

8. REFERENCES

- Arnold, J. G., J. R. Williams, A. D. Nicks and N. B. Sammons. 1990. SWRRB - A basin scale simulation model for soil and water resources management. Texas A&M Press. College Station, Texas. 255 pp.
- Bagnold, R. A. 1966. An approach to the sediment transport problem from general physics. U. S. Geological Survey Professional Paper 422-J.
- Baker, K. D., F. D. Theurer and J. Witte. 1995. AGNPS version 5.00 verification report: Science. File Name: vrfscien.doc - retrieved by ftp from "soils.mrsars.usda.gov". AGNPS Support, USDA-ARS-MWA, North Central Conservation Research Laboratory. Morris, Minnesota.
- Ball, R. O. and R. L. Church. 1980. Water quality indexing and scoring. *J. Environ. Eng.* 106(EE4): 757-771.
- Beasley, D. B. and L. F. Huggins. 1980. ANSWERS user's manual. Department of Agricultural Engineering, Purdue University. West Lafayette, Indiana. 55 pp.
- Bingner, R. L., C. E. Murphree, and C. K. Mutchler. 1987. Comparison of sediment yield models on various watersheds in Mississippi. ASAE Paper No. 87-2008. ASAE 1987 Summer Meeting, Baltimore, Maryland.
- Borland International Inc. 1989. Quattro Pro 1.0. Scotts Valley, California.
- Bourouai, Faycal. 1994. Development of a continuous, physically-based, distributed parameter, nonpoint source model. Ph.D. Dissertation. Virginia Tech, Department of Agricultural Engineering, Blacksburg, Virginia.
- Brann, Dan. 1995. Personal communication.
- Briggs, J. C. and J. F. Ficke. (1977) Quality of rivers of the United States, 1975 water year--based on the National Stream Quality Accounting Network (NASQAN). USGS Open-File Report 78-200.
- Brown, R. M., N. I. McClelland, R. A. Deininger and M. F. O'Connor. 1972. A water quality index - crashing the psychological barrier. In: Advances in water pollution research, Proceedings of the sixth international conference. S. H. Jenkins (ed.). Pergamon Press, New York. pp. 787-794.
- Brown, R. M., N. I. McClelland, R. A. Deininger and R. G. Tozer. 1970. A water quality index - do we dare? *Water and Sewage Works* 117(10): 339-343.
- Chesapeake Bay Decision Support System Working Group. 1994. Draft Worksheets. State Conservationists' Chesapeake Bay Decision Support System. National Center for Resource Innovations. Rosslyn, Virginia.
- CH2M Hill, Inc. 1990. Nonpoint source impact assessment: An assessment report. WPCF Research Foundation Report 90-5. WPCF Foundation, Alexandria, Virginia.
- Chesters, G. and L. Schierow. 1985. A primer on nonpoint pollution. *J. Soil and Water Cons.* 40(1): 9-13.
- Clausen, J. C. 1993. Post-audit verification of the model AGNPS in Vermont agricultural watersheds. EPA 841-R-93-006. U. S. Environmental Protection Agency, Office of Water, Washington, D.C.

- Couillard, Denis and Yves Lefebvre. 1985. Analysis of water quality indices. *J. Environ. Mgmt.* 21: 161-179.
- DEQ. 1994. Virginia water quality assessment for 1994. 305(b) report to EPA and Congress. Information Bulletin No. 597. Virginia Department of Environmental Quality. Richmond, Virginia.
- de Roo, A. P. J., L. Hazelhoff and P. A. Burrough. 1989. Soil erosion modeling using ANSWERS and geographical information systems. *Earth Surface Processes and Landforms* 14: 517-532.
- Dillaha, T. A. 1990. Role of Best Management Practices in restoring the health of the Chesapeake Bay: Assessments of effectiveness. In: *Perspectives on the Chesapeake Bay, 1990: Advances in estuarine sciences. CBP/TRS41/90.* Chesapeake Bay Consortium. U. S. EPA Chesapeake Bay Program. Annapolis, Maryland.
- Dillaha, T. A. III and D. B. Beasley. 1983. Distributed parameter modeling of sediment movement and particle size distributions. *Trans. of the ASAE* 26(6): 1766-1772, 1777.
