Jeffrey N. King, PhD, PE
Senior Engineer

Geosyntec consultants | ATM A Geosyntec Company

PROFESSIONAL EXPERIENCE

Overall Years: 24
Years with ATM: 2.5

AREAS OF SPECIALIZATION

- Surface Water Hydrology
- Wetland Hydrology
- Watershed Management Planning
- Hydrologic, Hydrodynamic, Hydrogeologic, and Water-Quality Modeling
- Stormwater Management
- Flood Hazard Risk Assessment
- Floodplain Mapping
- Hydrogeology
- Deep Well Injection
- Groundwater/Surface Water Interaction
- Benthic Flux
- Technical Communication

EDUCATION

PhD, Coastal and Oceanographic Engineering, University of Florida, 2007

MS, Environmental Water Resources Engineering, University of California at Berkeley, 1995

BS, Civil Engineering, University of Florida, 1993

PROFESSIONAL REGISTRATION

Professional Engineer (Civil), Florida, No. 54599, first registered in 1999

SUMMARY OF QUALIFICATIONS

Dr. Jeffrey King joined ATM in July 2019. He has almost 25 years professional experience, including a decade as a research hydrologist with the United States Geological Survey in their Caribbean and Florida Water Science Center, and three years as an in-house consultant to the Federal Emergency Management Agency's National Flood Insurance Program in greater Washington D.C. Dr. King models and analyzes watersheds, rivers, wetlands, alluvial fans, lakes, estuaries, the ocean, and aquifers to address practical challenges for both governmental entities and private clients.

Dr. King is a published author, with work in the *Journal of Geophysical Research*, *Hydrology Journal*, *Water Resources Research*, *Continental Shelf Research*, and Elsevier's twelve-volume Treatise on Estuarine and Coastal Science.

QUALIFICATIONS

Simulation Experience

- 3D Hydrodynamic Simulation: Delft3D-FM, EFDC, CH3D
- 2D Hydrodynamic Simulation: Delft3D-FM, HEC-RAS, ICPR4, SMS (FESWMS, RMA2), FLO-2D
- 1D Hydraulic Simulation: HEC-RAS, ICPR4, SWMM, HEC-2, WSP2, WSPG, QUICK2
- Sediment Transport and Bed Shear Stress Simulation: Delft3D-FM, HEC-RAS, HEC-6, Gstars,
- Hydrologic Simulation: ICPR4, SWMM, HEC-1, HEC-HMS, PeakFQ, NFF
- Alluvial Fan Flood Hazard Risk Assessment Simulation: FLO-2D, AFAN
- Visualization: TECPlot, Surfer
- GIS: ArcView, ArcINFO, ArcMap 3D Analyst, ArcMap Spatial Analyst
- Groundwater Simulation: SEAWAT, MT3DMS, MODFLOW, AQTESOLV, GWater1
- Optimization: PEST
- Mathematical: Matlab, Maple, MathCad, Mathmatica
- Programming Languages: Python, FORTRAN, Avenue, Visual Basic for Applications, HTML
- Drafting: AutoCad, AutoSolid, Microstation
- Operating Systems: UNIX, Linux, Cygwin, DOS

Training

- Continuous profiling using Chirp seismic and coupled-capacitance resistivity [USGS]
- Fiber-optic distributed temperature sensing (FO-DTS) [USGS]
- Flood hazard simulation with FLO-2D [Colorado State University]
- Geographic information system support for hydrologic and hydraulic simulation and analyses with Interconnected Channel and Pond Routing (ICPR4) [ESRI and Streamline Technologies]
- Ground penetrating radar (GPR) [USGS]
- Noise removal and drawdown estimation with MODOptim for aquifer analysis [USGS]
- R (statistics package) [USGS]
- Surface water modeling system (SMS) [Brigham Young University]
- U.S. Army Corps of Engineers Hydraulic Engineering Center River Analysis System (HEC-RAS) [Michigan Technological University]
- Water Level simulation and time-series analysis with SeriesSEE [USGS]
- Parameter estimation with the inverse method (PEST) [USGS and Watermark Numerical Computing]

PROJECT EXPERIENCE

ICPR

Senior Engineer with Applied Technology & Management
State Road 7 Extension, City of West Palm Beach and Palm Beach County, Florida; funded by the Florida Department of Transportation for about $400,000 (08/2019–present):
Dr. King and colleagues obtained an environmental resource permit and water use permit from the South Florida Water Management District, to extend State Road 7 in Palm Beach County from Okeechobee Boulevard to Northlake Boulevard. King and colleagues assisted as experts, outside defense council to the Florida Department of Transportation, and co-defendants South Florida Water Management District and Palm Beach County in an administrative lawsuit filed by the City of West Palm Beach, objecting to the issuance of these permits. King and colleagues assessed the following characteristics of the West Palm Beach Water Catchment Area: disturbed nature of the ecosystem, flood hazards, hydrogeology, hydraulics in the M canal, seasonal-high water level, water-constituent loads from constructed to the catchment area, water-constituent loads from natural systems, water resources of the State of Florida near the catchment area, the Comprehensive Everglades Restoration Project Loxahatchee River Watershed Restoration Project, and the City of West Palm Beach water supply. King simulated the surficial aquifer system with **MODFLOW**; and wetland hydrology, constructed stormwater management systems, precipitation, evapotranspiration, and surface-water/aquifer flux with **ICPR4**.

King, J.N., 2020 (November 20). State Road 7 extension, Palm Beach County, Florida (Okeechobee Blvd. to Northlake Blvd.), groundwater flow assessment: Applied Technology & Management, Inc. report for Florida Department of Transportation financial project identification 229664–6–52–01 & 229664–7–52–01, filed with the South Florida Water Management District under environmental resource permit application number 200390-4370, signed and sealed by Jeffrey N. King, PhD PE, 163 p., 10 tables, 108 figures, 1 plate, 18 photographs, accessed March 5, 2021 at https://apps.sfwmd.gov/entsb/docdownload?object_id=0900eeea8fdad0f6.

Frydenborg, R, S. Peene, J.N. King, and B. Frydenborg, 2021 (February 17). State Road 7 extension, (Okeechobee Blvd. to Northlake Blvd.), water-quality assessment north of Northlake Boulevard: Applied Technology & Management, Inc. report for Florida Department of Transportation financial project identification 229664–6–52–01 & 229664–7–52–01, filed with the South Florida Water Management District under environmental resource permit application number 200390-4370, 102 p., 28 tables, 58 figures, 1 appendix, archived with the South Florida Water Management District.

King, J.N., and S. Scheda, 2021 (April 9). Combined hydroperiod assessment: State Road 7 extension, Palm Beach County, and Northlake Boulevard, Stonewall Drive to State Road 7, Palm Beach County: Applied Technology & Management and Environmental Science Associates memorandum 193375, 7 p, archived with the South Florida Water Management District.

King, J.N., 2021 (March 5). Revised groundwater assessment: Applied Technology & Management memorandum 193375, 16 p, 9 tables, 7 figs, archived with the South Florida Water Management District.

King, J.N., 2020 (October 11). State Road 7 extension, Palm Beach County, Florida (Okeechobee Blvd. to Northlake Blvd.), assessment of the potential for adverse flooding north of Northlake Boulevard: Applied Technology & Management, Inc. report for Florida Department of Transportation financial project identification 229664–6–52–01 & 229664–7–52–01, filed with the South Florida Water Management District under environmental resource permit application number 200390-4370, signed and sealed by Jeffrey N. King, PhD PE, 3 volumes, 109 p, 12 tables, 5 figures, 26 plates, 63 photographs, accessed March 25, 2021 at https://apps.sfwmd.gov/entsb/docdownload?object_id=0900eeea8f5aa55c.

Associate Engineer with Wood Environment & Infrastructure Solutions
Albritton Wetland Restoration Easement, Natural Resource Conservation Service Wetlands Reserve Program, United States Department of Agriculture, Clewiston, FL, United States, $645,998 (09/21/2016–01/2019):

Dr. King lead the development of hydrologic and hydraulic simulations of the effects of five, synthetic, episodic precipitation events, and a continuous simulation of the hydrologic cycle from 1996 to 2016, on the contemporary drainage system, on two wetland restoration alternatives, for agricultural property owned by Albritton and Sons in Hendry County, Florida. The primary objective of the project was to recover historic hydrological and ecological conditions degraded by the practice of agriculture. Simulation was with **ICPR4**. Water-surface elevation, surface-water flows, and the area inundated by surface water were simulated throughout the hydrologic cycle on the Albritton project site. The simulation detailed a 52-square-mile basin, and included surface-water/groundwater interaction, a two-dimensional overland flow computational framework, a one-dimensional link-node computational framework, and an interface between two-dimensional and one-dimensional frameworks. The Green-Ampt method was used to convolve the rainfall signal into infiltration, runoff, and evapotranspiration signals. King authored parts of wetland reserve plan of operation. King authored and will submit a hydrology report to support application for the South Florida Water Management District Environmental Resource Permit and U.S. Army Corps of Engineers dredge and fill permit.

King, J.N., Stroehlen, C.S., 2019 (January 11), Albritton wetland restoration easement: hydrology report, Hendry County, Florida: Amec Foster Wheeler Environment & Infrastructure project report, Project number 1611-77-0038, 40 p, 49 figs, 16 tables, 3 appendices, DRAFT, to be archived by the U.S. Department of Agriculture, Natural Resource Conservation Service, Okeechobee, Florida, and by the State of Florida, South Florida Water Management District, West Palm Beach, Florida.

King, J.N., Ryan, J., Stroehlen, C.S., Corning, G.C., 2019 (January 11), Albritton wetland restoration easement: Wetlands reserve plan of operations, Hendry County, Florida: Amec Foster Wheeler Environment & Infrastructure project report, Project number 1611-77-0038, 70 p, 53 figs, 24 tables, 10 appendices, DRAFT, to be archived by the U.S. Department of Agriculture, Natural Resource Conservation Service, Okeechobee, Florida.

Associate Engineer with Wood Environment & Infrastructure Solutions
MK Ranch hydrological assessment, Florida Fish and Wildlife Conservation Commission, Apalachicola, FL, United States, $198,753 (09/09/2016–06/30/2017):

Dr. King and colleagues assessed the effectiveness of prior hydrologic restoration activities at the 6,500-acre MK Ranch in Gulf County, Florida, near the Apalachicola River and Bay estuary. King and one colleague prepared conceptual restoration options and estimated cost to restore the ranch to a more natural condition than currently exists. King and one colleague simulated the surface-water system on and near the ranch with **ICPR4**. Water-surface elevation, surface-water flows, and the area inundated by surface water were simulated. The simulation included surface-water/groundwater interaction, a two-dimensional overland flow computational framework, a one-dimensional link-node computational framework, and an interface between two-dimensional and one-dimensional frameworks. Wood installed rain gages, manual and automated surface water level recorders, and automated water temperature

recorders. Stations are solar powered and automated data were digital. King and colleagues managed hydrologic data with geographic information systems and hydrologic databases. The National Fish and Wildlife Foundation published a fact sheet in 2019 that describes the restoration project (https://www.nfwf.org/gulf/Documents/fl-mk-ranch-19.pdf).

King, J.N., and Schaefer, G.D., 2018 (June 15), Hydrologic restoration assessment and plan, MK Ranch, Apalachicola River Wildlife and Environmental Area, Gulf County, Florida: Florida Fish and Wildlife Conservation Commission assessment and plan, Wood project number 600508, Tallahassee, Florida, 353 p, 8 appendices, archived with the commission.

