

Myong-In Lee, Ph.D.

**Professor, Dept. of Civil, Urban, Earth, and Environmental Engineering
Climate-Environment Modeling Laboratory (<http://climate.unist.ac.kr>)
Ulsan National Institute of Science and Technology**

RESEARCH AREA

1. Earth System Modeling:

- Global Climate Models (GCMs) and moist physics parameterization
- Regional prediction model and urban canopy model
- Dynamic vegetation models for terrestrial carbon cycle and coupling with nitrogen

2. Sciences on Climate Variability and Change:

- Subseasonal-to-seasonal prediction, Atmosphere-Ocean coupled data assimilation
- Land data assimilation with Ensemble Kalman Filtering
- Arctic and Antarctic sea ice and climate variability
- Diurnal cycle, tropical Madden-Julian Oscillation, El-Nino and Southern Oscillation, East Asian monsoon, Heatwave and large-scale atmospheric teleconnection

EDUCATION

Ph.D., **Atmospheric Sciences**, 2001 – Seoul National University

Thesis: *Impacts of cumulus parameterization and cloud-radiation interaction processes in GCM simulation of tropical intraseasonal oscillation*

M.S., **Atmospheric Sciences**, 1996 – Seoul National University

Thesis: *Temperature variability and its secular warming trend in Korean peninsula*

B.S., **Atmospheric Sciences**, 1994 – Seoul National University

EMPLOYMENTS

Ulsan National Institute of Science and Technology

March 2020 – present, *Professor*

March 2014 – Feb 2020, *Associate Professor*

February 2010 – Feb 2014, *Assistant Professor*

NASA Goddard Space Flight Center & University of Maryland Baltimore County

March 2003 – January 2010

Research Associate (2003-2006), Assistant Research Scientist (2006-2010)

Climate Environment System Research Center, Seoul National University

March 2001 – March 2003

Post-doctoral Research Scientist

RESEARCH PROJECTS

- Study of Atmospheric Environment Variation Mechanism in East Asia using 3D VAR Data Assimilation system, NRF, 2018~present
- Development of Coupled Initialization of Climate Forecast System for Supporting Long-term Prediction, KMI, 2018~present,

- Research on the Long-Term Source Technology in the Heat Wave (Heat Wave Research Center), KMI, 2017~present
- Development of the GAIA Simulator Earth System Model with Atmospheric Carbon Cycle, NRF Korea, 2012-2016
- Land surface initialization for KMA GloSea5 dynamical ensemble prediction system, KMA, 2013-2015
- Evaluation of the GloSea4 Experimental Hindcasts, KMA, 2012-2013
- Development of Urban Climate and Environmental Prediction System Using WRF/UCM, NRF, 2011-2014
- Development of Tropical Cyclone Prediction System, APEC Climate Center, 2011-2013.
- Improvement of Diurnal Cycle of Warm-Season Precipitation in Global Climate Models, KMA, 2010-2012
- Development of a High-Resolution Global Climate Model for the Tropical Typhoon Simulation, KMA, 2010-2011.
- Use of cloud-resolving models to improve the simulation of convective precipitation and diurnal cycle in the NASA GEOS-5, Lee, M.-I., Principal Investigator with 5 other Co-Is, 2009 – 2012.
- Simulating and predicting sub-seasonal and longer-term changes in tropical storm characteristics using high-resolution climate models, PI: Schubert (NASA/GSFC), Co-I, 2009 – 2010.
- Improved representation of diurnal precipitation patterns in the NASA GEOS5 general circulation models, PI: Posselt (U. Michigan), Co-I, 2009 – 2010.
- Pathways to predictability on subseasonal time scales: assessing the role of tropical forcing and land surface conditions, PI: Schubert (NASA/GSFC), Co-I, 2005 – 2010.
- An assessment and analysis of the warm season diurnal cycle over the continental United States and northern Mexico in global atmospheric general circulation model, PI: Schubert (NASA/GSFC), Co-I, NOAA/OGP, 2003-2005

TEACHING EXPERIENCES

- *Climate Dynamics* (graduate), SNU, 2002
- An Introduction to the *Climate System Modeling* (graduate), SNU, 2002
- *Introduction to the Environmental Engineering* (undergraduate, co-teaching), UNIST, 2010-
- *Introduction to Climate Change* (undergraduate), UNIST, 2010
- *Global Environment* (undergraduate), UNIST, 2010-2019
- *Climate and Environmental Modeling* (graduate), UNIST, 2010-
- *Atmospheric Dynamics* (undergraduate), UNIST, 2011-
- *Advanced Statistics* (graduate), UNIST, 2013-
- *Statistics in Earth and Environmental Sciences* (undergraduate), UNIST, 2014-
- *Tropical Meteorology* (graduate), UNIST, 2014-
- *Remote Sensing* (undergraduate), UNIST, 2018

PROFESSIONAL SERVICES

- Professional Committee of Energy and Environment, National Scientific and Technological Advisory Conference, 2019-2020, 2023-24
- Ulsan Health City Committee, Ulsan, 2017-2019
- Professional Committee of Atmospheric Science in the Earth Science Field, National Research Foundation of Korea, 2016-2019
- Advisor Professor, APEC Climate Center, 2011-2016
- Advisory member, Korea Institute of Atmospheric Prediction System (KIAPS), 2011-2015
- Advisory Board, Korean Meteorological Administration, 2012-present
- Executive Member & Int'l Cooperation, Korean Meteorological Society, 2012-2013, 2015-present
- Director of International Cooperation Committee, Korean Meteorological Society, 2015-present
- Member, Working Group for the APEC Climate Center (APCC), 2007-2010
- Editor, Korean Atmospheric Scientists in America (KASA), publish on-line newsletter, 2006
- Member, Korean Meteorological Society, since 2001
- Member, American Meteorological Society, since 2008
- Member, American Geophysical Union, since 2008
- Journal Peer Reviewer: Tellus A, Atmos. Environ., J. Climate, J. Atmos. Sci., J. Geophys. Res, Geophys. Res. Lett., Climate Dynamics, Dynamics of Atmospheres and Oceans, Advances in Atmospheric Sciences, Scientific Online Letters on the Atmosphere, Asia-Pacific Journal of Atmospheric Sciences, since 2003
- Proposal/Award Reviewer: NASA Earth System Science (ESS) Fellowship (2006-2008), NOAA Oceanic and Atmospheric Research (OAR) Outstanding Paper Award (2008)

