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Kapitel: 2: Study area description

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2. STUDY AREA DESCRIPTION

The study area was established at the head of the Bay of Fundy (New Brunswick, Canada) in the 100 ha Hog Lake Impoundment ($45^{\circ}56' \text{ N}$, $64^{\circ}17' \text{ W}$); the site is part of the Tintamarre National Wildlife Area and is located about 12 km from Sackville, New Brunswick (Figs. 1 and 2). The general climatic conditions of the area are presented in Figure 3. Daily temperatures and rainfall measured on the site during 1982 are given in Figure 4, the mean chemical composition of the water in the impoundment during 1981 in Table 1.

Although some of the lower tidal wetlands in this area were dyked in the early 1600's, it was not until the 1800's that the present freshwater

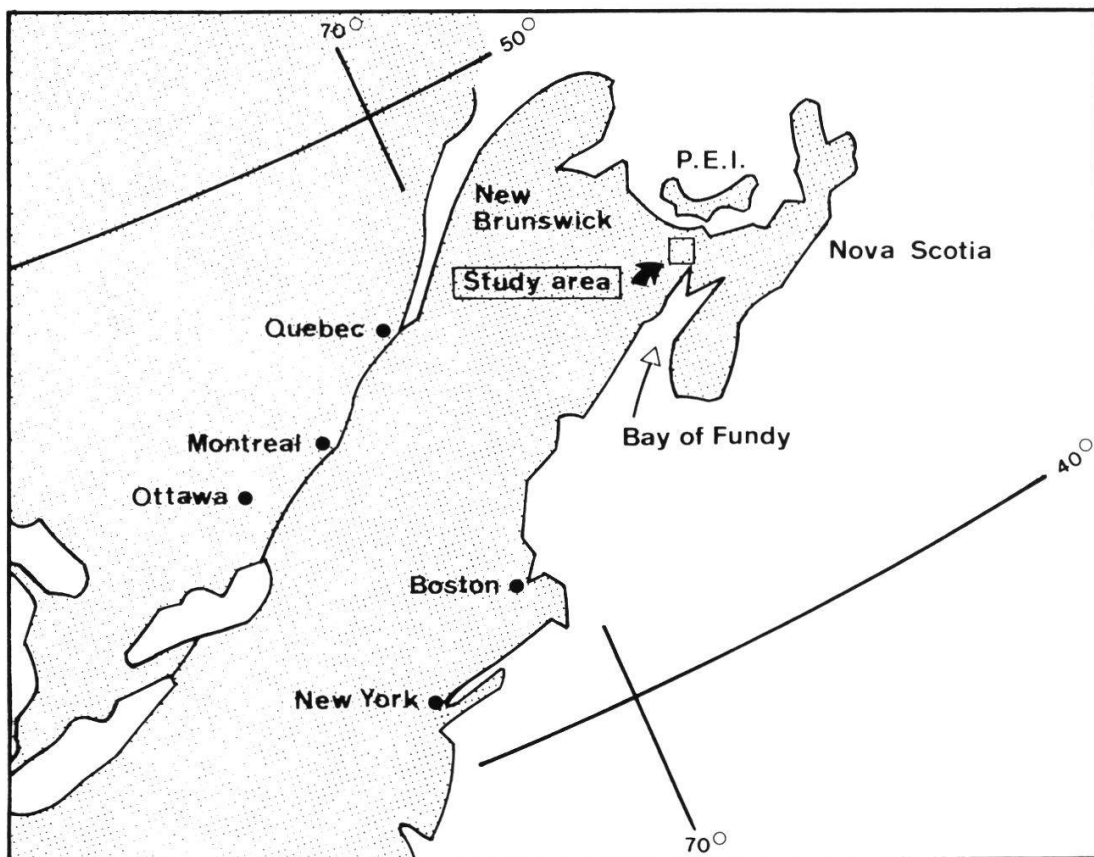


Fig. 1. Location of the study area: Map of Atlantic Canada showing the location of the study area near Sackville, New Brunswick, at the head of the Bay of Fundy.



Fig. 2. Aerial view of the study area: The photograph shows the Hog Lake Impoundment in 1981, with the central dyke dividing the impoundment into an undrained (on the right hand side) and a drained basin (on the left hand side). The "trails" were mechanically cut through the floating mat to improve the area for waterfowl. Rectangular dark areas are burned plots.

