CHAPTER 15
Part 1 of 2

Calm water on Sherbrooke Lake, Nova Scotia. DIANN ROBAR.

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A mixed Prairie grassland under good moisture conditions, Grasslands National Park of Canada, Saskatchewan. W. LYNCH, COPYRIGHT PARKS CANADA.

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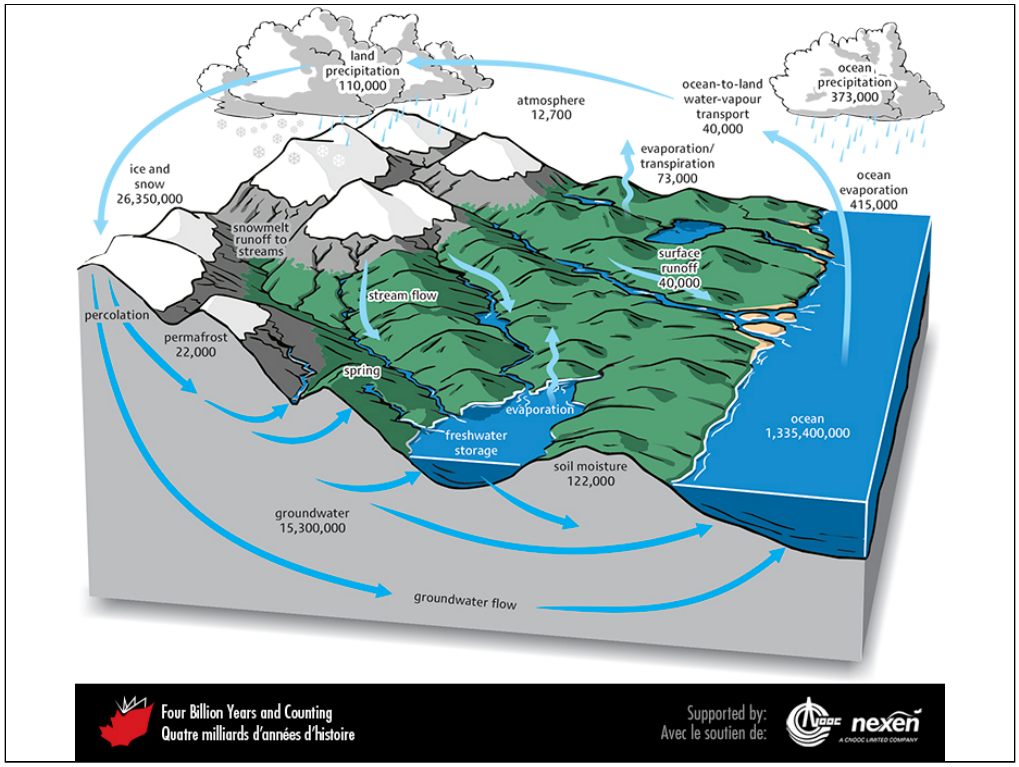
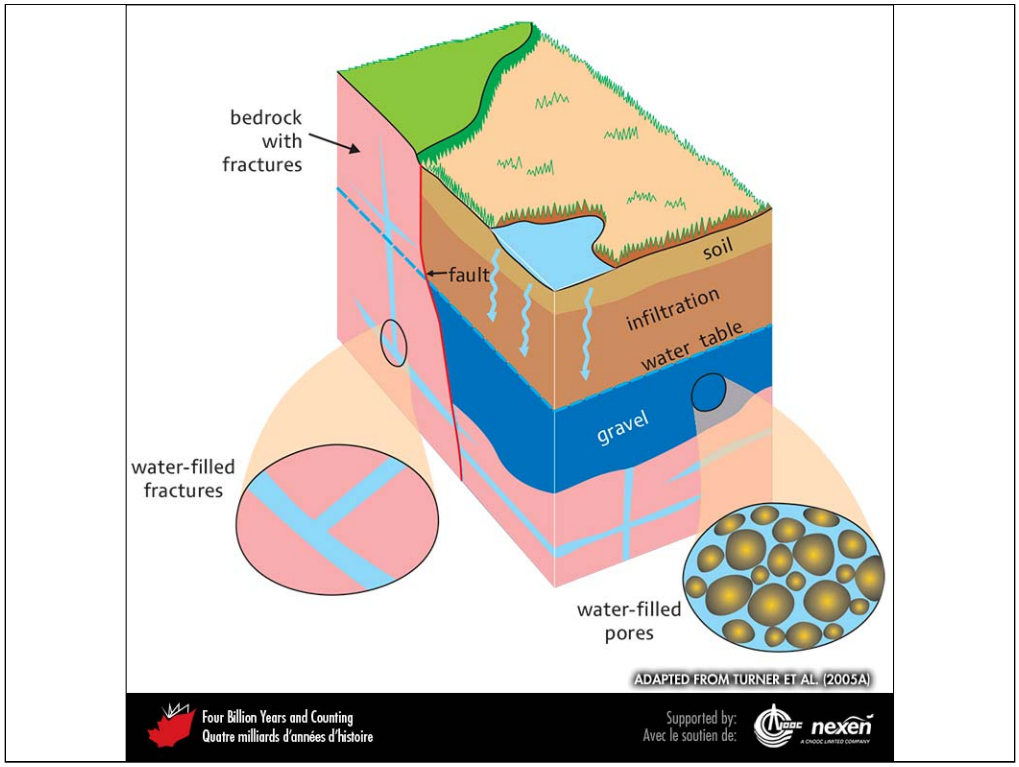
Farmland suffering drought in southwestern Saskatchewan. ROB FENSOME.



