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Personal

- Nationality: U.S.
- Date of Birth: December 25, 1952
- Marital Status: Married, three children

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 and Environmental Engineering, Department of Civil and Environmental Engineering, University of Delaware, 2003-present.
- Professor of Civil and Environmental Engineering, Department of Civil and Environmental Engineering, University of Delaware, 1994-2002. Secondary appointment in College of Marine Studies, University of Delaware, as Professor of Oceanography, 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 of Oceanography, 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
 - 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.
 - * Assistant Editor, *Journal of Waterway, Port, Coastal and Ocean Engineering*, 1994 - 1996.
 - * Editor, *Journal of Waterway, Port, Coastal and Ocean Engineering*, 1996 - 2000.
 - * Member, Technical Committee, *WAVES '01*, San Francisco, September 2001.
 - 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.
 - * Associate Editor, *Journal of Engineering Mechanics*, 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
 - Organizer, Nearshore Hydrodynamics sessions, *American Geophysical Union Fall Meeting*, December 1992.
 - Editor, *Journal of Geophysical Research - Oceans*, 2003-2006.
 - Editor-in-Chief, *Journal of Geophysical Research - Oceans*, 2006-2009.

Technical Advisory Panels and Committees

1. Member, Advisory Committee, NSF Network for Earthquake Engineering and Simulation (NEES), Tsunami Basin Project, 2001-2005.
2. Member, NSF Physical Oceanography Review Panel, May 2002.
3. Co-organizer, NSF Workshop on model validation and benchmarking for tsunami generation by submarine mass failure, University of Hawaii, May 30-31, 2003.
4. Member, Nearshore Advisory Group - informal advisory panel appointed to assist ONR and NSF program managers in areas of nearshore physical oceanography.
5. Member (East Coast Technical Representative), Coordinating Committee, National Tsunami Hazard Mitigation Program, NOAA, 2008-present.
6. Mapping and Modeling Subcommittee, National Tsunami Hazard Mitigation Program, NOAA, 2008-present.
7. Member, NSF CBET Review Panel, January 2009.

Academic Advisory Panels

1. National Advisory Board, Department of Naval Architecture and Marine Engineering, University of Michigan, 2005-2008.

Prizes and Honors

Walter L. Huber Civil Engineering Research Prize, American Society of Civil Engineers, 1992.
Nominated for University Excellence in Teaching Award, 2008.

Research Interests

Numerical modeling and laboratory investigation of ocean surface waves, tsunamis, wave-driven circulation and resulting sediment transport. Linear and nonlinear signal processing and nonlinear dynamics. Bubbles in the ocean and their influence on acoustic and optical signals. Oxygen dynamics in small coastal embayments.

PUBLICATIONS

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.
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.
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.
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.
5. Kirby, J.T., 1984, "A note on linear surface wave-current interaction over slowly varying topography", *Journal of Geophysical Research*, **89**, 745-747.
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.
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.
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.
9. Kirby, J.T., 1986, "A general wave equation for waves over rippled beds", *Journal of Fluid Mechanics*, **162**, 171-186.
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.

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.
12. Kirby, J. T., 1986, "Higher-order approximations in the parabolic equation method for water waves", *Journal of Geophysical Research*, **91**, 933-952.
13. Dalrymple, R. A. and Kirby, J. T., 1986, "Water waves over ripples", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **112**, 309-319.
14. Kirby, J. T. and Dalrymple, R. A., 1986, "Approximate modelling of nonlinear dispersion in monochromatic wave models", *Coastal Engineering*, **9**, 545-561, and reply to discussions, **11**, 87-92, 1987.
15. Kirby, J. T., 1986, "Open boundary condition in the parabolic equation method", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **112**, 460-465.
16. Kirby, J. T., 1986, "Rational approximations in the parabolic equation method for water waves", *Coastal Engineering*, **10**, 355-378.
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.
18. Kirby, J. T., 1988, "Current effects on resonant reflection of surface water waves by sand bars", *Journal of Fluid Mechanics*, **186**, 501-520.
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.
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.
21. Kirby, J. T., 1988, "Parabolic wave computations in non-orthogonal coordinate systems", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **114**, 673-685.
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.
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.
24. Kirby, J. T., 1989, "A note on parabolic radiation boundary conditions for elliptic wave calculations", *Coastal Engineering*, **13**, 211-218.
25. Kirby, J. T., 1989, "Propagation of surface waves over an undulating bed", *Physics of Fluids A*, **1**, 1898-1899.
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.
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.
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.
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.
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.