- DiLuzio, M. and M. A. Lenzi. 1995. The importance of proper rainfall inputs for the applicability of the AGNPS model integrated with geographic information system at watershed scale. In: *Water Quality Modeling - Proceedings of the International Symposium.* C. Heatwole (ed.). ASAE. St. Joseph, Michigan. pp. 259-273.
- Drungil, C., W. F. Geter and R. G. Shepherd. 1995. Watershed scale water quality modeling in the NRCS HUWQ Project. In: *Water Quality Modeling - Proceedings of the International Symposium.* C. Heatwole (ed.). ASAE. St. Joseph, Michigan. pp. 177-185.
- DSWC. 1993. Virginia nonpoint source pollution watershed assessment report. Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation. Richmond, Virginia.
- Dunnette, D. A. 1979. A geographically variable water quality index used in Oregon. *J. Wat. Poll. Control Fed.* 51: 53-61.
- Engel, B. A., R. Srinivasan, J. Arnold, C. Rewerts and S. J. Brown. 1993. Nonpoint source (NPS) pollution modeling using models integrated with geographic information systems (GIS). *Wat. Sci. Tech.* 28(3-5): 685-690.
- EPA. 1994. National water quality inventory: 1992 report to Congress. EPA 841/R-94-001. U. S. Environmental Protection Agency, Office of Water. Washington, D.C.
- EPA. 1987. Setting priorities: The key to nonpoint source control. U.S. Environmental Protection Agency. Office of Water Regulations and Standards.
- EPA. 1986. Quality criteria for water 1986. EPA 440/5-86-001. U.S. Environmental Protection Agency. Office of Water Regulations and Standards. Washington, D.C.
- EPA. 1985. Rates, constants, and kinetic formulations in surface water quality modeling. Second edition. EPA/600/3-85/040. U.S. Environmental Protection Agency.
- EPA. 1984. Nonpoint source pollution in the U.S.: Report to Congress. U. S. Environmental Protection Agency, Office of Water. Washington, D.C.
- Evans, B. A. and D. A. Miller. 1988. Modeling nonpoint pollution at the watershed level with the aid of a geographic information system. In: *Nonpoint Pollution: 1988 - Policy, Economy, Management and Appropriate Technology.* American Water Resources Association. pp. 283-291.

- Foster, G. R., L. J. Lane, J. D. Nowlin, J. M. Laflen and R. A. Young. 1981. Estimating erosion and sediment yield on field-sized areas. *Trans. ASAE* 24: 1253-1262.
- Fu, Youtong. 1994. Comparison of two hydrological models on a Virginia Piedmont watershed. M.S. Thesis. Virginia Tech, Department of Biological Systems Engineering, Blacksburg, Virginia.
- Garbrecht, J. and L. Martz. 1995. TOPAZ Version 1.10. An automated digital landscape analysis tool for topographic evaluation, drainage identification, watershed segmentation and subcatchment parameterization. Report No. NAWQL 95-1. National Agricultural Water Quality Laboratory, USDA-ARS. Durant, Oklahoma.
- Geter, W. F., P. Smith, C. Drungil, R. Shepherd and B. Kuenstler. 1995. Hydrologic unit water quality model GIS interface to four ARS water quality models for use by Soil Conservation Service. In: Water Quality Modeling - Proceedings of the International Symposium. C. Heatwole (ed.). ASAE. St. Joseph, Michigan. pp.341-347.
- Goodrich, D. C., J. J. Stone, and R. Van Der Zweep. 1993. Validation strategies based on model application objectives. In: Proceedings of the Federal Interagency Workshop on Hydrologic Modeling Demands for the 90's. USGS Water Resources Investigations Report 93-4018. U. S. Geological Survey; Denver, Colorado. pp. 8-1 to 8-8.
- Green, I. R. A. and D. Stephenson. 1986. Criteria for comparison of single event models. *Jour. Hydrological Sciences* 31(3): 395-411.
- Haith, Douglas A., Ross Mandel and Ray S. Wu. 1992. GWLF: Generalized watershed loading functions. Version 2.0. User's manual. Dept. of Agricultural & Biological Engineering, Cornell University. Ithaca, New York. 62p.
- Hamlett, J. M., D. A. Miller, R. L. Day, G. W. Peterson, G. M. Baumer and J. Russo. 1992. Statewide GIS-based ranking of watersheds for agricultural pollution prevention. *J. Soil and Water Cons.* 47(5): 399-404.
