

# Geologic Mapping Forum

Minneapolis • March 27 - 29 • 2018

Hosted by Minnesota Geological Survey in coordination with Association of American State Geologists (AASG) and the USGS National Cooperative Geologic Mapping Program (NCGMP)

## Humphrey School Conference Center, 301 19th Avenue South, Minneapolis

At the Geologic Mapping Forum in Minneapolis from March 27th to 29th, 2018, ~100 geological map authors, program managers and allied professionals from geological surveys and allied agencies will meet to discuss the status and future of geologic mapping in the USA – with a focus on the Decadal Strategic Plan of the USGS National Cooperative Geologic Mapping Program (NCGMP)

### Monday, March 26<sup>th</sup>

**1:30 – 4:30 PM** Great Lakes Geologic Mapping Coalition business meeting – **Room 170**  
**5:00 – 7:00 PM** *Registration & Reception* - **Courtyard Minneapolis Downtown**

### Tuesday, March 27<sup>th</sup>

**7:30 – 8:30 AM** *Registration, coffee, bagels, and pastries, and poster setup* - **Atrium**

**8:30 – 10:00 AM** Opening plenary - **Auditorium**

- Meeting overview, Harvey Thorleifson
- National Cooperative Geologic Mapping Program Decadal Plan, John Brock
- National Geologic Map Database, Dave Soller

**10:00 – 10:20 AM** *Break* - **Atrium**

**10:20 – 11:50 AM** Opening breakouts – regional and topical

Room:	10:20 AM – 11:00 AM	11:05 AM – 11:50 AM
<b>Auditorium</b>	<b>Great Lakes:</b> IL, IN, MI, MN, OH, WI	• <b>Appalachian</b>
<b>Conference Room 180</b>	<b>Northeast:</b> CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT	• <b>Cordilleran</b>
<b>Forum</b>	<b>Plains:</b> AR, IA, KS, LA, MO, ND, NE, OK, SD, TX	• <b>Precambrian</b>
<b>Freeman Commons 205</b>	<b>Southeast:</b> AL, FL, GA, KY, MS, NC, SC, TN, VA, WV	• <b>Quaternary</b>
<b>Wilkins Room 215</b>	<b>West:</b> AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY	• <b>Sedimentary cover</b>

**11:50 – 1:00 PM** *Box lunch* - **Atrium**

**1:00 – 2:30 PM** Plenary - Opening breakout reports - **Auditorium**

**2:30 – 3:00 PM** *Break* - **Atrium**

**3:00 – 4:30 PM** Plenary - **Auditorium**

- Continental resolution geological mapping – Shanan Peters
- National 3D geology – Oliver Boyd & Boyan Brodaric
- Basement geological mapping – Karen Lund & Dave Snyder

**4:30 PM** *Adjourn, poster viewing*

## Wednesday, March 28<sup>th</sup>

**7:30 – 8:30 AM** Registration, coffee, bagels, and pastries, and poster setup - **Atrium**

**8:30 – 10:00 AM** Concurrent sessions

**10:00 – 10:20 AM** Break - **Atrium**

**10:20 – 11:50 AM** Plenary - **Auditorium**

- Sedimentary basin stratigraphy and modeling – Chris Swezey
- National resolution geological mapping – Carma San Juan
- Aquifer mapping - Eddie Haj

**11:50 – 1:00 PM** Box lunch - **Atrium**

**1:00 – 2:30 PM** Concurrent sessions

**2:30 – 3:00 PM** Break - **Atrium**

**3:00 – 4:30 PM** Plenary - **Auditorium**

- Geophysical surveys and drillhole databases – Paul Bedrosian, Harvey Thorleifson
- Sediment thickness mapping – Dave Soller
- 3D geological mapping – Don Sweetkind & Kelsey MacCormack

**4:30 PM** Adjourn, poster viewing

Concurrent sessions	Wed 830-10AM	Wed 1-230PM	Thu 1020-1150 AM
Auditorium	Programs	Bedrock	Bedrock and methods
Conference Room 180	Surficial	Great Lakes Coalition	Great Lakes Coalition

