

## Curriculum Vitae

### Francis A. DiGiano, Ph.D., P.E., DEE

Professor Emeritus, Department of Environmental Sciences and Engineering  
University of North Carolina

Past-President and Co-Founder of Clean Jordan Lake ([www.cleanjordanlake.org](http://www.cleanjordanlake.org))

### Education

|       |   |      |
|-------|---|------|
| Ph.D. | University of Michigan/Ann Arbor (Sanitary & Water Resources Engineering) | 1969 |
| MSCE  | Tufts University, Medford, MA   | 1965 |
| BSCE  | University of Massachusetts/Amherst                                       | 1964 |

### Professional Experience

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| 2017-Present    | Board of Directors, Clean Jordan Lake, 501(c)(3) nonprofit organization  |
| 2010-2017       | President, Clean Jordan Lake, 501(c)(3) nonprofit organization   |
| 1981- 2007      | Professor of Environmental Sciences and Engineering, University of North Carolina  |
| 1991-1992       | Kenan Leave, Environmental Engineering, University of Michigan   |
| 1969-1981       | Assistant Professor, Associate Professor and Professor of Civil Engineering, University of Massachusetts                 |
| 1979-1981       | Environmental Engineering Program Coordinator University of Massachusetts  |
| 1977- Jan. 1978 | Alexander von Humboldt, Research Fellow Water Chemistry Institute, Karlsruhe University, Germany                         |
| 1976-1977       | Sabbatical Leave, Research Associate Department of Chemical Engineering Twente Technological University, The Netherlands |

### Awards

Distinguished Alumni Award University of Massachusetts Dept. Civil & Env. Eng., 2019  
Corps Foundation Coin Award for Volunteer Recognition, administered by the U.S. Army Corps of Engineers, 2015  
Jordan Lake Environment Education, Stewardship Award 2013  
Association of Environmental Engineering and Science Professors, Founders Award 2012  
Outstanding Achievement Award, Dept. of Civil and Environmental Engineering, Tufts University 2009  
American Water Works Association, Publication Award and Water Science and Research Division Best Paper Award (2006) (see DiGiano and Zhang, 2005)  
American Water Works Association, A. P. Black Award (2006) for sustained excellence in research

American Water Works Association – Selected as Honorary Member (2005); five national awards annually  
American Water Works Association- George W. Fuller Award for Outstanding Service to the Profession (2003)  
Fulbright Senior Scholar Research Award for 6 months at Milano Politechnical University, Italy to conduct research on membrane bioreactors (January-June 2003)  
Kenan Leave, University of North Carolina (2003): Milano Polytechnical University, Italy (January-June 2003)  
Rockefeller Foundation (2003), to conduct Workshop at the Bellagio Study and Conference Center (Italy) on “The Potential of Membrane Technology for Sustainable Decentralized Sanitation”  
Who’s Who in Health Sciences (2002)  
American Academy of Environmental Engineers Professional Magazine Feature - "Francis A. DiGiano - Water Environment as Profession and Passion," *Environmental Engineer*, Vol. 38, No. 3, July 2002, pp. 8-19 (see also [http://www.sph.unc.edu/envr/accompanying\\_files/digiano.pdf](http://www.sph.unc.edu/envr/accompanying_files/digiano.pdf))  
1999 Rudolf Hering Medal, for paper in the Journal of Environmental Engineering Division, ASCE with the most valuable contribution to the increase in knowledge in, and to the advancement of, the environmental branch of the engineering profession, with A. Braghetta and W. P. Ball “Nanofiltration of Natural Organic Matter: pH and Ionic Strength effects”  
Kenan Leave, University of North Carolina (1991): University of Michigan to prepare a textbook entitled Process Dynamics in Environmental Systems with W.J. Weber  
American Water Works Association, First Place in MS Thesis Competition (1989), Advisor to winner (Jan DeWaters)  
1988 Rudolf Hering Medal, for paper in the Journal of Environmental Engineering Division, ASCE with the most valuable contribution to the increase in knowledge in, and to the advancement of, the environmental branch of the engineering profession, with Rudolph Hering Medal with Dr. Gerald E. Speitel, Jr. “Biofilm shearing under dynamic conditions”  
Bernard G. Greenberg Award for Excellence in Doctoral Research (1985), Advisor to winner (Gerald E. Speitel, Jr.)  
Delta Omega - Honor Society for Public Health Research  
Alexander von Humboldt Research Fellow (1977) at the Univ. of Karlsruhe, Germany

### **Areas of Research**

Treatment of drinking water and wastewater by membrane processes  
Assessment of water quality deterioration in distribution systems  
Mathematical modeling of bacterial regrowth in distribution systems  
Treatment of drinking water by activated carbon adsorption  
Water quality of lakes

## **International Experience**

Twente Technological University, The Netherlands, Sabbatical Research on Phosphorus Exchange Between Sediments and Water and Modeling of Algal Growth Dynamics, 1976-77

Karlsruhe University, Federal Republic of Germany, von Humboldt Fellow Research on Adsorption for Removal of Trace Organic Contaminants from Drinking Water, 1977-78

Kenya, Lecturer in ETMA Sponsored Training Course on "Water Quality Monitoring for Lake Victoria Basin," 1983 (1 mo)

Advisor in ETMA Sponsored Project on Industrial Pollution in Lake Victoria Basin - Examination of Industrial Waste Treatment Practices, 1984 (1 mo) Kenya

Taiwan, Lecturer on "Advances in Water Pollution Control" invited by the Water Resources Planning Commission, Central Government (incl. visits to industrial waste treatment facilities), 1987 (1 mo.)

Milan Polytechnic Institute (Italy), Lecturer on "Adsorption and Membrane Technologies", 1998 (2 weeks)

Milan Polytechnic Institute (Italy), Lecturer on "Process Dynamics in Environmental Systems", 2003 (20 hours of lectures)

## **Publications**

### Refereed Publications

DiGiano, F.A. and M. Varma. 1968. Kinetics of oxygen uptake by dead algae. *Jour. Water Poll. Control Fed.*, 40:613-627.

DiGiano, F.A. and W.J. Weber Jr.. 1972. Sorption kinetics in finite-bath systems. *Jour. of the San. Engr. Div., Proc. Amer. Soc. Civil Engr*, 98:1021-36.

DiGiano, F.A. and W.J. Weber. 1973. Sorption kinetics in infinite- bath experiments. *Jour. Water Poll. Control Fed.*, 45:713-725.

Scaramelli, A. B. and F.A. DiGiano. 1973. Upgrading the activated sludge system with the addition of powdered carbon. *Water & Sewage Works*, 120:90-95.

DiGiano, F.A., C.J. Martel and J.R. Elwood. 1975. Wastewater pilot plant studies at the University of Massachusetts. *Jour. of the New England Water Poll. Control Assoc.* 9, No. 1:20-40.

DiGiano, F.A., R.J. DuPuis and P.J. Williams. 1975. Computerized monthly reports-cost effective alternative? *Water and Sewage Works*, 122, No. 12:49-53.

DiGiano, F.A. and A.S. Natter. 1977. Disperse dye-carrier interactions on activated carbon. *Jour. Water Poll. Control Fed.*, 49:235-244.

