

Daniel R. Lynch

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PERSONAL

Born 1950, Glens Falls, NY. Married Ellen Mannix Lynch, 1972. Brendan Lynch born 1980; Maureen Lynch born 1983.

PROFESSIONAL INTERESTS

Scientific management of natural resources; physical/biological interactions in the coastal ocean; professional education.

EDUCATION

Princeton University

Ph.D. Civil Engineering, Water Resources Program, June 1978
Thesis: "Finite Element Solution of the Shallow Water Equations"
M.S. Civil Engineering, June 1976

Massachusetts Institute of Technology

M.S. Mechanical Engineering, June 1972 (NSF Graduate Traineeship)
Thesis: "Effect of Subchondral Bone Stiffness on the Shock Absorbing
Properties of the Lower Extremity"
B.S. Mechanical Engineering, June 1972 (Honors Program)
Pi Tau Sigma and Tau Beta Pi honoraries.

EXPERIENCE

Dartmouth College, Thayer School of Engineering, Hanover, New Hampshire. 1978 – Present

MacLean Professor of Engineering, 1993 - Present
Professor of Engineering, 1989 - Present
Associate Professor of Engineering, 1984 - 1989
Assistant Professor of Engineering, 1978 - 1984

NSF Presidential Young Investigator, 1985-89.
Establishment of Numerical Methods Laboratory, for multidisciplinary computational research. 1984-present

Off-Campus Leaves:

2007-08: Senior Visiting Research Scholar, Woodrow Wilson School (STEP), Princeton University
2003-04: Visiting Scholar, School of Philosophy, The Catholic University of America.
Fall 2001: Melchor Visiting Professor, Univ. of Notre Dame, Dept. of Civil Engg. and Geol. Sci
1989-90: Visiting Scientist, Woods Hole Oceanographic Institution;
Institut de Mecanique de Grenoble; and Institute of Ocean Sciences, Sidney, BC

Director of Graduate Studies and Associate Dean of Engineering, 1985 - 1989
Committee Advisory to the President, AY 2000-01, 2001-02
Provost Search Committee, 1992-93
Presidential Search Committee, 1987-88
Chairman, Geophysics Coordinating Committee, 1982 - 1985

Instruction: numerical analysis; hydrology and water resources; environmental science; natural resource management; operations research; professional ethics.

Research: simulation methods for oceanic circulation; moving boundary and phase change problems; analysis of geochemical core data; land treatment system design; contaminant migration in landfills; electromagnetic problems associated with cancer therapy; coupled physical/biological interactions in the Coastal Ocean; statistical estimation.

Administrative

(1985-89):

Oversight of graduate programs, curricula, recruiting and financial aid.
Development and management of Project NORTHSTAR, a college-wide project in distributed scientific computing involving 400 networked Unix workstations.
Establishment of Professional Master of Engineering program jointly with the Amos Tuck School of Business Administration.

(1990-present):

Establishment of Modified Major: Engineering and Environmental Science
Initiation of Graduate Exchange Program with Vermont Law School (Environmental Law).
Ethics Across the Curriculum Project, with Inst. for Professional Ethics at Dartmouth (2003)
Faculty Advisory Board, NH Beta of Tau Beta Pi, 2002 - present (new chapter)
Faculty Adviser, Dartmouth Chapter, Engineers Without Borders, 2003 - 2007 (new chapter)
Faculty Advisory Board, Dartmouth Institute for Applied and Professional Ethics, 2002-2004
Advisory Committee on Investor Responsibility, 2006 - 2009

EXPERIENCE (cont'd)

Woods Hole Oceanographic Institution, Woods Hole, MA. 1998-present
Adjunct Scientist, Dept. of Applied Ocean Physics and Engineering

Univ. of Notre Dame, Melchor Visiting Professor, Dept. of Civil Engg. and Geol. Sci, Fall 2001.

U.S. Geological Survey, Water Resources Division, Reston, Virginia.
January 1977 - September 1980: Research Hydrologist

International Bank for Reconstruction and Development, Washington, D.C.
June 1976 - September 1976: Research Assistant, Office of Science & Technology

USCI Division of C.R. Bard, Inc., Billerica, Massachusetts.
March 1973 - September 1975: Quality Assurance Engineer

Stone & Webster Engineering Corporation, Boston, Massachusetts.
June 1972 - March 1973: Engineer, Power Division

PROFESSIONAL AFFILIATIONS and SERVICE

Fellow, American Society of Civil Engineers; Former President, Upper Valley Branch;
Chairman, Task Committee on Hydrodynamic Model Verification, 1984-1989;
Member, Task Committee on 3-D Model Verification, 1992-1994.
Member, Body of Knowledge Committee (BOK2), 2005 – 2008
Member, Sustainability TAC 2007-present.
Member, Task Committee on Verification of 3D Hydrodynamic Models, 2010-present.

