

DOMINIC M. DI TORO

EDWARD C. DAVIS PROFESSOR OF CIVIL AND ENVIRONMENTAL ENGINEERING

UNIVERSITY OF DELAWARE

EDUCATION

Manhattan College: B.E.E., Electrical Engineering (with honor) , 1963

Princeton University: M.A., Electrical Engineering, 1965

Princeton University: Ph.D., Civil and Geological Engineering, 1967

PROFESSIONAL HISTORY

2003 – Present Edward C. Davis Professor, Civil & Environmental Engineering, Univ. of Delaware

2006 – Present Senior Consultant, HydroQual, Inc.

1999 – 2003 Donald J. O'Connor Professor of Environmental Engineering, Manhattan College

1986 – 1999 Research Professor of Environmental Engineering, Manhattan College

1980 – 2006 Principal Consultant, HydroQual, Inc.

1974 – 1986 Adjunct Associate Research Professor, Environmental Engineering

1969 – 1974 Adjunct Assistant Professor, Environmental Engineering

1969 – 1980 Senior Research Consulting Engineer, Hydrosience, Inc.

1967 – 1969 Research Associate, Environmental Engineering and Science Program

REPRESENTATIVE EXPERIENCE

Dr. Di Toro has specialized in the development and application of mathematical and statistical models to stream, lake, estuarine, and coastal water and sediment quality problems. He has published over one hundred technical papers, as well as Sediment Flux Modeling, published by J. Wiley & Sons. He has participated as Expert Consultant, Principal Investigator, and Project Manager on numerous water quality studies for industry, research foundations, and governmental agencies. Recently his work has focused on the development of water and sediment quality criteria for the EPA, sediment flux models for nutrients and metals, and integrated hydrodynamic, sediment transport and water quality models.

HONORS

National Academy of Engineering

Elected, 2005

American Society of Civil Engineering

Simon Freese Award, 2005

Institute of Scientific Information

Highly Cited Researcher, Ecology and Environment, 2003

Gordon Conference Chairman (Elected)

Environmental Sciences Water, 2002

Society of Environmental Toxicology and Chemistry

The Founders Award - the society's highest award – 1997

New York Water Environment Association

Kenneth Allen Memorial Award - 1994

Department of the Army

Certificate of Achievement - 1991

International Association for Great Lakes Research,

The Chandler-Misener Award - 1983

American Society of Civil Engineers

Wesley W. Horner Award, 1980

International Association for Great Lakes Research,
The Chandler-Misener Award - 1978
American Society of Civil Engineers
Samuel A. Greely Award - 1974
American Society of Civil Engineers
Met Section Prize Paper Award - 1970
NSF Cooperative Fellowship
Princeton University - 1963-1966
Institute of Radio Engineers - AIEE
Prize Paper Contest - 1963

PROFESSIONAL AFFILIATIONS

American Chemical Society
American Geophysical Union
American Society of Civil Engineers
American Society of Limnology and Oceanography
Association of Environmental Engineering and Science Professors
Estuarine Research Federation
Institute of Electrical and Electronic Engineers
International Water Association
National Academy of Engineering
Society of Toxicology and Environmental Chemistry
The Geochemical Society

COURSES TAUGHT

Mathematical Water Quality Models
Mathematical Methods
Applied Environmental Statistics and Data Analysis (with Prof. Dentel)
Engineering Statistics
Simulation Analysis
Special Topics in Water Quality
Advanced Water Quality Modeling
Fate and Effects of Metals in the Environment (with Prof. Allen)

PUBLICATIONS

Books

Di Toro, D.M. Sediment Flux Modeling. J. Wiley and Sons., New York: (2001), 624p.
O'Connor, D.J. and D.M. Di Toro. Analytical Water Quality Modeling (in preparation)

Edited Books

Paquin, P. R., K. Farley, R. C. Santore, C. D. Kavvas, K. G. Mooney, R. P. Winfield, K. B. Wu, and D. M. Di Toro, eds. (2003). *Metals in Aquatic Systems: A Review of Exposure, Bioaccumulation, and Toxicity Models*, SETAC Press, Pensacola, FL.

Reiley, M. C., W. A. Stubblefield, W. J. Adams, D. M. Di Toro, P. V. Hodson, R. J. Erickson, and E. J. Keating Jr., eds. (2003). *Reevaluation of the State of the Science for Water Quality Criteria Development*, SETAC Press, Pensacola, FL.

Computational Chemistry Models

- Phillips K. L., Di Toro D. M., Sandler S.I., (2011) Prediction of Soil Sorption Coefficients using Model Molecular Structures for Organic Matter and the Quantum Mechanical COSMO-SAC Model. Environ. Sci. Technol., **45**(3), 1021-1027.
- Atalay YB, Carbonaro RF, Di Toro DM. (2009) Distribution of proton dissociation constants for model humic and fulvic acid molecules. Environ. Sci. Technol., **43**(10):3626-3631.
- Phillips K. L., Sandler S. I., Greene R. W., and Di Toro D. M. (2008) Quantum Mechanical Predictions of the Henry's Law Constants and Their Temperature Dependence for the 209 Polychlorinated Biphenyl Congeners. Environ. Sci. Technol., **42**(22), 8412-8418.
- Shough A. M., Doren D. J., and Di Toro D. M. (2008) Polyfunctional Methodology for Improved DFT Thermochemical Predictions. J. Phys. Chem. A **112**(42), 10624-10634.
- Carbonaro R. and Di Toro D.M. (2007) Linear free energy relationships for metal–ligand complexation: Monodentate binding to negatively-charged oxygen donor atoms. Geochimi. Cosmochim. Acta **71**, 3958–3968.

Water Quality Modeling

- Fennel K, Brady D, DiToro D, Fulweiler RW, Gardner WS, Giblin A, McCarthy MJ, Rao A, Seitzinger S, Thouvenot-Korppoo M, Tobias C. (2009) Modeling denitrification in aquatic sediments. Biogeochem. **93**(1-2):159-178.
- Moore TS, Nuzzio DB, Di Toro DM, Luther GW. (2009) Oxygen dynamics in a well mixed estuary, the lower Delaware Bay, USA. Mar. Chem. **117**(1-4):SI 11-20.
- Ball W. P., Brady D. C., Brooks M. T., Burns R., Cuker B. E., Di Toro D. M., Gross T. F., Kemp W. M., Murray L., Murphy R. R., Perlman E., Piasecki M., Testa J. M., and Zaslavsky I. (2008) Prototype system for multidisciplinary shared cyberinfrastructure: Chesapeake Bay Environmental Observatory. Journal of Hydrologic Engineering **13**(10), 960-970.
- Bisceglia, K. J., Rader, K. J., Carbonaro, R. F., Farley, K. J., Mahony, J. D., and Di Toro, D. M. "Iron(II)-Catalyzed Oxidation of Arsenic(III) in a Sediment Column." Environ. Sci. Technol., **39**(23) (2005): 9217-9222.
- Carbonaro, R., Mahony, J., Walter, A., Halper, E., and Di Toro, D. "Experimental and Modeling Investigation of Metal Release from Metal-Spiked Sediments." Environ. Toxicol. Chem., **24**(12) (2005): 3007-3019.
- Dombrowski, P. M., Long, W., Farley, K. J., Mahony, J. D., Capitani, J. F., and Di Toro, D. M. "Thermodynamic analysis of arsenic methylation." Environ. Sci. Technol., **39**(7) (2005): 2169-2176.
- Hellweger, F., K. J. Farley, U. Lall, and D. M. Di Toro. "Greedy algae reduce arsenate." Limnol. Oceanogr **48**(6) (2003): 2275-2288.
- Meyers, M. B., Di Toro, D. M., and Lowe, S. A. "Coupling suspension feeders to the Chesapeake Bay eutrophication model." Water Quality and Ecosystems Modeling, **1**(1-4) (2002): 123-140.
- Di Toro, D.M., J.D. Mahony, and A.M. Gonzalez. "Particle Oxidation Model of Synthetic FeS and Sediment AVS." Environ. Toxicol. Chem. **15**(12) (1996): 2156-2167.
- Di Toro, D.M., J.D. Mahony, D.J. Hansen, and W.J. Berry. "A model of the oxidation of iron and cadmium sulfide in sediments." Environ. Toxicol. Chem. **15**(12) (1996): 2168-2186.
- Nixon, SW, Ammerman, JW, Atkinson, LP, Berounsky, VM, Billen, G, Boicourt, WC, Boynton, WR, Church, TM, Di Toro, DM, Elmgren, R, Garber, JH, Giblin, AE, Jahnke, RA, Owens, NJP, Pilson, MEQ, and Seitzinger, SP, "The fate of nitrogen and phosphorus at the land sea margin of the North Atlantic Ocean." Biochem. **35**(1) (1996): 141-180.
- OConnor, TP, Mueller, JA, Mahony, JD, and Di Toro, DM, "A correction factor for predicting the

