# Hyoseob Noh

*Curriculum Vitae*

*Department of Civil and Environmental Engineering*
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## Education

Sep. 2019 – Feb. 2024 : **PhD, Civil and Environmental Engineering**, *Seoul National University*, Advisor: Prof. Park, Yong Sung.
Sediment Load Estimation Based on Optimized Parameters and Clusters with Hydro-acoustic Backscatter

Sep. 2017 – Feb. 2019 : **Master of Engineering, Civil and Environmental Engineering**, *Seoul National University*, Advisor: Prof. Seo, Il Won.
Development of Empirical Equations and Estimation Method of Transient Storage Model Parameters for Solute Transport in Rivers

Mar. 2011 – Aug. 2017 : **Bachelor of Engineering, Civil Engineering**, *University of Seoul*.

## Work Experience

Jun. 2024 – Present : **Research Assistant Professor**, *Institute of Construction and Environmental Engineering, Seoul National University*.

Mar. 2024 – May 2024 : **Postdoctoral Reasearch Fellow**, *Institute of Construction and Environmental Engineering, Seoul National University*.

## Publications

### In Review

(submitted) Siyoon Kwon, **Noh, Hyoseob**, Il Won Seo, and Yun Ho Lee. Cctv-hyperspectral imaging for suspended sediment transport (hisst): A continuous day-and-night monitoring approach. ***Water Resources Research***, (submitted).

(in preparation) Donghwi Son, Jeseon Yoo, and **Noh, Hyoseob**. Prediction of significant wave height around the korean peninsula through combination of time-series decomposition and a spatio-temporal deep learning model. ***Applied Ocean Research***, (in preparation).

(accepted) **Noh, Hyoseob**, Il Won Seo, and Yong Sung Park. Assessment of bedload empirical equation applicability based on recent bedload meta-analysis data. ***Journal of Korean Water Resources Association***, (accepted).

(accepted) Minjae Lee, Yong Sung Park, **Noh, Hyoseob**, Byunguk Kim, and Seoungjun Baek. Estimation of roughness height on oyster reefs. ***Journal of Geophysical Research: Oceans***, (accepted).

### Journal Articles

2025 Byunguk Kim, Yong Sung Park, **Noh, Hyoseob**, and Minjae Lee. Improving accuracy of image-based depth inversion with an adaptive window optimization. *Coastal Engineering Journal*, volume 0, pages 1–13. Taylor & Francis, 2025, **( Impact Factor:1.9 (2023) )**, doi:https://doi.org/10.1080/21664250.2025.2469957.

2024 **Noh, Hyoseob**, Geunsoo Son, Dongsu Kim, and Yong Sung Park. H-adcp-based real-time sediment load monitoring system using support vector regression calibrated by global optimization technique and its applications. ***Advances in Water Resources***, volume 185, page 104636, 2024, **( Impact Factor:4.7 (2022) )**, doi:https://doi.org/10.1016/j.advwatres.2024.104636.

2024 **Noh, Hyoseob**, Siyoon Kwon, Yong Sung Park, and Seung-Buhm Woo. Application of rgb uav imagery to sea surface suspended sediment concentration monitoring in coastal construction site. ***Applied Ocean Research***, volume 145, page 103940, 2024, **( Impact Factor:4.3 (2023) )**, doi:https://doi.org/10.1016/j.apor.2024.103940.

2023 **Noh, Hyoseob**, Yong Sung Park, and Il Won Seo. A novel efficient method of estimating suspended-to-total sediment load fraction in natural rivers. ***Water Resources Research***, volume 59, page e2022WR034401, 2023, **( Impact Factor:5.4 (2022) )**, doi:https://doi.org/10.1029/2022WR034401.

2023 Siyoon Kwon, **Noh, Hyoseob**, Il Won Seo, and Yong Sung Park. Effects of spectral variability due to sediment and bottom characteristics on remote sensing for suspended sediment in shallow rivers. ***Science of The Total Environment***, volume 878, page 163125. Elsevier, 2023, **( Impact Factor:10.753 (2021) )**, doi:https://doi.org/10.1016/j.scitotenv.2023.163125.

