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Academic Experience

- PhD** Cornell University, Biological and Environmental Engineering May, 2006
Thesis: "Incorporating Spatial Structure of Saturated Areas into Hydrological Models" (expected)
- MS** Cornell University, Biological and Environmental Engineering Jan, 2003
Thesis: "Using a Topographic Index to Distribute Variable Source Area Runoff Predicted with the SCS-Curve Number Equation"
- BS** Purdue University, Agricultural and Biological Engineering May, 2001
Minor: Mathematics GPA:3.62/4.00

Relevant Professional Experience

Graduate Research Assistant	Cornell University Biological and Environmental Engineering	09/2001 to Present
Research Fellow	Stockholm University Physical Geography and Quaternary Geology	09/2004 to 09/2005
Undergraduate Research Assistant	Purdue University USDA National Soil Erosion Research Lab	05/2000 to 09/2001
Undergraduate Teaching Assistant	Purdue University Agricultural and Biological Engineering	09/1999 to 05/2000
Engineer Intern & CAD Drafter	CTI Environmental Green, OH	05/1999 to 09/1999

Honorarys, Societies, and Professional Activities

Alpha Epsilon (Ag. Engineering)	American Society of Agricultural Engineers
Tao Beta Pi (Engineering)	Soil and Water Conservation Society
Gamma Sigma Delta (Agriculture)	EIT (Engineering in Training)
American Geophysical Union	Reviewer for: <i>Water Resources Research</i>

Grants, Awards, and Fellowships

IGERT Grant: Vespucci Summer School for SDI and Spatial Grid (2005)
American Scandinavian Foundation Fellow (2004-2005)
IGERT Equipment Grant in Biogeochemistry and Environmental Biocomplexity (2003)
Annie's Homegrown Environmental Studies Scholarship (2002)
International Erosion Control Association's Thrill of Achievement Scholar (2000)

Software, Programming, and Computer Skills

Matlab	Visual C++	GIS (ArcView, ArcGIS, GRASS)
Visual BASIC	FORTTRAN and C	Avenue
AutoCAD	UNIX and Windows	HTML

Papers and Publications

Professional Journal Publications*

- [A] Lyon, S.W., J. Seibert, A.J. Lembo, M.T. Walter, and T.S. Steenhuis. 2005. Geostatistical investigation into the temporal evolution of spatial structure in a shallow water table. *Hydrology and Earth System Sciences*. (Submitted)
- [B] Lyon, S.W., R. Sorensen, J. Stendahl, U. Zinko, and J. Seibert. 2005. Using landscape characteristics to define an adjusted distance metric for improving kriging interpolations. *Water Resources Research*. (Submitted).
- [C] Lyon, S.W., A.J. Lembo, J. Seibert, M.T. Walter, and T.S. Steenhuis. 2005. Interpolation of water quality along a stream network from synoptic data. (In preparation)
- [D] Lyon, S.W., M.T. Walter, and T.S. Steenhuis. 2005. Field validation of the variable source area runoff concept. (In preparation)
- [E] Lyon, S.W., A.J. Lembo, M.T. Walter, and T.S. Steenhuis. 2005. An integrated management tool for farm nutrient management [Web-based GIS application]. (In preparation)
- [1] Agnew, L.J., S.W. Lyon, P. Gérard-Marchant, V.B. Collins, A.J. Lembo, T.S. Steenhuis, M.T. Walter. 2005. Identifying hydrologically sensitive areas: Bridging the gap between science and application. *Hydrological Processes*. (In press)
- [2] Lyon, S.W., M.R. McHale, M.T. Walter, and T.S. Steenhuis. 2005. The impact of runoff-generation mechanisms on the location of critical source areas. *Journal of the American Water Resources Association*. (In press)
- [3] Lyon, S.W., A.J. Lembo, M.T. Walter, and T.S. Steenhuis. 2005. Defining probability of saturation with indicator kriging on hard and soft data. *Advances in Water Resources*. (In press)
- [4] Lyon, S.W., M.T. Walter, P. Gérard-Marchant, and T. S. Steenhuis. 2004. Using a topographic index to distribute variable source area runoff predicted with the SCS-curve number equation. *Hydrological Processes*. 18(15):2757-2771.

* Most available in PDF at www.bee.cornell.edu/swlab/SoilWaterWeb/papers.htm

Additional Presentations and Publications

Conference Presentations and Posters

Lyon, S., R. Sorensen, J. Stendahl, and J. Seibert. 2005. Adjusting distance using landscape factors and fuzzy logic in geostatistics. *EGU General Assembly*. Abstract EGU05-A-00090. Vienna, Austria Apr. 24-29, 2005.