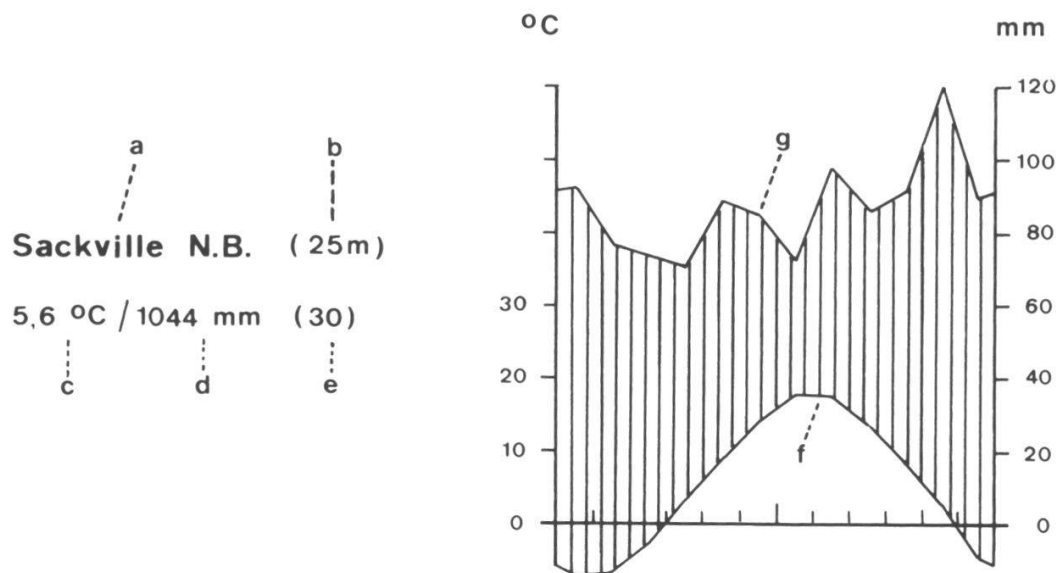


Fig. 3. Climatic diagram of Sackville, New Brunswick, 1941-1970.

(Data from ENVIRONMENT CANADA 1975)

a: station; b: height above sea level; c: mean annual temperature ($^{\circ}\text{C}$); d: mean annual precipitation (mm); e: observation period (years); f: curve of mean monthly temperature; g: curve of mean monthly precipitation. Ordinate: one division = 10°C or 20 mm of rain. Abscissa: months (January-December).