- Scaramelli, A.B. and F.A. DiGiano. 1977. Effect of sorbed organics on the efficiency of ammonia removal by chloramine-carbon surface reactions. *Jour. Water Poll. Control Fed.*, 49:693-705.
- DiGiano, F.A. and Y.S. Su. 1977. Nitrogen transformations in land treatment. *Journal of the Environ. Eng. Div. ASCE*, 103:1075-1088.
- DiGiano, F.A., L. Lijklema and G. Van Straten. 1978. Wind induced dispersion and algal growth in shallow lakes. *Ecological Modelling*, 4:237-252.
- DiGiano, F.A., G. Baldauf, B. Frick and H. Sontheimer. 1978. A simplified competitive equilibrium adsorption model. *Chemical Engineering Science (GB)*, 33:1667-1673.
- Ku, W.C., F.A. DiGiano and T.H. Feng. 1978. Factors affecting phosphate adsorption equilibria in lake sediments. *Water Research*, 12:1069-1074.
- Martel, C.J., F.A. DiGiano and R.E. Pariseau. 1979. Phosphorus removal in extended aeration systems by chemical clarification. *Jour. Water Poll. Control Fed.*, 51:140-149.
- Tirsch, F.S., J.H. Baker and F.A. DiGiano. 1979. Copper and cadmium reactions with soils in land application of wastewaters. *Jour. Water Poll. Control Fed.*, 51:2649-2650.
- DiGiano, F.A. (AWWA Committee Chairman). 1981. AWWA organic contaminants committee report - An assessment of microbial activity on GAC. *Jour AWWA*, 73:447-454.
- Li, A. Y. L. and F.A. DiGiano. 1983. Availability of sorbed substrate for microbial degradation on granular activated carbon. *Jour. Water Poll. Control Fed.*, 54:392-399.
- Saracen-Joyce, W., F.A. DiGiano. and P.C. Uden. 1984. THM precursors in the environment. *Jour AWWA*, 76:102-106.
- Kong, E.J. and F.A. DiGiano. 1986. Competitive adsorption among volatile organic chemicals (VOCs) on activated carbon and XE-340 resin. *Jour AWWA*, 78, 4:181-188.
- DiGiano, F.A., R.A. Carrier and A.M. Dietrich. 1986. Nitrification and nitrosation on the surface of activated carbon. *Jour AWWA*, 78, No.8:70- 74.
- Dietrich, M., D.L. Gallagher, P.M. DeRosa, D.S. Millington and F.A. DiGiano, 1986. Enhancement of N-nitrosamine formation on granular activated carbon from N-methyl aniline and nitrite. *Environ. Science & Technol.*, 20:1050-1055.
- Speitel, G.E., Jr. and F.A. DiGiano. 1987. Bioregeneration at micropollutant concentrations in GAC columns. *Jour AWWA*, 79:64-73 (Jan).

- Speitel, G.E., Jr., K. Dovantzis and F.A. DiGiano. 1987. Mathematical modeling of bioregeneration in GAC Columns. *Jour. Environ. Engrg. Div., ASCE*, 13:32-48.
- Speitel, G.E., Jr. and F.A. DiGiano. 1987. Biofilm shearing under dynamic conditions. *Jour. Environ. Engrg. Div., ASCE*, 113:464-474.
- Speitel, G.E., Jr. and F.A. DiGiano. 1988. Determination of microbial kinetic coefficients through measurement of initial rates by radiochemical techniques. *Water Research*, 22:829-835.
- DiGiano, F.A., D. Elliot and D. Leith. 1988. Application of passive dosimetry for detection of trace organic contaminants. *Environ. Sci. & Technol.*, 22:1365-67.
- Wallingford, E.D., F.A. DiGiano and C.T. Miller. 1988. Evaluation of a carbon adsorption method for sampling gasoline vapors in the subsurface. *Ground Water Monitoring Review*, Fall Issue: 85-92.
- Harrington, G.W. and F.A. DiGiano. 1989. Adsorption equilibria of humic substances after ozonation. *Jour AWWA*, 81:93-101 (June).
- DeWaters, J. and F.A. DiGiano. 1990. The influence of ozonated natural organic matter on biodegradation of a micropollutant in granular activated carbon bed. *Jour AWWA*, 82:69-75 (Aug).
- DiGiano, F.A., C. Clarkin, M.J. Charles, M.J. Maerker, D.E. Francisco and C. LaRocca. 1992. Testing of the EPA toxicity identification protocol in the textile manufacturing industry. *Water Sci. Tech.*, 25:3:55-63.
- DiGiano, F.A., C.T. Miller and J. Yoon. 1993. Predicting the release of PCB at the point of dredging. *Jour. Environ. Engrg. Div., ASCE* 119:1:72-89.
- Stringfellow, W.T., K. Mallon and F.A. DiGiano. 1993. Enumeration and disinfection of bacteria associated with particles released from GAC filter-adsorbers. *Jour AWWA*, 85:70-80.
- LaRocca, C. A., D.E. Francisco, and F.A. DiGiano. 1994. Effects of diet on survival, reproduction and sensitivity of *Ceriodaphnia dubia*, *Water Environment Research* 66:905-911.
- Nilson, J. and F.A. DiGiano. 1996. Influence of natural organic matter (NOM) composition on nanofiltration performance. *Jour AWWA* 88:5:53-66
- Braghetta, A., F.A. DiGiano, and W. Ball. 1997. Nanofiltration of natural organic matter: pH and ionic strength effects. *Jour. Environ. Engrg., ASCE*, July, 628-641

- Norton, M.V. and F.A. DiGiano. 1997. Selective separation of europium using polymer-enhanced ultrafiltration. *Water Environment Research* 69: 244-253
- Braghetta, A., F.A. DiGiano, and W. Ball. 1998. NOM accumulation at the NF membrane surface: impact of chemistry and shear. *Jour. Environ. Engrg., ASCE*, 124:1087-1098
- DiGiano, F.A., S. Arweiler, and J.A. Riddick. 1999. Alternative tests for evaluating NF fouling. *Jour. AWWA* 92:2:103-115
- Roudman, A. R. and F.A. DiGiano. 2000. Surface energy of experimental and commercial nanofiltration membranes: effects of etting and natural organic matter fouling. *Jour. Membrane Sci.* 175:61-73
- DiGiano, F.A., P.C. Singer, C. Parameswar, T.D. LeCourt. 2001. Biodegradation kinetics of ozonated natural organic matter and aldehydes. *Jour AWWA* 93:8:92-104
- Kazukiyo, N, S. Tanaka, Y. Hirata, T. Nakagawa, M. E. Arnold, B.D. Freeman, D. LeRoux, D.E. Betts, J.M. DeSimone and F.A. DiGiano. 2001. Solubility and diffusivity of sodium chloride in phase-separated block copolymers of poly(2-dimethylaminoethyl methacrylate), poly(1,1'-dihydroperfluorooctyl methacrylate) and poly(1,1,2,2-tetrahydroperfluorooctyl acrylate). *Polymer* 42: 9941-9948
- Zhang, W. and F.A. DiGiano. 2001. Comparison of bacterial regrowth in distribution systems usng free chlorine and chloramine: A statistical study of causative factors. *Water Research* 36:6:1469-1482
- DiGiano, F.A., A. Roudman, M. Arnold, M. and B. Freeman. 2002. Novel block copolymers as nanofiltration materials, *Env. Eng. Science* 19(6):497-511
- van der Bruggen, B., J.H. Kim, F.A. DiGiano, J. Geens, J. and C. Vandecasteele. 2004. Influence of MF pretreatment on NF performance for aqueous solutions containing particles and an organic foulant. *Separation and Purification Technology* 36 (3): 203-213
- DiGiano, F.A., V.L. Speight, and W. Zhang. 2004. Disinfectant decay and corrosion:laboratory and field studies. AwwaRF Report No. 90992F
- Speight, V.L, W.D. Kalsbeek and F.A. DiGiano. 2004. A randomized stratified sampling methodology for water quality in distribution systems. *Journal of Water Resources Planning and Management Div., ASCE* 130:4:330-338
- Zhang, W., C.T. Miller, and F.A. DiGiano. 2004. Bacterial regrowth model for water distribution systems incorporating the alternating split-operator solution technique. *Jour. Env. Eng. Div., ASCE* 130(9):932-941

