

***Professional Preparation***

College of William and Mary, Virginia Institute of Marine Science, Ph.D. Marine Science, 1988-1991.  
College of William and Mary, M.A. Biology (thesis degree), 1978-1981.

***Appointments***

1999-present Research Associate Professor, Department of Biology, East Carolina University  
1994-1999 Research Assistant Professor, Department of Biology, East Carolina University  
1993-1994 Senior Fish and Wildlife Biologist, U.S. Fish and Wildlife Service  
1991-1993 Marine Scientist, Virginia Institute of Marine Science

***Research Projects***

North Carolina Ecosystem Enhancement Program (2007-2008). Developing and testing multivariate approaches for evaluating success of restored vegetation communities. Co-PI with Mark Brinson and Tom Wentworth. \$105K.

EPA Region 10, Mary Kentula. 2006-2007. Strategy for testing rapid methods for use in watershed assessments \$8K.

North Carolina Ecosystem Enhancement Program (2005-2007). Development and Training for Reach and Watershed Assessment Protocols in Coastal Plain North Carolina. Co-PI with Mark Brinson and Mike O'Driscoll. \$193K.

North Carolina Ecosystem Enhancement Program (2002-2005). Co-PI with Mark Brinson and Bob Christian. Development and training for reach and watershed assessment protocols in coastal plain North Carolina (\$211K).

North Carolina Ecosystem Enhancement Program (2004). Co-PI with M. Brinson and Bob Christian. Development of Assessment Procedures and a Monitoring and Assessment Program for Restoration of Streams (\$97K).

North Carolina Ecosystem Enhancement Program (2000-2003). Co-PI with Mark Brinson and Bob Christian. Development of Assessment Procedures and a Monitoring and Assessment Program for Restoration of Streams in North Carolina (\$231K).

U.S. Environmental Protection Agency (2001-2003), part of an EPA STAR grant. Co-PI with Mark Brinson. Ecological and socioeconomic indicators for integrated assessment of aquatic ecosystems of the Atlantic Slope (\$310K). ECU is a consortium member with Penn State University, Smithsonian Environmental Research Center, Virginia Institute of Marine Science, Environmental Law Institute.

North Carolina Wetlands Restoration Program and U.S. EPA (2000-2005). Co-PI with Mark Brinson, Bob Christian. Development of assessment procedures and a monitoring and assessment program for restoration of streams (\$283K, including addendum).

North Carolina Department of Transportation and North Carolina State University Institute for Transportation, Research, and Education (1999-2001). Co-PI with Mark Brinson. Evaluating the effectiveness of existing NCDOT wetland mitigation sites: Selected case studies (\$157K). Evaluated compensatory mitigation sites, recommended improvement in mitigation program, provided training.

U.S. Environmental Protection Agency, U.S. Federal Highways Administration, and U. S. Army Corps of Engineers (1996-1998). Co-PI with Mark Brinson and Martha Rheinhardt. Hydrogeomorphic wetland studies

and training (\$260K). Developed a hydrogeomorphically-based wetland assessment guidebook for Mineral Soil Wet Pine Flats for the Gulf and Atlantic Coasts. Additional products included conducting workshops and training state and federal personnel on how to apply the HGM approach to wetland assessment.

North Carolina State University Institute for Transportation, Research, and Education (1995-1997). Co-PI with Mark Brinson. Restoration potential for small streams of the inner coastal Plain of North Carolina (\$95K). Characterized intact and altered streams and their floodplains to develop procedure for assessing and restoring small-stream ecosystems.

National Estuarine Research Reserve, North Carolina (1996). Co-PI with Martha Rheinhardt. Evaluation of habitat-use by feral horses on Currituck Banks, North Carolina (\$23K). Quantified foraging behavior of feral horses and habitat-use to recommend management requirements for maintaining a sustainable population.

National Park Service (1994-96). Co-PI with M. Brinson. Effects of groundwater withdrawal on the vegetation of wetland swale communities in Buxton Woods, Cape Hatteras, North Carolina (\$66K). Determined how groundwater withdrawal affected the composition of plant communities and how hydrologic modifications affected long-term changes in cover-types.

### ***Refereed publications and book chapters***

Brooks, R., M. McKenney-Easterling, M. Brinson, R. Rheinhardt, K. Haven, D. O'Brien, J. Bishop, J. Rubbo, B. Armstrong, J. Hite. 2009. A Stream–Wetland–Riparian (SWR) index for assessing condition of aquatic ecosystems in small watersheds along the Atlantic slope of the eastern U.S. *Environmental Monitoring and Assessment* 150:101–117.

