A STUDY TO CHARACTERIZE AND SOURCE HYDROCARBON CONTAMINATION OF SEDIMENTS AND SCALLOPS IN THE PORT AU PORT BAY, NL

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MEMORIAL UNIVERSITY
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THE HARRIS CENTRE
Memorial University

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This report focuses on the potential inorganic and organic contamination. The Port au Port Fishery Committee has indentified an oily substance discharging into the bay in the vicinity of former petroleum exploration wells (Fig. 1b). Recent studies have found that oil and polycyclic hydrocarbons (PAHs) - a major component of crude oil - exposure affects scallop immune function with lethal and long-term results (Hannam et al., 2010a; Hannam et al., 2010b). If this study determines that these point sources of contamination have affected the scallops fishery, then environmental policy regarding prevention, and remediation should be put in place, not only for the Port au Port area, but other regions in NL as well.

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The need for further research into the potential organic causes of scallop decline is demonstrated by the absence of scallops in 2014 and 2015 and the lack of inorganic contaminants in the water of the bay. A different approach, from what was used in this study, is needed to determine if petroleum hydrocarbons affected the scallops of Port au Port Bay, NL. First we need a detailed map of the distribution of hydrocarbons radiating from the suspected source of petroleum hydrocarbon contamination in the bay. Additionally, we need another way to determine if the health of scallops could have been affected by the petroleum hydrocarbons. We propose to do this by using other indicator organisms with similar feeding mechanisms and environmental niches (i.e., other more resilient molluscs).

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Hillier, B. (Narrator). (2014, February 11). Shellfish Mystery in Port au Port Bay [Radiobroadcast episode]. In P. Gullage (Producer), West Coast Morning Show. Corner Brook,NL: Local Public Radio.

8. Figures

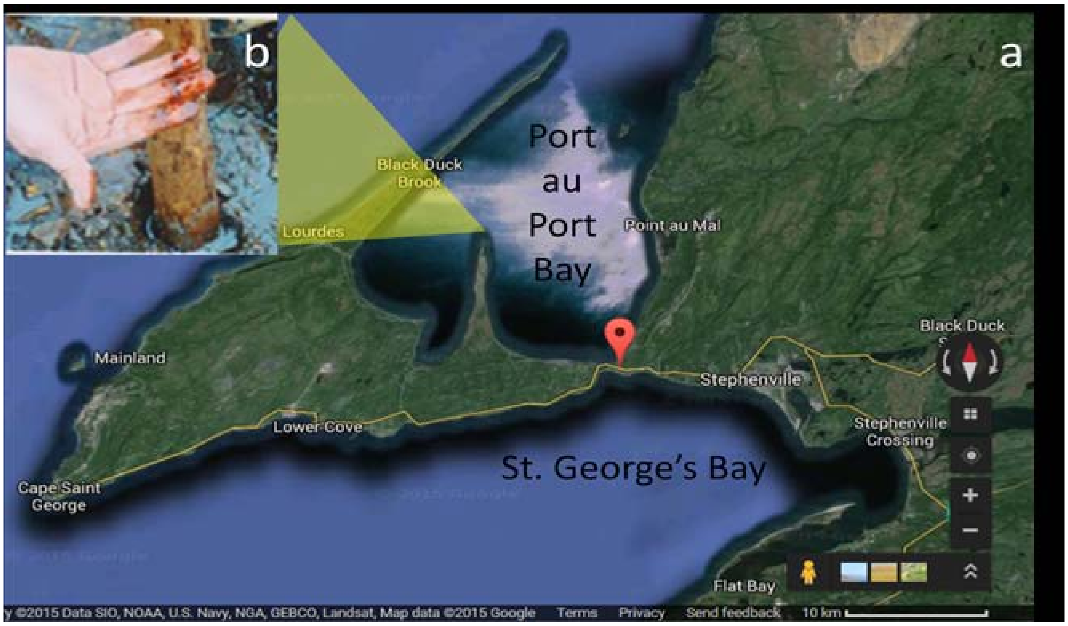

Figure 1. a. A Google map image of the Port au Port Bay and the St. George's Bay on the west coast of NL. **b.** The inset picture is of the oily substance discharging into the bay in the vicinity of former petroleum exploration wells. Image provided by the Port au Port Fishery Committee.

