

Dr Shuai Wang

CONTACT INFORMATION

Associate Research Scholar
Princeton University/NOAA-GFDL
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EDUCATION

Imperial College London, UK
2013 - 2017 Ph.D. in Atmospheric Science

Ocean University of China, China
2011 - 2013 M.S. in Meteorology

Ocean University of China, China
2007 - 2011 B.S. in Atmospheric Science

EMPLOYMENT

Princeton University - Program in Atmospheric and Oceanic Sciences (AOS)
NOAA - Geophysical Fluid Dynamics Laboratory (GFDL)
2022 - present Associate Research Scholar
Funded by the Postdoctoral and Visiting Research Scientist Program [[link](#)] through annual open search with original research proposal

Princeton University - Department of Civil and Environmental Engineering
2021 Postdoctoral Research Associate

Imperial College London - Department of Physics
2017 - 2020 Postdoctoral Research Associate
Funded by the Newton Fund [[link](#)] in collaboration with the UK Met Office
2021 - present Academic Visitor

SOAS University of London - School of Finance and Management
2018 - 2019 Joint Research Fellow

RESEARCH INTERESTS

Tropical Cyclones, Climate Modeling, Extreme Weather, Climate Service

RESEARCH AWARD AND GRANT

Princeton University
Proposal title: Coastal tropical cyclone activities and climate change
Postdoctoral and Visiting Research Scientist Program
Fellowship, 2022-2024

European Space Agency
Proposal title: Big data intelligent mining and coupling analysis of eddy and cyclone
Dragon 5 Cooperation
PI, 2020-2022

Monetary Authority of Singapore
Proposal title: Downscaling of physical risks for climate scenario design
Co-I, 2021-2022

Newton Fund | The Royal Society
Proposal title: Translational Services – Multi-model Approaches in Climate Services
Weather and Climate Science for Service Partnership (WCSSP) programme
Co-I, 2019-2021

OTHER HONORS AND AWARDS

2016 Postgraduate Research Symposium Prize for the best overall performance (Imperial College London, UK)

2012 Gold Medal in the National Competition for Innovation in Natural Sciences (Ministry of Education, China)

2013 and 2009 National scholarship (Ministry of Education, China)

2011 President's Award for Distinguished Undergraduates (top eight undergraduates of all disciplines at the Ocean University of China)

FULL PUBLICATION

Google Scholar statistics [\[link\]](#). Citations: 246. *h*-index: 11.

2022 (10 peer-reviewed papers + 1 white paper)

27. **Wang, S.**, Lin, N., and Gori, A.. Investigation of hurricane complete wind models and application in storm surge simulation [\[link\]](#). *Journal of Geophysical Research - Atmospheres*.
26. Xi, D., **Wang, S.**, and Lin, N.. Relationship Between Tropical Cyclone Intensity and Rain Rate [\[link\]](#). *Journal of Climate*.
25. Li, Y., Tang, Y., Toumi, R., and **Wang, S.**. Revisiting the definition of rapid intensification of tropical cyclones by clustering the initial intensity and inner-core size [\[link\]](#). *Journal of Geophysical Research - Atmospheres*. Accepted.
24. Tian, D., Zhang, H., **Wang, S.**, Zhang, W., Sun, X., Zhou, Y., Yang, S., and Zhou, F. Sea surface wind structure observed by wave gliders during tropical cyclones. *Journal of Geophysical Research - Atmospheres*. Accepted.
23. Biffis, E. and **Wang, S.** (2022). Downscaling of physical risks for climate scenario design [\[link\]](#). *White Paper* published by the Singapore Management University.
22. Li, Y., Tang, Y. and **Wang, S.**. Rapid growth of outer size of tropical cyclones: A new perspective on their destructive potential [\[link\]](#). *Geophysical Research Letters*. **Editor's Highlight** on EOS [\[link\]](#).
21. **Wang, S.** and Toumi, R.. An analytic model of tropical cyclone outer size [\[link\]](#). *npj Climate and Atmospheric Science*.
20. Xu, H., Tian, Z., Sun, L., Ragno, E., Bricker, J., Mao, G., Ye, Q., Tan, J., Wang, J., Ke, Q., **Wang, S.** and Toumi, R.. Compound flood impact of water level and rainfall during tropical cyclone period in a coastal city: The case of Shanghai [\[link\]](#). *Natural Hazards and Earth System Sciences*.
19. **Wang, S.** and Toumi, R. (2022). More tropical cyclones are striking coasts with major intensities at landfall [\[link\]](#). *Scientific Reports*.
18. **Wang, S.** and Toumi, R. (2022). On the intensity decay of tropical cyclones before landfall [\[link\]](#). *Scientific Reports*.
17. Meng Q., Zhou F., Ma X., Xuan J., Zhang H., Shuai Wang, **Wang, S.** et al.. Response Process of Coastal Hypoxia to a Passing Typhoon in the East China Sea [\[link\]](#). *Frontiers in Marine Science*.

