

WAYNE C. HUBER, PH.D., P.E. **urban hydrology and stormwater management**
engineering hydrology
pollutant transport
nonpoint source water quality control
mathematical modeling of surface water quantity and quality
application of hydrology and hydrodynamics to environmental problems

EDUCATION

Ph.D., Civil Engineering, Massachusetts Institute of Technology, 1968
M.S., Civil Engineering, Massachusetts Institute of Technology, 1965
B.S., Engineering, California Institute of Technology, 1963

REGISTRATIONS AND CERTIFICATIONS

Professional Engineer, State of Florida

CAREER SUMMARY

Wayne C. Huber, Ph.D., P.E., D.WRE, is Professor Emeritus of Civil and Construction Engineering, Oregon State University, and Senior Consultant with Geosyntec Consultants. He is a primary author of the EPA Storm Water Management Model (SWMM) and brings over 40 years of experience in management of stormwater, combined sewers, and nonpoint source runoff in urban areas, including simulation modeling, database formulation, receiving water impact evaluation, and control effectiveness assessment. His many publications include documents related to best management practices (BMPs), low impact development (LID), control trade-offs, and stormwater management methodologies. He has served as principal investigator (PI) or co-principal investigator for projects sponsored by the EPA, the National Cooperative Highway Research Program, and the Water Environment Research Foundation related to guidance methodology for evaluation, selection, placement, and design of BMP and LID facilities as well as on many other projects with federal, state and local agencies. As one example, in 2007-2009 he served as PI on a project for Seattle Public Utilities (SPU), to convert SPU's sewer modeling basis to SWMM5, with development of model input from SPU's extensive ArcGIS database.

PROFESSIONAL EXPERIENCE

ACADEMIC POSITIONS

Research Assistant, California Institute of Technology (summer), 1962

Research Assistant, Massachusetts Institute of Technology, 1963-68
Assistant Professor of Environmental Engineering Sciences, University of Florida,
1968-73
Associate Professor of Environmental Engineering Sciences, University of Florida,
1973-79
Professor of Environmental Engineering Sciences and Affiliate Professor of Civil
Engineering, University of Florida, 1979-91
Professor, Department of Civil, Construction, and Environmental Engineering
(School of Civil and Construction Engineering, 2008+), Oregon State
University, 1991- 2009, Department Head, 1991-2000, Professor Emeritus,
2009+

NON-ACADEMIC POSITIONS

Engineering Trainee, California Division of Highways Los Angeles, California
(summers), 1960-61
Surveyor, Construction Supervisor, Alaska Department of Highways, Nome, Alaska
(summer), 1965

Consultant to:

Environmental Engineering, Inc., Diffusion Studies, 1970
Central and Southern Florida Flood Control District, Hydrologic Studies in Everglades,
1971-72
Pan American Health Organization, Invited Lecturer on Water Pollution, 1972
Water and Air Research, Drainage Studies, Lake Hydrology, Thermal Pollution,
EPA 208 Planning, 1972-77
Frederic R. Harris, Inc., Water Quality Studies on St. Johns River, 1973
James F. MacLaren, Ltd., Urban Runoff Studies, 1974-75
Corps of Engineers, Urban Hydrology Lecturer, 1974
Environmental Science and Engineering, Impact of Finger Canals on Harbor Water
Quality, 1974-75
University of Massachusetts, Applications of Stormwater Management Models,
1974-76
University of North Carolina, EPA 208 Planning Methodology, 1975
Brevard Engineering Corp., Water Quality Analysis of Urban Development, 1975-76
Howard, Needles, Tammen and Bergendoff, EPA 208 Planning, 1976-77

C.D.D. Howard and Assoc., Urban Runoff Analysis, Hydraulic Transient Studies,
1976-77

Environmental Science and Engineering, Inc., Hydrologic Impact of Marsh
Development, 1977

Deltona Corporation, Assessment of Projected Lake Water Quality, 1978-82

Woodward-Clyde Inc., EPA Nationwide Urban Runoff Program Advisory Group,
1978-83

Black and Veatch, Detroit EPA 201 Advisory Committee, 1978-80

Clinton-Bogart Associates, Elizabeth, NJ and Boston EPA 201 Studies, 1978-79

Resources for the Future, Inc., Comparative Evaluation of Terrestrial Runoff Models,
1977-79

Najarian, Thatcher and Associates, Passaic River, NJ, EPA 201 Study, 1980-82

Office of Technology Assessment, US Congress, Review of Water Resources Models
for Use by Federal Agencies, 1980-81

Analysis of Agricultural Development in Upper St. Johns River Basin, 1981

Breedlove Associates, Hydrologic Modeling of Phosphate Mines, 1981-82

Water and Air Research, River Basin Modeling, Lake Destratification, 1981-82

Paul Larsen Associates, Flooding in South Dade County, 1984

CH2M-Hill, Recharge/Recycling for the Peace River Water Supply, 1983-84

Orange County, Florida, Waste Load Allocation Study, 1984

Tennessee Eastman Company, SWMM Seminar, 1985

Citrus County, Florida, Review of Small Hydropower Development, 1986

Holland and Knight, Peace River Hydrology, 1986-88

Woodward-Clyde, Inc., Nonpoint Source Pollution of San Francisco Bay, 1987-91

Mann and Davis, Flooding of Lake Floyd, Orange County, 1988

Chain of Lakes Property Owners Assn., Lake Kissimmee Hydrology, 1988

West Coast Regional Water Supply Authority, Tampa, FL, Hydrologic Impact
of Pumping, 1988-89

