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## Sigma Gamma Epsilon Student Research Poster Session, Geological Society of America Meeting 2014, Vancouver, British Columbia, Canada

Paula Even

University of Northern Iowa, [even@sigmagammaepsilon.com](mailto:even@sigmagammaepsilon.com)

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# SIGMA GAMMA EPSILON STUDENT RESEARCH POSTER SESSION, GEOLOGICAL SOCIETY OF AMERICA MEETING 2014, VANCOUVER, BRITISH COLUMBIA, CANADA

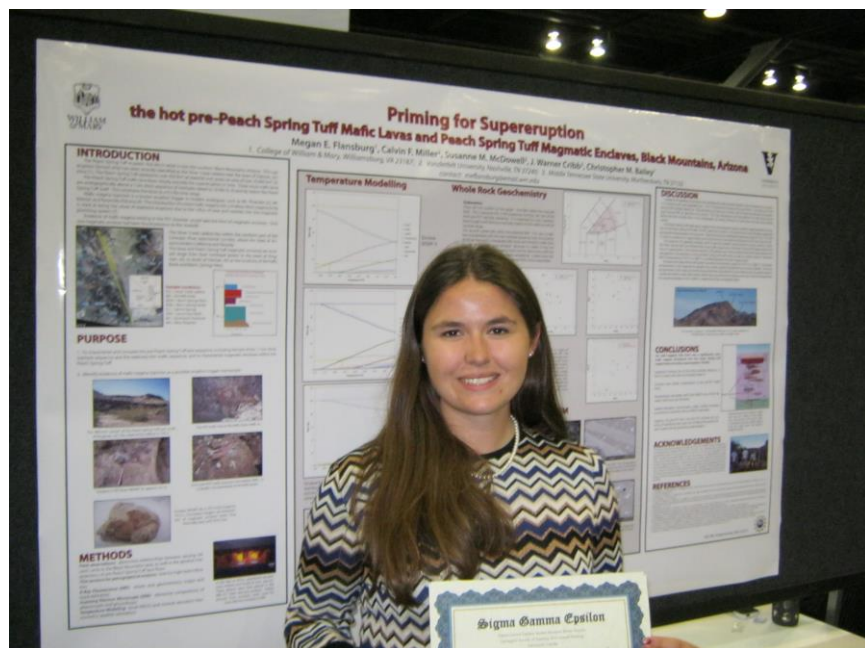
**Paula Even**

Dept. of Earth Sciences  
University of Northern Iowa  
Cedar Falls, IA 50614 USA  
even@sigmagammaepsilon.com

**ABSTRACT.** The 2014 Sigma Gamma Epsilon Undergraduate Research (Poster Session) took place during the 2014 Geological Society of American annual meeting in Vancouver, British Columbia, Canada on Tuesday, 21 October 2014. Fifty-two posters were presented at the SGE poster session. The National Council of Sigma Gamma Epsilon awarded the Austin A. Sartin Best Poster Award to Megan Flansburg a student at the College of William and Mary. Emily Lubicich, a student at the State University of New York - New Paltz, was awarded the National Council Best Poster Award.

**KEY WORDS:** Austin A. Sartin award, SGE National Council best poster award

## 2014 Austin A. Sartin Award



Recipient of the 2014 Austin A. Sartin Best Poster Award is **Megan Flansburg** from the College of William and Mary. Megan's co-authors were Calvin Miller and Susanne M. McDowell of Vanderbilt University); J. Warner Cribb of Middle Tennessee State University and Christopher Bailey of the College of William and Mary. The title of Megan's poster is: **Priming for Supereruption: The Hot**

**Pre-Peach Spring Tuff Lava Flows and Peach Spring Tuff Mafic Enclaves, Black Mountains, Arizona.**

**ABSTRACT.** Supereruptions are some of the most cataclysmic events on Earth, ejecting greater than 450 km<sup>3</sup> of volcanic material. The 18.8 Ma Peach Spring Tuff (PST) erupted in what is now the southern Black Mountains, Arizona (Ferguson *et al.*, 2013), with outflow deposits covering an area greater than 35,000 km<sup>2</sup> (Glazner *et al.*, 1986). The volcanic deposits erupted just prior to PST supereruption provide important insights on pre-supereruption magmatic conditions in the

Black Mountains volcanic center. The pre-PST volcanic sequence consists of a ~1 km thick suite of trachyte lavas, a relatively thin section of more mafic lavas, and Cook Canyon Tuff: an ignimbrite distinct from and smaller than PST (Pratt *et al.*, 2014 GSA). We took samples of pre-PST mafic lavas, one trachyte lava, and magmatic enclaves within PST. Bulk analyses of samples were obtained with XRF, phenocryst compositions were determined by SEM, and magmatic temperatures were estimated through use of the Excel MELTS program and apatite-saturation modeling. An atypically hot (~1015°C), aphyric trachyte lava, last of the thick trachyte sequence, contrasts with the rest of the sequence at temperatures near 850°C (Rice *et al.*, 2014 GSA) and is followed by the eruption of relatively mafic magmas that suggest significant heat input. Mafic lavas range from trachybasalts to basaltic trachyandesites, with estimated temperatures ranging from 1020-1150°C (assuming water content of 2 weight % and constant pressure of 200 MPa). Magmatic enclaves within the PST itself also range from trachybasalt to trachyandesite, and are similar geochemically and in phenocryst assemblage to the mafic lavas. Estimated temperatures of enclave magmas range from 1010-1075°C, similar to those of the mafic lavas. The only definitive magmatic enclave identified previously within the PST is similar in composition and petrographic characteristics to our enclaves (Pamukcu *et al.*, 2013). The presence of mafic enclaves, alone, is an indicator of hotter magma injected in the (PST) chamber and our data suggests that pre-PST lavas are related to these enclaves. The hot trachyte flow, followed by mafic lavas and related enclaves within the PST, indicate heat input into the Black Mountains magmatic system preceding PST supereruption and are possible evidence of the eruption trigger (cf. Pamukcu *et al.*, 2013).

