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.Sc. in Meteorology

Ocean University of China, China

2007 - 2011 B.Sc. in Atmospheric Science

EMPLOYMENT

NOAA-GFDL/Princeton University, US

2022 - Associate Research Scholar

Princeton University, US

2021 Postdoctoral Research Associate

Imperial College London, UK

2017 - 2021 Postdoctoral Research Associate

SOAS University of London, UK

2018 - 2019 Joint Research Fellow

RESEARCH INTERESTS

Climate Modeling, Tropical Cyclones, Severe Weather, Climate Service

RESEARCH AWARD AND GRANT

NOAA-GFDL/Princeton University, "Coastal tropical cyclone activities and climate change", Postdoctoral Research Scientist Program, **awardee**, 2022-2024

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

Monetary Authority of Singapore, "Downscaling of physical risks for climate scenario design", **Co-I**, 2021-2022

FEATURED PUBLICATION

Wang, S.* and Toumi, R. (2021). Recent Migration of Tropical Cyclones toward Coasts. *Science, 371(6528)*, 514-517.

PUBLICATION

Google Scholar statistics. Citations: 208. h-index: 10. *: corresponding author.

2022

Li, Y., Tang, Y. and **Wang, S.**. Rapid growth of outer size of tropical cyclones A new perspective on their destructive potential. *Geophysical Research Letters.*

Wang, S.* and Toumi, R.. An analytic model of tropical cyclone outer size. *npj Climate and*

Atmospheric Science.

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. *Natural Hazards and Earth System Sciences.* In press.

Wang, S.* and Toumi, R. (2022). More tropical cyclones are striking coasts with major intensities at landfall. *Scientific Reports.*

Wang, S.* and Toumi, R. (2022). On the intensity decay of tropical cyclones before landfall. *Scientific Reports.*

Biffis, E. and **Wang, S.** (2022). Downscaling of physical risks for climate scenario design. *White Paper* published by the Singapore Management University.

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. *Frontiers in Marine Science.*

2021

Wang, S.* and Toumi, R. (2021). Recent Migration of Tropical Cyclones toward Coasts. *Science.*

Wang, S.* and Toumi, R. (2021). Recent tropical cyclone changes inferred from ocean surface temperature cold wakes. *Scientific Reports.*

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? *Atmospheric Science Letters.*

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. *Natural Hazards.*

2020

Wang, S.*, Rashid, T., Throp, H. and Toumi, R. (2020). A shortening of the intensity life-cycle of major tropical cyclones. *Geophysical Research Letters.*

Bruneau, N., **Wang, S.** and Toumi, R. (2020). Long memory impact of ocean mesoscale temperature anomalies on tropical cyclone size. *Geophysical Research Letters.*

2019

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. *Journal of the Atmospheric Science.*

Wang, S.* and Toumi, R. (2019) Impact of dry midlevel air on the tropical cyclone outer circulation. *Journal of the Atmospheric Science.*

2018

Wang, S.* and Toumi, R. (2018). A historical analysis of the mature stage of tropical cyclones. *International Journal of Climatology.*

Wang, S.* and Toumi, R. (2018). Reduced sensitivity of tropical cyclones to sea surface temperature in a radiative-convective equilibrium environment. *Advances in Atmospheric Science.*

Bruneau, N., Toumi, R. and **Wang, S.** (2018) Impact of wave white-capping on landfalling tropical cyclones. *Scientific Reports.*

Before 2017

Wang, S.* and Toumi, R. (2016). On the relationship between hurricane cost and the integrated wind profile. *Environmental Research Letters*.

Wang, S.*, Toumi, R., Czaja, A. and Van Kan, A. (2015). An analytic model of tropical cyclone wind profiles. *Quarterly Journal of the Royal Meteorological Society*.

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. *Weather and Forecasting*.

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. *Oceanic and Coastal Sea Research*.

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. *Oceanic and Coastal Sea Research*.

Manuscript Under Review

Wang, S.*, Lin, N., and Gori, A.. Investigation of hurricane complete wind models and application in storm surge simulation. *Journal of Geophysical Research-Atmospheres*. In revision.

Xi, D., **Wang, S.**, and Lin, N.. Relationship Between Tropical Cyclone Intensity and Rain Rate. *Journal of Climate*. In revision.

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. *Journal of Geophysical Research-Atmospheres*. Under review.

Invited and Conference Presentations

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 34rd 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.

Teaching Experience

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

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

Supervising Experience

2020, Morgane Lardennois, M.Sc., "Investigating the shape of tropical cyclone eye"

2020, Rosemary Colaert, M.Sc., "Rapid growth of tropical cyclone size"

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

2019, Henry Throp, M.Sci., "Typhoon size life cycle analysis"

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

2016, Qiaoqiao Fu, M.Sc. project, "Temporal and spatial influence on the physics properties of typhoons"

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"

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)

Professional Service

Membership American Meteorological Society, American Geophysical Union, Royal Meteorological Society

Reviewer *Nature Communications*, *Journal of Climate*, *Monthly Weather Review*, *Geophysical Research Letters*, *Journal of Geophysical Research*, *Journal of Hydrometeorology*, *Environmental Re-*

search Letters, *Environmental Research Communication*, *International Journal of Climatology*, *Journal of Meteorological Research*, *Atmosphere*, *Advances in Space Research*

MEDIA COVERAGE

The Associated Press, 2021, "Tropical cyclones are nearing land more, except in Atlantic"

U.S. News, 2021, "Tropical cyclones are nearing land more"

BBC, 2017, "Furacões estão mais frequentes e destruidores este ano?"

Science Daily, 2021, "Hurricanes and typhoons moving 30km closer to coasts every decade"

The Independent, 2020, "How is the 'strongest storm of 2020' linked to the climate crisis?"

Carbon Brief 2021, "Recent increase in major Atlantic hurricanes after 1960-1980s lull"

2020, "Global warming has 'changed' spread of tropical cyclones around the world"

2020, "Major tropical cyclones have become '15% more likely' over past 40 years"

2018, "Global warming is causing tropical storms to slow down and last longer"