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Analyses and descriptions of geochemical samples Craggy Mountain Extension Buncombe County, North Carolina

by

J.M. Motooka, A.L. Meier
U.S. Geological Survey
Denver, Colorado

and

F.G. Lesure
U.S. Geological Survey
Reston, Virginia

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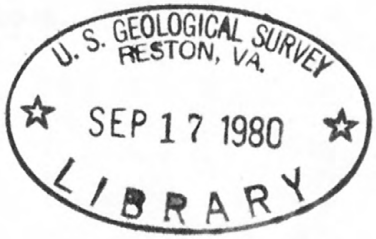

This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.

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Jerry M. Motooka, Allen L. Meier
U.S. Geological Survey
Denver, Colorado 80225

and

Frank G. Lesure
U.S Geological Survey
Reston, Virginia 22092

ABSTRACT

Semiquantitative spectrographic analyses for 31 elements and atomic-absorption analyses for gold and zinc on 6 bulk stream sediments, 20 soil, and 19 rock samples from the Craggy Mountain Extension area and vicinity, Buncombe County, North Carolina, are reported here in detail. Locations for all samples are given in Universal Transverse Mercator (UTM) coordinates. Brief descriptions of rock samples are also included. Rocks analyzed include mica-garnet-kyanite schist, mica-quartz gneiss, vein quartz, and amphibolite. The data contain no obviously anomalous values that might be related to mineralized rock.

INTRODUCTION

The analyses reported in this open-file report are on 6 stream sediment, 20 soil, and 19 rock samples from the Craggy Mountain Extension, Buncombe County, North Carolina, collected by F.G. Lesure and A.E. Grosz, in March, 1979. The 19 rock samples analyzed are described briefly in a separate section. All but three are chip samples of representative material collected from outcrop or road cuts; the exceptions are composite samples of chips from several boulders of float. Some of the rock is partly weathered, but the freshest material available was generally sampled. The soil samples are from the A_2 or upper B soil zone, just below the organic-rich surface soil or A_1 zone. Maps showing sample locations and discussion of the results of the analytical work are given by Lesure and others (in press). Analytical results on samples collected earlier in the Craggy Mountain Wilderness Study Area, which is adjacent, are in Motooka and others, 1978. The data contain no obviously anomalous values that might be related to mineralized rock.

The X and Y coordinates are Universal Transverse Mercator (UTM) grid, zone 17. The X coordinate is the easting value; the Y is the northing.

Rock sample descriptions

NCC 062 1m, chip sample, garnet-mica-kyanite schist, minor sulfides, medium grained.

NCC 063 1m, chip sample, biotite-quartz-kyanite-garnet schist, fine to medium grained.

NCC 064 0.6m, chip sample, biotite-garnet-muscovite-quartz-feldspar schist, medium grained, minor sillimanite and graphite.

NCC 067 0.6m, chip sample, quartz vein in mica-garnet schist. Vein branching, contorted, 5-60 cm thick.

NCC 068 1m, chip sample, mica-garnet-quartz-feldspar schist, migmatitic, minor sillimanite.

NCC 69 2m, chip sample, feldspar-quartz-biotite gneiss, fine to medium grained, locally schistose.

NCC 072 1m, chip sample, quartz-feldspar-biotite gneiss, fine grained.

NCC 073 1m, chip sample, biotite-garnet-muscovite-quartz-kyanite schist, medium grained.

NCC 074 2m, chip sample, quartz-feldspar-biotite gneiss, fine grained, minor garnet.

NCC 075 Composite sample from float, hornblende-feldspar gneiss, fine to medium grained, minor biotite and rutile.

NCC 076 Composite sample from float, altered peridotite (?), talc-chlorite-tremolite-hornblende (?) gneiss.

NCC 090 0.3m, chip sample, quartz vein, 0.1-0.3m thick, longer than 6m.

NCC 091 0.3m, chip sample, quartz vein, 0.1-0.3m thick, longer than 10m.

NCC 092 6m, chip sample, biotite-muscovite-kyanite-garnet schist, coarse grained. Contains iron sulfides and some quartz-feldspar-garnet-biotite gneiss layers.