- Bond, R. and F.A. DiGiano. 2004. Evaluating GAC Performance Using the ICR Database. *Jour AWWA* 96:6:96-104
- DiGiano, F.A. and W. Zhang. 2004. Uncertainty Analysis in a Mechanistic Model of Bacterial Regrowth in Distribution Systems. *Environ. Sci. & Technol* 38:22:5925-5931
- DiGiano, F.A. and W. Zhang. Pipe Section Reactor to Evaluate Chlorine-Wall Reaction. 2005. *Jour. AWWA* 97:1:74-85
- DiGiano, F.A., W. Zhang and A. Travaglia. 2005. Development of the mean residence time from tracer studies in distribution systems. *Jour. of Water Supply: Research and Technology Aqua* 54:1-14.
- Kim, J.H. and F.A. DiGiano. 2005. A two-fiber, bench-scale test of ultrafiltration (UF) for investigation of fouling rate characteristics. *Jour. Membrane Sci.* 271:1-2:196-204
- AWWA Membrane Research Technology Research Committee (member). 2005. Recent advances and research needs in membrane fouling. *Jour. AWWA* 97:8:79-90.
- AWWA Membrane Research Technology Research Committee (member). 2005. Recent advances and research needs in membrane fouling. *Jour. AWWA* 97:8:79-90.
- Kim, J.H. and F.A. DiGiano. 2006. A two-fiber, bench-scale test of ultrafiltration (UF) for investigation of fouling rate characteristics. *Jour. Membrane Sci.* 271:1-2:196-204
- Kim, J.H. and F.A. DiGiano. 2006. Defining critical flux in submerged membranes: Influence of length-distributed flux. *Jour. Membrane Sci.* 280: 752-761
- Kim, J.H. and F.A. DiGiano. 2006. Particle fouling in submerged microfiltration membranes: Effects of hollow-fiber length and aeration rate. *Jour. of Water Supply: Research and Technology Aqua.* 55 (7-8): 535-547
- Lautenschlager, S., DiGiano, F.A., Schuler, A. and Ferreira Filho, S. 2007. Net water production model for ultrafiltration including flow direction reversal and chemically assisted backwashing, *Water Environment Research* 79:8:877-886.
- Kim, J.H., F.A. DiGiano and R.D. Reardon. 2008. Autopsy of high-pressure membranes to compare effectiveness of MF and UF pretreatment in water reclamation. *Water Research* 42:3:697-706
- Elliott, M.A., Stauber, C.E., Koksal, F., DiGiano, F.A. and Sobsey, M.D. 2008. Reductions of E. coli, echovirus type 12 and bacteriophages in an intermittently operated household-scale slow sand filter. *Water Research* 42: 2662-2670

Ferguson, B., F.A. DiGiano., N.G. Love, P.J. Vikesland, K. Chandran, E.M. Fiss, and A.E. Zaklikowski. 2008. Effectiveness of disinfectant switching for control of nitrification. *Jour. Amer. Water Works Assoc.* 100:10:104-115

DiGiano, F.A., C. Weaver, D. Okun. 2009. Benefits of shifting fire protection to reclaimed water. *Jour. Amer. Water Works Assoc.* 101:2:65-74

Westbrook, A. and F.A. DiGiano. 2009. Rate of chloramine decay at pipe surfaces. *Jour. Amer. Water Works Assoc.* 101:7:59-7.

Kim, J.H. and F.A. DiGiano. 2009. Fouling models for low-pressure membrane systems. *Separation and Purification Technology* 68: 298-304

Elliott, M. A., DiGiano, F. A. and Sobsey, M. D. 2011. Virus attenuation by microbial mechanisms during the idle time of a household slow sand filter. *Water Research* 45:4092-4102

#### *Non-Refereed Publications*

Winklehaus, C., F.A. DiGiano and W.J. Weber, Jr. 1967. Discussion of: precipitation of iron in aerated ground water. *Jour. San Eng. Div. Proc. Amer. Soc. Civil Engr.*, 92:129-137.

Scaramelli, A.B. and F.A. DiGiano. 1974. Wastewater treatment- physical and chemical methods. *Jour. Water Poll. Control Fed.*, 46:1109-21.

Scaramelli, A.B. and F.A. DiGiano. 1975. Wastewater treatment - physical and chemical methods. *Jour. Water Poll. Control Fed.*, 47:1249-57.

Scaramelli, A.B. and F.A. DiGiano. 1976. Wastewater treatment-physical and chemical methods. *Jour. Water Poll. Control Fed.*, 48:1086-95.

Scaramelli, A.B. and F.A. DiGiano. 1977. Wastewater Treatment - physical and chemical methods. *Jour. Water Poll. Control Fed.*, 49:922-1001.

DiGiano, F.A., W.H. Frye and A.S. Natter. 1975. Treatment of basic and disperse dye wastes by activated carbon. *American Dyestuff Reporter*, 64, No. 8:15-20.

DiGiano, F.A., E.J. LaMotta, R.J. DuPuis. 1978. Computerized review of monthly treatment plant operating reports. *Prog. Water Tech.*, 9, Nos. 5/6:617-621.

DiGiano, F.A. Toward a better understanding of the practice of adsorption. 1980. *Water 1979 AIChE Symposium Series* 197, 76:86-95.



DiGiano, F.A. 1983. Discussion of: ammonia nitrogen removal in facultative wastewater stabilization ponds and nitrogen dynamics in waste stabilization ponds. *Jour. Water Poll. Control Fed.*, 54:1617-1618.

Bouwer, E., J. Mercer, M. Kavanaugh and F.A. DiGiano. 1988. Coping with groundwater contamination. *Jour. Water Poll. Control Fed.*, 60:1415-1427.

DiGiano, F.A. and G.E. Speitel. 1993. Biofilm computer models: time for practical applications?, *Jour AWWA*, 85:5:26

Backus, P.M. and F.A. DiGiano. 1994. The trouble with TREs. *Water Environment & Technology*, 57-60 (March 1994).

