BIOGRAPHICAL SKETCH

Yinglong Joseph Zhang, Ph.D.

Virginia Institute of Marine Science
Center for Coastal Resource Management
1375 Greate Road, P.O. Box 1346
Gloucester Point, VA 23062
Phone: 804-684-7466, Email: yjzhang@vims.edu

Professional Preparation

1996 Doctor of Philosophy in Applied Mathematics and Fluid Mechanics, University of Wollongong, Wollongong, NSW 2522, Australia
1993 Master of Science (Hon.) in Applied Mathematics, University of Wollongong, Wollongong, NSW 2522, Australia
1991 Bachelor of Science in Engineering Mechanics, Peking University, Beijing, China

Appointments

2022-present Professor of Marine Science, Virginia Institute of Marine Science, College of William and Mary
2018-2022 Research Professor, Virginia Institute of Marine Science, College of William and Mary
2012-2018 Research Associate Professor, Virginia Institute of Marine Science, College of William and Mary
2006-2012 Research Assistant Professor, NSF Science and Technology Center for Coastal Margin Observation and Prediction, Oregon Health & Science University
2001-2006 Associate Research Scientist, Department of Environmental and Biomolecular Systems, OGI School of Science & Engineering, Oregon Health & Science University
1999-2001 Postdoctoral Research Associate, Department of Environmental Science and Engineering, Oregon Graduate Institute of Science and Technology (OGI)
1998-1999 Project Manager and Senior Research Engineer, Institute of High Performance Computing, Singapore

Five Products Most Relevant to the Proposed Project

1. **Zhang**, Y., Anderson, J., Park, K., Wu, C.H., Wipperfurth, S., Anderson, E., Pe'eri, S., Beletsky, D., Titze, D., Di Lorenzo, E., Moghimi, S., Seroka, G., Myers, E., Fujisaki-Manome, A., Kelley, J. (2024) Debunking common myths in coastal circulation modeling, Ocean Modelling, 190, 102401, https://doi.org/10.1016/j.ocemod.2024.102401

2. Ye, F., Cui, L., **Zhang**, Y., Wang, Z., Moghimi, S., Myers, E., Seroka, G., Zundel, A., Mani, S., Kelley, J.G.W. (2023) A parallel Python-based tool for meshing watershed rivers at continental scale, Environmental Modelling & Software, 166, 105731. https://doi.org/10.1016/j.envsoft.2023.10573

3. **Zhang**, Y. J., Fernandez-Montblanc, T., Pringle, W., Yu, H.-C., Cui, L., and Moghimi, S. (2023) Global seamless tidal simulation using a 3D unstructured-grid model (SCHISM v5.10.0), Geoscientific Model Development, 16, 2565-2581. https://doi.org/10.5194/gmd-16-2565-2023

4. Cai, X., Shen, J., **Zhang**, Y. J., Qin, Q., & Linker, L. (2023). The roles of tidal marshes in the estuarine biochemical processes: A numerical modeling study. Journal of Geophysical Research: Biogeosciences, 128, e2022JG007066. https://doi.org/10.1029/2022JG007066

5. Fringer, O.B., Dawson, C.N., He, R., Ralston, D.K., and **Zhang**, Y. (2019) The future of coastal and estuarine modeling: Findings from a workshop, Ocean Modelling, 143, 101458. https://doi.org/10.1016/j.ocemod.2019.101458 [This is a review paper on current state of coastal modeling]

Other Significant Products

6. Ye, F., **Zhang**, Y., Yu, H., Sun, W., Moghimi, S., Myers, E.P., Nunez, K., Zhang, R., Wang, H.V., Roland, A., Martins, K., Bertin, X., Du, J., and Liu, Z. (2020) Simulating storm surge and compound flooding events with a creek-to-ocean model: importance of baroclinic effects, Ocean Modelling, 145.

7. Moghimi, S., Myers, E., Pe'eri, S., **Zhang**, Y.J., and Ye, F. (2021), Forecasting compound floods in complex coastal regions, Eos, 102, (https://doi.org/10.1029/2021EO210604) Published on 16 November 2021.

8. Wang, Q., **Zhang**, Y., Chai, F., Zhang, Y. J., and Zampieri, L. (2024) Development of a total variation diminishing (TVD) sea ice transport scheme and its application in an ocean (SCHISM v5.11) and sea ice (Icepack v1.3.4) coupled model on unstructured grids, Geosci. Model Dev., 17, 7067-7081, https://doi.org/10.5194/gmd-17-7067-2024

9. Yu, H.C., **Zhang**, Y., Jan, S., Yu, J.C.S., Chu, C.H., Terng, C.T., and Chiu, C.M. (2024) Internal tides reverse tidal currents around Southern Taiwan. Journal of Geophysical Research: Oceans, 129, e2024JC020897. https://doi.org/10.1029/2024JC020897

10. Park, K., Di Lorenzo, E., **Zhang**, Y., Wang, H.V., Ezer, T., and Ye, F. (2024) Delayed coastal inundations caused by ocean dynamics post-Hurricane Matthew. npj Clim Atmos Sci 7, 5. https://doi.org/10.1038/s41612-023-00549-2

Synergistic Activities

1. Zhang is the lead developer of the next-generation, open-source, 3D coupled geophysical fluid dynamics-biogeochemistry model on unstructured grids (SCHISM; schism.wiki), which has over 450 registered users worldwide. The model uses several novel methods (hybrid unstructured grids and flexible vertical coordinates; implicit time stepping) to enable effective cross-scale, creek-to-ocean capability without the need for bathymetry smoothing or grid nesting. He has also successfully built a comprehensive ecosystem model around SCHISM in collaboration with other developers. The model has been officially selected as the primary regulatory model for EPA's Chesapeake Bay Program (CBP) and is a core operational model of NOAA, California Department of Water Resource (DWR), EU's Joint Research Center, Helmholtz-Zentrum Hereon (HZH, Germany), and Taiwan's Central Weather Bureau (CWB).
2. He serves as an advisor to multiple government agencies (EPA's CBP, NOAA, DWR, Texas Water Development Board, HZH, CWB); many of these agencies are using SCHISM in their own decision-making tool. He is an associate editor for Ocean Modelling and Ocean Dynamics.
3. He has worked on street-level inundations using subgrid technology and successfully developed a subgrid finite-volume model (ELCIRC-sub). The model has been licensed by industry.
4. In 2014, he was awarded a fellowship by Hanse-Wissenschaftskolleg Foundation (HWK) in recognition of his outstanding collaborative work with German scientists.
5. He has taught geophysical fluid dynamics, advanced computing and numerical methods in engineering and other courses on numerical ocean circulation models, at universities in USA, China and Germany. He has supervised 4 M.S. (thesis) students and 7 PhD students and is serving as the major advisor of 2 PhD students. He has supervised 8 post-doctoral fellows.