2023 Byunguk Kim, **Noh, Hyoseob**, Yong Sung Park, and Minjae Lee. Non-spectral linear depth inversion using drone-acquired wave field imagery. ***Applied Ocean Research***, volume 138, page 103625, 2023, **( Impact Factor:4.3 (2023) )**, doi:https://doi.org/10.1016/j.apor.2023.103625.

2022 Siyoon Kwon, Jaehyun Shin, Il Won Seo, **Noh, Hyoseob**, Sung Hyun Jung, and Hojun You. Measurement of suspended sediment concentration in open channel flows based on hyperspectral imagery from uavs. ***Advances in Water Resources***, volume 159, page 104076. Elsevier, 2022, **( Impact Factor:5.361 (2021) )**, doi:https://doi.org/10.1016/j.advwatres.2021.104076.

2022 Siyoon Kwon, Il Won Seo, **Noh, Hyoseob**, and Byunguk Kim. Hyperspectral retrievals of suspended sediment using cluster-based machine learning regression in shallow waters. ***Science of The Total Environment***, volume 833, page 155168. Elsevier, 2022, **( Impact Factor:10.753 (2021) )**, doi:https://doi.org/10.1016/j.scitotenv.2022.155168.

2022 Byunguk Kim, Siyoon Kwon, **Noh, Hyoseob**, and Il Won Seo. Surrogate prediction of the breakthrough curve of solute transport in rivers using its reach length dependence. ***Journal of Contaminant Hydrology***, page 104024. Elsevier, 2022, **( Impact Factor:4.184 (2021) )**, doi:https://doi.org/10.1016/j.jconhyd.2022.104024.

2021 **Noh, Hyoseob**, Yong Sung Park, and Minjae Lee. Regional classification of total suspended matter in coastal areas of south korea. ***Estuarine, Coastal and Shelf Science***, volume 254, page 107339. Elsevier, 2021, **( Impact Factor:3.229 (2021) )**, doi:https://doi.org/10.1016/j.ecss.2021.107339.

2021 Siyoon Kwon, **Noh, Hyoseob**, Il Won Seo, Sung Hyun Jung, and Donghae Baek. Identification framework of contaminant spill in rivers using machine learning with breakthrough curve analysis. ***International Journal of Environmental Research and Public Health***, volume 18, page 1023. MDPI, 2021, **( Impact Factor:4.614 (2021) )**, doi:https://doi.org/10.3390/ijerph18031023.

2020 **Noh, Hyoseob**, Siyoon Kwon, Il Won Seo, Donghae Baek, and Sung Hyun Jung. Multi-gene genetic programming regression model for prediction of transient storage model parameters in natural rivers. ***Water***, volume 13, page 76. MDPI, 2020, **( Impact Factor:3.530 (2021) )**, doi:https://doi.org/10.3390/w13010076.

### KCI Journal Articles

2025 **Noh, Hyoseob**, Byunguk Kim, Yong Sung Park, and Minjae Lee. Enhancing efficiency while maintaining accuracy in repeated coastal drone monitoring through the use of fixed structures as ground control points. ***Journal of Korean Society of Coastal and Ocean Engineers***, volume 37, pages 1–14. Korean Society of Coastal and Ocean Engineers, 2025, doi:https://doi.org/10.9765/KSCOE.2025.37.1.1.

2024 Byunguk Kim, **Noh, Hyoseob**, jun Song Kim, and Il Won Seo. A review of transient storage modeling for analyzing one-dimensional non-fickian solute transport in rivers. journal of korea water resources association. ***Journal of Korea Water Resources Association***, volume 57, pages 263–276. Korea Water Resources Association, 2024, doi:https://doi.org/10.3741/JKWRA.2024.57.4.263.

2023 **Noh, Hyoseob**, GeunSoo Son, Dongsu Kim, and Yong Sung Park. A svr based-pseudo modified einstein procedure incorporating h-adcp model for real-time total sediment discharge monitoring. ***KSCE Journal of Civil and Environmental Engineering Research***, volume 43, pages 321–335. Korean Society of Civil Engineers, 2023, doi:https://doi.org/10.12652/Ksce.2023.43.3.0321.