Kubiak, E.A., F.A. DiGiano and P. Savard. 1994. Feasibility of wastewater reuse at the National Spinning Company, Inc., NC Section AWWA/NC Water Pollution Control Association, Vol. LXIX, 90-97

DiGiano, F.A., G. Andreottola, S. Adham, C. Buckley, P. Cornel, G.T. Daigger, A.G. Fane, N. Galil, J. Jacangelo, A. Pollice, B.E. Rittmann, A. Rozzi, T. Stephenson, and Z. Ujang. 2004 Safe water for everyone (summary of Bellagio Team Residency). *Water Environment & Technology* 16:6:31-35

DiGiano, F.A., G. Andreottola, S. Adham, C. Buckley, P. Cornel, G.T. Daigger, A.G. Fane, N. Galil, J. Jacangelo, A. Pollice, B.E. Rittmann, A. Rozzi, T. Stephenson, and Z. Ujang. 2004 Safe water for everyone (summary of Bellagio Team Residency). *Science in Africa* <http://www.scienceinAfrica.co.za/2004/june/membrane.htm>

Stauber, C.E., M.A. Elliott, F. Koksal, G.M. Ortiz, F.A. DiGiano and M.D. Sobsey. 2006. Characterisation of the biosand filter for E. coli reductions from household drinking water under controlled laboratory and field use conditions. *Water Science & Technology*, 54:3:1-7

#### Chapters in Books

DiGiano, F.A., G. Baldauf, B. Frick and H. Sontheimer. 1980. Simplifying the description of competitive adsorption for practical application in water treatment. Activated Carbon Adsorption of Organics from the Aqueous Phase-*Proceedings of ACS Symposium*, ed. I. H. Suffet and M. J. McGuire, Ann Arbor Science Pub., pp. 213-228.

Frick, B., R. Bartz, H. Sontheimer and F.A. DiGiano. 1980. Predicting competitive adsorption effects in granular activated carbon filters. *ibid.*, pp. 229-242.

DiGiano, F.A. Influence of biological activity on GAC performance. 1981. in *Proceedings of Application of Adsorption to Wastewater Treatment*, ed. W. W. Eckenfelder, Enviro Press, pp. 285-305.

Frye, W.H. and F.A. DiGiano. 1981. Experimentally observed anomalies in competitive adsorption and reexamination of some available models. in *Chemistry in Water Reuse*, 2, ed. W.J. Cooper, Ann Arbor Science Publishers, Inc.

DiGiano, F.A. and P. Hogan-Hamm. 1981. Further testing of the Polanyi adsorption potential concept: simple and bisolute adsorption from aqueous solution. in *Heft 20 Aktuelle Probleme der Wasserchemie und der Wasseraufbereitung*, pp. 107-127 Institute of Water Chemistry, Univ. of Karlsruhe, FRG.

DiGiano, F.A. Adsorption of organic substances in drinking water. 1983. in *Control of Organic Substances in Water and Wastewater* EPA Report No. 600/8-83-0111, ed. B. B. Berger, pp. 65-118.

DiGiano, F.A. 1986. Removal of organic contaminants in drinking water by adsorption. in *Organic Carcinogens in Drinking Water: Detection, Treatment, and Risk Assessment*, ed. N. M. Ram, E. J. Calabrese and R. F. Christman, John Wiley & Sons, Inc. Publishers, New York, NY, pp. 237-264.

DiGiano, F.A. 1986. Removal of Organic Contaminants in Drinking Water by Adsorption. in *Organic Carcinogens in Drinking Water: Detection, Treatment, and Risk Assessment*, ed. N. M. Ram, E. J. Calabrese and R. F. Christman, John Wiley & Sons, Inc. Publishers, New York, NY, pp. 237-264.

Harrington, G.W., F.A. DiGiano, and J. Fettig. 1989. Effect of Coagulation, Ozonation, and Biodegradation on the Activated Carbon Adsorption of Aquatic Humic Substances. in *Influence of Aquatic Humic Substances*, Edited by I. H. Suffet and P. MacCarthy, Advances in Chemistry Series No.219, American Chemical Society, pp.727-746.

Black, J. P., D.O. Rester, F.A. DiGiano and A. D. Nickols. 1992. Activated Carbon. in *Disinfection Alternatives for Safe Drinking Water*, Edited by E. A. Bryant, G. P. Fulton and G. C. Budd, Van Nostrand Reinhold Publishers, pp. 308-347.

### Books

Weber, W.J. Jr. and F.A. DiGiano. 1996. *Process Dynamics in Environmental Systems*, 950 pages. Wiley Interscience, New York, NY (Korean translation by Dong-II Publishing Company, Seoul Korea, 2000)

### Conference Proceedings

Weber, W.J. and F.A. DiGiano. Reclamation of water for reuse as a water resource. 1967. Paper presented at the *International Conference on Water for Peace*, May 23-31, 1967, Washington, D.C.

DiGiano, F.A., T.H. Feng and A. Morgenroth. 1971. Joint treatment of textile dyeing, paper coating and municipal wastewaters. *Proceedings of the 5th Mid-Atlantic Industrial Waste Conference*, Drexel University, pp. 76- 120.

Frye, W.H. and F.A. DiGiano. 1974. Adsorptive behavior of disperse and basic textile dyes on activated carbon. *Proceedings of Purdue Industrial Waste Conference*.

Jewell, T.K., P.A. Mangarella and F.A. DiGiano. 1974. Application and testing of the EPA storm water management model to Greenfield, Massachusetts. *Proceedings of the National Symposium on Urban Rainfall and Runoff and Sediment Control*, University of Kentucky July 29-31, pp. 61-71.

DiGiano, F.A. and P.D. Snow. 1977. Consideration of phosphorus release from sediments in a lake model. in *Interactions Between Sediments and Fresh Water -Proceedings of International Symposium* Amsterdam, Netherlands, Sept. 1976, pp. 318-323 Junk B. V. Publishers.

DiGiano, F.A., E.J. La Motta and R.J. DuPuis. 1977. *Computerized review of monthly treatment plant operating reports. International Workshop in instrumentation and Control for Water and Wastewater Treatment-Int. Assoc. Water Research*, London, England.

DiGiano, F.A. 1979. Mathematical models of competitive adsorption: successes, failures and future applications. *Proceedings of 39th International Water Conference* (Engineers Society of Western Pennsylvania), 109-219.

DiGiano, F.A. 1979. Influence of microbial activity on the performance of GAC. *AWWA Seminar Proceedings-Controlling Organics in Drinking Water*.

Zapata-Moreno, M.C.\*, K.B. Black and F.A. DiGiano. 1982. *Removal of naturally occurring trihalomethane precursors by polymer coagulation and direct filtration*. AWWA Annual Conference, Miami Beach, FL.

DiMambro, R.A., F.A. DiGiano and C.Y. Yen. 1982. A comparison of competitive adsorption on selected carbonaceous polymeric resins and activated carbon: expected and unexpected preferential adsorptions. *Proceedings of AWWA 1982 Annual Conference*, pp. 739-752.

Speitel, G.E., Jr. and F.A. DiGiano. 1983. Interpretation of microbial kinetics in adsorptive systems at low substrate concentrations. *Proceedings of AWWA 1983 Annual Conference*, pp. 487-502.

