

## Jacquelyn M. Strager

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### **Work Address**

Natural Resource Analysis Center  
Division of Resource Economics and Management  
Davis College of Agriculture, Natural Resources and Design  
West Virginia University  
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### **Summary of Abilities**

- Extensive experience in all aspects of creating, managing, and presenting spatial information for natural resource management
- Designed and developed several customized Geographic Information System applications, including complex water quality modeling applications and application extensions
- Designed, developed, and maintained interactive Internet-based mapping servers for several different organizations
- Have written and/or produced technical manuals, research proposals, training manuals, journal publications, and visually-based presentation materials
- Instructor for 2-day introductory GIS class, have developed and presented training materials for additional classroom and conference settings
- Coordinated, trained, and supervised GIS technicians at the Natural Resource Analysis Center for a variety of projects

### **Education**

M.S. May 1996. Wildlife and Fisheries Resources, West Virginia University, Morgantown WV. Thesis: Watershed and Stream-based Assessment and Inventory of the Fish Biodiversity of the Monongahela and Potomac River Basins, West Virginia.

B.S. May 1993. Natural Resources, Cornell University, Ithaca, NY.

### **Teaching Experience**

West Virginia University ENLM 441 (Applied GIS and Energy Land Management):  
Designed and taught course for Energy Land Management students: course provides GIS

skills necessary for planning, acquisition and development of natural gas resources, as well as exploration of use of GIS in other related energy fields.

West Virginia University RESM 442 (Applied GIS for the Social Sciences): Designed and taught applied introductory Geographic Information System course in the social sciences for upper level undergraduate and graduate students.

West Virginia University RESM 440 (Foundations of Applied GIS): Designed and taught 2 credit applied introductory Geographic Information System course for upper level undergraduate and graduate students.

ArcView / ArcGIS GIS Training: As an ESRI-Authorized ArcView and ArcGIS I Instructor, organized and taught 1 and 2-day GIS training classes targeted to natural resource professionals in West Virginia. I have also developed numerous customized courses for various state and federal agencies and professional groups, including the USDA Forest Service, WV Department of Environmental Protection, and American Association of Professional Landmen. Currently, I have taught over 400 individual students.

Introduction to GIS for WVU Extension Service: Developed and provided 2-day training classes to West Virginia University Extension specialists and county extension agents. Course content specially customized for extension needs.

### **Work and Research Experience**

Research Coordinator	Natural Resource Analysis Center, West Virginia University, Morgantown, WV. (November 1998-present)
Principal	Spatial Analytics, LLC – Morgantown, WV. (April 1999 - 2004)
Research Assistant	Division of Resource Management, West Virginia University, Morgantown, WV. (June 1996-November 1998)
Consultant	Canaan Valley Institute, Davis, WV. (January – May 1997)
Graduate Research Assistant	West Virginia Cooperative Fish and Wildlife Research Unit, Division of Forestry, West Virginia University, Morgantown, WV. (July 1993 – May 1996)
Research Intern	Cornell Biological Field Station, Bridgeport, NY. (June – August 1992)

## **Current/Recent Research Projects**

- Assessment of the distribution of NRCS assistance programs in West Virginia, and strategic enhancement of future outreach efforts (USDA NRCS 2016-2017)
- WV Manure Management Software Training Program Using GIS-Based Tools and Development of Associated User Documentation (USDA NRCS 2014-2017)
- Development and Implementation of a StreamStats Hydrologic Modeling Framework in West Virginia (US Geological Survey, 2014-2016)

## **Selected Research Projects (Completed)**

- Terrestrial wildlife species distribution modeling: Part of a hierarchical alternative futures modeling system to support decisions for the mountaintop removal/valley fill mining region. For the US Environmental Protection Agency (2013-2014).
- Development of a Spatially Explicit Surface Coal Mining Predictive Model: For The Nature Conservancy and the Appalachian Landscape Conservation Cooperative (2012-2013).
- Sustainable Energy Parks on Mine-Scarred Lands. For the Environmental Protection Agency (2009-2012).
- West Virginia Wetland Inventory and Modeling Project Phase III. For the WV Division of Natural Resources (2012-2013)
- Appalachian Assessment of Natural Resources: Forests. For the Appalachian Regional Commission (2010-2011).
- National Hydrography Dataset Stewardship and Maintenance. For the U.S. Geological Survey. (2010-2012).
- Spray Advisor: Multiple Line Approach. For the USDA Forest Service. (2010-2012).
- Appalachian Assessment of Natural Resources: Water. For the Appalachian Regional Commission (2009-2011).
- Using GIS Technology to Identify and Rank the Risk and Susceptibility of Sites in the Mid-Atlantic Area to Emerald Ash Borer. For the U.S.D.A. Forest Service. (2010)
- Diamond Darter Status Review and Recovery Effort Assistance. For the U.S. Fish and Wildlife Service. (2009)
- Development of a Habitat Restoration and Conservation Prioritization Tool for Songbirds and Mussels in the Appalachian Mountains. For the U.S. Geological Survey. (2009)
- High Resolution National Hydrography Dataset Data Development: Coordinated and supervised conflation of high resolution stream datasets for the Monongahela National Forest and West Virginia Department of Environmental Protection.

