GEOMORPHORUM

Newsletter of the Geomorphology Specialty Group of the Association of American Geographers

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SPECIALTY GROUP OFFICERS 2007-08

A MESSAGE FROM THE CHAIR

Geomorphology and the Third Pillar

Richard Chorley's comment in 1978 about a geomorphologist's instinct to reach for a shovel when theory is mentioned, served to highlight his perception of a lack of balance and connection between theory and observational work at that time. Although one could debate the degree to which theory and observation have become more tightly coupled since then, perhaps the equivalent issue of today is the need for geomorphology to more fully integrate the so-called "third pillar" of science.

In my youth I became unreasonably fascinated by glacial geomorphology as a result of living on a till plain and going hiking in the glaciated uplands of the English Lake District. As an undergraduate I had the good fortune to take part in several field expeditions, shovel in hand, that provided me with the chance to learn the basics of observational science in a variety of amazing glaciated mountains. By the time I embarked on my PhD I had worked out that theory drove me to pose questions that could only be answered by extensive field work in spectacular landscapes.

Imagine my horror when I discovered that the topic I selected for my PhD already had both extensive observational data from great field locations and some very interesting theoretical frameworks. What was needed was not more time with a shovel, or more theory, but a new way to test theory using the observational data. Thus, surprisingly, I found myself spending most of my PhD years in windowless rooms sitting in front of computers, adapting and modifying numerical models of glaciers and glacial erosion to examine how landscape development predictions based on theory compared to observational data. I had begun to use what is now often described as **the third pillar** of science, computational modeling and simulation.

As the President's Information Technology Advisory Committee argued in 2005, "Computational science

provides a unique window through which researchers can investigate problems that are otherwise impractical or impossible to address ..(and) .. now constitutes what many call the third pillar of the scientific enterprise, a peer alongside theory and physical experimentation". As a result, major agencies worldwide have been investing heavily in high performance computers, mass-storage systems, high-speed networks, visualization tools and other elements of cyberinfrastructure, including an NSF-funded environment for integrative geosciences research. Many of these same agencies are also investing heavily in research that is designed to make the kind of advances that are only possible in this type of environment.

Thus I would suggest that this is an excellent time for geomorphologists to take advantage of the revolutionary capabilities of modern cyberinfrastructure. One approach is to team up with colleagues who focus on simulation and modeling; interdisciplinary research teams are increasingly the source of major new advances in science, and are often encouraged by funding agencies. In addition, we should consider including more computational simulation and modeling in the programs of study that we encourage students of geomorphology to pursue. In combination, I would argue that this would dramatically enhance the type, scale and pace of advances in most branches of geomorphology.

In case you were wondering if there was a happy ending to the story I began earlier. Yes, the simulation work in my PhD did expose the need for new and more refined types of observation, and this led to extensive field programs in spectacular landscapes I had not had the chance to visit before. This in turn led to more simulation work, and recently one of my PhD students defending his dissertation in a virtual reality theater.

Jon Harbor

(Quote is from http://www.nitrd.gov/pitac/reports/20050609_computational/computational.pdf)

2008 AAG MEETING

http://aag.org/annualmeetings/2008/index.htm

The 2008 Annual Meeting of the AAG will be held in Boston, April 15th -19th. Highlights include:

Wiley Blackwell Lecture on Geomorphology and Society (Thursday lunchtime). *Managing the Mississippi Delta for the 21st Century: A Challenge to Science and Society.* Denise Reed, University of New Orleans.

Geomorphology Specialty Group Business Meeting followed by the **Physical Geography Reception** (Wednesday evening)

Sessions or particular interest to geomorphologists:

Tuesday:

- Restoration Geographies

Wednesday:

- Geomorphology Student Paper Competition
- Marine Geomorphology
- Scale Issues in Weathering Geomorphology

Thursday:

- Human Impacts on Watershed Processes
- Channel Morphology, Soil Erosion and Sediment Storage and Transport
- Channel Changes and Sediment Transport in Fluvial Systems
- Nutrient Loads, Stream Ecology and Stream Restoration
- Floods, Paleo-Floods and Sediment Transport in the American West

Friday:

- Soils as Text in Environmental Change, Paleoenvironments and Ancient Cultures
- Treeline Ecotones
- Geomorphology, Landform Analysis and Landscape Change

Full Program Schedule at
http://aag.org/annualmeetings/2008/schedule.htm

Opportunities for Input to NRC Studies

Two National Research Council studies are underway with relevance to geomorphology and GSG. Opportunities for community input are forthcoming (including at AAG meeting), and it will be very important for members of GSG to be heard (from Anne Chin).

1. Challenges and Opportunities in Earth Surface Processes
http://www8.nationalacademies.org/cp/projectview.aspx?key=48867

2. Strategic Directions for the Geographical Sciences in the Next Decade
http://www8.nationalacademies.org/cp/projectview.aspx?key=48903

Scope of the studies and statement of tasks are posted on the webpages.