## 2014 National Council Best Poster Award



Recipient of the 2014 National Council Best Poster Award is **Emily Lubich** from State University of New York - New Paltz. Emily's co-authors Tristan Craddock, Andres R. Werkhoven and Dr. Frederick W. Vollmer, the Sigma Gamma Epsilon chapter advisor. The title of Emily's posters is: **Evidence from Joint Sets and Shear Zones in Eastern New York for Two Orogenic Events and the Westward Displacement of the**

## Catskill Mountains along a Decollement.

**ABSTRACT.** A longstanding problem in the Hudson Valley fold thrust belt (HVFTB) is determining the relative effects of the Acadian and Alleghanian orogenies. The 010-trending

HVFTB is considered Acadian, but transitions into the 030-trending Alleghanian central Appalachian Valley and Ridge. This suggests that overprinting structures should exist, but they have not been confirmed. In the Catskill Mountains, west of the HVFTB, we believe structures in the relatively flat-lying strata contain evidence for stress trajectories related to both events. In the North-South Lake area, along the eastern edge of the Catskill Mountains, are two joint sets at 098-83 (J1) and 015-83 (J2). Truncation geometries show J1 is older than J2. Although mutually cross-cutting relationships occur, we believe these are due to joint reactivation, as suggested for western New York. Data collected along the Route 28 corridor also show two major joint sets, 292-82 (J1) and 205-89 (J2). This agrees with previous studies in the Phoenicia and Panther Mountain areas. Joint surface features, such as plumose structures, and the absence of slickensides, indicate the joints are extensional. We also examined exposures of what we consider a major regional detachment in the Devonian Stony Hollow Mbr, Union Springs Fm, Marcellus subgroup, Hamilton Gp. An exposure near the Route 28 / 209 intersection contains meter scale cleavage duplexes. The cleavage orientation is 019-61, giving a displacement direction of 289. An exposure 0.7 km NW, has well developed spaced cleavage refracted from sandy to shaley layers, indicating increasing shear strain. The cleavage is 032-80, giving a 302 displacement. A similar shear zone in this unit has been reported 110 km NW at Cherry Valley, NY, suggesting a regional detachment. Our working hypothesis is that the 280 joints represent Acadian stress trajectories, and are related to the west-directed displacement of the Catskills, and the 020 joints are related to Alleghanian stresses.

### **Posters Presented at the 2014 Sigma Gamma Epsilon Poster Session**

#### **SEDIMENT CONTAMINANT DISTRIBUTION AND CHEMICAL BEHAVIOR FROM THE TRI-STATE LEAD AND ZINC MINING DISTRICT**

**NORTH, Breanna**, Earth Science Department, University of Arkansas at Little Rock, 2801 S. University Ave, Little Rock, AR 72204, [benorth@ualr.edu](mailto:benorth@ualr.edu), **RUHL, Laura**, Earth Science, University of Arkansas at Little Rock, 2801 S. University Ave, 307 Fribourgh Hall, Little Rock, AR 72204-1000, and **POTRA, Adriana**, Geosciences, University of Arkansas, 1 Ozark Hall, Fayetteville, AR 72701

#### **NUTRIENT DYNAMICS IN A STORMWATER MANAGEMENT COMPLEX AT GRAND VALLEY STATE UNIVERSITY, ALLENDALE, MICHIGAN**

**BRADY, Ashley**, Geology, Grand Valley State University, 1 Campus Drive, Padnos 118, Allendale, MI 49401, [bradyash@mail.gvsu.edu](mailto:bradyash@mail.gvsu.edu), **KNEESHAW, Tara**, Geology Department, Grand Valley State University, Allendale, MI 49401, and **WAMPLER, Peter J.**, Geology Department, Grand Valley State University, 1 Campus Drive, Allendale, MI 49401

#### **DYNAMICS OF DESTABILIZATION: PUMICEOUS EVIDENCE OF REHEATED, REMELTED, AND REMOBILIZED CUMULATE FROM THE BASE OF A SUPERVOLCANO MAGMA CHAMBER**

**FOLEY, Michelle L.**, Geography & Geology, Western Kentucky University, Bowling Green, KY 42101, [michelle.foley229@topper.wku.edu](mailto:michelle.foley229@topper.wku.edu), **MILLER, C.F.**, Department of Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235, **WULFF, Andrew H.**, Geography and Geology, Western Kentucky University, 1906 College Heights Blvd. #31066, Bowling Green, KY 42101-1066, **MCDOWELL, Susanne M.**, Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235, and **COVEY, Aaron K.**, Dept. of Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235



