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Education

- University of Delaware, Newark, Delaware.
  Ph.D., Applied Sciences (Civil Engineering), 1983
- Brown University, Providence, Rhode Island.
  Sc.B.(magna cum laude), Environmental Engineering, 1975.
  Sc.M., Engineering Mechanics, 1976.

Professional Experience

- Edward C. Davis Professor of Civil Engineering, Department of Civil and Environmental Engineering, University of Delaware, 2003-present.
- Visiting Professor, Grupo de Dinámica de Flujos Ambientales, CEAMA, Universidad de Granada, 2010, 2012.
- Professor of Civil and Environmental Engineering, Department of Civil and Environmental Engineering, University of Delaware, 1994-2002. Secondary appointment in College of Earth, Ocean and the Environment, University of Delaware, 1994-present.
- Associate Professor of Civil Engineering, Department of Civil Engineering, University of Delaware, 1989-1994. Secondary appointment in College of Marine Studies, University of Delaware, as Associate Professor, 1989-1994.
- Associate Professor, Coastal and Oceanographic Engineering Department, University of Florida, 1988.
- Assistant Professor, Coastal and Oceanographic Engineering Department, University of Florida, 1984-1988.
- Assistant Professor, Marine Sciences Research Center, State University of New York at Stony Brook, 1983-1984.
- Graduate Research Assistant, Department of Civil Engineering, University of Delaware, 1979-1983.
- Principle Research Engineer, Alden Research Laboratory, Worcester Polytechnic Institute, 1979.
- Research Engineer, Alden Research Laboratory, Worcester Polytechnic Institute, 1977-1979.

Technical Societies

- American Society of Civil Engineers (ASCE)
  - Waterway, Port, Coastal and Ocean Engineering Division. (Now COPRI, the Coastal, Ocean, Port and River Institute).
    - Member, Organizing Committee, *Coastal Hydrodynamics '87*, Newark, June 1987.
    - Member, Publications Committee, 1987-2002.
    - Member, Technical Committee, *WAVES '01*, San Francisco, September 2001.
    - Member, Scientific Committee, *33d International Conference on Coastal Engineering*, Santander, 2012.
    - Member, Scientific Committee, *34th International Conference on Coastal Engineering*, Seoul, 2014.
  - Engineering Mechanics Division
    - Member, Fluids Committee, 1991-present.
    - Organizer, Wave Hydrodynamics sessions, *Joint SES-ASME-ASCE Meeting*, Charlottesville, June 1993.
    - Vice-Chairman, Fluids Committee, 1993-1994.
    - Chairman, Fluids Committee, 1994 - 1996.
    - Organizer, session on Breaking Waves and Turbulence, *10th Engineering Mechanics Division Specialty Conference*, Boulder, May 1995.
    - Member, Organizing Committee, *17th Engineering Mechanics Conference*, Newark, DE, June 2004.
- American Geophysical Union (AGU)
  - Organizer, Nearshore Hydrodynamics sessions, *American Geophysical Union Fall Meeting*, December 1992.
  - Member, Governing Board, American Institute of Physics, 2011-2013.
  - Organizer, Natural Hazards sessions on inundation, AGU Fall Meeting, 2012.
- American Physical Society
- Coastal and Estuarine Research Federation
- United States Association for Computational Mechanics
- Geological Society of America

Service on editorial boards

- Associate Editor, *Journal of Engineering Mechanics*, ASCE, 1994 - 1996.
- Assistant Editor, *Journal of Waterway, Port, Coastal and Ocean Engineering*, ASCE, 1994 - 1996.
- Editor, *Journal of Waterway, Port, Coastal and Ocean Engineering*, ASCE, 1996 - 2000.
- Editor, *Journal of Geophysical Research - Oceans*, AGU, 2003-2006.
- Editor in Chief, *Journal of Geophysical Research - Oceans*, AGU, 2006-2009.
- Associate Editor, *Journal of Marine Energy and Ocean Engineering*, Springer, 2015-2019.
- Associate Editor, *Journal of Fluid Mechanics*, Cambridge University Press, 2017-present.
- Editorial Board, *Coastal Engineering*, Elsevier, 2017-present.

Technical and Academic Advisory Panels and Committees

- Member, Advisory Committee, NSF Network for Earthquake Engineering and Simulation (NEES), Tsunami Basin Project, 2001-2005.
- Member, NSF Physical Oceanography Review Panel, May 2002.
- Co-organizer, NSF Workshop on model validation and benchmarking for tsunami generation by submarine mass failure, University of Hawaii, May 30-31, 2003.
- Member, Nearshore Advisory Group - informal advisory panel appointed to assist ONR and NSF program managers in areas of nearshore physical oceanography.
- National Advisory Board, Department of Naval Architecture and Marine Engineering, University of Michigan, 2005-2008.
- Member (East Coast Technical Representative), Coordinating Committee, National Tsunami Hazard Mitigation Program, NOAA, 2008-present.
- Mapping and Modeling Subcommittee, National Tsunami Hazard Mitigation Program, NOAA, 2008-present.
- Member, NSF CBET Review Panel, January 2009.
- Member, ERDC External Advisory Panel on Boussinesq Models, 2014 - present.
- Organizer, NTHMP Landslide Tsunami Modeling Workshop, Galveston, TX, Jan 9-11, 2017.
- Member, Academic Program Review team for Department of Ocean Engineering, Texas A & M University, 2018.
- Member, Organizing Committee, THESIS '19, Newark, DE.

Prizes and Honors

- Walter L. Huber Civil Engineering Research Prize, American Society of Civil Engineers, 1992.
- John G. Moffatt - Frank E. Nichol Harbor and Coastal Engineering Award, American Society of Civil Engineers, 2011.
- International Coastal Engineering Award, COPRI, American Society of Civil Engineers, 2018.

Research Interests

Historically, my largest research contribution has been in the development of open source models for nearshore processes. My research group has been responsible for the development of the parabolic refraction/diffraction model REF/DIF, the Boussinesq model FUNWAVE, and the 3D nonhydrostatic model NHWAVE. In addition, we have developed the NearCoM model, which couples an extensive rewrite and extension of the quasi-3D wave averaged circulation model Shorecirc to the spectral wave model SWAN. Model codes are available from

1. http://github.com/fengyanshi/FUNWAVE-TVD
2. http://github.com/NHWAVE
3. http://github.com/fyshi/NearCoM

or by contacting me at kirby@udel.edu Presently funded work topics include landslide-tsunami modeling, tsunami inundation mapping and hazard analysis, dynamics of frontal structures and stratified shear flow in estuaries and river mouths, ocean surface wave breaking and bubble injection, and dynamics and long term evolution and resilience of salt marshes.

PUBLICATIONS

Citation statistics

- Web of Science, 4/13/23: 9,748 citations, h-index = 49
- Google Scholar, 4/13/23: 20,127 citations, h-index = 65

Edited Proceedings

1. Kaliakin, V. N., Kirby, J. T., Yamamuro, J., Bhattacharya, B. and Shenton, H. W. (eds), EM2004, The 17th ASCE Engineering Mechanics Conference, Newark, June 13-16, 2004. Published on CD.

Chapters in Books

1. Kirby, J. T., 1997, "Nonlinear, dispersive long waves in water of variable depth", *Advances in Fluid Mechanics*, **10**, J. N. Hunt (ed), Computational Mechanics Publ., 55 - 125.
2. Martin, P. A., Dalrymple, R. A. and Kirby, J. T., 1997, "Parabolic modeling of water waves", *Advances in Fluid Mechanics*, **10**, J. N. Hunt (ed), Computational Mechanics Publ., 169 - 213.
3. Kirby, J. T., 2003, "Boussinesq models and applications to nearshore wave propagation, surfzone processes and wave-induced currents", in *Advances in Coastal Modeling*, V. C. Lakhan (ed), Elsevier, 1-41.

