

Raorao Su 蘇繞繞

Curriculum Vitae

Guangzhou University, School of Geography and Remote Sensing
230 Wai Huan Xi Road, Guangzhou Higher Education Mega Center, Guangzhou 510006, P.R. China
raosu@gzhu.edu.cn | raosu980@gmail.com | +86 150 2908 1035

PROFILE

Historian and spatial digital humanist specializing in historical GIS, environmental history, and the historical geography of China and Inner Asia. My research uses historical maps, archival sources, spatial databases, and GIS-based analysis to study long-term spatial change, cultural landscapes, water systems, settlements, frontier regions, and human-environment relations. I have experience in international research collaboration, bilingual academic writing, digital humanities projects, and interdisciplinary humanities and social sciences research.

RESEARCH INTERESTS

Digital Humanities; Spatial Humanities; Historical GIS; Cultural Analytics; Digital Mapping; Historical Spatial Databases; Environmental Humanities; Historical Geography of China and Inner Asia; Asian Studies; Human-Environment Relations; Historical Maps and Spatial Data Reconstruction.

EDUCATION

PhD, Renmin University of China 中國人民大學, 2020-2024

Advisor: Prof. Zhao Zhen 趙珍

Visiting PhD Student, University of Pittsburgh, 2022-2023

Advisor: Prof. Ruth Mostern

M.S., Shaanxi Normal University 陝西師範大學, 2016-2019

Advisor: Prof. Hou Yongjian 侯甬堅

B.A., Xi'an International Studies University 西安外國語大學, 2012-2016

ACADEMIC APPOINTMENTS & AFFILIATIONS

Postdoctoral Researcher / Distinguished Associate Researcher, Guangzhou University 廣州大學, 2024-present

Supervisor: Prof. David Dian Zhang 章典, former Head of the Department of Geography, The University of Hong Kong

GIS Consultant (remote, part-time), Dept. of English, University of Pittsburgh, 2025

Academic Secretary (part-time), National Qing Dynasty History Compilation Committee 國家清史編纂委員會, 2021-2022

Student Researcher / Editorial Assistant (part-time), Research Center for Digital Humanities, RUC 中國人民大學數字人文研究中心, 2021-2022

Research Assistant, Institute of Earth Environment, CAS 中國科學院地球環境研究所, 2019

PUBLICATIONS AND RESEARCH OUTPUTS

Peer-Reviewed Journal Articles (Selected)

