

**CEGIS Research Publications and Presentations  
2006-2012**

**Publications and Presentations 2007-2012  
Electronic Topographic Map Design Research**

**Dr. Cynthia A. Brewer**

*November 2012*

**Products related to CEGIS funding**

***Peer-Reviewed Publications***

1. Roth R.E., C.A. Brewer and M.S. Stryker, **2011**, "A Typology of Operators for Maintaining Legible Map Designs at Multiple Scales," *Cartographic Perspectives*, 68: 29-64.
2. Bittenfield, B.P., L.V. Stanislawski, and C.A. Brewer, **2011**, "Adapting Generalization Tools to Physiographic Diversity for the USGS National Hydrography Dataset," in U.S. National Report to the International Cartographic Association, *Cartography and Geographic Information Science*, 38(3): 289-301.
3. Butzler, S.J., C.A. Brewer, and W.J. Stroh, **2011**, "Establishing Classification and Hierarchy in Populated Place Labeling for Multiscale Mapping for *The National Map*," *Cartography and Geographic Information Science*, 38(2): 100-109.
4. Brewer, C.A., and B.P. Bittenfield, **2010**, "Mastering Map Scale: Balancing Workloads Using Display and Geometry Change in Multi-scale Mapping," *Geoinformatica*, 14(2): 221-239 (published as Open Access in May 2009: DOI 10.1007/s10707-009-0083-6).
5. Brewer, C.A., and B.P. Bittenfield, **2007**, "Framing Guidelines for Multi-Scale Map Design Using Databases at Multiple Resolutions," *Cartography and Geographic Information Science*, 34(1): 3-15.

***Refereed Conference Proceedings***

1. Brewer, C.A., L.V. Stanislawski, B.P. Bittenfield, P. Raposo, K. Sparks, and M. Howard, **2012**, "Multiscale Design for The National Map of the United States: Road Thinning for Topographic Mapping" *Proceedings, AutoCarto 2010*, Columbus OH, September.
2. Stanislawski, L.V. , M-O Briat, E. Punt, M. Howard, C.A. Brewer, and B.P. Bittenfield, **2012**, "Density Stratified Thinning of Road Networks to Support Automated Generalization for The National Map" *Workshop Proceedings, ICA Commission on Generalisation and Multiple Representation*, Istanbul, Turkey, September.

3. Brewer, C.A., B.P. Buttenfield, and L.V. Stanislawski, **2011**, "Choosing between Geometry Change and Display Change for Multiscale Mapping: The Role of Elimination in Design," *Proceedings, International Cartographic Conference 2011 (ICC2011)*, Paris, July, 11 pp. [icaci.org/documents/ICC\\_proceedings/ICC2011/](http://icaci.org/documents/ICC_proceedings/ICC2011/)
4. Brewer, C.A., and P. Raposo, **2011**, "Comparison of Topographic Map Designs for Overlay on Orthoimage Backgrounds," *Proceedings, ICC2011*, Paris, July, 10 pp. [icaci.org/documents/ICC\\_proceedings/ICC2011/](http://icaci.org/documents/ICC_proceedings/ICC2011/)
5. Brewer, C.A., J.E. Thatcher and S.J. Butzler, **2011**, "Combining Varied Federal Data Sources for Multiscale Map Labeling of Populated Places and Airports for *The National Map* of the United States," *Workshop Proceedings, ICA Commission on Generalisation and Multiple Representation*, Paris, June/July.
6. Buttenfield, B.P., L.V. Stanislawski, and C.A. Brewer, **2011**, "A Comparison of Star and Ladder Generalization Strategies for Intermediate Scale Processing of USGS National Hydrography Dataset Workshop," *Workshop Proceedings, ICA Commission on Generalisation and Multiple Representation*, Paris, June/July.
7. Brewer, C.A., C.L. Hanchett, B.P. Buttenfield, and E.L. Usery, **2010**, "Performance of Map Symbol and Label Design with Format and Display Resolution Options Through Scale for *The National Map*," *Proceedings, AutoCarto 2010*, Orlando FL, November, 6 pp. (CD-ROM).
8. Stroh, W.J., S.J. Butzler, and C.A. Brewer, **2010**, "Establishing Classification and Hierarchy in Populated Place Labeling for Multiscale Mapping for *The National Map*," *Proceedings, AutoCarto 2010*, Orlando FL, November, 6 pp. (CD-ROM).
9. Wilmer, J.M., and C. A. Brewer, **2010**, "Application of the Radical Law in Generalization of National Hydrography Data for Multi-Scale Mapping," *Proceedings, AutoCarto 2010*, Orlando FL, November, 6 pp. (CD-ROM).
10. Buttenfield, B.P., L.V. Stanislawski, and C.A. Brewer, **2010**, "Multiscale Representations of Water: Tailoring Generalization Sequences to Specific Physiographic Regimes," *Proceedings, GIScience 2010*, Zurich, Switzerland, September, 6 pp. (selected as a 'top four short paper' at the conference; refereed proceedings distributed on USB).
11. Brewer, C.A., B.P. Buttenfield, and E.L. Usery, **2009**, "Evaluating Generalizations of Hydrography in Differing Terrains for *The National Map* of the United States," *Proceedings, 24<sup>th</sup> International Cartographic Conference (ICC2009)*, Santiago, Chile, November, 12 pp. [icaci.org/documents/ICC\\_proceedings/ICC2009/html/nonref/19\\_12.pdf](http://icaci.org/documents/ICC_proceedings/ICC2009/html/nonref/19_12.pdf)

12. Brewer, C.A., and M.K. Akella, **2008**, “Multi-resolution Multi-scale Topographic Map Design: Toward a New Look for *The National Map*,” *Proceeding, AutoCarto 2008*, Shepherdstown WV, September, 12 pp. (CD-ROM).
13. Stryker, M., R.E. Roth, and C.A. Brewer, **2008**, “ScaleMaster.org: Illustrating and Constructing the Multi-scale Mapping Process,” *Proceedings, 5<sup>th</sup> International Conference on Geographic Information Science (GIScience 2008)*, Park City UT, September.

*These two are related to the project but precede funding*

14. Brewer, C.A., B.P. Buttenfield, C. Frye, and J. Acosta, **2007**, “ScaleMaster: Multi-Scale Mapmaking from Multiple Database Resolutions and for Multiple Map Purposes,” *Proceedings, 23<sup>rd</sup> International Cartographic Conference (ICC2007)*, Moscow, Russia, August, 10 pp. (CD-ROM).
15. Brewer, C.A., and B.P. Buttenfield, **2006**, “Mastering Map Scale: Formalizing Guidelines for Multi-Scale Map Design,” *Proceeding, AutoCarto 2006*, Vancouver WA, June, 10 pp. (CD-ROM).

### ***Presentations***

• denotes Brewer was presenter.

*Presentations are oral papers unless otherwise noted.*

*Bold conference names are listed by acronym alone in earlier listings.*

*Items in gray are redundant with the proceedings papers listed above.*

### **2012**

*Two presentations—North American Cartographic Information Society (NACIS) annual meeting, Portland OR, October 2012:*

1. “Mapping Around the World: A Cartographic Study Abroad Experience” (first author with A.C. Robinson and P. Raposo). •
2. “Techniques for Cartographic Presentation of Upsampled Raster Land Cover Data” (third author with P. Raposo and K. Sparks).
3. “Multiscale design for The National Map of the United States: Road Thinning for Topographic Mapping” (refereed submission; first author with L.V. Stanislawski, B.P. Buttenfield, P. Raposo, K. Sparks, and M. Howard), *AutoCarto 2010*, Columbus OH, September 2012. •
4. “Density Stratified Thinning of Road Networks to Support Automated Generalization for The National Map” (refereed submission; fifth author with L.V. Stanislawski, M-O Briat, E. Punt, M. Howard, and B.P. Buttenfield), Workshop, **International Cartographic Association (ICA) Commission on Generalisation and Multiple Representation**, Istanbul Turkey, September 2012.

5. Invited commentator, “US Topo,” video produced by J. Maxwell, U.S. Geological Survey, Department of Interior, released August 2012: [gallery.usgs.gov/videos/568](http://gallery.usgs.gov/videos/568) or [www.youtube.com/watch?v=hv0jxsW3qgY](http://www.youtube.com/watch?v=hv0jxsW3qgY) •

*Four invited presentations—Center of Excellence for Geospatial Information Science (CEGIS) meeting, U.S. Geological Survey (USGS), Rolla MO, June 2012:*

6. “National Mapping Around the World” (first author with A. Robinson and P. Raposo). •
7. “Multiscale Design for *The National Map* 2011/12” (first author with K.A. Sparks and P. Raposo). •
8. “Multiscale Land Cover Design for *The National Map*” (third author with K.A. Sparks and P. Raposo).
9. “Multiscale Land Cover Processing for *The National Map*” (third author with P. Raposo and K.A. Sparks).

*Four related presentations—“Multiscale Design for *The National Map* of the U.S.”:*

10. Association of American Geographers, Middle States Division annual meeting (first author with P. Raposo), Shippensburg PA, November 2012. •
11. Division Geoinformation, Bundesamt für Kartographie und Geodäsie (BKG; Federal Agency for Cartography and Geodesy), Frankfurt am Main, Germany, June 2012. •
12. Abu Dhabi Systems & Information Center, Abu Dhabi, UAE, June 2012. •
13. Center for Spatial Information Science, The University of Tokyo—Hongo, Tokyo, Japan, June 2012. •
14. Invited colloquium, Department of Geography, Ohio State University, Columbus OH, May 2012. •

## **2011**

15. “Multiscale Redesign of *The National Map* with USGS” (invited presentation), Coffee Hour, Department of Geography Colloquium, PSU, December 2011. •

Broadcast and posted online through the department’s *Coffee Hour to Go* program:

[e-education.mediasite.com/mediasite/Viewer/?peid=982eb32231c84250b725e25db4c215dc1d](http://e-education.mediasite.com/mediasite/Viewer/?peid=982eb32231c84250b725e25db4c215dc1d)

*Two presentations—NACIS annual meeting, Madison, WI, October 2011:*

16. “NACIS Presentations on Terrain Inspire Penn State *Applied Cartographic Design* Course” (first author with J. McGilloway and S.J. Butzler). •
17. “Multiscale Terrain Representation for *The National Map*” (second author with A. Stauffer).

*Two refereed presentations—International Cartographic Conference 2011 (ICC2011), Paris, July 2011:*

18. “Choosing between Geometry Change and Display Change for Multiscale Mapping: The Role of Elimination in Design” (first author with B.P. Buttenfield and L.V. Stanislawski). •
19. “Comparison of Topographic Map Designs for Overlay on Orthoimage Backgrounds” (second author with P. Raposo).

*Two refereed presentations*—Workshop, ICA Commission on Generalisation and Multiple Representation, Paris, June/July 2011:

20. “Combining Varied Federal Data Sources for Multiscale Map Labeling of Populated Places and Airports for *The National Map* of the United States” (first author with J.E. Thatcher and S.J. Butzler). •
21. “A Comparison of Star and Ladder Generalization Strategies for Intermediate Scale Processing of USGS National Hydrography Dataset” (third author with B.P. Buttenfield and L.V. Stanislawski).

*Two invited presentations*—CEGIS meeting, USGS, Rolla MO, June 2011:

22. “Generalization” (third author with L.V. Stanislawski and B.P. Buttenfield).
23. “Electronic Topographic Map Design” (co-presenter with A. Stauffer; coauthors P. Raposo, S.J. Butzler, J. Thatcher). •

*Two presentations*—*The National Map* Users Conference, Denver, May 2011:

24. “Establishing Classification and Hierarchy in Populated Place Labeling for Multiscale Mapping for *The National Map*” (second author with S.J. Butzler, J.E. Thatcher, and W.J. Stroh).
25. “Comparison of topographic map designs for overlay on orthoimage backgrounds” (second author with P. Raposo).

## **2010**

*Three presentations*—AutoCarto 2010, Orlando FL, November 2010:

26. “Performance of Map Symbol and Label Design with Format and Display Resolution Options Through Scale for *The National Map*” (first author with C.L. Hanchett, B.P. Buttenfield, and E.L. Usery). •
27. “Establishing Classification and Hierarchy in Populated Place Labeling for Multiscale Mapping for *The National Map*” (third author with W.J. Stroh and S.J. Butzler).
28. “Application of the Radical Law in Generalization of National Hydrography Data for Multi-Scale Mapping” (second author with J.M. Wilmer).