DENDROGEOMORPHIC EVIDENCE OF FREQUENT MASS WASTING FROM REACTION WOOD IN BLACK SPRUCE, NORTHWAY JCT., ALASKAN INTERIOR

**HEINRICH, Catherine**, Geology, St. Lawrence University, 23 Romoda Dr, Canton, NY 13617, cehein11@stlawu.edu, **STEWART, Alexander K.**, Department of Geology, St. Lawrence University, Canton, NY 13617, and **HUBBARD, Trent D.**, Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, AK 99709

VOLUMINOUS INTERMEDIATE, EFFUSIVE MAGMATISM IN THE BLACK MOUNTAINS, AZ, PRECEDING THE PEACH SPRING SUPERERUPTION, AND EVALUATION OF ITS POTENTIAL RELATIONSHIP TO THE SUPERVOLCANO MAGMA CHAMBER

**RICE, Stacey A.**, Geosciences, Stony Brook University, Stony Brook, NY 11794, stacey.rice@stonybrook.edu, **CLAIBORNE, Lily L.**, Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235, **RENTZ, Shannon P.**, Geosciences, Middle Tennessee State University, Murfreesboro, TN 37132, and **CRIBB, J. Warner**, Geosciences, Middle Tennessee State Univ, PO Box 9, Murfreesboro, TN 37132

POROSITY ANALYSIS OF DEFORMATION BANDS IN SANDSTONES AND CONGLOMERATES FROM HILLSDALE CANYON, SOUTHERN UTAH

**SKANKEY, Robert**, Physical Science, Southern Utah University, 364 North 4250 West, Cedar City, UT 84720, robertcskankey@gmail.com and **MACLEAN, John S.**, Geology, Southern Utah University, SC 309, 351 West University Boulevard, Cedar City, UT 84720

SPATIAL AND TEMPORAL DISTRIBUTION OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) WITHIN SEDIMENT AND FISH TISSUE OF THE LOWER CHESAPEAKE BAY BASIN, USA

**COLEMAN, Katherine L.**<sup>1</sup>, **ODHIAMBO, Ben K.**<sup>1</sup>, **SHARPLESS, Charles M.**<sup>2</sup>, **COXON, Taylor M.**<sup>1</sup>, **WIELAND, Werner**<sup>3</sup>, and **BUNCH, Aaron J.**<sup>4</sup>, (1) Earth and Environmental Sciences, University of Mary Washington, 1301 College Avenue, Fredericksburg, VA 22401, kcolema2@mail.umw.edu, (2) Department of Chemistry, University of Mary Washington, 1301 College Ave, Jepson Science Center, Fredericksburg, VA 22401, (3) Department of Biological Sciences, University of Mary Washington, 1301 College Avenue, Fredericksburg, VA 22401, (4) Virginia Department of Game and Inland Fisheries, 3801 John Tyler Memorial Highway, Charles City, VA 23030

A NOVEL METHOD FOR DETECTING PHARMACEUTICALS IN SURFACE WATERS, CENTRAL ARKANSAS, USA

**JOHNSON, Morgan E.**<sup>1</sup>, **MCMILLAN, Margaret E.**<sup>1</sup>, **WOODLING, Kellie**<sup>2</sup>, and **GAMBOA DA COSTA, Goncalo**<sup>2</sup>, (1) Department of Earth Sciences, University of Arkansas at Little Rock, 2801 S. University Avenue, Little Rock, AR 72204, mejohnson1@ualr.edu, (2) Division of Biochemical Toxicology, National Center for Toxicological Research, 3900 NCTR Road, Jefferson, AR 72079

INVESTIGATION OF A PRE-SUPERERUPTION IGNIMBRITE: PETROLOGY OF THE MIOCENE COOK CANYON TUFF, BLACK MOUNTAINS, ARIZONA

**PRATT, Ricky Daniel**<sup>1</sup>, **CLAIBORNE, Lily L.**<sup>2</sup>, **MILLER, Calvin F.**<sup>2</sup>, **FERGUSON, Charles A.**<sup>3</sup>, **CRIBB, J. Warner**<sup>4</sup>, and **SZRAMEK, Lindsay A.**<sup>1</sup>, (1) Geosciences, Austin Peay State University, Clarksville, TN 37042, rpratt3@my.apsu.edu, (2) Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235, (3) Arizona Geological Survey, 416 West Congress, Suite 100, Tucson, AZ 85719, (4) Geosciences, Middle Tennessee State Univ, Murfreesboro, TN 37132

TROPICAL SHALLOW-MARINE CARBONATE- SILICICLASTIC DEPOSITIONAL ENVIRONMENT OF THE LITTLE LAUGHLANDS BAY, JAMAICA

**MILLER, John D.**, Geology Department, St. Lawrence University, 23 Romoda Dr, Canton, NY 13617, jdmill12@stlawu.edu, **HUSINEC**, Antun, Geology Department, St. Lawrence University, 23 Romoda Drive, Canton, NY 13617, and **MURPHY**, John T. Jr, PetroTechnical Services, Schlumberger, 5080 California Ave, Suite 400, Bakersfield, CA 93309

