

Enrique N. Curchitser

Title and Address:

Associate Professor
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Contact Information:

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Education

Highest Earned Degree

1999 Ph.D. in Oceanography, Rutgers University.

Dissertation

On the Transient Adjustment of a Mid-latitude Abyssal Ocean Basin with Realistic Geometry and Bathymetry (1999). Director: Dr. Dale Haidvogel.

Other Earned Degrees

1993 M.S. in Mechanical and Aerospace Engineering, Rutgers University. Thesis title: *Cyclic Reduction Solutions of Aerodynamic Problems Using MIMD Distributed Memory Multiprocessors*.

1988 B.S. with honors, in Mechanical and Aerospace Engineering, Rutgers University. Honors thesis title: *Numerical Study of Rayleigh-Benard Convection in 3-D*.

Linguistic Ability

Spanish, English

Graduate Dissertation Advisors

Ph.D. Dr. Dale B. Haidvogel (Rutgers University)

M.Sc. Dr. Richard B. Pelz (Rutgers University)

Honors and Awards

Fellowships

Post-doctoral fellowship award from the Columbia University Earth Institute Center for Non-Linear Earth Systems, 2001 (2 years of salary support).

Faculty fellowship from the Advanced Study Program at the National Center for Atmospheric Research, Boulder, Colorado, Summer 2006 (2 months salary and travel support).

Professional Awards and Honors

International Council for the Exploration of the Seas (ICES) Service Award

National Science Foundation Antarctica Service Medal

American Society of Mechanical Engineers. Best technical paper award on a paper titled: *Numerical study of Rayleigh-Benard Convection in 3-D*. ASME northeast regional student competition

James Slade honors scholar, College of Engineering, Rutgers University

Tau Beta Pi national engineering honor society, elected

Pi Tau Sigma national mechanical engineering honor society, elected

Rutgers University College of Engineering Dean's List.

Research Interests

Professional Identification

Oceanographer, Climate Scientist, Modeler

Employment History

Positions Held

07/2012-ongoing Associate Professor, Department of Environmental Sciences, Rutgers University

05/2012-ongoing Affiliate Scientist, National Center for Atmospheric Research

03/2014-ongoing U.S. State Department representative to the North Pacific Marine Science Organization (PICES) governing council.

09/2006-ongoing Adjunct Associate Research Scientist at the Lamont-Doherty Earth Observatory, Columbia University.

09/2006-12/2013 Executive director for the U.S. GLOBEC program.

09/2006-06/2012 Associate Research Professor, Institute of Marine and Coastal Sciences, Rutgers University.

04/2002-08/2006 Doherty Associate Research Scientist, Lamont-Doherty Earth Observatory, Columbia University.

02/2001-04/2002 Post-Doctoral fellow, Lamont-Doherty Earth Observatory and the Department of Applied Physics and Applied Mathematics, Columbia University.

08/2000-02/2001 Visiting Scientist, Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany.

09/1999-08/2000 Postdoctoral scientist, NASA Goddard Institute for Space Studies, New York.

Graduate Program Affiliations

2012-ongoing: Graduate Program in Atmospheric Sciences, Full Member

2012-ongoing: Graduate Program in Oceanic Sciences, Full Member

Publications

Chapters in Books or Monographs

Ito, S.-I., K.A. Rose, A.J. Miller, K. Drinkwater, J.E. Overland, S. Sundby E.N. Curchitser, J.W. Hurrell and Y. Yamanaka, 2010. Ocean ecosystem responses to future global change scenarios: A way forward. In: *Global Change and Marine Ecosystems*, M. Barange, J. Field, R. Harris, E. Hofmann, I. Perry and F. Werner, Eds., Oxford press, pp 287-322.

Curchitser E.N. and R.B. Pelz, 1991. Implementation of the Euler equations on MIMD, distributed memory, multiprocessor computers using cyclic reduction algorithms. *Parallel Computational Fluid Dynamics*, Elsevier Science Publishers, pp 97-112.

Articles in Refereed Journals

(* denotes student or post-doc paper)

Curchitser, E.N., Small, R.J., Large, W., Hedstrom, K., Kaufman, B. and Alexander, M. (2016). A multi-scale study of the role of eastern boundary currents in the climate system. In preparation.

*Kang, D., E.N. Curchitser and A. Rosati (2016). Seasonal Variability of the Gulf Stream Kinetic Energy. *J. Phys. Oce.*, In review.

*Grieve, B.D., E.N. Curchitser and R. Rykaczewski (2016). Range expansion of the invasive lionfish in the Northwest Atlantic with climate change. *Mar. Eco. Prog. Series (MEPS)*. In review.

Kleypas, J.A., D.M. Thompson, F.S. Castruccio, E.N. Curchitser, M. Pinsky and J.R. Watson (2016). Can larval connectivity affect heat tolerance in coral populations?. *Global Change Biology*. Submitted.

Petrik, C.M., J.T. Duffy-Anderson, F. Castruccio, E.N. Curchitser, S.L. Danielson, K. Hedstrom and F. Mueter (2016). Modeled connectivity between Walleye Pollock (*Gadus chalcogrammus*) spawning and age-0 nursery areas in warm and cold years with implications for juvenile survival. *ICES Journal of Marine Science*. In review.

Parada, C., J.M. Orensanz, S. Hinckley, D. Armstrong, E. Curchitser and A. Hermann (2016). Gauging the Ratchet's Crank-Coupled Biophysical Modelling of Snow Crab (*Chionoecetes opilio*) Larval Dispersal in the Eastern Bering Sea. *Prog. Oce.*, In review.