HONORS/AWARDS

- Science and Technology Medal, Government of the Republic of Korea, 2024
- Songcheon Academic Award, Korea Meteorological Society, 2019
- Presidential Commendation, Government of the Republic of Korea, 2018
- Associate Member, Korean Academy of Science and Engineering, 2015
- Hallim Leading Scientist, Korean Academy of Science and Engineering, 2014
- Outstanding Performance Award, UNIST, 2014
- President Award for Best Teaching, UNIST, 2010
- Outstanding Performance Award, NASA/Goddard Space Flight Center/Global Modeling and Assimilation Office, 2004
- Best PhD Dissertation Award, Korean Meteorological Society, 2001

INVITED SEMINAR/PRESENTATIONS

- AOGS 2025, Singapore, 2025
- NASA GMAO Seminar, 2025
- Department Seminar, George Mason University, 2025
- The KIAPS International Symposium on NWP System Modeling, 4-6 Nov., Seoul, 2024
- 2020 Northeast Asian (NEA) Symposium, Zoom Online, 4-5 Nov. 2021
- IBS Conference on High-Resolution Earth System Modeling, 12-14 Oct. 2020, Busan, Korea
- ISPRS 2019, Nanjing 2019
- The 3rd Korea-Germany Environmental Workshop 2019

- Department Seminar, Stony Brook University 2016
- The Climate Prediction Program for the Americas (CPPA) 2008
- APEC Climate Symposium, Lima, Peru 2008
- APEC Climate Symposium, Busan, Korea 2007
- Climate Diagnostics & Prediction Workshop, Boulder, USA 2006
- A Workshop on the Seasonal-to-Interannual Prediction, Taipei, Taiwan 2003

PUBLICATIONS

[115] Lee, S, and **M.-I. Lee**, et al., 2025: Large-scale teleconnection pattern and Land-Atmosphere interaction Responsible for the Recent Increase in Central Siberia Fire Risk. ERL, In manuscript.

[114] Lee, S., **M.-I. Lee**, and S. Lee, 2025: An Observational Study on the Eddy-driven Dynamics of the Summer Arctic Jets. J. Clim., submitted.

[113] Tak, S., E. Seo, and **M.-I. Lee**, 2025: Advancing Global Soil Moisture Estimation Using Multiple Satellite Sensors and the Local Ensemble Transform Kalman Filter. Rem. Sens. Env., in manuscript.

[112] Mohammadzadeh and **Lee**, 2024: Identification of dominant sources of PM_{2.5} in major cities in South Korea using a receptor model. In preparation.

[111] Lee, S., **M.-I. Lee**, 2025: A Multiphysics Method for Increasing Model Background Error in the Aerosol Data Assimilation with an Ensemble Kalman Filter. Atmos. Poll. Res., submitted.

[110] Kim, K., D. Kang, **M.-I. Lee**, A. A. Scaife, 2025: Enhancing NAO Forecast Skill through Pacific Teleconnections: The Role of CP-ENSO in Seasonal Predictability. Submitted.

[109] Lee, S., **M.-I. Lee**, 2025 : A Perturbation Approach to Increase Model Background Error for Improving Aerosol Data Assimilation with an Ensemble Kalman Filter. JGR-Atmos., Submitted.

[108] Kim, J., **M.-I. Lee**, D. Kang, E. K. Jin, W.S. Lee, 2025: Future changes of the Antarctic sea ice by enhanced ENSO teleconnection. J. Climate, in revision.

[107] Kim, K., **M.-I. Lee**, Scaife A. Adam, Doug M. Smith. 2025: ENSO Phase Transition Enables Prediction of Winter North Atlantic Oscillation One Year Ahead. Nat. Communications., accepted.

[106] Kim, K., **M.-I. Lee**, N. Choi, S. Lee, and F.-F. Jin, 2025: Causes of the Intensifying Extreme Wildfire Conditions in Southeastern Australia. In revision.

[105] Lee, S., **M.-I. Lee**, S. Lee, F.-F. Jin, N. Choi, and S. Tak, 2025: Distinct features of the summer Arctic oscillation. J. Clim., accepted.

[104] Choi, N., **M.-I. Lee**, S. Tak, D.-H. Cha, and M. Watanabe, 2025: Siberian heat extremes caused by Eurasian atmospheric teleconnections and amplified by local land surface conditions. Env. Res. Lett., DOI 10.1088/1748-9326/adad88.

[103] Choi, N., J. Night, and **M.-I. Lee**, 2024: Characteristics of Northern Hemisphere Zonal Wavenumber 6 in Summer and Its Reproducibility in GloSea6 Hindcast, Atmos., Sci. Lett., Submitted.

[102] Park, H., D.-H. Cha, **M.-I. Lee** et al. 2024: How does Pacific Decadal Oscillation Modulate Extreme Heavy Rainfall Frequency over Far East Asia? Geophys. Res. Lett., in press.