Associate Engineer with Wood Environment & Infrastructure Solutions
Hogtown Creek, Possum Creek, and Hogtown Prairie Watersheds, Gainesville and Alachua County, FL, United States, for the City of Gainesville for about $200,000, (08/2018–06/2019):
Dr. King and colleagues simulated flood hazards in Hogtown Creek, Possum Creek, and Hogtown Prairie Watersheds with **ICPR4**. Simulation was necessary to retrofit or re-design flood mitigation structures in Florida Park and Mason Manor, and to obtain a letter of map revision from the Federal Emergency Management Agency to reflect contemporary flood hazards in about 60 percent of Gainesville. King wrote the proposal, was the technical director, and lead modeler until his departure from Wood.

Site development engineer-of-record for Parsons Engineering Science
Tampa Bay Regional Surface Water Treatment Plant, Hillsborough County, Florida; funded by Tampa Bay Water for over $750,000 (1999–2001):
Dr. King used **AdICPR**, a predecessor to ICPR4, to assess risk associated with floods with four-percent and one-percent annual exceedance probabilities for a proposed water-treatment plant east of Tampa, near Falkenburg Road. King built a geographic information system database of existing watershed conditions from his field measurements, and from construction plans for other facilities in the watershed, and from reports that supported the issuance of permits for other facilities. King prepared land development plans based on Hillsborough County and Southwest Florida Water Management District regulations. King designed ponds, roads, the site grade, and a stormwater management conveyance system. King obtained a Federal Emergency Management Agency National Flood Insurance Program Letter of Map Amendment to remove the plant site from the special flood hazard area. King also obtained a Southwest Florida Water Management District Environmental Resource Permit, U.S. Army Corp of Engineers Wetland Resource Permit, and a Hillsborough County Environmental Protection Commission permit. King managed a watershed survey sub-consultant and three staff engineers. Tampa Bay Water constructed the plant and presently treats up to 120 million gallons of water per day at the plant.

King, J.N. 1999. Hydrologic and hydraulic analyses at the Tampa Bay Regional Water Treatment Plant: Parsons Corporation, Parsons Engineering Science, Tampa, approximately 300 p.

Associate Engineer with Wood Environment & Infrastructure Solutions
Mill Creek treatment wetland, City of Alachua, Alachua, FL, United States, undisclosed project value, (2018–06/2019):
Dr. King's colleagues designed a treatment wetland, to treat stormwater that drains to a Floridan aquifer system swallet. King advised colleagues on the simulation of the Floridan aquifer system near the swallet, with **ICPR4** and **MODFLOW**.

Benthic Flux (Surface-Water/Groundwater Interaction, Submarine Groundwater Discharge)

Researcher Assistant with the University of Florida and principal investigator with the U.S. Geological Survey
Selective mechanisms for benthic water flux generation in coastal waters; partly funded by the University of Florida and the U.S. Geological Survey (2004–2012):

Dr. King and advisors developed new, innovative analytical equations for benthic water flux forced by the following processes, with the following methods: terrestrial hydraulic gradient with Schwarz-Christoffel mapping and the Poisson integral formula for the half plane; pressure gradient forced by the ground water tidal prism with a perturbation solution to a Darcy-based diffusion equation; and pressure gradient forced by surface gravity waves, with extension of a boundary value solution. King used these methods to characterize benthic water flux in five case studies: the Indian River Lagoon, Florida; Great South Bay, New York; Lake Sallie, Minnesota; the South Atlantic Bight; and the Patos Lagoon coastal zone, Rio Grande do Sol, Brazil. King's models are referenced and used by scientists investigating submarine groundwater discharge, surface-water groundwater interaction, and benthic flux of water, nutrients, and other fluxed constituents.

King, J.N. 2012. "Analytical characterization of selective benthic flux components in estuarine and coastal waters", Chapter 17 of Estuarine and Coastal Ecosystem Modeling edited by D. Baird and A.J. Mehta, Volume 9 in Treatise on Estuarine and Coastal Science edited by E. Wolanski and D.S. McLusky, Elsevier, New York, https://www.sciencedirect.com/science/article/pii/B9780123747112009177.

King, J.N. 2012. Synthesis of benthic flux components in the Patos Lagoon coastal zone, Rio Grande do Sul, Brazil: Water Resources Research, 48, W12530, http://dx.doi.org/10.1029/2011WR011477.

King, J.N. 2010. Analytical models of benthic flux and submarine groundwater discharge driven by forces that generate the groundwater tidal prism: application to Patos Lagoon coastal zone, Rio Grande do Sul, Brazil: Invited. Eos, Transactions, American Geophysical Union, vol 91, Number 26, Meeting of the Americas Supplement, Abstract H34A-01. Foz do Iguassu, Brazil. 1 p.

King, J.N. 2010. Geophysical conceptual model for benthic flux and submarine groundwater discharge: Abstract H43A-1203 presented at the 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec. 1 p.

King, J.N. 2010. Benthic Flux and Submarine Groundwater Discharge Calculators. U.S. Geological Survey, Water Resource Discipline, http://fl.water.usgs.gov/sgd/.

King, J.N. 2010. Calculator: Benthic Flux and Submarine Groundwater Discharge Component Forced by Surface Gravity Waves on a Dual-Unit System. U.S. Geological Survey, Water Resource Discipline, http://fl.water.usgs.gov/sgd/qbf.wave.pb.2unit.html.

King, J.N. 2010. Calculator: Benthic Flux and Submarine Groundwater Discharge Component Forced by Surface Gravity Waves on a Single-Unit Medium of Finite Thickness. U.S. Geological Survey, Water Resource Discipline, http://fl.water.usgs.gov/sgd/qbf.wave.pb.finite.html.

King, J.N. 2010. Calculator: Benthic Flux and Submarine Groundwater Discharge Component Forced by Surface Gravity Waves on a Single-Unit Medium of Infinite Thickness. U.S. Geological Survey, Water Resource Discipline, http://fl.water.usgs.gov/sgd/qbf.wave.pb.infinite.html.

King, J.N., A.J. Mehta, R.G. Dean. 2010. Analytical models for the groundwater tidal prism and associated benthic water flux: Hydrogeology Journal, vol 18, no 1, pp 203-215, http://dx.doi.org/10.1007/s10040-009-0519-y.

King, J.N., A.J. Mehta, R.G. Dean. 2009. Generalized analytical model for benthic water flux forced by surface-gravity waves: Journal of Geophysical Research—Oceans, 114, C04004, http://dx.doi.org/10.1029/2008JC005116.

King, J.N. 2008. Analytical benthic flux model forced by surface-gravity waves: Application to the South Atlantic Bight: Invited. 20th Saltwater Intrusion Meeting, Naples, Florida, C.D. Langevin, L. Lebbe, M. Bakker, C. Voss, Editors, Institute of Food and Agricultural Science, University of Florida, Gainesville, FL, pp 117-120.

King, J.N. 2007. Selective mechanisms for benthic water flux generation in coastal waters. Dissertation presented to the University of Florida in partial fulfilment of the Doctor of Philosophy Degree in Civil and Coastal Engineering, 231 p, 25 tables, 90 figs. University of Florida Library, Gainesville, Florida, http://purl.fcla.edu/fcla/etd/UFE0021567, http://uf.catalog.fcla.edu/permalink.jsp?20UF004067279.

"Target processes in Florida: benthic flux." J.N. King, L.K. Brakefield. U.S. Geological Survey Distributed Temperature Sensing Workshop. Fort Lauderdale, Florida. 2011.

"Analytical models of benthic flux and submarine groundwater discharge driven by forces that generate the groundwater tidal prism: application to Patos Lagoon Coastal Zone, Rio Grande do Sul, Brazil." J.N. King. American Geophysical Union Meeting of the Americas. Foz do Iguassu, Brazil. 2010.

"Analytical benthic flux model forced by surface-gravity waves: application to the South Atlantic Bight." J.N. King. 20th Saltwater Intrusion Meeting. Naples, Florida. 2008.

"Benthic flux driven by waves over porous media." J.N. King. University of Florida Coastal and Oceanographic Engineering Seminar Series. Gainesville, Florida. 2007.

"Physical factors that influence benthic flux in an estuary." J.N. King. U.S. Geological Survey. Fort Lauderdale, Florida. 2007.

"Benthic flux: a non-point source pollutant loading mechanism." J.N. King. St. Johns River Water Management District. Palatka, Florida. 2005.

"Benthic flux: a surface water – ground water interaction process: with application to the Indian River Lagoon, Florida, USA." J.N. King. University of Florida Coastal and Oceanographic Engineering Seminar Series. Gainesville, Florida. 2005.

Co-Principal Investigator for the U.S. Geological Survey Caribbean and Florida Water Science Center

Spatial and temporal distribution of benthic flux to the Indian River Lagoon, near Eau Gallie and Rockledge, Florida; funded by the St. Johns River Water Management District and the U.S. Geological Survey for about $450,000 (2015–10/2016):

Dr. King and colleagues designed an innovative, value-added suite of geophysical and geochemical field techniques to characterize the spatial and temporal distribution of groundwater discharge along transects near Eau Gallie and Riverwalk Park, and within a one square kilometer area that includes the Eau Gallie transect. King and colleagues specified fiber-optic distributed temperature sensors, continuous resistivity, electrical resistivity tomography, and geochemical tracers. They will use data and analyses to inform simulations of groundwater discharge designed to mitigate algal blooms in the Indian River Lagoon. King conceived the project as a co-principal investigator, primarily with two U.S. Geological Survey colleagues and with staff and managers at St. Johns River Water Management District. With one U.S. Geological Survey colleague, King wrote project proposals to both the St. Johns River Water Management District and the U.S. Geological Survey. King served with one U.S. Geological Survey colleague as co-principal investigator until King left the federal service in October 2016. Project activities prior to October 2016 included science design, field reconnaissance, and equipment tests.

Groundwater

Principal Investigator for the U.S. Geological Survey Florida Integrated Science Center, Florida Water Science Center, and Caribbean and Florida Water Science Center
Fate and transport of deep-well injectate at the North District Wastewater Treatment Plant, Miami-Dade County, Florida; funded by the Miami-Dade County Water and Sewer Department and the U.S. Geological Survey for about $2,200,000 (07/2007–10/2016):
Dr. King analyzed the transport history of a contaminant plume in a coastal part of the Floridan aquifer system using **SEAWAT** and **PEST**. With innovative techniques, King simulated the effects of effluent injection into the Boulder Zone with the transient, variable-density groundwater flow and constituent transport model SEAWAT; estimated parameters and characterized uncertainty with PEST; characterized effluent confinement in the Boulder Zone of the Floridan aquifer system; characterized effluent transport paths in the Floridan aquifer system, between the Avon Park permeable zone and Boulder Zone, from 1997 to 2011, as either persistent or as exclusively temporary; and estimated the extent of the North District effluent plume in 2011. King showed that the Boulder Zone is not a viable hydrogeologic unit for waste disposal in southeastern Florida. The Florida Department of Environmental Protection and Miami-Dade County used King's study to abandon the Boulder Zone as a waste disposal unit, and to make a $500M treatment decision. King's investigation motivated the County to conduct a $25M seismic investigation to characterize fractures and karst collapse in the Floridan aquifer system, and to drill a 10,000-foot exploratory well in search of deeper, confined hydrogeologic units suitable for waste disposal.