## Thursday, March 29<sup>th</sup>

**7:30 – 8:30 AM** Registration, coffee, bagels, and pastries, and poster setup - **Atrium**

**8:30 – 10:00 AM** Plenary - **Auditorium**

- Field and GIS methods – Kyle House
- Seamless 1:100,000 geological mapping – Drew Andrews
- Quaternary geological mapping – Hazen Russell

**10:00 – 10:20 AM** Break - **Atrium**

**10:20 – 11:50 AM** Concurrent sessions

**11:50 – 1:00 PM** Box lunch - **Atrium**

**1:00 – 2:30 PM** Plenary - **Auditorium**

- Offshore geological mapping – Walter Barnhardt
- Soil mapping - David Hoover
- Urban geological mapping – Dick Berg

**2:30 – 3:00 PM** Break - **Atrium**

**3:00 – 4:30 PM** Closing plenary

**4:30 PM** Adjourn

## Concurrent Sessions

### Wednesday, March 28<sup>th</sup>

**8:30 – 10:00 AM**

- **Auditorium – Programs**

830 THE USGS-NASA PLANETARY GEOLOGIC MAPPING PROGRAM, J. A. Skinner, Jr., Astrogeology Science Center, U. S. Geological Survey, Flagstaff

848 THE NEW MEXICO GEOLOGIC AND AQUIFER MAPPING PROGRAMS: INTEGRATED 4D RESEARCH TO BETTER UNDERSTAND THE STATE'S GROUNDWATER AQUIFER RESILIENCIES, J. Michael Timmons, New Mexico Bureau of Geology and Mineral Resources

906 THE MASSACHUSETTS SURFICIAL MATERIALS GEODATABASE AND QUATERNARY GEOLOGIC MAP: THE CULMINATION OF 80 YEARS OF COOPERATIVE EFFORT, Byron D. Stone, U.S. Geological Survey, Janet R. Stone (Emeritus), U.S. Geological Survey, Mary DiGiacomo-Cohen, U.S. Geological Survey, Ralph S. Lewis (Emeritus), University of Connecticut, Stephen B. Mabee, MA Geological Survey, UMass, 627 North Pleasant Street, Amherst, MA 01003

924 SUPPORTING THE USGS AND DOI MISSIONS THROUGH GEOLOGIC MAPPING IN THE WESTERN UNITED STATES, Colin F. Williams, US Geological Survey, Menlo Park, CA

942 MINNESOTA GEOLOGICAL SURVEY GEOLOGICAL MAPPING, Harvey Thorleifson, Minnesota Geological Survey

- **Conference Room 180 – Surficial**

830 NEW INSIGHTS INTO LATE-PLEISTOCENE GLACIATION AND RANGE-FRONT FAULT VERTICAL SEPARATION RATES USING GEOLOGIC MAPPING AND TERRESTRIAL COSMOGENIC NUCLIDE EXPOSURE AGES IN THE EAST HUMBOLDT RANGE, NEVADA, Seth Dee, Nevada Bureau of Mines and Geology, and Benjamin J.C. Laabs, Department of Geosciences, North Dakota State University

848 SURFICIAL GEOLOGY OF THE IRON MOUNTAIN 7.5 MINUTE QUADRANGLE, DICKINSON COUNTY, MICHIGAN, FLORENCE & MARINETTE COUNTIES, WISCONSIN, Esch, John M., Michigan Dept. of Environmental Quality, Kehew, Alan E., Department of Geological and Environmental Sciences, Western Michigan University, Huot, Sebastien, Illinois State Geological Survey, Yellich, John A., Michigan Geological Survey

906 GLACIAL LAKE NANETTE: A MIDDLE WISCONSIN (MIS 4 – 3) PROGLACIAL LAKE IN THE CAYUGA BASIN, Andrew Kozlowski, Director of Geological Mapping Program, NY

924 VISIONS OF NEW, SMALL-SCALE GLACIAL SURFICIAL GEOLOGIC MAPS FROM LESSONS LEARNED AT 1:24,000, Byron D. Stone, U.S. Geological Survey, East Hartford, CT