Refereed Journal Articles

1. Kirby, J.T., Dalrymple, R.A. and Liu, P.L.-F., 1981, "Modification of edge waves by barred-beach topography", *Coastal Engineering*, **5**, 35-49, doi:10.1016/0378-3839(81)90003-X.
2. Kirby, J.T. and Dalrymple, R.A., 1983, "Propagation of obliquely incident water waves over a submerged trench", *Journal of Fluid Mechanics*, **133**, 47-63, doi:10.1017/S0022112083001780.
3. Kirby, J.T. and Dalrymple, R.A., 1983, "Oblique envelope solutions of the Davey-Stewartson equations in intermediate water depth", *Physics of Fluids*, **26**, 2916-2918, doi:10.1063/1.864056.
4. Kirby, J.T. and Dalrymple, R.A., 1983, "A parabolic equation for the combined refraction-diffraction of Stokes waves by mildly-varying topography", *Journal of Fluid Mechanics*, **136**, 453-466, doi:10.1017/S0022112083002232.
5. Kirby, J.T., 1984, "A note on linear surface wave-current interaction over slowly varying topography", *Journal of Geophysical Research*, **89**, 745-747, doi:10.1029/JC089iC01p00745.
6. Dalrymple, R.A., Kirby, J.T. and Hwang, P.A., 1984, "Wave diffraction due to areas of energy dissipation", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **110**, 67-79, doi:10.1061/(ASCE)0733-950X(1984)110:1(67).
7. Kirby, J.T. and Dalrymple, R.A., 1984, "Verification of a parabolic equation for propagation of weakly-nonlinear waves", *Coastal Engineering*, **8**, 219-232, doi:10.1016/0378-3839(84)90002-4.
8. Liu, P.L.-F., Yoon, S.B. and Kirby, J.T., 1985, "Nonlinear refraction-diffraction of waves in shallow water" *Journal of Fluid Mechanics*, **153**, 184-201, doi:10.1017/S0022112085001203.
9. Kirby, J.T., 1986, "A general wave equation for waves over rippled beds", *Journal of Fluid Mechanics*, **162**, 171-186, doi:10.1017/S0022112086001994.
10. Kirby, J. T., 1986, "On the gradual reflection of weakly-nonlinear Stokes waves in regions with varying topography", *Journal of Fluid Mechanics*, **162**, 187-209, doi:10.1017/S0022112086002008.
11. Kirby, J. T. and Dalrymple, R. A., 1986, "Modelling waves in surfzones and around islands", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **112**, 78-93, doi:10.1061/(ASCE)0733-950X(1986)112:1(78).

12. Kirby, J. T., 1986, "Higher-order approximations in the parabolic equation method for water waves", *Journal of Geophysical Research*, **91**, 933-952, doi:10.1029/JC091iC01p00933.

13. Dalrymple, R. A. and Kirby, J. T., 1986, "Water waves over ripples",*Journal of Waterway, Port, Coastal and Ocean Engineering*, **112**, 309-319, doi:10.1061/(ASCE)0733-950X(1986)112:2(309).

14. Kirby, J. T. and Dalrymple, R. A., 1986, "An approximate model for nonlinear dispersion in monochromatic wave propagation models", *Coastal Engineering*, **9**, 545-561, doi:10.1016/0378-3839(86)90003-7, and reply to discussions, **11**, 87-92, 1987, doi:10.1016/0378-3839(87)90041-X.

15. Kirby, J. T., 1986, "Open boundary condition in the parabolic equation method", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **112**, 460-465, doi:10.1061/(ASCE)0733-950X(1986)112:3(460).

16. Kirby, J. T., 1986, "Rational approximations in the parabolic equation method for water waves", *Coastal Engineering*, **10**, 355-378, doi:10.1016/0378-3839(86)90021-9.

17. Kirby, J. T., Dalrymple, R. A. and Seo, S. N., 1987, "Propagation of obliquely incident water waves over a trench 2. Currents flowing along the trench" *Journal of Fluid Mechanics*, **176**, 95-116, doi:10.1017/S0022112087000582.

18. Kirby, J. T., 1988, "Current effects on resonant reflection of surface water waves by sand bars", *Journal of Fluid Mechanics*, **186**, 501-520, doi:10.1017/S0022112088000242.

19. Dalrymple, R. A. and Kirby, J. T., 1988, "Models for very wide-angle water waves and wave diffraction", *Journal of Fluid Mechanics*, **192**, 33-50, doi:10.1017/S0022112088001776.

20. Kirby, J. T. and Vengayil, P., 1988, "Non-resonant and resonant reflection of long waves in varying channels", *Journal of Geophysical Research*, **93**, 10,782-10,796, doi:10.1029/JC093iC09p10782.

21. Kirby, J. T., 1988, "Parabolic wave computations in non-orthogonal coordinate systems", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **114**, 673-685, doi:10.1061/(ASCE)0733-950X(1988)114:6(673).

22. Kirby, J. T. and Chen, T-M., 1989, "Surface waves on vertically sheared flows: approximate dispersion relations", *Journal of Geophysical Research*, **94**, 1013-1027, doi:10.1029/JC094iC01p01013.

23. Dalrymple, R. A., Suh, K., Kirby, J. T. and Chae, J. W., 1989, "Models for very wide-angle water waves and wave diffraction. Part 2. Irregular bathymetry", *Journal of Fluid Mechanics*, **201**, 299-322, doi:10.1017/S0022112089000959.

24. Kirby, J. T., 1989, "A note on parabolic radiation boundary conditions for elliptic wave calculations", *Coastal Engineering*, **13**, 211-218, doi:10.1016/0378-3839(89)90049-5.

25. Kirby, J. T., 1989, "Propagation of surface waves over an undulating bed", *Physics of Fluids A*, **1**, 1898-1899, doi:10.1063/1.857515.

26. Dalrymple, R. A., Munasinghe, L. C., Wood, D. H. and Kirby, J. T., 1990, "A very wide angle acoustic model for underwater sound propagation", *Journal of the Acoustical Society of America*, **88**, 1863-1876, doi:10.1121/1.400209.

27. Suh, K. D., Dalrymple, R. A. and Kirby, J. T., 1990, "An angular spectrum model for propagation of Stokes waves", *Journal of Fluid Mechanics*, **221**, 205-232, doi:10.1017/S0022112090003548.

28. Kirby, J. T., 1991, "Intercomparison of truncated series solutions for shallow water waves", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **117**, 143-155, doi:10.1061/(ASCE)0733-950X(1991)117:2(143).

29. Bailard, J. A., DeVries, J. W. and Kirby, J. T., 1992, "Considerations in using Bragg reflection for storm erosion protection", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **118**, 62-74, doi:10.1061/(ASCE)0733-950X(1992)118:1(62).

30. Dalrymple, R. A. and Kirby, J. T., 1992, "Angular spectrum modelling of water waves", *CRC Reviews in Aquatic Sciences*, **6**, 383-404.

31. Kirby, J.T., 1993, "A note on Bragg scattering of surface waves by sinusoidal bars", *Physics of Fluids A*, **5**, 380-386, doi:10.1063/1.858861.

32. Kirby, J.T. and Lee, C., 1993, "Short waves in a rotating, shallow tank with bathymetry: a model equation in the mild-slope approximation", *SIAM Journal of Applied Mathematics*, **53**, 1381-1400, doi:10.1137/0153065.

33. Mase, H. and Kirby, J. T., 1993, "Hybrid model for nonlinear transformation of random waves", *Transactions Japanese Society of Civil Engineers*, No. 479-25, 91-100. (in Japanese)

34. Kirby, J. T., Dalrymple, R. A. and Kaku, H., 1994, "Parabolic approximations for water waves in conformal coordinate systems", *Coastal Engineering*, **23**, 185-213, doi:10.1016/0378-3839(94)90001-9.

35. Ting, F. C. K. and Kirby, J. T., 1994, "Observations of undertow and turbulence in a laboratory surfzone", *Coastal Engineering*, **24**, 51-80, doi:10.1016/0378-3839(94)90026-4.

36. Dalrymple, R. A., Kirby, J. T. and Martin, P. A., 1994, "Spectral methods for forward-propagating water waves in conformally-mapped channels", *Applied Ocean Research*, **16**, 249-266, doi:10.1016/S0141-1187(94)90015-9.

