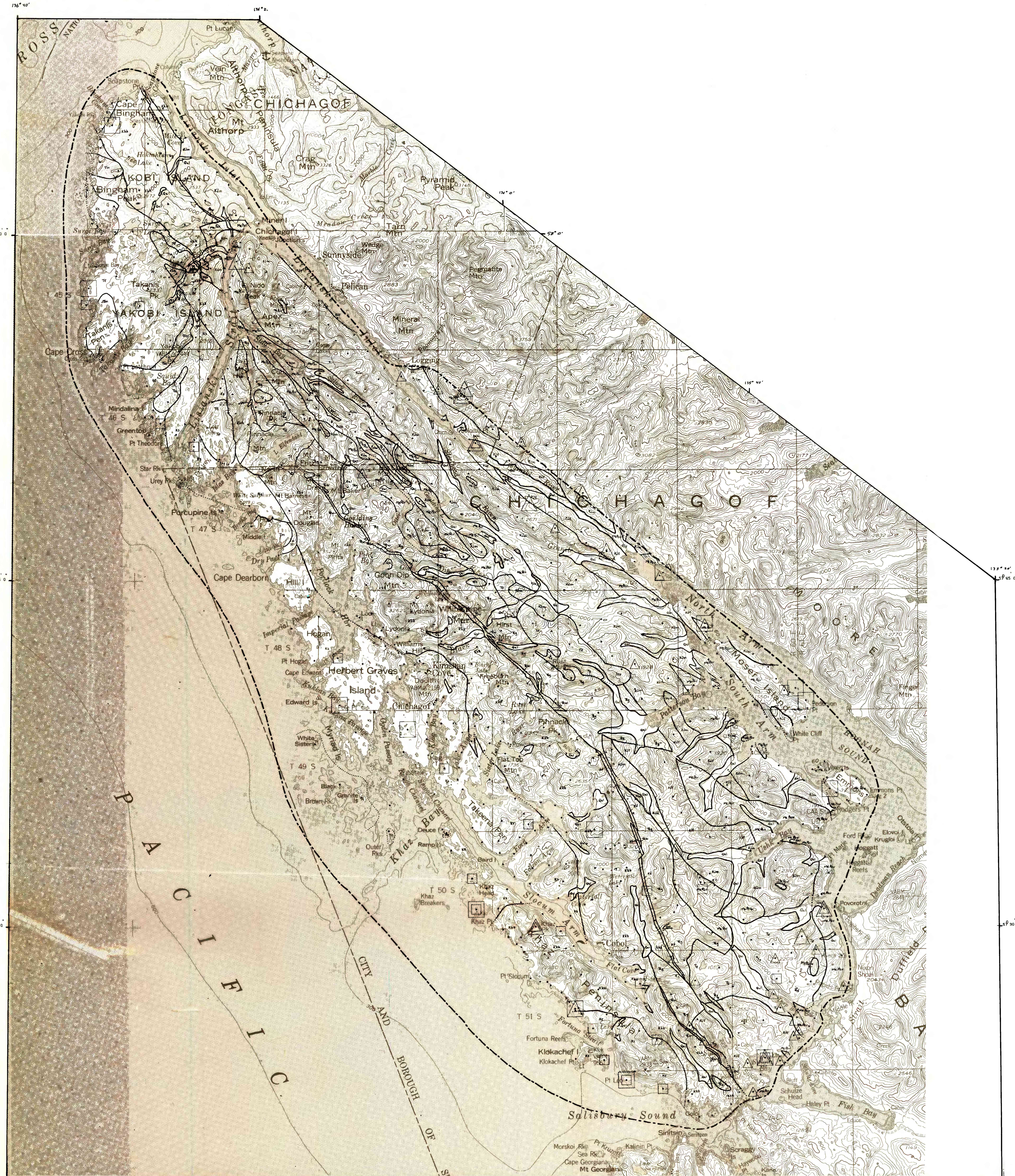
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN FILE REPORT 81-0027- J



Base from U.S. Geological Survey 1:250,000
Mt. Fairweather, 1961; Sitka, 1951

Geology generalized from Johnson and Karl (1982)