International Institute for Hydraulic and Environmental Engineering, Delft,
Netherlands, Urban Drainage Workshop, 1988-91

Woodward-Clyde, Inc., EPA Nationwide Nonpoint Source Analysis, 1988-91

Camp, Dresser and McKee, Inc., Review of Urban Drainage Studies, 1989-91
EPA, Review of Urban Nonpoint Source Modeling, 1989-90
Cohen, Milstein and Hausfeld, Pollution Assessment, 1989-90
Rose, Sundstrom and Bentley, Lake Hydrology, 1989-90
Roy F. Weston, Inc., NOAA Nonpoint Source Assessment Review, 1990-91
South Florida Water Management District, Hydrologic Review, 1991
Louis Berger and Assoc., Narragansett Bay CSO Study Review, 1992-93
Woodward-Clyde, Inc., Stormwater Quality Evaluation Review, 1992-93
Camp, Dresser and McKee, Inc., Detroit-Rouge River Review, 1993
Kennedy/Jenks Consultants, Sacramento Stormwater Management Modeling Review,
1994-95
Kent, Ridge and Crawford, Jacksonville Superfund Site Evaluation, 1994-95
McNamee, Porter & Seeley, CSO Impact Modeling Review, Lake St. Clair, MI, 1994
Woodward-Clyde, Inc., Stormwater Modeling Review, Eugene, 1995-98
Camp, Dresser and McKee, Inc., Massachusetts NPS Model Review, 1996
Environmental Protection Agency, Planning for EPA Modeling Activities, 1997-99
Phillip Williams and Associates, Johnson Creek Modeling, 1999
University of Georgia, SWMM and TMDL Modeling, 1999
Hardin-Davis, HSPF Modeling Review, 2003
Geosyntec Consultants, Salt Water Marsh Modeling, 2004
Brake Pad Institute, Evaluation of SF Bay Cu loadings, 2004-07
TetraTech, CSO modeling in Louisville, 2005-08
University of Florida, Bird hazards at airports, 2006.
Water Environment Research Foundation, Stormwater Modeling Project Review, 2007
Auckland Regional Council, Review of Harbour Pollution Study, 2007-09
Salmon Safe, Evaluation of University of Washington Stormwater Practices, 2008
Center for Watershed Protection, Review of Florida Stormwater Modeling Procedures,
2009
CITS Group, SWMM5 Workshop for Beijing Hydraulic Research Institute, 2009
TetraTech, EPA SUSTAIN Model Review, 2010

PROFESSIONAL ACTIVITIES

Professional Societies

Life Member, American Society of Civil Engineers
Diplomate, American Academy of Water Resources Engineers
Member, ASCE Environmental and Water Resources Institute
Member, American Geophysical Union
Member, International Association for Hydraulic Research
Member, American Water Resources Association
Member, Tau Beta Pi

Committees and Service

Member, Watershed Council, ASCE EWRI, Chair 1999-00
Member, Awards Committee, ASCE EWRI, 1999-03, 2007-, Chair 2010-2012
Chair, Executive Committee, ASCE Water Resources Engineering Division, 1998-99
Member, ASCE Urban Water Resources Research Council, Chair 1990-92
Member, ASCE-USGS Task Committee on Urban Gaging Networks, 1990
Member, ASCE Committee on Mgmt. Group D Reorganization, 1992-93
Member, ASCE Planning Committee for 2009 Joint ASCE-IAHR Congress
University of Florida Science Representative, Intercollegiate Alliance for Undergraduate Education, 1990-91
Member, City of Corvallis, Stormwater Planning Committee, 1998-02
Member, National Research Council, Committee on the Causes and Management of Coastal Eutrophication, 1998-00
Member, National Research Council, Committee on Restoration of the Greater Everglades Ecosystem, 1999-05
Member, National Research Council, Committee to Review Florida Keys Carrying Capacity Study, 2001-02. Member follow-up review committee for The Nature Conservancy, 2002-03.
Co-chair, Ninth International Conference on Urban Drainage, Portland, OR, ASCE/IAHR/IWA, September 2002.

Working Group Member, Implementation of Total Maximum Daily Loads (TMDLs) through Municipal Separate Storm Sewer System (MS4) Permits in Oregon, Oregon Dept. of Environmental Quality, 2002.

Panel Member for Engineering Awards, EPA Science Achievement Awards, 1999-2011.

Adjunct Advisor, Independent Science Panel, Washington State Department of Ecology, Review of *Stormwater Management Manual for Western Washington*, 2003.