- Harkins, R. S. 1974. An objective water quality index. *J. Wat. Poll. Control Fed.* 46(3): 588-591.
- He, C., J. F. Riggs and Y. T. Kang. 1993. Integration of geographic information systems and a computer model to evaluate impacts of agricultural runoff on water quality. *Wat. Res. Bull.* 29(6): 891-900.
- Heatwole, C. D. and V. O. Shanholtz. 1991. Targeting animal waste pollution potential using a geographic information system. *App. Engr. Agr.* 7(6): 692-698.
- Heimlich, R. E. and N. L. Bills. 1984. An improved soil erosion classification for conservation policy. *J. Soil and Water Cons.* 39(4): 261-266.
- Hellmund, P. A., R. K. Byler, S. Mostaghimi, V. O. Shanholtz, W. C. Hession, P. M. McClellan, J. C. Carr, B. B. Ross, E. R. Yagow and G. Seeley. 1986. A GIS approach to identifying ag non-point pollution. In: Effects of upland and shoreline activities on the Chesapeake Bay. Proceedings of the Chesapeake Bay Research Conference. March 20-21, 1986. Williamsburg, Virginia. pp. 11-20.
- Hession, W. C., K. L. Huber, S. Mostaghimi, V. O. Shanholtz and P. W. McClellan. 1989. BMP effectiveness evaluation using AGNPS and a GIS. ASAE Paper No. 89-2566. American Society of Agricultural Engineers, St. Joseph, Michigan.
- Hession, W. C. and V. O. Shanholtz. 1988. A geographic information system for targeting nonpoint-source agricultural pollution. *J. Soil and Water Cons.* 43(3): 264-266.

- Horton, R. K. 1965. An index number system for rating water quality. *J. Wat. Poll. Control Fed.* 37(3): 300-306.
- House, M. A. and D. H. Newsome. 1989. Water quality indices for management of surface water quality. In: *Urban Discharges and Receiving Water Quality Impacts*. J. B. Ellis (ed.). Pergamon Press. New York. pp. 159-171.
- Humenik, F. J., M. D. Smolen and S. A. Dressing. 1987. Pollution from nonpoint sources: Where we are and where we should go. *Environ. Sci. Technol.* 21(8): 737-742.
- James, L. D. and S. J. Burges. 1982. Selection, calibration, and testing of hydrologic models. In: *Hydrologic modeling of small watersheds*. C.T. Haan, H. P. Johnson and D. L. Brakensiek (eds.). American Society of American Engineers. St. Joseph, Michigan. pp.437-472.
- Jensen, S. K. and J. O. Dominique. 1988. Extracting topographic structure from digital elevation data for geographic information system analysis. *Photogrammetric Engineering and Remote Sensing* 54(11): 1593-1600.
- Jeton, A. E. and J. L. Smith. 1993. Watershed modeling -- spatial partitioning using GIS. In: *Proceedings of the Federal Interagency Workshop on Hydrologic Modeling Demands for the 90's*. USGS Water Resources Investigations Report 93-4018. U. S. Geological Survey; Denver, Colorado. pp. 5-81 to 5-88.
- Joung, H. M., W. W. Miller, C. N. Mahannah and J. C. Guitjens. 1979. A generalized water quality index based on multivariate factor analysis. *J. Environ. Qual.* 8(1): 95-100.
- Kasi, V. 1994. Using a geographic information system as a targeting tool for Pennsylvania's Chesapeake Bay Program. In: *Proceedings of Watershed '93*. EPA 840-R-94-002. U. S. Environmental Protection Agency; Office of Wetlands, Oceans and Watersheds; Washington, DC. pp. 203-209.
- Knisel, W. G. (ed.). 1980. CREAMS: A field scale model for chemical, runoff and erosion from agricultural management systems. Cons. Res. Rept. No. 26. U.S. Department of Agriculture, Science and Education Administration.
- Landwehr, J. M. 1974. Water quality indices - construction and analysis. Ph.D. Dissertation, University of Michigan, Univ. Microfilm no. 75-10, 212. Ann Arbor, Mich.