- multicomponent adsorption of air stripper offgas." Wat. Environ. Res., 68(1) (1996): 66-69.
- Mueller, J. A., Di Toro, D. M., and Maiello, J. A. "Fate of octamethylcyclotetrasiloxane (OMCTS) in the atmosphere and in sewage treatment plants as an estimation of aquatic exposure." Environ. Toxicol. Chem., 14(10) (1995): 1657-1666.
- Mueller, J.A and D.M. Di Toro. "Multicomponent adsorption of volatile organic chemicals from air stripper offgas." Water Environment Research 65(1) (1993): 15-25.
- Chapra, S. C., and Di Toro, D. M. "Delta method for estimating primary production, respiration, and reaeration in streams." J. Environ. Engr. ASCE 117(5) (1991): 640-655.
- Di Toro, D. M., J A. Hallden, and J L. Plafkin. "Modeling Ceriodaphnia Toxicity in the Naugatuck River. II. Copper, Hardness and Effluent Interactions." Environmental Toxicology and Chemistry 10(2) (1991): 261-274.
- Blumberg, A.F and D.M Di Toro. "Effect of climate warming on dissolved oxygen concentrations in Lake Erie." Trans. American Fisheries Society 119(2) (1990): 210-223.
- Di Toro, D. M., P R. Paquin, K Subburamu, and D A. Gruber. "Sediment Oxygen Demand Model: Methane and Ammonia Oxidation." J. Environ. Engr. ASCE 116(5) (1990): 945-986.
- Di Toro, D. M., J A. Hallden, and J L. Plafkin. "Modeling Cerodaphnia Toxicity in the Naugatuck River Using Additivity and Independent Action." In Toxic Contaminants and Ecosystem Health; A Great Lakes Focus, 403-425. New York, N.Y.: J. Wiley & Sons, (1988).
- Di Toro, D. M., N A. Thomas, C E. Herdendorf, R P. Winfield, and J P. Connolly. "A Post Audit of a Lake Erie Eutrophication Model." J. Great Lakes Res. 13(4) (1987): 801-825.
- Blumberg, A. F., Toro, D. M. D., Vassilakis, R. E., Paquin, P. R., & Fitzpatrick, J. J. A Unified Hydrodynamic-Water Quality Model. In Water Forum '86, ASCE, (1986): (pp. 1309-1316).
- Di Toro, D. M. "A Diagenetic Oxygen Equivalents Model of Sediment Oxygen Demand." In Sediment Oxygen Demand. Processes, Modeling, and Measurement, 171-208. Athens, GA.: University of Georgia, (1986).
- Di Toro, D. M., J S. Jeris, and D Ciarcia. "Diffusion and Partitioning of Hexachlorobiphenyl in Sediments." Environ. Sci. Technol. 19(12) (1985): 1169-1176.
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- Di Toro, D. M., D J. O'Connor, R V. Thomann, and J.P. St. John. "Simplified model of the fate of partitioning chemicals in lakes and streams." In Modeling the Fate of Chemicals in the Environment, ed. K.L. Dickson, A.W. Maki, and J. Cairns. 165-190. Ann Arbor, MI: Ann Arbor Science Publications, (1982).
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- Di Toro, D. M. "The Effect of Phosphorus Loadings on Dissolved Oxygen in Lake Erie." In Phosphorus Management Strategies for Lakes, ed. R.C. Loehr, C.S. Martin, and W. Rast. 191-205. Ann Arbor, MI: Ann Arbor Science, (1980).
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- O'Connor, D.J., J.P. St. John, and D.M. Di Toro. "Water quality analysis of the Delaware River Estuary." J. Sanitary Engr. Div. ASCE 94(SA6) (1968): 1225-1252.

Water Quality and Sediment Quality Criteria Models

- Kipka, U., Di Toro D. M. (2009) Technical basis for polar and nonpolar narcotic chemicals and polycyclic aromatic hydrocarbon criteria. III. A polyparameter model for target lipid partitioning. Environ. Toxicol. Chem., **27**(7), 11429-1438.
- McGrath J. A., Di Toro D. M. (2009) Validation of the target lipid model for toxicity assessment of residual petroleum constituents: Monocyclic and polycyclic aromatic hydrocarbons. Environ. Toxicol. Chem., **28**(6), 1130-1148.
- Mathew R., McGrath J. A., and Di Toro D. M. (2008) Modeling polycyclic aromatic hydrocarbon bioaccumulation and metabolism in time-variable early life-stage exposures. Environ. Toxicol. Chem., **27**(7), 1515-1525.
- Allen H. E., Lin Y. Q., and Di Toro D. M. (2008) Ecotoxicity of Ni in soil. Mineralogical Magazine **72**(1), 367-371.

- Redman A., McGrath J., Febbo E., Parkerton T., Letinski D., Connelly M., Winkelmann D., and Di Toro D. (2007) Application of the target lipid model for deriving predicted no-effect concentrations for wastewater organisms. Environ. Toxicol. Chem., **26**(11), 2317-2331.
- Di Toro, D. M., McGrath, J. A., and Stubblefield, W. A. "Predicting the toxicity of neat and weathered crude oil: Toxic potential and the toxicity of saturated mixtures." Environ. Toxicol. Chem., 26(1) (2007): 24-36.
- Thakali, S., Allen, H. E., Di Toro, D. M., Ponizovsky, A. A., Rooney, C. P., Zhao, F.-J., and McGrath, S. P. "A terrestrial biotic ligand model I: Development and application to Cu and Ni toxicities to barley root elongation in soils." Environ. Sci. Tech., 40(22) (2006): 7085-7093.
- Thakali, S., Allen, H. E., Di Toro, D. M., Ponizovsky, A. A., Rooney, C. P., Zhao, F.-J., and McGrath, S. P. "A terrestrial biotic ligand model 2. Application to Ni and Cu toxicities to plants, invertebrates, and microbes in soil." Environ. Sci. Technol., 40 (22) (2006): 7094-7100.
- Davidson, TL, Chen, HB, Di Toro, DM, D'Angelo, G, Costa, M, "Soluble nickel inhibits HIF-prolyl-hydroxylases creating persistent hypoxic signaling in A549 cells." Molecular Carcinogenesis, 45(7) (2006): 479-489.
- Di Toro, D. M., McGrath, J. M., Hansen, D. J., Berry, W. J., Paquin, P. R., Mathew, R., Wu, K. B., and Santore, R. C. "Predicting Sediment Metal Toxicity Using a Sediment Biotic Ligand Model: Methodology and Initial Application." Environ. Toxicol. Chem., 24(10) (2005): 2410-2427.
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- McGrath, J., Parkerton, T., and Di Toro, D. "Application of the narcosis target lipid model to algal toxicity and deriving predicted-no-effect concentrations." Environ. Toxicol. Chem., 23(10) (2004): 2503-2517.
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- Santore, R.C., D.M. Di Toro, P.R. Paquin, H.E. Allen, and J.S. Meyer. "A biotic ligand model of the acute toxicity of metals. II. Application to acute copper toxicity in freshwater fish and daphnia." Environ. Tox. Chem. 20(10) (2001): 2397-2402.
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Environmental Hazard Assessment of Effluents. Proceedings of a Pellston Environmental Workshop., ed. H.L. Bergman, R.A. Kimerle, and A.W. Maki. 135-151. Elmsford, N.Y. 10523: Pergamon Press, (1986).

