Chung-Yi Lin, Ph.D.

Postdoctoral Associate · Department of Civil and Environmental Engineering at Virginia Tech

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Education

Lehigh University (LU) — *Bethlehem, PA, USA*
- Ph.D. in Civil Engineering (CE) — *Aug 2019 - Jan 2023*

National Taiwan University (NTU) — *Taipei, Taiwan*
- M.S. in Bioenvironmental Systems Engineering (BSE) — *Sep 2017 - Feb 2019*

National Taiwan University — *Taipei, Taiwan*
- B.S. in Bioenvironmental Systems Engineering — *Sep 2014 - Jun 2017*

Research Experiences

Thrusts & Interests
- Water Management & Governance
  Human-water systems, agent-based modeling, uncertainty characterization, agricultural water allocation, groundwater management, nonpoint source pollution control, food-energy-water nexus
- Water Use Science
  Water use estimates, food and water security, large data analysis
- Water & disasters
  Climate risk assessment, software development, disaster risk reduction
- Smart Water Systems
  Smart stormwater systems, cyber-physical risks (e.g., cyber-attacks), anomally detection, model predictive control

Postdoctoral Associate
- Marston's Research Group, Virginia Tech (VT), Blacksburg, VA, US — *Feb 2023 - present*
  Supervisor: Dr. Landon Marston

Research Assistant
- Complex Adaptive Water Systems Lab., Lehigh University, Bethlehem, PA, US — *Aug 2019 - Dec 2022*
  Advisor: Dr. Ethan Yang

Visiting Scholar/Intern
- Institute for Global Environmental Strategies (IGES), Hayama, Japan — *Jun 2019 - Jul 2019*
- Institute of Meteorology and Climate Research Atmospheric Environmental Research (IMK-IFU), Garmisch-Partenkirchen, Germany — *Jul 2018 - Aug 2018*
- Microsoft Student Partner, Taipei, Taiwan — *Jun 2017 - Jun 2018*

Publications

Published (total 9)

Lin, C. Y., Miller, A., Waqar, M., & Marston, L. (2024). A database of groundwater wells in the United States. *Scientific Data*.

Zhang, J., Yang, Y. C. E., Abeshu, G. W., Li, H., Hung, F., & **Lin, C. Y.** (2024). Exploring the food-energy-water nexus in coupled natural-human systems under climate change with a fully integrated agent-based modeling framework. *Journal of Hydrology*.

Lin, C. Y., Yang, Y. C. E., & Moazeni, F. (2024). Flood risks of cyber-physical attacks in a smart stormwater system. *Water Resources Research*, *60*, e2023WR034827. https://doi.org/10.1029/2023WR034827.

Lin, C. Y., Yang, Y. C. E., & Chaudhary, A. K. (2023). Pay-for-practice or pay-for-performance? A coupled agent-based evaluation framework for assessing sediment management incentive policies. *Journal of Hydrology*, *624*, 129959.

Lin, C. Y., Yang, Y. C. E., & Wi S. (2022). HydroCNHS: A Python package of hydrological model for coupled natural human systems. *Journal of Water Resources Planning and Management*, *148*(12), 6022005.

Jhong, B. C., **Lin, C. Y.**, Jhong, Y. D., Chang, H. K., Chu, J. L., Fang, H. T. (2022). Assessing effective spatial characteristics of input features by physics-informed machine learning in inundation forecasting during typhoons. *Hydrological Sciences Journal*, 1-19.

Lin, C. Y., Yang, Y. C. E., Malekc, K., & Adam, J. C. (2022). An investigation of coupled natural human systems using a two-way coupled agent-based modeling framework. *Environmental Modelling & Software*, *155*, 105451

Lin, C. Y., & Yang, Y. C. E. (2022). The effects of model complexity on model output uncertainty in co-evolved coupled natural–human systems. *Earth's Future*, *10*, e2021EF002403.

Tung, C. P., Tsao, J. H., Tien, Y. C., **Lin, C. Y.**, & Jhong, B. C. (2019). Development of a novel climate adaptation algorithm for climate risk assessment. *Water*, *11*(3), 497.

