lini, A., and Noren, A.J., 2000, Using stable isotopes to determine ecosystem establishment rates following Holocene deglaciation in northeastern U.S.A.: GSA Abstracts with Programs, v. 32, p. 21.

Lini, A., Keane, P., **Galster**, J.C., and Howse, R.C., 2000, Integrated analysis of modern and sedimentary stable isotope data in lakes. ASLO Meeting 2000, Abstract Volume.

Galster, J.C, and Lini, A., 2000, Quantifying response rates of lake ecosystems to environmental change. ASLO Meeting 2000, Abstract Volume.

Galster, J.C., Lini, A., and Noren, A.J., 2000, Lake ecosystem response to Holocene environmental change: NEGSA Abstracts with Programs, v. 32, p. 19.

Noren, A.J., Bierman, P.R., **Galster**, J.C., Lini, A., Jennings, K.L., Janukajtis, F.A.,2000, A regional record of Holocene storms from terrigenous lake sediment, northern New England: GSA Abstracts with Programs, v. 31, p. 51.

Noren, A.J., Jennings, K.L., Bierman, P.R., **Galster**, J.C., Lini, A., Fredriksen, G., and Janukajtis, F.A., 1999, A regional record of Holocene hillslope erosion from lake and alluvial fan sediment, Vermont: New England Intercollegiate Geological Conference Guidebook, v. 91, p. 369-370.