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Research Interests:

Hydrology
Hillslope and Fluvial Geomorphology
Sediment Transport Processes
Watershed Drainage Networks
Watershed Best Management
and Restoration Practices



Sean M.C. Smith, Ph.D.

*Assistant Professor, School of Earth and Climate Sciences, University of Maine
Researcher and Research Council Member, Sustainability Solutions Initiative*

Profile:

Sean Smith is an Assistant Professor in the School of Earth and Climate Sciences at the University of Maine, with a joint appointment to Maine's Sustainability Solutions Initiative. His research seeks to understand the processes that shape the Earth's landscape, with special attention given to hillslope and stream alterations resulting from human activities. This pursuit focuses his work on watershed geomorphology and hydrology, including the stability of landforms and the flux of water, sediment, and nutrients in the contemporary landscape. A primary goal of his research is to advance the ability to predict and mitigate environmental impacts across varied spatial and time scales.

Smith is involved with the SSI project Safeguarding a Vulnerable Watershed focused on Sebago Lake and its contributing drainage area. The stakeholder driven project is using field measurements, spatial data, and both lumped and distributed modeling platforms to quantify surface flows and the flux of constituents carried by water in the contemporary landscape of central Maine. The approach provides a basis to test scenarios involving dam management, landscape alteration, and climate change. The goal of this research is to inform sustainability solutions that can be used to manage the Sebago Lake water resource system.

In addition to his teaching and research activities, Smith has experience working on watershed processes on the West Coast and the Mid-Atlantic region of North America, including extensive collaboration with partners involved with the U.S. EPA Chesapeake Bay Program. He has been published in multiple peer-reviewed publications including *Frontiers in Ecology and the Environment*, the *Encyclopedia of Water Science*, and *Water Resources Research*.

Degrees:

Ph.D. (The Johns Hopkins University)
M.S. (University of Maryland)
B.S. (University of Maryland)

Media Expertise:

Watershed Science and Impact Assessments

Water Resources Management

Stream and River Characteristics and Processes

SSI Projects:

Safeguarding a Vulnerable Watershed

Sustaining and Restoring Urban Stream Resources in Maine

Student Opportunities

Research assistantships related to watershed and fluvial processes (competitive)

Teaching assistantships through the School of Earth and Climate Sciences (competitive)

Independent study advisement (graduate and undergraduate)

Senator George J. Mitchell Center and the Sustainability Solutions Initiative

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Courses:

ERS 200: Earth Systems

ERS 350/588: Freshwater Flows

ERS 602: Critical Zone Processes

Selected Publications:

S.M.C. Smith and P.R. Wilcock, "Upland Sediment Supply and its Relation to Watershed Sediment Delivery in the Contemporary Mid-Atlantic Piedmont (U.S.A.)," *Geomorphology*, in review.

J. Peckenham, D. Hart, S. Smith, and S. Jain, "The Path to Water Resources Solutions," *Maine Policy Review* 7 (2012).

S.M.C. Smith, P. Belmont, and P.R. Wilcock. "Closing the Gap Between Sediment Budgeting, Watershed Modeling and Stream Restoration," in *Stream Restoration in Dynamic Systems: Scientific Approaches, Analyses, and Tools*, eds. A. Simon, S.J. Bennett, and J.M. Castro (Washington, D.C.: American Geophysical Union, Water Resources Monograph, 2011).

D.J. Bain, S.M.C. Smith, and G. N. Nagle, "Reservations About Dam Findings," *Science* 321, no. 5891 (2008): 910.

L.S. Craig, D.C. Richardson, M. Palmer, E. Bernhardt, B. Bledsoe, M. Doyle, B. Hassett, S. Kaushal, S. Smith, and P. Wilcock, "Stream Restoration Strategies for Reducing River Nitrogen Loads," *Frontiers in Ecology and the Environment* 6, no. 10 (2008).

S. Smith. "Chesapeake Bay," in *Encyclopedia of Water Science*, ed. S. Trimble (New York: Taylor and Francis Reference Group, LLC, 2006).

S. Smith and K.L. Prestegard, "Hydraulic Performance of a Morphology Based Stream Channel Design," *Water Resources Research* 41, no. 11 (2005).

B. Hassett, M. Palmer, E. Bernhardt, S. Smith, J. Carr, and D. Hart, "Restoring Watersheds Project by Project: Trends in Chesapeake Bay Tributary Restoration," *Frontiers in Ecology and the Environment* 3, no. 5 (2005): 259-267.

A. Gellis, S. Smith, and S. Stewart. "Watershed Sediment Sources," in *A Summary Report of Sediment Processes in Chesapeake Bay and Watershed*, eds. M. Langland and T. Cronin (U.S. Geological Survey Water Resources Investigations Report 03-4123, 2003), Chapter 2.

S. Smith, M. Langland, and R. Edwards. "Watershed Sediment Transport," in *A Summary Report of Sediment Processes in Chesapeake Bay and Watershed*, eds. M. Langland and T. Cronin (U.S. Geological Survey Water Resources Investigations Report 03-4123, 2003), Chapter 3.

S. Smith, J. Herman, T. Cronin, G. Schwarz, M. Langland, K. Patison, and L. Linker, "Integrated Approaches to Sediment Studies," in *A Summary Report of Sediment Processes in Chesapeake Bay and Watershed*, eds. M. Langland and T. Cronin (U.S. Geological Survey Water Resources Investigations Report 03-4123, 2003), Chapter 7.