

DEPARTMENT of the INTERIOR

news release

GEOLOGICAL SURVEY

Forrester (202) 343-4646

For release January 11, 1973

EROS REPRINT # 165

"GALLOPING" GLACIERS MONITORED FROM SPACE

"Galloping" or surging glaciers, as well as nonsurging glaciers up to 40 miles in length around Mt. McKinley in south central Alaska, have been identified clearly in images returned from the first experimental Earth Resources Technology Satellite (ERTS-1), according to scientists of the U.S. Geological Survey, Department of the Interior.

The images, also revealing the extent of sediment plumes from coastal glaciers, offer considerable promise as a tool for monitoring the behavior of glaciers, according to Survey specialists of the Interior Department's EROS (Earth Resources Observation Systems) program. The EROS program is aimed at applying high-altitude photographic data to a variety of natural resource and environmental problems.

Dr. Mark Meier, project chief of the Survey's glaciology research office, Tacoma, Washington, noted that "normal glaciers, such as the Ruth and Kahiltna, flow at quite uniform rates of only a few inches or a foot per day. Their medial moraines - dark colored strips of rock fragments stripped from mountains situated between tributary glaciers - are quite straight and uniform."

"Surging or 'galloping' glaciers, on the other hand, such as the Tokositna, Lacuna and Yentna," he explained, "have wiggly moraines which result from alternating periods of near stagnation (up to 50 years) and brief periods (1 to 3 years) of extremely high flow rates when the ice may flow as fast as 4 feet per hour or more."

Meier noted that the Tokositna Glacier has just completed a surge which began in 1970. The Lacuna Glacier, he reported, has been in a stagnant condition for 40 or more years, and its dirty mottled surface shows the effects of severe melting. The ERTS image of the Yentna Glacier shows that its folded moraines have been displaced more than 6,000 feet down valley from their positions shown on recent maps and 1970 aerial photographs.

"The causes of glacier surges - and why some glaciers surge while others do not - are questions of great scientific interest, Meier said, noting that "this type of sudden response to subtle changes in the environment is common to many other phenomena in nature, perhaps even to the mechanism of earthquakes."

(more)

"Surging glaciers may advance over large areas, and cause devastating floods by blocking and suddenly releasing large quantities of meltwater; thus, there is much practical interest in monitoring their behavior," the Survey scientist said, adding that "we can now use ERTS images to keep track of many large important surging glaciers in inaccessible areas."

In other ERTS images, Meier reported that sediment plumes could be clearly identified from Alaskan coastal glaciers extending more than 30 miles into the Pacific Ocean.

"Although it has been known that large amounts of sediments are carried to sea from glaciers, the overall view that the satellite images give are the first to visually show the extent," he said.

