

Dr. Joseph B. Zambon, Ph.D

Research Assistant Professor

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1. RESEARCH FIELDS

- Numerical Geophysical Modeling
- Deep-Sea Research and Submersible Vehicles
- Tropical Cyclone Modeling and Forecasting
- Air-Sea Interactions
- Coupled Ocean-Atmosphere-Wave Numerical Modeling
- Coastal Ocean Circulation Dynamics
- Statistical Validation of Numerical Models

2. EDUCATION

- Ph.D., North Carolina State University – Marine, Earth and Atmospheric Sciences 2014
- M.S., North Carolina State University – Marine, Earth and Atmospheric Sciences 2009
- B.S., University at Albany – Atmospheric Science 2007

3. EMPLOYMENT HISTORY

- Research Assistant Professor, North Carolina State University 2017-present
- Vice President of Research and Development, Co-Founder Fathom Science LLC 2017-present
- Postdoctoral Research Scholar, North Carolina State University 2014-2017
- Graduate Student Research Assistant, North Carolina State University 2007-2014
- Supervisor and Technician, ITS Helpdesk, University at Albany 2005-2007
- Student Intern, National Weather Service, Albany, NY 2006
- Student Intern, National Weather Service, Buffalo, NY 2004

4. GRANTS, AWARDS, AND SCHOLARSHIPS [TOTAL TO DATE: \$262,674]

- [1] United States Geological Survey. Using a Coupled Numerical Modeling System to Investigate Flooding Impacts During Hurricane Florence (2018). [PI, Award Amount: \$115,132] 2020-2021
- [2] National Academies of Sciences, Engineering and Medicine – Gulf Research Program. *Understanding and Predicting the Gulf of Mexico Loop Current, Topic 8: Numerical Modeling*. [Key Project Investigator, Model data analysis and management. Award Amount: \$126,792 of \$2,100,946] 2019-2020

- [3] Amazon.com, Inc – Amazon Web Services (AWS) Cloud Credits for Research Program. *Proposal to Transition the NC State Coupled Northwest Atlantic Prediction System (CNAPS) to AWS Cloud Computing.* [PI, Award Amount: \$45,000] 2019-2021
- [4] Southeast Coastal Ocean Observing Regional Association (SECOORA) Data Challenge Award. *Development of a 5-Year Daily, Cloud-Free Sea Surface Temperature (SST) and Chlorophyll-a Reconstruction Dataset Using the Data Interpolating Empirical Orthogonal Functions (DINEOF) Method.* [PI, Award Amount: \$2,500] 2017-2018
- [5] North Carolina Space Grant Research Fellowship, National Aeronautics and Space Administration (NASA). *Assimilating Satellite Observations in a Fully Coupled Ocean – Atmosphere – Wave – Sediment Transport (COAWST) Model.* [PI, Grant Amount: \$8,000] 2010-2011
- [6] University Graduate Student Association (UGSA) Travel Award, North Carolina State University. [Award Amount: \$250] 2010
- [7] United University Professions Undergraduate Scholarship, University at Albany. [Scholarship Amount: \$4,000] 2003-2007
- [8] Wegmans Employee Undergraduate Scholarship, University at Albany [Scholarship Amount: \$6,000] 2003-2007

5. PROFESSIONAL SERVICES

International and National Level

- [1] Member – National Weather Association 2014-present
- [2] Member – American Geophysical Union 2008-present
- [3] Member – American Meteorological Society 2005-present

University Level

- [1] Convener and Chair – Marine, Earth and Atmospheric Sciences Graduate Student Research Symposium on “Numerical Modeling”. North Carolina State University, Raleigh, NC. 2011
- [2] President – Marine, Earth and Atmospheric Sciences Graduate Student Association, North Carolina State University, Raleigh, NC. 2009-2010
- [3] Secretary – Marine, Earth and Atmospheric Sciences Graduate Student Association, North Carolina State University, Raleigh, NC. 2010-2012

Reviewer for Professional Journals

- [1] Monthly Weather Review
- [2] Ocean Dynamics
- [3] Journal of Geophysical Research – Oceans

- [4] Journal of Geophysical Research – Atmospheres
- [5] Journal of Marine Systems
- [6] Ocean Modelling
- [7] Journal of the Ocean University of China
- [8] Atmósfera
- [9] Energies

