

Yifei “Philip” Chu, Ph.D., P.E., MBA

NOAA Great Lakes Environmental Research Laboratory (GLERL)

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PROFESSIONAL INTERESTS

Operational Coastal Ocean Forecast System, Coupled Atmosphere-Ocean-Wave Modeling, Hydrodynamic Modeling, Sediment Transport Processes, Satellite Remote Sensing, Geographic Information Systems (GIS) and Data Visualization

EDUCATION

M.B.A., Freeman School of Business, Tulane University, 2014 New Orleans, LA

- Management and Finance concentration

Ph.D., Civil and Environmental Engineering, The Ohio State University, 1998 Columbus, OH

- Major: Coastal Engineering and Numerical Modeling
- Minor: Atmospheric Science and Geographic Information System (GIS)

MSCE, Civil and Environmental Engineering, The Ohio State University, 1989 Columbus, OH

BSCE, Civil Engineering, National Taipei Institute of Technology, 1985 Taipei, Taiwan

AWARDS/HONORS

- Patent, “An automated method and system for predicting high resolution tidal heights and currents in coastal and estuarine zones”, U.S. Patent and Trademark Office, 2014
- Contribution Award, Naval Research Laboratory, Department of the Navy, 2010, 2012, 2013
- Invention Award, Naval Research Laboratory, Department of the Navy, 2011, 2014
- American Meteorological Society Special Award, for “developing the first U.S. coastal forecasting system to make routine operational predictions of currents, temperature and key constituents”, 2001(with 12 other scientists)
- Licensed Professional Engineer (PE), 1998
- Fellowship, NOAA Colloquium on Environmental Predictions, 1993

PROFESSIONAL EXPERIENCE

Supervisory Physical Scientist and Branch Chief, Integrated Physical and Ecological Modeling and Forecasting (IPEMF), NOAA Great Lakes Environmental Research Laboratory,

Ann Arbor, MI 2015- present

- Develop, formulate and manage budget, resources, staffing and scientific research projects
- Conduct research and integrate physical and ecological models
- Transition the Next-Generation Great Lakes Operational Forecasting System to NOAA/CO-OPS

Oceanographer, Naval Research Laboratory, Stennis Space Center, MS 2009 - 2015

- Develop and implement coupled air-ocean-wave forecast models for the U.S. Navy
- Validate/verify water levels, current velocity, temperature and wave fields from model outputs
- Conduct basic and applied research in ocean sciences
- Transition ocean models into U.S. Navy operational forecast centers
- Perform numerical model simulation, data analysis and visualization
- Present research findings in professional conferences and publish journal articles and Validation Test Reports (VTR) and technical reports

- Adjunct Faculty, Dept. of Civil and Environmental Eng., OSU, Columbus, OH** 2007
- Taught Fluid Mechanics, Open Channel Hydraulics and Applied Hydrology
- Founder and Principal Scientist, Aqualinks Technologies Inc., Columbus, OH** 2003 – 2007
- Managed R&D staff and oversaw day-to-day operations
 - Developed and implemented the Next Generation Operational Forecast System for NOAA/NOS
 - Authored five NOAA/NOS technical memorandum reports
 - Designed VHF-based marine identification communication hardware (AIS) and software
 - Provided consulting services for ENR200 engineering firms and wrote SBIR proposals
- Senior Research Engineer, Dept. of Civil and Environmental Eng., OSU** 1998–2003
- Led team of the Great Lakes Forecasting System (GLFS)
 - Supervised post-doctoral scientists and graduate students
 - Developed and maintained the Great Lakes Forecasting System website
 - Conducted research projects funded by NSF, NOAA, EPA, and USGS
- Graduate Research Associate, Dept. of Civil and Environmental Eng., OSU** 1990–1998
- Assisted in the development of the Great Lakes Forecasting System (GLFS)
 - Applied satellite cloud data to improve heat flux and 3-D model's temperature predictions
 - Developed Visual Basic based GLFSVIEW software application to disseminate GLFS products
 - Derived Great Lakes water temperature and turbidity maps from NOAA satellite data
- Visiting Research Scientist, NOAA GLERL, Ann Arbor, MI** 1992
- Setup Great Lakes Forecasting System workstation version for the National Weather Service
 - Developed programs to decode meteorological data for numerical weather prediction models
 - Applied GIS software to generate Great Lakes ice contour maps from satellite data