- [101] Cha, Y., J.-J. Lee, C. H. Song, S. Kim, R. J. Park, **M.-I. Lee**, J.-H. Woo, J.-H. Choi, K. Bae, J. Yu, E. Kim, H. Kim, S.-H. Lee, J. Kim, L.-S. Chang, K.-h. Jeon, C.-K. Song, 2025: Investigating uncertainties in air quality models used in GMAP/SIJAQ 2021 field campaign: General performance of different models and ensemble results. *Atmos. Env.*, 340, 120896.
- [100] Choi, N., **M.-I. Lee**, Y.-G. Ham, Y.-K. Hyun, J. Lee, and K.-O. Boo, 2025: Reducing initialization shock by atmosphere-ocean coupled data assimilation and its impacts on the subseasonal prediction skill. *J. Climate*, in press.
- [99] Kim, H., N. Choi, S. Tak, S.-K. Min, and **M.-I. Lee**, 2024: Causes of the 2018 Record-Breaking Heatwave in Korea: Triple Impacts from Recurrent Large-scale Atmospheric Teleconnections. *ERL*, in press.
- [98] Lee, J., **M.-I. Lee**, S. Tak, E. Seo, and Y.-K. Lee, 2024: Assimilation of snow water equivalent from AMSR2 and IMS satellite data utilizing the local ensemble transform Kalman filter. *Geo. Mod. Dev.*, in press.
- [97] Tak, S., Choi, N., Lee, J., **Lee, M.-I.** 2024: Probabilistic Medium-Range Forecasts of Extreme Heat Events Over East Asia Based on a Global Ensemble Forecasting System. *Weather Clim. Extrem.*, 45, 100694.
- [96] Lee, Y., D. Cho, J. Im, C. Yoo, J. Lee, Y.G. Ham, **M.-I. Lee**, 2024: Unveiling teleconnection drivers for heatwave prediction in South Korea using explainable artificial intelligence. *npj Clim. Atmos. Sci.*, 7(1), 176.
- [95] Tak, S., E. Seo, P. A. Dirmeyer, and **M.-I. Lee**, 2024: The role of soil moisture-temperature coupling for the 2018 Northern European heatwave in a subseasonal forecast. *Weather Clim. Extrem.*, <https://doi.org/10.1016/j.wace.2024.100670>
- [94] Jang, J., S.-S. Baek, D. Kang, Y. Park, M. Ligaray, S. H. Baek, J. Y. Choi, B. S. Park, **M.-I. Lee**, K. H. Cho, 2024: Insights and machine learning predictions of harmful algal bloom in the East China Sea and Yellow Sea, *J. Clean. Prod.*, 459, 142515.
- [93] Park, H., J. Hwang, D.-H. Cha, **M.-I. Lee**, C.-K. Song, J. Kim, S. H. Park, D.-K. Lee, 2024: Does a Scale-Aware Convective Parameterization Scheme Improve the Simulation of Heavy Rainfall Events? *J. Geophys. Res.*, 129(7), e2023JD039407
- [92] Park, D.S.R., E. Seo, M. Lee, D.-H. Cha, D. Kim, C.-H. Ho, **M.-I. Lee**, H.-S. Kim, S.-K. Min, 2024: Sea surface temperature warming to inhibit mitigation of tropical cyclone destructiveness over East Asia in El Niño. *npj Clim. Atmos. Sci.*, 7(1), 24
- [91] Kim, J., D. Kang, **M.-I. Lee**, E.K. Jin, J.S. Kug, W.S. Lee, 2023: Remote Influences of ENSO and IOD on the Interannual Variability of the West Antarctic Sea Ice. *J. Geophys. Res.-Atmos.*, 128(10), e2022JD038.
- [90] Park, J., J. Moon, W. Cho, D.H. Cha, **M.-I. Lee**, E.C. Chang, J. Kim, S.H. Park, J. An, 2023: Sensitivity of Real-Time Forecast for Typhoons Around Korea to Cumulus and Cloud Microphysics Schemes. *J. Geophys. Res.-Atmos.*, 128, 3.
- [89] Yoon, D., T. Kang, D.H. Cha, C.-K. Song, **M.-I. Lee**, K.H. Min, J. Kim, J. A. Chun, E. Seo, 2023: Role of land-atmosphere interaction in the 2016 Northeast Asia heat wave: Impact of soil moisture initialization. *J. Geophys. Res.-Atmos.*, 28, 2.
- [88] Kim, D.S., S.Y. Jun, **M.-I. Lee**, and J.-S. Kug, 2022: Significant relationship between Arctic warming and East Asia hot summers. *Int. J. Climatology*, 42, 16, 9,530-9,538.
- [87] Lee, J., **M.-I. Lee***, and J.-B. Ahn, 2022: Importance of ocean initial conditions of late autumn on winter seasonal prediction skill in atmosphere-land-ocean-sea ice coupled forecast system. *Clim. Dyn.*, 58, 3,427-3,440.