Sorption Models

- Ponizovsky A. A., Thakali S., Allen H. E., Di Toro D. M., Ackerman A. J., and Metzler D. M. (2008) Nickel partitioning in acid soils at low moisture content. *Geoderma* **145**(1-2), 69-76.
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Statistical Models

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RESEARCH PROJECTS

University of Delaware

- Developing Quantum Chemical and Polyparameter Models for Predicting Environmentally Significant Parameters for New Munition Compounds
SERDP via Department of Defense
- Can TDML Models Reproduce the Nutrient Loading-Hypoxia Relationship?
Water Environmental Research Federation (WERF)
- Developing a Partitioning Model using the Abraham Polyparameter Model
HydroQual, Inc.
- NASA EPSCoR Research Project: Building and Enhancing a Competitive and Sustainable Remote Sensing Infrastructure for Critical Zone Studies and Cutting Edge Research
NASA via UD-CMES
- CZO: Spatial and Temporal Integration of Carbon and Mineral Fluxes: A Whole Watershed Approach to Quantifying Anthropogenic Modification of Critical Zone Carbon Sequestration
National Science Foundation.
- Collaborative Research: Process-Based Statistical Interpolation Methods for Improved Analysis of WATERS Test-bed Observations and Models
National Science Foundation (Johns Hopkins University)
- Improving Understanding of the Fate and Transport of Munitions Constituents to Enhance Sustainability of Operational Ranges
SERDP via Department of Defense
- Effect of Natural Organic Matter on Bioavailability and Mobilization of Metals
National Institute of Environmental Health and Safety (New York University)
- Concept Development Toward a Collaborative Large-Scale Engineering
National Science Foundation
- Modeling Hypoxia and Ecological Responses to Climate and Nutrients
National Oceanic and Atmospheric Administration (CRC-University of Maryland)
- Delaware Research Infrastructure Improvement Program
State of Delaware, EPSCoR Seed Grant Program
- Integrated Water Quality Monitoring, Habitat Mapping, and Fish Tracking with an Automated Underwater Vehicle

National Oceanic and Atmospheric Administration
A Prototype System for Multi-disciplinary Shared Infrastructure? Chesapeake Bay Environmental
Observatory (CBEO): Concept Development Toward a Collaborative Large Scale Engineering
Analysis Network for Environmental Research (CLEANER) with Focus on the Chesapeake Bay
National Science Foundation
CHRP: Linking Water Quality Models with Individual-based Models to Investigate Impacts of Diel-cycling
Hypoxia on Nursery Habitat Quality for Estuarine Dependent Fishes
National Oceanic and Atmospheric Administration
Toxicity and Mobilization of Metals and Metal Mixtures in Sediments
National Institute of Environmental Health and Safety
Developing a Unit World Model for Metals in Streams and Rivers
Center for the Study of Metals in the Environment. EPA Center
Collaborative Research: Concept Development Toward a Collaborative Large Scale Engineering Analysis
Network for Environmental Research (CLEANER) with Focus on the Chesapeake Bay
National Science Foundation
Mechanisms of Genetic and Epigenetic Susceptibility to Superfund Chemicals
NIEHS Superfund Hazardous Substances Research Program (New York University)
Developing a Unit World Model for Metals in Aquatic Environments
Center for the Study of Metals in the Environment. EPA Center
Developing a Model to Predict the Persistence of Metals in Aquatic Environments
Center for the Study of Metals in the Environment. EPA Center
Quantitative Structure Activity Relationships for Toxicity and Fate Parameters of Metal and Metal
Compounds
Center for the Study of Metals in the Environment. EPA Center

Manhattan College

Water-Sediment Model and Criteria for Arsenic and Chrome
NIEHS Superfund Hazardous Substances Research Program (New York University, Manhattan
College, Rutgers University)
Development of fate and transport models for exposure assessment
Center for the Study of Metals in the Environment. EPA Center
Oxidation of Sediment Bound Silver Sulfide and Application of Sediment Flux Model to Silver
Silver Coalition – Photographic Imaging Manufacturing Association
A Modeling and Experimental Investigation of Metal Release from Contaminated Sediments: The Effects
of Metal Sulfide Oxidation and Resuspension.
EPA STAR Grant
Bioavailability, Trophic Transfer and Fate of Pollutants in the Aquatic Environment
EPA Cooperative Agreement
Experimental Determination and Modeling of Flux of Copper from Sediments
International Copper Association
Investigating the Toxicity of Silver in Sediments
Silver Coalition
Application of a Modern Eutrophication Model to the MERL Mesocosm Experiments
National Science Foundation
Predicting Toxic Heavy Metal Adsorption and Desorption from Contaminated Soils and Suspensions
NIEHS Superfund Hazardous Substances Research Program

HydroQual: 1995 - Present

Development of a Contaminant Fate, Transport, and Toxicity Model for New York Harbor
Hudson River Foundation

Investigation of the Toxicity of Weathered and Non-weathered Oil
ExxonMobil Corporation, USA

Analysis of the Persistence of Metals in Aquatic Systems
Kennecott Copper Company

Review of Nutrient Criteria
Association of Municipal Sewerage Agencies

Development of a Biotic Ligand Model for Silver
Water Environment Research Foundation

Development of Biotic Ligand Model
EPA Office of Water

Technical Support Document of Sediment Quality Criteria
U.S. EPA, Criteria and Standards Division

Development of Sediment Quality Criteria for PAH Mixtures
U.S. EPA, Criteria and Standards Division

Sediment Quality Criteria for PAHs using Narcosis Theory
U.S. EPA, Criteria and Standards Division

Impact of Chromium Contaminated Sediments in Tannery Bay
Cypress AMAX

Long-Range Transport And Deposition: The Role Of Henry's Law Constant
Dow Corning Chemical Company

Review of a Model of the Lagoon of Venice
Delft Hydraulics Laboratory

Silver Risk Assessment
Eastman Kodak Company

Analysis of Cadmium in the Sediments of the Neponset Reservoir
Foxboro Co.

Biotic Ligand Model Review for EPA Science Advisory Board
EPA Office of Water

Development of a New York Harbor Eutrophication Model
New York Department of Environmental Protection

Development of a Biotic Ligand Model for Copper Toxicity
International Copper Association

Sediment Criteria for Zinc: Application to Risk Assessment
International Lead Zinc Research Association

Upper Mississippi River Eutrophication Study - Development of Coupled Eutrophication - Sediment
Transport Model
Metropolitan Council Wastewater Services

Development of a Eutrophication Model for the Croton Reservoir Filtration Study.
Metcalf and Eddy - Hazen and Sawyer

Investigation of the Impact of the Boston Harbor Outfall. Development of a Eutrophication Model
Massachusetts Water Resources Agency

Fate and Transport of Mine Tailings and Copper from a Copper Mine
Freeport – McMoRan

Model of Calcium Carbonate Precipitation in Onondaga Lake
AlliedSignal Corp.

Evaluation of a PCB Model for Green Bay
State of Wisconsin Department of Environmental Quality

Development of a Wetlands Water Quality Model of the Everglades
South Florida Water Management District

Development of a Sediment Flux Model for Iron and Manganese
U.S. Army Corps of Engineers-Waterways Experiment Station
Development of a Model of Bivalves in Chesapeake Bay
U.S. Army Corps of Engineers-Waterways Experiment Station

Selected Projects – pre 1995

Chesapeake Bay Water Quality Model - Development of Sediment Flux Model
U.S. Army Corps of Engineers-Waterways Experiment Station/U.S. EPA Chesapeake Bay Program

Upper Mississippi River Eutrophication Study - Development of Coupled Eutrophication – Sediment Transport Model
Metropolitan Council Wastewater Services

Development of a Wetlands Water Quality Model of the Everglades
South Florida Water Management District

Development of a Dissolved Oxygen/ Eutrophication Model of New York/New Jersey Harbor (HEM)
New York City Department of Environmental Protection, Bureau of Environmental Engineering

NY/NJ Toxic Metal Wasteload Allocation Model
U.S. EPA, Region II

Long Island Sound Eutrophication Study - Development of a Three Dimensional Eutrophication – Dissolved Oxygen Model
U.S. EPA Regions I and II

Urban Stormwater Manual - Statistical Models for Stormwater Treatment Systems
U.S. EPA, Office of Water

PCB Fate and Transport in Watts Bar Reservoir
McKenna & Cuneo, Washington, D.C. (representing Union Carbide)

Toxicity Modeling Feasibility Study, Naugatuck River
U.S. EPA, Monitoring and Data Support Division

Evaluate Suitability of Toxic Criteria Procedure for Complex Wastewater Discharges in the Naugatuck River
U.S. EPA, Office of Water, Office of Water Regulations and Standards