MAJOR RESEARCH AND CONSULTING CONTRACTS

- Co-Principal Investigator, The Central Role of the Mississippi River and its Delta in the Oceanography, Ecology and Economy of the Gulf of Mexico Large Marine Ecosystem, NOAA-RESTORE ACT. 2015-2017
- Consultant, Data Acquisition and Analysis on Hurricane Isaac wind and precipitation. Steines and Epling. 2014
- Consultant, Meteorological and oceanographic data analysis in Port Fourchon and Gulf of Mexico. Steines and Epling. 2014
- Principal Scientist, Development and Implementation of the Next Generation Operational Forecasting (NGOFS). NOAA/NOS. 2004 - 2007
- Principal Scientist, Performance Evaluation and Skill Assessment of the Great Lakes Forecasting System. NOAA/NOS. 2004 - 2005
- Co-Principal Investigator, The Impact of Episodic Events on Nearshore-Offshore Transport in the Great Lakes: Sediment Resuspension and Transport Modeling Program, National Science Foundation (NSF). 1997 - 2002

- Co-Principal Investigator, Examining the Effects of Lake Water Level Variations on Sediment Resuspension, Ohio Sea Grant, 2002 - 2004
- Co-Principal Investigator, Development and evaluation of a coupled model to predict E.Coli concentration at public beaches: a first application at Edgewater Park, Ohio, Lake Erie Protection Fund (LEPF) and United States Geological Survey (USGS), 2001- 2002
- Consultant, Development of a high resolution hydrodynamic and bacteria model for the Cleveland, Ohio region CSO facility planning, Limno-Tech Inc., 2002.
- Consultant, Lake Ontario Hydrodynamic Modeling project to evaluate lake currents during extreme storm events. O'Brien and Gere Engineers Inc.,
- Consultant, Long-term meteorological data analysis for the Green Bay. Limno-tech Inc.
- Consultant, Temperature and currents analyses for the Cleveland harbor. Limno-tech Inc.,
- Consultant, 30-year Lake Ontario thermal and current structure. Environment Canada
- Consultant, Columbus Engineering Consultants, Hydrological and hydraulic analyses for City of Columbus storm water Capital Improvement Projects (CIP)

RELATED TRAINING

- Federal Emergency Management Agency (FEMA) Multi-hazard Building Design Summer Institute (MBDSI) flood mitigation, wind loading and earthquake courses
- ESRI ARC/GIS training on GIS workflow analysis, geodatabase and spatial analysis
- ADCIRC Storm Surge and Hydrodynamic Modeling Workshop
- NOAA Operational Storm Surge Inundation Mapping Workshop
- Tulane Engineering Forums on Mississippi River flooding and coastal restoration
- HEC-RAS application to bridge sites workshop
- ASCE Storm water management course

COMPUTER SKILLS

- Hardware platforms: PC, Mac, workstation, clusters and supercomputer
- Operating System: Windows, MacOS, Unix/Linux
- Software/Applications: MS office Suite
- GIS/Image Processing: ARC/GIS, Matlab, IDL, ERDAS
- Numerical Models: Various Ocean Circulation Models, Hydrodynamic, Hydrological, Hydraulic, Sediment Transport and Water Quality Models
- Modeling Tools: HEC-RAS, TR55, CH3DSED, SWMM and SMS

INVITED SPEECH

- Tulane University, Naval Postgraduate School
 - National Central University (Taiwan), National Kaohsiung Marine University (Taiwan), Tamkang University (Taiwan) and Taiwan Ocean Research Institute (TORI)
 - University of Tokyo (Japan) and Korean Ocean Research and Development Institute (KORDI)
 - Canadian Centre for Inland Waters (CCIW)
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JOURNAL REVIEW/CONFERENCE SERVICE

- Reviewer, Journal of Ocean Dynamics
- Reviewer, International Journal of Marine Geodesy
- Reviewer, Journal of Great Lakes Research
- Reviewer, Lake Erie at the Millennium bi-national conference proceedings
- Reviewer, International Conference on Estuarine and Coastal Modeling
- Reviewer, Marine and Coastal Geographical Information System (M&CGIS)
- Reviewer, Bulletin of American Meteorological Society (BAMS)
- Co-Chair, Session of Satellite Remote Sensing, 42nd Conference on Great Lakes Research
- Session Chair, 1st International Workshop on Modeling the Ocean (IWMO)