- Small, R.J., E.N. Curchitser, K.S. Hedstrom, B. Kaufman and W. Large (2015). The Benguela Upwelling System: Quantifying the Sensitivity to Resolution and Coastal Wind Representation in a Global Climate Mode. *Journal of Climate*, Vol. 28, pp. 9409-9432. DOI: 10.1175/JCLI-D-15-0192.1.
- *Kang, D., and E.N. Curchitser (2015). Energetics of Eddy-Mean Flow Interactions in the Gulf Stream region. *J. Phys. Oce.*, Vol. 45, pp. 1102-1120. DOI: 10.1175/JPO-D-14-0200.1
- Curchitser, E.N., K.A. Rose, S-I. Ito, M.A. Peck and M.J. Kishi (2015). Combining modeling and observations to better understand marine ecosystem dynamics, *Progress in Oceanography*, Volume 138, Part B, pp. 327-330, <http://dx.doi.org/10.1016/j.pocean.2015.11.001>. (Editorial)
- *Cheng, W., E.N. Curchitser, C. Stock, A. Hermann, E. Cokelet, C. Mordy, P. Stabeno, G. Hervieux and F. Castruccio (2015). What processes contribute to the spring and fall bloom co-variability on the Eastern Bering Sea shelf? *Deep-Sea Res. II*, <http://dx.doi.org/10.1016/j.dsr2.2015.07.009i>
- Fiechter, J., K.A. Rose, E.N. Curchitser and K.S. Hedstrom (2015). The role of environmental controls in determining sardine and anchovy population cycles in the California Current: Analysis of an end-to-end model, *Progress in Oceanography*, Volume 138, Part B, pp. 381-398, <http://dx.doi.org/10.1016/j.pocean.2014.11.013>.
- Kleypas, J., F. Castruccio and E. N. Curchitser and E. McLeod (2015). The impact of ENSO on coral heat stress in the western equatorial Pacific. *Global Change Biology*, *Global Change Biology*, pp.1-15, doi: 10.1111/gcb.12881.
- *Richar, J.I., G.H. Kruse, E.N. Curchitser and A.J. Hermann (2015). Patterns in connectivity and retention of simulated Tanner crab (*Chionoecetes bairdi*) larvae in the eastern Bering Sea, *Progress in Oceanography*, Volume 138, Part B, pp. 475-485. <http://dx.doi.org/10.1016/j.pocean.2014.08.001>.
- Rose, K.A., J. Fiechter, E.N. Curchitser, K. Hedstrom, M. Bernal, S. Creekmore, A. Haynie, S-I. Ito, S. Lluch-Cota, B.A. Megrey, C.A. Edwards, D. Checkley, T. Koslow, S. McClatchie, F. Werner, A. MacCall and V. Agostini (2015). Demonstration of a fully-coupled end-to-end model for small pelagic fish using sardine and anchovy in the California Current, *Progress in Oceanography*, Volume 138, Part B, pp. 348-380, <http://dx.doi.org/10.1016/j.pocean.2015.01.012>.
- *Dorman, J.G., F. Castruccio, E.N. Curchitser, J. Kleypas and T. Powell (2015). Modeled connectivity of *Acropora millepora* populations from reefs of the Spratly Islands and the greater South China Sea. *Coral Reefs*. DOI:10.1007/s00338-015-1354-3.
- Fiechter, J, D.D. Huff, B.T. Martin, D.W. Jackson, C.A. Edwards, K.A. Rose, E.N. Curchitser, K.S. Hedstrom, S.T. Lindley and B.K. Wells (2015). Environmental conditions impacting juvenile Chinook salmon growth off central California: An ecosystem model analysis. *Geophys. Res. Lett.*, 42, 2910–2917. doi: 10.1002/2015GL063046.
- Hermann, A.J., G.A. Gibson, N.A. Bond, E.N. Curchitser, K. Hedstrom, W. Cheng, M. Wang, E.D. Cokelet and P.J. Stabeno (2015). Projected future biophysical states of the Bering Sea. *Deep-Sea Res. II*, <http://dx.doi.org/10.1016/j.dsr2.2015.11.001>
- *Navarez, D.A., D.M. Munroe, E.E. Hofmann, J.M. Klinck, E.N. Powell, R. Mann and E.N. Curchitser (2015). Long-term dynamics in Atlantic surfclam (*Spisula solidissima*) populations: The role of bottom water temperature. *J. Mar. Sys.* 141, pp. 136-148. DOI: 10.1016/j.jmarsys.2014.08.007
- Parada, C., S. Hinckley, J. Horne, M. Mazur, A. Hermann, E.N. Curchitser (2015). Modeling connectivity of walleye pollock in the Gulf of Alaska: Are there any linkages to the Bering Sea and Aleutian Islands? *Deep-Sea Res. II* (2015), <http://dx.doi.org/10.1016/j.dsr2.2015.12.010>.
- Petrik, C.M., J.T. Duffy-Anderson, F. Mueter, K. Hedstrom and E.N. Curchitser (2015). Biophysical transport model suggests climate variability determines distribution of Walleye Pollock early life stages in the eastern Bering Sea through effects on spawning, *Progress in Oceanography*, Volume 138, Part B, pp. 459-474, <http://dx.doi.org/10.1016/j.pocean.2014.06.004>.
- Fiechter, J., E. N. Curchitser, C. A. Edwards, F. Chai, N. L. Goebel, and F. P. Chavez (2014). Air-sea CO₂ fluxes in the California Current: Impacts of model resolution and coastal topography. *Global Biogeochem. Cycles*, 28. doi:10.1002/2013GB004683.
- Cheng, W., E.N. Curchitser, C. Ladd and P. Stabeno (2014). Ice--Ocean Interactions in the Eastern Bering Sea: NCAR CESM Simulations and Comparison with Observations. *Deep Sea Res. II*. doi:10.1016/j.dsr2.2014.03.002.
- Danielson, S.L., T.J. Weingartner, K.S. Hedstrom, K. Aagaard, R. Woodgate, E.N. Curchitser and P.J. Stabeno (2014). Coupled wind-forced controls of the Bering-Chukchi shelf circulation and the Bering Strait throughflow: Ekman transport, continental shelf waves, and variations of the Pacific-Arctic sea surface height gradient. *Prog. Oce.* 125, pp. 40-61. DOI:10.1016/j.pocean.2014.04.006.
- McKinell, S., E.N. Curchitser, K. Groot, M. Kaeriyama and M. Trudel (2014). Oceanic and atmospheric extremes motivate a new hypothesis for variable marine survival of Fraser River sockeye salmon. *Fish. Oceanogr.* 23:4, pp. 322-341. DOI:10.1111/fog.12063.
- Kristiansen, T., C. Stock, K. Drinkwater and E.N. Curchitser (2014). Mechanistic insights into the effects of climate change on larval cod. *Global Change Biology*. doi: 10.1111/gcb.12489.

