Richard Henry Styron

Address and contact information
The University of Michigan
Department of Earth and Environmental Sciences
Ann Arbor, Michigan
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Current Position
Post-doctoral Researcher
Crustal Mechanics and Lithospheric Dynamics Research Group
Department of Earth and Environmental Sciences
University of Michigan
supervisor: Eric Hetland

Primary Research Interest:
Tectonic and volcanic deformation of lithosphere via field, geodetic, and thermochronologic methods

Specialties include field mapping, low-temperature thermochronology and cosmogenic nuclide dating, and computer modeling of faulting and orogenesis

Personal Information
DOB: 15 Dec 1982, Tulsa, Oklahoma USA (US citizen)
Married, no children

Education

University of Kansas	Geology	Ph.D., 2012

Thesis: Estimating fault slip rates in the Indo-Asian Collision Zone over 10 to 10^6 yr timescales
Primary Advisor: Michael H. Taylor

University of Arkansas	Geology	M.S., 2008

Thesis: Kinematics of the western margin of Nicaragua from GPS geodesy
Primary Advisor: Glen S. Mattioli

University of Arkansas	Geology	B.S., 2005

Academic Appointments

Spring 2013-Fall 2014	Post-doctoral Researcher, CMLD Group, Univ. Michigan
Fall 2012	Visiting Scientist, CLMD Group, Univ. Michigan
Fall 2011 – Spring 2012	Teaching Assistant, University of Kansas
Summer 2011	Teaching Assistant, KU Field Camp
Fall 2010-Spring 2011	Patterson Fellow, University of Kansas
Summer 2010	Teaching Assistant, KU Field Camp
Spring 2010	Teaching Assistant, University of Kansas

Fall 2009	Patterson Fellow, University of Kansas
Summer 2009	Teaching Assistant, KU Field Camp
Spring 2009 - Spring 2010	Technician, KU Cosmogenic Nuclide Extraction Lab
Fall 2008 - Spring 2009	Teaching Assistant, University of Kansas
Fall 2007 - Spring 2008	Research Assistant, University of Arkansas
Summer 2007	Geodesist, University of Arkansas Geodesy Lab
Summer 2006	Geodesist, University of Arkansas Geodesy Lab
Spring 2006 - Spring 2007	Teaching Assistant, University of Arkansas
Fall 2004 - Fall 2005	Technician, University of Arkansas Tree-Ring Lab

Courses Instructed (I) /Assisted (A)

Structural Geology Laboratory (KU, UARK) (I)
Earthquakes and Natural Disasters (KU) (A)
Environmental Geology (KU) (A)
Geology Field Camp (KU) (I/A)
Introduction to Geology (KU) (A)
Advanced Field Mapping (KU) (I/A)
Introduction to Geology Laboratory (KU, UARK) (I)
Igneous and Metamorphic Petrology Laboratory (UARK) (I)

Honors and Awards

2012	Erasmus Haworth Award, top graduating Ph.D. student, University of Kansas
2010	Geological Society of America Outstanding Student Research Award, Structural Geology and Tectonics Division
2009-2011	Patterson Fellowship, University of Kansas

Grants:

2012	University of Kansas Summer Research Fellowship, $5000
2010	Geological Society of America Student Research Grant, Late Quaternary slip rate on the southeast Karakoram Fault from Terrestrial Cosmogenic Nuclides, $3600
2010	Summer Support, KU Department of Geology, $1200
2009	Summer Support, KU Department of Geology, $1200

Field Experience

5 field campaigns for GPS geodesy in Nicaragua and Dominica, 2006-2008
2 field campaign for tectonics (mapping, thermochronology, TCN sampling), S. Tibet, 2009-2010
2 mapping projects along the Garlock Fault, California, 2009 and 2011
1 field campaign for LiDAR survey of the 4 April 2010 Mexicali earthquake rupture, 2011
3x Teaching Assistant, University of Kansas Geology Field Camp, Cañon City, Colorado, 2009-2010
3x Dendrochronology field campaigns, Utah-Idaho, Arkansas, Oklahoma, 2004-2005
University of Arkansas Geology Field Camp, Dillion, Montana, Summer 2003

