Research Project Details for Graduate Research Assistant (GRA) Recruitment

Research Project Title

CoastHAB-Alert: Early Warning System for Harmful Algal Bloom and Coastal Water Quality Risk in Malaysian Aquaculture Zones

Programme Name

Master of Science in Marine Science (Research Mode)
Scope: Aquaculture GIS/Coastal Water Quality Modelling

Details of Primary Supervisor

1. Name: Dr. Syazwani Mohd Yusop
2. Department and University: China-ASEAN College of Marine Sciences (CAMS), Xiamen University Malaysia
3. Email address: syazwani.mohdyusop@xmu.edu.my
4. Research interests: Remote Sensing and GIS, marine resources and environmental modelling

Details of Research Project

1. Duration: 2 years
2. Monthly allowance: RM2,500/month
3. Summary: CoastHAB-Alert is an integrated early warning system for harmful algal blooms (HABs) and coastal water-quality risk in selected aquaculture zones of Peninsular Malaysia. The project combines satellite remote sensing, weather and oceanographic data and farm-level in-situ measurements to develop a site-specific risk index and machine-learning forecasts with 3–14-day lead times. Random Forest and XGBoost will be used to generate spatial risk maps and site-level warnings. A cloud-based proof-of-concept dashboard and automated alert system will then be developed, pilot-tested, field-validated and refined with user feedback to support climate-resilient aquaculture management.
4. Skills/techniques development: The project will cover satellite remote sensing data acquisition and processing; GIS and spatial analysis; harmful algae bloom (HAB) and coastal water-quality assessment; field sampling and in-situ sensor data handling; multi-source data integration and database development; machine learning workflows (Random Forest and XGBoost); feature engineering, spatio-temporal forecasting, model evaluation and explainability; spatial risk mapping; and cloud-based dashboard/alert-system development. The GRA will also gain experience in scientific data management, technical reporting, SOP/guideline preparation, research publication and stakeholder engagement.

5. Location: Xiamen University Malaysia and field work at selected aquaculture site (pilot site) in Klang, Selangor.

GRA Requirements:

Number of Master places available: 1

1. The candidate must be enrolled in CAMS, XMUM - Master of Science in Marine Science (Research Mode). Research scope: Aquaculture GIS/coastal water quality modelling.
2. Preferred background: Marine Science, Environmental Science, Remote Sensing/GIS, Geoinformatics, Data Science or a related discipline.
3. Interest in HABs, coastal water quality, aquaculture, satellite remote sensing, GIS and environmental modelling.
4. GIS/remote sensing and quantitative data analysis experience is desirable; Python/R and machine learning experience is an advantage.
5. Willingness to participate in fieldwork and water quality monitoring at selected aquaculture site.
6. Good data management, scientific writing, communication and teamwork skills.