

Introduction

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The Digital Mapping Techniques '08 (DMT'08) workshop was attended by more than 100 technical experts from 40 agencies, universities, and private companies, including representatives from 24 State geological surveys (see Appendix A). This workshop, hosted by the Idaho Geological Survey, from May 18-21, 2008, on the University of Idaho campus in Moscow, Idaho, was similar in nature to the previous 11 meetings (see Appendix B). As in the previous meetings, the objective was to foster informal discussion and exchange of technical information. It is with great pleasure that I note that the objective was again successfully met, as attendees continued to share and exchange knowledge and information, and renew friendships and collegial work begun at past DMT workshops.

Each DMT workshop has been coordinated by the Association of American State Geologists (AASG) and U.S. Geological Survey (USGS) Data Capture Working Group, the latter of which was formed in August 1996 to support the AASG and the USGS in their effort to build a National Geologic Map Database (see Soller and Stamm, this volume, and <http://ngmdb.usgs.gov/info/standards/datacapt/>). The Working Group was formed because increased production efficiencies, standardization, and quality of digital map products were needed for the database—and for the State and Federal geological surveys—to provide more high-quality digital maps to the public.

At the 2008 meeting, oral and poster presentations and special discussion sessions emphasized (1) methods for creating and publishing map products (here, "publishing" includes Web-based release); (2) field data capture software and techniques, including the use of LiDAR; (3) digital cartographic techniques; (4) migration of digital maps into ArcGIS Geodatabase format; (5) analytical GIS techniques; and (6) continued development of the National Geologic Map Database.

Acknowledgments

I thank the Idaho Geological Survey (IGS) and the Director and State Geologist, Roy Breckenridge, for hosting this meeting. Loudon Stanford and Jane Freed coordinated the event; their management was flawless. It has been my distinct pleasure to work with them on various DMT-related activities over the years. I also thank Jennifer Rice and Linda Newberry for providing the registration and conference services that ensured the meeting's success.

I also thank the members of the Data Capture Working Group (Warren Anderson, Kentucky Geological Survey; Sheena Beaverson, Illinois State Geological Survey; Elizabeth Campbell, Virginia Division of Mines and Geology; Scott McColloch, West Virginia Geological and Economic Survey; George Saucedo, California Geological Survey; Loudon Stanford, Idaho Geological Survey; and Tom Whitfield, Pennsylvania Geological Survey), for advice in planning the workshop's content. Scott McColloch graciously served as peer reviewer of the Proceedings.

Last but not least, I thank all attendees for their participation; their enthusiasm and expertise were the primary reasons for the meeting's success.

Presentations and Posters

The workshop included 16 oral presentations, 3 discussion sessions, and 19 posters. Many are supported by a paper contained in these Proceedings. The papers describe technical and procedural approaches that currently meet some or all needs for digital mapping at the respective agency. There is not, of course, a single "solution" or approach to digital mapping that will work for each agency or for each program or

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group within an agency; personnel and funding levels, and the schedule, data format, and manner in which we must deliver our information to the public require that each agency design its own approach. However, the value of this workshop and other forums like it is through their roles in helping to design or refine these agency-specific approaches to digital mapping and to find applicable approaches used by other agencies. In other words, communication helps us to avoid having to “reinvent the wheel.”

During the course of the 12 annual DMT meetings, it has been my pleasure to meet, and work with, the many talented people who have authored papers in these Proceedings. As the subjects addressed by the DMT meetings have become even more essential to the Nation's geological surveys, the demands placed on them have risen to the point where many authors scarcely have time to address their work fully. Predictably, less time is then available to compose written summaries of their work; I'm sure the readers (or at least other editors) can

sympathize with this predicament. Therefore, I include with this Introduction a list of all presentations and posters (Appendix C). If the reader finds an interesting title that isn't recorded in these Proceedings, I encourage the reader to contact the authors directly. Further, some presentations and related information are available for download at <http://ngmdb.usgs.gov/Info/dmt/DMT08presentations.html>.