- Curchitser, E.N., H.P. Batchelder, D.B. Haidvogel, J. Fiechter and J. Runge (2013). Advances in Physical, Biological and Coupled Ocean Models During the US GLOBEC Program. *Oceanography*, Vol. 26, No. 4, pp. 54-69.
- *Castruccio, F. S., E. N. Curchitser, and J. A. Kleypas (2013). A model for quantifying oceanic transport and mesoscale variability in the Coral Triangle of the Indonesian/Philippines Archipelago. *J. Geophys. Res. Oceans*, 118, doi:10.1002/2013JC009196.
- *Kang, D. and E.N. Curchitser (2013). Gulf Stream eddy characteristics in a high-resolution ocean model. *J. Geophys. Res. Oceans*, doi:10.1002/jgrc.20318.
- *Gibson, G.A., A. J. Hermann, K. Hedstrom, E. N. Curchitser (2013). A modeling study to explore on-shelf transport of oceanic zooplankton in the Eastern Bering Sea Deep-Sea Res. II, 121–122: pp. 47-64.
- *Meccia, V., M. Tonelli, I. Weiner and E.N. Curchitser (2013). A numerical study of the Southern Ocean including a thermodynamic active ice shelf: part I Weddell Sea. *Geosci. Model Dev.*, 6, pp. 1209-1219. doi:10.5194/gmd-6-1209-2013.
- Haidvogel, D.B., E. Turner, E.N. Curchitser and E.E. Hofmann (2013). Looking Forward: Transdisciplinary Modeling, Environmental Forecasting and Management. *Oceanography*, Vol. 26, No. 4, pp. 136-143.
- Hermann, A.J., G.A. Gibson, N.A. Bond, E.N. Curchitser, K. Hedstrom, W. Cheng, M. Wang, P. J. Stabeno, L. Eisner, K.D. Cieciel (2013). A multivariate analysis of observed and modeled biophysical variability on the Bering Sea shelf: multidecadal hindcasts (1970-2009) and forecasts (2010-2040). *Deep-Sea Res. II*, 56: pp. 2474-2486. doi:10.1016/j.dsr2.2009.02.008.
- Hollowed A.B., E.N. Curchitser, C. Stock, C.I. Zhang, 2012. Trade-offs associated with different modeling approaches for assessment of fish and shellfish responses to climate change. *Climate Change*. doi:10.1007/s10584-012-0641-z.
- *Danielson, S., K. Hedstrom, K. Aagard, T. Weingartner and E.N. Curchitser, 2012. Wind-induced reorganization of the Bering shelf circulation. *Geo. Res. Lett.* doi:10.1029/2012GL051231.
- Capotondi, A., M. Alexander, N. Bond, E. Curchitser and J. Scott, 2012. Enhanced upper-ocean stratification with climate change in the CMIP3 models. *J. Geophys. Res.*, doi:10.1029/2011JC007409.
- *Danielson, S., E. Curchitser, K. Hedstrom, T. Weingartner, and P. Stabeno, 2011. On ocean and sea ice modes of variability in the Bering Sea. *J. Geophys. Res.*, 116, C12034, doi:10.1029/2011JC007389.
- Arango, H., J. Levin, E.C. Curchitser, B. Zhang, A.M. Moore, W. Han, A.L. Gordon, C. Lee and J.B. Girton, 2011. Development of a Hindcast/Forecast Model for the Philippine Archipelago. *Oceanography*, 20(1), pp. 58-69, doi:10.5670/oceanog.2011.04.
- Stock C.A., M.A. Alexander, N.A. Bond, K.M. Brander, W.W.L. Cheung, E.N. Curchitser, T.L. Delworth, J.P. Dunne, S.M. Griffies, M.A. Haltuch, J.A. Hare, A.B. Hollowed, P. Lehodey, S.A. Levin, J.S. Link, K.A. Rose, R.R. Rykaczewski, J.L. Sarmiento, R.J. Stouffer, F.B. Schwing, G.A. Vecchi and F.E. Werner, 2011. On the use of IPCC-class models to assess the impact of climate on Living Marine Resources. *Prog. Ocean*, 88 (1-4), pp. 1-27, doi:10.1016/j.pocean.2010.09.001.
- Ito, S.-I., K.A. Rose, A.J. Miller, K. Drinkwater, J.E. Overland, S. Sundby E.N. Curchitser, J.W. Hurrell and Y. Yamanaka, 2010. Ocean ecosystem responses to future global change scenarios: A way forward. In: *Global Change and Marine Ecosystems*, M. Barange, J. Field, R. Harris, E. Hofmann, I. Perry and F. Werner, Eds., Oxford press, pp 287-322.
- Combes, V., E. Di Lorenzo and E. Curchitser, 2009. Interannual and decadal variations in cross-shore mixing in the Gulf of Alaska. *J. Phys. Oce.*, 39(4): pp. 1050-1059.
- Hermann, A.J., E.N. Curchitser, E.L. Dobbins and D.B. Haidvogel, 2009. A comparison of remote versus local influence of El Nino on the coastal circulation of the Northeast Pacific. *Deep-Sea Res. II*, doi:10.1016/j.dsr2.2009.02.005.
- *Fiechter J., A.M. Moore, C.A. Edwards, K.W. Bruland, E. Di Lorenzo, C.V. Lewis, T.M. Powell, E.N. Curchitser and K. Hedstrom, 2009. A simple approach to model iron limitation on primary production in the coastal Gulf of Alaska. *Deep-Sea Res. II*, doi:10.1016/j.dsr2.2009.02.010.
- Han W., A. M. Moore, J. Levin, B. Zhang, H. G. Arango, E.N. Curchitser, E. Di Lorenzo, A. Gordon, J. Lin, 2009. Seasonal surface ocean circulation and dynamics in the Philippine Archipelago region during 2004-2008. *Dyn. Atm. Oce.*, 47, pp. 114-137.
- Di Lorenzo, E., N. Schneider, K.M. Cobb, K. Chhak, P.J. Franks, A.J. Miller, J.C. McWilliams, S.J. Bograd, H. Arango, E.N. Curchitser, T.M. Powell and P. Rivere, 2008. North Pacific Gyre Oscillation links ocean climate and ecosystem change. *Geophys. Res. Lett.*, 35, L08607, doi:10.1029/2007GL032838.
- Haidvogel D.B., H. Arango, W.P. Budgell, B. Cornuelle, E.N. Curchitser, E. Di Lorenzo, K. Fennel, W.R. Geyer, A.J. Hermann, L. Lanerolle, J. Levin, J.C. McWilliams, A.J. Miller, A.M. Moore, T.M. Powell, A. Shchepetkin, C.R. Sherwood, R.P. Signell, J.C. Warner and J. Wilkin, 2008: Regional Ocean Forecasting in Terrain-Following Coordinates. *J. Comp. Phys.*, 227, pp. 3595-3624.
- Huang, H.P., A. Kaplan, E.N. Curchitser, and N. Maximenko, 2007. The degree of anisotropy for mid-ocean currents from satellite observations and an eddy-permitting model simulation. *J. Geophys. Res.*, 112, C09005, doi:10.1029/2007JC004105.