King, J.N., and Decker, J.D., 2018 (February 9), Distribution of effluent injected into the Boulder Zone of the Floridan aquifer system at the North District Wastewater Treatment Plant, southeastern Florida, 1997–2011: U.S. Geological Survey Scientific Investigations Report 2017–5145, 52 p, https://doi.org/10.3133/sir20175145.

Decker, J.D., King, J.N., 2018 (February 9), SEAWAT Data Sets for Simulation of Effluent Transport in the Floridan Aquifer System at the North District Wastewater Treatment Plant, Southeastern Florida, 1997-2011: U.S. Geological Survey data release, https://water.usgs.gov/GIS/metadata/usgswrd/XML/sir2017-5145.xml.

King, J.N., A.L. Foster, L.K. Brakefield, V. Walsh. 2010. Monitoring, modeling, management, and mitigation: potential for densification, subsurface disposal, and transport of buoyant wastewater treatment plant effluent in Miami-Dade County, Florida, USA: Eos, Transactions, American Geophysical Union, vol 91, Number 26, Meeting of the Americas Supplement, Abstract H41C-08. Foz do Iguassu, Brazil. 1 p.

King, J.N., V. Walsh, K.J. Cunningham, F.S. Evans, C.D. Langevin, A. Dausman. 2009. Analytical models of the transport of deep-well injectate at the North District Wastewater Treatment Plant, Miami-Dade County, Florida, U.S.A.: Eos, vol 90, Number 52, 29 December 2009, Fall Meet. Supl., Abstract H21C-0869, 1 p.

"The human waste stream, underground injection control, ocean outfalls, drinking water supply, natural system vitality, and the hydrologic cycle: A Florida case study." J.N. King. Presentation to the Earth and Atmospheric Science Department, City College of New York, New York City, New York. Spring 2012.

"Deep-well injection." D.M. Sumner, R.M. Spechler, J.N. King. Orlando Utilities Commission. Orlando, Florida. 2010.

"Monitoring, modeling, management, and mitigation: Potential for densification, subsurface disposal, and transport of buoyant wastewater treatment plant effluent in Miami-Dade County, Florida, USA." J.N. King, A.L. Foster, L.K. Brakefield, V. Walsh. American Geophysical Union Meeting of the Americas. Foz do Iguassu, Brazil. 2010.

"Using Organic Wastewater Compounds as Tracers for Subsurface Disposal and Transport of Buoyant Wastewater Treatment Plant Effluent in Miami-Dade County, Florida, USA." A.L. Foster, J.N. King, B.G. Katz. American Geophysical Union Meeting of the Americas. Foz do Iguassu, Brazil. 2010.

"Injectate densification with seawater." J.N. King. Florida Department of Environmental Protection, Underground Injection Control Working Group. Wekiva Springs, Florida. 2009.

Principal Investigator for the U.S. Geological Survey Florida Water Science Center, and Caribbean and Florida Water Science Center
Pressure and flow rate measurements to support hydraulic tomography of the Floridan aquifer system at the North District Wastewater Treatment Plant, Miami-Dade County, Florida; funded by the Miami-Dade County Water and Sewer Department and the U.S. Geological Survey for about $250,000 (2012–10/2016):
Dr. King performed an innovative sequential, aquifer stress test from August 15 to October 12, 2011, on a part of the Floridan aquifer system under coastal influence, at the North District Wastewater Treatment Plant. Miami-Dade County stressed the Floridan aquifer system with four municipal injection wells at the plant. Three injection wells stressed the aquifer system with injection and a fourth well stressed the aquifer system with pressure release from the injection zone, caused by reverse flow of formation fluid mixed with effluent, such that pressurized formation fluid from the injection zone flowed up an injection well, into the plant. King measured potentiometric-surface elevation and temperature with InSitu **Level Trolls** and **Baro Trolls**. King simulated the test with transient, variable-density groundwater flow and constituent transport model **SEAWAT** and the parameter estimation tool **PEST** to improve hydrogeologic parameter estimates. King served as the principal investigator until departure from the federal service in October 2016.

King, J.N., 2016, Pressure and flow rate measurements to support hydraulic tomography of the Floridan aquifer system at the North District Wastewater Treatment Plant, Miami-Dade County, Florida: U.S. Geological Survey data release, http://dx.doi.org/10.5066/F7QZ2819.
King, J.N., K.J. Cunningham, A.L. Foster. 2011. Observation of a distinct transition in transport response to injection stress in the Floridan aquifer system, Southeastern Florida, USA: Abstract H13A-1174 presented at the 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec. 1 p.
Foster, A.L., J.N. King, B.G. Katz 2010. Using Organic Wastewater Compounds as Tracers for Subsurface Disposal and Transport of Buoyant Wastewater Treatment Plant Effluent in Miami-Dade County, Florida, USA: Eos, Transactions, American Geophysical Union, vol 91, Number 26, Meeting of the Americas Supplement, Abstract H41C-07. Foz do Iguassu, Brazil. 1 p.
"Quantitative analysis of temperature data: SEAWAT modeling." J.N. King. U.S. Geological Survey Distributed Temperature Sensing Workshop. Fort Lauderdale, Florida. 2011.

Principal Investigator for the U.S. Geological Survey Florida Water Science Center, and Caribbean and Florida Water Science Center
Preliminary investigation of groundwater flow and trichloroethene transport in the surficial aquifer system, Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota; funded by the U.S. Navy, Naval Facilities Engineering Command, and the U.S. Geological Survey for over $400,000 (2012–10/2016):
Dr. King and a U.S. Geological Survey colleague used groundwater flow model **MODFLOW** and single-phase, conservative, non-reactive, miscible transport model **MT3DMS** to simulate trichloroethene concentrations in the surficial and Cambrian-Ordovician aquifer systems. The Naval Industrial Ordnance Plant is a Superfund site from which volatile organic compounds discharge to the Mississippi River, upstream of the intake to a municipal water supply. King and his colleague clarified the extent of the plume, which allowed the Navy to better focus remediation efforts.

King, J.N., and Davis, J.H., 2016, Preliminary investigation of groundwater flow and trichloroethene transport in the surficial aquifer system, Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota: U.S. Geological Survey Open-File Report 2016–1066, 120 p, http://dx.doi.org/10.3133/ofr20161066.
Davis, J.H., and King, J.N., 2016, Simulation of potentiometric head using MODFLOW 2000 and trichloroethene concentration using mt3dms at the Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota: U.S. Geological Survey data release, http://dx.doi.org/10.5066/F798853M.

Lead author for the U.S. Geological Survey Caribbean and Florida Water Science Center
Biscayne aquifer groundwater availability study; funded by the U.S. Geological Survey for about $25,000 (2012):
Dr. King and one U.S. Geological Survey colleague authored a 70-page workplan for the $2,200,000 Biscayne Aquifer Groundwater Availability Study. The study will be funded by the U.S. Congress. The workplan will be used by the U.S. Geological Survey water availability and water-use science program as partial, written justification for allocation of Congressional funds.

King, J.N., and K.J. Cunningham, 2012. Biscayne aquifer groundwater availability study work plan: U.S. Geological Survey working document, 70 p, archived in the U.S. Geological Survey Florida Water Science Center.
Cunningham, K.J, C. Walker, J.N. King. 2011. Eocene-Miocene karst seismic-sag structural systems in the southeastern Florida platform: Proceedings of the American Association of Petroleum Geologists, Annual Convention, Houston, Texas. 1 p.
King, J.N., K.J. Cunningham, C. Walker, R.S. Reese. 2011. Do seismically-imaged sag structures in Biscayne National Park influence submarine groundwater discharge?: Proceedings of the Coastal and Estuarine Research Federation, 21st Biennial Conference: Societies, estuaries and coasts: Adapting to change, November, Daytona Beach, Florida. 1 p.
"Do seismically-imaged sag structures in Biscayne National Park influence submarine groundwater discharge?" J.N. King, K.J. Cunningham, C. Walker, R.S. Reese. 21st Biennial Conference of the Coastal and Estuarine Research Federation: Societies, estuaries and coasts: Adapting to change. Daytona Beach, Florida. November 2011.
"Eocene-Miocene karst seismic-sag structural systems in the southeastern Florida platform." K.J Cunningham, C. Walker, J.N. King. American Association of Petroleum Geologists Annual Convention. Houston, Texas. 2011.
"An overview of southern Florida's karst hydrogeology." J.N. King. Everglades Research and Education Center, Institute of Food and Agricultural Sciences, University of Florida. Belle Glade, Florida. 2010.
"Karst hydrogeology in the southeastern United States: the Biscayne Aquifer and the Floridan Aquifer System." J.N. King. United Nations Educational, Science & Cultural Organization Institute for Water Education. Fort Lauderdale, Florida. 2010.

Research Assistant with the University of Florida
Numerical simulation of flow in porous media in a curvilinear, boundary-fitted coordinate system; funded by the University of Florida for about $35,000 (2001–2004):
Dr. King implemented in the **MODFLOW** framework, a solution to the flow-in-porous-media problem in a curvilinear coordinate system. This innovative approach allows the computational grid to be fit to curvilinear, geographic features, such as rivers, coastlines, or hydrogeologic units; and cell-to-cell alignment with circulation and transport models, such as **CH3D** and **EFDC**. King also described a new validation of the implementation.

King, J.N. 2008. Validation of MODFLOW in a curvilinear, boundary-fitted coordinate system: MODFLOW and More 2008: Ground Water and Public Policy, Golden, Colorado, E. Poeter, M. Hill, and C. Zheng, Editors, International Ground Water Modeling Center, Colorado School of Mines, pp 93-97.
King, J.N. and others. 2003. A Comparison of advection schemes in variable-density, highly conductive, ground water domains: Second MIT Conference on Computational Fluid and Solid Mechanics, Boston, Massachusetts, K. Bathe Editor, Article 754, Elsevier, The Netherlands, 6 p.
"Validation of MODFLOW in a curvilinear, boundary-fitted coordinate system." J.N. King. MODFLOW and More 2008: Ground Water and Public Policy. Colorado School of Mines, Golden, Colorado. 2008.
"A comparison of advection schemes in variable-density, highly conductive, groundwater domains." J.N. King. Second MIT Conference on Computational Fluid and Solid Mechanics, Massachusetts Institute of Technology. Boston, Massachusetts. 2003.

Associate Engineer with Wood Environment & Infrastructure Solutions
Barrancas National Cemetery expansion, United States Department of Veterans Affairs, Pensacola Naval Air Station, Pensacola, FL, United States, undisclosed project value, (12/2018–02/2019):
Dr. King, Wood colleagues, and C&C Contractors designed and built an expansion to the Barrancas National Cemetery. King investigated water-resource issues associated with Pensacola Naval Air Station

operable unit 1—a Superfund site listed on the United States Environmental Protection Agency national priorities list.

King, J.N., 2019 (January 30), Alternative water-supply analysis, Barrancas National Cemetery expansion, U.S. Department of Veterans Affairs, Pensacola Naval Air Station operable unit 1, Pensacola, Florida: Wood Environment & Infrastructure Solutions project memorandum, Project number 6166170433, 23 p, 5 figs, 6 tables, to be archived by the U.S. Department of Veterans Affairs, Washington DC.

