

R. C. Berger
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EDUCATIONAL BACKGROUND:

B.S. (1973), Civil Engineering, Mississippi State University, Mississippi State, MS
M.S. (1986), Civil Engineering, Mississippi State University, Mississippi State, MS
PhD (1992), Engineering Mechanics, University of Texas and Austin, Austin, TX

MEMBERSHIP IN PROFESSIONAL/TECHNICAL/HONORARY SOCIETIES:

Registered Professional Engineer, Mississippi 1978
Fellow, American Society of Civil Engineers
Diplomate, Coastal Engineering, ASCE

AWARDS:

Herbert D. Vogel Award in Engineering 1993
Director's Research and Development Achievement Award 1993 and 1998
Federal Laboratory Consortium, Southeast Regional, Award of Excellence 1998
ASCE Mississippi Section, Hydraulics Achievement Award 1999
ERDC Outstanding Team Award 2005
ERDC Research and Development Achievement Award 2006
Dept. of the Army, Superior Civilian Service Award 2008

PROFESSIONAL EXPERIENCE:

Dr. Berger retired from the Engineer Research and Development Center's Coastal and Hydraulics Laboratory in 2008. His career began there in 1974. Subsequently Dr. Berger has worked at ERDC as a Reired Annuitant and later a contractor. Dr. Berger has worked with Free Flow Power, Inc. and as a consultant with Dynamic Solutions, LLC. Dr. Berger is presently Research Hydraulic Engineer Emeritus at ERDC.

Model Development

Dr. Berger co-created the HIVEL2D two-dimensional model to allow the investigation of super- and subcritical flood control channels. Dr. Berger created the technique represent navigation effects on the waterway.

Dr. Berger created the basic 2D shallow water module of the ADaptive Hydraulics (ADH) modeling system. This model replaced HIVEL2D and additionally provided the basis for modeling of river hydrodynamics and sedimentation.

Dr. Berger created the first edition of the sediment library used to recreate noncohesive and cohesive sediment processes with an array of hydrodynamic models.

Dr. Berger created the 3D Navier Stokes module of ADH that is used for navigation lock and hydraulic structure approach studies.

Dr. Berger created the 3D Shallow Water module of ADH needed for study of estuaries, rivers and reservoirs.

Appointments

Director of the Computational Hydraulics Institute 1997-2007, Coastal and Hydraulics Laboratory.

Technical Team Lead, Environmental Modeling & System-wide Assessment Center, 2003-2005 Coordinate modeling activities between the Environment Laboratory, the Information Technology Laboratory, and the Coastal and Hydraulics Laboratory and resolve technical hurdles.

Upper Mississippi River Restoration Science Panel Member 2005-2007. Provide guidance on modeling to address system-wide goals in the restoration of the upper Mississippi River.

Adjunct professor, Dept of Civil and Env. Engineering, The University of Washington, Seattle Washington, 1993-1995.

Adjunct professor, Department of Civil Engineering, Mississippi State University. 1999-Present

Graduate Courses Taught

Finite Element Methods in Hydraulics, 1999 and in 2004

Physical Characteristics of Rivers, Estuaries, and Coastal Zones, Summer 2008, Fall 2012, Spring 2017, Fall 2020

Tidal Hydraulics, Spring 2009, Spring 2013

Sediment Model Applications Spring 2011

SPECIALTY EXPERTISE (EXAMPLES):

Estuaries: Dr. Berger has been the lead investigator for several estuarine projects including:

Galveston Bay: This involved numerical modeling evaluation of the impacts of channel enlargement on the salinity regime of the bay. Subsequent studies included the impacts of the addition of barge lanes. Further investigations were made by Dr. Berger on the long-term sedimentation in the navigation channel using the 3D modeling tools previously developed but validated for sedimentation. Dr. Berger also led several investigations in the Lower Louisiana region around New Orleans. These included the evaluation of the impact of closing the Mississippi River Gulf-Outlet on the salinity in Lake Pontchartrain, and an evaluation of the use of the Bonnet Carre Spillway to enhance the salinities for oyster production in Lake Borgne. Dr. Berger was a consultant on many other studies including Sabine-Neches, Mississippi River Passes, Cape Fear River, Savannah Harbor, ..., etc.