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.
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.
35. Ting, F. C. K. and Kirby, J. T., 1994, "Observations of undertow and turbulence in a laboratory surfzone", *Coastal Engineering*, **24**, 51-80.
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.
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.
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.
40. Kaihatu, J. M. and Kirby, J. T., 1995, "Nonlinear transformation of waves in finite water depth", *Physics of Fluids*, **7**, 1903-1914.
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.
42. Ting, F. C.-K. and Kirby, J. T., 1996, "Dynamics of surf-zone turbulence in a spilling breaker", *Coastal Engineering*, **27**, 131-160.
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.
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.
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.
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.
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.
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.
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.
50. Chen, Q., Dalrymple, R. A., Kirby, J. T., Kennedy, A. and Haller, M. C., 1999, "Boussinesq modeling of a rip current system", *Journal of Geophysical Research*, **104**, 20,617 - 20, 637.
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.

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, and erratum, **40**, 277, 2000.
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.
54. 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.
55. 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.
56. 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.
57. 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.
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.
59. Kennedy, A. B., Kirby, J. T., Chen, Q. and Dalrymple, R. A., 2001, "Boussinesq-type equations with improved nonlinear behaviour", *Wave Motion*, **33**, 225-243.
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.
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.
62. Chawla, A. and Kirby, J. T., 2002, "Current limited wave breaking at or before the blocking point in monochromatic and random waves", *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.
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.
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.
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.
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.
68. Chen, Q., Kirby, J. T., Dalrymple, R. A., Shi, F. and Thornton, E. B., 2003, "Boussinesq modeling of longshore currents", *Journal of Geophysical Research*, **108**(C11), 3362, doi:10.1029/2002JC001308.
69. Day, S. J., Watts, P., Grilli, S. T. and Kirby, J. T., 2005, "Mechanical models of the 1975 Kalapana, Hawaii earthquake and tsunami", *Marine Geology*, **215**, 59-92.
70. Thomas, M., Misra, S., Kambhamettu, C. and Kirby, J. T., 2005, "A robust motion estimation algorithm for PIV", *Measurement Science and Technology*, **16**, 865-877.

71. Shi, F. and Kirby, J. T., 2005, "Curvilinear parabolic approximation for surface wave transformation using covariant-contravariant tensor method", *J. Computational Physics*, **204**, 562-586.
72. Misra, S. K., Thomas, M., Kambhamettu, C., Kirby, J. T., Veron, F. and Brocchini, M., 2006, "Estimation of complex air-water interfaces from PIV images", *Experiments in Fluids*, **40**, doi 10.1007/s00348-006-0113-1.
73. Terrile, E., Briganti, R., Brocchini, M. and Kirby, J. T., 2006, "Topographically-induced enstrophy production/dissipation in coastal models", *Physics of Fluids*, **18**(12), 126603.
74. Kaihatu, J. M., Veeramony, J., Edwards, K. L. and Kirby, J. T., 2007, "Asymptotic behavior of frequency and wavenumber spectra of nearshore shoaling and breaking waves", *J. Geophys. Res.*, **112**, C06016, doi:10.1029/2006JC003817.
75. Ioualalen, M., J. A. Asavanant, N. Kaewbanjak, N., Grilli, S. T., Kirby, J. T. and Watts, P., 2007, "Modeling of the 26th December 2004 Indian Ocean tsunami: Case study of impact in Thailand", *J. Geophys. Res.*, **112**, C07024, doi:10.1029/2006JC003850.
76. Grilli, S. T., Ioualalen, M., Asavanant, J., Shi, F., Kirby, J. T. and Watts, P., 2007, "Source constraints and model simulation of the December 26, 2004 Indian Ocean tsunami", *J. Waterway, Port, Coast. and Ocean Engrng.*, **133**, 414-428.
77. Shi, F., Kirby, J. T. and Hanes, D. M., 2007, "An efficient mode-splitting method for a curvilinear nearshore circulation mode", *Coastal Engineering*, **54**, 811-824.
78. Long, W., Kirby, J. T. and Shao, Z., 2008, "A numerical scheme for morphological bed level calculations", *Coastal Engineering*, **55**, 167-180.
79. Misra, S., Kirby, J. T., Brocchini, M., Veron, F., Thomas, M. and Kambhamettu, C., 2008, "The mean and turbulent flow structure of a weak hydraulic jump", *Phys. Fluids*, **20**, 035106.
80. Terrile, E., Brocchini, M., Christensen, K. H. and Kirby, J. T., 2008, "Dispersive effects on wave-current interaction and vorticity transport in nearshore flows: a GLM approach", *Phys. Fluids*, **20**, 036602.