Senior Engineer with Wood Environment & Infrastructure Solutions
Limited scope remedial action plan, S&S Food Store No. 310, 9390 S. US HWY 441, Lake City, Columbia County, Florida. Florida Department of Environmental Protection, about $25,000 (04/2017):
Dr. King and colleagues presented a plan to remediate groundwater and soil contaminated with petroleum at S&S Food Store No. 310, with in-situ chemical oxidation. Specifically, the site was proposed to be remediated with a Geo-Cleanse® Process (Geo-Cleanse International, Inc.) and injection into the subsurface at 20 injection points, with catalyzed hydrogen peroxide. King and colleagues also proposed post-active groundwater and soil sampling and laboratory analyses of oxidation effectiveness. King was the engineer of record for the plan.

Burgard, S., Yanczak, P., King, J.N., 2017. Limited scope remedial action plan, S&S Food Store No. 310, 9390 S. US HWY 441, Lake City, Columbia County, Florida: Amec Foster Wheeler Environment & Infrastructure project report number 6062-16-0372, Florida FDEP Facility ID No. 12/8503489, FDEP Purchase Order AE7C01, Task 4, 153 p, 8 figs, 5 tables, 7 appendixes, 1 calculation sheet, archived by the Florida Department of Environmental Protection, Tallahassee, Florida.

Senior Engineer with Wood Environment & Infrastructure Solutions
Review findings and recommendations: 1,4-dioxane plume mitigation alternatives, former Siemens main facility, 400 Rinehart Road, City of Lake Mary, Florida. Chubb Environmental, about $35,000 (10/2016–12/2017):
Dr. King and colleagues reviewed a treatment alternative feasibility study for 1,4–dioxane pollution at an industrial site in the City of Lake Mary, Seminole County, Florida. King and colleagues determined whether the feasibility study appropriately considered new water-supply wells as a viable, cost-effective, strategy to mitigate effects of a 1,4-dioxane plume on the City of Lake Mary groundwater supply; described a viable, cost-effective mitigation strategy that was not described in the feasibility study; and identified aquifer, well-location, permit, and cost factors that may influence this strategy.

King, J.N., S. Burgard, and M.C. Diblin, 2016. Review findings and recommendations: 1,4-dioxane plume mitigation alternatives, former Siemens main facility, 400 Rinehart Road, City of Lake Mary, Florida: Amec Foster Wheeler Environment & Infrastructure project report number 6062-16-0378, 20 p, 4 figs, archived by Chubb Environmental, Jersey City, New Jersey.

Senior Engineer with Wood Environment & Infrastructure Solutions
Project Blue Wave, confidential industrial client, about $200,000 (03/2017–03/2018):
Dr. King and colleagues identified candidate groundwater resources of a specific, unique quality for use by an international manufacturer in a confidential industrial process. King was the lead technical professional for the hydrogeologic component of the search. The geographic scope of the search was the continental United States. King managed and queried a Federal hydrologic database with geographic information systems. One of King's colleagues designed and drilled a water-supply well based on King's recommendation. The confidential client subsequently constructed a manufacturing facility and are using water with a specific chemical content from the unique groundwater supply as a key ingredient in a manufactured commodity.

Senior Engineer with Applied Technology & Management
Spicewood Crushed Stone, Proposed Limestone Quarry, Burnet County, Texas, about $20,000 (03/2021–09/09/2021):
Spicewood Crushed Stone, LLC (SCS) proposes to quarry limestone in Burnet County, Texas. King and colleagues evaluated hydrogeologic conditions at the quarry. King and colleagues published a hydrogeologic investigation report to support issuance of a New Large-Well Operating Permit Application (NLWOPA) to the Central Texas Groundwater Conservation District. King and colleagues describe regional geology, the proposed groundwater supply, and pump tests in 2018 and 2021. King and colleagues used the Cooper-Jacob (1946) straight-line method during pumping, the Theis (1935) straight-line method during recovery, and the Hantush (1934) method during pumping to estimate 550 square feet per day transmissivity and 0.5 feet per day hydraulic conductivity of the Ellenburger-San Saba aquifer near proposed water-supply well WW–9 in Burnet County, Texas. King and colleagues summarize assumptions inherent in these analytical methods and discuss the applicability of these methods are appropriate for use in the Ellenburger-San Saba aquifer in Burnet County.

King, J.N. and C. Montero, 2021 (June). Hydrogeologic report, Spicewood Crushed Stone, Burnet County, Texas: Applied Technology & Management report 213623, 32 p, 19 figs, archived with the Central Texas Groundwater Conservation District.

King, J.N. and C. Montero, 2021 (September 9). Well WW–9 pump test analysis: Applied Technology & Management memorandum 213623, 8 p, 3 figs, 4 tables, archived with the Central Texas Groundwater Conservation District.

Watershed Hydrology and River Hydraulics

Senior Engineer for Applied Technology & Management
Flow Rate and Stage Measurements on the Waccasassa River for Minimum Flows and Levels Development, for the Suwannee River Water Management District for $150,000 (12/23/2019–04/302021):
ATM constructed flow rate and stage measurement platforms and measured flow rate and stage with acoustic Doppler velocity meters on the Waccasassa River upstream of the Wekiva River at Levy County Road 326; and on Cow Creek downstream of Tenmile Creek. ATM used the U.S. Geological Survey index velocity method to relate acoustic Doppler velocity meter measurements of velocity and water-surface elevation, every 15 minutes to discrete acoustic Doppler current profile measurements on the Waccasassa River upstream of the Wekiva River at Levy County Road 326; and on Cow Creek downstream of Tenmile Creek. ATM also constructed conductivity-temperature-depth measurement platforms and measured salinity and water-surface elevation on the Waccasassa River upstream of the Wekiva River at Levy County Road 326; on the Waccasassa River at the confluence with Cow Creek on day marker 36; on Cow Creek downstream of Tenmile Creek; and in Waccasassa Bay on day marker 3.

King, J.N., S. So, R. Taylor, E. Whiteside, S. Peene, 2021 (April 30). Waccasassa River Tidal Monitoring Report, Levy County, Florida: Applied Technology & Management project report 203475, 350 p, 180 figs., 9 appendices, 9 tables, archived with the Suwannee River Water Management District.

Senior Engineer for Applied Technology & Management
Flow Rate and Stage Measurements on the Upper Withlacoochee River for Minimum Flows and Levels Development, for the Southwest Florida Water Management District for $200,000 (2019–present):
ATM constructed flow rate and stage measurement platforms and measured flow rate and stage with acoustic Doppler velocity meters at the following three locations in the Upper Withlacoochee River: upstream of Sioux Canal near Gum Swamp; downstream of Jumper Creek near Kettle Island; and upstream of the Little Withlacoochee River near Webster. ATM used the U.S. Geological Survey index velocity method to relate acoustic Doppler velocity meter measurements of velocity and water-surface elevation, every 15 minutes to discrete acoustic Doppler current profile measurements.

Senior Engineer for Applied Technology & Management
Water-Quality Assessments for Minimum Flows and Levels Development, for the Southwest Florida Water Management District for about $219,974 (2020–06/02/2021):
Dr. King and colleagues assessed the water quality of the Withlacoochee River, Horse Creek, and Charlie Creek in the Southwest Florida Water Management District. The team performed the following tasks: reviewed and summarized publications related to water quality on each conveyance; tabulated regulatory water-quality standards for each conveyance; determined, from publications and regulations, the water-quality parameters most important to the health of each conveyance; tabulated historic water-quality measurements that exceeded regulatory standards; tabulated impairment determinations; built a database of water-quality data and water-quantity data; described a regression method to relate water-quality data to water-quantity data; developed and described water-quality relationships with flow rate using the regression method; described time series trends in water-quality parameter concentrations; and identified and described other important trends or statistical relationships relevant to predicting changes to water quality in this system.

King, J.N., M. Wessell, T. Janicki, and S. Peene, 2020 (August 25). Upper Withlacoochee River water-quality assessment, Marion, Citrus, Sumter, Hernando & Pasco Counties, Florida: Applied Technology & Management report 193446, 60 p, 23 figs, 36 tables, archived with the Southwest Florida Water Management District.

King, J.N., M. Wessell, T. Janicki, and S. Peene, 2021 (January 14). Water-quality assessment for the Lower Withlacoochee River, including Lake Rousseau and the Withlacoochee River to Dunnellon, Marion, Citrus & Levy Counties, Florida: Applied Technology & Management report 203526, 64 p, 15 figs, 50 tables, archived with the Southwest Florida Water Management District.

King, J.N., M. Wessell, T. Janicki, and S. Peene, 2021 (June 2). Charlie Creek water-quality assessment, Hardee & Polk Counties, Florida: Applied Technology & Management report 203559, 37 p, 10 figs, 20 tables, archived with the Southwest Florida Water Management District.

King, J.N., M. Wessell, T. Janicki, and S. Peene, 2021 (June 2). Horse Creek water-quality assessment, Hardee & DeSoto Counties, Florida: Applied Technology & Management report 203558, 48 p, 12 figs, 24 tables, archived with the Southwest Florida Water Management District.

Senior Engineer for Applied Technology & Management
Deerfield Beach Water-Quality Assessment for a Stormwater Master Plan, for the City of Deerfield Beach for $45,515 (2019–2020):
Dr. King and ATM are assessing water quality—with a team of consultants—in the City of Deerfield Beach. King and ATM are archiving baseline data, assessing impairment, assessing contemporary hot spots, assessing future-condition hot spots, identifying capital improvement projects to address water-quality challenges, and presenting findings at public meetings.

King, J.N., 2021 (February 19). City Deerfield Beach water-quality assessment & capital improvement recommendations: Applied Technology & Management project report 193451, 86 p, 8 tables, 13 figs, 47 plates, archived with the City of Deerfield Beach.

Senior Engineer for Applied Technology & Management
Bay County Water-Quality Assessment for a Stormwater Master Plan, for Bay County, Florida for $34,925.25 (2020):
Dr. King and ATM are assessing water quality—with a team of consultants—in Bay County. King and ATM are archiving baseline data, reviewing Bay County's master storm drainage plan, assessing impairment, recommending water quality projects, reviewing and assessing Bay County's multiple separate storm sewer system (MS4), reviewing and assessing stormwater outfalls, reviewing and assessing Bay County's dredging program, and evaluating built and proposed infrastructure that were or are intended to follow best management practices.

Senior Engineer for Applied Technology & Management
Comprehensive Wastewater Treatment Facilities Plan, for Leon County, Florida for $620,446.30 (2019–present):
Dr. King and ATM are developing a plan for Leon County—with a team of consultants—to reduce nitrogen loads from onsite sewage treatment and disposal systems to groundwater and surface waters. Onsite sewage treatment and disposal systems (OSTDS) are also known as septic systems. The Florida Department of Environmental Protection found that nutrient loads from several sources—including onsite sewage treatment and disposal systems in Leon County—impaired Upper Wakulla River and Wakulla Spring. Leon County's plan has two parts: (1) a comprehensive wastewater treatment facilities plan for the entire county, and (2) a more focused facilities plan for part of the county that loads nitrogen to the Wakulla River and Wakulla Spring, to further the Florida DEP Basin Management Action Plan for the river and spring. The objective of the plan is to identify onsite sewage treatment and disposal systems to transition to alternative wastewater treatment systems, where the transition will most reduce nitrogen loads to surface waters and groundwater. King and his colleagues are creating the plan by performing the following tasks: develop a nitrogen reduction score to identify likely contribution of nitrogen from OSTDSs to groundwater and surface waters; and use the score to quantify, rank, and identify OSTDSs to transition to alternate wastewater treatment systems; quantify cost-effectiveness of alternate systems; identify other factors that influence selection of an alternate systems; survey opinions of the citizens of Leon County, with respect to this plan; analyze implementation scenarios for alternate systems; calculate the anticipated decrease in nitrogen load to the Upper Wakulla River and Wakulla Spring, between 2020 and 2040, due to OSTDS transition to alternate systems; survey again, opinions of the citizens of Leon County, with respect to this plan; and present the plan to the Leon County Board of County Commissioners.

