

# Jaewon Joo

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## CONTACT DETAILS

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## PERSONAL DETAILS

Nationality: Korean (Republic of Korea)      Gender : Male      Date of Birth: 25th of June, 1984

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## EDUCATION AND PROFESSIONAL STATUS

Sep. 2013 – June 2017 **Peking University, China.**

Doctor of Engineering in Hydrology

Key Modules: hydrology, water resource management, surface water and groundwater modelling, flood risk assessment.

Thesis title: Simulation and Management of Flood Events Based on Integrated Surface Water and Groundwater Modelling.

May. 2010 – Feb. 2012 **Chungbuk National University, South Korea.**

M.S. in Hydrology and Water Resource Engineering

Key Modules: hydrology, water resources management, catchment hydrology, flood risk assessment, design flood.

Thesis title: Flood Risk Analysis of the Cultural Heritage in Buyeo.

Mar. 2003 – Feb. 2010 **Chungbuk National University, South Korea (Including Military service (2years and four month (July 2004-Nov. 2006)).**

B.S. in Civil Engineering

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## RESEARCH EXPERIENCE

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| April 2025-Present    | <b>AI based surface and groundwater modeling in urban forest area</b>  |
| Jan. 2024 – Present   | <b>Korea Carbon Project.</b>   |
| Nov. 2023 – Present   | <b>To develop the methane emission rate model and high-resolution methane inventory through the mobile methane measurement for the polluting power plants, and cooperate with the environmental organizations to strengthen regulations and raise social awareness related to methane emissions.</b> |
| Nov. 2022 – Oct. 2023 | <b>To develop the methane emission rate model and high-resolution methane inventory through the mobile methane measurement for the LNG power plants, and cooperate with the environmental organizations to strengthen regulations and raise social awareness related to methane emissions.</b>       |
| Oct. 2019 – Dec. 2023 | <b>Development of Flood and Drought Assessment System for Climate Change Adaptation at the Urban and Basin Scales</b>  |
| Apr. 2018 – Jun. 2019 | <b>Development of reliability evaluation system for greenhouse gas information and base study for WMO Pilot Project</b>  |
| Sep. 2013 – Jan. 2017 | <b>System Behaviors and Regulation of Ecohydrological Processes in the Middle</b>  |

**and Lower Heihe River Basin (Research Assistant):**

I supported data collection and data analyses during project

May. 2011 – July. 2013 **Revitalized Flood Estimation Method in Mid-small sized catchments, Korea (Research Assistant):**

I did model analysis (ReFH , HEC-HMS and RRMT(Rainfall Runoff Modeling Tool))

Mar. 2011 – Nov.2011 **Flood and Seismic Risk Assessment for Seoul Histories Areas (Research Assistant):**

I estimated and analyzed the catchment characteristics of the Changgyeong Palace basin and estimated the flood risk assessment models (ReFH and HEC-HMS).

Apr 2010 – Dec. 2011 **Operation of the Experimental Watersheds for Sediment and Deriving Vegetation Parameters in National Mountain Areas (Research Assistant):**

I gauged the rainfall events, outflow and the sediment and found the relationship between Rainfall Kinetic Energy (RKE) and the outflow/ sediment yield.

May 2010 – Dec. 2010 **Flood and Seismic Risk Assessment for Buyeo Historic Area (Research Assistant):**

I estimated the catchment characteristics of the Buyeo basin using the GIS program and estimated the probable maximum flood based on several rainfall scenarios using HEC-HMS. Moreover, I established the flood inundation map on GIS.

## **GREENHOUSE GAS MONITORING CAMPAIGN EXPERIENCE**

Jan. 2024 **Petrochemical: Observation Campaign for Monitoring Greenhouse Gases in the Daesan**

Campaign Lead & Mobile Greenhouse Gas Monitoring

Jan. 2022 **Seoul-Tokyo EM27/SUN Campaign:**

Mobile Greenhouse Gas Monitoring

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## **WORK EXPERIENCE**

Oct. 2019 – Present **Environmental Planning Institute (Seoul National University)**

Sep. 2017 – Aug. 2019 **School of Environmental Science and Engineering (Southern University of Science and Technology)**

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## **PUBLICATIONS & PRESENTATIONS**

### **Journal Paper**

Cho, Y., Jeong, S., Chang, D. Y., Lelieveld, J., Pozzer, A., Park, C. E., **Joo, J.**, & Park, C. R. (2024). Rising atmospheric levels of fine particulate matter reduce the degree of linear polarisation of light. *Communications Earth & Environment*, 5(1), 517.

**Joo, J.**, Jeong, S., Shin, J., & Chang, D. Y. (2024). Missing methane emissions from urban sewer networks. *Environmental Pollution*, 123101.