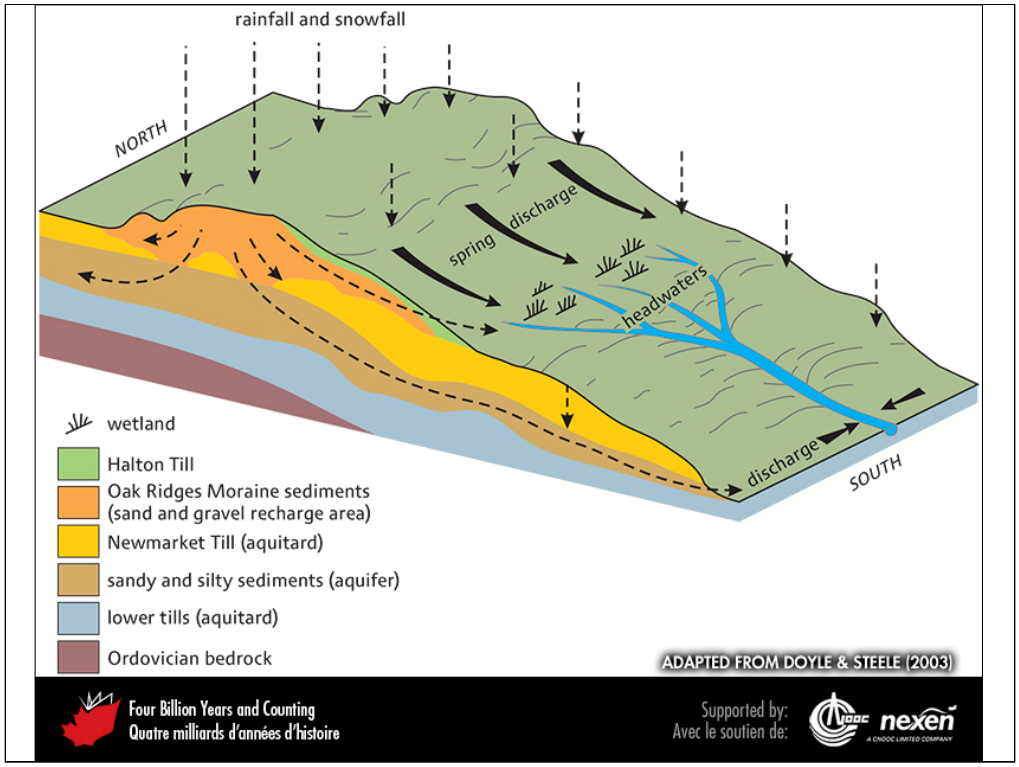
The hydrological cycle begins with the evaporation of seawater to create the world's ongoing supply of fresh water. Moisture-filled air formed over the oceans brings fresh water onto the continents, where it precipitates and eventually returns to the ocean through rivers and groundwater seepage to complete the cycle. Numbers represent in cubic kilometres how much water is either in storage or moving through the various parts of the water cycle on average in one year: for example, 415,000 cubic kilometres refers to the amount of ocean evaporation, of which 373,000 cubic kilometres is returned to the ocean as precipitation, and 15,300 cubic kilometres is stored in groundwater.