- [86] Lee, S., G. Kim., **M.-I. Lee**, Y. Choi, C.-K. Song, and H.-K. Kim, 2022: Seasonal Dependence of Aerosol Data Assimilation and Forecasting Using Satellite and Ground-Based Observations. *Rem. Sens.*, 14, 9.
- [85] Yoon, D., K. Kim, D.H. Cha, **M.-I. Lee**, J. Im, D. Cho, K.H. Min, 2021: Development of model output statistics based on the least absolute shrinkage and selection operator regression for forecasting next-day maximum temperature in South Korea. *Quart. J. Roy. Met. Soc.*, 148, 745, 1,929-1,944.
- [84] Lee, S., S. Park, **M.-I. Lee**, G. Kim, J. Im, and C.-K. Song, 2022: Air Quality Forecasts Improved by Combining Data Assimilation and Machine Learning with Satellite AOD. *Geophys. Res. Lett.*, 49, <https://doi.org/10.1029/2021GL096066>.
- [83] Kim, H.-K., S. Lee, K.H. Bae, K. Jeon, **M.-I. Lee**, C.-K. Song, 2022: An Observing System Simulation Experiment Framework for Air Quality Forecasts in Northeast Asia: A Case Study Utilizing Virtual Geostationary Environment Monitoring Spectrometer and Surface Monitored Aerosol Data, *Rem. Sens.*, 14, 2.
- [82] Kim, G., S. Lee, J. Im, C.-K. Song, J. Kim, and **M.-I. Lee**, 2021: Aerosol Data Assimilation and Forecast Using Geostationary Ocean Color Imager Aerosol Optical Depth and In-situ Observations during the KORUS-AQ Observing Period. *GIScience & RS*, 58, <https://doi.org/10.1080/15481603.2021.1972714>.
- [81] Ham, Y.-G., J.-G. Kim, J.-G. Lee, T. Li, **M.-I. Lee**, S.-W. Son, and Y.-K. Hyun, 2021: The origin of systematic errors in the forecast of extreme 2020 East Asian summer monsoon rainfall in GloSea5. *Geophys. Res. Lett.*, 48, e2021GL094179.
- [80] Yasunari, T., H. Nakamura, K.-M. Kim, N. Choi, **M.-I. Lee**, Y. Tachibana, A.M. da Silva, 2021: Relationship between circum-Arctic atmospheric wave patterns and large-scale wildfires in boreal summer. *Env. Res. Lett.*, 16(6), 064009.
- [79] Yoon, D., D.-H. Cha, **M.-I. Lee**, K.-H. Min, S.-Y. Jun, and Y. Choi, 2021: Comparison of regional climate model performances for different type heat waves over South Korea. *J. Climate*, 34(6), 2157-2174.
- [78] Kim, G., J. Lee, **M.-I. Lee***, and D. Kim, 2021: Impacts of urbanization on atmospheric circulation and aerosol transport in a coastal environment simulated by the WRF-Chem coupled with urban canopy model. *Atmos. Env.*, 249, 118253.
- [77] Pak, G., Y. Noh, **M.-I. Lee**, S. W. Yeh, D. Kim, S.Y. Kim, J. Lee, H. J. Lee, S. H. Hyun, K. Y. Lee, J. H. Lee, Y.G. Park, H. Jin, H. Park, Y.H. Kim, 2021: Korea Institute of Ocean Science & Technology Earth System Model and its simulation characteristics. *Ocean Science Journal*, 56(1), 18-45.
- [76] Kim, H., **M. I. Lee***, S. Kim, Y.-K. Lim, S. D. Schubert, and A. M. Molod, 2020: Representation of Tropical Cyclones by the Modern-Era Retrospective Analysis for Research and Applications Version 2. *Asia-Pacific J. Atmos. Sci.*, 57(1), 35-49.
- [75] Seo, E., **M.-I. Lee***, and R. H. Reichle, 2021: Assimilation of SMAP and ASCAT Soil Moisture Retrievals into the JULES Land Surface Model Using the Local Ensemble Transform Kalman Filter. *Rem. Sen. Env.*, 253, 112222.
- [74] Park, C.E., S. Jeong, L. J. Harrington, **M. I. Lee**, and C. Zheng, 2020: Population Ageing determines changes in heat vulnerability to future warming. *Env. Res. Lett.*, 15(11), 114043.
- [73] Seo, E., **M.-I. Lee***, S. D. Schubert, R. Koster, and H.-S. Kang, 2020: Investigation of the 2016 Eurasia heat wave as an event of the recent warming. *Env. Res. Lett.*, 15(11).
- [72] Yoon, D., D. -H. Cha, **M.-I. Lee**, K.-H. Min, J. Kim, S.-Y. Jun, and Y. Choi, 2020: Recent Changes in Heatwave Characteristics over Korea. *Clim. Dyn.*, 55, 1685-1696.

- [71] Lee, S., **M.-I. Lee**, 2020: Effects of Surface Vegetation on the Intensity of East Asian Summer Monsoon as Revealed by Observation and Model Experiments. *Int. J. Climatol.*, 40(7), 3634-3648.
- [70] Kim, G., **M.-I. Lee***, S. Lee, S.-D. Choi, S.-J. Kim, and C.-K. Song, 2020: Numerical Modeling for the Accidental Dispersion of Hazardous Air Pollutants in the Urban Metropolitan Area. *Atmosphere*, 11(5), 477. *Highlighted in Cover Story*.
- [69] Park, S., D. Kang, C. Yoo, J. Im, and **M.-I. Lee**, 2020: Recent ENSO influence on East African drought during rainy seasons through the synergistic use of satellite and reanalysis data. *ISPRS Photogrammetry and Remote Sensing*, 162, 17-26.
- [68] Choi, N., **M. I. Lee***, D. H. Cha, Y. K. Lim, and K. M. Kim, 2020: Decadal Changes in the Interannual Variability of Heatwaves in East Asia Caused by Atmospheric Teleconnection Changes. *J. Clim.*, 33(4), 1505-1522.
- [67] Lee, S., **M.-I. Lee***, C.-K. Song, K.-M. Kim, and A. M. da Silva, 2020: Interannual Variation of the East Asia Jet Stream and Its Impact on the Horizontal Distribution of Aerosol in Boreal Spring. *Atmos. Env.*, 223, 117296.
- [66] Kang, D., and **M.-I. Lee**, 2017: ENSO Influence on the dynamical seasonal prediction of the East Asian Winter Monsoon. *Clim. Dyn.*, 53(12), 7479-7495.
- [65] Kim, H., M.-I. Lee*, D.-H. Cha, Y.-K. Lim, and W. M. Putman, 2019: Improved representation of the diurnal variation of warm season precipitation by an atmospheric general circulation model at a 10 km horizontal resolution. *Clim. Dyn.*, 53(11), 6523-6542
- [64] Choi, N., K.-M. Kim, Y.-K. Lim, and M.-I. Lee*, 2019: Decadal changes in the leading patterns of sea level pressure in the Arctic and their impacts on the sea ice variability in boreal summer, *The Cryosphere*, 13, 3007–3021.
- [63] Seo, E., M.-I. Lee*, D. Kim, Y.-K. Lim, S. D. Schubert, and K.-M. Kim, 2019: Interannual variation of tropical cyclones simulated by GEOS-5 AGCM with modified convection scheme. *Int J Climatol.*, 39, 4041– 4057. <https://doi.org/10.1002/joc.6058>
- [62] Kim, M., M.-S. Park, J. Im, S. Park, and M.-I. Lee*, 2019: Machine Learning Approaches for Detecting Tropical Cyclone Formation Using Satellite Data. *Rem. Sens.*, 11(10):1195.
- [61] Seo, E., M.-I. Lee**, et al., 2018: Impact of soil moisture initialization on boreal summer subseasonal forecasts: mid-latitude surface air temperature and heat wave events. *Clim. Dyn.*, in press.
- [60] Kim, S.-J., H.-O. Kwon, M.-I. Lee, Y. Seo, and S.-D. Choi, 2019: Spatial and temporal variations of volatile organic compounds using passive air samplers in the multi-industrial city of Ulsan, Korea, *Environmental Science and Pollution Research*, 26, 5831-5841.
- [59] Choi, N. and M.-I. Lee*, 2019: Spatial Variability and Long-Term Trend in the Occurrence Frequency of Heatwave and Tropical Night in Korea, *Asia-Pacific Journal of Atmospheric Sciences*, 55, 101-114
- [58] Kim, D., Lee, M.-I. *, and E. Seo, 2019: Improvement of Soil Respiration Parameterization in a Dynamic Global Vegetation Model and Its Impact on the Simulation of Terrestrial Carbon Fluxes, *J. Climate*, 32, 127-143.
- [57] Kim, H., **M.-I. Lee**, D. Kim, H.-S. Kang, Y.K. Hyun, 2018: Representation of Boreal Winter MJO and Its Teleconnection in a Dynamical Ensemble Seasonal Prediction System. *J. Climate*, 31(21), 8803-8818.
- [56] Yoon, D., D.-H. Cha, G. Lee, C. Park, **M.-I. Lee**, and K.-H. Min, 2018: Impacts of Synoptic and Local Factors on Heat Wave Events Over Southeastern Region of Korea in 2015. *J. Geophys. Res. – Atmos.*, 123 (21), 12,081-12,096.