CORRELATION OF MAP UNITS

Map units	Age
Qal	QUATERNARY
Tf, Tm	TERTIARY(?)
Kd	CRETACEOUS(?)
Ks, Kkb	CRETACEOUS
KJf, KJm	CRETACEOUS AND JURASSIC
₹w, ₹g	TRIASSIC(?)
MzPzu	MESOZOIC AND PALEOZOIC

LIST OF MAP UNITS

Qal	Alluvial deposits, undivided
Tf	Felsic plutonic rocks
Mf	Mafic plutonic rocks
Kd	Diorite sill, extensively altered
Ks	Sitka Graywacke
Kkb	Kelp Bay Group
KJf	Felsic plutonic rocks
KJm	Mafic plutonic rocks
₹w	Whitestripe Marble
₹g	Goon Dip Greenstone
MzPzu	Undivided metasedimentary, metavolcanic, and metaplutonic rocks

SYMBOLS

- Contact, approximately located, dotted where concealed
- Boundary of study area
- Geochemical sample site
- △ Strontium = 1500 ppm
- △ (large) Strontium > 1500 ppm
- □ Lanthanum = 50 ppm
- □ (large) Lanthanum > 50 ppm

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a geochemical survey of the Western Chichagof-Yakobi Islands Wilderness Study Area in the Tongass National Forest, Alaska. About 65 percent of the study area was established as a wilderness on December 2, 1980, under the Alaska National Interest Lands Conservation Act (P.L. 96-487).

In the course of the U.S. Geological Survey investigations of the Western Chichagof-Yakobi Islands Wilderness Study Area, 2,230 bedrock geochemical samples were collected. Samples were analyzed for 31 elements by a 6-step, semiquantitative spectrographic method (Grimes and Marranzino, 1968) and for 4 elements by atomic absorption spectrophotometry (Ward and others, 1969). Complete analytical data, station coordinates, and a station location map are available in two reports: Johnson, 1982, and Johnson and Elliott, 1984. A map and discussion of the mineral resource potential of the study area is also available (Johnson, Kimball, and Still, 1982).

Background levels for each element vary for different lithologies in the study area. Because of this and variability introduced from other sources such as sampling technique, analytical variance, and chemical weathering, it is impossible to select a specific analytical level above which values indicate mineralization. Higher values may indicate a greater likelihood of bedrock mineralization, but confidence levels are low for single element high values and results which are not supported by neighboring values. This map shows the distibution of high analytical values for the elements strontium and lanthanum as well as the location of all 2,230 samples. Multiple symbols for a single element at one sample site represent multiple samples at that site. Although not of economic interest in this area, these elements, along with other, may prove to be pathfinders, or indicators of economic mineralization in other elements. In a statistical analysis of similar geochemical data from Glacier Bay National Monument, high values for strontium and lanthanum were found to correlate with high values for zinc (Johnson, 1978).

REFERENCES CITED

Grimes, D. J., and Marranzino, A. P., 1968, Direct-current arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.

Johnson, B. R., 1978, Statistical analysis of geochemical data from Glacier Bay National Monument, Alaska: U.S. Geological Survey Open-File Report 78-495, 16 p.

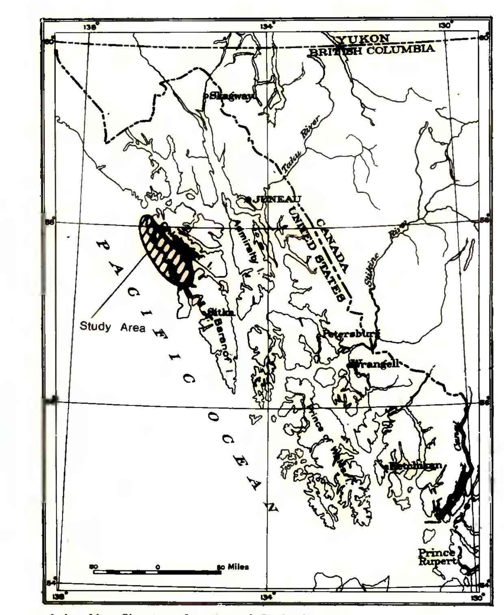
Johnson, B. R., 1982, Magnetic tape containing trace element data for bedrock geochemical samples from the West Chichagof-Yakobi Islands Wilderness Study Area, southeastern Alaska: National Technical Information Service Report No. USGS-GD-82-005, computer tape, 1 reel.