- Lane, L. J. and M. A. Nearing (ed.). 1989. USDA - Water erosion prediction project; Hillslope profile version. NSERL Report No. 2. National Soil Erosion Research Laboratory, W. Lafayette, Indiana.
- Lane, L. J. 1982. Development of a procedure to estimate runoff and sediment transport in ephemeral streams. In: *Recent Developments in the Explanation and Prediction of Erosion and Sediment Yield*. Proceedings of the Exeter Symposium. IAHS Publication No. 137. pp. 275-282.
- Leeming, F. and J. Soussan. 1979. Structures at the fringe of the city. *Intl. Soc. Sci. Jour.* 31(2): 237-281.
- Loague, K. and R. E. Green. 1991. Statistical and graphical methods for evaluating solute transport models: Overview and application. *Jour. of Contaminant Hydrology* 7: 51-73.
- Lucord, Bruce and Robert A. Young. 1989. An urban component for the AGNPS model. ASAE Paper No. 89-2117. American Society of Agricultural Engineers. St. Joseph, Michigan.

- MacAlpine, N. D., S. M. Ahmed, R. A. Young, J. G. Arnold, A. J. Sosiak and D. O. Trew. 1995. Validation of nonpoint source pollution models for a Northern Great Plains lake. In: Water Quality Modeling - Proceedings of the International Symposium. C. Heatwole (ed.). ASAE. St. Joseph, Michigan. pp.154-163.
- Mandel, R. S. 1993. The impact of septic systems on surface water quality. Unpublished M. S. dissertation. School of Civil and Environmental Engineering, Cornell University. Ithaca, New York.
- MapTech, Inc. 1994. PC-VirGIS Geographic Information System: Software Documentation. Blacksburg, Virginia.
- Martz, L.W. and J. Garbrecht. 1993. DEDNM: A software system for the automated extraction of channel network and watershed data from raster digital elevation models. In: Proceedings of the Symposium on Geographic Information Systems and Water Resources. J.M. Harlin and K.J. Lanfear (eds.). American Water Resources Association. Bethesda, Maryland. pp. 211-220, 224.
- Microrim Inc. 1986. R:Base System V. Bellevue, Washington
- Mills, W. B., D. B. Porcella, M. J. Ungs, S. A. Gherini, K. V. Summers, Lingfung Mok, G. L. Rupp, G. L. Bowie and D. A. Haith. 1985. Water quality assessment: A screening procedure for toxic and conventional pollutants in surface and ground water. Part 1. EPA 600/6-85-002a. U. S. Environmental Protection Agency. Athens, Georgia.
- Mills, W. B., J. D. Dean, D. B. Porcella, S. A. Gherini, R.J.M. Hudson, W. E. Frick, G. L. Rupp, and G. L. Bowie. 1982. Water quality assessment: A screening procedure for toxic and conventional pollutants - Part 1. EPA 600/6-82-004a. U. S. Environmental Protection Agency. Athens, Georgia.
- Minitab Inc. 1996. MINITAB Release 11 for Windows. State College, Pennsylvania.
- Mitchell, J. K., B. A. Engel, R. Srinivasan and S.S.Y. Wang. 1992. Validation of AGNPS for small watersheds using an integrated AGNPS/GIS system. ASAE Paper No. 92-2532. American Society of Agricultural Engineers, St. Joseph, Michigan.
- Mueller, D. K., P. A. Hamilton, D. R. Helsel, K. J. Hitt, and B. C. Ruddy. 1995. Nutrients in ground water and surface water of the United States--An analysis of data through 1992. U. S. Geological Survey, National Water-Quality Assessment Program. Water Resources Investigations Report 95-4031. Denver, Colorado.
- Myers, C. F., J. Meek, S. Tuller and A. Weinberg. 1985. Nonpoint sources of water pollution. *J. Soil and Water Cons.* 40(1): 14-18.
- National Well Water Association. 1985. DRASTIC: A standardized system for evaluating ground water pollution potential using hydro-geologic settings. EPA 600/2-85/018. U. S. Environmental Protection Agency. Ada, Oklahoma.
- Needham, S. E. and Young, R. A. 1993. ANN-AGNPS: A continuous simulation watershed model. In: Proceedings of the Federal Interagency Workshop on Hydrologic Modeling Demands for the 90's. U.S. Geological Survey Water-Resources Investigations Report 93-4018. pp. 4-32 to 4-39.