Powell, T, C. Lewis, E.N. Curchitser, D.B. Haidvogel, A.J. Hermann and E.L Dobbins, 2006. Results from a three-dimensional, nested biological-physical model of the California Current System and comparisons with statistics from satellite imagery. *J. Geophys. Res.*, 111, C07018, doi:10.1029/2004JC002506

Curchitser, E.N., D.B. Haidvogel, A.J. Hermann, E. Dobbins, T.M. Powell and A. Kaplan, 2005. Multi-scale modeling of the North Pacific Ocean: Assessment of simulated basin-scale Variability (1996-2003). *J. Geophys. Res.*, 110, C11021, doi:10.1029/2005JC002902.

Gan J.P., H. Li, E.N. Curchitser and D.B. Haidvogel, 2005. Modeling South China Sea Circulation . Part I: Response to seasonal forcing regimes. *J. Geophys. Res.*, 111, C06034, doi:10.1029/2005JC003298.

Iskandarani, M, D.B. Haidvogel, J. Levin, E.N. Curchitser, and C.A. Edwards, 2002. Multiscale Geophysical Modeling Using the Spectral Element Method. *Computing in Science and Engineering*, 4(5): pp. 42-48.

Curchitser, E.N. , D.B. Haidvogel, and M. Iskandarani, 2001. Transient adjustment of circulation in a mid-latitude abyssal ocean basin with realistic geometry and bathymetry. *J. Phys. Oce.*, 31(3): pp. 725-745.

Curchitser, E.N., D.B. Haidvogel, and M. Iskandarani, 1999. On the transient adjustment of a mid-latitude abyssal ocean basin with realistic geometry: The constant depth limit. *Dyn. Atm. Oce.*, 29: pp. 147--188.

Curchitser, E.N., M. Iskandarani, and D.B. Haidvogel, 1998. Spectral element solution of the Shallow-Water Equations on multiprocessor computers. *J. Atmo. Oce. Tech.*, 15(2): pp. 510--521.

Haidvogel, D.B., E.N. Curchitser, M. Iskandarani, R. Hughes, and M. Taylor, 1997. Global modeling of the ocean and atmosphere using the spectral element method. *Atmo.-Oce. Vol XXXV*, No. 1.

Articles in Non-refereed or General Journals

Curchitser, E.N., R.J. Small, B. Kaufman, W. Large and K. Hestrom (2015). Regional Climate Modeling in the California Current System. *CalCOFI Rep.*, Vol. 56.

Blastoch, A., E. Curchitser, R. Small and C. Boning, 2014. Nested ocean modelling. *CLIVAR Exchanges No. 65* (Vol. 19 No. 2).

Curchitser, E.N. and I. Allen, 2012. Report on workshop on Climate Change Projections. *PICES Press Vol. 20*, No. 2.

Haidvogel, D.B., and E.N. Curchitser, 2011. Interdisciplinary Modeling in U.S. GLOBEC. *Current*, Vol. 27 No. 2.

Curchitser, E.N., A. Gallego, M. Kishi and E. Di Lorenzo, 2009. Report on Modeling Ecosystems and Ocean Processes Workshop. *PICES Press Vol. 17* No. 2.

Published Conference Proceedings

Petrik, C.M., J. T. Duffy-Anderson, F. Mueter, K. Hedstrom, S. Danielson, E. Curchitser, and S. Barbeaux. Modeling climate effects on the dispersal and distribution of early life Oral stages of walleye pollock over the eastern Bering Sea Shelf. *ICES, CM 2013/B:43*

Curchitser, E.N., K.A. Rose, K. Hedstrom, J. Fiechter, S.-I. Ito, S. Lluch-Cota and B.A. Megrey, 2009. Development of a climate-to-fish-to-fishers model: progress, issues, and some solutions. *ICES CM 2009/E:26*

Chyczewski, Marconi, Pelz, and Curchitser. *Solution of the Euler and Navier-Stokes Equations on Parallel Processors Using a Transposed Thomas ADI Algorithm*. AIAA paper 93-3310, in proceedings of 11th Computational Fluid Dynamics Conference, Orlando, FL 1993.

Curchitser, Pelz, and Marconi. *Solution of the Euler and Navier-Stokes equations on MIMD multiprocessors using cyclic reduction*. AIAA paper 92-0561, in proceedings of the 30th Aerospace Sciences Meeting 1992.