DiGiano, F.A., G.E. Speitel, Jr. and K. Dovantzis. 1984. A biofilm model incorporating simultaneous supply of substrate from external solution and internal adsorption sites.

*Proceedings of the 1984 ASCE National Conference on Environmental Engineering*, pp. 382-397.

DiGiano, F.A. 1984. General considerations in assessing the beneficial aspects of microbial activity on granular activated carbon. *Proceedings of the NATO/CCMS Conference on Adsorption Techniques in Drinking Water Treatment*, P.V. Roberts, R. S. Summers, S. Regli, R. Pickford, F. Bell Eds., USEPA 570/ 9-84-005 CCMS-112, pp. 769-788.

DiGiano, F.A., R.A. Carrier and A. M. Dietrich. 1984. Nitrification and nitrosation on the surface of activated carbon. *Proceedings of AWWA 1984 Annual Conference*, pp 294-313.

Kong, E. J. and F.A. DiGiano. 1985. Competitive adsorption among volatile organic chemicals (VOCs) on activated carbon and XE-340 resin. *Proceedings of AWWA 1985 Annual Conference*, pp. 529-552.

Speitel, G.E. Jr. and F.A. DiGiano. 1985. Bioregeneration at micropollutant concentrations in GAC columns. *Proceedings of 1985 AWWA Annual Conference*, pp. 981-1005.

DiGiano, F.A., 1987. Ozone and biodegradation in slow sand filters and granular activated carbon. *Proceedings of the 1986 AWWA Pre- Conference Seminar on Ozonation: Recent Advances and Research Needs*, pp. 47-70.

Harrington, G.W. and F.A. DiGiano. 1988. Effects of coagulation, ozonation, and biodegradation on the equilibrium adsorption behavior of aquatic humic substances. *Proceedings of the 1988 AWWA Annual Conference*, Orlando, FL, pp. 707-734.

DiGiano, F.A. and C.K.Wang. 1988. The effect of ozonation on adsorption of humic substances and micropollutants. *Proceedings of the 1988 AWWA Annual Conference*, Orlando, FL, pp. 153-173.

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- Frick, B., R. Bartz, H. Sontheimer and F.A. DiGiano\*. 1978. *Problems of designing large carbon filter plants*. Amer. Chem. Soc. Semi-Annual Mtg.-Symposium on Adsorption, Miami, FL.
- DiGiano, F.A. 1979. *General considerations in assessing the beneficial aspects of microbial activity on granular activated carbon*. U.S. EPA and NATO/CCMS Sponsored International Conference on Practical Applications of Adsorption Techniques in Drinking Water, April 30, May 1-2, 1979, Reston, VA..
- DiGiano, F.A. 1979. *Toward a better understanding of the practice of adsorption in water treatment*. AIChE Symposium on Adsorption, Boston, MA.
- Hogan, P.A.\* and F.A. DiGiano. 1979. *Application of Polanyi's adsorption potential theory to single solute and bisolute adsorption from aqueous solutions on activated carbon*. ACS Symposium on Physico-Chemical Properties of Colloidal Particles: "The Effect of Surface Chemistry on Activated Carbon Adsorption," Washington, D.C.
- Frye, WH., F.A. DiGiano\*, and P.A. Hogan-Hamm. 1980. *Experimentally observed anomalies in competitive adsorption and re-examination of some available models*. ACS Symposium on Trace Organics Removal by Activated Carbon Adsorption: Competitive Models in the Aqueous Phase, Houston, TX.
- Li, A.Y.L.\* and F.A. DiGiano. 1980. *The availability of sorbed substrate for microbial degradation on granular activated carbon*. Water Poll. Control Fed., Las Vegas, Nevada.
- DiGiano, F.A.\* (AWWA Committee Chairman) 1981. *AWWA organic contaminants committee report - An assessment of microbial activity on GAC*. AWWA Annual Conference, St. Louis, Missouri.
- DiGiano, F.A.\*, R.W. Gullick and M.F. Lorenzo. 1982. *The effect of ozonation on adsorption equilibria using specific aromatic compounds as precursors*. Amer. Inst. of Chemical Engineers Summer National Meeting, Cleveland, OH..
- DiGiano, F.A. 1984. *Overview - Process design and control*. 1984. Seminar on Adsorption sponsored by the U.S. EPA, Office of Research and Development, Cincinnati, OH.
- DiGiano, F.A.\*, G.E. Speitel, Jr. and K. Dovantzis. 1984. *A biofilm model incorporating simultaneous supply of substrate from external solution and internal adsorption sites*. ASCE National Conference on Environmental Engineering, Los Angeles, CA.
- DiGiano, F.A. 1986. *Methodologies for Monitoring in Saturated and Unsaturated Zones*. Triangle Conference on Environmental Technology, NC Water Resources Research Institute, Chapel Hill, NC



- Wallingford, E.D.\*, F.A. DiGiano and C.T. Miller. 1986. *Vapor phase sampling methodology for assessing the movement of gasoline contaminants in a partially saturated soil environment*. Triangle Conference on Environmental Pollution.
- Miller, C. M.\*, F.A. DiGiano, and E.D. Wallingford. 1987. *Vapor phase sampling methodology for assessing gasoline contamination.*" Amer.Geophys. Union, Baltimore, MD
- DiGiano, F.A. 1987. *Removal of organic contaminants from drinking water: Microbial Degradation on Porous Adsorbents*. Gordon Research Conference on Applied and Envir. Microbiol., New London, N.H.
- DiGiano, F.A. 1987. *Application of European experiences with granular activated carbon to the United States*. AWWA Pre-Conference Seminar on GAC Installations:Conception to Operation, panelist/moderator, Kansas City, MO.
- DiGiano, F.A. \*, G.W. Harrington and J. Fetting. 1987. *Effect of ozonation and coagulation on adsorption of aquatic humic substances on activated carbon*. ACS Symposium on Influence of Aquatic Humic Substances on Fate and Treatment of Pollutants, Denver,CO.
- DiGiano, F.A. \*, J.F. Storm, and S. Shoaf. 1988. *Toxicity reduction evaluation at the Westside Wastewater Treatment Plant in High Point, N.C*. North Carolina Section AWWA/WPCA Seminar on Strategies of Reduction of Effluent Toxicity, Charlotte, NC
- DiGiano, F.A. 1988. *Case history: toxicity reduction evaluation at High Point, NC* U.S./U.S.S.R. Bilateral Agreement on Prevention of Water Pollution, EPA RREL, Cincinnati, OH
- DiGiano, F.A. 1988. *Case history:toxicity reduction evaluation at High Point, NC* Wastewater Toxics Management Seminar, Virginia Water Poll. Control Assoc., Richmond, VA.
- DiGiano, F.A. 1988. *A test of EPA's toxicity reduction evaluation protocol at High Point, NC* North Carolina AWWA/WPCA Annual Meeting, Durham, NC
- Storm, J.F.\* and F.A. DiGiano. 1988. *The chemical-specific approach to toxicity reduction at a municipal wastewater treatment plant*. Poster Session, SETAC Annual Meeting, Arlington, VA
- Grimberg, S.\* and F.A. DiGiano. 1989. *Biodegradation and adsorption of ozonated natural organic matter in granular activated carbon beds*. Fine Particle Society Symposium on Activated Carbon Technology, Boston, MA
- DiGiano, F.A. 1989. *Recent advances in adsorption technology*. Fine Particle Society Symposium on Activated Carbon Technology, Boston, MA
- DiGiano, F.A. 1989. *Microorganisms on granular activated carbon*. AWWARF Technology Transfer Conference, Denver, CO
- DiGiano, F.A.,\* Maerker, M.L., Frey, M., Champlin, T. and Weiss, C.. 1989. *Application of EPA's phase I toxicity characterization procedures at POTW's in High Point and Fayetteville, NC*. Annual Water Pollution Control Federation Meeting, San Francisco, CA
- DiGiano, F.A.,\* Miller, C.T. and Yoon, J. 1990. *Predicting the release of PCB at the point of dredging*. Fine Particle Society Symposium on Adsorption of Priority Pollutants, San Diego, CA.