Johnson, B. R., and Elliott, G. S., 1984, Map showing bedrock geochemical station locations, Western Chichagof-Yakobi Islands Wilderness Study Area, southeastern Alaska: U.S. Geological Survey Open-File Report 81-0027-A, scale 1:125,000.

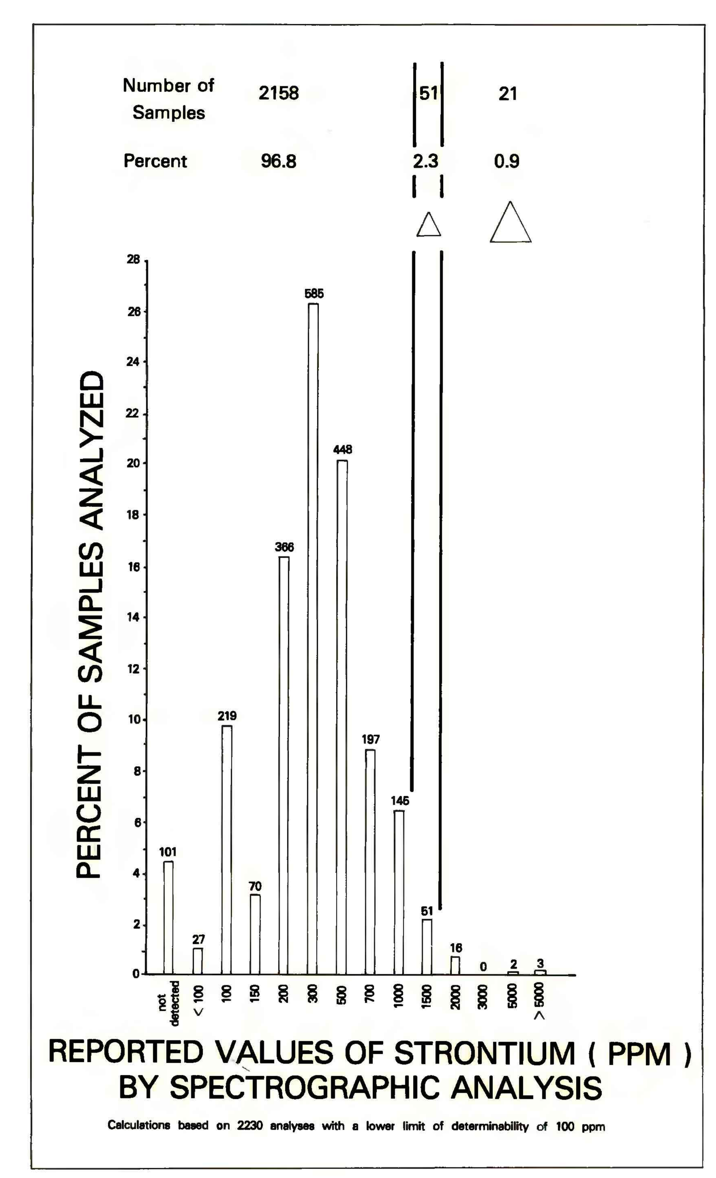
Johnson, B. R., and Karl, S. M., 1982, Reconnaissance geologic map of the Western Chichagof and Yakobi Islands Wilderness Study Area, southeastern Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-1476-A, scale 1:125,000.

Johnson, B. R., Kimball, A. L., and Still, Jan, 1982, Mineral resource potential map of the Western Chichagof and Yakobi Islands Wilderness Study Area, southeastern Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-1476-B, scale 1:125,000.

Ward, F. N., Nakagawa, H. M., Harms, T. F., and Van Sickle, G. H., 1969, Atomic absorption methods of analysis useful in geochemical exploration: U.S. Geological Survey Bulletin 1289, 45 p.