- Geospatial User Interface for Potomac Corridor Historic Resources: Designed and developed Internet-based mapping website for historic resources documented by the Institute for the History of Technology and Industrial Archaeology at West Virginia University and the Library of Congress.
- West Virginia Gap Analysis Project: Developed wildlife species-habitat relationship models and related database for terrestrial vertebrate and butterfly species of West Virginia. Produced land use/land cover map for West Virginia from classified satellite imagery, and compiled final report and results for extensive multi-year project. (2002)
- Aquatic Gap Analysis for West Virginia: Designed and implemented a searchable, spatially-referenced database of stream fish survey and management data for the Monongahela and Potomac River Basins of WV using ArcView GIS software. Also used workstation ArcInfo GIS software to compile environmental, land use, and human disturbance data for each watershed in the two river basins. (2001)

### **Relevant Computer Skills and Knowledge**

Geographic Information Systems Software: Desktop and Workstation ArcGIS, PC and workstation ARC/INFO, ArcView GIS, ArcView GIS Spatial Analyst Extension, AML Programming, Avenue Programming.

### **Recent Publications (Refereed)**

Strager, M.P., J.M. Strager, J.S. Evans, J.K. Dunscomb, B.J. Kreps, A.E. Maxwell. 2015. Combining a spatial model and demand forecasts to map future surface coal mining in Appalachia. *PLoS ONE* 10(6): e0128813.  
doi:10.1371/journal.pone.0128813.

Teske, M.E., H.W. Thistle, W.C. Schou, P.C.H. Miller, J.M. Strager, B. Richardson, M.C. Butler Ellis, J.W. Barry, D.B. Twardus, D.G. Thompson. 2011. A review of computer models for pesticide deposition prediction. *Transactions of the American Society of Agricultural and Biological Engineers* 54(3):789-801.

Strager, M. P., J. J. Fletcher, J. M. Strager, C. B. Yuill, R. N. Eli, J. T. Petty, S. J. Lamont. 2010. Watershed analysis with GIS: The Watershed Characterization and Modeling System software application. *Computers and Geosciences* 36(2010):970-976.

Strager, M.P., J.T. Petty, J.M. Strager, and J. Barker-Fulton. 2009. A spatially explicit framework for quantifying downstream hydrologic conditions. *Journal of Environmental Management* 90(2009):1854-1861.

Mynsberge, A.R., M.P. Strager, J.M. Strager, and P.M. Mazik. 2009. Developing predictive models for freshwater mussels (Mollusca:Unionidae) in the Appalachians: Limitations and directions for future research. *Ecoscience* 16(3):387-398.

### **Additional Publications**

Strager, J.M. and M.P. Strager. 2014. A hierarchical alternative futures modeling system to support decisions for the mountaintop removal-valley fill mining region. Objective 2: Terrestrial wildlife species distribution modeling. Final report submitted to the U.S. Environmental Protection Agency Region 3 and Region 4. West Virginia University, Morgantown, WV. 78 pp.

Strager, M.P., J.M. Strager, J.W. Burnett, A.E. Maxwell. 2013. Development of a spatially explicit surface coal mining predictive model. Final technical report submitted to The Nature Conservancy. West Virginia University, Morgantown WV. 62pp.

P. Ziemkiewicz, P. Butler, J. Fillhart, B. Gutta, P. Kirby, A. Maxwell, M. O'Neal, C. Risch, D.W. Saville, D. Springston, J. Strager, T. Vandivort. 2012. Sustainable energy parks on mine-scarred lands in Appalachia. Final project report. Prepared for USEPA Assistance ID TR-83418501-0.

Downstream Strategies (L. Hartz, F. Boettner, J. Clingerman, R. McIlmoil, A. Hereford, E. Hansen), West Virginia University (M. Vanderberg, K. Arano, J. Deng, J. Strager, M. Strager), and the National Network of Forest Practitioners (C. Donohue). 2011. An assessment of natural assets in the Appalachian Region: Forest Resources. Final report prepared for the Appalachian Regional Commission, Washington, DC, dated December 19, 2011 Contract #CO-16812-2010.

