HOONSHIN JUNG, MS

Research Hydraulics – Water Quality Scientist

Hoonshin (Hoon) Jung has more than 15 years of experience in computer modeling of coastal, estuarine, and riverine systems. His work includes projects related to hydrodynamic, sediment transport, thermal mixing and dispersion, and water quality modeling in river and coastal zones.

Prior to joining The Water Institute, Hoon worked as a researcher at Jackson State University in Mississippi, where he helped develop natural disaster forecasting and response systems, including a storm-surge forecast project funded by the Department of Homeland Security.

Hoon earned master's degrees in physical oceanography from Inha University in South Korea and in civil engineering from Louisiana State University.

PROFESSIONAL EXPERIENCE

2016–Present: Research Scientist: Hydraulics–Water Quality, The Water Institute

2012–2016: Research Associate, The Water Institute

2009–2012: Research Associate, Center of Excellence—Center for Analysis and Response to Coastal Hazards

2007–2008: Graduate Assistant, Department of Civil and Environmental Engineering

2003–2006: Graduate Assistant, Department of Marine Sciences

ORGANIZATION ROLE

Research Hydraulics – Water Quality Scientist

PROJECT ROLE / FOCUS AREAS

Hydraulics

Water quality

Coastal hydrodynamics

EDUCATION

MS, Civil Engineering, Louisiana State University, 2008

MS, Oceanography, Inha University, 1998

BS, Oceanography, Inha University, 1996

PROFESSIONAL MEMBERSHIP

American Geophysical Union (AGU)

SELECTED PROJECTS

Developing a harmful algal bloom threat index to assess risks to marine organisms, human health, and economic well-being of shellfish and fish industries. *BTNEP. (2022–2024)*. Role: Designed training dataset for ML and trained ML model. Developed the model using machine learning (ML) to predict harmful algal bloom threat index.

Partnership of our Working Coast: Advancing Coastal Habitat Assessment. *Chevron. (2022–2023).* Role: Trained and validated the model. Analyzed vegetation and abiotic data (i.e., water elevation, salinity, temperature, etc.) from CRMS. Constructed dataset for ML model training.

Refining the Analytical Approach that Louisiana Uses to Estimate Coastal Wetland Greenhouse Gas Fluxes. *CPRA. (2022–2023).* Role: Conducted sensitivity tests for assumptions and uncertainties used in the coastal carbon assessment. Reviewed and evaluated assumptions, methodology, and parameters used for blue carbon assessment in RESTORE Council-funded study coastal.

Mid-Breton Sediment Diversion – Environmental Impact Statement (EIS) support and evaluation of diversion operation, *CPRA (2019–Present).* Role: Conducted model simulations (water quality and vegetation) and analyzed the model results. Large numerical modeling project (~1 million CPU hours) to assess impacts of the planned Mid-Breton Sediment Diversion in southeast Louisiana on geomorphology, salinity, flooding, and water quality in the receiving area as well as the Mississippi River).

Partnership of our Working Coast Phase II, Port Fourchon, Louisiana. *Partnership of our Working Coast. (2020–2022).* Role: Developed the model framework (water quality and vegetation) and analyzed the model results. Estimated vegetation species distribution on future conditions and evaluated the co-benefits of the placement of dredged material for created wetlands, including carbon capture in wetland soils. Developed the wetland carbon model to assess carbon sequestration in wetlands built with dredged material.

SELECTED PUBLICATIONS

1. Liu, B.; Sevick, T.; Jung, H.; Kiskaddon, E.; Carruthers, T. (2023) Quantifying the Potential Contribution of Submerged Aquatic Vegetation to Coastal Carbon Capture in a Delta System from Field and Landsat 8/9-Operational Land Imager (OLI) Data with Deep Convolutional Neural Network. Remote Sens.

2. Jung, H.; Nuttle,W.; Baustian, M.M.; Carruthers, T. (2023). Influence of Increased Freshwater Inflow on Nitrogen and Phosphorus Budgets in a Dynamic Subtropical Estuary, Barataria Basin, Louisiana. Water.

3. Melissa M. Baustian, Hoonshin Jung, Harris C. Bienn, Monica Barra, Scott A. Hemmerling, Yushi Wang, Eric White, Ehab Meselhe (2020). Engaging coastal community members about natural and nature-based solutions to assess their ecosystem function. Ecological Engineering.

4. Ehab Meselhe, Yushi Wang, Eric White, Hoonshin Jung, Melissa M. Baustian, Scott Hemmerling, Monica Barra, and Harris Bienn (2020). Knowledge-Based Predictive Tools to Assess Effectiveness of Natural and Natural-Based Solutions for Coastal Restoration and Protection Planning. Journal of Hydrodynamic Engineering, 146(2): 05019007.

5. Melissa Baustian, Ehab Meselhe, Hoonshin Jung, Kazi Sadid, Scott Duke-Sylvester, Jenneke Visser, Mead Allison, Leland Moss, Cyndhia, Ramatchandirane, Bas van Maren, Michel Jeuken, Sibel Bargu (2018). Development of an integrated biophysical model to represent morphological and ecological processes in a changing deltaic and coastal ecosystem, Environmental Modelling & Software.

6. Park, K., Powers, S.P., Bosarge, G.S., & Jung, H.-S. (2014). Plugging the leak: Barrier island restoration following Hurricane Katrina enhances larval retention and improves salinity regime for oysters in Mobile Bay, Alabama, Marine Environmental Research, 94:48–55.

7. Jung, H.-S. & Deng, Z.-Q. (2010). Modeling of nitrogen retention in Amite River. Water, Air, & Soil Pollution.