SUPERVISING/MENTORING

- Adjunct Faculty, Dissertation Committee, School of Earth Sciences, The Ohio State University
- Thesis committee, Department of Earth and Environmental Sciences, Tulane University
- Thesis committee, Department of Civil Engineering, University of Wisconsin
- Thesis committee, Department of Civil Engineering, Michigan Technological University
- NOAA/NOS Operational Forecast System (OFS) System Development Implementation Team (SDIT) and Modeling Advisory Board
- Supervisor, Navy Research Enterprise Internship Program (NREIP) summer students
- Mentor, NRL Science and Engineering Apprentice Program (SEAP) summer students
- Mentor, MentorNet in Engineering and Science

PUBLICATIONS

1. Allard, R.A., E.R. Rogers, P. J. Martin, T.G. Jensen, **P.Y. Chu**, T. Campbell, J. Dykes, T.A. Smith, "The US Navy Coupled Ocean –Wave Prediction System", Journal of Oceanography, p92-103, 2014.
2. Allard, Campbell, Smith, **Chu**, Dykes, Veeramony and Rogers, "Coupled Ocean-Wave-Air Prediction System". FY13 NRL DoD High Performance Computing Modernization Program Annual Reports, p70-71, 2014.
3. **Chu, P.**, G. A. Jacobs, M.K. Cambazoglu and R.S. Linzell, "Multi Model Validation of Currents in the Chesapeake Bay Region in June 2010", J. Marine Geodesy, 35:399-428, 2012.
4. Allard, R.A., T.J. Campbell, T.A. Smith, T.G. Jensen, **P. Chu**, E.W. Rogers, U.M. Gravois and S.N. Carroll, Validation Test Report for the Coupled Ocean Atmosphere Mesoscale Prediction System (COAMPS) Version 5.0 Ocean/Wave, NRL/MR/7322-11-2012, 110pp, 2012.
5. Smith S., J. Cummings, C. Rowley, **P. Chu**, J. Shriver, R. Helber, P. Spence, S. Carroll and O.M. Smedstad, Validation Test Report for the Navy Coupled Ocean Data Assimilation 3D Variational Analysis(NCODA-VAR) System Version 3.43, NRL/MR/7320-12-9363,148pp, 2012.
6. **Chu, P.**, G.A. Jacobs, K.M. Cambazoglu and R.S. Linzell, Multi-Model Validation in the Chesapeake Bay Region in June 2010, NRL Report MR/7320-12-9297, 40pp, 2012.
7. Allard, R.A., T.J. Campbell, T.A. Smith, T.G. Jensen, **P. Chu** and J. Dykes, Coupled Ocean-Air Prediction System, DoD High Performance Computing Modernization Program Annual Report, p68-69, 2012.
8. **Chu, P.** and J. Kelley, G. Mott, A.J. Zhang and G. Lang, "Development, Implementation and Skill Assessment of the NOAA/NOS Great Lakes Forecast System", J. of Ocean Dynamics, Vol61, No9, p1305-1316, 2011.

