

## Weifeng (Gordon) Zhang

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### EDUCATION:

B.S. 2000 Fluid Mechanics, Zhejiang University, China  
M.E. 2003 Fluid Mechanics, Zhejiang University, China  
Ph.D. 2009 Oceanography, Rutgers, The State University of New Jersey

### PROFESSIONAL EXPERIENCE:

2015 – present Associate Scientist, Woods Hole Oceanographic Institution  
2011 – 2015 Assistant Scientist, Woods Hole Oceanographic Institution  
2009 – 2011 Postdoctoral Scholar, Woods Hole Oceanographic Institution  
2004 – 2009 Research Assistant, Institute of Marine and Coastal Sciences, Rutgers University

### AWARDS AND HONORS:

2009 Woods Hole Oceanographic Institution Postdoctoral Scholarship  
2008 Invited to Physical Oceanography Dissertation Symposium  
2008 AGU Ocean Science Meeting Travel Award  
2003 Rutgers University Graduate Fellowship

### PROFESSIONAL AFFILIATIONS:

American Geophysical Union  
American Meteorological Society  
The Oceanographic Society

### RESEARCH INTERESTS:

Coastal ocean circulation, frontal dynamics, internal wave dynamics, gravity currents, bio-physical interactions, numerical ocean modeling, data assimilation, model-based observing system design

### PROFESSIONAL ACTIVITIES:

#### *WHOI*

2012 – 2014 WHOI Summer Student Fellowship Selection Committee  
2011 – 2014 WHOI Community Cluster (Scylla) Advisory Committee

#### *Outside WHOI*

Invited to NSF EarthCube Early Career Strategic Visioning Workshop, Oct 16–17, 2012

Panelist and proposal reviewer for NSF Division of Ocean Sciences

Reviewed manuscripts for *Ocean Modelling*, *Journal of Physical Oceanography*, *Deep-Sea Research*, *Applied Mathematical Modelling*, *Journal of Geophysical Research – Oceans*, *Continental Shelf Research*, *Dynamics of Atmospheres and Oceans*, *Ocean Dynamics*, *Journal of Atmospheric and Oceanic Technology*, *Journal of Ocean University of China*, and *PLOS ONE*

#### SUPERVISION AT WHOI:

Sep 2012 – Mar 2014 (part-time), Ilya Udovydchenkov

#### CRUISE PARTICIPATION:

- Aug 2010 R/V *Tioga*  
One-day hydrographic survey of the flow east of Cape Cod with a REMUS-100
- May 2010 OC460, R/V *Oceanus* (CTD operator)  
Synoptic mapping of hydrography and *Alexandrium fundyense* concentration on Georges Bank and in the Gulf of Maine
- Aug 2006 US Coast Guard Cutter *Sturgeon Bay*  
One-day hydrographic survey in New York Harbor
- May 2005 One-day hydrographic survey in Passaic River, New Jersey
- Apr 2004 One-day mooring deployment in New York Bight

#### PAPERS IN REFEREED JOURNALS AND BOOKS:

- Zhang, W. G.**, and G. G. Gawarkiewicz, 2015: Dynamics of the Direct Intrusion of Gulf Stream Ring Water onto the Mid-Atlantic Bight Shelf, *Geophysical Research Letters*, in press, DOI: 10.1002/2015GL065530.
- Zhang, W. G.**, and G. G. Gawarkiewicz, 2015: Length-scale of the finite-amplitude meanders of shelfbreak fronts, *J. Phys. Oceanogr.*, in press, DOI: JPO-D-14-0249.1.
- Chen, K, G. Gawarkiewicz, Y.-O. Kwon, and **W. G. Zhang**, 2015: The role of atmospheric forcing versus ocean advection during the extreme warming of the Northeast U.S. continental shelf in 2012, *Journal of Geophysical Research: Oceans*, DOI: 10.1002/2014JC0101547.
- Li, Y., W. Han, J. L. Wilkin, **W. G. Zhang**, H. Arango, J. Zavala-Garay, J. Levin, F. S. Castruccio, 2014: Interannual variability of the surface summertime eastward jet in the South China Sea, *Journal of Geophysical Research – Oceans*, 119, 7205-7228.
- Zhang, W. G.**, C. Cenedese, 2014: The dispersal of dense water formed in an idealized coastal polynya on a shallow sloping shelf, *Journal of Physical Oceanography*, 44(6), 1563-1581.
- Zhang, W. G.**, T. F. Duda, Ilya A. Udovydchenkov, 2014: Modeling and analysis of internal-tide generation and beam-like onshore propagation in the vicinity of shelfbreak canyons, *Journal of Physical Oceanography*, 44(3), 834-849.
- Zhang, W. G.**, T. F. Duda, 2013: Intrinsic nonlinear and spectral structure of internal tides at a shelfbreak, *Journal of Physical Oceanography*, 43(12), 2641-2660.

