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Mini-ROVs improving aquaculture operations

Kiara Vallier

Deep Trekker Inc., Canada

Background: Aquaculture operations involve a number of tasks being handled on a daily basis to ensure farm integrity. These tasks include but are not limited to net inspections, mort retrieval, size grading, and fish monitoring. The proposed presentation offers a case study analysis of the use of Deep Trekker mini-ROVs to perform daily inspection tasks at Canadian salmon aquaculture sites.

Reason: Salmon farms require divers to perform tasks and inspections but associated costs can be high. Mini-ROVs are revolutionizing the way that managers go about their daily operations without hiring divers until there is a true need to have hands below the water. Mini-ROVs are able to perform net inspections, observe fish behaviour and bridge the knowledge gap between employees and what takes place below the surface while simultaneously recording the footage.

Cases: The case studies include 2 major aquaculture companies; Marine Harvest and Agrimarine to demonstrate the ways that a mini-ROV can improve operation efficiency and reduce costs.

Conclusions: Findings suggest that the use of mini-ROVs have significantly reduced farm managers' needs to hire dive teams. With their ROVs, Agrimarine and Marine Harvest can perform daily inspections and ensure that there's an issue before calling in divers. If infrastructure integrity is compromised, the faster a problem is identified the sooner it can be fixed, improving efficiency and reducing loss. Mini-ROVs can be deployed immediately, eliminating the need to call divers and wait for them to arrive. In cases where net integrity is compromised, hasty inspection is the key to ensuring zero loss. Dropped equipment is either ignored because costs associated with retrieving it is not worth it or divers are called and costs incurred. With ROVs, managers and employees have been able to retrieve equipment without the need to call help. The use of mini-ROVs has given managers the ability to teach employees about the underwater aspects of the farm as well as identify and explain any problems to a dive team in cases where divers are needed.

kiaravallier@deeptrekker

Tropical sea cucumber aquaculture technology – Promising opportunity to meet growing sea cucumber demand

Beni Giraspy and Grisilda Ivy

Sea Cucumber Aquaculture Consultancy, Australia

Sea cucumber fishery is collapsing throughout the world due to the lack of fishery management and unsustainable fishing. The increasing demand for the processed product Beche de mer, is making the sea cucumbers more vulnerable for exploitation. Sea cucumber aquaculture and restocking programs are urgently needed to overcome declining fishery and also prevent extinction of species. In tropical countries the sea cucumbers sandfish (*Holothuria scabra*) and the golden sandfish (*H. lessoni*) are the most valuable species fetching premium prices (US\$ 100 – 250/Kg) in the international market. Sandfish and Golden sandfish are widely distributed throughout South-east Asia and Middle-East. Relatively warm water temperatures, wide distribution, suitable coastal habitats for grow out and the availability of commercial hatchery technology makes sea cucumber aquaculture very promising. Sea cucumber Consultancy, Australia has made tremendous improvements in sea cucumber hatchery technology through its R&D and commercial hatchery development programs. The main achievements include: a) Broodstock management for successful spawning; b) in vitro fertilisation for offseason spawning; c) high post-larval settlement and; d) intensive rearing of juveniles for pre-growout and growout. Using this advanced technology commercial sea cucumber hatcheries are established in Maldives, Australia and Saudi Arabia for the mass production of tropical sea cucumbers. This state of the art technology can be used to produce, millions of sea cucumber juveniles routinely in specialized hatchery to meet the growing market demand.

beni@seacucumberconsultancy.com.au