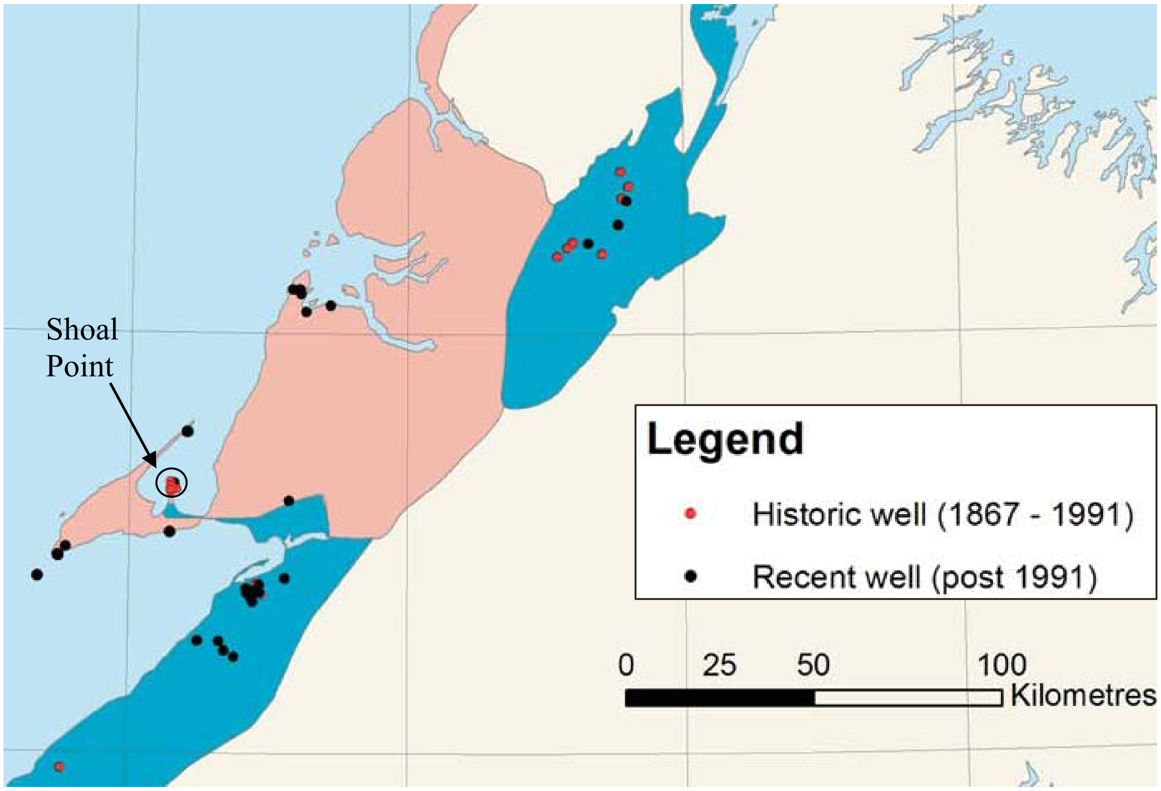

Figure 2. A map of recent and historic oil wells drilled the Port au Port area. The oily substance documented in Fig. 1a is coming from Shoal Point, and was the focus petroleum source area for this study.

Figure 3. Sample sites plotted a Google Earth Map.