Other Publications

Curchitser, E.N., K. Hedstrom, S. Danielson and T. Weingartner. 2013. Adaptation of an Arctic Circulation Model. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Environmental Studies Program, Headquarters, Herndon, VA. OCS Study BOEM 2013-202. 82 pp.

McKinnell, S.M., E. Curchitser, C. Groot, M. Kaeriyama and K.W. Myers. 2011. The decline of Fraser River sockeye salmon *Oncorhynchus nerka* (Steller, 1743) in relation to marine ecology. *PICES Advisory Report. Cohen Commission Tech. Rep. 4: 195p*. Vancouver, B.C. www.cohencommission.ca

Curchitser, E.N., J. Small, K. Hedstrom and W. Large, 2011. Up- and down-scaling effects of upwelling in the California Current System. pp. 98-102. In: Foreman, M.G., Yamanaka, Y. (Eds), Report of Working Group 20 on Evaluations of Climate Change Projections, *PICES Scientific Report No. 40*.

Curchitser, E.N, K. Hedstrom, S. Danielson and T. Weingartner, 2010. Modeling of Circulation in the North Aleutian Basin. Department of the Interior, Bureau of Ocean Energy Management, Regulation and Enforcement, Environmental Studies Program, Headquarters, Herndon, VA. OCS Study BOEMRE 2010-028. 69p.

Teaching Activities

Courses Taught

Computational Methods for Meteorology, Undergraduate, Rutgers University
Large-scale Ocean and Atmospheric Dynamics, Graduate, Rutgers University
Numerical Modeling of the Atmosphere and Ocean, Graduate, Rutgers University
Assessing the Economic Risks of Climate Change, Graduate, Rutgers University
Graduate Ocean Seminar, Graduate, Rutgers University
Fundamentals of Ocean Climate Modeling at Global and Regional Scales, Graduate summer school, Hyderabad, India
Numerical Modeling, Graduate, Columbia University

Special Courses Taught

Ocean Climate Modeling: Physical and biogeochemical dynamics of semi-enclosed seas. Ankara, Turkey (2015)
Ocean Climate Modeling: Physical and biogeochemical dynamics of semi-enclosed seas. Ankara, Turkey (2015)
South Atlantic circulation variability and change: integrating models and observations. Buenos Aires, Argentina (2014)
International Center for Theoretical Physics: Summer school on *Fundamentals of Ocean Climate Modeling at Global and Regional Scales*. Hyderabad, India (2013).

Curricular Development - Courses and Programs Developed

2014-ongoing Fundamentals of Geophysical Fluid Dynamics. Developed new course for graduate students in Atmospheric and Oceanic Sciences at Rutgers. To be taught every other year.
2014-ongoing Large-scale Atmosphere and Ocean Dynamics. Re-designed course for graduate students in Atmospheric and Oceanic Sciences at Rutgers. To be taught every other year.
2014-ongoing Development of a numerical laboratory for Geophysical Fluid Dynamics: As part of the re-design of the graduate level Atmosphere and Ocean dynamics courses, I am developing a computational laboratory to assist students in developing a physical intuition for the subject.
2013-ongoing Assessing the Economic Risks of Climate Change. Developed new graduate course, first taught in the Spring of 2014.
2013-ongoing Computational Methods for Meteorology. Developed new course required for undergraduate majors in Meteorology. To be taught every Spring.
2013-ongoing Computational Methods for Meteorology. Development of course slides and software that students can access through the course (Sakai) website to help them with material.

Conference Presentations, Lectures, Demonstrations

Keynote or Plenary Addresses

Modeling the Earth System: Are we ready? . Science Board invited talk at the PICES annual meeting, Portland, OR (2010).
A multi-scale approach to modeling the North Pacific ocean. Keynote address at the Brazilian Oceanography Society (SBO) annual meeting, Sao Paulo, Brazil (2009).
Multi-scale modeling in the North Pacific Ocean. Bjerknes Institute invited scientist keynote address, Bergen, Norway (2004).

Invited Addresses

Regional and global ramifications of eastern boundary upwelling. International Symposium on Climate Change and Marine Ecosystems invited presentation. Santos, Brazil (2015).
Climate model availability and limitations: Regional scales. NOAA Tipping Points workshop invited presentation. La Jolla, CA (2015).
Climate-boundary current interactions. Texas A&M University invited colloquium. College Station, TX (2015).

Climate-boundary current interactions: Stories from east and west. Virginia Institute of Marine Science, College of William and Mary invited colloquium, Gloucester Point, VA (2015).

Regional Climate Modeling in the California Current System (and beyond), CalCOFI Symposium, La Jolla, CA (2014).

A climate-to-fish-to-fishing model for the eastern Pacific sardine and anchovy system, NOAA-NWFSC, Seattle, WA (2014).

Multi-scale modeling of boundary currents, CLIVAR workshop on high-resolution modeling, Kiel, Germany (2014).

Climate—Boundary Current Interactions: Stories from East and West. PICES annual meeting, Yeosu, Korea (2014).

Climate change and marine ecosystem research, PICES FUTURE workshop, Kona, HI (2014).

Recent Advances in Regional, Climate and Earth System modeling, India Institute of Technology, Bhubaneswar, India (2013).

Ecosystem models and their relevance to management strategy evaluations, Pacific Fisheries Management Council, La Jolla, CA (2013).

Multi-scale modeling of oceanic boundary currents, Regional Climate Modeling workshop, Busan, Korea (2013).

Imagining the future: Towards an integrated multi-scale Earth System Model, University of Delaware, College of Earth, Ocean, and Environment colloquium, Newark, Delaware (2012).

Some thoughts on global climate and regional ecosystems, International Consortium for the Exploration of the Seas (ICES), Copenhagen, Denmark (2012).

Local and remote climate effects of eastern boundary upwelling. Gordon Research Conference, South Hadley, MA (2011).

