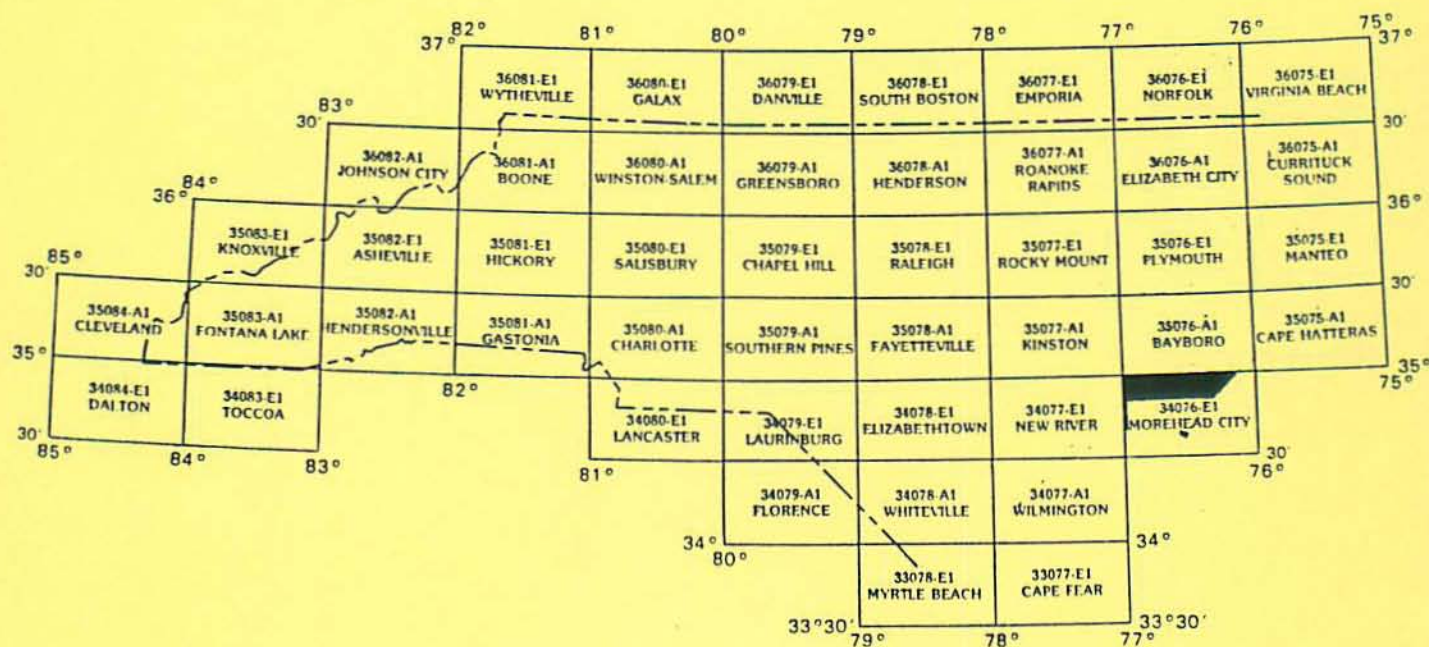


**Listing of Concentrations of Variables
of
Stream Sediment, Stream Water, and Groundwater
for the
Morehead City 30 x 60 - Minute Quadrangle
-NURE Database**

by
Robert H. Carpenter and Jeffrey C. Reid



**NORTH CAROLINA GEOLOGICAL SURVEY
OPEN-FILE REPORT 93-33**

State of North Carolina
James B. Hunt, Jr., Governor

Department of Environment,
Health and Natural Resources
Jonathan B. Howes, Secretary
Division of Land Resources
Charles H. Gardner,
Director and State Geologist

July, 1993

GEOLOGICAL SURVEY SECTION

The Geological Survey Section examines, surveys and maps the geology, mineral resources, and topography of the State to encourage the wise conservation and use of these resources by industry, commerce, agriculture and government agencies for the general welfare of the citizens of North Carolina.

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Jeffrey C. Reid
Chief Geologist

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INTRODUCTION

This report is a compilation of geochemical data for stream sediment and groundwater for the Morehead City 30 x 60 - minute quadrangle (Figure 1). Maps and tables were prepared from statewide data obtained by the Savannah River Laboratory under sponsorship of the U.S. Dept. of Energy in its National Uranium Resources Evaluation (NURE) program (Sargent and others, 1982). Sampling and analysis were performed during the period 1976 - 1980.