Holley, A., A. Baker, J.N. King, M. Frick, C. Diamond, and C.B. Greene, 2020 (March 9). Comprehensive wastewater treatment facilities plan, task 1: nitrogen reduction performance criteria for alternative wastewater treatment systems: Jim Stidham & Associates project report 193450, 25 p, 12 figs, 1 table, archived with the Leon County Public Works Department.

Holley, A., C. Diamond, A. Baker, M. Frick, C.B. Greene, and J.N. King, 2020 (May 5). Comprehensive wastewater treatment facilities plan, task 2: cost-effectiveness of alternative technologies: Jim Stidham & Associates project report 193450, 54 p, 8 figs, 10 tables, 9 appendices, archived with the Leon County Public Works Department.

Holley, A., M. Frick, A. Baker, C. Diamond, C.B. Greene, and J.N. King, 2020 (December 1). Comprehensive wastewater treatment facilities plan, task 3: factors other than cost-effectiveness that influence selection of treatment technology: Jim Stidham & Associates project report 193450, 25 p, 6 figs, 7 tables, archived with the Leon County Public Works Department.

Holley, A., M. Frick, C.B. Greene, A. Baker, C. Diamond, and J.N. King, 2021 (December 4). Comprehensive wastewater treatment facilities plan, task 5: implementation scenarios for alternative wastewater treatment systems: Jim Stidham & Associates project report 193450, 25 p, 18 figs, 3 tables, archived with the Leon County Public Works Department.

Senior Engineer for Applied Technology & Management
Basin Management Action Plan, Total Maximum Daily Load, and National Pollution Discharge Elimination System technical support to the Florida Department of Transportation, for about $3,500,000 (2018–present):
ATM provide basin management action plan (BMAP), total maximum daily load (TMDL), and National Pollution Discharge Elimination System (NPDES) permitting and water quality support to the Florida Department of Transportation. King and colleagues review technical approach and findings, including **HSPF** simulations of pollutant load analyses.

King, J.N., J. Hearn, 2019 (September). Kissimmee River Basin: Lake Istokpoga (1856B), Lake Glenada (1813L), Lake Placid (1938C), and Red Water Lake (1938F)—Total maximum daily load technical workshop: Applied Technology & Management workshop notes for the Florida Department of Transportation, 4 p.

King, J.N., J. Hearn, 2019 (September). Kissimmee River Basin: FDEP—Total maximum daily load technical workshop Lake Istokpoga (WBID 1856B), Lake Glenada (WBID 1813L), Lake Placid (WBID 1938C), and Red Water Lake (WBID 1938F): Applied Technology & Management technical approach comments for the Florida Department of Transportation, 4 p.

King, J.N., J. Hearn, 2019 (September). Kissimmee River Basin: Lakes Reedy (WBID 1685D), Ida (WBID 1685E), Hickory (WBID 1730), Clinch (WBID 1706), and Adelaide (WBID 1730D) Total maximum daily load rule meeting: Applied Technology & Management meeting notes for the Florida Department of Transportation, 4 p.

King, J.N., J. Hearn, 2019 (September). Kissimmee River Basin: FDEP—Total maximum daily load draft report—Nutrient TMDLs for Lakes Reedy (WBID 1685D), Ida (WBID 1685E), Hickory (WBID 1730), Clinch (WBID 1706), and Adelaide (WBID 1730D) and documentation in support of the development of site-specific numeric interpretations of the narrative nutrient criterion: Applied Technology & Management report review comments for the Florida Department of Transportation, 7 p.

Senior Engineer with Applied Technology & Management
Cawcaw Swamp Flood Hazard Risk Assessment; funded by Brunswick County, North Carolina for about $200,000 (2021–present):
Dr. King and colleagues are assessing flood hazards in the Cawcaw Swamp, in Brunswick County, North Carolina with **HEC-RAS** for revision to Federal Emergency Management Agency's National Flood Insurance Program special flood hazard area delineations, base flood elevations, floodway boundary delineations, and other flood hazard information.

Deputy project manager, project engineer, and task manager for Parsons Engineering Science
Alafia River watershed management plan, Hillsborough County and Polk County, Florida; funded by Hillsborough County Public Works Department, Stormwater Management Division for about $1,200,000 (1999–2001):
Dr. King and colleagues assessed flood control, water quality, water quantity, and habitat of the 420-square-mile Alafia River watershed. King and colleagues simulated watershed hydrology and river hydraulics with a version of **SWMM**, modified by Hillsborough County. King surveyed hydrologic and hydraulic conditions, built a geographic information system database of hydrologic and hydraulic data, and hosted public meetings.

Parsons Engineering Science. 2002. Alafia river watershed management plan, volume 1, introduction and flood control: Parsons Corporation, Parsons Engineering Science, Tampa, for the Hillsborough County Stormwater Management Section, 581 p, http://www.hillsborough.wateratlas.usf.edu/upload/documents/Volume01.pdf.

Parsons Engineering Science. 2002. Alafia river watershed management plan, volume 2, water quality, natural systems, and water supply: Parsons Corporation, Parsons Engineering Science, Tampa, for the Hillsborough County Stormwater Management Section, 290 p, http://www.hillsborough.wateratlas.usf.edu/upload/documents/Volume02.pdf.

Parsons Engineering Science. 2002. Alafia river watershed management plan, volume 3, alternative analyses: Parsons Corporation, Parsons Engineering Science, Tampa, for the Hillsborough County Stormwater Management Section, 343 p, http://www.hillsborough.wateratlas.usf.edu/upload/documents/Volume03.pdf.

Parsons Engineering Science. 2002. Alafia river watershed management plan, map appendix 1: Parsons Corporation, Parsons Engineering Science, Tampa, for the Hillsborough County Stormwater Management Section, 23 plates, http://www.hillsborough.wateratlas.usf.edu/upload/documents/Map_Appendix_1.pdf.

Parsons Engineering Science. 2002. Alafia river watershed management plan, map appendix 2: Parsons Corporation, Parsons Engineering Science, Tampa, for the Hillsborough County Stormwater Management Section, 25 plates, http://www.hillsborough.wateratlas.usf.edu/upload/documents/Map%20Appendix%20_2.pdf.

"Alafia River watershed management plan charrette." J.N. King. Hillsborough County Department of Public Works. Tampa, Florida. 2000.

"Watershed management planning." J.N. King. Hillsborough County Department of Public Works, Tampa, Florida. 2000.

"Development of a watershed management plan." J.N. King. Association of State Floodplain Managers. Austin, Texas. 2000.

Project manager and project engineer for Parsons Engineering Science

Lake Olivia management plan, Orange County, Florida; funded by the Orange County Environmental Protection Department for about $200,000 (1999–2000):
Dr. King used **SWMM** and **WASP** to assess water quality and habitat in the Lake Olivia watershed. King conducted a public meeting for Lake Olivia shoreline residents. King recommended that hydrologic and hydraulic structures be constructed to improve water quality in Lake Olivia. Orange County installed a continuous deflection separation (CDS) stormwater unit and made other system improvements proposed in the plan.

King, J.N., K. Kuhlman, G. Morrison. 2000. Phase 1: Lake Olivia management plan: Parsons Corporation, Parsons Engineering Science, Tampa, approximately 150 p.
"Lake Olivia management plan." J.N. King. Orange County Environmental Protection Division, Orlando, Florida. 2000.

Regional manager, lead engineer, and review engineer for Michael Baker International Technical evaluation contractor serving (in-house) with the National Flood Insurance Program; funded by the Federal Emergency Management Agency for about $50,000,000 (1995–1998):
Dr. King provided regulatory and program guidance to community officials, consultants, and property owners with pending or future issues before the Federal Emergency Management Agency's National Flood Insurance Program. King was involved in well over 1,000 requests to change flood hazard boundaries based on existing or proposed flood control projects; levee and bridge construction; and fill placement. King worked with constituents on letters of map revision, letters of map amendment, physical map revisions, the limited map maintenance program, and special projects. King reviewed and assessed the validity of hydraulic and hydrologic simulations with **HEC-1, HEC-2, HEC-6, HEC-RAS, HEC-IFH, HEC-HMS, WES-RMA2, SMS**, and **Flo-2D**. King added value to the following technical submissions before the Agency by conducting internal analyses to justify federal action:

- Nellis Boulevard storm drain, Range Wash confluence detention basin, and Sloan Channel construction in the City of Las Vegas and Clark County, Nevada: King calculated hydraulic and hydrologic response of a failure of the Nellis Boulevard Storm Drain to act as a drainage divide, on a planned flood control system. King's analysis was adopted by the Federal Emergency Management Agency and resulted in changes to the design of the system and the proposed flood hazard risk assessment.
- Castalia Street Bridge construction in the City of Blue Diamond, Nevada: King determined the effect of the Castalia Street Bridge on the hydraulic response of a synthetic, episodic flood in Blue Diamond Wash. King determined the effect of erosion, deposition, and sediment transport on the elevation of a flood with a 1-percent annual exceedance probability, upstream and downstream of the bridge. King modified Einstein's bed-load function (1950, Technical Bulletin 1026, U.S. Department of Agriculture, Soil Conservation Service) to incorporate variation in kinematic viscosity and von Karman's universal constant of turbulent energy exchange, as a function of sediment concentration.
- El Rodeo Road flood control project, Mohave County, Arizona: King assessed the potential for failure of El Rodeo Road by overtopping or erosive undermining during the flood with a 1-percent annual exceedance probability, and the ability of El Rodeo Road and Emerald River Drive to act as a levee. King calculate bed-load using Einstein's bed-load function (1950, Technical Bulletin 1026, U.S. Department of Agriculture, Soil Conservation Service) to determine the effect of sediment deposition on the hydraulic performance of the El Rodeo Road Flood Control Channel and the State Road 95 Bridge. King characterize bed shear, channel velocity distribution, and sediment transport capacity in existing natural washes that drain to the Colorado River. King compared the Einstein estimate to estimates using the Meyer-Peter & Muller module of the U.S. Army Corps of Engineers Hydrologic Engineering Center Program No. 6, the Meyer-Peter & Muller Method, and the Yang Method. King assessed the degree to which the El Rodeo Road Flood Control Project would mitigate the existing alluvial fan flood hazard.

King's analysis was adopted by the Federal Emergency Management Agency and justified rejection of the proposed flood control project and flood hazard risk assessment.

- Crabtree Valley Mall road widening, City of Raleigh, North Carolina
- Timberline Road extension, City of Fort Collins and Larimer County, Colorado
- Ralston Road flood control project, City of Arvada and Jefferson County, Colorado
- Glenwood Springs alluvial fan flooding and mud-flow risk assessment, Glenwood Springs, Colorado

King, J.N. 2000. Development of a watershed management plan: Proceedings of the Association of State Floodplain Managers, Austin, Texas, 6 p.

King, J.N. 2000. Flood hazard risk assessment and the design storm: Proceedings of the Association of State Floodplain Managers, Austin, Texas, 6 p.

King, J.N. 1998. Two assumptions used in the development of Einstein's bed-load function: Proceedings of the Association of State Floodplain Managers, Milwaukee, Wisconsin, 7 p.

