Holocene Reconstruction of Vegetation from Baie-Comeau and Havre-Saint-Pierre areas, North Shore of St. Lawrence, Québec

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Introduction

The postglacial history on the coastal North shore of the Saint-Lawrence allowed the edification of important deltaic formation from about 9 000 cal. years BP (Dionne, 1977). These deltas have first been colonized by forest stands dominated by Picea mariana, Betula papyrifera, Populus tremuloides and Pinus banksiana species (Schaffhauser et al., 2011). From about 7000 cal BP, forests started to be paludified with massive regional peatland development (Magnan et al., 2011). The origin of this shift in moisture balance is still not understood and different hypothesis have been raised to explain it but not yet demonstrated.

Very little is known in term of Holocene palaeoecology and palaeoclimatology along the North Shore of the Saint-Lawrence except for Mott (1976) who presented a Holocene pollen profile from Sept-Iles area.

The present study aims at reconstructing the Holocene regional vegetation history from Baie-Comeau and Havre-Saint-Pierre located respectively along the estuary and Gulf of Saint-Lawrence. The expected results will be compared with the interpretation of other ongoing projects realized in the same region.

Objectives

• Compare the regional vegetation succession since the beginning of peat accumulation to the present in the two regions;
• Identify potential distinct migration patterns for specific forest species;
• Recognize the effects of external disturbance such as fire on regional vegetation composition;
• Assess the role of climate over these changes.

Study Regions

• The Baie-Comeau region belongs to the balsam fir-white birch domain. Peatlands are domed ombrotrophic systems with concentric pool patterns.
• The Havre-Saint-Pierre region is part of the spruce-moss domain although forest tundra is found on hilltops. Peatlands are characterized by numerous rounded pools with considerable size.
• Both regions are represented by non-forested coastal peatlands.

Material and Methods

• One peat core was retrieved from the deepest sections of each peatland using a Box type peat corer for the first top meter and a Russian peat corer for the successive downward meters.
• Stratigraphic descriptions have been made following Troels-Smith (1955).
• Bulk density and organic matter content will be determined using loss-on-ignition (LOI) method (Dean, 1974).
• Pollen analysis will be performed at 4 cm intervals following Fægri and Iversen (1989).

Peat core chronologies, sediment accumulation rates, pollen influx and timing of vegetation succession will be determined using AMS radiocarbon (14C) dating (Keck Lab, U. of California, USA).

Palaeoclimate (temperatures and precipitations) will be inferred using a transfer function based on Whitmore et al. (2005) modern database.

References


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