*Three presentations*—NACIS annual meeting, St. Petersburg FL, October 2010:

29. “Design Examples for Multiscale Topographic Mapping for *The National Map*” (poster; first author with C.L. Hanchett and B.P. Buttenfield). •
30. “Tapered Symbols for NHD Flowlines Systematically Adjusted for Dry Versus Humid Zones” (second author with A. Stauffer).
31. “Populated Place Label Classification and Hierarchy for Multiscale Mapping” (third author with S.J. Butzler and W.J. Stroh).
32. “Multiscale Representations of Water: Tailoring Generalization Sequences to Specific Physiographic Regimes” (refereed short paper; third author with B.P. Buttenfield and L. Stanislawski), GIScience 2010, Zurich, Switzerland, September 2010.
33. “Designing USGS Topographic Mapping for Multiscale Online Use” (invited keynote; first author with B.P. Buttenfield and E.L. Usery), GeoCart'2010 (New Zealand National Cartographic Conference) and International Cartographic Association (ICA) Symposium

on Cartography for Australasia and Oceania, Auckland, New Zealand, August/September 2010. •

34. “Designing USGS Topographic Mapping for Multiscale Online Use” (first author with B.P. Buttenfield and E.L. Usery), Esri International User Conference, San Diego CA, July 2010. •

*Four presentations*—CEGIS meeting, U.S. Geological Survey (USGS), Denver CO, June 2010 (invited presentations):

35. “Progress and Rationale for Electronic Topo Map Design Decisions” (first author with B.P. Buttenfield and L.V. Stanislawski). •
36. “Multiscale Design: ScaleMaster Decisions and MXD Settings for Symbol Evaluation” (second author with C.L. Hanchett).
37. “Evaluation of Map Symbols by Screen Resolution and File Format Through Scale” (first author with C.L. Hanchett). •
38. “Tapered Symbols for NHD Flowlines Systematically Adjusted for Dry Versus Humid Zones” (second author with A. Stauffer).

## **2009**

39. “Recommendations for Symbol and Label Design for Multiscale Online Topographic Mapping for *The National Map*” (briefing). USGS Headquarters, Reston VA, December 2009. •
40. “Evaluating Generalizations of Hydrography in Differing Terrains for *The National Map* of the United States” (refereed paper; first author with B.P. Buttenfield and E.L. Usery). ICC2009, Santiago, Chile, November 2009. •

*Two presentations*—NACIS annual meeting, Sacramento CA, October 2009:

41. “Designing *The National Map* by USGS for Multi-scale Online Use” (first author with B.P. Buttenfield and E.L. Usery). •
42. “Place Still Matters: Generalizing the National Hydrography Dataset by Local Terrain and Climate” (second author with B.P. Buttenfield and E.L. Usery).
43. “Topographic Map Design to Support Evaluation of Generalization Solutions” (invited presentation; co-presenter with B.P. Buttenfield), CEGIS-USGS, Rolla MO, August 2009. •
44. “Cartographic Generalization by Physiographic Region” (fourth author with J. Wendel, B.P. Buttenfield, and C. Anderson-Tarver), AAG annual meeting, Las Vegas NV, March 2009.

## **2008**

45. “Redesigned Maps” (invited in-class presentation), Department of Geography, University of Colorado—Boulder, November 2008. •

*Two presentations*—NACIS annual meeting, Missoula MT, October 2008:

46. “ScaleMaster.org: Multi-scale Mapping Made Easy” (third author with R.E. Roth and M. Stryker).
47. “Typology of Multi-scale Mapping Operators” (poster; third author with R.E. Roth and M. Stryker).

*Two presentations*—GIScience 2008, Park City UT, September 2008:

48. “ScaleMaster.org: Illustrating and Constructing the Multi-scale Mapping Process” (refereed paper; third author with M. Stryker and R.E. Roth).
49. “Typology of Multi-scale Mapping Operators” (poster; third author with R.E. Roth and M. Stryker).
50. “Multi-resolution Multi-scale Topographic Map Design: Toward a New Look for *The National Map*” (first author with M.K. Akella), AutoCarto 2008, Shepherdstown WV, September 2008. •
51. “Multi-Resolution Multi-Scale Topographic Map Design” (Map Gallery poster; first author with M.K. Akella), ESRI International User Conference, San Diego CA, August 2008. •
52. “Electronic Topographic Map Design” (invited presentation), CEGIS and National Geospatial Technical Operations Center (NGTOC), U.S. Geological Survey, Rolla MO, July 2008. •

*These seven items are related to the project but precede CEGIS funding*

### **2007**

*Two presentations*—NACIS annual meeting, St. Louis MO, October 2007:

53. “ScaleMaster Characterization of Types of Design Change Through Scale for Mapping from Multi-Resolution Databases” (first author with J. Acosta, B.P. Buttenfield, C. Frye, and A. Buckley). •
54. “What is a Base Map?” (second author with B.P. Buttenfield, C. Frye and A. Buckley).
55. “Scalemaster: Multi-Scale Mapmaking from Multiple Database Resolutions and for Multiple Map Purposes” (refereed paper; first author with B.P. Buttenfield, C. Frye, and J. Acosta), ICC2007, Moscow, Russia, August 2007. •

### **2006**

56. “Map Design through Scale Change and Varied Map Purpose” (first author with C. Frye and B.P. Buttenfield), NACIS annual meeting, Madison WI, October 2006. •

*Three presentations*—“Mastering Map Scale: Formalizing Guidelines for Multi-Scale Map Design:”

57. Conference paper (first author with B.P. Buttenfield), AutoCarto 2006, Vancouver WA, June 2006. •
58. Invited talk, UMR 8504 Géographie-cités: CNRS (Centre National de la Recherche Scientifique) and Universités Paris 1 and 7, Paris, France, May 2006. •

59. Invited talk, Laboratoire COGIT (Conception Objet et Généralisation de l'Information Topographique), Institut Geographique National (IGN), Paris, France, May 2006. •

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## Publications Related to CEGIS Generalization Initiative (2007-2012)

Barbara Buttenfield

(NOTE: Barbara Buttenfield and Cindy Brewer joined CEGIS as Faculty Affiliates in 2008, and publications on generalization prior to 2008 were funded by ESRI not USGS. As a consequence, they are not listed here. Larry Stanislawski's publication record dates back through 2007. Cindy may have publications on the E-TOPO Design project in addition to those listed in this document.)

### Books

Buttenfield, B.P. and Mackaness, W.A. (eds.) *Generalization and Spatial Data Integration* (in preparation).

### Articles in Refereed Journals

2011 Buttenfield, B.P., Stanislawski, L.V. and Brewer, C.A. Adapting Generalization Tools to Physiographic Diversity for the USGS National Hydrography Dataset. *Cartography and GIS* 38(3): 289-301.

2011 Stanislawski, L.V. and Buttenfield, B.P. Hydrographic Generalization Tailored to Dry Mountainous Regions. *Cartography and GIS* 38(2): 117-125.

2011 \* Anderson-Tarver, C., Leyk, S. and Buttenfield, B.P. Fuzzy Modeling of Geometric Textures for Identifying Archipelagos in Area-Patch Generalization. *Cartography and GIS* 38(2):137-146.

2010 Brewer, C.A. and Buttenfield, B.P. Mastering Map Scale: Balancing Workloads Using Display and Geometry Change in Multi-scale Mapping. *Geoinformatica* 14(2):221 - 239. Open Access Number DOI 10.1007/s10707-009-0083-6.

2009 \* Wendel, J., Buttenfield, B.P. and Smith, J. Spatializing a GIS Software Toolbox. *Kartographische Nachrichten* 5: 257-263.

2009 Stanislawski, L.V. Feature Pruning by Upstream Drainage Area to Support Automated Generalization of the United States National Hydrography Dataset. *Computers, Environment, and Urban Systems*. 33(5):325-333.

### Refereed Conference Proceedings

- 2012 Stanislawski, L.V., Doumbouya, A.T., and Miller-Corbett, C.D. 2012. Mapping Natural Variability in Drainage Density for the Coterminous United States to Support Hydrologic Generalization. *GIS in the Rockies 2012*. Denver Colorado, September (abstract submitted)
- 2012 Stanislawski, L.V., Doumbouya, A.T. Miller-Corbett, C.D., Battenfield, B.P. and Arundel-Murin, S.T. Scaling Stream Densities for Hydrologic Generalization. *GIScience 2012 Short Paper Proceedings*, Columbus Ohio, September (abstract accepted).
- 2012 Stanislawski, L.V., Briat, M.O., Punt, E., Howard, M. Brewer, C.A., and Battenfield, B.P. Density Stratified Thinning of Road Networks to Support Automated Generalization for *The National Map*. *Proceedings, 15th Workshop of the International Cartographic Association Commission on Generalisation and Multiple Representation*, Istanbul, Turkey, September 2012 (abstract accepted).
- 2012 \* Wolf, E.B. and Battenfield, B.P. Aggregating Data Quality Metrics for Item Level Metadata. *Proceedings, Auto-Carto 12*, Columbus, Ohio (September) (abstract accepted)
- 2012 \* Stauffer, A.J., Battenfield, B.P., and Stanislawski, L.V. Effects of Generalization on DEM Resolution. *Proceedings, Auto-Carto 12*, Columbus, Ohio (September) (abstract accepted)
- 2012 Stanislawski, L.V., Raposo, P., Howard, M. and Battenfield, B.P. Automated Metric Assessment of Line Simplification in Humid Landscapes. *Proceedings, Auto-Carto 12*, Columbus, Ohio (September) (abstract accepted)
- 2012 Brewer, C.A., Stanislawski, L.V., Battenfield, B.P., Raposo, P., Sparks, K. and Howard, M. Multi-Scale Design for *The National Map* of the United States: Roads, Populated Places, Boundaries and Landcover. *Proceedings, Auto-Carto 12*, Columbus, Ohio (September) (abstract accepted)
- 2012 \* Anderson\_Tarver, C. Gleason, M., Battenfield, B.P., and Stanislawski, L.V. Automated Centerline Delineation to Enrich the National Hydrography Dataset. *Proceedings GIScience 2012* Columbus, Ohio (September) (in press).
- 2011 Battenfield, B.P., Stanislawski, L.V. and Brewer, C.A. A Comparison of Star and Ladder Strategies for Intermediate Scale Processing of USGS National Hydrography Dataset. *Proceedings, 14th Workshop of the International Cartographic Association Commission on Generalisation and Multiple Representation*, Paris France, July 2011.
- 2011 Stanislawski, L.V. and Battenfield, B.P. A Raster Alternative for Partitioning Line Densities to Support Automated Cartographic Generalization. *Proceedings, 25<sup>th</sup> International Cartographic Congress*, Paris France, July 20
- 2011 Stanislawski, L.V., and Savino, S. Pruning of Hydrographic Networks: A Comparison of Two Approaches. *Proceedings, 14th ICA/ISPRS Workshop on Generalisation and Multiple Representation*, Paris France, July.

2011 \* Anderson-Tarver, C. and Buttenfield, B.P. Stanislawski, L.V. and Koontz, J. Automated Delineation of Stream Centerlines for the USGS National Hydrography Dataset. *Proceedings 25<sup>th</sup> International Cartographic Congress: Advances in Cartography and GIScience* Paris France, Vol 1, Lecture Notes in Geoinformation and Cartography: 409-423.

2011 \* Wendel, J. and Buttenfield, B.P. Flexible Characterization of Cartographic Generalization Resources for an Online Self-Organizing Catalog. *Proceedings 25<sup>th</sup> International Cartographic Congress*, Paris France, 3-8 July 2011.

2011 Brewer, C.A., Buttenfield, B.P., and Stanislawski, L.V. Choosing Between Geometry Change and Display Change for Multiscale Mapping: The Role of Elimination in Design. *Proceedings, 14th Workshop of the International Cartographic Association Commission on Generalisation and Multiple Representation*, Paris France, July 2011.

2010 Stanislawski, L.V. and Buttenfield, B.P. Hydrographic Feature Generalization in Dry Mountainous Terrain. *Proceedings, AutoCarto 2010*, Orlando FL, November.

2010 Stanislawski, L.V., Finn, M.P. and Buttenfield, B.P. (submitted 2010). Integrating Hydrographic Generalization over Multiple Physiographic Regimes. Chapter for *Generalization and Data Integration* book compiled for *CEGIS International Symposium on Generalization and Data Integration*, Boulder Colorado, June (book chapter submitted November 2010).

2010 \* Anderson-Tarver, C., Leyk, S. and Buttenfield, B.P. Identifying Vector Feature Textures Using Fuzzy Sets. *Proceedings, AutoCarto 2010*, Orlando FL, November.

2010 Brewer, C.A., Hanchett, C.L., Buttenfield, B.P. and Usery, E.L. Performance of Map Symbol and Label Design with Format and Display Resolution Options Through Scale for The National Map. *Proceedings, AutoCarto 2010*, Orlando FL, November.