Thomas, W.O., J.N. King, M. Grimm. 1998. Regional flood frequency analysis in the plains region of Colorado and Kansas: Proceedings of the Association of State Floodplain Managers, Milwaukee, Wisconsin, 6 p.

"Two assumptions used in the development of Einstein's bed-load function." J.N. King. Association of State Floodplain Managers, Milwaukee, Wisconsin. 1998.

"Regional flood frequency analysis in the plains region of Colorado and Kansas." W.O. Thomas, M. Grimm, J.N. King. Association of State Floodplain Managers, Milwaukee, Wisconsin. 1998.

"National flood insurance program regulations & letters of map change." J.N. King. Federal Emergency Management Agency, Region VIII, CAPSHMO, Denver, Colorado. 1998.

"Flood hazard risk assessment and the design storm." J.N. King. Association of State Floodplain Managers. Austin, Texas. 2000.

Lead reviewer for Michael Baker International
Flo-2D model review and assessment; funded by the Federal Emergency Management Agency for about $20,000 (1997–1999):
Dr. King reviewed and recommended approval of the **Flo-2D** model for use in Federal Emergency Management Agency National Flood Insurance Program hazard risk assessments of mud and debris flow. King determined that Flo-2D satisfied Title 44 of the Code of Federal Regulations, Part 65.

Project engineer for Michael Baker International
U.S. Geological Survey National Flood Frequency program documentation update; funded by the U.S. Geological Survey for about $30,000 (1997–1998):
Dr. King tested the U.S. Geological Survey **NFF** computer program and updated help files with colleagues to include comprehensive descriptions of each state's regionalized hydrologic regression model for discharge as a function of probability and hydrologic parameters. Scientists and engineers use NFF to simulate observation based probabilistic estimates of flood flow rate, to size hydraulic structures, and to assess the validity of deterministic hydrologic simulations.

Mason, R.R., L.A. Fuste, J.N. King, W.O. Thomas. 2001. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural and urban areas in North Carolina: U.S. Geological Survey FS-007-00, http://pubs.usgs.gov/fs/fs-007-00/.
Mason, R.R., L.A. Fuste, J.N. King, W.O. Thomas. 2001. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural areas in Maryland: U.S. Geological Survey FS-098-01, http://pubs.usgs.gov/fs/fs-098-01/.
Mason, R.R., L.A. Fuste, J.N. King, W.O. Thomas. 2000. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural areas in New Mexico: U.S. Geological Survey FS-055-00, http://pubs.usgs.gov/fs/fs-055-00/.
Mason, R.R., L.A. Fuste, J.N. King, W.O. Thomas. 2000. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural areas in Hawaii, Island of Oahu: U.S. Geological Survey FS-004-00, http://pubs.usgs.gov/fs/fs-004-00/.
Mason, R.R., L.A. Fuste, J.N. King, W.O. Thomas. 2000. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural and urban areas in South Carolina: U.S. Geological Survey FS-001-00, http://pubs.usgs.gov/fs/fs-001-00/.
Sumioka, S.S., R.R. Mason, J.N. King, W.O. Thomas. 2000. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural areas on the Island of Tutuila, American Samoa: U.S. Geological Survey FS-008-00, http://pubs.usgs.gov/fs/fs-008-00/.
Mason, R.R., J.N. King, W.O. Thomas. 1999. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in Arizona: U.S. Geological Survey FS-111-98, http://pubs.usgs.gov/fs/fs-111-98/.
Mason, R.R., J.N. King, W.O. Thomas. 1999. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural and urban areas in Alabama: U.S. Geological Survey FS-088-97, http://pubs.usgs.gov/fs/fs-088-97/.
Mason, R.R., K.G. Ries III, J.N. King, W.O. Thomas. 1999. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural areas in Utah: U.S. Geological Survey FS-124-98, http://pubs.usgs.gov/fs/fs-124-98/.
Mason, R.R., K.G. Ries III, J.N. King, W.O. Thomas. 1999. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural areas in Nevada: U.S. Geological Survey FS-123-98, http://pubs.usgs.gov/fs/fs-123-98/.
Mason, R.R., L.P. Turner, J.N. King, W.O. Thomas. 1999. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural and urban areas in Georgia: U.S. Geological Survey FS-169-98, http://pubs.usgs.gov/fs/fs-169-98/.
Mason, R.R., J.N. King, W.O. Thomas. 1999. The National Flood Frequency Program – Methods for estimating flood magnitude and frequency in rural areas in Arkansas: U.S. Geological Survey FS-128-97, http://pubs.usgs.gov/fs/fs-128-97/.

Project engineer for Michael Baker International
Temporary bridge adjacent to the James Rumsey Bridge over the Potomac River, Shepherdstown, West Virginia; funded by the West Virginia Department of Transportation for over $500,000 (1998–1999):
Dr. King authored a bridge hydraulics report. King analyzed hydrology and hydraulics of floods with 4-percent, 2-percent, 1-percent, and 0.2-percent annual exceedance probabilities on the Potomac River at Shepherdstown for existing conditions (James Rumsey Bridge), proposed conditions (James Rumsey Bridge and a temporary bridge), and natural conditions (no bridges). King used the guidelines outlined in **Bulletin 17B** of the Interagency Committee on Water Data to simulate discharge estimates based on a

gage record; and **HEC-RAS** to simulate water-surface elevations and other hydraulic metrics. The West Virginia Department of Transportation replaced the old James Rumsey truss bridge in 2004. The West Virginia Department of Transportation uses plans for the James Rumsey Bridge in the design of other bridges in West Virginia, as one of two large-bridge design examples.

King, J.N. 1997. Bridge hydraulics report, James Rumsey Bridge over the Potomac River, Shepherdstown, West Virginia: Michael Baker Corporation, Tampa, approximately 300 p.

Project engineer for Michael Baker International
Appalachian Corridor H bridge across Shavers Fork, Tucker County, West Virginia; funded by the West Virginia Department of Transportation for over $500,000 (1998–1999):
Dr. King authored a bridge hydraulics report. King analyzed hydrology and hydraulics of floods with 4-percent, 2-percent, 1-percent, and 0.2-percent annual exceedance probabilities on Shavers Fork in Tucker County for existing and proposed conditions. King used the guidelines outlined in **Bulletin 17B** of the Interagency Committee on Water Data to simulate discharge estimates based on a gage record; and **HEC-RAS** to simulate water-surface elevations and other hydraulic metrics.

King, J.N. 1997. Bridge hydraulics report, Appalachian corridor H highway over Shavers Fork, Tucker County, West Virginia: Michael Baker Corporation, Tampa, approximately 300 p.

Project engineer Parsons Engineering Science
Basin-Wide Stormwater Capital Improvement Studies Priority Area 2, Cobb County, Georgia; funded by Cobb County for over $100,000 (1999):
King estimated the cost for proposed stormwater management structures and assessed bank stability of natural channels in the Lake Allatoona Watershed.

Estuary Science

Co-researcher and co-author for the University of Florida
Flow structure at a trifurcation near a North Florida inlet; funded by the U.S. National Science Foundation for less than $15,000 (2006–2007):
Dr. King and three colleagues observed hydrography and current velocity over a semidiurnal period at a tidally driven coastline trifurcation adjacent to the St. Augustine Inlet in the Guana-Tolomato-Matanzas Estuary with a boat-mounted ADCP and cast CTD. King and colleagues determined that the domain was well mixed, and that convergence fronts were aligned with bathymetry. They also determined that almost 90% of the tidal variability in the study area was explained by the semidiurnal harmonic, which propagates through the system as a quasi-standing wave. Subsequent researchers, including scientists funded through the U.S. Department of Commerce, National Oceanic and Atmospheric Administration's National Estuarine Research Reserve, and the staff at the St. Johns River Water Management District, used these measurements to validate circulation simulations of the estuary, and to manage water and natural resources.

Webb, B.M., J.N. King, B. Tutak, A. Valle-Levinson. 2007. Flow structure at a trifurcation near a north Florida inlet: Continental Shelf Research, vol 27, no 10-11, pp 1528-1547, http://dx.doi.org/10.1016/j.csr.2007.01.021.
"Residual flow in a north Florida tidal inlet." J.N. King, B.M. Webb, B. Tutak, J. Marin. University of Florida Coastal and Oceanographic Engineering Seminar Series. Gainesville, Florida. 2006.

Senior Engineer for Applied Technology & Management
San Sebastian River Flood Hazard Risk Assessment, funded by St. Johns County, Florida (2019–2020):
Dr. King and colleagues assessed flood hazards in the San Sebastian River—a tidal tributary to the Guana-Tolomato-Matanzas estuary on the Atlantic coast of Florida. The estuary is connected to the ocean by the St. Augustine inlet. King and colleagues simulated hydrodynamics in three dimensions with **AdCIRC**. King and colleagues mapped the area inundated by the following 12 flood scenarios: 4-percent annual exceedance probability (AEP) flood with no sea level rise (SLR); 4-percent AEP flood with expected SLR in

2040; 4-percent AEP flood with expected SLR in 2070; 4-percent AEP flood with expected SLR in 2120; 2-percent AEP flood no SLR; 2-percent AEP flood, 2040 SLR; 2-percent AEP flood, 2070 SLR; 2-percent AEP flood, 2120 SLR; 1-percent AEP flood, no SLR; 1-percent AEP flood, 2040 SLR; 1-percent AEP flood, 2070 SLR; and 1-percent AEP flood, 2120 SLR. King and colleagues determined that flood risk under the influence of sea level rise is not equivalent to the sum of sea level rise and risk in the absence of sea level rise; restated, the influence of sea level rise on flood hazard risk assessment is not linear. King and colleagues also compared risk assessments in three dimensions with AdCIRC to flood hazard information published by the Federal Emergency Management Agency's National Flood Insurance Program; and determined that risk is overestimated in some parts of the tributary with the lower resolution Federal method, and underestimated in other parts.

Research assistant for the University of Florida
Indian River Lagoon estuary simulation; funded by the St. Johns River Water Management District for over $1,000,000 (2001–2003):
Dr. King maintained a geographic information system, updated an **ArcView** user interface written in the **Avenue** programming language, and authored three Avenue tools for maintenance of curvilinear **CH3D** grids with irregular geometry. The University of Florida delivered these tools to the St. Johns River Water Management District, for use in addressing resource challenges in the Indian River Lagoon, and in other surface water bodies.

Kim, T., D. Christian, J.N. King, and others. 2002. Modeling the effect of reduced freshwater and nutrient loading on salinity, hypoxia, seagrass in Tampa Bay: Proceedings of A Water Budget for Tampa Bay: Sources, Trends, and Effects, St. Petersburg, Florida, 6p.

Estuarine and Riverine Remediation

Associate Engineer with Wood Environment & Infrastructure Solutions
Penobscot River mercury remediation Phase III engineering study, United States District Court, Bangor, ME, United States, $11,622,390 (01/04/2016–2019):
Dr. King and colleagues evaluated systems to remediate mercury in contaminated sediments of the Penobscot River, Maine—a Superfund site listed on the United States Environmental Protection Agency national priorities list. About 30 kilometers of the river and estuary were polluted with mercury from the 1960s to the 1990s. Mercury is sorbed onto sediments in the river and exists in aqueous form in pore and surface water. King and one colleague simulated estuarine hydrodynamics and bed shear stress with **Delft3D–FM**. King authored a hydrodynamic simulation report. The Penobscot River and its estuary is the second-longest river in New England. The study focused on the river, from the former Veazie Dam south to the Upper Penobscot Bay, including Mendall Marsh and the Orland River. The study evaluated the consequences of mercury release from a chlor-alkali facility in Orrington into the estuary during plant operations. King's colleagues collected additional field data to further refine the conceptual site model of mercury in the ecosystem, included analyses of surface water, sediment, woodchips, and biota throughout all trophic levels. King and colleagues satisfied the goal of the study, which was to evaluate potential and cost-effective engineering alternatives to reduce mercury concentrations in the estuary and ecosystem, thereby mitigating harm to the people, biota, and environment in the Penobscot River estuary.