Journal papers submitted

1. Waythomas, C. F., Watts, P., Shi, F. and Kirby, J. T., "Pacific basin tsunami hazards associate with mass flows in the Aleutian Arc of Alaska", submitted to *Quaternary Science Reviews*, under revision.
2. Debsarma, S., Das, K. P. and Kirby, J. T., "Fully nonlinear higher order model equations for long internal waves in a two-fluid system", submitted to *J. Fluid Mech.*, Jan. 2009
3. Shi, F., Kirby, J. T. and Hanes, D. M., "Alongshore currents induced by focused waves", submitted to *J. Fluid Mech.*, March 2009.

Nonrefereed Journal and Magazine Articles

1. Dalrymple, R. A., Grilli, S. T. and Kirby, J. T., 2006, "Tsunamis and challenges for accurate modeling", *Oceanography*, **19** (1), 142-151.

Discussions and Reviews

1. Kirby, J.T. and Dalrymple, R.A., 1984, "discussion of 'Surfzone currents' by D.R. Basco", *Coastal Engineering*, **8**, 387-392.
2. Kirby, J. T., 1986, "Comments on 'The effect of jet-like currents on gravity waves in shallow water'", *Journal of Physical Oceanography*, **16**, 395-397.
3. Kirby, J. T., 1988, "Discussion of 'Refraction-diffraction model for linear water waves' by B. A. Ebersole", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **114**, 101-103.

4. Kirby, J. T., 1989, review of *Remote Sensing of Shelf Sea Hydrodynamics* by J. C. J. Nihoul (ed), *Photogrammetric Engineering and Remote Sensing*, **55**, 565-566.
5. Kirby, J. T., 1992, "discussion of 'Linear surface waves over rotating fluids' by T.-K. Tsay", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **118**, 331-333.
6. Kirby, J. T., 1993, "discussion of 'Shoreline profile of Stokes-mode edge waves' by H. H. Yeh", *Journal of Waterway, Port, Coastal and Ocean Engineering*, **119**, 228-229.
7. Kirby, J. T., 1998, "Discussion of 'Note on a nonlinearity parameter of surface waves' by S. Beji", *Coastal Engineering*, **34**, 163-168.
8. Shi, F. and Kirby, J. T., 2008, "Discussion of 'Wave setup and setdown generated by obliquely incident waves' by T.-W. Hsu et al, *Coastal Engrng*, 53, 865-877, 2006.", *Coastal Engineering*, **55**, 1247-1249.