Rheinhardt, R., M. Brinson, R. Brooks, M. McKenney-Easterling, J. Masina-Rubbo, J. Hite, and B. Armstrong. 2007. Development of a referenced-based method for identifying and scoring indicators of condition for coastal plain riparian reaches. *Ecological Indicators* 7:339-361.

Rheinhardt, R., M. Brinson, R. Christian, K.H. Miller, G. Meyer. 2007. A referenced-based framework for evaluating the ecological condition of stream networks in small watersheds. *Wetlands* 27:534-542.

Rheinhardt, R., M. McKenney-Easterling, M. Brinson, J. Rubbo, R. Brooks, D. Whigham, D. O'Brien, J. Hite, and B. Armstrong. 2007. Canopy composition and forest structure as indicators of habitat condition in headwater riparian ecosystems. *Restoration Ecology* 17(1):51-59.

Rheinhardt, R. 2007. Tidal freshwater swamps of a lower Chesapeake Bay subestuary. Pp. 161-181 in W.H. Conner, T.W. Doyle, and K.W. Krauss (eds.), *Ecology of Tidal Freshwater Forested Wetlands of the Southeastern United States*. New York, NY.

Rheinhardt, R. 2007. Hydrogeomorphic and compositional variation among red maple wetlands in southeastern Massachusetts. *Northeastern Naturalist* 14:589-604.

Rheinhardt, R. and G. Hollands. 2007. Classification of vernal pools: geomorphic setting and distribution. Pp. 11-30 in Calhoun, A.J.K. and P. G. deMaynadier (eds.). *Science and Conservation of Vernal Pools in Northeastern North America*. CRC Press, Boca Raton, FLA, USA.

Rheinhardt, R. and M. Rheinhardt. 2004. Feral horse seasonal habitat use on a coastal barrier spit. *Journal of Range Management* 57: 253-258.

Rheinhardt, R., M. Rheinhardt, M. Brinson. 2002. A regional guidebook for applying the hydrogeomorphic approach to wet pine flats on mineral soils in the Atlantic and Gulf coastal plains. Waterways Experiment Station (WES), Wetlands Research Program Technical Report ERDC/EL TR-02-9. Vicksburg, Mississippi, USA (<http://el.ercd.usace.army.mil/wetlands/guidebooks.html>)

- Rheinhardt, R. and K. Faser. 2001. Relationship between hydrology and zonation of freshwater swale wetlands on lower Hatteras Island, North Carolina. *Wetlands* 21:265-273.
- Rheinhardt, R., D. Whigham, H. Khan, and M. Brinson. 2000. Floodplain vegetation of headwater streams in the inner coastal plain of Virginia and Maryland. *Castanea* 65:21-35.
- Rheinhardt, M., and R. Rheinhardt. 2000. Canopy and woody subcanopy composition of wet hardwood flats in eastern North Carolina and southeastern Virginia. *Journal of the Torrey Botanical Society* 127:33-43.
- Rheinhardt, R., M. Rheinhardt, M. Brinson, and K. Faser. 1999. Application of reference data for assessing and restoring headwater ecosystems. *Restoration Ecology* 7:241-251.
- Whigham, D., L. Lee, M. Brinson, R. Rheinhardt, M. Rains, J. Mason, H. Kahn, M. Ruhlman, and W. Nutter. 1999. Hydrogeomorphic (HGM) assessment - a test of user consistency. *Wetlands* 19:560-569.
- Brinson, M.M., R.D. Smith, D.F. Whigham, L.C. Lee, R.D. Rheinhardt, and W.L. Nutter. 1998. Progress in development of the hydrogeomorphic approach for assessing the functioning of wetlands. Pages 383-406 in A. J. McComb and J.A. Davis, editors. *Wetlands for the Future*. Gleneagles Publishing, Adelaide, Australia.
- Rheinhardt, R.D., M.C. Rheinhardt, M.M. Brinson, and K.E. Faser. 1998. Forested wetlands of low order streams in the inner coastal plain of North Carolina, USA. *Wetlands* 18(3):365-378.
- Brinson, M.M., and R.D. Rheinhardt. 1997. Wetland functions and relations to societal values. Pages 29-48 in M.G. Messina and W.H. Conner (eds.), *Southern Forested Wetlands Ecology and Management*. Lewis Publishers, Boca Raton, Florida, USA.
- Rheinhardt, R. D., M. M. Brinson, P. M. Farley. 1997. Applying reference wetland data to functional assessment, mitigation, and restoration. *Wetlands* 17:195-215.
- Brinson, M.M., and R.D. Rheinhardt. 1996. The role of reference wetlands in functional assessment and mitigation. *Ecological Applications* 6:69-76.
- Rheinhardt, R., and C. Hershner. 1993. The relationship of below-ground hydrology to canopy composition in five tidal freshwater swamps. *Wetlands* 12:208-216.
- Rheinhardt, R. D. 1992. Disparate distribution patterns between canopy and subcanopy life-forms in two temperate North American forests *Vegetatio* 103:67-77.
- Rheinhardt, R. D. 1992. A multivariate analysis of vegetation patterns in tidal freshwater swamps of lower Chesapeake Bay, USA. *Bulletin of the Torrey Botanical Club* 119:193-208.
- Rheinhardt, R.D. 1990. Development of epibenthic fouling communities on a natural oyster bed in the James River, Virginia. *Biofouling* 2:13-25.
- Rheinhardt, R.D. 1984. Comparative study of composition and distribution patterns of subalpine forests in the Balsam Mountains of southwest Virginia and the Great Smoky Mountains. *Bulletin of the Torrey Botanical Club* 111:489-493.
- Rheinhardt, R.D. and S. Ware. 1984. Vegetation of the Balsam Mountains of southwest Virginia: a phytosociological study. *Bulletin of the Torrey Botanical Club* 111: 287-300.