Rivers:

Dr. Berger created the models used for river evaluations in multidimensions. During the development Dr. Berger led the team to evaluate the capability of the modeling system to replicate known river behavior in hydrodynamics and sedimentation. Dr. Berger was a part of a large study of the navigation impacts on the Upper Mississippi and Illinois river systems. This involved modeling the impact of vessel movements on the sedimentation regime of the system. In 2009-2010 Dr. Berger developed the model aspects of the work plan for hydrokinetic turbine impacts in the Mississippi River for the Free Flow Power Company. The modeling plan called for the use of 2D and 3D models to evaluate the impact of arrays of hydrokinetic turbines in the Mississippi River. The concerns addressed were those of impacts on navigation and in particular the impact on the sediment transport in the region around these arrays.

Reservoirs:

Dr. Berger worked in the Reservoir Water Quality Branch for about 4 years where he developed a numerical model to evaluate the impact of reregulation pools on the upstream reservoir. He also evaluated numerical models to represent stratification and flow in reservoirs. Later Dr. Berger worked to produce tools to evaluate the upstream approach to hydraulic structures. These developments were used as the driver for evaluations of fish simulations and reactions to the structures.

PUBLICATIONS/PAPERS:

Author/co-author of 28 peer-reviewed publications and about 80 other publications including conference papers, reports, etc. Select relevant publications are:

Refereed Journals and Books:

- Berger, R. C. and Carey, G. F. 1991. "A Perturbation Analysis and Finite Element Approximate Model for Free Surface Flow over Curved Beds," *International Journal of Numerical Methods in Engineering*, vol. 31, 493-507s.
- Berger, R. C. 1994. "A Finite Element Model Application to a Study of Circulation and Salinity Intrusion in Galveston Bay, Texas," Chapter 10, in *Finite Elements in Environmental Problems*, ed. G. F. Carey, John Wiley & Sons, West Sussex, England
- Berger, R. C. and Stockstill, R. L. 1995. "Finite Element Model for High Velocity Channels," *ASCE, Journal of Hydraulic Engineering*, 7 pages, Vol 121, No. 10, 710-716, Oct.
- Stockstill, R. L., Martin, S. K., and Berger, R. C. 1995. "A Hydrodynamic Model of Vessel-Generated Currents to Determine the Effects of Navigation," *Regulated Rivers: Research and Management*, Vol. 11, 211-225, Nov.
- Stockstill, R. L., Berger, R. C., Nece, R. E. 1997. "Two-Dimensional Flow Model for Trapezoidal High-Velocity Channels" *ASCE, Journal of Hydraulic Engineering*, Vol 123, No. 10, 844-852, October
- J.P. Holland, R.C. Berger, and J.H. Schmidt. 1998 "Finite Element Analyses in Surface Water and Groundwater: an Overview of Investigations at the U.S. Army Engineer Waterways Experiment Station," *IJCFD*, vol. 9, pp. 237-247.
- Berger, R. C. and Carey, G. F. 1998. "A Perturbation Formulation for Free-Surface Flow over Curved Surfaces, Part I: Perturbation Analysis," *Int. J. Num. Meth. Fluids* 28: 191-200.
- Berger, R. C. and Carey, G. F. 1998. "A Perturbation Formulation for Free-Surface Flow over Curved Surfaces, Part II: Computational Model," *Int. J. Num. Meth. Fluids*, 28: 201-213.
- Carey, G. F., Bicken, Carey, Berger, and Sanchez. 2001. "Locally Constrained Projections on Grids," *International Journal of Numerical Methods in Engineering*, 50:549-577.
- Teeter, A.M., Johnson, B. H., Berger, C., Stelling, G., Scheffner, N. W., Garcia, M. H., and Parchure, T. M. 2001. "Hydrodynamic and sediment transport modeling with emphasis on shallow-water, vegetated areas (lakes, reservoirs, estuaries and lagoons)," *Hydrobiologia*, 444: 1-23.
- Burg, C. O. E., Huddleston, D. H., and Berger, R. C. (2001), "An Efficient, Robust Design Tool for Open-Channel Flow," *ASCE Journal of Hydraulic Engineering*, Vol. 127, No. 1, pp. 62-71, January.
- Stockstill, R.L. and Berger, R.C. 2001. "Simulating Barge Drawdown and Currents in Channel and Backwater Areas," *ASCE Journal of Waterway, Port, Coastal, and Ocean Engineering*, Vol 127 No. 5 (Sep-Oct) 290-298.
- Berger, R. C. and Howington, S. E. 2002. "Discrete Fluxes and Mass Balance in Finite Elements," *ASCE Journal of Hydraulic Engineering*, Vol 128, No. 1 (Jan) 87-92.
- Aliabadi, S., Johnson, A., Zellars, B., Abatan, A. and Berger, C. 2002. "Parallel simulation of flows in open channels," *Future Generation Computer Systems* 18 (2002) 627-637.
- Stockstill, R.L., Berger, R.C., and Hite, J.E. Jr. 2005. "Application of Computational Hydraulics for the Evaluation of Navigation Structures," *PIANC AIPCN* 119 April 2005, pp 31-35.
- Tate, J. N., Berger, R. C., and Stockstill, R. L. 2006. "Refinement indicators for mesh adaption in shallow-water modeling," *ASCE Journal of Hydraulic Engineering*, Vol 132, No. 8, pp 854-857.
- Savant, G., Berger, C., McAlpin, T. O., and Tate, J. N. 2011. "Efficient Implicit Finite-Element Hydrodynamic Model for Dam and Levee Breach," *ASCE J. Hyd. Eng.*, Vol. 137, No. 9, 1005-1018, Sep 2011.