West Virginia University and the Regional Research Institute (J. Deng, J. Anderson, A. Collins, T. Harris, F. LaFone, S. Lamont, J. Strager, M. Strager, W. Veselka, N. Zegre), Downstream Strategies (F. Boettner, E. Hansen, S. Zegre, A. Hereford), Pennsylvania State University (C. Abdalla, S.J. Goetz), 2011. An assessment of natural assets in the Appalachian Region: Water. Final report prepared for the Appalachian Regional Commission, Washington, DC, dated June 17, 2011. Contract#CO-16503-09.

Teske, M.E., H.W. Thistle, J.W. Barry, B. Richardson, R.B. Ekblad, W.C. Schou, J.M. Strager, D.B. Twardus. 2011. A retrospective look at aerial spray model development by the USDA Forest Service. Forest Health Technology Enterprise

- Team FHTET-11-09. United States Department of Agriculture, Washington, D.C.
- Strager, J.M., M.B. Shumar, P. Bohall Wood, M.P. Strager, M.E. McDermott, A.R. Mynsberge, P.M. Mazik. 2009. Development of a habitat restoration and conservation tool for songbirds and mussels in the Appalachian Mountains. Final Report submitted to the USGS Science Support Partnership Program. 107 pp.
- Ayersman, W., M.P. Strager, J.M. Strager. 2009. Modeling emerald ash borer establishment and spread using GIS. 2009 ESRI 29<sup>th</sup> Annual International Users Conference Proceedings, July 13-17, 2009, San Diego, CA.
- Strager, M.P., J.M. Strager, W. Ayersman. 2009. Assessing the potential risk of emerald ash borer (*Agrilus planipennis*) establishment and spread using GIS. International Union of Forest Research Organizations (IUFRO) International Forest Biosecurity Conference Popular Summaries. March 16-20, 2009, Rotorua, New Zealand.
- Strager, J.M., H.W. Thistle, D.B. Twardus. 2009. The Spray Advisor: A Geographic Information Systems approach for aerial spraying. International Union of Forest Research Organizations (IUFRO) International Forest Biosecurity Conference Popular Summaries. March 16-20, 2009, Rotorua, New Zealand.
- Schou, W., H. Thistle, J. Strager, B. Richardson, D. Thompson, and D. Twardus. 2009. Approach to grouping flight lines in the Spray Advisor aerial spray simulation model. Spray Efficacy Research Group International (SERG-I) 2009 Workshop Proceedings. February 9-12, 2009, Winnipeg, Manitoba, Canada.
- Wood, P.B., Strager, M. and Strager, J.M. 2006. Fine-scale Forest Bird Habitat Modeling for the Mountaintop Mining Region within the Appalachian Bird Conservation Region. Final report submitted to USGS. West Virginia Cooperative Fish and Wildlife Research Unit, Morgantown, WV.
- Strager, J.M. 2006. The Central Appalachian Regional Gap Analysis Project Final Report. Submitted to USGS. Natural Resource Analysis Center and West Virginia Cooperative Fish and Wildlife Research Unit, Morgantown, WV. 93 pp.
- Strager, J.M. 2004. Spray Advisor ArcView Extension Technical Manual. Natural Resource Analysis Center, West Virginia University, Morgantown, WV.
- Strager, J.M. 2004. National Hydrography Dataset (NHD): High-Resolution Stream Dataset Development for West Virginia - Final Project Technical Summary.

Natural Resource Analysis Center, West Virginia University, Morgantown, WV.

Strager, J.M, and D. Bonenberger. 2001. Potomac Corridor Historic Resources IMS: Connecting Past and Present. Proceedings of the 21<sup>st</sup> Annual ESRI International Users Conference, July 9-13, 2001, San Diego, CA.

Strager, M., Claggett, P., Clifton, E., Fletcher, J., Kinder, P., Kemlage, D., Pomponio, R., Schroeder, T., Sherald, M., Strager, J. and Yuill, C. 2001. Landscape Assessment Tools: Integrating science and data for decision support. Proceedings of the 21<sup>st</sup> Annual ESRI International Users Conference, July 9-13, 2001, San Diego, CA.

### **Presentations/Seminars**

Strager, J.M. 2015. Exploring mapping online: Interactive mapmaking resources for STEM education and more, K-12. June 24, 2015, WV Ag in the Classroom, Morgantown, WV.

Strager, J.M. 2015. Landscape change and hydrologic alterations: Impacts on the NHD, WBD, and Stream Stats for West Virginia. Invited presentation for the US Geological Survey, National Hydrography Dataset Advisory Team, June 2, 2015 via webex.