The Odyssey of a GLOBEC-ian. U.S. GLOBEC final symposium young scientist presentation, Washington, DC (2011).

Local and remote climate effects of eastern boundary upwelling. Regional Climate Modeling Workshop, Seoul, Korea (2011).

Modeling Climate-to-fish-to-fishers: Yes We Can!, North Carolina State Colloquium, Raleigh, NC (2011).

Development of a climate-to-fish-to-fishers model: Implementation in the eastern Pacific sardine and anchovy systems. American Fisheries Society annual meeting, Seattle, WA (2011).

Local and remote climate effects of eastern boundary upwelling. American Fisheries Society annual meeting, Seattle, WA (2011).

Modeling Climate-to-fish-to-fishers: Yes We Can!, Princeton University colloquium, Princeton, NJ (2011).

Modeling the ocean, one piece at a time. Geophysical Fluid Dynamics Laboratory colloquium, Princeton, NJ (2011).

Some thoughts on climate-and-ecosystem research directions: A modeler's perspective. Friday Harbor, WA (2010).

The ocean in 2030: A modeler's perspective. National Research Council committee on the future of ocean research, Washington, DC (2010).

Development of a climate-to-fish-to-fishers model: Implementation in the eastern Pacific Sardine and Anchovy system. AGU Ocean Sciences Meeting, Portland, OR (2010).

On Climate, Predictability, Earth System Models and other random thoughts. MARIFISH--ICES joint workshop on integrated ecosystem modelling, Barcelona, Spain (2010).

Climate, biology or human activity: How do we study the relative roles causing marine ecosystem variability? IMBER IMBIZO, Crete, Greece (2010).

Mechanisms for low-frequency variability of forage fish: A comparative analysis of North Pacific sardine systems. AGU Ocean Sciences meeting, Portland, OR (2010).

Modeling Climate-to-fish-to-fishers: Yes We Can!, NOAA GLOBEC seminar series, Washington, DC (2009).

End-to-end marine ecosystem models: Strategies, applications and future directions. ICES annual meeting, Berlin, Germany (2009).

Modeling Climate-to-fish-to-fishers: Yes We Can!, University of Maryland at Horn Point colloquium, Horn Point, MD (2009).

A multi-scale approach to modeling the north Pacific Ocean. Old Dominion University Colloquium, Norfolk, VA (2008).

Coupled bio-physical modeling in the North Pacific ocean: A multi-scale approach. SUNY Stony Brook colloquium, Stony Brook, NY (2007).

Multi-scale modeling in the north Pacific ocean: Assessment of basin-scale variability. Institute of Ocean Sciences colloquium, Sydney, BC (2005).

Papers, Abstracts, and Lectures

- AGU Ocean Sciences Meeting. Regional and Global Ramifications of Boundary Current Upwelling. Curchitser, Small, Hedstrom, Kaufman, Large and Alexander (2016).
- AGU Ocean Sciences. Energetics of Eddy-Mean Flow Interactions in the Gulf Stream Region. Kang and Curchitser (2016).
- AGU Ocean Sciences Meeting. Future Projection of the California Current System Using a Downscaled Coupled Bio-physical Model (Invited). Dussin, Curchitser and Stock (2016)
- AGU Ocean Sciences Meeting. Effect of including high-resolution ocean models in climate simulations of the north-west Atlantic and US East coast. Small, Curchitser, Dussin and Bryan (2016).
- AGU Ocean Sciences Meeting. Future Changes of Nutrient Dynamics and Biological Productivity in California Current System. Chai, Xiu and Curchitser (2016).
- AGU Ocean Sciences. A High-Resolution Model of the Beaufort Sea Circulation. Hedstrom, Danielson, Curchitser, Lemiux and Kasper (2016).
- AGU Ocean Sciences Meeting. Impacts of Larval Connectivity on Coral Heat Tolerance. Kleypas, Thompson, Castruccio, Curchitser, Pinsky and Watson (2016).
- AGU Ocean Sciences Meeting. Interannual Drivers of Circulation and Heat Exchange in the Coral Triangle. Sexton, Haidvogel and Curchitser (2016).
- AGU Ocean Sciences Meeting. A New Perspective on the Foraging Ecology of Apex Predators in the California Current: Results from a Fully Coupled Ecosystem Model. Fiechter, Huckstadt, Rose, Costa, Curchitser, Hedstrom, Edwards and Moore (2016).
- AGU Ocean Sciences Meeting. Toward Dynamic Ocean Management: Fisheries assessment and climate projections informed by community developed habitat models based on dynamic coastal oceanography. Kohut, Manderson, Palamara, Saba, Saba, Hare, Curchitser, Moore, Seibel and DiDomenico (2016).
- AGU Fall Meeting. Variability in Reef Connectivity in the Coral Triangle. Diane Thompson, Joan Kleypas, Frederic Castruccio, James Watson and Enrique Curchitser (2015).
- PICES Annual Meeting. Regional climate modeling and FUTURE - An overview and possible future directions (Invited). Foreman, Chan, Curchitser and Peña (2015).
- PICES Annual Meeting. Future changes of nutrient dynamics and biological productivity in California Current System. Chai, Xiu and Curchitser (2014).
- PICES Annual Meeting. Modeling the Pacific Ocean: present capabilities and challenges for the next decade in relation to pelagic ecosystems. Curchitser (2014).
- PICES Annual Meeting. The relative importance of advective vs. in-situ processes to mesozooplankton biomass on the Eastern Bering Sea shelf. Gibson, Hermann, Coyle, Hedstrom and Curchitser (2014).
- PICES Annual Meeting. Impact of horizontal model resolution on air-sea CO₂ exchange in the California Current. Fiechter, Curchitser, Edwards, Chai, Goebel and Chavez (2014).

