

These reservoirs make it possible for British Columbia to develop up to 4 000 MW (megawatts) of hydroelectric generating capacity in the Columbia basin. The Yukon River, also an international river and the largest on the Pacific slope remains largely undeveloped.

Use of inland water. Over 41.1% of all water withdrawn in Canada (excluding withdrawals associated with hydro projects) is for condenser cooling in steam-electric plants including thermonuclear. About 99% is returned to source. Municipal use, including small industrial processors served by municipal systems, accounts for 9% of current water withdrawals. On average, 75% of the water pumped into municipal water distribution systems is discharged as storm and sanitary sewage containing waste materials. A large and generally unmeasured volume of surface run-off is also discharged from municipal systems.

Other industrial users, manufacturing and mining firms, account for 38% of total withdrawals of water. About 8% of that intake is consumed or lost. Discharged water is frequently returned to source in a highly polluted condition and may be unfit for some uses downstream. Canadian agriculture depends largely upon supplies of water from melting snow and rainfall. In many regions such natural sources are inadequate. Agriculture requires an estimated 8% of the nation's total withdrawals annually for irrigation, stock watering and rural domestic use.

Hydroelectric power generation uses the kinetic energy of falling water to produce electricity. Except for evaporation losses from the surface of reservoirs, the water is not consumed or changed in any way. However, flooding of land for storage and interference with natural flow may have adverse effects.

1.2.3 Coastal waters

Canada's coastlines, measuring nearly 244 000 km on the mainland and offshore islands, are collectively among the longest of any country in the world (Table 1.6).

Atlantic. Along this coast, over time the sea has inundated valleys, lower parts of the Appalachian Mountains and the Canadian Shield. The submerged continental shelf has great width and diversity of relief. From the coast of Nova Scotia its width varies from 60 to 100 nautical miles, from Newfoundland 100 to 280 nautical miles at the entrance of Hudson Strait, and northward it merges with the submerged shelf of the Arctic Ocean. The outer edge varies in depth from 183 to 366 m. The overall gradient of the Atlantic continental shelf is slight but the whole area is studded with shoals, plateaus, banks, ridges and islands. The 73 m line is an average of 12 nautical miles from the Nova Scotia coast and is the danger line for shipping. The whole floor of the marginal sea is traversed by channels and gullies cutting deep

into the shelf. Large areas undergo constant change because of continuous marine deposit of materials eroded by rivers, wave action, wind and ice.

Hudson Bay and Hudson Strait bite deeply into the continent. Hudson Bay is a shallow inland sea 822 324 km² in area having an average depth of about 128 m; the greatest depth in the centre of the bay is 258 m. Hudson Strait separates Baffin Island from the continental coast and connects Hudson Bay with the Atlantic Ocean. It is 796 km long and from 69 to 222 km wide; its greatest depth of 880 m is close inside the Atlantic entrance. There are great irregularities in the sea floor but few navigational hazards, except in inshore waters.

Pacific. The marginal sea of the Pacific differs strikingly from other marine zones of Canada. The hydrography of British Columbia is characterized by bold, abrupt relief — a repetition of the mountain landscape. Numerous inlets penetrate the mountainous coasts for distances of 93 to 139 km. They are usually a nautical mile or two wide with deep canyon-like sides. From the islet-strewn coast, the continental shelf extends from 50 to 100 nautical miles to its limit at depths of about 366 m. The sea floor drops rapidly from the western slopes of Vancouver Island and the Queen Charlotte Islands. These detached land masses are the dominant features of the Pacific marginal sea. Numerous shoals and pinnacle rocks necessitate cautious navigation.

Arctic. The submerged plateau extending north of North America is part of the great continental shelf surrounding the Arctic Ocean, on which lie all the Arctic islands of Canada, Greenland, and most of the Arctic islands of Europe and Asia. This shelf north of Siberia is about 500 nautical miles wide; north of North America it surrounds the western islands of the archipelago and extends 50 to 300 nautical miles seaward from the outermost islands.

The floor of the submerged continental margin is nearly flat to gently undulating, with isolated rises and hollows. Most of it slants seaward with an abrupt break at the outer edge to the continental slope. From the Alaskan border eastward to the mouth of the Mackenzie River the shelf is shallow and continuous with the coastal plain on the mainland; its outer edge is at a depth of about 64 m and 40 nautical miles offshore. Near the western edge of the Mackenzie River delta it is indented by the deep Mackenzie Trough, formerly referred to as the Herschel Sea Canyon, whose head comes within 15 nautical miles of the coast. The submerged portion of the Mackenzie Delta forms a great pock-marked undersea plain, most of it less than 55 m deep, up to 75 nautical miles wide and 250 miles long. North and east of it, the continental shelf is more deeply submerged. Most of the well-defined continental shoulder is over 549 m deep, giving way to the smooth continental slope which extends to the abyssal Canada Basin at about 3 658 m. The deeply submerged continental shelf