- [16] "120-Year spatiotemporal evolution of water-settlement interactions in Xinjiang, China. *Applied Water Science*." (2026, Accepted). (**SCI**; first author; with Zhao Zhen)
- [15] "清代西北茶法與茶引的官茶探析"[J], *Researches in Chinese Economic History 中國經濟史研究*, 2026(4):10-27. (**CSSCI**; corresponding author; with Zhao Zhen)
- [14] "Canal Contraction and Hydraulic Responses to Water-Sediment Dynamics in Xinjiang during the Late Qing Dynasty 乾旱綠洲區水沙運動與農田水利應對——以晚清新疆為例", *Ancient and Modern Agriculture 古今農業*, 2026, (**AMI**, forthcoming).
- [13] "Long-term evolution of hydrographic network density in arid Xinjiang, China: reconstruction from historical maps (1900-2020)". *Sci Rep* 16, 18764 (2026). <https://doi.org/10.1038/s41598-026-49759-7>. (**SCI**; first author; with Zhao Zhen)
- [12] "近百年來塔里木河上游水系形態演變特徵及其驅動因素"[J], *Historical Geography Research 歷史地理研究*, 2026, 46(01):1-20+157. DOI:10.20166/j.issn.2096-6822.L20240076. (**CSSCI**; first author; with Pan Wei)
- [11] "Coupled evolution of polders, water systems, and lakes in the Jiangnan plain based on historical topographic maps" [J]. *South China Geographical Journal*, 2025, 3(4): 70-82. DOI:10.20125/j.2097-2245.20250060 (first author; with Pan Wei and Li Sheng).
- [10] "Spatial Structure of Settlements in Mainland China in the Early 20th Century". *Land*. 2025; 14(11):2245. <https://doi.org/10.3390/land14112245>. (**SSCI**; first author; with Zhao Zhen)
- [9] "Temporal and spatial evolution of human-water relationships in Junggar Basin under the background of water conservancy modernization" [J], *Journal of Water Resources & Water Engineering*, 2025,36(02):49-56. (**CSCD**; first author; with Pan Wei)
- [8] "A GIS-Based Study on the Changes in Water Areas of Ordos Lake Over the Past Century and Related Issues 基於 GIS 的過去百年鄂爾多斯湖泊水域變遷及相關問題研究"[J]. *Journal of Nanjing Forestry University (Humanities and Social Sciences Edition) 南京林業大學學報(人文社會科學版)*,2025,25(01):44-56. DOI:10.16397/j.cnki.1671-1165.202501044. (second author; with Zhao Zhen).
- [7] "Severe Drought and Ecological Response in the Tarim Basin in the Early 20th Century" [J]. *Plateau Meteorology*, 2024, 43(3): 605-616 <https://doi.org/10.7522/j.issn.1000-0534.2024.00023>. (**CSCD**; first author; with Zhao Zhen).
- [6] "Spatial Diffusion and Driving Factors of Tibetan Buddhist Temples in the Hehuang Valley Region After Song Dynasty" [J]. *Economic Geography*, 2023,43(06):220-229. (**CSSCI**; **CSCD**; corresponding author; with Zhao Zhen)
- [5] "清末民國新疆農田水利建設成果可視化及分析 (1909—1935) Visualization and analysis of farmland water conservancy construction achievements in Xinjiang during the late Qing Dynasty and the Republic of China (1909-1935)" [J]. *中國經濟史研究 Researches in Chinese Economic History*, 2022, No.161(3):155-166. (**CSSCI**; first author; with Pan Wei)
- [4] "清代北運河楊村剝運與水環境"(Barge Transportation in Yang Cun and Water Environment of the North Canal in Qing Dynasty) [J]. *中國歷史地理論叢 Journal of Chinese Historical Geography*,2021,36(04):96-102+110. (**CSSCI**; second author; with Zhao Zhen)
- [3] "The evolution and driving factors of the North Canal system since the end of 16th century" [J]. *Advances in Earth Science*, 2021,36(04):390-398. (**CSCD**; first author; with Zhao Zhen)
- [2] "A dataset of lakes and wetlands in Xinjiang region of the late Qing and Republican

period", *China Scientific Data* 3(2018). DOI:10.11922/csdata.2018.0018.zh. (CSCD; first author; with Pan Wei and Wang Fang)

- [1] "Influence of the irrigation canal change on the surface water system in the Weigan-Kuqa Oasis in recent 100 years" [J]. *Journal of Arid Land Resources and Environment*, 2018(10):123-129. (CSSCI; CSCD; first author; with Pan Wei)

PUBLICATIONS AND RESEARCH OUTPUTS

Book Chapters

- [6] "Frontier Military Colonies and Environmental Change on the Loess Plateau in the Eleventh Century." In *China's Environmental History: A Reader*, edited by Brian Lander and Peter B. Lavelle. New York: Columbia University Press, forthcoming. (second author; with Ruth Mostern)
- [5] "A Shatterzone on an Ecotone: Spatial and Political Ecologies of Erosion in the Jing River Basin", Prasenjit Duara and James Wescoat ed. *The Hydrosphere of Monsoon Asia: Lives, Histories, and Waters*[M]. Cambridge University Press, in press. (second author; with Ruth Mostern)
- [4] "The Ecology of the Political Landscape in Northern Shaanxi During the Long Eleventh Century: The Environmental and Spatial History of a Multiethnic Borderland." In *The Great Wall of China as a Climate Frontier: Climatic and Historical Perspectives on the Ordos Region*, edited by Nicola Di Cosmo, David Bello, Jürg Luterbacher, and Elena Xoplaki. Cham: Springer, in press. (second author; with Ruth Mostern)
- [3] "Paleoclimatic Evidence Across the Ordos Region and Yellow River Loop." In *The Great Wall of China as a Climate Frontier: Climatic and Historical Perspectives on the Ordos Region*, edited by Nicola Di Cosmo, David Bello, Jürg Luterbacher, and Elena Xoplaki. Cham: Springer, in press. https://doi.org/10.1007/978-3-032-21642-7_2. (seventh author; with Elena Xoplaki et al.)
- [2] "Digital Historical Yellow River". In: Ye, X., Lin, H. (eds) *Spatial Synthesis. Human Dynamics in Smart Cities*. Springer, Cham. 2020. https://doi.org/10.1007/978-3-030-52734-1_5 (second author; with Pan Wei et al.)
- [1] "博斯騰湖地區生態對近百年來氣候變化的響應：新疆虎滅絕的可能原因"(The Responses of Ecology to Climate Change in Bosten Lake Region: Possible Causes of the Extinction of the Tiger in Xinjiang) [M]//*Interactive and Communication: Silk Road in the History of Global 互動與交流：全球史視野下的絲綢之路*. Yunnan University Press, 2020: 272-290. (second author; with Pan Wei and Cao Zhihong)