Development of Sediment Quality Criteria for Metals
U.S. EPA, Office of Water, Health and Ecological Criteria Division, Office of Science and Technology

Determination of Water-Sediment Partition Coefficients for Priority Heavy Metals
U.S. EPA, Environmental Research Laboratory

Metals Sediment Quality Criteria Methodology Development
U.S. EPA, Criteria and Standards Division

Development of Interim Sediment Quality Criteria
U.S. EPA, Criteria and Standards Division

Technical Guidelines Supporting Establishment of Sediment Quality Criteria
U.S. EPA, Office of Water, Health and Ecological Criteria Division, Office of Science and Technology

Sediment Quality Criteria For Five Nonionic Organic Chemicals
U.S. EPA, Office of Water, Health and Ecological Criteria Division, Office of Science and Technology

SQC Science Advisory Board Briefing Document
U.S. EPA, Criteria and Standards Division

Sediment Criteria Workshops

U.S. EPA, Criteria and Standards Division
Waukegan Harbor PCB Project
U.S. EPA, Region V

PROFESSIONAL ACTIVITIES

Academic Year 2010

Sabbatical

EAWAG, Swiss Federal Institute of Aquatic Science and Technology

Invited Lectures and Seminars, Meetings and Workshops

Predicting Chemical Partitioning to Natural Organic Matter Using Organic Matter Molecular Structure
EAWAG Seminar
October 1, 2010

Modeling Sediment-Water Column Dissolved and Particulate Chemical Exchange:
A Simple Model with an Analytical Solution and Surprising Explanatory Power
EAWAG Seminar

Perspectives on Environmental Chemistry and Toxicology: The Past and the Future
EAWAG UChem-UTox
9 November 2010

On the Chemical Properties of Natural Organic Matter: Insights from Linear Solvation/Free Energy
Models
ETH Institute of Biogeochemistry and Pollutant Dynamics
Seminar
November 10, 2010

Modeling Sediment-Water Column Fluxes of Nutrients, Oxygen, and Methane
EAWAG Kastanienbaum Seminar
November 8 2010

NRC Committee

Evaluation of Chesapeake Bay Program Implementation for Nutrient Reduction to Improve Water Quality
National Research Council
National Academies
Baltimore, MD
March 24-26, 2010
(Invited)

University, Department, College Committees

Member: Middle States Self-Study Committee
Member: P&T Subcommittee
Member: Sea Level Rise Committee (DENIN)
Member: Computer Research Advisory Committee
Member: Named Professors
Member: Cosgrove Chair Search Committee
Member: Chrysler Advisory Support Group
Associate Director: Center for the Study of Metals in the Environment
Member: DENIN Council of Fellows

PROFESSIONAL ACTIVITIES

Academic Year 2009

Invited Lectures and Seminars, Meetings and Workshops

Metals in the Human Environment Strategic Network (MITHE-SN)

2009 Annual Research Symposium

Gatineau (Québec)

January 22-23, 2009

Member Science Advisory Panel (Invited)

Sediment Biotic Ligand Model Predicts No Toxicity Variation due to Hardness: Why? Availability and Mobility of Metals in Sediments Session

American Chemical Society

Washington DC

August 16-20, 2009.

(Invited)

EPA Science Advisory Board

Testimony

Review of Empirical Approaches for Nutrient Criteria Derivation

Science Advisory Board

Ecological Processes and Effects Committee

Public Meeting – Washington DC

September 9-11, 2009

ECETOC (European Centre for Ecotoxicology and Toxicology of Chemicals)

Workshop: Significance of Bound Residues in Environmental Risk Assessment

Brussels (Belgium)

October 14-15 2009

(Invited)

SETAC North America 30th Annual National Meeting

Society of Environmental Toxicology and Chemistry

New Orleans, LA

19-23 Nov. 2009

Strategic Environmental Research and Development Program (SERDP) Department of Defense's (DoD) environmental science and technology program

Partners in Environmental Technology Technical Symposium and Workshop

Washington, DC

December 1-3, 2009

NRC Committee

Evaluation of Chesapeake Bay Program Implementation for Nutrient Reduction to Improve Water Quality

National Research Council

National Academies

Washington D.C.

December 16-17, 2009

(Invited)

University, Department, College Committees

Member: Middle States Self-Study Committee

Member: CIEG Environmental Group Search Committee

Member: P&T Subcommittee

Member: Sea Level Rise Committee (DENIN)

Member: Computer Research Advisory Committee

Member: Named Professors

Associate Director: Center for the Study of Metals in the Environment
Member: DENIN Council of Fellows

Presented Papers/Posters Co-authored

Combining Polyparameter and Quantum Chemical Models to Estimate Partition Coefficients.
D. M. Di Toro; U. Kipka
Modern Perspectives on the Equilibrium Partitioning Model (EqP) of Sediment Toxicity and Bioavailability
D. M. Di Toro
Equilibrium Partitioning: What's it Good For and How Do You Know if it Works?
D. M. Di Toro
A Chemically Based Model for Metal Partitioning to Organic Matter
Y. B. Atalay; K. J. Rader; R. F. Carbonaro; D. M. Di Toro
Performance Assessment of Chemical Speciation Models
K. J. Rader; R. F. Carbonaro; K. J. Farley; D. M. Di Toro

PROFESSIONAL ACTIVITIES

Academic Year 2008

Invited Lectures and Seminars, Meetings and Workshops

Metals in the Human Environment Strategic Network (MITHE-SN) 2008 Annual Research Symposium
Gatineau (Québec)
January 22-23, 2008
Member Science Advisory Panel (Invited)
National Institute for Environmental Sciences (NIEHS) Workshop
Superfund Basic Research Program (SRBP)
Assessing Bioavailability as a Determinant of Pollutant Exposure: Building a Multidisciplinary Paradigm for the 21st Century and Beyond
Tampa, Florida February 19-21, 2008
Keynote Paper (Invited) - Uncertainties in Environmental Control of Bioavailability:
Environmental Control of Metal Bioavailability
WATERS Network Community Workshop
EPA Sponsored Workshop
Arlington, VA
March 24th-25th, 2008
Discussion Leader: Environmental Engineering (Invited)
Chesapeake Modeling Symposium (Invited)
May 12-14 2008
Annapolis, MD
NIEHS – EPA Sponsored SBRP Webinar
28 May 2008
Series name: Bioavailability – Metals, Organics, and Use at Hazardous Waste Sites
Environmental Control of Metal Bioavailability
Gordon Research Conferences
Environmental Sciences: Water
June 22-27, 2008
Discussion Leader (Invited)
Metal speciation modeling and bioinorganic chemistry
Strategic Environmental Research and Development Program (SERDP) Department of Defense's (DoD) environmental science and technology program - Workshop on Research and Development Needs for Understanding and Assessing the Bioavailability of Contaminants in Soils and Sediments
August 20-21, 2008

Annapolis, Maryland
Invited Keynote Paper -Bioavailability Issues in Sediments
Society of Environmental Toxicology and Chemistry
SETAC 29th Annual National Meeting
Tampa Fl.
16-20 Nov. 2008

University, Department, College Committees

Member: Dean's Search Committee
Member: CIEG Coastal Group Search Committee
Member: COE Strategic Planning Committee
Member: Cluster Computer Committee
Member: Computer Research Advisory Committee
Associate Director: Center for the Study of Metals in the Environment
Leadership Team: Center for Critical Zone Research
Leadership Team: UD Institute for the Environment

Presented Papers/Posters Co-authored

A Framework for Establishing Soil Ecotoxicity Guidelines for Complex Petroleum Substances Using Target Lipid and Equilibrium Partitioning Models. .
A. Redman; J. McGrath; T. Parkerton; D. Di Toro
A Probabilistic Unit World Model for Metal Fate and Toxicity in Rivers.
K. J. Rader; R. F. Carbonaro; K. J. Farley; D. M. Di Toro
Validation of the "Unit World" Model for Metals in Lakes.
K. J. Farley; A. N. Miglino; K. J. Rader; R. F. Carbonaro; D. M. Di Toro
Kinetics and Modeling of Nickel Sulfide Oxidation.
B. P. McGuire; K. J. Farley; D. M. Di Toro; R. F. Carbonaro
Predicting Ecotoxicity of Nickel in Soil.
L. Yanqing; H. E. Allen; D. M. Di Toro