Outreach

- [1] Invited Speaker – NC State University Geographic Information Systems (GIS) Day 2019
- [2] Invited Speaker – Waddington Middle School, NC SeaGrant Oceanography Lectures 2017
- [3] Invited Speaker – Victor Middle School, Men and Womens Leadership Group 2016
- [4] Invited Instructor – North Carolina Museum of Natural Sciences (via satellite from R/V Atlantis in the North Atlantic) 2016
- [5] Guest Instructor – Exploris Middle School Raleigh, NC. 2007

6. REFEREED PUBLICATIONS [Number of Citations 703, h-Index: 5 (as of December 2020)]

Published/In Press

- [1] Zambon, J. B., R. He, J. C. Warner, and C. Hegermiller (2021). Impact of SST and Surface Waves on Hurricane Florence (2018): A Coupled Modeling Investigation. *Weather and Forecasting*, doi: 10.1175/WAF-D-20-0171.1.
- [2] Xue, Z., J. Zambon, Z. Yao, Y. Liu, and R. He (2015). An integrated ocean circulation, wave, atmosphere and marine ecosystem prediction system for the South Atlantic Bight and Gulf of Mexico. *Journal of Operational Oceanography*, Vol. 8, 80–91, doi: 10.1080/1755876X.2015.1014667.
- [3] Zambon, J. B. (2014). Air-sea interaction during landfalling tropical and extra-tropical cyclones. *Ph.D. Dissertation – North Carolina State University*, 201pp, Available online: <http://repository.lib.ncsu.edu/ir/handle/1840.16/9951>
- [4] Zambon, J. B., R. He, and J. C. Warner (2014). Tropical to extratropical: Marine environmental changes associated with Superstorm Sandy prior to its landfall. *Geophysical Research Letters*, 2014GL061357, doi:10.1002/2014GL061357
- [5] Zambon, J. B., R. He, and J. C. Warner (2014). Investigation of Hurricane Ivan using the coupled ocean-atmosphere-wave-sediment transport (COAWST) model. *Ocean Dynamics*, Vol. 64, 1535–1554, doi:10.1007/s10236-014-0777-7
- [6] Olabarrieta, M., J. C. Warner, B. Armstrong, J. B. Zambon, and R. He (2012). Ocean–atmosphere dynamics during Hurricane Ida and Nor’Ida: An application of the coupled ocean–atmosphere–wave–sediment transport (COAWST) modeling system. *Ocean Modelling*, Vol. 43-44, 112–137, doi:10.1016/j.ocemod.2011.12.008

- [7] Warner, J. C., B. Armstrong, R. He, and J. B. Zambon (2010). Development of a coupled ocean–atmosphere–wave–sediment transport (COAWST) modeling system. *Ocean Modelling*, Vol. 35, 230–244, doi:10.1016/j.ocemod.2010.07.010
- [8] Zambon, J. B. (2009). An examination of tropical cyclone dynamics utilizing the 3-Way coupled ocean atmosphere wave sediment transport (COAWST) model. *Masters Thesis – North Carolina State University*, 154pp, Available online: <http://repository.lib.ncsu.edu/ir/handle/1840.16/475>
- In Review/To Be Submitted
- [9] Zambon, J. B., R. He, and J. C. Warner (in revision). Impact of SST and Surface Waves on Hurricane Florence (2018): A Coupled Modeling Investigation. *Weather and Forecasting*
- [10] Zambon, J. B., R. He, J. Bane, J. Clayson, C. A. Clayson (in preparation). From the Bottom of the Ocean to the Top of the Atmosphere: A 3-Dimensional Examination of Explosive Cyclogenesis Crossing the Gulf Stream Onboard the R/V Neil Armstrong. To be submitted to *Geophysical Research Letters*
- [11] Yao, Z., J. B. Zambon, A. C. Todd, Z. Xue, and R. He (in review). A fully coupled ocean circulation, wave, and atmosphere nowcast and forecast system for the northwest Atlantic coastal ocean. *Ocean Dynamics, Topical Collection on Coastal Ocean Forecasting Science*