2010 Buttenfield, B.P., Stanislawski, L.V. and Brewer, C.A. Multiscale Representations of Water: Tailoring Generalization Sequences to Specific Physiographic Regimes. *GIScience 2010 Short Paper Proceedings*, Zurich, Switzerland, September.  
[http://www.colorado.edu/geography/babs/webpage/publications/GIScience2010\\_Buttenfield\\_etal.pdf](http://www.colorado.edu/geography/babs/webpage/publications/GIScience2010_Buttenfield_etal.pdf)

2010 \* Wendel, J. and Buttenfield, B. P. Formalizing Guidelines for Building Self-Organizing Maps. *GIScience 2010 Short Paper Proceedings*, Zurich, Switzerland, September.  
[http://www.colorado.edu/geography/babs/webpage/publications/GIScience2010\\_Wendel\\_Buttenfield.pdf](http://www.colorado.edu/geography/babs/webpage/publications/GIScience2010_Wendel_Buttenfield.pdf)

2010 Stanislawski, L. V., Buttenfield, B.P. and Samaranyake, V.A. Automated Metric Assessment of Hydrographic Feature Generalization Through Bootstrapping. *Proceedings, 13th International Cartographic Association Symposium on Multiple Representations and Map Generalization*, Zurich Switzerland, September.  
[http://ica.ign.fr/2010\\_Zurich/genemr2010\\_submission\\_11.pdf](http://ica.ign.fr/2010_Zurich/genemr2010_submission_11.pdf)

2009 Brewer, C.A., Bittenfield, B.P., and Usery, E.L. Evaluating Generalizations of Hydrography in Differing Terrains for *The National Map* of the United States. *Proceedings, International Cartographic Conference*, Santiago, Chile, November.  
[http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_etal\\_ICC2009\\_paper\\_Nov2009.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_etal_ICC2009_paper_Nov2009.pdf)

2009 Stanislawski, L.V. Bittenfield, B.P. Finn, M.P. and Roth, K. Stratified Database Pruning to Support Local Density Variations in Automated Generalization of the United States National Hydrography Dataset. *Proceedings, International Cartographic Association Conference*, Santiago, Chile, November. [http://carto-research.er.usgs.gov/generalization/pdf/StatifiedPruning StanislawskiBittenfieldFinnRoth\\_ICC2009.pdf](http://carto-research.er.usgs.gov/generalization/pdf/StatifiedPruning_StanislawskiBittenfieldFinnRoth_ICC2009.pdf)

2008 \* Wolf, E. B. and Bittenfield, B. P. Dimensional Collapse and Airports in Multi-Scale Mapping. *Proceedings, AUTO-CARTO 2008*, Shephardstown, West Virginia, September.  
[http://www.cartogis.org/docs/proceedings/2008/wolf\\_bittenfield.pdf](http://www.cartogis.org/docs/proceedings/2008/wolf_bittenfield.pdf)

2008 \* Wendel, J. Bittenfield, B.P., Viger, R., and Smith, J. Characterizing Hydrology Commands: Spatialization with SOM Mapping. *Proceedings, GIScience 2008*, Park City Utah, September.

2008 Stanislawski, L.V. Development of a Knowledge-based Network Pruning Strategy for Automated Generalisation of the United States National Hydrography Dataset. *11<sup>th</sup> ICA Workshop on Generalisation and Multiple Representation*. Montpellier France, June.

### **Invited Keynotes, Lectures, and Colloquia**

2011 Bittenfield, B.P. Multiple Representations of Geospatial Data: A Cartographic Search for the Holy Grail? *The National Map Users Conference*, Denver Colorado, May.

2010 Bittenfield, B.P. Mapping Water with the Best Intentions. Department of Geography, Penn State University  
<http://e-education.mediasite.com/mediasite/Viewer/?peid=7fe32293be1a445f98418f9b274a1fb4>

2010 Bittenfield, B. P. Generalization and Data Integration. University of Zurich, Switzerland  
[http://ica.ign.fr/2010\\_Zurich/slides/2010-ICAWSGene-Invited-Bittenfield.pdf](http://ica.ign.fr/2010_Zurich/slides/2010-ICAWSGene-Invited-Bittenfield.pdf)

### **Conference Presentations Not Published in Proceedings or Journal Articles**

2012 \* Bittenfield, B.P. Gleason, M. and Tarver, C. Automatic Delineation of Centerlines and Stream Braids for Cartographic Generalization. North American Cartographic Information Society Annual Meeting (NACIS 32), Portland Oregon (October, 2012).

- 2012 \* Wendel, J., Buttenfield, B.P., and Stanislawski, L.V. Comparison of Unsupervised learning Algorithms for Physiographic Classification of U.S. Landscape Types. *Annual Meetings of the Association of American Geographers*, New York City, February.
- 2012 Stanislawski, L.V. Overview of CEGIS NHD and Transportation Generalization Tools for Grid-Computing Application. *CEGIS Visit to National Center for Supercomputing Applications at UIUC*. Champaign-Urbana Illinois, February.
- 2011 \* Gleason, M.J., Pitlick, J. and Buttenfield, B.P. Filtering Raw Terrestrial Laser Scanning Data for More Efficient and Accurate Use in Geomorphologic Modeling. *American Geophysical Union Annual Meetings*, San Francisco, CA, December.
- 2011 Stanislawski, L.V., Finelli, E., Doumbouya, A., and Buttenfield, B.P. Metric Assessment of NHD Cartographic Generalization Supporting 1:24,000 USGS Digital Topographic Maps for New Jersey. *USGS GIS Workshop*. Denver Colorado, May.
- 2011 Finelli, E.L., Bates, A.T., Stanislawski, L.V., and Buttenfield, B.P. National Hydrography Dataset Generalization Case Study: From Local Resolution New Jersey NHD to 1:24,000-Scale. *USGS GIS Workshop*. Denver Colorado, May.
- 2011 Buttenfield, B.P. Automated Methods for Simplifying Surface Water Features: Flowlines, Waterbodies and Centerlines. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)
- 2011 Stanislawski, L.V. Estimating 1:24,000-scale Drainage Density for the Coterminous United States using Elevation-Derived Streams. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)
- 2011 Stanislawski, L.V. Partitioning Line Densities to Support Automated Cartographic Generalization. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)
- 2011 Stanislawski, L.V. Overview of Procedures to Prune High-Resolution NHD. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)
- 2011 Stanislawski, L.V. Overview of CEGIS Generalization Research on Best Practices Transportation Data. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)
- 2011 Stanislawski, L.V. Landscape Classification to Support Automated Generalization. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)

2011 Stanislawski, L.V. Catchment and Upstream Drainage Area Processing for Enriching the NHD for Generalization. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)

2011 Howard, M., and Stanislawski, L.V. Average Segment Length within Landscape Classes of NHD Subbasins. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)

2011 Stanislawski, L.V. Review of Coefficient of Line Correspondence and Coefficient of Area Correspondence for Hydrography Validation. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)

2011 Finelli, E. National Map – US Topo Requirements: Generalized Local Resolution NHD to 1:24,000. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)

2011 \* Bittenfield, B.P. and Gleason, M. Automatic Identification of Islands in the National Hydrography Dataset. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)

2011 Bittenfield, B.P. and Stanislawski, L.V. Generalization for the National Map. *USGS-CEGIS “All-Hands” Annual Research Meeting*, Rolla Missouri, June.

2010 Brewer, C.A., Bittenfield, B.P. and E.L. Usery. Designing USGS Topographic Mapping for Multiscale Online Use. *ESRI User Conference*, San Diego CA, July. Also presented *International Cartographic Symposium on Cartography for Australasia and Oceania (GeoCart 2010)*, Auckland, New Zealand, September.  
[http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_ESRI-UC\\_Multiscale-Topo\\_July2010.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_ESRI-UC_Multiscale-Topo_July2010.pdf)

2010 Bittenfield, B.P., Stanislawski, L.V., and Brewer, C.A. Generalization to Support the National Map. *USGS-CEGIS “All-Hands” Annual Research Meeting*, Denver CO, June.

2010 Brewer, C.A., B.P. Bittenfield, and L. Stanislawski, Progress on Electronic Topo Map Design Decisions. *USGS-CEGIS “All-Hands” Annual Research Meeting*, Denver CO, June.  
[http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_Talk1\\_Overview-Topo\\_CEGIS-AllHands\\_June2010.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_Talk1_Overview-Topo_CEGIS-AllHands_June2010.pdf)

2010 Brewer, C.A., C.L. Hanchett, B.P. Bittenfield, and L. Stanislawski. Evaluation of Map Symbols by Screen Resolution and File Format Through Scale. *USGS-CEGIS “All-Hands” Annual Research Meeting*, Denver CO, June.  
[http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_Talk2\\_Eval-Multiscale-Topo\\_CEGIS-AllHands\\_June2010.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_Talk2_Eval-Multiscale-Topo_CEGIS-AllHands_June2010.pdf)

2010 \* Wendel, J. and Bittenfield, B. P. Guidelines for Self-Organizing Maps. *Annual Meetings Association of American Geographers*, Washington D.C., April.

- 2010 \* Anderson-Tarver, C. and Buttenfield, B.P. Generalizing a Swamp-Marsh Database Using Texture. *Annual Meetings Association of American Geographers*, Washington D.C., April.
- 2010 Stanislawski, L.V. Cluster Processing for Enriching the National Hydrography Dataset for Automated Generalization. *UIUC, Cyberinfrastructure and Geospatial Information Laboratory Visit to USGS*, Rolla Missouri, March.
- 2009 Buttenfield, B.P., Brewer, C.A., and Usery, E.L. Place Still Matters: Generalizing the National Hydrography Dataset by Local Terrain and Climate. *North American Cartographic Information Society (NACIS 29)*, Sacramento, California, October.
- 2009 Brewer, C.A., Buttenfield, B.P. and Usery, E.L. Designing The National Map Produced by USGS for Multi-Scale Online Use. *North American Cartographic Information Society (NACIS 29)*, Sacramento, California, October.  
[http://www.personal.psu.edu/cab38/ScaleMaster/Brewer-et-al\\_NACIS\\_2009.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer-et-al_NACIS_2009.pdf)
- 2009 Buttenfield, B.P. Stanislawski, L.V. and Brewer, C.A. NHD Generalization and Multiscale Topographic Map Design. *USGS Center for Excellence "All-Hands" Annual Research Meeting*, Rolla Missouri, August.
- 2009 Stanislawski, L.V. 2009. An Automated Approach to Compare Generalized Hydrographic Network Features to a Benchmark Dataset. *Dagstuhl Seminar on Generalization of Spatial Information*. Schloss-Dagstuhl Germany, April.  
<http://www.dagstuhl.de/Materials/index.en.phtml?09161>
- 2009 \* Wendel, J, Buttenfield, B.P. Anderson-Tarver, C. and Brewer, C.A. Cartographic Generalization by Physiographic Region. *Annual Meetings Association of American Geographers*, Las Vegas, Nevada, April.
- 2008 Buttenfield, B.P. Hydrographic Generalization: Problems to Solve for *The National Map*. *USGS Center for Excellence "All-Hands" Annual Research Meeting*, Rolla Missouri.
- 2008 Stanislawski, L.V. Generalization of Primary Data Themes for *The National Map*. *USGS CEGIS "All-Hands" Annual Research Meeting*, Rolla Missouri.
- 2008 \* Viger, R., Buttenfield, B. P. Semantics for Integrating Hydrologic Models. *USGS Symposium on GIS Research*, USGS Headquarters, Reston Virginia, September.
- 2008 \* Wendel, J., Buttenfield, B.P., Viger, R. and Smith, J. Spatializing GIS Commands with Self-Organizing Maps. *Annual Meetings Association of American Geographers*, Boston, Massachusetts, April.
- 2008 Stanislawski, L.V., and Schnarr III, O.C. Implementation of an Automated Network Pruning Strategy for Generalization of the National Hydrography Dataset. *Annual Meetings Association of American Geographers*, Boston Massachusetts. April.

2007 Stanislawski, L.V., Finn, M., Barnes, M., and Usery, E.L. Assessment of a Rapid Approach for Estimating Catchment Areas for Surface Drainage Lines. *ACSM-IPLSA-MSPS 2007*, St. Louis Missouri, March.

