

**Michael A. Mobile, Ph.D., CGWP**

**Summary**

Dr. Mobile focuses in the areas of quantitative hydrogeology and hydrology, solute fate-and-transport, and water resources management. He has worked as a researcher and consultant specializing in numerical groundwater flow and reactive fate-and-transport modeling for nearly 20 years. Project experience has included model development in support of several large-scale, high-profile construction activities, natural resource management projects, and litigation/conflict resolution assignments. The challenging nature of much of this work has allowed Dr. Mobile to explore a wide variety of innovative and interdisciplinary approaches to addressing regional and site-specific challenges.

**Professional Experience**

**McDonald Morrissey Associates, LLC, President (2018-current)**

Directs and provides technical assistance to projects dealing with a wide variety of water resource issues. Leads design, development, calibration and sensitivity testing of numerical groundwater flow and solute fate-and-transport models. Oversees geospatial data management and geostatistical evaluations. Acts as lead expert on projects involving assessments of per- and polyfluoroalkyl substance (PFAS) occurrence and fate-and-transport in groundwater.

**GZA GeoEnvironmental, Inc., Senior Technical Specialist (2012-2018)**

Served as a technical resource and project manager for a variety of projects spanning multiple disciplines. Served as in-house technical lead on quantitative groundwater modeling, PFAS occurrence and fate-and-transport characteristics, and three-dimensional data analysis. Contributed to several deterministic and probabilistic flood hazard evaluations mandated by the Nuclear Regulatory Commission (NRC).

**Independent Consulting with Dr. M. Widdowson, Technical Specialist (2007-2012)**

Provided numerical modeling support to environmental and geotechnical engineering projects. Modified and implemented advanced reactive transport codes to simulate non-aqueous phase liquid (NAPL) source behavior.

**McDonald Morrissey Associates, Inc., Hydrogeologist (1999-2006)**

Supported a variety of numerical modeling projects. Assisted with geographical information system (GIS) data analysis and model integration.

## **Representative Major Projects**

**Nebraska Department of Natural Resources (NeDNR) General Support Services, 2022 – current** – Serving as project lead in supporting the NeDNR and its staff in their water planning work by providing services and creating software that will support efficient development of groundwater modeling analyses for testing groundwater management strategies. Leading MMA’s efforts in providing guidance and training in groundwater modeling methods, model review best practices, approaches to groundwater calibration, and workflow development.

**Regional Groundwater Model Review and Revision, Platte River and Basin Cooperative Hydrologic Study (COHYST), Nebraska Department of Natural Resources (NeDNR), 2022 – 2023** – assisted in reviews the existing COHYST regional groundwater model and its application to various management issues. Supported updating certain model specifications; provided guidance to the NeDNR relative to their applications of the updated model; assisted in the development of model documentation; participated in reviews by the stakeholder technical committee; and assisted with preparing deliverables to parties interested in the Upper Platte Basin Plan.

**Expert Review of Groundwater Mounding Analysis for Proposed Residential Development in Weston, Massachusetts, Hill Law, 2020 – current** – Reviewed MODFLOW modeling and groundwater mounding analyses performed in support of a Comprehensive Permit application submitted to the Weston Zoning Board of Appeals (ZBA) on behalf of abutters to the proposed development project. Prepared and issued several comment letters to the ZBA and to the Massachusetts Department of Environmental Protection (MassDEP) noting deficiencies identified during the review process. Presented review findings during ZBA public meetings. Utilizing advanced uncertainty and calibration techniques (e.g., iterative ensemble smoothing via PEST++) to assess predictive uncertainty tied to uncertainty associated with the values of key model parameters.

**Expert Review of Groundwater Mounding Analysis for Proposed Residential Development in Milton, Massachusetts, Corcoran & Associates, PC, 2021 – current** – Reviewed MODFLOW modeling and groundwater mounding analyses performed in support of permit applications submitted to the Milton Zoning Board of Appeals (ZBA) and Conservation Commission (ConCom) on behalf of abutters to the proposed development project. Prepared and issued several comment letters noting deficiencies identified during the review process. Presented review findings during ZBA and ConCom public meetings.