- Clarkin, C.\*, Charles, J., DiGiano, F.A. and Maerker, M.J. 1991. Characterization of aquatic toxicity in an effluent from a dye-manufacturing industry. *Poster session at the American Chemical Society Meeting, Atlanta, Ga.*
- DiGiano, F.A., Clarkin, C.\*, Charles, J., Maerker, M.J. Francisco, D. and LaRocca, C. 1991. Testing of the EPA toxicity identification evaluation protocol in the textile dye manufacturing industry. *Conference on Waste Management in the Chemical and Petrochemical Industries-Toxics Management* (sponsored by the International Association on Water Pollution Research and Control), New Orleans, La.
- Clarkin, C.M.\*, M. J. Charles and F. A. DiGiano 1991. Mass spectral identification of compounds present in toxic fractions of dye manufacturing plant. *39th ASMS Conference on Mass Spectrometry and Allied Topics, Nashville, Tenn.*
- DiGiano, F. A.\* and C. T. Miller. 1991. Prediction of contaminant release from sediment resuspended at the point of dredging. *Dredging Contaminated Sediments Workshop, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.*
- DiGiano, F. A. 1992. Aquatic toxicity identification in the textile industry. *Amer. Assoc. of Textile Chemists and Colorists, Charleston, S.C.*
- DiGiano, F. A. 1993. Total organic carbon removal by membranes. Invited speaker for Virginia Section of AWWA- Section Research Committee (Herndon, Virg.)
- Utne, B., A. Braghetta, F.A.\*, DiGiano and J. Nilson. 1994. Influence of cross-flow velocity on membrane fouling and rejection of natural organic matter. *AWWA National Conference, Research Div. Poster Session (New York, N.Y.)*
- DiGiano, F.A. 1996. Basic Concepts for the use of GAC technology in drinking water treatment. *GAC, Membranes and the ICR Workshop on Bench-scale and Pilot-scale Evaluations, AWWA (Cincinnati, Ohio)*
- DiGiano, F.A. 1996. Evaluation of natural organic matter fouling in bench-scale, batch recycle tests of nanofiltration,. *GAC, Membranes and the ICR Workshop on Bench-scale and Pilot-scale Evaluations, AWWA (Cincinnati, OH)*
- DiGiano, F.A. 1997. Bench-scale study of nanofiltration and GAC adsorption for removal of DBP precursors in three North Carolina cities. *NCAWW/WEA Annual Conference, Winston-Salem, N.C.*
- DiGiano, F.A.\* and J. A. Riddick. 1997. Batch-recycle as an alternative to continuous-flow bench-scale membrane test system. *AWWA Membrane Technology Conference, New Orleans, La.*
- Jackson, T.L.\*, W. B. Dowbiggin, F. A. DiGiano and K. Christmas, K. 1997. Granular activated carbon, membranes, and the Information Collection Rule. *AWWA Annual Conference, Atlanta, GA*
- DiGiano, F.A. 1998. Activated carbon operations. Short Course on Fundamentals and Recent Developments in Water Treatment: The Views of Several Experts. Virginia Polytechnic Institute and State University
- Long, T.C.\*, F. A. DiGiano, and P. C. Singer. 1998. Application of computational fluid dynamics for prediction of disinfection efficiency in drinking water treatment. *NC AWWA/WEA Annual Conference, Durham, N.C.*
- Parameswar, C.\*, L. McMillan, K. Best, B. Kidd, F. A. DiGiano, and K. Hughes. 1998. GAC treatment studies for the ICR: Pilot vs. bench studies at two North Carolina utilities. *NC AWWA/WEA Annual Conference, Durham, N.C.*

- Zhang, W.\*, F. A. DiGiano, D. Francisco and L. Todd. 1999. A statistical study on the relationship between bacterial growth and water quality parameters. *NC AWWA and WEA Annual Meeting*, Asheville, N.C.
- DiGiano, F. A. 1999. Chloramination: How to do it right- Microbiological considerations. *AWWA WQTC Conference*, Tampa, Fla.
- DiGiano, F. A. 1999. Carbon adsorption chemistry. *AWWA WQTC Preconference Workshop on The Fundamentals of Water Quality and Treatment Chemistry*, Tampa, Fla.
- DiGiano, F. A. 2000. Principles of membrane technology. NC AWWA Section Seminar of Membrane Technology, Raleigh, N.C.
- Zhang, W.\*, C. T. Miller, and F. A. DiGiano. 2000. Using alternating Split-operator method to solve a bacterial regrowth model for drinking water distribution systems. Poster session - Water Quality, ASCE 2000 Joint Conference on Water Resources Engineering and Water Resources Planning & Management, Minneapolis, Minn.
- Bond, R.\*, H. Shorney, J. Clune, W. Vernon and F. A. DiGiano. 2001. A comparison of small-scale column and pilot-scale test results of lignite and bituminous GAC, Poster Session, *AWWA Water Quality Technology Conference*, Memphis, Tenn.
- DiGiano, F.A. 2002. Case studies of bacterial regrowth in distribution systems: chlorine and chloramine disinfection strategies, *Southeast Regional Technology Transfer Conference of SC AWWA*, Greenville, S.C.
- DiGiano, F.A. 2002. Evolving role of membrane technology in drinking water treatment, *Southeast Regional Technology Transfer Conference of SC AWWA*, Greenville, S.C.
- DiGiano, F.A.\* , D. E. Francisco, T. Bishop, and A. Oldham. 2002. Conversion from conventional treatment to microfiltration in a small water system (Carthage, N.C.): Assessment of Water Quality Improvement and Regulatory/Public Acceptance. NC AWWA/WEA Spring Fling Conference, Wilmington, N.C.
- DiGiano, F.A.\*, V. L. Speight and C. Pan. 2002. Vulnerability of public water supplies to bioterrorism. Association of Schools of Public Health: Responding to a New Environment Emergency Response at Schools of Public Health, Pittsburgh, Penn. (presentation available at [http://www.asph.org/fac\\_document.cfm/72/72/6876](http://www.asph.org/fac_document.cfm/72/72/6876))
- DiGiano, F.A. 2002. Activated carbon adsorption principles and applications. Preconference Workshop, *AWWA Water Quality Technology Conference*, Seattle, Wash.
- DiGiano, F.A. 2003. Summary of Bellagio Team Residency on exploration of the potential of membrane technology for sustainable decentralized sanitation. *International Conference on the Applications and Perspectives on MBRs in Wastewater Treatment and Reuse*, April 28-29, 2003, Cremona, Italy
- Reardon, R. D.\*, F.A. DiGiano, M.D. Aitken, M. D., S. Paranjape, X. Fousseureau, and J. Kim. 2003. Membrane treatment of secondary effluent for subsequent use *Virginia Water Environment Assoc. Education Seminar on Application of Membrane Technology for Wastewater Reuse*. Richmond, Virg.
- DiGiano, F.A. 2003. Membrane technologies for decentralized reuse: Bellagio Conference Findings. *Virginia Water Environment Assoc. Education Seminar on Application of Membrane Technology for Wastewater Reuse*. Richmond, Virg.