Chair of the following Ph.D. Committees with Research Directly Related to CEGIS Research

Wendel, Jochen U. Colorado - Boulder (entered the program Fall 2007)  
Explicit and Implicit Indexing Schemas for Multiple Data Types of Online Generalization Resources; Dissertation defense planned January 2013

Supervised Master's degrees (University of Colorado)

Stauffer, Andrew (ongoing) Impacts of Iterative Filtering on Terrain Resolution;  
Entered the program August 2011

Gleason, Michael (ongoing) Filtering TLIDAR Point Clouds for DEM Interpolation;  
Thesis defense November 28, 2012

Anderson-Tarver, Chris (Feb 2010) Generalizing a Swamp-Marsh Database Using Texture



## Generalization

Larry Stanislawski

### Journal Articles

2012 Brewer, C.A., Stanislawski, L.V., Buttenfield, B.P., Raposo, P., Sparks, K. and Howard, M.A. Multiscale Design of Thinned Road Networks for *The National Map* of the United States. *Cartography and Geographic Information Science* (submitted; under review).

2011 Buttenfield, B.P., Stanislawski, L.V., and Brewer, C.A. Adapting generalization tools to physiographic diversity for the United States National Hydrography Dataset. *Cartography and Geographic Information Science*. 38(3):289-301.

2011 Stanislawski, L.V., and Buttenfield, B.P. Hydrographic generalization tailored to dry mountainous regions. *Cartography and Geographic Information Science*. 38(2):117-125.

2009 Stanislawski, L.V. Feature pruning by upstream drainage area to support automated generalization of the United States National Hydrography Dataset. *Computers, Environment, and Urban Systems*. 33(5):325-333.

### Proceedings and Workshop Papers (peer-reviewed)

2012 Buttenfield, B.P., Stanislawski, L.V., Anderson-Tarver, C. and Gleason, M.J. Automatic Enrichment of Stream Networks with Primary paths for Use in the United States National Atlas. *Proceedings, 26<sup>th</sup> International Cartographic Congress*, Dresden, Germany, August 2013 (submitted 14 November 2012; under review).

2012 Stanislawski, L.V., Buttenfield, B.P., and Brewer, C.A. Integration Metrics for Cartographic Generalization: Assessment of 1:1000,000 Scale Hydrography and Terrain. *Proceedings, 26<sup>th</sup> International Cartographic Congress*, Dresden, Germany, August 2013 (submitted 14 November 2012; under review).

2012 Brewer, C.A., Stanislawski, L.V., and Buttenfield, B.P. Labeling Through Scale Using Hierarchies of Thinned Road Networks for Design of *The National Map* of the United States. *Proceedings, 26<sup>th</sup> International Cartographic Congress*, Dresden, Germany, August 2013 (submitted 14 November 2012; under review).

2012 Anderson-Tarver, C., Gleason, M., Buttenfield, B.P., and Stanislawski, L. Automated centerline delineation to enrich the National Hydrography Dataset. *Seventh International Conference on Geographic Information Science*. September 18-21, 2012. Columbus, Ohio, LNCS 748: 15-28. DOI: 10.1007/978-3-642-33024-7..

2012 Stanislawski, L.V., Briat, M., Punt, E., Howard, M., Brewer, C.A., and Buttenfield, B.P. Density stratified thinning of road networks to support automated generalization of The National Map. *15<sup>th</sup> ICA Workshop on Generalization*. September 13-14, 2012. Istanbul, Turkey.

2012 Stanislawski, L.V., Doumbouya, A.T., Miller-Corbett, C.D., Buttenfield, B.P. and Arundel-Murin, S.T. Scaling stream densities for hydrologic generalizations. *Seventh International Conference on Geographic Information Science*. September 18-21, 2012. Columbus, Ohio.

2011 Anderson-Tarver, C., Buttenfield, B.P., Stanislawski, L.V., and Koontz, J. Automated delineation of stream centerlines for the USGS National Hydrography Dataset. *Proceedings 25<sup>th</sup> International Cartographic Conference*, July 3-8, 2011. Paris, France. Vol. 1, Lecture Notes in Geoinformation and Cartography: 409-423.

2011 Brewer, C.A. Buttenfield, B.P., and Stanislawski, L.V. Choosing between geometry change and display change for multiscale mapping: The role of elimination in design. *14th ICA/ISPRS Workshop on Generalization and Multiple Representations*. June 30-July 1, 2011. Paris, France.

2011 Buttenfield, B.P., Stanislawski, L.V., and Brewer, C.A. A comparison of star and ladder strategies for intermediate scale processing of USGS National Hydrography Dataset. *14th ICA/ISPRS Workshop on Generalization and Multiple Representations*. June 30-July 1, 2011. Paris, France.

2011 Stanislawski, L.V., and Savino, S. Pruning of hydrographic networks: a comparison of two approaches. *14th ICA/ISPRS Workshop on Generalization and Multiple Representations*. June 30-July 1, 2011. Paris, France.

2011 Stanislawski, L.V., and Buttenfield, B.P. A raster alternative for partitioning line densities to support automated cartographic generalization. *25<sup>th</sup> International Cartographic Conference*: July 3-8, 2011. Paris, France.

2010 Buttenfield, B.P., and Stanislawski, L.V. Multiscale representations of water: Tailoring generalization sequences to specific physiographic regimes. *Sixth International Conference on Geographic Information Science*. Sept. 14-17, 2010. Zurich, Switzerland.

2010 Stanislawski, L.V., Buttenfield, B.P., and Samaranayake, V.A. Automated Metric Assessment of Hydrographic Feature Generalization Through Bootstrapping. *12th ICA Workshop on Generalization and Multiple Representations*. September, 2010. Zurich, Switzerland.

2009 Stanislawski, L.V., Buttenfield, B.P., Finn, M.P., and Roth, K. Stratified database pruning to support local density variations in automated generalization of the United States National Hydrography Dataset. *24th International Cartographic Conference*: November 15-21. Santiago, Chile.

2008 Stanislawski, L.V. Development of a knowledge-based network pruning strategy for automated generalisation of the United States National Hydrography Dataset. *11th ICA Workshop on Generalisation and Multiple Representation*: June 20-21. Montpellier, France.

### **Proceedings and Workshop Papers (not peer-reviewed)**

2012 Brewer, C.A., Stanislawski, L.V., Battenfield, B.P., Raposo, P., Sparks, K.A., and Howard, M. Multiscale design for *The National Map* of the United States: Road Thinning for Topographic Mapping. *AutoCarto 2012*. September 16-18, 2012. Columbus, Ohio.

2012 Stanislawski, L.V., Raposo, P., Howard, M., and Battenfield, B. P. Automated metric assessment of line simplification in humid landscapes. *AutoCarto 2012*. September 16-18, 2012. Columbus, Ohio.

2012 Stauffer, A., Battenfield, B. P., and Stanislawski, L.V. Effects of generalization on DEM resolution. *AutoCarto 2012*. September 16-18, 2012. Columbus, Ohio.

2010 Stanislawski, L.V., Finn, M.P., and Battenfield, B.P. (submitted Nov. 2010). Integrating hydrographic generalization over multiple physiographic regimes. Chapter for *Generalization and Data Integration* book compiled for CEGIS International Symposium on Generalization and Data Integration, June 20-22, Boulder, Colorado.

2010 Stanislawski, L.V., Battenfield, B.P. Hydrographic feature generalization in dry mountainous terrain, *AutoCarto 2010*. November 15-19, 2010. Orlando, Florida.

2007 Stanislawski, L.V., M. Finn, M. Barnes, and E.L. Usery. Assessment of a rapid approach for estimating catchment areas for surface drainage lines. *ACSM-IPLSA-MSPS 2007*: March 9-12, 2007. St. Louis, MO.

2007 Stanislawski, L.V., M. Finn, E.L. Usery, and P. M. Robinette. Development of a blunder detection approach for automated point matching during vector to image data integration. *ASPRS 2007 Annual Conference*: May 7-11, 2007. Tampa, FL.

2006 Stanislawski, L.V., M. Finn, M. Starbuck, E.L. Usery, and P. Turley. Estimation of accumulated upstream drainage values in braided streams using augmented directed graphs. *AutoCarto 2006*: June 26-28, 2006. Vancouver, WA.

2005 Stanislawski, L.V., M. Starbuck, M. Finn, and E.L. Usery. Generalization for *The National Map* with emphasis on the National Hydrography Dataset. *ESRI International User Conference 2005*: July 24-29, 2005. San Diego, CA. URL: <http://gis.esri.com/library/userconf/proc05/abstracts/a1893.html> (presentation and abstract).

### **Presentations**

- 2012 Bittenfield, B.P., \*Gleason, M.J. and \*Anderson-Tarver, C. Automatic Delineation of Primary Channels Through Braided Stream Networks for Cartographic Generalization. *North American Cartographic Information Society (NACIS 2012)*, Portland, Oregon, October.
- 2012 Anderson-Tarver, C., Gleason, M., Bittenfield, B.P., and Stanislawski, L. Automated centerline delineation to enrich the National Hydrography Dataset. *Seventh International Conference on Geographic Information Science*. September 18-21, 2012. Columbus, Ohio.
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- 2012 Stanislawski, L.V. Overview of CEGIS NHD and Transportation Generalization Tools for Grid-Computing Application. *CEGIS Visit to National Center for Supercomputing Applications at UIUC*. Champaign-Urbana Illinois, February.
- 2012 Stanislawski, L.V., Briat, M., Punt, E., Howard, M., Brewer, C.A., and Bittenfield, B.P. Density stratified thinning of road networks to support automated generalization of The National Map. *15<sup>th</sup> ICA Workshop on Generalization*. September 13-14, 2012. Istanbul, Turkey.
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- 2012 Stanislawski, L.V., Doumbouya, A.T., and Miller-Corbett, C.D. Mapping natural variability in drainage density for the coterminous United States to support hydrologic generalization. *GIS in the Rockies 2012*. September 20-21, 2012. Denver, Colorado.
- 2012 Stanislawski, L.V., Raposo, P., Howard, M., and Bittenfield, B. P. Automated metric assessment of line simplification in humid landscapes. *AutoCarto 2012*. September 16-18, 2012. Columbus, Ohio.
- 2012 Stauffer, A., Bittenfield, B. P., and Stanislawski, L.V. Effects of generalization on DEM resolution. *AutoCarto 2012*. September 16-18, 2012. Columbus, Ohio.
- 2012 Wendel, J., Bittenfield, B.P., and Stanislawski, L. Comparison of unsupervised learning algorithms for physiographic classification of the United States landscape types. *Annual Meetings of the Association of American Geographers*. February 24-28, 2012. New York City, New York.
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- 2011 Bittenfield, B.P., Stanislawski, L.V., and Brewer, C.A. A comparison of star and ladder strategies for intermediate scale processing of USGS National Hydrography Dataset. *14th ICA/ISPRS Workshop on Generalization and Multiple Representations*. June 30-July 1, 2011. Paris, France.
- 2011 Bittenfield, B.P. and Stanislawski, L.V. Generalization for the National Map. *USGS-CEGIS "All-Hands" Annual Research Meeting*, Rolla Missouri, June.
- 2011 Finelli, E.L., Bates, A.T., Stanislawski, L.V., and Bittenfield, B.P. National Hydrography Dataset Generalization Case Study: From Local Resolution New Jersey NHD to 1:24,000-Scale. *USGS GIS Workshop*. Denver Colorado, May.
- 2011 Howard, M., and Stanislawski, L.V. Average Segment Length within Landscape Classes of NHD Subbasins. *USGS Workshop on Cartographic Generalization and Concurrent Processing*, Rolla Missouri, October 17. (web presentation)
- 2011 Stanislawski, L.V., Finelli, E., Doumbouya, A., and Bittenfield, B.P. Metric Assessment of NHD Cartographic Generalization Supporting 1:24,000 USGS Digital Topographic Maps for New Jersey. *USGS GIS Workshop*. Denver Colorado, May.
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2010 Brewer, C.A., B.P. Battenfield, and L. Stanislawski, Progress on Electronic Topo Map Design Decisions. *USGS-CEGIS "All-Hands" Annual Research Meeting*, Denver CO, June. [http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_Talk1\\_Overview-Topo\\_CEGIS-AllHands\\_June2010.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_Talk1_Overview-Topo_CEGIS-AllHands_June2010.pdf)

2010 Brewer, C.A., C.L. Hanchett, B.P. Battenfield, and L. Stanislawski. Evaluation of Map Symbols by Screen Resolution and File Format Through Scale. *USGS-CEGIS "All-Hands" Annual Research Meeting*, Denver CO, June. [http://www.personal.psu.edu/cab38/ScaleMaster/Brewer\\_Talk2\\_Eval-Multiscale-Topo\\_CEGIS-AllHands\\_June2010.pdf](http://www.personal.psu.edu/cab38/ScaleMaster/Brewer_Talk2_Eval-Multiscale-Topo_CEGIS-AllHands_June2010.pdf)

2010 Stanislawski, L.V., Battenfield, B.P. Hydrographic feature generalization in dry mountainous terrain, *AutoCarto 2010*. November 15-19, 2010. Orlando, Florida.