Park, C., Jeong, S., Kim, C., Shin, J., & **Joo, J.** (2023). Machine learning based estimation of urban on-road CO<sub>2</sub> concentration in Seoul. *Environmental Research*, 116256.

Chen, X., Jeong, S., Park, C. E., Park, H., **Joo, J.**, Chang, D., & Yun, J. (2022). Different responses of surface freeze and thaw phenology changes to warming among Arctic permafrost types. *Remote Sensing of Environment*, 272, 112956.

**Joo, J.**, & Tian, Y. (2021). Impact of Stream-Groundwater Interactions on Peak Streamflow in the Floods. *Hydrology*, 8(3), 141.

Yan, Y., Jeong, S., Park, C. E., Mueller, N. D., Piao, S., Park, H., **Joo, J.**, Chen, X., Wang, X., Liu, J., Zheng, C. (2021). Effects of extreme temperature on China's tea production. *Environmental Research Letters*.

Lee, A., Jeong, S., **Joo, J.**, Park, C. R., Kim, J., & Kim, S. (2021). Potential role of urban forest in removing PM<sub>2.5</sub>: A case study in Seoul by deep learning with satellite data. *Urban Climate*, 36, 100795.

**Joo, J.**, Jeong, S., Zheng, C., Park, C. E., Park, H., & Kim, H. (2020). Emergence of significant soil moisture depletion in the near future. *Environmental Research Letters*.

Chen, X., Jeong, S., Zheng, Y., Park, H., Park, C. E., **Joo, J.**, ... & Zheng, C. (2020). Evaluation of different roof materials for the mitigation of urban warming in a subtropical monsoon climate. *Journal of Geophysical Research: Atmospheres*, 125(14), e2019JD031972.

**Joo, J.**, Tian, Y., Zheng, C., Zheng, Y., Sun, Z., Zhang, A., Chang, H. (2018) "An Integrated Modeling Approach to Study the Surface Water-Groundwater Interactions and Influence of Temporal Damping Effects on the Hydrological Cycle in the Miho Catchment in South Korea". *Water*, Vol.10, No. 11, 1529.

**Joo, J.**, Zhang, A., Li, X., Zheng, C. (2017) "Hydrological responses to climate shifts for a minimally disturbed mountainous watershed in northwestern China", *Hydrological Sciences Journal*, Vol. 62, No. 9, pp. 1440-1455.

**Joo, J.**, Lee, H. (2014) "Flood Hazard Assessment on Cultural Heritage-Jungrimsa's Pagoda, Buyeo, Korea", *Disaster Advances*.

**Joo, J.**, Kjeldsen, T., Kim, H., Lee, H. (2013) "A comparison of two event-based flood models (ReFHrainfall runoff model and HEC-HMS) at Korean catchments, Bukil and Jeungpyeong", *Journal of Civil Engineering*, Vol. 62, No. 9, pp. 1440-1455.

**Joo, J.** and Loo, H. (2011) "Application of the FEH-ReFH at Jeungpyeong catchment", *Journal of the Institute of Construction Technology*, Vol.30, No.2, pp.161-168.

Lee, H., **Joo, J.**, Ko, A. (2010) "Application Study of Conceptual Rainfall Runoff Models in Chungbuk, Bocheonchun Basin", *Journal of the Institute of Construction Technology*, Vol. 29, No. 1, pp. 43-53.

## Conference Presentation

Jul. 2024 Mobile Monitoring of Fugitive Methane Emissions from Liquefied

Natural Gas (LNG)-Fired Power Plants in South Korea

Asia Oceania Geosciences Society

Jun. 2024 Significant methane emissions from manholes in urban areas

Asia Oceania Geosciences Society

Jun. 2024 CANIFFER Project: Intensive Greenhouse Gas Monitoring at the Daesan Petrochemical Complex in South Korea

Asia Oceania Geosciences Society

Dec. 2023 A non-negligible atmospheric methane emission in urban areas from sewers

American Geophysical Union, United states

Apr. 2023 Quantification of methane emissions from urban sewer network

European Geophysical Union, Austria

- Dec.2018 Analysis of the hydrological response of an integrated surface water and groundwater  
American Geophysical Union, United states
- Dec.2016 An Integrated Modeling Study of the Miho Catchment in Korea  
American Geophysical Union, United states
- Oct. 2011 Study of Conceptual Rainfall Runoff Models for Regionalization Study in the Mid-Small Size  
Catchment  
Korean Society of Civil Engineers, South Korea
- Sep. 2011 Estimation of the Reservoirs Flood Attenuation Index- Upper Geumgang Catchment Korean  
Society of Civil Engineers, South Korea
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