Project Advisor, University of Illinois Stormwater Project, 2004.

Member, ASCE EWRI Conference Planning Committee for IAHR International Conference, Vancouver, BC, 2009.

Chair, National Research Council, Committee on Independent Scientific Review of Everglades Restoration Progress, 2004-06; member 2006-2008.

Chair, Engineering Conferences International, Intelligent Modeling to Improve Stormwater Management, Arcata, CA, July 2007.

Associate Editor, ASCE *Journal of Environmental Engineering*, 2007-

Honors and Awards

National Science Foundation Trainee, 1965-66

Lorenz G. Straub Award from University of Minnesota for “Outstanding Thesis in Hydraulic Engineering,” 1969

ASCE Hilgard Hydraulic Prize for technical paper in Hydraulics, 1973

1981-1982 President, Gainesville Branch ASCE

Outstanding Dept. of Env. Eng. Sci. Professor, 1982 (by student vote)

Florida Engineering Society, Outstanding Technical Achievement Award, (for EPA Storm Water Management Model), North Central Chapter Award, 1984, FES State Award, 1985.

Engineer of the Year, 1986, Gainesville Branch, ASCE

Eminent Speaker and Invited Lecture Tour, Institution of Engineers, Australia, February 1992

Invited Speaker and Lecturer, Kyoto and Tokyo Universities, October 1998

Kennison Lecturer, Boston Society of Civil Engineers, May 2000

Oregon Section ASCE Engineer of the Year, September 2005

ASCE Life Member, January 2006

Invited Lecturer, University of Florida, November 2006

ASCE/EWRI Julian Hinds Award, May 2007

OSU College of Engineering, Alumni Professor Award, September 2008

SELECTED PUBLICATIONS & PRESENTATIONS

Books and Book Chapters

Huber, W.C. and J.P. Heaney, "Drainage, Flood Control and Navigation," Chapter 9 in *Water Resources Atlas of Florida*, E.A. Fernald and D.J. Patton, eds., Florida State University Press, Tallahassee, 1984, pp. 116-121.

Bedient, P.B., W.C. Huber and B.E. Vieux, *Hydrology and Floodplain Analysis*, Prentice-Hall Publishing Co., Upper Saddle River, NJ, First Edition, 1988; Second Edition, 1992; Third Edition, 2002; Fourth Edition, 2008.

Huber, W.C., "Modeling," Chapter 4 in *Combined Sewer Overflow Pollution Abatement*, Manual of Practice No. FD-17, Water Pollution Control Federation, Alexandria, VA, 1989.

Huber, W.C., "Contaminant Transport in Surface Water," Chapter 14 in *Handbook of Hydrology*, D.R. Maidment, ed., McGraw-Hill, New York, 1993.

Huber, W.C., "EPA Storm Water Management Model -- SWMM," Chapter 22 in *Computer Models of Watershed Hydrology*, V.P. Singh, ed., Water Resources Publications, Highlands Ranch, CO, 1995, pp. 783-808.

Donigian, A.S., Jr., Huber, W.C., and T.O. Barnwell, Jr., "Modeling of Nonpoint Source Water Quality in Urban and Nonurban Areas," Chapter 7 in *Nonpoint Pollution and Urban Stormwater Management*, V. Novotny, ed., Technomic Publishing Co., Inc., Lancaster, PA, 1995, pp. 293-345.

Committee on the Causes and Management of Coastal Eutrophication, *Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution*, Ocean Studies Board, Water Science and Technology Board, National Research Council, National Academies Press, Washington, DC, 2000. [Contributing author.]

James, W., Huber, W.C., Pitt, R.E., Dickinson, R.E. and W.R.C. James, *Hydrology, A Guide to the Rain, Temperature, Runoff, Combine and Statistics Modules of the USEPA SWMM4*, CHI Publications, Guelph, ON, 2002.

James, W., Huber, W.C., Pitt, R.E., Dickinson, R.E., Roesner, L.A., Aldrich, J.A. and W.R.C. James, *Hydraulics, A Guide to the Extran, Transport, and Storage*

Treatment Modules of the USEPA SWMM4, CHI Publications, Guelph, ON, 2002.

Huber, W.C., Rossman, L.A. and R.E. Dickinson, "EPA Storm Water Management Model, SWMM5," Chapter 14 in *Watershed Models*, V.P. Singh and D.K. Frevert, eds., CRC Press, Boca Raton, FL, 2006.

James, W., Huber, W.C., Rossman, L.A., Dickinson, R.E., Pitt, R.E., W.R.C. James, W.R.C., Roesner, L.A., and J.A. Aldrich, *User's Guide to SWMM*, CHI Publications, Guelph, ON, 2005.

Committee on Independent Scientific Review of Everglades Restoration Progress, *Progress Toward Restoring the Everglades, The First Biennial Review – 2006*, Water Science and Technology Board, National Research Council, National Academies Press, Washington, DC, 2007. [W.C. Huber chaired the Committee.]

