

An aerial photograph of a coastal area in Nova Scotia, Canada. In the foreground and middle ground, numerous circular salmon feedlots are visible, floating in the water. These feedlots are arranged in two main rows, one above the other. The water is a dark blue-grey color. In the background, there is a shoreline with a small town or village, featuring several houses and buildings. A larger body of water is visible beyond the town. The overall scene illustrates the environmental impact of salmon farming on a coastal environment.

Environmental Impacts of Salmon Feedlots

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Sheet Harbour, Nova Scotia

Waste production for an average salmon farm

500 mt production - 200,000 fish (5-6 lb per fish)

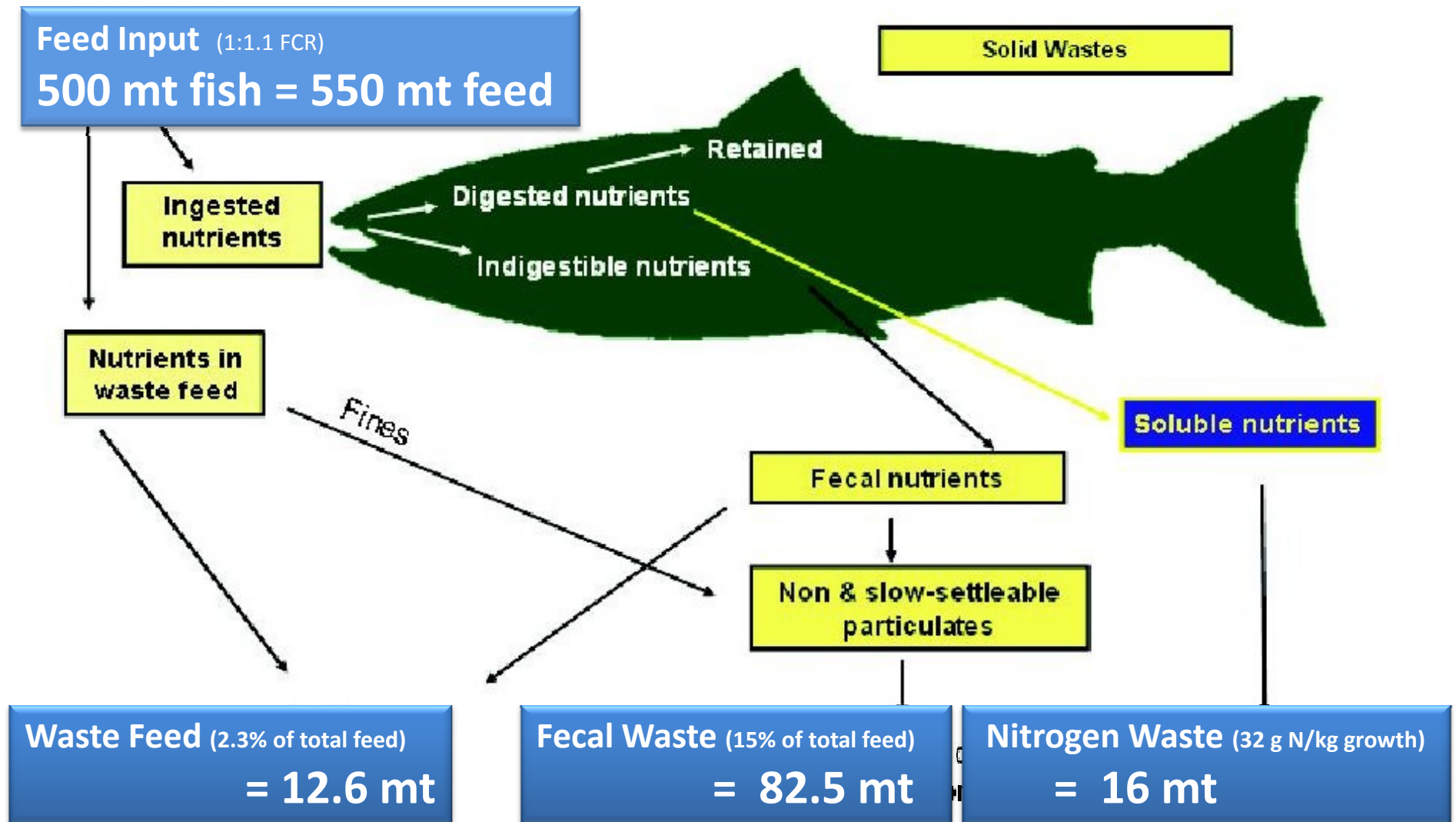
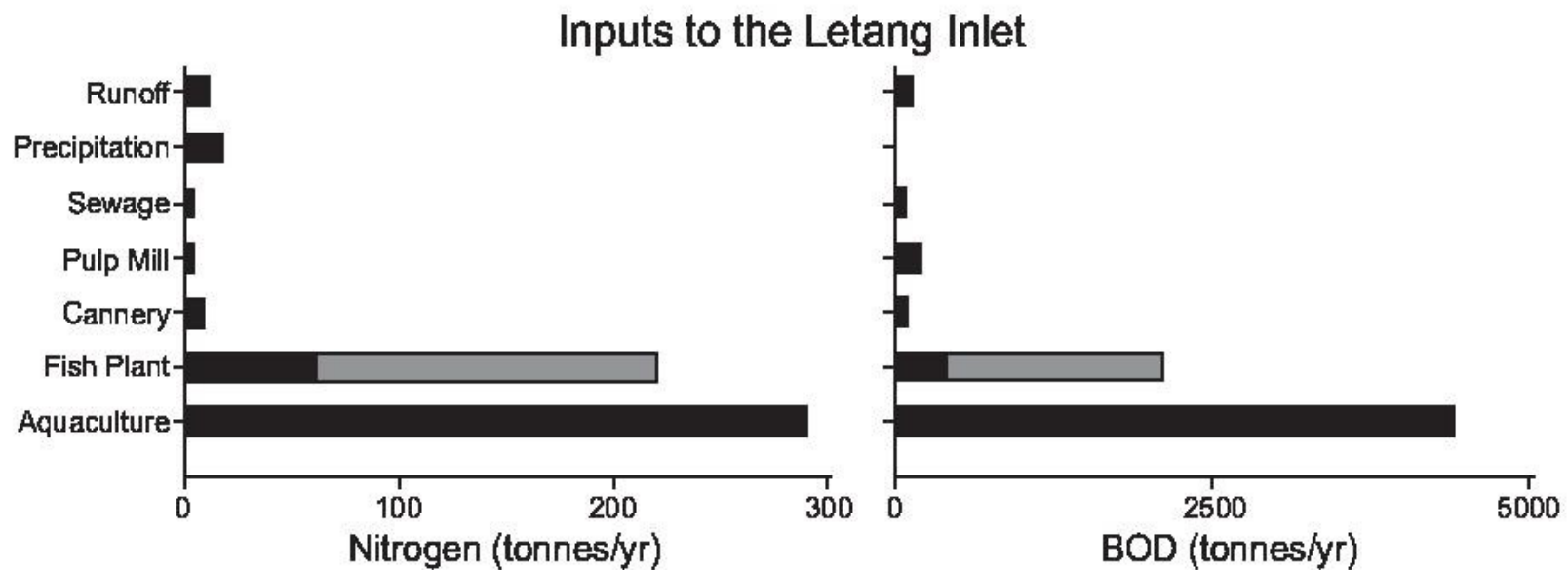
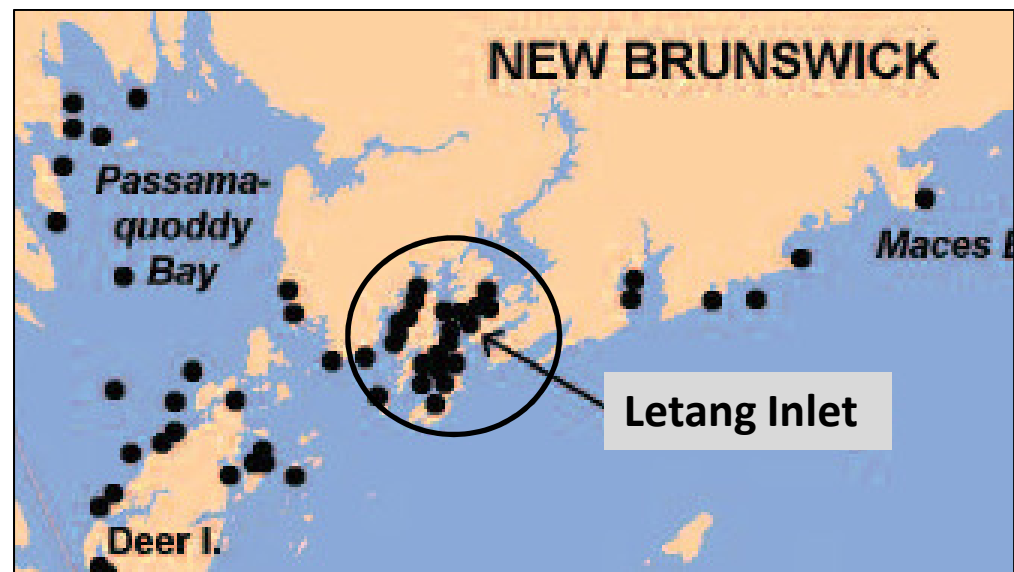


