Utilization of inland water. Over 43% of all water withdrawn in Canada (excluding withdrawals associated with hydro projects) is for one end use, condenser cooling in thermal steam-electric plants. However, about 99% of this water is returned for re-use. Municipal water use, including small industrial processors served by the municipal supply systems of Canada, accounts for some 10.5% of current daily water withdrawals. On average, approximately 75% of the water pumped into the system is discharged as storm and sanitary sewage containing waste materials.

Other industrial users, manufacturing and mining firms, account for 38% of the total withdrawals of water in Canada and about 10% of that intake is consumed or lost. Discharged water is frequently returned to source in a highly polluted condition and may be unfit for most uses downstream. Agriculture requires 7.7% of the nation's total withdrawals annually for irrigation, stockwatering and rural domestic use and relatively little is returned to the water supply source.

Hydro-electric power generation utilizes the kinetic energy of falling water to produce energy. During the process, the water is not consumed except for evaporation losses from the surface of reservoirs. However, flooding of land for storage and interference with natural flow may cause serious adverse effects.

1.1.3 Coastal waters

The coastline of Canada, measuring over 150,000 miles, is one of the longest of any country of the world. It comprises the following estimated mileages (statute) — Mainland: Atlantic 9,843; Pacific 4,363; Hudson Strait 2,643; Hudson Bay 7,623; Arctic 11,884; total 36,356 miles. Islands: Atlantic 18,176; Pacific 11,622; Hudson Strait 5,340; Hudson Bay 9,181; Northwest Territories south of Arctic Circle 13,800; Arctic 57,014; total 115,133 miles.

A comprehensive description of the coastal waters of Canada would require information from sciences such as oceanography, marine biology and meteorology. However, the basic factor in any study of the oceanic-continental margin is the physical relief of the sea floor and the scope of the information presented here is therefore restricted to this and a few salient features of the Atlantic, Pacific and Arctic marginal seas surrounding Canada.

Atlantic. Along this coastal area, the sea has inundated valleys and lower parts of the Appalachian Mountains as well as those of the Canadian Shield. The submerged continental shelf, protruding seaward from the shore, effects the transition from continental to oceanic conditions. This shelf is distinguished by great width and diversity of relief. From the coast of Nova Scotia its width varies from 60 to 100 miles, from Newfoundland 100 to 280 miles (at the entrance of Hudson Strait), and northward it merges with that of the Arctic Ocean. The outer edge of the shelf varies in depth from 100 to 200 fathoms before the shelf gives way to the declivity leading to abyssal depths. The over-all gradient of the Atlantic continental shelf is slight but the whole area is studded with shoals, plateaus, banks, ridges and islands and the coasts of Nova Scotia and Newfoundland are rugged and fringed with islets and shoals. Off Nova Scotia, the 40-fathom line lies at an average of 12 miles from the shore and constitutes the danger line for coastal shipping. The whole floor of the marginal sea appears to be traversed by channels and gullies cutting well into the shelf.

The topography of much of the Atlantic marginal sea floor has been shaped in the past by processes of glacial erosion and deposition. Large areas, however, are in a constant state of change due to continuous marine deposition of materials eroded by rivers, wave action, wind and ice. Navigation charts of such areas must therefore be continuously revised.

Hudson Bay and Hudson Strait bite deeply into the continent. Hudson Bay is an inland sea 317,501 sq miles in area having an average depth of about 70 fathoms; the greatest charted depth in the centre of the Bay is 141 fathoms. Hudson Strait separates Baffin Island from the continental coast and connects Hudson Bay with the Atlantic Ocean. It is 430 miles long and from 37 to 120 miles wide and its greatest charted depth of 481 fathoms is close inside the Atlantic entrance. Great irregularities of the sea floor are indicated but, except in inshore waters, few navigational hazards have been located.

Pacific. The marginal sea of the Pacific differs strikingly from the other marine zones of Canada. The hydrography of British Columbia is characterized by bold, abrupt relief — a repetition of the mountainous landscape. Numerous inlets penetrate the mountainous coasts for distances of 50 to 75 miles. They are usually a mile or two in width and of considerable