

**EXPERIENCE SUMMARY**

Steve has fifteen years of experience in both hydrogeology and water resources engineering, giving him a broad perspective on water issues. Steve's expertise includes hydrologic and hydrogeologic field methods, surface water and groundwater modeling, and engineering design. At the U.S. Environmental Protection Agency, he developed public health policy related to land use and water resources. Steve has given over 20 research and design presentations across the country and abroad and interpreted Grand Canyon natural history to visitors as a park volunteer.

EXPERTISE

Groundwater Analysis & Modeling
Water Supply & Watershed Planning
Thermal Impact Assessment
Recharge Analysis & Design
Stream Analysis & Design

REGISTRATION

Professional Engineer
WI 39140

EDUCATION

BA-Geology & BA-Physics, 1988
Albion College
Albion, MI

PhD-Geological Engineering, 2000
MS-Geology, 1991
University of Wisconsin-Madison
Madison, WI

PROFESSIONAL HISTORY

Montgomery Associates: Resource Solutions,
LLC
Senior Hydrologist, 2004 – Present

Wisconsin Geological & Natural History
Survey
Hydrogeologist & GIS Specialist, 2000 – 2004

U.S. E.P.A. Office of Children's Health
Protection, American Association for the
Advancement of Science Fellow, 2001-2003

BT², Inc.: Hydrogeologist, 1991-1996

SELECTED PROJECT EXPERIENCE**Replacement Siting Study for Unit Well 3, Madison Water Utility, (MARS Project Manager)**

- Leading multidisciplinary team in hydrogeologic, land use, and infrastructure analysis of potential well sites on Madison's east isthmus
- Coordinating extensive public involvement including public meetings & community working group

Urban Service Area Extension Impact Assessment, City of Verona, WI (MARS Project Manager)

- Assessing surface water and groundwater hydrology & ecological resources for Badger Mill Cr. and Upper Sugar R. southwest of Verona
- Modeling impacts of development on ecological resources, including trout fishery & wetlands
- Recommending future development location, type & management practices to maintain key ecological functions

Groundwater Recharge System Design, Madison Gas & Electric (MARS Project Manager)

- Designed 80 MGY stormwater infiltration system at the Odana Hills Golf Course
- Conducted soil & groundwater field investigation
- Modeled surface water source hydraulics (XP-SWMM), soil infiltration & groundwater flow with 3-dimensional flow model (MODFLOW)
- Coordinated extensive public input & regulatory review

Proposed Subdivision Water Supply Options Analysis, Middleton, WI (MARS Project Engineer)

- Evaluated hydrogeologic data to assist risk analysis for a proposed residential subdivision well adjacent to a Superfund landfill
- Modeled groundwater capture for potential well locations using MODFLOW & MODPATH



SELECTED PUBLICATIONS & PRESENTATIONS

Larson, A and S Gaffield, 2007. *Siting a New Well in an Urban Setting: The Story of Replacing Well 3 in Madison, WI*. Presentation at Wisc. Water Assoc. annual meeting.

Gotkowitz, MB and SJ Gaffield, 2006. *Water-Table and Aquifer-Susceptibility Maps of Calumet County, Wisconsin*. Wisc. Geol. & Nat. History Survey Miscellaneous Map 56.

Montgomery, RJ, SJ Gaffield and NR Zolidis, 2005. *Infiltration of Stormwater Runoff for Groundwater Recharge, Dane County, Wisconsin*. Paper for 10th Internatl. Conf. on Urban Drainage, Copenhagen, Denmark.

Gaffield, SJ, KW Potter and L Wang, 2005. *Predicting the Summer Temperature of Small Streams in Southwestern Wisconsin*. Jour. Amer. Water Res. Assoc. 41(1): 25-36.

Coauthor of *Ch. 7: Water Quantity and Quality*, in H Frumkin, L Frank and R Jackson, 2004, *Urban Sprawl and Public Health*. Island Press.

Gaffield, SJ, RL Goo, LA Richards and RJ Jackson, 2003. *Public Health Effects of Inadequately Managed Stormwater Runoff*. Amer. Jour. of Public Health 93(9): 1527-1533.

Potter, KW and SJ Gaffield, 2001. *Watershed Assessment with Synoptic Base-Flow Surveys*. Amer. Geophys. Union, Water Sci. & Application 4: 19-25.

Gaffield, SJ, KR Bradbury and MB Gotkowitz, 2001. *Analysis of Uncertainty in Analytic Element Groundwater Models by the Monte Carlo Method*. Presentation at Geol. Soc. Amer. annual meeting.

Gaffield, SJ and DM Mickelson, 1995. *Driving Stress, Hydraulic Head and Landform Genesis at the Southeastern Burroughs Glacier*. Proc. of Third Glacier Bay Sci. Symp, 1993.

TECHNICAL COMMITTEES

Dane County Infiltration Task Force, 2006

Water Supply Well Capture Zone Delineation, Rock County, WI (WGNHS Hydrogeologist)

- Delineated zones of contribution for all municipal wells in Rock County
- Constructed analytic element (GFLOW) and finite-difference (MODFLOW & MODPATH) models
- Calibrated GFLOW with inverse model UCODE (Perl language)
- Developed Visual Basic for Applications code to run Monte Carlo statistical analysis using GFLOW for parameter uncertainty analysis

Little Green Lake Proposed Water Quality Dam Breach Analysis, Green Lake County, WI (MARS QA/QC Manager)

- Assisted in planning hydraulic model design and construction, including double dam breach analysis using HEC-RAS in unsteady mode
- Reviewed hydraulic model, flood shadow inundation maps, and project report

Dam Safety Analysis and Repair Plan, LaFayette, WI (MARS Project Manager)

- Conducted dam breach analysis using watershed model (XP-SWMM) and hydraulic model (HEC-RAS)
- Prepared drawings and specifications for repairs
- Observed site grading, erosion control & armor placement

San Diego Creek Channel Repair Design, Irvine, CA (MARS Project Engineer)

- Assisted repair design for articulated concrete block (ACB) channel lining, including drop structure design
- Modeled sediment transport with HEC-RAS to assess sediment thickness and channel bedforms & roughness

Round Lake Water Level Analysis, Sawyer County, WI (MARS Project Engineer)

- Provided hydraulic assistance in legal dispute over lake level
- Conducted extensive historical lake level data and management review
- Reviewed hydraulic models of opposing experts (HEC-1 & HEC-RAS) & conducted additional hydraulic modeling of potential lake outlet structure modifications

Groundwater and Trout Stream Temperature Research (UW-Madison & WGNHS)

- Monitored & modeled stream temperature and groundwater flow to assess & predict water temperature controls
- Simulated land use impacts on stream baseflow & temperature with geographic information system (GIS) & groundwater models (GFLOW & MODFLOW)

STEPHEN J. GAFFIELD, PH.D., P.E.
SENIOR HYDROLOGIST

Montgomery Associates 
Resource Solutions, LLC