



PHIL BURKHALTER, PH.D., P.E.

Water Resources Engineering Specialist



LICENSES

Professional Engineer:

#37721, Colorado

Certified Floodplain Manager:

#US-21-12063

Project Management Professional:

#1740832

EXPERTISE

- Floodplain Management
- Program and Project Management
- Hydrologic and Hydraulic Modeling
- Decision Support System Development
- Consumptive Use Modeling
- Water Allocation Modeling
- Water Rights
- Real-Time Flood Forecasting
- Remote Sensing

EDUCATION

Texas A&M University:

BS/1992/Civil Engineering

Colorado State University:

MS/2000/ Water Resources Planning
& Management, Civil Engineering

BIO

Dr. Burkhalter has over 25 years of experience working in water resources and environmental consulting and research. With an emphasis on Water Resources Planning and Management, his work has included decision support system development and implementation, flood forecasting model development, groundwater flow and quality modeling, water allocation studies, water rights, and application of several hydrologic and hydraulic models. He is the current project manager and technical lead for Trihydro's floodplain modeling and mapping work with the Federal Emergency Management Agency (FEMA). Additionally, he has served for many years as a Program and Project Manager for several clients including the U.S. Army Corps of Engineers and the National Weather Service, where he assisted the Southeast River Forecast Center (SERFC) with several hydrologic modeling and forecasting projects.

EXPERIENCE

ENGINEERING AND HYDROLOGIC MODELING SUPPORT FOR THE NATIONAL WEATHER SERVICE, SOUTHEAST RIVER FORECAST CENTER • MULTIPLE LOCATIONS IN SOUTHEASTERN US

Project Manager/Technical Lead

Performed a wide variety of modeling projects in support of the Southeast River Forecast Center (SERFC). Projects included the hydrologic model development and calibration of the St. Johns River basin, the development of a hydraulic and hydrologic model to improve forecasts of the interaction of the Santa Fe and Suwanee Rivers, as well as development and calibration of over 100 hydrologic models in the SERFC service area including basins in North Carolina, South Carolina, Georgia, Florida, and Alabama. Additional projects included developing dozens of operational reservoir models, performing dam break analyses, and development of historical mean areal precipitation time series for the entire SERFC service area.

REGIONAL GROUNDWATER SUPPLY PROTECTION PROJECT • MODESTO, CA

Project Manager

Dr. Burkhalter is currently serving as the Project Manager for a project with the City of Modesto to protect and enhance the City's existing groundwater supply. Following a previous feasibility study that identified a preferred approach to effectively mitigate non-point source pollution derived from regional agricultural activities, the current project is performing required environmental assessments in accordance with California Environmental Quality Act (CEQA) regulations. The preferred approach includes an optimized pumping strategy that was developed through MODFLOW and MT3D modeling in conjunction with the modeling and design of four large Managed Aquifer Recharge (MAR) basins. Following the completion of this CEQA compliance project, it is expected that the implementation phase of the project will begin in Summer 2023.

Colorado State University:
PhD/2005/Water Resources Planning
& Management, Civil Engineering

PUBLICATIONS

Burkhalter, J. P., Martin, T. C., Allen, R. G., Kjaersgaard, J., Wilson, E., Alvarado, R., & Polly, J. S. (2013).

Estimating crop water use via remote sensing techniques vs. conventional methods in the South Platte River Basin, Colorado. *Journal of the American Water Resources Association*, 49(3), 498–517.

Burkhalter, J. P., & Gates, T. K. (2006). Evaluating regional solutions to salinization and waterlogging in an irrigated river valley. *Journal of Irrigation and Drainage Engineering*, 132(1), 21–30. Selected as Honorable Mention Paper of the Year for 2006.

Burkhalter, J. P., & Gates, T. K. (2005). Agroecological impacts from salinization and waterlogging in an irrigated river valley. *Journal of Irrigation and Drainage Engineering*, 131(2), 197–209.

Martin, T. C., Allen, R. G., Brazil, L. E., Burkhalter, J. P., & Polly, J. S. (2013). Evapotranspiration estimates from remote sensing for irrigation water management. In J. Qu, A. Powell, & M. V. K. Sivakumar (Eds.), *Satellite-based applications on climate change* (pp. 195–216). New York: Springer.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) MAPPING PARTNER • STRATEGIC ALLIANCE FOR RISK REDUCTION (STARR II) • MULTIPLE LOCATIONS

Project Manager/Technical Lead

As part of the STARR II team, serves as the Trihydro Project Manager and Technical Lead as a mapping partner for FEMA Flood Insurance Study (FIS) updates. Current projects include areas in FEMA Region 3, with upcoming projects in Regions 8, 9, and 10 expected to begin in mid-2022. Project work includes developing hydraulic floodplain models in HEC-RAS, updating mapping products, and revising FIS documentation. Models are developed from high-resolution terrain data, field survey data of river cross-sections and structures, and hydrologic modeling outputs.