- Zhang, W. G.**, D. J. McGillicuddy, and G. G. Gawarkiewicz, 2013: Is biological productivity enhanced at the New England Shelfbreak Front? *Journal of Geophysical Research – Oceans*, 118(1), 517-535.
- Garau, B., Ruiz, B., **W. G. Zhang**, A. Pascual, E. Heslop, J. Kerfoot, and J. Tintore, 2011: Thermal lag correction on Slocum CTD glider data, *Journal of Atmospheric and Oceanic Technology*, 28(9), 1065-1071.
- Zhang, W. G.**, G. G. Gawarkiewicz, D. J. McGillicuddy, and J. L. Wilkin, 2011: Climatological mean circulation at the New England shelf break, *Journal of Physical Oceanography*, 41(10), 1874-1893.
- Wilkin, J. L., **W. G. Zhang**, B. Cahill and R. C. Chant, 2011: Integrating coastal models and observations for studies of ocean dynamics, observing systems and forecasting, In operational Oceanography in the 21<sup>st</sup> Century, A. Shiller and G. Brassington (eds.), Springer, pp 487-512 (book chapter), DOI: 10.1007/978-94-007-0332-2\_19.
- Zhang, W. G.**, J. L. Wilkin, J. C. Levin, 2010b: Towards building an integrated observation and modeling system in the New York Bight using variational methods, Part II: representer-based observing system evaluation, *Ocean Modelling*, 35(3), 134-145.
- Zhang, W. G.**, J. L. Wilkin, H. G. Arango, 2010a: Towards building an integrated observation and modeling system in the New York Bight using variational methods, Part I: 4DVAR data assimilation, *Ocean Modelling*, 35(3), 119-133.
- Zhang, W. G.**, J. L. Wilkin, O. M. E. Schofield, 2010: Simulation of age and residence time in the New York Bight, *Journal of Physical Oceanography*, 40(5), 965-982.
- Zhang, W. G.**, J. L. Wilkin, J. C. Levin, H. G. Arango, 2009b: An Adjoint Sensitivity Study of Buoyancy- and Wind-driven Circulation on the New Jersey Inner Shelf, *Journal of Physical Oceanography*, 39(7), 1652-1668.
- Zhang, W. G.**, J. L. Wilkin, R. J. Chant, 2009a: Modeling of the pathways and mean dynamics of river plume dispersal in New York Bight, *Journal of Physical Oceanography*, 39(5), 1167-1183.
- Chant, R. J., J. Wilkin, **W. G. Zhang**, B.-J. Choi, E. Hunter, R. Castelao, S. Glenn, J. Jurisa, O. Schofield, R. Houghton, J. Kohut, T.K. Frazer, and M.A. Moline, 2008: Dispersal of the Hudson River Plume in the New York Bight: synthesis of observational and numerical studies during LaTTE, *Oceanography*, 21(4), 148-161.
- Lin, J. Z., K. Sun, **W. G. Zhang**, 2008: Orientation distribution of fibers and rheological property in fiber suspensions flowing in a turbulent boundary layer, *ACTA MECHANICA SINICA*, 24(3), 243-250.
- Wilkin, J. L., **W. G. Zhang**, 2007: Modes of mesoscale sea surface height and temperature variability in the East Australian Current, *Journal of Geophysical Research*, 112(C1), C01013.
- Zhang, S. L., J. Z. Lin, **W. G. Zhang**, 2007: Numerical research on the fiber suspensions in a turbulent T-shaped branching channel flow, *Chinese Journal of Chemical Engineering*, 15(1), 30-38.
- Lin, J. Z., L. X. Zhang, **W. G. Zhang**, 2006: Rheological behavior of fiber suspensions in a turbulent channel flow, *Journal of Colloid and Interface Science*, 296(2), 721-728.

