

Professional Résumé for  
**Michael A. Ports, PE, PH, D.WRE, D. NE, BCEE**

*Principal • Environmental Engineer • Navigation Engineer • Water Resources Engineer*



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**43 Years Experience**

**Education**

M.S., Water Resources, University of Maryland, 1974

B.S., Civil Engineering, University of Maryland, 1970

**Professional Registrations**

Professional Engineer (Florida No. 68707, Texas No. 50067)

Certified Professional Hydrologist (AIH No. 644)

Certified Professional Soil Erosion and Sediment  
Control Specialist (IECA No. 198)

Diplomate, Water Resources Engineer (AAWRE No. 002)

Diplomate, Navigation Engineer (ACOPNE No. 001)

Board Certified Environmental Engineer (AAEE No. 09-E0016)

**Professional Associations**

American Society of Civil Engineers

~ Fellow

~ Board of Direction 2004-6

~ Technical Region Board of Governors 2006-07

National Energy, Environment and Water Policy Committee

Environmental and Water Resources Institute

~ Founder

~ Governing Board 2000-06

~ President 2004-05

Urban Water Resources Research Council – Member

Urban Watershed Management Committee – Member

American Academy of Water Resources Engineers

~ Founder

~ President, 2007-08

Academy of Coastal, Ocean, Port, and Navigation Engineers ~

Founder

~ President, 2011-12

Civil Engineering Certification, Inc.

~ Founder

~ President, 2012-13

ABET, Civil Engineering Program Evaluator

American Academy of Environmental Engineers – Member

American Institute of Hydrology – Member

**Michael Ports** in various roles as principal, lead designer, project director, consultant, or expert witness, has been involved in numerous water resources projects all over the world. These hydrological projects range in complexity from river training and bank stabilization works to urban stream channel restoration and comprehensive flood control investigations as well as design and statistical analysis.

As a panel member, he continues to provide independent expert peer review services in hydrologic and hydraulic engineering for multiple Hurricane and Storm Damage Risk Reduction System projects in the greater New Orleans metropolitan area. Mandated by Congress, these high-level peer review efforts are part of the process by which the U. S. Army Corps of Engineers designs, builds, and operates the flood protection system. Michael participated in the expert peer review of the HSDRRS Design Guidelines, Levee Backslope Armoring Design Manual, and the Gulf Intracoastal Waterway West Closure Complex. In addition, he participated in the external expert peer review of the Chacon Creek, Rio Grande, Texas Draft Feasibility Report and Integrated Environmental Assessment project for the USACE IWR as a subcontractor for Battelle Memorial Institute.

As a member of EWRI's Blue Ribbon Panel, Michael recently completed the final peer review for the WEF/ASCE Manual of Practice Number 87 Design of Urban Runoff Controls.

## Examples of typical projects:

Currently, in conjunction with the Low Impact Development Center, Inc., Beltsville, Maryland, Michael is providing technical advice and training to the **Urban Planning and Design Institute of Shenzhen, China** for the application of green infrastructure and low impact development techniques for public infrastructure. The first assignment includes stormwater modeling and design assistance in applying low impact street development practices for the design of fifteen streets at the International Low Carbon City in Shenzhen.

Currently, Michael is evaluating the flooding that took place in July 2010 as a result of a levee failure at the **Thermovalle power plant property near Cali, Columbia**, including data collection, field reconnaissance, hydrologic and hydraulic engineering analysis, and expert report, to determine the cause of the levee failure and the resulting flooding.

Michael was the key senior technical advisor on **EPA's National Demonstration of Advanced Drainage Concepts Using Green Solutions**. The project demonstrates the efficacy of implementing integrated, green infrastructure-based solutions, including rain gardens, downspout disconnections, bio-retention, porous pavements, rain barrels, micro-detention, and public outreach, to urban wet weather flow problems.

As project manager, Michael led the design of the **Roads Acting as Dams Project at Devils Lake, North Dakota**. The project consists of preparing complete construction plans and specifications for building approximately fifty miles of elevated roadway embankments to protect the Indian reservation from the rising water levels of Devils Lake. The design includes raising the roadway embankments in stages to elevations 1455, 1460, and 1468 feet.

As project director, Michael led the development of the **first comprehensive city-wide urban storm water management program for Kansas City, Missouri**. The project dubbed **KC-One** includes fully integrated watershed models and master plans, revised and updated FEMA floodplain submittals, updated watershed master planning manual, strategic asset management plan, consolidated

CIP and funding program, comprehensive review of City codes, ordinances, and standards, strategic organization plan, and formal public education and inclusion program.

In addition, he led the development of the **Long Term CSO Control Plans for the Turkey Creek and Missouri River NEID Basins in Kansas City, Missouri**. The project includes development of detailed work plan, field reconnaissance, hydrologic and hydraulic modeling, assessment of existing conditions, formulation and analysis of alternative improvement scenarios, facility siting and feasibility, basin plan integration, water in basement analyses, and public education and participation program.

Moreover, as the project director he led the development of Long Term CSO Control Plans for the **Minna Lusa and Papillion Creek South Basins in Omaha, Nebraska**. The project includes development of a detailed work plan, field reconnaissance, basin characterization, hydrologic and hydraulic modeling, assessment of existing conditions, CSO control technology screening, formulation and analysis of alternative improvement scenarios, facility siting and feasibility, basin plan integration, water in basement analyses, and public education and participation program.

**Turkey Creek Flood Damage Reduction, Reconnaissance Study, Kansas City, Kansas and Kansas City, Missouri**, including an initial phase report, engineering design appendix to the feasibility report, and environmental assessment for 1.75 miles of channel improvements, levees, hillside runoff interceptors, drop structures, floodwalls, bank stabilization, and slope stability analysis.

**Emergency Streambank Protection (Section 14) throughout Missouri and Kansas**, including field reconnaissance, hydrology, hydraulics, and river mechanics for the design of various river training facilities to protect public roads, bridges, or other infrastructure against bank erosion. Typical sites include Kansas River near Eudora, Kansas, Delaware River in Brown County, Kansas, and U.S. Route 169 over the Middle Fork Grand River, Gentry County, Missouri.

## Typical projects (continued)

**Upper Turkey Creek Flood Damage Reduction,** Expedited 905-B Reconnaissance Study, Johnson and Wyandotte Counties, Kansas, including field reconnaissance, hydrology, hydraulics, and environmental assessment for 13 miles of urban stream channel, flood control levees, and opportunities for channel restoration and rehabilitation.

**Blue River Watershed Master Plan, Kansas City, Missouri,** including GIS integrated field surveys, data collection, hydrologic analyses (SWMM), hydraulic analyses (SWMM and HEC-RAS), water quality analyses (BASINS and HSPF), alternatives analyses, and master plan development in order to solve existing flooding problems and preclude the adverse impacts on water quantity and quality from both recent and future development in the 36 square mile urban and suburban watershed.

**St. Paul Downtown Airport, Holman Field, Levee Design, St. Paul, Minnesota,** including data collection, hydraulic modeling, alternatives analysis, and design for approximately 8,000 feet of levee along the right bank of the Mississippi River.

**Kansas City Downtown Airport, Levee Modifications, Kansas City, Missouri,** including critical review of the hydraulic design for proposed modifications to the Missouri River levee to accommodate safety required runway lengthening.

**Yacyreta Reservoir, Hydrologic and Hydraulic Analyses, Parana River, Paraguay and Argentina,** including field reconnaissance, data collection, hydrologic, hydraulic, and sediment transport modeling, evaluation of effects, and alternatives analysis for raising reservoir water levels to full design elevations.

**Integrated Watershed Management Plan, Chi-Tou National Forest Ecological Area, Taiwan,** including field reconnaissance, hydrologic, hydraulic, and sediment transport modeling, public participation program, environmental impact assessment, restoration design, and ecosystem management plan.

**Watershed Pollution Control Program, Taiwan,** including development of integrated, holistic approach for application of constructed wetlands for nonpoint source pollution control for protection of water supply reservoirs.



## Typical projects (continued)

Since 1990, Michael has led the hydraulic and scour analyses for more than 3,600 bridges, both existing and proposed, in 28 states and four foreign countries. He led the hydraulic analyses for the design of the following major bridge projects utilizing the latest two-dimensional hydrodynamic model (FESWMS-2DH), conventional hydraulic models (HEC-RAS and WSPRO), and scour evaluation procedures from HEC-18, HEC-20, and HIRE. The hydraulic analyses include the comparison of alternative bridge and approach roadway configurations in order to minimize the potential backwater and the redistribution of flow across the floodplain. The scour evaluations include the estimation of local contraction, pier, and abutment scour as well as long-term erosion. Typical recent projects include:

**McKinley/Knapp Street Bridge over the Milwaukee River, Milwaukee County, Wisconsin**, including data collection, two-dimensional hydraulic modeling, scour analysis, and design of countermeasures to protect the 96-inch sanitary sewer crossing located adjacent to the proposed bridge piers.