2021 (4 peer-reviewed papers)

16. **Wang, S.** and Toumi, R. (2021). Recent Migration of Tropical Cyclones toward Coasts [\[link\]](#). *Science*.
15. **Wang, S.** and Toumi, R. (2021). Recent tropical cyclone changes inferred from ocean surface temperature cold wakes [\[link\]](#). *Scientific Reports*.
14. **Wang, S.**, Toumi, R., Ye, Q., Ke, Q., Bricker, J., Tian, Z.* and Sun, L. (2021). Is the tropical cyclone surge in Shanghai more sensitive to landfall location or intensity change? [\[link\]](#) *Atmospheric Science Letters*.
13. Ke, Q., Yin, J., Bricker, J., Buonomo, E., Ye, Q., Visser, P., Dong, G., **Wang, S.**, Tian, Z., Sun, L., Toumi, R. and Jonkman, S. (2021). An integrated framework of coastal flood modelling under the failures of sea dikes: a case study in Shanghai [\[link\]](#). *Natural Hazards*.

2020 (2 peer-reviewed papers)

12. **Wang, S.**, Rashid, T., Throp, H. and Toumi, R. (2020). A shortening of the intensity life-cycle of major tropical cyclones [\[link\]](#). *Geophysical Research Letters*.
11. Bruneau, N., **Wang, S.** and Toumi, R. (2020). Long memory impact of ocean mesoscale temperature anomalies on tropical cyclone size [\[link\]](#). *Geophysical Research Letters*.

2019 (2 peer-reviewed papers)

10. Sparks, N., Hon, K., Chan. P., **Wang, S.**, Chan, J., Lee, T., and Toumi, R. (2019). Aircraft Observations of Tropical Cyclone Boundary Layer Turbulence over the South China Sea [\[link\]](#). *Journal of the Atmospheric Science*.
9. **Wang, S.** and Toumi, R. (2019) Impact of dry midlevel air on the tropical cyclone outer circulation [\[link\]](#). *Journal of the Atmospheric Science*.

2018 (3 peer-reviewed papers)

8. **Wang, S.** and Toumi, R. (2018). A historical analysis of the mature stage of tropical cyclones [\[link\]](#). *International Journal of Climatology*.
7. **Wang, S.** and Toumi, R. (2018). Reduced sensitivity of tropical cyclone intensity and size to sea surface temperature in a radiative-convective equilibrium environment [\[link\]](#). *Advances in Atmospheric Science*.
6. Bruneau, N., Toumi, R. and **Wang, S.** (2018) Impact of wave white-capping on landfalling tropical cyclones [\[link\]](#). *Scientific Reports*.

Before 2017 (5 peer-reviewed papers)

5. **Wang, S.** and Toumi, R. (2016). On the relationship between hurricane cost and the integrated wind profile [\[link\]](#). *Environmental Research Letters*.
4. **Wang, S.**, Toumi, R., Czaja, A. and Van Kan, A. (2015). An analytic model of tropical cyclone wind profiles [\[link\]](#). *Quarterly Journal of the Royal Meteorological Society*.
3. Li, P., Fu, G., Lu, C., Fu, D., and **Wang, S.** (2012) The formation mechanism of a spring sea fog event over the yellow sea associated with a low-level jet [\[link\]](#). *Weather and Forecasting*.
2. **Wang, S.**, Fu, G., and Pang, H. (2017). Structure analyses of the explosive extratropical cyclone: A case study over the Northwestern Pacific in March 2007 [\[link\]](#). *Oceanic and Coastal Sea Research*.
1. Fu, D., **Wang, S.**, Chen, D., Pang, H. and Li, P. (2012). Comparison study between observation and simulation for sea fog over the Yellow Sea in May 2009 [\[link\]](#). *Oceanic and Coastal Sea Research*.

MANUSCRIPT
UNDER REVIEW

Wang, S., Murakami, H., Cooke, W., and Delworth, T.. Anthropogenic warming changes coastal tropical cyclone frequency.

Wang, S. and Murakami, H.. Hurricane activity near the western Europe under anthropogenic climate change.

Li, Y., Tang, Y., **Wang, S.**, and Toumi, R.. Recent Increase of Tropical Cyclone Rapid Intensification in Global Coastal Regions [\[link\]](#).

TEACHING
EXPERIENCE

Guest lecturer Princeton/GFDL Summer Intern lecture, Princeton University, 2022

Instructor First-year postgraduate lectures (Climate Modelling), Imperial College, 2019-2021

Demonstrator First-year undergraduate physics laboratory, Imperial College, 2014-2017

SUPERVISING
EXPERIENCE

Supervised **5** Master theses, **1** Final undergraduate project, **2** UROP projects, and **multiple** undergraduate lab projects

2022, Rachel Gupta, **UROP project**, "A new spatial downscaling method based on quantile mapping"

2022, Xueying Wang, **UROP project**, "Climate downscaling for Uganda - A case study"

2021, Qiaoqiao Fu, **M.S. thesis**, "Temporal and spatial influence on the physics properties of typhoons"

2020, Morgane Lardennois, **M.S. thesis**, "Investigating the shape of tropical cyclone eye"

2020, Rosemary Colaert, **M.S. thesis**, "Rapid growth of tropical cyclone size"

