#### Yang Zhang, Professor, Distinguished Fellow, and Associate Chair for Research

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**Professional Preparation**

Tsinghua University (Beijing, China), Environmental Engineering, B.S., 1988

University of Iowa (Iowa City, U.S.), Chemical and Biochemical Engineering, Ph.D., 1994

# Professional Appointments

Professor, Civil and Environmental Engineering, Northeastern University, 2020–present

Professor, Atmospheric Sciences, North Carolina State University (NCSU), 2009–2020

Associate Professor (early tenured promotion), Atmospheric Sciences, NCSU, 2006–2009

Assistant Professor, Atmospheric Sciences, NCSU, 2003–2006

Senior/Staff Scientist, Atmospheric & Environmental Research, Inc., 1997–2003

Research Scientist, Pacific Northwest National Laboratory (PNNL), 1994–1997

Research/Teaching Assistant, University of Iowa, 1990-1994

Assistant Research Fellow, Chinese Academy of Sciences, Beijing, China, 1988-1990

**Scientific and Technical Background and Management Experience**

Dr. Zhang has 30 years of research experience in academia, governmental laboratories, industry, and international collaborations. She has devoted sustained efforts to solve some of the most pressing and challenging environment- and energy-related scientific and technical issues related to air and water pollution, acid deposition, climate change, as well as associated health and ecosystem effects. Her research advances the scientific understanding of these issues by developing and utilizing the state-of-the-science 3-D atmospheric models and analysis tools to address relevant science and policy questions pertaining to controlling air pollution, mitigating adverse climate change, and minimizing environmental damages in the entire Earth system. She has led and successfully completed many single-PI and several large (> 1 M) multi-disciplinary and cross institutional research projects on urban, regional, and global scale air pollution and transport, atmospheric chemistry and dynamics, source appointment, sensitivity and process analysis, as well as interactions among energy/fuel use, climate change, meteorology, air and water quality, land, ocean, forest, and ecosystems. In a recent project co-sponsored by NSF and USDA, she led a team of > 20 people with diversified expertise to develop an Integrated Technology-Driven Earth System model. In an ongoing EPA ACE center, the *S*olutions for *E*nergy, *A*i*R*, *C*limate, and *H*ealth (SEARCH), hosted at Yale University, she is leading a key project on improving projections of multi-pollutants to enhance assessment of public health in a changing climate through improving and applying multiple online-coupled meteorology-chemistry models under several energy transition scenarios for future years. She led the development of a 576-page book entitled Training Materials and Best Practices for Chemical Weather /Air Quality Forecasting (CW-AQF) published by WMO in 2020. Dr. Zhang was a recipient of the NSF Career Award and several international scholarship awards. Her research led to 188 peer-reviewed journal publications and >7500 citations and an *h*-index of 48 from the ISI Web of Science (11,645 citations and the *h*-index of 57 from Google Scholar). She is a member of the External Advisory Committee of the Community Modeling and Analysis System (CMAS) center, the University of North Carolina at Chapel Hill (UNC), and a member of the WMO's Global Air quality Forecasting and Information System (GAFIS) Steering Committee and also Team Leader for Capacity Building subgroup of GAFIS. She is a member of A&WMA, AGU, AMS, and *Sigma Xi*, The Scientific Research Honor Society.

###### Selected Honors, Awards, and Professional Services

* Member of the WMO's Global Air quality Forecasting and Information System (GAFIS) Steering Committee and Team Co-Leader for Capacity Building subgroup of GAFIS, 2020-2022
* Lead Editor, special issue on Air Quality Research at Street-Level, co-sponsored by ACP and GMD, 2018-present
* The RTI University Scholar Awards,2018 –2019
* The FAPESP(TheSão Paulo Research Foundation, Brazil)Visiting Researcher Program

Award, visiting professorship at the University of Sao Paulo**,** Brazi**l,** Nov.-Dec., 2017

* The University of Wollongong (UOW) Vice - Chancellors Visiting International Scholar Award (VISA), Apr.-Oct., 2017
* Fellowship Award, visiting professorship at the Atmospheric Environment Center (CEREA), Ecole des Ponts ParisTech, Paris, France, Oct. 8, 2010-Jan. 7, 2011 and May-Aug., 2017

