



# **Management of Wastes from Seafood Processing**

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# Project Partners

In Atlantic Canada:

EC, DFO, various provincial governments, industry

In Newfoundland and Labrador:

DFO, DFA are major partners in current work

Atlantic Team of the National Programme of Action (NPA): formed a working group to coordinate the project

Produced Report in 2003: “Management of Wastes from Atlantic Seafood Processing Operations” – available at

<http://aczisc.dal.ca/nparpt.pdf> (English) and

<http://aczisc.dal.ca/nparptf.pdf> (French)

# **Project Objectives**

- Characterize processing plant discharges and receiving environment impacts
- Identify potential pollution prevention strategies and beneficial uses of wastes
- Engage industry to raise awareness of the issues, and gain cooperation for voluntary corrective actions
- Develop appropriate effluent quality criteria

# Why? What's the Problem?

- Some localized problems – smell, water quality
  - Fish meal plants most problematic
- Offal disposal
  - Environmental problems related to Ocean Dumping
  - Environmental problems related to disposal on land
  - Wasting a potentially valuable resource
  - Evolving regulatory requirements
    - Increased financial and logistical problems for plant

# Why? What's the Problem?



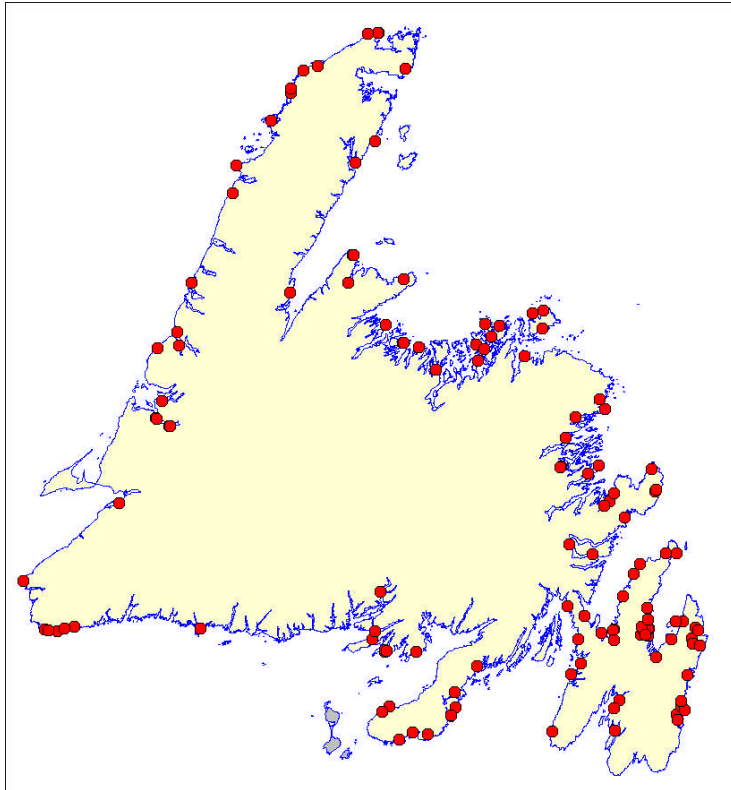
Figure 2 – Algal bloom (*Ulva lactuca*) along the shores of Lameque Bay (Source: Heike Lotze, 2004).