2019, Theo Rashid, **M.S. thesis**, "Changes in the intensity life-cycle of tropical cyclones"

2019, Henry Throp, **M.S. thesis**, "Typhoon size life cycle analysis"

2018, Lin Qiao, **Final B.S. project**, "Investigating tropical cyclone's damage and its physical properties"

2016, Matthew Castro, **physics 1st year undergraduate project**, "A simple mountain wave numerical simulation with Python"

2016, Jon Vanderpuye, **physics 1st year undergraduate project**, "A simple mountain wave numerical simulation with Matlab"

2016, Theo Rashid, **physics 1st year undergraduate project**, "Idealised steady-state tropical cyclone modelling in Python"

2016, Henry Throp, **physics 1st year undergraduate project**, "Tropical cyclone and sea surface temperature"

2015, Binsheng Chen, **physics 1st year undergraduate project**, "Mountain wave modelling: vertical propagating division"

2015, Duan Yi Ong, **physics 1st year undergraduate project**, "Mountain wave modelling: horizontal propagating division"

INVITED AND
CONFERENCE
PRESENTATIONS

The 35th Conference on Hurricanes and Tropical Meteorology (AMS), New Orleans, USA: "Recent migration of tropical cyclones toward coasts". **Oral presentation**, May. 2022.

City University of Hong Kong, HK: "Too close to comfort". **Invited talk**, June. 2021.

Met Office, UK: "Landward migration of tropical cyclone activities". **Invited talk**, Mar. 2021.

Princeton University, GFDL/NOAA, USA: "Tropical cyclone activities in coastal regions". **Invited talk**, Jan. 2021.

University College London, UK: "Estimating the destructive potential of tropical cyclones". **Invited talk**, Mar. 2019.

The 34th Conference on Hurricanes and Tropical Meteorology (AMS), virtual, USA: "Midlevel dry air and tropical cyclone structure change". **Oral presentation**, Apr. 2020.

The 13th Conference on Mesoscale Convective Systems and High-Impact Weather in East Asia (ICMCS), Naha, Japan: "Impact of dry midlevel air on the tropical cyclone outer circulation". **Oral presentation**, Mar. 2019.

The 33rd Conference on Hurricanes and Tropical Meteorology (AMS), Florida, USA: "A historical

analysis of the mature stage of tropical cyclones". **Oral presentation**, Apr. 2018.

The 33rd Conference on Hurricanes and Tropical Meteorology (AMS), Florida, USA: "Reduced sensitivity of tropical cyclone intensity and size to sea surface temperature in a radiative-convective equilibrium environment". **Poster presentation**, Apr. 2018.

The 32nd Conference on Hurricanes and Tropical Meteorology (AMS), San Juan, Puerto Rico: "Hurricane cost is largely controlled by the vertical wind shear". **Oral presentation**, Apr. 2016.

The Climate Science for Service Partnership (CSSP) China-UK Workshop, Nanjing, China: "Tropical cyclone damage and potential environmental factors". **Oral presentation**, Nov. 2015.

National Basic Research Program Annual Meeting, Guangzhou, China: "Factors on tropical cyclone destructive potential". **Oral presentation**, Nov. 2015.

European Geosciences Union Annual meeting, Vienna, Austria: "Factors that influence the size of tropical cyclones". **Oral presentation**, Apr. 2015.

Korea-China Joint Workshop on Marine Environment Forecasting System for the Yellow Sea and East China Sea, Seoul, South Korea: "Explosive Extra-tropical Cyclogenesis over the Yellow Sea". **Oral presentation**, Apr. 2012.

PROFESSIONAL
SERVICE

Membership

American Meteorological Society, American Geophysical Union, Royal Meteorological Society

Peer Review

NOAA internal reviewer for the Fifth National Climate Assessment (NCA5, Climate Trends section)

Nature Climate Change, Nature Communications, Journal of Climate, Monthly Weather Review, Environmental Research Letters, Climate Dynamics, Geophysical Research Letters, Journal of Geophysical Research, Journal of Hydrometeorology, International Journal of Climatology, Natural Hazards (among others)

MEDIA COVERAGE

The Associated Press, 2021, "Tropical cyclones are nearing land more, except in Atlantic" [[link](#)]

U.S. News, 2021, "Tropical cyclones are nearing land more" [[link](#)]

Science Daily, 2021, "Hurricanes and typhoons moving 30km closer to coasts every decade" [[link](#)]

Carbon Brief, 2021, "Recent increase in major Atlantic hurricanes after 1960-1980s lull" [[link](#)]

The Independent, 2020, "How is the 'strongest storm of 2020' linked to the climate crisis?" [[link](#)]

Carbon Brief, 2020, "Global warming has 'changed' spread of tropical cyclones around the world" [[link](#)]

Carbon Brief, 2020, "Major tropical cyclones have become '15% more likely' over past 40 years" [[link](#)]

Carbon Brief, 2018, "Global warming is causing tropical storms to slow down and last longer" [[link](#)]

BBC, 2017, "Furacões estão mais frequentes e destruidores este ano?" [[link](#)]