Book

- [1] *Theory and Practice of Historical Geography Informatization 歷史地理信息化的理論與實踐* [M]. Beijing: Science Press, 2024. (third author; with Pan Wei and Bai Jiangtao)

Manuscripts under Review

- [1] "Gridded Reconstruction of Population Density Evolution in Xinjiang over the Past 120 Years." *Arid Land Geography 乾旱區地理*, under review. (CSCD)

CONFERENCES AND WORKSHOPS

- [11] "過去 120 年塔里木盆地水系格局演變", 第二屆"興地"青年歷史地理學者论坛, 暨南大學 Jinan University, Guangzhou, China, November 2025.
- [10] 10th Multidisciplinary Research International Conference (10th MRIC-2025), 8-9 October, 2025 (Keynote Speaker). University of Wah, Wah Cantt., Pakistan.
- [9] "Reconstruction and Study of the Evolution of Surface Water System Patterns in the Northwest Arid

- Region of China Over the Past Century". Session43 Research on the Formation of Economic Development, Land Use, and Regional Landscape Diversity in Historical Periods, 18th International conference of Historical Geographers, Shanghai, China, July 2025 (second author; with Pan Wei).
- [8] "The Spatiotemporal Evolution of Hunting Grounds during the Qing Dynasty". The 1st International Conference on Manchu Studies 2024, National University of Mongolia, Ulaanbaatar, Mongolia, August 2024 (second author; with Zhao Zhen).
- [7] "清末烏魯木齊灌區可視化與灌溉效率分析", 中國環境科學學會環境史專業委員會第四屆年會暨東西方比較視野下的環境史研究學術討論會, Taiyuan, China, August 2024 (first author; with Zhao Zhen).
- [6] "The Political Ecology of Settlement in Northern Shaanxi: Environmental and Spatial History on a Multiethnic Borderland". The Ordos Region: Climate, Environment, and History, **Institute for Advanced Study, Princeton**, USA, May 2024 (second author; with Ruth Mostern).
- [5] "A Shatterzone on an Ecotone: Spatial and Political Ecologies of Erosion in the Yellow River Watershed With a Focus on the Distribution of Settlements in the Jing River Basin and their Contribution to Erosion Processes". Hydrospheres Workshop, **Duke University**, Durham, USA, April 2023 (second author; with Ruth Mostern).
- [4] "Evolution of the Water System in the Bachu Section of the Tarim River Basin since the 19th Century." Paper presented at The First Academic Symposium on the Historical Evolution of Chinese Western Region Civilization, Xinjiang University, November 2022. (second author; with Pan Wei).
- [3] "Research on the pattern and network of agricultural irrigation in the Weigan River-Kuqa oasis area in the late Qing Dynasty", Paper presented at International Symposium on Economic History Research from a Comparative Perspective and the 8th Annual Meeting of the Chinese Society of Economic History, Editorial Department of Researches in Chinese Economic History, Lanzhou University, October 2021.
- [2] "Visualization and Analysis of the Modernization Achievements of Agricultural Water Conservancy in Xinjiang during the Republic of China Period (1909—1935)". Third Chinese Economic History Young Scholars Seminar, Editorial Department of Researches in Chinese Economic History, Southwest University 西南大學, August 2020 (second author; with Pan Wei).
- [1] "The Area Change of Bosten Lake in Xinjiang Since 1935." Paper presented at The Fourth Conference of East Asian Environmental History, Nankai University, October 2017.