About 65 percent of the planet's fresh water is locked up in glacier ice, as in this glacier west of McKinley Bay, northern Ellesmere Island, Nunavut. STEVE GRASBY.

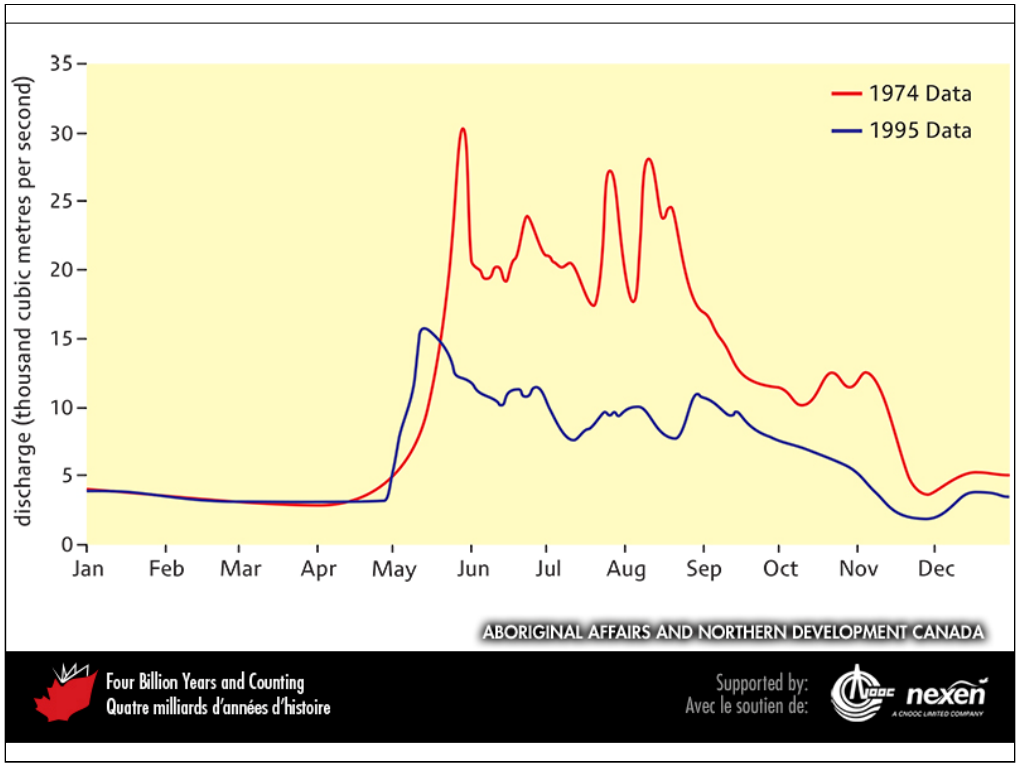


Water that soaks into the ground fills pores and fractures in soil or rock to become groundwater. Pores and fractures below the water table are saturated with groundwater. ADAPTED FROM TURNER ET AL. (2005A).

