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U.S. Geological Survey
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Current Position

Mendenhall Postdoctoral Fellow, U.S.G.S. - Menlo Park, CA

Research focus: Examining past and present heterogeneous deformation of the San Andreas Fault region using a 3-d geologic map of the San Francisco Bay area

Other interests: (1) Integrating geological and geophysical datasets, (2) Rheology of naturally deformed rocks, (3) Pluton emplacement processes, (4) Causes and consequences of heterogeneous deformation at crystallographic to tectonic scales, (5) Tectonic geomorphology.

Education & Relevant Work Experience

Postdoctoral Scholar, University of California - Berkeley (August 2006 – December 2007)

Postdoctoral Research Associate, University of Wisconsin - Madison

Research topics: (1) Development of lattice-preferred orientation and microstructural fabric in naturally deformed rocks, (2) Pluton emplacement processes.

Ph.D. in Geology, University of Wisconsin - Madison (May 2006)

Dissertation topic: Quantifying heterogeneous deformation: theory and application

Dissertation advisor: Dr. Basil Tikoff

M.S. in Geology, University of Wisconsin - Madison (January 2003)

Thesis topic: Magmatic fabric and sheeted emplacement of the Maiden Creek sill, Henry Mountains, Utah

Thesis advisor: Dr. Basil Tikoff

Environmental Geologist, URS / Dames & Moore, Houston, TX (Summer 1999 – Summer 2000)

B.A. in Geology, Rice University, Houston, TX (May 1999)

Thesis topic: Lineation rotation due to pluton emplacement, Mt. Morrison Pendant, Sierra Nevada: testing transpressional models

Thesis advisor: Dr. Virginia Sisson

Awards

2006 Distinguished Graduate Student Award (departmental), Univ. of Wisconsin - Madison

2006 Innovative Teaching Award (university-wide), Univ. of Wisconsin - Madison

2005 Ciriacks Distinguished Graduate Fellowship (departmental), Univ. of Wisconsin - Madison

- 2005 Thomas E. Berg Award for Excellence in Teaching (departmental), Univ. of Wisconsin - Madison
- 2005 Geology & Geophysics Teaching Enhancement Award (departmental), Univ. of Wisconsin - Madison
- 2004 Outstanding Student Research Award, G.S.A. Structure & Tectonics division
- 2001 Thomas E. Berg Award for Excellence in Teaching (departmental), Univ. of Wisconsin - Madison
- 2000 Weeks Research Assistantship (departmental), Univ. of Wisconsin - Madison

Grants

- 2005 Student Research Grant, G.S.A.
- 2004 Student Research Grant, G.S.A.
- 2003 Co-author of funded NSF grant to co-PIs Basil Tikoff and Dyanna Czeck
- 1998 Undergraduate research grant, G.S.A. South-Central Section
- 1998 Undergraduate research grant, Rice University

Teaching Experience

- Graduate Teaching Assistant, Department of Geology & Geophysics, Univ. of Wisconsin - Madison (four semesters). *Courses:* Structural Geology, Field Methods, Historical Geology, Introduction to Geologic Structures
- Lecturer, Department of Geosciences, Univ. of Wisconsin - Milwaukee (Spring 2003). *Course:* Structural Geology (lecture & lab)
- Delta program Certificate in Research, Teaching and Learning (www.delta.wisc.edu)

Publications

- Horsman, E., Morgan, S., de Saint-Blanquat, M., Gabert, G., Hunter, R.S., Nugent, R. & Tikoff, B.* (in press). Emplacement and assembly of shallow plutons through multiple magma pulses, Henry Mountains, Utah. Special Volume of the Transactions of the Royal Society of Edinburgh.
- Morgan, S., Stanik, A., *Horsman, E.*, Tikoff, B., de Saint-Blanquat, M., & Habert, G., 2008. Emplacement of multiple magma sheets and wall rock deformation: Trachyte Mesa intrusion, Henry Mountains, Utah. *Journal of Structural Geology*, v. 30, n. 4, pp. 491-512.
- Horsman, E., Tikoff, B., & Czeck, D.*, 2008. Rheological implications of heterogeneous deformation at multiple scales in the Late Cretaceous Sierra Nevada, California. *G.S.A. Bulletin*, v. 120, n. 1/2, pp. 238-255.
- Horsman, E. & Tikoff, B.*, 2007. Constraints on deformation path from finite strain gradients. *Journal of Structural Geology*, v. 29, n. 2, pp. 256-272.
- de Saint-Blanquat, M., Habert, G., *Horsman, E.*, Morgan, S. S., Tikoff, B., Launeau, P., & Gleizes, G., 2006. Mechanisms and duration of non-tectonically assisted magma emplacement in the upper crust, the Black Mesa pluton, Henry Mountains. *Tectonophysics* v. 428, n. 1-4, pp. 1-31.
- Horsman, E., Tikoff, B. & Morgan, S.*, 2005. Emplacement-related fabric and multiple sheets in the Maiden Creek sill, Henry Mountains, Utah. *Journal of Structural Geology*, v. 27, n. 8, pp. 1426-1444.
- Horsman, E. & Tikoff, B.*, 2005. Quantifying simultaneous discrete and distributed displacement. *Journal of Structural Geology*, v. 27, n. 7, pp. 1168-1189.

