

Environmental Monitoring

Existing Aquaculture Site 0835 Spectacle Island

In June 2006, sediment monitoring at this existing aquaculture site revealed mean sulphide levels higher than previously recorded in 2004 and 2005. Two stations were extremely anoxic and three others were in the medium to high hypoxic range with standard errors of the mean indicating that the highest sample still approached anoxic levels. The November 2006 mean sulphide levels followed the established pattern of lower levels in November than in June, except for station PTM 14 which was even more anoxic than in June 2006.

These monitoring results for Site 0835 at Spectacle Island are the worst of any aquaculture operation monitored to date in Nova Scotia and the only one to be labeled as Type C “anoxic” by Nova Scotia Fisheries and Aquaculture.

It is not known how much time is required for recovery of the ocean floor from this anoxic state - proposed fallowing times do not have a record of recovery to baseline conditions from such extreme anoxic conditions at a site with such low current speeds and lack of tidal flushing. Mechanical methods (such as harrowing) to disperse anoxic sediments merely export the problem to the *wider* embayment which cannot effectively assimilate wastes because of the low current speeds and lack of tidal flushing.

Sediment data are an indicator of effects on the benthic community within the boundaries of the site. Even after a recovery of sediments at the site to oxic levels, research has shown that a much longer time is required for recovery of the benthos in the *wider* embayment area to initial levels. Research also shows that the longer a site stays hypoxic and/or anoxic, the less chance the site has of recovering from the embayment-wide benthic impact. (Milewski 2001¹, Poehle, 2000²).

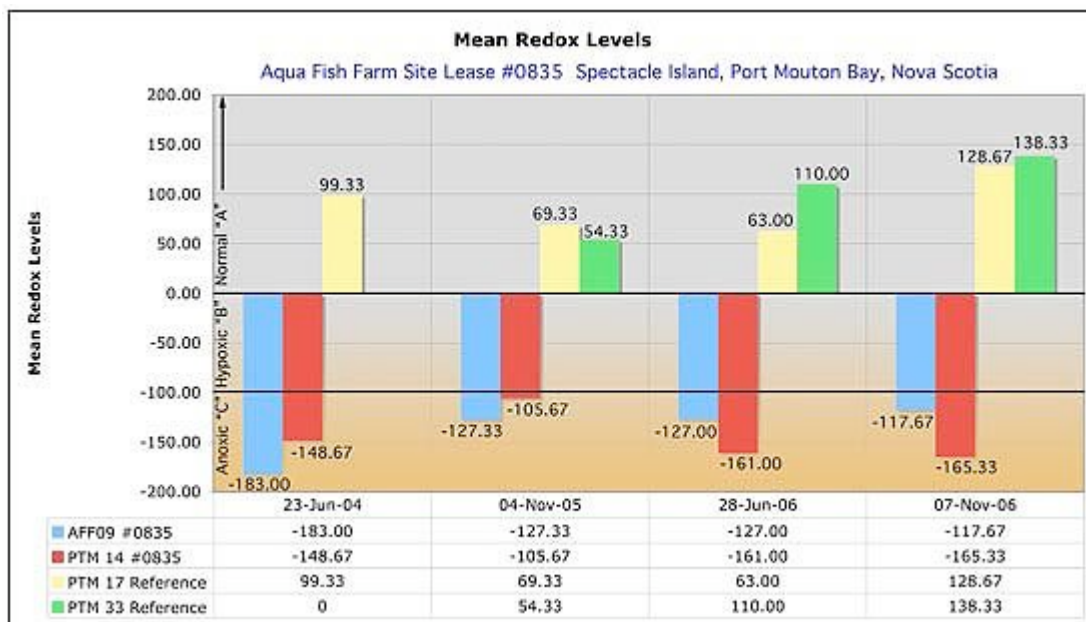
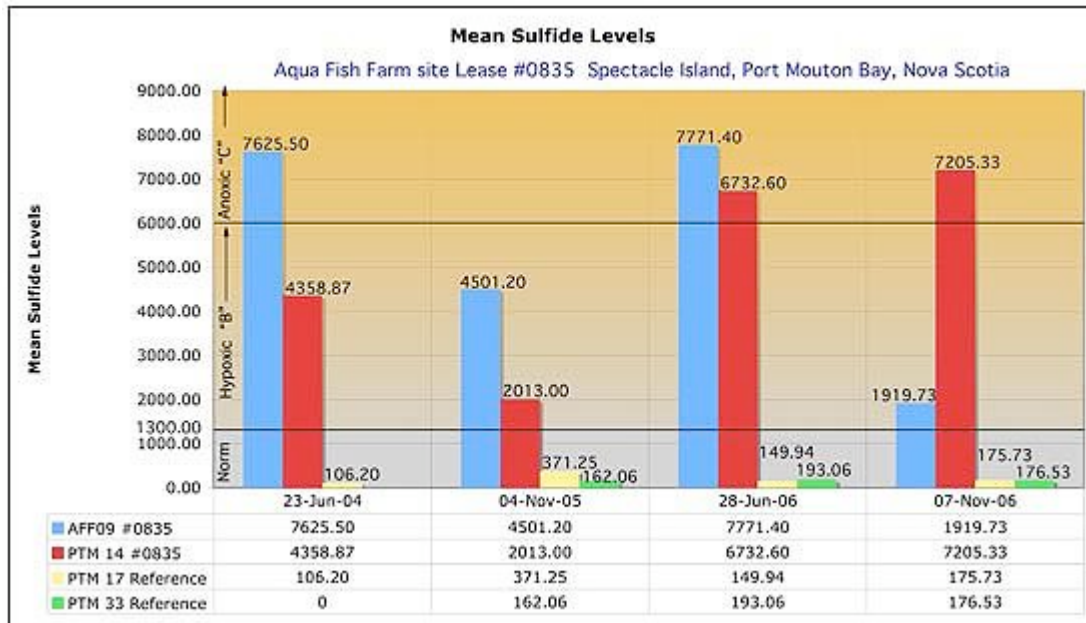
Inner Port Mouton Bay has experienced a significant decline or disappearance of species such as lobster, scallops, crabs, mussels, clams, and Irish moss, all of which are part of the traditional fishery. The community must be consulted and involved in monitoring and documenting the restoration and rehabilitation of Port Mouton Bay to its former healthy productive ecosystem.