**U.S. Route 54/69 Bypass Bridge over Marmaton River, Fort Scott, Kansas**, including data collection, hydrologic and hydraulic modeling, scour and head cut analysis, and countermeasure design.

**Great River Bridge over the Mississippi River, Desha County, Arkansas to Bolivar County, Mississippi**, including the hydraulic modeling, scour analysis, and scour countermeasure design.

**U.S. Route 60 over Cane Creek and Goose Creek, Butler County, Missouri**, including hydrologic and hydraulic modeling and scour analysis.

**Paksey Bridge Construction Project, Ganges River, Paksey, Bangladesh**, including data collection, bathymetric surveys, two-dimensional hydrodynamic modeling, long-term geomorphic modeling with MIKE 21-C, physical modeling, scour analysis, river training works, and flood control levee design and construction for 15-span concrete highway bridge and 27 kilometers of levees and river training works.

**Greater Cairo Metro Tunnel Crossing of Nile River, Cairo, Egypt**, including field reconnaissance, bathymetric surveys, two-dimensional hydrodynamic and sediment transport modeling with HEC-6 of 15 kilometer reach of Nile River, and scour analyses of six river crossings and tunnel protection works.

**Herbert C. Bonner Bridge carrying NC Route 12 over the Oregon Inlet**, including data collection, bathymetric surveys, two-dimensional hydrodynamic modeling, physical modeling, and scour analysis for the main span connecting Pea and Hatteras Islands, in the Outer Banks of North Carolina.

**U.S. Route 501 over the Intracoastal Waterway**, including wetlands and floodplain analysis, hydraulic analysis, and scour analysis for the main span over the tidal estuary and three separate bridge structures over Socastee Swamp in Horry County, South Carolina.

**State Route 105 Bridge over the Waccamaw River, Horry County, South Carolina**, including hydraulic analysis for the existing and proposed structures under a no rise criteria imposed by FEMA and comprehensive scour evaluation for both structures. The hydraulic analysis was complicated by the comparison of alternative roadway approaches and substructure configurations.

**State Route 15 Bridge over the Housatonic River at Stratford, Connecticut**, including scour evaluation of the existing structure using two-dimensional hydrodynamic modeling for conventional flood events during alternative tidal surge conditions.

**Canal Parkway over the Potomac River and C&O Canal**, including floodplain analysis and delineation, hydraulic analysis, and scour analysis for the main span over the Potomac River and relief span over the C&O Canal in South Cumberland, Maryland.

**Typical projects (continued)**

**West Baltimore Street Bridge Rehabilitation over the Gwynn’s Falls**, including floodplain analysis, channelization alternatives, guide banks, and scour analysis of the existing three span arch bridge at Baltimore, Maryland.

**U.S. 119 over Tug Fork**, including four separate bridge crossings near Williamson, West Virginia.

**Attaway Road Bridge Emergency Repair**, including guide banks, channelization, and additional spans over Gila River in Pinal County, Arizona.

**U.S. 231 over Ohio River** including the main span and 2.5 miles of approach embankment within the

floodplain at Owensboro, Kentucky.

**West Virginia Route 4 over the Ohio River** including the main span and roadway approaches at New Martinsville, West Virginia.

**Seventeenth Street Causeway over the Intracoastal Waterway** (Stranahan River) at Fort Lauderdale, Florida.

**District-wide Scour Evaluations for the Florida Turnpike Authority** including 63 preliminary screenings to determine if scour critical and 14 detailed scour evaluations.



As project hydraulic engineer, Michael Ports led the hydraulic and sediment transport modeling for the **design of the permanent protection of the buried aqueduct crossings of the San Luis Rey River** for the San Diego County Water Authority. The hydraulic modeling using both HEC-RAS and FESWMS-2DH and the sediment transport modeling using both HEC-6 and FLUVIAL-12 is required to design the protection of the buried aqueducts from scour, assess the long-term impacts on the extensive flood control levee system from sand mining within the river.

Michael was the project manager for the planning and design of the **rechannelization of the Salt River in Phoenix, Arizona** from Mill Avenue to 40th Street, a total distance exceeding three miles. The new channel design controls the dynamic behavior of the river, provides a corridor for two major freeways, reduces the length of three new bridges, removes developable land from the floodplain, stabilizes old landfills adjacent to the channel, replaces existing low quality riparian habitat, and provides excess material for roadway embankment. The hydraulic analysis required conventional water surface profile computations using HEC-2 and WSPRO, bridge scour and long-term sediment transport modeling using QUALPRO and HEC-6, and two-dimensional hydrodynamic modeling using FESWMS-2DH. The complexity of the project required extensive coordination throughout all phases of the planning and design, with five roadway and bridge design consultants and over fifteen federal, state, and local agencies and utilities. Major project elements include

5.3 miles of levees, 3.7 miles of 72-inch sanitary sewer and water main pipeline relocation, and major recreational and landscaped features, such as bike paths, jogging trails, an urban park, and creation of 50 acres of riparian wildlife habitat.

Mr. Ports was directly responsible for the hydraulic engineering aspects of the design for the **Alaska Natural Gas Transportation System**. As chief hydraulic engineer, he led the development of the hydrologic, hydraulic, erosion and sediment control, restoration and revegetation, fishery and wildlife habitat mitigation criteria, practices, standards, and specifications for the planning, design, and construction of the 750-mile long, 48-inch diameter buried pipeline from Prudhoe Bay to the Canadian border, including access roads, compressor stations, material sites, disposal sites, camps, airfields, and other appurtenant facilities. More than 500 pipeline stream crossings were designed.

As Project Hydraulic Engineer, Michael performed the hydraulic design and risk analysis for the construction of the **Shot Tower Subway Station** beneath the Jones Falls in Baltimore, Maryland. The hydraulic analysis was complicated by the fact that the Jones Falls flows through three parallel conduits underneath the central business district of Baltimore City, a total distance of 9,000 feet. A unique approach to the risk analysis coupled the application of the HEC-2 model for overland flows to the EXTRAN hydrodynamic model for pressure flows in the three parallel conduits in order to accurately delineate the flood plain through the project area.

## Typical projects (continued)

As project manager and chief hydrologist, Michael directed the development of the **master plan for drainage improvements** for the 98,000-acre New Orleans metropolitan district, an area largely below sea level, protected by levees and served by a 180-mile network of canals with 20 major pumping stations. Development of the master plan required extensive hydrologic and hydraulic modeling using SWMM as well as statistical analysis of hourly rainfall data collected over a 90-year period. An implementation plan was formulated for a 10-year, \$500 million capital improvement program that would double the capacity of the entire storm drainage system.

Utilizing the latest in computer simulation techniques, including SWMM, HSPF, HEC-RAS, UNET, and HEC-DSS, Michael Ports has gained extensive and unique experience in the analysis of existing storm drainage and flood control facilities, including levees, canal systems, and pumping facilities, in southern Louisiana. As project hydrologist, Michael performs statistical analysis and computer simulation for projects such as:

- The hydrologic impacts from the construction of oil pipelines, tank battery, docking facilities, and access roads on runoff quality and quantity for the 140-acre Moseley Tract on Avery Island, Iberia Parish, Louisiana.

- To determine the extent and causes of the April 6-7, 1983 storm event and the resultant flooding experienced within the levee system in the Lower Coast Algiers, Orleans Parish, Louisiana.
- The May 1978 and April 1983 storm events in order to determine the extent and causes of the resultant flooding experienced within the levee system of Chalmette, St. Bernard Parish, Louisiana.
- The May 1978, April 1980, and April 1983 storm events in order to determine the extent and causes of the resultant flooding within the leveed portions of Harahan, Jefferson Parish, Louisiana.

Previously, as Chief of the Watershed Management Division, Maryland Water Resources Administration, Micheal was responsible for the State regulatory programs for surface water resources. He was instrumental in the development and implementation of the first state regulatory programs for urban stormwater management, erosion and sediment control, and floodplain and waterway construction. He served as the State Dam Safety Officer and was responsible for the management of the statewide dam safety program. By applying the Universal Soil Loss Equation, Michael developed methodologies for estimating erosion rates and sediment yields on urban and highway construction sites.



