Mingyu Park

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RESEARCH EXPERIENCE

Atmospheric and Oceanic Sciences Program, Princeton University, USA

Seasonal-to-Decadal Variability and Predictability Division, Geophysical Fluid Dynamics Laboratory, NOAA, USA

Postdoctoral Research Associate **Jan 2022 to Present**

- Research topics: Seasonal-to-Decadal variability and predictability of climate extremes, Atmospheric blocking variability, Stratosphere-troposphere coupling, Dynamical mechanism of Extreme precipitation

Department of Meteorology and Atmospheric Science, Pennsylvania State University, USA

Research Assistant **Aug 2016 to Dec 2021**

- Topics: Large-scale atmospheric dynamics, Polar Climate, Storm Track Dynamics, Climate modeling
- Participated in **Rossbypalooza (**Jun 2018). Climate modeling summer school program at the University of Chicago. Research topic: Barotropic eddy saturation in a two-layer QGPV model

PUBLICATION

- Clark, J. P., N. C. Johnson, **M. Park**, M. Bernardez, and T. L. Delworth, 2024: Predictable Patterns of Seasonal Atmospheric River Variability Over North America during Winter, *submitted*
- **Park, M.**, N. C. Johnson, J. Hwang, and L. Jia, 2024: A hybrid approach for skillful multiseasonal prediction of winter North Pacific blocking, *in revision, Npj climate and atmospheric science*
- **Park, M.**, N. C. Johnson, T. L. Delworth, 2024: The Driving of North American Climate Extremes by North Pacific Stationary-transient Wave Interference, *accepted, Nature Communications*
- S. Lee, P. R. Bannon, **M. Park**, and J. P. Clark, 2024: Zonal Contrasts of the Tropical Pacific Climate Predicted by a Global Constraint, *Asia-Pac J Atmos Sci*, https://doi.org/10.1007/s13143-024-00373-5
- H-C Kim, S. Son, C Jo, Y. Kim, **M. Park**, Y-G Park, and J. Ryu, 2023: Spatio-temporal structures of satellite-derived water quality indicators along the Korean South Coast, *Environment International*, https://doi.org/10.1016/j.envint.2023.108083
- **Park, M.**, and S. Lee, 2022: On the Causes of Synoptic-Scale Eddy Heat Flux Decline, *Geophys. Res. Lett.,* https://doi.org/10.1029/2022GL100963
- **Park, M.**, and S. Lee, 2022: Which is the More Effective Driver of the Poleward Eddy Heat Flux: Zonal Gradient of Tropical Convective Heating or Equator-To-Pole Temperature Gradient?, *J. Atmos. Sci.,* https://doi.org/10.1175/JAS-D-21-0262.1
- **Park, M.**, and S. Lee, 2021: The role of planetary-scale eddies on the recent isentropic slope trend during boreal winter, *J. Atmos. Sci.,* https://doi.org/10.1175/JAS-D-20-0348.1
- **Park, M.**, and S. Lee, 2021: Is the stationary wave bias in CMIP5 simulations driven by latent heating biases?, *Geophys. Res. Lett.,* **48**, e2020GL091678. https://doi.org/10.1029/2020GL091678
- **Park, M.**, and S. Lee, 2020: A mechanism for the midwinter minimum in North Pacific storm-track intensity from a global perspective, *Geophys. Res. Lett.*, **47**, e2019GL086052. https://doi.org/10.1029/2019GL086052

- **Park, M.**, and S. Lee, 2019: Relationship between Tropical and Extratropical Diabatic Heating and their Impact on Stationary-transient Wave Interference, *J. Atmos. Sci*., **76**, 2617-2633. https://doi.org/10.1175/JAS-D-18-0371.1
- **Park, M.**, Choi, Y., and S.-W. Son, 2016: The Impact of Satellite Observations on Large-scale Atmospheric Circulation in the Reanalysis Data: A comparison Between JRA-55 and JRA-55C, *Atmosphere*, **26(4)**, 523-540, https://doi.org/10.14191/Atmos.2016.26.4.523

MANUSCRIPTS IN PREPARATION

- **Park, M.**, N. C. Johnson, and Coauthors, 2024: A Linkage between Atmospheric Rivers, Blocking, and North American Heatwaves in High-Resolution Climate Model Simulations, *in preparation.*
- **Park, M.**, S. B. Feldstein, and N. C. Johnson, 2024: The Role of the North Pacific Latent Heating in Driving the Pacific-North American Teleconnection Pattern and Surface Temperature Anomalies during Boreal Winter, *in preparation.*
- White, R., **M. Park**, and V. Narinesingh, 2024: The representation of winter and summer stationary waves in climate models, Chapter in Encyclopedia of Climate System Science (Editor: Isla Simpson), *in preparation.*

PROFESSIONAL LEADERSHIP

Session Convener and OSPA Liaison at the session: Jetstream Dynamics, Atmospheric Rossby Waves, and Associated Extreme Events, 2023, AGU Fall Meeting, San Francisco, CA.