- [55] Park, S., E. Seo, D. Kang, J. Im, and **M.-I. Lee**, 2018: Prediction of drought on pentad scale using remote sensing data and MJO index through random forest over East Asia. *Remote Sens.*, 10(11), 1811.
- [54] Kim, D., **M.-I. Lee**, S.-J. Jeong, J. Im, D. H. Cha, and S. Lee, 2018: Intercomparison of Terrestrial Carbon Fluxes and Carbon Use Efficiency Simulated by CMIP5 Earth System Models, *Asia-Pacific J. Atmos. Sci.*, 54(2), 145-163.
- [53] Kang, D., and **M.-I. Lee**, 2017: Increase in the Potential Predictability of the Arctic Oscillation via Intensified Teleconnection with ENSO after the Mid-1990s. *Clim. Dyn.*, 49(5-6), 2147-2160.
- [52] Shin, S.-H., O.-Y. Kim, D. Kim, and **M.-I. Lee**, 2017: Cloud radiative effects and changes simulated by the Coupled Model Intercomparison Project Phase 5 models. *Adv. Atmos. Sci.*, 34, 859-876.
- [51] Kim, M., J. Im, H. Park, S. Park, **M.-I. Lee**, and M.-H. Ahn, 2017: Detection of Tropical Overshooting Cloud Tops Using Himawari-8 Imagery, *Remote Sensing*, 9, 685.
- [50] Lee, S., D. Kim, J. Im, **M.-I. Lee**, and Y.-G. Park, 2017: CO₂ concentration and its spatiotemporal variation in the troposphere using multi-sensor satellite data, carbon tracker, and aircraft observations. *GIScience & Remote Sensing*, 54, 592-613.
- [49] Choi, Y., D.-H. Cha, **M.-I. Lee**, J. Kim, C.-S. Jin, S.-H. Park, and M.-S. Joh, 2017: Satellite radiance data assimilation for binary tropical cyclone cases over the western North Pacific, *J. Adv. Model Earth Sys.*, 9, 832-853.
- [48] Lee, S., H. Han, J. Im, E. Jang, and **M.-I. Lee**, 2017: Detection of deterministic and probabilistic convection initiation using Himawari-8 Advanced Himawari Imager data. *Atmos. Mea. Tech.*, 10, 1859-1874.
- [47] Park, M.-S., **M.-I. Lee**, D. Kim, D.-H. Cha, M. M. Bell, and R. L. Elsberry, 2017: Land-based convection effects on formation of a tropical cyclone Mekkhala (2008). *Mon. Wea. Rev.*, 145, 1315-1337.
- [46] Kim, D., H. Kim, and **M.-I. Lee**, 2017: Why does the MJO detour the Maritime Continent during Austral summer? *Geophys. Res. Lett.*, 44 2579–2587.
- [45] Kim, O.-Y., H.-M. Kim, **M.-I. Lee**, Y.-M. Min, and S.-H. Shin, 2017: Dynamical-statistical seasonal prediction for western North Pacific typhoons based on APCC multi-models. *Clim. Dyn.*, doi:10.1007/s00382-016-3063-1.
- [44] Lee, W.-S., and M.-I. Lee*, 2016: Interannual variability of heat waves in South Korea and their connection with large-scale atmospheric circulation patterns. *Int. J. Climatol.*, DOI: 10.1002/joc.4671
- [43] Truong, S. C. H., M. -I. Lee**, G. Kim, D. Kim, J.-H. Park, S.-D. Choi, and G. Cho, 2016: Accidental benzene release risk assessment in an urban area using an atmospheric dispersion model. *Atmos. Environ.*, 144, 146-159.
- [42] Park, M.-S., M. Kim, M.-I. Lee**, J. Im*, S. Park, 2016: Detection of Tropical Cyclone Genesis via Quantitative Satellite Ocean Surface Wind Pattern and Intensity Analyses using Decision Trees. *Remote Sens. Env.*, 183, 205-214.
- [41] Park, M.-S., M.-I. Lee**, H. Kim, and J.-M. Yoo, 2016: Spatial and diurnal variations of storm height in the East Asia summer monsoon: storm height regimes and large-scale diurnal modulation, *Clim. Dyn.*, 46, 3-4, 745-763, DOI 10.1007/s00382-015-2610-5.
- [40] Pradhan, P. K., P. Venkatraman, D.-Y. Lee, and **M.-I. Lee**, 2016: El Niño and Indian Summer Monsoon Rainfall Relationship in retrospective seasonal prediction runs: Experiments with