Morgan, S., *Horsman, E.*, Tikoff, B., de Saint-Blanquat, M., & Habert, G., 2005. Sheet-like emplacement of satellite laccoliths, sills, and bysmaliths, Henry Mountains, southern Utah. In: Pederson, J. & Dehler, C.M. (eds.) Interior Western United States: G.S.A. Field Guide 6, pp. 283-309.

Publications in Review and Preparation

Czeck, D., Fissler, D., *Horsman, E.*, and Tikoff, B. (in review). Strain analysis and rheology contrasts in polyimictic conglomerates: an example from the Seine metaconglomerates, Superior Province, Canada. Submitted to the Journal of Structural Geology, Sept. 2008.

Titus, S.J. & *Horsman, E.* (in review). Improving students' spatial visualization skills. Submitted to the Journal of Geoscience Education, Dec. 2008.

Horsman, E., Titus, S.J., & Tikoff, B. (in prep.). Shallow emplacement in magmatic arcs. For submission to Lithosphere, Winter 2008-09.

Horsman, E., Tikoff, B., & Czeck, D. (in prep.). Evolution of fabric and LPO in naturally deformed rocks, Seine metaconglomerate, Ontario. For submission to the Journal of Structural Geology, Spring 2009.

Selected Abstracts

Horsman, E., Graymer R.W., McLaughlin, R.J., Jachens R.C. & Scheirer, D.S. Examining the evolution of the Peninsula segment of the San Andreas Fault, northern California, using a 4-D geologic model. Eos Trans. AGU 89(53), Fall Meet. Suppl., Abstract T41A-1933.

Horsman, E., Graymer R.W., Jachens R.C. & McLaughlin, R.J. Unraveling the History of the Peninsula Segment of the San Andreas Fault Using a 4-D Geologic Map. G.S.A. Annual Meeting, Abstracts with Programs, v. 40.

Horsman, E., Czeck, D. & Tikoff, B., 2007. Evolution of LPO and fabric in naturally deformed granite, Seine metaconglomerate, Ontario. Eos Trans. AGU 88, Fall Meet. Suppl., Abstract T33C-1506.

Horsman, E. & Saint-Blanquat, M. (de), 2007. Progressive cataclasite development, Buckhorn Ridge intrusion, Henry Mountains, Utah. G.S.A. Annual Meeting, Abstracts with Programs, v. 39.

Horsman, E. & Ketcham, R., 2006. Comparing and interpreting three-dimensional fabric analysis results, Henry Mountains porphyry, Utah, U.S.A. Eos Trans. AGU 87(52), Fall Meet. Suppl., Abstract GP31A-0081.

Horsman, E., Czeck, D. & Tikoff, B., 2006. Constraints on Late Cretaceous kinematics in the Sierra Nevada, California from finite strain and transpressional modeling. G.S.A. Annual Meeting, Abstracts with Programs, v. 38.

Horsman, E., de Saint-Blanquat, M., Habert, G., Morgan, S.S. & Tikoff, B., 2006. Examining relationships between geometric evolution and fabric development during incremental emplacement of sheeted igneous intrusions, Henry Mountains, southern Utah, USA. LASI II: Physical Geology of Subvolcanic Systems. Visual Geosciences, DOI 10.1007/s100069-006-0002-z

Horsman, E., Czeck, D. & Tikoff, B., 2005. Does the rheology of naturally deformed rocks depend on finite strain? G.S.A. Annual Meeting, Abstracts with Programs, v. 37, n. 7.