Academic Year 2007

Invited Lectures, Seminars, Meetings and Workshops

Snoeyink Distinguished Lecture Series
University of Illinois
April 24-27, 2007
US EPA Metals Fate and Transport Modeling Workshop Engineering
Region 8 Office, Denver, CO
February 13-14, 2007
Ecological Impacts of Hypoxia on Living Resources Meeting
Sponsored by NCCOS/CSCOR, GLERL, NESDIS, and the Northern Gulf Cooperative Institute
Bay St. Louis, Mississippi
March 26-29, 2007
Modern Water, Sediment and Soil Quality Criteria for Metals: Toxicological and Chemical Interactions
University of Maryland
Department of Chemistry
March 30, 2007
Establishing a Research Agenda for Assessing the Bioavailability of Wastewater-Derived Organic Nitrogen in Treatment Systems and Receiving Waters
Water Environment Research Federation
Ramada Inn-BWI, Baltimore, Maryland

September 27 and 28, 2007
Hudson/Delaware Chapter of SETAC: 2007 Fall Workshop
Environmental Risk Assessment of Metals and Metalloids
October 26, 2007
Society of Environmental Toxicology and Chemistry National Meeting
11-15 November 2007
NOAA CSCOR CHRP Project Workshop
Modeling Hypoxia and Ecological Responses to Climate and Nutrients
UMCES Horn Point Lab, Cambridge, MD USA
3-4 December 2007

Presented Papers/Posters Co-authored

Henry's law constants for PCBs - Experimental and theoretical model disagreements: A quantum chemical analysis.

Di Toro, D.M., Phillips, K., Sandler, S.I.

A WHAM based kinetics model for Zn adsorption and desorption reactions with soils.

Di Toro, D.M., Shi, Z., Allen, H.E., Sparks, D.L.

Quantifying the concentration of crude oil microdroplets in oil-water preparations.

Redman, A., McGrath, J., Stubblefield, W.; Maki, A., Di Toro, D.

Development of linear free energy relationships for estimating monodentate and bidentate metal binding to functional groups present in natural organic matter.

Carbonaro, R.F., Di Toro, D.M.

Investigating solid-solution metal partitioning in surface waters using chemical speciation software.

Rader, K.J., Di Toro, D.M.

Tier 1 'unit world' model for metals in lakes.

Farley, K.J., Carbonaro, R.F., Rader, K.J., Di Toro, D.M.

Transport and Fate of Metals in Surface Waters and Sediments: The Role of Partitioning and Precipitation

Dominic M. Di Toro, Kevin J. Rader

Academic Year 2005-2006

Invited Lectures, Workshops, and Seminars

"Environmental Toxicology and Chemistry in 25 Years: Predictions and Computational Toxicology and Chemistry"

Invited Lecture, SETAC – Vision of Future Session, Baltimore, MA, November 14, 2005

"Metals in the Environment: Speciation, Geochemistry and Bioavailability A Retrospective and Prospective View"

Invited Keynote Lecture: MIT(H)E-RN Symposium, SETAC, Montreal, Canada, November 2006

"Modern Water and Sediment Quality Criteria: Toxicological and Chemical Interactions"

Superfund Basic Research Program, National Institute of Environmental Health Science

Bioavailability Workshop, Newark NJ, November 9-10, 2005

"Overview and Application of Modern Toxicological Models: Past, Present and Future"

Federal Contaminated Sites National Workshop

Crowne Plaza Hotel, Ottawa, Ontario, Canada, March 7-10, 2006

"Hydrological, Biogeochemical and Water Quality Modeling - Are We Data Limited?"

NSF Environmental Observatories NEON, OOI, WATERS Network Modelling Workshop

16-17 May, 2006, Tucson, Arizona

"Perspective on CCZR Research Areas"

Center for Critical Zone Research Workshop

Delaware Biotechnical Institute, Newark DE. October 10, 2006

"Sediment Flux Modeling"

Institute of Ecosystem Studies, Millbrook, New York

Presented by Damian C. Brady for Dominic Di Toro, November 28-30, 2006

Expert Panels and Review Committees

Committee on Sediment Dredging at Superfund Megasites
National Research Council, March 2006, Washington, D. C.
Committee on Sediment Dredging at Superfund Megasites
National Research Council, July 2006, Woods Hole, M. A.
Committee on Sediment Dredging at Superfund Megasites
National Research Council, September 2006, Washington, D. C.
Committee on Sediment Dredging at Superfund Megasites
National Research Council, October 2006, Washington, D. C.
Metals in the Human Environment (MITHE-RN) Symposium
Expert Advisory Panel, January 2006

Short Courses

“Introduction to Toxic Contaminants”
Sediment Quality Criteria -Narcosis and PAH Mixtures
Sediment Quality Criteria - Metals
Sediment Quality Criteria - Equilibrium Partitioning
Manhattan College 51th Annual Summer Institute, June 2006

Papers Presented

“Bioavailability of Metals and Organics in the Water Column and Sediment Ecotoxicology: A Hudson River Case Study”
Department of Environmental Medicine, New York University, October 6, 2005
“Predicting and Comparing the Narcotic Potential of Neat and Weathered Crude Oil: Is A New Paradigm Needed?”
SETAC, Baltimore, MD, November 16, 2005
“Modern Sediment Quality Criteria for Metals and Applications to Superfund Sites”
Annual Meeting of the NIEHS Superfund Basic Research Program
New York Academy of Medicine, January 12-13, 2006
“Developing a Unit World Model for Metals in Streams and Rivers”
US EPA Site Review
University of Delaware, Newark DE, April 6, 2006

Presented Papers/Posters Co-authored

““Unit World Model Tier 1 Model for Metals in Lakes: Users Guide No”
Farley, K. J., Carbonaro, R. F., and Di Toro, D. M. (2005)
Manhattan College, Riverdale NY.
“Investigation of Metal-ligand Interactions of Model Ligands for Modeling Metal-organic Carbon Binding”
Carbonaro, R., and Di Toro, D.
SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005
“Evaluation of critical metal loads using the unit world model for lakes”
Farley, K.J., Carbonaro, R.P., Di Toro, D.M.
SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005
“A Time-Variable Model of PAH Bioaccumulation and Metabolism”
Mathew, R., McGrath, J. and Di Toro, D.
SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005
“Development of a physiologically-based pharmacokinetic (PBPK) model for metal bioaccumulation by bivalves”

- Paquin, P.R., Mathew, R., Salazar, M., Salazar, S., Damiani, D., Dwyer, R., Farley, K., Santore, R., and Di Toro, D.M.
 SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005
 “Mechanistic fate and effects model to predict the aquatic toxicity of complex petroleum products in laboratory tests”
 Redman, A., McGrath, J., Parkerton, T., and Di Toro, D.
 SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005
 “Development of terrestrial biotic ligand models for copper and nickel toxicity in soils: Application for plant, invertebrate, and microbial tests”
 Thakali, S., Allen, H.E., Di Toro, D.M., Ponizovsky, A.A., Rooney, C.P., Zhao, F.J., McGrath, S.P., Criel, P., Janssen, C., Oorts, K., and Smolders, E.
 SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005
 “Application of the narcosis target lipid model to wastewater treatment plant microorganisms”
 Redman, A., McGrath, J., Parkerton, T., and Di Toro, D.
 SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005
 “An experimental and modeling investigation of iron(II)-catalyzed arsenic(III) oxidation”
 Rader, K.J., Bisceglia, K.J., Farley, K.J., Mahony, J.D., Carbonaro, R.F., and Di Toro, D.M.
 SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005
 “Predicting the acute and chronic effects of PAHs using the target lipid model of narcotic toxicity:
 McGrath, J. and Di Toro, D.
 SETAC 26th Annual Meeting in North America Baltimore, Maryland Nov. 2005

Academic Year 2004-2005

Invited Lectures and Seminars

Gordon Conference, Environmental Sciences: Water
 Sorption Phenomena, Chair and Discussion Leader (Invited), June 27 - July 2, 2004