2023 **Noh, Hyoseob**, Byunguk Kim, Minjae Lee, Yong Sung Park, Ki Young Bang, and Hojun Yoo. Survey of coastal topography using images from a single uav. ***Journal of Korea Water Resources Association***, volume 56. Korea Water Resources Association, 2023, doi:https://doi.org/10.3741/JKWRA.2023.56.S-1.1027.

2022 **Noh, Hyoseob**, GeunSoo Son, Dongsu Kim, and Yong Sung Park. Clustering of sediment characteristics in south korean rivers and its expanded application strategy to h-adcp based suspended sediment concentration monitoring technique. ***Journal of Korea Water Resources Association***, volume 55, pages 43–57. Korea Water Resources Association, 2022, doi:https://doi.org/10.3741/JKWRA.2022.55.1.43.

2021 **Noh, Hyoseob** and Yong Sung Park. Identification of shear layer at river confluence using (rgb) aerial imagery. ***Journal of Korea Water Resources Associatio***n, volume 54, pages 553–566. Korea Water Resources Association, 2021, doi:https://doi.org/10.3741/JKWRA.2021.54.8.553.

2019 **Noh, Hyoseob**, Donghae Baek, and Il Won Seo. Analysis of the applicability of parameter estimation methods for a transient storage model. ***Journal of Korea Water Resources Association***, volume 52, pages 681–695. Korea Water Resources Association, 2019, doi:https://doi.org/10.3741/JKWRA.2019.52.10.681.

### In Conference Proceedings

2023 **Noh, Hyoseob**, Gensoo Son, Dongsu Kim, and Yong Sung Park. Importance of bedload sediment supply in the riverine sediment supply revealed from a real-time total load monitoring using horizontal-adcp and the support vector regression. In *The Proceedings of the Coastal Sediments 2023 In 5 Volumes*, pages 1801–1808. World Scientific, 2023. Coastal Sediments 2023, New Orleans, LA, USA, 11 – 15 April 2023.

2021 **Noh, Hyoseob** and Yong Sung Park. Confluence shear layer feature extraction method using rgb aerial imagery. In *Proceedings of the Korea Water Resources Association Conference*, pages 277–277. Korea Water Resources Association, 2021.

2020 **Noh, Hyoseob**, Yong Sung Park, and Minjae Lee. Coastal area classification using total suspended matter concentration. In *1st IAHR Young Professionals Congress*, pages 108–109. International Association for Hydro-Environment Engineering and Research, 2020. The 1st IAHR Young Professionals Congress 17-18 November 2020.

2020 Siyoon Kwon, Il Won Seo, and **Noh, Hyoseob**. Identification of contaminant source using truncated breakthrough curves in rivers. In *1st IAHR Young Professionals Congress*, pages 40–41. International Association for Hydro-Environment Engineering and Research, 2020. The 1st IAHR Young Professionals Congress 17-18 November 2020.

2019 Siyoon Kwon, Il Won Seo, and **Noh, Hyoseob**. Characterizations of the breakthrough curve to identify pollution sources with storage zone effect in natural streams. In *E-proceedings of the 38th IAHR World Congress*, pages 161–166. International Association for Hydro-Environment Engineering and Research, 2019. The 38th IAHR World Congress September 1-6, 2019, Panama City, Panama.

2018 Jaehyun Shin, Il Won Seo, and **Noh, Hyoseob**. Two-dimensional flow analysis model incorporating secondary current effects in meandering channels. In *Proceedings of the Korea Water Resources Association Conference*, pages 140–140. Korea Water Resources Association, 2018.