Technical Journals (Refereed)

Huber, W.C., Harleman, D.R.F. and P.J. Ryan, "Temperature Prediction in Stratified Reservoirs," *J. Hydraulics Division, Proc. ASCE*, Vol. 98, No. HY4, April 1972, pp. 645-666.

Perez, A.I., Huber, W.C., Heaney, J.P. and E.E. Pyatt, "Water Quality Model for a Conjunctive Surface-Groundwater System," *Water Resources Bulletin*, Vol. 8, No. 5, October 1972, pp. 900-908.

Huber, W.C., "Modeling for Storm Water Strategies," *The APWA Reporter*, Vol. 42, No. 5, May 1975, pp. 10-14.

Bedient, P.B., Huber, W.C. and J.P. Heaney, "Application of a Hydrologic Model for Land Use Planning in Florida," *Water Resources Bulletin*, Vol. 11, No. 3, June 1975, pp. 469-482.

Bedient, P.B., Huber, W.C. and J.P. Heaney, "Environmental Model of the Kissimmee River Basin," *Journal of Water Resources Planning and Management Division, Proc. ASCE*, Vol. 103, No. WR2, November 1977, pp. 241-256.

Heaney, J.P., Huber, W.C., Sullivan, R.H. and R. Field, "Nationwide Cost of Controlling Combined Sewer Overflows and Urban Stormwater Discharges," *Journal of Water Pollution Control Federation*, Vol. 51, No. 8, August 1979, pp. 2043-2053.

Bedient, P.B., Huber, W.C. and J.P. Heaney, "Drainage Density as an Index of Watershed Development," *Journal of Water Resources Planning and Management Division, Proc. ASCE*, Vol. 104, No. IR4, December 1978, pp. 373-387.

- Scholl, J., Heaney, J.P. and W.C. Huber, "Water Quality Analysis of the Halifax River, Florida," *Water Resources Bulletin*, Vol. 16, No. 2, April 1980, pp. 285-293.
- Medina, M.A., Huber, W.C., Heaney, J.P. and R. Field, "River Quality Model for Urban Stormwater Impacts," *Journal of Water Resources Planning and Management Division, Proc. ASCE*, Vol. 107, No. WR1, March 1981, pp. 263-280.
- Medina, M.A., Huber, W.C. and J.P. Heaney, "Modeling Stormwater Storage/Treatment Transients: Theory," *Journal of Environmental Engineering Division, Proc. ASCE*, Vol. 107, No. EE4, August 1981, pp. 781-797.
- Medina, M.A., Huber, W.C. and J.P. Heaney, "Modeling Stormwater Storage/Treatment Transients: Applications," *Journal of Environmental Engineering Division, Proc. ASCE*, Vol. 107, No. EE4, August 1981, pp. 799-816.
- Ammon, D., Huber, W.C. and J.P. Heaney, "Wetlands' Use for Water Management in Florida," *Journal of Water Resources Planning and Management Division, Proc. ASCE*, Vol. 107, No. WR2, October 1981, pp. 315-327.
- Goforth, G.F., Heaney, J.P. and W.C. Huber, "Comparison of Basin Performance Modeling Techniques," *Journal of Environmental Engineering, ASCE*, Vol. 109, No. 5, October 1983, pp. 1082-1098.
- Heaney, J.P. and W.C. Huber, "Nationwide Assessment of Urban Runoff Impact on Receiving Water Quality," *Water Resources Bulletin*, Vol. 20, No. 1, February 1984, pp. 35-42.
- Aldrich, J.A. and W.C. Huber, Discussion of "Transient Mixed-Flow Models for Storm Sewers" by C.S. Song et al., *Journal of Hydraulic Engineering, ASCE*, Vol. 111, No. 3, March 1985, pp. 555-557.
- Huber, W.C., Discussion of "Estimating Urban Time of Concentration," by R.H. McCuen et al., *Journal of Hydraulic Engineering, ASCE*, Vol. 113, No. 1, January 1987, pp. 122-124.
- Maalel, K., Huber, W.C. and J.P. Heaney, "Generalization of an Optimal Decision Rule to the Box-Cox Transformation for ARMA Models," *Hydrosoft*, Vol. 1, No. 3, 1988, pp. 152-154.
- Nix, S.J., Heaney, J.P. and W.C. Huber, "Suspended Solids Removal in Detention Basins," *Journal of Environmental Engineering, ASCE*, Vol. 114, No. 6, December 1988, pp. 1331-1343.
- Miller, W.L., Foran, J.A., Huber, W.C., Davidson, J.M., Moye, H.A. and D.P. Spangler, "Ground Water Monitoring for Temik (Aldicarb) in Florida," *Water Resources Bulletin*, Vol. 25, No. 1, February 1989, pp. 79-86.