Session Convener at the session: Bridging the Gap from Climate to Extreme Weather: Observations, Theory and Modeling, 2024, AGU Fall Meeting, DC.

Associate Editor at Korean Atmospheric Scientists in America (KASA) Since Jan 2023

REVIEWER FOR INTERNATIONAL JOURNALS

Nature, Science Advances, Journal of the Atmospheric Sciences, npj Climate and Atmospheric Science, Journal of Climate, Geophysical Research Letter, Journal of Geophysical Research: Atmospheres, Journal of International Climatology, Advances in Atmospheric Science, Atmospheric Research

EDUCATION

Ph.D. in Meteorology and Atmospheric Science

Department of Meteorology and Atmospheric Science, Pennsylvania State University (08/2016 – 12/2021)

Thesis: Impacts of the Heating-Circulation Relay Mechanism on Stationary Wave and Storm Track Dynamics

Supervisor: Prof. Sukyoung Lee

B.Sc. in Atmospheric Science

School of Earth and Environmental Science, Seoul National University (03/2010 – 02/2016)

Supervisor: Prof. Seok-woo Son (Engaged in the Army for military service: Jun 2012 to Mar 2014)

GRANTS AND AWARDS

- Princeton Atmospheric and Oceanic Sciences Fellowship for Postdoctoral Research Scientists, 2022
- Hans Neuberger Award (Best Teaching Award), Pennsylvania State University, 2022
- Student Travel Grant, 99th AMS Annual Meeting, Phoenix, AZ, 2019

Academic Fellowship

- Dean's list - School of Earth and Environmental Science Spring 2014 to Fall 2015
- Best Academic Performance in School of Earth and Environmental Science Year 2014

Scholarship

- National Science and Engineering Scholarship Spring 2014 to Fall 2015

ORAL PRESENTATIONS

< Oral >

- **Park, M.**, N. C. Johnson, and coauthors, 2024, A Linkage between Atmospheric Rivers, Blocking, and North American Heatwaves in High-Resolution Climate Model Simulations, 2024 AGU Fall meeting, DC (**Invited Talk**).
- **Park, M.**, N. C. Johnson, D. Yoon, and L. Jia, 2024, The role of moisture transport in the development of North American summertime heatwaves in high-resolution climate model simulations, Extreme heat workshop at Columbia University, Manhattan, NY.
- **Park, M.**, S. B. Feldstein, and N. C. Johnson, 2024, The Role of the North Pacific Latent Heating in driving the Pacific-North American (PNA) Teleconnection Pattern during Boreal Winter, AMS-Middle Atmosphere Conference, Burlington, VT.
- **Park, M.**, 2024, Zonally asymmetric atmospheric circulation and North American climate extremes during boreal winter: From stationary waves to atmospheric blocking, GFDL internal seminar.
- **Park, M.**, N. C. Johnson, J. Hwang, and L. Jia, 2024, Seasonal Prediction of Wintertime North Pacific Blocking in the GFDL SPEAR forecasting system, Japan Geoscience Union, Chiba, Japan (Virtual).
- **Park, M.**, and N. C. Johnson, 2024, Seasonal Prediction of Wintertime North Pacific Blocking: What Are We Capturing and Missing?, 2024 US CLIVAR Blocking and Extreme Weather in a Changing Climate Workshop, Boulder, CO.
- **Park, M.**, and N. C. Johnson, 2024, Seasonal Prediction of Wintertime North Pacific Blocking: What Are We Capturing and Missing?, 104th AMS Annual Meeting, Baltimore, MD.
- **Park, M.**, and N. C. Johnson, 2023, Seasonal Prediction of Wintertime North Pacific Blocking: What Are We Capturing and Missing?, 2023 AGU Fall meeting, San Francisco, CA.
- **Park, M.**, 2023, Vertical structure of temperature trends in AM4 and AM5 model simulations, Stratosphere subgroup for AM5 development, GFDL.
- **Park, M.**, 2023, The driving of North American climate extremes by North Pacific blocking and wave interference (**Invited Talk**), Woods Hole Oceanographic Institution (WHOI), MA.
- **Park, M.**, and N. C. Johnson, 2023, Changes in the North Pacific Stationary-Transient Wave Interference and Downstream Regional Impacts on Subseasonal-to-Seasonal Timescale, Japan Geoscience Union, Chiba, Japan.
- **Park, M.**, 2023, Changes in the North Pacific Stationary-Transient Wave Interference and Downstream Impacts on Regional Climate Variability, IBS Center for Climate Physics (ICCP), Busan, Korea.
- **Park, M.**, 2023, The driving of North American climate extremes by North Pacific stationary-transient wave interference (Department seminar), Yonsei University, Seoul, Korea.
- **Park, M.,** and N. C. Johnson**,** 2023, The role of tropical air-sea interactions in modulating North Pacific stationary-transient eddy interaction and North American climate extremes, USCMS9 Topical Workshop on the oceans' role on air – sea coupled climate interactions, GFDL, NJ.
- **Park, M.**, S. B. Feldstein, and N. C. Johnson, 2023, The Role of the North Pacific Latent Heating in Driving the Pacific-North American Teleconnection Pattern and Surface Temperature Anomalies during Boreal Winter, 60th KMS Spring Meeting, Busan, Korea.
- **Park, M.**, 2023, On the cause of synoptic-scale eddy heat flux decline (**Invited Talk**), Stony Brook University, NY.
- **Park, M.**, 2023, AM4 stationary waves and troposphere-stratosphere coupling, Stratosphere subgroup for AM5 development, GFDL.
- **Park, M.**, and N. C. Johnson, 2023, Future changes in winter stationary waves and their regional impacts in the SPEAR model, GFDL internal seminar.
- **Park, M.**, and N. C. Johnson, 2023, Changes in the North Pacific Stationary-Transient Wave Interference and Downstream Impacts on Regional Climate Variability, 103rd AMS Annual Meeting, Denver, CO.