Savant, G. and Berger, R. 2012. "Adaptive Time Stepping Operator-Splitting Strategy to Couple Implicit Numerical Hydrodynamic and Water Quality Codes," ASCE Journal of Environmental Eng., Vol 138, No. 9, pp 979-984, Sep 2012.

Savant, G., Trahan, C. J., Berger, C., McAlpin, J. T., and McAlpin, T. O. 2018. "Refinement Indicator for Dynamic-Mesh Adaption in Three-Dimensional Shallow-Water Equation Modeling," ASCE J. Hydraul. Eng. 2018, 144(2) : 0617026

Trahan, C.J., Savant, G., Berger, R. C., Farthing, M., McAlpin, T. O., Pettey, L., Choudhary, Dawson, C.N., 2018. "Formulation and application of the adaptive hydraulics three-dimensional shallow water and transport models," J. Comp. Physics, Vol. 374, 1 Dec. 2018, pp. 47-90. <https://doi.org/10.1016/j.jcp.2018.04.055>

Berger, R. C. and Kiesel, Jens. 2019. "Conceptual Model of Salinity Intrusion by Tidal Trapping," ASCE Journal of Hydraulic Eng. Vol. 145, Issue 10, July, [https://doi.org/10.1061/\(ASCE\)HY.1943-7900.0001627](https://doi.org/10.1061/(ASCE)HY.1943-7900.0001627)

Refereed Conference Papers:

Trawle, M. J., and Berger, R. C., 1986. "Predicting Maintenance Dredging Requirements, A Case Study, Thimble Shoal and Elizabeth River Channels, Norfolk, Virginia," XIth World Dredging Congress, 1266-1275, March 1986.

Berger, R. C. and Trawle, M. J., 1986. " Predicting Channel Maintenance Requirements for Deepened Navigation Channel in the Elizabeth River," Proceedings of the International Symposium on River Sedimentation, July 1986.

Keslich, J. M., Rennie, T. H., Martin, W. D., Berger, R. C., and Daggett, L. L. 1993. "Analysis of Navigation Improvements and Marine Environmental Impacts in Galveston Bay, Texas," Proceedings of the 28th International Navigation Congress, PIANC, Gdansk Poland.

Berger, R. C., Martin, W. D., McAdory, R. T., and Schmidt, J. H., 1993. "Galveston Bay 3D Model Study, Channel Deepening, Circulation and Salinity Results," 3rd International Estuarine and Coastal Modeling Conference, Oak Brook, Illinois, 1-13.

Huddleston, D. H., Burg, C. O. E., and Berger, R. C. 1998. "Coupling Nonlinear Optimization and Computational Simulation to Design Flood Control Channels," Advances in Hydroscience and Engineering, Vol. 3. 15 pages.