Lyon, S., J. Seibert, T. Walter, and T. Steenhuis. 2005. Spatial and temporal evolution of near-stream saturated areas. *EGU General Assembly*. Abstract EGU05-A-00091. Vienna, Austria Apr. 24-29, 2005.

Sorensen, R., S. Lyon, J. Stendahl, and J. Seibert. 2005. Effects of DEM resolution on the performance of topographic indices. *EGU General Assembly*. Abstract EGU05-A-00941. Vienna, Austria Apr. 24-29, 2005.

Lyon, S.W., P. Gérard-Marchant, M.T. Walter, and T.S. Steenhuis. 2003. Improving the P-index by locating runoff-sources of P in watersheds with saturation excess hydrology. *SWCS Annual Conference Abstracts*. Spokane, WA. Jul. 26-30, 2003.

Lyon, S.W., T.S. Steenhuis, M.T. Walter, P. Gérard-Marchant, and V.K. Mehta. 2002. Using the SCS runoff equation and topographic index to dynamically predict the location of variable source runoff areas. *Eos. Trans. AGU*, 83(19), Spring Meet. Suppl., Abstract H41A-07. Washington, D.C. May 28-31, 2002.

Other Publications and Abstracts

Steenhuis, T.S., P. Gérard-Marchant, S. Lyon, A. Neil, B. Liu, E. Schneiderman, M.T. Walter. 2005. Delineating landscape elements for describing of hydrological processes in distributed watershed models in temperate humid climates. *EGU General Assembly*. Abstract EGU05-A-10742. Vienna, Austria Apr. 24-29, 2005

Steenhuis, T.S., G. Mendoza, S.W. Lyon, P. Gérard-Marchant, M.T. Walter, E. Schneiderman. 2003. Distributed GIS based runoff predictions for variable source watersheds using the SCS-Curve Number. *EGS Geophysical Abstracts* 5, 01628, 2003.

Crist, J.T., Y. Zevi, J. Taylor, N. Peranginangin, B. Gao, S. Lyon, T. Dittrich, A.G. Marshall, D. De Alwis, P.C. Baveye, J.-Y. Parlange, J.F. McCarthy, and T.S. Steenhuis. 2002. Visualization of colloidal transport in porous media. *In: Colloids and Colloid-Facilitated Transport of Contaminants in Soils and Sediments*, L.S. de Jonge, O.H. Jacobsen and P. Moldrup, Eds. DIAS Report, Plant Production No. 80:31-38.

- Steenhuis, T.S., C.J.G. Darnault, J.T. Crist, T.M. Dittrich, S. Lyon, Y. Zevi, B. Gao, N. Peranginangin, J.C. Taylor, D. De Alwis, Y.-J. Kim, A. Marshall, P.C. Baveye, J.-Y. Parlange, J.F. McCarthy, and P. Garnier. 2002. Interaction of colloid transport and preferential flow. *In: Rhizosphere, Preferential Flow and Bio-availability: A Holistic View of Soil-to-Plant Transfer*. Abstracts. Int. Workshop, Centro Stefano Franscini, Monteverità, Ascona, Switzerland. Sept. 21-26, 2002. pp. 128-131.
- Steenhuis, T.S., J. Crist, Y. Zevi, D. De Alwis, A. Marshal, T. Dittrich, S. Lyon, B. Gao, N. Peranginangin, J. Taylor, P. Baveye, J.-Y. Parlange, and J. McCarthy. 2002. Determining (un)certainty in modeling colloid transport by visualization. *AGU Fall Meeting*. San Francisco, CA. Dec. 6-10, 2002.
- Klien, C., M.T. Walter, T.S. Steenhuis, and S.W. Lyon. 2001. Hydrological and land use controls on phosphorus distribution and movement in upland landscapes. *Proc. Geoenvironmental Impact Management, Geoenvironmental Engineering Conference*. Sept. 17-19, Edinburgh. 525-530.

Research Experience and Interests

My research focuses on the nexus of data and modeling for the protection of ecosystems and preservation of drinking water quality. By examining hydrologic pathways from landscapes to reservoirs, we can see where water comes in contact with pollutants that adversely influence the health of the environment. To this end, my research interest is on how to best collect, represent, interpret, and employ data measured at various scales to better understand and model these natural processes. I feel this coming together of real world data and modeling is a critical point that needs to be stressed in scientific research. Thus, there is a common thread in my research of confirming and developing water quality models based on field data.