CAL-WOOD FIRE INFRASTRUCTURE PROTECTION PROJECT • BOULDER COUNTY, COLORADO

Project Manager/Lead Modeler

Serving as Project Manager and Lead Modeler on a project to provide debris and sediment flow protection to a post-wildfire region in Boulder County. As part of the Natural Resources Conservation Service (NRCS) Emergency Watershed Protection program, the project includes the design of specific mitigation measures based on hydrologic, hydraulic, and debris flow modeling results, which were performed primarily using a 2-D rain-on-grid approach available in HEC-RAS v.6.0. In addition, prepared 1-D hydraulic models of proposed structures in support of obtaining a floodplain development permit for the County. Work also includes field data collection and analysis, site assessment, additional permitting support, construction oversight, post-construction inspections, and additional design modeling.

MODELING, MAPPING, AND CONSEQUENCES (MMC) PRODUCTION CENTER, CORPS WATER MANAGEMENT SYSTEM (CWMS) DEVELOPMENT • MULTIPLE LOCATIONS

Program Manager/Project Manager/Technical Lead

For the U.S. Army Corps of Engineers' (USACE's) Vicksburg District, oversaw multiple projects in support of the MMC Production Center's efforts to deploy the Hydrologic Engineering Center's Corps Water Management System (HEC-CWMS) across the country. Projects included complete CWMS implementations for the Rogue River watershed in Oregon and the Cowlitz and Lewis watersheds in Washington and developing a 2-D river analysis system (RAS) model for the Boise River in Idaho.

EXPERT WITNESS SERVICES – PLATTE RIVER BASIN • NEBRASKA

Flood Modeling Expert

Provided an expert witness opinion for a confidential client in a case involving flooding along the Platte River in Nebraska. Performed a detailed analysis of hydrometeorological data and modeling of a historic flooding event along the Platte River in Nebraska that occurred in 2019. Collected and reviewed available datasets and used statistical analyses to characterize the event and determine the most significant factors that drove historic flood levels. Reviewed existing models and assessed their adequacy in simulating the actual conditions. Produced an opinion paper that is being used in ongoing litigation.



TEXAS WATER DEVELOPMENT BOARD—HYDROLOGIC MODEL DEVELOPMENT FOR THE WEST GULF RIVER FORECAST CENTER (WGRFC) • MULTIPLE RIVER BASINS IN TEXAS

Project Manager/Senior Hydrologic Modeler

This project involved the development and calibration of hydrologic models to support the National Weather Service's (NWS's) WGRFC. Funded by the Texas Water Development Board, the project included sites in Texas impacted by recent major floods, including Hurricane Harvey, in and near the cities of Houston, Austin, and San Antonio. Models were developed to execute at a 1-hour time step with the primary purpose of improving the WGRFC's capacity to provide timely and accurate flood forecasts.

LOWER ARKANSAS RIVER VALLEY WATERLOGGING AND SALINITY MODELING • ARKANSAS RIVER BASIN, COLORADO

Research Lead

Developed and calibrated a three-dimensional steady-state and transient groundwater flow (MODFLOW) and contaminant transport (MT3DMS) models for a study area in the Lower Arkansas River Valley of Colorado. Programming in FORTRAN90, created a modified version of MT3DMS that includes a new module to model contaminant transport within the unsaturated zone. Initiated and implemented data collection program that included contacting local farmers, installing monitoring wells, global positioning system (GPS) surveying, slug test analyses, soil surveys, and weekly water table depth and contaminant monitoring. Applied the developed models to evaluate proposed regional waterlogging and salinity solution alternatives.

INTEGRATED WATER RESOURCES SCIENCE AND SERVICES (IWRSS) DEMONSTRATION PROJECT • SILVER SPRING, MD

Project Manager

The purpose of this project was to assist NWS's Office of Hydrologic Development (OHD) with investigating and demonstrating modeling tools provided by IWRSS partners. Work included implementing the U.S. Geological Survey (USGS) models PRMS, MODFLOW, and GSFLOW for a test region of interest. The investigation also included demonstration of USACE-supported models including GSSHA. Project work included the demonstration of the modeling capabilities to simulate groundwater-surface water interactions and the benefits of utilizing high-resolution distributed modeling methods.

