

Jeongmin Yun

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RESEARCH INTERESTS

- Exploring how and why carbon sources and sinks change over the globe
- Bottom-up and Top-down modeling of terrestrial carbon fluxes
- Exploring effects and responses of vegetation activities to climate change

EDUCATION

Seoul National University, Seoul, Korea

Ph.D. in Earth and Environmental Sciences, Feb. 2021

| Advisor: Prof. Chang-hoi Ho

Thesis: "Evolution of natural carbon sinks over the globe: diagnosed from seasonal changes in atmospheric CO₂"

M.Sc. in Earth and Environmental Sciences, Aug. 2017

| Advisor: Prof. Chang-hoi Ho

Yonsei University, Seoul, Korea

B.Sc. in Atmospheric Sciences, Aug. 2015

- Explored effects of climate variables on changes in vegetation phenology of boreal forests
- Diagnosed regional changes in terrestrial carbon fluxes in Korea from the atmospheric CO₂
- Diagnosed changes in the seasonality of air-sea CO₂ fluxes from the atmospheric CO₂ over the globe and examined related mechanisms
- Participated in several projects to understand future changes in extreme weather or to evaluate current terrestrial carbon fluxes over East Asia

RESEARCH EXPERIENCE

Jet Proportional Laboratory, California Institute of Technology

Postdoctoral Research Fellow

| Advisor: Dr. Junjie Liu

| Oct. 2022 – present

- Quantifying the uncertainty in surface carbon flux estimates
- Developing nested-grid atmospheric CO₂ inversion over Africa under CMS-flux system
- Examining responses of terrestrial and ocean carbon fluxes to climate and anthropogenic forcing

Environmental Planning Institute, Seoul National University

| Advisor: Prof. Dr. Sujong

Jeong

Postdoctoral Research Fellow

| Mar. 2021 – Oct. 2022

- Investigated causes of spatiotemporal variations of atmospheric CO₂ over East Asia
- Developing nested-grid atmospheric CO₂ inversions for East Asia by utilizing the GEOS-Chem adjoint model
- Examining responses of terrestrial and ocean carbon fluxes to ENSO
- Advising graduate students about academic writing and model simulations
- Involved in several projects to evaluate carbon budgets over East Asia
 - Principal investigator of <Investigations on variations of terrestrial carbon fluxes over East Asia from inverse modeling based on terrestrial and atmospheric measurements>
(Jun. 2021 – Oct. 2022, funded by National Research Foundation of Korea)
 - Participated in <Investigations on megacity CO₂ variations and its contribution to climate change>
(Sep. 2018 – Oct. 2022, funded by National Research Foundation of Korea)

AWARDS AND GRANTS

• **Best PhD Thesis Award**

Korean Meteorological Society (KMS)

| Oct. 2021

- **BIEN 2021 Best Poster award**
Korean Woman Scientists and Engineers | Aug. 2021
- **Brain Korea 21 Plus Scholarship**
National Research Foundation of Korea | Sep. 2015 - Feb. 2021
- **National Scholarship for Science and Technology**
National Research Foundation of Korea | Mar. 2013 - Aug. 2015

SKILLS

- **Language:** English (fluent), Korean (native)
- **Programming language:** NCL & Python (advanced), Fortran & IDL (basic)
- **Modeling:** GEOS-Chem & GEOS-Chem adjoint (CO₂ simulation), CESM (especially CLM)
- **Data analysis:**
 - Atmospheric measurements: CO₂ concentration [in-situ, satellite (OCO-2, GOSAT, AIRS)], meteorological variables
 - Satellite-based ecological dataset: NDVI, LAI, SIF, Chl-a
 - Modeling outputs: CMIP5, CMIP6, TRENDY, FLUXCOM, SOCOM, Inverse modeling (e.g., Jena, CAMS, CT)