Refereed Conference Proceedings

1. Brocard, D. N. and Kirby, J. T., 1978, "Farfield model for waste heat discharge in the coastal zone", *Proc. 2nd Annual Conf. on Waste Heat Management and Utilization*, Miami, December, .
2. Kirby, J. T. and Dalrymple, R. A., 1983, "Propagation of weakly nonlinear surface waves in the presence of varying depth and currents", *Proc. 20th Congress Int. Assoc. Hydraulic Research*, Moscow, September, **7**, 198-202.
3. Dalrymple, R. A., Kirby, J. T. and Mann, D. W., 1984, "Wave propagation in the vicinity of islands" *Proc. 16th Offshore Technology Conf.*, Houston, May 7-9, 249-253.
4. Kirby, J. T., Liu, P. L.-F., Yoon, S. B. and Dalrymple, R. A., 1984, "Combined refraction-diffraction of nonlinear shallow water waves" *Proc. 19th International Conference on Coastal Engineering*, Houston, September 3-7, 999-1015.
5. Kirby, J. T., 1986, "Large-angle parabolic equation methods" *Proc. 20th International Conference on Coastal Engineering*, Taipei, November 9-14, 410-424.
6. Vengayil, P. and Kirby, J. T., 1986, "Shoaling and reflection of nonlinear waves" *Proc. 20th International Conference on Coastal Engineering*, Taipei, November 9-14, 794-806.
7. Dalrymple, R. A., Kirby, J. T. and Seli, D. J., 1986, "Wave trapping by breakwaters" *Proc. 20th International Conference on Coastal Engineering*, Taipei, November 9-14, 1820-1830.
8. Kirby, J. T., 1987, "Effect of ambient current on resonant reflection of surface water waves by sand bars" *Proc. Coastal Hydrodynamics '87*, Newark, June 28 - July 1, 107-123.
9. Kirby, J. T., Philip, R. and Vengayil, P., 1988, "One-dimensional and weakly two-dimensional waves in varying channels: numerical examples", in *Nonlinear Water Waves*, K. Horikawa and H. Maruo (eds), Springer, 357-364. (*Proc. IUTAM Symposium on Nonlinear Water Waves*, Tokyo, August 25-28, 1987).
10. Kirby, J. T., "Weakly nonlinear long waves in varying channels", in *Developments in Theoretical and Applied Mechanics*, **14**, Wang, S.Y. et al, (eds), University of Mississippi, 111 - 118, April 1988. (*Proc. 14th South Eastern Conference on Theoretical and Applied Mechanics*)
11. Kirby, J. T. and Anton, J. R., 1990, "Bragg reflection of waves by artificial bars", *Proc. 22nd International Conference on Coastal Engineering*, Delft, July 2-6, 757-768.
12. Kirby, J. T., 1990, "Modelling shoaling directional wave spectra in shallow water", *Proc. 22nd International Conference Coastal Engineering*, Delft, July 2-6, 109-122.
13. Bailard, J. A., DeVries, J., Kirby, J. T. and Guza, R. T., 1990, "Bragg reflection breakwater: a new shore protection method?", *Proc. 22nd International Conference on Coastal Engineering*, Delft, July 2-6, 1702-1715.

