

Chung-Yi Lin, Ph.D.

POSTDOCTORAL ASSOCIATE · DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING AT VIRGINIA TECH

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Education

Lehigh University (LU)

- PH.D. IN CIVIL ENGINEERING (CE)

Bethlehem, PA, USA

Aug 2019 - Jan 2023

National Taiwan University (NTU)

- M.S. IN BIOENVIRONMENTAL SYSTEMS ENGINEERING (BSE)

Taipei, Taiwan

Sep 2017 - Feb 2019

National Taiwan University

- B.S. IN BIOENVIRONMENTAL SYSTEMS ENGINEERING

Taipei, Taiwan

Sep 2014 - Jun 2017

Research Experiences

Thrusts & Interests

- WATER MANAGEMENT & GOVERNANCE

Human-environmental 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), model predictive control

Postdoctoral Associate

- MARSTON'S RESEARCH GROUP, VIRGINIA TECH (VT), BLACKSBURG, VA, US

Supervisor: Dr. Landon Marston

Feb 2023 - present

Research Assistant

- COMPLEX ADAPTIVE WATER SYSTEMS LAB., LEHIGH UNIVERSITY, BETHLEHEM, PA, US

Advisor: Dr. Ethan Yang

Aug 2019 - Dec 2022

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 8)

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 1)

- Lin, C. Y.**, Miller, A., Waqar, M., & Marston, L. (2024) Groundwater wells in the United States. *Scientific Data*, in revision.

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.**, Orduna Alegria, M., & Marston, L. (2024) Exploring the interplay of heterogeneity in coevolved human-water systems for effective community-driven groundwater management. *Environmental Modelling & Software*
- Tysinger, W., Ao, Z., **Lin, C. Y.**, & Marston, L. (2024) Food supplies and demand reliant on large irrigation dams.
- Amaya, M., **Lin, C. Y.**, & Marston, L. (2024) Understanding the socio-environmental impacts of water transfers from agricultural communities to cities.

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 of 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 University*)
- 2020 **Jasreen Kaur**, Ph.D., LU (through *Mentor Collective Program at Lehigh University*)

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