## Teaching

### Seoul National University

2025-Spring ***Advanced Engineering Mathematics I***.
F31.201-004

## Research Projects

### Ongoing

May 2024 – Apr. 2029 ***Development of a River Hydraulics-Based Sediment and Bed level Change Analysis Framework through Optimization of Multi-source Data***, *다중 소스 데이터 최적화를 통한 하천수리학 기반 유사 및 하상변동 분석 프레임워크 개발*.
Funding: Ministry of Science and ICT

Role: **PI**, Development of a River Hydraulics-Based Sediment and Bed level Change Analysis Framework through Optimization of Multi-source Data

Apr. 2024 – Dec. 2027 ***Continuous Automated Measurement Technology: Development for River Sediment Discharge using Acoustic and Optical Sensors***, *초음파 및 광학기반 하천 유사량 연속 자동 측정 기술개발* .
Funding: Ministry of Environment

Role: **Researcher**, Development of a framework for total sediment load estimation utilizing CCTV-derived suspended sediment concentration data

Key Output: Empirical equations for bedload and $F_{sus}$; Hyperspectral CCTV-driven total load estimation framework

Apr. 2023 – Dec. 2026 ***Cyclic Adaptive Coastal Erosion Management Technology Development***, *순환적응형 연안침식 관리기술 개발* .
Funding: Ministry of Oceans and Fisheries

Role: **Researcher**, Development of methods for monitoring coastal processes, including bathymetry and waves, using drones; South Korean littoral cell classification

Key Output: RGB drone-based coastal process monitoring algorithms (depth, wave, current); South Korean littoral cells

### Completed

May 2024 – Nov. 2024 ***An Investigation on Suspended Sediment Characteristics in the Geum River Basin – Monitoring of Suspended Sediment in Mainstream and Tributaries for Evaluating Fluvial Processes*** , *금강수계 부유사 발생특성 조사 연구–퇴적환경 변화 파악을 위한 본류 및 지천 부유사 모니터링*.
Funding: National Institute of Environmental Research

***An Investigation on Suspended Sediment Characteristics in the Geum River Basin – Quantitative Assessment of Tributary Contributions to Suspended Sediment Load Using a Watershed Model*** , *금강수계 부유사 발생특성 조사 연구–유역 모델을 활용한 유입 지천별 부유사 퇴적 기여율 산정*.
Funding: National Institute of Environmental Research

May 2023 – Apr. 2024 ***An Investigation on Fluvial Processes of Large Rivers in South Korea*** , *국가하천 퇴적환경 변화조사*.
Funding: National Institute of Environmental Research

Role: **Researcher**, Acquisition of field monitoring data through drone- and boat-mounted sensor systems

Jan. 2023 – Dec. 2023 ***Gyeonggi-Incheon Sea Grant*** , *2023년 경기인천씨그랜트 사업.*
Funding: Ministry of Oceans and Fisheries

Role: **Researcher**, Development of a drone-based algorithm for nearshore bathymetry monitoring and the acquisition of field monitoring data

Key Output: RGB drone-based suspended sediment concentration monitoring method in the coastal construction field

May 2022 – Dec. 2022 ***Development of beach monitoring and diagnosis technology using drone image based on AI cognitive technology*** , *드론 영상 AI 인지 기술 기반 해수욕장 모니터링 및 진단 기술 개발.*
Funding: Ministry of SMEs and Startup

Role: **Researcher**, Development of a drone-based algorithm for integrated nearshore bathymetry monitoring (land and underwater) and acquisition of field monitoring data

Key Output: RGB-drone-based land and underwater integrated bathymetry monitoring framework

Jun. 2020 – Feb. 2023 ***Experimental and Field Study on the Transport of Microplastics in coastal Sediment*** , *해안 유사 내 미세플라스틱의 거동에 관한 실험 및 현장 관측 연구* .
Funding: National Research Foundation of Korea

Role: **Researcher**, Field campaigns and laboratory experiment

May 2022 – Dec. 2022 ***Development of River Sediment Discharge Mearsurement Technique using Acoustic Sensors*** , *초음파센서를 이용한 하천 유사량 조사기술 개발.*
Funding: Ministry of Environment

Role: **Researcher**, Development of an H-ADCP-based real-time framework for suspended and total sediment load estimation, including ungauged monitoring stations, using machine learning techniques

Key Output: H-ADCP-based realtime total sediment monitoring framework

Jun. 2019 – Dec. 2022 ***Development of a drone platform for river management, and water quality prediction Software*** , *하천조사 및 모니터링 특화 드론 플랫폼 기반 하천관리 기술 개발.*
Funding: Ministry of Environment, and Ministry of Land, Infrastructure and Transport

