CRIMSON PUBLISHERS
Wings to the Research

Cohesive Journal of
Microbiology & Infectious Disease

ISSN 2578-0190

Opinion

Established the Environmental Monitoring Program Indicators to Prevent Disease Infection and Promote Sustainable Development

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Submission: :October 03, 2018; **Published:** October 05, 2018

Introduction

Marine aquaculture may also cause environmental degradation from feces, uneaten feed and use of chemicals if the local carrying capacity is exceeded [1]. The most important benthic impact relates to the formation of anoxic sediments [2-4] which can be easily monitored. Both sediment condition and waste accumulation are good indicators for detecting the environmental condition at aquaculture sites. Beveridge [5] revealed that environmental deterioration because of high organic matter concentrations in the sediments may affect the health of farmed fish and hence profitability. Waste and waste-makes quality management for marine aquaculture in other countries has not only focused on the release limitations of organic matter, and nutrients [6-8] but also on chemicals [9] used on the farms regardless wherever into estuaries or nearshore coastal waters [10,11]. This investigation uses an environmental monitoring program to understand and assess the environmental impact of marine farming.

Environmental monitoring program ratings for the near-field effects from trace metals in sediments [12]. Waste management for marine aquaculture in other countries has focused on the release of organic matter, nutrients, and chemicals directly from the farms into estuaries and coastal waters. Finfish farms need more extensive programs for the management of waste than shellfish farms, because finfish provide exogenous food sources [10]. Redox potential is useful as an indicator of the degree of microbial activity in organically-enriched sediments [13,14]. Here we used an EMP to determine and assess the environmental impact of farming.

Environmental monitoring program

Currently there are very limited approaches for assessing the impacts of aquaculture on sediment with the exception of the environmental monitoring program (EMP), implemented by the Department of the Environment, New Brunswick, Canada. EMP is based on sediment redox potential, sulfide concentrations, and video transects data for monitoring environmental effects of salmon aquaculture operations [15]. The impacts are considered unacceptable when sediments become anoxic. There is a need for the development of more sensitive tools and methods for detecting environmental effects of aquaculture and for determining what constitutes acceptable and unacceptable impacts. Other sediment chemistry indicators of environmental effects would assist in assessing the sustainability of aquaculture operations. The environmental monitoring program (EMP) approach was adopted to evaluate the marine environmental impact of cobia marine aquaculture environmental management [16,17]. The EMP ratings were assessed by the diver on site following the guidelines defined by the Department of Environment and Local Government of New Brunswick, Canada [15]. Redox potential in core samples was measured with a Fisher Scientific Co., USA. AP-63 (PH/MV/Temp/Ion), using methods described by Wildish et al. [18] The sulfide probes were calibrated just before use on each sampling day by checking against freshly prepared Na2S⍰9H_2O solutions at three concentrations (10μM, 100μM and 1000μM). Sediment samples were mixed immediately after collection with sulfide antioxidant buffer (SOAB from Fisher Science Co.) (1:1v/v). Sulfide levels were recorded in millivolts (mV) when the reading stabilized. These methods were confirmed experimentally [16-18].

The study shows that assessment of the marine environment at aquaculture sites requires a tool beyond the environmental monitoring program (EMP) rating. The sediment chemistry response to changes in environmental conditions at the aquaculture sites clearly result in differences from natural background sediment levels. Those changes make the modeling approach feasible in this study and useful for interpreting the impact of the aquaculture activities to the environment. This approach provides an effective means for assessing the environmental conditions based on sediment chemistry, and consequently in establishing regulatory guidelines to establish baseline information, such as marine environmental quality, sediment remediation or degradation in relation to the aquaculture conditions..

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