• Member of the External Advisory Committee of the Community Modeling and Analysis System (CMAS) center, the UNC at Chapel Hill/U.S. EPA, 2016-2021

• Editor-in-Chief*,* *Climate,* 2016- 2018; the Editorial Board Member since 2014

* International expert for an EU international collaborative project on the implementation of a European Concerted Research Action designated as COST Action ES1004: European framework for online integrated air quality and meteorology modeling, 2011-2015
* National Science Foundation Career Award (2004)

**Journal Publications (selected from 188)**

Itahashi, S., R. Mathur, C. Hogrefe, S. L. Napelenok, and **Y. Zhang**, 2021, Incorporation of volcanic SO2 emissions in the Hemispheric CMAQ (H-CMAQ) version 5.2 modeling system and assessing their impacts on sulfate aerosol over Northern Hemisphere, *Geosci. Model Dev.*, 14, 5751–5768, https://doi.org/10.5194/gmd-14-5751-2021.

Wang, K., Y. Zhang, S.-C. Yu, D. C. Wong, J. Pleim, R. Mathur, J. T. Kelly, and M. Bell, 2021, A Comparative Study of Two-way and Offline Coupled WRF v3.4 and CMAQ v5.0.2 over the Contiguous U.S.: Performance Evaluation and Impacts of Chemistry-Meteorology Feedbacks on Air Quality, <https://doi.org/10.5194/gmd-2020-218>, *Geosci. Model Dev*.

**Zhang, Y.,** S. Smith, M. Bell, A. Mueller, M. Eckelman, S. Wylie, E. L. Sweet, P. Chen, and D. A. Niemeier, 2021, Pollution inequality 50 years after the Clean Air Act: the need for hyperlocal data and action, *Environmental Research Letters*, 16, 071001.

Wang, S.-C., Y. Qian, L. R. Leung, and **Y. Zhang**, 2021, Identifying key drivers of wildfires in the contiguous US using machine learning and game theory interpretation, *Earth’s Future*, 9 (6), e2020EF001910, <https://doi.org/10.1029/2020EF001910>.

Chen, X.-Y., **Y. Zhang**, K. Wang, D. Tong, P. Lee, Y.-H. Tang, J.-P. Huang, P. C. Campbell, J. Mcqueen, H. O.T. Pye, B. N. Murphy, and D.-W. Kang, 2021, Evaluation of the offline-coupled GFSv15-FV3-CMAQv5.0.2 in support of the next-generation National Air Quality Forecast Capability over the contiguous United States, Geosci. Model Dev., 14 (6), 3969–3993, <https://gmd.copernicus.org/articles/14/3969/2021/>.

Gavidia-Calderón, M., S. Ibarra-Espinosa, Y. Kim, **Y. Zhang**, and M. F. Andrade, 2021,

Simulation of O3 and NOx in Sao Paulo street urban canyons with VEIN (v0.2.2) and MUNICH (v1.0),*Geosci. Model Dev.*, 14, 3251–3268.

# Wang, K.,Y. Zhang, and K. Yahya, 2021, Decadal application of WRF/Chem over the

# continental U.S.: Simulation design, sensitivity simulations, and climatological model evaluation, *Atmos. Environ.*, 253 (15), 118331.

Baklanov, A. and **Y. Zhang**, 2020, Advances in Air Quality Modeling and Forecasting, *Global Transitions*, 2:261-270, DOI: [10.1016/j.glt.2020.11.001](https://www.researchgate.net/deref/http%3A%2F%2Fdx.doi.org%2F10.1016%2Fj.glt.2020.11.001)

Hong, C.-P., Q. Zhang, **Y. Zhang**, S. J. Davis, X. Zhang, D. Tong, D. Guan, Z. Liu, and K.-B. He, 2020, Weakening aerosol direct radiative effects mitigate climate penalty on Chinese air quality, *Nature Climate Change*, [https://www.nature.com/articles/s41558-020-0840-y](https://nam12.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nature.com%2Farticles%2Fs41558-020-0840-y&data=02%7C01%7Cya.zhang%40northeastern.edu%7C723beb87442b4a8cfb1b08d8325f46c4%7Ca8eec281aaa34daeac9b9a398b9215e7%7C0%7C0%7C637314732089962930&sdata=lC9qOxYc8ZANxGY%2Bs5JNlUQRmuRmlMwFlTEAUX%2BtvF4%3D&reserved=0).