Selected projects that illustrate Michael's experience in hydraulic and hydrologic analysis, water quality modeling, storm water management, soil erosion and sediment control, and environmental impact assessment include:

**Mize Boulevard Lake for the Canyon Creek Project, Lenexa, Kansas**, including field reconnaissance, hydrologic and hydraulic modeling, and design for a 30-foot dam impounding an 11-acre reservoir used for storm water detention, water quality, and aquatic and riparian habitat enhancement.

**Quality Assurance Evaluation and Peer Review of the Storm Water Management/Fluid De-Icing Issues at Dayton International Airport**, including background data collection, airport briefing and field reconnaissance, project review meeting and analysis, and summary project review report and presentation.

**Overbrook Stormwater Management Plan, Norfolk, Virginia**. As project hydrologist, directed the development of the storm water management plan for the 150-acre watershed, including catchment modeling using SWMM, assessment of baseline conditions, formulation of alternative flooding solutions, and preliminary design of the preferred alternative.

**Hughes Aircraft Company NPDES Permit, Tucson, Arizona**. As project hydraulic engineer, directed the characterization of the storm water runoff from the plant site using HSPF and designed a field screening and flow monitoring program for the plant site.

## Selected projects (continued)

**Storm water Retrofit of Major and Minor Outfalls in Redhouse Run Watershed, Baltimore County, Maryland.** As principal investigator, directed the watershed study to assess the need for and feasibility of implementing storm-water BMPs. The study included a detailed field reconnaissance and survey to identify potential sites for new or retrofitted BMPs. The survey included an analysis of the existing conditions, sources of erosion and water quality problems, and drainage system deficiencies.

**Arizona Department of Transportation NPDES Permit Support, Pima County, Arizona.**

As project hydraulic engineer, directed the summarization of storm drainage data, preparation of storm drainage facilities mapping, characterization of storm-water runoff using HSPF, and implementation of field screening program for the constructed portions of all ADOT facilities in Pima County.

**49th Street Bridge over Tampa Bay and Approaches, Pinellas County, Florida.** As project hydraulic engineer, performed preliminary analysis and final design for proposed storm water management facilities for both runoff water quantity and quality control, including infiltration, extended detention, and sediment control.

**Dorsey Road Park and Ride Facility, Anne Arundel County, Maryland.** Provided quality assurance reviews for designs of proposed runoff water quantity and quality control facilities, including detention and erosion control.

**Tucson International Airport and Ryan Field, Storm Water Pollution Prevention Plans and Spill Prevention, Control, and Countermeasure Plan, Tucson, Arizona,** including background data collection, field reconnaissance, environmental audits and interviews for all owner and tenant operations at both facilities. Special emphasis was placed on the application of cost effective BMPs into ongoing airport operations.

**Hopkins International Airport, Cleveland, Ohio.** As chief hydrologic and hydraulic engineer, prepared appropriate sections of environmental assessment for the proposed runway extension, which was complicated by the presence of wetlands and

floodplains and the necessity to conform to the NPDES storm-water permitting requirements.

**Rosedale Park and Ride Facility, Baltimore County, Maryland.** Provided quality assurance reviews for designs of proposed runoff water quantity and quality control facilities, including detention and erosion control.

**White Marsh Park and Ride Facility, Baltimore County, Maryland.** Provided quality assurance reviews for design of proposed runoff water quantity and quality control facilities, including detention and erosion control.

**Continuous Electron Beam Accelerator Facility, Newport News, Virginia.** As project hydraulic engineer, designed storm water drainage systems for water quantity and quality control, including detention and erosion control.

**Air Force One Maintenance and Support Complex, Andrews Air Force Base, Maryland.** As project hydraulic engineer, designed storm water drainage systems for water quantity and quality control, including infiltration, extended detention, filtration, and erosion and sediment control.

**College Park Metro Station, College Park, Maryland.** As project hydraulic engineer, designed storm water drainage system, including infiltration facilities, for both water quantity and quality control and erosion and sediment control.

**Greensville Multiple Facility Prison Complex, Jarrett, Virginia.** As deputy project manager and project hydraulic engineer, responsible for overall civil engineering and site work and storm drainage designs, including storm water management for water quantity and quality control and for erosion and sediment control.

**Hydrologic Investigation of the Wolfswinkel Tract, Phoenix, Arizona.** As project hydrologist, performed flood plain delineations to determine the developable portion of 150-acre tract.

**American Public Works Association, Chicago, Illinois,** senior technical advisor on research project Nationwide Characterization, Impacts and Critical Evaluation of Storm-water Discharges, Combined Sewer Overflows, and Non-Sewered Urban Runoff.



## Expert Witness Experience:

Michael Ports' education, experience, ability to perform critical analysis and articulate results make him a sought-after expert witness. His years of planning, analysis, design, and construction experience in a broad spectrum of water resources engineering applications give him credibility beyond the ordinary lay person. He is well respected in the field, is fully licensed, certified, trained and honored.

Currently, Michael is performing a critical evaluation of the design, operation, and maintenance for portions of the **Milwaukee Metropolitan Sewerage District wastewater collection system**. The evaluation includes field reconnaissance of the neighborhoods that experienced sewer backups, hydrologic analyses of the significant flood events of 2008 and 2010, and critical review of the wastewater collection system operation during the events.

Michael performed the critical evaluation of the design and operation of the two pumped drainage systems at **New Roads, Louisiana during Hurricane Gustav** in September 2008 that are the subject of the suit **Toussaint Battley, Sr. vs. Pointe Coupee Parish Police Jury, et al.** The investigation included field reconnaissance of the 100-acre catchment, data collection, literature review, and detailed hydrologic and hydraulic modeling and analyses.

Michael performed a hydrologic and hydraulic engineering analysis for the **Cheyenne River Sioux Tribe, et al v. United States litigation**. The plaintiffs claim that the design and operation of the **Oahe Dam and Reservoir on the main stem of the Missouri River** has adversely affected the cattle ranching operations along the Moreau River and floodplain and that the prolonged flooding and resulting sediment deposition from the 1997 Flood were the direct result of the design and construction of the dam and reservoir. The analysis included a field reconnaissance, data collection, literature review, flood frequency analysis, sediment transport analysis, and water surface profile computations.

Michael also worked on the **Ruche J. Marino, et al vs. Parish of St. Charles, Louisiana litigation** concerning the flood of April 25, 2004 in Norco, Louisiana. The plaintiffs alleged that the Parish was negligent in its planning, design, operation, and maintenance of the drainage system

and that their negligence caused the subject flooding. Michael prepared a hydrologic and hydraulic engineering evaluation of the causes of the subject flooding and the operation and maintenance of the subject drainage system. His evaluation includes a field reconnaissance of the Norco catchment area; office review of the available records, documents, reports, maps, and photographs; technical literature review; hydrologic and hydraulic engineering analyses; and, critical review of the Plaintiff's claims.

Recently, Michael performed a critical review of the hydrologic and hydraulic design elements associated with the site drainage and combined sewer relocation of the residential condominium development named the **Lofts at the Park I & II in Atlanta, Georgia**. Working with one of the defendants, Michael provided expert testimony on the standard of care for site drainage and combined sewer relocation design and construction.

Previously, Michael performed a critical evaluation of the hydrologic and hydraulic engineering aspects of the design, operation, and maintenance of the **Upper Mississippi River Navigation System for the U. S. Department of Justice**. The system consists of 29 locks and dams on the mainstream of the Mississippi River extending from St. Paul, Minnesota to St. Louis, Missouri, a total distance of 857.6 miles. The evaluation included the critical review of the navigation system regulation and operation, effects of wing dams, erosion on river levees, seepage under and through river levees, maintenance dredging operations, and the need for river levees.

Also recently, Michael **served as an expert for the City of West Des Moines, Iowa, Department of Public Works** to determine whether two residential subdivisions and one commercial development met the City floodplain and storm drainage design criteria.

## Expert Witness Experience (continued)

Michael performed the analysis of the hydrologic impacts from the construction, operation, and maintenance of oil pipelines, tank battery, docking facilities, and access roads on the runoff quality and quantity for the 140-acre **Moseley Tract on Avery Island, Iberia Parish, Louisiana.**

Michael performed the statistical analysis and computer simulation of the April 6-7, 1983 storm event in order to determine the extent and causes of the resultant flooding experienced within the **levee system in the Lower Coast Algiers in Orleans Parish, Louisiana.** The hydrologic and hydraulic engineering analyses included extensive field reconnaissance and surveys, review of operational and maintenance records, damage assessments, and remediation recommendations.