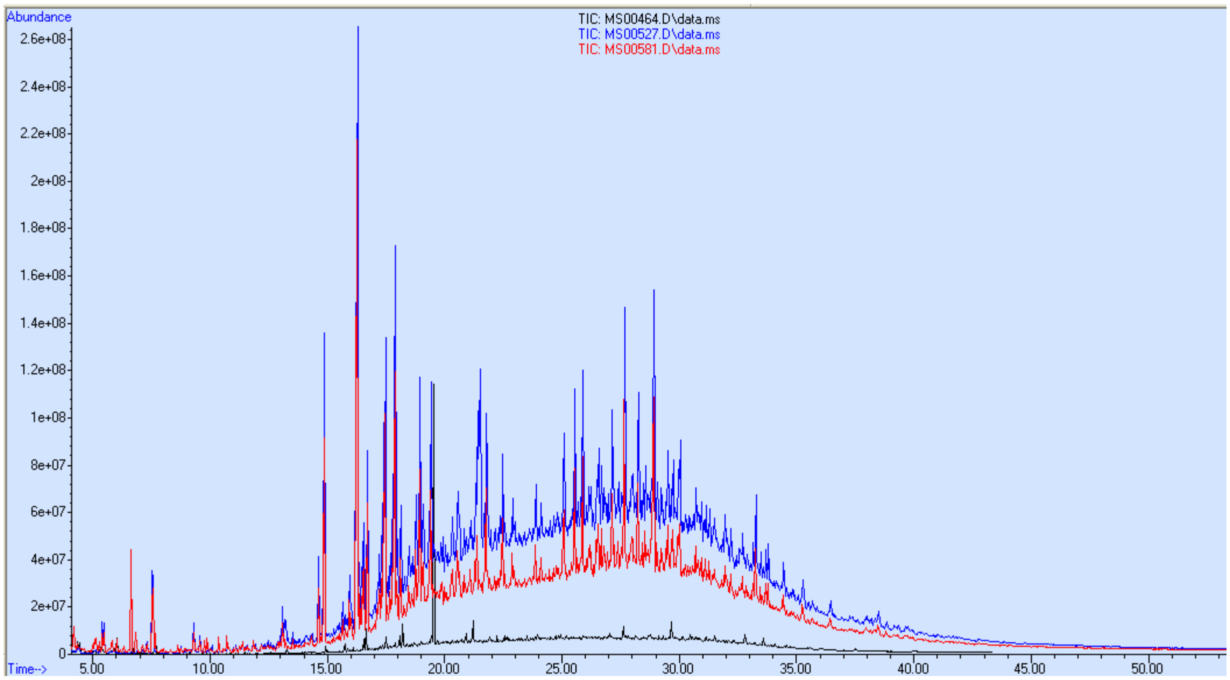

Figure 4. GC/MS chromatographs of ASE method development and optimization. The black line represents the PAHs that were extracted using the Soxhlet extraction method, the red line represents the PAHs that were extracted using the ASE method, and the blue line represents the PAHs that were extracted using the optimized ASE method.

