Xuanyu Chen

Research Scientist II

CIRES at NOAA Physical Sciences Laboratory
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Education

2015–2020 **University of Rhode Island**, *Graduate School of Oceanography*, Narragansett, RI.
Ph.D. in Physical Oceanography
Dissertation: Impacts of Shoaling Ocean Surface Waves on Wind Stress and Storm Surge

2011–2015 **Ocean University of China**, Qingdao, China.
B.S. in Marine Science

Experience

02/2023–present **Research Associate**, *Cooperative Institute for Research in Environmental Sciences (CIRES)*, University of Colorado, Boulder, CO .
- Design and conduct Large-Eddy Simulations (LES) to study shallow convection and its role in mesoscale air-sea interaction.
- Apply machine learning methods to analyze satellite data and high-resolution results to improve boundary layer and shallow convection parameterizations for the air-sea transition zone.

03/2021–01/2023 **Post-doctoral Associate**, *Cooperative Institute for Research in Environmental Sciences (CIRES)*, University of Colorado, Boulder, CO.
- Analyzed in-situ measurements and publicly released satellite products in the Atlantic Tradewind Ocean-Atmophere Mesoscale Interaction Campaign
- Designed and configured LES experiments with the System for Atmospheric Modeling to investigate the role of mesoscale SST anomalies in shallow convection
- Facilitated collaboration between the science teams in the NOAA Physical Sciences Laboratory

09/2020–02/2021 **Post-doctoral Research Fellow**, *Graduate School of Oceanography*, University of Rhode Island, Narragansett, RI.
- implemented the effects of shoaling ocean surface wave on drag coefficient into the coupled ADCIRC–WAVEWATCH III system (developed by NOAA OCS and EMC)
- communicated with NOAA collaborators, and assisted a first-year graduate student to run the coupled system.

09/2015–08/2020 **Graduate Research Assistant**, *Hurricane Modeling Group and Air-Sea Interaction Lab*, GSO/URI, Narragansett, RI.
Worked on two research projects funded by the U.S. Department of Homeland Security:
1) Modeling the combined coastal and inland hazards from high-impact hypothetical hurricanes
2) Sea-state dependent drag coefficient in coastal waters and its impacts on storm surge modeling

09/2017–12/2017 **Graduate Teaching Assistant**, *OCG123: Climate Change and the Oceans*, URI.

09/2014 **Undergraduate Intern**, *Dong-Fang Oceanographic Station*, Hainan, China.

Publications

2026 [1] Hu, I.-K., **Chen, X.**, Bengtsson, L., Thompson, E. J., Dias, J., & Tulich, S. N. (2026). Utilizing ATOMIC observations for assessing marine shallow cumuli in single column models. Journal of Advances in Modeling Earth Systems, 18, e2024MS004814. https://doi.org/10.1029/2024MS004814

[2] **Chen, X.**, Ginis, I., Hara, T. (2026). Impact of shoaling-wave-modulated wind stress on storm surge modeling (*submitted*)

2025 [3] **Chen, X.**, Dias, J., Wolding, B., Blossey, P. N., DeMott, C., Pincus, R., & Thompson, E. J. (2025). Impacts of weak sea surface temperature warm anomalies on local trade cumulus cloudiness in large eddy simulations. Journal of Advances in Modeling Earth Systems, 17, e2024MS004778. https://doi.org/10.1029/2024MS004778

2024 [4] Nuijens, L., Wenegrat, J., Dekker, P. L., Pasquero, C., L.W. O'Neill, Ardhuin, F., Ayet, A., Bechtold, P., Bruch, W., Laurindo, L., **Chen, X.**, Desbiolles, F., Foster, R., Frenger, I., George, G., Giesen, R., Hayden, E., Hell, M. C., Iyer, S., ... Zippel, S. (2024). The air-sea interaction (ASI) submesoscale: Physics and impact. https://doi.org/10.5065/78ac-qd31

2023 [5] **Chen, X.**, J. Dias, B. Wolding, R. Pincus, C. DeMott, G. Wick, E. J. Thompson, and C. W. Fairall. (2023). Ubiquitous Sea Surface Temperature Anomalies Increase Spatial Heterogeneity of Trade Wind Cloudiness on Daily Time Scale. J. Atmos. Sci., 80, 2969–2987, https://doi.org/10.1175/JAS-D-23-0075.1.

2020 [6] **Chen, X.**, Hara, T., Ginis, I. (2020). Impact of shoaling ocean surface waves on wind stress and drag coefficient in coastal waters: 1. Uniform wind. *Journal of Geophysical Research: Oceans, 125, e2020JC016222.*

[7] **Chen, X.**, Ginis, I., Hara, T. (2020). Impact of shoaling ocean surface waves on wind stress and drag coefficient in coastal waters: 2. Tropical cyclones. *Journal of Geophysical Research: Oceans, 125, e2020JC016223.*

2019 [8] Ullman, D. S., Ginis, I., Huang, W., Nowakowski, C., **Chen, X.**, Stempel, P. (2019). Assessing the multiple impacts of extreme hurricanes in southern New England, USA. *Geosciences, 9(6), 265.*

2018 [9] **Chen, X.**, Ginis, I., Hara, T. (2018). Sensitivity of Offshore Tropical Cyclone Wave Simulations to Spatial Resolution in Wave Models. *J. Mar. Sci. Eng. 2018, 6, 116.*