7. PROFESSIONAL MEETINGS AND ABSTRACTS

- [1] Zambon, J. B., R. He, J. C. Warner, and C. Hegermiller, Investigation of Extreme Weather, Ocean Current, Wave, and Coastal Flooding during Hurricane Florence (2018) Using the Coupled Ocean–Atmosphere–Wave–Sediment Transport (COAWST) Model. AMS Annual Meeting, Boston, MA, 2020.
- [2] Zambon, J. B., R. He, J. C. Warner, and C. Hegermiller, WRF Explicit Surface Wave Modeling Experiments Beneath Hurricane Florence (2018). NCAR WRF/MPAS Workshop, Boulder, CO, 2019.
- [3] Zambon, J. B., R. He, and J. Bane, From Top to Bottom: An Investigation of Wintertime Atmosphere-Ocean Interaction in the Vicinity of the Gulf Stream in January 2018. Mid-Atlantic Bight Physical Oceanography and Meteorology (MABPOM) Conference, Woods Hole Oceanographic Institute, Woods Hole, MA, 2018.
- [4] Zambon, J. B., R. He, and J. C. Warner, Investigation of Precipitation on Upper-Ocean Stratification during Hurricanes Irene (2011) and Harvey (2017). AGU Ocean Sciences Meeting, Portland, OR, 2018.
- [5] Zambon, J. B., R. He, and J. Bane, Preliminary Comparisons of the Coupled Northwest Atlantic Prediction System (CNAPS) to Data at the Cape Hatteras Shelf Break in April

2017. Mid-Atlantic Bight Physical Oceanography and Meteorology (MABPOM) Conference, Coastal Studies Institute, Wanchese, NC, 2017.
- [6] Zambon, J. B., R. He, and J. C. Warner, Development of the Coupled Northwest Atlantic Prediction System (CNAPS). AGU Ocean Sciences Meeting, New Orleans, LA, 2016
- [7] Zambon, J. B., Tropical to Extratropical: Marine Environmental Changes Associated with Superstorm Sandy Prior to its Landfall. Coastal Ocean Modeling Gordon Research Conference, University of New England, Biddeford, ME, 2015
- [8] Zambon, J. B., Tropical to Extratropical: Marine Environmental Changes Associated with Superstorm Sandy Prior to its Landfall. Marine, Earth and Atmospheric Sciences (MEAS) and Forestry and Environmental Resources (FER) Graduate Research Symposium, North Carolina State University, Raleigh, NC, 2014
- [9] Zambon, J. B., R. He, and J. C. Warner, Northeast Tropical/Extra-Tropical Cyclone Case Studies: Irene (2011) and Sandy (2012). Coastal Processes Project Meeting, Woods Hole Oceanographic Institute, Woods Hole, MA, 2014
- [10] Zambon, J. B., R. He, and J. C. Warner, Investigation of Hurricane Sandy Dynamics Using the 3-Way Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Model. AGU Ocean Sciences Meeting, Honolulu, HI, 2014
- [11] He, R., J. B. Zambon, Z. Yao, J. Nelson, and J. C. Warner, NCSU COAWST Nowcast/Forecast Modeling System: Implementation and Examples. Mid-Atlantic Regional Association Coastal Ocean Observing System (MARACOOS) Modeling Meeting, Washington, DC, 2013
- [12] Zambon, J. B., and R. He, Coupled Application Examples: Modeling of Tropical Cyclones. Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) User Workshop, Woods Hole Oceanographic Institute, Woods Hole, MA, 2012
- [13] He, R., Z. Xue, and J. B. Zambon, An Integrated Ocean Circulation, Wave, Atmosphere and Marine Ecosystem Prediction System for the South Atlantic Bight and Gulf of Mexico. Southeast Coastal Ocean Observing Regional Association (SECOORA) Meeting, Miami, FL, 2012
- [14] He, R., W. Woods, Z. Xue, J. B. Zambon, K. Chen, Y. Li, Y. Gong, and Y. Yin, Glider Surveys in the South Atlantic Bight: a Component of an Integrated Coastal Ocean Observing and Data Assimilative Prediction System. Southeast Coastal Ocean Observing Regional Association (SECOORA) Meeting, Miami, FL, 2012
- [15] Zambon, J. B., Using the Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) model to forecast Hurricane Irene. Department of Marine, Earth and Atmospheric Sciences (MEAS) Seminar, North Carolina State University, Raleigh, NC 2012