1. Milewski, Inke (2001) Impacts of Salmon Aquaculture on the Coastal Environment: A Review in Tlusty, M.F., D.H. Bengston, H.O. Halvorson, S.E. Oktay, J.B. Peauand R.B. Rneasult,Je. (eds.) 2001. Marine Aquaculture and the Environment: A meeting for stakeholders in the North East. 166-197 pp. Cape Cod Press, Falmouth, Mass. 324p

2. Poehle, G. (2000) Letang Inlet: Long Term Far-Field Monitoring and Assessment of Benthos in an Area with Nutrient Loading. Proceedings of the 4th Bay of Fundy Science Workshop, Environment Canada - Atlantic Region, Occasional Report No. 17, pg.130

Hypoxic sites with mean sulphide levels above 3000 uM meet DFO's definition of a HADD, the harmful alteration, disruption or destruction of fishery habitat. In June and November 2006, some locations at Spectacle Island reached levels above 7000.

The two charts below from the Friends of Port Mouton Bay website (www.friendsofportmoutonbay.ca) plot the sulphide and mean redox values at the same four sampling stations, from 2004 to 2006. Stations #AFF 09 and #PTM 14 are in the fish farm lease area. Stations #PTM 17 and #PTM 33 are reference sites.



(Sources: [Monitoring Data 2004](#), [2005](#), [Monitoring Data 2006](#), [Map of Test Locations](#))

The 2002 monitoring report by Dominator Marine on contract to Aqua Fish clearly states the site as being “anoxic”¹⁰. It describes the site as follows:

"Evidence of organic loading beneath the cages was identified during the survey. The source of this organic overloading appears to be the combination of waste feed, fecal matter and fouling organisms falling from the cages structures. The accumulation and degradation of this materials has results in widespread sea floor 'souring'".

Subsequent monitoring results through to 2006, as detailed above, show repeated anoxic site conditions. Is the drop in sulphide levels at # AFF09 in November 06 due to mechanical measures which distribute sediments into the wider bay? Both levels of government are aware of the ongoing anoxic site conditions. In the spring of 2007, Aqua Fish Farms is permitted to continue operations while committing a HADD and a second larger salmon aquaculture site is being considered for Port Mouton Bay. Port Mouton Bay needs the protection of the *Fisheries Act* for the health of existing viable fishery, for critical habitat (lobster migration, moulting and nursery area) and for the integrity of the marine environment.

Conclusion:

The Friends of Port Mouton Bay have real and valid concerns about the useful and practical application of this monitoring data. Therefore, for this reason among others, we are strongly opposed to the ongoing environmental degradation caused by the existing site and strongly opposed to the second application.

The community must be consulted and involved in monitoring and documenting the restoration and rehabilitation of Port Mouton Bay to its former healthy productive ecosystem

Proposed Aquaculture Site #1251 Port Mouton Island

More extensive video monitoring at Site 1251 on March 9, 2007 at 12 stations within the site boundaries shows the nature of the ocean bottom here. The smooth sand/silt composition occurs throughout with either sand or silt predominating. This type of bottom is preferred by lobsters for moulting and reproduction according to the traditional ecological knowledge of the local fishermen.

On March 9, water temperatures were cold with the result that lobsters are less active. Lobsters tend to be most active at night and to conceal themselves in daytime, except when migrating. This area was fished for lobsters in December-January with the result that most lobsters here at that time were caught. Lobster will begin migrating to this area when water temperatures rise in late spring.

Crabs are fished here for bait when they migrate back into Port Mouton Bay with the arrival of warmer water temperatures. Crabs are also nocturnal and during the day crabs typically bury themselves in the sand.

Conclusion:

Information from the local fishermen and documentation in the Traditional Ecological Knowledge report for Port Mouton Bay (March 23, 2007) explains the absence of lobsters and crabs on any of the video monitoring from March, 2007.