- Coupled Global Climate Models and MMEs. *Meteorology and Atmospheric Physics*, 128, 1, 97-115. DOI: 10.1007/s00703-015-0396-y.
- [39] Yoo, J.-M., Jeong, M.-J., Kim, D., Stockwell, W. R., Yang, J.-H., Shin, H.-W., Lee, M.-I., Song, C.-K., and Lee, S.-D., 2015: Spatiotemporal variations of air pollutants (O₃, NO₂, SO₂, CO, PM₁₀, and VOCs) with land-use types, *Atmos. Chem. Phys.*, 15, 10857-10885
- [38] Han, H., S. Lee, J. Im, M. Kim, **M.-I. Lee**, M. H. Ahn, and S.-R. Chung, 2015: Detection of convective initiation using meteorological imager onboard Communication, Ocean, and Meteorological Satellite based on machine learning approaches. *Remote Sens.* 7, 9184-9204.
- [37] Min, S.-K., S.-W. Son, K.-H. Seo, J.-S. Kug, S.-I. An, Y.-S. Choi, J.-H. Jeong, B.-M. Kim, J.-W. Kim, Y.-H. Kim, J.-Y. Lee, **M.-I. Lee**, 2015: Changes in weather and climate extremes over Korea and possible causes: A review, *Asia-Pacific J. Atmos. Sci.*, **51**, 103-121.
- [36] Lim, Y.-K., S. D. Schubert, O. Reale, **M.-I. Lee**, A.M. Mold, and M. J. Suarez, 2015: Sensitivity of Tropical Cyclones to Parameterized Convection in the NASA GEOS5 Model. *J. Climate*, 28, 2, 551-573. DOI: 10.1175/JCLI-D-14-00104.1
- [35] Park, M.-S., H.-S. Kim, C.-H. Ho, R.L. Elsberry, and **M.-I. Lee**, 2015: Tropical cyclone Mekkhala(2008)'s formation over South China Sea: Mesoscale, synoptic-scale, and large-scale contributions. *Mon. Wea. Rev.*, 143, 88–110.
- [34] **Kim, D.**, **M.-I. Lee**, H.-M. Kim, and S. D. Schubert, 2014: The Modulation of Tropical Storm Activity in the Western North Pacific by the Madden-Julian Oscillation in the GEOS-5 AGCM Experiments. *Atmos. Sci. Lett.*, DOI:10.1002/asl2.509
- [33] **Kang, D.**, J. Im*, **M.-I. Lee**, and L. J. Quackenbush, 2014: The MODIS Ice Surface Temperature Product as an Indicator of Sea Ice Minimum over the Arctic Ocean, *Remote Sens. Environ.*, 152, 99-108, DOI:10.1016/j.rse.2014.05.012
- [32] Shin, S.H., **M.-I. Lee**, and O.-K. Kim, 2014: Examinations of cloud variability and future change in the coupled model intercomparison project phase 3 simulations. *Asia-Paific J. Atmos. Sci.*, 50(4), 481-495, DOI:10.1007/s13143-014-0038-1
- [31] Kim, D., **M.-I. Lee***, **D. Kim**, S. D. Schubert, D.E. Waliser, B. Tian, 2014: Representation of tropical subseasonal variability of precipitation in global reanalysis. *Clim. Dyn.*, doi: 10.1007/s00382-013-1890-x
- [30] **Kang, D.**, **M.-I. Lee***, J. Im, D. Kim, H.-M. Kim, H.-S. Kang, S. D. Schubert, A. Arribas, C. MacLachlan, 2014: Prediction of the Arctic Oscillation in Boreal Winter by Dynamical Seasonal Forecasting Systems, *Geophys. Res. Lett.*, 41, 3577-3585, DOI:10.1002/2014GL060011
- [29] **Lee, M.-I.**, H.-S. Kang, D. Kim, **D. Kim**, **H. Kim**, and **D. Kang**, 2014: Validation of the Experimental Hindcasts Produced by the GloSea4 Seasonal Prediction System. *Asia-Pacific J. Atmos. Sci.*, 50(3), 307-326, DOI:10.1007/s13143-014-0019-4
- [28] Kim, H.-M, **M.-I. Lee**, P.J. Webster, **D. Kim**, and J.-H. Yoo, 2013: A physical Basis for the Probabilistic Prediction of the Accumulated Tropical Cyclone Kinetic Energy in the Western North Pacific. *J. Clim.*, 26, 7981-7991, doi: <http://dx.doi.org/10.1175/JCLI-D-12-00679.1>
- [27] Blackburn, M.*, D. L. Williamson, K. Nakajima, W. Ohfuchi, Y. O. Takahashi, Y.-Y. Hayashi, H. Nakamura, M. Ishiwatari, J. McGregor, H. Borth, V. Wirth, H. Frank, P. Bechtold, N. P. Wedi, H. Tomita, M. Satoh, M. Zhao, I. M. Held, M. J. Suarez, **M.-I. Lee**, M. Watanabe, M. Kimoto, Y. Liu, Z. Wang, A. Molod, K. Rajendran, A. Kitoh, and R. Stratton, 2013: The Aqua Planet Experiment(APE): Control SST simulation. *J. Meteor. Soc. Japan*, 91A, 17-56, doi:10.2151/jmsj.2013-A02.