Upcoming Conferences

39th Annual Binghamton Geomorphology Symposium
University of Texas at Austin. Oct 10th-11th, 2008
Fluvial Deposits and Environmental History
https://webspace.utexas.edu/hudsonpf/binghamton.html
Registration is now open, and the poster submission deadline is September 1st, 2008. Pre-symposium field trip is Oct 8th-9th.

7th International Conference on Geomorphology
Melbourne, 7-12 July 2009.
Ancient Landscapes - Modern Perspectives
www.geomorphology2009.com
The scientific program will accommodate all aspects of geomorphology, including:
- River Management
- Landscapes and geomorphic processes in drylands
- Ancient landforms and regolith
- Fire and geomorphology
- Global environmental change and geomorphology
- Landscape connectivity
- Applications of long-term chronometric methods, including cosmogenic isotopes
-Landscape and process modeling
- Coastal geomorphology
- Hillslopes and mass movement
- Applied and urban geomorphology
- Quaternary and glacial geomorphology and dating
- Karst geomorphology
- Geomorphology and archaeology
- Geomorphology and ecology
- Planetary geomorphology

A wide range of field trips will be offered for delegates to experience the diversity of Australian and New Zealand landforms. One-day mid-conference field trips will be offered, as well as longer pre- and post-conference trips.

IAG/AIG Regional Conference on Geomorphology
The International Association of Geomorphologists (IAG/AIG) offers 3 grants of 500 (five hundred) Euros each for YOUNG GEOMORPHOLOGISTS (under 35 yrs old) world-wide (except Romania) who would like to take part in the IAG/AIG Regional Conference on Geomorphology (Brasov, Romania, 15-26 September 2008). More details on IAG/AIG Website (www.geomorph.org) Deadline May 30th, 2008.

Third Interagency Conference on Research in the Watersheds (ICRW):
Planning for an Uncertain Future: Monitoring, Integration, and Adaptation. This conference is being organized by the U.S. Geological Survey and will be held 8-11 September 2008 in Estes Park, Colorado. The purpose of this conference is to highlight research conducted in small watersheds. This research provides important answers for stakeholders charged with managing water resources at the watershed scale and improves our understanding of global processes. The conference will have both oral and poster presentations from universities, government agencies, industry, and stakeholders. Field trips and activities are planned to acquaint participants with alpine and montaine hydrology, ecology, geomophology, and biogeochemisty. Deadline for initial abstracts is May 2. Topics, travel and lodging information, registration, and other details are available on the conference web site (http://www.hydrologicscience.org/icrw/).

GSA/SSSA
Special Geomorphology Sessions at the 2008 Joint Annual Meeting of the Geological Society of America and the Soil Science Society of America
"Celebrating the International Year of Planet Earth"
October 5-9, 2008, Houston, Texas USA
(http://www.geosociety.org/meetings/2008/index.asp)

Updates from Members

Carol Harden (University of Tennessee) has been elected Vice President of the AAG. Her term as VP begins July 1, 2008. One of her goals for this leadership position is to increase the visibility of physical geography. She invites your ideas and suggestions.

Carol reports a thriving Watershed Research Group at the University of Tennessee, with a group of interesting theses on various aspects of stream morphology and water quality in the “pipeline.” In response to requests from partner organizations in the EPA-funded “Little River Watershed Initiative,” Carol and her students will present their semester and thesis research in an open meeting at a public library. Check with her after the semester ends for a report on the success (or…) of this venture.

Jon Harbor recently moved from serving as Dean of the College of Liberal Arts and Sciences at the University of Colorado Denver, to Associate Vice President for Research at Purdue University. He also serves as the interim director of the Discovery Learning Center which focuses on interdisciplinary research in education. Recent publications Jon and his students have been involved in include:
- Darmody, R., Thorn, C., Seppälä, M., Campbell, S., Li, Y.K. and Harbor, J. 2008. Age and weathering status of granite tors in Arctic Finland (~68 N.) *Geomorphology*, 94 (1) p.10-23.
- Napieralski, J., Harbor, J., and Li, Y.K., 2007. Glacial Geomorphology and Geographic Information Systems. *Earth Science Reviews*, 85, p.1-22.
- Napieralski, J. Hubbard, A., Li, Y.K., Harbor, J., Stroeven, A., Kleman, J, Alm, G. and Jansson, K., 2007. Towards a GIS assessment of numerical ice sheet model performance using geomorphological data. *Journal of Glaciology*, 53, 71-83.