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8. Figures

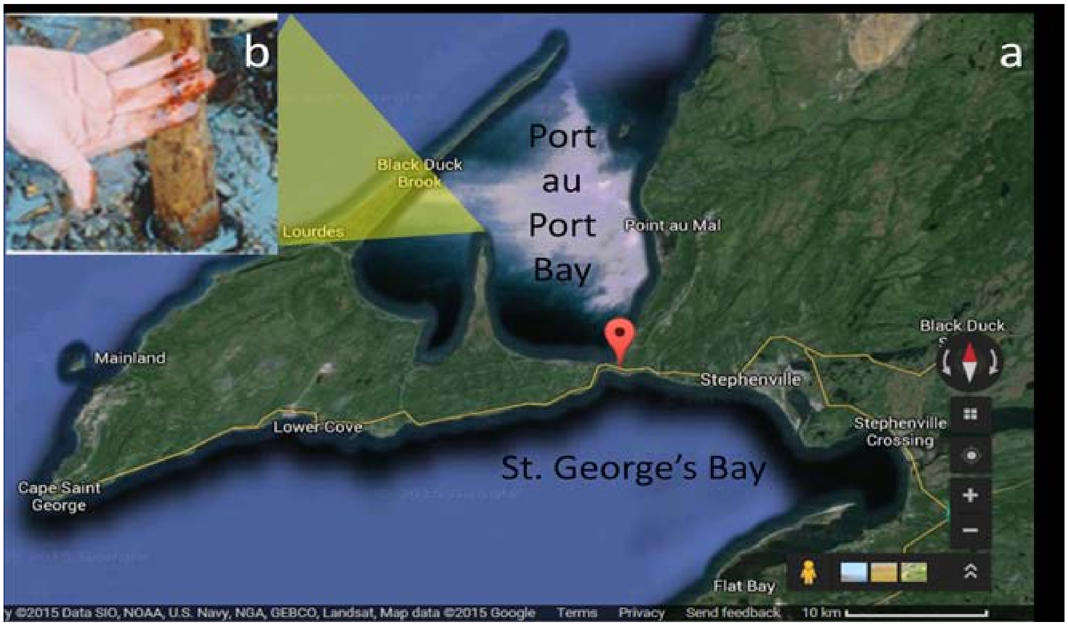

Figure 1. a. A Google map image of the Port au Port Bay and the St. George's Bay on the west coast of NL. **b.** The inset picture is of the oily substance discharging into the bay in the vicinity of former petroleum exploration wells. Image provided by the Port au Port Fishery Committee.