Because of the large size of the database, the North Carolina Geological Survey is presenting the database in both statewide and 30 x 60 - minute quadrangle formats. Statewide formats currently available include atlases of stream sediment and hydrogeochemical data which contain maps showing quartile distribution of concentrations of variables (Reid, 1991; Reid, 1993). Reid and Carpenter (1993a, 1993b) present listings of concentrations of variables which equal or exceed the 90th percentile (and pH and conductivity below the 10th percentile) for stream sediment and groundwater-stream water.

This open-file report is part of a series of reports that present sample-location maps and listings of analyses of all variables in all of the 30 x 60 - minute quadrangles that comprise the state of North Carolina. Subsequent reports will review the NURE data for individual 30 x 60 - minute quadrangles. These reviews will contain the following: 1) maps showing concentrations of all the variables in up to eight class intervals; 2) geologic review of the quadrangle and discussion of relationship of geochemical variables to rock units and structural features; 3) review of mineral resources and discussion of relationship of geochemical variables to mineral occurrences; and 4) discussion of outliers that may relate to anthropogenic contamination.

In this report, site-location maps use state boundaries, county boundaries and 7-1/2 - minute quadrangle boundaries as references to site-locations. The North Carolina Index to Topographic and Other Map Coverage, prepared by the U.S. Geological Survey, is a useful reference document. The List of Publications of the North Carolina Geological Survey indicates areas within the state for which some geologic and geophysical maps, and reports, are available.

Listings in this report are in the same basic format as those presented in microfiche by Sargent

and others (1982). Column 1 lists the laboratory numbers applied to each analyzed sample. Column 2 lists site identification codes. The first two characters are the codes for the county name. The next three digits are sample numbers. They are listed sequentially for each county in the order they were collected. The next two columns list the latitude and longitude of the sampling sites in decimal degree format. The remaining columns are data columns and analyses are given in parts per million (stream sediment) and parts per billion (groundwater). In these columns, a minus (-) sign indicates that a value is below the detection limit. If background is high, and an accurate estimate of minimum detection limit could not be made, a period (.) indicates that the element was not detected and that the detection limit is unusually high. Missing data are denoted by the letter "M". For gold, analyses are listed only for those samples in which gold was detected. For arsenic, a value of 0 is assigned for samples in which arsenic was analyzed, but not detected.

For stream sediment, two listings are presented. The first listing is for elements analyzed by neutron activation as well as field measurements for pH and conductivity of stream water. Variables included in this listing are pH, conductivity, uranium (U), thorium (Th), hafnium (Hf), cerium (Ce), iron (Fe), manganese (Mn), sodium (Na), scandium (Sc), titanium (Ti), vanadium (V), aluminum (Al), dysprosium (Dy), europium (Eu), lanthanum (La), samarium (Sm), ytterbium (Yb), and lutetium (Lu). The second listing is for supplemental elements analyzed by a variety of techniques. These include extractable uranium (Ux), silver (Ag), arsenic (As), barium (Ba), beryllium (Be), calcium (Ca), cobalt (Co), chromium (Cr), copper (Cu), potassium (K), lithium (Li), magnesium (Mg), molybdenum (Mo), niobium (Nb), nickel (Ni), phosphorous (P), lead (Pb), selenium (Se), tin (Sn), strontium (Sr), tungsten (W), yttrium (Y), and zinc (Zn). Stream sediment analyses are for the minus 100 mesh fraction (< 149 microns) unless otherwise noted.

Groundwater, normally samples of water from wells, was also analyzed by neutron activation. Field measurements were made of pH and conductivity. Variables included in listings of groundwater analyses include pH, conductivity, uranium (U), bromine (Br), chlorine (Cl), fluorine (F), magnesium (Mg), manganese (Mn), sodium (Na), vanadium (V), uranium/conductivity, aluminum (Al), and dysprosium (Dy). Stream water was also analyzed for these variables at 295 sites in North Carolina. Listings for stream water are included for areas in which these sites are located.

Although the data was acquired with considerable attention to quality control, some errors exist. These include uncertainties of sample locations due to the use of county road maps as base maps for field use and digitizing sampling sites. Malfunction of field equipment used in measurement of pH and conductivity has also been recognized in some areas. Some of the analyses are also in error. Some of these errors are apparent when concentrations show systematic "breaks" at county boundaries. This suggests that conditions of analysis for different batches of samples were not uniform. In general, analyses of stream sediment by neutron activation are more reliable than analyses of sediment by other supplemental methods.

For a number of counties, supplemental analyses were not made. Thus elements of interest for mineral exploration and environmental geochemistry are lacking for large areas.

REFERENCES

- Reid, Jeffrey C., 1991 (revised 1993), A geochemical atlas of North Carolina: North Carolina Geological Survey, Bulletin 93, text plus 45 plates.
- Reid, Jeffrey C., 1993, A hydrogeochemical atlas of North Carolina: North Carolina Geological Survey, Bulletin 94, text plus 26 plates.

