JINGTAO LAI

Postdoctoral Researcher
Section 4.7: Earth Surface Process Modelling
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EDUCATION

PhD in Geology, University of Illinois at Urbana-Champaign, USA 2015–2020

Dissertation: Constraining tectonic and climatic controls on glacial/postglacial landscape evolution using numerical modeling
Advisor: Dr. Alison Anders

BSc in Geology, Peking University, China 2011–2015

Thesis: Using surface roughness to understand spatial scale of erosional and tectonic processes

RESEARCH INTERESTS

- Interactions between climate, glacial processes, and Earth surface processes
- Fluvial and glacial geomorphology
- Numerical modeling of Earth surface processes

PUBLICATIONS

Submitted or in preparation

[9] **J. Lai** and K. Huppert. "Climate-driven topographic asymmetry enhanced by glaciers: Implication for drainage reorganization in glacial landscapes". Preprint in *ESS Open Archive*. Submitted to *Geophysical Research Letters*, in revision. 2024. DOI: https://doi.org/10.22541/essoar.170688852.24848827/v1.

[8] **J. Lai**, K. Huppert, and J. Braun. "Sediment Dynamics Control Transient Fluvial Incision - Comparison of Sediment Conservation Schemes in Models of Bedrock-Alluvial River Channel Evolution". Preprint in *ESS Open Archive*. Submitted to *Journal of Geophysical Research: Earth Surface*, in revision. 2023. DOI: 10.22541/essoar.169903595.56113017/v1.

Peer reviewed

[7] **J. Lai** and K. Huppert. "Asymmetric Glaciation, Divide Migration, and Postglacial Fluvial Response Times in the Qilian Shan". In: *Geology* 51.9 (2023), pp. 860–864. DOI: 10.1130/G51086.1.

[6] L. Gao, C. He, G. Rao, C.-J. Yang, X. Yuan, **J. Lai**, P. Tang, and L. Wu. "Numerical Examination of the Geomorphic Indicators for Lateral Fold Growth". In: *Geomorphology* 432 (2023), p. 108702. DOI: 10.1016/j.geomorph.2023.108702.

[5] A. M. Anders, **J. Lai**, and S. Marshak. "Development of Foreland Intracratonic Plateaus (Ozark Plateau and Appalachian Plateaus): A Consequence of Topographic Inversion Due To Erosion of Adjacent Fold-Thrust Belts". In: *Tectonics* 41.4 (2022). DOI: 10.1029/2021TC006957.

[4] C. Cullen, A. M. Anders, **J. Lai**, and J. L. Druhan. "Numerical Modeling of Groundwater-driven Stream Network Evolution in Low-relief Post-glacial Landscapes". In: *Earth Surface Processes and Landforms* October (2021), pp. 1–14. DOI: 10.1002/esp.5278.

[3] **J. Lai** and A. M. Anders. "Climatic Controls on Mountain Glacier Basal Thermal Regimes Dictate Spatial Patterns of Glacial Erosion". In: *Earth Surface Dynamics* 9.4 (2021), pp. 845–859. DOI: 10.5194/esurf-9-845-2021.

[2] **J. Lai** and A. M. Anders. "Tectonic Controls on Rates and Spatial Patterns of Glacial Erosion through Geothermal Heat Flux". In: *Earth and Planetary Science Letters* 543 (2020), p. 116348. DOI: 10.1016/j.epsl.2020.116348.

[1] **J. Lai** and A. M. Anders. "Modeled Postglacial Landscape Evolution at the Southern Margin of the Laurentide Ice Sheet: Hydrological Connection of Uplands Controls the Pace and Style of Fluvial Network Expansion". In: *Journal of Geophysical Research: Earth Surface* 123.5 (2018), pp. 967–984. DOI: 10.1029/2017JF004509.

Selected Conference Abstracts

[9] **J. Lai** and K. Huppert. "Relief evolution in mountain ranges controlled by glacier dynamics". In: *AGU Fall Meeting 2023*. AGU. 2023.

[8] **J. Lai** and K. Huppert. "Asymmetric glaciation, divide migration, and postglacial fluvial response times in the Qilian Shan". In: *EGU General Assembly 2023*. EGU. 2023.

[7] **J. Lai** and K. Huppert. "Cross-divide topographic contrasts created by asymmetrical glaciation: A case study from the northeastern Qilian Shan". In: *EGU General Assembly 2022*. EGU. 2022.

[6] **J. Lai** and K. Huppert. "What We Can Expect from Our Model–a Comparison of Sediment Conservation Schemes in Models of Bedrock-alluvial River Channel Evolution". In: *AGU Fall Meeting 2021*. AGU. 2021.