The Next DMT Workshop

The 13th annual DMT meeting will be held in the Spring of 2009 on the campus of West Virginia University in Morgantown, West Virginia. Please consult the Web site (<http://ngmdb.usgs.gov/Info/dmt/>) for additional information about this and other DMT meetings.

Appendix A. List of Workshop Attendees

[Grouped by affiliation]

Alaska Division of Geological and Geophysical Surveys

Jennifer Athey
Seth Snedigar

Arizona Geological Survey

Ryan Clark

Arizona Geological Survey / USGS

Steve Richard

California Geological Survey

Carlos Gutierrez
George Saucedo

Central Washington University

Robert Hickey

Colorado State University / National Park Service

Stephanie O'Meara
Ronald Karpilo

ESRI, Inc.

Charlie Frye
Peter Kasianchuk
Willy Lynch
Steve Mulberry

Geological Survey of Alabama

Philip Dinterman

Geological Survey of Canada

Peter Davenport
Parm Dhesi
Vic Dohar
Linda Guay
Jamel Joseph
Roger Macleod
Marianne Quat
Carol Wagner

Geological Survey of Finland

Hannu Idman
Jyrki Kokkonen
Jouni Vuollo

Hecla Mining Company

Deb Glader
Jim Myers
Brandi Rollins

Idaho Geological Survey

Roy Breckenridge
Jane Freed
Dean Garwood
Reed Lewis
William Phillips
Loudon Stanford
Benjamin Studer

Illinois State Geological Survey

Sheena Beaverson
Jane Domier

Kentucky Geological Survey

Gerald Weisenfluh

Louisiana Geological Survey

Robert Paulsell

Minnesota Geological Survey

Harvey Thorleifson

Missouri Division of Geology and Land Survey

Edie Starbuck

Montana Bureau of Mines and Geology

Ken Sandau
Susan Smith

National Park Service

Gregory Mack
Georgia Hybels

Nevada Bureau of Mines and Geology

Christine Arritt
Jordan Hastings
Peter House
Jennifer Mauldin

New Mexico Bureau of Geology and Mineral Resources

Glen Jones

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Ohio Division of Geological Survey

James McDonald
Kelli Vogt

Oregon Department of Geology & Mineral Industries

Jed Roberts
Ian Madin

Pennsylvania Geological Survey

Rose-Anna Behr
Thomas Whitfield

Portland State University

David Percy

SNS Silver Corp.

Jesse Bird

South Carolina Geological Survey

Scott Howard

U.S. Geological Survey

Mary Digiacommo-Cohen
Christopher Garrity
Ralph Haugerud
Chad Hults
Keith Labay
Nancy Norvell
Randall Orndorff
Sue Priest
Lydia Quintana
David Soller
Nancy Stamm
Will Stettner
Byron Stone
Scott Van Hoff
Ronald Wahl
Frederic Wilson

University of Alabama

Douglas Behm

University of Idaho

Melissa Sabga
Travis Steel
Theresa Taylor

University of Nebraska, Conservation and Survey Division

Les Howard

University of Tennessee

Andrew Wunderlich

USDA Forest Service

Andrew Rorick

Utah Geological Survey

Kent Brown
Jared Ehler

Washington Geology and Earth Resources Division

John Bromley
Recep Cakir
Charles Caruthers
Trevor Contreras
Kelsay Davis
Bryan Garcia
Isabelle Sarikhan

West Virginia Geological and Economic Survey

Gayle McColloch
Jane McColloch

William Lettis and Associates

Mark Zellman

Wisconsin Geological and Natural History Survey

Bill Bristoll
Deborah Patterson
Kathy Roushar
Peter Schoephoester

Wyoming Geological Survey

Allory Deiss
Richard Jones
Phyllis Ranz

Appendix B. Previous Digital Mapping Techniques Workshops

1997:

Hosted by the Kansas Geological Survey, Lawrence, Kansas, June 2-5. 73 technical experts attended, from 30 State geological surveys, the USGS, and the Geological Survey of Canada.