King, J.N., Walter, N., 2018 (May 23), Hydrodynamic simulation report, Penobscot River Phase III Engineering Study, Penobscot River, Maine: Amec Foster Wheeler Environment & Infrastructure project number 3616–16–6052, 57 p, 14 tables, 19 figs, 2 appendices, archived by the U.S. Federal District Court, District of Maine, Case Number 1:00-cv-00069-JAW, Maine People's Alliance, et al v. Holtrachem Mfg Co, et al., archived with the court, http://www.penobscotmercurystudy.com/documents/phase-iii-reports/hydrodynamic-model-report/978-hydrodynamic-simulation-report-filed-10-02-2018_text_tables_figures.pdf, http://www.penobscotmercurystudy.com/documents/phase-iii-reports/hydrodynamic-model-report/06-hydrodynamic-model-report-appendix-a-b5pdf.

King, J.N., 2018 (January 19), Bed shear synthesis, Penobscot River phase III engineering study, Penobscot River, Maine: Amec Foster Wheeler Environment & Infrastructure project number 3616–16–6052, 64 p, 75 figs, DRAFT,

memorandum associated with the U.S. Federal District Court, District of Maine, Case Number 1:00-cv-00069-JAW, Maine People's Alliance, et al v. Holtrachem Mfg Co, et al., archived with the court.

"Hydrodynamic Simulation Report (WO 2A-100), Penobscot River Phase III Engineering Study, Penobscot River, Maine." J.N. King. Tele-conference presentation to the Special Master, U.S. District Court, District of Maine, Portland, Maine, Case C.A. No. 00–69–B–W, January 26, 2018.

Maine People's Alliance and Natural Resources Defense Council, Inc. vs. HoltraChem Manufacturing Company and Mallinckrodt US LLC: Deposition of Jeffrey King, Offices of the Natural Resources Defense Council, New York, New York, Friday March 1, 2019. United States District Court for the District of Maine, Case C.A. No. 00–69–B–W, 264 p.

Wetland Science and Restoration

Senior Engineer with Applied Technology & Management

Preliminary assessment of hydrologic and water-quality conditions, Los Lagos Hacienda, Punta Cana, Dominican Republic (2019–03/17/2020):

Inversiones Ronda, Grupo Puntacana, and partners are constructing a lake system at Los Lagos Hacienda, in Punta Cana, La Altagracia, Dominican Republic. Inversiones Ronda contracted Applied Technology & Management to assess anticipated hydrologic and water-quality conditions in the proposed lake system. The lake system will be constructed on about one square kilometer of land; the eastern extent of the lake system is about one-half kilometer from the ocean. Objectives of the present report are to make preliminary lake-system design recommendations—where feasible—to satisfy proposed lake-system uses; and to identify additional measurements or investigations necessary for design. Dr. King reviewed and obtained data, assessed the proposed system, identified additional measurements and investigations that will likely be necessary for Inversiones Ronda to complete a lake-system design, and published the present report. King recommend system design elements for lake area, lake width, elevated ditch-bottom inlets, lake elevations, lake connectivity, lake connection to groundwater, lake circulation, lake aeration, littoral area, lake maintenance, lake circulation, lake aeration, littoral area, source-water quality, and lake maintenance. King identified the following additional measurements or investigations necessary for lake-system design: measure and interpret geologic, geotechnical, hydrogeologic, hydrologic, and meteorological parameters throughout the lake system; determine ideal aquatic ecosystem plants; measure and interpret additional groundwater-quality constituents; simulate lake-system hydrology and hydraulics; simulate groundwater flow and salt transport; assess flood hazard risk, sinkhole risk, and saltwater intrusion risk; and document regulations relevant to land development and lake-system construction.

King, J.N., 2020 (March 17). Draft preliminary assessment of hydrologic and water-quality conditions, Los Lagos Hacienda, Punta Cana, La Altagracia, Dominican Republic: Applied Technology & Management report, 33 p, 14 figs., 2 tables, archived with Grupo Puntacana.

Associate Engineer with Wood Environment & Infrastructure Solutions

Lockheed Martin–Sikorsky Aircraft wetland, Stratford, Connecticut, United States, undisclosed project value (05/2018–02/2019):

Dr. King and colleagues are analyzing remediation options at a wetland in Stratford, Connecticut, near a Lockheed Martin–Sikorsky Aircraft manufacturing facility. The wetland is connected to a tidal part of the Housatonic River. One remediation option is to cap contaminated wetland sediment; a second option is to dilute contaminated sediment. Wood simulated hydrodynamics in the Sikorsky wetland with **HEC–RAS**, forced by a normal tide; an astronomically extreme tide; and tidally-forced, episodic floods with 10-percent, 2-percent, 1-percent, and 0.2-percent annual exceedance probabilities.

King, J.N., 2018 (November 30), Unsteady hydraulic analyses and cap sediment stability, Sikorsky wetland, Stratford, Connecticut: Amec Foster Wheeler Environment & Infrastructure project memorandum, Project number 3616166054, 39 p, 20 figs, 7 tables, 2 appendices, archived with the State of Connecticut.

Coastal Infrastructure

Senior Engineer with Applied Technology & Management

Environmental monitoring and hydrodynamic & water-quality simulation, proposed Amphitheater Road Marina, Peletier, North Carolina, about $50,000 (2021):
Dr. King and colleagues monitored the environment and are simulating flushing and dissolved oxygen concentration near the proposed Amphitheater Road Marina on the White Oak River near Peletier, in Carteret County, North Carolina. Dirt2Dreams propose to construct a marina in an unnamed tributary to the White Oak River, on the eastern side of the river south of Hancock Point. Dirt2Dreams may also construct marina infrastructure in the White Oak River, between the unnamed tributary and a point about 300 meters (m) southeast of the unnamed tributary.

The State of North Carolina, Department of Environmental Quality (DEQ) permit marina construction to address ecosystem concerns related to environmental quality [North Carolina Department of Environment and Natural Resources, (NCDENR) 2011]. The State of North Carolina created DEQ from NCDENR in 2015. DEQ suggest that the permit process begin with an environmental monitoring and hydrodynamic simulation plan. The objective of the plan is to obtain concurrence from the DEQ on monitoring and simulation approaches.

King, J.N., 2021 (July 23). Amphitheater Road Marina environmental monitoring and hydrodynamic & water-quality simulation plan, Peletier, North Carolina: Applied Technology & Management plan 213667, 29 p, 4 tables, 8 figs, 10 photographs, archived with the State of North Carolina Department of Environmental Quality.

Senior Engineer with Applied Technology & Management
Dolphin Cove facility improvements: Dolphin Cove, Grand Cayman Island, Cayman Islands, $54,500 (07/2019):
Dr. King and colleagues provided professional coastal engineering consulting services for proposed infrastructure improvements at the at Dolphin Cove facility on Grand Cayman's North Sound. King's main contribution was to author parts of a planning, engineering, and simulation report related to numerical simulation. Proposed project goals included the following: address and minimize sargassum impacts to the Dolphin Cove dolphin habitat; maintain and improve the flushing characteristics of the dolphin habitat; create a protected beach/swimming area at the facility; and improve vessel berthing infrastructure at the facility. The primary goal of this project was to address and minimize the sargassum impacts to the facility. The preferred alternative to this issue included a physical breakwater barrier structure to block and divert sargassum, minimize direct and indirect impacts to the facility, and allow sargassum to be removed and properly disposed of more effectively. Since this barrier structure represents a relatively significant infrastructure expenditure, additional benefits were incorporated into an overall facility improvement to provide value and minimize the need for future work and associated impacts at the site. ATM conducted detailed coastal planning, engineering, and hydrodynamic modeling analyses with **EFDC** to assess the existing site, determine environmental conditions affecting the project, evaluate proposed project alternatives, analyze flushing characterizes, and develop recommended improvements to meet the project goals.

Hansell, H., S. So, J.N. King, S. Peene, and S. Phlegar, 2019 (July). Coastal planning, engineering, and flushing simulation report: proposed Dolphin Cove facility improvements: Dolphin Cove, Grand Cayman Island, Cayman Islands: Applied Technology & Management technical report 193344, 25 p, archived with Dolphin Cove (Cayman) Ltd.

Senior Engineer with Applied Technology & Management
Coastal Flushing Simulation: Proposed Marina on the Atlantic Intracoastal Waterway in Myrtle Beach, South Carolina (7/2019–11/13/2019):
GDMB Marina Land LLC hired Applied Technology and Management, Inc. (ATM) to support regulatory permitting for a proposed marina along the Atlantic Intracoastal Waterway (AIWW) in Myrtle Beach, South Carolina. Design objectives were to minimize environmental impacts, maintain biological productivity in the marina, and reduce the potential for toxic accumulation of pollutants in marina sediment. King and colleagues simulated hydrodynamics to evaluate flushing of proposed marina layouts. A semi-enclosed

water body connected to a larger water body is flushed adequately when water flows into and out of the enclosed body at a rate that causes the concentration of constituents in the enclosed body to be approximately equivalent to concentrations in the larger, connected water body. King and colleagues evaluated site conditions; scoped project goals; researched and reviewed data and documents that describe the site and surrounding area; assessed characteristics of the shoreline and intracoastal waterway; determined potential impacts of the proposed marina to the shoreline and intracoastal waterway; developed alternative marina layouts; simulated flushing under contemporary conditions, a proposed design, and alternatives to the proposed design; and conceptually designed coastal infrastructure.

So, S., J.N. King, and S. Peene, 2019 (November 13). Coastal flushing simulation, proposed marina on the Atlantic Intracoastal Waterway, Myrtle Beach, South Carolina: Applied Technology & Management report, 29 p, archived with GDMB Marina Land LLC.

Senior Engineer with Applied Technology & Management
Desalination discharge modeling study, Turismo Itzé S.A. de C.V.'s proposed El Zacatón desalination plant: Los Cabos, Baja California Sur, Mexico, $58,900 (08/2019–10/2019):
Dr. King and colleagues investigated the feasibility of constructing intake and discharge structures for the proposed El Zacatón desalination plant, about four kilometers northwest of Santa Cruz de los Zacatitos, Los Cabos, Baja California Sur, Mexico. Turismo Itzé propose to withdraw water from the Gulf of California and desalinate this withdrawn water to produce potable water. One by-product of desalination is the creation of a brine with a salinity greater than both the salinity of the source water from the gulf, and the salinity of the potable, desalinated production water. Turismo Itzé propose to discharge the brine into the Gulf of California. Turismo Itzé directed ATM to propose preliminary withdrawal and discharge locations, and a diffusion-structure geometry to achieve the following design objectives: the intake structure location is outside the diffusion zone, and the plume does not degrade the marine environment. Locating the intake structure outside the diffusion zone minimizes the volume of brine that may flow back into the desalination plant through the intake pipe.