14. Kirby, J. T. and Rasmussen, C., 1991, "Numerical solutions for transient and nearly periodic waves in shallow water", *Proc. ASCE Engineering Mechanics Specialty Conference: Mechanics Computing in the 1990's and Beyond*, Columbus, May, 328-332.
15. Mase, H., Kirby, J. T. and Kuribayashi, K., 1991, "Shoaling model of random waves - modified empirical KdV model", *Proc. 38th Japanese Conference on Coastal Engineering*, October, 51-55 (in Japanese).
16. Kirby, J. T., Kaihatu, J. M. and Mase, H., 1992, "Shoaling and breaking random waves: spectral approach", *Proc. 9th Engineering Mechanics Specialty Conference*, College Station, May 24-27, 71-74.
17. Kirby, J. T., Chajes, M. J. and Melby, J. A., 1992, "Wavelet transform analysis of several transient or non-stationary phenomena in engineering mechanics", *Proc. 9th Engineering Mechanics Specialty Conference*, College Station, May 24-27, 204-207.
18. Kirby, J. T., 1992, "Water waves in variable depth under continuous sea ice", *Proc. 2nd International Offshore and Polar Engineering Conference*, San Francisco, June 14-19, 70-76.
19. Kaihatu, J. M. and Kirby, J. T., 1992, "Spectral evolution and dissipation in waves in finite water depth", *Proc. 23d International Conference on Coastal Engineering*, Venice, October 4-9, 364-377.
20. Kirby, J. T., Lee, C. and Rasmussen, C., 1992, "Time-dependent solutions of the mild-slope wave equation", *Proc. 23d International Conference on Coastal Engineering*, Venice, October 4-9, 391-404.
21. Mase, H. and Kirby, J. T., 1992, "Modified frequency domain KdV equation for random wave shoaling", *Proc. 23d International Conference on Coastal Engineering*, Venice, October 4-9, 474-487.
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53. Murty, T., Watts, P., Fullarton, M., Grilli, S. T., Kirby, J.T., 2003, "Boussinesq modeling of the 1975 Kitimat, British Columbia landslide tsunami", poster presented at *AGU Fall Meeting*, San Francisco, Dec. 8-12. Abstract published in *EOS Trans. AGU*, **84(46)**, Abstract OS22B-1160, 2003.
54. Shi, F. and Kirby, J. T., 2004, "An enhanced REF/DIF model for wave predictions in tidal inlets", *AGU Ocean Sciences Meeting*, Portland, January 26-30. Abstract published in *EOS Trans. AGU*, **84(52)**, Ocean Sci. Meeting Suppl. Abstract XXX, 2004.
55. Shi, F. and Kirby, J. T., 2003, "An enhanced REF/DIF model for wave predictions in tidal inlets", *EOS, Trans. AGU*, **84(52)**, Ocean Sciences Meet. Suppl., Abstract OS42A-13.
56. Fryer, G., Watts, P., Grilli, S. T. and Kirby, J. T., 2004, "The Aleutian landslide-tsunami of 1946", submitted for International Geological Congress, Florence, August 2004.
57. Kirby, J. T., Shi, F., Watts, P. and Grilli, S. T., 2004, "Propagation of short, dispersive tsunami waves in ocean basins", *EOS Trans. AGU*, **85(47)**, Fall Meet. Suppl., Abstract OS21E-02.
58. Shi, F., Nayak, M., Qin, W., Xu, L. and Kirby, J. T., 2004, "Coupling of NearCoM, ROMS and SWAN in a MCEL system", *EOS Trans. AGU*, **85(47)**, Fall Meet. Suppl., Abstract OS23E-04.
59. North, E. W., Chen, S.-N., Hood, R. R., Shi, F., Sanford, L. P., Kirby, J. T., Koch, E. W., Newell, R. I. E., 2005, "Understanding the effects of oyster reefs and breakwaters on seagrass habitat: an open-source modeling approach", *Estuarine Research Foundation Meeting*, Norfolk.
60. Grilli, S. T., Ioualalen, M., Asavanant, J., Kirby, J. T., Shi, F., Watts, P. and Dias, F., 2005, "Modeling of the 12/26/04 Indian Ocean tsunami generation, propagation, and coastal impact. Integration of the SEATOS cruise and other geophysical data", *Eos Trans. AGU*, **86(52)**, Fall Meet. Suppl., Abstract U13A-07.
61. Shi, F., Kirby, J. T. and Haas, K., 2006, "Investigation of consistency between two types of wave force formulation in modeling of rip currents", *Eos Trans. AGU*, **87(36)**, Ocean Sci. Meet. Suppl., Abstract OS32B-02.
62. Guannel, G., Özkan-Haller, H. T., Magalen, J., Haller, M. and Kirby, J., 2006, "Evaluation of boundary layer models in the mobilization and onshore transport of sediments", *Eos Trans. AGU*, **87(36)**, Ocean Sci. Meet. Suppl., Abstract OS42C-03.