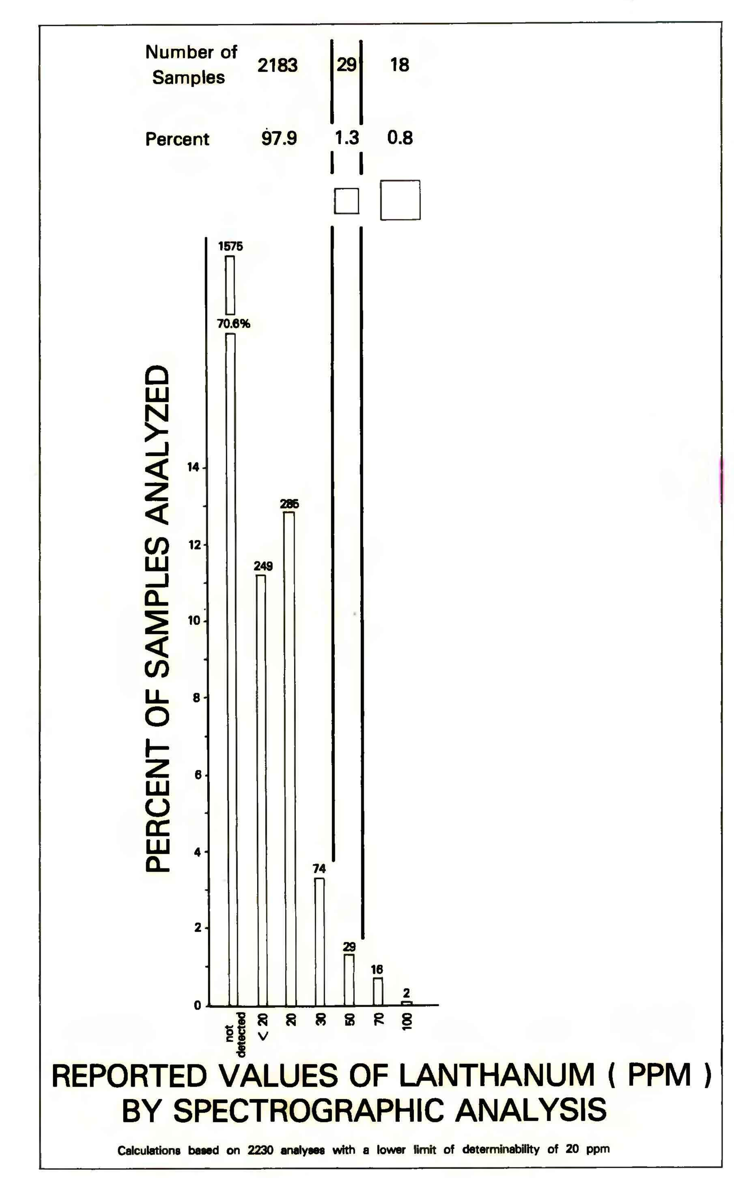


Index Map Showing Location of Study Area



REPORTED VALUES OF STRONTIUM (PPM) BY SPECTROGRAPHIC ANALYSIS

Calculations based on 2230 analyses with a lower limit of determinability of 100 ppm



REPORTED VALUES OF LANTHANUM (PPM) BY SPECTROGRAPHIC ANALYSIS

Calculations based on 2230 analyses with a lower limit of determinability of 20 ppm

SCALE 1:125 000

2 0 2 4 6 8 MILES

2 0 2 4 6 8 KILOMETERS

MAP SHOWING THE DISTRIBUTION AND ABUNDANCE OF STRONTIUM AND LANTHANUM IN BEDROCK SAMPLES, WESTERN CHICHAGOF AND YAKOBI ISLANDS WILDERNESS STUDY AREA, SOUTHEASTERN ALASKA

By
Bruce R. Johnson and Geoffrey S. Elliott

1984

This map is preliminary and has not been reviewed for conformity with U. S. Geological Survey editorial standards, but the stratigraphic nomenclature has been approved previously.