YIHENG DU

PhD, MSc, BSc

Research Leader

AI for Hydrological Applications

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CONTACT

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RESEARCH INTERESTS

- Hydrological modeling, forecasting and prediction at large-scale;
- AI and Machine learning (post-processing, causation analysis) - Hybrid modelling;
- Impact of climate change on water resources;
- Hydro-climatic extremes analysis;
- Process understanding and comparative analysis;
- User-centric hydrological services;
- Flood damage and vulnerability analysis.

EDUCATION

- Lund University, Lund, Sweden
  Ph.D in Water Resources Engineering, 2021
  Thesis: Present and future precipitation variations in the source region of the Yangtze River, China
- Hohai University, Nanjing, China
  M.S in Water Resources Engineering, 2015
  Thesis: Streamflow extremes under climate change in the Huang-Huai-Hai Plain, China
  B.S in Water Resources Management, 2012
  Thesis: Analysis of river ice regime in the source region of the Yellow River, China

WORKING EXPERIENCE

- Postdoctoral Researcher, SMHI, 2021-2023, Sweden
- Project Manager for water conservancy construction, 2013, China

ACADEMIC TEACHING EXPERIENCE

- Teaching assistant, 2015-2016, Hydrology and Aquatic Ecology, compulsory course for bachelor degree student in year 1, Lund University, Sweden
- Teaching assistant, 2017, Fluid Mechanics, compulsory course for bachelor degree student in year 3, Lund University, Sweden

SKILLS

Software

- Programing: R; Matlab; C; Python.
- ArcGIS/QGIS;
- Microsoft Office applications;
- High performance computing system (HPC).

Language

English (Advanced), Chinese (Native), Swedish (Acquainted and improving).

PEDAGOGIC/ PROJECT MANAGEMENT TRAINING

- 2016: Project Management in Research and Development Projects, Lund University, Sweden
- 2015: Introduction to Teaching and Learning in Higher Education, Lund University, Sweden
- 2013: Project Management for Constructor, Nanjing, China

PARTICIPATION IN PROJECTS

- ACT4Drought: Actionable Climate Tools for Drought Preparedness in Sweden, granted by FORMAS (2025-01330). 2026-2027. Principal Investigator.
- CLINT: Climate Intelligence: extreme events detection, attribution and adaptation design using machine learning, (nr

101003876). Lead the investigation on post processing hydrological seasonal forecasting to better meet local conditions.

- I-CISK: Innovating climate services through integrating scientific and local knowledge, (nr 101037293). Lead the investigation on large scale hydrological services using user-tailored indices.
- GlobalHydroPressure: Model-based Global Assessment of Hydrological Pressure, (nr 2018-02379). Lead the investigation on application-based evaluation metrics for multi-basin hydrological models.
- Åforsk Young Researcher Grant: Identification of high-risk clusters of extreme rainfall in southern Sweden: the past and the future, 2021. Principal Investigator.

PARTICIPATION IN WORKSHOPS

- Panta Rhei Drought in the Anthropocene (DitA) Annual Workshop, IRIS Adlershof der Humboldt-Universität zu Berlin, July 12, 2023, Berlin, Germany.
- Panta Rhei Drought in the Anthropocene (DitA), workshop organized by IAHS Panta Rhei and Uppsala University, 29-30 August, 2022, Uppsala, Sweden.
- Workshop on regional climate modelling and reanalysis with a focus on Tibet. Regional Climate Group, Department of Earth sciences, University of Gothenburg, 14 Nov, 2016, Gothenburg, Sweden.
- HYPE course, 6-8 Sept, 2022, SMHI, Norrköping, Sweden.

JOURNAL REVIEW

For: Water Resources Research; Journal of Hydrology; Advances in Climate Change Research; Journal of Hydrology: Regional Studies; Hydrology and Earth System Sciences; Scientific Reports; Hydrology Research; Water; Atmosphere.

JOURNAL PUBLICATIONS

[1] Du, Y., & Pechlivanidis, I. G. (2025). Hybrid approaches enhance hydrological model usability for local streamflow prediction. *Communications Earth & Environment*, 6, 334. https://doi.org/10.1038/s43247-025-02324-y

[2] Du, Y., Clemenzi, I., & Pechlivanidis, I. (2023). Hydrological regimes explain the seasonal predictability of streamflow extremes. *Environmental Research Letters*, 18, 094060. https://doi.org/10.1088/1748-9326/acf678

[3] Du, Y., Olsson, J., Isberg, K., et al. (2024). Application-based evaluation of multi-basin hydrological models. *Journal of Hydrology*, 641, 131727. https://doi.org/10.1016/j.jhydrol.2024.131727

[4] Clemenzi, I., **Du, Y.**, & Pechlivanidis, I. G. (2025). Attributing European runoff changes to climatic drivers under future conditions. *Journal of Hydrology*, 134794.

[5] An, D., Olsson, J., **Du, Y.**, Sörensen, J., Uvo, C. B., & Berg, P. (2025). Future projections of wet and dry spells in southern Sweden: The impact of climate model resolution. *Atmospheric Research*, 108547.