-
- [26] Williamson, D. L.*, M. Blackburn, K. Nakajima, W. Ohfuchi, Y. O. Takahashi, Y.-Y. Hayashi, H. Nakamura, M. Ishiwatari, J. McGregor, H. Borth, V. Wirth, H. Frank, P. Bechtold, N. P. Wedi, H. Tomita, M. Satoh, M. Zhao, I. M. Held, M. J. Suarez, **M.-I. Lee**, M. Watanabe, M. Kimoto, Y. Liu, Z. Wang, A. Molod, K. Rajendran, A. Kitoh, and R. Stratton, 2013: The Aqua Planet Experiment(APE): Response to changed meridional SST fields. *J. Meteor. Soc. Japan*, 91A, 57-89 doi:10.2151/jmsj.2013-A03.
- [25] Jiang, X., D.E. Waliser, D. Kim, M. Zhao, K.R. Sperber, W. F. Stern, S.D. Schubert, G.J. Zhang, W. Wang, M. Khairoutdinov, R. B. Neale, and **M.-I. Lee**, 2012: Simulation of the intraseasonal variability over the Eastern Pacific ITCZ in climate models. *Clim. Dyn.*, 39, 3, 617-636. DOI 10.1007/s00382-011-1098-x.
- [24] Yamada, T. J., **M.-I. Lee**, M. Kanamitsu, H. Kanamaru, 2012: Diurnal Characteristics of Rainfall over the Contiguous United States and Northern Mexico in the Dynamically Downscaled Reanalysis Dataset (US10). *J. Hydrometeor*, 13, 1142–1148. doi: <http://dx.doi.org/10.1175/JHM-D-11-0121.1>.
- [23] **Lee, M. -I.**, S. D. Schubert. and **D. Kim**, 2011: Representaton of Tropical Storms in the Northwestern Pacific by the Modern-Era Retrospective Analysis for Research and Applications. *Asia-Paific J. Atmos. Sci.*, 47, 245-253, DOI:10.1007/s13143-011-0013-z
- [22] Frierson, D. M. W., D. Kim, I.-S. Kang, **M.-I. Lee**, J. Lin, 2011: Structure of AGCM-Simulated Convectively Coupled Kelvin Waves and Sensitivity to Convective Parameterization. *J. Atmos. Sci.*, 68, 26–45. doi: <http://dx.doi.org/10.1175/2010JAS3356.1>.
- [21] Matsui, T., D. Mocko, **M.-I. Lee**, W.-K. Tao, M. J. Suarez, and R. A. Pielke Sr., 2010: Ten-year climatology of summertime diurnal rainfall rate over the conterminous U.S. *Geophys. Res. Lett.*, **37**, L13807, doi:10.1029/2010GL044139.
- [20] **Lee, M.-I.**, I. Choi, W.-K. Tao, S. D. Schubert, I.-S. Kang, 2010: Mechanisms of diurnal precipitation over the US Great Plains: A cloud resolving model perspective. *Clim. Dyn.*, **34**, 419-437, doi 10.1007/s00382-009-0531-x.
- [19] Kim, D., K. Sperber, W. Stern, D. Waliser, I.-S. Kang, E. Maloney, W. Wang, K. Weickmann, J. Benedict, M. Khairoutdinov, **M.-I. Lee**, R. Neale, M. Suarez, K. Thayer-Calder, and G. Zhang, 2009: Application of MJO Simulation Diagnostics to Climate Models, *J. Climate*, **22**, 6413-6436.
- [18] Bell, T. L., J.-M. Yoo, and M.-I. Lee, 2009: Note on the weekly cycle of storm heights over the SE U.S., *Journal of Geophysical Research*, **114**, D15201, doi:10.1029/2009JD012041.
- [17] Gutzler, D., L. N. Long, J. Schemm, M. Bosilovich, J. Chern, J. C. Collier, M. Kanamitsu, P. Kelly, D. Lawrence, **M.-I. Lee**, R. Lobato S., B. Mapes, K. Mo, A. Nunes, E. Ritchie, J. Roads, S. B. Roy, S. Schubert, H. Wei and G. Zhang, 2009: Simulations of the 2004 North American Monsoon circulation: NAMAP 2. *J. Climate*, **22**, 6716-6740.
- [16] **Lee, M.-I.**, M. J. Suarez, I-S. Kang, I. M. Held, and D. Kim, 2008: A moist benchmark calculations for atmospheric general circulation models. *J. Climate*, **21**, 4934-4954.
- [15] **Lee, M.-I.**, S. D. Schubert, M. J. Suarez, J.-K. E. Schemm, H.-L. Pan, J. Han, and S.-H. Yoo, 2008: Role of convection triggers in the simulation of the diurnal cycle of precipitation over the United States Great Plans in a general circulation model. *J. Geophys. Res.*, **113**, D02111, doi:10.1029/2007JD008984.
- [14] Lin, J.-L., **M.-I. Lee**, D. Kim, I.-S. Kang, and D. M. W. Frierson, 2008: Impacts of convective parameterization and moisture convective trigger on AGCM-simulated convectively coupled equatorial waves. *J. Climate*, **21**, 883-909.