Figure 1: The flow and fate of nutrients in a cage aquaculture system

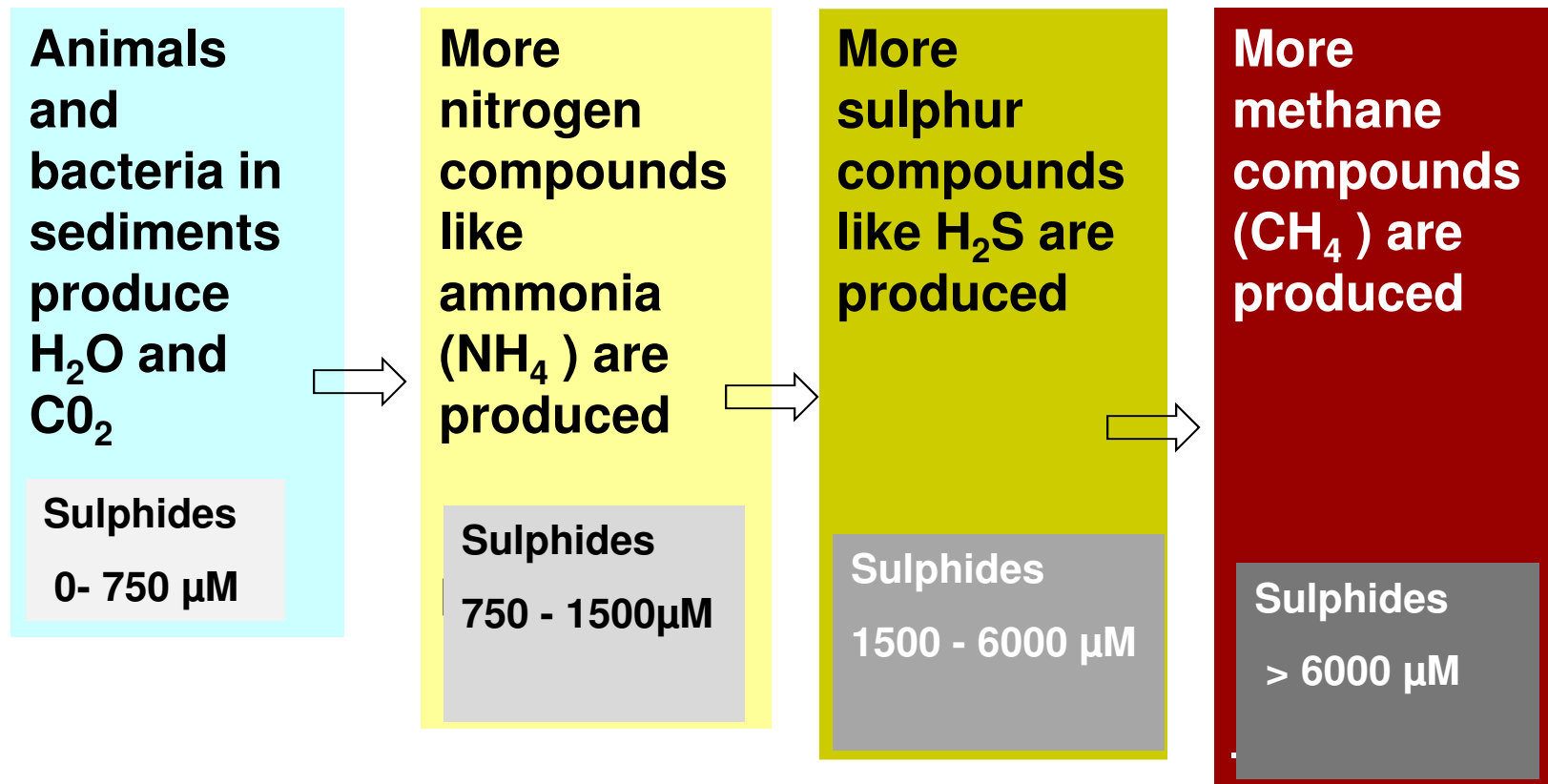
Source: Buschmann et al 2007



Source: Strain et al. 1995

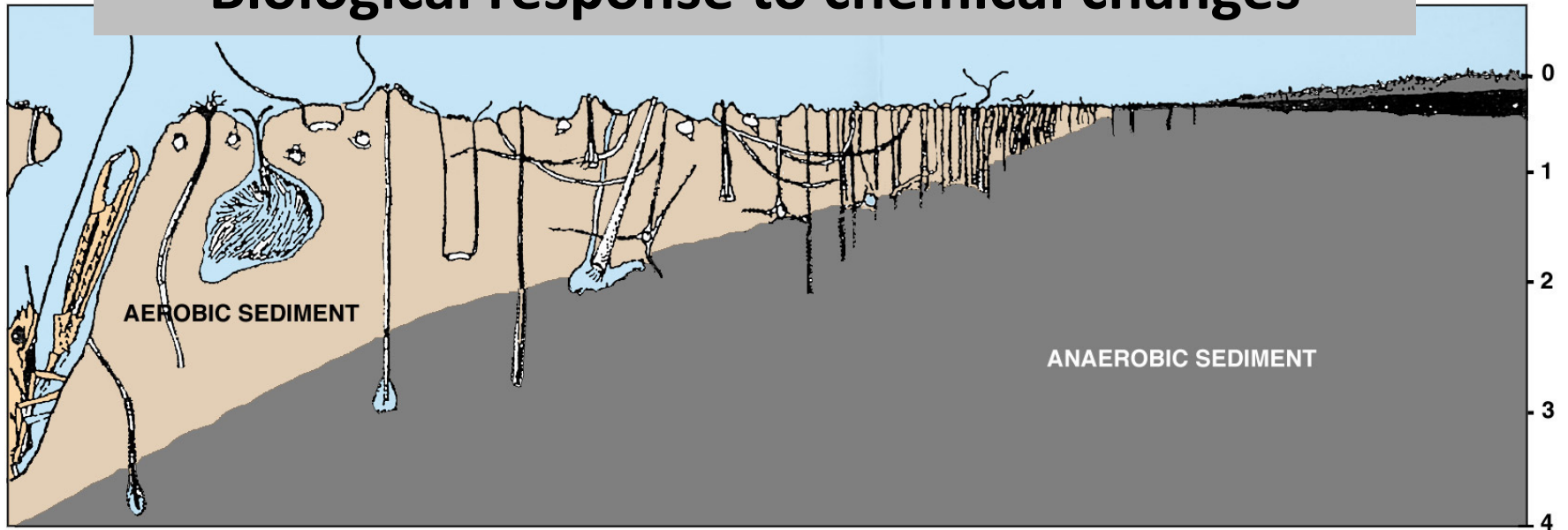


Chemical changes in the sediment



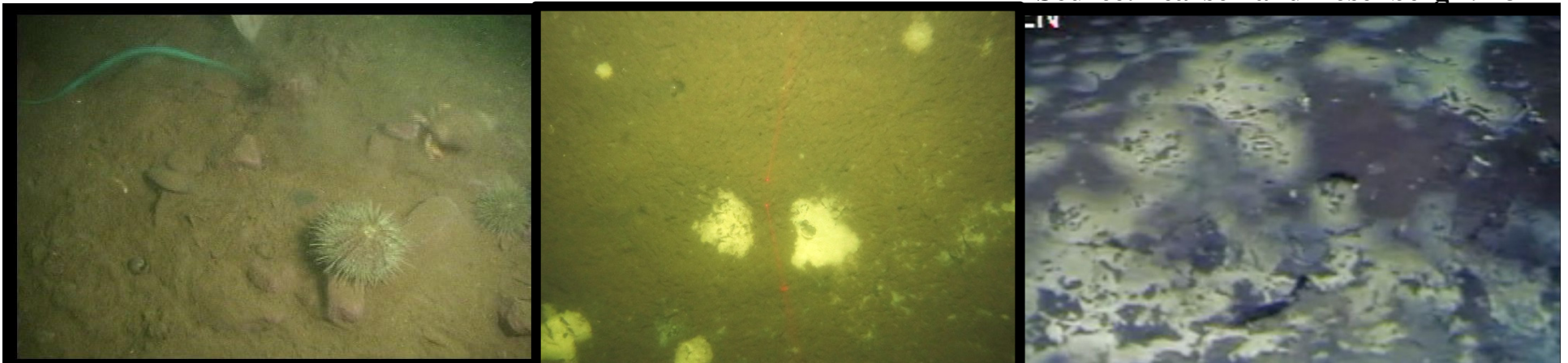
Organic loading

Biological response to chemical changes