Organizing and Chairing Activities

Participation in Organizing or Chairing Conferences, Workshops, and Organizations

2006-ongoing Session and workshop convener in national and international meetings including: American Geophysical Union Ocean Sciences Meeting, North Pacific Marine Science Organization (PICES), International Consortium for the Exploration of the Seas (ICES), Ecosystem Studies of Sub-Arctic Seas (ESSAS), Global Ecosystem Dynamics (GLBOEC), International Symposium on the Effects of Climate Change on the World's Oceans, Regional Climate Modeling Workshops and Climate and Ocean Variability, Predictability and Change (CLIVAR).

Editorial Activities

Editorship of Scholarly or Professional Journals

2014-2015 Guest managing editor for Progress in Oceanography special volume on Modeling and observational approaches to understanding marine ecosystem dynamics.

Memberships

Membership/Offices Held in Scholarly and Professional Societies

- 2005-ongoing American Meteorological Society
- 1994-ongoing American Geophysical Union.
- 1986-1994 American Society of Mechanical Engineering.
- 1986-1994 American Institute of Aeronautics and Astronautics.

Funding

Externally-Funded Research and/or Training Grants

- 2015-2018 (Grant Amount: \$1,500,000) NOAA. A coupled physical-biogeochemical study of the Northeast U.S. shelf: Past variability and future change, Curchitser
- 2015-2018 (Grant Amount: \$489,735) Department of Interior. Development of a Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Area, Curchitser
- 2015-2016 (Grant Amount: \$99,749) NOAA CICS sub-award. Coupled bio-physical modeling of California Current System., Curchitser
- 2014-2017 (Grant Amount: \$1,200,000) NSF. EaSM-3: Regional decadal predictions of coupled climate-human systems, Curchitser, Seneca, Felder, Andrews, Kopp
- 2014-2018 (Grant Amount: \$385,384) NSF. Support of US Scientific Participation in the North Pacific Marine Science Organization (PICES)., Curchitser
- 2014-2017 (Grant Amount: \$63,271) NOAA. Assessing regional sea-ice predictability in the U.S. Arctic: A multi-model approach., Curchitser
- 2013-2015 (Grant Amount: \$108,292) Department of Interior. Cook Inlet Circulation Model Calculations., Curchitser
- 2013-2015 (Grant Amount: \$270,749) NOAA. Integrated rapid-response observations and ocean ensemble optimization to improve storm intensity forecasts in the northeast U.S., Glenn (PI), Curchitser, Wilkins
- 2012-2015 (Grant Amount: \$38,136) ONR. Predicting trophic interactions and habitat utilization in the California Current ecosystem., Flechter, Curchitser, Rose
- 2012-2014 (Grant Amount: \$24,948) NSF. Regional variability in future temperature stress to coral reefs in the Coral Triangle., Curchitser
- 2011-2015 (Grant Amount: \$3,853,332) NSF. A CRI-EaSM Collaborative proposal: Climate-to-humans: A study of urbanized coastal environments, their economics and vulnerability to climate change., Curchitser, Felder, Fefferman, Reinfeldter, Werner
- 2011-2013 (Grant Amount: \$193,953) NSF. Collaborative Research – BEST Synthesis: The variable transport of pollock larvae and eggs over the Bering shelf: A marriage of physics and biology., Curchitser
- 2011-2012 (Grant Amount: \$120,000) NOAA. Coupled bio-physical projections in the California Current., Curchitser
- 2010-2012 (Grant Amount: \$349,999) Department of Interior. Adaptation of an Arctic Circulation Model. Department of Interior, Bureau of Ocean Energy Management., Curchitser
- 2010-2015 (Grant Amount: \$853,738) NSF. Multi-scale modeling: Assessing the role of eastern boundary upwelling regions and their ecosystems on climate variability using a fully coupled model., Curchitser
- 2010-2012 (Grant Amount: \$113,116) UCAR. Coral Reef Bleaching and Recruitment under Future Climate Change Scenarios in the Coral Triangle – A Vulnerability Study using a Multi-scale Climate Model., Curchitser
- 2010-2012 (Grant Amount: \$53,263) Washington Sea Grant. Projections of ocean properties along the Washington coast related to environmental health., Bond, Curchitser, Hermann
- 2009-2012 (Grant Amount: \$56,673) Spanish Institute of Oceanography (IEO). REPROdUCE: understanding REcruitment PROcesses Using Coupled biophysical models of the pelagic Ecosystem., Curchitser
- 2009-2011 (Grant Amount: \$77,997) NOAA. Cross-shelf exchange processes in the Bering Sea. Downscaling climate models and ecosystems implications., Curchitser
- 2008-2012 (Grant Amount: \$83,389) NSF. Collaborative Research: Assessing the IPCC models for climate variability and change and the implication to ecosystems in the U.S. GLOBEC regions., Curchitser

2008-2009 (Grant Amount: \$56,876) NOAA. Tightly Coupled Dynamic End-to-End Marine Ecosystem Models., Curchitser

2008-2012 (Grant Amount: \$69,916) North Pacific Research Board (NPRB). Recruitment mechanisms for Tanner Crabs in the Eastern Bering Sea., Curchitser

2008-2012 (Grant Amount: \$317,666) NOAA/NSF. CAMEO: Building the Foundation: Mechanisms for low-frequency variability of forage fish: A comparative analysis of North Pacific Sardine systems., Curchitser

2008-2011 (Grant Amount: \$204,001) NSF. The effect of varying freshwater inputs on regional ecosystems in the Atlantic., Haidvogel (PI), Curchitser

2007-2011 (Grant Amount: \$206,037) NSF. Downscaling global climate projections to the ecosystems of the Bering Sea with nested biophysical models., Curchitser

2007-2010 (Grant Amount: \$278,000) Department of Interior (DOI). Modeling of circulation in the North Aleutian Basin., Curchitser

2006-2011 (Grant Amount: \$798,791) NSF. U.S. GLBOEC Coordinating Office., Haidvogel (PI), Curchitser

2006-2009 (Grant Amount: \$156,287) ONR. Characterization and modeling of Lombok Strait dynamics using the ROMS 4DVAR data assimilation system., Moore (PI), Arango, Curchitser, Wilkins, Levin

2005-2007 (Grant Amount: \$355,016) ONR. Testing parameterizations of submesoscale ocean variability: Resolution and power spectra., Kaplan, Curchitser, Huang

2005-2008 (Grant Amount: \$182,974) NSF. US-GLOBEC NEP phase IIIA-CCS: Effects of meso-zooplankton populations in the CCS using data-assimilative, physical/ecosystem models., Curchitser

2005-2006 (Grant Amount: \$19,500) NOAA. A coupled ocean-sea ice model of the Bering Sea., Curchitser

Service

Contributions to the Advancement of the Academic Profession

2014-ongoing Leader for International Climate Variability and Predictability (CLIVAR) research focus on bio-physical interactions and the dynamics of upwelling systems.