Reid, Jeffrey C., and Carpenter, Robert H., 1993a, Listings of concentrations (stream sediments) of variables which equal or exceed the 90th percentile, and pH and conductivity below the 10th percentile in the North Carolina portion of the NURE database: North Carolina Geological Survey, Open-File Report 93-1, introductory text plus 178 pages of data.

Reid, Jeffrey C., and Carpenter, Robert H., 1993b, Listing of concentrations (groundwater and stream water) of variables which equal or exceed the 90th percentile, and pH and conductivity below the 10th percentile in the North Carolina portion of the NURE data base: North Carolina Geological Survey, Open-File Report 93-2, introductory text plus 162 pages of data.

Sargent, K.A., Cook, J.R., and Fay, W.M., 1982, Data report: North and South Carolina, National Uranium Resource Evaluation Program, Hydrochemical and stream sediment reconnaissance: E.I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, S.C., under contract to the U.S. Dept of Energy, contract DE-AC09-76SR000001 (DPST-81-146-22; GBJX-102), 45 p. plus microfiche.

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COUNTY CODES

<u>Code</u>	<u>County</u>
CN	Craven
CR	Carteret
PA	Pamlico

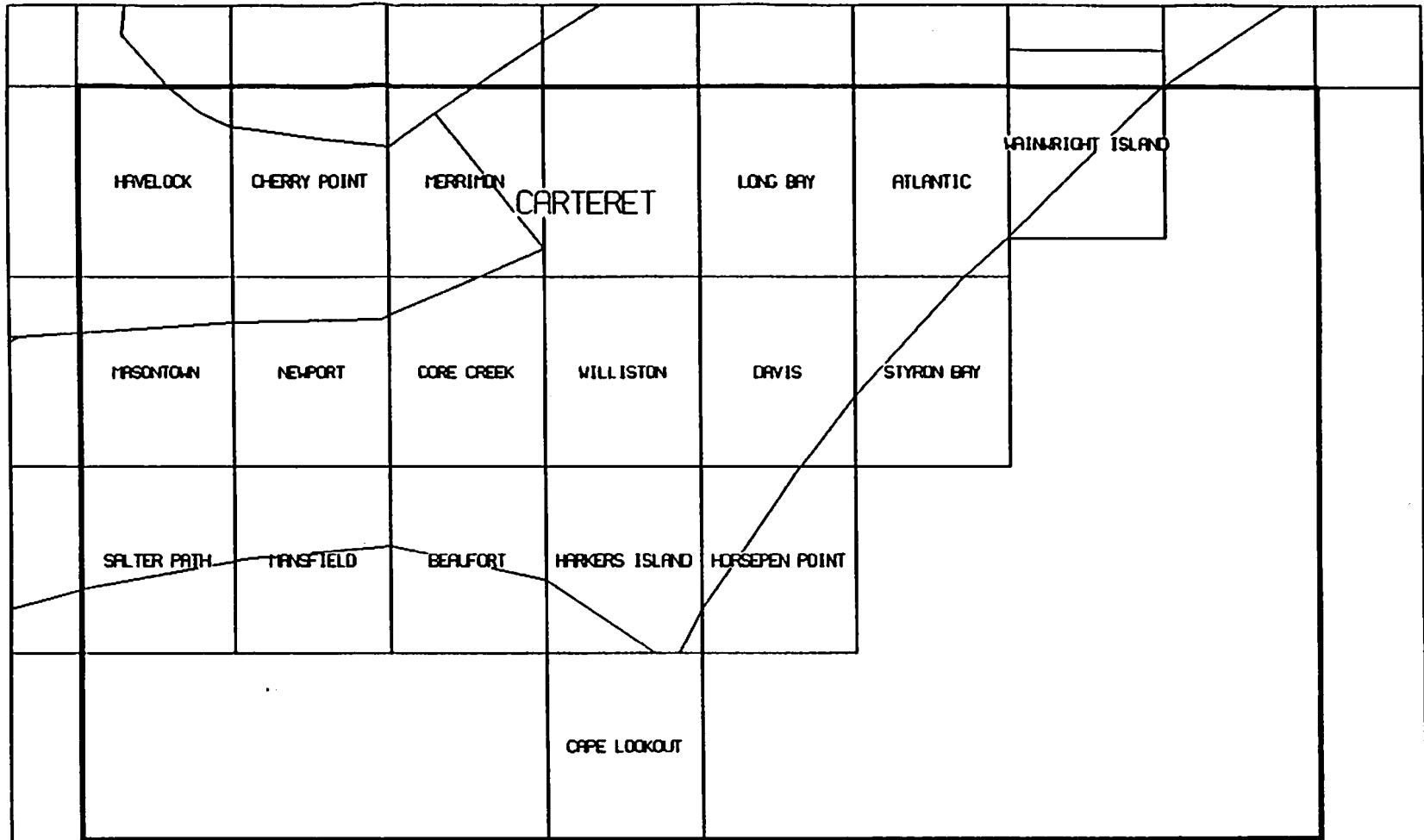


Figure 1. Map Showing Outlines of Morehead City 30 x 60 Minute - Quadrangle and Contained 7 - 1/2 Minute Quadrangles.