63. Magalen, J. M., Haller, M. C., Ozkan-Haller, H. T., Kirby, J. T., Guannel, G. and Teran Cobo, P., 2006, "Testing energetics-based models for onshore sediment transport", *Eos Trans. AGU*, **87**(36), Ocean Sci. Meet. Suppl., Abstract OS35E-27.
64. Geiman, J., Qin, W., Nayak, M., Kirby, J. T. and Badiey, M., 2006, "Strong tidal modulation of estuarine surface wind waves", *EOS Trans. AGU*, **87**(36), Jt. Assem. Suppl., Abstract OS33A-05.
65. Kirby, J.T., 2006, "Simulations of tsunami runup", presentation at *NEES Training and Research Workshop*, Corvallis, July 27-28.
66. Kirby, J. T., Briganti, R., Brocchini, M. and Chen, Q. J., 2006, "Lagrangian particle statistics of numerically simulated shear waves", *Eos Trans. AGU*, **87**(52), Fall Meet. Suppl., Abstract OS41C-0633.
67. Shi, F., Hanes, D. M., Eshleman, J., Erikson, L., Barnard, P. and Kirby, J. T., 2006, "NearCoM Modeling of San Francisco Bight and its Open Coast", *Eos Trans. AGU*, **87**(52), Fall Meet. Suppl., Abstract OS41B-0607.
68. Chen, Y., Shi, F. and Kirby, J. T., 2007, "Coupling of ROMS and SWAN for predicting waves and currents in Delaware Bay", poster presentation at Gordon Research Conference, New London, NH.
69. Shi F., Hanes D. M. and Kirby J. T., 2007, "Modeling of an erosional hot spot at Ocean Beach, California", presented at ROMS Workshop, Los Angeles, October.
70. Brady, D., Di Toro, D., Kirby, J., Xu, L. and Targett, T., 2007, "Water quality modeling of diel-cycling hypoxia in Delaware's coastal bays", presented at ERF '07, Estuarine Research Foundation, Providence, Nov 4-8.
71. Shi, F., Kirby, J. T., Haller, M. C. and Catalan, P., 2008, "Numerical study on surfzone air bubbles using a multiphase VOF model", Ocean Sciences Meeting, Orlando, February.
72. Guannel, G. E., Ozkan-Haller, H. T., Haller, M. C., Kirby, J. T. and Teran Cobo, P., 2008, "Modeling of sediment transport modes during CROSSTEX experiment", Ocean Sciences Meeting, Orlando, February.
73. Ma, G., Shi, F. and Kirby, J. T., 2008, "Two-phase approach for simulating surfzone bubbles", presented at *AGU Fall Meeting*, San Francisco, December 15-19.
74. Hampson, R. W. and Kirby, J. T., 2008, "Video-based Nearshore Depth Inversion using WDM Method", presented at *AGU Fall Meeting*, San Francisco, December 15-19.
75. Geiman, J., Kirby, J. T., Reniers, A., MacMahan, J. H., Brown, J. W., Brown, J. A. and Stanton, T. P., 2008, "Wave-averaged and wave-resolving simulations of the RCEX experiment: Mean flows and drifter dispersion", presented at *AGU Fall Meeting*, San Francisco, December 15-19.
76. Shi, F., Zhu, S. and Kirby, J. T., 2008, "A surfzone circulation model with influence of surf-swash interaction", presented at *AGU Fall Meeting*, San Francisco, December 15-19.

Published Programs and Documentation

One of the primary products of the Center for Applied Coastal Research are computer models designed for use in engineering practice and by other scientists. I have directed the development of the REF/DIF and FUNWAVE models, and the history of this development is outlined below. Public access to these programs is available through <http://chinacat.coastal.udel.edu/~kirby/programs/>. In addition, the recently developed NEARCOM (for Nearshore Community Model) developed with NOPP funding, is also maintained at this site.

1. Dalrymple, R.A. and Kirby, J.T., 1985, "Wave modification in the vicinity of islands. REF/DIF 1 Documentation manual", Coastal and Offshore Engineering and Research, Inc., Newark, DE., January. (Revised June, 1986)
2. Kirby, J.T. and Dalrymple, R.A., 1985, "Combined refraction/diffraction model REF/DIF 1, user's manual", Coastal and Offshore Engineering and Research, Inc., Newark, DE., January. (Revised June, 1986)

3. Kirby, J.T. and Dalrymple, R.A., 1986, "Combined refraction/diffraction model REF/DIF 2, user's manual", Coastal and Offshore Engineering and Research, Inc., Newark, DE., July.
4. Kirby, J. T. and Ozkan, H. T., 1992, "Combined Refraction/Diffraction Model for Spectral Wave Conditions REF/DIF S, Version 1.0. Documentation and User's Manual", Research Report No. CACR-92-06, Center for Applied Coastal Research, Department of Civil Engineering, University of Delaware, Newark.
5. Kirby, J. T. and Dalrymple, R. A., 1993, "Combined Refraction/Diffraction Model REF/DIF 1, Version 2.4. Documentation and User's Manual", Research Report No. CACR-92-04, Center for Applied Coastal Research, Department of Civil Engineering, University of Delaware, Newark.
6. Kirby, J. T. and Özkan, H. T., 1994, "Combined Refraction/Diffraction Model for Spectral Wave Conditions REF/DIF S, Version 1.1. Documentation and User's Manual", Research Report No. CACR-94-04, Center for Applied Coastal Research, Department of Civil Engineering, University of Delaware, Newark.
7. Kirby, J. T. and Dalrymple, R. A., 1994, "Combined Refraction/Diffraction Model REF/DIF 1, Version 2.5. Documentation and User's Manual", Research Report No. CACR-94-22, Center for Applied Coastal Research, Department of Civil Engineering, University of Delaware, Newark.
8. Kirby, J. T., Wei, G., Chen, Q., Kennedy, A. B. and Dalrymple, R. A., 1998, "FUNWAVE 1.0. Fully nonlinear Boussinesq wave model. Documentation and user's manual", Report CACR-98-06, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.
9. Kirby, J. T., Dalrymple, R. A. and Shi, F., 2002, "Combined Refraction/Diffraction Model REF/DIF 1, Version 2.6. Documentation and User's Manual", Research Report No. CACR-02-??, Center for Applied Coastal Research, Department of Civil Engineering, University of Delaware, Newark (in preparation).