REMOTE SENSING CHARACTERIZATION OF A MAJOR PRE-SUPERERUPTION EFFUSIVE UNIT IN THE BLACK MOUNTAINS OF NORTHWEST ARIZONA

**MCGUINNESS, Sarah A.**, Geography, Geology, and the Environment, Slippery Rock University, Slippery Rock, PA 16057, sam1272@sru.edu, **LANG, N.P.**, Department of Geology, Mercyhurst University, Erie, PA 16546, **RICE**, Stacey A., Geosciences, Stony Brook University, 38 Lenox Street, Lindenhurst, NY 11757, **RENTZ**, Shannon P., Geosciences, Middle Tennessee State University, Murfreesboro, TN 37132, **MILLER**, Calvin F., Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235, and **MCDOWELL**, Susanne M., Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235-1805

ANALYSIS OF PHOSPHATE IN RIPARIAN SEDIMENT PORE-WATERS: DOES PHOSPHATE SEQUESTERED IN THE STREAM BED CONTRIBUTE TO THE PHOSPHATE LOAD OF THE KALAMAZOO RIVER?

**HARVEY, Kayleigh M.**, **HAVENS**, Kaitlyn Pospiech, and **LINCOLN**, Timothy N., Department of Geological Sciences, Albion College, 611 E Porter St, Albion, MI 49224, kmh12@albion.edu

REPORT OF AN ONGOING INVESTIGATION INTO THE DEVELOPMENT OF DISSOLUTION VOIDS IN PETROCALCIC MATERIALS AT MORMON MESA, NEVADA

**MORGENTHALER, Sarah E.**, Physics, Geology and Astronomy, University of Tennessee at Chattanooga, 615 McCallie Ave. MS 6556, Chattanooga, TN 37403, xpj869@mocs.utc.edu and **BROCKHON**, Amy L., Department of Physics, Geology and Astronomy, University of Tennessee at Chattanooga, 615 McCallie Avenue, Chattanooga, TN 37403

PRIMING FOR SUPERERUPTION: THE HOT PRE-PEACH SPRING TUFF LAVA FLOWS AND PEACH SPRING TUFF MAFIC ENCLAVES, BLACK MOUNTAINS, ARIZONA

**FLANSBURG, Megan**, Department of Geology, College of William & Mary, Williamsburg, VA 23185, meflansburg@email.wm.edu, **MILLER**, Calvin, Earth and Environmental Sciences, Vanderbilt University, VU Station B #351805, 2301 Vanderbilt Place, Nashville, TN 37235, **MCDOWELL**, Susanne M., Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235, **CRIBB**, J. Warner, Geosciences, Middle Tennessee State Univ, Murfreesboro, TN 37132, and **BAILEY**, Christopher, Department of Geology, College of William & Mary, P.O. Box 8795, Williamsburg, VA 23187-8795

REMOTELY-SENSED DISTRIBUTION OF THE MIOCENE-AGED PEACH SPRING TUFF SUPERERUPTION DEPOSIT IN THE SOUTHERN BLACK MOUNTAINS OF NW AZ

**GIBSON, Brandt M.**, Department of Agriculture, Geosciences, and Natural Sciences, University of Tennessee at Martin, 256 Brehm Hall, Martin, TN 38238, bgibson@utm.edu, **LANG, N.P.**, Department of Geology, Mercyhurst University, Erie, PA 16546, **MILLER**, Calvin F., Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235, **FOLEY**, Michelle L., Geography & Geology, Western Kentucky University, Bowling Green, KY 42101, and **HOOKS**, Benjamin P., Department of Agriculture, Geosciences, and Natural Resources, The University of Tennessee at Martin, 256 Brehm Hall, Martin, TN 38238

THERMOCHRONOLOGY OF THE MCCLURE MOUNTAIN SYENITE: CHARACTERIZATION OF NEW HE THERMOCHRONOMETERS AND CONSTRAINTS ON THE COOLING HISTORY OF THE WET MOUNTAINS, COLORADO

**WEISBERG, Wesley R.**<sup>1</sup>, METCALF, James R.<sup>2</sup>, and FLOWERS, Rebecca M.<sup>2</sup>, (1) Geography, Geology, and Planning Department, Missouri State University, 901 S. National Ave, Springfield, MO 65897, wes4891@live.missouristate.edu, (2) Department of Geological Sciences, University of Colorado, Campus Box 399, 2200 Colorado Ave, Boulder, CO 80309

FRACTURE ORIENTATION AND STRUCTURAL ANALYSIS OF THE CHAUMONT LIMESTONE

**POPE, Gina G.**, Earth Sciences, SUNY College at Brockport, 350 New Campus Dr, Brockport, NY 14420, gpope1@brockport.edu and **RICHARDS, Paul L.**, Dept. of Earth Sciences, The College at Brockport, 350 Newcampus Lane, Brockport, NY 14420