37. Lee, C. H. and Kirby. J. T., 1994, "Analytical comparison of time-dependent mild-slope equations", *Journal of the Korean Society of Coastal and Ocean Engineers*, **6**, 389-396.

38. Ting, F. C.-K. and Kirby, J. T., 1995, "Dynamics of surf-zone turbulence in a strong plunging breaker", *Coastal Engineering*, **24**, 177-204, doi:10.1016/0378-3839(94)00036-W.

39. Wei, G., Kirby, J. T., Grilli, S. T. and Subramanya, R., 1995, "A fully nonlinear Boussinesq model for surface waves. I. Highly nonlinear, unsteady waves", *Journal of Fluid Mechanics*, **294**, 71-92, doi:10.1017/S0022112095002813.

40. Kaihatu, J. M. and Kirby, J. T., 1995, "Nonlinear transformation of waves in finite water depth", *Physics of Fluids*, **7**, 1903-1914, doi:10.1063/1.868504.

41. Wei, G. and Kirby, J. T., 1995, "A time-dependent numerical code for extended Boussinesq equations", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **121**, 251-261, doi:10.1061/(ASCE)0733-950X(1995)121:5(251).

42. Ting, F. C.-K. and Kirby, J. T., 1996, "Dynamics of surf-zone turbulence in a spilling breaker", *Coastal Engineering*, **27**, 131-160, doi:10.1016/0378-3839(95)00037-2.

43. Walker, C. A., Kirby, J. T. and Dentel, S. K., 1996, "The streaming current detector: a quantitative model", *Journal of Colloid and Interface Science*, **182**, 71-81, doi:10.1006/jcis.1996.0438.

44. Chajes, M. J., Finch, W. W. and Kirby, J. T., 1996, "Dynamic analysis of a ten-story reinforced concrete building using a continuum model", *Computers and Structures*, **58**, 487-498, doi:10.1016/0043-7949(95)00166-E.

45. Chajes, M. J., Zhang, L. and Kirby, J. T., 1996, "Dynamic analysis of tall building using reduced-order continuum model", *Journal of Structural Engineering*, **122**, 1284-1291, doi:10.1061/(ASCE)0733-9443(1996)122:11(1284).

46. Özkan-Haller, H. T. and Kirby, J. T., 1997, "A Fourier-Chebyshev collocation method for the shallow water equations including shoreline runup", *Applied Ocean Research*, **19**, 21-34, doi:10.1016/S0141-1187(97)00011-4.

47. Kaihatu, J. M. and Kirby, J. T., 1998, "Two-dimensional parabolic modeling of extended Boussinesq equations", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **124**, 57-67, doi:10.1061/(ASCE)0733-950X(1998)124:2(57).

48. Chawla, A., Özkan-Haller, H. T. and Kirby, J. T., 1998, "Spectral model for wave transformation over irregular bathymetry", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **124**, 189-198, doi:10.1061/(ASCE)0733-950X(1998)124:4(189).

49. Wei, G., Kirby, J. T. and Sinha, A., 1999, "Generation of waves in Boussinesq models using a source function method", *Coastal Engineering*, **36**, 271-299, doi:10.1016/S0378-3839(99)00009-5.

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51. Özkan-Haller, H. T. and Kirby, J. T., 1999, "Nonlinear evolution of shear instabilities of the longshore current: A comparison of observations and computations", *Journal of Geophysical Research*, **104**, 25,953 - 25,984, doi:10.1029/1999JC900104.

52. Gobbi, M. F. and Kirby, J. T., 1999, "Wave evolution over submerged sills: Tests of a high-order Boussinesq model", *Coastal Engineering*, **37**, 57-96, doi:10.1016/S0378-3839(99)00015-0, and erratum, **40**, 277, 2000, doi:10.1016/S0378-3839(00)00022-3.

53. Kennedy, A. B, Chen, Q., Kirby, J. T., and Dalrymple, R. A., 2000, "Boussinesq modeling of wave transformation, breaking and runup. I: One dimension", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **126**, 39-47, doi:10.1061/(ASCE)0733-950X(2000)126:1(39).

54. Gobbi, M. F., Kirby, J. T. and Wei, G., 2000, "A fully nonlinear Boussinesq model for surface waves. II. Extension to $O(kh^4)$" , *Journal of Fluid Mechanics*, **405**, 181-210, doi:10.1017/S0022112099007247.

55. Chawla, A. and Kirby, J. T., 2000, "A source function method for generation of waves on currents in Boussinesq models", *Applied Ocean Research*, **22**, 75-83, doi:10.1016/S0141-1187(00)00005-5.

56. Kennedy, A. B., Dalrymple, R. A., Kirby, J. T. and Chen, Q., 2000, "Determination of inverse depths using direct Boussinesq modelling", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **126**, 206-214, doi:10.1061/(ASCE)0733-950X(2000)126:4(206).

57. Chen, Q., Kirby, J. T., Dalrymple, R. A., Kennedy, A. B. and Chawla, A., 2000, "Boussinesq modeling of wave transformation, breaking and runup. II: Two horizontal dimensions", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **126**, 48-56, doi:10.1061/(ASCE)0733-950X(2000)126:1(48).

58. Svendsen, I. A., Veeramony, J., Bakunin, J. and Kirby, J. T., 2000, "The flow in weak turbulent hydraulic jumps", *Journal of Fluid Mechanics*, **418**, 25-57, doi:10.1017/S0022112000008867.

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60. Shi, F., Dalrymple, R. A., Kirby, J. T., Chen, Q. and Kennedy, A., 2001, "A fully nonlinear Boussinesq model in generalized curvilinear coordinates", *Coastal Engineering*, **42**, 337-358, doi:10.1016/S0378-3839(00)00067-3.

61. Kennedy, A. B., Kirby, J. T. and Gobbi, M. F., 2002, "Simplified higher order Boussinesq equations. 1: Linear considerations", *Coastal Engineering*, **44**, 205-229, doi:10.1016/S0378-3839(01)00032-1.

62. Chawla, A. and Kirby, J. T., 2002, "Monochromatic and random wave breaking at blocking points", *Journal of Geophysical Research*, **107(C7)**, doi:10.1029/2001JC001042.

63. Misra, S. K., Kennedy, A. B. and Kirby, J. T., 2003, "An approach to determining nearshore bathymetry using remotely sensed ocean surface dynamics", *Coastal Engineering*, **47**, 265-293, doi:10.1016/S0378-3839(02)00118-7.

64. Shi, F., Kirby, J. T., Dalrymple, R. A., Chen, Q., 2003, "Wave simulations in Ponce de Leon Inlet using a Boussinesq model", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **129**, 124-135, doi:10.1061/(ASCE)0733-950X(2003)129:3(124).

65. Kennedy, A. B. and Kirby, J. T., 2003, "An unsteady wave driver for narrow-banded waves: Modeling nearshore circulation driven by wave groups", *Coastal Engineering*, **48**, 257-275, doi:10.1016/S0378-3839(03)00031-0.

66. Shi, F., Svendsen, I. A., Kirby, J. T. and Smith, J. M., 2003, "A curvilinear version of a quasi-3D nearshore circulation model", *Coastal Engineering*,**49**, 99-124, doi:10.1016/S0378-3839(03)00049-8.

67. Watts, P., Grilli, S. T., Kirby, J. T., Fryer, G. J. and Tappin, D. R., 2003, "Landslide tsunami case studies using a Boussinesq model and a fully nonlinear tsunami generation model", *Natural Hazards and Earth System Sciences*, **3**, 391-402, doi:10.5194/nhess-3-391-2003.

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71. Shi, F. and Kirby, J. T., 2005, "Curvilinear parabolic approximation for surface wave transformation using covariant-contravariant tensor method", *Journal of Computational Physics*, **204**, 562-586, doi:10.1016/j.jcp.2004.10.022.

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Additional Technical Reports

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2. Roberge, J. C. and Kirby, J. T., "Hydraulic model studies for the expansion of the port of Champerico, Guatemala", Alden Research Laboratory, Worcester Polytechnic Institute, Report No. 122-77/M350CF, September, 1977.