- DiGiano, F.A., R.D. Reardon, R., and M.D. Aitken. 2004. Critical assessment of the state-of-the art of membrane technology for wastewater reuse applications. *NC AWWA/WEA Water Reuse Seminar*. Charlotte, N.C.
- Speight, V.L.\* and F.A. DiGiano. 2004. Where, when and how many? Water quality sampling in distribution systems. *Poster Session, AWWA Annual Conference*, Orlando, Fla.
- DiGiano, F.A.. 2004. Free chlorine vs. chloramine disinfection: Impacts on water quality in the distribution system. *Michigan Section, AWWA Research and Technical Practices Seminar*
- DiGiano, F.A. 2004. Water quality modeling: Advantages and limitations. South Carolina/Georgia AWWA Sections Drinking Water Technology Forum, Hilton Head, SC.
- DiGiano, F.A. 2005. Bench and pilot plant studies of membrane technology in wastewater reuse applications. *Preconference Workshop on Membrane Technologies in Wastewater Reuse, AWWA Membrane Technology Conference*, Phoenix, Ariz.
- Miller, E.C.\* , O.D. Simmons, M.D. Sobsey, and F.A. DiGiano. 2005. Comparison of low-pressure membrane processes (MF vs. UF) as pretreatment for subsequent virus removal by high-pressure membranes (NF and RO) for wastewater reuse. *Poster presentation, Amer. Soc. Microbiology*, Atlanta, Ga.
- Stauber, C.E., M.A. Elliott\*, F. Koksai, F.A. DiGiano and M.D. Sobsey. 2005. reduction of bacteria and viruses via household scale intermittently operated slow sand filtration, *Poster presentation, Amer. Soc. Microbiology*, Atlanta, Ga.
- Stauber, C.E., M.A. Elliott\*, F. Koksai, G.M. Ortiz, K. Liang, F.A. DiGiano, and M.D. Sobsey. 2005. Characterization of the biosand filter for microbial reductions under controlled laboratory and field use conditions. *Poster presentation, WHO Household Water treatment and Safe Storage Conference*, Bangkok, Thailand
- DiGiano, F.A.\* , C. Nesbit and L. McMillan. 2005. Factors influencing the occurrence of coliform positives in a chloraminated distribution system. *AWWA Distribution Systems Seminar*, Tampa, Fl.
- DiGiano, F.A. 2005. Bench and pilot plant studies of membrane technology in wastewater reuse applications. *Preconference Workshop on Membrane Technologies in Wastewater Reuse, AWWA Membrane Technology Conference*, Phoenix, Ariz.
- Kim, J-H\* , DiGiano, F.A., Reardon, R., Treadway, J. 2006. "Effect of membrane pretreatment (MF vs. UF) on high pressure membrane fouling: Fouling analysis by membrane autopsy, *North American Membrane Society*, Chicago, Ill.
- Westbrook, A.\* and F.A. DiGiano. 2006. Determination of chloramine decay rates on pipe surfaces and bulk water in a simulated distribution Ssystem environment, NC Section AWWA Spring Fling Research Conf., New Bern, NC.
- DiGiano, F.A. 2006. Emerging chemical contaminants- What is out there and what does it mean? NC Section AWWA-WEA Annual Conference, Greenboro, N.C.
- Scruggs, C.\* , Rimer, A., Kobylinski, E, DiGiano, F.A. 2006. A holistic approach to managing the EDC issue. *Poster session, Water Environment Federation Annual Conference & Exposition*, Chicago, Ill.

- Weaver, C\*., F.A. DiGiano, D.A. Okun. 2007. Reclaimed water for fire demand: A conceptual study for a new residential community in N.C., NC AWWA/WEA Water Reuse-Facing Future, Charlotte, N.C.
- Kim, J-H\*, DiGiano, F.A., Reardon, R., Treadway, J. 2006. "Effect of membrane pretreatment (MF vs. UF) on high pressure membrane fouling: Fouling analysis by membrane autopsy, *North American Membrane Society*, Chicago, Ill.
- Westbrook, A.\* and F.A. DiGiano. 2006. Determination of chloramine decay rates on pipe surfaces and bulk water in a simulated distribution system environment, NC Section AWWA Spring Fling Research Conf., New Bern, NC.
- DiGiano, F.A. 2006. Emerging chemical contaminants- What is out there and what does it mean? NC Section AWWA-WEA Annual Conference, Greenboro, N.C.
- Scruggs, C.\*, Rimer, A., Kobylinski, E, DiGiano, F.A. 2006. A holistic approach to managing the EDC issue. Poster session, Water Environment Federation Annual Conference & Exposition, Chicago, Ill.
- DiGiano, F.A. 2007. Positive and negative impacts of annual switches from chloramines to free chlorine on water quality in distribution systems. Watershed Symposium and Drinking Water Technology Forum, NC AWWA-WEA, SC AWWA and WEASC, and GAWP, Wilmington, N.C.
- DiGiano, F.A. 2007. Dual water system utilization of MBR technology for water reclamation and fire protection: Water infrastructure of the future? Watershed Symposium and Drinking Water Technology Forum, NC AWWA-WEA, SC AWWA and WEASC, and GAWP, Wilmington, N.C. DiGiano, F.A. 2012. Removal of DBPs by membranes. *North Carolina Division of Public Water Supply Workshop*, Raleigh, N.C.

### **Invited Seminars**

*Mathematical Modeling of Phosphorus Exchange Between Sediments and Overlying Water.* Twente Technological University, Department of Chemical Engineering, The Netherlands (1976)

*Recent Theories Describing Competitive Adsorption.* Royal Institute of Technology, Dept. of Chemical Engineering, Stockholm, Sweden (1977)

*Simplifying the Description of Competitive Adsorption for Granular Activated Carbon Treatment of Water Supplies.* Karlsruhe University, Water Chemistry Institute, Fed. Rep. of Germany (1977)

*European Experience with Granular Activated Carbon for Water Treatment.* University of Illinois, Water Resources Research Center and Department of Civil Engineering (1978)

*European Experience with Granular Activated Carbon for Water Treatment.* Princeton University, Water Resources Engineering Program (1978)

*Describing Competitive Adsorption: Successes, Failures and Future Applications..* Syracuse University, Department of Chemical Engineering (1979)

*BAC-Biological Activated Carbon, A Process Description.* Short Course Lecturer-Water Treatment, University of North Carolina, Department of Environmental Sciences and Engineering (1979)

*The Role of Adsorption in Drinking Water Treatment.* University of Florida, Department of Environmental Science and Engineering (1979)