Workshops

- Multi-Investigator Discussion of National Observing System Opportunities for the Chesapeake Bay Basin & Neighbors, CLEARER Meeting
 University of Maryland Baltimore County, September 23, 2004
 Mercury Fate and Transport Models: State of the Art, Development Needs, and Application to TMDL Development
 E.I. Du Pont Corp., Clayton Hall Conference Center, University of Delaware, January 4-5, 2005
 Water Quality Modeling for National-Scale Economic Benefit Assessment
 Office of Water, U.S. Environmental Protection Agency, EPA Water Quality Modeling Workshop, Wyndham Washington, DC Hotel, Washington DC, 9-10 February 2005
 The scientific reliability of the Acid Volatile Sulfide/Simultaneously Extracted Metal (AVS/SEM) to assess metals bioavailability and sediment toxicity.
 Sediment Management Work Group, University of Maryland University Conference Center Adelphi, Maryland, April 11, 2005
 Third NSF Sponsored CyberInfrastructure Conference
 Drexel University, Philadelphia, PA, 22-23 April, 2005
 Potential Value of a Network for Environmental Research: “Cyberinfrastructure and all that...”
 Workshop for the Conceptual Design of a Network for Environmental Research (CLEANER) on the Chesapeake Bay, Annapolis, MD, June 13-14, 2005
 CSME External Advisory Committee Meeting: Status of Research Program
 Department of Civil and Environmental Engineering, University of Delaware, May 17, 2005
 Workshop for the Conceptual Design of a Network for Environmental Research (CLEANER) on the Chesapeake Bay
 Chesapeake Bay Foundation Philip Merrill Environmental Center, Annapolis, MD 21403, 9-10 August 2005

Expert Panels and Review Committees

National Institutes of Environmental Health Sciences
Proposal Review Panel, RTP Raleigh Durham NC, 4-7 Oct. 2004

Short Courses

“Introduction to Toxic Contaminants”
Sediment Quality Criteria -Narcosis and PAH Mixtures
Sediment Quality Criteria - Metals
Sediment Quality Criteria - Equilibrium Partitioning
Manhattan College 50th Annual Summer Institute, June 15-17, 2005

Papers Presented

“Toxicology, Chemistry and Theory: The Past and the Future”
Invited Kenote Address - Perspectives Session, SETAC 2004
November 17, 2004

“Predicting Sediment Metal Toxicity Using a Sediment Biotic Ligand Model”
Platform Presentation, SETAC 2004

“Modern Water and Sediment Quality Criteria for Toxic Metals: The Biotic Ligand Model and its Applications”
Department of Environmental Medicine, New York University School of Medicine and
Nelson Institute of Environmental Medicine, January 14, 2005

“Modern Eutrophication and Sediment Flux Models: Site Specific Regressions or Generally Applicable Theories?”
Department of Civil Engineering, The City College of New York, March 31, 2005

“Development of Water and Sediment Quality Criteria”
Manhattan College Summer Institute 50th Anniversary Symposium, Manhattan College
June 17, 2005

“Modern Water Quality and Sediment Criteria: Toxicological and Chemical Interactions”
Simon W. Freese Environmental Engineering Award and Lecture, Watershed Management
Conference, Williamsburg VA, July 19, 2005

Presented Papers/Posters Co-authored

“Predictive ability of sediment quality guidelines derived using equilibrium partitioning”
Di Toro, D. M., Berry, W. J., Burgess, R. M., Mount, D., R, O'Connor, T. P., and Swartz, R. C.
Environmental Toxicology and Chemistry. (2004).

“Modeling effects of pH and dissolved organic matter on kinetics of Cu and Zn desorption from soils”
Shi ZQ, Di Toro DM, Ponizovsky AA, and Allen HE, Abstracts of Papers of the American
Chemical Society 2004

“Predicting sediment metal toxicity using a sediment biotic ligand model”
Di Toro, D.M., McGrath, J.A., Hansen, D.J., Berry, W.J., Paquin, P.R., Mathew, R., Wu, K.B.
Santore, R.C.
4th SETAC World Congress/25th Annual Meeting in North America Portland, Oregon Nov. 2004

“Sulfide, or everything I need to know I could have learned in kindergarten”
Paquin, P.R., Brix, K.V., Gorsuch, J.W., Mathew, R., Santore, R.C., Wu, K.B. Di Toro, D.M.
4th SETAC World Congress/25th Annual Meeting in North America Portland, Oregon Nov. 2004

“Bioaccumulation of PCB homologs in New York-New Jersey Harbor worms”
Farley, K.J.I, Miller, R.L. Saha, S. Douglas, W.S. Di Toro, D.M.
4th SETAC World Congress/25th Annual Meeting in North America Portland, Oregon Nov. 2004

“Development of a physiologically-based pharmacokinetic (PBPK) model of metal bioaccumulation by bivalves”

- Paquin, P.R., Mathew, R., Damiani, D.R., Dwyer, R.L., Farley, K.J., Santore, R.C., Di Toro, D.M.
4th SETAC World Congress/25th Annual Meeting in North America Portland, Oregon Nov. 2004
“Development of a unit world model for metals in aquatic environments”
Farley, K.J., Costanzo, R., Carbonaro, R., Di Toro, D.M.
4th SETAC World Congress/25th Annual Meeting in North America Portland, Oregon Nov. 2004
“Copper and nickel release to soil solutions at field moisture capacity”
Ponizovsky, A.A., Thakali, S., Allen, H.E., Di Toro, D.M., Metzler, D.M.
4th SETAC World Congress/25th Annual Meeting in North America Portland, Oregon Nov. 2004
“Fe(II)-catalyzed oxidation of As(III) in sediment columns”
Rader, K.J.I, Bisceglia, K.J., Farley, K.J., Carbonaro, R., Mahony, J.D., Di Toro, D.M.
4th SETAC World Congress/25th Annual Meeting in North America Portland, Oregon Nov. 2004
“Terrestrial biotic ligand model (TBLM) to predict copper toxicity in soil systems”
Thakali, S., Ponizovsky, A., Metzler, D., Allen, H.E., Di Toro, D.M., Rooney, C., Zhao, F-J.,
McGrath, S.
4th SETAC World Congress/25th Annual Meeting in North America Portland, Oregon Nov. 2004

Academic Year 2003-2004

Invited Lectures and Seminars

- “Bioavailability of Metals and Organics in the Water Column and Sediment”
Ecotoxicology: A Hudson River Case Study
Department of Environmental Medicine, New York University, October 2003
“Understanding Bioavailability and Mechanisms of Toxicity: Impacting Risk Assessment and Criteria Development”
Invited Keynote Address, Workshop: Internal Exposure- Linking Bioavailability to Effects
International Conference Center Stefano Franscini, Monte Vérita, Ascona, Switzerland
August 22 - 27, 2004

Workshops

- “Overview of Environmental Ecological Modeling and its Relationship to Criteria Development”
Hudson-Delaware Chapter of SETAC Fall Workshop, Environmental Ecological Modeling and its Relationship to Criteria Development, September 26, 2003
“Exposure Assessment: The Unit World Approach”
EPA Stakeholders Meeting, Papers Addressing Scientific Issues in the Risk Assessment on Metals
Washington DC, October 29, 2003
“A (Very) Short History of the *BLM*”
Water Environment Research Foundation Multi-Metal Meeting, Miami, FL, October 22–24, 2003
NSF Sponsored CLEANER Workshop
Rensselaer Polytechnic Institute, June 14-15 2004

Expert Panels and Review Committees

- Nickel Environmental Risk Assessment Research Peer-Review Panel (NERAP)
Nickel Producers Environmental Research Association
Arona, Italy
December 19, 2003
Lead Risk Assessment Meeting
Environmental and Waste Risk Assessments of Lead Metal, Lead Oxides and Lead Stabilizers
Peer Review Panel Member
Rothamsted Experimental Station, Harpenden, UK., 5-6 April 2004
Metals In The Environment Research Network (MITE-RN) Annual Research Symposium
Chaudière B & C of Chateau Cartier Resort, 1170 Aylmer Road, Aylmer (Quebec)
Member: Expert Advisory Panel, May 11-13, 2004

Short Courses

“Introduction and Overview”

“EqP Sediment Quality Guidelines Criteria”

SETAC Annual Meeting, Austin, TX, Short Course: Characterization and Remediation of Contaminated Sediments, November 9, 2003

“Introduction to Toxic Contaminants”

Sediment Quality Criteria -Narcosis and PAH Mixtures

Sediment Quality Criteria - Metals

Sediment Quality Criteria - Equilibrium Partitioning

Manhattan College 49th Annual Summer Institute, June, 2004

Papers Presented

“Computed and Observed Redox Chemistry of Methyl Arsenic Species”

SETAC Annual Meeting, Austin, TX, November 12, 2003.