2010 Stanislawski, L.V., Battenfield, B.P., and Samaranayake, V.A. Automated Metric Assessment of Hydrographic Feature Generalization Through Bootstrapping. *12th ICA Workshop on Generalization and Multiple Representations*. September, 2010. Zurich, Switzerland.

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2009 Stanislawski, L.V., Battenfield, B.P., Finn, M.P., and Roth, K. Stratified database pruning to support local density variations in automated generalization of the United States National Hydrography Dataset. *24th International Cartographic Conference*: November 15-21. Santiago, Chile.

2009 Stanislawski, L.V. An automated approach to compare generalized hydrographic network features to a benchmark dataset. *Dagstuhl Seminar on generalization of spatial information*. April 13-17, 2009. Schloss-Dagstuhl, Germany. URL: <http://www.dagstuhl.de/Materials/index.en.phtml?09161>

2008 Stanislawski, L.V., and O.C. Schnarr III. Implementation of an automated network pruning strategy for generalization of the National Hydrography Dataset. *AAG 2008 Annual Meeting*: April 15-19, 2008. Boston, MA.

2008 Stanislawski, L.V. Development of a knowledge-based network pruning strategy for automated generalisation of the United States National Hydrography Dataset. *11th ICA Workshop on Generalisation and Multiple Representation*: June 20-21. Montpellier, France.

2007 Stanislawski, L.V., M. Finn, M. Barnes, and E.L. Usery. Assessment of a rapid approach for estimating catchment areas for surface drainage lines. *ACSM-IPLSA-MSPS 2007*: March 9-12, 2007. St. Louis, MO.

2007 Stanislawski, L.V., M. Finn, E.L. Usery, and P. M. Robinette. Development of a blunder detection approach for automated point matching during vector to image data integration. *ASPRS 2007 Annual Conference*: May 7-11, 2007. Tampa, FL.

2006 Stanislawski, L.V., M. Finn, M. Starbuck, E.L. Usery, and P. Turley. Estimation of accumulated upstream drainage values in braided streams using augmented directed graphs. *AutoCarto 2006*: June 26-28, 2006. Vancouver, WA.

2005 Stanislawski, L.V., M. Starbuck, M. Finn, and E.L. Usery. Generalization for *The National Map* with emphasis on the National Hydrography Dataset. *ESRI International User Conference 2005*: July 24-29, 2005. San Diego, CA. URL: <http://gis.esri.com/library/userconf/proc05/abstracts/a1893.html> (presentation and abstract).

## Publications and Presentation 2007-2012

### Data Integration

*Integration of Roads and Images* (includes some items that pre-date CEGIS and 2007, but were part of the Data Integration project)

*E.Lynn Usery, Michael Finn and others*

#### *Presentations*

Usery, E. L., 2009. Geospatial Data Integration: A Review and a USGS Approach, China-US Roundtable on Scientific Data Cooperation, Qingdao, China.

Usery, E. L., 2009. Geospatial Data Integration: A Review and a USGS Approach, University of Missouri-Kansas City.

Usery, E. L., 2007. Data Integration for *The National Map*, University of Missouri-Rolla.

Stanislowski, L., M.P. Finn, E.L. Usery, P.L. Robinette, 2007. Development of a Blunder Detection Approach for Automated Point Matching During Vector to Image Data Integration, *Proceedings, American Society for Photogrammetry and Remote Sensing Annual Conference*, Tampa, FL.

Usery, E. L., 2003. Data Integration of Layers and Features for *The National Map*, American Congress on Surveying and Mapping, Phoenix, AZ.

#### *Publications*

Weaver, Bryan, 2004. *Data and Institutional Integration across Spatial Scales for The National Map*, Unpublished master's Thesis, University of Georgia.

Usery, E.L., M.P.Finn ,B. Weaver, M. Starbuck, and G.M. Jaromack, 2004. Integration of *The National Map*, International Society for Photogrammetry and Remote Sensing, Istanbul, Turkey, Presented by M.P. Finn, August, 2004.

Usery, E.L., M.P. Finn, and M. Starbuck, 2009. Data Layer Integration for *The National Map* of The United States, *Cartographic Perspectives*, v. 62, p. 28-41.

Usery, E.L., 2012. Generalization and Data Integration (GDI): A USGS CEGIS Perspective, *Generalization and Data Integration*, Springer, in press.



## ***The National Map and Other USGS Data***

**Thomas Shoberg**

### *Publications*

Varanka, D., J. Carter, E. L. Usery, and T. Shoberg. Topographic Mapping Data Semantics Through Data Conversion and Enhancement, in Ashish, N. and A.P. Sheth, eds., *Geospatial Semantics and the Semantic Web: Foundations, Algorithms and Applications*, Series, Semantic Web and Beyond, V. 12, DOI 10.1007/978-1-4119-9446-2\_7. Springer Science and Business Media, LLC, 2011.

Shoberg, T, Stoddard, P.R. and Finn, M.P., 2012. Rejuvenating Pre-GPS Era Geophysical Surveys Using *The National Map*, *Journal of Surveying Engineering*, Vol. 138, No. 2, 57-65.

Shoberg, T., and Stoddard, P.R., 2012. Integrating stations from the North America Gravity Database into a local GPS-based land gravity survey, in review with *Journal of Applied Geophysics*.

Shoberg, T., 2012. Using GIS Data Interpolation as an Aid in the Design of Low Station Density Geophysical Surveys, Submitted to GDI2010 conference proceedings, Barbara Buttenfield, editor.

### *Presentations*

Shoberg, T., Long, S., Corns, S., and Carlo, H., 2012 Integrating *The National Map* geospatial data into Extreme Events Supply Chain Networks to Improve Resiliency Following Large-Scale Urban Disasters, Presented at the American Association of Geographers national conference, February 2012, New York, NY

Shoberg, T., 2012. Data Integration at CEGIS, Presented at the CEGIS Yearly planning meeting, June 2012, Rolla, MO.

Shoberg, T. and Stoddard, P.R., 2012. Finding Nothing: Algorithms to search for circular features across geospatially integrated datasets. Accepted by the American Geophysical Union for presentation in their Fall 2012 conference in San Francisco, CA

Data Management Sub-Group. Proposal Round-Robin Panel. Community for Data Integration Annual Conference, Denver, CO – 2011.

Shoberg, T., 2011. Data Integration at CEGIS, Presented at the CEGIS Yearly planning meeting, June 2011, Rolla, MO.

Shoberg, T. and P.R. Stoddard. Integrating National Database Stations into GPS-based Land Surveys, American Geophysical Union, National Conference – San Francisco, CA – 2010.

Shoberg, T., P.R. Stoddard, and M.P. Finn. Rejuvenating pre-GPS Era Geophysical Surveys with *The National Map*, Geological Society of America, National Conference – Denver, CO – 2010.

Shoberg, T., 2010. Data Integration at CEGIS, Presented at the CEGIS Yearly planning meeting, June 2010, Denver, MO.

Shoberg, T., Integrating Geophysical, Geological and Geospatial Data – INVITED – GDI 2010: Generalization and Data Integration Conference – Boulder, CO – 2010.

## *Lidar Extraction and Conflation*

**Keith Clarke**

Clarke, Keith & Archer, Reginald; 2009. Terrain Feature Extraction from Variable Resolution Digital Elevation Models. *24th International Cartographic Conference*. November 2009.  
<http://www.icc2009.cl>

Archer, R. & Clarke, K. "Comparison of Open Source Terrain Feature Extraction Algorithms for Variable Resolution Digital Elevation Models" Presented at Special Joint Symposium of ISPRS Technical Commission IV and AutoCarto 2010 and ASPRS/CaGIS Fall Specialty Conference, Orlando, FL. November 2010

DRAFT

**Publications and Presentation 2007-2012**  
**Ontology and Geospatial Semantics**

**Dalia Varanka**

**Presentations**

2007

Varanka, D., Kriging and Spatial Interaction: a Combined Approach for Scaling and Generalizing Urbanization Pressure on the Environment [abs.]: The Second International Cartographic Association Workshop on Geospatial Analysis and Modeling, Spatial Structure and Dynamics of Urban Environments, July 12-13, 2007, Athens, Georgia. (INVITED, PRESENTED)

Varanka, D., The Rise of Scientific Plain Style Cartography in English World Atlases [abs.]: North American Cartographic Information Society (NACIS) 2007, October 11, 2006, St. Louis, Missouri, pp. 12-13. (PRESENTED)

Varanka, D., Effects of Raster Resolution Changes on Agricultural Non-point Source Pollution Modeling Output [abs.]: Association of American Geographers Annual Meeting, April 19, 2007, at URL <http://internal.usgs.gov/conferences/aag/2007/> (PRESENTED)

Varanka, D., Ontological Foundations of Transportation Data for the National Map (USA) [abs.]: XXIII International Cartographic Conference abstracts with programs, August 4-10, 2007, Moscow, Russia, p. 161.

2008

Varanka, D., Topographic Feature Inventories for National Mapping Ontology [abs.]: Annual Meeting of the Association of American Geographers, Boston, Massachusetts, April, 2008. (PRESENTED)

Varanka, D., Interpolating Missouri Population Pressure on Urbanizing Natural Areas [abs.]: Mid-America GIS Consortium (MAGIC), Kansas City, Missouri, April, 2008. (PRESENTED)

Varanka, D., Interpolating Missouri Population Pressure on Urbanizing Natural Areas: Poster presented at USGS Modeling Conference, Perdido Beach, Alabama, February 14, 2008.

Varanka, D., Krigingo metodai: populiacijos daroma spaudimo urbanizuojant gamtą matavimas ir apibendrinimas (A Kriging Approach for Scaling and Generalizing Population Pressure on Urbanizing Natural Areas) [abs.]: XIV Mokslo ir Kūrybos Simpoziumas (14-th World Lithuanian Symposium on the Arts and Sciences), Lemont, Illinois, November 28, 2008. (INVITED, PRESENTED)

Varanka, D., Ontology Research for *The National Map*: Spatial Ontology Community of Practice Workshop, MITRE, McLean, Virginia, October 17, 2008. <http://socop.org/> (INVITED, PRESENTED)

Varanka, D., National Topographic Modeling, Ontology-Driven Geographic Information in the Context of *The National Map*, First International Workshop on Information Semantics and its Implications for Geographical Analysis (ISGA '08) at GIScience 2008, the 5<sup>th</sup> International Conference on Geographic Information Science, Park City, Utah, September 23, 2008. (INVITED, PRESENTED)

2009

Varanka, D., A Topographic Feature Taxonomy For A U.S. National Topographic Mapping Ontology, International Cartography Conference, Santiago, Chile, November, 2009. (PRESENTED)

Varanka, D., Landscape Features, Technology Codes, and Semantics in U.S. National Topographic Mapping Databases, The International Conference on Advanced Geographic Information Systems & Web Services (GEOWS), Cancun, Mexico, February 1-7, 2009. (PRESENTED)

Varanka, D., Report on Building Ontology for *The National Map*: UCGIS/USGS Specialist Workshop, UCGIS Winter Assembly, Washington, D.C., February 3-4, 2009. (INVITED, PRESENTED)

Varanka, D., Building Ontology for *The National Map*. Presentation for the Joint Mid-Continent Geographic Science Center/Center for Advanced Spatial Technologies, University of Arkansas, exploratory research meeting, Rolla, MO, April 3, 2009. (PRESENTED)

2010

Varanka, D., The Diffusion of U.S. Geological Survey Digital Geospatial Data Products for Research and Public Use [abs.]: 3<sup>rd</sup> International Symposium on the History of Cartography, University of Texas at Arlington, Arlington, Texas, October 10, 2010. (INVITED, PRESENTED)

Varanka, D.E. and Caro, H.K., Spatial Relation Predicates for National Topographic Ontologies: Cognitive and linguistic aspects of geographic space in the age of ontology and cyber-infrastructure, Las Navas del Marques, Avila Province, Spain, July 5-9, 2010. (INVITED, PRESENTED)

Varanka, D. and Jerris, T., Ontology Patterns for Complex Topographic Features. AutoCarto 2010, Orlando FL. Nov, 2010. (PRESENTED)

Varanka, D., Bulen, A., and Carter, J.J., Triple Data from *The National Map*. D., 3<sup>rd</sup> Annual Spatial Ontology Community of Practice (SOCoP) Workshop, Reston, Virginia, December 3, 2010. <http://www.socop.org/> (INVITED, PRESENTED)

2011

Varanka, D., Building Ontology for *The National Map*. USGS National Geospatial Program Products and Services Leads Research Meeting. January 31, 2011. (PRESENTED)

Varanka, D.E., A Topographic Feature Vocabulary for Ontology Development. GeoVoCamp. Washington, D.C. June 3, 2011.(INVITED, PRESENTED)

Varanka, D., Semantic Web Technology for *The National Map* [abs]: *The National Map* Users Conference. Denver, Colorado, May, 2011. (PRESENTED)

Usery, E.L. and Varanka, D., Semantics for Complex Features from Images [abs]: American Society for Photogrammetry and Remote Sensing 2011 Annual Conference, May 1 – 5, Milwaukee, WI.

