

Zhu Deng (鄧鑄), Dr.

Research interests: **GHG emission accounting; Climate Change; AI and Spatial Big Data**

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WORKING EXPERIENCE

Post-doctoral Research Fellow, Department of Geography 2024-present

The University of Hong Kong, Hong Kong SAR, China

Supervised by Prof. Peng Gong

Assistant Researcher, Department of Earth System Science 2022-2024

Tsinghua University, Beijing, China

Supervised by Prof. Zhu Liu

EDUCATION

Ph.D., Ecology 2016-2022

Department of Earth System Science, **Tsinghua University**, Beijing, China



Dissertation: Research on Near-real-time Accounting for Anthropogenic CO₂ Emissions

Supervised by Prof. Zhu Liu


B.S., Geographic Information System & Remote Sensing 2012-2016

School of Geography and Planning, **Sun Yat-sen University**, Guangzhou, China

PUBLICATIONS

Legend:  ESI Hot Paper  ESI Highly Cited Paper [†] Co-First Author

SELECTED PUBLICATIONS

- **Z Deng**[†], P Ciaia[†], ZA Tzompa-Sosa, M Saunois, C Qiu, C Tan, T Sun, P Ke, Y Cui, K Tanaka, X Lin, RL Thompson, H Tian, Y Yao, Y Huang, R Lauerwald, AK Jain, X Xu, A Bastos, S Sitch, PI Palmer, T Lauvaux, A d'Aspremont, C Giron, A Benoit, B Poulter, J Chang, R Petrescu, SJ Davis, Z Liu, G Grassi, C Albergel, and F Chevallier. Comparing national greenhouse gas budgets reported in UNFCCC inventories against atmospheric inversions. **Earth System Science Data**. 2022. doi: 10.5194/essd-2021-235.  [Citations: 110]
- Z Liu[†], **Z Deng**[†], P Ciaia, J Tan, B Zhu, SJ Davis, RM Andrew, O Boucher, SB Arou, JG Canadell, X Dou, P Friedlingstein, R Guo, C Hong, RBJackson, D Kammen, P Ke, C Le Quéré, C Monica, G Janssens-Maenhout, GP Peters, K Tanaka, Y Wang, B Zheng, H Zhong, T Sun, H Schellnhuber, P Gentile. Global patterns of daily CO₂ emissions reductions in the first year of COVID-19. **Nature Geoscience**. 2022. doi: 10.1038/s41561-022-00965-8. [Citations: 77]
- Z Liu[†], **Z Deng**[†], P Ciaia[†], R Lei, SJ Davis, S Feng, B Zheng, D Cui, X Dou, P He, B Zhu, C Lu, P Ke, T Sun, Y Wang, X Yue, Y Wang, Y Lei, H Zhou, Z Cai, Y Wu, R Guo, T Han, J Xue, O Boucher, F Chevallier, E Boucher, Y Wei, Q Zhang, D Guan, P Gong, DM Kammen, K He, and HJ Schellnhuber.

Near-real-time monitoring of global CO₂ emissions reveals the effects of the COVID-19 pandemic.

Nature Communications. 2020. doi: 10.1038/s41467-020-18922-7. 🏆 [Citations: 1059]

- Z Liu, **Z Deng**, G He, H Wang, X Zhang, J Lin, Y Qi, X Liang. Challenges and opportunities for carbon neutrality in China. **Nature Reviews Earth & Environment.** 2022. doi: 10.1038/s43017-021-00244-x. 🏆 [Citations: 971]
- Z Liu[†], P Ciais[†], **Z Deng**[†], SJ Davis, B Zheng, Y Wang, Y Lei, D Cui, B Zhu, X Dou, P Ke, T Sun, R Guo, C Lu, R Guo, O Boucher, F-M Bréon, E Boucher, and F Chevallier. Carbon Monitor: a near-real-time daily dataset of global CO₂ emission from fossil fuel and cement production. **Scientific Data.** 2020. 🏆 [Citations: 195]

OTHER PUBLICATIONS

- C Lu, Y Huang, Y Yu, J Hu, H Mo, Y Li, D Huo, X Song, X Huang, Y Sun, K Liu, S Zhang, K Morrissey, J Hong, **Z Deng**, Z Du, F Creutzig, Z Liu. Health co-benefits of post-COVID-19 low-carbon recovery in Chinese cities. **Nature Cities.** 2024.
- Y Huang, J Ou, **Z Deng**, W Zhou, Y Liang, X Huang. Peak patterns and drivers of city-level daily CO₂ emissions in China. **Journal of Cleaner Production.** 2024.
- X Huang, **Z Deng**, F Jiang, M Zhou, X Lin, Zhu Liu, M Peng. Improved Consistency of Satellite XCO₂ Retrievals Based on Machine Learning. **Geophysical Research Letters.** 2024.
- Z Liu, **Z Deng**, SJ Davis, and P Ciais. Monitoring global carbon emissions in 2023. **Nature Reviews Earth & Environment.** 2024.
- K Tibrewal, P Ciais, M Saunio, A Martinez, X Lin, J Thanwerdas, **Z Deng**, F Chevallier, C Giron, C Albergel, K Tanaka, P Patra, A Tsuruta, B Zheng, D Belikov, Y Niwa, R Janardanan, S Maksyutov, A Segers, ZA Tzompa-Sosa, P Bousquet, J Sciare. Assessment of methane emissions from oil, gas and coal sectors across inventories and atmospheric inversions. **Communications Earth & Environment.** 2024
- B Luo, J Liu, **Z Deng**, C Yuan, Q Yang, L Xiao, Y Xie, F Zhou, W Zhou, Z Liu. AutoPCF: A Novel Automatic Product Carbon Footprint Estimation Framework Based on Large Language Models. **Proceedings of the AAAI Symposium Series.** 2024.
- H Yang, P Ciais, F Frappart, X Li, M Brandt, R Fensholt, L Fan, S Saatchi, S Besnard, **Z Deng**, S Bowring, JP Wigneron. Global increase in biomass carbon stock dominated by growth of northern young forests over past decade. **Nature Geoscience.** 2023
- X Lin, R A, J Laat, H Eskes, F Chevallier, P Ciais, **Z Deng**, Y Geng, X Song, X Ni, D Huo, X Dou, Z Liu. Monitoring and quantifying CO₂ emissions of isolated power plants from space. **Atmospheric Chemistry and Physics.** 2023.
- P Ke, **Z Deng**, B Zhu, B Zheng, Y Wang, O Boucher, SB Arous, C Zhou, RM Andrew, X Dou, T Sun, X Song, Z Li, F Yan, D Cui, Y Hu, D Huo, J Chang, R Engelen, SJ Davis, P Ciais, Z Liu. Carbon Monitor Europe near-real-time daily CO₂ emissions for 27 EU countries and the United Kingdom. **Scientific Data.** 2023.
- B Zhu[†], **Z Deng**[†], X Song[†], W Zhao, D Huo, T Sun, P Ke, D Cui, C Lu, H Zhong, C Hong, J Qiu, SJ Davis, P Gentile, P Ciais, Z Liu. CarbonMonitor-Power near-real-time monitoring of global power generation on hourly to daily scales. **Scientific Data.** 2023.
- Z Liu, **Z Deng**, SJ Davis, and P Ciais. Monitoring global carbon emissions in 2022. **Nature Reviews Earth & Environment.** 2023.