TVA RIVER FORECAST CENTER MODERNIZATION • TENNESSEE RIVER VALLEY

Senior Hydrologic Modeler/Technical Lead

For the Tennessee Valley Authority (TVA), coordinated and performed detailed model calibration of NWS-River Forecast System (RFS) models within the TVA service area. Specifically, derived sets of Sacramento Soil Moisture Accounting (SAC-SMA) and unit hydrograph (UNIT-HG) model parameters to improve overall predictive performance of TVA's inflow forecasting system. In addition, developed models to simulate reservoir water surface evaporation and direct precipitation effects. Also performed detailed calibration of required routing (LAG/K method) models.

USACE HYDROLOGIC HAZARDS TEAM PROBABLE MAXIMUM FLOOD ANALYSIS • MULTIPLE RIVER BASINS IN OHIO

Project Manager/Senior Hydrologic Modeler

Performed two Probable Maximum Flood (PMF) studies as part of USACE's Hydrologic Hazards Team. Work included development of calibrated HEC-HMS models and routing models incorporating USACE dam operations in HEC-ResSim. Developed models were used to simulate system response to selected Probable Maximum Precipitation events, which were developed using HMR-52 guidelines.

DYNAMIC FLOOD ROUTING MODELING • TAR RIVER BASIN, NORTH CAROLINA

Project Manager

The purpose of this project for NWS's OHD was to develop a dynamic flood routing model of the Tar River in North Carolina by using HEC-GeoRAS (a river system modeling package coupled with ESRI's ArcGIS software) in conjunction with FLDWAV. Process involved extensive use of GIS technologies including digitizing data from bathymetric maps, importing and processing grid data (including light detection and ranging and USGS Digital Elevation Model), and visually verifying model input. Additionally, oversaw final model testing and calibration.



Travis C. Richardson, M.S., CPSS

Email: Travis@RichardsonSoils.com

Phone No.: 386-937-1283

PROFESSIONAL EXPERIENCE

February 2017 – Present

T. Richardson Soils and Environmental, LLC – Owner and private consultant providing expertise on hydric soils and wetlands to resolve regulatory issues. Responsibilities include oversight and development of all aspects of business. Technical responsibilities include hydric soil assessments, wetland delineation, wetland assessments (UMAM/WRAP), mitigation planning and implementation, onsite treatment and disposal system permitting, and site feasibility studies.

Examples of Technical Support and Training to agencies and consulting firms:

- Soil and wetland evaluations for Wellfield monitoring
- Soil and wetland monitoring for Central Florida Water Initiative DMIT sites (2022 and 2023)
- Hydric Soils Training for SWFWMD water use and regulatory staff (Mar. 2022; Dec 2022)
- Soils Training for SWFWMD engineering staff – USDA methods vs. geotechnical methods (Feb. 2022)
- Seasonal High Water Table Determination – support resolution between SWFWMD and Engineering Firm (Feb. 2021)

April 2014 – June 2017

Technical Program Coordinator for FDOT Mitigation Program – St. Johns River Water Management District, Division of Regulatory Services. Responsibilities include development and implementation of mitigation plans to offset wetland impacts associated with FDOT road projects. Mitigation must satisfy ACOE and SJRWMD requirements. Extensive coordination with federal and state agencies is required. Develop annual budget for program and oversee project implementation and expenditures.

December 2007 – April 2014

Soil Scientist – St. Johns River Water Management District, Division of Regulatory Services. Responsibilities include investigation of dredge and fill of wetlands; expert testimony in administrative hearings; providing training to District, state, and county staff regarding pedology, soil processes and hydric soils; processing Petitions for Formal Determinations of the Landward Extent of Wetlands and other surface waters; assisting staff with soils analyses, conducting soils interpretations, and estimation of seasonal high saturation to support permit reviews, difficult wetland delineations, and compliance cases; review and processing of environmental resource permit applications to determine impacts to environmental resources, ensure adherence to state regulations, and verify implementation of Best Management Practices; assess wetland impacts with the Unified Mitigation Assessment Method; conduct hydrologic assessments for wetland enhancement and restoration activities; and conducting soil investigations and interpretations for hydrologic impacts to wetlands.