- **Park, M.**, and S. B. Feldstein 2023, The Role of the North Pacific Latent Heating in Driving the Pacific-North American Teleconnection Pattern and Surface Temperature Anomalies during Boreal Winter, 103rd AMS Annual Meeting, Denver, CO.
- **Park, M.**, 2022, Impacts of The Heating–Circulation Relay Mechanism on Stationary Wave Dynamics and Teleconnections, Ewha Women University, Seoul, Korea
- **Park, M.**, and S. Lee, 2021, The Role of Equator-To-Pole Temperature Gradients and Tropical Convective Heating in Driving Poleward Eddy Heat Flux, 2021 AGU Fall Meeting, New Orleans, LA.
- **Park, M.**, and S. Lee, 2021, Relationship Between Stationary Wave Bias and Precipitation Bias in CMIP5 Simulations, 101st AMS Annual Meeting, Virtual conference.
- **Park, M.**, and S. Lee, 2021, Impact of planetary-scale eddies on the recent trend of the extratropical isentropic slope and Arctic warming during boreal winter, 101st AMS Annual Meeting, Virtual conference.
- **Park, M.**, 2020, Impact of climate model bias on future projections: old biases die hard, Earth System Science Centre seminar, Pennsylvania State University, PA.
- **Park, M.,** and S. Lee, 2020, Impacts of the Planetary-Scale Eddies on the Midwinter Suppression in North Pacific Storm Track Intensity, 100th AMS Annual Meeting, Boston, MA.
- **Park, M.,** and S. Lee, 2019, Impacts of the Planetary-Scale Eddies on the Midwinter Suppression in North Pacific Storm Track Intensity, 22nd Atmospheric and Oceanic Fluid Dynamics Conference, Portland, Maine.
- **Park, M.,** 2019, Storm track shifts, why so serious?, Department seminar, Pennsylvania State University, PA.
- **Park, M.,** and S. Lee, 2019, Impacts of Tropical and Extratropical Diabatic Heating on Stationary Wave Forcing and Arctic Warming, 99th AMS Annual Meeting, Phoenix, AZ.
- **Park, M.,** and S. Lee, 2019, Storm Track Shifts Induced by Regional Stationary Wave Interference, 99th AMS Annual Meeting, Phoenix, AZ.

OUTREACH AND DIVERSITY

- BCC meets Climate Scientists, Oct 2022, Princeton AOS Outreach at Bronx Community College, Bronx, New York.
- Climate Science Outreach event for Students at University of Maryland Baltimore County, Nov 2022, Virtual.
- 16th Annual Monmouth Junction Elementary School Science Fair, Feb 2023, New Jersey.
- Princeton Plasma Physics Laboratory Young Women's Conference in STEM, Mar 2023, New Jersey.
- Climate Science 101, Dec 2023, Princeton AOS Outreach at Bronx Community College, Bronx, New York.
- NOAA CESSRT II Student Fellows Visit, Jul 2024, GFDL Outreach, GFDL.

TEACHING AND MENTORING EXPERIENCE

Mentor, CIMES internship, *Princeton University and GFDL*

- 2024 (Summer) Mayumi Miyazato from Dartmouth College: Research topic – "Evaluating the Impacts of Climate Mitigation on South American Atmospheric Rivers by the End of the 21st Century"

Teaching Assistant, *Pennsylvania State University*

- 2017 (Fall), 2021 (Fall) METEO 421: Atmospheric Dynamics
- 2019 (Spring) METEO 470: Climate Dynamics