Member, American Geophysical Union; Horton Medal Subcommittee, 1988/1990;
Editor (w/A. Davies), CES 47 (1995).

Member: International Water Resources Association; American Society for Engineering Education; Resource Modeling Association

Editorial Board Service (past):
Estuarine, Coastal, and Shelf Science
Computer Applications in Engineering Education

Advances in Water Resources
Continental Shelf Research (2005 guest editor, 2 vols. with A.M.Davies)
Journal of Marine Systems (guest editor)
Current Issues in Catholic Higher Education (guest editor)

Executive Director, Regional Association for Research on the Gulf of Maine, 1992-96.

US GLOBEC NW Atlantic Executive Committee, 1993-2001. (NSF/NOAA research)

Gordon Research Conference: Coastal Ocean Circulation, quadrennial. Initiated with C. Mooers (U. Miami) in 1999; Chairman, 2003.

QUODDY Users' Group -- Web-served software for Coastal Ocean Simulation; Founder.

PUBLICATIONS

Over 180 Publications in Biomedical Engineering, Water Resources, Environmental Engineering, Coastal Oceanography, and Professional Engineering. (list attached)

NML Report Series on Computational Science – Editor. A web-served internal report series, Thayer student and staff contributions; roughly 10 entries per year since 1995. http://www-nml.thayer.dartmouth.edu/Publications/internal_reports/

SPONSORED RESEARCH: In excess of \$20M. (list attached)

BOOK PROJECTS:

Current:

- *Natural Resource Management for Scientists and Engineers: Framing Sustainability.* (2nd ed, under construction)
- *Stochastic Simulation: Particles in Motion.* (under construction with D. Greenberg, A. Bilgili)
- *Validation and Verification of 3-D Hydrodynamic Models,* with R. Schmaltz (under construction)

Completed:

- *Sustainable Natural Resource Management for Scientists and Engineers.* D.R. Lynch, Cambridge University Press (2009)
- *Skill Assessment for Coupled Physical-Biological Marine Models,* D. Lynch, D. McGillicuddy, F. Werner, guest eds. J. Marine Systems (2009).
- *The Civil Engineering Body of Knowledge – 2nd Edition.* With R. Anderson et al. ASCE, 2008.
- *Quantitative Skill Assessment for Coastal Ocean Models,* D.R. Lynch and A.M. Davies, eds. American Geophysical Union, Coastal and Estuarine Series CES 47, 1995 (510 pp).
- *Recent Developments in Physical Oceanographic Modeling,* A.M. Davies and D.R. Lynch, guest editors, Continental Shelf Research, (2 special volumes, 2004-5). Vol.I (CSR 24:18); Vol II (CSR 25:7-8)
- *Numerical Partial Differential Equations for Environmental Scientists and Engineers – A First Practical Course.* D.R. Lynch, Springer, 2005, 388 pp..
- *Professions and the Common Good,* D.R. Lynch (ed.). November 2004 Symposium, Columbus School of Law, Catholic University of America. Proceedings: *Current Issues in Catholic Higher Education* 25:1 (2005).

CURRENT RESEARCH:

- *Coupled Physical-Biological Processes: Statistical properties, stochastic simulation, inference.* Collaborative with WHOI Dept of Applied Ocean Physics/Engineering, Bedford Institute of Oceanography, Istanbul Technical University
- *Oceanographic Forecasting of Circulation and Harmful Algal Blooms.* Collaborative with Woods Hole Oceanographic Institution (Depts of Biology and Applied Ocean Physics/Engineering)
- *The Civil Engineering Body of Knowledge – Accreditation, Licensing and Experiential Learning.* Collaborative with ASCE CAP³.
- *Professions, Technology and the Common Good.* MacLean Chair Project. Currently: Natural Resource Responsibility

COMMUNITY SERVICE (recent)

National Ski Patrol, 1999- 2002
Sacred Heart Church, Lector 1998-2008; RCIA, 2004-2007
Boy Scouts of America, Assistant Scoutmaster 1993-1998
Hanover Girls' Softball Coach, 1996-1998
Fiddling Coach, Hanover High School Orchestra, 2000-2003
Hanover Area Contra Dance Organizations: Smash the Windows, Northern Spy, Orion Consort

COURSES OFFERED AT DARTMOUTH:

+ Initiated
* Text in print
Cross-Listed

Undergraduate:

TECH 07: Freshman Seminar: Community Systems
ENGS 23: Distributed Systems and Fields
+ * ENGS 41: Sustainability and Natural Resource Management
+ *ENGS 42: Contaminant Hydrogeology (with Earth Sciences)*
+ ENGS 43: Environmental Transport and Fate
+ ENGS 52: Introduction to Operations Research
ENGS 57: Engineering Economy and Optimization
+ ENGS 80: Ethics and Engineering
ENGS 91: Numerical Methods in Computation (with Mathematics)