**Testifying Expert, PFAS Fate and Transport, Confidential Client, New Hampshire, 2019 – current** – Reviewed materials submitted by testifying experts and others, including calculations and mathematical modeling results used to assess PFAS fate and transport behaviors in unsaturated and saturated subsurface media. Developed and issued expert and rebuttal reports. Supported lead attorneys during depositions and hearings. Provided deposition testimony.

### **Representative Major Projects (cont.)**

**Confidential Project, Southern Maine, 2019 – current** – Serving as project director and technical lead overseeing the development of a complex groundwater flow and solute transport model dedicated to assessing ex-situ treatment strategies. Utilizing MODFLOW-NWT, MODPATH, MT3D-USGS, and advanced PEST-based calibration techniques.

**Proposed Nordic Aquafarms Aquaculture facility, Belfast, Maine, 2019 – 2020** – Provided hydrogeologic and modeling services to a technical team focused on supporting various permit applications associated with the proposed facility. Led development, calibration, and application of a MODFLOW-USG model of the local fractured bedrock aquifer that was used to support estimates of potential yield from a network of proposed supply wells.

**Expert Support, Assessing PFAS Fate and Transport, Confidential Client, Vermont, 2018 – 2021** – Reviewed materials submitted by testifying experts, including various mathematical models used to support opinions on PFAS fate and transport behaviors in unsaturated and saturated subsurface media. Contributed to expert rebuttal reports. Supported lead attorneys during depositions and hearings.

**Confidential Project, Long Island, New York, 2018 – 2019** – Primarily responsible for reviewing MODPATH advective transport and MT3DMS reactive transport simulations. Supported condition evaluations by team members using analytical modeling, data assessment, and independent modeling techniques.

**Confidential Modeling Assessment, Southern Vermont, 2018 – 2020** – Served as project director and technical lead overseeing the development of groundwater flow and advective PFAS transport simulations using MODFLOW-NWT and MODPATH, respectively. Led advanced calibration efforts using PEST\_HP and local high-performance computing cluster.

**Municipal Water Supply Expansion Assessment, Bethel, Connecticut, 2018 - 2019** – Served as project director and technical lead responsible for overseeing data assessment and assimilation into numerical model dedicated to assessing potential yield of proposed municipal supply well. Utilized unstructured grid modeling code (MODFLOW-USG) and applied advanced techniques (PEST\_HP) to support extensive calibration effort.

### **Representative Major Projects Completed Prior to Rejoining MMA**

**Confidential Contaminated Site, Michigan, 2017 – 2018** – Primarily responsible for reviewing analytical data associated with sampling and analysis of soil, groundwater, and drinking water from sites potentially impacted by PFAS use at former tannery. Additional responsibilities included preparation and implementation of site investigation work plans and conceptual model development.

## **Representative Major Projects Completed Prior to Rejoining MMA (cont.)**

**Investigation of Perfluorooctanoic Acid (PFOA) Contamination, Amherst, New Hampshire, 2016 - 2018** – Responsible for preparation and implementation of soil sampling and site investigation work plans associated with assessing PFOA contamination linked to a former textile coating operation in Amherst, New Hampshire.

**Brentwood Drill Yard Site Investigation, Brentwood, New Hampshire, 2017 – 2018** – Responsible for preparation and implementation of site investigation work plan associated with assessing PFAS contamination linked to historical fire training practices. Additional responsibilities included serving as point-of-contact with the State regulatory agency, coordination and management of specialized analytical laboratory services, data analysis, and report preparation.

**Third-Party Review of Supplemental Remedial Investigation of the Former Chlor-Alkali Plant Property, Berlin, New Hampshire, 2017 – 2018** – Provided third-party reviews of documents submitted by the responsible party's consultant pertaining to assessing and proposing potential remedial options for various site contaminants, including mercury in soil, groundwater, and occurring in liquid elemental form within the Androscoggin River. Acted as technical lead in communications with EPA, the responsible party, and their consultants.

**Expert Support for the Independent Oil and Gas Association of West Virginia, 2016 – 2017** – Provided expert review services related to a geospatial analysis and empirical modeling technique being used to determine zones of critical concern (ZCCs) and zones of peripheral concern (ZPCs) above surface water intakes. Presented expert opinion during appeal heard by the West Virginia Environmental Quality Board.

