

**Jane Ma, Ph.D.**  
**Senior Scientist**

**Professional Profile**

Dr. Jane Ma is a Senior Scientist in Exponent's EcoSciences practice. She has a strong interdisciplinary background in geosciences and Computer Science including extensive work in geographic information systems (GIS), remote sensing, landscape/watershed analysis, geostatistics, on-line web mapping, environmental/ecological model implementation, and decision support system (DSS) development. Her scientific expertise is principally in the areas of water resources management, with an emphasis on wetland assessment. Her study involves with aquatic habitat evaluation, wetland vulnerability assessment, headwater wetland mitigation, low-impact Best Management Practices (BMPs) design, and watershed-scale ecological restoration study.

Dr. Ma is highly skilled in geospatial analysis and GIS programming. She is experienced in ArcGIS suite, ERDAS, Plone, PostgreSQL and programming languages in Visual Basic, Python, and C++. She has developed numerous desktop and web-based GIS applications customized to meet the requirement of different projects.

**Academic Credentials and Professional Honors**

Ph.D., Geosciences and Computer Science, University of Missouri, Kansas City, 2006  
M.S., GIS and Remote Sensing, Peking University, China 2001  
B.S., Geography, Beijing Normal University, China 1998

**Licenses and Certifications**

Wetland Delineation Training and Field Practicum, Adaptive Ecosystems, Inc., Kansas City, Missouri, April 19–23, 2004, Certified

**Languages**

Chinese

## **Publications**

Ji W, Ma J, Twibell RW, Underhill K. Characterizing urban sprawl using multi-stage remote sensing images and landscape metrics. *Computers, Environment and Urban Systems* 2006; 30(6):861–879, November.

Ji W, Twibell RW, Ma J. A decision support GIS for the Clean Water Act permit review analysis. Proceedings, International Environmental Modeling and Software Society Conference Lugano, Switzerland, June 24–27, 2002.

## **Published Abstracts of Presentations**

Ma J, Wahab-Twibell RA, Adegoke JO, Ji W. Sensitivity of landscape indices to satellite-derived urban heat island phenomenon: a case study of Lee’s Summit, MO. Proceedings, ASPRS Specialty Conference: from Imaging to Decision Making, Kansas City, MO, September 12–16, 2004.

Ma J, Ji W. Decision support GIS for assessing the vulnerability of waters to potential human impacts. Paper presented at Centennial Meeting of Association of American Geographers (AAG), Philadelphia, PA, March 2004.

Ji W, Wahab Twibell RA, Ma J. A GIS approach for the Clean Water Act Permitting across spatial scales. 17<sup>th</sup> Annual Symposium International Association for Landscape Ecology, Lincoln, NE, April 2002.

Ma J, Fan H, Chen X. A case study on change detection from Thematic Mapper (TM) data for monitoring land resource in mountainous region. Paper presented at the 3<sup>rd</sup> Korea-China Workshop on Spatial Information Technology Application for Sustainable Development, Kongju, Korea, Republic of (South), November 2000.

## **Book Chapters**

Ji W, Ma J. Geospatial decision models for rapidly assessing the vulnerability of wetlands under potential human impacts. In: *Wetland and Water Resource Modeling and Assessment: A Watershed Perspective*. Ji, et. al. (eds), Science Press, Chinese Academy of Sciences, Beijing, 2007.

## **Prior Experience**

Research Assistant, University of Missouri – Kansas City, 2001–2006  
GIS Analyst/Programmer, Applied Ecological Services, Inc., 2005–2006  
Environmental Specialist II, Missouri Department of Natural Resources, 2005  
Research Assistant, Peking University, China, 1998–2001

## **Project Experience**

Provided GIS support to various projects. Created data visualization for use in expert reports presentations, courtroom displays and web-sites. Provided services in geospatial data management, spatial analysis, spatial statistics and 3D analysis.

Developed web-tools for various projects. The web-tools provide efficient and powerful searching and reporting functionalities for accessing complex databases that include chemical analytical results, field survey information, lab reports, quality control data, etc. The web-tools also provide functions to the users to plot query results in an interactive web map or generate statistical graphs. Migrated web-tools to laptops so that clients can conveniently access the web-tools in the court-room.

Developed web-tools for litigation document reviews. The web-tools allow reviewers to work collaboratively for assessing documents and entering review comments to a centralized database via the web-tool. The web-tools also enable project managers to monitor the review progress, assign documents to individual reviewers and QC the reviewed documents.

Estimated the potential in-stream nitrogen incremental that could result from a proposed power plant. Predicted the annual deposition of nitrite/nitrate from the power plant's estimated emission. Modeled the transports and fates of nitrogen in the potential impacted stream networks using SPARROW model.

Created an algorithm for mapping the uncertainty of the natural neighborhood interpolation function in ArcGIS's spatial analysis extension. The algorithm was applied to evaluate the spatial interpolation uncertainty of the bathymetry maps produced by a client.

Created a software for pulling the relevant NLINK and NHANES codes for a food(s) of interests from a USDA food code database and create the NET file as the input files to a food ingredients analysis software. The software was developed using Microsoft Visual Basic.

Geo-coded plaintiff locations based on their addresses and calculated their flow distances to the nearby water bodies. The information was used for cost allocation among the potential responsible parties (PRPs) for mercury pollution in the concerned water bodies.

Created chlorophyll-a density maps from remote sensing images. The maps were used to study the cause-effect relationship between a severe eutrophication event and the discharges from a paper mill nearby. The final exhibit map is the key evidence referenced in the courtroom.

Performed shoreline type interpretation using Google Earth and studied the adverse impacts of a oil spill event to the shoreline habitats.

Performed spatial interpolation of odor monitoring data to plot odor density in the vicinity of a hog farm over a certain period of time. The information was used to examine the temporal relationship between odor density and duration of a plaintiff's stay.

Performed spatial interpolation of chemical sampling data to plot the concentration contours for lead, mercury and copper in a municipal lake. The information was used to examine the cause-effect relationship between chemical concentration and sewage outfalls in the lake.

Created a 3-D model to estimate the fill and dredge volume of litter/landfill using the pre-littered contours and post-littered contours. The information was used to develop sampling plan and estimate the cost for clean-up activities.

Created a web-tool for litigation document search. The web-tool provided a variety of search options, such as search with wildcards, specify the relationship (AND or OR) between keywords, search keyword phrase in quotes, search case sensitive or insensitive, etc.

Created a GIS animation using ArcScene to illustrate the temporal relationship between the duration of plaintiff's residence and the operation of chat piles.

Developed a web-based VAST tool – a Validation, Analysis and Storage database for Environmental investigation. Provided a great deal of flexibility in data storage and summarization capability, as well as information delivery via Internet.

Provided GIS programming for the Habitat Equivalency Analysis (HEA). The product was delivered as a stand-alone GIS application developed with ArcEngine in Visual Basis environment.

### **Professional Affiliations**

- Association of American Geographers—AAG
- American Society for Photogrammetry and Remote Sensing—ASPRS
- International Association for Landscape Ecology—IALE