

The Great (Polluted) Lakes

The Great Lakes are accidents of time and temperature—melted ice in rock basins. If the weather stayed cold enough they would freeze completely again; if it grew hot enough they would boil away.

They are the most impressive grouping of big lakes on earth. Viewed from a whaleboat, the smallest, Ontario, seems an ocean. But viewed (as they are every thirty minutes) from a satellite 22,300 miles out, Superior is an inkblot, Ontario a drop of spilled tea.

They are owned by the United States and Canada. The future of the Lakes, like the depths of Erie, is hazy and dim. It depends on the continued and expensive efforts of two national, one provincial and eight state governments.

A commitment, called formally the Great Lakes Water Quality Agreement, was made in 1972 when Canada and the US agreed to spend billions of dollars to restore Great Lakes waters for fish and man. The third annual report on the progress of the rehabilitation was issued by the International Joint Commission on March 11, 1976, and it is a sober though not an entirely pessimistic document.

In this issue of CANADA TODAY/D'AUJOURD'HUI, we look at the ability of the two countries to adjust together to the new world of instant communications and novel forms of pollution. Present problems sometimes seem almost beyond solution, but we have data and analytical tools, most particularly earth observation satellites, that give us new abilities, the extent of which we still cannot grasp.

These satellites were built and launched by the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA) in the United States. They do not look alike and they move in different orbits at different altitudes, but they resemble each other in basics. They take pictures without cameras. They use sensors to measure reflected light and heat and then produce the results in the form of lists of numbers. The numbers, each one a measurement of heat or light intensity, are sent by radio to receiving stations throughout the world.

Canada's involvement is extensive. To receive data from the Landsat satellites, Canada has developed its own receiving equipment at Prince Albert, Saskatchewan and Shoe Cove, Newfoundland, which gives instant television and photographic read-outs as the satellites pass. The station now under construction at Shoe Cove will be semi-mobile—ideal for use in developing nations.

Satellite information means different things to different people. It assists in hunting mineral deposits, mapping unmapped country, planning highways, measuring agricultural productivity, predicting the weather and navigating Arctic waters. Our emphasis is on its role in monitoring polluted waters. Hopefully within two decades the clear satellite pictures will be of five clear lakes.

Cover: Satellite pictures reflect the changing seasons. These four show the Niagara Peninsula in winter, spring, summer and fall. Summer vegetation is red, snow is white, and the bare ground of fall is pale tan.

Right: The varying shades of a Landsat picture can show the varying states of Lake waters. In

this picture of Lakes Ontario and Erie, turbidity is white and biotic materials are light brown. The suggestive shades are primary pollution clues which are varified by close examination—the "ground truth." Scientists believe that satellite data will be an increasingly important tool in monitoring water quality.