Graduate:

+ * ENGS 105 Computational Methods for Partial Differential Equations I
+ *ENGS 106 Numerical Linear Algebra (with Computer Science)*
+ *ENGS 170 Topics in Environmental Science (with Biology and Earth Sciences)*
 Climate Change
 Industrial Ecology
 Sustainability
+ ENGS 172 Climate Change and Engineering
+ ENGS 205 Computational Methods for Partial Differential Equations II

PUBLICATIONS

Environmental Engineering and Water Resources

- "Alternative Time Stepping Schemes for Finite Element Tidal Computations," W.G. Gray and D.R. Lynch, *Advances in Water Resources*, **1**, 2, (December 1977)
- "Finite Element Solution of the Shallow Water Equations," D.R. Lynch, Ph.D. Thesis, Princeton University, June 1978.
- "Finite Element Simulation of Shallow Water Problems with Moving Boundaries," D.R. Lynch and W.G. Gray, *Proc 2nd Intl Conf on Finite Elements in Water Resources*, London 1978. Brebbia et al., eds. Pentech Press, London (1978).
- "Analytic Solutions for Computer Flow Model Testing," D.R. Lynch and W.G. Gray, *J. Hydraulic Division, ASCE*, **104**, HY10, 1409-1428 (October 1978)
- "On the Control of Noise in Finite Element Tidal Computations: A Semi-Implicit Approach," W.G. Gray and D.R. Lynch, *Computers and Fluids*, **7**, 1, 47-67 (March 1979).
- "A Wave Equation Model for Finite Element Tidal Computations," D.R. Lynch and W. G. Gray, *Computers and Fluids*, **7**, 3, 207-228 (September 1979).
- "Finite Element Simulation of Flow in Deforming Regions," D.R. Lynch and W.G. Gray, *J. Comput. Phys.*, **36**, 2, 135-153 (July 1980).
- "Role of Optimization Techniques in the Operation and Management of Land Treatment Systems," D.R. Lynch and P.H. Kirshen, Chap. 25 in *Modeling Wastewater Renovation by Land Treatment*, I.K. Iskandar, ed., John Wiley & Sons (1981).
- "An Explicit Model for Two-Dimensional Tidal Circulation Using Triangular Finite Elements--WAVETL User's Manual," D.R. Lynch and W.G. Gray, USGS Water Resources Investigation, #80-42 (1980).
- "Effective and Highly Accurate Solution of Diffusion and Convection-Diffusion Problems Using Moving, Deforming Coordinates," K.O'Neill and D.R. Lynch, *Proc. 3rd Intl Conf on Finite Elements in Water Resources*, 3.67-3.76, Wang et al., eds., University of Mississippi (1980).
- "Dynamics of Mixing in Estuaries," C.B. Officer and D.R. Lynch, *Estuarine, Coastal, and Shelf Science*, **12**, 525-533 (1981).
- "Impact of Economic and Financial Policies on the Development of Small-Scale Hydroelectric Facilities in New England," D.R. Lynch and P.H. Kirshen, *Vermont Law Review*, **5**, 2, 295-312 (Fall 1980).
- "Discussion - Moving Boundary Storm Surge Model," D.R. Lynch, *J. Waterway Port Coastal and Ocean Div. ASCE*, **106**, WW3, 425-428 (August 1980).
- "Watershed Research in New England," D.R. Lynch, *The Year 1980*, Thayer School of Engineering, Hanover, NH (1980).
- "Interpretation procedures for the determination of sediment parameters from time-dependent flux inputs," C.B. Officer and D.R. Lynch, *Earth and Planetary Science Letters*, **61**, 55-62 (1982).
- "Comparison of Spectral and Time-Stepping Approaches for Finite Element Circulation Problems," D.R. Lynch, *Proc. OCEANS* 81, 810-814, Boston, MA (1981) (invited paper).
- "Models of Landfill Leaching: Moisture Flow and Inorganic Strength," W.A. Straub and D.R. Lynch, *J. Env. Engg. Div. ASCE*, **108**, EE2, 231-250 (April 1982).
- "Models of Landfill Leaching: Organic Strength," W.A. Straub and D.R. Lynch, *J. Env. Engg. Div. ASCE*, **108**, EE2, 251-268 (April 1982).
- "Optimization Model for Land Treatment Planning, Design, and Operation. Part I, Background and Literature Review," J.A. Baron, D.R. Lynch and I.K. Iskandar, U.S. Army Cold Regions Research & Engineering Lab. Special Report #83-6 (1983).
- "Optimization Model for Land Treatment Planning, Design, and Operation. Part II, Case Study," J.A. Baron, D.R. Lynch and I.K. Iskandar, U.S. Army Cold Regions Research & Engineering Lab. Special Report #83-7 (1983).
- "Optimization Model for Land Treatment Planning, Design, and Operation. Part III, Model Description and User's Guide," J.A. Baron and D.R. Lynch, U.S. Army Cold Regions Research & Engineering Lab. Special Report #83-8 (1983).
- "Nonlinear Parameter Estimation for Sediment Cores," D.R. Lynch and C.B. Officer, *Chemical Geology*, **44**, 203-225 (1984).
- "Basic Hydrodynamic Equations for Lakes," D.R. Lynch, Ch. 2 of *Physics-Based Modeling of Lakes, Reservoirs, and Impoundments*, W.G. Gray, ed., American Society of Civil Engineers, New York, (1986).
- "Determination of Mixing Parameters from Tracer Distributions in Deep Sea Sediment Cores," C.B. Officer and D.R. Lynch, *Marine Geology*, **52**, 59-74 (1983).
- "Progress in Hydrodynamic Modeling: Review of U.S. Contributions 1979-1982," D.R. Lynch, *Reviews of Geophysics and Space Physics*, **21**, 3 (1983).