Soller, D.R., ed., 1997, Proceedings of a workshop on digital mapping techniques: Methods for geologic map data capture, management, and publication: U.S. Geological Survey Open-File Report 97-269, 120 p., <http://pubs.usgs.gov/of/of97-269/>.

1998:

Hosted by the Illinois State Geological Survey in Champaign, Illinois, May 27-30. More than 80 technical experts attended, mostly from the State geological surveys and the USGS.

Soller, D.R., ed., 1998, Digital Mapping Techniques '98—Workshop Proceedings: U.S. Geological Survey Open-File Report 98-487, 134 p., <http://pubs.usgs.gov/of/of98-487/>.

1999:

Hosted by the Wisconsin Geological and Natural History Survey in Madison, Wisconsin, May 19-22. 91 selected technical experts from 42 agencies, universities, and private companies attended, including representatives from 30 State geological surveys.

Soller, D.R., ed., 1999, Digital Mapping Techniques '99—Workshop Proceedings: U.S. Geological Survey Open-File Report 99-386, 216 p., <http://pubs.usgs.gov/of/of99-386/front.html>.

2000:

Hosted by the Kentucky Geological Survey in Lexington, Kentucky, May 17-20. 99 technical experts from 42 agencies, universities, and private companies attended, including representatives from 28 State geological surveys.

Soller, D.R., ed., 2000, Digital Mapping Techniques '00—Workshop Proceedings: U.S. Geological Survey Open-File Report 00-325, 209 p., <http://pubs.usgs.gov/of/of00-325/>.

2001:

Hosted by the Geological Survey of Alabama, in Tuscaloosa, Alabama, May 20-23. 108 technical experts from 48 agencies, universities, and private companies attended, including representatives from 31 State geological surveys.

Soller, D.R., ed., 2001, Digital Mapping Techniques '01—Workshop Proceedings: U.S. Geological Survey Open-File Report 01-223, 248 p., <http://pubs.usgs.gov/of/2001/of01-223/>.

2002:

Hosted by the Utah Geological Survey, in Salt Lake City, Utah, May 19-22. More than 100 technical experts from 40 agencies, universities, and private companies attended, including representatives from 30 State geological surveys.

Soller, D.R., ed., 2002, Digital Mapping Techniques '02—Workshop Proceedings: U.S. Geological Survey Open-File Report 02-370, 214 p., <http://pubs.usgs.gov/of/2002/of02-370/>.

2003:

Hosted by the Pennsylvania Geological Survey, in Millersville, Pennsylvania, June 1-4. Nearly 90 technical experts from 36 agencies, universities, and private companies attended, including representatives from 22 State geological surveys.

Soller, D.R., ed., 2003, Digital Mapping Techniques '03—Workshop Proceedings: U.S. Geological Survey Open-File Report 03-471, 262 p., <http://pubs.usgs.gov/of/2003/of03-471/>.

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2004:

Hosted by the Oregon Department of Geology and Mineral Industries, in Portland, Oregon, May 16-19. Nearly 100 technical experts from 40 agencies, universities, and private companies attended, including representatives from 22 State geological surveys.

Soller, D.R., ed., 2004, Digital Mapping Techniques '04—Workshop Proceedings: U.S. Geological Survey Open-File Report 2004-1451, 220 p., <http://pubs.usgs.gov/of/2004/1451/>.

2005:

Hosted by the Louisiana Geological Survey, in Baton Rouge, Louisiana, April 24-27. More than 100 technical experts from 47 agencies, universities, and private companies attended, including representatives from 25 State geological surveys.

Soller, D.R., ed., 2005, Digital Mapping Techniques '05—Workshop Proceedings: U.S. Geological Survey Open-File Report 2005-1428, 268 p., <http://pubs.usgs.gov/of/2005/1428/>.

2006:

Hosted by the Ohio Geological Survey, in Columbus, Ohio, June 11-14. More than 115 technical experts from 51 agencies, universities, and private companies attended, including representatives from 27 State geological surveys.