[6] Pechlivanidis, I. G., **Du, Y.**, et al. (2025). Enhancing research-to-operations in hydrological forecasting: Innovations across scales and horizons. *Bulletin of the American Meteorological Society*, 106, E894–E919. https://doi.org/10.1175/BAMS-D-24-0322.1

[7] An, D., & **Du, Y.** (In preparation). The influence of ENSO and climate shift on short- and long-term drought variations over China.

[8] Du, Y., Berndtsson, R., An, D., Zhang, L., Yuan, F., & Hao, Z. (2019). Integrated large-scale circulation impact on rainy season precipitation in the source region of the Yangtze River. *International Journal of Climatology*, 1–11.

[9] Du, Y., Berndtsson, R., An, D., Zhang, L., Yuan, F., Uvo, C. B., & Hao, Z. (2019). Multi-space seasonal precipitation prediction model applied to the source region of the Yangtze River, China. *Water*, 11, 2440.

[10] Du, Y., Berndtsson, R., An, D., Zhang, L., Hao, Z., & Yuan, F. (2017). Hydrologic response of climate change in the source region of the Yangtze River, based on water balance analysis. *Water*, 9, 115.

[11] Du, Y., Hao, Z., & Ju, Q. (2013). Feature analysis and prediction of ice regime in the source region of the Yellow River. *IAHS-IAPSO-IASPEI Assembly*, Gothenburg, Sweden (IAHS Publ. 360, 201).

[12] Du, Y. (2020). Can the wind in the Pacific Ocean influence the rainfall across the Himalaya Mountains? (Popular science summary). *VATTEN – Journal of Water Management and Research*, 76(1).

[13] Olsson, J., **Du, Y.**, An, D., Uvo, C. B., Sörensen, J., Toivonen, E., Belušić, D., & Dobler, A. (2021). An analysis of (sub-)hourly rainfall in convection-permitting climate simulations over southern Sweden from a user's perspective. *Frontiers in Earth Science*, 9, 681312.

[14] An, D., **Du, Y.**, Berndtsson, R., Niu, Z., Zhang, L. T., & Yuan, F. (2020). Evidence of climate shift for temperature and precipitation extremes across Gansu Province in China. *Theoretical and Applied Climatology*, 139(3–4), 1137–1149.

[15] Wang, Q., Ju, Q., Wang, Y., Fu, X., Zhao, W., **Du, Y.**, Jiang, P., & Hao, Z. (2022). Regional patterns of vegetation dynamics and their sensitivity to climate variability in the Yangtze River Basin. *Remote Sensing*, 14, 5623.

[16] Ma, J., Ju, Q., **Du, Y.**, et al. (2022). Assessing precipitation variations in the Yangtze River Basin during 1979–2019 by vertically integrated moisture flux divergence. *Natural Hazards*, 114, 971–987.

[17] Ju, Q., Wu, J., Shen, T., Wang, Y., Cai, H., Jin, J., ... & **Du, Y.** (2025). Enhancing climate projections via machine learning: Multi-model ensemble of precipitation and temperature in the source region of the Yellow River. Journal of Hydrology, 133945.

CONFERENCES PRESENTATIONS

[1] **Du, Y.**, Clemenzi, I., and Pechlivanidis, I.: Tailoring Hydro-Climate Services to Local Conditions with Machine Learning Methods, IUGG General Assembly 2023, Berlin, Germany, 11-20 Jul 2023.

[2] **Du, Y.**, Clemenzi, I., and Pechlivanidis, I.: Enhancing the seasonal forecasts from large-scale hydro-climate services to better meet the local conditions, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-6796.

[3] **Du, Y.**, Pechlivanidis, I., and Clemenzi, I.: How does the seasonal forecast quality of hydrological extremes vary in space and time? IAHS-AISH Scientific Assembly 2022.

[4] **Du, Y.**, Clemenzi, I., and Pechlivanidis, I. Assessment of seasonal forecast performance of hydrological extremes over Europe. (**Invited Speaker**). Kick-Off of the Network of Drought Observatories in the EU, June 16th-17th 2022.

[5] Olsson, J., Sörensen, J., **Du, Y.**, An, D., Berg, P., Toivonen, E., and Belusic, D. (2020). Short-duration rainfall extremes in very high-resolution climate projections: historical evaluation and future projections, EGU General Assembly 2020, Online, 4–8 May 2020, EGU2020-7007.

[6] **Du, Y.**, Berndtsson, R. (2019). Integrated impacts of large-scale circulations on rainy season precipitation in the source region of Yangtze River. EGU General Assembly 2019, 7-12 April, in Vienna, Austria, EGU2019-2901.

[7] **Du, Y**. Application of SPSS Software in data processing of real estate appraisal. Annual Conference of China Institute of Real Estate Appraisers and Agents. 2012.

[8] **Du, Y**. Application of ArcGIS in influence factor amendment of real estate appraisal. Annual Conference of China Institute of Real Estate Appraisers and Agents. 2011.

REPORTS PUBLICATION

[1] **Du, Y.**, Vlachopoulos, O., et al., 2022, CLINT (Grant agreement 101003876), Milestone Report 15, Report on ‘Catalogue of water, energy and food related European events, impact indicators and descriptors’.

[2] Pesquer, L., Pechlivanidis I.G., **Du, Y.**, et al., 2022, I-CISK (Grant agreement 101037293), Deliverable 3.1, Report on ‘Preliminary report on the skill assessment and comparison of state-of-the-art methods for forecasts and projections of extremes’.