

Min-Hui Lo (羅敏輝)

Department of Atmospheric Sciences, National Taiwan University,

No. 1, Sec. 4, Roosevelt Rd. Taipei, 10617, Taiwan

Office Tel: +886-2-3366-3918

Email: minhuilo@ntu.edu.tw

Lab website link: hydro.as.ntu.edu.tw

EDUCATION

2005/09 – 2010/08 Ph.D. Earth System Science, University of California, Irvin, CA, USA

1999/09 – 2001/06 M.S. Depart. of Atmospheric Sciences, National Taiwan Uni., Taiwan

1995/09 – 1999/06 B.A. Depart. of Atmospheric Sciences, National Taiwan Uni., Taiwan

EMPLOYMENT

2023/08 - present Research Fellow (joint appoint.) RCEC, Academia Sinica, Taiwan

2022/08 - present Professor Depart. of Atmospheric Sciences, National Taiwan Uni., Taiwan

2017/08 - 2022/07 Associate Professor Depart. of Atmospheric Sciences, National Taiwan Uni., Taiwan

2012/02 - 2017/07 Assistant Professor Depart. of Atmospheric Sciences, National Taiwan Uni., Taiwan

HONORS & AWARDS

- 2023: Outstanding Research Award, National Science and Technology Council
- 2021: Franco-Taiwanese Scientific Prize 2021
- 2017: Ta You Wu Memorial Award for Young Scientists, Ministry of Science and Technology

PROFESSIONAL SERVICE

Journal editors:

2013 – present: **Topical Editor** for the Geoscientific Model Development (GMD), an Interactive Open Access Journal of the European Geosciences Union (EGU).

2020 – present: **Executive Editor** for the Geoscientific Model Development (GMD).

2022 – present: **Editor** for Terrestrial, Atmospheric and Oceanic Sciences (TAO).

2022 – present: **Editorial Board Member** for the *Nature series: Communications Earth & Environment*.

Panel committee member, Atmos. Sci., Div. of Natural Sciences, Ministry of Science and Technology, 2018/01- 2020/12/31

RESEARCH INTEREST

Dr. Lo's research has focused on understanding the linkages and feedback mechanisms between the land and the climate, especially in the following areas:

- **Land-Atmosphere interactions:** Understand the interactions and feedback processes between the land and atmosphere.
- **Anthropogenic effects on the water cycle:** Quantify human activities on the freshwater redistribution and use the climate model to explore the anthropogenic impacts on the regional/global hydrological cycle.
- **Hydro-Climatology in cloud-fog forest:** explore the role of fog and canopy water in water, energy, and carbon cycle in cloud forest.

RESEARCH HIGHLIGHTS

Dr. Lo's research has concentrated on understanding linkages and feedbacks between the land and the climates, focusing specifically on how land hydrological processes affect the local/regional/global climate and exploring how anthropogenic forcings (such as irrigation, deforestation, CO₂ concentrations, etc.) impact the hydrological cycle across various spatiotemporal scales by using satellite datasets, in-situ observations, reanalysis datasets, and climate models.

A critical issue in hydro-climatology is quantifying the complex feedback between soil moisture and precipitation. Dr. Lo characterizes the spatial distribution of precipitation in relation to soil wetness and mesoscale soil moisture heterogeneity, which enhances our understanding of soil moisture–precipitation spatial coupling. It also highlights the importance of land surface hydrological processes in the climate system, with implications for precipitation changes during the dry regions that are not accurately observed in most current climate models. Furthermore, Dr. Lo applies this concept to explore the anthropogenic forcings' fingerprint on the hydrological cycle. He studies the impact of the Maritime Continent's land-use changes (deforestation) on the atmospheric convection and larger-scale climate, in which the deforestation in the Maritime Continent regions can increase the low-level water vapor convergences from the surrounding ocean that may destabilize the atmosphere, leading to potentially higher precipitation rates. These findings are different from what we thought previously about drying effects from land-use changes, which indicates the importance of regional dependence on the impact of land hydrological processes. The results also reveal possible

reasons contributing to the disagreement among precipitation responses in current model simulations, providing clues to improve the climate models. Dr. Lo also uses model simulations and satellite datasets to evaluate and constrain the climate model's land water storage simulations and rainfall anomalies, providing a comprehensive assessment of the reliability of the simulated land water storage that can be used to guide future water resource assessment. The above achievements are essential to understanding the interactions between the land surface and the climate, and expose the complex nuances of these land-atmosphere interactions, with implications for precipitation changes and water cycles under climate changes and land use changes.