NCC 100 1m, chip sample, garnet-biotite-muscovite-quartz feldspar-gneiss, schistose, minor sillimanite and graphite.

NCC 101 1m, chip sample, quartz-feldspar-biotite gneiss, fine to medium grained, minor biotite-muscovite-kyanite-garnet schist layers.

NCC 105 1.5m, chip sample, quartz-feldspar-biotite gneiss, fine to medium grained.

NCC 109 Composite of float, hornblende-feldspar-biotite gneiss, medium grained.

NCC 111 1m, chip sample, quartz-feldspar-mica-gneiss, fine grained, schistose, minor garnet.

ANALYTICAL TECHNIQUES

Rock samples were crushed to approximately 0.25 inch (6 mm) and pulverized to minus 140-mesh (0.105 mm) in a vertical grinder with ceramic plates. Stream sediments and soils were dried and sieved to minus 80-mesh (0.177 mm) and then pulverized.

Each sample was analyzed semiquantitatively for 31 elements by a six-step, D.C. arc, optical emission spectrographic method (Grimes and Marranzino, 1968). In addition, each sample was analyzed by an atomic absorption technique for gold (Ward and others, 1969, p. 33) and zinc (Ward and others, 1969, p. 20).

The semiquantitative spectrographic values are reported as six steps per order of magnitude (1, 0.7, 0.5, 0.3, 0.2, 0.15, or multiples of 10 of these numbers) and are approximate geometric midpoints of the concentration ranges. The precision is shown to be within one adjoining reporting interval on each side of the reported value 83 percent of the time and within two adjoining intervals 96 percent of the time (Motooka and Grimes, 1976).

EXPLANATION OF TABLE

Iron, magnesium, calcium, and titanium values are reported in percent (%), all others are in parts per million (ppm). Letters preceeding chemical symbols indicate the method of analyses: S, six-step semiquantitative spectrographic method; AA, atomic absorption. Other symbols represented on the table are: N, not detected; <, amount detected is below the lowest limit of determination which is figure shown; P, partial digestion.

Elements looked for spectrographically but not found, except as noted, and the lower limits of determination are, in ppm: for stream sediments and soils, Ag(0.5); As(200); Au(10); Bi(10); Cd(20); Mo(5); Sb(100); Sn(10); Th(100); W(50); and Zn(200). For rock samples: Ag(0.5); As(200); Au(10), Bi(10), Cd(20); Mo(5) except NCC 062 and 072 reported as 5 ppm; Sb(100); Sn(10); Th(100); W(50); and Zn(200) except NCC 062, 300 ppm, NCC 063 and 073, 200 ppm.

REFERENCES CITED

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Motooka, J.M., Sharkey, J.D., and Lesure, F.G., 1978, Analyses and description of geochemical samples, Craggy Mountain Wilderness Study Area, Buncombe County, North Carolina: U.S. Geological Survey Open-File Report 78-856.

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.