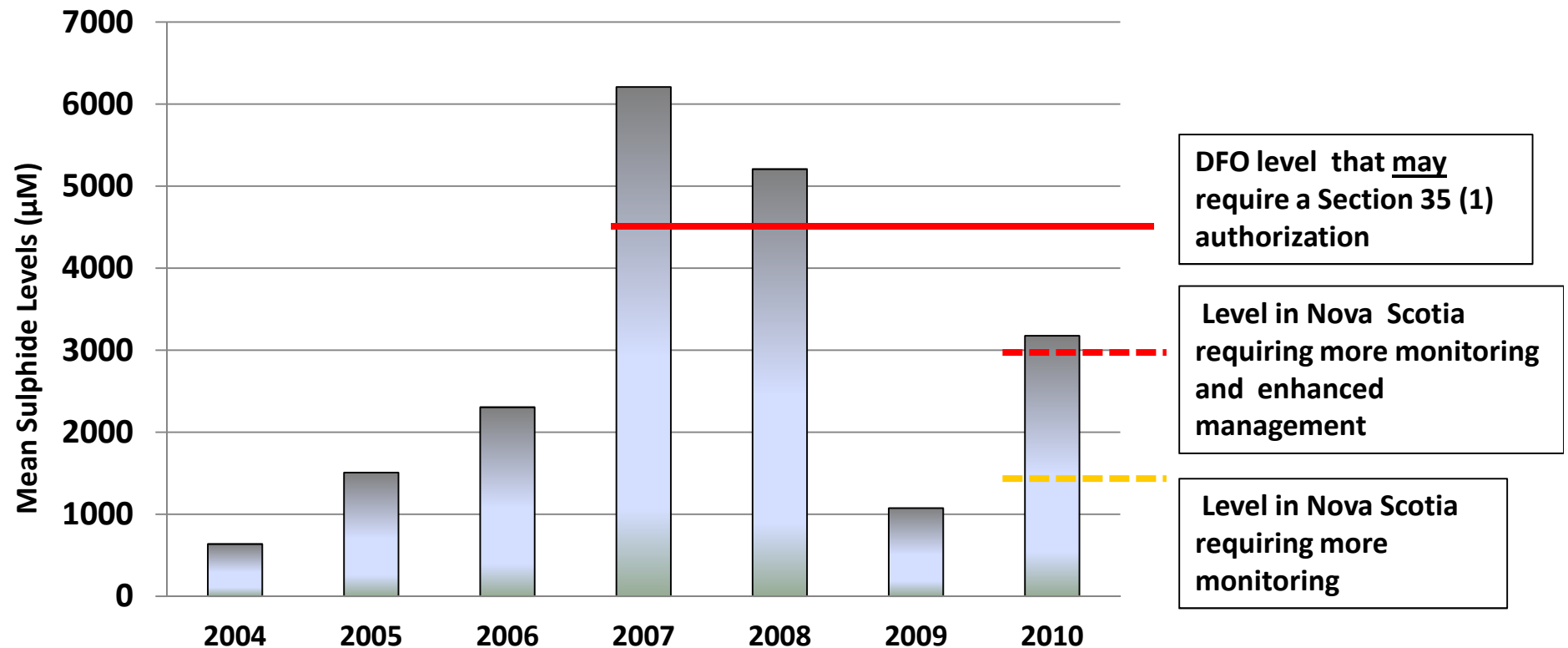
Zone	Normal	Transitory		Polluted	Grossly Polluted
Dominant Macrofauna	Nucula Amphiura Terebellides Rhodine Echinocardium Nephrops	Labidoplax Corbula Goniada Thyasira Pholoe	Chaetozone Anaitides Pectinaria Myriochele Ophiodromus	Capitella Scolelepis	NO MACROFAUNA Surface covered by fibre "blanket"