IMPLICATIONS OF ERUPTIVE, EROSION, AND DEPOSITIONAL PROCESSES PRIOR TO A SUPER ERUPTION IN THE SOUTHERN BLACK MOUNTAINS

**LEE, Jacob W.**, Earth and Environmental Sciences, University of Kentucky, Lexington, KY 40506, jacob.w.lee2@uky.edu, **WILLIAMS, Scott H.**, Geology, Occidental College, 1600 Campus Rd. Box 2182, Los Angeles, CA 90041, **FLANSBURG, Megan**, Department of Geology, College of William & Mary, Williamsburg, VA 23185, **BECKENS, Holland**, Department of Geology, University of Vermont, Burlington, VT 05405, **MILLER, Calvin F.**, Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235, **LANG, N.P.**, Department of Geology, Mercyhurst University, Erie, PA 16546, and **CRIBB, J. Warner**, Geosciences, Middle Tennessee State Univ, PO Box 9, Murfreesboro, TN 37132

TECTONIC SIGNIFICANCE OF MYLONITES IN THE LITTLE BUCKSKIN MOUNTAINS, WEST-CENTRAL ARIZONA: INSIGHTS FROM QUARTZ MICROSTRUCTURAL DATA

**GROSS, Caroline E.**, Atmospheric, Oceanic, and Earth Sciences, George Mason University, 4400 University Drive, Fairfax, VA 22030, chenrygr@gmu.edu, **SINGLETON, John**, Atmospheric, Oceanic, and Earth Sciences, George Mason University, 4400 University Drive, Mail Stop 5F2, Fairfax, VA 22030, and **WONG, Martin S.**, Department of Geology, Colgate University, Hamilton, NY 13346

USING SCANNING ELECTRON MICROSCOPY TO CATALOG MINERALS FROM THE TRANSPecos MAGMATIC PROVINCE

**GRAVES, Shawna Marie**, Sul Ross State University, East Highway 90, Alpine, TX 79832, sgra6282@sulross.edu and **URBANCZYK, Kevin M.**, Department of Biological, Geological and Physical Sciences, Sul Ross State Univ, Box C-139, Alpine, TX 79832

FACIES STACKING PATTERN WITHIN THE ORDOVICIAN RED RIVER FORMATION, WILLISTON BASIN: A CASE STUDY FROM EASTERN NORTH DAKOTA

**HUSINEC, Antun** and **BARNES, Joseph P.**, Geology Department, St. Lawrence University, 23 Romoda Drive, Canton, NY 13617, jpbarn11@stlawu.edu

COMPARISON OF TWO SUSPENDED SEDIMENT ANALYSIS METHODS

**COLAIANNE, Nicholas J.**<sup>1</sup>, **BARRETTE, Andrew J.**<sup>1</sup>, **WAMPLER, Peter J.**<sup>2</sup>, and **KNEESHAW, Tara**<sup>3</sup>, (1) Geology, Grand Valley State University, 1 Campus Dr, Padnos 118, Allendale, MI 49401, colaiann@mail.gvsu.edu, (2) Geology Department, Grand Valley State University, 1 Campus Drive, Allendale, MI 49401, (3) Geology Department, Grand Valley State University, Allendale, MI 49401

WATER CHEMISTRY OF A HEMLOCK FOREST IN THE ROBERT V. RIDDELL STATE PARK, NY

**REDDER, Brian W.**<sup>1</sup>, BALNIS, Joseph M.<sup>1</sup>, and BALOGH-BRUNSTAD, Zsuzsanna<sup>2</sup>, (1) Department of Chemistry, Hartwick College, 1 Hartwick Drive, Oneonta, NY 13820, redderb@hartwick.edu, (2) Department of Geology and Environmental Sciences, Hartwick College, Oneonta, NY 13820

UNDERSTANDING PRE-SUPERERUPTION MAGMATIC PROCESSES: MULTIPLE VARIETIES OF ENCLAVES IN PRE-PEACH SPRING TUFF TRACHYTE LAVAS

**RENTZ, Shannon P.**<sup>1</sup>, RICE, Stacey A.<sup>2</sup>, CRIBB, J. Warner<sup>1</sup>, CLAIBORNE, Lily L.<sup>3</sup>, and MILLER, Calvin F.<sup>3</sup>, (1) Geosciences, Middle Tennessee State University, Murfreesboro, TN 37132, shannoneporter@hotmail.com, (2) Geosciences, Stony Brook University, 38 Lenox Street, Lindenhurst, NY 11757, (3) Earth and Environmental Sciences, Vanderbilt University, Nashville, TN 37235

PARTICLE IMAGE/TRACKING VELOCIMETRY AS AN EFFECTIVE, LOW-COST SOLUTION FOR THE STUDY OF SMALL-SCALE HYDRODYNAMIC PROCESSES IN GEOLOGY

**NGUYEN, Thu A.**, Geology and Geophysics, Texas A&M University at College Station, College Station, TX 77840, thu4nguyen\_1412@yahoo.com, GONG, Jian, Dept. of Geology & Geophysics, Texas A&M University, College Station, TX 77843, and OLSEN, Kyle Anthony, Geology and Geophysics, Texas A&M University, College Station, TX 77840