September 2002 – December 2007

Environmental Scientist II – St. Johns River Water Management District, Division of Water Supply Management. Responsibilities included preparation and review of technical reports establishing minimum hydrologic regimes for lakes, springs, rivers, and groundwater aquifers; publishing Minimum Flows and Levels reports as Technical Publications with the District; database management and data analysis with SAS, MiniTab, and MS Excel to establish minimum hydrologic regimes; developing criteria to support the establishment of minimum hydrologic regimes; conducting soils investigations (including soil classification, hydric soil determinations, and hydrologic assessment), vegetation surveys and monitoring with belt transect and line intercept methods, and topographic surveys; identifying Florida's ecological communities following the Cowardin et al. 1979; Classification of wetlands and deepwater habitats of the United States and Kinser 1996; Wetland vegetation classification systems; managing contracts for soils analysis and peer reviews of technical reports; and supervising the work load and work products of interns and contingent workers.

April 2000 – September 2002

Environmental Scientist – BCI Engineers and Scientists, Inc., Contractor to St. Johns River Water Management District, Division of Water Supply Management. Responsibilities included preparation and review of technical reports establishing minimum hydrologic regimes for lakes, springs, streams, rivers, and groundwater aquifers; analyzing data to establish minimum hydrologic regimes; developing criteria to support the establishment of minimum hydrologic regimes; conducting soils investigations, vegetation surveys, and topographic surveys; and managing contracts for soils analysis and peer reviews of technical reports.

EDUCATION

Master of Science in Soil and Water Science – University of Florida, 2006
Bachelor of Science in Zoology – University of Florida, 1999

EXPERT TESTIMONY

August 25-29, 2014	FLORIDA DEFENDERS OF THE ENVIRONMENT SIERRA CLUB ST. JOHNS RIVER KEEPER	vs. SLEEPY CREEK LANDS SJRWMD
December 10, 2013	BARNES vs. ST. JOHNS RIVER STATE COLLEGE	
March 11 & 12, 2009	SJRWMD vs. FRANK MOLICA	

OTHER TRAINING

May 2014; June 2021	Certified Professional Soil Scientist Florida Certification Course
April 2009-2022	Annual Florida Association of Environmental Soil Scientists Hydric Soils Workshop
April 16, 2008	Hydric Soils and Whole Landscape Hydrology Workshop
March 19-20, 2008	Florida Stormwater, Erosion and Sedimentation control Inspector Training and Certification Program
March 3, 2007	Vegetation Monitoring in a Management Context (Feb 26 – March 3)
June 30, 2006	Hydric Soils Short Course (June 26-30)
December 13, 2002	Hydric Soils: Specialized Training for the Wetlands Professional (Dec 9-13)

SOFTWARE PROFICIENCY

Microsoft Office (Word, Excel, PowerPoint, Access), ArcMap, ArcPad, Grapher, MiniTab

PUBLICATIONS

Ellis, L.R., Mahler, W.D., and Richardson, T.C. 2012. LiDAR Based Delineation of Depressional Wetlands. Trends in Soil and Plant Sciences Journal. Vol. 3(1). April 2012.

Richardson, T.C., P. Robison, C.P. Neubauer, and G.B. Hall. 2009. Hydrologic signature analysis of select organic hydric soil indicators in northeastern Florida. Soil Science Society of America Journal. Vol. 73(3). May-June 2009.

Richardson, T.C. 2008. Minimum levels reevaluation: Lake Colby, Volusia County. Technical Publication SJ2008-1. St. Johns River Water Management District. Palatka, Florida.

Richardson, T.C. 2008. Minimum levels reevaluation: Three Island Lakes, Volusia County. Technical Publication SJ2008-2. St. Johns River Water Management District. Palatka, Florida.

Nkedi-Kizza, P. and T.C. Richardson. 2007. Characterization of sandhill lake soils: In support of St. Johns River Water Management District's Minimum Flows and Levels Program. Special Publication SJ2007-SP7.

Richardson, T.C. 2006. Relationships of Florida sandhill lake soil parameters with the capillary fringe, oxidation-reduction potential, and air entry values. Thesis. University of Florida.

PROFESSIONAL ORGANIZATIONS

Florida Association of Environmental Soil Scientists (2006 – present), Secretary/Treasurer (2009 – 2016), President Elect (2022 – present)

Soil Science Society of America (2008 – present)

Society of Wetland Scientists (2021 – present)