

VITAE

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Professor and Director

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EDUCATION:

Rutgers University, New Brunswick NJ

Ph.D. in Environmental Science (1984) Thesis: Modeling and Simulation of Compressive Gravity Thickening of Activated Sludge

M.S. in Chemical Engineering (1983). Thesis: Mean Cell Residence Time in a Nonsteady-state Activated Sludge System

M.S. in Environmental Science (1979)

B.S. in Environmental Science (1974)

PROFESSIONAL EXPERIENCE:

Stevens Institute of Technology, Hoboken NJ

ASSISTANT PROFESSOR -- January 1985 to August 1989

ASSOCIATE PROFESSOR -- September 1989 to 2012

PROFESSOR -- 2012 to present

Research interests: *Biological control processes:* Control theory applied to the activated sludge process; modeling of compression in gravity thickening of sludge; nonlinear time-series analysis for system identification. *Physicochemical control processes:* Air-stripping for removal of volatile organics. Corrosion byproduct formation in drinking water. *Process Modeling:* Nonlinear time-series analysis. Integrated modeling of bioregenerative life support systems for long-term space travel.

ReSource Technologies, Inc. ENGINEERING CONSULTANT -- March 1988 to Dec. 1995

Responsible for design and testing of packed-column air-stripping equipment for the removal of volatile organic compounds from drinking water and wastewater. Developed new technologies for solvent recovery from air, and for point-of-use and point-of-entry removal of VOCs from drinking water.

EnviroSystems Company PRINCIPAL CONSULTANT -- June 1982 to January 1985

Development and marketing of software product for unit process simulation and control.

Rahway Valley Sewerage Authority, CHEMIST -- June 1974 -- January 1979

Supervised laboratory operations and technicians; operated atomic absorption spectrophotometer; assistant for activated sludge process control

DIRECTOR Dept. of Civil, Environmental and Ocean Engineering -- March 2007 to present

PROFESSIONAL SOCIETIES and ACTIVITIES:

Water Environment Federation (Technical Practice Committees for Wastewater Biology Manual of Practice and for Instrumentation and Control)

American Society of Civil Engineers

American Academy of Environmental Engineers

Board of Trustees member (2015-2018)

Engineering Education Committee (Co-chair)
Participation as Accreditation Evaluator
Association of Environmental Engineering Professors
ABET Board of Directors member (2009 – 2015)
ABET Technology Accreditation Commission, member 2004 - 2006
ABET Accreditation Visitor for Bachelor of Environmental Engineering and
Bachelor of Engineering Technology in Environmental Engineering
Global TraPs Project – Scientific Node Leader for Exploration

CERTIFICATIONS AND AWARDS:

Licensed Professional Engineer, New Jersey, 1989
S-4 Wastewater Treatment Plant Operator's License
Stationary Engineer (High Pressure Boiler Operator's License)
International Assoc. on Water Quality USA National Committee Founders Award for outstanding paper
in *Water Research* by an US author.
2009 Educator of the Year award from the American Council of Engineering Companies of NJ
2010 Wiley/AEESP Award for Outstanding Contribution to Environmental Engineering and Science
Education

REPRESENTATIVE PUBLICATIONS

Papers:

Cacossa, K. and D.A. Vaccari, "Prediction of Continuous Thickening from Batch Experiments", *Water Science and Technology*, July 1994

Vaccari, D.A. and C. Christodoulatos, "Generalized Multiple Regression with Interaction and Nonlinearity for System Identification in Biological Treatment Processes", *Trans. Instr. Soc. Am.* v31, n1, p97-102 (1992)

Christodoulatos, C., D.A. Vaccari, "Correlations of Performance for Activated Sludge Using Multiple Regression with Autocorrelation", *Water Research*, v27, n1, pp51-62 (1993)

Vaccari, D.A., and C. Christodoulatos, "A Comparison of Several Control Algorithms for Activated Sludge Waste Rate", *Wat. Sci. Tech.* vol 21, pp. 1249-1260, (1989)

Vaccari, D.A., A. Cooper, and C. Christodoulatos, "Feedback Control of Activated Sludge Waste Rate", *JWPCF*, v60, n11, p 1979-1985, (1988)

Vaccari, D.A., M. Kaouris, "A Model for Irreversible Adsorption Hysteresis", *J. Env. Sci and Health, Part A -- Env. Sci. and Engg.*, 23, 8, (1988)

Vaccari, D.A., T. Fagedes, and J. Longtin, "Mean Cell Residence Time in a Nonsteady-State Activated Sludge System", *Biotechnology and Bioengineering*, v. 27, pp. 695-703, (1985).