- "Mass Conservation in Finite Element Groundwater Models," D.R. Lynch, *Advances in Water Resources*, **7**, 67-75 (1984).
- "Mixing, Sedimentation Rates and Age Dating for Sediment Cores - Reply," C.B. Officer and D.R. Lynch, *Marine Geology*, **52**, 292-297 (1983).
- "Recent Sedimentation Rates in Chesapeake Bay," C.B. Officer, D.R. Lynch, G.H. Setlock, and G.R. Helz, (invited paper), *The Estuary as a Filter*, V.S. Kennedy, ed., Academic Press, 131-157 (1984).
- "Mass Balance in Shallow Water Simulations," D.R. Lynch, Proc. Fifth Int'l Conf. on Finite Elements in Flow Problems, U. of Texas at Austin, Jan. 23-26, 1984 (pp. 1-5), Carey and Oden, eds.; also *Comm in Applied Numerical Methods*, **1**, 153-159 (1985).
- "Dynamic Velocity Profiles on Simple Elements," D.R. Lynch and J.-L. Hazard, *Proc. Fifth Int'l Conf. on Finite Elements in Water Resources*, Univ. of Vermont, June 1984, pp. 63-76. Laible et al, eds. Springer-Verlag (1984).
- "Estimation of Benthic Respiration Parameters from Field Data," C.B. Officer, D.R. Lynch, W.M. Kemp, and W.R. Boynton, *Estuarine, Coastal and Shelf Science*, **21**, 357-364 (1985).
- "Analytic Test Cases for Three-Dimensional Hydrodynamic Models," D.R. Lynch and C.B. Officer, *Int'l. J. Num. Meths. in Fluids*, **5**, 529-543 (1985).
- "Economics of Ground Freezing for Management of Uncontrolled Hazardous Waste Sites," J.M. Sullivan, D.R. Lynch and I.K. Iskandar, *Proc. 5th National Conference on Management of Uncontrolled Hazardous Waste Sites*, November 1984, Hazardous Materials Control Institute, Silver Spring, MD (1984).
- "Report of the Task Committee on Test Cases for Verification of 2-D Depth-Averaged Hydrodynamic Models," Daniel R. Lynch, *Proc. ASCE specialty conference on Hydraulics and Hydrology in the Small Computer Age*, William R. Waldrop, ed. pp. 711-714. ASCE, 1985.
- "Three-dimensional harmonic model for linearized tidal circulation," D.R. Lynch and F.E. Werner, *Proc. 6th Intl. Conf. on Finite Elements in Water Resources*, Lisbon (1986).
- "Field studies with the wave equation formulation," F.E. Werner and D.R. Lynch, *Proc. 6th Intl. Conf. on Finite Elements in Water Resources*, Lisbon (1986).
- "Three-Dimensional Hydrodynamics on Finite Elements, Part I: Linearized Harmonic Model," D.R. Lynch and F.E. Werner, *Int. J. Num. Meths. in Fluids*, **7**, 871-909 (1987).
- "Field Verification of Wave Equation Tidal Dynamics in the English Channel and Southern North Sea," F.E. Werner and D.R. Lynch, *Adv. in Water Resources* **10**, 115-130 (1987).
- "King's Bay/Cumberland Sound, Georgia Part II: Numerical Modeling," D. G. Aubrey, V.A. Fry and D.R. Lynch, Woods Hole Oceanographic Institution Technical Report #WHOI-87-2, March 1987.
- "Glacial Isostatic Adjustment and Mantle Viscosity," C.B. Officer, W.S. Newman, J.M. Sullivan, Jr., D.R. Lynch, *J. Geophys. Research*, **93**, B6, 6397-6409 (1988).
- "Wave Equation Hydrodynamics on Deforming Elements," G.L.D. Siden and D.R. Lynch, *Int. J. Numerical Meths. in Fluids*, **8**, 1071-1093 (1988).
- "Long-Term Simulation and Harmonic Analysis of North Sea/English Channel Tides," D.R. Lynch and F.E. Werner, *Proc., VII Int'l Conf. on Computational Methods in Water Resources*, MIT, June 1988, Celia et al., eds. Elsevier, 257-266 (1988).
- "Bioturbation, Sedimentation, and Sediment-Water Exchanges," C.B. Officer and D.R. Lynch, *Estuarine, Coastal, and Shelf Science*, **28**, 1, 1-12 (1989).
- "Harmonic Structure of English Channel/Southern Bight Tides from a Wave Equation Simulation," F.E. Werner and D.R. Lynch, *Adv. in Water Resources*, **12**, 3, 121-142 (1989).
- "Finite Element Modeling of Reduced-Gravity Flow in the Alboran Sea: Sensitivity Studies," D.R. Lynch, F.E. Werner, A. Cantos-Figuerola, and G. Parrilla. *Proc. Seminario Sobre la Oceanografia Fisica del Estrecho de Gibraltar*, Madrid, 24-28 Oct. 1988. J.L. Almazan et al, eds. pp 283-295 (1989).
- "Wave Equation Hydrodynamics on Simple 3-D Elements", D.R. Lynch and F.E. Werner. *Proc. 7th Int'l Conf. on Finite Elements in Flow Problems*, U. of Alabama, April 1989. Chung and Kerr, eds. U. of Alabama Huntsville Press, 1373-1382 (1989).
- "Tides in the Southern North Sea/English Channel: Data Files and Procedure for Reference Computation," F.E. Werner and D.R. Lynch, Numerical Methods Laboratory Report, February 1988 (Distributed in conjunction with the 7th Int'l Conf. on Comp. Meths. in WR, MIT, June 1988).
- "3-D Finite Element Modeling of the Circulation in the Gulf of Maine and the Bay of Fundy" F.E. Werner and D.R. Lynch. *Proc. ARGO-Maine Workshop*, Boothbay Harbor, Maine, April 1989.
- "Meeting Report: 2nd Tidal Flow Forum", F.E. Werner and D.R. Lynch. *EOS*, **64**, 44, 1027-28 (November 1, 1988).