- Marsalek, J., Barnwell, T.O., Geiger, W., Grottker, M., Huber, W.C., Saul, A.J., Schilling, W., and H.C. Torno, "Urban Drainage Systems: Design and Operation," *Water Science and Technology*, Vol. 27, No. 12, 1993, pp. 31-70.
- O'Loughlin, G., Huber, W.C., and B. Chocat, "Rainfall-Runoff Processes and Modelling," *Journal of Hydraulic Research*, Vol. 34, No. 6, 1996, pp. 733-751.
- Huber, W.C., Nelson, P.O., Eldin, N.N., Williamson, K.J., and J.R. Lundy, "Environmental Impact of Runoff from Highway Construction and Repair Materials: Project Overview," *Transportation Research Record 1743*, National Academies Press, Washington, DC, 2001, pp. 1-9.
- Nelson, P.O., Williamson, K.J., Azizian, M.F., Thayumanavan, P., Huber, W.C., and N.N. Eldin, "Environmental Impact of Runoff from Highway Construction and Repair Materials: Screening and Evaluation Methodology," *Transportation Research Record 1743*, National Academies Press, Washington, DC, 2001, pp. 16-24.
- Schmitt, T.G. and W.C. Huber, "The Scope of Integrated Modelling: System Boundaries, Sub-systems, Scales and Disciplines," *Water Science and Technology*, Vol. 54, No. 6-7, 2006, pp. 405-413.
- Huber, W.C., Wells, W.J., Besaw, I.K. and M.A. Leisenring, "Hydrologic Regionalisation Impacts on Wet-weather Control Selection," *Water Science and Technology*, Vol. 54, No. 6-7, 2006, pp. 485-492.

Conference Proceedings Edited

- Strecker, E.W. and W.C. Huber, eds., *Global Solutions for Urban Drainage*, Proc. Ninth International Conference on Urban Drainage, Portland, Oregon, September 2002, American Society of Civil Engineers, Reston, VA, 2002 (CD-ROM). Similar citation for printed volume of Extended Abstracts.
- Huber, W.C. and E.W. Strecker, eds., *Proceedings of Urban Runoff Modeling: Intelligent Modeling to Improve Stormwater Management*, July 22-27, 2007, Humboldt State University, Arcata, CA, Engineering Conferences International, Brooklyn, NY, <http://www.engconfintl.org/pastconf/07asfin.pdf>

Conference Proceedings Papers (Refereed)

- (Asterisk means only the abstract is referred. Final, completed paper subject to minimal or no review).
- Harleman, D.R.F., Holley, E.R. and W.C. Huber, "Interpretation of Water Pollution Data from Tidal Estuary Models," Proc. Third International Conference on Water Pollution Research, Sec. III, Paper No. 3, Munich, Germany, September 1966, Pergamon Press, pp. 1-11.

- Harleman, D.R.F. and W.C. Huber, "Laboratory Studies on Thermal Stratification in Reservoirs," Proc. of the ASCE Specialty Conference on Current Research into the Effects of Reservoirs on Water Quality, Portland, Oregon, January 1968, Vanderbilt University, Department of Env. and Water Res. Eng., Tech. Rept No. 17, Nashville, TN, pp. 1-29.*
- Huber, W.C., Russell, L.W. and E.E. Pyatt, "Routing Model for Combined Sewage," Preprint No. 1108, ASCE National Water Resources Engineering Meeting, Memphis, TN, January 1970, 24 pp.*
- Huber, W.C., Heaney, J.P. and S.M. Hasan, "The EPA Storm Water Management Model: A Current Overview," in Combined Sewer Overflow Seminar Papers, EPA-670/2-73-077, Environmental Protection Agency, Cincinnati, OH, November 1973, pp. 181-216.*
- Huber, W.C., Medina, M.A., Hasan, S.M. and J.P. Heaney, "The EPA Storm Water Management Model (SWMM) - An Introduction," Proc. Storm-Water Management Workshop, Gainesville, M.P. Wanielista, ed., Florida Technological University, Orlando, February 1975, pp. 199-226.*
- Huber, W.C. and J.P. Heaney, "The Storm Water Management Model" in Proc. Applications of Stormwater Management Models, F.A. DiGiano and P.A. Mangarella, eds., EPA-670/2-75-065, (NTIS PB-247163), Environmental Protection Agency, Cincinnati, OH, June 1975, pp. 242-246.*
- Doyle, J.R., Heaney, J.P., Huber, W.C. and S.M. Hasan, "Efficient Management of Urban Storm Water Runoff," Proceedings, EPA Conference on Environmental Modeling and Simulation, Cincinnati, Ohio, April 1976, W.R. Ott, ed., EPA-600/9-76-016 (NTIS PB-257142), Cincinnati, OH, July 1976, pp. 139-143.
- Heaney, J.P., Huber, W.C., Murphy, M.P. and S.M. Hasan, "Generalized Method for Evaluating Urban Storm Water Quality Management Storage/Treatment Alternatives," Proceedings, EPA Conference on Environmental Modeling and Simulation, Cincinnati, April 1976, W.R. Ott, ed., EPA-600/9-76-016 (NTIS PB-257142), Cincinnati, OH, July 1976, pp. 358-361.
- Bedient, P.B., Huber, W.C. and J.P. Heaney, "Modeling Hydrologic Land Use Interactions in Florida," Proceedings, EPA Conference on Environmental Modeling and Simulation, Cincinnati, April 1976, W.R. Ott, ed., EPA-600/9-76-016 (NTIS PB-257142), Cincinnati, OH, July 1976, pp. 362-366.
- Huber, W.C. and J.P. Heaney, "Introduction to the EPA Stormwater Management Model (SWMM)," in Proceedings of Applications of Stormwater Management Models-1976, DiGiano, F.A., Adrian, D.D. and P.A. Mangarella, eds.,