Soller, D.R., ed., 2007, Digital Mapping Techniques '06—Workshop Proceedings: U.S. Geological Survey Open-File Report 2007-1285, 217 p., <http://pubs.usgs.gov/of/2007/1285/>.

2007:

Hosted by the South Carolina Geological Survey, in Columbia, South Carolina, May 20-23. More than 85 technical experts from 49 agencies, universities, and private companies attended, including representatives from 27 State geological surveys.

Soller, D.R., ed., 2008, Digital Mapping Techniques '07—Workshop Proceedings: U.S. Geological Survey Open-File Report 2008-1385, 140 p., <http://pubs.usgs.gov/of/2008/1385/>.

Appendix C. List of Oral and Poster Presentations, and Discussion Sessions

Oral Presentations

Braving the Rocky Waters – Standards Development and the U.S. National Geologic Map Database
By David R. Soller and Nancy R. Stamm (U.S. Geological Survey)

Digital Geologic Mapping at CGS – Basic Data for Analysis of Geologic Resources and Hazards
By George J. Saucedo, Chris J. Wills, and Carlos I. Gutierrez (California Geological Survey)

The Transition from Traditional to Digital Mapping: Maintaining Data Quality while Increasing Geologic Mapping Efficiency in Alaska
By Jennifer E. Athey, Lawrence K. Freeman, and Kenneth A. Woods (Alaska Division of Geological and Geophysical Surveys)

The State of the State Data: An End-User's Perspective
By Mark Zellman, David Slayter, Ranon Dulburg, Marco Ticci, Kevin Whaley, Jeff Hemphill, and Jason Finley (William Lettis & Associates, Inc.)

Rescuing Legacy Digital Data: Maps Stored in Adobe Illustrator™ Format
By Andrew L. Wunderlich and Robert D. Hatcher Jr. (Tectonics and Structural Geology Research Group, University of Tennessee, Knoxville)

ESRI Cartographic Representations for the FGDC Digital Cartographic Standard for Geologic Map Symbolization – A Preliminary Report
By Peter M. Kasianchuk and Charlie Frye (ESRI)

Copper Archiving and Stone Printing
By Will Stettner and Robert Kelley (U.S. Geological Survey)

Geologic Quadrangle Mapping Using High Resolution LiDAR: Promise and Problems
By Ian Madin (Oregon Department of Geology and Mineral Industries)

The National Survey and Analysis Alaska Database: Extensions To Produce the International Polar Year Circum-Polar Bedrock Geologic Map
By Frederic H. Wilson, Chad P. Hults, Keith A. Labay, and Nora Shew (U.S. Geological Survey)

Geologic Mapping and LiDAR
By Ralph Haugerud (U.S. Geological Survey)

Development of Standard Vocabularies for the U.S. National Geologic Map Database and the CGI-GeoSciML Working Group
By Steve Richard (Arizona Geological Survey / U.S. Geological Survey) and David R. Soller (U.S. Geological Survey)

Tracking New and Ongoing Geologic Mapping in the U.S. – The National Cooperative Geologic Mapping Program's Mapping in Progress Database
By Lydia Quintana, Nancy R. Stamm, Randy Orndorff (U.S. Geological Survey)

Kentucky Field Data Entry Tools Developed in ArcIMS
By Gerald A. Weisenfluh and Douglas C. Curl (Kentucky Geological Survey)

ESRI Presentation and Demonstration on “Enterprise Management and Dissemination of Geographic Information”
By Steve Mulberry (ESRI)

National Geologic Map Databases of Afghanistan and Liberia
By Ronald R. Wahl (U.S. Geological Survey)

Defining a Three Dimensional Geologic Map for the Appalachian Plateau
By Gayle H. McColloch, Jr., and Jane S. McColloch (West Virginia Geological and Economic Survey)

Global Mapper: The Swiss Army Knife for GIS!
By Kent D. Brown and J. Buck Ehler (Utah Geological Survey)