UNDERSTANDING THE ROLE OF STRIKE-SLIP FAULTING AS OCEANS CLOSE, NORTH CENTRAL TURKEY

**PETTIT, Bridget S.**, Geological Sciences, The University of Texas at Austin, 7 Las Flores, Aliso Viejo, CA 92656, bridgetpettit@utexas.edu, CATLOS, Elizabeth J., Geological Sciences, University of Texas at Austin, Jackson School of Geosciences, Austin, TX 78712, and ELLIOTT, Brent, The Bureau of Economic Geology, The University of Texas at Austin, University Station Box X, Austin, TX 78713

FOSSIL CORAL FROM THE MISSISSIPPIAN REDWALL LIMESTONE IN THE BEAVER DAM MOUNTAINS, WASHINGTON COUNTY, UTAH

**MCLEMORE, Devin M.**, Physical Science, Southern Utah University, 351 W. University Blvd, Cedar City, UT 84720, mclemoredev@gmail.com and HARGRAVE, Jennifer E., Physical Science, Southern Utah University, Cedar City, UT 84720

NEW U-PB ZIRCON AGES FROM PLUTONS OF THE MT. WADDINGTON REGION, SOUTHERN COAST MOUNTAINS BATHOLITH, BRITISH COLUMBIA

**CHISOM, Charles**<sup>1</sup>, CECIL, M. Robinson<sup>2</sup>, RUSMORE, Margaret E.<sup>1</sup>, and WOODSWORTH, Glenn J.<sup>3</sup>, (1) Geology, Occidental College, Los Angeles, CA 90041, chisom@oxy.edu, (2) Department of Geological Sciences, California State University Northridge, 18111 Nordhoff St, Northridge, CA 91130-8266, (3) Geol Survey of Canada, 101-605 Robson St, Vancouver, BC V6B 5J3

DESCRIPTION OF A GARNET-BEARING GRANOFELS FOUND AT WEST CHICAGO CREEK, COLORADO

**LUPO, Nicholas S.**, Department of Geological Sciences, SUNY Geneseo, 1 College Circle, Geneseo, NY 14454, nsl2@geneseo.edu and FARTHING, Dori J., Geological Sciences, SUNY-Geneseo, Geneseo, NY 14454

PATHWAYS OF NITRATE INTO THE KALAMAZOO RIVER: A PHYSICAL, CHEMICAL AND MICROBIOLOGICAL STUDY

**HEERSPINK, Brent P.**, Department of Geological Sciences, Albion College, 611 E Porter, Albion, MI 49224, BPH11@albion.edu and LINCOLN, Timothy N., Department of Geological Sciences, Albion College, 611 E Porter St, Albion, MI 49224



CARBONATE  $\delta^{13}\text{C}$  AND PRELIMINARY CONODONT  $\delta^{18}\text{O}$  FROM THE UPPER STONES RIVER FORMATION AND LOWER NASHVILLE FORMATION (LATE ORDOVICIAN) NEAR GADSDEN, AL

**LAW, Stacey E.**, Department of Geology and Environmental Science, James Madison University, Harrisonburg, VA 22807, lawse@dukes.jmu.edu, **QUINTON, Page C.**, Department of Geological Sciences, The University of Missouri-Columbia, University of Missouri, 101 Geology Building, Columbia, MO 65211, **LESLIE, Stephen A.**, Geology and Environmental Sciences, James Madison University, MSC 6903, Harrisonburg, VA 22807, **MACLEOD, Kenneth G.**, Department of Geological Sciences, University of Missouri-Columbia, Columbia, MO 65211, and **HERRMANN, Achim D.**, Geology & Geophysics, Louisiana State University, Baton Rouge, LA 70803

A TEXTURAL AND GEOCHEMICAL ANALYSIS OF GOAT ROCK DOME XENOLITHS

**BERTOLETT, Elisabeth M.**, Geosciences, Denison University, Granville, OH 43023, bertol\_e1@denison.edu, **DEERING, Chad D.**, Geological and Mining Engineering and Sciences, Michigan Technological University, Houghton, MI 49931-1295, **PRIOR, David J.**, Geology, University of Otago, Dunedin, 9054, New Zealand, and **GRAVLEY, Darren M.**, Geological Sciences, University of Canterbury, Christchurch, 8140, New Zealand

SYNEXTENSIONAL SEDIMENTATION IN THE HANGING WALL OF THE BUCKSKIN DETACHMENT FAULT, WEST-CENTRAL ARIZONA: EVIDENCE FOR ACCELERATED EXTENSION RATES IN THE MIDDLE MIOCENE?

**HATFIELD, Marques E.**<sup>1</sup>, **SINGLETON, John**<sup>2</sup>, **BIRD, Emily**<sup>2</sup>, and **PRIOR, Michael G.**<sup>3</sup>, (1) George Mason University, 10483 Malone Court, Fairfax, VA 22032, marques.hatfield@gmail.com, (2) Atmospheric, Oceanic, and Earth Sciences, George Mason University, 4400 University Drive, Mail Stop 5F2, Fairfax, VA 22030, (3) Jackson School of Geosciences, University of Texas at Austin, Jackson School of Geosciences1 University Station C9000, Austin, TX 78712-0254

A COMPARISON OF TWO COMMON CONTINUOUS FLOW IRMS APPROACHES ON THE ISOPRIME MULTIFLOW AND THE ISOPRIME PYROCUBE FOR  $\delta^{13}\text{C}$  USING LATE ORDOVICIAN CARBONATES FROM SWEDEN