-
- [13] Bell, T. L., D. Rosenfeld, K.-M. Kim, J.-M. Yoo, **M.-I. Lee**, and M. Hahnenberger, 2008: Midweek increase in U.S. summer rain suggests air pollution invigorates rainstorms. *J. Geophys. Res.*, 113, D02209, doi:10.1029/2007JD008623.
- [12] Jiang, X., D. E. Waliser, M. C. Wheeler, C. Jones, **M.-I. Lee**, and S. D. Schubert, 2008: Assessing the Skill of an All-season Statistical Forecast Model for the Madden-Julian Oscillation. *Mon. Weather Rev.*, **136**, 1940-1956.
- [11] Lin, J.-L., B. E. Mapes, K. M. Weickmann, G. N. Kiladis, S. D., Schubert, M. J. Suarez, J. T. Bacmeister, and **M.-I. Lee**, 2008: North American monsoon and convectively coupled equatorial waves simulated by IPCC AR4 coupled GCMs. *J. Climate*, **21**, 2919-2937.
- [10] Lin, J.-L., K. M. Weickmann, G. N. Kiladis, B. E. Mapes, S. D., Schubert, M. J. Suarez, J. T. Bacmeister, and **M.-I. Lee**, 2008: Subseasonal variability associated with Asian summer monsoon simulated by 14 IPCC AR4 coupled GCMs. *J. Climate*, **21**, 4541-4567.
- [9] **Lee, M.-I.**, S.D. Schubert, M. J. Suarez, I. M. Held, A. Kumar, T. L. Bell, J.-K. E. Schemm, N.-C. Lau, J.-J. Ploshay, H.-K. Kim, J. J. Ploshay, S.-H. Yoo, 2007: Sensitivity to horizontal resolution in the AGCM simulations of warm season diurnal cycle of precipitation over the United States and northern Mexico. *J. Clim.*, **20**, 1862–1881.
- [8] **Lee, M.-I.**, S.D. Schubert, M. J. Suarez, I. M. Held, N.-C. Lau, J. J. Ploshay, A. Kumar, H.-K. Kim, and J.-K. E. Schemm, 2007: An analysis of the warm season diurnal cycle over the continental United States and northern Mexico in general circulation models. *J. Hydromet.*, **8**, 344-366.
- [7] **Lee, M.-I.**, S.D. Schubert, M. J. Suarez, T. L. Bell, and K.-M. Kim, 2007: Diurnal cycle of precipitation in the NASA Seasonal to Interannual Prediction Project atmospheric general circulation model. *J. Geophys. Res.*, 112, D16111, doi:10.1029/2006JD008346.
- [6] Lau, W. K. M., K.-M. Kim, and **M.-I. Lee**, 2007: Characteristics of diurnal and seasonal cycles in global monsoon systems. *J. Meteorol. Soc. Japan*, 85A, 403-416.
- [5] Lin, J.-L., D. Kim, **M.-I. Lee**, and I.-S. Kang, 2007: Effects of cloud-radiative heating on atmospheric general circulation model (AGCM) simulations of convectively coupled equatorial waves, *J. Geophys. Res.*, 112, D24107, doi:10.1029/2006JD008291.
- [4] Higgins, W., D. Ahijevych, J. Amador, A. Barros, E. H. Berbery, E. Caetano, P. Ciesielski, R. Cifelli, M. Cortez-Vazquez, A. Douglas, M. Douglas, G. Emmanuel, C. Fairall, D. Gochis, D. Gutzler, R. Johnson, C. King, T. Lang, **M.-I. Lee**, D. Lettenmaier, R. Lobato, V. Magaña, J. Meitin, K. Mo, S. Nesbitt, E. Pytlak, P. Rogers, S. Rutledge, J. Schemm, S. Schubert, F. Torres, A. White, C. Williams, A. Wood, R. Zamora, C. Zhang, 2006: The NAME 2004 Field Campaign and Modeling Strategy. *Bull. Amer. Meteorol. Soc.*, **87**, 79–94.
- [3] Waliser, D. E., K. Jin, I.-S. Kang, W. F. Stern, S. D. Schubert, K.-M. Lau, **M.-I. Lee**, V. Krishnamurthy, A. Kitoh, G. A. Meehl, V. Y. Galin, V. Satyan, S. K. Mandke, G. Wu, Y. Liu, and C.-K. Park, 2003: AGCM Simulations of Intraseasonal Variability Associated with the Asian Summer Monsoon, *Clim. Dyn.*, **21**, 423-446.
- [2] **Lee, M.-I.**, I.-S. Kang, and B. E. Mapes, 2003: Impacts of cumulus convection parameterization on the aqua-planet AGCM simulations of tropical intraseasonal oscillation, *J. Meteorol. Soc. Japan*, **81**, No.5, 963-992.
- [1] **Lee, M.-I.**, I.-S. Kang, J.-K. Kim, and B. E. Mapes, 2001: Influences of cloud-radiation interaction on simulating tropical intraseasonal oscillation with an atmospheric general circulation model. *J. Geophys. Res.*, 106, **D13**, 14,219-14,233.

Non-SCI PUBLICATIONS

- [6] 여희동, 김상우, 이철규, 김덕현, 김병곤, 김세원, 남형구, 노영민, 박수진, 박찬봉, 서광석, 최진영, 이명인, 이은혜, 2016: 한반도 에어로졸 라이다 네트워크(KALION)의 에어로졸 유형 구분 및 질량 농도 산출 알고리즘. 대한원격탐사학회지, 32 (2), 119-131.
- [5] 서은교, 이명인, 정지훈, 강현석, 원덕진, 2016: 전지구 계절 예측 시스템의 토양수분 초기화 방법 개선, 대기, 26(1), 35-45.
- [4] Williamson, D.L., M. Blackburn, B. J. Hoskins, K. Nakajima, W. Ohfuchi, Y. O. Takahashi, Y.-Y. Hayashi, H. Nakamura, M. Ishiwatari, J. L. McGregor, H. Borth, V. Wirth, H. Frank, P. Bechtold, N. P. Wedi, H. Tomita, M. Satoh, M. Zhao, I. M. Held, M. J. Suarez, **M.-I. Lee**, M. Watanabe, M. Kimoto, Y. Liu, Z. Wang, A. Molod, K. Rajendran, A. Kitoh and R. Stratton, 2012: THE APE ATLAS, NCAR Technical Note NCAR/TN-484+STR, National Center for Atmospheric Research, Boulder, Colorado, xxii+508 pp, <http://dx.doi.org/10.5065/D6FF3QBR>. Available online at <http://nldr.library.ucar.edu/repository/collections/TECH-NOTE-000-000-000-865>.
- [3] Gutzler, D., L. N. Long, J. Schemm, M. Bosilovich, J. Chern, J. C. Collier, M. Kanamitsu, P. Kelly, D. Lawrence, **M.-I. Lee**, R. Lobato S., B. Mapes, K. Mo, A. Nunes, E. Ritchie, J. Roads, S. B. Roy, S. Schubert, H. Wei and G. Zhang, 2008: Atmospheric simulations of the 2004 North American Monsoon circulation: NAMAP2, CLIVAR Exchanges, No. 45, 31pp [PDF]
- [2] **Lee, M.-I.**, 2001: Influence of cloud-radiation interaction in AGCM simulations of tropical intraseasonal oscillation. Atmosphere, 11(4), 13-16 [PDF]
- [1] **Lee, M.-I.**, and I.-S. Kang, 1997: Temperature variability and warming trend associated with global warming in Korean peninsula, Asian-Pacific Journal of Atmospheric Sciences, 33(3), 429-443 [PDF]

As of Sep 14, 2024