*Interaction Between Adsorption and Biodegradation.* Clemson University, Department of Environmental Systems Engineering (1981)

*Applications of Adsorption in Water Treatment.* Duke University, Department of Civil Engineering (1983)

*Process Design Considerations in Adsorption System.* Virginia Polytechnic Institute and State University (1984)

*Process Design of Adsorption Systems.* University of North Carolina at Charlotte (1984)

*Removal of Organic Contaminants in Drinking Water Treatment.* Clarkson University. (1984)

*Effect of Ozonation on Adsorption.* Illinois Institute of Technology, Department of Environmental Engineering (1987)

*Development and Testing of a Carbon Adsorption Trap Method for Detection of Gasoline from Leaking Underground Storage Tanks in the Unsaturated Zone.* National Taiwan University, Department of Environmental Engineering (1987)

*Biodegradation on Activated Carbon.* The Johns Hopkins University, Department of Geography and Environmental Engineering (1989)

*Interaction Between Adsorption and Biodegradation on Activated Carbon.* Duke University, Department of Civil and Environmental Engineering. (1989)

*Interaction Between Adsorption and Biodegradation on Activated Carbon.* University of Michigan, Department of Civil and Environmental Engineering (1991)

*Adsorption Technology in Water and Wastewater Treatment,* Battelle Northwest Laboratory. (1992)

*Bench- and Pilot-Plant Data Obtain for the Evaluation of Adsorption-Biodegradation on Granular Activated Carbon in Treatment of Drinking Water.* Department of Civil and Environmental Engineering, Washington State University (1992)

*TOC Removal by Membranes Seminar*, Virginia Section-American Water Works Assoc. Research Committee (1993)

*Advances in Membrane Technology*. Quadrangle Conference of Graduate Research in Environmental Engineering, Georgia Institute of Technology (1997)

*Principles of the biological activated carbon process*. Univ. of Milan (1998)

*Bench-scale Studies of Granular Activated Carbon and Membranes in Water Treatment*, Department of Hydraulics, Environmental Engineering and Surveying, Polytechnical Institute of Milan, Italy (1998)

*Experimental Techniques to Determine the Interaction Between Biodegradation and Adsorption on Activated Carbon*. National Water Research Institute of Italy, Bari (1998)

*Development and Testing of Novel Block Copolymers for Nanofiltration of Drinking Water*. Special Seminar Series on Membrane Applications in Water Treatment, Dept. of Geography and Environmental Engineering. Johns Hopkins University (1999)

*The Future of Membrane Processes in Water Treatment*. Dept. of Civil & Environmental Eng., NCSU (1999)

*Development and Testing of New Membrane Materials for Application in Water Treatment*. Dept. of Civil Engineering, Duke University (2000)

*Principles of Membrane Technology*. NC AWWA Section Seminar of Membrane Technology, Raleigh, N.C. (2000).

*Field Measurements and Mathematical Modeling of Bacterial Regrowth in Distribution Systems*. Dept. of Civil Engineering, Univ. of Waterloo, Canada (2000)

*Bacterial Regrowth in Drinking Water Distribution Systems: A Comparison of Free- and Combined Chlorine in Two Utilities and Mechanistic Modeling*. Dept. of Environmental Engineering Sciences, Univ. of Florida (2001)

*Principles of Membrane Technology*. NC AWWA Section Seminar of Membrane Technology, Greensboro, NC (2001)

*Vulnerability of Public Water Supplies to Terrorism*. School of Public Health, UNC course on Terrorism and Community Preparedness (2002)

*Role of Membrane Technology in Water Treatment*. Dept. of Civil and Environmental Eng., Univ. of Trento, Italy (2003)

*Critical Research Needs to Advance Membrane Technology*. National Water Research Institute of Italy, Bari (2003)

*Particle Fouling of Submerged- and Hard-shell Encased, Low-Pressure Membranes*  
Dept. of Chemical and Environmental Engineering, Univ. of Toledo (2005).

*Water quality deterioration in distribution systems and futuristic solutions*, Dept. of Civil and Environmental Engineering, University of Michigan, Ann Arbor (2006)

*Water quality deterioration in distribution systems and futuristic solutions*, Dept. of Civil and Environmental Engineering, North Carolina State University, Raleigh (2006)

*Low-pressure, hollow-fiber submerged membrane systems: Effects of fiber length, aeration rate and particle characteristics on specification of critical flux*. Gordon Research Conference on Membrane Materials and Processes, New London, N.H. (2006)

*Water reclamation by membranes: Is ultrafiltration better than microfiltration as pretreatment for reverse osmosis?*, Center for Water Science, Cranfield University, UK (2006)

*Advancing water sustainability and improving drinking water quality*, Dept. of Civil and Environmental Engineering, Michigan State Univ. (2007)

Challenges to Implementation of Dual Water Distribution. Google, Inc., Boulder Col. (2009)

The Greening of Water Infrastructures. Dept. of Civil and Env. Eng., Tuft Univ. (2009)

Water Reclamation and Energy. Special Seminar on Energy Production and Greenhouse Gas Reduction in Wastewater Treatment Plants, Inha University, Korea (2009)

## **Clean Jordan Lake Accomplishments**

[cleanjordanlake.org](http://cleanjordanlake.org)

Co-founder, 2009

Nonprofit status 501(c) 3 in 2010

Mission: Restore Jordan Lake to a healthy and vibrant resource by removing trash from the shoreline and preventing its recurrence

With no paid staff, 6,700 volunteers recruited to remove 17,000 bags of trash (about 170 tons) and 4,700 tires from 20 miles of critical shoreline in 500 cleanup events

1,200 members in [meetup.com/helpcleanjordanlake](https://www.meetup.com/helpcleanjordanlake)



\$35,000 in grants and donations from Walmart Foundation, Boat U.S. Foundation, REI, Biogen Idec, Chatham Park Investors, LLC, Syngenta Community Foundation and local Rotary clubs

Summer university student interns from the University of Texas and North Carolina State University

Cooperative Agreement with the U.S. Army Corps of Engineers, managing agency of lake

Formal partnership with Chatham County to provide trash hauling and disposal

Grants from Bridgestone Americas for pick up and recycle of tires

GIS research to quantify spatial and temporal accumulation of trash, volunteer effort to remove and correlation with stormwater events

Presentations to university professional societies, local and county governments, professional societies, civic groups, recreational clubs

#### Publications and Professional Presentations

DiGiano, F.A. 2014. How to Remove 90 Tons of Trash and 3,400 Tires, *Fall American Canoe Association Newsletter*

DiGiano, F.A. 2014. Assessing Stormwater Driven Trash at Jordan Lake, *NC Water Resources Research Institute Annual Conference*, March

DiGiano, F. A., and Frei, J. 2014. Quantifying Trash Accumulation at Jordan Lake from Stormwater Events, *APWA-NC, Stormwater Division Conference*

DiGiano, F. A. 2017. Talk'n Trash, *Chatham County Line*, May

King, S. and DiGiano, F.A. 2018. GIS Mapping of Volunteer Cleanups at Jordan Lake to Remove Trash and Tire Loadings from Stormwater, *NC Water Resources Research Institute Annual Conference*, March