- Needham, S. and B. E. Vieux. 1989. A GIS for AGNPS parameter input and mapping output. ASAE Paper No. 89-2673. American Society of Agricultural Engineers. St. Joseph, Michigan.

- Neumiller, S. K., L. C. Linker, J. E. Hannawald, A. S. Donigian, Jr. and B. R. Bicknell. 1994. Review Draft. Chesapeake Bay Program, Phase III watershed model application to calculate Bay nutrient loadings. Appendix E: Land use and selected parameter values. Chesapeake Bay Program Office, U. S. Environmental Protection Agency, Region III. Annapolis, Maryland.
- NVPDC. 1991. 1991 Occoquan basin land use update: Summary statistics. Northern Virginia Planning District Commission. Annandale, Virginia.
- NVPDC. 1990. Occoquan watershed septic system assessment. Final report. Northern Virginia Planning District Commission. Annandale, Virginia.
- Novotny, V. and G. Chesters. 1981. Handbook of nonpoint pollution: Sources and management. Van Nostrand Reinhold Co., New York.
- OWML. 1994. A water quality assessment for the Occoquan Reservoir. Prepared for the Northern Virginia Planning District Commission. Occoquan Watershed Monitoring Laboratory, Virginia Tech, Department of Civil Engineering; Manassas, Virginia.
- Olivieri, L. J., G. M. Schaal, T. J. Logan, W. J. Elliot and B. Motch. 1991. Generating AGNPS input using remote sensing and GIS. ASAE Paper No. 91-2622. American Society of Agricultural Engineers. St. Joseph, Michigan.
- Ott, W. R. 1978. Environmental indices theory and practice. Ann Arbor Science Publishers Ind. Ann Arbor, Michigan.
- Park, S. W., J. T. Kim and J. J. Lee. 1995. A GRASS interface system for AGNPS model applications. ASAE Paper No. 95-3243. American Society of Agricultural Engineers. St. Joseph, Michigan.
- Parrish, R. S. and C. N. Smith. 1989. A method for testing whether model predictions fall within a prescribed factor of true values, with an application to pesticide leaching. Ecological Modelling 51: 59-72.
- Pennell, K. D., A. G. Hornsby, R. E. Jessup, and P. S. C. Rao. 1990. Evaluation of five simulation models for predicting aldicarb and bromide behavior under field conditions. Water Resources Research 26(11): 2679-2693.
- Peterson, G. W., J. M. Hamlett, G. M. Baumer, D. A. Miller, R. L. Day, and J. M. Russo. 1991. Evaluation of agricultural nonpoint pollution potential in Pennsylvania using a geographic information system. ER9105. Environmental Resources Research Institute, Pennsylvania State University. University Park, Pennsylvania.
- Pirie, Walter. 1996. Personal communication.
- Prati, L., R. Pavanello and F. Pesarin. 1971. Assessment of surface water quality by a single index of pollution. Water Research 5: 741-751.
- Prato, T., H. Q. Shi, R. Rhew and M. Brusven. 1989. Soil erosion and nonpoint- source pollution control in an Idaho watershed. J. Soil and Water Cons. 44(4): 323-328.
- Ramalingam, S. and K. L. Farrell-Poe. 1995. Predicting rural municipal nonpoint source pollution using GIS and AGNPS. ASAE Paper No. 95-3241. American Society of Agricultural Engineers. St. Joseph, Michigan.
- Reckhow, K. H., J. T. Clements and R. C. Dodd. 1990. Statistical evaluation of mechanistic water-quality models. Jour. Environ. Eng. 116(2): 250-268.

- Reckhow, K. H. and S. C. Chapra. 1986. Engineering approaches for lake management. Vols. 1 and 2. Butterworth Publishers. Boston, Massachusetts.
- Rewerts, C. C. and B. A. Engel. 1991. ANSWERS on GRASS: Integrating a watershed simulation with a GIS. ASAE Paper No. 91-2621. American Society of Agricultural Engineers; St. Joseph, Michigan.
- Richardson, C. W., G. R. Foster and D. A. Wright. 1983. Estimation of erosion index from daily rainfall amount. Trans. ASAE : 153-156, 160.