Cacossa, K. and D.A. Vaccari, Prediction of Continuous Thickening from A Single Batch Experiment, *Water Science Technology*, v30, n8, pp107-116 (1994).

"Predicting Process Performance with Polynomials", D.A. Vaccari and E. Wojciechowski, WEF Specialty Conf. "Automating to Improve Water Quality", Minn., MN, June 25-28, 1995

"Nonlinear Analysis of Retail Performance", D.A. Vaccari, presented at the IEEE/IAFE Conf. on Computational Intelligence for Financial Engineering, March 24-26, 1996, New York, NY

Vaccari, D.A. and J. Levri, "Multivariable Empirical Modeling of ALS Systems Using Polynomials," *Life Support and Biosphere Science*, vol. 6 pp. 265-271, (1999)

Levri, J., and D.A. Vaccari, "Model Implementation for dynamic computation of system cost for advanced life support," *Advances in Space Research*, Space Life Sciences: Life Support Systems and Biological Systems under Influence of Physical Factors, Vol 34/7 pp 1539-1545 (2004).

- Vaccari, D. A. and Wang, H. -K. (2007) 'Multivariate polynomial regression for identification of chaotic time series', *Mathematical and Computer Modelling of Dynamical Systems*, 13:4, 395 - 412
- Vaccari, D.A., "Phosphorus: A Looming Crisis," *Scientific American*, v300, n6, pp 54-59 (June, 2009).
- Jagupilla, S.J.K., D.A. Vaccari; R.I. Hires, "Multivariate Polynomial Time-Series Models and Importance Ratios to Identify Fecal Coliform Sources," *ASCE Journal of Environmental Engineering*, v136, n7, pp657-665 (2010).
- Vaccari, D.A. and N. Strigul (2011) Extrapolating phosphorus production to estimate resource reserves, *Chemosphere* 84 (2011) 792-797.
- Jagupilla, S.J.K. David A Vaccari, Robert Miskewitz, (2013) Adjusting Error Calculation to Account for Temporal Mismatch in Evaluating Models, *ASCE J. of Hydrologic Engineering*, vol 19, no. 6, pp 1186-1193
- Meng, Xiaoyang; Vaccari, David; Zhang, Jianfeng; Fiume, Antonio; Meng, Xiaoguang, "Bio-regeneration of Spent Anion Exchange Resin for Treatment of Nitrate in Water", *Environmental Science & Technology Manuscript ID: es-2013-043534.R1*, in press (2014)

Books and Chapters:

- "Automatic Process Control" Chapter 8 of "Instrumentation and Automation for Wastewater Treatment, Manual of Practice 21", with W. Joseph Myers, to be published by the Water Environment Federation (1995).
- "Sludge Waste Control", Chapter 10, Section D of "Automated Process Control Strategies for Wastewater and Sludge Treatment Plants", a Special Publication to be published by the Water Environment Federation, R. Hill, editor (1995).
- "Chemical Precipitation", by Lawrence K. Wang, David A. Vaccari, Yan Li, and Nazih K. Shammam, Chapter 5 of "Physicochemical Treatment Processes," edited by Wang, Lawrence K., Hung, Yung-Tse, and Shammam, Nazih K., (Humana Press, 2005).
- "Environmental Biology for Engineers and Scientists", Vaccari, D.A., P.F. Strom, and J.E. Alleman, (John Wiley & Sons, 2005).
- Burt, D., Dumas, M. Springer, N, and Vaccari, D., Global Phosphorus: Geological Sources and Demand-Driven Production, Chapter 3 in *Phosphorus, Food and Our Future*, Karl A. Wyant, Jessica R. Corman, and Dr. Jim Elser, Editors (in preparation, 2012)
- Exploration, Vaccari, D.A., Röhling, Van Kauwenbergh, Wellmer, Section 3.1 in *Roadmap to sustainable phosphorus use, management and stewardship: Orientations of a global transdisciplinary process*, Scholz, R.W., Roy, A., Hellums, D., Brand, F., and Ulrich, A., editors (SpringerBriefs, in preparation, 2012).