Additional Technical Reports

1. Kirby, J. T., "Some aspects of the upstream disturbance in the flow of a two-layered stratified fluid over an obstacle", M.S. thesis, Brown University, June, 1976.
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.
5. Kirby, J.T. and Brocard, D.N., "An investigation of the effect of discharge velocity on surface isotherm areas", Alden Research Laboratory, Worcester Polytechnic Institute, letter report, June, 1978.
6. Kirby, J.T. and Roberge, J.C., "An investigation of remedial plans for minimizing shoaling in a recessed intake forebay", Alden Research Laboratory, Worcester Polytechnic Institute, Report No. 21-79, February, 1979.
7. Kirby, J.T. and Brocard, D.N., "Analytical prediction of surface temperature rises induced by blowdown discharge - Palisades Nuclear Power Plant", Alden Research Laboratory, Worcester Polytechnic Institute, Report No. 40-79, April, 1979.
8. Kirby, J.T., Steiner, U. and Brocard, D.N., "Analytic prediction of bounding streamlines for flow into off-shore submerged intakes", Alden Research Laboratory, Worcester Polytechnic Institute, Report No. 107-79, June, 1979.

9. Kirby, J.T. and Brocard, D.N., "Remedial structures for inducing full lateral mixing in a discharge channel", Alden Research Laboratory, Worcester Polytechnic Institute, Report No. 93-79, July, 1979.
10. Kirby, J.T. and Brocard, D.N., "Hydrothermal model studies of a diffuser discharge in a coastal environment", Alden Research Laboratory, Worcester Polytechnic Institute, Report No. 127-79, July, 1979.
11. Kirby, J.T. and Dalrymple, R.A., "Numerical modelling of the nearshore region", Department of Civil Engineering, University of Delaware, Research Report CE-82-24, June, 1982.
12. Kirby, J.T., "Propagation of weakly-nonlinear surface water waves in regions with varying depth and current", Department of Civil Engineering, University of Delaware, Research Report CE-83-37, July, 1983. (also Ph.D. dissertation)
13. Kirby, J.T., "Water wave propagation over uneven bottoms", Coastal and Oceanographic Engineering Department, University of Florida, Technical Report UFL/COEL-TR/055, January, 1985.
14. Kirby, J.T., "A model for the gradual reflection of weakly two- dimensional waves in water with varying depth and currents: governing equations", Tech. Report UFL/COEL-TR/060, Coastal and Oceanographic Engineering Department, University of Florida, Gainesville, July, 1986.
15. Vengayil, P. and Kirby, J.T., "Shoaling and reflection of nonlinear long waves", Tech. Report UFL/COEL-TR/062, Coastal and Oceanographic Engineering Department, University of Florida, Gainesville, August, 1986.
16. Kirby, J.T., "A program for calculating the reflectivity of beach profiles", Misc. Report UFL/COEL-87/004, Coastal and Oceanographic Engineering Department, University of Florida, Gainesville, March, 1987.
17. Kirby, J.T., "A large - grid parabolic approximation for surface wave propagation", Tech. Report UFL/COEL-TR/068, Coastal and Oceanographic Engineering Department, University of Florida, Gainesville, Draft, April, 1987.
18. Kaku, H. and Kirby, J.T., "A parabolic model in polar coordinates for breakwater harbors", Tech. Report UFL/COEL-TR/075, Coastal and Oceanographic Engineering Department, University of Florida, Gainesville, May, 1988.
19. Kirby, J.T., "Survey data report: Cape Canaveral March - July 1988", Report UFL/COEL-88/011, Coastal and Oceanographic Engineering Department, University of Florida, Gainesville, November, 1988.
20. Kirby, J. T. and Anton, J. P. , "Modelling Bathymetric Control of Near Coastal Wave Climate: Report 2", Report CACR-90-1, Center for Applied Coastal Research, Department of Civil Engineering, University of Delaware, Newark, April 1990.
21. Kirby, J. T., "Evaluation of wave height correction algorithm for SHOALS system", for Coastal Engineering Research Center, USAE-WES, Vicksburg, draft, August 1990.
22. Holman,R.A., Bowen,A.J., Dalrymple, R.A., Dean, R.G., Elgar, S., Flick, R., Freilich, M., Guza, R.T., Hanes, D., Kirby, J., Madsen, O., Sternberg, R. and Svendsen, I., 1990, "Report on the state of nearshore processes research. Report from the Nearshore Processes Workshop, St. Petersburg, FL, April 1989", Report OSU-CO-90-6, Oregon State University.
23. Kirby, J. T., 1993, "Wave conditions in North Channel", consulting report to Marex Technology Limited, Isle of Wight, UK.
24. Bowen, G. D. and Kirby, J. T., 1994, "Shoaling and breaking random waves on a 1:35 laboratory beach", Report No. CACR-94-14, Center for Applied Coastal Research, Department of Civil Engineering, University of Delaware, June.
25. Kirby, J. T., 1994, "Wave conditions at Bacton, U. K. and Zeebrugge, Belgium", Consulting report to Paras Limited, Isle of Wight, UK.