**Zhang, Y.**, P.-L. Yang, Y. Gao, R. L. Leung, and M. Bell, 2020, Health and Economic Impacts of Air Pollution Induced by Weather Extremes over the Continental U.S.,*Environmental International*,143, 105921, https://doi.org/10.1016/j.envint.2020.105921.

Hong, C.-P., Q. Zhang, **Y. Zhang**, S. J. Davis, S. J. Davis, D. Tong, Y.-X. Zheng, Z. Liu, D.-B. Guan, K.-B. He, and H. J. Schellnhuber, 2019, Impacts of climate change on future air quality and human health in China, *PNAS*, August issue, 1-8.

**Zhang, Y.**, C. Jena, K. Wang, C. Paton-Walsh, E.-A. Guerette, S. Utembe, J. D. Silver, and M. Keywood, 2019, Multiscale Applications of Two Online-Coupled Meteorology-Chemistry Models during Recent Field Campaigns in Australia, Part I: Model Description and WRF/Chem-ROMS Evaluation Using Surface and Satellite Data and Sensitivity to Spatial Grid Resolutions, Atmosphere, *10(4)*, 189, 1-44; doi:10.3390/atmos10040189.

**Zhang, Y.**, C. Jena, K. Wang, C. Paton-Walsh, E.-A. Guerette, S. Utembe, J. D. Silver, and M. Keywood, 2019, Multiscale Applications of Two Online-Coupled Meteorology-Chemistry Models during Recent Field Campaigns in Australia, Part II: Comparison of WRF/Chem and WRF/Chem-ROMS and Impacts of Air-Sea Interactions and Boundary Conditions, Atmosphere, *10(4)*, 210, 1-36; doi: 10.3390/atmos10040210.

Campbell, P., F. Yan, Z.-F. Lu, **Y. Zhang**, D. Streets, 2018, Impacts of Transportation Sector Emissions on Future U.S. Air Quality in a Changing Climate. Part II: Air Quality Projections and the Interplay between Emissions and Climate Change, *Environ. Poll.*, 238:918-930.

Wang, K., **Y. Zhang**, X. Zhang, J.-W. Fan, L. R. Leung, B. Zheng, Q. Zhang, and K.-B. He, 2018, Fine-Scale Application of WRF-CAM5during a dust storm episode over East Asia: Sensitivity to grid resolutions and aerosol activation parameterizations, *Atmos. Environ.*, 176, 1-20, <https://doi.org/10.1016/j.atmosenv.2017.12.014>.

Hong, C.-P., Q. Zhang, **Y. Zhang**, Y.-H. Tang, D. Tong, and K.-B. He, 2017, Multi-year Downscaling Application of Two-Way Coupled WRF v3.4 and CMAQ v5.0.2 over East Asia for Regional Climate and Air Quality Modeling: Model Evaluation and Aerosol Direct Effects, *Geoscientific Model Development*, 10, 2447-2470.

Zhang, Y., C.-P. Hong, K. Yahya, Q. Li, Q. Zhang, and K.-B. He, 2016, Comprehensive evaluation of multi-year real-time air quality forecasting using an online-coupled meteorology-chemistry model over southeastern United States, *Atmos. Environ.*, 138, 162-182.

Yahya, K., **Y. Zhang**, and J. M. Vukovich, 2014, Real-Time Air Quality Forecasting over the Southeastern United States using WRF/Chem-MADRID: Multiple-Year Assessment and Sensitivity Studies, *Atmos. Environ.*, 92, 318-338

**Zhang, Y.**, C. Seigneur, [M. Bocquet](http://cerea.enpc.fr/HomePages/bocquet/), [V. Mallet](http://cerea.enpc.fr/HomePages/mallet/), and A. Baklanov, 2012, Real-Time Air Quality Forecasting, Part I: History, Techniques, and Current Status, *Atmos. Environ.*, 60, 632-655.

**Zhang, Y.**, C. Seigneur, [M. Bocquet](http://cerea.enpc.fr/HomePages/bocquet/), [V. Mallet](http://cerea.enpc.fr/HomePages/mallet/), and A. Baklanov, 2012, Real-Time Air Quality Forecasting, Part II: State of the Science, Current Research Needs, and Future Prospects, *Atmos. Environ.*, 60, 656-676.