- Rodstrom, C., M. Lahlou, A. Cavacas and M. S. Cheng. 1994. Watershed simulation modeling with GIS in Prince George's County. In: Proceedings, Watershed '93, A national conference on watershed management. March 21-24, 1993; Alexandria, Virginia. EPA 840-R-94-002. pp.217-223.
- Ross, M. A. and P. D. Tara. 1993. Integrated hydrologic modeling with geographic information systems. J. Water Res. Plan. and Mgmt. 119(2): 129-140.
- Sagona, F. J. and C. G. Phillips. 1994. Application of watershed index of pollution potential to aerial inventory of land uses and nonpoint pollution sources. In: Proceedings of Watershed '93. EPA 840-R-94-002. U. S. Environmental Protection Agency; Office of Wetlands, Oceans and Watersheds; Washington, DC. pp. 705-711.
- Shanholtz, V. O. and J. W. Kleene. Draft. Nonpoint source watershed management model. Virginia Tech, Department of Agricultural Engineering. Blacksburg, Virginia.
- Shanholtz, V. O., C. D. Heatwole, E. R. Yagow, J. M. Flagg, R. K. Byler, S. Mostaghimi, T. Dillaha and E. R. Collins, Jr. 1988a. Agricultural pollution potential database for Shenandoah Valley (Rockingham County) Soil and Water Conservation District. Interim Report VirGIS 88-9. Dept. of Cons. and Historic Resources, Division of Soil and Water Conservation. Richmond, Virginia.
- Shanholtz, V. O., E. R. Yagow, J. M. Flagg, R. K. Byler, S. Mostaghimi, and T. Dillaha. 1988b. Agricultural pollution potential database for John Marshall Soil and Water Conservation District. Interim Report VirGIS 88-4. Dept. of Cons. and Historic Resources, Division of Soil and Water Conservation. Richmond, Virginia.
- Shanholtz, V. O., P. A. Hellmund, R. K. Byler, S. Mostaghimi and T. A. Dillaha. 1987a. Agricultural pollution potential database Phase I. Final report to the Division of Soil and Water Conservation, Richmond, Virginia.
- Shanholtz, V. O., P. A. Hellmund, R. K. Byler, S. Mostaghimi, E. R. Collins and E. R. Yagow. 1987b. Virginia Chesapeake Bay database for soil erosion estimations. ASAE Paper No. 87-2109. American Society of Agricultural Engineers. St. Joseph, Michigan.
- Shepherd, R. G. and W. F. Geter. 1995. Verification, calibration, validation, simulation: Protocols in ground-water and AG/NPS modeling. In: Water Quality Modeling - Proceedings of the International Symposium. C. Heatwole (ed.). ASAE. St. Joseph, Michigan. pp.87-90.
- Spickler, D. L. 1984. Priority watersheds for the potential release of agricultural non-point phosphorus and nitrogen. Maryland State Soil Conservation Committee, Maryland Department of Agriculture.
- Srinivasan, R. and J. G. Arnold. 1993. Basin scale water quality modeling using GIS. In: Application of Advanced Information Technologies; Effective Management of Natural Resources. Proceedings of the June 18-19, 1993 Conference; Spokane, Washington. ASAE, St. Joseph, Michigan. pp. 475-484.

- Srinivasan, R. and B. A. Engel. 1991. A knowledge based approach to extract input data from GIS. ASAE Paper No. 91-7045. American Society of Agricultural Engineers. St. Joseph, Michigan.
- Steinhart, Carol E., Linda-Jo Schierow and William C. Sonzogni. 1982. An environmental quality index for the Great Lakes. *Water Res. Bull.* 18(6): 1025-1031.
- Steinhart, C., L. Schierow and G. Chesters. 1981. A review of water quality and related indices. Great Lakes Environmental Planning Study Contribution No. 38. Water Resources Center, University of Wisconsin. Madison, Wisconsin.
- Storm, D. E., T. A. Dillaha III, S. Mostaghimi and V. O. Shanholtz. 1988. Modeling phosphorus transport in surface runoff. *Trans. of the ASAE* 31(1): 117-127.
- Thomann, R. V. 1982. Verification of water quality models. *Jour. Environ. Eng.* 108(EE5): 923-940.
- Tomlin, C. D. 1980. The Map Analysis Package. Unpublished manuscript. School of Forestry and Environmental Studies. Yale University.