Grants & Collaborations

05/2024-10/2025 **CIRES Innovative Research Program**, *Role: PI*, Amount awarded: $\$26,011$.
Project Title: Examine downstream impacts of mesoscale sea surface temperature anomalies on trade cumulus clouds and their radiative effects using satellite observation
Unfunded collaborators: Ryan Eastman (Univ of Washington), Isabel McCoy (CIRES/NOAA CSL), Juliana Dias (NOAA PSL)

2023-2025 **International Teams awarded by the International Space Science Institute at Bern**, *Role: unfunded collaborator*.
Project Title: Constraining Trade-Cumuli Feedback by Means of Process Understanding
Led by: Geet Geroge (TU Delft), Hauke Schulz (Danish Meteorological Institute)

Selected Presentations

09/2023-03/2025 ○ **Mesoscale Sea Surface Temperature Warm Anomalies Increase Trade Cumulus Generation in North Atlantic Trades:** *Satellite Observations & Large Eddy Simulations*
(& its variation at different stages of the work presented at:)
- 24^{th} conference on Air-Sea Interaction, 105^{th} AMS Annual Meeting, New Orleans, LA, Jan 15, 2025
- NOAA 2^{nd} Annual UFS Physics Workshop, Norman, OK, Jul 12, 2024
- NOAA Physical Sciences Lab FLASH seminar, Boulder, CO, May 21, 2024
- Mesoscale & Microscale Meteorology seminar at NSF NCAR, Boulder, CO, Apr 25, 2024 (*Recorded*)
- Atmosphere-Ocean Coupling at (Sub)mesoscales, Leiden, The Netherlands, Sept 25, 2023 *(Poster)*

02/2022-09/2023 ○ **Trade Cumulus Cloudiness Modulated by Weak Sea Surface Temperature Anomalies during Atlantic Tradewind Ocean-Atmosphere Mesoscale Interaction Campaign**
(& its variation at different stages of the work presented at:)
- An invited talk at *Wageningen University & Research*, Wageningen, The Netherlands. Sept 12, 2023
- An invited talk at *TU Delft-GRS: Symposium on Winds and Convection*, Delft, The Netherlands. Sept 18, 2023
- 103^{rd} Amer. Meteor. Soc. Annually Meeting, Denver, CO, Jan 8-12, 2023 (*Recorded*)
- NOAA Physical Sciences Lab ATOMIC science day (virtual), May 2, 2022
- EUREC^{4}A-ATOMIC Celebrosium (virtual), Feb 14-18, 2022

2018-2021 ○ Work funded by the U.S. Department of Homeland Security:
- **Implementation of a Flexible ADCIRC-WAVEWATCH III Coupling System.** *DHS Coastal Resilience Center* 6^{th} *Annual Meeting.* Virtual, Apr 21, 2021 (*Recorded*)
- **Impacts of Shoaling Ocean Surface Waves on Wind Stress and Drag Coefficient.** *DHS Coastal Resilience Center 6th Annual Meeting.* Virtual, Apr 21, 2021 (*Recorded*)
- **Numerical Study of Wind Stress in Coastal Water Under a Tropical Cyclone**. *Ocean Sciences Meeting 2020*, San Diego, CA, Dec 16-21, 2020 (*Poster*)
- **Impact of Shoaling Wind Waves on Drag Coefficient in Finite Depth**. *Ocean Sciences Meeting 2020*, San Diego, CA, Dec 16-21, 2020 (*Poster*)
- **Sea-state dependent drag coefficient in shallow water under tropical cyclones**. 21^{st} *Amer. Meteor. Soc. Conf. on Air-Sea Interaction*, Oklahoma City, OK, Jun 11-15, 2018 (*Recorded*)

Technical Skillsets

Numerical Modelling — **Ocean Surface Waves, Storm Surge, Large Eddy Simulations**.
- WAVEWATCH III and SWAN
- ADCIRC (The ADvanced CIRCulation Model)
- SAM (System for Atmospheric Modeling)

Programming — MATLAB, FORTRAN, Python

Scripting — Linux Shell

Software — GitHub, LaTeX

Services

2020–present — **Journal Reviewer**.
including **Geophysical Research Letters**, **Journal of Geophysical Research: Oceans**, **Journal of Advances in Modeling Earth Systems**, & **Ocean Modelling**, among others

10/2022–01/2023 — **Postdoc Peer Mentoring Program**, University of Colorado Boulder.
Serving as a peer-mentor to a 1^{st} year CU postdoc.

08/2020–02/2021 — **GSO Mentoring Program**, *GSO/URI*.
Serving as a peer-mentor to a 1^{st} year GSO master student from Indonesia.

2017–2018 — **Student Coordinator for Physical Oceanography Seminar Series**, *GSO/URI*.

Summer 2017 — **Research Mentor to a SURFO undergraduate student**, *GSO/URI*.

03/2017 — **Webinar talk "Storm Surge 101" to high school students**, *MaTTS project*, GSO/URI.

10/2012–05/2013 — **Volunteer Teacher to** 4^{th} **graders**, *Shi-Lao-Ren Primary School*, Qingdao, China.

Awards

2019 — William E. Simmons Memorial Scholarship Award in Oceanography for research expected to be of real economic value, *GSO/URI*

2018 3^{rd} Place Student Oral Presentation, 21^{st} Conference on Air-Sea Interaction, Oklahoma, *American Meteorological Society*

2018 Marine Science Award, Thomas and Kathy J. McNiff Graduate Student Endowment, *GSO/URI*

2016, 2017 GSO Alumni Awards, GSO/URI

2012–2014 Scholarship for Academic Excellence, Ocean University of China

2013 Outstanding Volunteer Teacher, Shi-Lao-Ren Primary School, Qingdao, China