942 IMPROVING THE AVAILABILITY AND QUALITY OF SURFICIAL GEOLOGIC MAPS IN VIRGINIA, Heller, Matthew J., Virginia Department of Mines, Minerals, and Energy

**1:00 – 2:30 PM**

• **Auditorium – Bedrock**

100 AN OVERVIEW OF BEDROCK GEOLOGIC MAPPING IN THE EASTERN UNITED STATES FROM THE FEDMAP PERSPECTIVE, Gregory J. Walsh, USGS, Montpelier, VT

118 BEDROCK GEOLOGIC MAPPING IN PENNSYLVANIA – PAST, PRESENT, AND FUTURE, Stuart O. Reese and Gale C. Blackmer, Pennsylvania Geological Survey

136 GEOLOGIC MAPPING IN SOUTH CAROLINA: A STATUS REPORT, Robert H. Morrow IV and Tanner Arrington, South Carolina Department of Natural Resources

154 RECONCILING REGIONAL STRATIGRAPHY FROM KENTUCKY THROUGH MULTIPLE APPLIED INTERSTATE PROJECTS, Drew Andrews, Kentucky Geological Survey

212 MAPPING MINNESOTA'S BEDROCK GEOLOGY, Mark A. Jirsa, MN Geological Survey

• **Conference Room 180 – Great Lakes Coalition**

100 GLACIAL GEOLOGY OF LEELANAU COUNTY, MICHIGAN, Kevin Kincare, USGS

118 QUATERNARY GEOLOGICAL MAPPING IN MINNESOTA, Barbara Lusardi, Minnesota Geological Survey

136 GLACIAL MAPPING OF WESTERN WAUSHARA COUNTY, WISCONSIN, J Elmo Rawling III, Wisconsin Geological and Natural History Survey

154 RADIOCARBON IN ILLINOIS, Curry, Brandon, Illinois State Geological Survey

212 NEW SURFICIAL GEOLOGICAL INTERPRETATIONS FOR THE EASTERN PORTION OF CASS COUNTY, MICHIGAN, John Yellich, Alan Kehew, John Esch, and Sita Karki

## **Thursday, March 29<sup>th</sup>**

**10:20 – 11:50 AM**

- **Auditorium – Bedrock and Methods**

1020 GEOLOGICAL MAPPING WITH AIRBORNE ELECTROMAGNETICS, Jared D. Abraham, Ted H. Asch, James C. Cannia, Aqua Geo Frameworks, Mitchell, NE

1038 INTERPRETING STRATIGRAPHY AND SEDIMENT TEXTURE FROM LITHOLOGICAL DATABASES: EXAMPLES FROM CALIFORNIA GROUNDWATER BASINS, D.S. Sweetkind, U.S. Geological Survey, Denver

1056 GEOLOGIC MAPPING IN KANSAS: OVERVIEW OF PROGRAMMATIC DIRECTIONS AND CURRENT PROJECTS, Jon J. Smith, Greg A. Ludvigson, Anthony Layzell, and John W. Dunham, Kansas Geological Survey

1114 GEOLOGIC MAPPING IN THE OZARK PLATEAUS OF ARKANSAS, Chandler, A.K. and Hutto, R.S., Arkansas Geological Survey

1132 THE UTAH GEOLOGIC MAPPING PROGRAM, LESSON LEARNED, FUTURE PLANS, Grant Willis, Mapping Program Manager, Utah Geological Survey

- **Conference Room 180 - Great Lakes Coalition**

1020 BEDROCK TOPOGRAPHY AND SEDIMENT THICKNESS MAPPING IN INDIANA WITH AN EXPANDED EFFORT TO SYNTHESIZE MAPPING EFFORTS THROUGHOUT GLACIATED NORTH AMERICA, Shawn Naylor, Indiana Geological and Water Survey

1038 QUATERNARY MAPPING ALONG THE LATE WISCONSIN MARGIN, CENTRAL INDIANA, Henry Loope, Jose Luis Antinao, and Robin Rupp, Indiana Geological and Water Survey