Poster Presentations (listed alphabetically, by author):

Bringing Geological Mapping into the Digital Era - A Finnish Case
By Niina Ahtonen, Hannu Idman, Esa Kauniskangas, Jarmo Kohonen, Jyrki Kokkonen, Jouni Luukas, Jukka-Pekka Palmu, and Jouni Vuollo (Geological Survey of Finland)

Creating a Virtual Geologic Map and Field Trip of the St. George 30' x 60' Quadrangle, Washington County, Utah – An Adventure in Google Earth
By Kent D. Brown, Lance B. Weaver, and Robert F. Biek (Utah Geological Survey)

Digital Mapping Process of Seismic Design Category Information for Residential Construction in Washington
By Recep Cakir, Timothy J. Walsh, Karen D. Meyers, Anne C. Heintz, Elizabeth E. Thompson, Isabelle Y. Sarikhan, Charles G. Caruthers, Jaretta M. Roloff, and David K. Norman (Washington Division of Geology and Earth Resources)

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ArcMap tools for geologic map and database construction at the Arizona Geological Survey

By Ryan Clark (Arizona Geological Survey)

Digital Map Production and Publication at the Geological Survey of Alabama

By Philip A. Dinterman, G. Daniel Irvin, and W. Edward Osborne (Geological Survey of Alabama)

GIS database for the DNAG Geologic Map of North America

By Christopher P. Garrity and David R. Soller (U.S. Geological Survey)

ESRI Cartographic Representations for Geologic Mapping

By Peter Kasianchuk and Charlie Frye (ESRI)

Creating Geologic Maps for the Appalachian Plateau in a GIS Environment

By Jane S. McColloch and Gayle H. McColloch, Jr. (West Virginia Geological and Economic Survey)

Project-Management GIS Applications and Tools for Coastal-Erosion Mapping in Ohio

By James McDonald (Ohio Division of Geological Survey)

Evolution of the NPS GRE Geology-GIS Data Model (1998 to 2008)

By Stephanie A. O'Meara, Heather I. Stanton, James R. Chappell, and Ronald D. Karpilo (Colorado State University)

A simplified database design, for publication of single geologic maps ("NGMDB-lite")

By Stephen M. Richard (Arizona Geological Survey / U.S. Geological Survey), David R. Soller (U.S. Geological Survey), and Jon Craigie (U.S. Geological Survey)

Sharing Technical Information with Nontechnical Users – An Example from the Monterey Bay Area Quaternary Fault Atlas

By Lewis I. Rosenberg (Tierra Geoscience)

Washington Geological Survey GIS Statewide Landslide Database – From Design to Implementation

By Isabelle Sarikhan and Kelsay M.D. Stanton (Washington Geology and Earth Resources Division)

The National Geologic Map Database

By David R. Soller and Nancy R. Stamm (U.S. Geological Survey)

Improving the Legibility of Base Maps for Geologic Mapping at the Missouri Division of Geology and Land Survey

By Edith Starbuck and Karen Loveland (Missouri Department of Natural Resources, Division of Geology and Land Survey)

A structural analysis of the Waha escarpment, utilizing LiDAR data to obtain slope and orientation of basalt bedding planes

By Travis Steel (University of Idaho)

Migrating the surficial mapping process from paper to digital format

By Kelli L. Vogt, Joseph G. Wells, Erik R. Venteris, Douglas L. Shrake, Glenn E. Larsen, Richard R. Pavey, and Michael P. Angle (Ohio Geological Survey)

Progress Toward More Detailed Site-Conditions Maps for California

By Chris J. Wills, Carlos I. Gutierrez, and Michael A. Silva (California Geological Survey)

The National Survey and Analysis Alaska database:

Extensions to produce the International Polar Year Circum-Polar Bedrock Geologic Map

By Frederic H. Wilson, Chad P. Hults, Keith A. Labay, and Nora Shew (U.S. Geological Survey)