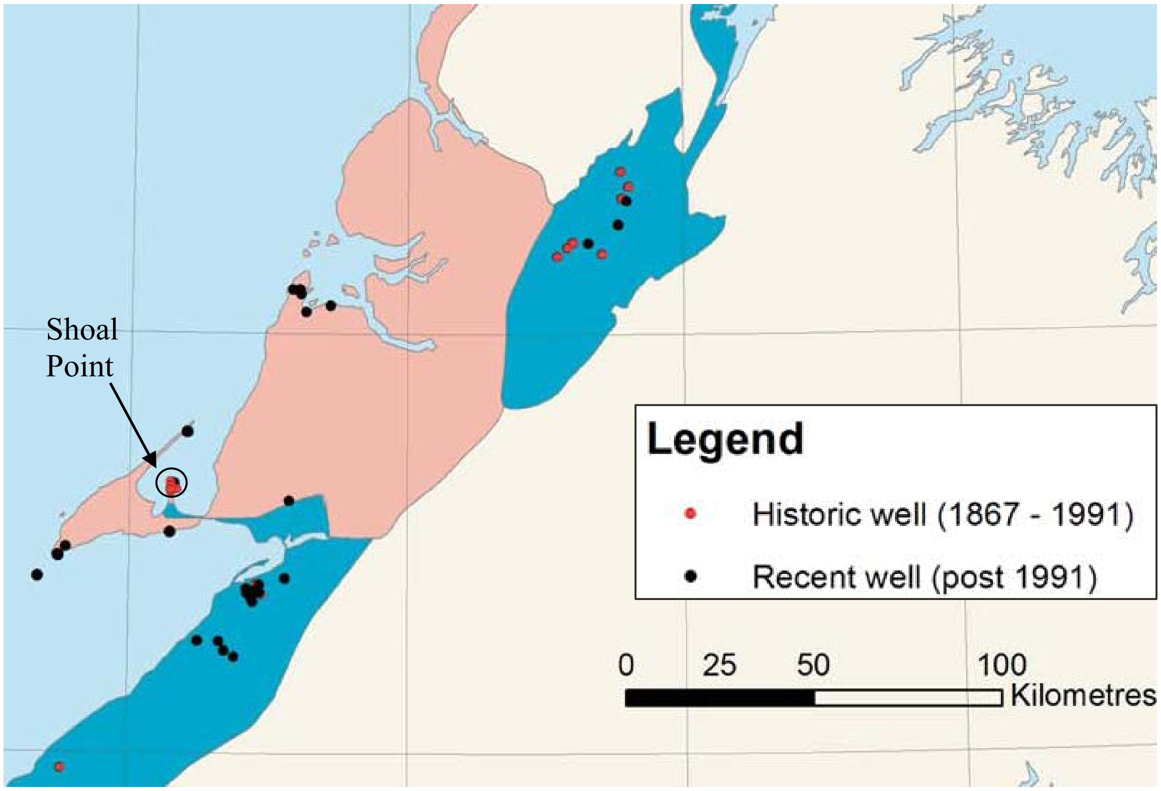

Figure 2. A map of recent and historic oil wells drilled the Port au Port area. The oily substance documented in Fig. 1a is coming from Shoal Point, and was the focus petroleum source area for this study.

Figure 3. Sample sites plotted a Google Earth Map.

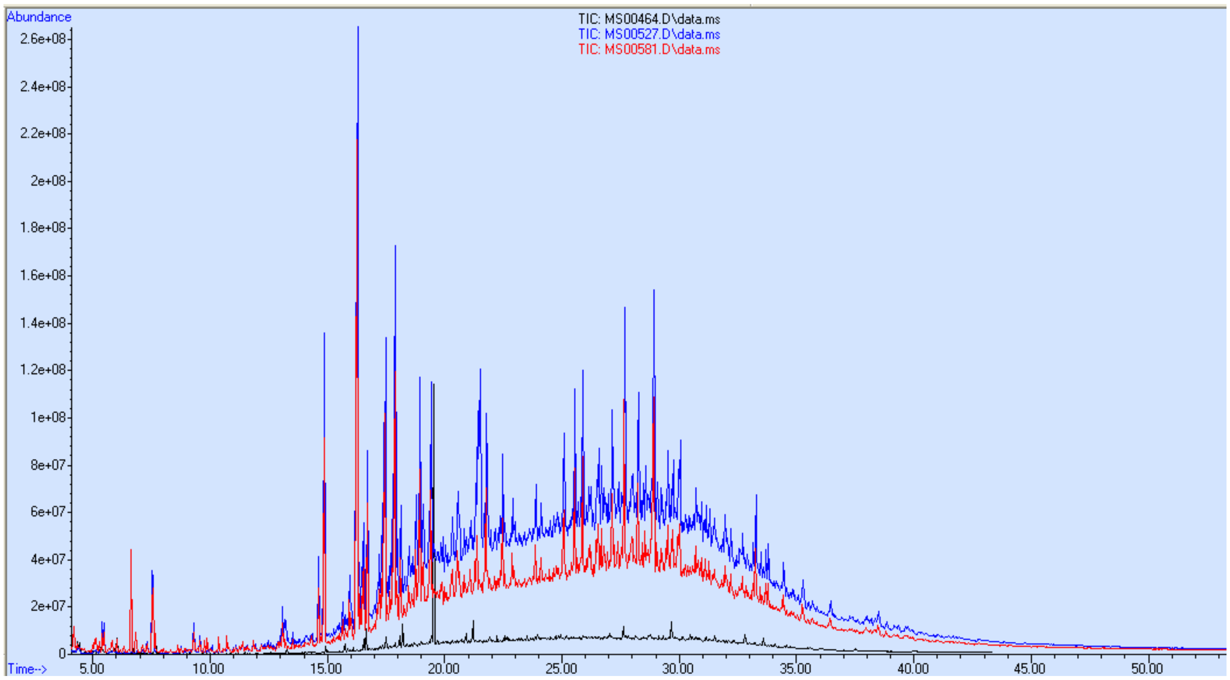

Figure 4. GC/MS chromatographs of ASE method development and optimization. The black line represents the PAHs that were extracted using the Soxhlet extraction method, the red line represents the PAHs that were extracted using the ASE method, and the blue line represents the PAHs that were extracted using the optimized ASE method.