3. Kirby, J.T. and Brocard, D.N.,"Minimization of recirculation in submerged intakes located offshore of a diffuser discharge - a hydrothermal model study for the J.H. Campbell Electric Generating Station, Units 1 through 4", Alden Research Laboratory, Worcester Polytechnic Institute, Report No. 35-78/M182CF, February, 1978.

4. Kirby, J.T. and Brocard, D.N., "Feasibility study for various remedial plans for achieving full mixing in a discharge canal", Alden Research Laboratory, Worcester Polytechnic Institute, letter report, April, 1978.

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31. Gungordu, O. and Kirby, J. T., 2001, “Evolution of coupled hydrodynamic and bed instabilities”, Report CACR-01-04, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware, July.

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46. Tehranirad, B., Kirby, J. T., Callahan, J. A. and Shi, F., 2015, "Tsunami inundation mapping for the northern half of the State of New Jersey"', Research Report No. CACR-15-02, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware. (DRAFT)

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58. Schambach, L. and Grilli, S. T. and Kirby, J. T. and Shi, F., 2017, "Landslide tsunami hazard along the upper U. S. East Coast: Effects of slide rheology and bottom friction", Research Report No. CACR-17-04, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.

59. Zhang, C., Kirby, J. T., Ma, G., Shi, F., Grilli, S. T. and Shelby, M., 2017, "NTHMP landslide benchmark results for NHWAVE, Version 3.0", Research Report No. CACR-17-05, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.

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61. Deb, M., Abdolali, A., McDowell, C., Kirby, J. T., Sommerfield, C. and Shi, F., 2018, "Hydrodynamic, survey and sediment data collection. Bombay Hook National Wildlife Refuge, Delaware", Research Report No. CACR-18-03, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware, https://cpb-us-w2.wpmucdn.com/sites.udel.edu/dist/0/7241/files/2019/10/CACR-18-03_Bombay_Hook_Data-002.pdf.

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63. Grilli, S. T., Grilli, A. R., Inkley, T., Kirby, J. T. and Shi, F., 2020, "NTHMP status and gap analysis, U. S. East Coast work (2010-2018)", Research Report No. CACR-20-03, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware (in preparation).

64. Deb, M., Kirby, J. T., Shi, F. and Abdolali, A., 2020, "Tidal hydrodynamics in a multi-inlet wetland system: Toward improved modeling of salt marsh flooding and draining", Research Report No. CACR-20-04, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.

RECENT SEMINARS

1. "Evaluating the low frequency predictions of a Boussinesq wave model: Field cases", College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, June 2, 2003.
2. "Acceleration effects in a time-resolved cross-shore sediment transport model", College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, June 3, 2003.
3. "A progress report on various applications of the Boussinesq equations", Department of Civil and Environmental Engineering, University of Delaware, Newark, November 11, 2003.
4. "From surf to tsunami: modeling weakly dispersive shallow water waves", Inaugural lecture, E. C. Davis Professorship, College of Engineering, University of Delaware, October 5, 2004.
5. "Lectures on Boussinesq wave modeling", College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, August 2005.
6. "Modeling the 2004 Sumatra tsunami", Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, April 13, 2006.
7. "The 2004 Indian Ocean tsunami: Source determination and runup in Thailand", Department of Civil and Environmental Engineering, University of Delaware, April 2007.
8. "The 2004 Indian Ocean tsunami: Source determination and runup in Thailand", Department of Civil and Engineering, Johns Hopkins University, April 2007.
9. "Applications of Boussinesq models to surf zone flows: shear waves, rip currents and mixing", Grupo de Dinámica de Flujos Ambientales, CEAMA, Univ. de Granada, May 2010.
10. "The 2011 Tohoku tsunami: missing pieces of the puzzle?", Grupo de Dinámica de Flujos Ambientales, CEAMA, Univ. de Granada, May 2012.
11. "Multiple source mechanisms for the 2011 Tohoku-oki tsunami", Physical Ocean Sciences and Engineering, College of Earth, Ocean and Environment, University of Delaware, November 2012.
12. "Modeling ocean waves at a variety of scales", Department of Civil Engineering, Notre Dame University, March 25, 2014.
13. "Surface waves on strongly sheared currents", Applied Ocean Sciences and Engineering, Woods Hole Oceanographic Institution, Sept. 10, 2015.
14. "Dynamics of short-crested breaking waves", Dept. of Energy and Process Engineering, Norwegian University of Science and Technology, Trondheim, Sept. 20, 2017

OTHER PUBLIC PRESENTATIONS

1. "Modeling tsunamis: Science issues and social impacts", Marine Associates Meeting, College of Marine Studies, University of Delaware, March 22, 2005.
2. "Hydrodynamics of tsunami waves", Delaware Academy of Sciences, May 18, 2005.
3. "From surf to tsunami: modeling water waves from nearshore to oceanic scale", Ocean Currents Series Lecture, College of Marine Studies, Lewes, June 16, 2005.
4. "From surf to tsunami: modeling water waves from nearshore to oceanic scale", Academy of Life Long Learning, Wilmington, Sept. 28, 2005.

5. "Preparedness planning for tsunami", FEMA Region II Webinar Series, Oct. 27, 2020. (invited, with Stephan Grilli (URI) and Ed Fratto (NESEC)).

Other Activities

1. Judge, Sophomore Science Fair, Charter School of Wilmington, Wilmington, DE, January 9, 2004.

FUNDED RESEARCH PROJECTS (University of Delaware)

1. Project title: Studies of Methods for Wave Field and Mean Flow Modification near Open Coastlines
   Sponsor: Office of Naval Research
   Sponsor's Grant Number:
   P.I.: James T. Kirby
   Duration: 01/01/1990 - 12/31/1990
   Amount of support: $70,000

2. Project title: Sloshing and Wave Breaking in a Rectangular Container
   Sponsor: University of Delaware Research Foundation
   Sponsor's Grant Number:
   P.I.: James T. Kirby
   Duration: 06/01/1990 - 05/31/1991
   Amount of support: $17,000

3. Project title: Modelling Effects of Vertical Current Shear in Wave Propagation Schemes
   Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
   Sponsor's Grant Number: R/OE-9
   P.I.: James T. Kirby
   Duration: 02/01/1991 - 01/31/1993
   Amount of support: $111,198

4. Project title: Enhancements and extension to the program REF/DIF 1
   Sponsor: U. S. Army Corps of Engineers, Coastal Engineering Research Center
   Sponsor's Grant Number: DACW 39-90-D-0006-D002
   P.I.: James T. Kirby
   Duration: 01/01/1992 - 12/31/1992 ?
   Amount of support: $39,697

5. Project title: Nearshore Wave and Circulation Modelling
   Sponsor: Army Research Office (University Research Inititative)
   Sponsor's Grant Number: DAAL03-92-G-0116
   P.I.: Robert A. Dalrymple, James T. Kirby, Ib A Svendsen, Nobu Kobayashi, John D. McCalpin, Philip L. F. Liu (Cornell University)
   Duration: 07/01/1992 - 06/30/1997
   Amount of support: $\sim$ $2,000,000

6. Project title: Spectral Wave Evolution Near Tidal Inlets
   Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
   Sponsor's Grant Number: R/OE-13
   P.I.: James T. Kirby
   Duration: 02/01/1993 - 01/31/1995
   Amount of support: $126,500

7. Project title: Studies of Finite Amplitude Shear Wave Instabilities
   Sponsor: Office of Naval Research, Coastal Dynamics Program
   Sponsor's Grant Number: N00014-94-1-0214
   P.I.: James T. Kirby
   Duration: 01/01/1994 - 12/31/97
   Amount of support: $162,621

8. Project title: Study of Breaking Wave Dynamics
   Sponsor: National Science Foundation, Physical Oceanography Program
   Sponsor's Grant Number: OCE-9203277
   P.I.s: Ib A. Svendsen, James T. Kirby and Pablo I. Huq
   Duration: 07/01/1994 - 12/31/1996
   Amount of support:$360,000

