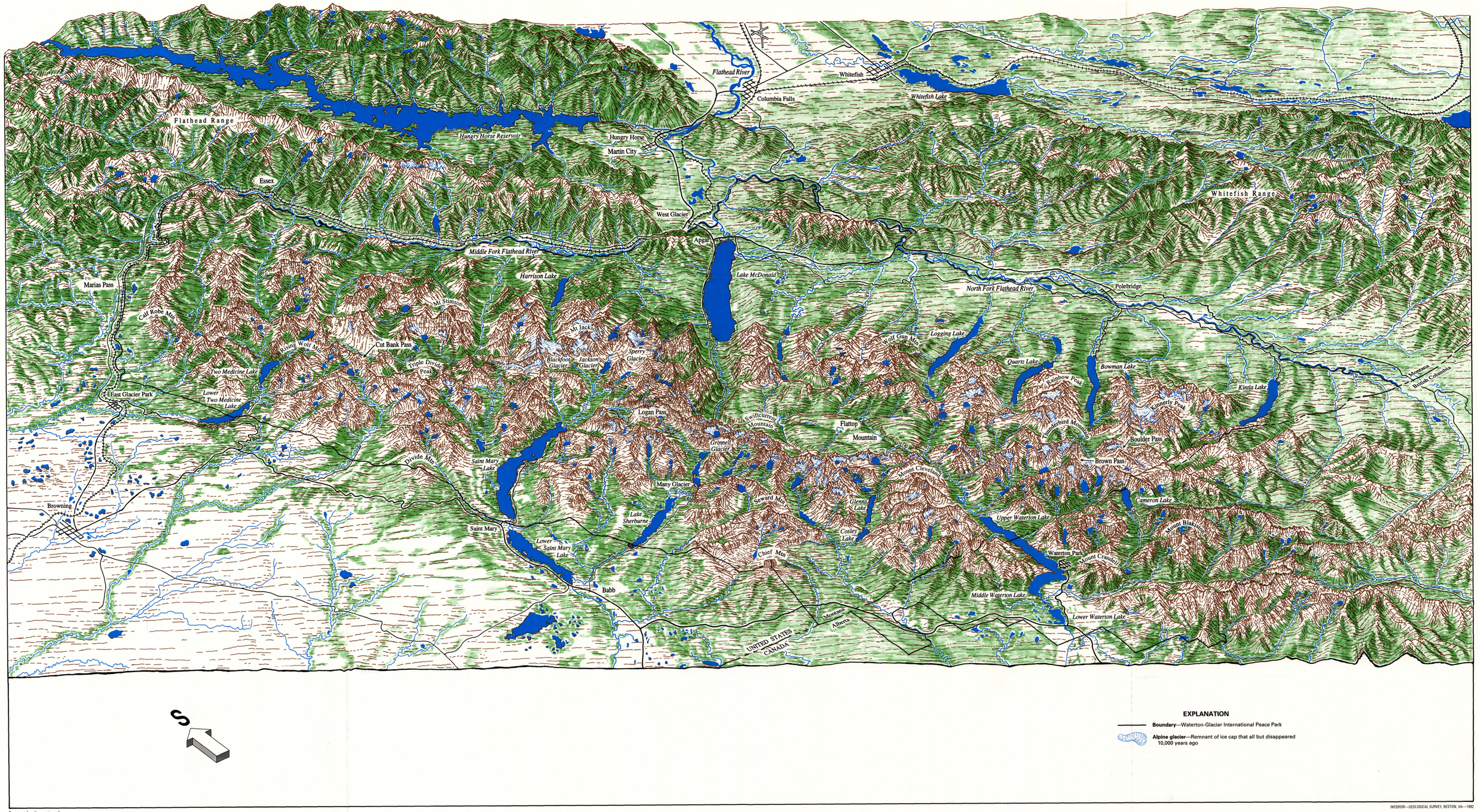
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with
CANADIAN PARKS SERVICE AND THE NATIONAL PARK SERVICE

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I–1508–G

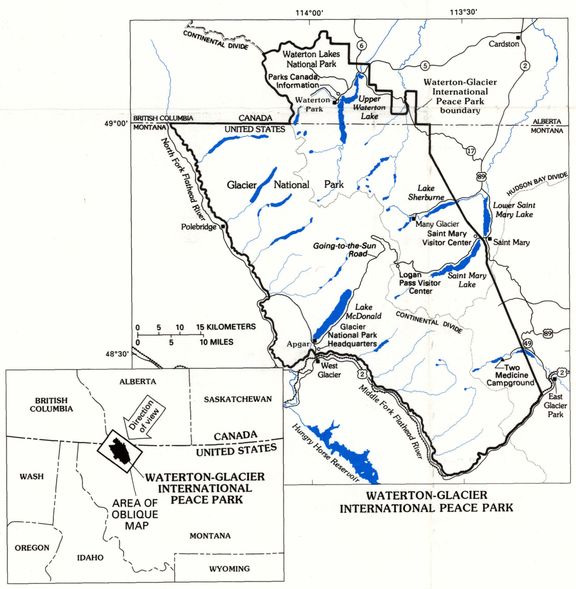


EXPLANATION

Boundary—Waterton-Glacier International Peace Park

Alpine glacier—Remnant of ice cap that all but disappeared 10,000 years ago

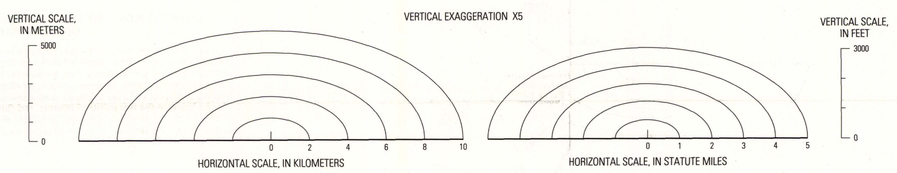
See text for discussion of maps used in this compilation