**Remedial Performance Assessment for Confidential Industrial Client, Massachusetts, 2014 – 2016** – Served as technical lead responsible for evaluating state of capture associated with existing groundwater “pump-and-treat” remediation system at a site contaminated with chlorinated solvents. Developed three-dimensional numerical groundwater flow model (MODFLOW-2005) for the site and calibrated the model to observed hydraulic head and pumping test data using a model-independent parameter estimation technique (PEST). Recommendations were made to the client regarding locations and target pumping rates for recovery system expansions and replacements.

**Remedial Investigation Support, Town of Salem, New Hampshire, 2016 – 2018** – Served as technical lead responsible for evaluating plume extent and degradation rates at a site contaminated with chlorinated solvents. Developed three-dimensional numerical groundwater flow (MODFLOW-2005) and reactive-solute transport model (MT3DMS) for the site. Reactivity with a remedial additive was simulated to determine zone-of-influence dimensions and to evaluate potential for interaction with down-gradient groundwater sink.

## **Education**

2003 – B.S. Hydrology, University of New Hampshire

2008 – M.S. Environmental Engineering, Virginia Polytechnic Institute and State University (Virginia Tech)

2012 – Ph.D. Civil Engineering, Virginia Polytechnic Institute and State University (Virginia Tech)

## **Publications and Presentations Within the Last 10 Years**

**Mobile, M. A.**, Widdowson, M., Stewart, L., Nyman, J., Deeb, R., Kavanaugh, M., Mercer, J., Gallagher, D., *In-situ Determination of Field-Scale NAPL Mass Transfer Coefficients: Performance, Simulation, and Analysis*, Journal of Contaminant Hydrology 187:31-46, 2016.

**Mobile, M. A.**, Widdowson, M., Gallagher, D., *Multicomponent NAPL Source Dissolution: Evaluation of Mass-Transfer Coefficients*, Environmental Science & Technology 46(18): 10047-54, 2012.

**Mobile, M. A.**, Stapleton, D., Stewart, D., Branscome, L. *Assessing Extreme Coastal Storm Climatology and Associated Flooding Potential for Coastal New England*, (Platform) Coasts, Oceans, Ports, and Rivers Institute (COPRI) Coastal Structures and Solutions to Coastal Disasters Joint Conference 2015, September 11, 2015.

Wang, B., Liu, T., Stapleton, D., **Mobile, M.** Coastal Data Application: *Projecting Future Coastal Flood Risk for Massachusetts Bay*, (Platform) Coastal GeoTools Conference, April 2, 2015.

Wang, B., **Mobile, M.**, Stapleton, D., Leone, D. *Low-Probability Storm Surge Analysis*, (Platform) American Shore and Beach Preservation Association (ASBPA) 2014 - Virginia Beach, October 14, 2014.

Kinsella, K., **Mobile, M.** *Phytoremediation for Tritiated Groundwater Management*, (Platform) Electric Power Research Institute (EPRI) Nuclear Energy Institute (NEI) Groundwater Protection Workshop, June 27, 2014.

**Mobile, M. A.**, Barvenik, M., Hunu, K. *Impacts of Flooding on Groundwater at Nuclear Power Plants*, (Platform) EPRI NEI Groundwater Protection Workshop, June 27, 2013.

**Mobile, M. A.** *Using Models to Evaluate Remedial Options*, (Platform) Joint American Council of Engineering Companies (ACEC) and Maine Department of Environmental Protection (MEDEP) Technical Seminar – Key Challenges Affecting Development and Engineering Work in Maine, 2013.

### **Professional Registrations**

National Groundwater Association (NGWA) Certified Groundwater Professional  
#3145204

### **Professional Affiliations**

Geological Society of America (GSA)  
National Groundwater Association (NGWA)  
Interstate Technology and Regulatory Council (ITRC), PFAS technical team (former)  
ITRC, Managed Aquifer Recharge (MAR) technical team (current)

### **Honors/Relevant Training**

OSHA HAZWOPER 40 Hour Training Certificate  
Edna Bailey Sussman Research Fellowship  
NEWMOA Monitored Natural Attenuation (MNA) for Site Cleanup Short Course  
IGWMC Certificate, Introduction to Numerical Modeling  
Best Student Research Poster, 2011 REMTEC Summit