1056 THE OHIO GEOLOGICAL SURVEY'S GREAT LAKES GEOLOGIC MAPPING COALITION PROJECTS IN 2018, J. D. Stucker, Ohio Department of Natural Resources Division of Geological Survey

1114 DIGITAL BEDROCK TOPOGRAPHIC, DRIFT THICKNESS, AND 3-D SURFICIAL GEOLOGIC MAPS OF THE GLACIATED COUNTIES OF NORTHWESTERN PENNSYLVANIA, Stuart Reese and Gary Fleeger, Pennsylvania Geological Survey

1132 GLACIAL GEOLOGIC MAPPING IN CAYUGA COUNTY, NEW YORK: FOOTPRINT TO FRAMEWORK, Andrew Kozlowski, Geological Mapping Program, NY

## **Posters – up for the entire meeting**

1:24,000-SCALE GEOLOGIC MAPPING OF BASIN DEPOSITS EXPOSED IN HADRIACUS CAVI, MARS, J. A. Skinner, Jr., Astrogeology Science Center, USGS, Flagstaff, AZ

A NEW SURFICIAL GEOLOGICAL MAP FOR CALHOUN COUNTY, MICHIGAN, Kehew, Alan E., Western Michigan University; Esch, John, M., Michigan Department of Environmental Quality; Linker, John S., Kellogsville, Michigan High School; Kozlowski, Andrew L., New York Geological Survey; Karki, Sita, Western Michigan University, and Yellich, John A., Michigan Geological Survey

ADVANCES IN 3-D GEOLOGIC MAPPING OF NORTHERN INDIANA USING 3-D GEOLOGICAL INTERPRETATION SOFTWARE, José Luis Antinao, Robin Rupp, Indiana Geological and Water Survey

AN ALTERNATIVE APPROACH TO SUPPLEMENTING GEOLOGICAL MAPPING OF THE ALABAMA PIEDMONT: CONVERTING EDMAP PRODUCTS TO GEOLOGICAL SURVEY OF ALABAMA QUADRANGLE SERIES GEOLOGIC MAPS, Dane S. VanDervoort<sup>1</sup>, Gregory M. Guthrie<sup>1</sup>, and Mark G. Steltenpohl<sup>2</sup>, <sup>1</sup>Geologic Investigations Program, Geological Survey of Alabama, 420 Hackberry Lane, Tuscaloosa, Alabama 35486; <sup>2</sup>Department of Geosciences, Auburn University, 2050 Memorial Coliseum, Auburn, Alabama 36849

AN ANIMATION OF THE 3D PHANEROZOIC GEOLOGICAL MODEL OF SOUTHERN ONTARIO, Hazen A.J. Russell<sup>1</sup>, Boyan Brodaric<sup>1</sup>, Frank R. Brunton<sup>2</sup>, Terry Carter<sup>3</sup>, Jordan Clark<sup>4</sup>, Charles Logan<sup>1</sup>, and Liz Sutherland<sup>4</sup> <sup>1</sup> Geological Survey of Canada, <sup>2</sup> Ontario Geological Survey, <sup>3</sup> Geological consultant, London, ON, <sup>4</sup> Oil, Gas, & Salt Resources Library

AN OVERVIEW OF GEOLOGIC MAPPING IN MISSOURI, Vicki Voigt, Trevor Ellis, and Kyle Ganz, Missouri Geological Survey

DEVELOPING THE BEDROCK LAYER FOR CANADA 3-D: THE PRECAMBRIAN-PHANEROZOIC BOUNDARY, de Kemp, E.A.<sup>1</sup>, Schetselaar, E.M.<sup>1</sup>, Hillier, M.<sup>1</sup>, Montsion, R.<sup>2</sup> , <sup>1</sup>Geological Survey of Canada, <sup>2</sup>PhD. Student, MERC, Laurentian University, Sudbury, Canada

FIELD TRIP BASED ON EXTENSIVE MAPPING EFFORTS IN WILL AND COOK COUNTY, ILLINOIS, Caron, O., Curry, B., and Thomason, J., Illinois State Geological Survey