- Zhang, L. X., J. Z. Lin, **W. G. Zhang**, 2006: Theoretical model of particle orientation distribution function in a cylindrical particle suspension subject to turbulent shear flow, *Progress in Natural Science*, 16(1), 16-20.
- Lin, J. Z., J. Li, **W. G. Zhang**, 2005: Orientation distribution of fibres in a channel flow of fibre suspension, *Chinese Physics*, 14(12), 2529-2538.
- Lin, J. Z., Y. L. Wang, **W. G. Zhang**, 2005: Sedimentation of short cylindrical pollutants with mechanical contacts, *Journal of Environmental Sciences*, 17(6), 906-911.
- You, Z. J., J. Z. Lin, X. M. Shao, **W. G. Zhang**, 2004: Stability and drag reduction in transient channel flow of fibre suspension, *Chinese Journal of Chemical Engineering*, 12(3), 319-323.
- Lin, J. Z., J. Li, **W. G. Zhang**, 2004: The force for cylindrical particles in an elongational-shear flow, *International Journal of Nonlinear Sciences and Numerical Simulation*, 5(1), 9-16.
- Lin, J. Z., **W. G. Zhang**, Z. S. Yu, 2004: Numerical research on the orientation distribution of fibers immersed in laminar and turbulent pipe flows, *Journal of Aerosol Science*, 35(1), 63-82.
- Zhang, W. G.**, J. Z. Lin, 2004: Research on the motion of particles in the turbulent pipe flow of fiber suspensions, *Applied Mathematics and Mechanics*, 25(7), 417-750.
- Zhang, W. G.**, J. Z. Lin, 2003: Research on the orientation of cylindrical particles in gas-solid two-phase pipe flows, *ACTA Aerodynamica Sinica*, 21(2), 237-243. (In Chinese)
- Lin, J. Z., **W. G. Zhang**, Y. L. Wang, 2002: Research on the orientation distribution of fibers immersed in a pipe flow, *Journal of Zhejiang University SCIENCE (English Edition)*, 3(5), 501-506.

#### PAPERS IN CONFERENCE PROCEEDINGS:

- Duda, T. F., **W. G. Zhang**, K. R. Helfrich, A. E. Newhall, Y.-T. Lin, and J. F. Lynch, 2014: Issues and progress in the prediction of ocean submesoscale features and internal waves. In *Oceans '14 St. Johns Conference Proceedings*, IEEE/MTS, (9 pp.).
- Duda, T. F., Y.-T. Lin, A. E. Newhall, K. R. Helfrich, **W. G. Zhang**, M. Badiéy, P. F. J. Lermusiaux, J. A., Colosi, and J. F. Lynch, 2014: The “Integrated Ocean Dynamics and Acoustics” (IODA) hybrid modeling effort. In *Proceedings of the international conference on Underwater Acoustics – 2014 (UA2014)*, 621-628, 22–27 June 2014, Island of Rhodes, Greece, doi: 10.13140/2.1.2853.3123.
- Duda, T. F., **W. G. Zhang**, and Y.-T. Lin, 2012: Studies of internal tide generation at a slope with nonlinear and linearized simulations: Dynamics and implications for ocean acoustics. In *Oceans 2012, Hamptons Road, Virginia, Conference Proceedings*, MTS/IEEE.
- Duda, T. F., Y.-T. Lin, **W. G. Zhang**, B. D. Cornuelle, P. F. J. Lermusiaux, 2011: Computational studies of three-dimensional ocean sound fields in areas of complex seafloor topography and active ocean dynamics. In *Proceedings of the 10th International Conference on Theoretical and Computational Acoustics*, ICTCA 2011, Taipei, Taiwan, World Scientific Publishing.
- Duda, T.F., Y.-T. Lin, A.E. Newhall, **W. G. Zhang**, and J.F. Lynch, 2010: Computational studies of time-varying three-dimensional acoustic propagation in canyon and slope regions. In *Oceans 2010, Seattle, WA, Conference Proceedings*, IEEE/MTS.

Wilkin, J., J. Zavala-Garay, J., Levin, and **W. G. Zhang**, 2008: Four-dimensional variational assimilation of satellite temperature and sea level data in the coastal ocean and adjacent deep sea, *Geoscience and Remote Sensing Symposium*, IGARSS 2008, IEEE International, 3, pp.III-427-III-430, 7-11 July 2008, doi: 10.1109/IGARSS.2008.4779375.