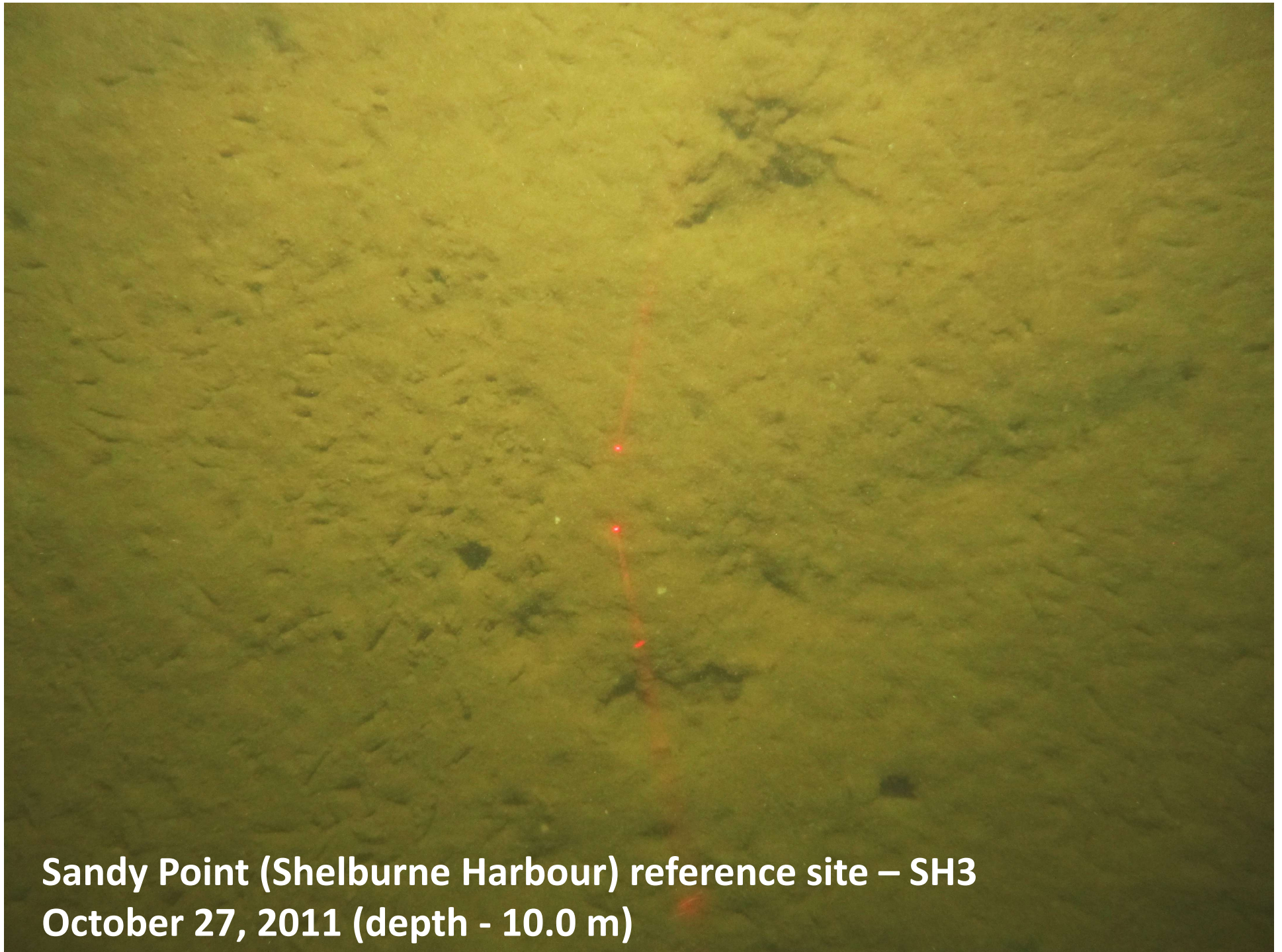
Source: Pearson and Rosenberg 1978