- Li, Y.K., Napieralski, J., Harbor, J. and Hubbard, A., 2007. Identifying patterns of correspondence between modeled flow directions and field evidence: an automated flow direction analysis. *Computers and Geosciences*, 33,141-150.
- Davis Todd, C., Goss, A., Tripathy, D., and Harbor, J., 2007. The effects of landscape transformation in a changing climate on local water resources. *Physical Geography*, 28, p.21-36.
- Dalzell, B., Filley, T. and Harbor, J. 2007. The role of hydrology in annual organic carbon loads and terrestrial organic matter export from a Midwestern agricultural watershed*. Geochimica et Cosmochimica Acta*, 71, 1448-1462.
- Shepardson, D., Wee, B., Priddy, M., and Harbor, J. 2007. Students' Mental Models of the Environment. *Journal of Research in Science Teaching*. 44, 327-348.
- Shepardson, D., Wee, B., Priddy, M., Schellenberger, L. and Harbor, J. 2007. What is a Watershed? Implications of Student Conceptions for Environmental Science Education and the National Science Education Standards. *Science Education*. p.554-578.

Antony Orme (UCLA) published the following items in geomorphology during 2007:
- J.G.Zoulas and A.R.Orme (2007) "Multidecadal-scale beach changes in the Zuma littoral cell, southern California," *Physical Geography*, 28 (4), 277-300, which suggests a correlation between beach changes and the Pacific Decadal Oscillation over the past 80 years;
- A.R.Orme (2007) "Clarence Edward Dutton (1841-1912): soldier, polymath and aesthete," *Geological Society, London, Special Publication*s 287, 271-286, which explores Dutton's concept of isostasy, ignored by Davis but resurrected in recent research;
- A.R.Orme (2007) "The rise and fall of the Davisian cycle of erosion: prelude, fugue, coda and sequel," *Physical Geography*, 28 (6), 474-506, which places cyclic concepts in historical and modern contexts
- "The tectonic framework of South America" (pp. 3-22), and (5) "Tectonism, climate, and landscape change" (pp. 23-44), two chapters in the *The Physical Geography of South America* (T.T.Veblen, K.R.Young, and A.R.Orme, editors), Oxford University Press, New York, 2007. Geomorphologists Jose Araya-Vergara, Thomas Dunne, Carol Harden, Leal Mertes, and Geoffrey Seltzer, together with soil scientist Stanley Buol, also contributed to this book.

David R. Butler received the 2007 Presidential Award for Excellence in Scholarly/Creative Activity from Texas State University-San Marcos, the highest award for scholarly activity at the university. Recent Publications:
- Akiwumi, Fenda A., and David R. Butler, 2007. Mining and environmental change in Sierra Leone, west Africa: a remote sensing and hydrogeomorphological study. *Environmental Monitoring and Assessment* DOI 10.1007/s10661-007-9930-9.
- Butler, David R., George P. Malanson, and Stephen J. Walsh, 2007. Glacier National Park, Montana, U.S.A. In: *Encyclopedia of Environment & Society* (P. Robbins, General Editor), Sage Publications, Thousand Oaks, CA, 769-770.
- Butler, David R., George P. Malanson, Stephen J. Walsh, and Daniel B. Fagre, 2007. Influences of geomorphology and geology on alpine treeline in the American West – more important than climatic influences? *Physical Geography* 28(5), 434-450.
- Malanson, George P., and David R. Butler, 2007, Guest Editors. Alpine Treeline, Climate, and Environmental Changes. *Physical Geography* 28(5), pp. 375-450.
- Malanson, George P., and David R. Butler, 2007. Introduction – Alpine treeline, climate, and environmental changes. *Physical Geography* 28(5), 375-377.
- Malanson, George P., David R. Butler and Daniel B. Fagre, 2007. Alpine ecosystem dynamics and change: a view from the heights. In: *Sustaining Rocky Mountain Landscapes: Science, Policy and Management for the Crown of the Continent Ecosystem* (T. Prato and D. Fagre, eds.), RFF Press, Washington D.C., 85-101.
- Malanson, George P., David R. Butler, Daniel B. Fagre, Stephen J. Walsh, Diana F. Tomback, Lori D. Daniels, Lynn M. Resler, William K. Smith, Daniel J. Weiss, David L. Peterson, Andrew G. Bunn, Christopher A. Hiemstra, Daniel Liptzin, Patrick S. Bourgeron, Zehao Shen, and Constance I. Millar, 2007. Alpine treeline of western North America: linking organism-to-landscape dynamics. *Physical Geography* 28(5), 378-396.
- Zeng, Yu, George P. Malanson, and David R. Butler, 2007. Geomorphological limits to self-organization of alpine forest-tundra ecotone vegetation. *Geomorphology* 91(3-4), 378-392.

Geomorphorum is issued twice a year by the Geomorphology Specialty Group of the Association of American Geographers. The purpose of this newsletter is to exchange ideas and news about geomorphology, and to foster improved communication within our community of scholars. The editor of Geomorphorum welcomes news, comments, and suggestions from all members of the geomorphological community. Issues of Geomorphorum are posted on the website of the GSG; new issues are announced through the Geomorphlist listing service currently maintained by David Wilkins at Boise State University.