

# AQUAM

## ENVIRONMENT MONITORING SYSTEM FOR MANGROVE AQUACULTURE

### IN CA MAU

Funding granted: AUD 500,623

## CONTEXT

Mangrove aquaculture systems provide multiple products and ecosystem services such as support of fisheries, biodiversity, carbon sequestration, coastal protection and resilience to climate change. Mangrove aquaculture systems are considered to be more sustainable than other forms of aquaculture. The health of the mangrove and the health and productivity of aquatic species are linked, which helps maintain long-term production capacity and high productivity.

Mangrove aquaculture is heavily dependent on the influx of high quality natural tidal water. If tidal water is polluted, low in oxygen, infected or affected by salinity changes due to heavy rains or drought then this poses risks to both aquatic species and mangrove trees. Therefore, monitoring of water quality is critical to support farmers decision making on what species to culture and when to exchange water within aquaculture ponds. This is especially important in the Mekong Delta where water pollution due to upstream agricultural production, intensive aquaculture, industrial production and domestic waste is becoming more severe. Sustaining mangrove aquaculture supports resilient communities in the Mekong Delta.

## SOLUTION

This project will develop an environmental monitoring system that includes a suite of mangrove-aquaculture health indicators, which will guide sustainable management of mangrove-aquaculture. This project will enable monitoring and reporting of water quality, mangrove change and aquaculture in Ca Mau province, Vietnam, through integration of wireless environmental monitoring stations (AQUAM stations) at critical water points in conjunction with real-time automated mangrove change detection using remote sensing images.

## KEY ACTIVITIES

1. Design, production, installation and operation of 15 wireless aquatic environmental monitoring stations (AQUAM stations) at key water points for mangrove-aquaculture in Ca Mau Province;
2. Upgrading and tailoring automated mangrove change detection for Ca Mau province using Sentinel 1 and 2 images using the Google Earth Engine, Google Deep learning TensorFlow and low cost Google cloud platform;
3. Upgrade of the Geosurvey software as new app, AQUAM software, for reporting changes in mangroves and water environment and which allows farmers and technicians to report environmental hazards and fluctuations in real-time;
4. Integrate and process all monitoring information including automatic satellite image interpretation into the AQUAM app system, update of monitoring Geosurvey software and production of intuitive and easy-to-use environmental reports for all stakeholders.

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