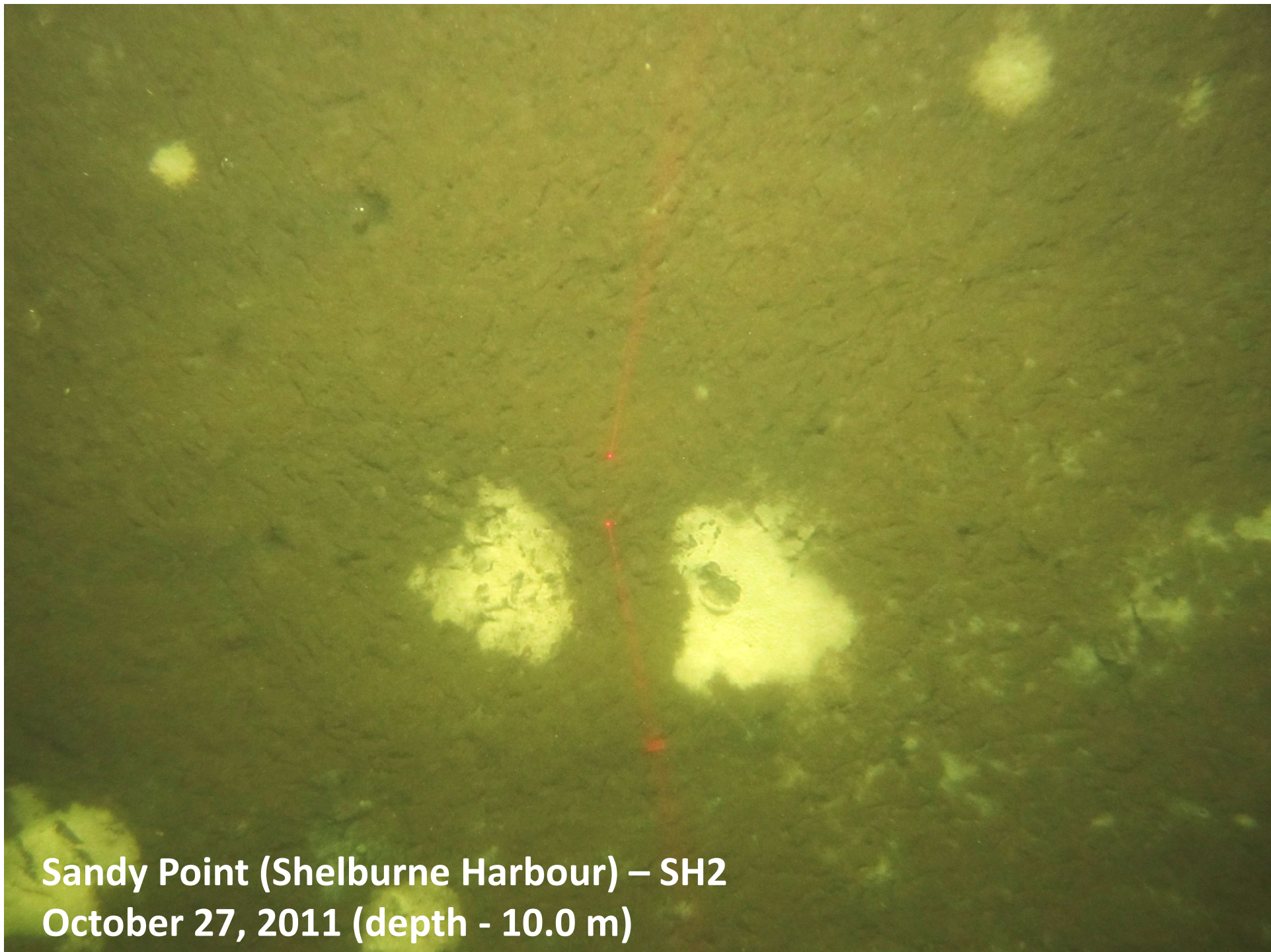
Nova Scotia Environmental Monitoring Results