9. Project title: Wave Processes Near Tidal Inlets
   Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
   Sponsor's Grant Number: R/OE-13
   P.I.: James T. Kirby
   Duration: 02/01/1995 - 01/31/1997
   Amount of support: $105,000

10. Project title: Using Hydrodynamic Models to Interpret Remote Sensing Images of the Sea Surface
    Sponsor: Office of Naval Research, Base Enhancement Program
    Sponsor's Grant Number: N00014-97-1-0283
    P.I.'s: James T. Kirby and Robert A. Dalrymple
    Duration: 01/01/1997 - 06/30/2001
    Amount of support: $526,581

11. Project title: Harbor Response to Wave Breaking on Opposing Ebb Currents
    Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
    Sponsor's Grant Number: R/OE-21
    P.I.: James T. Kirby
    Duration: 02/01/1997 - 01/31/1999
    Amount of support: $90,000

12. Project title: Hydrodynamics of the Nearshore Zone
    Sponsor: Office of Naval Research, Coastal Dynamics Program
    Sponsor's Grant Number: N00014-98-1-0521
    P.I.'s: Robert A. Dalrymple, James T. Kirby and Ib A. Svendsen
    Duration: 03/01/1998 - 09/30/1999
    Amount of support: $154,319

13. Project title: Boussinesq Modelling of Waves in Harbors and Tidal Inlets
    Sponsor: Army Research Office
    Sponsor's Grant Number: DAAG55-98-0173
    P.I.'s: James T. Kirby and Robert A. Dalrymple
    Duration: 04/15/1998 - 04/14/2001
    Amount of support: $165,000

14. Project title: Effects of Vertical Current Shear on Spatial Wave Evolution
    Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
    Sponsor's Grant Number: R/OE-24
    P.I.: James T. Kirby
    Duration: 02/01/1999 - 01/31/2001
    Amount of support: $67,000

15. Project title:Modeling Beach Morphology Changes Coupled to Incident Wave Climate and Low Frequency Currents
    Sponsor: Office of Naval Research, Coastal Dynamics Program
    Sponsor's Grant Number: N00014-99-1-0398
    P.I.'s: James T. Kirby
    Duration: 03/01/1999 - 06/30/2001
    Amount of support: $100,851

16. Project title: Development and Verification of a Comprehensive Community Model for Physical Processes in the Nearshore Ocean
    Sponsor: National Ocean Partners Program (National Science Foundation and Office of Naval Research)
    Sponsor's Grant Number: N00014-99-1-1051
    P.I.s: James T. Kirby, John Allen (Oregon State University), Tom Drake (North Carolina State University), Steve Elgar (Woods Hole Oceanographic Institution), Bob Guza (Scripps Institution of Oceanography), Dan Hanes (University of Florida), Tom Herbers (Naval Postgraduate School), James Kaihatu (Naval Research Laboratory), George Mellor (Princeton University), H. Tuba Özkan-Haller (Oregon State University), Ib A. Svendsen, Ed Thornton (Naval Postgraduate School)
    Duration: 08/01/1999 - 03/31/2005
    Amount of support: $4,360,192

17. Project title: Alongshore Propagating Waves in the Nearshore Region
    Sponsor: Office of Naval Research, Coastal Dynamics Program
    Sponsor's Grant Number: N00014-00-1-0076
    P.I.'s: James T. Kirby
    Duration: 10/01/1999 - 09/30/2000
    Amount of support: $34,647

18. Project title: Surface Wave Propagation on Vertically-Sheared Currents
    Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
    Sponsor's Grant Number: R/OE-30
    P.I.: James T. Kirby
    Duration: 02/01/2001 - 01/31/2003
    Amount of support: $75,000

19. Project title: Directional, Dissipative and Random Effects in Wave Forcing of Nearshore Circulation"
    Sponsor: Office of Naval Research, Ocean Modeling Program
    Sponsor's Grant Number:
    P.I.: J. Kaihatu, J. Veeramony and J. T. Kirby
    Duration: 10/01/2002 - 03/31/2005
    Amount of support: $246,200

20. Project title: Coupling Inner Shelf Ocean Model and a Nearshore Community Model for Wave and Current Predictions at Tidal Inlets"

Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
Sponsor's Grant Number: R/OE-31
P.I.: James T. Kirby and F. Shi
Duration: 02/01/2003 - 01/31/2005
Amount of support: $175,457

21. Project title: Coupled Wind Wave and Acoustic Model to Predict Sea Surface Roughness in Delaware Bay"
Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
Sponsor's Grant Number: R/OE-32
P.I.: James T. Kirby, M. Badiey, K. C. Wong
Duration: 02/01/2003 - 01/31/2005
Amount of support: $271,131

22. Project title: Parameterization of a Two-Phase Sheet Flow Model and Application to Nearshore Morphology
Sponsor: Office of Naval Research, Coastal Geosciences Program
Sponsor's Grant Number:
P.I.'s: J. T. Kirby, T.-J. Hsu, S. Elgar, D. M. Hanes
Duration: 10/01/2003 - 09/30/2005
Amount of support: $71,378

23. Project title: Collaborative Research: CROSSTEX - Experimental Study of Onshore Bar Movement
Sponsor: National Science Foundation, Physical Oceanography Program
P.I.s: H. T. Ozkan-Haller, M. C. Haller, J. T. Kirby
Duration: 06/01/2004 - 12/31/2007
Amount of support: $270,637 (Delaware)

24. Project title: Generation and transport of vorticity and effects on mean surfzone currents: wave-averaged and wave-resolving formulations
Sponsor: Office of Naval Research, Coastal Geosciences Program
P.I.: J. T. Kirby
Duration: 10/1/2004 - 9/31/2006
Amount of support: $123,577

25. Project title: Real-time surface wave measurement and modeling in Delaware Bay
Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
Sponsor's Grant Number: R/OE-xx
P.I.: James T. Kirby, M. Badiey, K. C. Wong
Duration: 02/01/2003 - 01/31/2005
Amount of support: $169,138

26. Project title: Field observations and predictions of rip currents
Sponsor: Delaware Sea Grant College (U. S. Department of Commerce)
Sponsor's Grant Number: R/OE-xx
P.I.: James T. Kirby
Duration: 02/01/2003 - 01/31/2005
Amount of support: $128,104

27. Project title: Parallel computing facilities for ONR-sponsored nearshore and coastal ocean research
Sponsor: ONR DURIP program

Sponsor's Grant Number: N00014-05-1-0752
PI: James T. Kirby, A. D. Kirwan, B. Lipphardt and F. Shi
Duration: 6/1/2005-4/31/2006
Amount of support: $142,639

28. Project title: Enhancement of the NearCoM model for nearshore hydrodynamics
Sponsor: ONR Coastal Geosciences
Sponsor's Grant number: N00014-05-1-0423
PI: J. T. Kirby
Duration: 5/1/2005-6/30/2006
Amount of support: $49,075

29. Project title: Operation and maintenance of a video beach observing system at Sea Colony, Bethany Beach, DE
Sponsor: State of Delaware Department of Natural Resources (DNREC)
PI: J. T. Kirby
Duration: 11/01/2005 - 6/30/06
Amount of support: $14,825.40

30. Project title: Community sediment transport model
Sponsor: NOPP, subcontract to WHOI
P.I.: C. Sherwood, W. R. Geyer, T. R. Keen (Kirby co-PI)
Duration: 06/01/2006-12/31/2009
Amount of support: $150,000 (UD), $2,700,000 (overall)

31. Project title: Generation, transport and fate of surfzone bubbles
Sponsor: ONR Coastal Geosciences
P.I. J. T. Kirby, F. Shi
Duration: 02/01/07-9/30/09
Amount of support: $350,218.