In Review/Revision (total 2)

Orduña Alegría, M. E., Zipper, S., Shin, H. C., Deines, J. M., Hendricks, N. P., Allen, J. J., Bohling, G. C., Golden, B., Griggs, B. W., Lauer, S., **Lin, C. Y.**, Marston, L. T., Sanderson, M. R., Smith, S. M., Whittemore, D. O., Wilson, B. B., Yu, D. J., & Yu, Q. C. (2024). Unlocking aquifer sustainability through irrigator-driven groundwater conservation. *Nature Sustainability*, *in revision*.

Lin, C. Y., Orduna Alegria, M., Dhakal, S., Zipper, S.,& Marston, L. (2024). PyCHAMP: A crop-hydrological-agent modeling platform for groundwater management. *Environmental Modelling & Software*

Software (without journal publication; total 1)

Lin, C. Y. (2021). MultiWG: Multi-site stochastic weather generator (MultiWG) (v1.0.0). *Zenodo*.

In Preparation (Total 3)

Lin, C. Y., Amaya, M., Son, K., & Marston, L. (2024). Navigating structural uncertainty in agent-based modeling: insights and perspectives. *Earth Future*

Amaya, M., **Lin, C. Y.**, & Marston, L. (2024). Understanding the socio-environmental impacts of water transfers from agricultural communities to cities.

Tysinger, W., Ao, Z., **Lin, C. Y.**, & Marston, L. (2024). Food supplies and demand reliant on large irrigation dams.

Book, Report & Thesis (total 3)

Lin, C. Y. (2023). Co-evolution in complex adaptive water systems from long-term planning to short-term responses. Doctoral dissertation, LU, USA.

Tung, C. P., Li, M. H., Liu, T. M., Sung, R. T., Hong, N. M., Hsu, S. Y., Lee, T. Y., Tsao, J. H., Li, Y. H., Jhong, B. C., & **Lin, C. Y.** (2020) Climate adaptation advanced training – water resources (translated). Ministry of Education, Taiwan. (Mandarin)

Lin, C. Y. (2019). Development of interdisciplinary AgriHydro model and application with climate smart adaptation algorithm - A case study in Taoyuan. Master thesis, NTU, Taiwan. (Mandarin with English abstract)

Research Funding & Grants

Co-PI, 2023-2024	***"Conducting parcel-scale mapping of water rights to irrigation croplands to advance understanding of agricultural water access security."***, PI Landon Marston with Co-PI Chung-Yi Lin and Co-PI Majid Shafiee-Jood, 4-VA Collaborative Research Grant	*$30,000*
Co-PI, 2023	***"Conducting parcel-scale mapping of water rights to irrigation croplands to advance understanding of agricultural water access security."***, PI Landon Marston with Co-PI Chung-Yi Lin, Pre-tenure 4-VA Collaborative Research Grant (Spring and Summer)	*$15,000*
PI, 2023	***"Creating a Public US National Groundwater Wells Dataset."***, PI Chung-Yi Lin with Co-PI Yunus Naseri, CUAHSI Hydroinformatics Innovation Fellowship	*$4,990*
Contributor, 2023-2025	***"Understanding the drivers of interbasin water transfers to identify and mitigate future conflict."***, PI Landon Marston with Co-PI Kathryn Powlen (USGS), United States Geological Survey and National Institutes for Water Resources	*$248,458*