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

- Chen, C.-C., Min-Hui Lo*, E.-S. Im, J.-Y. Yu, Y.-C. Liang, W.-T. Chen, I. Tang, C.-W. Lan, R.-J. Wu, R.-Y. Chien (2019), Thermodynamic and dynamic responses to deforestation in the Maritime Continent: A modeling study, *Journal of Climate*, DOI: 10.1175/JCLI-D-18-0310.1
- Chia-Wei Lan, Min-Hui Lo*, Chao-An Chen, Jia-Yuh Yu (2019), The mechanisms behind changes in the seasonality of global precipitation found in reanalysis products and CMIP5 simulations, *Climate Dynamics*, <https://doi.org/10.1007/s00382-019-04781-6>
- Wen-Ying Wu, Min-Hui Lo*, Yoshihide Wada, James S. Famiglietti, John T. Reager, Pat J.-F. Yeh, Agnès Ducharne & Zong-Liang Yang (2020) Divergent effects of climate change on future groundwater availability in key mid-latitude aquifers. *Nature Communications* 11, 3710. <https://doi.org/10.1038/s41467-020-17581-y>
- Min-Hui Lo*, Wen-Ying Wu, Lois Iping Tang, Dongryeol Ryu, Mehnaz Rashid, Ren-Jie Wu (2021) Temporal Changes in Land-Surface Coupling Strength: An Example in A Semi-Arid Region of Australia, *Journal of Climate*, 34, 4, 1503–1513, <https://doi.org/10.1175/JCLI-D-20-0250.1>
- Xiao, H.-M., M-H. Lo*, and J.-Y. Yu (2022) The Increased Frequency of Combined El Nino and Positive IOD events since 1965s and Its Impacts on Maritime Continent Hydroclimates, *Scientific Reports*, 12, 7532, <https://doi.org/10.1038/s41598-022-11663-1>

Others (Invited Talks , Keynote speech et al.)

Invited Talk:

- Lo, Min-Hui (2022). Anthropogenic Climate Changes Impact on the Terrestrial Water Cycle and Water Resources, Future Earth Taipei, 28 September 2022 (online).
- Lo, Min-Hui (2021), Global hydrological cycle and climate changes-- where does the water go? Southern Region Weather Center, Tainan, Taiwan. (in person).

- Lo, M.-H. and Yen-Ning Kuo (2020) The ocean mass emphasizes the interannual variations of sea level difference in super El Niño events, and its relation to land water storage variations, AGU Fall Meeting 2020, Dec 1-17, SF, USA. (online).
- Lo, M.-H. (2020) Young Earth System Scientists community webinar, www.yess-community.org/science-webinars-2020/ (online).
- Lo, M.-H. (2020) Precipitation Changes over the Maritime Continent under Deforestation and Global Warming, The workshop on "Interaction between forest and atmosphere in Southeast and East Asia under changing environment", 2020, Feb 6, Kyushu University (in person).
- Lo, M.-H. and co-authors (2019) ENSO Modulation of Global Sea Level Variations Through Land Hydrological Processes, AOGS Meeting 2019, July 28-Aug 2, Singapore.
- Lo, M.-H. and Chi-Ya Liou (2018) Impacts of Agricultural Irrigation on Land-Atmosphere Coupling Strength and Extreme Precipitation. AGU Fall Meeting 2018, Dec 10-14, DC, USA.
- Lo, M.-H. (2018) A decade of sea level rise slowed by climate-driven hydrology and its implications on land-atmosphere interaction, UCR's Hewett Club Speaker Series, Oct 30, 2018, UC-Riverside, Riverside, USA.