9. Blain, C.A., R.S. Linzell, **P. Chu** and C. Massey, Validation Test Report for the ADvanced CIRCulation Model (ADCIRC) V45.11, NRL Technical Report, NRL/MR/7320-10-9205, 109pp, 2010.
10. Kelley, J., A.J. Zhang, **P. Chu** and G. Lang, "Skill Assessment of NOS Lake Huron Operational Forecast System (LHOFS)", NOAA Technical Report NOS CS23, 53pp, 2010.
11. **Chu, P.**, Blain C.A. and Linzell, R.S., Development and Implementation of an Operational Coastal Forecast System, Proceeding of Korea-China Joint Workshop on Marine Environment Forecasting System for the Yellow Sea and East China Sea, Jeju, Korea, p13-16, 2010.
12. **Chu, Y.P.**, C.A. Blain and R.S. Linzell, Development of a Relocatable Operational Coastal Modeling System for the US Navy, Oceans 09 MTS/IEEE, MS, 2009.
13. **Chu, P.**, C.A. Blain, Development of a Relocatable Coastal Forecast System – Korean Coast Application, 2009 International Workshop on Operational System for Marine Environment and Forecasting, Kaohsiung, Taiwan, p123-130, 2009.
14. Kelley, J., A.J. Zhang, **P. Chu** and G. Lang, "Skill Assessment of NOS Lake Ontario Operational Forecast System (LOOFS)", NOAA Technical Report NOS CS13, 40pp. 2008.
15. **Chu, P.**, J. Kelley, A.J. Zhang, G. Lang and K. Bedford, "Skill Assessment of NOS Lake Erie Operational Forecast System (LEOFS)", NOAA Technical Report NOS CS12, 73p, 2007.
16. Kelley, John, **P. Chu**, A.J. Zhang, G. Lang and D. Schwab, "Skill Assessment of NOS Lake Michigan Operational Forecast System (LMOFS)", NOAA Technical Report NOS CS8, 67p.
17. Kelley, J., **P. Chu**, "Skill Assessment of NOS Lake Superior Operational Forecast System (LSOFS)", NOAA Technical Report NOS CS9, 48p, 2007.
18. **Chu, P.**, J. Kelley, A.J. Zhang, G. Lang and K. Bedford, "Skill Assessment of NOS Great Lakes Forecast System", 10th International Conference on Estuarine and Coastal Modeling, 2007.
19. Schwab, D., G. Lang, K. Bedford and **P. Chu**, "Great Lakes Coastal Forecasting System" American Meteorological Society conference on Coastal and Atmospheric Predictions, 2001.
20. Beletsky, D., D.J. Schwab, K.W. Bedford, C. Chen, **Y.P. Chu**, J. Lou, P.J. Roebber, and J. Rubao, "Physical-Biological Modeling of Lake Michigan in the EEGLE Program", 43rd International Association of Great Lakes Research conference, Cornwall, Ontario, 2000.
21. **Chu, Y.P.** and K.W. Bedford, "Development of Lake Michigan Nowcast/Forecast Modeling System and the Prospects for a Sediment Transport Prediction Model", 6th International Conference on Estuarine and Coastal Modeling, New Orleans, LA, 2000.
22. Schwab, D., G. Lang, K. Bedford and **Y.P. Chu**, "Recent Development in the Great Lakes Forecasting System (GLFS)", Third Conference on Coastal Atmospheric and Ocean Prediction and Processes, New Orleans, LA, pp201-206, 2000.
23. **Chu, Y.P.** and K.W. Bedford, "Lake Michigan Nowcast/Forecast System", Abstracts, 42nd Conference on Great Lakes Research, International Association of Great Lakes Research, Cleveland, OH, 1999.
24. Bedford, K.W. and **Chu, Y.P.**, "Progress on verification of the Great Lakes Forecasting System", Abstracts, 42nd Conference on Great Lakes Research, International Association of Great Lakes Research, Cleveland, OH, 1999.
25. **Chu, Y.P.** and K.W. Bedford, "Impact of Satellite Derived Cloud Data on Model Predictions of Surface Heat Flux and Temperature: A Lake Erie Example", Proceedings of the International Conference on Estuarine and Coastal Modeling, Alexandria, VA, pp556-569, 1998.
26. **Chu, Y.P.**, "The Incorporation of Hourly GOES Data in a Surface Heat Flux Model and Its Impacts on Operational Temperature Predictions in Bodies of Water", Ph.D. dissertation, The Ohio State University, Columbus, OH, 273p, 1998.

27. **Chu, Y.P.** and K.W. Bedford, 1998, "Evaluation of Lake Ontario Nowcasts", Abstracts, 41st Conference on Great Lakes Research, International Association of Great Lakes Research, Hamilton, ON, 1998.
28. **Chu, Y.P.** and K.W. Bedford, GLFSView3.0 User's Guide, Ohio Sea Grant Program, 12p, 1995.
29. **Chu, Y.P.**, Bedford. K.W. and Marble. D.F., "Technical Issues Surrounding the Integration of GIS with 3-D Numerical Models of Spatial Processes" in GIS Applications in Natural Resources 2. Ed. Heit, Dennison and Shortreid. GIS World Books, pp233-240, 1995.
30. **Chu, Y.P.**, Bedford. K.W. and Marble. D.F., "Technical Issues Surrounding the Integration of GIS with 3-D Numerical Models of Spatial Processes", Ninth Annual Symposium on Geographic Information Systems, Vancouver, BC, pp274-381, 1995.
31. **Chu, Y.P.**, C.C.J. Yen and K.W. Bedford, "GLFSVIEW- GLFS Product Viewing Application". National Conference on Hydraulic Engineering, ASCE, Buffalo, NY, pp207-211, 1994.
32. **Chu, Y.P.**, K.W. Bedford, C.J. Merry and J.S. Hobgood, "Impact of GOES Data on Surface Heat Flux Predictions". National Conference on Hydraulic Engineering, ASCE, Buffalo, 1994.
33. **Chu, Y.P.** and K.W. Bedford, GLFSView2.0 User's Guide, Ohio Sea Grant Program, 12p, 1994.
34. **Chu, Y.P.** and K.W. Bedford, "GLFSVIEW-Great Lakes Forecasting System Viewing Application", Abstracts, 36th Conference on Great Lakes Research, De Pere, WI, P82, 1993.
35. **Chu, Y.P.** and K.W. Bedford, 1993, GLFSView1.0 User's Guide, Ohio Sea Grant Program, 12p
36. Merry, C.J., D. Welsh, **Y.P. Chu**, K.W. Bedford and D.J. Schwab, "Incorporating AVHRR Data into a Surface Heat Flux Model for Lake Erie", Abstracts, 35th Conference on Great Lakes Research, Waterloo, Ontario, 1992.