Role: **Researcher**, Development of a framework for total sediment load estimation utilizing hyperspectral drone-derived suspended sediment concentration data

Key Output: Empirical equations for suspended-to-total sediment load ratio ($F_{sus}$)

Jun. 2018 – Dec. 2020 ***Development of Mobile-based Technology for Tracing and Back-tracking of Hazardous Chemicals in the Water Environment*** , *모바일 기반 수환경 유출 유해화학물질 추적 및 발생원 역추적 기술 개발.*
Funding: Ministry of Environment

Role: **Researcher**, Development of empirical equations to estimate the key parameters of a transient storage model for solute mixing in rivers, using machine learning techniques

Key Output: TSM-SC-SAHEL (inverse modeling algorithm), TSM parameter estimation equations

## Fellowships & Awards

### Fellowships

2024-2029 (**National Research Foundation of Korea (NRF)**), **Sejong Science Fellowship (5 years, KWR 600,000,000)**

Project : Development of a River Hydraulics-Based Sediment and Bed level Change Analysis Framework through Optimization of Multi-source Data

### Awards

2025 The Korea Water Resources Association (**KWRA**) 2024 **Dissertation Award**

2022 The Korean Association of Ocean Science and Technology Societies (**KAOSTS**) 2022 **Future Marine Science and Technology Award**

2022 The Korean Association of Ocean Science and Technology Societies (**KAOSTS**) 2021 **Academic Presentation Excellent Paper Award**

2020 Seoul National University Smart City Competition Encouragement Prize

## Patents

### Korea Patent

4 Yong Sung Park, and **Noh, Hyoseob**. Device and method for simultaneous determination of optimal input variables and hyperparameters of support vector regression. Korea Patent, filed December 06, 2024 (10-2024-0180918).; 서포트 벡터 회귀의 최적 입력변수 및 초매개변수 동시 결정 장치 및 방법

3 Yong Sung Park, **Noh, Hyoseob**, Kim, Byunguk, and Lee, Minjae. Method for Surveying Nearshore Bathymetry using Drone Imagery. Korea Patent, filed May 22, 2024 (10-2024-0066370).; 드론영상을 이용한 근해의 해저지형 조사 방법

2 Yong Sung Park, **Noh, Hyoseob**, and Il Won Seo. METHOD AND APPARATUS FOR ANALYZING RIVER CONFLUENCE SHAER LAYER USING RGB IMAGES. Korea Patent, filed January 25, 2022 (10-2022-0010628), issued May 5, 2024 (10-2665566-0000).; RGB 영상을 이용한 하천의 합류부 전단층 해석 장치 및 방법

1 Il Won Seo, Byunguk, Kim, Siyoon Kwon, and **Noh, Hyoseob**. Method and Device for Predicting Time-Concentration Curves using Its Reach-Length Dependence. Korea Patent, filed October 7, 2022 (10-2022-0129022), issued December 12, 2023 (10-2614520-0000).; 유하거리-농도곡선 상관성 기반 물질혼합 예측 방법 및 장치

## Computer programming libraries

pyGOSH Python library for Global Optmization and SHallow machine learning. URL: `https://github.com/hyoddubi1/pyGOSH`; doi: `https://doi.org/10.5281/zenodo.8198535`

Fsus-models Python scripts of the derived Fsus estimation models from "A novel efficient method of estimating suspended total1 sediment load fraction in natural rivers" URL: `https://github.com/hyoddubi1/Fsus-sediment-fraction-models`; doi: `https://doi.org/10.5281/zenodo.7707130`

## Skills

Programming Languages Python, PyTorch, MatLab, C++

Languages Korean, English

Instruments ADCPs and ADVs (Sontek, Nortek), RTK-GPS (Sokkia GRX2), LISST-200X, Sediment Samplers (Suspended, bedload, bed material), Drones (DJI Mavic 2 Pro, DJI Phantom 4 RTK, DJI M600), hyperspectral camera (Corning SHARK 410)