
Yixuan Zheng

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Research Interests

Energy Transition; Mitigation of Air Pollution and Climate Change; Atmospheric Chemistry Modeling; Acid Deposition; Satellite Remote Sensing

Current Employment

Postdoctoral Research Scientist in Ken Caldeira's group, Department of Global Ecology, Carnegie Institution for Science, Stanford, California, U.S., August 2018-present

Education

- 2013.09-2018.07, Ph.D. in Atmospheric Science, Tsinghua Univ. (Supervisor: Qiang Zhang)
- 2016.09-2017.03, Exchange Ph.D. Student in Public and International Affairs, Princeton Univ.
- 2015.07-2015.08, Visiting Student, National Center for Atmospheric Research of the U.S.
- 2009.09-2013.7 B.E. in Remote Sensing Science and Technology, Wuhan Univ. (with honor)

Professional Skills

- Professional skill: Chemical transport modeling (WRF-CMAQ, WRF-Chem, GEOS-Chem), Emission inventory and emission projection model, Policy analysis, Statistical analysis
- Scripting language and software: Python, R, IDL, NCL, Bash, Matlab, C++, ArcGIS, etc.
- Language: Chinese (native), English (fluent)

Major Research and Projects

Research Interests: *energy transition, mitigation of air pollution and climate change, atmospheric chemistry modeling; acid deposition, satellite remote sensing*

- **CO distribution in China (Sep 2012 - Jun 2013, Senior Thesis Project)**
Analyzed the spatial-temporal distribution of CO based on MOPPIT data and GEOS-Chem.
- **Satellite-based regional PM_{2.5} retrieval (Mar 2014 – Feb 2015)**
Developed statistical models for retrieving ground-level PM_{2.5} concentrations over three megalopolises in China based on satellite remote sensing.
- **Impact estimations of China's recent air quality policy (Feb 2016 – Nov 2016)**
Data fusion model with multi-source inputs was utilized to estimate air quality improvement and public health benefits of China's stringent clean air actions since 2013. Contribution of major measures were further estimated by scenario analysis.

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- **Potential of co-benefits from China's cement industry (Sep 2016 – Mar 2017)**
Potential of air quality, health and climate benefits from China's cement industry by 2030 were evaluated by emission projection model, air quality model, and epidemiological model.
 - **Variation and drivers of air pollution deaths over China (Feb 2017 - present)**
Simulated continuous air quality variations over China during 2000-2017 using the WRF-CMAQ model and then estimated the trend of PM_{2.5}-related deaths. Decomposed drivers of PM_{2.5}-related deaths by using an econometric model and a chemical transport model. Estimated impacts of environmental policies on the variation of PM_{2.5} and related deaths.
 - **Trend and sectorial contribution of nitrogen deposition over China (Oct 2017-present)**
Simulated continuous trend of nitrogen deposition over China and quantified its sectorial contribution by WRF-CMAQ model. Analyzed impacts of variations of emission on deposition.

Publications and Presentations

- **Zheng, Y.**, Q. Zhang, Y. Liu, et al., Estimating ground-level PM_{2.5} concentrations over three megalopolises in China using satellite-derived aerosol optical depth measurements, *Atmos. Environ.*, 2016, 232–42
- **Zheng Y.**, T. Xue, Q. Zhang, et al., Air quality improvements and health benefits from China's clean air action since 2013, *Environ. Res. Lett.* 2017, 12, 114020
- Xue, T.; **Y. Zheng**, G. Geng, et al., Fusing Observational, Satellite Remote Sensing and Air Quality Model Simulated Data to Estimate Spatiotemporal Variations of PM_{2.5} Exposure in China. *Remote Sens.*, 2017, 9, (3).
- Yang, X., **Y. Zheng**, G. Geng, et al., : Development of PM_{2.5} and NO₂ models in a LUR framework incorporating satellite remote sensing and air quality model data in Pearl River Delta region, China, *Environ. Pollut.*, 2017, 226, 143-153
- Jiang X., C. Hong, **Y. Zheng**, et al., To what extent can China's near-term air pollution control policy protect air quality and human health? A case study of the Pearl River Delta region, *Environ. Res. Lett.* , 2015, 10(10), 104006
- Zhang, X., Q. Zhang, C. Hong, **Y. Zheng**, et al., Enhancement of PM_{2.5} concentrations by aerosol-meteorology interactions over China, *J. Geophys. Res.-Atmos.*, 2017, 123, 1179–1194.
- Cai W., J. Hui, C. Wang, **Y. Zheng et al.**, PM_{2.5} pollution-related health impacts of China's projected CO₂ mitigation in the power generation sector under the Paris Agreement, *the Lancet Planetary Health*, 2018, accepted
- Guan T., T. Xue, Y. Liu, **Y. Zheng**, et al., Differential susceptibility in ambient particle-related first-ever stroke onset risk: findings from a national case-crossover study, 2018, *Am. J. Epidemiol.*, <https://doi.org/10.1093/aje/kwy007>
- Geng, G., Q. Zhang, D. Tong, ..., **Y. Zheng**, et al., Chemical composition of ambient PM_{2.5} over China and relationship to precursor emissions during 2005–2012, *Atmos. Chem. Phys.*, 2017, 17, 9187-9203, 10.5194/acp-17-9187-2017