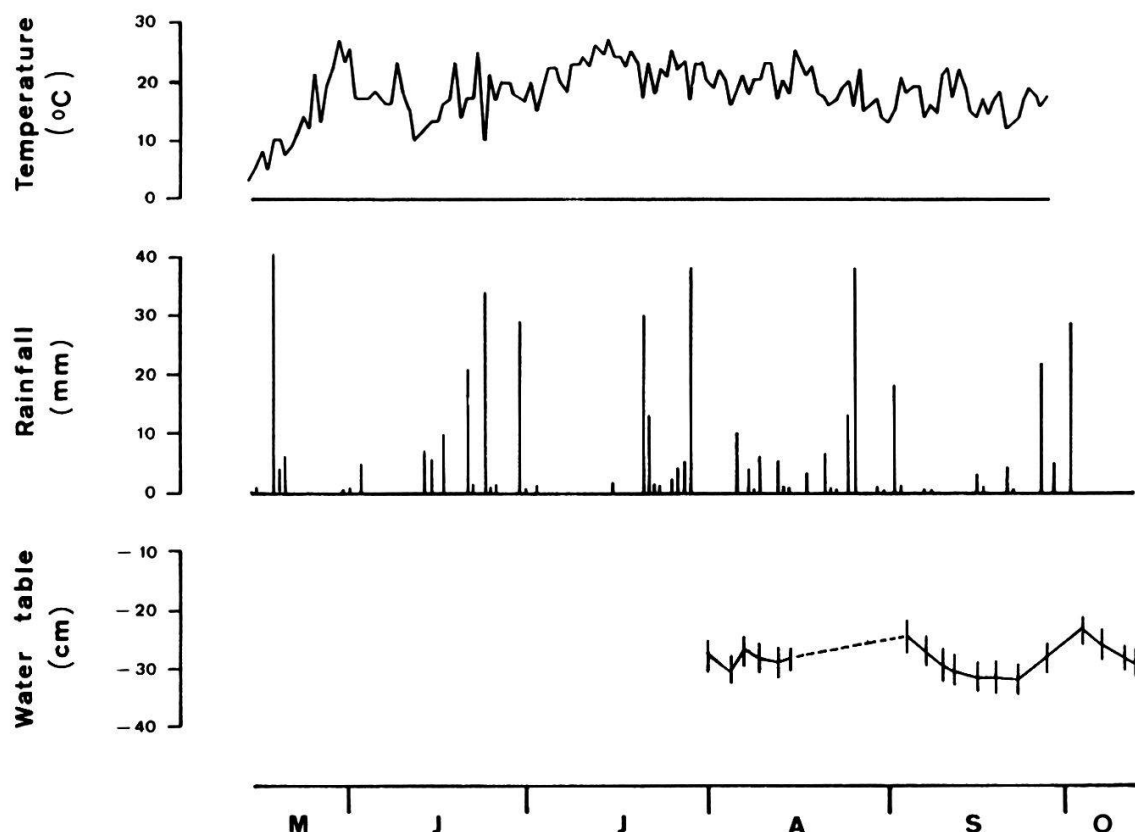


Fig. 4. Temperature, rainfall and water level at the site in 1982: Daily temperatures at 1400 hours, rainfall per 24 hours at the study site and mean (n=8) and standard error of the location of the water table in the drained basin during the vegetation period of 1982.

Table 1. Mean chemical composition of the water in the impoundment studied, during the summer 1981 (from LAKSHMINARAYANA and RIOUX 1982).

* Near the mat surface the pH of the water ranged from 6.2 to 4.8 on Typha-dominated mats and from 4.9 to 3.9 in areas where the successional trend towards poor fen had already progressed (HOGG and WEIN 1988a).

| Parameter | ppm | Parameter | ppm |
|---------------------------------|-------|-----------------|------|
| Dissolved oxygen | 5.3 | Magnesium | 8.3 |
| Carbon Dioxide | 10.1 | Sodium | 26.2 |
| Total residue | 182.8 | Potassium | 2.1 |
| Total suspended residue | 28.4 | Chloride | 70.4 |
| Total filtrable residue | 154.4 | Sulfate | 7.5 |
| pH | 6.5* | Ortho-phosphate | 0.2 |
| Alkalinity (CaCO ₂) | 52.5 | Silica | 3.9 |
| Hardness (CaCO ₃) | 39.6 | COD | 56.1 |
| Calcium | 3.4 | | |

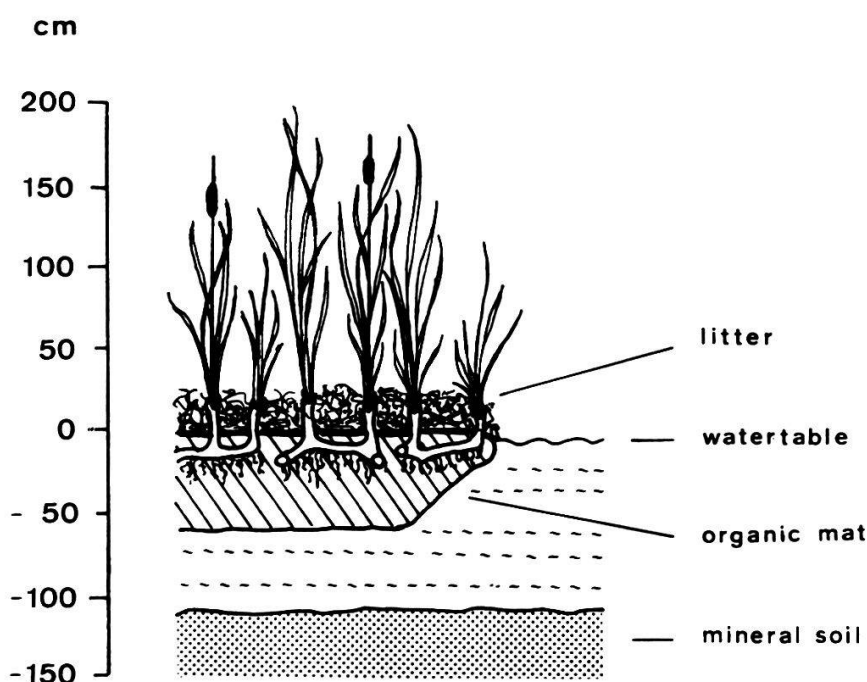


Fig. 5. Schematic profile of the floating mat in the undrained basin.

study site was drained for pasture and hay production. The widespread mechanization of agriculture in the 1950's has made these areas much less attractive for agricultural activities. In the mid-1960's the Canadian Wildlife Service and the Province of Nova Scotia began to acquire some of these unused wetlands as wildlife management areas.

In 1973, the impoundment was dyked on four sides and a water control structure was installed. The site was dominated to some extent by Typha glauca Bodr., a robust hybrid between T. latifolia L. and T. angustifolia L., before the dyking, and after the water level was raised to approximately 1.0 to 1.2 m by snowmelt and rainfall, the Typha mat vegetation floated to the surface and began to expand (Fig. 5). For additional information on the study area, the composition of the floating mat and the mechanism of buoyancy see HOGG and WEIN (1987, 1988a,b).