PEER-REVIEWED PUBLICATIONS

1. **Yun, J., Jeong, S., Gruber, N., Gregor, L., Ho, C. H., Piao, S., Ciais, P., Schimel, D., & Kwon, E. Y. 2022, *Sci. Adv.*, 8(41), eabq0220**
– *Enhance seasonal amplitude of atmospheric CO₂ by the changing Southern Ocean carbon sink*
2. **Chen, X., Jeong, S., Park, C.-E., Park, H., Joo, J., Chang, D., Yun, J. 2022, *Remote Sens. Environ.*, 272, 112956**
– *Different responses of surface freeze and thaw phenology changes to warming among Arctic permafrost types*
3. **Park, C., Jeong, S., Park, M. S., Park, H., Yun, J., Lee, S. S., & Park, S. H. 2022, *Carbon Balance and Manag.*, 17(1), 1-14**
– *Spatiotemporal variations in urban CO₂ flux with land-use types in Seoul*
4. **Sim et al. (including Yun, J.) 2022, *Environ. Res. Lett.*, 17(2), 024036**
– *Short-term reduction of regional enhancement of atmospheric CO₂ in China during the first COVID-19 pandemic period*
5. **Yun, J. & Jeong, S. 2021, *Carbon Balance Manag.*, 16(1), 22**
– *Contributions of economic growth, terrestrial sinks, and atmospheric transport to the increasing atmospheric CO₂ concentrations over the Korean Peninsula*
6. **Ho, C. H., Park, C. K., Yun, J., Lee, E. J., Kim, J., & Yoo, H. D. 2021, *Asia-Pac. J. Atmospheric Sci.*, 57(3), 619-627**
– *Asymmetric expansion of summer season on May and September in Korea*
7. **Park, C., Jeong, S., Park, H., Yun, J., & Liu, J. 2021, *Asia-Pac. J. Atmospheric Sci.*, 57(2), 289-299**
– *Evaluation of the potential use of satellite-derived XCO₂ in detecting CO₂ enhancement in megacities with limited ground observations: a case study in Seoul using Orbiting Carbon Observatory-2*
8. **Yun, J., Jeong, S., Ho, C. H., Park, H., Liu, J., et al. 2020, *Glob. Chang. Biol.*, 26(6), 3368-3383**
– *Enhanced regional terrestrial carbon uptake over Korea revealed by atmospheric CO₂ measurements from 1999 to 2017*
9. **Yun, J., Jeong, S. J., Ho, C. H., Park, C. E., Park, H., & Kim, J. 2018, *Glob. Chang. Biol.*, 24(11), 5176-5187**
– *Influence of winter precipitation on spring phenology in boreal forests*

SELECTED CONFERENCE PRESENTATIONS AND INVITED SEMINARS

1. **Transcom-2022, Wageningen, The Netherland, 2022**
– *Development of regional atmospheric inversion system for estimating terrestrial CO₂ flux in Asia*

2. 2022 KMS spring conference, Busan, Korea, 2022

– *Development and evaluation of an atmospheric CO₂ inversion system in Asia*

3. Climate System Laboratory, POSTECH, Pohang, Korea (invited seminar), 2022

– *Diagnosis of changes in natural carbon sinks from atmosphere CO₂*

4. 2021 KMS autumn conference, Gwangju, Korea, 2021

– *Causes of increasing atmospheric CO₂ in South and North Korea*

5. BIEN 2021, Daejeon, Korea, 2021

– *Emerging impacts of ocean carbon cycle on the atmospheric CO₂ seasonal amplification*

6. AOGS2021 18th Annual Meeting, Virtual, 2021

– *Emerging effects of ocean carbon cycle on enhanced seasonal cycle of atmospheric CO₂*

7. Department of Atmospheric Sciences, Yonsei University, Seoul, Korea (invited seminar), 2021

– *Understanding the global carbon cycle from the atmosphere*

8. 2020 KMS autumn conference, Virtual, 2020

– *Causes of seasonal changes in terrestrial carbon flux at northern high-latitudes*

9. IG³IS-TRANSCOM Workshop and IG3IS Science Team Meeting, Paris, France, 2019

– *Estimations of terrestrial carbon cycle over South Korea from atmospheric CO₂ measurements from 1999 to 2017*

10. Chapman conference on understanding carbon climate feedbacks, San Diego, USA, 2019

– *Changes in terrestrial carbon cycle over South Korea derived from atmospheric CO₂ measurements from 1999 to 2017*

11. AGU Fall Meeting, Washington D.C., USA, 2018

– *Mechanism on the influence of winter precipitation on spring phenology in boreal forests*

12. IG³IS/TRANSCOM Workshop, Lund, Sweden, 2018

– *Contribution of terrestrial carbon budget to atmospheric CO₂ in South Korea*

13. Asian Conference on Meteorology (ACM) 2017, Busan, Korea, 2017

– *Influence of winter precipitation on spring phenology in boreal forests over the Northern Hemisphere*