For a different client in a different court, Michael performed statistical analysis and computer simulation of the May 1978 and April 1983 storm events in order to determine the extent and causes of the resultant flooding experienced within the **Chalmette levee system in St. Bernard Parish, Louisiana.**

Michael performed the statistical analysis and computer simulation of the May 1978, April 1980, and April 1983 storm events in order to determine the **extent and causes of the resultant flooding within the Harahan neighborhood in Jefferson Parish, Louisiana.** His evaluation included extensive field reconnaissance, hydrologic analysis and modeling, hydraulic engineering analysis and modeling, review of construction practices, review of drainage system operation and maintenance, and flood damage assessments.



## Awards

Michael has received numerous awards for his contributions to the technical literature and his profession from the **American Academy of Water Resources**, which he founded, **American Society of Civil Engineers**, **Environment and Water Resources Institute**, **Maryland State Highway Administration**, **National Taiwan University**, **Parsons Brinckerhoff**, and **University of Iowa**, including:

**EWRI Fellow, elected by the Environmental An Water Resources Institute Governing Board**, July 2013.

**IWA Project Innovation Awards** presented in appreciation of support and contribution as a member of the Global Judging Panel, 2012.

**Certificate of Appreciation** for outstanding service on the EWRI Urban Water Resources Research Council, 2012.

**Expression of Appreciation** in recognition of excellent service as a member of the Blue Ribbon Review Panel for the WEF/ASCE Manual of Practice 87, Design of Urban Stormwater Controls, 2012.

**Certificate of Appreciation** in recognition for invaluable contributions to the 2010 International Workshop on Integrated Watershed Management, Environmental Protection Administration, Executive Yuan, Republic of China, Taiwan, July 2010.

**Service to the Institute Award** for his more than 42 years service to ASCE and EWRI. He has served in every capacity of the Water Resources Planning and Management Division and EWRI from task committee to President. Environmental and Water Resources Institute, May 2010.

**Certificate of Appreciation** in recognition for invaluable contributions to International Workshop on Integrated Watershed Management, Environmental Protection Administration, Executive Yuan, Republic of China, Taiwan, July 2009.

**Certificate of Appreciation** in recognition for invaluable contributions to the 2008 International Workshop on Water Environment and Professional Issues. Graduate Institute of Environmental Engineering, 2008 International Workshop on Water Environment and Professional Issues, National Taiwan University, Taipei, Taiwan, Republic of China, June 2008.

**Certificate of Appreciation** for invaluable contributions to the 2nd International Conference on Sustainable Water Environment: Water Resources and Quality Management, Graduate Institute of Environmental Engineering, National Taiwan University, November 2006.

**Certificate of Appreciation** for invaluable contributions to the 1st International Conference on Sustainable Water Environment: Water Resources and Quality Management, Graduate Institute of Environmental Engineering, National Taiwan University, November 2005.

**Iowa Institute of Hydraulic Research Advisory Committee** in recognition of his numerous contributions to the field of hydraulic engineering, including the application of rigorous principles of hydraulic research to practical problems in design. University of Iowa, Member January 2001 and Vice Chair 2004.

**Certificate of Appreciation** in recognition of outstanding vision, service, and leadership, Environmental and Water Resources Institute, September 2002.

**Certificate of Appreciation** for his outstanding contribution as a member of the Hydrology Panel in developing state-of-the-art procedures and common sense recommendations for hydrologic engineering design criteria and methodologies. Maryland State Highway Administration, December 1999.

**Award of Merit** in recognition of outstanding vision, service, and leadership as a founding member of the Environmental and Water Resources Institute. American Society of Civil Engineers, October 1999.

**Reconocimiento por su participacion en la 1a Reunion Sobre el Futuro** de la Ingenieria Civil de America Del Norte, Enero 1996. Colegio Ingenieria Civil de Mexico.

**Awards (continued)**

**Principal Professional Associate of Parsons Brinckerhoff** in recognition of the highest degree of personal professional achievement and eminence within the field of water facilities planning and engineering. Parsons Brinckerhoff, Inc., New York, New York, March 1995.

**William Barclay Parsons Fellow**, 1994. Parsons Brinckerhoff, Inc., New York, New York.

**Certificate of Appreciation** in recognition of his distinguished service as Chairman of the First North American Water Resources and Environmental Engineering Congress, June 1992. American Society of Civil Engineers.

**Certificate of Appreciation** in recognition of his distinguished service as Chairman of the Water Resources Planning and Management Division, 1991-1992. American Society of Civil Engineers.



## Publications

Michael Ports has authored more than one hundred fifty technical papers, articles, reports, and chapters on subjects ranging from hydrologic analysis, computer modeling, master planning, and geomorphology to erosion and sediment control, water law, flood plain management, storm-water planning, and urban watershed management. Below is a partial listing of typical publications. Please contact Michael if you have any questions about a particular hydrologic engineering topic that may not be listed here.

**157.** *Preliminary Design Report, Low Impact Street Development Project, International Low Carbon City, Shenzhen, China*, October 2013. Low Impact Development Center, Inc., Beltsville, Maryland.

**156.** *Stormwater as Art*, August 2013. Urban Planning and Design Institute, Shenzhen, China.

**155.** *Ethics, Engineers, and Experts: Who is Your Master?*, August 2013. Ports 2013 Conference, Coastal, Ocean, Ports, and Rivers Institute, American Society of Civil Engineers, Reston, Virginia. (K. A. Goodwin, co-author.)

**154.** *National Demonstration of the Integration of Green and Gray Infrastructure in Kansas City, Missouri*, August 2011. Urban Watershed Management Branch, Water Supply and Water Resources Division, National Risk Management Research Laboratory, U. S. Environmental Protection Agency, Edison, New Jersey. (S. Struck, et al, co-authors.)

**153.** *Cost Comparison of Conventional Gray Combined Sewer Overflow Control Infrastructure versus a Green/Gray Combination*, June 2012. *Journal of Irrigation and Drainage Engineering*, American Society of Civil Engineers, Reston, Virginia. (J. P. Cohen, et al, co-authors.)

**152.** *Selecting and Prioritizing Green Infrastructure in Combined Sewer Catchments*, September 2011. Eighth International Urban Watershed Management Conference, Tsinghua University, Beijing, People's Republic of China.

**151.** *Prioritizing and Selecting Green Infrastructure in Combined Sewer System Service Areas, Volume 1 Strategies for Planning and Implementing Green Infrastructure*, August 2011. Urban Watershed Management Branch, Water Supply and Water Resources Division, National Risk Management Research Laboratory, U. S. Environmental Protection Agency, Edison, New Jersey. (S. Struck, et al, co-authors.)

**150.** *Final Independent External Peer Review Report for the Chacon Creek, Rio Grande Texas Draft Feasibility Report*

*and Integrated Environmental Assessment*, November 2010. Flood Risk Management Planning Center of Excellence, Baltimore District, U.S. Army Corps of Engineers. (B. Wilcox, et al, co-authors)

**149.** *Advanced Drainage Concepts Demonstration Project: The Kansas City Experience*, July 2010. The Sixth International Conference on Sustainable Water Environment, University of Delaware, Newark, Delaware.

**148.** *Storm water as Entertainment*, July 2010. 2010 International Workshop on Integrated Watershed Management, National Taiwan University, Taipei, Republic of China.

**147.** *Water Quality Goals and Standards, The U. S. Experience*, July 2010. 2010 International Workshop on Integrated Watershed Management, National Taiwan University, Taipei, Republic of China.

**146.** *Evaluating Green/Gray Infrastructure for CSO/Storm-water Control*, June 2010. 2010 International Workshop on Watershed Management and Green Infrastructure, National Taiwan University of Technology, Taipei, Republic of China. (R. Field et al co-authors)

**145.** *Maintenance of Storm-water BMPs*, June 2010. 2010 International Workshop on Watershed Management and Green Infrastructure, National Taiwan University of Technology, Taipei, Republic of China.

**144.** *How the Heart of America is Goin' Green to Solve Water and Sewer Issues, Prioritizing and Selecting Green Infrastructure in Combined Sewer System Service Areas, Strategies for Planning and Implementing Green Infrastructure Volume 1; Milwaukee, Wisconsin*, January 2010. India 2010, 3rd International Perspective on Current & Future State of Water Resources & the Environment, Indian Institute of Technology (Madras) Chennai, India.