“Hydrodynamic/Chemical/Biological/Water Quality Models”

The State of the Art in Practice – Are We Data Limited?, CLEANER Path Forward Meeting
University of Iowa -- February 9-10, 2004

“Modeling Eutrophication in Estuaries: The Modern Conceptual and Computational Approaches and Applications”

Seminar, Department of Civil, Architectural, & Environmental Engineering, Drexel University
March 2, 2004

“Theoretical and Computational Environmental Science and Engineering: An Emerging Discipline”

Named Professor Lecture, University of Delaware, March 10, 2004

Presented Papers/Posters Co-authored

“Effect of thioarsenite formation on As(III) toxicity.”

Rader KJ, Dombrowski PM, Farley KJ, Mahony JD, and Di Toro DM

American Chemical Society National Meeting

New York NY, September 7, 2003

“Computed and Observed Redox Chemistry of Methyl Arsenic Species”

P. M. Dombrowski , D. M. Di Toro, K. J. Farley , J. D. Mahony, and L. Wei

American Chemical Society National Meeting

New York NY, September 7, 2003

“Arsenic Transformation by Algae: The Role of Phosphorus Luxury Uptake”

F. L. Hellweger, K. J. Farley, U. Lall, and D. M. Di Toro

American Chemical Society National Meeting

New York NY, September 7, 2003

“Application of the Narcosis Target Lipid Model to Complex Mixtures Using Gasoline as a Case Study”

J. A. McGrath, F. L. Hellweger, T. F. Parkerton, and D. M. Di Toro

SETAC Annual Meeting, Austin, TX, November 12, 2003.

November 10, 2003

“Site-Specific Water Quality Criteria for Copper-Validation and Application of the BLM”

R. Mathew, R. C. Santore, P. R. Paquin, K. J. Heim, D. P. Galya, and D. M. Di Toro

SETAC Annual Meeting, Austin, TX, November 12, 2003.

November 11, 2003

“Metals Bioaccumulation and Effects: Consideration of Intracellular Speciation”

P. R. Paquin, D. Damiani, K. J. Farley, R. Mathew, R. C. Santore, D. M. Di Toro

SETAC Annual Meeting, Austin, TX, November 12, 2003.

November 11, 2003

Platform Paper # 436, “Computed and Observed Redox Chemistry of Methyl Arsenic Species”

P. Dombrowski, D. M. Di Toro, K. J. Farley, W. Long, and J. D. Mahony
SETAC Annual Meeting, Austin, TX, November 12, 2003.
November 12, 2003

Academic Year 2002-2003

Invited Lectures and Seminars

“Modern Entrophication and Sediment Flux Models: Site Specific Regressions or Generally Applicable Theories?”

Lewes Invitational Seminar Series
College of Marine Studies, University of Delaware, March 2003

Workshops

Metal Unit World Workshop

Center for the Study of Metals in the Environment, University of Delaware, Newark, Delaware
February 3–5, 2003

“Effect QSAR and the Narcosis Lipid Model”

CONCAWE Workshop, Simplifying the Environmental Risk Assessment of Complex Substances
RIVM, Bilthoven, NL, April 4, 2003

“Assessing Persistence”

Hazard Identification Approach for Metals and Metal Substances: A SETAC-Sponsored
Workshop, SETAC Technical Workshop on Hazard Identification for Metals, May 3–8, 2003

“Introduction to Water Quality and TMDLs”

“Introduction to Eutrophication and Nutrient Criteria”

“Sediment Flux Modeling”

“Introduction to Toxic Contaminants”

“Probability and Probabilistic Dilution Model”

“Water Quality Criteria”

“Sediment Quality Criteria for Toxic Organic Contaminants and Metals”

48th Institute in Water Pollution Control, Manhattan College, Bronx NY, June 9–13, 2003

“High Resolution Large Scale Hydrodynamic/Chemical/Biological/Water Quality Models: The State of the Art in Practice”

Frontiers in Assessment Methods for the Environment (FAME), NSF Sponsored Workshop
University of Minnesota, August 10–13, 2003

Expert Panels and Review Committees

Lead Risk Assessment Scientific Review Panel (Environmental)

Lead Development Association International
London, UK
February 13–14, 2003

Metals in the Environment – Research Network (MITE-RN)

Expert Advisory Panel
Ottawa, Canada
February 24–26, 2003

Presented Papers/Posters Co-authored

“Partitioning of metal between soil and soil solution: a key process controlling the risk of metals to soil organisms”

Allen, H.E., Z. Shi, S. Thakali, A.A. Ponizovsky, D.M. Metzler, and D.M. Di Toro (2003).
Proceedings of the Copper 2003 - Cobre 2003 International Conference. Santiago, Chile,
Canadian Institute of Mining, Metallurgy and Petroleum.

Academic Year 2001-2002

Invited Lectures and Seminars

“The Biotic Ligand Model”

International Copper Association Conference.
Woods Hole Oceanographic Institution. Woods Hole, MA. July 2001

“Numerical Water Quality Standards”

Association of Metropolitan Sewerage Agencies (AMSA) Developments in Water & Wastewater Law. Savannah GA November 2001

“Modern Water Quality and Sediment Criteria: Toxicological Interactions”

Environmental Sciences Department. Rutgers University, October 2001

“Modern Water and Sediment Quality Criteria: Toxicological and Chemical Interactions - How Much Is Too Much”

Department of Earth and Environmental Engineering. Columbia University, November 2001

“TMDL Listings and Modern Water Quality Criteria”

Metropolitan Water Reclamation District of Greater Chicago. Cicero IL, March 2002.

Workshops

“Evaluating persistence: suspended solids and sediments”

Workshop on Metals Persistence, Bioaccumulation and Toxicity in Aquatic Systems.
University of Quebec, CA. March 2002

Short Courses

“Understanding Total Maximum Daily Loads, Tools and Techniques for Achieving Reasonable

TMDL-Based Limits” D. Katz, D. M. Di Toro, T. W. Gallagher, A. Thuman,
Government Institutes Division, ABS Group Inc. Washington, DC , October 2001

“Introduction to Toxic Contaminants”

Sediment Quality Criteria -Narcosis and PAH Mixtures
Sediment Quality Criteria - Metals
Sediment Quality Criteria - Equilibrium Partitioning
Manhattan College 47th Annual Summer Institute, June, 2002

Papers Presented

“The Intrinsic Toxicity of Narcotic Chemicals and PAHs in Pure Phases and Mixtures”

SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

Presented Papers /Posters Co-authored

“Alternative Approaches for Modeling the Physiological Response of Aquatic Organisms to Acute Metal Toxicity”

P. R. Paquin, V. Zoltay, K.B. Wu, V. Navab, R. Mathew, R. C. Santore, and D. M. Di Toro,
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

“Predicting the Effects of Weathering on Crude Oil Using Narcosis Theory: Case Studies”

J. A. McGrath, F. L. Hellweger, W. Stubblefield, D. M. Di Toro,
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

“An Application of the Biotic Ligand Model (BLM) Framework for Cadmium”

K.B. Wu, V. Navab, R. C. Santore, P. R. Paquin, D. M. Di Toro,
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

“The Partitioning of Silver at Picomolar Concentrations to Humic Material”

J. Mahony, D. M. Di Toro, T. Shadi, K. Rader
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

“An Alternative Approach to PBT for Assessing Hazard of Metals and Metal Compounds”

W. Adams, K. Brix, D. M. Di Toro, P. R. Paquin, H. Allen, P. Campbell, D. DeForest, A. Green
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

“Arsenic Fate and Transport Modeling in Lakes: Approach and Preliminary Results”

F. L. Hellweger, K. Farley, U. Lall, D. M. Di Toro,
Arsenic in Drinking Water - An International Conference at Columbia University. November,
2001

“Estimating the Competition of Other Metals to the Binding of Copper to NOM”

R. Mathew, R. C. Santore, P. R. Paquin, D. M. Di Toro, J. Mitchell
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

“Application of the Biotic Ligand Model to Acute Metal Toxicity for Aquatic Organisms”

R. C. Santore, R. Mathew, V. Navab, V. Zoltay, P. R. Paquin, K.B. Wu, D. M. Di Toro,
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