Geoscience Research Skills

Field

Geology: Structural mapping (bedrock and neotectonic), thermochronologic sampling, terrestrial cosmogenic nuclide sampling, instruction

Geodesy: Campaign GPS site installation and monitoring, Terrestrial LiDAR surveying

Laboratory

Geochronology: Zircon and apatite (U-Th)/He mineral separation, picking, noble gas and ICP mass-spectrometry, ^{10}Be and ^{36}Cl TCN sample preparation and isolation

Dendro: Tree-ring specimen preparation, ring width measurements, chronology development

Computer

GIS: ArcGIS (analysis and geologic mapping), Generic Mapping Tools, ENVI, Quantum GIS

Thermochron: Pecube (3D Finite Element thermochronological modeling program), Helium Modeling Package (HeMP).

Geodesy: GIPSY-OASIS, various GPS receiver apps (Trimble, Leica, Ashtech), GMT, Riegl RiScan (LiDAR data collection and management), ROI-PAC (limited experience)

General: Python, MATLAB, Linux, Picloud (python interface to Amazon cloud). Extensive experience with scientific programming in Python, in particular.

Leadership and logistics

Lead or co-lead 7 international field campaigns (Nicaragua, Dominica, Tibet (China), Mexico), several domestic field trips, working knowledge of Spanish, 3 summers as whitewater (raft, kayak) and mountain bike guide

Service

2014	Session Convener, Seismological Society of America meeting
2011	Organizer the KU Geology G-Hawker Student Research Symposium
2010-2011	President, KU Geology Club
2010-2011	President, Sigma Gamma Epsilon, Alpha Chapter (KU)
2009-2011	Mentor, KU Geology Undergraduate Mentor Program
2010	Organizer the KU Geology G-Hawker Student Research Symposium
2009	Co-founder and co-chair, KU Geology Undergraduate Mentor Program (undergraduates mentored by graduate students)
2007-2008	Vice President, Sigma Gamma Epsilon (UARK)
2007-2008	Graduate Student Representative (UARK)
2006-2008	Treasurer, Sigma Gamma Epsilon (UARK)

Academic Affiliations
American Geophysical Union (AGU)
Geological Society of America (GSA)
Sigma Gamma Epsilon (ΣΓΕ)
Seismological Society of America (SSA)

Publications

1. McCallister, A., Taylor, M., Murphy, M., **Styron, R.**, Stockli, D., Pullen, A., Kapp, P., *in press*, Thermochronologic constraints on the late Cenozoic exhumation history of the Gurla Mandhata metamorphic core complex, Southwestern Tibet, *Tectonics*, doi: 10.1002/2013TC003302

2. Sundell, K., Taylor, M., **Styron, R.**, Stockli, D., Kapp, P., Hager, C., Liu, D., Ding, L., 2013, Evidence for constriction and Pliocene acceleration of east-west extension in the North Lunggar rift region of west-central Tibet, *Tectonics*, vol. 32, no. 5, p. 1454-1479, doi: 10.1002/tect.20086.

3. **Styron, R.**, Taylor, M., Sundell, K., Stockli, D., Oalmann, J., Möller, A., McCallister, A., Liu, D., Ding, L., 2013, The South Lunggar Rift, southwest Tibet: Rates, timing and magnitude of deformation of an active detachment system, *Tectonics,* vol. 32, no. 4, p. 880-907, doi: 10.1002/tect.20053.

4. Veloza, G., **Styron, R**., Taylor, M., Mora, A., 2012, Active Tectonics of the Andes: An open-source archive for active faults in northwestern South America, *GSA Today*, vol. 22, no. 10, p. 4-10, doi: 10.1130/GSAT-G156A.1.

5. **Styron, R.**, Taylor, M., Murphy, M., 2011, Oblique convergence, arc-parallel extension, and strike-slip faulting in the High Himalaya, *Geosphere*, vol. 7, no. 2, 587-596.

