Hydro Québec Production

SUMMARY

Author(s) and title (for reference) :

LALUMIÈRE, R. et C. LEMIEUX, 2002. *Suivi environnemental des projets La Grande-2-A et La Grande-1. La zostère marine de la côte nord-est de la baie James*. *Rapport synthèse pour la période 1988-2000.* Rapport du Groupe conseil GENIVAR inc. pour l'unité Environnement, direction Barrages et Environnement d'Hydro-Québec. 92 p. and appendices.

Abstract :

Eelgrass, a strict halophyte, forms extensive meadows along James Bay east coast. Any change in the freshwater plume of the La Grande Rivière, following commissioning of La Grande-2-A and La Grande-1 generating stations, could have induced changes in eelgrass distribution and production, possibly affecting the wildlife species that use them as well as the traditional goose hunting activities of the Crees.

In this context, two types of coastal habitats were studied : eelgrass meadows and salt marches. Eelgrass is the major biological component of the monitoring program, included in the La Grande-2-A authorization certificate. Studies of the salt marches were added to better understand the effects of isostatic uplift on coastal vegetation.

Monitoring of eelgrass included mapping its distribution at a scale of 1:125 000 and measuring its production (shoot density and leaf dry biomass) at six permanent sampling stations.

Mapping

Three distribution maps were produced within the monitoring program : 1986-1987, 1991-1992 and 1996. General distribution of the eelgrass meadows exhibit high stability throughout the years. Major beds are still present in the same embayments. This high stability suggests strongly that the commissioning of La Grande-2-A and La Grande-1 generating stations has had no effect on them. This constatation is enforced by the fact that eelgrass has always maintained itself in good shape in the first shallow embayments, south of the La Grande Rivière which are frequently subjected to very low salinities.

A few methodological learnings are discussed relating to small scale mapping of submerged vegetation.

Eelgrass production

Data on eelgrass production are presented for three distinct periods : 1988-1995, 1998 and 1999-2000. From 1988 to 1995, eelgrass production showed high annual variation at all stations and at all depths. Linear regressions highlighted the tendency of eelgrass production to diminish at 0,5 m and 1,0 m and the opposite tendency at 1,5 and 2,0 m.

Climate and isostatic uplift exert a strong influence on eelgrass production. Climate is mainly responsible for annual variations in leaf dry biomass while isostatic uplift causes the progressive long term disappearance of eelgrass in shallow waters and its seaward expansion.

In 1998, a massive decline of eelgrass happened all along the James and Hudson bays' eastern coasts. This decline appears to be of the same nature as the one that has affected eelgrass meadows along the European and Atlantic coasts in the early 1930's. The so-called wasting disease was attributed to a fungus which proliferation was triggered by anormal high spring temperatures.

Since 1999, eelgrass shows signs of a slow recovery.

Other studies

This report also summarizes basic ecological information on eelgrass meadows that were collected through a few studies aimed at better understanding their ecological importance. Biophysical components described are : water and sediment quality, epiphytes, fish, infauna and supra-benthos.

At last, changes in the vegetation composition and abundance, in ten permanent samples located in a salt mash, were monitored for several years. Results show that the vegetation changes rapidly under the effect of isostatic uplift and notable expanses of vegetation were observed.

The report concludes that the commissioning of the La Grande-2-A generating station has had no effect on the eelgrass meadows of the James Bay northeast coast.

Key words : coastal habitats, eelgrass, *Zostera marina*, marsh, mapping, environmental monitoring, La Grande complex, James Bay, biomass, density, isostatic uplift.

Distribution list : Ministère de l'Environnement, James Bay Advisory Committee on the Environment, Review Committee, Cree Regional Authority, Cree communities, Eeyou Corporation, Makivik Corporation, Société de la faune et des parcs du Québec, Société d'énergie de la Baie James, Société de développement de la Baie James, Municipalité de la Baie James, Hunting, Fishing and Trapping Coordinating Committee, Canadian Electrical Association, Environment Canada, Fisheries and Oceans Canada, Unités d'environnements et de relations avec le milieu des divisions d'Hydro-Québec, Documentation centre of Direction Environnement d'Hydro-Québec.

Version : final ***Diffusion code :*** internal/external ***Date :*** December 2002

Call number at Centre de documentation Environnement d'Hydro-Québec : HQ-2002-100