

Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China

Home Page: <https://shengli-zhu.github.io>

Email: [zhushengli1019@outlook.com](mailto:zhushengli1019@outlook.com)

RESEARCH INTERESTS

- Hydrology and Water Resources
- Large-Scale Hydrologic Simulation and Prediction;
- Rainfall-Runoff Modelling;
- Remote Sensing;
- Cold Regions Hydrological Processes;
- Deep Learning;

EDUCATION BACKGROUND

- Sep. 2022 - PresentM.ScGPA: 3.87/4
- Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China;  
Majoring in Hydrology and Water Resources;  
Core courses: Modern Hydrology and Water Resources, Geospatial Statistics and Modelling, Remote Sensing Science;  
Supervisor: Prof. Zhaofei Liu
- Sep.2018 - Jun.2022B.S.GPA: 3.91/5
- College of Geography and Environment, Shandong Normal University, China;  
Majoring in Geographic Science;  
Core courses: Physical Geography, Geographic Information System, Hydrology;  
Supervisor: Prof. Houfeng Liu  
Thesis: “Spatial Characteristics and Influence of Topography and Synoptic Systems on PM2.5 in the Eastern Monsoon Region of China”.

PUBLICATIONS

- **Zhu, S.**, Liu, Z., 2024. Comprehensive quantitative assessment of the performance of fourteen satellite precipitation products over Chinese mainland. *Climate Dynamics*. DOI: 10.1007/s00382-024-07237-8.
- Yang, H., Yang, F., Sun, L., Ye, Y., **Zhu, S.**, 2023. Relationship between the North Atlantic sea surface temperature and the summer extreme high temperature in the Beijing-Tianjin-Hebei region, China. *Urban Climate*, 52:101683. DOI: 10.1016/j.uclim.2023.101683.
- **Zhu, S.**, Wang, Z., Qu, K., Xu, J., Zhang, J., Yang, H., Wang, W., Sui, X., Wei, M., Liu, H., 2023. Spatial Characteristics and Influence of Topography and Synoptic Systems on PM2.5 in the Eastern Monsoon Region of China. *Aerosol and Air Quality Research*, 23:220393. DOI: 10.4209/aaqr.220393.

RESEARCH PROJECTS

- The hydrological processes of the alpine river-lake connected basin, National Natural Science Foundation of China (42171029); RMB 0.7 million. **(Co-investigator, secretary and student co-author)**
  - Combined with stable isotope, remote sensing and snowmelt runoff model, the process of snow melt water at different time scales was analyzed to clarify the influence mechanism of snow melt factors on snowmelt runoff;
  - Combined with remote sensing inversion and time stability methods, the soil water content at point scales was upscaled to that at basin scales;
  - Clarified the influence mechanism of environmental factors on lake water evaporation, based on the energy balance, water balance, satellite altimetry and aerodynamics methods;

- Analyzed the actual land evapotranspiration process at the river-lake connected basin, based on the hydrological simulation inversion method.
- Fundamental investigation and carrying capacity assessment of water resources in the South-Asia channel, Second Tibetan Plateau Scientific Expedition and Research Program (2019QZKK1006); RMB 0.3 million. **(Co-investigator, secretary and student co-author)**
  - Conducted fundamental investigations and potential assessments of water resources in the South-Asia channel;
  - Revealed quantitatively the regional differences and changing trends in the carrying capacity of water resources in the South-Asia channel;
  - Proposed enhancement paths and regional adaptation strategies for the carrying capacity of water resources in the South-Asia channel.
- Disaster risk assessment of mountain ecological and hydrological changes under climate change conditions, Strategic Priority Research Program of the Chinese Academy of Sciences (XDA23090302); RMB 3.3 million. **(Co-investigator and student co-author)**
  - Delineated the digital boundaries of the Hengduan Mountains region with scientific basis;
  - Clarified the technical route for climate ecological and hydrological zoning in the Hengduan Mountains;
  - Achieved hydrological zoning and climate ecological zoning in the Hengduan Mountains region;
  - Extracted key environmental disaster causing factors in the Hengduan Mountain area and analyzed the spatial differences of disaster environmental factors based on three-level hydrological zoning.

**SKILLS**

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- Modelling: Rainfall-Runoff Simulation for Alpine Regions;
- Programming: Python, MATLAB, R;
- Software: ArcGIS, Endnote, GeoDa, SPSS, Origin, GitHub;
- Fieldwork Techniques: Hydrological measurements (e.g., water level and flow velocity) in remote and high-altitude areas, precipitation data collection, use of field instruments (e.g., GPS, Rain Gauge Data Logger, Water Level Data Logger).

**FIELDWORK EXPERIENCE**

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- Hydrological Research Expeditions in the Source Region of the Yellow River: Participated in three extensive field expeditions as part of the "Fundamental Investigation and Comprehensive Assessment of the Carrying Capacity of Water Resources in the South-Asia Channel" project, focusing on hydrological process studies in the Qinghai-Tibet Plateau **(July 2023, October 2023 and May 2024)**
  - Installed and maintained automatic water level, temperature, and precipitation monitoring instruments in the source region of the Yellow River, including key locations like the Yellow River's first bridge, Eling Lake, and Zhaling Lake;
  - Conducted in-situ measurements of river and lake hydrological parameters, including water level, flow velocity, and channel cross-sections, under challenging high-altitude conditions (up to 4,500 meters);
  - Collected essential hydrological data over multiple field visits, providing a continuous record from July 2023 to May 2024 to support ongoing research on the water resources of the Yellow River source region.
- South-Asia Channel Resource and Environment Carrying Capacity Investigation: Contributed to the "Fundamental Investigation and Comprehensive Assessment of the Carrying Capacity of Resources and Environment in the South-Asia Channel" along the Xinjiang-Tibet Highway **(June 2023)**
  - Collected water resource data along the route and assisted in the use of cameras and drones to document wildlife in the region;
  - Participated in a 17-day expedition across diverse terrains, covering approximately 6,500 kilometers and traversing regions with extreme altitudes;
  - The data and insights gathered during this expedition contributed to understanding regional differences and trends in resource and environment carrying capacities, supporting future infrastructure development in the area.

**ACADEMIC HONORS, FELLOWSHIPS & MEMBERSHIP**

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| ➤ European Geosciences Union (EGU) Student Membership | 2024-present |
| ➤ American Geophysical Union (AGU) Student Membership | 2024-present |

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| ➤ The Second prize of the 2023 IGSNRR director's scholarship, CAS           | 2023-2024 |
| ➤ The Third Prize of <i>the 18<sup>th</sup> SuperMap GIS Contest</i>        | 11/2020   |
| ➤ The Second-Class Fellowships of Shandong Normal University                | 2019-2020 |
| ➤ The Honorary Title of “Outstanding Student” of Shandong Normal University | 2019-2020 |
| ➤ The Third-Class Fellowships of Shandong Normal University                 | 2018-2019 |