TEACHING EXPERIENCE

- [4] **Teaching Assistant** to Prof. He Jie, Session: "Spatial Humanities Theory, Methods and GIS Practice." Peking University Digital Humanities Youth Scholar Training Camp (1st Cohort), Peking University Digital Humanities Research Center & Institute for Artificial Intelligence, July 2024.
- [3] **Teaching Assistant**, Advanced Physical Geography (graduate level), Guangzhou University, 2024 (Instructor: Prof. David Dian Zhang)
- [2] **Teaching Assistant**, Chinese Environmental History (graduate seminar), Renmin University of China, 2021–2022 (Instructor: Prof. Zhao Zhen)
- [1] **Teaching Assistant**, *Studies in Classical Chinese Historical Geography Texts* (graduate seminar), Renmin University of China, 2021–2022 (Instructor: Prof. Zhao Zhen)

INVITED TALKS & PUBLIC LECTURES

- [2] "Water environment and empire: an environmental history of water in Xinjiang in the Qing dynasty", presented at the Pittsburgh Water Collaboratory's "Water in a Changing World" on February 28th, 2023, Department of Geology & Environmental Science, University of Pittsburgh (in person).
- [1] "Erosion of the Loess Plateau", presented at the Pittsburgh Water Collaboratory's "Water in a

Changing World" on March 28th, 2023, Department of Geology & Environmental Science, University of Pittsburgh (in collaboration with Professor Ruth Mostern).

RESEARCH FUNDING

- [7] **PI.** Postdoctoral Research Funding, Guangzhou Municipal Government 廣州市博士後科研項目資助, 2024-present.
- [6] Researcher. National Social Science Fund Major Project 國家社科基金重大項目 "History of Qing Frontier Governance in Northwest China" "清朝西北邊疆經略史" (Grant No. 20&ZD230), 2020-present.
- [5] Researcher. Yongyou Foundation, "Compilation and Research of Business Materials in Northwest China from the Qing Dynasty to the Republic of China" 用友基金會,"清代至民國西北商業資料整理與研究" (Grant No. 2018-Z06), 2020-2024.
- [4] Researcher. Beijing Social Science Fund Major Project, "The Water Environmental Studies of Capital Region in Qing Dynasty" "清代京畿水環境研究" (Grant No. 15LSA005), 2020-2021.
- [3] **PI.** Supported by the Fundamental Research Funds For the Central Universities (SNNU Postgraduate Major Project), "Reconstruction of Artificial Irrigation Canal System in Xinjiang in Modern Times and exploration of its relationship with water environment" (2017CSZ017), 2017-2019.
- [2] Researcher. National Social Science Fund Major Project 國家社科基金重大項目, "Historical Geographic Information System of the Silk Road" "絲綢之路歷史地理信息系統建設" (14ZDB031), 2016-2019.
- [1] Researcher. "The Historical Atlas of Grand Xi'an" "大西安城市歷史圖集" (1204011031), 2017-2018.

LABORATORY RESEARCH EXPERIENCE

2019, State Key Laboratory of Loess and Quaternary Geology (SKLLQG), IEE CAS
2016-2019, HGIS Laboratory, Shaanxi Normal University

TECHNICAL SKILLS

GIS and Spatial Analysis: ArcGIS, QGIS, MapInfo, remote sensing data processing, historical map georeferencing, cartography

Digital and Data Methods: Python, R, Stata, Pajek, Origin, database construction, data visualization, digital humanities

LANGUAGES

Classical Chinese (advanced), English (fluent), Modern Chinese (native)

SELECTED AWARDS AND HONORS

2023.10 Graduate students' basic scholarship of Renmin University of China (major award)
2022-2023 China Scholarship Council (CSC)
2022.10 National Scholarship for Postgraduate (PhD) students, Ministry of Education
2022.10 Graduate students' basic scholarship of Renmin University of China (major award)
2021.12 Supported by the Outstanding Innovative Talents Cultivation Funded Programs of Renmin University of China
2021.10 Graduate students' basic scholarship of Renmin University of China (major award)

2020.10 Graduate students' basic scholarship of Renmin University of China (minor award)
2018.10 National Scholarship for Postgraduate students, Ministry of Education
2017.12 University scholarship for Postgraduate students
2016.10 University scholarship for Postgraduate students