Honors & Awards

Oct 2023	**MultiSector Dynamics Workshop Scholarship**, MSD, DOE
Mar 2023	**CUAHSI Hydroinformatics Innovation Fellowship**, CUAHSI
Dec 2022	**Graduate Student Senate Travel Grant**, LU
Aug 2022	**Gibson Teaching Fellowship**, LU
Dec 2019	**Certificate of Teacher Development Program**, LU
Sep 2019	**Lehigh University Fellowship**, LU
Jul 2018	**Summer Institute Programme Scholarship (at IMK-IFU, Garmisch-Partenkirchen, Germany)**, Ministry of Science and Technology-German Academic Exchange Service (MOST-DAAD)
Nov 2017	**Award for Excellent Oral Presentation**, PAWEES International Conference
Sep 2017	**Chi-Seng Water Management Research & Development Foundation Scholarship**, NTU
Aug 2017	**Water Youth Ambassador (to the Netherlands)**, Water Resources Agency, Taiwan
Jun 2017	**Award of Academic Research Thesis in Bachelor**, NTU
Jul 2016	**College Student Research Scholarship**, Ministry of Science and Technology, Taiwan
Jul 2016	**First prize in Taiwan Water Youth Camp & Wetskills (an Netherlands organization)**, Water Resources Agency, Taiwan
Apr 2016	**Academic Excellence Award-BSE**, NTU
Jan 2016	**Exchange program to Purdue University**, NTU
Dec 2015	**Agricultural Engineering Research Center Scholarship**, Agricultural Engineering Research Center, NTU
Apr 2015	**Academic Excellence Award-BSE**, NTU
Oct 2014	**Academic Excellence Award-BSE**, NTU
Apr 2014	**Academic Excellence Award-BSE**, NTU

Professional Presentations & Conferences

Invited Talks

Feb 2023. Los Alamos National Lab., Webinar, USA.
"Co-Evolution in Complex Adaptive Water Systems: Application of Agent-based Modeling."

Jan 2023. USGS Factors Team meeting, Webinar, USA.
"Analyzing the Role of Socioeconomic Factors in Sediment Management through Agent-Based Modeling□Susquehanna River Basin, US."

Nov 2022. 2022 CUAHSI Making Waves in Water Science: Open Source Tools for Water Science Webinar, USA.
"An open-source software, HydroCNHS."

Jul 2019. Institute for Global Environmental Strategies (IGES), Japan.
"Exploring challenges & opportunities of nitrogen management in Japan & Taiwan."

Aug 2018. Institute of Meteorology and Climate Research Atmospheric Environmental Research (IMK-IFU) in Garmisch-Partenkirchen, Germany.
"Stochastic weather generator and climate risk assessment in the water-food nexus."

Sep 2017. National Science and Technology Center for Disaster Reduction (NCDR), Taiwan.
"The water-food nexus under climate change for Taoyuan, Taiwan."

Conferences

Lin, C. Y., Orduna Alegria, M., Zipper, S., Wilson, B., and Marston, L. (2022). Exploring the Interplay of Heterogeneity in Coevolved Human-Water Systems for Effective Community-Driven Groundwater Management. Abstract [H24B-05] presented at 2023 Fall Meeting, AGU, San Francisco, CA, 11-15 Dec.

Lin, C. Y., Orduna Alegria, M., Zipper, S., and Marston, L. (2022). Exploring the Interplay of Heterogeneity in Coevolved Human-Water Systems for Effective Community-Driven Groundwater Management. 2023 MultiSector Dynamics (MSD) Workshop, Davis, CA, 3-5 Oct.

Lin, C. Y., Yang, Y. C. E. (2022). Analyzing the role of social-economic factors in water quality management through agent-based modeling-Susquehanna River Basin, US. Abstract [H32L-05] presented at 2022 Fall Meeting, AGU, Chicago, IL, 12-16 Dec.

Lin, C. Y., Yang, Y. C. E. (2022). Risk assessment of compound disturbances in coupled natural human systems. Oral [1107573] presented at 2022 EWRI Congress, Atlanta, GA, 5-8 Jun.

Lin, C. Y., Yang, Y. C. E. (2021). Uncertainty decomposition of coupled natural human systems with differing model parameter complexity. Abstract [H25U-1267] presented at 2021 Fall Meeting, AGU, New Orleans, LA, 13-17 Dec.

Tung, C. P., Tsao, J. H., Jhong, B. C., Li, M. H., Perng, P. W., Huang, J., Tien, Y. C., & **Lin, C. Y.** (2019) Enable climate intelligent assistant for resilient cities. ECCA International Conference Abstracts, Lisbon, Portugal.

Takeda, T. & **Lin, C. Y.** (2019) Japan's challenges and opportunities regarding nitrogen management. Water and Environment Technology Conference 2019, Suita, Osaka, Japan.