Horsman, E., Morgan, S., de Saint-Blanquat, M., Habert, G. & Tikoff, B., 2005. Shape evolution and fabric development during progressive sheeted growth of igneous intrusions, Henry Mountains, southern Utah. G.S.A. Annual Meeting, Abstracts with Programs, v. 37, n. 7, p. 132.

- Titus, S.J., *Horsman, E.*, Goodwin, L. & Tikoff, B., 2005. Improving students' three-dimensional visualization skills in lecture and lab. G.S.A. Annual Meeting, Abstracts with Programs, v. 37, n. 7, p. 412.
- Horsman, E.*, Tikoff, B. & Czeck, D., 2005. Complex deformation patterns caused by protolith heterogeneity, Gem Lake shear zone, east-central Sierra Nevada. G.S.A. Cordilleran section meeting, Abstracts with Programs, v. 37, n. 4, p. 73.
- Horsman, E.*, Tikoff, B. & Czeck, D., 2004. The effects of composition and finite strain on rock rheology: constraints from analysis of natural deformation. Eos Trans. AGU 85(47), Fall Meet. Suppl., Abstract T41F-1301.
- Horsman, E.*, Ketcham, R.A., Tikoff, B. & Morgan, S., 2003. Comparing results of three-dimensional fabric analysis using X-ray computed tomography, image analysis, and anisotropy of magnetic susceptibility. G.S.A. Annual Meeting, Abstracts with Programs, v. 35, n. 6, p. 179.
- Horsman, E.* & Tikoff, B., 2002. Three-dimensional magmatic fabric of a sheeted sill, Henry Mountains, Utah. G.S.A. Annual Meeting, Abstracts with Programs, v. 34, n. 6, p. 375.
- Horsman, E.* & Tikoff, B., 2002. Quantifying combined discrete and distributed displacement. G.S.A. Penrose Conference: Three-dimensional flow, fabric development, and strain in deformed docks and the significance for mountain building processes.
- Horsman, E.* & Tikoff, B., 2001. Quantifying combined discrete and distributed displacement. G.S.A. Annual Meeting, Abstracts with Programs, v. 33, n. 6, p. 324.
- Horsman, E.*, Sisson, V.B. & Tikoff, B., 1999. Lineation rotation due to pluton emplacement, Mt. Morrison Pendant, Sierra Nevada: testing transpressional models. G.S.A. Cordilleran Section Meeting, Abstracts with Programs, v. 31, n. 4, p. 63.

Invited Presentations

East Carolina University, Winter 2009
AGU Fall meeting, Winter 2008
Sacramento State University, Winter 2008
University of California - Davis, Spring 2008
Sonoma State University, Fall 2006 and Fall 2007
Colgate University, Spring 2007
San Jose State University, Fall 2006
GSA annual meeting, Fall 2005

Collaborators

Sven Morgan, Central Michigan Univ.
Sarah Titus, Carleton College
Scott Giorgis, SUNY-Geneseo
Russell Graymer, U.S.G.S.
Dyanna Czeck, Univ. of Wisconsin - Milwaukee
Michel de Saint-Blanquat, Univ. Paul-Sabatier, Toulouse, France
Thierry Menand, Univ. of Bristol, UK
Guillaume Delpech, Univ. Orsay - Paris Sud XI, France

Professional Development

Session co-convener, Understanding strike-slip faults, A.G.U. Fall Meeting, December 2008

Session co-convener, Using geology and geophysics to solve geoscience problems, G.S.A. Annual Meeting, Fall 2007

Session co-convener, Visualization in the Geosciences, G.S.A. Annual Meeting, Fall 2006

Field trip co-leader, Sheet-like emplacement of satellite laccoliths, sills, and bysmaliths, Henry Mountains, southern Utah. G.S.A. Annual Meeting, Fall 2005

Reviewer - Geological Society of America Bulletin

Reviewer - Journal of Structural Geology

Reviewer - Journal of South American Earth Science

Developed and co-led TA training sessions for the Department of Geology and Geophysics, University of Wisconsin – Madison, Fall 2005

Presentation of teaching research at the National Advisory Board meeting for the NSF-funded Center for the Integration of Research, Teaching and Learning (CIRTL), Spring 2005

Presentation of teaching research at the Teaching and Learning Symposium, University of Wisconsin – Madison, Spring 2005

Panelist at Project Kaleidoscope workshop on building interdisciplinary programs, Spring 2005

Panelist at the Diversity Forum, University of Wisconsin – Madison, Spring 2005