32. Project title: Video-based bathymetric determination for rip current studies
PIs: James T. Kirby, Chandra Kambhamettu, Jamie MacMahan
Sponsor: Sea Grant
Amount: $140,000
Duration: 02/01/07-01/31/09

33. Project title: ESMF coupling of meteorology, ocean and nearshore models for use in predicting coastal inundation.
PIs: Fengyan Shi, James T. Kirby
Sponsor: Sea Grant
Amount: $125,600
Duration: 02/01/07-01/31/09

34. Project title: Understanding rip current outbreaks and tracking victims in a rip current
PIs: Jamie MacMahan, Fengyan Shi and James T Kirby
Sponsor: Sea Grant
Amount: $139,900
Duration: 02/01/07-01/31/09

35. Project title: Effects of oceanographic variability on underwater communications
PIs: W. Hodgkiss (SIO) et IX alia. (J. T. Kirby and M. Badiey, UD)
Sponsor: ONR MURI program
Amount: $4,500,000 (total, estimate), $850,000 (UD, estimate)
Duration: ??/??/07-??/??/12

36. Project title: Generation, transport and fate of surfzone bubbles
    PIs: James T. Kirby and Fengyan Shi
    Sponsor: ONR Coastal Geosciences
    Amount: $390,000
    Duration: 3/1/07-9/30/09

37. Project title: Collaborative Research: Rip current dynamics in a complex beach environment
    PIs: James T. Kirby (UD), Jamie MacMahan, Tim Stantoin, Ed Thornton (NPGS), Ad Reniers (U. Miami)
    Sponsor: NSF Physical Oceanography
    Amount:$229,214 (UD)
    Duration: 12/1/07-11/30/10

38. Project Title: Validation of a coupled model system for Delaware Bay and adjacent coasal region
    PIs: James T. Kirby
    Sponsor: Sea Grant
    Amount:$150,144
    Duration: 2/1/09-1/31/11

39. Project Title: CHRP07: Modeling hypoxia and ecological responses to climate and nutrients
    PIs: W. Kemp (U. MD) et alia (D. DiToro and J. T. Kirby, UD)
    Sponsor: NOAA Coastal Hypoxia Research Program (CHRP)
    Amount: $2,321,845 Duration: 7/1/07-6/30/12

40. Project Title: Collaborative research: The dynamics of sediment-laden river plume and initial deposition off small mountainous rivers
    PI's: T-J Hsu and J. T. Kirby (UD), W. R. Geyer (WHOI)
    Sponsor: NSF Physical Oceanography
    Amount:$450,361 (UD) Duration: 9/1/09-8/31/12

41. Project Title: Simulating surf zone bubbles
    PI's: J. T. Kirby and F. Shi
    Sponsor: ONR Coastal Geosciences
    Amount: $496,628
    Duration: 10/1/09-9/31/12

42. Project Title: Best practices for physical processes and impact assessment in support of dredging operations on the U. S. outer continental shelf
    PI's: J-T Kirby (UD), J. Ramsey (ACE), S. Misra (Gerwick, Inc.)
    Sponsor: Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE)
    Amount: $490,000 ($140,000 UD)
    Duration: 10/1/10-9/30/12

43. Project Title: Modeling tsunami inundation and assessing tsunami hazards for the U. S. east coast
    PI's: J. T. Kirby (UD), S. T. Grilli, (URI)
    Sponsor: NTHMP (NOAA)
    Amount:
    Duration: 9/1/10-8/31/14

44. Project Title: A process-based model of long term marsh platform and shoreline evolution in response to rising sea level and subsurface flow
    PI's: J. T. Kirby and F. Shi
    Sponsor: Delaware Sea Grant College (NOAA)
    Amount: $57,073
    Duration: 2/1/11-1/31/12

45. Project Title: A process-based model of long term marsh platform and shoreline evolution in response to rising sea level and changing sediment supplies

PI's: J. T. Kirby and F. Shi
Sponsor: Delaware Sea Grant College (NOAA)
Amount: $121,226
Duration: 2/1/12-1/31/14

46. Project Title: Surfzone bubbles: Model development, testing and extension to chemical/biological processes
PI's: J. T. Kirby and F. Shi
Sponsor: ONR Littoral Geosciences and Optics
Amount: $322,406
Duration: 10/1/12-9/30/15

47. Project Title: Interactions of waves, tidal currents and riverine outflow and their effects on sediment transport
PI's: T. J. Hsu, F. Shi and J. T. Kirby
Sponsor: ONR Littoral Geosciences and Optics
Amount: $322,406
Duration: 12/1/12-11/30/14

48. Project Title: Interactions of waves, tidal currents and riverine outflow and their effects on the delivery and resuspension of sediments in the near field
PI's: J. T. Kirby, T. J. Hsu, F. Shi (UD) and G. Ma (ODU)
Sponsor: NSF Physical Oceanography
Amount: $483,437 (UD)
Duration: 9/1/13 - 8/31/17

49. Project Title: Modeling tsunami inundation and assessing tsunami hazards for the U. S. east coast (Phase 2)
PI's: J. T. Kirby (UD), S. T. Grilli, (URI)
Sponsor: NTHMP (NOAA)
Amount:$144,056
Duration: 9/1/13-8/31/15

50. Project Title: Extension of NHWAVE for modeling wave-ice floe interaction
PI's: F. Shi, J. T. Kirby
Sponsor: Office of Naval Research
Amount: $83,557
Duration: 10/1/13-9/30/15

51. Project Title: Extending models of surface hydrodynamics in complex natural and modified tidal marsh environments
PI's: J. T. Kirby and F. Shi
Sponsor: Delaware Sea Grant College (NOAA)
Amount: $70,000
Duration: 2/1/14-1/31/16

52. Project Title: A hydrodynamic modeling system for the Delaware coast environment PI's: T. Kukulka, J. T. Kirby and F. Shi
Sponsor: State of Delaware DNREC
Amount: $243,605
Duration: 8/1/14-7/30/17

53. Project Title: Modeling tsunami inundation and assessing tsunami hazards for the U. S. east coast (Phase 3)
PI's: J. T. Kirby (UD), S. Grilli (URI)
Sponsor: NTHMP (NOAA)
Amount:$175,000
Duration: 9/1/14 - 8/31/15

54. Project Title: Wave breaking across the inner shelf and nearshore regions
    PI's: J. T. Kirby, F. Shi
    Sponsor: NSF Physical Oceanography
    Amount: $363,133
    Duration: 9/1/14 - 8/31/17

55. Project Title: Modeling, validation and accretion data for Bombay Hook NWR
    PI's: J. T. Kirby, C. Sommerfield, F. Shi
    Sponsor: National Fish and Wildlife Foundation
    Sponsors Grant Number:
    Amount: $400,000
    Duration: 10/1/14 - 9/31/16

56. Project Title: Modeling tsunami inundation and assessing tsunami hazards for the U. S. east coast (Phase 4)
    PI's: J. T. Kirby (UD), S. Grilli (URI)
    Sponsor: NTHMP (NOAA)
    Sponsors Grant Number:
    Amount:$248,000
    Duration: 9/1/15 - 8/31/17

57. Project Title: Collaborative Research: Development, experimental validation and case studies for the next generation of landslide tsunami models for coastal hazard mitigation
    PI's: S. T. Grilli (URI), J. T. Kirby (UD), G. Ma (ODU)
    Sponsor: NSF CMMI- Engineering for Natural Hazards (ENH)
    Sponsors Grant Number:
    Amount: $244,995 (UD portion)
    Duration: 9/1/15 - 8/31/18

58. Project Title: Frontal structures in the Columbia River plume nearfield - a non-hydrostatic coastal modeling study
    PI's: T. J. Hsu, F. Shi and J. T. Kirby
    Sponsor: ONR Littoral Geosciences and Optics
    Sponsors Grant Number:
    Amount: $322,406
    Duration: 10/1/15 - 9/30/17

59. Project Title: Coupling geomorphological and ecological processes in numerical simulations of Delaware salt marsh evolution
    PI's: J. T. Kirby and F. Shi
    Sponsor: Delaware Sea Grant College (NOAA)
    Sponsors Grant Number:
    Amount: $135,636
    Duration: 2/1/16-1/31/18