Most of these models are concerned with runoff [1,4]* and contaminant transport [2] at the watershed scale. Although I have researched colloid transport at the pore scale, my current focus is on larger scales because I feel this is where the most impact can be made in terms of policy to address excess contaminant loading. To demonstrate this impact, one study focused on the importance of selecting the appropriate runoff mechanism in best management practice (BMP) implementation [2]. Here, 'appropriate' is defined by expert knowledge based on field observations and represents the coming together of data and modeling. My research interests at this scale also include using new methods to measure water tables and represent spatially-variable runoff source areas [3,A,D]. This research creates data for the validation of hydrological models [1] that can be used to underpin web-based tools usable by watershed planners [E]. This realm of web-based GIS applications is very exciting to me as a way of bridging the gap between academia and the public sector, something that I feel is an important aspect of research.

While much of my research deals with physically measuring and modeling water pathways and quality in the environment, more recent studies focus on the influence landscape properties have on chemical constituents on the ground and in streams [B,C]. To borrow economic rhetoric, I am concerned with maximizing the return on field data while minimizing the investment. This involves making intelligent choices, again incorporating field experience, when representing and interpolating data using common geostatistical techniques. Field experience comes from a variety of sources leading to interdisciplinary contacts that increase understanding and often provide new research pathways. In recent work, I have used physical landscape parameters derived from topographic, soil, and vegetation information to redefine distance, in effect a transformation of vector space, in order to minimize error made when interpolating between observations [B]. This process produces spatially distributed data from point observations that not only contain quantifiably less error but also fit what is expected giving our understanding of dominant processes in nature. My recent research takes this process and uses it to produce spatially continuous measures of stream water quality [C].

These ideas of relating data and modeling will influence my future research. I see this relation as a feedback loop where real-world observations improve models that can be used to fortify data at other scales. This increases our understanding of processes and allows smaller dataset to say more about the environment.

* References to CV, numbers are published or 'in press' and letters are 'in preparation' or 'submitted'

Teaching Theory

The focus of my teaching style is to foster understanding that leads to independent thinking. I believe more is gained from applying knowledge than simply attaining it. From this basic philosophy, it is easy to understand why I enjoy teaching in a hands-on lab environment. Really, my teaching experience started in high school when I organized a program to teach 10-year-old children how to play chess. But, more appropriately, I have extensive experience as both an undergraduate and graduate teaching assistant. I have assisted in numerous lab-based courses ranging from a Matlab computer programming course (4 semesters at Purdue University) aimed at the freshmen level to a soil and water engineering design course (1 semester at Purdue University and 1 semester at Cornell University) aimed at the junior/senior level to a GIS applications course (1 semester at Purdue University) aimed at the junior/senior level. Teaching these positions consisted of describing a process (use of an engineering level or what a 'for' loop is), providing demonstration, and then assisting students in using the process. I do not micromanage students and feel that they benefit mostly from mistakes. This allows them to learn why things (programs or calculations) work when they work. The students appreciate this style and have shown their approval time and again in favorable reviews.

In addition to lab-based teaching experience, I have conducted many seminars and lectures in several courses. One lecture given at Cornell University for a senior level drainage course required covering a large portion of my master's research to demonstrate the importance of distinguishing between runoff processes. For this, I needed to condense difficult topics to make sure students starting from different technical backgrounds ended with the same level of understanding. Another, taught while I was an undergraduate, required me to give an overview of my department to freshman in general engineering. Using energetic language to keep up interest, I delivered one of the better seminars in the series based on reviews. Of course, not all learning takes place in the classroom. I have been a mentor for three years in my department's NSF-funded Research Experience for Undergraduates (REU) program. During these experiences, the mentor has 10 weeks to get an undergraduate up to speed on a research topic so they can conduct, what amounts to, publishable research. In my most recent mentoring venture, the student seriously doubted the approach we were using to measure overland flow. However, by going into the field, looking at the site, and trouble shooting the design together, we were able to show which process was dominant at that particular site. This excited the student and made the program a worthwhile experience in the student's education. In addition to these REU experiences, I have been able to fill the role of mentor to newer graduate students and help them learn the how and why of many field sampling techniques. One example of this is a recent field campaign conducted during my time in Sweden while working with a German graduate student where I explained the theory and technique of stream flow sampling we were using in a synoptic study. This allowed him to understand the margin of error in the measurement and better grasp what the data represents.

My teaching philosophy has been successful to date. I am looking forward to the chance to develop courses that can incorporate hands-on situations into classroom settings. I think this provides the best opportunity for a student to learn.

Professional References*

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* Listed by length of active working relationship