- [16] Zambon, J. B., R. He, and J. C. Warner, Investigation of Hurricane Ivan Using the 3-Way Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Model. 10th Symposium on the Coastal Environment. AMS Annual Meeting, New Orleans, LA, 2012
- [17] Zambon J. B., Investigation of Hurricane Ivan Using the 3-Way Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Model. Marine, Earth and Atmospheric Science Graduate Student Symposium, North Carolina State University, Raleigh, NC, 2011
- [18] Zambon J. B., R. He, J. C. Warner, Investigation of Hurricane Ivan Using the 3-Way Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Model. Ocean Modeling Gordon Research Conference, Mount Holyoke College, South Hadley, MA, 2011
- [19] Zambon J. B., R. He, J. C. Warner, Investigation of Hurricane Ivan Using the 3-Way Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Model. North Carolina State University Graduate Student Research Symposium, North Carolina State University, Raleigh, NC, 2010
- [20] Warner, J. C., B. N. Armstrong, M. Olabarrieta, R. He, J. B. Zambon, G. Voulgaris, N. Kumar, and K. A. Haas, Development and application of a Coupled-Ocean-Atmosphere-Waves-Sediment Transport (COAWST) Modeling System for Nearshore Environments (Invited). AGU Ocean Sciences Meeting, Portland, OR, 2010
- [21] Zambon J. B., R. He, and J. C. Warner, Investigation of Hurricane Ivan Using the 3-Way Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Model. AGU Ocean Sciences Meeting, Portland, OR, 2010
- [22] Warner, J. C., R. He, B. Armstrong, and J. B. Zambon, Numerical Investigation of Hurricane Isabel Impacts. Mid-Atlantic Bight Physical Oceanography and Meteorology and Southeast Coastal Oceanography and Meteorology (MABPOM SECOM) Conference, North Carolina State University, Raleigh, NC, 2009
- [23] Zambon J. B., Numerical Investigation of Hurricane Ivan. Mid-Atlantic Bight Physical Oceanography and Meteorology and Southeast Coastal Oceanography and Meteorology (MABPOM SECOM) Conference, North Carolina State University, Raleigh, NC, 2009
- [24] Zambon J. B., Investigation of Tropical Cyclone Using a New Coupled Ocean – Atmosphere – Wave – Sediment Transport (COAWST) Model. Masters Thesis Defense to the Department of Marine, Earth and Atmospheric Sciences (MEAS), North Carolina State University Raleigh, NC, 2009

- [25] Zambon J. B., R. He, J. C. Warner, 2008: Investigation of Coastal Ocean Response to Landfalling hurricane using Coupled Ocean Atmosphere Wave Sediment Transport (COAWST) Model: Idealized Experiments. American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, 2008
- [26] Warner, J. C., B. Armstrong, R. He, J. B. Zambon, 2008: Using a Coupled Ocean - Atmosphere - Wave - Sediment Transport (COAWST) Modeling System to investigate impacts of storms on coastal systems. American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, 2008
- [27] He, R., J. C. Warner, B. Armstrong, J. B. Zambon, 2008: Investigation of Coastal Ocean Response to Landfalling hurricane using Coupled Ocean Atmosphere Wave Sediment Transport (COAWST) Model: Realistic Hindcast. American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, 2008
- [28] Zambon J. B., 2008: Investigating a 3-Way Coupled Model of a Landfalling Tropical Cyclone. Department of Marine, Earth and Atmospheric Sciences (MEAS) Seminar, North Carolina State University, Raleigh, NC 2008

8. RESEARCH PROJECTS

- [1] **Title:** Using a Coupled Numerical Modeling System to Investigate Flooding Impacts During Hurricane Florence (2018)
Sponsor: United States Geological Survey
Duration: 2020-2021
- [2] **Title:** Understanding and Predicting the Gulf of Mexico Loop Current, Topic 8: Numerical Modeling.
Sponsor: National Academies of Sciences, Engineering, and Medicine
Duration: 2019-2020
- [3] **Title:** Transitioning the NC State Coupled Northwest Atlantic Prediction System (CNAPS) to AWS Cloud Computing
Sponsor: Amazon Web Services, Amazon.com, Inc.
Duration: 2019-2021
- [4] **Title:** Processes Driving Exchange At Cape Hatteras (PEACH).
Sponsor: National Science Foundation (NSF) Award OCE-1559178
Duration: 2016-2020
- [5] **Title:** Development of a 5-Year Daily, Cloud-Free Sea Surface Temperature (SST) and Chlorophyll-a Reconstruction Dataset Using the Data Interpolating Empirical Orthogonal Functions (DINEOF) Method.
Sponsor: Southeast Coastal Ocean Observing Regional Association (SECOORA)
Duration: 2017-2018