**EUKER, Brandon C.**<sup>1</sup>, **LAW, Stacey E.**<sup>1</sup>, **MEIERDIERCKS, Kathleen Anne**<sup>1</sup>, **BAEDKE, Steve J.**<sup>2</sup>, **LESLIE, Stephen A.**<sup>3</sup>, and **HERRMANN, Achim D.**<sup>4</sup>, (1) Department of Geology and Environmental Science, James Madison University, Harrisonburg, VA 22807, eukerb@dukes.jmu.edu, (2) Department of Geology and Environmental Science, James Madison University, MSC 6903, Harrisonburg, VA 22807, (3) Geology and Environmental Sciences, James Madison University, MSC 6903, Harrisonburg, VA 22807, (4) Geology & Geophysics, Louisiana State University, Baton Rouge, LA 70803

SEASONAL CHLORIDE BEHAVIOR IN THE GREAT MIAMI RIVER, OHIO

**STARR, Lindsay**, Geology, Wittenberg University, PO Box 125, Springfield, OH 45501, sl4.lstarr@exchange.wittenberg.edu and **FORTNER, Sarah K.**, Department of Geology, Wittenberg University, Springfield, OH 45501

A SCHEME FOR EVALUATING THE IMPACT OF DEVELOPMENT ON THE GEOMORPHIC AND ECOLOGIC PROCESSES OF LAKE MICHIGAN'S COASTAL DUNES

**PLOWMAN, Jacquelyn K.**<sup>1</sup>, **DEVRIES-ZIMMERMAN, Suzanne J.**<sup>1</sup>, **DAVIS, Charles F. III**<sup>2</sup>, and **HANSEN, Edward C.**<sup>1</sup>, (1) Geological and Environmental Sciences Department, Hope College, 35 E. 12th Street, Holland, MI 49423, jackie.plowman@hope.edu, (2) Davis Associates Architects & Consultants, Inc, 53 West Jackson Boulevard, Chicago, IL 60604

#### THE HARPETH RIVER FAULT ZONE, CENTRAL TENNESSEE

**YOUNG, Shaunna D.**, Earth Science Education, Radford University, 2421 3rd St, Radford, VA 24141, syoung22@radford.edu, **CAMACHO, Joe**, National Park Service, 427 Palm Place, Pomona, CA 91767, and **ABOLINS, Mark**, Department of Geosciences, Middle Tennessee State University, Box 9, Murfreesboro, TN 37132

#### REVEALING THE HIDDEN PAST OF LEGACY SEDIMENTS FROM MIDDLE CREEK LAKE, SELINGSGROVE, PA

**SEAMAN, Kyle A.**, ELICK, Jennifer M., and HOLT, Jack R., Earth and Environmental Sciences, Susquehanna University, 514 University Avenue, Natural Sciences Center 111C, Selingsgrove, PA 17870, seaman@susqu.edu

#### PHYSIOLOGICAL AND ISOTOPIC RESPONSES OF THE CORAL *STYLOPHORA PISTILLATA* TO FUTURE COASTAL OCEAN CONDITIONS

**SAUP, Casey**, School of Earth Sciences, The Ohio State University, 2915 Honeysuckle Lane, Hilliard, OH 43026, saup.4@osu.edu, **GROTTOLI, Andréa**, School of Earth Sciences, The Ohio State University, 125 South Oval Mall, Columbus, OH 43210, **FERRIER-PAGÈS, Christine**, Centre Scientifique de Monaco, 8 Quai Antoine 1er, MC, 98000, Monaco, and **MATSUI, Yohei**, School of Earth Sciences, The Ohio State University, 275 Mendenhall Laboratory, 125 South Oval Mall, Columbus, OH 43210

#### SOIL LEAD DISTRIBUTION AT A TWO SITES: IMPLICATIONS FOR LEAD SOIL OUTREACH IN THE PROMISE NEIGHBORHOOD, SPRINGFIELD, OH

**WILSON, Elizabeth L.**<sup>1</sup>, **BRESLIN, Kyle D.**<sup>1</sup>, **MARVELLE, Keith A.**<sup>1</sup>, **THACKER, Tyler N.**<sup>1</sup>, **FORTNER, Sarah K.**<sup>1</sup>, and **RITTER, John B.**<sup>2</sup>, (1) Environmental Science, Wittenberg University, Springfield, OH 45501, s14.ewilson@wittenberg.edu, (2) Geology, Wittenberg University, P.O. Box 720, Springfield, OH 45501

#### MIOCENE STRUCTURAL EVOLUTION OF THE BUCKSKIN DETACHMENT FAULT ZONE, WEST-CENTRAL ARIZONA: INSIGHTS FROM GEOLOGIC MAPPING IN THE SOUTHERN LINCOLN RANCH BASIN

**BIRD, Emily**<sup>1</sup>, **SINGLETON, John**<sup>1</sup>, and **HATFIELD, Marques E.**<sup>2</sup>, (1) Atmospheric, Oceanic, and Earth Sciences, George Mason University, 4400 University Drive, Mail Stop 5F2, Fairfax, VA 22030, ejenkin4@gmu.edu, (2) Atmospheric, Oceanic, and Earth Sciences, George Mason University, 4400 University Dr, Fairfax, VA 22030