6. **Styron, R.**, Taylor, M., and Okoronkwo, K., 2010, *HimaTibetMap-1.0*: new 'web-2.0' online database of active structures from the Indo-Asian collision, *Eos,* vol.91 no. 20.

Manuscripts in review

1. Taylor, M., Gosse, J., Horton, B., **Styron, R.**, Al Zayer, Y., Yang, G., Caffee, M., *in revision*, Active shortening along the Andean thrust front, Precordillera, Argentina: Implications for rates of deformation and eastward advance of the Andes, *Geophysical Journal International*

2. **Styron, R.**, and Hetland, E., *in review,* Estimated likelihood of observing a large earthquake on a continental low-angle normal fault, and implications for low-angle normal fault activity, *Geophysical Research Letters*

Selected Abstracts

1. **Styron, R.**, Hetland, E., and Zhang, G., 2013, The influence of topographic stresses on faulting, emphasizing the 2008 Wenchuan, China earthquake rupture, *Eos Trans. AGU, 93 (52),* Fall Meet Suppl., T54A-05

2. **Styron, R.**, Hetland, E., 2013, Topographic stress fields and their influence on faulting, SCEC 2013 annual meeting.

3. **Styron, R.**, Taylor, M., Sundell, K., Stockli, D., McCallister, A., Liu, D., Ding, L., 2011, Variations in extensional style in the Lunggar Rift, Southern Tibet, through a change in extensional driving forces, *Eos Trans. AGU, 92* (52), Fall Meet Suppl., T43F-2457.

4. Sundell, K., Taylor, M., **Styron, R.**, Stockli, D., Kapp, P., Liu, D., Ding, L, 2011, Late Miocene – Pliocene development of the North Lunggar Rift: Implications for the onset of strike-slip faulting and constrictional strain in central Tibet, *Eos Trans. AGU, 92* (52), Fall Meet Suppl., T43F, 2458.

5. Elliott, A., Gold, P., **Styron, R**., Oskin, M., Taylor, M., Hinojosa-Corona, A., Herrs, A., 2011, Time-series of scarp modification on the 2010 El Mayor-Cucapah earthquake rupture from repeat terrestial LiDAR surveys, *Eos Trans. AGU, 92*(52) Fall Meet. Suppl., T31B-2351.

6. **Styron, R.**, Taylor, M., Sundell, K., Stockli, D., McCallister, A., Liu, D., Ding, L., The South Lunggar Rift, western Tibet: Rates, timing and evolution of an active detachment system from structural mapping and (U-Th)/He thermochronology, *Geological Society of America Abstracts with Programs*, *Vol., 43*, paper 52-10.

3. **Styron, R.**, Taylor, M., Stockli, D., Sundell, K., Liu, D., Ding, L., 2010, Preliminary structural and thermochronological observations from the South Lunggar Rift, western Tibet, *Eos Trans. AGU, 91* (52), Fall Meet. Suppl., T43C-2243.

4. Sundell, K., Taylor, M., Stockli, D., Kapp, P., **Styron, R.**, Liu, D., Ding, L., 2010, Late Miocene - Pliocene rifting in west-central Tibet: Evidence from (U-Th)/He thermochronology of the North Lunggar Rift, *Eos Trans. AGU, 91* (52), Fall Meet. Suppl., T43B-2202.

5. **Styron, R.**, Taylor, M., Sundell, K., Stockli, D., Liu, D., Ding, L., 2010, The South Lunggar Rift: A juvenile detachment in western Tibet? *Geological Society of America Abstracts with Programs, Vol. 42*, No. 5, p. 619, paper 264-4.

6. Sundell, K., Taylor, M., Stockli, D., **Styron, R.**, Kapp, P., Liu, D., Ding, L., 2010, Low-temperature thermochronology of the North Lunggar Rift, west-central Tibet, *Geological Society of America Abstracts with Programs, Vol. 42*, No. 5, p. 619, paper 285-5.

7. **Styron, R.,** Taylor, M., and Murphy, M., 2009. Kinematics of the Himalayan arc from GPS geodesy and structural geology, *Eos Trans. AGU, 90*(52), Fall Meet. Suppl., Abstract T41D-07.