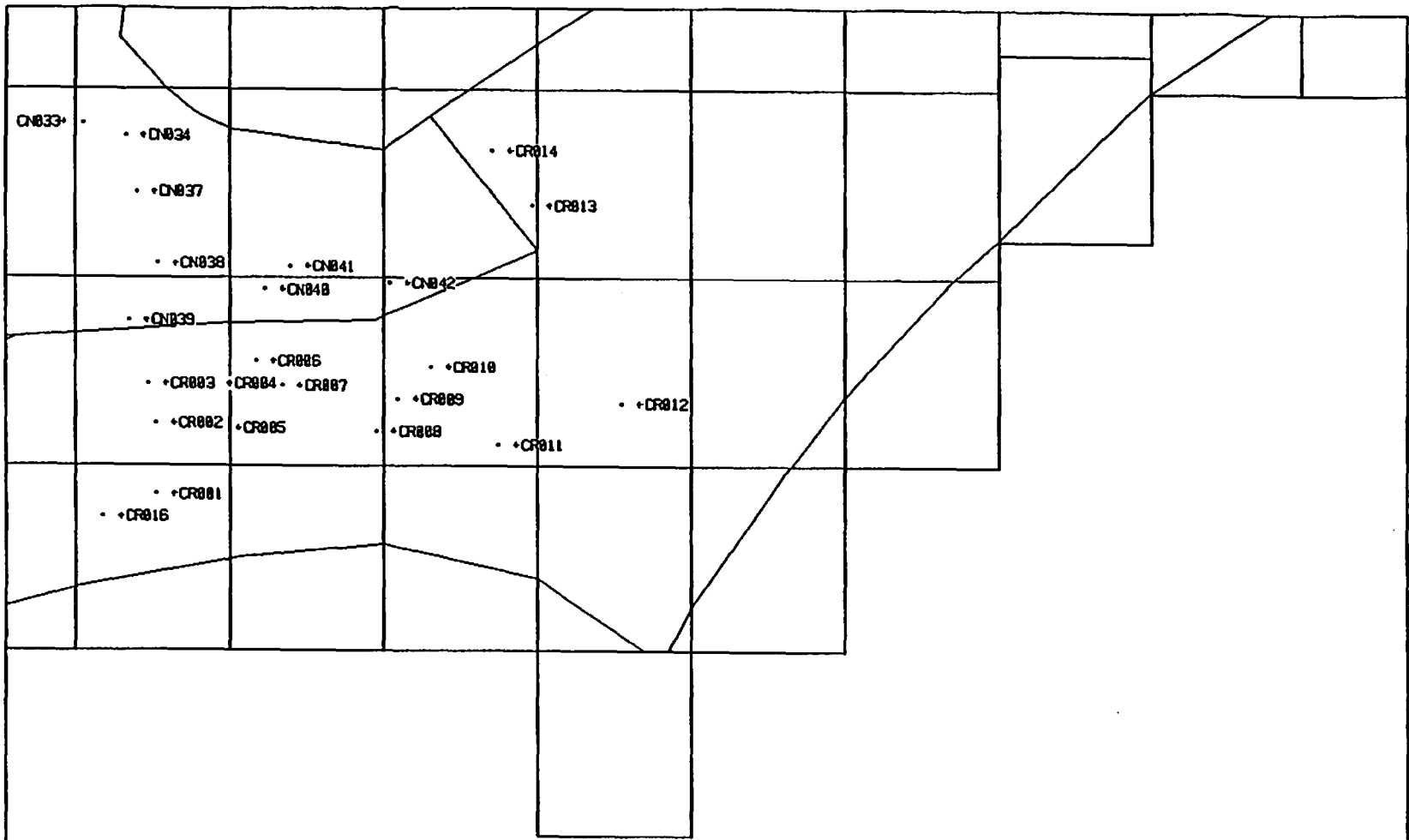


Figure 2. Stream Sediment Sites - Morehead City 30 x 60 Minute - Quadrangle

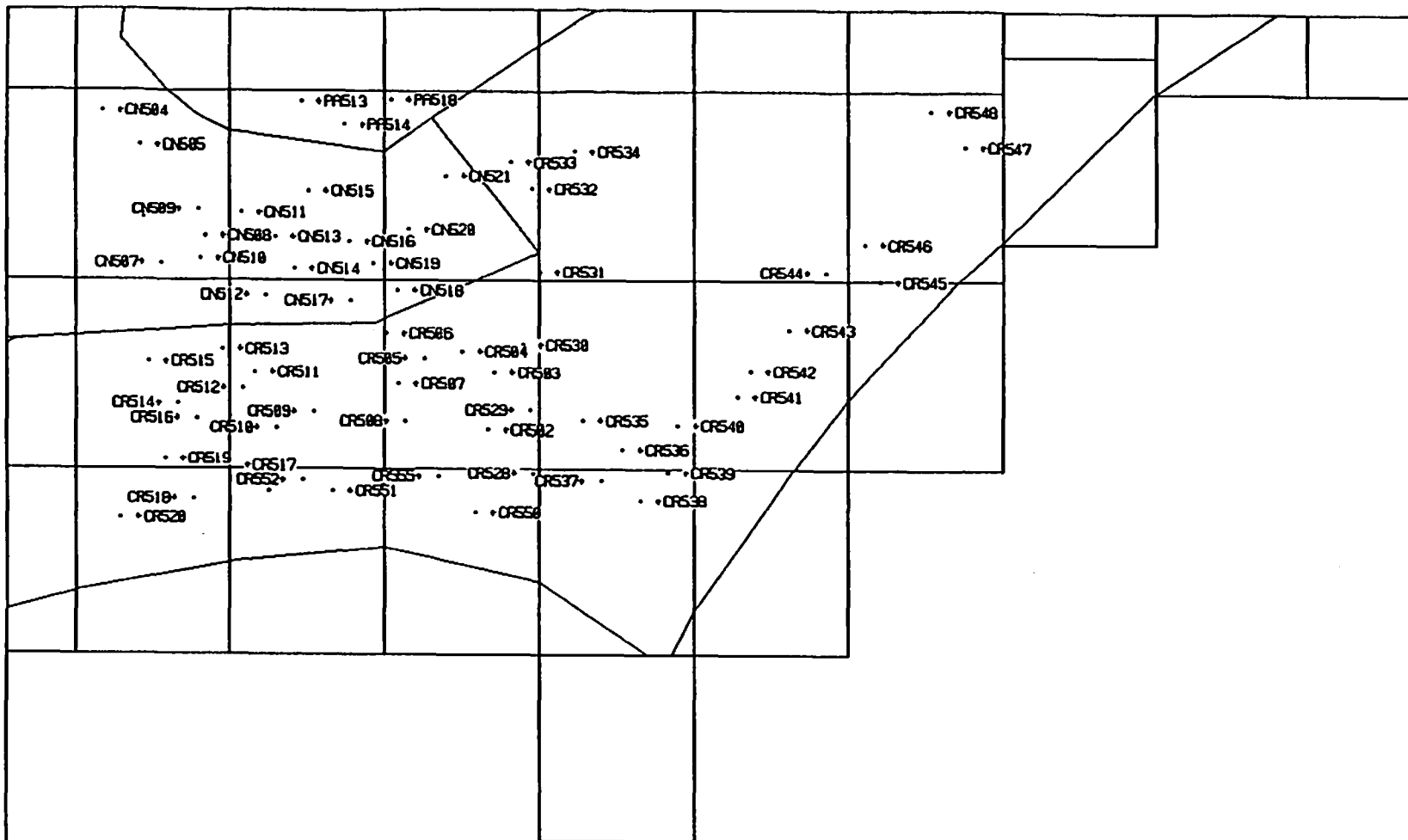


Figure 3. Groundwater Sites - Morehead City 30 x 60 Minute - Quadrangle

MOREHEAD CITY 100K QUADRANGLE - STREAM SEDIMENT

Lab #	County	Lat	Long	pH	Cond	U	Th	Hf	Al	Ce	Fe	Mn	Na	Sc	Ti	V	Dy	Eu	La	Sm	Yb	Lu	Au
ID				um/cm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
1297	CN033	34.9770	76.9935	5.6	65	1.8	6	23	19700	49	9800	180	4400	3.2	6200	30	2.5	-1.0	21	3	1.3	0.3	
1298	CN034	34.9685	76.9591	5.5	58	1.9	6	24	18800	31	12900	200	3300	2.8	6800	30	M	-1.0	18	3	2.1	0.2	
1301	CN037	34.9312	76.9502	5.6	59	3.1	13	88	10400	44	24400	600	1200	3.2	19100	50	M	-1.0	21	3	M	0.5	
1302	CN038	34.8847	76.9327	4.7	41	2.1	7	44	11200	33	17700	440	1200	2.5	15100	40	M	1.8	14	2	M	0.2	
1303	CN039	34.8467	76.9564	3.7	70	7.3	21	213	27000	100	37300	990	1200	11.4	35600	120	M	-1.0	54	7	7.4	1.2	