- EPA-600/2-77-065 (NTIS PB-265321), Environmental Protection Agency, Cincinnati, OH, March 1977, pp. 34-73.*
- Medina, M.A., Huber, W.C. and J.P. Heaney, "Impact of Urban Water Pollution Control on Receiving Water Quality," Preprint No. 2859, ASCE Spring Convention, Dallas, April 1977, 29 pp.*
- Ammon, D.C., Huber, W.C. and J.P. Heaney, "Multipurpose Storage Treatment Analysis," *Proceedings, Stormwater Retention/Basins Seminar*, Y.A. Yousef, ed., Report ESE1. 77-9, Florida Technological University, Orlando, July 1977, pp. 70-89.*
- Huber, W.C., "Use of the EPA SWMM for Continuous Simulation," *Proc. Symposium on Urban Watershed Management: Flooding and Water Quality*, Rice University, May 1978, Rice University Studies, Houston, Vol. 65, No. 1, Winter 1979, pp. 43-51.
- Huber, W.C. and J.P. Heaney, "Urban Rainfall-Runoff-Quality Data for Hydrologic Model Testing and Urban Runoff Characterization," in *Urban Storm Drainage, Proceedings of the International Conference* held at the University of Southampton, April 1978, P.R. Helliwell, ed., Pentech Press, London and J. Wiley, New York, 1978, pp. 138-148.
- Huber, W.C., Heaney, J.P. and H.C. Torno, "Computer Impact on Environmental Runoff and Wastewater Studies," Preprint 3106, ASCE Fall Convention, San Francisco, CA, October 1977, 30 pp.*
- Ammon, D.C., Huber, W.C. and J.P. Heaney, "Use of Wetlands for Water Resource Management in Florida's Kissimmee River Basin," Preprint 3394, ASCE Fall Convention, Chicago, IL, October 1978, 17 pp.*
- Huber, W.C., Nix, S.J., Peltz, W.A. and J.P. Heaney, "Overview of November 1977 Release of SWMM," in *Urban Stormwater Management Workshop Proceedings*, R. Field, ed., EPA-600/9-78-017 (NTIS PB-288801), Environmental Protection Agency, Cincinnati, OH, August 1978. pp. 33-39.*
- Nix, S.J., Heaney, J.P. and W.C. Huber, "Revised SWMM Storage/Treatment Block," *Proc., Storm Water Management Model Users Group Meeting*, Annapolis, Maryland, November 1978, H.C. Torno, ed., EPA-600/9-79-003 (NTIS PB-290742/6BE), Environmental Protection Agency, Washington, DC, November 1978, pp. 1-27.*
- Heaney, J.P., Huber, W.C. and M. Lehman, "National Assessment of Receiving Water Impact from Urban Stormwater Pollution," *Proceedings, National Conference of Urban Stormwater and Combined Sewer Overflow-Impact on Receiving Water Bodies*, Orlando, Florida, November 1979, Yousef, Y.A., Wanielista, M.P.,

- McLellon, W.M. and J.S. Taylor, eds., EPA-600/9-80-056 (NTIS B81-155426), Environmental Protection Agency, Cincinnati, OH, December 1980, pp. 407-436.
- Huber, W.C., Discussion in *The Design Storm Concept*, G. Patry and M.B. McPherson, eds., EP 80-R-8, GREMU-79/02, Civil Engineering Department, Ecole Polytechnique de Montreal, Montreal, Quebec, December 1979, pp. 58-59.*
- Huber, W.C., "Urban Wasteload Generation by Multiple Regression Analysis of Nationwide Urban Runoff Data," in *Workshop on Verification of Water Quality Models*, R.V. Thomann and T.O. Barnwell, eds., EPA-600/9-80-016, Environmental Protection Agency, Athens, GA, April 1980, pp. 167-174.
- Huber, W.C. and J.P. Heaney, "Operational Models for Stormwater Quality Management," in *Environmental Impact of Nonpoint Source Pollution*, M.R. Overcash and J.M. Davidson, eds., Ann Arbor Science Publishers, Ann Arbor, MI, 1980, pp. 397-444.
- Huber, W.C. and J.P. Heaney, "The USEPA Storm Water Management Model, SWMM: A Ten Year Perspective," in *Urban Stormwater Hydraulics and Hydrology*, Proceedings of the Second International Conference on Urban Storm Drainage, University of Illinois, Urbana, June 1981, B.C. Yen, ed., Water Resources Publications, Littleton, CO, 1982, pp. 247-256.
- Huber, W.C. and P.L. Brezonik, "Water Budget and Projected Water Quality in Proposed Man-Made Lakes Near Estuaries in the Marco Island Area, Florida," *Proc. of the National Symposium on Freshwater Inflow to Estuaries*, R.D. Cross and D.L. Williams, eds., FWS/OBS-81/04, US Department of Interior, Fish and Wildlife Service, Washington, DC, October 1981, Vol. I, pp. 241-251.
- Huber, W.C. and D.F. MacIntyre, "Receiving Water Quality Data Base for Model Testing," *Proceedings, Stormwater and Water Quality Model Users Group Meeting*, Dept. of Civil Engineering, University of Ottawa, Ontario, October 1982, pp. 203-211.*
- Huber, W.C., "The EPA Storm Water Management Model: Documentation and Maintenance." *Proc. of the Conf. on Frontiers in Hydraulic Engineering*, Cambridge, MA, Hydraulics Division, ASCE, New York, August 1983, pp. 312-317.
- Huber, W.C., Gancarz, D.H. and R.E. Dickinson, "Apple SWMM -- A Possibility?," *Proc. ASCE Engineering Foundation Conf. on Emerging Computer Techniques in Stormwater and Flood Management*, Niagara-on-the-Lake, Ontario, November 1983, ASCE, New York, pp. 366-372.