**143.** *Prioritizing and Selecting Green Infrastructure in Combined Sewer System Service Areas, Strategies for Planning and Implementing Green Infrastructure Volume 1; December 2011. United States Environmental Protection*

## Publications (continued)

Agency, Washington, D.C.(S. Struck et al, co-authors)

**142.** *Hydrologic and Hydraulic Engineering Investigations and Findings, Milwaukee, Wisconsin*, February 2011, Tom Reep, et al, Plaintiffs vs. Veolia Water North America–Central, LLC, et at Defendants Case No. 09-CV-3483

**141.** *Advanced Drainage Concepts Using Green Infrastructure*, October 2009. Bergmann Associates, Jacksonville, Florida. Advanced Drainage Concepts Using Green Infrastructure,

**140.** Recommendations and Strategies for the Black River Watershed Management Plan, September 2009. Bergmann Associates, Rochester, New York. (K. Baptiste, et al co-authors)

**139.** *The Great Midwest Flood or 2008*, August 2009. Water Engineering for a Sustainable Environment, 33rd International Association for Hydraulic Engineering and Research, Vancouver, British Columbia. (S. K. Nanda, co-author)

**138.** *Tropical Storm Fay*, August 2009. Water Engineering for a Sustainable Environment, 33rd International Association for Hydraulic Engineering and Research, Vancouver, British Columbia. (M. Meyer, co-author)

**137.** **An Introduction to Stormwater Indicators**, July 2009. Roundtable Discussion, International Workshop on Integrated Watershed Management, Graduate Institute of Environmental Engineering, National Taiwan University, Taipei, Taiwan.

**136.** *Advanced Credentialing for Civil Engineers*, July 2009. Task Committee Report, Committee on Professional Practice, American Society of Civil Engineers, Reston, Virginia. (S. Knight, et al co-authors)

**135.** *Protecting Natural and Historic Resources in Conflict*, July 2009, International Workshop on Integrated Watershed Management, Graduate Institute of Environmental Engineering, National Taiwan University, Taipei, Taiwan.

**134.** *10,000 Rain gardens in Kansas City*, June 2009. Summer Meeting, Florida Stormwater Association, Tallahassee, Florida. (L. Hinkle, co-author)

**133.** *Balancing Green Infrastructure with Traditional Approaches for CSO Control*, May 2009. Urban watershed Management Symposium, World Environmental and Water Resources Congress, American Society of Civil Engineers, Reston, Virginia. (S. Struck, et al, co-authors)Balancing Green Infrastructure with Traditional Approaches for CSO Control, May 2009.

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**132.** *Five-Year History of Water Resources Specialty Certification and Value Slogans*, May 2009. Great Rivers History Symposium, World Environmental and Water Resources Congress, American Society of Civil Engineers, Reston, Virginia. (J. Rogers, et al, co-authors)

**131.** *Prioritization Report for the Black River Watershed Management Plan*, April 2009. Bergmann Associates, Rochester, New York. (K. Baptiste, et al co-authors)

**130.** *How the Heartland of America is Goin' Green to Solve Water and Sewer Issues*, January 2009. International Perspectives on Water Resources, Asian Institute of Technology, Bangkok, Thailand. (L. Hinkle, co-author)

**129.** *Characterization Report for the Black River Watershed Management Plan*, January 2009. Bergmann Associates, Rochester, New York. (K. Baptiste, et al co-authors)

**128.** *An Integrated, Multi-Scale, Interagency Approach to Green Infrastructure*, November 2008. International Low Impact Development Conference, American Society of Civil Engineers, Reston, Virginia. (T. Jacobs, co-author)

**127.** *Protecting Natural and Historic Resources in Conflict*, October 2008. 6th International Conference on Urban Watershed Management and Lake Eco-system Protection and Resource Utilization, Nanchang, China.

**126.** *Hydrologic and Hydraulic Engineering Investigations and Findings, Ruche J. Marino, et al v. Parish of St. Charles, Louisiana*, July 2008. Bergmann Associates, Jacksonville, Florida.

**125.** *Source Control, the Solution to Stormwater Pollution*, June 2008. International Forum on Green Infrastructure, National Taiwan University of Technology, Taipei, Taiwan, Republic of China.

**124.** *Opportunities for Continued Professional Development*, June 2008. 2008 International Workshop on Water Environment and Professional Issues, National Taiwan University, Taipei, Taiwan, Republic of China.

**123.** *Advanced Professional Certification: What is it and Why is it Important*, June 2008. 2008 International Workshop on Water Environment and Professional Issues, National Taiwan University, Taipei, Taiwan, Republic of China.

**122.** *A Green Filter Approach to Turning a City Green One BMP at a Time*, May 2007. World Environment and

Water Resources Congress, Tampa, Florida. (S. Schulte and B. Lawrence, co-authors)

**121.** *Green Infrastructure Approaches to Solving Wet Weather Problems*, April 2007. 4th International Conference on Watershed Management and Mountain River Protection, Chengdu, Sezhuan, China.

**120.** *Hydrologic and Hydraulic Investigations and Findings, Moreau River, Cheyenne River Sioux Tribe et al v. United States*, February 2007. Black and Veatch Corporation, Kansas City, Missouri.

**119.** *Evaluation of Urban Runoff Control Programs*, November 2006. The Second International Conference on Sustainable Water Environment: Water Resources and Quality Management, National Taiwan University, Taipei, Taiwan.

**118.** *The ABCs of BMPs for Erosion and Sediment Control*, October, 2006. The Second International Conference on Sustainable Water Environment: Water Resources and Quality Management, Forum C: Water Safety Plans, Environmental Protection Administration, Executive Yuan, Taipei, Taiwan.

**117.** *Developing an Integrated Urban Watershed Management Program*, June 2006. Hydrological Sciences for Managing Water Resources in the Asian Developing World, Zhongshan University, Guangzhou, China.

**116.** *BMPs in the Heartland: An Institutional Framework for Stormwater Management*, May 2006. BMP Technology in Urban Watersheds: Current and Future Directions, Environmental and Water Resources Institute, American Society of Civil Engineers, Reston, Virginia. (T. Jacobs, co-author)

**115.** *Integrated Urban Stormwater Management*, April 2006. Carolinas Floodplain Conference, North Carolina Association of Floodplain Managers, Myrtle Beach, South Carolina.

**114.** *Integrated Urban Stormwater Management: Research Trends and Needs*, March 2006. Workshop on Innovation and Research for Water Infrastructure in the 21st Century, Office of Research and Development, U. S. Environmental Protection Agency, Washington, DC.

**113.** *Developing an Integrated Watershed Management Program*, November 2005. First International Conference on Sustainable Water Environment, National Taiwan University, Taipei, Taiwan.

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*for Stormwater Management*, May 2005. BMP Technology, Environmental and Water Resources Institute, Reston, Virginia. (T. Jacobs, co-author)

**111.** *Opportunities for International Cooperation and Professional Certification*, December 2004. 4th International Conference on Watershed Management and Urban Water Supply, Shenzhen, China.

**110.** *Herdling More Cats: Developing Vision, Principles, and Priorities for an Integrated Stormwater Management Program*, June 2004. Proceedings of the World Water and Environmental Resources Congress, Environmental and Water Resources Institute, Reston, Virginia. (A. Almai, co-author)

**109.** *Critical Review of the Floodplain and Storm Drainage Design for the Reeds Crossing Planned Unit Development*, February 2004. Black & Veatch Corporation, Kansas City, Missouri.

**108.** *Hydrologic and Hydraulic Investigations and Report, Mississippi River, Henderson County Drainage District No. 3, et al, Plaintiffs v. United States of America, Defendant*, September 2003. Black & Veatch Corporation, Kansas City, Missouri.

**107.** *Watershed Management*, December 2001. Proceedings of the Third International Watershed Management Conference, American Society of Civil Engineers, Reston, Virginia. (D. Renetzky, co-editor)

**106.** *Evaluation of Urban Runoff Control Programs*, December, 2001. Proceedings of the Third International Watershed Management Conference, National Taiwan University, Taipei, Taiwan.

**105.** *Engineering Intrigue at Barnums Hotel*, October, 2001. Proceedings of the International Civil Engineering History and Heritage Congress, American Society of Civil Engineers, Reston, Virginia.

**104.** *Lincoln Creek Reach 6: Critical Review of the Manning Roughness Coefficients*, May 2001. HNTB Corporation, Kansas City, Missouri.

**103.** *Application of Hydrologic Methods in Maryland*, February, 2001. A Report Prepared by the Hydrology Panel Convened by the Maryland State Highway Administration and the Maryland Department of the Environment, Baltimore, Maryland. (M. Ports, panel member)

**102.** *Can Urban Streams be Restored?* May, 2000. Proceedings of International Workshop on Watershed Management in the 21st Century, National Taiwan

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University, Taipei, Taiwan. (C. Shea, co-author)

**101.** *Additional Hydraulics, Scour, and River Training Evaluation for the Provisional Design of the Paksey Bridge Construction Project, Addendum No. 1*, March, 2000.