Varanka, D., Building Ontology for *The National Map* – So Far... Presentation for the Community for Data Integration, Semantic Web Working Group. Monthly meeting, Sept. 7, 2011.(INVITED, PRESENTED)

Usery, E.L. and Varanka, D.E., USGS Needs and Advancements in Semantics of Geospatial Data and Cyber GIS: 4<sup>th</sup> Annual Spatial Ontology Community of Practice Workshop, Reston, Virginia, December 2, 2011. (INVITED, PRESENTED)

## 2012

Usery, E.L. and Varanka, D., Geomorphic Features on the Semantic Web [abs.]: Annual Meeting of the Association of American Geographers, New York, New York, April, 2012.

Varanka, D.E., Semantic Technology Research in Support of *The National Map*. USGS Core Science Systems (CSS) Senior Staff Meeting, March, 2012. (INVITED, PRESENTED)

Varanka, D.E., Geospatial Semantics, A Basic Introduction. Introduction to Geospatial Semantics and Technology Workshop. University Consortium for Geographic Information Science (UCGIS) Symposium, May 29, 2012, Washington D.C. (INVITED, PRESENTED)

Varanka, D.E., Topographic Feature Type Vocabularies for Ontology Design Patterns. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), July 2012. (INVITED, PRESENTED)

Varanka, D.E., Rethinking the Meaning of Data for Integrated Science Problem Solving. EarthScienceOntolog, August 2012. (INVITED, PRESENTED)

Varanka, D.E., Topographic Predicate Vocabularies for Ontology Patterns. AutoCarto 2012, September, 2012.

## Publications

Varanka, D.E., 2006, National Trends Regarding Aggregate Materials for Urban Development, With a Method for the Analysis of Aggregates Distribution, *in* Rates, Trends, Causes, and Consequences of Urban Land-Use Change in the United States: USGS Professional Paper 1726, pp. 45-54.

Varanka, D.E., 2006, Interpreting Map Art with a Perspective Learned from J.M. Blaut. *Cartographic Perspectives*, n. 53, pp. 15-23.

Varanka, D.E., 2006, Centralization and Locality in the 20<sup>th</sup> Century National Topographic Mapping Program In The United States: *in* Postnikov, A., ed., Development of Ideas and Methods in Cartography: Moscow, Russian Academy of Sciences, pp. 26-41.

Varanka, D.E., 2007, Ontological Foundations of Transportation Data for the National Map (USA), *in* XXIII International Cartographic Conference Proceedings 4-10, August 2007, Moscow, Russia, 13 p. (CD)

Varanka, D.E., and Shaver, D.K., 2007, Land-Use Change Trends in the Interior River Lowlands Ecoregion: U.S. Geological Survey Scientific Investigations Report 2007-5145, p. 12, at URL <http://pubs.usgs.gov/sir/2007/5145/>. (95% of writing)

Varanka, D., 2008, Interpolating Population Pressure on Urbanizing Natural Areas, [Poster] at URL [http://mcgsc.usgs.gov/publications/IMPPUNA%20poster\\_112707.pdf](http://mcgsc.usgs.gov/publications/IMPPUNA%20poster_112707.pdf).

Varanka, D.E., 2008, National Topographic Modeling, Ontology-Driven Geographic Information in the Context of *The National Map*, First International Workshop on Information Semantics and its Implications for Geographical Analysis (ISGA '08) at GIScience 2008, the 5<sup>th</sup> International Conference on Geographic Information Science, Park City, Utah, September 23, 2008.

Usery, E.L., Varanka, D.E., and Finn, M.P., 2009, 125 Years of Topographic Mapping, Part 1, 1884 – 1980, *in* ESRI ArcNews, vol. 31, no. 3, p. 1. Available on the Web at <http://www.esri.com/news/arcnews/fall09articles/125-years.html>. (20% of writing)

Usery, E.L., Varanka, D.E., and Finn, M., 2009, USGS History, Part 2: From the Dawn of Digital to The National Map, 125 Years of Topographic Mapping, Part 2, *in* ESRI ArcNews, vol. 31, no. 4, p. 39. Available on the Web at <http://www.esri.com/news/arcnews/winter0910articles/125-years.html>. (20% of writing)

Varanka, D.E., 2009, Landscape Features, Technology Codes, and Semantics in U.S. National Topographic Mapping Databases, The International Conference on Advanced Geographic Information Systems & Web Services (GEOWS), Cancun, Mexico, February 1-7, 2009.

Usery, E.L., Varanka, D.E., and Finn, M., 2009, A 125 Year History of Topographic Mapping and GIS in the USGS, 1884-2009: International Cartography Conference, Santiago, Chile, November, 2009. (5% of writing)

Varanka, D.E., 2009, A Topographic Feature Taxonomy For A U.S. National Topographic Mapping Ontology, International Cartography Conference, Santiago, Chile, November, 2009.

Varanka, D., 2009, Interpreting Missouri Population Pressure on Urbanizing Natural Areas [Poster]: *Manual of Geographic Information Systems (GIS) Supplemental DVD*, ed., Marguerite Madden, Bethesda, Maryland, American Society for Photogrammetry and Remote Sensing (ASPRS).

Varanka, D.E. and Usery, E.L., 2010, Special Section: Ontological Issues for *The National Map: Cartographica: The International Journal for Geographic Information and Visualization*, v. 45, n. 2, p. 103-104. (95% of writing)

Varanka, D.E., 2010, Interpolating a Consumption Variable for Scaling and Generalizing Potential Population Pressure on Urbanizing Natural Areas, in Jiang, B., and Yao, X., eds., *Geospatial Analysis and Modeling of Urban Structure and Dynamics*: New York, Springer Publishing Co., p. 293-310.

Varanka, D.E., 2010, Ontology, in Warf, B., ed., *Encyclopedia of Geography*: Thousand Oaks, California, Sage Publications, Inc.

Varanka, D.E. and Jerris, T., 2010, Ontology Design Patterns for Complex Topographic Features. AutoCarto 2010, Orlando FL, November 15 – 18, 2010. (90% of writing)

Varanka, D.E., 2011, Ontology Design Patterns for Complex Topographic Feature Types: *Cartography and Geographic Information Science* v. 38, n. 2, p. 126-136.

Varanka, D.E., 2011, Advances Toward Expanding Gazetteer Semantics. International Cartography Conference, Paris, France.

Caro, H.K. and Varanka, D.E., 2011, Analysis of spatial relation predicates in U.S. Geological Survey feature definitions. U.S. Geological Survey Open-File Report 2011-1235, 37 p. <http://pubs.usgs.gov/of/2011/1235/>. (50% of analysis, 20% of writing)

Bulen, A.N., Carter, J.J., and Varanka, D.E., 2011, A program for the conversion of *The National Map* data from proprietary format to Resource Description Framework (RDF): U.S. Geological Survey Open-File Report 2011-1142, 9 p. <http://pubs.usgs.gov/of/2011/1142/>. (10% of writing)

Varanka, D., 2011, *The National Map* Geospatial Semantic Linked Data. [Poster] USGS Information Product.

Varanka, D.E., Carter, J.J., Shoberg, T., and Usery, E.L., 2011, Topographic Mapping Data Semantics Through Data Conversion and Enhancement, in Sheth, Amit and Ashish, Naveen, Eds., *Geospatial Semantics and the Semantic Web, Foundations, Algorithms, and Applications. Semantic Web and Beyond*, Vol. 12: Computing for Human Experience, Springer. P. 145–162. (80% of analysis, 95% of writing)

Varanka, D.E., Deering, C. and Caro, H., 2012, The Use of U.S. Geological Survey Digital Geospatial Data Products for Science Research. *In* Elri Liebenberg and Imre Demhardt, eds., History of Cartography. Lecture Notes in Geoinformation and Cartography, Vol. 6, Part 3, Springer, Berlin. P. 129-141. (50% of analysis, 100% of writing)

Usery, E.L. and Varanka, D.E., 2012, Design and Development of Linked Data for *The National Map*. *The Semantic Web Journal*. <http://www.semantic-web-journal.net/content/design-and-development-linked-data-national-map>. (40% of writing, 50% of the research)

Varanka, D.E., 2012, Introduction to Geospatial Semantics and Technology Workshop Handbook: U.S. Geological Survey Open-File Report 2012-1109, 107 p. (25% of writing, 100% compilation and editing)

Varanka, D.E. and Usery, E.L., 2012, Topographic Feature Type Vocabularies for Ontology Design Patterns. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), July 2012.

Varanka, D. and Caro, H., 2013, Spatial Relation Predicates for Topographic Data Triples. In Martin Raubal, Andrew Frank, and David Mark, Eds., Cognitive and Linguistic Aspects of Geographical Space. Springer. 21 p. (95% writing)



**Publications and Presentation 2007-2012**  
**User Centered Design**  
**(VGI, Crowdsourcing and Social Media)**

**Barbara Poore**

Poore, B. and Wolf E. (2012). Metadata squared: Enhancing its usability for volunteered geographic information and the GeoWeb. In *Volunteered Geographic Information, Public Participation, and Crowdsourced Production of Geographic Knowledge*. ed D. Z. Sui, S. Elwood and M. F. Goodchild. Berlin, Springer.

Liu, Sophia B., Poore, B. Earle, P. Geospatial crowdsourcing: A typology of crowdsourcing for the emergency management domain.” *Cartography and Geographic Information Science*, special issue on Mapping Cyberspace and Social Media (submitted).

### **Reports**

Poore, B.; Wolf, E.; Korris, E.; Walter, J. (2012) Matthews G. (2012). Structures data collection for *The National Map* using volunteered geographic information. USGS Open-File Report: 2012-1209

Bristol, R. Euliss, Jr. Euliss, N.; Booth, N.; Burkardt, N; Diffendorfer, J.; Gesch, D.; McCallum, B.; Miller, D.; Morman, S.; Poore, B.; Signell, R.; Viger, R. (2012) Science strategy for Core Science Systems in the U.S. Geological Survey, 2013-2023. USGS Open-File Report: 2012-1093.

### **Presentations**

Wolf, E. (2012). I fight authority, authority always wins. Annual Meeting of the Association of American Geographers, February, New York, WhereCampTB, February, Saint Petersburg, and AutoCarto 2013, September Columbus OH.

Poore, B., Wolf, E., Matthews, G. (2012). The integration of crowdsourced data into spatial data infrastructures: issues and future prospects. Presented by Poore at the Global Spatial Data Infrastructure (GSDI'13), May 2012, Quebec City, Canada

Poore, B., Wolf, E., Liu, S. (2012) Citizen science and social media for *The National Map* presented by Poore and Liu at the CEGIS annual meeting, June, Rolla MO.

Poore, B, Wolf, E. (2012) What does the USGS need to consider when designing policy for citizen science projects? Presented by Wolf at the USGS Citizen Science Workshop, September, Denver CO.

Poore, B. Wolf, Eric B., Matthews, Greg (2012) Engaging citizens to update *The National Map* at the USGS. Presented by Wolf at AutoCarto September, Columbus OH.

## VGI and Social Media for *The National Map*

### Refereed Publications

Liu, S., B. Poore, P. Earle, P. Geospatial crowdsourcing: A typology of crowdsourcing for the emergency management domain. *Cartography and Geographic Information Science*, special issue on Mapping Cyberspace and Social Media (submitted).

Poore, B. and E. Wolf . (2012). Metadata squared: Enhancing its usability for volunteered geographic information and the GeoWeb. In *Volunteered Geographic Information, Public Participation, and Crowdsourced Production of Geographic Knowledge*. ed D. Sui, S. Elwood and M. Goodchild. Berlin, Springer.

Poore, B. 2011. Users as essential contributors to spatial cyberinfrastructures  
*Proceedings of the National Academy of Sciences*, 108 (4): 5504-5509

Poore, B. 2010. [WALL-E and the “Many, Many Maps”](#): Toward user-centred ontologies for *The National Map*. *Cartographica* 45 (2) 113-20.