Craggy Mountain Data

sample	X-COORD.	Y-COORD.	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-B	S-BA	S-BE	S-CO
					Rocks						
NCC062	374,260	3,951,590	10.00	2.00	0.50	1.000	5,000	<10	700	<1.0	70
NCC063	374,720	3,951,680	7.00	2.00	.50	.700	1,000	10	1,500	<1.0	20
NCC064	374,470	3,951,980	5.00	2.00	.30	.500	3,000	20	700	2.0	50
NCC068	373,200	3,954,180	5.00	1.50	1.50	.500	1,000	<10	700	1.5	15
NCC069	373,100	3,955,430	2.00	.70	1.00	.300	500	<10	1,000	1.0	7
NCC072	373,500	3,955,020	2.00	1.00	1.00	.700	700	<10	500	2.0	10
NCC073	373,580	3,954,930	10.00	2.00	.50	1.000	1,000	10	1,500	<1.0	30
NCC074	373,620	3,954,880	2.00	.50	1.50	.200	500	<10	500	2.0	7
NCC092	373,700	3,952,490	3.00	1.50	.70	.500	700	<10	700	1.0	20
NCC100	374,150	3,952,360	5.00	1.50	1.00	.500	5,000	20	500	3.0	30
NCC101	374,190	3,952,670	2.00	1.00	2.00	.300	500	<10	500	2.0	7
NCC105	373,390	3,955,190	2.00	.50	.70	.700	500	<10	500	<1.0	7
NCC111	373,810	3,955,260	2.00	.70	.70	.500	500	<10	1,000	1.0	10
NCC075	373,710	3,954,390	3.00	3.00	3.00	.500	1,000	N	50	<1.0	30
NCC076	373,710	3,954,390	3.00	5.00	2.00	.500	1,000	N	<20	N	50
NCC109	373,780	3,954,540	3.00	2.00	3.00	.700	1,000	N	50	<1.0	30
NCC067	373,200	3,954,180	.15	.03	.20	.030	70	N	20	N	N
NCC090	374,130	3,955,400	.20	.05	.05	.003	150	N	30	N	N
NCC091	374,120	3,955,450	.07	.03	<.05	.030	20	N	30	N	N
					Stream Sediments						
NCC065	374,470	3,951,980	5.00	.70	1.00	.700	3,000	15	300	1.0	20
NCC066	374,460	3,952,050	3.00	.50	.50	.500	3,000	15	500	3.0	20
NCC082	372,070	3,954,840	3.00	.50	.70	1.000	1,500	10	700	2.0	15
NCC083	372,120	3,954,920	3.00	.50	.50	.700	1,000	10	1,000	1.5	7
NCC089	374,840	3,954,950	3.00	.70	.70	.500	2,000	15	700	2.0	20
NCC113	373,360	3,955,720	7.00	.70	.30	1.000	1,500	30	700	1.0	20
					Soils						
NCC070	373,280	3,955,260	3.00	.50	.07	.700	500	15	700	3.0	30
NCC071	373,420	3,955,110	3.00	.50	<.05	.700	300	10	700	2.0	20
NCC077	373,470	3,954,460	3.00	.70	.15	.700	700	10	700	3.0	20
NCC078	373,230	3,954,470	3.00	.70	.07	.700	1,500	20	700	3.0	30
NCC079	372,980	3,954,610	3.00	.20	<.05	.700	700	15	700	2.0	15
NCC080	373,630	3,954,460	3.00	.70	.05	.700	1,500	20	700	3.0	30
NCC081	372,940	3,954,770	3.00	.50	<.05	.700	500	10	300	1.5	20
NCC084	372,070	3,955,120	3.00	.70	.10	1.000	1,000	50	700	3.0	30
NCC085	375,830	3,952,960	3.00	.20	.15	.700	500	50	300	<1.0	<5
NCC086	375,160	3,953,360	2.00	.20	.30	.300	200	10	150	2.0	5