Prepared for the Government of the Peoples Republic of Bangladesh, Roads and Highways Department by Parsons Brinckerhoff International, Inc., Dhaka, Bangladesh.

**100.** *Additional Hydrologic Investigation of the Flood of May 8-9, 1995 in the River Ridge, Harahan, and Elmwood Areas of Jefferson Parish, Louisiana*, October, 1999.

Parsons Brinckerhoff, New Orleans, Louisiana.

**99.** *Hydraulic Engineering Considerations in Planning and Design of the Paksey Bridge Construction Project*, August, 1999. *Water Resources into the New Millennium: Past Accomplishments, New Challenges*, American Society of Civil Engineers, Reston, Virginia.

**98.** *Resolving Conflicts in Hydrologic Design Criteria: A Case Study in Maryland*, June 1999. Proceedings of the 26th Annual Water Resources Planning and Management Conference, American Society of Civil Engineers, Reston, Virginia.

**97.** *Additional Hydraulics, Scour, and River Training Evaluation for the Provisional Design of the Paksey Bridge Construction Project*, March, 1999. Prepared for the Government of the Peoples Republic of Bangladesh, Roads and Highways Department by Parsons Brinckerhoff International, Inc., Dhaka, Bangladesh.

**96.** *History and Heritage Program for the Maryland Section*, October, 1998. *Engineering History and Heritage*, Proceedings of the Second National Congress on Civil Engineering History and Heritage, American Society of Civil Engineers, Reston, Virginia. (S. Yochum, co-author)

**95.** *Design Review Report for the Hydraulics, Scour, and River Training Evaluation for the Paksey Bridge Construction Project*, September, 1998. Prepared for the Government of the Peoples Republic of Bangladesh, Roads and Highways Department by Parsons Brinckerhoff International, Inc. Dhaka, Bangladesh.

**94.** *Tributary Strategies in the Middle Potomac River Basin of the Chesapeake Bay*, June, 1998. *Coordination: Water Resources and Environment*, American Society of Civil Engineers, Reston, Virginia.

**93.** *Alternatives Analysis for Reduction of Maintenance Dredging of a Tidal Inlet*, April, 1998. Proceedings of the First Interagency Hydrologic Modeling Conference,

Las Vegas, Nevada. (C. Shea and D. Froehlich, co-authors)

**92.** *Hydrologic Investigation of the Flood of May 8-9, 1995 in the River Ridge, Harahan, and Elmwood Areas of Jefferson Parish, Louisiana*, April, 1998. Parsons Brinckerhoff, Baltimore, Maryland.

**91.** *A Floodplain Virtually at Your Fingertips: Touring Double Pipe Creek*, March, 1998. Proceedings of the Spring Conference Floodplain Management Association, Mission Viejo, California.

**90.** *On Scours Frontier*, August, 1997. *Civil Engineering Magazine*, Volume 67, Number 8, American Society of Civil Engineers, Reston, Virginia. (P. Johnson, C. Shea, and A. Rahmani, co-authors)

**89.** *Hydrologic Investigation of the Bradley Property in the City of Southlake, Tarrant County, Texas*, August, 1997. Parsons Brinckerhoff, Baltimore, Maryland.

**88.** *Physical and Computational Modeling of Bridge Scour at Oregon Inlet, North Carolina*, August, 1997. *Managing Water: Coping with Scarcity and Abundance*, Proceedings of the 27th Congress of the International Association for Hydraulic Research, American Society of Civil Engineers, Reston, Virginia. (C. Shea, co-author)

**87.** *Hydraulic Modeling and Scour Analysis for the Cairo Metro Tunnel Crossings of the Nile River*, July 1997. Ministry of Public Works and Water Resources, National Water Research Center, Nile Research Institute, Cairo, Egypt.

**86.** *North Carolina: Physical and Computer Modeling of Bridge Scour*, Spring, 1997. *PB Network*, Issue 38, Volume XI, Number 2, Parsons Brinckerhoff, New York, New York. (C. Shea, co-author)

**85.** *Stormwater Retrofit of Major and Minor Outfalls in Redhouse Run Watershed*, July 1996. Baltimore County, Department of Environmental Protection and Resources Management, Towson, Maryland.

**84.** *Design of a Floodplain Road Crossing Using Two-Dimensional Modeling*, June, 1996. *North American Water and Environment Congress*, American Society of Civil Engineers, New York, New York. (A. Kosicki and N. South, co-authors)

**83.** *Two-Dimensional Modeling of the Mobile River Delta and Mobile Bay System*, June, 1996. *North American Water and Environment Congress*, American Society of Civil Engineers, New York, New York. (C. Powell and C. Shea, co-authors)

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**82.** *Multi-Permitting Strategy for NPDES Stormwater Permits*, June, 1996. North American Water and Environment Congress, American Society of Civil Engineers, New York, New York. (W. H. Espey and J. Whitescarver, co-authors)

**81.** *South Carolina DOT Statewide Program of Bridge Scour Evaluation*, June, 1996. North American Water and Environment Congress, American Society of Civil Engineers, New York, New York. (R. D. Williamson and D. Hatfield, co-authors)

**80.** *Scour Analysis for a Dynamic Inlet: A Case Study of the Proposed Bonner Bridge Spanning Oregon Inlet, North Carolina*, March, 1996. Proceedings of the Sixth Federal Interagency Sedimentation Conference, Las Vegas, Nevada. (C. Shea and A. Ramani, co-authors)

**79.** *Estimated Compliance Costs: SWPPPs, Permit Fees, Monitoring, Training, etc.*, November, 1995. Presented at the American Association of Airport Executives Storm water Management and Permit Strategy Workshop, Atlanta, Georgia. (J. Whitescarver, co-author)

**78.** *Mobile Bay Hydraulic Study and Scour Analysis in Mobile and Baldwin Counties, Alabama*, October, 1995. Prepared for the Alabama Department of Transportation by Parsons Brinckerhoff, Baltimore, Maryland. (C. Shea, co-author)

**77.** *Storm Water Pollution Prevention Plan for Tucson International Airport*, September, 1995. Prepared for the Tucson Airport Authority by Parsons Brinckerhoff, Tucson, Arizona. (C. Shea and E. Griffith-Metty, co-authors)

**76.** *Storm Water Pollution Prevention Plan for Ryan Field*, September, 1995. Prepared for the Tucson Airport Authority by Parsons Brinckerhoff, Tucson, Arizona. (C. Shea and E. Griffith-Metty, co-authors)

**75.** *Oil Spill Prevention, Control and Countermeasure Plan for the Tucson International Airport*, August, 1995. Prepared for the Tucson Airport Authority by Parsons Brinckerhoff, Tucson, Arizona. (L. Voellinger and E. Griffith-Metty, co-authors)

**74.** *Oil Spill Prevention, Control and Countermeasure Plan for Ryan Airfield*, August, 1995. Prepared for the Tucson Airport Authority by Parsons Brinckerhoff, Tucson, Arizona. (L. Voellinger and E. Griffith-Metty, co-authors)

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Department of Transportation by Parsons Brinckerhoff, Baltimore, Maryland. (C. Shea, co-author)

**72.** *A Practical Application of Two-Dimensional Hydraulic Analysis for the Baltimore Street Bridge Rehabilitation Project*, August, 1995. Proceedings of the 1st International Conference on Water Resources Engineering, American Society of Civil Engineers, New York, New York.

**71.** *Evaluation of Appeal of the St. Mary Parish Drainage District No. 1 for Drainage Channel Debris Removal in the Vicinity of Franklin and Baldwin, Louisiana*, May, 1995. American Society of Civil Engineers, New York, New York. (T. Jackson and J. Scott, co-authors)

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**69.** *Bridge Replacement Hydraulic Analysis over Cane Creek on Route S-29-56, Lancaster County, South Carolina*, April 1995. Prepared for the South Carolina Department of Transportation by Parsons Brinckerhoff, Raleigh, North Carolina. (B. Hancock, co-author)

**68.** *Hydraulic Analysis for the 51st Avenue Bridge over the Salt River in Maricopa County, Arizona*, December 1994. Prepared for the Maricopa County Department of Transportation by Parsons Brinckerhoff, Tempe, Arizona.