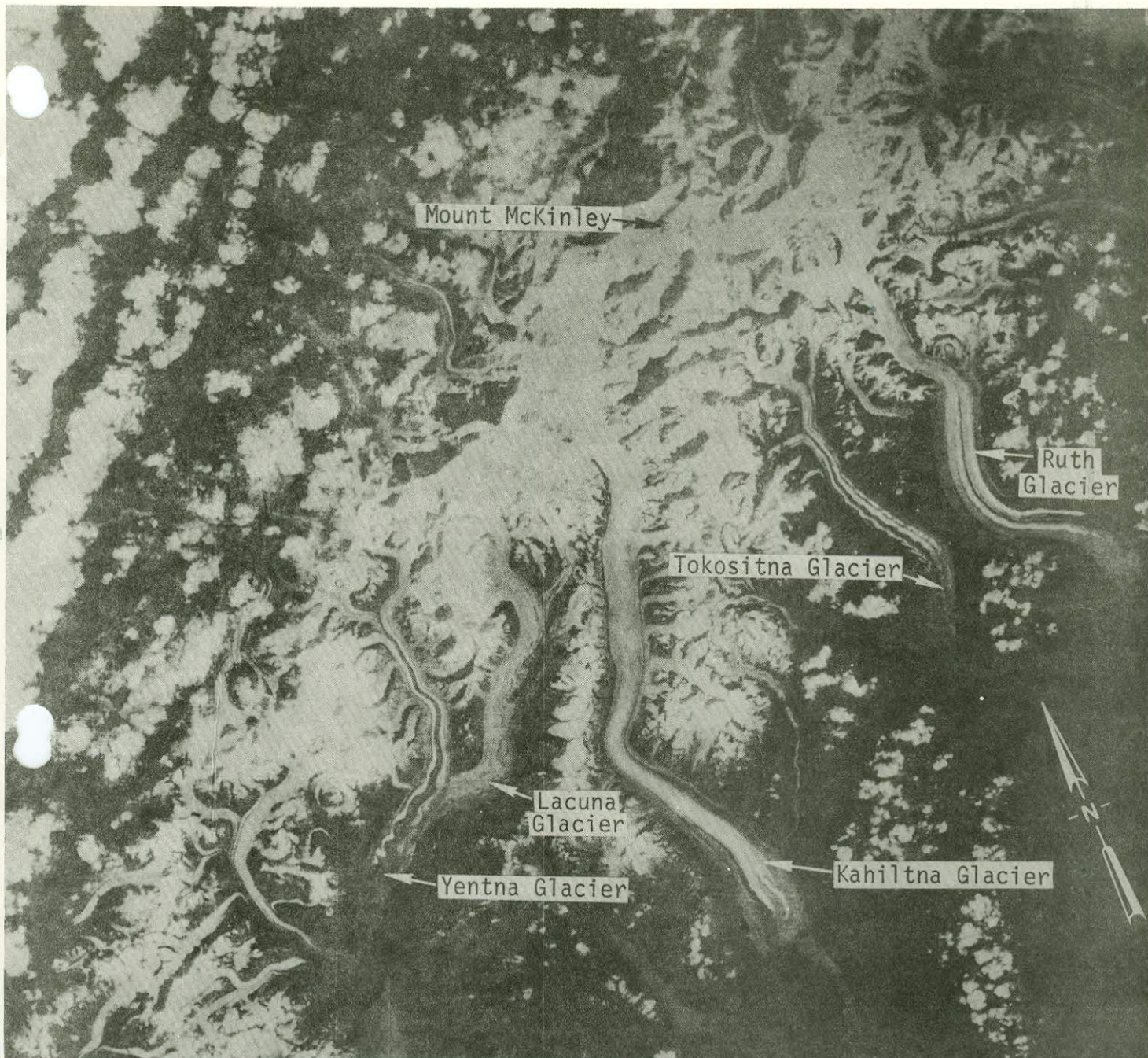
"Especially striking," Meier said, "is the amount of glacial sediment in the surface water along the coast northwest of Glacier Bay in the Alaskan Panhandle, as seen in one of the ERTS images. A visible plume from the Lituya Bay glaciers extends 34 miles away from the coast. Also noteworthy are the large plumes from the Alsek River (which is fed by glaciers in Canada), and from Brady Glacier."

"A better understanding of glacier hydrology is becoming increasingly important because of their potential as sources of water supply," Meier said, noting that "glaciers are one of the few sources of water supply that remain unexploited, and with the advance of civilization into the subpolar regions, more attention should be paid to these ice masses in relation to potential water resources development."

Meier noted that an enormous reserve of water is stored in the form of glacier ice. "About three-fourths of all the fresh water in the world - equivalent to about 60 years of precipitation over the entire globe - is locked in glacier ice," he said.

X X X

(Note to Editors: See photos attached)



Surging or "galloping" glaciers in south central Alaska are identified in this Earth Resources Technology Satellite (ERTS-1) image.

Scientists of the U.S. Geological Survey, Department of the Interior, believe that such images can be useful in monitoring the behavior of surging glaciers, the causes of which are questions of great scientific interest.