Tulita Spring, near the confluence of the Mackenzie and Great Bear rivers in the Northwest Territories, brings groundwater to the surface. STEVE GRASBY.



Section through the Oak Ridges Moraine of southern Ontario. Water can move relatively easily into and through porous, permeable material. When saturated by water from rain and melted snow (recharge), the sediments exposed at ground level and extending below the surface become reservoirs of groundwater known as aquifers. Groundwater movement is restricted by impermeable layers, or aquitards. In this example, the groundwater of the Oak Ridges Moraine supports stream and wetland ecosystems. To safeguard this water, areas where recharge occurs must be protected. ADAPTED FROM DOYLE AND STEELE (2003).



The flow of rivers varies dramatically through the year. The Mackenzie River (shown here) has peak discharge in the late spring when snow is melting and then wanes through the summer and fall. The low-flow period of the winter and early spring is when the water supply is predominantly fed by groundwater discharge. Changes in annual precipitation can have significant impacts on flow from year to year as shown by the pattern of the maximum (1974) and minimum (1995) daily discharge of the Mackenzie into the Beaufort Sea at Arctic Red River. ADAPTED FROM ABORIGINAL AFFAIRS AND NORTHERN DEVELOPMENT CANADA WEBSITE.

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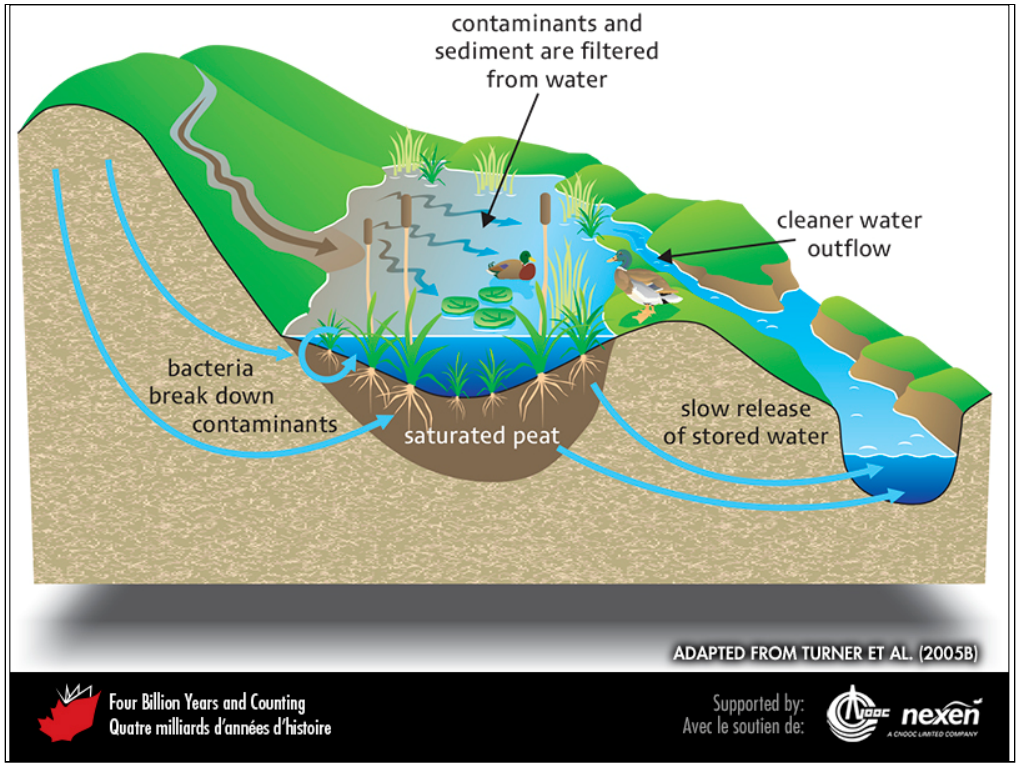
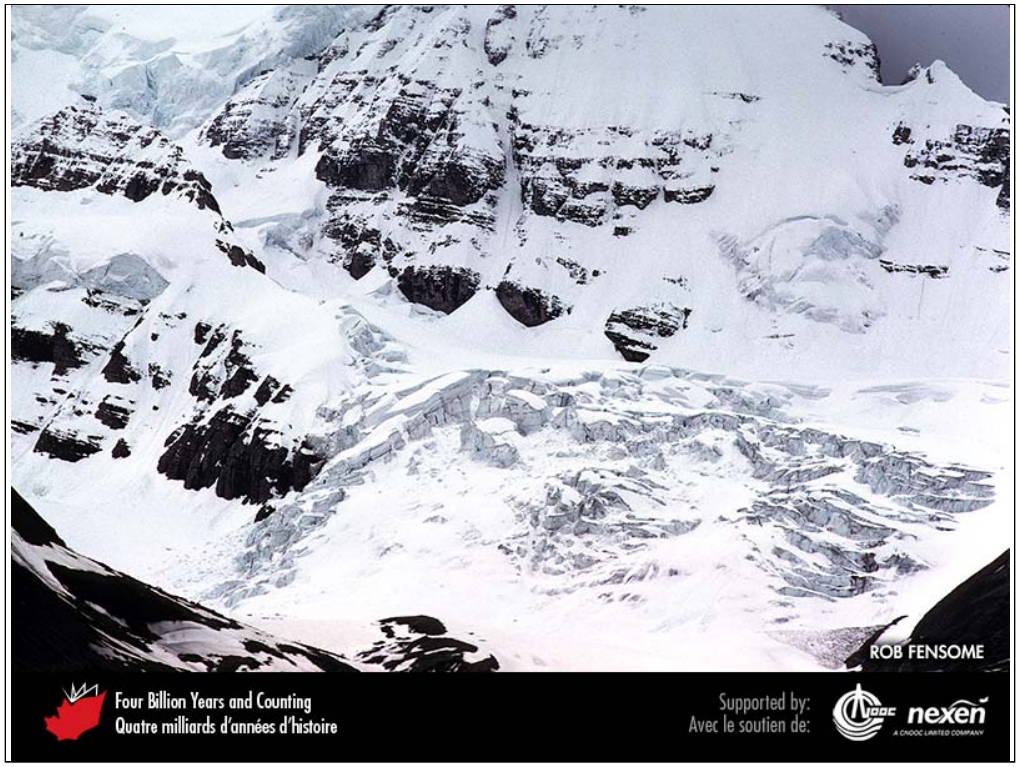
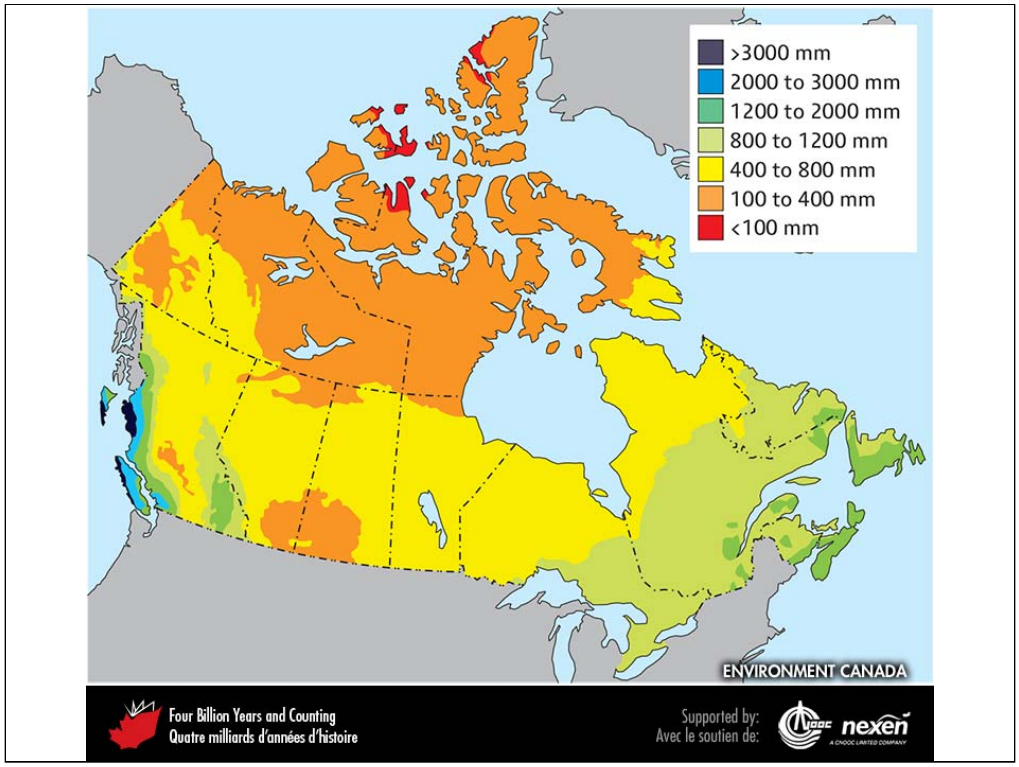
Small upland lakes such as those shown here at Hudson Bay Mountain, near Smithers, British Columbia, demonstrate the concept of a water budget. New water inflow from rain, snowmelt, and springs is balanced by downstream water outflow and evaporation. IAN SPOONER.