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- Liu F, Q. Zhang, R. van der A, ..., **Y. Zheng**, et al., Recent reduction in NO_x emissions over China: synthesis of satellite observations and emission inventories, *Environ. Res. Lett.*, 2016, 11, 114002
 - Xu, L., F. Duan, K. He, ..., **Y. Zheng**, et al., Characteristics of the secondary water-soluble ions in a typical autumn haze in Beijing, *Environ. Pollut.*, 2017, 227, 296-305
 - Li, X., Q. Zhang, Y. Zhang, ..., **Y. Zheng**, et al., Attribution of PM_{2.5} Exposure in Beijing-Tianjin-Hebei Region to Emissions: Implication to Control Strategies, *Chinese Sci. Bull.*, 2017, 62, 957-964
 - Li, H., B. Zheng, Q. Zhang, ..., **Y. Zheng**, et al., Nitrate-driven haze pollution during summertime over the North China Plain, *Atmos. Phys. Chem. Discuss*, 2018, 2018:1-22
 - Liu, M., J. Lin, Y. Wang, ..., **Y. Zheng**, et al., Spatiotemporal variability of NO₂ and PM_{2.5} over Eastern China: observational and model analyses with a novel statistical method, *Atmos. Phys. Chem. Discuss.*, 2018
 - Zhang, Y., X. Li, M. Li, Y. Zheng, et al., Reduction in black carbon light absorption due to multi-pollutant emission control during APEC China 2014 *Atmos. Phys. Chem.*, *in press*
 - **Zheng Y.**, H. Zhao, Q. Zhang, et al., Revealing driving factors of China's PM_{2.5} pollution, American Geophysical Union Fall Meeting 2017, New Orleans, Dec. 2017 (Poster)
 - **Zheng Y.**, T. Xue, Q. Zhang, et al., Air quality improvements and health benefits from China's clean air action since 2013, 5th iLEAPS Science Conference, Oxford, Sep. 2017 (Oral)
 - **Zheng Y.**, T. Xue, Q. Zhang, et al., Air quality and health benefits related to the implementation of China's 2013 clean air action plan, American Geophysical Union Fall Meeting 2016, San Francisco, Dec. 2016 (Poster)
 - **Zheng Y.**, Q. Zhang, Y. Liu, et al., Assessment of ground-level PM_{2.5} concentrations over three megalopolises in China using satellite-derived aerosol optical depth measurements, Asia Oceania Geosciences Society 13th Annual Meeting, Beijing, Aug. 2016 (Poster)
 - **Zheng Y.**, Q. Zhang, Y. Liu, et al., Estimating ground-level PM_{2.5} concentrations over three megalopolises in China using satellite-derived aerosol optical depth measurements, European Geosciences Union General Assembly 2016, Vienna, Austria, Apr. 2016 (Oral)

Selected Honors

- **National Scholarship**, Ministry of Education of China, Nov. 2017
- **Guanghua Scholarship**, Tsinghua University, Oct. 2016
- **Best Poster Award**, Asia Oceania Geosciences Society 13th Annual Meeting, Aug. 2016
- **Shen Yungang Oceanology Scholarship**, Tsinghua University, Oct. 2015
- **Outstanding Graduate**, Wuhan University, Jun. 2013
- **National Scholarship**, Ministry of Education of China, Sep. 2012

Teaching Experience

- **Teaching assistant**, Air pollution and its impacts, Tsinghua Univ., Fall. 2017
- **Teaching assistant**, Remote sensing of the atmosphere, Tsinghua Univ., Fall. 2015