1304	CN040	34.8671	76.8469	5.1	41	1.3	9	32	12200	21	9800	250	3000	1.5	10000	30	3.3	-1.0	11	M	1.7	0.2	0.020
1305	CN041	34.8829	76.8257	5.6	60	1.6	11	29	17300	20	14300	160	3000	2.0	5800	20	M	-1.0	15	2	M	0.2	
1306	CN042	34.8716	76.7446	4.9	34	2.9	11	70	16000	43	30000	640	3700	2.2	19400	60	M	M	27	6	1.8	0.6	
1337	CR001	34.7311	76.9342	5.4	50	2.7	5	79	9900	-20	10500	390	2100	1.7	13600	30	M	-1.0	11	6	3.2	M	
1338	CR002	34.7789	76.9344	3.7	46	4.7	14	134	9000	55	16600	550	1800	2.7	17200	50	M	0.4	23	2	2.8	0.9	
1339	CR003	34.8045	76.9409	3.8	58	3.4	9	106	7600	33	20100	990	1200	2.9	33300	90	2.8	M	18	3	2.8	0.5	
1340	CR004	34.8045	76.8903	6.3	139	1.2	2	21	7200	17	6400	190	1300	1.2	6700	20	1.6	-1.0	6	2	M	0.2	
1341	CR005	34.7755	76.8829	6.6	111	1.3	3	25	11200	22	8300	350	2200	2.1	11300	30	M	-1.0	10	3	M	0.2	
1342	CR006	34.8199	76.8541	6.6	89	2.2	9	50	11200	45	12800	330	2600	2.0	10400	30	2.4	0.6	21	2	5.5	0.3	