# Why? What's the Problem?

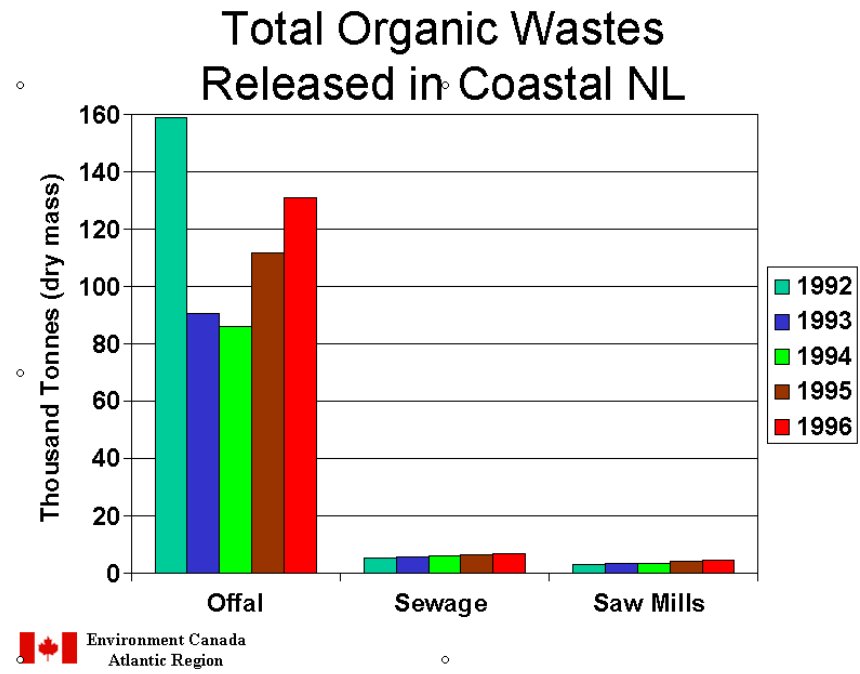
- Growing global recognition of problems related to excess nutrient inputs
- CCME developing regulations for sewage
  - Likely fish plant effluent will follow
- Many similarities between sewage and fish plant effluent
  - Often discharged in close together – cumulative effects

## Typical Wastewater Discharge Characteristics

<u>Industry</u>	<u>BOD mg/L</u>	<u>TSS mg/L</u>	<u>NH3 mg/L</u>
Crab Processing	180-1280	80-815	6-13
Shrimp Processing	530-1240	240-660	
Groundfish	27-1775	7-1550	20
Herring Pumpout water	33500	7955	
Stickwater discharge	~34000	~54000	
Salmon Processing	397-3082	40-1600	42
Potato Processing	61	8	2
Meat Rendering	22	64	8
Raw Municipal Wastewater	220	220	25
Treated Municipal Wastewater	20	20	20



**Newfoundland Fish Plant Locations**





# Impacts of Fish Plant Effluent

- Can range from severe to beneficial
  - Amount
  - Composition
  - Receiving environment
- Effluents typically high in nutrients
  - Effects include algal blooms, offensive odour, acutely lethal discharges, localized areas of anoxia (dead zones)
- Other substances of concern include fish oils, pathogens, food additives, chemicals used for cleaning, pest control, disinfection - chlorine
  - Chlorinated organics (chloramines, THMs)

# Overview of Current Activity (2005)

- Lee Jamieson: graduate student at Dalhousie University working in NL with DFO and DFA – monitored 3 plants in NL
- Ben Lalonde, EC: monitored selected plants in the Atlantic provinces, including two in NL
- Composite wastewater sample collected for analysis:
  - Raw
  - Cleanup effluent
  - Treated

## **Acute Lethality:**

- Microtox
- Sea Urchin Fertilization Test
- Fish survival (stickleback, rainbow trout, etc.)

## **Effluent Characterization:**

- BOD (Biological Oxygen Demand)
- COD (Chemical Oxygen Demand)
- TSS (Total Suspended Solids)
- NH<sub>3</sub> (ammonia)
- Turbidity
- AOX (Chlorinated Organics)

## **Receiving Environment Quality:**

- Temperature
- Salinity
- pH
- Dissolved oxygen
- Redox
- Total Dissolved Solids

## **Wastewater Treatment:**

- Peat filtration
- Coagulation
- Dissolved air flotation, and
- Ultrafiltration

# **Future Directions and Challenges**

## Plant Audits

- May include one plant in Newfoundland

Environmental monitoring of receiving environment using an autonomous Underwater Vehicle (AUV) - Memorial University of Newfoundland

# **Future Directions and Challenges**

Issue is becoming National in Scope

- BC is interested in joining the Working Group
- Québec is also interested in project
- Increased funding anticipated
- Increased need for project co-ordination
- NPA Secretariat in Ottawa is working on the file

# Thank you.

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