- Troutman, B. M. 1983. Runoff prediction errors and bias in parameter estimation induced by spatial variability of precipitation. *Water Resources Research* 19(3): 791-810.
- Truett, J. B., A. C. Johnson, W. D. Rowe, K. D. Feigner and L. J. Manning. 1975. Development of water quality management indices. *Water Res. Bull.* 11(3): 436-448.
- USDA. 1972. Hydrology. National Engineering Handbook, Section 4. U.S. Department of Agriculture, Soil Conservation Service. Washington, D. C.
- USDA-ARS-MWA. 1995. AGNPS 5.00 Program, Manuals and Technical References. Retrieved by ftp from "soils.mrsars.usda.gov". AGNPS Support, USDA-ARS-MWA, North Central Conservation Research Laboratory. Morris, Minnesota.
- USDA-ARS/SCS. 1989 Draft. RUSLE User's Guide.
- USDA-SCS. 1986. Urban hydrology for small watersheds. Technical Release (TR-55). U. S. Department of Agriculture, Soil Conservation Service, Engineering Division. (210-VI-TR-55, Second Ed., June 1986).
- van Vuuren, W., C. Giraldez, and D. P. Stonehouse. 1995. Importance of benefit identification in evaluating water pollution control programs. *Can. Water Resour. Jour.* 20(1): 1-10.
- VCES. 1987. Handbook of agronomy. Publication 424-100. Virginia Tech and Virginia State Universities. Blacksburg, Virginia.
- VWCB. 1988. Potomac-Shenandoah River basin nutrient evaluation, April 1979 - September 1988. Valley Regional Office, Virginia Water Control Board, Commonwealth of Virginia. Richmond, Virginia.
- VWCB. 1986. Water quality standards. Publication No. RB-2-86. Commonwealth of Virginia, Virginia Water Control Board, Richmond, Virginia.
- Wischmeier, W. H. and D. D. Smith. 1978. Predicting rainfall erosion losses - A guide to conservation planning. Agriculture Handbook No. 537. U. S. Government Printing Office, Washington, D.C.
- Witte, J., F. D. Theurer and K. D. Baker. 1995. AGNPS version 5.00 verification report: Software. File Name: vrfstwr.doc - retrieved by ftp from "soils.mrsars.usda.gov". AGNPS Support, USDA-ARS-MWA, North Central Conservation Research Laboratory. Morris, Minnesota.

- WPCF Research Foundation, Inc. 1990. Nonpoint source impact assessment: Final report. RP No. 90-5. Prepared by CH2M Hill. Gainesville, Florida.
- Yagow, G. and V. Shanholtz. 1995. PC-VirGIS / AGNPS 5.00 File Builder - Draft Documentation. PC-VirGIS Reference Material: Volume VII-3. MapTech, Inc. Blacksburg, Virginia.
- Young, R. A., C. A. Onstad, D. D. Bosch and W. P. Anderson. 1994. Agricultural non-point source pollution model, version 4.03, AGNPS user's guide. USDA-ARS. Morris, Minnesota.
- Young, R. A., R. S. Alessi and S. E. Needham. 1992. Application of a distributed parameter model for watershed assessment. In: Managing Water Resources During Global Change. American Water Resources Association. Bethesda, Maryland. pp.107-115.
- Young, R. A., C. A. Onstad, D. D. Bosch and W. P. Anderson. 1989. AGNPS: a nonpoint-source pollution model for evaluating agricultural watersheds. J. Soil and Water Cons. 44(2): 168-173.
- Young, R. A., C. A. Onstad, D. D. Bosch and W. P. Anderson. 1987. AGNPS, Agricultural non-point-source pollution model: A watershed analysis tool. Cons. Res. Rpt. 35. U. S. Department of Agriculture. Washington, D.C.
- Zacharias, S. and C. W. Coakley. 1993. Comparison of quantitative techniques used for pesticide model validation. ASAE Paper No. 93-2506. American Society of Agricultural Engineers. St. Joseph, Michigan.
- Zacharias, S. and C. D. Heatwole. 1993. Predicting tillage treatment effects on pesticide transport: a validation study. ASAE Paper No. 93-2592. American Society of Agricultural Engineers. St. Joseph, Michigan.