- [6] **Title:** Developing At-Sea & Telepresence-Led Deep-Submergence Science Leadership (National Science Foundation Early-concept Grants for Exploratory Research; NSF EAGER)
Sponsor: National Science Foundation (NSF) Award #1641453
Duration: 2016-2017
- [7] **Title:** Connectivity in Western Atlantic Seep Populations: Oceanographic and Life History Processes Underlying Genetic Structure
Sponsor: National Science Foundation (NSF) Award #1031050
Duration: 2010-2015
- [8] **Title:** Coastal Ocean Processes and Sediment Transport Dynamics
Sponsor: U. S. Geological Survey (USGS)
Duration: 2007-2012
- [9] **Title:** Assimilating Satellite Observations in a Fully Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Model
Sponsor: National Aeronautics and Space Administration North Carolina (NASA NC) Space Grant
Duration: 2010-2011

9. RESEARCH CRUISES AS CHIEF SCIENTIST (*) / RESEARCH SCIENTIST

[1]	NSF: Processes Driving Exchanges at Cape Hatteras	R/V Neil Armstrong	11/2018
[2]	NSF: Processes Driving Exchanges at Cape Hatteras	R/V Neil Armstrong	01/2018
[3]	NSF: Processes Driving Exchanges at Cape Hatteras	R/V Neil Armstrong	04/2017
[4]	*NSF: Deep Submergence Science Leadership	R/V Atlantis	07-08/2016
[5]	NSF: US East Coast Survey	R/V Atlantis	07/2015
[6]	NSF: Gulf of Mexico Survey	R/V Pelican	11/2013
[7]	NSF: North Atlantic Shelf Survey	R/V Endeavor	08/2013
[8]	NSF: North Atlantic Shelf Survey	R/V Cape Hatteras	10-11/2012
[9]	NSF: Caribbean Sea, Barbados Shelf	R/V Atlantis	05-06/2012
[10]	Glider Deployment: Mid-Atlantic Coastal Shelf	R/V Seahawk	03/2012
[11]	Glider Deployment: Mid-Atlantic Coastal Shelf	R/V Seahawk	08/2011
[12]	NSF: Caribbean Sea, Barbados Shelf	R/V Oceanus	05/2011
[13]	Student Research Cruise	R/V Cape Hatteras	11/2008

10. GRADUATE/UNDERGRADUATE TEACHING

[1]	MEA 462: Observational Methods and Data Analysis in Marine Physics	North Carolina State University	Spring 2015-2020
[2]	MEA 611: Ocean Modelling II	North Carolina State University	Fall 2013
[3]	MEA 611: Ocean Modelling I	North Carolina State University	Spring 2011
[4]	MEA 811: Air-Sea Interaction	North Carolina State University	Fall 2009

11. STUDENT ADVISING

[1] S. Mao, North Carolina State University, Committee member. 2016-Present

12. VOLUNTEER EXPERIENCE

• Captain/EMT	Swift Creek Fire Department	Cary, NC	2019-present
• Firefighter/EMT	Swift Creek Fire Department	Cary, NC	2007-2019
• Chairman	Swift Creek Firefighters Association	Cary, NC	2018-present
• Pilot	Pilots n' Paws	Sanford, NC	2013-present
• EMT	Western Turnpike Rescue Squad	Guilderland, NY	2006-2007
• Firefighter	McKownville Fire Department	Guilderland, NY	2004-2007

13. ADDITIONAL SKILLS

- Certificated Private Pilot with over 152 hours flying time and 10 years flying experience
- Licensed North Carolina Emergency Medical Technician (EMT-B; exp. 4/2022)
- NFPA Firefighter I/II (IFSAAC accredited), NFPA Driver/Operator (IFSAAC accredited), Hazardous Materials Operations
- USA Hockey, ice hockey player and team captain
- PADI Open Water Diver