Groundwater and surface water are all part of one interconnected system. Movement of water through ground and wetland environments is a natural process that reduces the contaminants in water. Peat, an especially effective filter, is excellent for storing water, which is then released slowly. The filtered water that leaves the peat has far fewer contaminants and sediment than the water that entered it. ADAPTED FROM TURNER ET AL. (2005B).

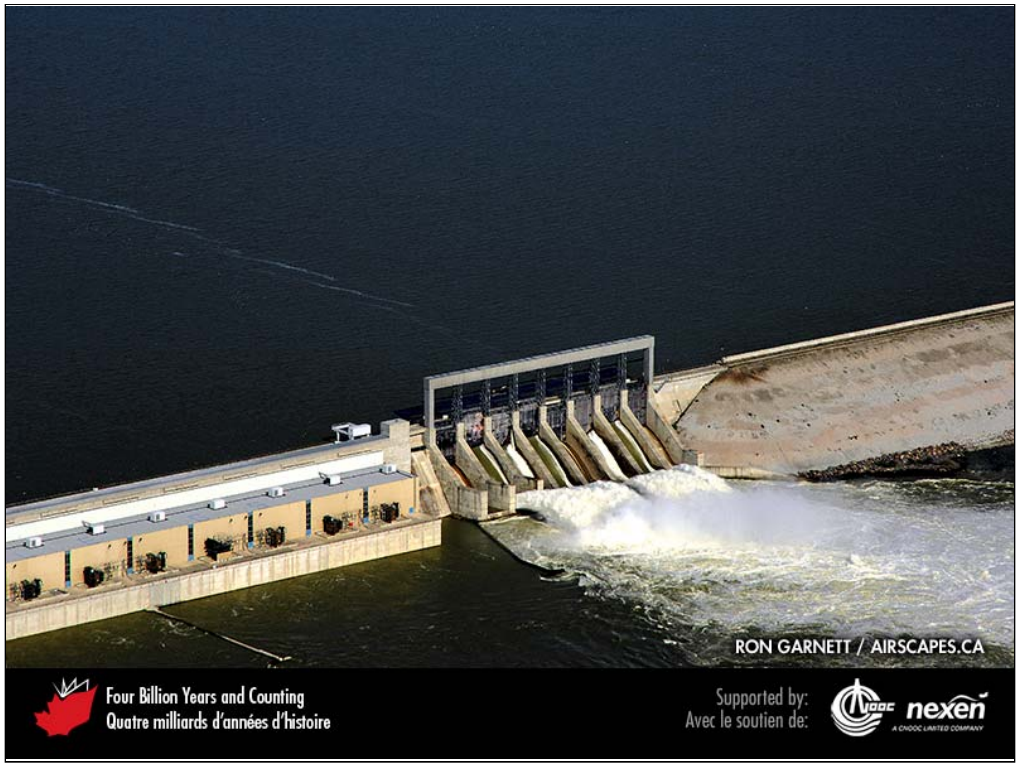


A glacier on Mount Brazeau, at the south end of Maligne Lake, Jasper National Park of Canada, Alberta. Glaciers in the Cordillera source and supply many of western and central Canada's great rivers. ROB FENSOME.