WATERTON-GLACIER INTERNATIONAL PEACE PARK

HOW TO MEASURE HORIZONTAL DISTANCES ON THIS OBLIQUE MAP

On a planimetric map, the scale is the same in all directions and orientations, and the user can measure the distance between two points by comparing the map distance with the bar scale. On an oblique map, because the front-to-back scale is foreshortened and the left-to-right scale remains constant, an elliptical scale must be used to measure horizontal distances. To use it, place a scaling instrument on the map, note the number of units between the two points of interest, and then move it to the zero point on the elliptical scale, keeping the instrument parallel to its original alignment on the two map points. Read the distance from the elliptical scale, estimating as necessary.



DISCUSSION

In 1932, the U.S. Congress and the Canadian Parliament established the first international peace park by joining Waterton Lakes National Park of Alberta, Canada, with Glacier National Park of Montana, United States. The Waterton-Glacier International Peace Park continues to symbolize the bonds of peace and friendship between these two countries. Though administered by separate governments and divided by the international boundary, the park is at the same time united by its physiography and the geologic and climatic processes that created it. Glaciers carved the Upper Waterton Valley, which lies in both nations; the native plants and animals are similar; and the massive Rocky Mountains span the two countries. Long before European explorers and settlers began to venture into the Rockies, the peoples native to this region shared the bounties of the land and considered it one (Canadian Parks Service and National Park Service, 1984).

Through the United Nations Education and Scientific Organization's Man and Biosphere Program, Waterton Lakes and Glacier National Parks have also been designated as Biosphere Reserves. The Man and Biosphere Program explores the relations between people and the many ecosystems of the world. Biosphere Reserves provide for scientific research, education, and the preservation of biologic and genetic diversity (Canadian Parks Service and National Park Service, 1984).

The landscape of the Peace Park has been determined by the geology and by the natural forces that have acted upon the land surface. The Continental Divide in the northern Rocky Mountains of Alberta and Montana separates the Waterton-Glacier International Peace Park into three watersheds. Runoff from melting snow and rain in these watersheds flows to the Pacific Ocean, to the Arctic Ocean by way of Hudson Bay, and to the Atlantic Ocean by way of the Gulf of Mexico.

Several times in the geologic past, the park has been covered by a large ice cap. This ice cap was the source of many large glaciers that carved out the mountain valleys and flowed out of the mountains, filling the valleys of the North Fork of the Flathead and the Flathead Rivers with ice and glacial deposits. The glaciers continued to flow eastward, joining with the large continental ice sheets. Although Glacier National Park was named for the large glaciers that created most of the physiographic features we see today, the glaciers all but disappeared approximately 10,000 years ago. Features such as U-shaped mountain valleys, long narrow finger lakes dammed by moraines, waterfalls created where streams issue from high "hanging" valleys, steep-sided cirques, sharp-crested aretes, and matterhorn-type peaks are all the result of the past glaciation.

The purpose of this oblique map is to provide an overview of the physiography of the park. The United States part of the oblique map is based on the 1:100,000-scale topographic map entitled "Glacier National Park, part of Waterton-Glacier International Peace Park, Montana" (U.S. Geological Survey, 1968), as well as other 1:100,000-scale topographic maps (U.S. Geological Survey, 1981a,b). The Canadian part is based on the 1:50,000-scale topographic map entitled "Waterton Lakes National Park, Alberta" (Canadian Parks Service, 1973). Contours from these planimetric maps were transformed to an oblique contour map by an isometrograph. Using the oblique contour map as a base, the physiography was interpreted and compiled, with emphasis on the outline, shape, form, and rock type of the landscape. Geologic maps (Carrara, 1990; Raup and others, 1983; Ross, 1959; Whipple, in press) were consulted to define the physiographic features commonly associated with the different rock types. For example, sedimentary rocks are usually recognized by the clearly visible bedding planes they display; these rocks are portrayed on the map by parallel, gently sloping, or horizontal lines across the slopes of the mountains.

Additional sketches of the Waterton-Glacier park and adjacent areas are portrayed in Alpha and Nelson (1990). A complete description of how physiography is compiled and portrayed can be found in Alpha and others (1988).

ACKNOWLEDGMENTS

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OBLIQUE MAP OF WATERTON-GLACIER INTERNATIONAL PEACE PARK, ALBERTA, CANADA, AND MONTANA, UNITED STATES

By

Tau Rho Alpha

1992

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