- "Three-Dimensional Velocities from a Finite Element Model of English Channel/Southern Bight Tides," D.R. Lynch and F.E. Werner, *Tidal Hydrodynamics*, B. Parker, ed., John Wiley, 1991.
- "Tidal Dynamics in a Coupled Ocean-Lake System", D.R. Lynch, F.E. Werner, J.M. Molines and M. Fornerino. *Estuarine, Coastal & Shelf Science* **31**, 319-343 (1990).
- "Three-Dimensional Hydrodynamics on Finite Elements, Part II: Nonlinear Time-Stepping Model", D.R. Lynch and F.E. Werner. *Int. J. Numerical Methods in Fluids* **12**, 507-533 (1991).
- "Tidal Modeling", D.R. Lynch. *Proc. Coastal Ocean Prediction System Workshop*, C. Mooers, ed. New Orleans, October 1989. Joint Oceanographic Institutions, May 1990.
- "Finite Element Models for Continental Shelf Studies", D.A. Greenberg, D.R. Lynch and F.E. Werner, *Proc. Canadian Applied Mathematics Society*, Halifax, NS, May 1990.
- "Analytic Solutions for 1-D and 3-D Periodic Motions", D.R. Lynch, in GENOME Project Report, MUMM (in press 1990).
- "Velocity Asymmetries in Frictionally-Dominated Tidal Embayments: Longitudinal and Lateral Variability", C.T. Friedrichs, D.R. Lynch, D.G. Aubrey, *Physics of Estuaries and Coastal Seas Vol 5*, D. Prandle, ed. AGU CES 40, Washington DC (1992).
- "Diagnostic Model for Baroclinic and Wind-Driven Circulation in Shallow Seas", D.R. Lynch, F.E. Werner, D.A. Greenberg, J.W. Loder, *Continental Shelf Research* **12**, 37-64 (1992).
- "Three-Dimensional Diagnostic Model for Baroclinic, Wind-Driven and Tidal Circulation in Shallow Seas -- FUNDY4 Users' Manual", D.R. Lynch, Numerical Methods Laboratory Report, 1990.
- "Review: Gulf of Maine Circulation Modeling", D. A. Greenberg and D.R. Lynch, *Proc. Gulf of Maine Scientific Workshop*, Woods Hole Oceanogr. Inst., Jan. 1990, Wiggins and Mooers, eds; pp125-140. Urban Harbor Institute, Boston, 1992.
- "A Numerical Study of the Continental Shelf Circulation of the U.S. South Atlantic Bight during the Autumn of 1987", F.E. Werner, J.O. Blanton, D.R. Lynch, D.K. Savidge, *Continental Shelf Research* **13** (8/9), 971-998 (1993).
- "The M2 Tide and its Residual on Georges Bank", D.R. Lynch and C.E. Naimie. *J. Phys. Oceanogr* **23**, 10, 2222-2253 (1993).
- "A Finite Element Model for Three Dimensional Flows Along the West Coast of Vancouver Island", M.G.G. Foreman, R.E. Thomson, D.R. Lynch, R.A. Walters, *Proc. ASCE Conf. on Estuarine and Coastal Modeling*, Tampa, Nov. 1991. M. Spaulding et al, eds; ASCE (1992) pp 574-585.
- "Application of the Nonlinear Three-Dimensional Shallow Water Equations to a Coastal Ocean", C.E. Naimie and D.R. Lynch. *Proc. IX Int'l Conf. Computational Methods in Water Resources*, Denver, June 1992. pp 589-608. Volume published as *Mathematical Modeling in Water Resources*, Vol II, Russell et al, eds. Elsevier, New York, 1992.
- "Influences of Mean Advection and Simple Behaviour on the Distribution of Cod and Haddock Early Life Stages on Georges Bank". F. Werner, F. Page, D. Lynch, J. Loder, G. Lough, I. Perry, D. Greenberg, M. Sinclair. *Fisheries Oceanogr.* **2:2**, 43-64 (1993).
- "Comprehensive Circulation Model for the Gulf of Maine." D.R. Lynch, J.T.C. Ip, L. Wolff, F.E. Werner. *Gulf of Maine Circulation Modeling*, Regional Association for Research in the Gulf of Maine, Dartmouth College, October 1993. RARGOM Report #94-2 (1994).
- "A Second-Order Radiation Boundary Condition for the Wave Equation on Two-Dimensional Unstructured Finite Element Grids", M.T. Johnsen and D.R. Lynch. *Int. J. Num. Meths. in Fluids* **18**, 575-604 (1994).
- "Seasonal Variation of Three-Dimensional Residual Circulation on Georges Bank", C.E. Naimie, J.W. Loder, D.R. Lynch. *J. Geophys. Resch.* **99**, C8, pp 15,967-989 (1994).
- "Influence of wind-driven advection on interannual variability in cod egg and larval distributions on Georges Bank: 1982 vs 1985." R.G. Lough, W.G. Smith, F.E. Werner, J.W. Loder, F.H. Page, C.G. Hannah, C.E. Naimie, R.I. Perry, M.M. Sinclair, D.R. Lynch. *ICES mar. Sci. Symp.* **198**: 356-378 (1994).
- "Assessment of a Second-Order Radiation Boundary Condition for Tidal and Wind-Driven Flows", M.T. Johnsen and D.R. Lynch. *Quantitative Skill Assessment for Coastal Ocean Models*, D.R. Lynch and A.M. Davies, eds. American Geophysical Union, Coastal and Estuarine Studies Volume 48, 1994.
- "Convergence Studies of Tidally-Rectified Circulation on Georges Bank", D.R. Lynch, J.T.C. Ip, C.E. Naimie, F.E. Werner. *Quantitative Skill Assessment for Coastal Ocean Models*, D.R. Lynch and A.M. Davies, eds. American Geophysical Union, Coastal and Estuarine Studies Volume 48, 1994.
- "Environmental Hydrodynamics: Comprehensive Model of the Gulf of Maine", D.R. Lynch, J.T.C. Ip, F.E. Werner, E.M. Wolff. Ch. 2 of *Finite Element Modeling of Environmental Problems*, G.F. Carey, ed. John Wiley 1995.
- "A Coupled Individual-Based Trophodynamics and Circulation Model for Studies of Larval Cod and Haddock on Georges Bank", F.E. Werner, R.I. Perry, R.G. Lough, D.R. Lynch. U.S. GLOBEC News 7, Sept. 1994.
- "Comprehensive Coastal Circulation Model with Application to the