Wilson, M. and B. Poore 2009. Repositioning Critical GIS. *Cartographica* 44 (1) 6-7. Edited special issue.

### Reports

Poore, B., E. Wolf, E. Korris, J. Walter, G. Matthews. (2012). Structures data collection for *The National Map* using volunteered geographic information. USGS Open-File Report: 2012-1209

Bristol, R. N. Euliss, Jr. , N. Booth, N. Burkardt, J. Diffendorfer, D. Gesch, B. McCallum, D. Miller, S. Morman, B. Poore, R. Signell, R. Viger. (2012) Science strategy for Core Science Systems in the U.S. Geological Survey, 2013-2023. USGS Open-File Report: 2012-1093.

Wolf, E. G. Matthews, K. McNinch, Kevin; B. Poore (2011). OpenStreetMap Collaborative Prototype, Phase 1, USGS Open-File Report: 2011-1136

Poore, B. (2011). “U.S. Geological Survey,” and “Open GIS Consortium” In *Encyclopedia of Geography* ed. Piotr Jankowski. Thousand Oaks, CA: Sage Publications.

Sugarbaker, Larry, K. Coray, and B. Poore. *The National Map* Customer Requirements: Findings from interviews and surveys. USGS Open-File Report 2009-1222.

### Workshops

Poore, B. Co-organized USGS Citizen Science Workshop, September 10-13, 2012 Denver, CO. 2012 (with Community for Data Integration.)

Poore, B. Co-organized workshop “Law and the Geoweb.” Sponsored by Microsoft Research and the Association of American Geographers, Seattle, April 2011 (with Puneet Kishor of Creative Commons)

Poore, B. Co-organized workshop “Volunteered Geographic Information”, USGS, Herndon, January 2010 (with Kari Kraun and Morgan Bearden)

### **Invited talks**

Poore, B. (2011). Always in beta, Invited talk, Mapping Democracy: Technology, Social Change, and Web 2.0 Conference, University of Colorado Boulder, September.

Poore, B. (2010) Slow Maps, Invited talk, Microsoft Research Forum, New York University, January.

Poore, B. (2010) CyberGIs: Learning from Users, Invited panelist. CyberGIS Workshop, sponsored by the National Science Foundation and the University Consortium for Geographical Information Science, D.C. February 4.

Poore, B. . (2010) The metadata crisis: Can geographic information be made more usable? Presented at Second Workshop on Geographic Data Usability, sponsored by the Ordnance Survey, University of Nottingham and University College London. March 23, London, England.

Poore, B. Mapping the Unmappable: Is it possible, ethical, or even desirable to incorporate volunteered geographic information into scientific projects? Invited paper at workshop on the Role of Volunteered Geographic Information in Science, sponsored by Oak Ridge National Laboratory and University of California, Santa Barbara, Zurich, September 2010.

### **Technical Presentations**

Wolf, E. (2012). I fight authority, authority always wins. Annual Meeting of the Association of American Geographers, February, New York, WhereCampTB, February, Saint Petersburg, and AutoCarto 2013, September Columbus OH.

Poore, B., E. Wolf, E., G. Matthews (2012). The integration of crowdsourced data into spatial data infrastructures: issues and future prospects. Presented by Poore at the Global Spatial Data Infrastructure (GSDI' 13), May 2012, Quebec City, Canada

Poore, B. Liu, S. (2012) Citizen science and social media for *The National Map*, CEGIS annual meeting, June, Rolla MO.

Poore, B. (2012) What does the USGS need to consider when designing policy for citizen science projects? Presented by Wolf at the USGS Citizen Science Workshop, September, Denver CO.

Poore, B., G. Matthews, Greg (2012) Engaging citizens to update *The National Map* at the USGS. Presented by Wolf at AutoCarto September, Columbus OH.

Poore, B. (2011). User-Centered Design for The National Map CEGIS Annual Meeting.

Wolf, E. (2011). GeoData 2011, March 2-4, Broomfield. CO.

Poore, B. (2011). Volunteered geographic information at the US Geological Survey. Where 2.0. Santa Clara, CA, O'Reilly Media.

Poore, B. (2011). The OpenStreetMap collaborative prototype. 2011 NC GIS. Raleigh, NC.

Poore, B. (2011). OpenStreetMap and the US Geological Survey. WhereCampDC 2011. Washington, DC.

Poore, B. (2010). OpenStreetMap and the US Geological Survey. WhereCamp5280 2010. Denver, CO.

Poore, B. (2009). "Ethics and GIS," "Philosophy and GIS," "User issues in GIS for cloud computing." panel sessions at the Annual Meeting of the Association of American Geographers, Las Vegas, NV, March 22-27. Invited panelist.

Poore, B. (2010) What a long strange trip it's been:" Mapping and virtual community from The Grateful Dead to OpenStreetMap. Presented at 3rd International Symposium on the History of Cartography, Arlington, TX, October 10-13.

Poore, B. (2009) "Volunteered geographic information," discussant at a paper session and respondent to a plenary address by Dr. Michael Goodchild, University of California, Santa Barbara at the Annual Meeting of the Association of American Geographers, Las Vegas, NV, March 22-27.

Poore, B. (2009). Wall-e and the 'Many, Many' Maps: Ontologies for distributed collaboration, UCGIS/USGS Ontology for The National Map Specialists Meeting, Washington, D.C. February 3-4.

Poore, B. and M. Finn (2008) Who will Use cyberinfrastructure and how? Cyberinfrastructure for GIScience Workshop, Sponsored by the National Science Foundation and GIScience 2008. Park City, Utah (Poore presented)

Poore, B. (2008) Mapping without maps: What about the users of GIS?" GIScience 2008, Park City, Utah, September 23-36. Refereed

Poore, B. (2008). "Push-pin geography: Implications for the design of user-centered interfaces for Internet mapping," Association of American Geographers Annual Meeting, Boston, MA.

Poore, B. and M. Finn (2008). "User-Centered design for spatial data infrastructures: Implications of new Internet technologies," Auto-Carto 2008, Shepherdstown, WV, September 8-11.

Poore, B. User-Centered Design for *The National Map*," in USGS Gulf Coast Science Conference & Florida Integrated Science Center (FISC) Meeting: Proceedings with Abstracts, October 22-2008, Orlando FL ed. D.L. Lavoie, B.H. Rosen, D.M Sumner, K.H. Haag, A.B. Tihansky, A.B. Boynton, R. R. Koenig. USGS Open-File Report 2009-1329. p.137. Poster presentation.

### **Software Development**

Wolf, E. Submitted OpenStreetMap Collaborative Project Software to Map Mashup Contest at USGS The National Map

## Publications and Presentation 2007-2012

### Multi-resolution Raster (High Performance Computing)

Michael P. Finn

#### 2012

Behzad, Babak, Yan Liu, Eric Shook, Michael P. Finn, David M. Mattli, and Shaowen Wang (2012). A Performance Profiling Strategy for High-Performance Map Re-Projection of Coarse-Scale Spatial Raster Data. Abstract presented at the *Auto-Carto 2012, A Cartography and Geographic Information Society Research Symposium*, Columbus, OH.

Finn, Michael P., Daniel R. Steinwand, Jason R. Trent, Robert A. Buehler, David Mattli, and Kristina H. Yamamoto (2012). A Program for Handling Map Projections of Small Scale Geospatial Raster Data. *Cartographic Perspectives*, Number 71, pages 53 – 67.

Finn, Michael P., Gary W. Krizanich, Kevin R. Evans, Melissa R. Cox, and Kristina H. Yamamoto (2012). Visualizing Impact Structures Using High-Resolution LiDAR Derived DEMs: A Case Study of Two Structures in Missouri. *Surveying and Land Information Science*, Vol. 72, No. 2, pp. 87 - 97.

Finn, Michael P., Yan Liu, David M. Mattli, Qingfeng (Gene) Guan, Kristina H. Yamamoto, Eric Shook and Babak Behzad (2012). pRasterBlaster: High-Performance Small-Scale Raster Map Projection Transformation Using the Extreme Science and Engineering Discovery Environment. Abstract presented at the *XXII International Society for Photogrammetry & Remote Sensing Congress*, Melbourne, Australia.

Finn, Michael P., Yan Liu, David M. Mattli, Babak Behzad, Kristina H. Yamamoto, Anand Padmanabhan, and Michael Stramel (2012). Raster Map Projection Transformation Using a Virtual System to Interactively Share Computing Resources. Presentation made at *The First International Conference on Space, Time, and CyberGIS (CyberGIS'12)*, Urbana-Champaign, Illinois.

Mattli, David, Michael P. Finn, and Michael Stramel (2012). pRasterBlaster: Fast, Accurate Raster Reprojection. Poster presented at *The First International Conference on Space, Time, and CyberGIS (CyberGIS'12)*, Urbana-Champaign, Illinois.

Yamamoto, Kristina H., and Michael P. Finn (2012). Approximating Tasseled-Cap Values to Evaluate Brightness, Greenness, and Wetness for the Advanced Land Imager (ALI). *U. S. Geological Survey Scientific Investigation Report 2012-5057*, 9 p.

Shoberg, Tom, Paul Stoddard and Michael P. Finn (2012). Rejuvenating Pre-GPS era geophysical surveys using the National Map. *Journal of Surveying Engineering*, Vol. 138, No. 2, May 1. ISSN 0733-9453/2012/2-0-0/

Finn, Michael P., and David M. Mattli (2012). User's Guide for the mapIMG 3: Map Image Reprojection Software Package. *U. S. Geological Survey Open-File Report 2011-1306*, 12 p.

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Finn, Michael P., Jason R. Trent, and Robert A. Buehler (2006). User's Guide for the MapImage Reprojection Software Package, Version 2.1. *U. S. Geological Survey Open-File Report 2006-1016*.

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Williams, Michael S., Michael P. Finn, and Robert A. Buehler (2006). An Open Source, Object-Oriented General Cartographic Transformation Program (GCTP). Abstract presented at the *International Society for Photogrammetry and Remote Sensing Commission IV Symposium on Geospatial Databases for Sustainable Development*, Goa, India.

## CEGIS Publications and Presentations 2006-2012

E. Lynn Usery

### Publications

Usery, E.L., 2005. Geography for a Changing World, *Bulletin of the American Congress on Surveying and Mapping*, No. 217, pp. 23-24.

I.B. Arpinar, A. Sheth, C. Ramakrishnan, E.L. Usery, M. Azami, M. Kwan, 2006. Geospatial Ontology Development and Semantic Analytics, *Transactions in GIS*, v. 10, no. 4, p. 551-576. (20 % problem definition, research, writing)

Ling, Y., M. Ehlers, E.L. Usery, and M. Madden, 2006. Enhanced IHS Transform Methods for Fusing Commercial High Resolution Satellite Images, *ISPRS Journal of Photogrammetry and Remote Sensing*, v. 61, no. 6, p. 381-392. (20 % problem definition, research, writing)

Finn, M.P., E.L. Usery D.J. Scheidt, G.M. Jaromack, and T.D. Krupinski, 2006. An Interface between the Agricultural Non-Point Source (AGNPS) Pollution Model and the ERDAS Imagine Geographic Information System, *Geographic Information Sciences*, v. 12, no. 1, p. 10-20. (30 % problem definition, research, writing)

Knoblock, C.A., C.C. Chen, E.L. Usery, 2006. Automatic Alignment of Vector Data and Orthoimagery for *The National Map*, Digital Government Conference, San Diego, CA. Presented by C. Knoblock. (30 % problem definition, research, writing)

Stanislawski, L., M.P. Finn, M. Starbuck, E.L. Usery, and P. Turley, 2006. Estimation of Accumulated Upstream Drainage values in Braided Streams using Augmented Directed Graphs, *Proceedings, Auto Carto 2006*, Vancouver, WA, Presented by L. Stanislawski. (20 % problem definition, research, writing)

Ruhl, S., E.L. Usery and M.P. Finn, 2006, EL68D Wasteway Land Cover Generation, USGS Open File Report OF 2007-1143. (70 % problem definition, research, writing)

Stanislawski, L., M.P. Finn, E.L. Usery, P.L. Robinette, 2007. Development of a Blunder Detection Approach for Automated Point Matching During Vector to Image Data Integration, *Proceedings, American Society for Photogrammetry and Remote Sensing Annual Conference*, Tampa, FL. Presented by L. Stanislawski. (15 % problem definition, research, writing)

Stanislawski, L., M.P. Finn, M. Barnes, E.L. Usery, 2007. Assessment of a Rapid Approach for Estimating Catchment Areas for Surface Drainage Lines, *Proceedings, American Congress on Surveying and Mapping Annual Conference*, St. Louis. Presented by L. Stanislawski. (15 % problem definition, research, writing)