#### MINERALOGY OF THE LUNA VISTA SILL, BREWSTER COUNTRY, TEXAS

**CAYLOR, Sofia**, Biological, Geological and Physical Sciences, Sul Ross State University, Box C-139, SRSU, Alpine, TX 79830, sofia.caylor@gmail.com and **URBANCZYK, Kevin M.**, Department of Biological, Geological and Physical Sciences, Sul Ross State Univ, Box C-139, Alpine, TX 79832

#### POTENTIAL INFLUENCE OF CLIMATE ON FLOOD RECURRENCE IN THE WINOOSKI RIVER WATERSHED, VERMONT

**BARNEY, Grant** and **NOLL, Mark R.**, Department of the Earth Sciences, SUNY College at Brockport, 350 New Campus Dr, Brockport, NY 14420, gbarn1@brockport.edu

#### INFLUENCE OF PRECIPITATION PATTERNS ON SURFACE WATER AND GROUNDWATER IN THE SANDY CREEK WATERSHED, NEW YORK

**FRANCIS, Skylar J.** and **NOLL, Mark R.**, Department of the Earth Sciences, SUNY College at Brockport, 350 New Campus Dr, Brockport, NY 14420, sfran5@u.brockport.edu

EVIDENCE FROM JOINT SETS AND SHEAR ZONES IN EASTERN NEW YORK FOR TWO OROGENIC EVENTS AND THE WESTWARD DISPLACEMENT OF THE CATSKILL MOUNTAINS ALONG A DECOLLEMENT

**LUBICICH, Emily J.**, CRADDOCK, Tristan, WERKHOVEN, Andres R., and VOLLMER, Frederick W., Geology Department, SUNY New Paltz, 1 Hawk Drive, New Paltz, NY 12561, e.lubicich@gmail.com

DEVELOPMENT OF A RAPID FIELD-PORTABLE SOIL PHOSPHORUS ANALYSIS METHOD AND APPLICATION TO ARCHAEOLOGICAL SITES

**SMITH, Nicholas<sup>1</sup>**, KREPPEL, Elizabeth<sup>1</sup>, MITCHELL, Aimee<sup>2</sup>, and NOLL, Mark R.<sup>1</sup>, (1) Department of the Earth Sciences, SUNY College at Brockport, 350 New Campus Dr, Brockport, NY 14420, nsmit4@brockport.edu, (2) Department of Anthropology, SUNY at Buffalo, 380 MFAC-Ellicott Complex, Buffalo, NY 14261

EVALUATION OF FLOOD RECURRENCE IN THE CHEMUNG RIVER WATERSHED, NEW YORK

**GROH, Katelynn** and NOLL, Mark R., Department of the Earth Sciences, SUNY College at Brockport, 350 New Campus Dr, Brockport, NY 14420, kgroh1@brockport.edu

PROVENANCE OF LATE JURASSIC TO LATE CRETACEOUS SANDSTONES IN SOUTHWEST OREGON

**RIVAS, Jonathan<sup>1</sup>**, MCCLAUGHRY, Jason D.<sup>2</sup>, and SCHWARTZ, Joshua J.<sup>1</sup>, (1) Department of Geological Sciences, California State University Northridge, 18111 Nordhoff Street, Northridge, CA 91330, jonathan.rivas.726@my.csun.edu, (2) Oregon Department of Geology and Mineral Industries, 1995 3rd Street, Suite 130, Baker City, OR 97814

CO<sub>2</sub> FLUX FROM A SINGLE MAPPED SOIL UNIT UNDER DIFFERENT MANAGEMENT PRACTICES

**WELCH, Sarah** and NOLL, Mark R., Department of the Earth Sciences, SUNY College at Brockport, 350 New Campus Dr, Brockport, NY 14420, swelc2@brockport.edu

VARIATIONS IN GROUNDWATER AND SURFACE WATER CHEMISTRY IN THE SANDY CREEK (NY) WATERSHED: NATURAL OR ANTHROPOGENIC IMPACTS

**COWLING, Owen** and NOLL, Mark R., Department of the Earth Sciences, SUNY College at Brockport, 350 New Campus Dr, Brockport, NY 14420, ocow1@brockport.edu

DISSOLUTION OF TREMOLITE BY ARTIFICIAL LYSOSOMAL FLUIDS

**SEIDERMAN, Benjamin** and NOLL, Mark R., Department of the Earth Sciences, SUNY College at Brockport, 350 New Campus Dr, Brockport, NY 14420, bseid3@brockport.edu

INVESTIGATION OF SUBFOSSIL TREES AT IRELY LAKE, OLYMPIC NATIONAL PARK, WASHINGTON, USA

**MARLANTES, Garret A.**, Science Dept, Centralia College, 600 Centralia College Blvd, Centralia, WA 98531, marlantes.garret@gmail.com, PRINGLE, Patrick T., Centralia College, 600 Centralia College Blvd, Centralia, WA 98531, and WEGMANN, Karl W., Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University, Campus Box 8208, Raleigh, NC 27695