### *Non-refereed reports, publications, and monographs*

Rheinhardt, R., T. Wentworth, and M. Brinson. 2008. Developing and testing multivariate approaches for evaluating success of restored vegetation communities. Report to the Ecosystem Enhancement Program, North Carolina Department of Environment and Natural Resources, Raleigh, NC, USA.

O'Driscoll, M., E. Hardison, R. Rheinhardt, M. Brinson. 2008. Developing reference data to identify and calibrate indicators of riparian ecosystem condition in urban coastal plain landscapes in North Carolina. Report to the Ecosystem Enhancement Program, North Carolina Department of Environment and Natural Resources, Raleigh, NC. <http://www.nceep.net/pages/resources.htm>

Rheinhardt, R. 2007. Review of potentially useful indicators for rapid assessments of non-tidal wetlands. Report to U. S. Environmental Protection Agency, National Health and Environmental Effects Research Lab, Western Ecology Division, Corvallis, OR, USA.

Rheinhardt, R., M. Brinson, R. Christian, K. Miller, G. Meyer. 2005. Applying Ecological Assessments to Planning Stream Restorations in Coastal Plain North Carolina. Report to the Ecosystem Enhancement Program, North Carolina Department of Environment and Natural Resources, Raleigh, NC, USA. (<http://www.nceep.net/pages/resources.htm#papers>)

Rheinhardt, R., and M. Brinson. 2007. Framework for developing a reference-based assessment approach for evaluating the ecological condition of coastal watersheds. Report to the Ecosystem Enhancement Program, North Carolina Department of Environment and Natural Resources, Raleigh, NC, USA.

Rheinhardt, R., M. Brinson, and E. Hardison. 2007. Ecological assessment of three coastal stream networks in the Lockwoods Folly Basin, North Carolina. Report to the Ecosystem Enhancement Program, North Carolina Department of Environment and Natural Resources, Raleigh, NC, USA.

Brinson, M.M., K.H. Miller, R. Rheinhardt, R. Christian, G. Meyer, J. O'Neal. 2006. Developing reference data to identify and calibrate indicators of riparian ecosystem condition in rural coastal plain landscapes in North Carolina. Report to the Ecosystem Enhancement Program, North Carolina Department of Environment and Natural Resources. Raleigh, NC, USA. (<http://www.nceep.net/pages/resources.htm#papers>)

Rheinhardt, R. and M. Brinson. 2001. An evaluation of North Carolina Department of Transportation wetland mitigation sites: Selected case studies, Phase 2 Report. North Carolina Department of Transportation and North Carolina State University Institute for Transportation, Research, and Education. Raleigh, NC.

Rheinhardt, R.D. 2000. Variations among red maple swamps in Plymouth and Bristol Counties, Massachusetts. Report to Massachusetts Natural Heritage and Endangered Species Program. Westborough, MA 01581.