Huddleston, D. H., Burg, C. O. E., and Berger, R. C. 1998. "Coupling Nonlinear Optimization and Computational Simulation to Design Flood Control Charnnels," 3rd International Conference on Hydroscience and Engineering, Aug. 31-Sep. 3 1998, Cottbus/Berlin, Germany.

Stockstill, Richard L., and Berger, R. C. "Modeling Vessel-Generated Currents in Inland Waterways," *Transportation Research Circular, Inland Waterway Technical Studies*, Transportation Research Board, Washington, DC, No. 491, December 1999.

Reports and Other Publications

Berger, R. C. and Boland, R. A., Jr. 1976 (Sep). " Hydraulic Characteristics of Rigolets Pass, Louisiana, Hurricane surge Control Structures," Technical Report H-76-16, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C. and Trawle, M. J. 1977 (Mar). "Dispersion of Proposed Theodore Industrial Park Effluents in Mobile Bay", Miscellaneous Paper H-77-3, USAE Waterways Experiment Station, Vicksburg, MS. Text 15 pages, 4 figures, 1 table, 173 plates.

Berger, R. C., and Boland, R. A., Jr. 1979 (Mar). "Mobile Bay Model Study, Report 2: Effects of Enlarged Navigation Channel on Tide Currents, Salinities, and Dye Dispersion," Technical Report H-75-13, Report 2, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C. 1979 (Nov). "Carquinez Strait, California Salinity Barrier Calibration Study," Technical Report HL-79-18, USAE Waterways Experiment Station, Vicksburg, MS.

Butler, H. L., Berger, R. C., Daggett, L. L., and Berninghausen, T. F. 1982 (Jun). "Lake Pontchartrain and Vicinity Hurricane Protection Plan, Report 2: Physical and Numerical Model Investigation of Control Structures and the Seabrook Lock," Technical Report HL-82-2, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C., Heltzel, S. B., Athow, R. F., Jr., Richards, D. R., and Trawle, M. J. 1985 (Mar). "Norfolk Harbor and Channels Deepening Study, Report 2: Sedimentation Investigation," Technical Report HL-83-13, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C., and Boyd, J. A., Jr. 1985 (Apr). "Effects of Depth on Dredging Frequency, Evaluation of Advance Maintenance Projects," Technical Report H-78-5, Report 3, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C. 1987 (May). "Hydrodynamics and Modeling of Reregulation Pools," Technical Report E-87-6, USAE Waterways Experiment Station, Vicksburg, MS.

Heltzel, S. B., Martin, W. B., Berger, R. C., and Richards, D. R. (Nov) 1989. "An Analysis of Training Structure Designs in Southwest Pass, Mississippi," Technical Report HL-89-22, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C. (Sep) 1990. "Channel Maintenance by Training Structures: Guidance for Numerical Model Mesh Development," Technical Report HL-90-13, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C. (Aug) 1993. "A Finite Element Scheme for Shock Capturing," Technical Report HL-93-12, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C. (Aug) 1993. "Free-Surface Flow Over Curved Surfaces," Technical Report HL-93-10, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C., Teeter, A. M., and Pankow, W. (Sep) 1993. "Use of a Simple Model to Calculate Velocity Profiles over Changing Bed Slopes," Miscellaneous Paper DRP-93-1, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C. and Alexander, M. P. (Dec) 1993. "Design Criteria for Lateral Dikes in Estuaries," Technical Report REMR-HY-9, USAE Waterways Experiment Station, Vicksburg, MS.

McAdory, R. T. and Berger, R. C. "Galveston Bay Hydrodynamic Study: Salinity Comparisons," Video #94070, USAE Waterways Experiment Station, Vicksburg, MS.

Stockstill, R. L. and Berger, R. C. 1994. "HIVEL2D: A Two-Dimensional Flow Model for High-Velocity Channels," Technical Report REMR-HY-12, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C., Stockstill, R. L. and Ott, Mikel 1995. "HIVEL2D: User's Manual," Technical Report REMR-HY-13, USAE Waterways Experiment Station, Vicksburg, MS.

Berger, R. C. (Nov) 1995. "Hydrodynamic and Salinity Investigations for Strategic Waterway Modifications," Highlights in Computational Science and Engineering, USAE Waterways Experiment Station, Vicksburg, MS. p. 30.