60. Project Title: U. S. East Coast: Maritime assessments and improvements to source and inundation modeling procedures
    PI's: J. T. Kirby (UD), S. Grilli (URI)
    Sponsor: NTHMP (NOAA National Weather Service)
    Sponsors Grant Number: NA16NWS4670034
    Amount:$236,658
    Duration: 9/1/16 - 8/31/18

61. Project Title: Development and validation of ship-wake generation in FUNWAVE-TVD for predicting ship-wake effects on adjacent shorelines
    PI's: F. Shi and J. T. Kirby
    Sponsor: US Army Corps of Engineers

Amount: $144,953
Duration: 9/27/16 - 9/26/17

62. Project Title: Ship-wake modeling
PI's: F. Shi and J. T. Kirby
Sponsor: US Army Corps of Engineers
Sponsor's Grant Number: W912HZ17P0129
Amount: $147,866
Duration: 7/30/17 - 7/30/18

63. Project Title: Frontal structures and surface signatures revealed by non-hydrostatic eddy resolving numerical simulations
PI's: T. J. Hsu, F. Shi and J. T. Kirby
Sponsor: Office of Naval Research
Sponsor's Grant Number: N00014-17-1-2796
Amount: $332,525
Duration: 8/01/17 - 7/31/20

64. Project Title: U. S. East Coast: Maritime assessments and improvements to source and inundation modeling procedures
PI's: J. T. Kirby (UD), S. Grilli (URI)
Sponsor: NTHMP (NOAA National Weather Service)
Sponsor's Grant Number: NA17NWS4670010
Amount:$120,290
Duration: 9/1/17 - 8/31/19

65. Project Title: Implementing a subgrid scheme for improving marsh inundation estimates in the community model FVCOM
PI's: J. T. Kirby, F. Y. Shi
Sponsor: Delaware Sea Grant College (NOAA)
Sponsor's Grant Number:
Amount:$115,390
Duration: 2/1/18 - 1/31/20

66. Project Title: Collaborative Research: Ocean wave dissipation through breaking and bubble generation
PI: J. T. Kirby (with M. Derakhti and J. Thomson, UW-APL)
Sponsor: National Science Foundation, Physical Oceanography Program
Sponsor's Grant Number: OCE-1756355
Amount: $145,500
Duration: 3/1/18 - 2/28/21

67. Project Title: U. S. East Coast: Maritime assessments and improvements to source and inundation modeling procedures
PI's: J. T. Kirby (UD), S. Grilli (URI)
Sponsor: NTHMP (NOAA National Weather Service), subcontract through NESEC
Sponsor's Grant Number: NA18NWS4670010
Amount:$120,290
Duration: 9/1/18 - 8/31/19

68. Project Title: U. S. East Coast: Maritime assessments and improvements to source and inundation modeling procedures
PI's: J. T. Kirby (UD), S. Grilli (URI)
Sponsor: NTHMP (NOAA National Weather Service), subcontract through NESEC
Sponsor's Grant Number: NA19NWS4670010
Amount:$120,290
Duration: 9/1/19 - 8/31/21

69. Project Title: Collaborative Research: Modeling wave breaking onset and dissipation in energy-conserving models for surface waves
PI: J. T. Kirby (with M. Derakhti and J. Thomson, UW-APL, and Stephan Grilli, URI)
Sponsor: National Science Foundation, Physical Oceanography Program
Sponsor's Grant Number: OCE-1948705
Amount: $238,685
Duration: 4/1/20 - 3/31/22

70. Project Title: United States East Coast tsunami hazard program
PI's: J. T. Kirby (UD), S. Grilli (URI), E. Fratto (NESEC, lead)
Sponsor: NTHMP (NOAA National Weather Service), subcontract through NESEC
Sponsor's Grant Number: NA20NWS4670061-SUUD
Amount:$67,349
Duration: 9/1/20 - 8/31/21

71. Project Title: Collaborative Research: Experimental and numerical study of bed shear stress and turbulent boundary layer structure induced by breaking-wave-generated vortices
PI: J. T. Kirby (with F. C. K. Ting, South Dakota State University, and M. Derakhti, U. Washington
Sponsor: National Science Foundation, Physical Oceanography Program
Sponsor's Grant Number: OCE-2048844
Amount: $390,198
Duration: 7/1/21 - 6/30/24

72. Project Title: ROXSI: Rocky shore eXperiments and Simulations
PI: J. T. Kirby (UD), with J. H. MacMahan (NPS), F. Feddersen (UCSD), G. Wilson, (Oregon State U.), J. Rosman (UNC), S. Suanda (UNC-Wilmington)
Sponsor: Office of Naval Research, FY2021 Multidisciplinary University Research Initiative (MURI)
Sponsor's Grant Number: N00014-21-1-2700
Amount:
Duration: 8/1/21 - 7/31/26

73. Project Title: United States East Coast tsunami hazard program
PI's: J. T. Kirby (UD), S. Grilli (URI), E. Fratto (NESEC, lead)
Sponsor: NTHMP (NOAA National Weather Service), subcontract through NESEC
Sponsor's Grant Number: NA21NWS4670007-SUD
Amount: $165,729
Duration: 9/1/21 - 8/31/23

74. Project Title: United States East Coast tsunami hazard program
PI's: J. T. Kirby (UD), S. Grilli (URI), E. Fratto (NESEC, lead)
Sponsor: NTHMP (NOAA National Weather Service), subcontract through NESEC
Sponsor's Grant Number: NA22NWS4670017-SUD
Amount: $74,749
Duration: 9/1/22 - 8/31/23

EDUCATIONAL ACTIVITIES

Graduate Degrees Supervised

University of Florida

1. Padmaraj Vengayil, Master of Science, 1986. "Shoaling and reflection of nonlinear shallow water waves".

2. Haruhiko Kaku, Master of Science, 1987. "A parabolic equation method in polar coordinates for waves in harbors".

3. Renji Philip, Master of Science, 1988. "Numerical simulation of shallow water waves".

4. Jeffrey P. Anton, Master of Science, 1989. "Resonant and non-resonant reflection of linear waves over rapidly varying bottom undulations".

5. Thomas R. McSherry, Master of Science, 1989. "Wave-current interaction over a submerged bar field."

University of Delaware

1. Christina A. Rasmussen, Master of Civil Engineering, 1992. "Transient numerical modeling of the mild-slope equation".

2. H. Tuba Özkan-Haller, Master of Civil Engineering, 1993. "Evolution of breaking directional spectral waves in the nearshore zone".

3. Glenn D. Bowen, Master of Civil Engineering, 1994. "Shoaling and breaking random waves on a 1:35 laboratory beach".

4. Changhoon Lee, Ph.D. Civil Engineering, 1994. "A study of time-dependent mild-slope equations".

5. James M. Kaihatu, Ph.D. Civil Engineering, 1994. "Frequency domain models for nonlinear finite depth water wave propagation".

6. Arun Chawla, Master of Civil Engineering, 1995. "Wave transformation over a submerged shoal".

7. John Bakunin, Master of Civil Engineering, 1995. "Experimental study of hydraulic jumps in low Froude number range".

8. Ge Wei, Ph.D. Civil Engineering, 1997. "Simulation of water waves by Boussinesq models".

9. H. Tuba Özkan-Haller, Ph.D. Civil Engineering, 1997. "Nonlinear evolution of shear instabilities of the longshore current".

10. Mauricio F. Gobbi, Ph.D. Civil Engineering, 1998. "A new Boussinesq-type model for surface water wave propagation".

11. Arun Chawla, Ph.D. Civil Engineering, 1999. "An experimental study on the dynamics of wave blocking and breaking on opposing currents".

12. Shubhra Misra, Master of Civil Engineering, 1999. "Determining water depths from surface images using Boussinesq equations".

13. Lisa Hommel, Master of Civil Engineering, 2000. "Vortex formation resulting from solitary wave interaction with a breakwater".

14. Ozgur Gungordu, Master of Civil Engineering, 2001. "Evolution of coupled hydrodynamic and bed instabilities".

15. Furong Zhen, Master of Civil Engineering, 2004. "On the numerical properties of staggered vs. non-staggered grid schemes for a Boussinesq equation model".