GEOLOGIC MAP OF THE MISSOURI NATIONAL RECREATIONAL RIVER AND ADJOINING AREA, NEBRASKA, SOUTH DAKOTA, AND IOWA: 59-MILE REACH AND KENSLERS BEND REACH, Scott Lundstrom, U.S. Geological Survey, Denver

GEOLOGIC MAPPING ACTIVITIES AT THE CALIFORNIA GEOLOGICAL SURVEY, Delattre, Marc P., California Geological Survey

GEOLOGIC MAPPING AT THE WYOMING STATE GEOLOGICAL SURVEY, Seth J. Wittke, Wyoming State Geological Survey

GEOLOGIC MAPPING IN MIAMI COUNTY, KANSAS, Anthony Layzell<sup>1</sup>, K. David Newell<sup>1</sup>, Stephen Oborny<sup>2</sup>, Greg Ludvigson<sup>1</sup>, John Dunham<sup>1</sup>, <sup>1</sup>Kansas Geological Survey, <sup>2</sup>Department of Earth and Environmental Sciences, University of Iowa

GEOLOGY OF THE DURHAM QUADRANGLE, MADISON AND WASHINGTON COUNTIES, ARKANSAS, Hutto, R.S. and Hatzell, G.H., Arkansas Geological Survey

GEOHERMAL RESEARCH AT UIUC; SUPPORTING FUTURE ENERGY NEEDS, Stumpf, Andy, Illinois State Geological Survey

LIDAR AND STRUCTURE FROM MOTION-ENHANCED GEOLOGIC MAPPING, EXAMPLES FROM OREGON, Carlie J.M. Duda, Jason D. McClaughry, Robert A. Houston, Clark A. Niewendorp, Oregon Department of Geology and Mineral Industries

NEW BEDROCK GEOLOGIC MAPPING, DODGE COUNTY, WI, Esther Kingsbury Stewart, Kathy Roushar, and Eric Stewart. Wisconsin Geological and Natural History Survey

SHOWCASING GEOLOGIC RESOURCES INVENTORY DIGITAL MAP PRODUCTS: GRAND CANYON NATIONAL PARK, O'Meara, Stephanie A., Witt, Derek R., Chappell, James R. and Karpilo, Ronald D. Jr.

STRABOSPOT: A NEW GEOLOGIC DATA COLLECTION SYSTEM, Bunse, Emily<sup>1</sup>; Tikoff, Basil<sup>2</sup>; Walker, J. Douglas<sup>1</sup>; Newman, Julie<sup>3</sup>, <sup>1</sup>Department of Geology, University of Kansas, <sup>2</sup> Department of Geoscience, University of Wisconsin- Madison, <sup>3</sup>Department of Geology and Geophysics, Texas A&M University

THE MASSACHUSETTS SURFICIAL MATERIALS GEODATABASE AND QUATERNARY GEOLOGIC MAP: THE CULMINATION OF 80 YEARS OF COOPERATIVE EFFORT, , Byron D. Stone, U.S. Geological Survey, Janet R. Stone (Emeritus), U.S. Geological Survey, Mary DiGiacomo-Cohen, U.S. Geological Survey, Ralph S. Lewis (Emeritus), University of Connecticut, Stephen B. Mabee, MA Geological Survey, UMass, 627 North Pleasant Street, Amherst, MA 01003

THE SURFICIAL GEOLOGIC MAP AND GEODATABASE OF BERRIEN COUNTY MI, SUBSURFACE VERIFICATIONS, AND INNOVATIVE CUT-AWAY THREE-DIMENSIONAL TIME SLICES, Byron D. Stone, U.S. Geological Survey, East Hartford, CT, Kevin A. Kincare, U.S. Geological Survey, Manistee, MI, James R. Estabrook, U.S. Geological Survey, Reston

THE SURFICIAL GEOLOGY OF FIVE 7.5-MINUTE QUADRANGLES IN THE PERRY COUNTY AREA, OHIO, Nash, Thomas A., Jr. Ohio Department of Natural Resources, Division of Geological Survey