1343	CR007	34.8036	76.8325	6.6	121	2.4	7	39	12200	31	12300	620	2900	1.7	19600	60	2.7	1.0	54	8	3.1	0.3	
1344	CR008	34.7737	76.7555	6.5	13300	3.6	9	9	55300	42	35200	250	7700	11.9	4400	60	0.4	2.2	23	4	M	M	
1345	CR009	34.7950	76.7379	7.3	890	1.0	M	15	10500	16	11400	110	2900	1.8	3100	10	M	-1.0	12	3	M	M	
1346	CR010	34.8161	76.7111	4.4	60	3.4	14	11	61500	75	14400	80	2200	6.5	6600	80	M	M	27	M	M	M	
1347	CR011	34.7649	76.6561	6.7	4720	3.3	8	5	51700	67	26300	160	10900	8.1	4300	60	M	-1.0	29	4	M	M	
1348	CR012	34.7921	76.5556	7.3	2560	4.2	3	7	31100	-20	20800	150	5000	3.2	4600	40	M	-1.0	9	1	M	M	
1349	CR013	34.9232	76.6292	5.8	1000	3.3	12	52	20500	58	23800	480	5300	4.0	12000	40	3.7	M	25	5	M	0.6	
1350	CR014	34.9597	76.6610	6.7	3710	2.6	9	48	18200	-20	31300	470	3900	3.2	15300	40	4.4	-1.0	31	4	M	M	
1352	CR016	34.7159	76.9778	5.8	59	1.1	4	29	10700	-20	6900	340	3100	2.2	10800	30	1.7	M	10	2	M	0.1	