Usery, E.L. and M.P. Finn, 2007. Cartographic Research at the U.S. Geological Survey Center of Excellence for Geospatial Information Science, *Proceedings, International Cartographic*

Conference, Moscow, Russia. (Paper accepted and published). (80 % problem definition, research, writing)

Wei, M., T. Zhao, D. Varanka, and E.L. Usery, 2008. A Conceptual Design Towards Semantic Geospatial Access, presented poster, *GIScience 2008*, Park City, Utah. (20 % problem definition, research, writing)

Giraldo, M.A., D. Bosch, M. Madden, E.L. Usery, and C. Kvien, 2008, Landscape complexity and soil moisture variation in South Georgia, USA, for remote sensing applications, *Journal of Hydrology*, v. 357, pp. 405-420. (30 % problem definition, research, writing)

Wu, S., X. Qiu, E.L. Usery, L. Wang, 2008. Using Geometrical, Textural, and Contextual Information of Land Parcels for Classification of Detailed Urban Land Use, *Annals of the Association of American Geographers*, v. 99, no. 1, pp. 76-98. (30 % problem definition, research, writing)

Ling, Y, E.L. Usery, M. Ehlers, M. Madden, 2008. Effects of Spatial Resolution in Image Fusion, *International Journal of Remote Sensing*, v. 29, no. 7, pp. 2157-2167. (30 % problem definition, research, writing)

Choi, J., J.C. Seong, B. Kim, E.L. Usery, 2008. Innovations in Individual Feature History Management -- The Significance of Feature-based Temporal Model, *Geoinformatica*, 12:1-20. (30 % problem definition, research, writing)

Giraldo, M.A., D. Bosch, M. Madden, E.L. Usery, and C. Kvien, 2008, Landscape complexity and soil moisture variation in South Georgia, USA, for remote sensing applications, *Journal of Hydrology*, v. 357, pp. 405-420. (30 % problem definition, research, writing)

Brewer, C.A., B.P. Buttenfield, E.L. Usery, 2009. Evaluating Generalizations of Hydrography in Differing Terrains for *The National Map of The United States*, *Proceedings, International Cartographic Conference*, Santiago, Chile. (Presented by C.A. Brewer). (10 % problem definition, research, writing)

Usery, E.L., D. Varanka, M.P. Finn, 2009. Mapping Developments and GIS in the USGS, 1884-2009, *Proceedings, International Cartographic Conference*, Santiago, Chile (70 % problem definition, research, writing)

Usery, E.L., M.P. Finn, and C. Mugnier, 2009. Coordinate Systems and Map Projections, *Manual of Geographic Information Systems*, American Society for Photogrammetry and Remote Sensing, Bethesda, MD, p. 87-112.

Usery, E.L., D.D. Bosch, M.P. Finn, T. Wells, S. Pocknee, and C. Kvien, 2009. GIS in Precision Agriculture and Watershed Management, *Manual of Geographic Information Systems*, American Society for Photogrammetry and Remote Sensing, Bethesda, MD, p. 1169-1198. (70 % problem definition, research, writing)

Y. Le and E.L. Usery, 2009. Adding Time to GIS, *Manual of Geographic Information Systems*, American Society for Photogrammetry and Remote Sensing, Bethesda, MD, p. 311-332. (50 % problem definition, research, writing)

Usery, E.L., J. Choi, and M.P. Finn, 2009. Modeling Sea-level Rise and Surge in Low-lying Urban Areas using Spatial Data, Geographic Information Systems, and Animation Methods, in Showalter, P. and Lu, Y., (eds), 2009. *Geospatial Techniques in Urban Hazard and Disaster Analysis*, Springer, Dordrecht, pp. 11-20. (70 % problem definition, research, writing)

Fleming, S., T. Jordan, M. Madden, E.L. Usery, and R. Welch, 2009. GIS Applications for Military Operations in Coastal Zones, *ISPRS Journal of Photogrammetry and Remote Sensing*, v. 64, p. 213-222. (15 % problem definition, research, writing)

Wu, S., E.L. Usery, M.P. Finn, and D. Bosch, 2009. An Assessment of the Effects of Cell Size on AGNPS Modeling of Watershed Runoff, *Cartography and Geographic Information Science*, v. 35, no. 4, p. 265-278. (40 % problem definition, research, writing)

Usery, E.L., M.P. Finn, and M. Starbuck, 2009. Data Layer Integration for *The National Map of The United States*, *Cartographic Perspectives*, v. 62, p. 28-41. (60 % problem definition, research, writing)

Giraldo, M.A., D. Bosch, M. Madden, E.L. Usery, and M. Finn, 2009. Ground and surface temperature variability for remote sensing of soil moisture in a heterogeneous landscape, *Journal of Hydrology*, v. 368, pp 214-223. (20 % problem definition, research, writing)

Wu, S., E.L. Usery, M.P. Finn, and D. Bosch, 2009. Effects of sampling interval on spatial patterns and statistics of watershed nitrogen concentration, *GIScience and Remote Sensing*, v. 46, n. 2, p.172-186. (40 % problem definition, research, writing)

Choi, J. and E.L. Usery, 2009. A Prototype Feature System for Feature Retrieval Using Relationships, *Cartography and Geographic Information Science*, v. 36, no. 4, p. 331-345. (40 % problem definition, research, writing)

Finn, M., E.L. Usery, and M. Reed, 2009, Approximating Tasseled-Cap Values for the Advanced Land Imager (ALI), *ASPRS Manual of Geographic Information Systems*. (CD-ROM publication) (40 % problem definition, research, writing)

Usery, E.L., J. Choi, M. Finn, 2009. Simulating Sea Level Rise and Surges with Geographic Information Datasets and Animation Methods, *ASPRS Manual of Geographic Information Systems*. (CD-ROM publication) (50 % problem definition, research, writing)

Varanka, D. and Usery, E.L., 2010, Special Section: Ontological Issues for *The National Map: Cartographica: The International Journal for Geographic Information and Visualization*, v. 45, n. 2, p. 103-104. (50 % problem definition, research, writing)

Usery, E.L., 2011. The Digital Transition in Cartography: USGS Data Innovations, 1970s,

Liebenberg, E. and I. Demhardt, eds., *History of Cartography. International Symposium of the ICA Commission, 2010*, Berlin, Springer Verlag. pp 113-126.

Varanka, D., J. Carter, E.L. Usery, and T. Shoberg, 2011. Topographic Mapping Data Semantics through Data Conversion and Enhancement, in Ashish, N. and A.P. Sheth, (eds), 2011. *Geospatial Semantics and the Semantic Web: Foundations, Algorithms, and Applications*, Springer, New York, pp. 145-162. (30 % problem definition, research, writing)

Usery, E.L. and Dalia Varanka, 2012. Design and Development of Linked Data from *The National Map*, *Semantic Web Journal*, <http://www.semantic-web-journal.net/content/design-and-development-linked-data-national-map>. (50 % problem definition, research, writing)

Usery, E.L., 2012. Generalization and Data Integration (GDI): A USGS CEGIS Perspective, *Generalization and Data Integration*, Springer, in press.

## **Presentations**

The Web Mercator Projection: The Legacy Continues into the Electronic Age, 4<sup>th</sup> International Conference on Cartography and GIS, Albena, Bulgaria, 2012. (INVITED)

Geospatial Semantic Technology: A Case Study with USGS Data, University Consortium for Geospatial Information Science Workshop/USGS on Geospatial Semantics, Washington, D.C. (PRESENTED)

CyberGIS in the USGS: Perspective and Vision, Association of American Geographers Annual Meeting, New York, 2012. (INVITED)

Geomorphic Features on the Semantic Web, Association of American Geographers Annual Meeting, New York, 2012. (PRESENTED)

Geospatial Semantics and CyberGIS, University of Illinois at Urbana-Champaign, 2012. (INVITED)

USGS Advancements in Geospatial Semantics and CyberGIS, Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China, 2011. (INVITED)

Data Exchange for Global Science, US China Roundtable on Scientific Data Cooperation, Beijing, China, 2011. (INVITED)

USGS Needs and Advancements in CyberGIS, CyberGIS All-hands Meeting, Oak Ridge, TN, 2011. (INVITED)

National Geospatial Data Assets Maintained by the U.S. Geological Survey as Part of *The National Map*, International Cartographic Conference, Paris, France, 2011. (PRESENTED)

The U.S. National Committee and the International Cartographic Association, North American Cartographic Information Society, Madison, WI, 2011. (INVITED)

Ontology and Semantics for *The National Map*, University of Nebraska, Department of geography, Lincoln, Nebraska, 2011 (INVITED)

Semantics for Complex Features and Images, American Society for Photogrammetry and Remote Sensing, Milwaukee, 2011. (PRESENTED)

CyberGIS Research and Implementation in the USGS, Association of American Geographers Annual Conference, Seattle, WA, 2011. (INVITED)

USGS Volunteered Geographic Information Workshop, Herndon, VA, 2010. (INVITED)

Cyberinfrastructure Components of *The National Map*, CyberGIS Workshop 2010, Washington, D.C. (INVITED)

Data Sharing – Critical for Global Science, US China Roundtable on Scientific Data Cooperation. Irvine, CA, USA, 2010. (INVITED)

The Digital Transition in Cartography: USGS Data Innovations, 1970s, 3<sup>rd</sup> International Symposium on the History of Cartography, University of Texas at Arlington, Arlington, TX, 2010. (INVITED)

*The National Map*, Geospatial Ontology, and the Semantic Web, International Semantic Web Conference, *Terra Cognita* Workshop, near Washington, D.C. , 2009. (INVITED Keynote)

Mapping Developments and GIS in the USGS, 1884-2009, International Cartographic Conference, Santiago, Chile, 2009. (PRESENTED)

125 Years of Topographic Mapping, 80-panel exhibit of USGS Topographic Mapping history, ESRI User Conference, San Diego, CA, 2009. (INVITED)

Place Still Matters: Generalizing the National Hydrography Dataset by Local Terrain and Climate, Buttenfield, B., C. Brewer, E.L. Usery, North American Cartographic Information Association, 2009.

The USGS Center of Excellence for Geospatial Information Science, CEGIS Research Meeting, Rolla, MO , 2009 (PRESENTED)

Geospatial Data Integration: A Review and a USGS Approach, China-US Roundtable on Scientific Data Cooperation, Qingdao, China, 2009. (INVITED)

Geospatial Data Integration: A Review and a USGS Approach, University of Missouri-Kansas City, 2009. (INVITED)



The USGS Center of Excellence for Geospatial Information Science – Spatio-temporal Data Model Research, National Science Foundation Workshop on Geospatial and Geotemporal Informatics, 2009. (INVITED)

Modeling Sea Level Rise and Surge with Geographic Information System Datasets, International Geographical Union, Tunis, Tunisia, 2008. (PRESENTED)

Modeling and Animation of Sea Level Rise and Surge with Geographic Information System Datasets, Missouri University of Science and Technology, Rolla, MO, 2008. (INVITED)

Resolution and Resampling Effects of Raster Data in Global and Regional Models , National Research Council Board on Earth Sciences and Resources, Irvine, CA, 2008. (INVITED)

The USGS Center of Excellence for Geospatial Information Science, Association of American Geographers, Boston, 2008. (PRESENTED)

The USGS Center of Excellence for Geospatial Information Science, AutoCarto 2008, Shepherdstown, West Virginia, 2008. (PRESENTED)

Elements of a Global Model: An Example of Sea Level Rise and Human Populations at Risk, 2<sup>nd</sup> USGS Modeling Conference, Orange Beach, AL, 2008. (PRESENTED)

The Use of Geospatial Data, Methods, Models, Processes, Simulation, and Animation to Model Global and Regional Events, National Research Council Board on Earth Sciences and Resources, Irvine, CA, 2007. (INVITED)

From Numbers to Graphics; From Graphics to Animation, U.S. Geological Survey New England Science Forum, 2007. (INVITED)

Modeling Sea-Level Rise Effects on Population using Global Elevation and Land-Cover Data, Association of American Geographers, San Francisco, 2007. (PRESENTED)

Data Integration for *The National Map*, University of Missouri-Rolla, 2007. (INVITED)

Generalization for *The National Map*, University of North Carolina-Greensboro, 2007. (INVITED)

Geographic Information Science Research in the U.S. Geological Survey, Association of American Geographers, Chicago, 2006. (PRESENTED)

Integrating Data Layers to Support *The National Map* of The United States, International Cartographic Conference, A Coruña, Spain, 2005. (PRESENTED)

Reprojecting Raster Data of Global Extent, Auto-Carto 2005, Las Vegas, Nevada. (PRESENTED)