8. Sundell, K., M. Taylor, Stockli, D., Kapp, P., **Styron, R.**, 2009. A field test of the rolling hinge

model: Example from the Lunggar extensional system, *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract T43C-2112.

9. **Styron, R.**, Taylor, M., Murphy, M., 2009. Himalayan orogen-parallel extension from GPS geodesy and structural geology. *The 5th International Symposium on Tibetan Plateau / The 24th Himalaya-Karakorum-Tibet Workshop*, Beijing, China. August 11-14, 2009.

10. **Styron, R.**, Mattioli, G., and Cothren, J., 2007, Rapid Syn-eruptive Ground Deformation During July 2003 Soufriere Hills Volcano Eruption Constrained by Continuous Kinematic GPS, *Eos Trans. AGU, 88* (52), Fall Meet. Suppl., Abstract V24B-01.

11. **Styron, R**., Turner, H., James, S., Mattioli, G., and Jansma, P., 2007, Definition and kinematics of the Nicaraguan forearc and stable Caribbean from GPS geodesy, *Eos Trans. AGU, 88* (23) Spring Meet. Suppl., Abstract G33A-03.

12. Turner, H., Mattioli, G., Jansma, P., **Styron, R.**, 2007, Forearc Sliver Translation, a Lack of Arc-Normal Strain Accumulation, and Interplate Thrust Earthquakes: GPS Geodesy in Western Nicaragua, *Eos Trans. AGU, 88* (23), Spring Meet. Suppl., G33A-02

13. Fauria, K., **Styron, R.H**., James, S., Turner, H.L., Ashlock, A., Cavness, C.L., Collier, X., Feinstein, R., Murphy, R., Staisch, L., Williams, B., DeMets, C., Mattioli, G.S., Jansma, P.E., and J. Cothren, 2007, A revised Caribbean plate motion model: GPS geodetic results from the Dominica NSF-REU site, *Eos Trans. AGU, 88* (52), Fall Meet. Suppl., Abstract G21C-0657.

14. Staisch, L., **Styron, R.H**., James, S., Turner, H.L., Ashlock, A., Cavness, C.L., Collier, X., Fauria, K., Feinstein, R., Murphy, R., Williams, B., Mattioli, G.S., Jansma, P.E., and J. Cothren, 2007, Dislocation modeling and comparison with GPS data to assess possible elastic strain accumulation in the Central Lesser Antilles: New constraints from the NSF REU site in Dominica between 2001 and 2007, *Eos Trans. AGU, 88* (52), Fall Meet. Suppl., Abstract G21C-0656.

15. Murphy, R., James, S., **Styron, R.H**., Turner, H.L., Ashlock, A., Cavness, C.L., Collier, X., Fauria, K., Feinstein, R., Staisch, L., Williams, B., Mattioli, G.S., Jansma, P.E., and J. Cothren, 2007, Volcanic surface deformation in Dominica from GPS geodesy: Results from the 2007 NSF-REU site, *Eos Trans. AGU*, 88 (52), Fall Meet. Suppl., Abstract V11C-0754.

16. Graham, S., Turner, H.L., Mattioli, G.S., Jansma, P.E., **Styron, R.H**., Burch, M.J., Carr, B.B., FitzGerald, K., and C. Mansfield, 2007, GPS geodetic constraints on the November 21, 2004 Mw 6.3 earthquake off the northwest coast of Dominica: implications for in situ volatile solubilities and eruptions dynamics, *Eos Trans. AGU 88* (23), Jt. Assem. Suppl., G43B-1

17. Carr, B.B., Mattioli, G.S., Jansma, P., Turner, H., **Styron, R.**, Burch, M.J., Mansfield, C., Graham, S.E., and K. Fitzgerald, 2006, Ongoing Surface Deformation Studies of Dominica, BWI: GPS Results and Interpretations From the 2006 NSF-REU Campaign, *Eos Trans. AGU 87 (52)*, Fall Meet. Suppl., G53A-0867.