Strager, M. P., J. M. Strager, A. E. Maxwell. Development of a Spatially Explicit Surface Coal Mining Predictive Model. WV Association of Geospatial Professionals (WVAGP) Conference, Charleston, WV, June 2-5, 2014.

Burnett, J.W., M. Strager, J. Strager, B. Kreps. 2013. Projecting surface coal mining footprints in Central Appalachians over the next 25 years: A spatially explicit surface coal mining predictive model. 2013 International Pittsburgh Coal Conference, September 16-19, 2013, Beijing, China.

Strager, J.M., M.P. Strager, W. Kordek, K. Krantz. 2012. GIS-based classification and evaluation of West Virginia's wetlands. Poster presented at 2012 West Virginia Association of Geospatial Professionals meeting, Morgantown, WV.

Strager, J.M., E.J. Fedorko, and D. Arnold. 2012. National Hydrography Dataset. Workshop presented at the WV Association of Geospatial Professionals Annual Conference, May 11, 2012, Morgantown, WV.

Strager, J.M. 2009. Using GIS in support of community based efforts. Presented at Citizen Corps, VISTA training. South Charleston, WV September 23, 2009.

- Strager, J.M. 2009. Improvements in modeling water resources in West Virginia. Presented at ESRI International Users Conference, July 16, 2009, San Diego, CA.
- Strager, J.M. 2009. Emerging tools in community development: Geographic Information Systems (GIS). Invited presentation at Community Development Institute (East). May 18, 2009, Bridgeport, WV.
- Strager, J.M. 2009. Mapping your community. Presented at Spring Association Meeting, WVEA4-HA/WVEAFCS. May 8, 2009, Capon Springs, WV.
- Strager, J.M. 2009. The Spray Advisor: A GIS approach for aerial spraying. Presented to the International Union of Forest Research Organizations (IUFRO) International Forest Biosecurity Conference, March 16-20, 2009, Rotorua, New Zealand.
- Strager, J.M. 2008. The Spray Advisor. Invited presentation at the Off-Target Movement Modeling Workshop of the 8<sup>th</sup> Annual Pesticide Stewardship Conference, Asheville NC February 24-27, 2008.
- Strager, J.M. and M.Dougherty. 2008. Using GIS and geospatial technologies within WVU Extension. Presentation at WV Extension Professional Development Day, Jacksons Mill WV, February 28, 2008.
- Strager, J.M. 2008. Practical Applications of Enhanced Water Resources GIS Datasets. Invited symposium presentation at 2008 Southern Division American Fisheries Society spring meeting, Wheeling WV, February 28-March 2, 2008.
- Strager, J.M. 2008. Watershed Modeling and Characterization System (WCMS) overview for WV Department of Environmental Protection, Division of Mining and Reclamation. Charleston, WV, March 4, 2008.
- Strager, J.M. and M.P Strager. 2008. Extending the National Hydrography Dataset: A Spatial Framework for Water Resources Applications in West Virginia. Presented at 2008 West Virginia GIS Conference, Charleston WV, June 10-12, 2008.
- Strager, J.M., M.P. Strager, and J.J. Fletcher. 2007. Development of enhanced water resources datasets and capabilities for West Virginia. Presented at the VA/WV Water Resources Research Symposium, November 26-30, 2007, Blacksburg, VA.
- Strager, J.M. and M.J. Dougherty. 2007. GIS and Mapping Tools for Extension Programming. Presented at West Virginia University Extension Service



Professional Development Day, September 12, 2007, Jacksons Mill, WV.

Strager, J.M., K. Donaldson, and K. Kuhn. 2007. Local-Resolution Photo-Based Revision in West Virginia. Invited presentation at the USGS National Hydrography Dataset Stewardship meeting, April 24-26, 2007, Denver CO.

Strager, J.M. 2007. The Spray Advisor. Invited presentation at the Helicopter Herbicide Spraying Workshop, Deer Lodge MT, April 10-12, 2007.

### **Service Activities/Other**

- Cornell Alumni Admissions Ambassador Network (Cornell University, Ithaca NY), December 2006-present. Conduct informational meetings with local applicants to Cornell, submit contact reports.
- Anonymous paper reviewer, International Journal of GIS, Journal of Herpetology.
- Moderator, 2008 Southern Division American Fisheries Society spring meeting, Wheeling WV, February 28-March 2, 2008.
- Student paper judge, 2008 Southern Division American Fisheries Society spring meeting, Wheeling WV, February 28-March 2, 2008.
- Best poster award (professional category), WVGIS meeting, Charleston WV June 11, 2008