RECENT PRESENTATIONS

1. "Ocean Modeling and Prediction Capabilities at the U.S. Naval Research Laboratory", Tulane University, Department of Earth and Environmental Sciences, October, 2014.
2. "An overview of COAMPS Capabilities at NAVOCEANO for One and Two-way Coupled Modeling", NAVOCEANO Science and Technology Symposium, June, 2014
3. "Impact of high-resolution atmospheric fields on a numerical model of the Gulf of Taranto", NATO/CMRE REP11 Workshop, January, 2013.
4. "Atmosphere, current and wave interaction in the Kuroshio and Okinawa Trough region during the 2007 typhoon season", 2012 Ocean Sciences Meeting, Feb 2012.
5. "Ocean Modeling and Prediction Capability at the US Naval Research Laboratory – An Overview", Institute of Hydrological and Oceanic Sciences, National Central University, Taiwan, Feb 2012.
6. "Air-Sea-Wave Interaction in the Okinawa Trough region during 2007 Typhoon Season", International Workshop on Modeling of Oceans, May 2012.
7. "Ocean Modeling and Prediction Capability at the US Naval Research Laboratory – An Overview", Department of Earth and Planetary Sciences, University of Tokyo, Japan, May 2012.
8. "Impact of Internal Tides on the Boundary Conditions for a Regional Model of the NW Australia Shelf", 2012 Ocean Sciences Meeting, Feb 2012.
9. "Operational Forecasts Supporting US Navy", 2011 ADCIRC workshop, NRL Stennis Space Center, MS, April, 2011.
10. "Interaction Between Barotropic and Baroclinic Tides in a Region of Complex Topography", IUGG

General Assembly Melbourne AUS, June, 2011.

11. “Development, Implementation and Validation of an ADCIRC-based Operational Coastal Forecast System”, 2010 ADCIRC workshop, USACE/ERDC, Vicksburg, MS April, 2010.

12. “Development and Implementation of an Operational Coastal Forecast System”, Korea-China Joint Workshop on Marine Environment Forecasting System for the Yellow Sea and East China Sea, Jeju, Korea, March, 2010.

13. “Development, Implementation and Validation of an Operational Coastal Forecast System”, Invited presentation at Korean Ocean Research and Development Institute (KORDI), Ansan, Korea, March, 2010.

14. “Development and Implementation of an Operational Coastal Forecast System for the Korean Coast”, 2010 AGU Oceans Science Meeting, Portland, Oregon, February, 2010.

15. “Development of a Relocatable Coastal Forecast System – Korean Coast Application” International Workshop on Operational System for Marine Environment and Forecasting, National KaoHsiung Marine University, Kaohsiung, Taiwan, October, 2009.

16. “Development of a Relocatable Operational Coastal Modeling System for the US Navy”, Oceans 2009 MTS/IEEE Biloxi, MS, October, 2009.

17. "Skill Assessment of the NOAA/NOS Great Lakes Operational Forecasting System”, 10th International Conference on Estuarine and Coastal Modeling, New Port, RI, Nov, 2007.

18. “Skill assessment of NOS Lake Erie Nowcast/Forecast System”, 50th Conference on Great Lakes Research, College Park, PA, May, 2007.

19. “Overview and Skill Assessment of the Great Lakes Operational Forecasting System”, NOAA Great Lakes Environmental Research Laboratory, Ann Arbor, Michigan, Feb, 2006

20. “Research vs. Operational – Coastal Forecast System in the United States”, Korea Ocean Research and Development Institute (KORDI), Korea, June, 2005.