Craggy Mountain Data

Sample	S-CR	S-CU	S-LA	S-NB	S-NI	S-PB	S-SC	S-SR	S-V	S-Y	S-ZR	AA-AU-P	AA-ZN-P
Rocks													
NCC062	150	50	150	<20	50	20	20	N	150	100	100	0.008	45
NCC063	100	30	200	20	20	30	15	150	150	70	150	.006	160
NCC064	100	30	150	20	50	30	20	150	150	70	100	.002	120
NCC068	70	20	50	20	20	30	20	300	150	50	100	<.002	20
NCC069	50	7	30	<20	10	20	7	200	100	30	200	.010	70
NCC072	30	7	N	<20	15	15	10	200	70	20	150	.002	80
NCC073	100	50	150	20	30	30	20	100	200	70	100	.012	120
NCC074	30	10	N	<20	10	20	10	300	70	20	100	<.002	100
NCC092	70	20	100	<20	50	15	15	150	100	30	150	<.002	75
NCC100	50	30	150	<20	30	50	15	150	100	50	100	N	120
NCC101	20	15	50	<20	7	15	10	1,000	50	30	150	.004	85
NCC105	30	5	30	<20	15	20	10	100	70	20	150	<.002	120
NCC111	50	20	30	<20	20	15	15	150	100	30	200	<.002	55
NCC075	300	50	N	N	70	10	20	150	150	30	50	.002	5
NCC076	700	50	N	N	300	<10	15	N	150	20	30	.004	20
NCC109	150	30	N	N	70	10	15	150	150	30	50	<.002	20
NCC067	<10	<5	N	N	N	N	N	N	N	N	N	<.002	N
NCC090	<10	10	N	N	N	10	N	N	N	N	N	.002	10
NCC091	<10	<5	N	N	N	N	N	N	N	N	N	<.002	N
Stream Sediments													
NCC065	70	20	200	20	15	70	15	300	100	100	300	.002	55
NCC066	50	20	150	<20	15	70	10	200	70	70	200	.010	100
NCC082	70	20	150	20	20	30	15	200	100	100	700	.006	85
NCC083	50	15	70	<20	15	30	10	100	70	70	700	.002	85
NCC089	100	50	300	<20	20	70	10	150	50	70	150	.004	150
NCC113	100	70	100	<20	20	50	15	100	200	100	1,000	N	100
Soils													
NCC070	100	50	200	20	50	50	15	N	150	100	500	N	140
NCC071	70	50	200	20	50	70	15	N	150	100	500	.002	120
NCC077	70	50	100	<20	50	50	15	<100	150	100	300	.016	130
NCC078	70	50	150	20	50	50	15	<100	150	150	300	.006	140
NCC079	70	50	100	20	50	30	15	N	150	150	300	N	85
NCC080	100	70	200	20	70	30	15	N	150	150	300	.002	140
NCC081	70	70	150	<20	50	50	15	N	150	100	300	N	90
NCC084	100	50	200	30	50	30	15	100	150	150	500	N	130
NCC085	70	20	200	20	15	30	10	150	150	70	200	N	20
NCC086	15	50	20	N	10	30	5	300	50	20	150	N	35

Craggy Mountain Data--continued

sample	X-COORD.	Y-COORD.	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-B	S-BA	S-BE	S-CO
NCC087	375,160	3,953,690	3.00	0.30	0.05	.700	200	10	300	2.0	7
NCC088	375,060	3,954,040	3.00	.50	.30	.700	300	20	300	3.0	20
NCC103	372,930	3,955,600	2.00	.20	<.05	.700	300	10	700	3.0	10
NCC104	373,200	3,955,340	2.00	.30	.05	.700	300	20	700	3.0	10
NCC106	373,660	3,954,830	3.00	.20	.30	.700	300	10	500	3.0	5
NCC107	373,750	3,954,700	3.00	.30	<.05	.700	500	30	500	2.0	10
NCC108	373,880	3,954,270	3.00	.50	.30	.700	1,500	30	300	2.0	10
NCC110	373,760	3,954,630	3.00	1.00	.50	1.000	700	15	300	3.0	20
NCC112	373,710	3,955,560	3.00	.70	.70	.700	3,000	50	700	3.0	15
NCC114	373,430	3,954,020	3.00	.70	.70	.700	1,000	30	700	2.0	20

Craggy Mountain Data--continued

sample	S-CR	S-CU	S-LA	S-NB	S-NI	S-PB	S-SC	S-SR	S-V	S-Y	S-ZR
NCC087	70	30	70	<20	20	50	10	N	100	70	200
NCC088	70	30	150	<20	30	50	10	500	150	50	200
NCC103	50	20	100	20	15	20	15	N	100	100	300
NCC104	50	15	50	<20	15	50	10	N	100	50	300
NCC106	50	20	20	<20	20	70	10	100	100	30	300
NCC107	70	30	50	<20	20	70	10	N	150	70	200
NCC108	70	50	100	<20	15	70	10	200	150	50	200
NCC110	150	50	150	<20	70	50	20	N	150	70	200
NCC112	70	50	150	<20	30	70	15	150	100	50	300
NCC114	100	30	70	20	50	70	10	200	150	70	500

Craggy Mountain Data--continued

sample	AA-AU-P	AA-ZN-P
NCC087	N	80
NCC088	<.002	90
NCC103	<.002	130
NCC104	N	70
NCC106	N	80
NCC107	.002	100
NCC108	.002	95
NCC110	N	180
NCC112	.004	160
NCC114	<.002	100