Rheinhardt, R.D. and M.M. Brinson. 1999. An evaluation of the effectiveness of existing North Carolina Department of Transportation wetland mitigation sites, Phase 1 Report. North Carolina Department of Transportation and North Carolina State University Institute for Transportation, Research, and Education. Raleigh, NC.

Rheinhardt, M.C. and R.D. Rheinhardt. 1999. Canopy and woody subcanopy composition of non-riverine wet hardwood forests in eastern North Carolina. Report to North Carolina Natural Heritage Program, Department of Environment and Natural Resources. Raleigh, North Carolina.

Rheinhardt, R.D. and M.M. Brinson. 1997. Impact of water withdrawals on the vegetation of dune and swale

communities of Cape Hatteras National Seashore, North Carolina. Technical Report to National Park Service Water Resources Branch. Colorado Springs, Colorado.

Rheinhardt, R.D., and M.C. Rheinhardt. 1997. Habitat-use of feral horses on Currituck Banks, North Carolina: Foraging ecology and Management implications.

Brinson, M.M., L.C. Lee, W. Ainslie, R.D. Rheinhardt, G.G. Hollands, R.D. Smith, D.F. Whigham, and W.B. Nutter. 1997. Common misconceptions of the hydrogeomorphic approach to functional assessment and mitigation: scientific and technical issues. *Bulletin of the Society of Wetland Scientists* 14:16-21.

Brinson, M.M., F. R. Hauer, L. C. Lee, W. L. Nutter, R. D. Rheinhardt, R. D. Smith, D. Whigham. 1996. A guidebook for application of hydrogeomorphic assessments to riverine wetlands. U.S. Army Corps of Engineers Waterways Experiment Station. Wetlands Research Program Technical Report WRP-DE-11. Vicksburg, Mississippi, USA. (<http://el.erdc.usace.army.mil/wetlands/guidebooks.html>)

Brinson, M.M., W. Nutter, R.D. Rheinhardt, and B. Pruitt. 1996. Background and recommendations for establishing reference wetlands in the Piedmont of the Carolinas and Georgia. U.S. Environmental Protection Agency, Corvallis, Oregon. National Health and Environmental Effect Laboratory Technical Report.

Rheinhardt, R. 1992. Tidal freshwater swamps of the lower Chesapeake Bay. Virginia Institute of Marine Science Wetlands Program Technical Report 92-4.

Rheinhardt, R. and J. Perry. 1992. Effects of nutrient enrichment on natural and transplanted salt marshes in Virginia: literature review with management recommendations. Commonwealth of Virginia, Division of Soil and Water. SEAS Policy Advisory Report CMAP-5.

Rheinhardt, R. 1991. Vegetation ecology of tidal freshwater swamps in lower Chesapeake Bay, USA. Ph.D. Dissertation, School of Marine Science, College of William and Mary, Gloucester Point, VA, 184 pp.

Rheinhardt, R. 1981. Vegetation of the Balsam Mountains of southwest Virginia: a phytosociological study. M.A. Thesis, Department of Biology, College of William and Mary, Williamsburg, VA, 146 pp.

### ***Collaborators, past 4 years***

Mark Brinson, East Carolina University, Greenville, NC

Robert Brooks, Penn State University Cooperative Wetlands Center, State College, PA

Aram Calhoun, University of Maine, Orono, ME

Robert Christian, East Carolina University, Greenville, NC

Siobhan Fennessy, Kenyon College, Gambier, OH

Kurt Havens, Virginia Institute of Marine Science, Gloucester Point, VA

Carl Hershner, Virginia Institute of Marine Science, Gloucester Point, VA

Mary Kentula, Environmental Protection Agency, Corvallis, OR

Kevin Miller, East Carolina University, Greenville, NC

Jennifer Rubbo, Hudson River Sloop Clearwater, Inc., Beacon, NY

Dennis Whigham, Smithsonian Environmental Research Center, Edgewater, MD

Mary McKenney-Easterling, Penn State University Cooperative Wetlands Center, State College, PA

Michael O'Driscoll, East Carolina University, Greenville, NC

David O'Brien, Virginia Institute of Marine Science, Gloucester Point, VA

Garrett Hollands (retired), ENRS Consulting, MA

Tim Wilder, Engineer Research and Development Center, Vicksburg, MS