26. Gobbi, M. F. and Kirby, J. T., 1998, "A new Boussinesq-type model for surface water wave propagation", Report No. CACR-98-01, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.
27. Chawla, A. and Kirby, J. T., 1999, "Waves on opposing currents: Data report", Report CACR-99-03, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware, May.
28. Misra, S. K., Kennedy, A. B. and Kirby, J. T., 2000, "Determining water depths from surface images using Boussinesq equations", Report CACR-00-01, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware, January.
29. Chawla, A. and Kirby, J. T., 2000, "An experimental study on the dynamics of wave blocking and breaking on opposing currents", Report CACR-00-02, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware, March.
30. Hommel, D. L., Kirby, J. T. and Shi, F., 2001, "Vortex formation resulting from solitary wave interaction with a breakwater", Report CACR-01-03, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware, July.
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.
32. Misra, S. K., Kirby, J. T. and Brocchini, M., 2005, "The turbulent dynamics of quasi-steady spilling breakers - Theory and experiment", Report CACR-05-0X, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.
33. Qin, W., Kirby, J. T. and Badiey, M., 2005, "Application of the spectral wave model SWAN in Delaware Bay", Report CACR-05-09, Center for Applied Coastal Research, Department of Civil and Environmental Engineering, University of Delaware.
34. Long, W. and Kirby, J. T., 2006.

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.

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.

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 Initiative)
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: ~ \$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: 06/01/2006-05/31/2009
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: 02/01/07-01/31/09
Amount of support: \$209,899.
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 al. (J. T. Kirby and M. Badiey, UD)
 Sponsor: ONR MURI program
 Amount: \$4,500,000 (total, estimate), \$850,000 (UD, estimate)
 Duration: 7/07-7/12
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 coastal 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 al. (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

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 Badiy, 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.
25. Jeff Brown, Master of Civil Engineering, 2008. (Joint with J. H. MacMahan)
26. Yunfeng Chen, MCE expected 2009.
27. Cihan Bayandir, MCE expected 2009.
28. Gangfeng Ma, Ph. D. expected 2011.

29. Joseph Geiman, Ph. D. expected 2011.

30. Phil Castellano, MCE expected 2010.

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. An extensive set of notes has been developed and is available to students online, as a precursor to a completed textbook.
7. CIEG 682. "Nearshore 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 Badiy, 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 CMS POSE program.
10. CIEG 872, "Advanced Water Wave Mechanics". Existing course providing an introduction to the nonlinear theories of surface water waves. An extensive set of notes has been developed and is available to students online, as a precursor to a completed textbook.

Recent Short Courses

1. Coastal modeling, *30th Intl. Conf. Coastal Engineering*, San Diego, September 2, 2006. (with R. A. Dalrymple).