**67.** *Use of FESWMS-2DH for the Attaway Road Bridge Repair Project*, August, 1994. Proceedings of the National Conference on Hydraulic Engineering, American Society of Civil Engineers, New York, New York. (D. Dee and J. Warren, co-authors)

**66.** *Spotlight on the Owensboro Bridge: Hydraulic Analysis and Scour*, Summer 1994. PB Network, Issue No. 28, Volume VIII, Number 2, Parsons Brinckerhoff, New York, New York. (V. Chandra, co-author)

**65.** *Computer Modeling Speeds Bridge Scour Analysis*, May 1994. Better Roads, New York, New York.

**64.** *Tug Fork Floodplain Modifications and Wetlands Mitigation*, May, 1994. Water Policy and Management: Solving the Problems, Proceedings of the 21st Annual Water Resources Planning and Management, American Society of Civil Engineers, New York, New York. (D. Dee and C. Riling, co-authors)

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- 63.** *Final Hydraulic Analysis Report, Relocated US Route 119 Over the Tug Fork*, August, 1993. Parsons Brinckerhoff Quade & Douglas, Inc., Baltimore, Maryland. (D. Dee, co-author)
- 62.** *Practical Comparison of One-Dimensional and Two-Dimensional Hydraulic Analyses for Bridge Scour*, August, 1993. Proceedings of the 1993 National Conference on Hydraulic Engineering, Bridge Scour Symposium, American Society of Civil Engineers, New York, New York. (T. Turner and D. Froehlich, co-authors)
- 61.** *Hydraulic Analysis Report for the Attaway Road Bridge Repair Project, Florence, Arizona*, June, 1993. Parsons Brinckerhoff Quade & Douglas, Inc., Baltimore, Maryland. (D. Dee, co-author)
- 60.** *Alternatives Analysis Using Two-Dimensional Modeling for the Owensboro Bridge and Approaches*, May, 1993. Proceedings of the 1993 National Conference on Water Resources Planning and Management, American Society of Civil Engineers, New York, New York. (T. Turner and D. Froehlich, co-authors)
- 59.** *Hydraulic Analysis for the Construction of the Tunnel Alternative for the Seventeenth Street Causeway, Fort Lauderdale, Florida*, September, 1992. Parsons Brinckerhoff Quade & Douglas, Inc., Baltimore, Maryland.
- 58.** *Scour Analysis Report for the New Martinsville Bridge Over the Ohio River*, September, 1992. State Project S352-7-0.02, Wetzel County, West Virginia Department of Transportation, Division of Highways, Charleston, West Virginia. (D. Dee, co-author)
- 57.** *Two-Dimensional Hydraulic Analysis of the Owensboro Bridge and Approaches*, August, 1992. Proceedings of the 1992 National Conference on Water Resources Planning and Management, American Society of Civil Engineers, New York, New York. (D. Froehlich and T. Turner, co-authors)
- 56.** *Hydrologic Investigation of the April, 1983 Flooding in New Orleans, Louisiana*, August, 1992. Proceedings of the 1992 National Conference on Water Resources Planning and Management, American Society of Civil Engineers, New York, New York.
- 55.** *Scour Analysis Report, New Bridge over Ohio River at Owensboro, US 60 in Kentucky to US 231 in Indiana*, March, 1992. Commonwealth of Kentucky, Transportation Cabinet, Department of Highways, Frankfort, Kentucky. (V. Chandra, R. Robison, and T. Turner, co-authors)
- 54.** *Anacostia Waterfront Master Plan Phase II Report, Transportation and Infrastructure*, 1992. Federal City Council, Anacostia Water Front Task Force Technical Committee, Washington, DC. (In association with Wallace Roberts & Tood and Grove/Slade Associates, Inc.)
- 53.** *Hydraulic Analysis for the Shot Tower Subway Station beneath the Jones Falls*, August, 1990. Proceedings of the 1990 National Conference on Hydraulic Engineering, American Society of Civil Engineers, New York, New York.
- 52.** *Storm Water Management Report and Plan for the Proposed Dorsey Road Park and Ride Facility*, April, 1990. Maryland Mass Transit Administration, Baltimore, Maryland.
- 51.** *Report on the Hydrologic and Hydraulic Analysis for the Replacement of the Existing Single Span Stone Arch Bridge Carrying Trewellyn Creek Under SR 2016, Sect 44M, Evans Road in Lower Gwynedd Township, Montgomery, Pennsylvania*, February, 1990. Pennsylvania Department of Transportation, Harrisburg, Pennsylvania.
- 50.** *Report on the Hydrologic and Hydraulic Analysis for the Rehabilitation of the Existing Twin Cell Reinforced Concrete Box Culvert carrying Sproegels Run under SR 0422; Section 43M, Pottstown Bypass, TR 422, in Lower Pottsgrove Township, Montgomery County, Pennsylvania*, January, 1990. Pennsylvania Department of Transportation, Harrisburg, Pennsylvania.
- 49.** *Hydrologic Investigation of the April, 1983 Flooding at Lower Coast Algiers, New Orleans, Louisiana*, October, 1989. Plaquemines Parish Government, Port Sulphur, Louisiana.
- 48.** *Hydraulic Engineering*, August, 1989. Proceedings of the 1989 National Conference on Hydraulic Engineering, American Society of Civil Engineers, New York, New York.
- 47.** *Design of a Major River Channel in an Urban Environment*, May, 1989. Proceedings of the 16th Annual Conference on Water Resources Planning and Management, American Society of Civil Engineers, New York, New York. (D.N. Jermeland, co-author)
- 46.** *Channel Lining Design Guidelines*, February 1989. Urban Highways, Arizona Department of Transportation, Phoenix, Arizona.
- 45.** *Hydraulic Risk Analysis for the Construction of the Shot Tower Station*, December, 1988. Maryland Mass Transit Administration, Baltimore, Maryland.

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- 44.** *Design of Alluvial Channel Relocation in an Urban Environment*, August, 1988. Proceedings of the 1988 National Conference on Hydraulic Engineering, American Society of Civil Engineers, New York, New York. (G.K. Cotton, co-author)
- 43.** *Jones Falls Hydraulic Study for the Proposed Shot Tower Station*, July, 1988. Maryland Mass Transit Administration, Baltimore, Maryland.
- 42.** *Comparison of Storm Water Management for Phoenix and Washington, DC Urban Areas*, June, 1988. Critical Water Issues and Computer Applications, American Society of Civil Engineers, New York, New York. (D.N. Jermeland, co-author)
- 41.** *Concept Hydraulic Design Report, Salt River Channelization*, May, 1988. Arizona Department of Transportation, Phoenix, Arizona. (G.K. Cotton, co-author)
- 40.** *Hydrologic Investigation of the Wolfswinkel Tract, Phoenix, Arizona*, January, 1988. CSA Financial Corporation, Phoenix, Arizona.
- 39.** *Storm Drainage Design Report*, September, 1987. WMATA Greenbelt Route, College Park Site Facilities, Contract 1E0092, College Park, Maryland.
- 38.** *Storm Drainage Design Report*, September, 1987. WMATA Greenbelt Route, College Park Facilities, Contract 1E0091, College Park, Maryland.
- 37.** *Hydrologic Investigation of the Moseley Tract, Avery Island, Louisiana*, July, 1987. Exxon Company, U.S.A., New Orleans, Louisiana.
- 36.** *Alternative Plan Analysis, Arkansas River Navigation System, Robert S. Kerr Lake to Eufaula Lake*, May, 1987. U.S. Army Corps of Engineers, Tulsa District, Tulsa, Oklahoma. (R.L. Day, F.M. Vasquez, and R.A. Wolf, co-authors)
- 35.** *Storm Water Management Report and Plan*, February, 1987. Air Force One Maintenance and Support Complex, Naval Facilities Engineering Command, Andrews Air Force Base, Camp Springs, Maryland.
- 34.** *Design Drainage Report*, October, 1986. Continuous Electron Beam Accelerator Facility, U.S. Department of Energy, Newport News, Virginia.
- 33.** *Computer Keeps New Orleans' Head Above Water*, August, 1985. Civil Engineering, American Society of Civil Engineers, New York, New York.
- 32.** *Case Study of Computer Applications in Urban Drainage Master Planning*, April, 1985. CADDMANIA: Causes and Cure, Society for Computer Applications in Engineering, Planning, and Architecture, Orlando, Florida.
- 31.** *Plans and Profiles of Proposed Improvements*, November, 1984. Volume IV, Master Plan for Orleans Parish Drainage Improvements, Sewerage & Water Board of New Orleans, New Orleans, Louisiana.
- 30.** *Implementation Plan*, November, 1984. Volume III, Master Plan for Orleans Parish Drainage Improvements, Sewerage & Water Board of New Orleans, New Orleans, Louisiana.
- 29.** *Development of Alternative Solutions*, June, 1984. Volume II, Master Plan for Orleans Parish Drainage Improvements, Sewerage & Water Board of New Orleans, New Orleans, Louisiana.
- 28.** *Discussion of Hydraulic and Hydrologic Computer Applications*, May, 1984. American Society of Civil Engineers, Journal of Technical Topics in Civil Engineering, Volume 110, Number 1, New York, New York.
- 27.** *Development of the Computer Simulation Model*, November, 1983. Volume I, Master Plan for Orleans Parish Drainage Improvements, Sewerage & Water Board of New Orleans, New Orleans, Louisiana.
- 26.** *Erosion and Sediment Control on Drastically Disturbed Lands*, October, 1983. American Society of Civil Engineers, Annual Convention and Exposition, Houston, Texas. (R.E. Benner, co-author)
- 25.** *Restoration*, May, 1982. Chapter 12, Pipeline Design Criteria Manual, Northwest Alaska Pipeline Company, Salt Lake City, Utah.
- 24.** *Drainage and Erosion Control*, May, 1982. Chapter 11, Pipeline Design Criteria Manual, Northwest Alaska Pipeline Company, Salt Lake City, Utah.
- 23.** *Clearing*, February, 1982. Chapter 10, Pipeline Design Criteria Manual, Northwest Alaskan Pipeline Company, Salt Lake City, Utah.
- 22.** *Sediment Yield from Cultivated Lands: Selected Bibliography*, January, 1981. American Society of Civil Engineers, Journal of the Hydraulics Division, Volume 107, Number 1, New York, New York. (F.D. Masch and A.R. Robinson, co-authors)
- 21.** *Design Criteria for Urban Erosion and Sediment Control*, March, 1978. Presented in Seminar at Duke University, Durham, North Carolina.
- 20.** *Economic and Environmental Considerations in*