#### **INVITED PRESENTATIONS:**

- 2015 “Internal waves and frontal instability at the Mid-Atlantic Bight continental shelfbreak.” *Gordon Research Conference – Coastal Ocean Modeling*, Jun 7-12, 2015, University of New England, Biddeford, ME.
- 2014 “The generation of internal tides at a shelf edge.” May 12, College of Physical and Environmental Oceanography, Ocean University of China, Qingdao, China.  
“The generation of internal tides at a shelf edge.” May 10, Department of Information Science & Electronic Engineering, Zhejiang University, Hangzhou, China.  
“The generation of internal tides at a shelf edge.” May 8, The Second Institute of Oceanography, State Ocean Administration, Hangzhou, China.
- 2013 “Dispersal of the Hudson River plume in the New York Bight.” Oct 25, State Key Laboratory of Estuarine and Coastal Research, East China Normal University, Shanghai, China.  
“Dispersal of the Hudson River plume in the New York Bight.” Oct 22, Ocean College, Zhejiang University, Hangzhou, China.
- 2012 “Is biological productivity enhanced at the New England Shelfbreak?” Apr 18, The School for Marine Science and Technology, University of Massachusetts Dartmouth.
- 2010 “Pathways and time scales of the freshwater dispersal on the New York Bight.” Sep 17, Graduate School of Oceanography, University of Rhode Island.
- 2009 “Towards building an integrated observation and modeling system in the New York Bight using variational methods.” Glider Data Assimilation Workshop, Sep. 17-18, Chapel Hill, North Carolina.
- 2008 “Modeling of the New York Bight for freshwater dispersal study and observing system design.” Dec. 10, Applied Ocean Physics & Engineering Department, Woods Hole Oceanographic Institution, Massachusetts.  
“Coastal Ocean Modeling Using Variational Methods for Data Assimilation and Observing System Design.” Oct. 17, Department of Civil and Environmental Engineering, Princeton University, New Jersey.  
“Coastal Ocean Modeling Using Variational Methods for Data Assimilation and Observing System Design.” *Physical Oceanography Dissertation Symposium*, Oct. 5-10, Honolulu, Hawaii.
- 2005 “Sensitivity Analysis of SST along New Jersey coast with ROMS Adjoint model.” ROMS workshop, Oct. 24-26, La Jolla, CA.

#### **CONFERENCE PRESENTATIONS:**

- 2014 “Modeling and analysis of internal-tide generation and beam-like onshore propagation in the vicinity of shelfbreak canyons.” Ocean Science Meeting, Feb 24-28, Honolulu, HI.

- (poster)
- 2013 “Intrinsic nonlinear and spectral structure of internal tides at a shelfbreak.” Gordon Research Conference – Coastal Ocean Circulation, Jun 9-14, University of New England, Biddeford, ME. (poster)
- 2012 “Is biological productivity enhanced at the New England Shelfbreak?” The Middle Atlantic Bight Physical Oceanography and Meteorology Conference, Nov 7-8, University of Connecticut, Avery Point, Connecticut. (talk)
- “Mean circulation and biological production at the New England Shelfbreak.” Ocean Science Meeting, Feb 20-24, Salt Lake City, UT. (poster)
- 2011 “Climatological mean circulation at the New England shelf break.” Gordon Research Conference – Coastal Ocean Modeling, Jun 26-Jul 1, Mount Holyoke College, South Hadley, MA. (poster)
- 2010 “Towards an integrated coastal ocean observation and modeling system.” Ocean Science Meeting, Feb 22-26, Portland, Oregon. (poster)
- 2009 “Representative-based observing system in the New York Bight.” The 8th Workshop on Adjoint Model Applications in Dynamic Meteorology, May 18-22, Tannersville, Pennsylvania. (talk)
- 2008 “Simulation of age and residence time in the New York Bight.” Dec 15-19, AGU Fall Meeting, San Francisco, California. (talk)
- “Modeling of the mean dynamics and freshwater pathways in New York Bight.” Ocean Science Meeting, Mar 3-7, Orlando, FL. (poster)
- 2007 “Variational Data Assimilation off New Jersey Coast.” Gordon Research Conference - Coastal Ocean Modeling, Jun 17-22, Colby-Sawyer College, New London, NH. (poster)
- 2006 “Adjoint Sensitivity Analysis of SST on New Jersey coast.” The 7th International Workshop on Adjoint Applications in Dynamics Meteorology, Oct 8-13, Obergurgl, Tyrol, Austria. Abstract (208), p39. (talk)

**WHOI SEMINAR PRESENTATIONS:**

- 2013 “Dispersal of the dense water formed in an idealized coastal polynya.” Dec 6, Coastal Ocean and Fluid Dynamics Lab Seminar.
- “Distributed source physics of internal tide horizontal beam patterns near shelfbreak canyons.” Sep 4, Applied Ocean Physics & Engineering Department Seminar.
- 2012 “Intrinsic nonlinearity and spectral structure of internal tides at a shelf break.” Sep 26, Applied Ocean Physics & Engineering Department Seminar.
- 2011 “Mean biological production at the New England Shelfbreak.” Dec 16, Coastal Ocean and Fluid Dynamics Lab Seminar.
- “Climatological mean circulation at the New England Shelfbreak.” Nov 16, Applied Ocean Physics & Engineering Department Seminar.
- 2010 “Coastal ocean modeling for studying circulation and transport across the continental shelf in the Mid-Atlantic Bight.” Jun 9, Applied Ocean Physics & Engineering Department Seminar.
- “Towards an integrated coastal ocean observation and modeling system.” Jan 20, Applied

Ocean Physics & Engineering Department Seminar.