ATM simulated desalination discharge to satisfy Iberostar's directive and achieves design objectives. We simulated withdrawal of source water from the Gulf of California and discharge of brine into the gulf, near the proposed El Zacatón desalination plant. We used Visual Plumes to characterize the near-field brine plume, within about 100 meters of the discharge structure; and **EFDC** to characterize the far-field brine plume, more than several hundred meters away from the discharge structure. Both tools were published by the United States Environmental Protection Agency. The far-field simulation was partly based on velocity measurements by a teaming partner with an InterOcean **S4ADW** current meter.

King, J.N., E. Bondi, N. Pisarello, and S. Peene, 2019 (September). Desalination discharge modeling study, proposed El Zacatón desalination plant: Los Cabos, Baja California Sur, Mexico: Applied Technology & Management technical report 193365, 35 p, archived with Turismo Itzé SA DE CV.

Senior Engineer with Applied Technology & Management
Bay Point Marina Redevelopment Panama City Beach, Florida, $93,500 (07/2019–01/2020):
The St Joe Company hired Applied Technology & Management to redesign Bay Point Marina, in Bay County near Panama City Beach, Florida. The marina was damaged during Hurricane Michael in early October 2018. Prior to the hurricane, the marina had 180 wet slips, 800 feet of side-tie dock, and a fuel dock. ATM will re-evaluate the marina layout, water depth, and utilities. King and colleagues proposed to collect hydrographic data with **ADCPs**, InSitu **Level Trolls**, and InSitu **Baro Trolls**, and simulate hydrodynamics with **EFDC**, to support Florida Department of Environmental Protection regulatory activities at Bay Point Marina. In the study plan, King and colleagues summarized specific, regulatory, water-quality considerations for hydrographic studies of docking facilities and described activities necessary to create specific technical information to support the department's regulatory activities at Bay Point Marina.

Semmes, R., S. Peene, and J.N. King, 2019 (August). Hydrographic Study Plan—Bay Point Marina Redevelopment Panama City Beach, Florida: Applied Technology & Management planning document, prepared for the St. Joe Company, archived with the Florida Department of Environmental Protection, 6 p.

King, J.N., S. So, S. Peene, R. Semmes, 2020 (January). Draft coastal flushing simulation, proposed Bay Point Marina redevelopment, Panama City, Florida: Applied Technology & Management report 193322, 24 p, 17 figs, 2 tables, archived with the Florida Department of Environmental Protection.

Senior Engineer with Applied Technology & Management
Jolly Harbour, Antigua numerical flushing simulation; funded by Deborah Brosnan & Associates for about $15,000 (2021):

Dr. King simulated flushing in Jolly Harbour, St. Mary, Antigua and Barbuda. King found that filling in a southern flushing canal with earth or sediment will not cause flushing in Jolly Harbour to be worse. The southern flushing canal can be filled or removed by some other means with no material effect on harbour flushing. King found that closure of a southern flushing canal did not materially decrease the mass of constituents—such as pollutants—flushed from Jolly Harbour to the Caribbean Sea, in which the full volume of the harbour is considered. King found that removal of sediment from the southern flushing canal will not materially increase the mass of constituents flushed from Jolly Harbour to the sea; and pumping water to or from a southern part of Jolly Harbour will not materially increase the mass of constituents flushed from Jolly Harbour to the sea. King also found that pumping water from parts of Jolly Harbour to other parts of the harbour does not materially increase the mass of constituents flushed from Jolly Harbour to the sea. King found that pumping water to or from a southern part of Jolly Harbour will materially increase the mass of constituents flushed from part of Jolly Harbour to other parts of the harbour. King found that pumping water from Lignumvitae Bay to a channel in Jolly Harbour will materially increase the mass of constituent flushed from the channel near a commercial property to other parts of the harbour.

King, J.N., 2021 (August 25). Jolly Harbour, Antigua numerical flushing simulation: Applied Technology & Management report 213642, 59 p, 4 tables, 25 figs, 19 photographs, archived with Deborah Brosnan & Associates.

Associate Engineer with Wood Environment & Infrastructure Solutions
Space Fence stormwater management analysis, Kwajalein Atoll, United States Space Command, undisclosed project value, (07/2018–02/2019):

Dr. King analyzed a failed stormwater management system on Kwajalein Atoll. The system outfall was constructed on a white, sandy beach. Part of the beach was excavated to construct the outfall. Natural coastal processes caused the outfall to be buried under beach sand, and to be undermined by erosion during a storm. King analyzed five actions to mitigate the failed system.

King, J.N., 2018 (August 10), Space Fence stormwater management system peer review: Wood project memorandum, Project number 100132.4SSPM.1110, 7 p, 3 figs, archived with the United States Space Command.

Senior Engineer with Wood Environment & Infrastructure Solutions
Wynn construction oversight, Wynn Design & Development, Everett, MA, United States, $1,200,000 (08/28/2017–03/01/2018):

Dr. King and colleagues designed a sediment cap for contaminated sediments in an embayment on the Mystic River in Everett, Massachusetts. King analyzed sediment cap mobility during episodic storms, designed coastal structures to mitigate the effects of episodic storms on the sediment cap, and authored an engineering report to describe the analysis and design. King and colleagues supported Wynn Casinos with a complex and fast-paced, multi-million-dollar sediment remediation project, advancing the project in nine months from conceptual design to construction to meet the client's aggressive schedule. This project represents the first major sediment remediation in the Mystic River. A 13-acre embayment of the river was remediated in conjunction with redevelopment of the adjacent upland property into the new Wynn Boston Harbor Resort. Sediments in the river were contaminated by metals from historical chemical

manufacturing, phthalates and polychlorinated biphenyls from an adjacent property and low levels of polycyclic aromatic hydrocarbons and petroleum from stormwater runoff, industrial releases, and shipping-related releases. Remedy implementation began on October 1, 2017 and involved demolition and removal of five abandoned barges, dredging 24,200 cubic yards of sediment, proper disposal of approximately 42,000 tons of stabilized dredged material, and capping of 7.3 acres.

King, J.N., 2017 (June 1), Coastal erosion forced by surface gravity waves at the former Everett staging yard, for a proposed sediment cap of contaminated sediment at the proposed Wynn Casino, Boston and Everett, Massachusetts: Amec Foster Wheeler Environment & Infrastructure project report, Project number 3651-16-0042, 13 p, 4 figs, 3 tables, 3 design calculation sheets, 2 design plan sheets, to be archived by the State of Massachusetts.

Water Supply and Water Treatment

Associate Engineer with Wood Environment & Infrastructure Solutions
confidential investigation for the Maher Law Firm, Florida, United States, undisclosed project value, (02/2018–02/2019):
Dr. King and colleagues investigated a confidential environmental science matter for the Maher Law Firm.

King, J.N., 2018 (July 18), confidential report to the Maher Law Firm, 102 p, 2 figs, 7 tables, 1 appendix, privately archived.

Senior Engineer for Applied Technology & Management and Associate Engineer with Wood Environment & Infrastructure Solutions
Harvest Health & Recreation Professional Services, less than $200,000 (01/15/2018–2020):
Dr. King and colleagues measured groundwater quality and are designing a public water system to replace an existing limited-use public water system at the former San Felasco Nursery—a nursery licensed by the State of Florida to produce medical marijuana. King also facilitated planning, site civil, and fire suppression services for Harvest.

Associate Engineer with Wood Environment & Infrastructure Solutions
San Felasco Nursery hydrogeologic services, less than $50,000 (06/27/2018–12/2018):
In two months, Dr. King and colleagues designed and facilitated construction of a groundwater supply well and a limited-use public water system, and measured groundwater quality at San Felasco Nursery—a nursery licensed by the State of Florida to produce medical marijuana. The functioning water system was one key component of the $65.6M, December 2018 sale of the nursery and license to Harvest Health & Recreation, Inc.

Transportation or Other Infrastructure

Project engineer for Michael Baker International
Junior Non-Commissioned Officers Housing Project, McDill Air Force Base, Tampa, Florida; funded by the United States Air Force for over $50,000 (1998–1999):
Dr. King authored permit applications for the Southwest Florida Water Management District General Permit and U.S. Army Corps of Engineers Nationwide Fill Permit.

Project engineer for Michael Baker International
U.S. Highway 98, Lakeland, Florida; funded by the Florida Department of Transportation District 1 for over $100,000 (1999):
Dr. King authored a Florida Department of Transportation Quality Assurance Design Services Unit comment-response letter.

Project engineer for Michael Baker International
State Road 776, Venice, Florida; funded by the Florida Department of Transportation District 1 for over $100,000 (1999):
Dr. King reviewed the project drainage report.

Project engineer for Michael Baker International:
State Road 64, Manatee County, Florida; funded by the Florida Department of Transportation District 1 for over $100,000 (1998–1999):
Dr. King authored the National Pollutant Discharge Elimination System permit application and authored a Quality Assurance Design Services Unit comment-response letter.

OTHER TECHNICAL PRODUCTS

Other Publications (not previously cited)

Covington, M.D., D.H. Doctor, J.N. King, C.M. Wicks. 2011. Research in karst: a model for future directions in hydrologic science?: American Geophysical Union, Hydrology Section Newsletter, Summer, http://www.speleophysics.com/pubs/Karst_AGU_Hydrology_newsletter_July_2011.pdf.

Other Presentations (not previously cited)

"Hydrologic Assessment in Coastal Wetlands: Signal Processing Simulated Constituent Transport." J.N. King. Lunch presentation to a northern Florida agriculture interest group, Alachua, Florida, November 2018.

"Strategies to quantify the influence of groundwater management on ecosystem vitality." J.N. King. Presentation to the American Water Resources Association, North Florida Chapter, Gainesville, Florida, March 2017.

"Reevaluation Strategies for Minimum Flows and Levels made with the U.S. Army Corps of Engineers' Streamflow Synthesis and Reservoir Regulation (SSARR) Model." J.N. King. Presentation to the St. Johns River Water Management District, Palatka, Florida, March 2017.

SERVICE

Peer reviewer since 2007 for the American Geophysical Unions' *Water Resource Research*

Technical Advisor for Low Impact Development + Green Stormwater Infrastructure in Karst Areas. in 2021 for the University of Florida Institute of Food and Agricultural Science and the Florida Department of Environmental Protection:
IFAS and the FDEP are developing educational and technical resources related to design, construction, and maintenance of green stormwater infrastructure in karst areas in Florida. Karst landscapes are underlain by partly dissolved or eroded limestone. Springs, sinkholes, and dissolution channels are common in karst landscapes. The potential for aquifer pollution is greater in karst landscapes than in landscapes without karst because stormwater flows directly into aquifers through sinkholes and dissolution channels. Green stormwater design mitigates pollutant loads from constructed lands by reducing pollutant discharge to surface waters, and pollutant infiltration into aquifers. Green stormwater design maintains or replicates natural hydrologic regimes. GSI are constructed structures or facilities that include functions or processes that replicate natural hydrologic regimes. GSI preserves landscape function. GSI includes structures or facilities that store, infiltrate, evaporate, or transpire stormwater to maintain natural discharge volumes and frequencies.

Water Management Advisory Committee Member to the City of Gainesville in 2002 and 2003:
Dr. King was appointed by the City Commission to assess the quality and quantity of water resources available to the citizens of Gainesville; identify and assess potential threats that might degrade water quality, increase flooding, or adversely affect water resources; and inform the citizens of Gainesville through public deliberations and by regular reports to the City Commission regarding water management practices.