HOONSHIN JUNG, M.Sc.

Company Role
Research Scientist: Hydraulics-Water Quality

Project Role / Focus Areas
- Hydraulics
- Water Quality
- Coastal Hydrodynamics

Education
- M.S. – Civil Engineering, Louisiana State University, 2008
- M.S. – Oceanography, Inha University, 1998
- B.S. – Oceanography, Inha University, 1996

Registration / Certification
- N/A

Professional Membership
- American Geophysical Union (AGU)

Experience Profile

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 of the Gulf, Jung 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.

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

Professional Experience

The Water Institute of the Gulf   2016-Present
- *Research Scientist: Hydraulics-Water Quality*

The Water Institute of the Gulf   2012-2016
- *Research Associate*

Center of Excellence- Center for Analysis and Response to Coastal Hazards   2009-2012
- *Research Associate*

Department of Civil and Environmental Engineering   2007-2008
- *Graduate Assistant*

Department of Marine Sciences   2003-2006
- *Graduate Assistant*

Recent Projects

Ecosystem Model Runs for Mid-Breton Scenarios (EIS) (Nov. 2021-current)
Role: developed Habitat Suitability Index (HSI) automation script to prepare HSI input parameters and calculate HSI, analyzed the model results.
The HSI for 10 aquatic species (blue crab, brown shrimp, white shrimp, Gulf menhaden, spotted seatrout, largemouth bass, bay anchovy, Atlantic croaker, southern flounder, and eastern oyster) and 4 terrestrial species (green wing teal, mottled duck, America alligator, and gadwall) using model outputs under different diversion operations from Basin-wide Model Version 4, which is developed under the Mississippi River Hydro and Delta Management (MRHDM) and other related projects.

Recent Projects (cont.)

Partnership of our Working Coast Phase II, Port Fourchon, Louisiana (2020-current).
Role: Developing the model framework (water quality and vegetation) and analyzed the model results.
In order to evaluate the co-benefits of the placement of dredged material for created wetlands, including carbon capture in wetland soils, an integrated model framework is being developed using the Delft3D-Flexible Mesh suite that takes into account the interaction among hydro-, morpho-, and vegetation dynamics. In particular, the wetland carbon model was developed to assess carbon sequestration in wetlands built with dredged material.

Delft3D Basin-wide model 50-year Production Runs to support Mid-Breton Environmental Impact Statement (EIS) and for Evaluation of Diversion Operations (2020-current)
Role: Conducted the model simulations (water quality and vegetation) and analyzed the model results.
Evaluated and analyzed the impact of the Mid-Breton Sediment Diversion operation on water quality and vegetation in the receiving basin using the Basin-wide integrated biophysical Delft3D model developed under the Mississippi River Hydro and Delta Management (MRHDM) and other related projects.

Selected Publications

1. 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, https://doi.org/10.1016/j.ecoena.2019.100015.
2. Ehab Meselhe, Yushi Wang, Eric White, **Hoonshin Jung**, Melissa M. Baustian, Scott Hemmerling, Monica Barra, and Harris Bienn (2020). Knowledge-Based Predictive Tools to Asses Effectiveness of Natural and Natural-Based Solutions for Coastal Restoration and Protection Planning. Journal of Hydrodynamic Engineering, 146(2): 05019007.
3. Scott Hemmerling, Monica Barra, Harris C. Bienn, Melissa M. Baustian, **Hoonshin Jung**, Ehab Meselhe, Yushi Wang, Eric White (2019). Elevating local knowledge through participatory modeling: active community engagement in restoration planning in coastal Louisiana, Journal of Geographical Systems.
4. 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.
5. 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.
6. Das, H.S. & **Jung, H.-S**. (2013). An efficient tool to assess risk of storm surge using data mining. Costal Hazards, American Society of Civil Engineers.
7. Deng, Z.-Q., **Jung, H.-S.,** & Ghimire, B. (2010). Effect of channel size on solute residence time distribution in rivers. Advances in Water Resources, DOI: 10.1016/j.advwatres.2010.06.016.
8. **Jung, H.-S**. & Deng, Z.-Q. (2010). Modeling of nitrogen retention in Amite River. Water, Air, & Soil Pollution, DOI:10.1007/s11270-010-0487-9.
9. Deng, Z.-Q. & **Jung, H.-S**. (2009). Variable Residence Time Based Model for Solute Transport in Streams. Water Resources Research, 45, W03415, doi:10.1029/2008WR007000.
10. Deng, Z.-Q. & **Jung, H.-S.** (2009). Scaling dispersion model for pollutant transport in river. Environmental Modeling & Software, 24:627-631.
11. Deng, Z.-Q., Lima, J., & **Jung, H.-S.** (2008). Sediment transport rate-based model for rainfall-induced soil erosion. Catena, 76:54-62.
12. Park, K., **Jung, H.-S**., Kim, H.-S., & Ahn, S.M. (2005). Three-dimensional hydrodynamic-eutrophication model (HEM-3D): Application to Kwang-Yang Bay, Korea. Marine Environmental Research, 60(2), 171-193.

Presentations

1. **Hoonshin Jung**, Melissa M. Baustian, Tim Carruthers, and William Nuttle, Modeling the changes in nutrients and phytoplankton dynamics from large-scale coastal restoration in Louisiana, USA, Coastal & Estuarine Research Federation (CERF) Biennial Conference, 2021
2. **Hoonshin Jung**, Melissa M. Baustian, and Tim Carruthers, Evaluation of Potential Impacts of Nutrients and Primary Production in the Barataria Basin in Response to Proposed the Mid-Barataria Sediment Diversion, State of the Coast, 2021