MOREHEAD CITY 100K QUADRANGLE - GROUNDWATER

Lab #	County	Lat	Long	pH	Cond	U	Br	Cl	F	Mg	Mn	Na	V U/cond	Al	Dy
ID					um/cm	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb x 1000	ppb	ppb
1168	CN504	34.9859	76.9781	7.4	442	-0.002	22	8300	212	3900	75	19460	-0.1 0.0	52	-0.001
1169	CN505	34.9638	76.9478	7.3	440	0.025	29	8700	120	4940	164	18700	-0.1 0.0	93	-0.001
1170	CN506	34.9170	76.9446	7.6	322	0.006	.	6700	51	1560	81	15700	-0.1 0.0	137	-0.001
1171	CN507	34.8864	76.9305	7.7	320	0.004	20	8900	26	.	60	15550	-0.1 0.0	69	-0.001
1172	CN508	34.9041	76.8945	7.8	400	-0.002	16	8000	103	1290	80	16140	-0.1 0.0	59	-0.001
1173	CN509	34.9211	76.9005	7.5	375	0.021	.	6400	90	2760	83	20240	-0.1 0.0	38	-0.001
1174	CN510	34.8892	76.8986	7.5	390	-0.002	.	4800	73	2670	97	17060	-0.1 0.0	40	-0.001
1175	CN511	34.9193	76.8656	7.5	420	0.011	22	5100	74	2370	92	21860	-0.1 0.0	37	-0.001
1176	CN512	34.8650	76.8457	7.8	500	-0.002	.	6800	71	.	37	95730	0.4 0.0	31	-0.001
1177	CN513	34.9035	76.8381	7.4	42	0.018	.	7500	.	1110	48	16700	-0.1 0.4	41	-0.001
1178	CN514	34.8826	76.8227	6.9	381	0.009	25	9100	79	2050	137	18260	-0.1 0.0	29	-0.001
1179	CN515	34.9336	76.8114	7.4	382	-0.002	21	3500	92	2050	85	17320	0.4 0.0	50	-0.001
1180	CN516	34.9005	76.7779	6.9	93	0.009	.	4900	.	1830	71	15380	-0.1 0.1	107	-0.001
1181	CN517	34.8613	76.7772	6.4	105	-0.002	90	14100	.	.	89	18270	-0.1 0.0	34	-0.001
1182	CN518	34.8683	76.7393	6.8	450	0.017	18	8500	52	.	90	15410	-0.1 0.0	44	-0.001
1183	CN519	34.8863	76.7585	7.2	463	-0.002	31	7600	90	2930	82	18150	-0.1 0.0	41	-0.001
1184	CN520	34.9085	76.7300	7.3	480	0.003	58	4600	104	3240	88	17010	-0.1 0.0	82	-0.001
1185	CN521	34.9441	76.7002	7.7	492	-0.002	56	7600	86	8680	60	17720	0.4 0.0	99	-0.001
1283	CR501	34.7448	76.6534	7.2	600	0.016	.	10700	363	21700	25	35940	-0.1 0.0	293	-0.001
1284	CR502	34.7765	76.6659	7.5	650	0.014	353	18000	197	.	18	135240	-0.1 0.0	268	-0.001
1285	CR503	34.8143	76.6610	7.2	700	-0.002	.	12000	319	25640	42	44380	-0.1 0.0	271	-0.001
1286	CR504	34.8282	76.6872	7.4	600	0.010	106	11400	375	.	252	46800	-0.1 0.0	141	-0.001
1287	CR505	34.8237	76.7174	7.3	625	0.007	39	11900	134	11800	245	31040	-0.1 0.0	296	-0.001
1288	CR506	34.8400	76.7480	7.4	610	-0.002	74	6300	131	9930	148	15340	-0.1 0.0	161	-0.001
1289	CR507	34.8065	76.7386	7.3	600	0.035	.	11800	283	8210	238	30340	-0.1 0.0	258	0.020
1290	CR508	34.7820	76.7323	7.2	650	0.019	256	12500	263	7630	216	30580	-0.1 0.0	268	0.030
1291	CR509	34.7884	76.8075	7.3	550	0.016	.	11200	146	.	251	30480	-0.1 0.0	225	-0.001
1292	CR510	34.7776	76.8372	7.4	430	-0.002	17	9400	59	.	122	18210	-0.1 0.0	44	-0.001
1293	CR511	34.8142	76.8549	7.3	450	0.012	27	9400	134	.	131	17790	-0.1 0.0	51	-0.001
1294	CR512	34.8035	76.8644	7.4	315	-0.002	.	6600	52	.	110	15460	-0.1 0.0	110	-0.001
1295	CR513	34.8296	76.8809	7.5	325	0.010	78	7200	54	2550	147	17140	-0.1 0.0	129	-0.001
1296	CR514	34.7933	76.9171	7.6	300	-0.002	95	8200	56	.	93	17290	-0.1 0.0	160	-0.001
1297	CR515	34.8213	76.9412	7.3	455	0.014	.	8000	162	.	109	19030	-0.1 0.0	144	-0.001
1298	CR516	34.7837	76.9022	7.6	290	-0.002	.	6600	57	.	100	15610	-0.1 0.0	116	-0.001
1299	CR517	34.7525	76.8751	7.2	650	0.003	56	16400	.	.	297	34700	-0.1 0.0	336	-0.001
1300	CR518	34.7302	76.9045	7.6	290	0.007	63	15200	.	.	152	19040	-0.1 0.0	145	0.010
1301	CR519	34.7565	76.9272	7.4	415	-0.002	33	11200	35	.	118	19730	-0.1 0.0	72	-0.001
1302	CR520	34.7177	76.9632	7.3	230	0.013	94	8300	43	.	107	15990	-0.1 0.0	139	-0.001

