

the primary objective was to maximize power production or flood control. Fish passages and migration were blocked; mercury was released from flooded soils; water temperature, quantity, and sediment transport changed, all having significant impacts on species, wetlands, and users. Canada now recognizes these problems and is putting more emphasis on conservation and demand management with respect to all uses.

Information about water quantity such as flows, levels, and sediment transport is necessary to make decisions about sustainable use and for resolving conflicts. The Water Survey of Canada, established in 1908, operates the national hydrometric network under federal-provincial agreements and supplies timely information on water levels and flows. Modernization of the network permits users access to real-time data via satellites or telephone lines. Water quantity data can be integrated with other environmental data in geographic information systems to assist water resource managers. Models are applied to watercourses to manage and apportion the flow, to forecast floods and supplies, and to predict the impacts of changes on flow regimes to human and aquatic health and economic activity.

Water Use

Water is essential for all life. It is required for irrigating crops, for supporting fish and wildlife resources, commercial fisheries, recreation, tourism, transportation, manufacturing, and other industrial production, and for municipal and household use. It is used extensively for the large-scale generation of electricity. Freshwaters perform essential ecological functions, including the provision of habitats for many species.

Canada's population is approximately 30 million. On a per capita basis, the water supply appears generous. However, 90 percent of the population lives in a narrow band within 300 kilometres of Canada's southern border, while most rivers flow north to the Arctic Ocean and Hudson Bay. This concentration of people puts high demands on local water supplies and increases conflicts between upstream and downstream users. Industry also typically locates close to these population centres, further increasing demands on water.

Canada's per capita demands on water resources are the second highest in the world. At about 326 litres per person per day at home, Canadians use twice as much water as the average European. The price that Canadians pay for water does not reflect the full cost of providing the service. As a result, we tend to overuse freshwater, rates of industrial water recirculation have been low, and we have not been re-investing sufficiently in municipal delivery and treatment systems.

Healthy House Project, Toronto, Ontario

Since the beginning of 1997, two families of four have been living in a semi-detached house that is completely independent of municipal systems. All water comes from rainfall and is stored in a cistern. An innovative waste treatment system with passive biological filtration is used for recycling the water.

Water consumption in the house was first reduced to half that of a conventional style home by water-saving appliances. Without sacrificing lifestyle, water use in the home is 720 litres per day. Of this amount, 600 litres are cleaned and used again in the home.

Ten water treatment systems are to begin trial in the Yukon; the system is being adapted for an apartment building in Vancouver, British Columbia; and 400 units are planned for use in Egypt.