Average annual precipitation across Canada. COURTESY OF ENVIRONMENT CANADA.

Oldman River Dam, Pincher Creek, Alberta, stores water for irrigation. RON GARNETT / AIRSCAPES.CA.



Kettle Rapids Generating Station, Gillam, Manitoba. The wide use of flowing river water to generate electricity has led to the word “hydro” being synonymous with electricity in several provinces. RON GARNETT / AIRSCAPES.CA.

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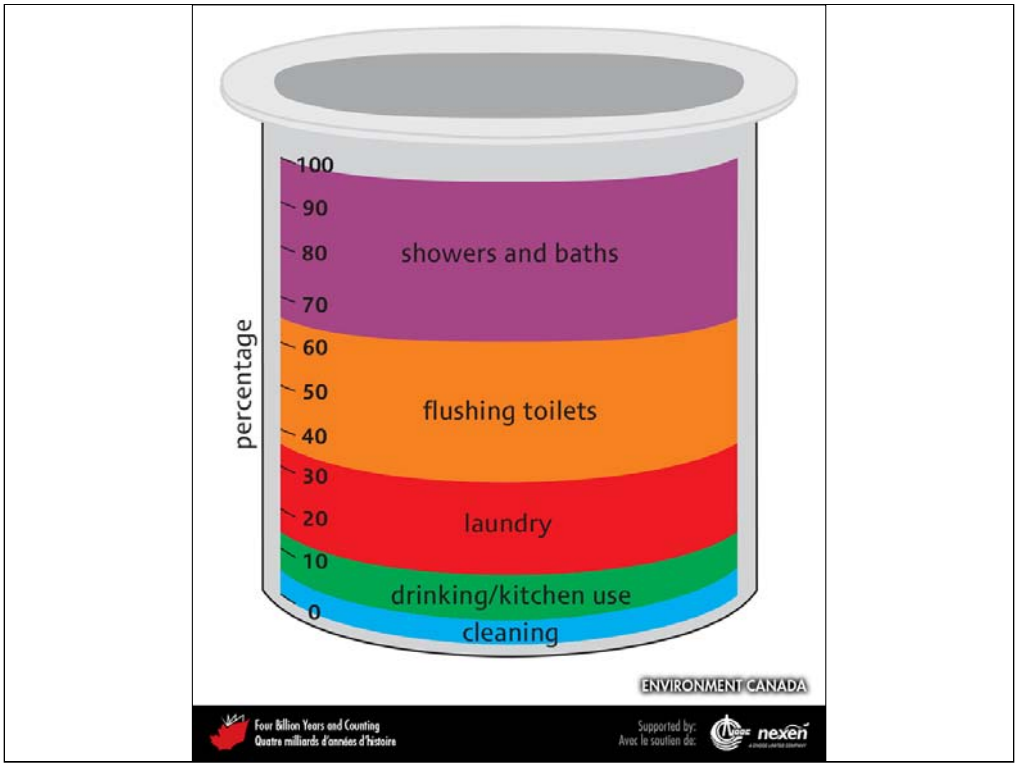
Old-fashioned irrigation in the Okanagan Valley, near Oliver, British Columbia. GODFREY NOWLAN.



Summary of water consumption in a typical Canadian home. ADAPTED FROM ENVIRONMENT CANADA WEBSITE.