“Dissolution, Weathering and Toxicity of Exxon Valdez Crude Oil”

F. L. Hellweger, J. A. McGrath, W. Stubblefield, D. M. Di Toro
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

“The Chemical Immobilization of Silver in Sediments when Acid Volatile Sulfide is not Present”

J. Mahony, D. M. Di Toro, T. Shadi, K. Rader, P. Dombrowski
SETAC 22nd Annual Meeting, Baltimore MD. Nov. 2001

Academic Year 2000-2001

Invited Lectures and Seminars

“Review and Comparison of Existing and Developing Standards/Criteria/Screening Guidelines for
MGP Sites”

Electric Power Research Institute (EPRI) Conference
Jacksonville FL, October 2000

“Theoretical Approaches to Sediment Quality Guidelines Development and their Applications”

A Short Course on the Collection, Analysis, and Interpretation of Sediment Quality Data
Southern California Coastal Water Research Project (SCCWRP)
Long Beach, CA. October 2000

“Reflections on the History of SETAC. Virtues and Faults. Sins of Omission, Sins of Commission”

Plenary Lecture.
Society of Environmental Toxicology and Chemistry (SETAC)
21st Annual Meeting, Nashville, TN November 2000

“The Chesapeake Bay Eutrophication Model”

Johns Hopkins University, Department of Geography and Environmental Engineering
February 2001

“Modern Water Quality Criteria in the TMDL Modeling Process” Keynote Speaker, TMDL Science Issues
Conference.

Water Environment Federation and ASIWPCA
St. Louis MO, March 2001

“Rational Criteria and Remediation”

Keynote Speaker, 33rd Mid-Atlantic Industrial and Hazardous Waste Conference
Manhattan College, Riverdale NY June 2001

Workshops

“Current Structure of the BLM Model”

The Biotic Ligand Model (BLM): Current Status and Future Directions
Colloquium sponsored by the Electric Power Research Institute (EPRI)
January 2001, Wash. DC

Short Courses

The Safe Drinking Water Act & Clean Water Act:

1. Understanding the Basics of How Water Quality Standards Are Developed
2. Wet Weather and Nutrients: Special Concerns for Special Problems

The Association of Metropolitan Sewerage Agencies and the Association of Metropolitan Water Agencies (AMSA)

Phoenix, AZ. November 2000

Advanced Study Institute on

Recent Developments in Coastal Eutrophication Research: Prediction,
Decision Support Systems, and Management

1. Modern Eutrophication Models
2. Sediment Flux Modeling

Supported by the Croucher Foundation

The University of Hong Kong, Hong Kong. February 2001

Manhattan College 47th Institute in Water Pollution Control. Water Quality Modeling. A
Computer-Based Workshop with Applications to TMDLs. June 2001

Papers Presented

“Sediment Toxicity Prediction”

Conference on Dredged Material Management: Options and Environmental Considerations
Massachusetts Institute of Technology, Cambridge, MA December 3-6, 2000

“Determining Site-Specific Water Quality Criteria for Copper”

WERF 2001 Subscriber Meeting
Washington DC, April 2001

Panel Member

Expert Advisory Panel

Canadian Network of Toxicology Centre

Metals in the Environment Research Program (MITE-RN) March, 2001

Academic Year 1999-2000

Invited Lectures and Seminars

“Modeling Contaminant Fate in Aquatic Systems in the New Millennium”

Invited Paper: Gordon Conference, Environmental Sciences: Water, June 2000
“Modeling the Environmental Impacts of Copper Mining in Indonesia”
Department of Civil and Environmental Engineering
University of Delaware, March 2000

Workshops

“Bioavailability of Organic Chemicals and Metals in the Water Column and in Sediments”
Experts Workshop on Review of the State of the Science, PBT Concepts and Metals and Metal
Compounds. US EPA and International Council of Metals in the Environment (ICME), January,
2000 Arlington VA

Short Courses

Manhattan College 46th Institute in Water Pollution Control. Water Quality Modeling. A
Computer-Based Workshop . June 2000

Papers Presented

“Narcosis and PAH Sediment Criteria”
Electric Power Research Institute (EPRI) Conference, New Orleans, September 1999
“A Mass Balance Model for Use in Evaluating Exposure Levels and Effects of Metals
Downstream of Point Source Discharges”, Society of Environmental Toxicology and Chemistry
(SETAC)
20th Annual Meeting, Phil. PA November 1999
“Long-Range Transport and Deposition: The Role of Henry’s Law Constant”
Society of Environmental Toxicology and Chemistry (SETAC)
20th Annual Meeting, Phil. PA November 1999
“Mechanism of hydrogen sulfide oxidation I. Methodology”
American Chemical Society National Meeting,
Computational Methods in Environmental Chemistry
Division of Chemistry in Computers, Division of Geochemistry
San Francisco, CA March 2000
“A Sediment Flux Model for Manganese”
American Chemical Society National Meeting, Division of Environmental Chemistry.
Chemical Speciation and Reactivity in Water Chemistry and Water Technology: A Symposium in
Honor of James J. Morgan. Washington DC, August 2000

Presented Papers Co-authored

“MARS: Model for the Assessment and Remediation of Sediments”
Society of Environmental Toxicology and Chemistry (SETAC)
20th Annual Meeting, Phil. PA November 1999, 1999
“Extension of the Biotic Ligand Model of Acute Toxicity of Copper and Silver to Invertebrates”
Society of Environmental Toxicology and Chemistry (SETAC)
20th Annual Meeting, Phil. PA November 1999
“Mechanism of hydrogen sulfide oxidation II. Application”
American Chemical Society National Meeting, San Francisco, CA
Computational Methods in Environmental Chemistry

Posters Co-authored

- “Predicting the Toxicity of Metals in Sediments”
Society of Environmental Toxicology and Chemistry (SETAC)
20th Annual Meeting, Phil. PA November 1999
- “Defining total PAH concentrations in Field Collected sediments”
Society of Environmental Toxicology and Chemistry (SETAC)
20th Annual Meeting, Phil. PA November 1999
- “Orthogonal Distance Regression: An Alternative to Ordinary Least Squares.”
Society of Environmental Toxicology and Chemistry (SETAC)
20th Annual Meeting, Phil. PA November 1999
- “Assessing the Importance of Environmental Ligands in Determining Metal Speciation and Bioavailability”
Society of Environmental Toxicology and Chemistry (SETAC)
20th Annual Meeting, Phil. PA November 1999
- “Sediment Transport Modeling in Green Bay: A precursor to Addressing PCB Fate and Transport”
Society of Environmental Toxicology and Chemistry (SETAC)
20th Annual Meeting, Phil. PA November 1999

Panel Member

- Mercury Source-Receptor Relationships Expert Panel
Sponsored by EPRI. Madison WI, May 2000
- Expert Review Panel: Channel Deepening Project. Modeling Review.
Port of New York and New Jersey Authority

Academic Year 1998-1999

Invited Lectures and Seminars

- “PAH Sediment Quality Criteria: Narcosis Theory and EPA Guidelines”
PSE&G. Newark, NJ. Sept. 1998
- Debate: “Equilibrium Partitioning vs. Empirically Based Criteria”
SETAC Conference Charlotte, NC. Nov. 1998
- “The Biotic Ligand Model and its Applicability to Water Quality Criteria”
EPA Science Advisory Board: Wash. DC, April 1999

Workshops

- Hudson River Foundation
CARP Workshop. NYC. Oct. 1998
- EPA Sponsored Workshop: Dissolved Oxygen Criteria.
Annapolis, MD. Nov. 1998
- Hudson River Foundation
CARP Workshop. NYC. Dec. 1998
- Silver Water and Sediment Criteria Workshop.
Kodak. Rochester, NY. May 1999

Short Courses

Manhattan College 45th Institute in Water Pollution Control. Water Quality Modeling. A Computer-Based Workshop. June 1999

Papers Presented

“PAH Mixture Criteria and the Narcosis Model”

SETAC Regional Meeting. Presented Paper Newark, NJ. Sept. 1998

“Biotic Ligand Model and Silver Water Quality Criteria”

SETAC Conference Charlotte, NC. Nov. 1998

“Metals Criteria and Environmental Impacts”

International Corrosion Conference Galveston TX, Feb. 1999

“Bioavailability of Metals in the Water Column and Sediment”

SETAC Europe Conference. Brussels. May 1999