- Berger, R. C., McAdory, R. T., Martin, W.D. and Schmidt, J. H. "Houston-Galveston Navigation Channels, Texas Project; Report 3, Three-Dimensional Hydrodynamic Model Verification," Technical Report HL-92-7, USAE WES, Vicksburg, MS. Jul 1995.
- Berger, R. C., McAdory, R. T., Schmidt, J. H. and Martin, W.D. "Houston-Galveston Navigation Channels, Texas Project; Report 4, Three-Dimensional Numerical Modeling of Hydrodynamics and Salinity," Technical Report HL-92-7, USAE WES, Vicksburg, MS. Sep. 1995.
- McAnally, W. H. and Berger, R. C. 1996. "Salinity Changes in Pontchartrain Basin Estuary Resulting from Bonnet Carre Freshwater Diversion," Technical Report CHL-97-2, USAE WES, Vicksburg, MS. Feb 1997
- Stockstill, R.L. and Berger, R. C. 1999. "A Two-Dimensional Flow Model for Vessel-Generated Currents," Upper Mississippi River - Illinois Waterway System Navigation Study, ENV Report 10, January 1999, USAE WES, Vicksburg, MS.
- Stockstill, R.L. and Berger, R. C. (Dec.) 2000. "Simulation of Flow in Hydraulic Structures using ADH," Coastal and Hydraulics Engineering Technical Notes, <http://chl.wes.army.mil/library/publications>, section IX-4, pp. 1-7. USAE Research & Development Center, Vicksburg, MS.
- Carrillo, A.R., Sarruff, M.S. and Berger, R.C. (Sep) 2002. "Effects of Adding Barge Lanes Along Houston Ship Channel Through Galveston Bay, Texas", Technical Report TR-02-23, USAE Research and Development Center, Coastal and Hydraulics Laboratory, Vicksburg, MS.
- Regional Sediment Management Volume 1, Winter/Spring 2003, RSM State of the Science: One-stop knowledge transfer integrating water depth, velocity, and concentration values under development, Berger and Tate, pp 10-12.
- Brown, G.L, McAdory, R.T., Nail, G.H., Sarruff, M.S., and Berger, R.C. 2003. "Development of a two-dimensional numerical model of hydrodynamics and salinity for Biscayne Bay, Florida," ERDC/CHL TR-03-10, U.S. Army Corps of Engineers, Engineer Research and Development Center, Coastal and Hydraulics Laboratory, Vicksburg, MS.
- Pokrefke, T.F., Berger, R.C, Rhee, J.P., and Maynard, S.T. 2003. "Tow-induced backwater and secondary channel sedimentation, Upper Mississippi River System," Interim Report for the Upper-Mississippi River-Illinois Waterway System Navigation Study, ENV Report 41, U.S. Army Engineer Research and Development Center.
- Berger, Charlie and Lee, Lisa (Mar) 2005. "Modeling of Vessel Effects: Selection of Adaption Parameters for Modeling Vessels in ADH", Coastal and Hydraulics Engineering Technical Notes, <http://chl.wes.army.mil/library/publications>, ERDC/CHL CHETN-IX-15, USAE Research & Development Center, Vicksburg, MS, 8 pages.
- Berger, R.C. and Lee, L.M. (Sep) 2005. "Multidimensional Numerical Modeling of Surges Over Initially Dry Land," Technical Report ERDC/CHL TR-04-10, U.S. Army Corps of Engineers, Engineer Research and Development Center.
- Tate, J.N. and Berger, R.C. (June) 2006. "ADH Sediment Module Testing," ERDC TN-SWWRP-06-6, U.S. Army Corps of Engineers, Engineer Research and Development Center.
- Stockstill, R., Kees, C., Berger, C. (Aug) 2006. "Modeling Free-Surface Flow Over a Weir," Coastal and Hydraulics Engineering Technical Notes, <http://chl.wes.army.mil/libary/publications>, ERDC/CHL CHETN-XIII-1, USAE Research & Development Center, Vicksburg, MS, 11 pages.

Tate, J. N., and Berger, R. C. (Aug) 2006. "Houston-Galveston Navigation Channel, Texas Project, Navigation Channel Sedimentation Study, Phase 1, ERDC/CHL TR-06-8, U.S. Army Corps of Engineers, Engineer Research and Development Center, Coastal and Hydraulics Laboratory, Vicksburg, MS.