- Gulf of Maine", D.R. Lynch, J.T.C. Ip, C.E. Naimie, F.E. Werner. *Continental Shelf Research* 16, 7, 875-906 (1996).
- "The Maine Coastal Current: Spring Climatological Circulation", D.R. Lynch, M.J. Holboke, C.E. Naimie. *Cont. Shelf Resch* 17, 6, 605-634 (1997).
- "Spatial and temporal structure of the barotropic response of the Scotian Shelf and Gulf of Maine to surface wind stress", D.A. Greenberg, J.W. Loder, Y. Shen, D.R. Lynch, C.E. Naimie. *J. Geophys. Resch.* 102, C9, 20897-20915 (1997).
- Quantitative Skill Assessment for Coastal Ocean Models*, D.R. Lynch and A.M. Davies, eds. American Geophysical Union, Coastal and Estuarine Studies Volume 47, 1995 (510 pp).
- "Simulations of the Maine Coastal Current", M.J. Holboke and D.R. Lynch. *Proc. ASCE Conf. on Estuarine and Coastal Modeling*, San Diego, Oct. 1995.
- "Normal flow boundary conditions in 3D circulation models", D.R. Lynch and M.J. Holboke. *Int. J. Numerical Methods in Fluids* 25, 1185-1205 (1997).
- "Simulation of estuarine flooding and dewatering, with application to Great Bay, New Hampshire", J.Ip, D.Lynch, C.Friedrichs. *Estuarine, Coastal and Shelf Science* 47, 119-141 (1998).
- "A spherical-polar coordinate version of a linearized three-dimensional finite element ocean model", D.A. Greenberg, F.E. Werner, D.R. Lynch. *J. Ocean. Atmos. Tech* Vol. 15, No. 4, pages 942-958 (1998).
- "Hindcasting the Georges Bank circulation, Part I: Detiding", D.R. Lynch, C.E. Naimie, C.G. Hannah. *Cont. Shelf Resch*, 18, 607-639 (1998).
- "Hydrographic data assimilation on Georges Bank". D.R. Lynch and C.E. Naimie. In M.L. Spaulding and A.F. Blumberg (eds): *Estuarine and Coastal Modeling V*. Reston, VA: American Society of Civil Engineers, (1998). pp 523-540
- "Biological/Physical Simulations of *Calanus finmarchicus* Population Dynamics in the Gulf of Maine", Daniel R. Lynch, Wendy C. Gentleman, Dennis J. McGillicuddy, Jr., Cabell S. Davis. *Marine Ecology Progress Series* 169:189-210 (1998).
- "Coupling of an Individual-Based Population Dynamics Model for Stocks of *Calanus finmarchicus* with a Circulation Model for the Georges Bank Region", C.B. Miller, D.R. Lynch, F. Carlotti, W. Gentleman, C. Lewis. *Fisheries Oceanography* 7:3/4, 219-234 (1998).
- "An Adjoint Data Assimilation Approach to the Estimation of Pseudocalanus spp. Population Dynamics in the Gulf of Maine - Georges Bank Region". D.J. McGillicuddy, D.R. Lynch, A.M. Moore, W. C. Gentleman, C.S. Davis, C.J. Meise. *Fisheries Oceanography* 7:3/4, 205-218 (1998).
- "Can Georges Bank Larval Cod Survive on a Calanoid Diet?" D.R. Lynch, C.V.W. Lewis, F.E. Werner. *Deep-Sea Research II*, 48 (1-3), 609-630 (2001).
- "Evaluating the USGLOBEC Georges Bank Broad-Scale Sampling Pattern with Observational System Simulation Experiments". D.J. McGillicuddy, Jr., D.R. Lynch, P. Wiebe, J. Runge, E.G. Durbin, W.C. Gentleman, C.S. Davis. *Deep-Sea Research II*, 48 (1-3), 483-500 (2001).