MOREHEAD CITY 100K QUADRANGLE - GROUNDWATER

Lab #	County	Lat	Long	pH	Cond um/cm	U ppb	Br ppb	Cl ppb	F ppb	Mg ppb	Mn ppb	Na ppb	V U/cond ppb x 1000	Al ppb	Dy ppb	
1310	CR528	34.7476	76.6294	7.4	650	0.016	.	10500	344	19350	246	39540	0.5	0.0	207	-0.001
1311	CR529	34.7895	76.6318	7.2	650	-0.002	.	19600	136	.	225	37540	-0.1	0.0	315	-0.001
1312	CR530	34.8326	76.6376	7.3	700	-0.002	.	12600	208	13100	222	36980	-0.1	0.0	332	-0.001
1313	CR531	34.8805	76.6241	7.0	800	0.014	.	14200	96	6690	228	36660	1.2	0.0	320	-0.001
1314	CR532	34.9353	76.6308	7.2	700	0.008	37	11200	159	17660	280	39500	-0.1	0.0	133	-0.001
1315	CR533	34.9531	76.6476	7.4	600	0.012	44	9900	304	14870	258	51520	-0.1	0.0	97	-0.001
1316	CR534	34.9600	76.5960	6.8	450	0.296	142	51900	.	4480	234	39550	-0.1	0.6	30	0.030
1317	CR535	34.7829	76.5895	7.1	700	0.072	.	16600	213	16370	278	39040	-0.1	0.1	110	-0.001
1318	CR536	34.7637	76.5575	7.4	800	-0.002	126	17700	277	21500	287	66620	-0.1	0.0	199	-0.001
1319	CR537	34.7427	76.5746	6.7	1800	0.025	203	337800	.	22150	546	214100	-0.1	0.0	461	-0.001
1320	CR538	34.7293	76.5433	7.2	500	0.042	.	27900	113	5370	235	39320	-0.1	0.0	112	-0.001
1321	CR539	34.7479	76.5208	7.2	650	-0.002	52	24900	113	4400	266	38900	-0.1	0.0	128	-0.001
1322	CR540	34.7797	76.5127	6.3	150	0.010	64	21800	.	1500	87	21460	-0.1	0.0	48	-0.001
1323	CR541	34.7987	76.4653	7.4	700	0.012	.	9600	379	8330	181	83260	-0.1	0.0	105	-0.001
1324	CR542	34.8153	76.4547	7.9	1000	0.072	283	98800	.	.	476	96400	-0.1	0.0	572	0.090
1325	CR543	34.8430	76.4229	7.7	800	-0.002	235	18400	.	11600	248	108040	-0.1	0.0	231	0.030
1326	CR544	34.8805	76.3929	7.3	500	0.083	29	3000	43	3290	194	41060	1.5	0.1	228	-0.001
1327	CR545	34.8747	76.3495	7.4	600	-0.002	67	1300	.	.	185	39320	-0.1	0.0	283	-0.001
1328	CR546	34.8996	76.3613	7.3	470	0.015	21	1500	.	1150	121	21350	0.9	0.0	148	-0.001
1329	CR547	34.9640	76.2812	7.1	550	0.206	54	27000	.	2750	162	38920	2.7	0.3	377	0.040
1330	CR548	34.9872	76.3084	7.4	600	0.008	29	21900	.	.	217	40180	-0.1	0.0	247	-0.001
1332	CR550	34.7212	76.6764	7.3	700	0.007	.	1300	298	19500	198	39700	-0.1	0.0	281	-0.001
1333	CR551	34.7356	76.7919	7.7	330	0.005	103	2600	21	1070	127	20650	-0.1	0.0	135	-0.001
1334	CR552	34.7427	76.8165	7.3	600	0.006	16	5800	25	1000	87	16330	-0.1	0.0	154	-0.001
1335	CR553	34.7353	76.8437	7.3	475	-0.002	.	12900	84	6010	167	22450	-0.1	0.0	162	-0.001
1336	CR554	34.7398	76.7506	7.5	590	0.014	.	5400	213	18180	265	34180	-0.1	0.0	269	-0.001
1337	CR555	34.7453	76.7061	7.1	600	-0.002	48	2100	227	6880	191	33360	-0.1	0.0	285	-0.001
3864	PA513	34.9927	76.8170	7.5	490	0.008	24	5900	213	.	31	91110	-0.1	0.0	50	0.010
3865	PA514	34.9772	76.7818	5.0	172	0.216	101	19400	.	5830	84	19460	-0.1	1.2	465	0.260
3869	PA518	34.9942	76.7444	5.4	101	0.027	.	20600	.	.	69	21510	-0.1	0.2	37	-0.001