

Yue He



Title: Assistant Research Fellow

Research focus: land carbon cycle, land-use change, reduced-complexity Earth system models

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Dr. Yue He is an Assistant Research Fellow at the Institute of Carbon Neutrality, Peking University, specializing in terrestrial carbon cycle dynamics. Her research focuses on understanding how climate change and anthropogenic activities (particularly land-use change) regulate ecosystem response mechanisms. To address these questions, she employs multiple approaches including machine learning techniques, model-data integration, and developing reduced-complexity Earth system models. Dr. He holds a PhD in physical geography from Peking University (2021) and conducted joint postdoctoral research at Peking University and the International Institute for Applied Systems Analysis (IIASA, 2021-2023). Her work has advanced the integration of observational data with modeling frameworks to improve carbon cycle estimates, with publications in journals including Nature Communications, Global Change Biology, Science Bulletin, and Agricultural and Forest Meteorology. Further details of her publications are available on [Google Scholar](#).

Education

2016.9-2021.7 Peking University, PhD in Physical Geography

2012.9-2016.7 Lanzhou University, Bachelor of Science in Geographic Science

Work Experience

2025.1-Present Assistant Research Fellow, Institute of Carbon Neutrality, Peking University

2023.11-2024.11 Assistant Research Fellow, International Institute for Applied Systems Analysis

2021.11-2023.11 PKU-IIASA Joint Postdoctoral Researcher

Future land carbon removals in China consistent with national inventory

China's commitment to carbon neutrality by 2060 relies on the Land Use, Land-Use Change, and Forestry (LULUCF) sector, with forestation targets designed to enhance carbon removal. However, the exact sequestration potential of these initiatives remains uncertain due to differing accounting conventions between national inventories and scientific assessments. Here, we reconcile both estimates and reassess LULUCF carbon fluxes up to 2100, using a spatially explicit bookkeeping model, state-of-the-art historical data, and national forestation targets. We simulate a carbon sink of $-0.24 \pm 0.03 \text{ Gt C yr}^{-1}$ over 1994–2018 from past forestation efforts, aligned well with the national inventory. Should the official forestation targets be followed and extended, this could reach $-0.35 \pm 0.04 \text{ Gt C yr}^{-1}$ in 2060, offsetting $43 \pm 4\%$ of anticipated residual fossil CO_2 emissions. Our findings confirm the key role of LULUCF in carbon sequestration, but its potential will decline if forestation efforts cease, highlighting the necessity for emission reductions in other sectors to achieve carbon neutrality.