- "Seasonal mean circulation in the Yellow Sea - A model generated climatology." C.E. Naimie, C.A. Blain, D.R. Lynch. *Continental Shelf Research*, 21, 667-695 (2001).
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- "Modeling the Transport of Larval Lobsters in the Gulf of Maine", L.S. Incze, D.R. Lynch, C.E. Naimie. NOAA Regional Marine Research Program, Aug 1995 - July 1997. \$55,906: Dartmouth; \$61,840: Bigelow Laboratory.
- "Finite Element Modeling of Coastal Circulation", D.R. Lynch and C.E. Naimie. ONR Grant No. N00014-96-1-0572, March 1996-Jan 1999. \$428,859.
- "USGlobec: Importance of Physical and Biological Processes to Population Regulation of Cod and Haddock on Georges Bank: a Model-Based Study", D.R. Lynch, F.E. Werner, J.W. Loder, R.I. Perry, M.M. Sinclair, R.G. Lough, D.A. Greenberg, F.H. Page, P.C. Smith, C.E. Naimie, C.G. Hannah, C.J. Meise. NSF, Oct 1996-Sept. 1999, \$991,000, distributed as follows: Dartmouth, \$280,000; Bedford Institute of Oceanography, \$350,000; Univ. of North Carolina, \$270,000; National Marine Fisheries Service-NFSC, \$91,000.
- "USGlobec: Remote Physical Forcing on Georges Bank", D.B. Haidvogel, D.R. Lynch, M.Iskandarani, Oct 1996-Sept 1999, \$450,000 distributed as follows: Dartmouth, \$120,000; Rutgers University, \$330,000.
- "USGlobec: Modeling Biological/Physical Processes Controlling Copepod Abundance in the Gulf of Maine/Georges Bank Region", C.S. Davis, D.R. Lynch, Oct 1996-Sept 1999, \$605,000 distributed as follows: Dartmouth, \$195,000; WHOI, \$410,000.
- "KDI: Next-Generation Agent-Based Distributed Simulation". Linda F. Wilson, George Cybenko, Daniel R. Lynch. National Science Foundation, \$1,400,000; October 1998-September 2001.
- "USGlobec: Real-Time Data Assimilation on Georges Bank". D. R. Lynch, C. E. Naimie, C. V. Lewis, B. Cushman-Roisin (Dartmouth College); R. G. Lough, J. P. Manning (NMFS); F. E. Werner (University of North Carolina); D. J. McGillicuddy, C. S. Davis, S. M. Gallagher (Woods Hole Oceanographic Institution). National Science Foundation. Nov 1998 - Oct 2001, \$679,000. Distribution: \$369,430 (Dartmouth), \$121,286 (UNC), \$136,264 (WHOI), \$52,020 (NMFS).
- "Program in Interdisciplinary Marine Modeling and Management." D.R. Lynch. National Oceanic and Atmospheric Administration (NMFS), \$975,000. Sept. 1999-Sept. 2002.
- "Limited-area operational coastal ocean models: Assimilation of observations from fixed platforms on the continental shelf and far-field forcing from open ocean models". NOPP, (ONR), 1 July 2000-30 June 2003, \$1,498,547.
- "Computer Modeling Assistance: Fate of Reactive Nitrogen Derived from Agricultural Sources in Coastal Lagoons". Virginia Institute of Marine Science, D.R. Lynch. 5/1/01 - 7/31/03, \$9500.