- A Bastos, P Ciais, S Sitch, L E. O. C. Aragão, F Chevallier, D Fawcett, T M. Rosan, M Saunois, D Günther, L Perugini, C Robert, **Z Deng**, J Pongratz, R Ganzenmüller, R Fuchs, K Winkler, S Zaehle, C Albergel. On the use of Earth Observation to support estimates of national greenhouse gas emissions and sinks for the Global stocktake process: lessons learned from ESA-CCI RECCAP2. **Carbon Balance and Management**. 2022.
- D Huo, X Huang, X Dou, P Ciais, Y Li, **Z Deng**, Y Wang, D Cui, F Benkhelifa, T Sun, B Zhu, G Roest, KR. Gurney, P Ke, R Guo, C Lu, X Lin, A Lovell, K Appleby, PL. DeCola, SJ. Davis, Z Liu. Carbon Monitor Cities near-real-time daily estimates of CO2 emissions from 1500 cities worldwide. **Scientific Data**. 2022.
- Z Liu, **Z Deng**, X Huang. A carbon-monitoring strategy through near-real-time data and space technology. **The Innovation**. 2022.
- S J. Davis, Z Liu, **Z Deng**, B Zhu, P Ke, T Sun, R Guo, C Hong, B Zheng, Y Wang, O Boucher, P Gentine, P Ciais. Emissions rebound from the COVID-19 pandemic. **Nature Climate Change**.2022.
- Z Liu, **Z Deng**, SJ Davis, and P Ciais. Monitoring global carbon emissions in 2021. **Nature Reviews Earth & Environment**. 2022.
- Z Liu, T Sun, Y Yu, P Ke, **Z Deng**, C Lu, D Huo, X Ding. Near-Real-Time Carbon Emission Accounting Technology Toward Carbon Neutrality. **Engineering**. 2022.
- R B Jackson, P Friedlingstein, C Le Quéré, S Abernethy, R M Andrew, J G Canadell, P Ciais, S J Davis, **Z Deng**, Z Liu, J I Korsbakken, G P Peters. Global fossil carbon emissions rebound near pre-COVID-19 levels. **Environmental Research Letters**. 2022.
- X Dou, C Liao, H Wang, Y Huang, Y Tu, X Huang, Y Peng, B Zhu, J Tan, **Z Deng**, N Wu, T Sun, P Ke, Z Liu. Estimates of daily ground-level NO2 concentrations in China based on Random Forest model integrated K-means. **Advances in Applied Energy**. 2021.
- F Chevallier, B Zheng, G Broquet, P Ciais, Z Liu, S J. Davis, **Z Deng**, Y Wang, F Bréon, C W. O'Dell. Local Anomalies in the Column-Averaged Dry Air Mole Fractions of Carbon Dioxide Across the Globe During the First Months of the Coronavirus Recession. **Geophysical Research Letters**. 2020.
- X Dou, **Z Deng**, T Sun, P Ke, B Zhu, Y Shan, Z Liu. Global and local carbon footprints of city of Hong Kong and Macao from 2000 to 2015. **Resources, Conservation and Recycling**. 2020.
- Z Liu, J Meng, **Z Deng**, P Lu, D Guan, Q Zhang, K He, P Gong. Embodied carbon emissions in China-US trade. **Science China Earth Sciences**. 2020.
- D Cui, **Z Deng**, Z Liu. China's non-fossil fuel CO2 emissions from industrial processes. **Applied Energy**. 2019.

PROFESSIONAL ACTIVITIES

IPCC Expert Meeting on Reconciling Land Use Change Emissions	<i>Ispra, Italy, 2024</i>
Global Youth Summit on Net-Zero Future	<i>Beijing, China, 2021</i>
2021 Sino-American Youth Dialogue	<i>Beijing, China, 2021</i>
ESA-CCI RECCAP2 progress meeting	<i>Virtual meeting, 2021</i>

SELECTED HONORS & AWARDS

The RGC Postdoctoral Fellowship Scheme (PDFS), University Grants Committee	<i>2024</i>
Jiang Nanxiang (Presidential) Scholarship, Tsinghua University	<i>2021</i>