16. Shubhra Misra, Ph.D.Civil Engineering, 2005. "The turbulent dynamics of quasi-steady spilling breakers - Theory and experiment".

17. Wenting Qin, Master of Civil Engineering, 2005. "Application of the spectral wave model SWAN in Delaware Bay" (co-advised with Mohsen Badiey, CMS)

18. Wen Long, Ph. D. Civil Engineering, 2006. "Boussinesq modeling of waves, currents and sediment transport".

19. Long Xu, Master of Civil Engineering, 2006, "Numerical study in Delaware Inland Bays" (co-advised with Dom DiToro, CEE).

20. Todd DeMunda, Master of Civil Engineering, 2006, "A system for video observation of nearshore processes".

21. Pablo Teran, Master of Civil Engineering, 2007. "Model simulations of bar evolution on a large scale laboratory beach"

22. Allison Bridges, Master of Civil Engineering, 2008. "The effect of model seagrass on wave runup. A laboratory investigation"

23. Joseph Geiman, Master of Ocean Engineering, 2008. "Vorticity dynamics in the presence of shallow water waves"

24. Rob Hampson, Master of Civil Engineering, 2008. "Video-based nearshore depth inversion using WDM method".

25. Jeff Brown, Master of Civil Engineering, 2008. (Joint with J. H. MacMahan), "Lagrangian field observations of rip currents"

26. Cihan Bayandir, Master of Civil Engineering, 2009, (Joint with M. Badiey), "Impact of linear and nonlinear surface gravity waves on high frequency acoustic propagation"

27. Jennifer Brown, Master of Civil Engineering, 2009, (joint with J. H. MacMahan), "Field measurements and modeling of surfzone currents on inhomogeneous beaches".

28. Yunfeng Chen, Master of Civil Engineering, 2010, (Joint with F. Shi), "Coupling of wave and circulation models for predicting storm-induced waves, surges, and coastal inundation".

29. Phil Castellano, Master of Civil Engineering, 2011, "Validation of a hydrodynamic model of Delaware Bay and the adjacent coastal region".

30. Joseph Geiman, Ph.D. Ocean Engineering, 2011, "Forced vortex dynamics in the surf zone".

31. Gangfeng Ma, Ph.D. Civil Engineering, 2012, "Multiscale numerical study of turbulent flow and bubble entrainment in the surf zone".

32. Nuttita Pophet, Master of Ocean Engineering, 2012, "Parallel implementation of a three-dimensional nonlinear wave model for random directional seas".

33. Morteza Derakhti, Master of Civil Engineering, 2013, "Bubble entrainment and liquid-bubble interaction under unsteady breaking waves".

34. Ryan Mieras, Master of Civil Engineering, 2014, "A high-resolution numerical model investigation into the response of a channelized salt marsh to a storm surge event".

35. Morteza Derakhti, Ph. D. Civil Engineering, 2016, "LES and σ-coordinate RANS simulations of laboratory surface wave breaking".

36. Babak Tehranirad, Ph. D. Civil Engineering, 2016, "Does morphological adjustment during tsunami inundation increase levels of hazard?".

37. Zhifei Dong, Ph. D. Ocean Engineering, 2016, "Wave-current interaction in strongly sheared mean flows".

38. Saeideh Banihashemi, Ph. D. Civil Engineering, 2019, "Waves and strongly sheared currents: Extensions to coastal ocean models".

39. Cheng Zhang, Ph. D. Civil Engineering, 2020, "A two-layer non-hydrostatic landslide model for tsunami generation on irregular bathymetry".

40. Mithun Deb, Ph. D. Civil Engineering, 2020, "Tidal hydrodynamics in a multi-inlet wetland system: Toward improved modeling of salt marsh flooding and draining".

41. Maria Fotia, Ph. D. expected 2023.
42. Daniel Sharar-Salgado, MCE expected 2023.
43. Chris Malone, MCE expected 2024.
44. Mateo Mezic, Ph. D. expected 2025.
45. Sudhanshu, Ph. D. expected 2025.

Supervision of Postdoctoral Scholars

Listed with co-advisors (if any) and present affiliations

1. Francis C. K. Ting, 1989 - 1991, South Dakota State University
2. Qin J. Chen, 1997 - 2000, (with Tony Dalrymple), Northeastern University
3. Andrew B. Kennedy, 1997 - 2001, (with Tony Dalrymple), Notre Dame University
4. Ali Abdolali, 2015 - 2017, National Weather Service
5. Morteza Derakhti, 2016 - 2017, University of Washington - Applied Physics Lab

Courses Taught at University of Delaware

1. CIEG 125, "Introduction to Civil Engineering". Occasional guest lectures and laboratory tours.
2. MECH 305/CIEG 305, "Fluid Mechanics"
3. MECH 306/CIEG 306, "Fluid Mechanics Laboratory"
4. CIEG 639, "Hydromechanics" (now "Ocean Fluid Dynamics"). Existing course, providing first semester graduate students with an introduction to the differential equation approach to fluid mechanics.
5. CIEG 672, "Water Wave Mechanics". Existing course, providing first semester graduate students an introduction to the linear theory of surface water waves.
6. CIEG 681, "Water Wave Spectra". Existing course providing an introduction to spectral time series analysis in the context of ocean waves and other marine phenomena.
7. CIEG 682. "Nearshore Processes". Existing course. Introduction to physical basis for wave-current interaction and wave-driven surfzone processes.
8. CIEG 684, "Numerical Methods in Coastal Modeling". New course. Introduction to numerical methods for partial differential equations, with applications to parabolic, hyperbolic and elliptic model equation systems appearing in coastal engineering applications.
9. CIEG 693/MAST 693, "Waves in the Marine Environment". New course developed in conjunction with Mohsen Badiey, CMS. Course provides a broad based introduction to wave processes in the marine environment, including water gravity waves, acoustic waves, seismic waves and electromagnetic waves. Course is required for graduate students in the CEOE POSE program.
10. CIEG 872, "Advanced Water Wave Mechanics". Existing course providing an introduction to the nonlinear theories of surface water waves.

A textbook, "Waves in the Nearshore and Coastal Ocean", covering the content of CIEG672, CIEG 682 and CIEG 872, is in preparation for publication by *World Scientific*.

Recent Consulting Activities

1. Mactec, Inc., 2009, 2011.

   Tsunami simulations as part of flood analysis for an NRC licensing effort for a proposed expansion for an East Coast nuclear power plant.

2. Sargent & Lundy, 2011.

   Tsunami simulations as part of flood analysis for an NRC licensing effort for a proposed Gulf Coast nuclear power plant.

3. Bechtel, Inc., 2012-2013.

   Tsunami simulations as part of flood analysis for an NRC licensing effort for expansion of an East Coast nuclear power plant.

4. CH2M-Hill, Inc., 2012-2013.

   Tsunami simulations as part of flooding reanalysis for an existing West Coast nuclear power plant.

5. AMEC, Inc., 2013-2014.

   Tsunami hazard assessment as part of flooding reanalysis for East Coast nuclear power plant.

6. Water Institute of the Gulf, 2013.

   Evaluation of storm surge protection system for New Orleans, LA.

7. Chevron, 2014-2015.

   Landslide tsunami hazard analysis.

8. State of Alaska, 2014.

   Simulations of wave activity and harbor resonance in a small fishing harbor.

9. DHI, 2019-2020.

   Tsunami hazard analysis and mapping for the Capitol Regional District, Vancouver Island, Canada.

Recent Short Courses and Workshop Supervision

1. Coastal modeling, *30th Intl. Conf. Coastal Engineering*, San Diego, September 2, 2006.
2. Modeling shallow water waves, *CEAMA, Univ. of Granada*, May 2012.
3. Benchmark testing of landslide tsunami generation models, Galveston, TX, Jan. 9-11, 2017 (NTHMP)
4. FUNWAVE Workshop, University of Delaware, July 25-27, 2017 (Supported by USACE ERDC Coastal Hydrodynamics Lab).
5. FUNWAVE Workshop, Hohai University, Nanjing, China, October 18-20, 2019.