- “Collaborative research: ECOHAB-GOM: The Ecology and Oceanography of Toxic Alexandrium Blooms in the Gulf of Maine.” 6-1-98--5-31-02, D. Anderson et al, WHOI. NSF-OCE: \$125,000. Annual support for DRL: 1 month.
- “Development of a 3-D model-based climatology for the Irish Shelf”, D.R. Lynch. National Oceanic and Atmospheric Administration. 06/01/2001- 05/31/2002 and 9/2003-9/2004, \$50,731.
- “Predictive models of the toxic dinoflagellate *Alexandrium fundyense* in the Gulf of Maine: quantitative evaluation, refinement, and transition to operational mode for coastal management.” US-ECOHAB (EPA/NOAA); with D. J. McGillicuddy, D.M. Anderson, A. Solow (Woods Hole Oceanographic Institution); and D. Townsend (U. Maine). \$1,547,230 (all institutions); Dartmouth portion \$493,861. January 2003-December 2006.
- "Modeling Transport and Ocean- Estuary Processes in the Great Bay Estuary", NH SeaGrant. J. Proehl, A. Bilgili, K. Smith, D. Lynch. Feb. 2003-Jan 2004, \$90,000.
- “Gordon Research Conference -- Coastal Ocean Modeling”. D.R. Lynch, \$73,000, June 2003. GRC Inc; ONR; USGS; NOAA; NSF.
- “Perceptual Optimization for Data Visualization”, NSF, J. Proehl and D. Lynch, \$83K, 3 years beginning Sept. '03. ITR Collaborative Research with UNH (\$403.K), Brown U. (\$120.K), Texas A&M (\$435.K).
- “Structures of Uncertainty in Coupled Physical-Biological Estimation in the Coastal Ocean.” NSF, CMG Collaborative Research. D. Lynch, (Dartmouth) A. Solow, D. McGillicuddy (WHOI). Jan 14, 2004. Oct 2004, 4 years, \$1.1 M (\$551,607. DC + \$577,610. WHOI) total.
- “Interdisciplinary Transfer of a Lagrangian Circulation Model to Researchers in Environmental Science and Education”. A. Bilgili, (P.I.) under supervision of D. Lynch. NOAA Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET). \$193,313 over two years beginning Nov 2004.
- “Coupled Biological/Physical Models in the Coastal Ocean: Skill Assessment and Planning for Regional Testbed Projects.” D.Lynch, D.McGillicuddy, F.Werner, D.Haidvogel. NOAA - Coastal Ocean Program, \$100,000. Sept. 2005-2009.