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*Controlling Erosion and Sedimentation on Construction Sites*, December, 1977. American Society of Agricultural Engineers, National Symposium on Soil Erosion and Sedimentation by Water, Chicago, Illinois. (P. Oscanyon, co-author)

**19.** *Prediction and Control of Urban Erosion and Sedimentation*, July, 1976. National Symposium of Urban Hydrology, Hydraulics, and Sediment Control, University of Kentucky, Lexington, Kentucky. (L.D. Meyer, co-author)

**18.** *Urban Sediment Control: The Maryland Experience*, May, 1976. National Soil Erosion Conference, Purdue University, West Lafayette, Indiana. (R.A. Kanerva, co-author)

**17.** *Maryland Highway Erosion and Sediment Control: Evaluation and Future Direction*, March, 1976. Soil Conservation Society of America, Proceedings of the Conference on Land Application of Waste Materials, Des Moines, Iowa. (J.O. Smith, co-author)

**16.** *Urban Sediment Control Design: Criteria and Procedures*, December, 1975. American Society of Agricultural Engineers, Winter Meeting, Paper Number 75-2567, Chicago, Illinois.

**15.** *Sediment and Erosion Control Design Criteria*, May, 1975. American Public Works Association Reporter, Volume 42, Number 5, Chicago, Illinois.

**14.** *Sediment and Erosion Control Design Criteria*, September, 1974. Presented in Seminar at the University of Florida, Gainesville, Florida.

**13.** *Survey of State Floodplain Management Programs*, November, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**12.** *Proposed Sediment and Erosion Control Design Criteria*, July, 1973. Presented in Seminar at the Sedimentation Laboratory, U.S.D.A. Agricultural Research Service, Oxford, Mississippi.

**11.** *Nonlinear Curve Fitting of Rainfall-Runoff Relationships*, May, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**10.** *Multiple Partial Correlation Analysis of Rainfall-Runoff Relationships*, May, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**9.** *The Formation, Movement, and Morphological Function of Stream Channel Meanders*, April, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**8.** *Principal Components Analysis of Rainfall-Runoff Relationships*, April, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**7.** *Factor Analysis of Rainfall-Runoff Relationships*, April, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**6.** *Polynomial Curve Fitting of Rainfall-Runoff Relationships*, March, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**5.** *Multiple Regression Analysis of Rainfall-Runoff Relationships*, March, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**4.** *Correlation Analysis of Rainfall-Runoff Relationships*, February, 1973. Maryland Water Resources Administration, Annapolis, Maryland.

**3.** *The Use of the Universal Soil Loss Equation as a Design Standard*, February, 1973. American Society of Civil Engineers, Water Resources Engineering Meeting, Washington, DC.

**2.** *The Government of Water Resource Management in the Anacostia River Basin*, November, 1972. Maryland Water Resources Administration, Annapolis, Maryland.

**1.** *Optimization of a Multi-Purpose Water Resource System*, October, 1972. Presented in Seminar at the University of Maryland, College Park, Maryland.



## Clients

Michael Ports works on a wide variety of hydrology projects all over the world and is well known for his articulate expertise. Below is a list of various entities with which he has had paying contracts as well as universities and foreign governments with which he has consulted on various topics:

### US Government Agencies

Environmental Protection Agency  
 Bureau of Land Management  
 Corps of Engineers  
 Naval Facilities Engineering  
 Command  
 Federal Highway Administration  
 Agricultural Research Service  
 Natural Resources Conservation  
 Service

### State Governments

Alabama  
 Florida  
 Georgia  
 Mississippi  
 Louisiana  
 Texas  
 Tennessee  
 Kentucky  
 Virginia  
 Maryland  
 North Carolina  
 Pennsylvania  
 Ohio  
 Missouri  
 Kansas  
 South Carolina  
 West Virginia  
 Arizona  
 California  
 Colorado

### Municipalities

Baltimore  
 Boston  
 Philadelphia  
 Atlanta  
 New Orleans  
 Austin  
 Omaha  
 Kansas City  
 St. Louis  
 San Diego  
 Milwaukee  
 Chicago  
 Portland  
 New York  
 Washington, DC

### Universities

North Carolina State University  
 University of New Orleans  
 University of Colorado Boulder  
 University of Florida  
 University of North Florida  
 Tsinghua University  
 Nanchang University  
 Beijing Hydraulic Research  
 Institute  
 Xi'an University of Technology  
 National Yunlin University of  
 Science and Technology  
 National Taiwan University  
 National Sun Yat-Sen University

### Foreign Governments

Bangladesh  
 China  
 Taiwan  
 Singapore  
 Egypt  
 Hong Kong  
 Columbia  
 Panama

### Private Industry

Veolia Water  
 Battelle Memorial Institute  
 Chinese Academy of Sciences  
 World Green Building Council  
 Exxon Mobile  
 Pepsi Cola Bottling Company,  
 Brooklyn  
 Well Meet technology Co., Ltd.

## Testimonials

“It is a pleasure to know Michael Ports. As an environmental scientist, it was a delight to work with such a knowledgeable engineer. I worked with Michael on an expert witness case for USDOJ and Rock Island District of US Army Corps of Engineers and an expert witness case for USDOJ and Omaha District of US Army Corps of Engineers. Michael performed in an exemplary professional manner and exceeded all of the clients expectations. One of the Senior Engineers with the Rock Island District was so pleased with Michael's expert testimony in the US Federal Court of Claims, that he began crying with pleasure and gratitude that his life's work was being totally vindicated.”

— *Barrett L. Kays, Ph.D.,  
Landis, Inc.,  
Raleigh, NC*

“I've known and worked in the water resources profession with Michael for more than 30 years. He is innovative, multidisciplinary and a very reliable water resources engineer. As a team technical advisor, he has made invaluable contributions to the U.S. EPA Office of Research & Development's "National Demonstration Project in Kansas City, MO for the Integration of Green & Gray Infrastructure for CSO Control." He was outstanding as President and cofounder of both the EWRI and American Academy of Water Resources Engineers. Michael has recently co-authored an EWRI/ASCE water resources publication with me. He is well-liked and schedule conscious.”

— *Richard Field, PE, D.WRE, BCEE,  
National Risk Management  
Research Laboratory  
US Environmental Protection Agency  
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“After serving as Staffer and Executive Engineer in several major engineering consultancies where he honed his skills, Mike Ports has launched his own Water Resources and Environmental Engineering consultancy operation under "Ports Engineering" in Jacksonville, Florida. Mike is a Registered Professional Engineer, a Board Certified Water Resources Engineer, a Professional Hydrologist, and a Board Certified Environmental Engineer, credentials which speak to his professionalism, dedication, and competency. By virtue of my personal knowledge of Mike's professional competence and experience, I view his operation as one of the better small consultancies in the SE United States in the fields of Water Resources and Environmental Engineering. Be among his family of satisfied clientele, give him a call at 913-544-4897.”

— *Cecil Lue-Hing, D.Sc., PE, DEE,  
Hon. M ASCE, NAE.*