[5] **J. Lai** and A. M. Anders. "Climatic controls on mountain glacier basal thermal regimes dictate spatial patterns of glacial erosion". In: *EGU General Assembly 2021*. EGU. 2021.

[4] **J. Lai** and A. M. Anders. "Tectonic controls on rates and spatial patterns of glacial erosion through geothermal heat flux". In: *AGU Fall Meeting 2019*. AGU. 2019.

[3] **J. Lai**, A. Anders, and S. Marshak. "The influence of flexural unloading and rock fractures on landscape evolution at the boundary between a cratonic platform and an orogen: A case study of uplift in the southern Ozark Plateau". In: *GSA Annual Meeting in Phoenix, Arizona, USA-2019*. GSA. 2019.

[2] **J. Lai** and A. Anders. "Climatic controls on glacial erosion – insights from numerical glacial landscape evolution modeling". In: *GSA Annual Meeting in Indianapolis, Indiana, USA-2018*. GSA. 2018.

[1] **J. Lai** and A. M. Anders. "A Comparison of Basal Sliding and Erosion in Numerical Glacial Landscape Evolution Models Using Two Different Sliding Laws". In: *AGU Fall Meeting 2018*. 2018.

Funding

Marie Skłodowska-Curie Postdoctoral Fellowship (as P.I.) 2022-2023
Funding agency: European Union's Horizon Europe Framework Programme
Grant number: 101064307
Amount awarded: €130,385.52
Project: POSTCOLD - Understanding the influence of sediment dynamics on postglacial landscape evolution

Teaching

Teaching assistantship at UIUC 2017–2020

GEOL 107 Physical Geology: Spring 2018, Spring 2019 (rank as excellency), Spring 2020 (rank as excellency), Fall 2020
GEOL 401 Geomorphology: Fall 2017
GEOL 143 History of Life: Fall 2018
GEOL 118 Natural Disasters: Fall 2017, Spring 2018, Spring 2019

Guest lectures

Glacial erosion (UIUC GEOL 401)	Oct 2019
Glacier dynamics (UIUC GEOL 401)	Oct 2017
Glacier dynamics (UIUC GEOL 107)	Apr 2020

Mentoring

Yasmine Loussaief, master student at University of Potsdam	2024-
Kexin Yi, PhD student at Peking University/University of Rennes 1	2023-
Cecilia Cullen, master student at UIUC	2016-2018

Appointments

Postdoctoral Researcher, GFZ	2024-now
Marie Skłodowska-Curie Postdoctoral Fellow, GFZ	2022–2023
Postdoctoral Researcher, GFZ	2021-2022
Graduate Teaching Assistant, UIUC	2017-2020
Graduate Research Assistant, UIUC	2016-2020
Wanless Graduate Fellow, UIUC	2015-2016

Awards & Honors

EGU Outstanding Student and PhD candidate Presentation Award	2021
SESE Research Review Outstanding Poster Award, Geology, UIUC	2020
CSDMS Student Modeler Award, 3rd place	2019
SESE Research Review Outstanding Poster Award, Geology, UIUC	2017
Wanless Graduate Fellowship, Department of Geology, UIUC	2015
Model Student of Academic Records, Peking University	2013
Merit Student, Peking University	2012

Invited Talks

University of Potsdam, Germany	Oct 2022
Zhejiang University, China	Dec 2021
China University of Geosciences (Wuhan), China	Dec 2021
Peking University, China	Dec 2021
GFZ German Research Centre for Geosciences, Geomorphology Seminar, Germany	May 2021
CSDMS Annual Meeting 2019, USA	May 2019

Service & Outreach

Peer Review

Reviewer for *Nature Communications*, *Geophysical Research Letters*, *Journal of Open Source Software*, *Journal of Mountain Science*.

Conference session convener

EGU General Assembly 2024
: Interaction between climate, glaciations, and surface processes across scales

AGU Fall Meeting 2023
: Fluid flow, sediment transport, and landscape evolution in fluvial systems across scales

EGU General Assembly 2022-2023
: Advances in modelling of erosion, sediment dynamics, & landscape evolution

Outreach

Panelist at the Long Night of Sciences GFZ Earth Surface Process Modelling public Q&A, 2022
Exhibitor at the UIUC Engineering Open House, 2019

Skills

Computer skills
: Python (main tool for data analysis and visualization), C/C++
: ArcGIS, QGIS, Matlab, Git, LaTeX
: Linux-based supercomputing environments

Language skills
: Chinese (native language), English (fluent)