2014-ongoing U.S. State department appointed academic delegate to the North Pacific Marine Science Organization (PICES) governing council.

2014-ongoing Member (elected) U.S. Climate Variability and Predictability (CLIVAR) Panel on Predictability, Predictions and Applications Interface (PPAI).

2014-2015 Guest managing editor for Progress in Oceanography special volume on Modeling and observational approaches to understanding marine ecosystem dynamics.

2013-ongoing U.S. representative (alternate) to the International Consortium for the Exploration of the Seas (ICES) scientific committee (SCICOM).

2011-ongoing Co-chair of North Pacific Marine Science Organization (PICES) working group on Regional Climate Modeling (WG-29).

2011-ongoing Member (elected) North Pacific Marine Science Organization (PICES) Physical Oceanography and Climate (POC) Committee.

2010-ongoing Member (elected) International Climate Variability (CLIVAR) Ocean Model Development Panel (OMDP).

2010-2015 Member (elected) North Pacific Marine Science Organization (PICES) working group on North Pacific Climate Variability and Change (WG-27).

2010-2015 Co-chair of Ecosystem Studies of Sub-Arctic Seas (ESSAS) modeling working group.

2010-2010 Member of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) external review panel.

2006-ongoing Panelist on multiple National Science Foundation, Department of Energy and Sea Grant award panels.

2006-2010 U.S. Member of North Pacific Marine Science Organization (PICES) working group on Evaluation of Climate Change Projections (WG-20). National Center for Atmospheric Research Community Earth System Model (NCAR-CESM) ocean working group.

2005-2008 Member of the National Science Foundation (NSF) Partnership for Advanced Computational Infrastructure (PACI) allocations committee.

1999-ongoing Ad-hoc grant and manuscript reviewer for the National Science Foundation (NSF), North Pacific Research Board (NPRB), Department of Energy (DOE), NOAA-Sea Grant, German Science Foundation (DFG) and various journals including: Nature, J. Geophys. Res., J. Phys. Oce., Deep Sea Res., Ocean Mod. and Prog. Oce.

Service to Other Public Bodies

2014-2014 Department of Energy Peer Review Panelist (SciDAC Panel)

2013-2013 Massachusetts Sea Grant Panelist

2011-2011 Department of Energy Peer Review Panelist (SciDAC Panel)

2010-2010 National Science Foundation Peer Review Panelist (FESD Panel)

2009-2009 National Science Foundation Peer Review Panelist (CMG Panel)

2009-2009 National Science Foundation Peer Review Panelist (OPP Panel)

2005-2008 National Science Foundation Partnership for Advanced Cyber Infrastructure (PACI) Panel member (2 panels per year).

Service to Rutgers University

2015-ongoing Department of Environmental Sciences Curriculum committee

2014-ongoing New Brunswick Faculty Council

2014-ongoing New Brunswick Faculty Council: Faculty Affairs and Personnel Policy Committee

2013-ongoing Department of Environmental Sciences computer committee

2013-2015 Department of Environmental Sciences nominations committee

Publics Served

2013-ongoing: Fisheries managers: Consult with fisheries managers on uses for model outputs.

2012-ongoing: Non-profits: Provide Nature Conservancy with model output for use in planning.

Participation in Field Work

02/2003-04/2003 *R/V N. B. Palmer*, 43 day Ross Sea AnSlope cruise. Salinometer and CTD operation during cruise to explore bottom water formation and pathways in the Ross Sea.

09/2001-10/2001 *R/V N. B. Palmer*, 45 day Western Antarctic Peninsula Long Term Ecosystem Research (LTER) cruise. Collected data on sea ice properties as part of a multi-decadal data gathering effort in the region.

Students Supervised

Master's or Doctoral Students by Type of Supervision

Zhuomin Chen (Primary), currently enrolled. Oceanography, Rutgers University.

Chuning Wang (Primary), currently enrolled. Oceanography, Rutgers University.

Alexandra Ramos (Primary), currently enrolled. Atmospheric Sciences, Rutgers University.

Lori Sentman, currently enrolled. Atmospheric Sciences, Rutgers University

Caroline Farkas, currently enrolled. Atmospheric Sciences, Rutgers University.

Sarah Lietzke, currently enrolled. Oceanography, Rutgers University.

Yi Guan. Visiting student, University of Bremen.

Arielle Alpert, written comps. Atmospheric Sciences, Rutgers University.

David Langer, written comps. Atmospheric Sciences, Rutgers University.

Seth Danielson, external advisor, Oceanography, University of Alaska Fairbanks.

Postdoctoral Trainees

Shuwen Zhang, Oceanography and climate, Rutgers University.

Amir BozorgMagham, Oceanography and climate, Rutgers University.

Haruka Nishikawa, Oceanography and fisheries, Rutgers University.

Dimitris Politikos, Oceanography and fisheries, Rutgers University
Elizabeth Drenkard, Biogeochemistry and climate, Rutgers University.
Dajuan Kang, Oceanography and climate, Rutgers University
Frederic Castruccio, Oceanography and climate, Rutgers University
Gaelle Hervieux, Oceanography and climate, Rutgers University
Bin Zhang, Oceanography, Rutgers University
Ezgi Taskinogulo, Oceanography, Rutgers University