Lin, C. Y., Wang, Z. L., Huang, J., Jhong, B. C., & Tung, C. P. (2018). Development of a cross-scale and cross-sector adaptation assessment model integrating agriculture and water resources fields: A case study of regional to local scale. Abstract [H21Q-1953] presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Wang, Z. L., Tung, C. P., **Lin, C. Y.**, Jhong, B. C., & Huang, J. (2018). Investigating the feasibility of water market in water reallocation by virtual gaming simulation during drought periods: A case study of the Taoyuan area, Taiwan. Abstract [H21Q-1938] presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Jhong, B. C., Tung, C. P., Tsao, J. H., **Lin, C. Y.**, & Li, M. H. (2018). Interdisciplinary assessment of climate risk for water resources and agriculture and flood disaster. PAWEES & INWEPF International Conference 2018 Abstracts, Nara, Japan.

Lin, C. Y., Jhong, B. C., Chen, P. Y., & Tung, C. P. (2017). Development of surrogate model for the hydrological module of SWAT. PAWEES International Conference 2017 Abstracts, Taichung, Taiwan. (Award for Excellent Oral Presentation)

Lin, C. Y., Li, Y. H., Li, M. H., & Tung, C. P. (2015). Analysis of the water-food nexus under climate change: A case study of thousand-ponds-city in Taiwan. ECCA International Conference Abstracts, Glasgow, Scotland.

Convener and Others

Aug 2022. 2022 AGU-H3S Navigating Academic Waters: Succeeding as a Postdoc webinar, USA.
Organize and moderate the virtual panel discussion on *"Navigating Academic Waters: Succeeding as a Postdoc."*

Teaching Experience

**CEE = Civil & Environmental Engineering*

Sp'23	**Instructor**, CEE 4994 Undergraduate Research: Data Analysis of Human-water System	*VT*
Sp'23	**Guest lecture (with Prof. Marston)**, CEE 4344 Water Resources Planning	*VT*
F'22	**Co-instructor/developer (with Prof. Yang)**, CEE 497 Applications of Catastrophe Modeling	*LU*
F'22	**Teaching Assistant**, CEE 122 Fluid Mechanics	*LU*
Sp'22	**Teaching Assistant**, CEE 222 Water Resources Engineering	*LU*
Sp'18	**Teaching Assistant**, BSE 5071 Climate Change and Environmental Ecology	*NTU*
F'17	**Teaching Assistant**, BSE 5091 Environmental Systems Analysis	*NTU*
Sp'17	**Teaching Assistant**, BSE 5071 Climate Change and Environmental Ecology	*NTU*

Mentoring

2023	**Sameer Dhakal**, Ph.D., VT
2023	**Megan Schantz**, M.S. & B.S., VT
2023	**Musab Waqar**, M.S., VT
2020	**Tanumoy Banerjee**, Ph.D., LU (through *Mentor Collective Program at Lehigh Univerity*)
2020	**Jasreen Kaur**, Ph.D., LU (through *Mentor Collective Program at Lehigh Univerity*)

Service

Professional Service

2022-present	**AGU, Water and Society Technical Committee**, Social media chair
2023	**AGU, Hydrology Section Student Subcommittee (H3S)**, Secretary
2022	**AGU, Hydrology Section Student Subcommittee (H3S)**, Prof. Dev. Subcommittee Co-chair
2021-present	**ASCE, EWRI, Environmental and Water Resources System (EWRS)**, Committee member

University Service

2021-2022	**Graduate Students Recruitment Program**, CEE Department Representatives, LU
2021	**Graduate Senate Meeting**, CEE Department Representatives, LU
2021-2022	**Lehigh Graduate Open House**, CEE Department Representatives, LU
2021-2022	**Lehigh Mentor Collective**, CEE Department Representatives, LU
2014-2015	**Climate Action Club**, Charter President, NTU

Ad Hoc Reviewer – Journals

- Water Resources Research – American Geophysical Union
- Journal of Hydrology – ELSEVIER
- Science of the Total Environment – ELSEVIER
- Environmental Modeling & Software – ScienceDirect
- Journal of Water Resources Planning and Management – ASCE
- Ecology & Society – Resilience Alliance
- Environmental Science and Policy – ScienceDirect
- PLOS Water – PLOS