Savant, G., and Berger, C. 2009 (May). "Considerations for Modeling Flow Structures in Adaptive Hydraulics (ADH), ERDC TN-SWWRP-09-3, U.S. Army Corps of Engineers, Engineer Research and Development Center, System-Wide Water Resources Program, Vicksburg, MS.

Brown, G. L., Savant, G., Berger, C., and Smith, D. S. 2009 (May). "Considerations for Stationary Ice Covered Flows in Adaptive Hydraulics (ADH), ERDC TN-SWWRP-09-4, U.S. Army Corps of Engineers, Engineer Research and Development Center, System-Wide Water Resources Program, Vicksburg, MS.

Savant, G., and Berger, C. 2015 (Apr). "Three-Dimensional Shallow Water Adaptive Hydraulics (ADH-SW3) Validation: Galveston Bay Hydrodynamics and Salinity Transport," ERDC/CHL TR-15-3, U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS.

Savant, G., Berger, R.C., Trahan, C. J., Brown, G.L. 2020 (May). "Theory, formulation and implementation of the cartesian and spherical coordinate two-dimensional depth-averaged module of the Adaptive Hydraulics (AdH) finite element numerical code." Technical Report (Engineer Research and Development Center (U.S.); no. ERDC TR 20-8. <https://hdl.handle.net/11681/36993>
<https://dx.doi.org/10.21079/11681/36993>.

Berger, R. C. 1986 (May). "Reregulation Pool Hydrodynamics," Masters Thesis, Mississippi State University, Miss. State, MS.

Hydraulics editor for Engineering for Deep-Draft Navigation Projects, EM 1110-2-1202, 29 May 1987 and wrote "Prevention and Control of Salinity Intrusion", Environmental Engineering for Deep-Draft Navigation Projects, EM 1110-2-1202, 29 May 1987, Sect 3-2, pages 3-7 through 3-9.

Berger, R. C. 1992 (May). "Free-Surface Flow Over Curved Surfaces," PhD. Dissertation, The University of Texas at Austin, Austin, TX.

Stockstill, R. L. and Berger, R. C. 1992 (Dec). "Flow Model for Evaluation and Maintenance of High-Velocity Channels," The REMR Bulletin, Vol 9, No. 4.

Bernard, R. S., Berger, R. C., Stockstill, R. L., and Stagg, A. K. 1998(May). "Coupled Structured-Unstructured Flow Simulation," High Performance Computing contributions to DoD Mission Success 1998. page 136.

Bernard, R.S., Berger, R.C., Stockstill, R.L., and Stagg, A.K. 1998(July). "Coupled Structured-Unstructured Flow Simulation" Highlights in Computational Science and Engineering, USAE Waterways Experiment Station, pp 8-9.

Stockstill, R.L., Berger, R.C., and Rhee, J.P. 1998(July). "Hydrodynamic Model of Vessel-Generated Currents" Highlights in Computational Science and Engineering, USAE Waterways Experiment Station, pp 24-25.

Aliabadi, S., Johnson, A., Zellars, B., Berger, C., and Smith, J. 2001(May). "Parallel Simulation of Waves Interacting with Ships in Motion," Preprint 2001-023, Army High Performance Computing Research Center, Minneapolis, Minnesota. p. 1-14.

Aliabadi, S., Abedi, J., Zellars, B., Johnson, A., Berger, C., and Smith, J. 2002. "Implicit Parallel Finite Element Technique for Simulation of Water Waves Interacting with Floating Object," Technical Report 2002-122. Army High Performance Computing Research Center, Minneapolis, Minnesota. 10 pages.

Kavanagh, K.R., Kelley, C.T., Berger, R.C., Hallberg, J.P., and Howington, S.E. 2002 (Jan). "Nonsmooth Nonlinearities and Temporal Investigation of Richard's Equation," CRSC-TR02-01, Center for Research in Scientific Computation, North Carolina State University. 8 pages.

Savant, G., Berger, C., Trahan, C.J., and T.O. McAlpin 2017. "A Mass-Conservative Finite-Element Numerical Code for Three-Dimensional Flows," World Environmental and Water Resources Congress.