- Maalel, K. and W.C. Huber, "SWMM Calibration Using Continuous and Multiple Event Simulation," *Proceedings of the Third International Conference on Urban Storm Drainage*, Chalmers University, Gothenburg, Sweden, June 1984, Vol. 2, pp. 595-604.
- Huber, W.C., Discussion of papers on "Special Model Studies," *Proceedings of the Third International Conference on Urban Storm Drainage*, Chalmers University, Gothenburg, Sweden, June 1984, Vol. 4, pp. 1564-1577.*
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Research

(PI = Principal Investigator, Co-PI = Co-Principal Investigator, Co-I = Co-Investigator)

Current Research

Guidelines for Evaluating and Selecting Modifications to Existing Roadway Drainage Infrastructure to Improve Water Quality in Ultra-Urban Areas, Co-PI, National Cooperative Highway Research Program through subcontract with Geosyntec Consultants, 2008-2011 (\$87,160)

Prior Research

Storm Water Management Model, Co-I, FWQA, 1969-1970 (\$125,000)

Prediction of Solar and Atmospheric Radiation for Energy Budget Studies of Lakes and Streams, PI, OWRR, 1969-1970 (\$10,800)

Decision Model for Stormwater Management, Co-PI, EPA, 1971-1973 (\$105,000)

A Water Quality Control Strategy for a Conjunctive Surface-Groundwater System, PI, EPA, 1970-1971 (\$48,000)

Comprehensive Procedure for Socio-Economic Analysis in Upper St. Johns River Basin, Co-I, Corps of Engineers, 1972-1973 (\$60,000)

Data Collection Strategy for Water-Quality Studies, Co-PI, NSF, 1972-1974 (\$45,000/yr)

An Environmental Study of the Gordon River, Naples, Florida, Co-I, Collier County, 1972 (\$5,000)

Environmental Resources Management Studies in the Kissimmee River Basin, Co-PI, Central and Southern Florida Flood Control District, 1973-1975 (\$76,000)

Nationwide Characterization of Stormwater Discharges (with American Public Works Association), Co-PI, EPA, 1973-1976 (\$100,000)

Decision Model for Stormwater Management, Co-PI, EPA, 1973-1975 (\$100,000)

Analysis of Storm Water Recharge Basin, Co-I, OWRR, 1974-1976 (\$32,000)

Establishment of an Urban Rainfall-Runoff-Quality Data Base, Co-PI, EPA, 1974-1975 (\$48,000), 1976-1977 (\$14,000), 1977-1978 (\$50,000)

Impact on the Great Lakes of Wet Weather Flows from Urban Areas in Canada, Co-PI, Environment Canada, 1974-1975 (\$25,000)

