

2.0 ECOLOGICAL OVERVIEW

The Hudson Bay marine ecosystem extends over a very large geographical area. It includes James Bay and Hudson Bay and is bounded in the east by the coast of Québec, in the south by Ontario and Manitoba, and in the west by Nunavut. Its northern marine boundary has been set arbitrarily as a line that extends from Cap Aivriuvik, Québec (61°41'N, 77°58'W) to Cape Low, Southampton Island, via the southern tips of Mansel and Coats Island, and from Cape Welsford on Southampton Island to Cape Clarke on the Nunavut mainland via White Island (Figure 2-1). The ecosystem receives Arctic marine water from Foxe Basin and freshwater runoff from a catchment basin that is larger than those of the Mackenzie and St. Lawrence rivers combined (Figure 2-1). Because of its large extent, the ecosystem spans many different coastal ecozones. It offers a broad and varied range of habitats that are used year-round by a range of Arctic and Subarctic biota, and seasonally by many migratory fishes, marine mammals and birds.

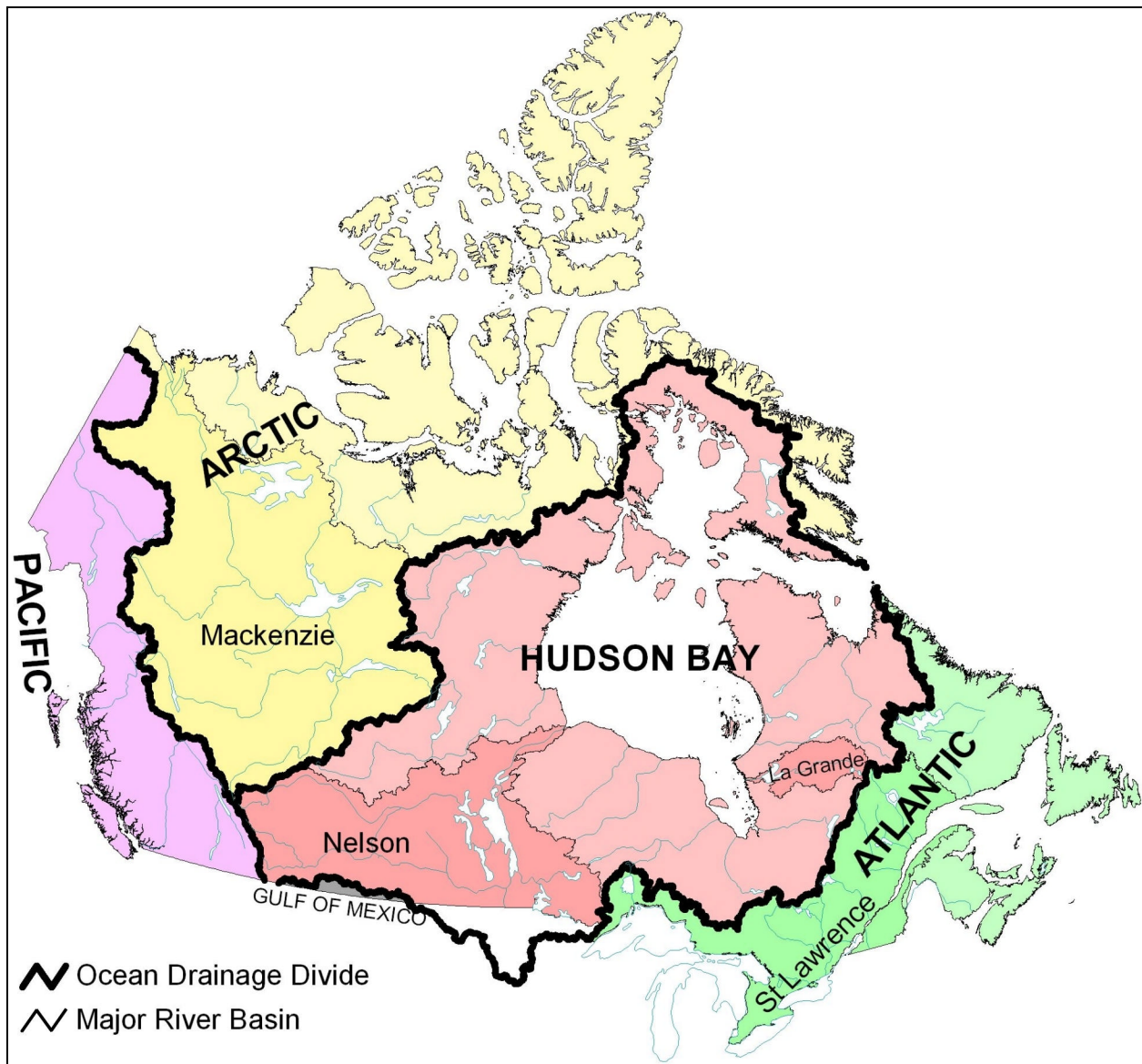


Figure 2-1. Hudson Bay watershed.

Three key features characterize the Hudson Bay marine ecosystem (Stewart 2000). The first of these is the extreme southerly penetration of Arctic marine water, which enables polar bear to live and breed in southern James Bay at the same latitude as the holiday resorts in Jasper, Alberta. Second is the very large volume of freshwater runoff that enters it from the land--each year James Bay has a net gain of freshwater that, spread over its entire surface, would form a layer 4.73 m thick (Prinsenberg 1986a). And third, is the dynamic geomorphology of the coastal zone, which is still rebounding from the great weight of the Laurentide Ice Sheet that covered the entire area. New land is emerging from the sea at a rate of up to 15 horizontal m per year along the stretch of low-lying, marshy coast with its wide tidal flats that continues almost uninterrupted from the Conn River in Québec to Arviat in Nunavut (d'Anglejan 1980; Martini 1982).

Each of these key aspects of the ecosystem creates critically important seasonal habitat for large concentrations of internationally important migratory species. The sea ice supports seals upon which polar bears depend; literally millions of geese and shorebirds feed and/or breed in the vast coastal salt marshes; productive eelgrass (*Zostera marina* L.) beds provide food for multitudes of waterfowl on their way to and from breeding habitat in the Arctic Islands; and the large estuaries provide vital habitat for anadromous fishes and beluga whales. Indeed, the number of belugas in the area of the Nelson River estuary on 19 July 1987 was estimated at 19,500 animals (Richard et al.1990)! This is the largest single concentration of belugas in the world. While the key aspects of the Hudson Bay environment are interesting, the habitats they create are unique and irreplaceable.

The overview that follows describes the Hudson Bay marine ecosystem and how it interacts with its surroundings. It is based on existing knowledge and progresses from the physical to the biological, and finally to the human features of the ecosystem. The overview is an update of two earlier reviews of the region's marine ecology prepared by Stewart et al. (1991, 1993). Geological and climatic forces that have shaped and continue to influence the Hudson Bay basin will be discussed first, then oceanography within the basin, and finally use of coastal and marine habitats by biota including humans.