Sandy Point Farm #0602 – Shelburne Harbour






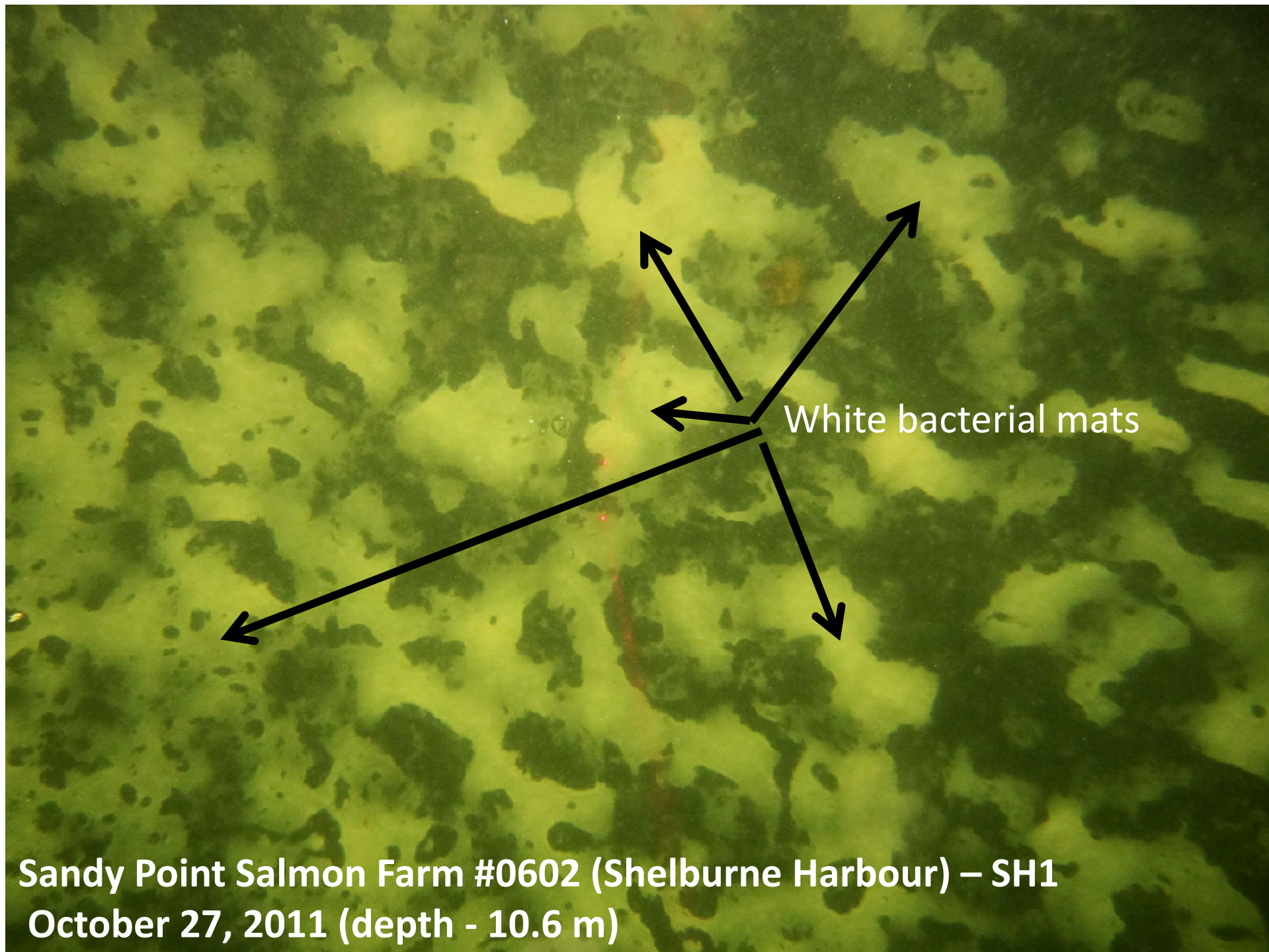
Sandy Point (Shelburne Harbour) reference site – SH3
October 27, 2011 (depth - 10.0 m)



Sandy Point (Shelburne Harbour) – SH2
October 27, 2011 (depth - 10.0 m)

An underwater photograph showing a dense, greenish-yellow net or mesh structure, likely part of a salmon farm. The net is illuminated from above, creating a bright, vertical light streak in the center. The background is dark and murky, suggesting deep water.

