



**COLLEGE OF ENGINEERING  
AND COMPUTER SCIENCE**  
FLORIDA ATLANTIC UNIVERSITY

Announces the Ph.D. Dissertation Defense of

## **Rahul Dev Raju**

for the degree of Doctor of Philosophy (Ph.D.)

### **“Experimental Investigation on Wave Breaking and Transmission in Submerged Artificial Reefs”**

**June 21, 2023, 11:30 a.m.**  
**Engineering West Building, Room 187**  
**777 Glades Road**  
**Boca Raton, FL**

**DEPARTMENT:**

Ocean and Mechanical Engineering

**ADVISOR:**

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**PH.D. SUPERVISORY COMMITTEE:**

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**ABSTRACT OF DISSERTATION**

**Experimental Investigation on Wave Breaking and Transmission in Submerged Artificial Reefs**

Artificial reefs are coastal structures built to improve marine life and prevent beach erosion. During earlier days artificial reefs were constructed for recreational fishing using discarded scraps and waste materials. Later on, ships were scuttled for constructing artificial reefs. The artificial reefs used for coastal protection are usually in submerged condition as this condition does not affect the aesthetic beauty of the beach. Artificial reefs dissipate the energy of the wave by causing the wave to break over the reef. The efficiency of submerged detached coastal protection structures in protecting the beach is usually measured in terms of wave transmission coefficient. The experimental investigation in the present study is carried out for submerged two-dimensional impermeable and permeable reefs for different water depths. The permeable artificial reefs are made up of oyster shells in biodegradable and non-biodegradable bags. The wave transmission coefficient is calculated for submerged impermeable and permeable reefs for different water levels and reef crest widths. Based on the results of the present studies, it is logical to conclude that both submerged impermeable and permeable artificial reefs contribute to a significant extent to the attenuation of the incident wave

**BIOGRAPHICAL SKETCH**

Born in Kerala, India

Bachelor of Technology, Kerala University, Kerala, India, 2013

Master of Technology, Indian Institute of Technology Madras, Tamil Nadu, India, 2016

Ph.D., Florida Atlantic University, Boca Raton, Florida, 2023

**CONCERNING PERIOD OF PREPARATION  
& QUALIFYING EXAMINATION**

**Time in Preparation:** 2018 - 2023

**Qualifying Examination Passed:** Fall 2018

**Published Papers:**

**Papers in the area of coastal protection.**

1. Raju, R. D., Arockiasamy, M., Sundaravadivelu, R., & Selvaraj, S. P. N. (2020, August). Numerical Investigation on Wave Transmission by a

Submerged Reef Using MIKE 3 WAVE FM. In International Conference on Offshore Mechanics and Arctic Engineering (Vol. 84379, p. V06AT06A001). American Society of Mechanical Engineers.

2. Raju, R. D., & Arockiasamy, M. (2022). Coastal protection using integration of mangroves with floating barges: An innovative concept. *Journal of Marine Science and Engineering*, 10(5), 612.

3. Raju, R. D., & Arockiasamy, M. (2023), Experimental Investigation on Wave Transmission by Submerged Artificial Reef made up of Oyster Shells in Biodegradable Mesh Bags. *Journal of Coastal Research* (Submitted).

**Papers in the related subject areas.**

1. Arvan, P. A., Raju, R. D., & Arockiasamy, M. (2023). Offshore Wind Turbine Monopile Foundation Systems in Multilayered Soil Strata under Aerodynamic and Hydrodynamic Loads: State-of-the-Art Review. *Practice Periodical on Structural Design and Construction*, 28(3), 03123001.

2. Raju, R. D., Nagarajan, S., Arockiasamy, M., & Castillo, S. (2022). Feasibility of Using Green Laser in Monitoring Local Scour around Bridge Pier. *Geomatics*, 2(3), 355-369.

3. Raju, R. D., Nagarajan, S., Arockiasamy, M., & Castillo, S. (2023). Feasibility of Using Green Laser for Underwater Infrastructure Monitoring: Case Studies in South Florida. *Geomatics* (Under review)