- Urban Stormwater Management Model, Co-PI, EPA, 1975-1977 (\$120,000) and Urban Runoff Analysis Methodology, 1976 (\$25,000)
- Model Watershed-Water Quality Management Program for the Chandler Slough Area, Kissimmee River Basin, Co-PI, Central and Southern Florida Flood Control District, 1976-1977 (\$28,000)
- Multipurpose Stormwater Management, Co-PI, EPA, 1977 (\$59,000)
- Urban Rainfall-Runoff-Quality Data Base, Co-PI, EPA, 1978-1979 (\$51,000)
- General Methodology for Evaluating Urban Stormwater Quality Management Alternatives, Co-PI, EPA 1978-1980 (\$73,000)
- Assessment of Receiving Water Impacts from Urban Stormwater Pollution, EPA, Co-I, 1978-1979 (\$79,000)
- Evaporation Estimates Based on Surface Temperature and Net Radiation, Co-I, OWRT, 1979-1981 (\$18,000)
- Urban Rainfall-Runoff-Quality Data Base, PI, EPA, 1980-1982 (\$20,000)
- Dynamics of Nutrient Cycles in Lake Okeechobee: Development of Spatially Resolved Models for Nitrogen and Phosphorus, Co-I, South Florida Water Management District, 1979-1980 (\$47,000)
- Hogtown Creek Environmental Study, Co-PI, Florida Department of Environmental Regulation and UF Engineering and Industrial Experiment Station, 1980 (\$20,000)
- Receiving Water Quality Data Base and Model Review, PI, EPA, 1980-1983 (\$94,000)
- Development of Classification Systems for Florida Lakes, Co-PI, Florida Department of Environmental Regulation, 1981-1982 (\$65,000)
- Water Demand During the 1981 Drought in South Florida, Co-I, South Florida Water Management District, 1982-1983 (\$39,000)
- Computerized Data Base Integration for a Major Command Environmental Planning Office, Co-PI, U.S. Air Force, 1983 (\$61,000)
- Impacts of Development on the Water Resources of Cypress Creek North of Tampa, Co-PI, Southwest Florida Water Management District, 1984-1986 (\$113,000)
- Florida Temik Study, Co-I, EPA, 1984-1985 (\$341,800)
- Storm Water Management Model: Maintenance and User Support, PI, EPA, 1984-1987 (\$94,700)
- Design Procedure to Estimate Pollutant Loadings from Highway Stormwater Runoff, PI, FHWA (Subcontract through Woodward-Clyde Inc.), 1984-1987 (\$30,000)

- Computer-Aided Engineering Approach to Urban Flood Hazard Management in Florida, PI, USGS, 1985-1987 (\$34,400)
- Multi-purpose Management of Mosquito Control Impoundments in Coastal Areas, Co-I, Sea Grant, 1985-1986 (\$29,000)
- Phosphorus Dynamics in Lake Okeechobee, Co-PI, South Florida Water Management District, 1988-1991 (\$100,000 out of \$1,500,000)
- Formulation of New Hydrologic Methodologies, PI, Florida DOT, 1988-1990 (\$100,000)
- State of the Art Review for Urban Stormwater and Combined Sewer Overflow Modeling Needs, Co-PI, EPA, 1989-1991 (\$27,500)
- Modeling Assistance for Barton Creek Watershed, PI, Espey-Huston and Associates, 1990-1991 (\$14,000)
- Review of Water Quality Standards for the Suwannee River Basin, Co-PI, Suwannee River Water Management District, 1990-1991 (\$100,000)
- Stormwater Runoff from Landfills, Co-PI, Florida Center for Solid Wastes, 1990-1991 (\$45,000)
- Tualatin River Basin Study, Co-I, Oregon Dept. of Environmental Quality, 1992-1993 (\$204,000)
- SWMM-ARC/INFO AML Development, PI, Delaware Dept. of Natural Resources and Environmental Quality, 1993-1994 (\$100,000)
- Environmental Impact of Construction and Repair Materials on Surface and Ground Waters, Co-PI, National Cooperative Highway Research Program, 1994-2000 (\$1,355,373)
- Evaluate/Improve SWMM Modeling Techniques for Stormwater, Sanitary Sewer Overflow, and Combined Sewer Overflow Management, PI, Environmental Protection Agency, 1997-2001 (\$49,000)
- SWMM Water Quality Enhancements for Coastal Areas, PI, University of New Orleans (funds from Environmental Protection Agency STAR grant), 2000-2001 (\$76,354)
- Using GIS Databases to Estimate Stormwater Runoff, Co-I, US Geological Survey, Oregon Water Resources Research Institute, 2000-2001 (\$6,615)
- Sustaining Multiple Functions for Urban Wetlands, Co-I, National Science Foundation, 2001-2003 (\$70,000)

- Optimization of Urban Sewer Systems During Wet-Weather Periods, Co-PI, Environmental Protection Agency through subcontract from University of Colorado, 2001-2004 (\$54,793)
- Environmental Impact of Construction and Repair Materials on Surface and Ground Waters – Outreach and Training, Co-PI, National Cooperative Highway Research Program, 2002-2004 (\$99,957)
- Water Quality Facility Investigation, PI, Oregon Department of Transportation, 2002-2005 (\$94,931)
- Technical Services for Storm Water Management Model (SWMM) Redevelopment, PI, Environmental Protection Agency, 2002-2005 (\$25,000)
- Evaluation of Best Management Practices for Highway Runoff Control, PI, National Cooperative Highway Research Program, 2002-2006 (\$699,826)
- Critical Assessment of Stormwater Treatment and Control (BMP) Selection Issues, Co-PI, Water Environment Research Foundation through subcontract from Geosyntec, 2003-2005 (\$52,000)
- Decentralized Stormwater Controls for Urban Retrofit and Combined Sewer Overflow Reduction, Co-PI, Water Environment Research Foundation through subcontract from Low Impact Development Center, 2004-2005 (\$29,500). Phase II: 2006-2007 (\$24,000)
- Intelligent Modeling for Stormwater Management, Conference Support, PI, NSF, 2007 (\$15,000)
- SPU SWMM5 Modeling for Seattle, PI, Seattle Public Utilities, 2007-2009 (\$137,451)