Sandy Point Salmon Farm #0602 (Shelburne Harbour) – SH1
October 27, 2011 (depth - 10.6 m)



Sandy Point Salmon Farm #0602 (Shelburne Harbour) – SH1
October 27, 2011 (depth - 10.6 m)

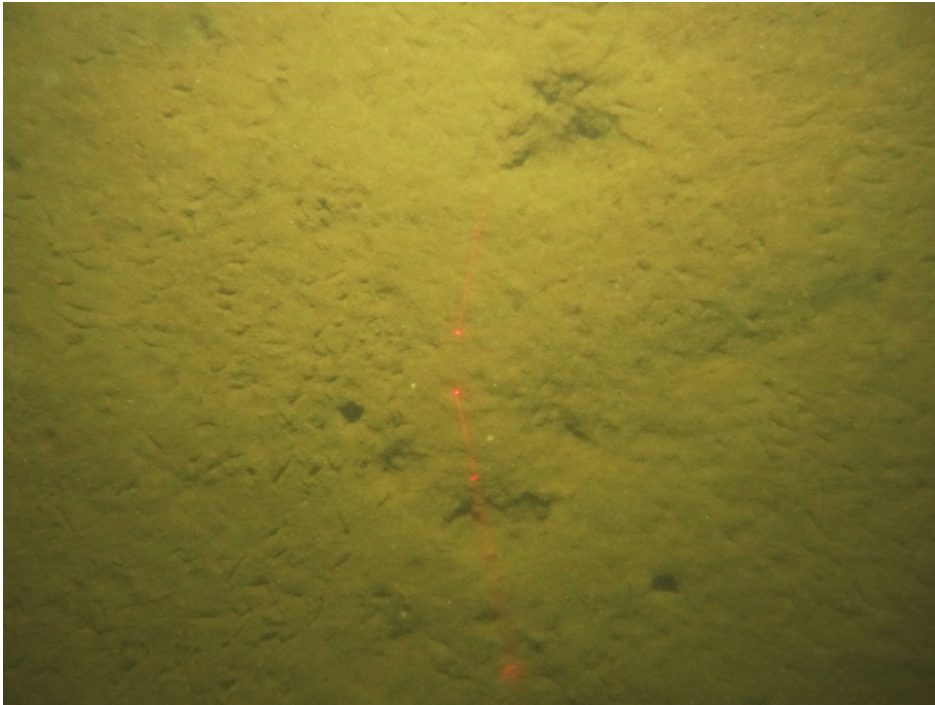
Species Abundance/Diversity

Sandy Point reference (S1) vs Farm Site (S6)

16 species – 131 individuals

1 species account for 65 % of individuals

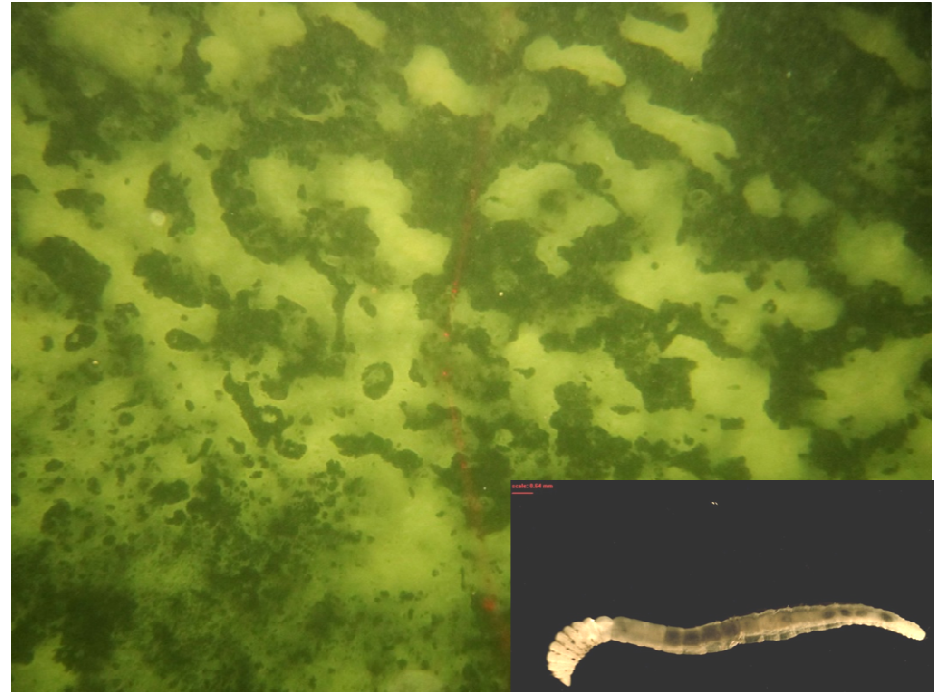
Nephtys neotenus - 85



7 species – 595 individuals

2 species account for 91 % of individuals

Capitella capitata - 325



Fisheries-Aquaculture Interactions

Environmental Impacts

- Environmental degradation
 - “Sewage”/“rotten fish” smell
 - “mildewed”, moldy “whitish” bottom
- Habitat Loss
 - Loss of hard/gravel bottom
 - Decline of kelp and rockweed
- Changes in predator/prey relationships
 - Starfish blooms
 - Whales no longer feeding near shore
 - Krill not washing up on beaches
 - Herring not coming inshore

Impacts on Commercial Species

- Lobster
 - Pesticides killing adult and possible juvenile lobster
- Herring
 - Lights, odour, noise affect behaviour
- Scallops
 - Meat to shell ratio lower near farms
- Sea Urchins
 - Shells brittle and roe discoloured near farms
- Crab/Shrimp
 - Dead crab and shrimp found near pesticide treatment or “well” boat