

Potentiometric Surface of the Crouch Branch Aquifer in South Carolina, November–December 2023

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EXPLANATION

125

Potentiometric contour, in feet NAVD 88; dashed where inferred

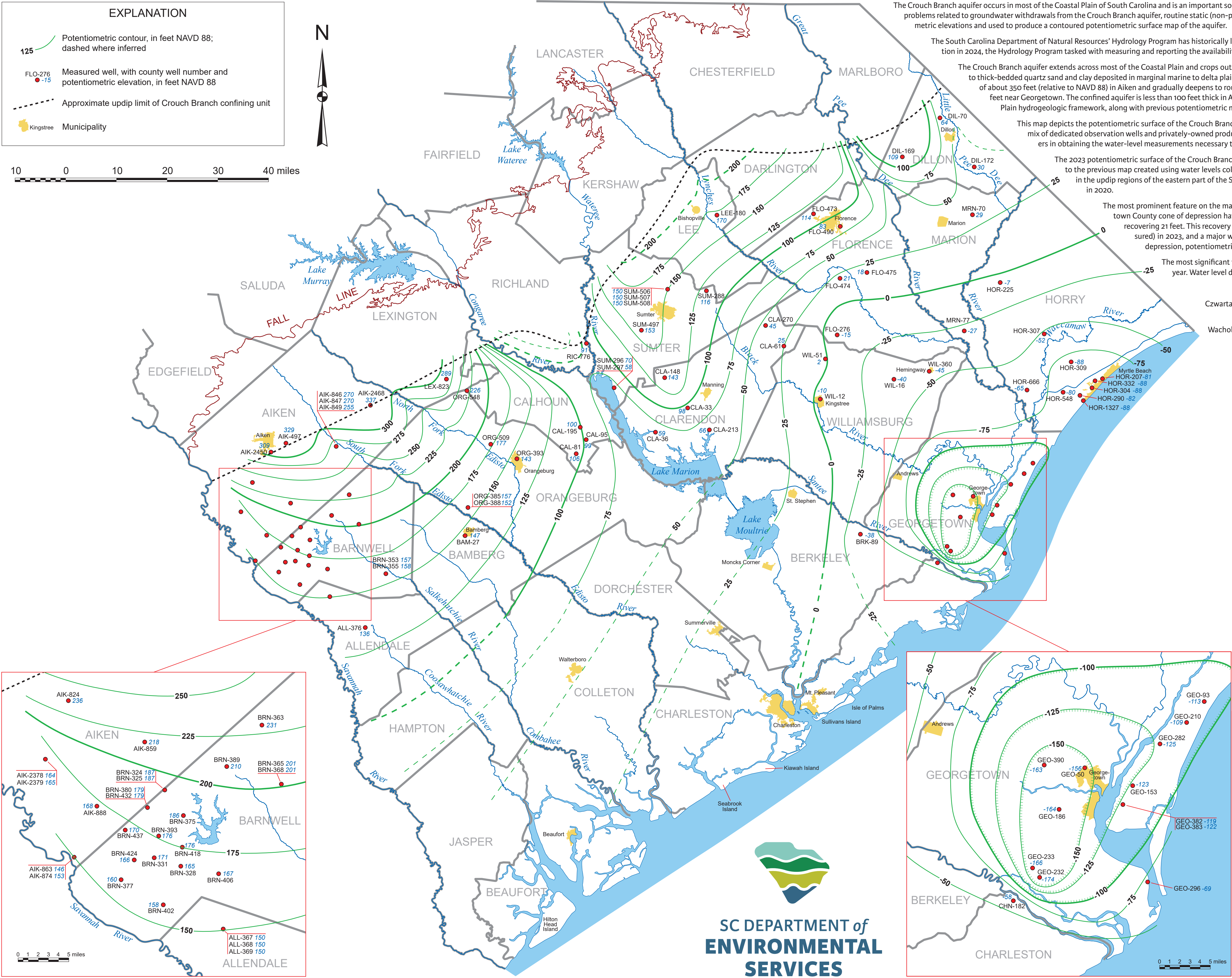
FLO-276
● -15

Measured well, with county well number and potentiometric elevation, in feet NAVD 88

Approximate updip limit of Crouch Branch confining unit

Kingstree

Municipality



The Crouch Branch aquifer occurs in most of the Coastal Plain of South Carolina and is an important source of groundwater for public-supply, industrial, agricultural, and domestic uses in the State. To help identify and assess existing or potential problems related to groundwater withdrawals from the Crouch Branch aquifer, routine static (non-pumping) water-level measurements are collected in wells open to the aquifer, and those water-level measurements are converted to potentiometric elevations and used to produce a contoured potentiometric surface map of the aquifer.

The South Carolina Department of Natural Resources' Hydrology Program has historically led this annual mapping effort with support from cooperating state and federal agencies. However, following a state government reorganization in 2024, the Hydrology Program tasked with measuring and reporting the availability of groundwater resources was transferred to the newly formed South Carolina Department of Environmental Services.

The Crouch Branch aquifer extends across most of the Coastal Plain and crops out near the Fall Line in a narrow band from Aiken County to Sumter County, widening from Sumter County to Dillon County. It consists of thin-to thick-bedded quartz sand and clay deposited in marginal marine to delta plain environments, with beds that generally dip southeast toward the coast. In western South Carolina, the top of the aquifer lies at an elevation of about 350 feet (relative to NAVD 88) in Aiken and gradually deepens to roughly -600 feet in Walterboro. In eastern South Carolina, the aquifer top is around 100 feet near Florence and declines to approximately -300 feet near Georgetown. The confined aquifer is less than 100 feet thick in Aiken County and exceeds 400 feet in coastal Horry County. A detailed description of the Crouch Branch aquifer and the South Carolina Coastal Plain hydrogeologic framework, along with previous potentiometric maps for the Crouch Branch (formerly the Black Creek) aquifer, is provided in Wachob and others (2017).

This map depicts the potentiometric surface of the Crouch Branch aquifer based on water level measurements collected from 100 wells in November and December 2023 (see table). The measured wells are mix of dedicated observation wells and privately-owned production wells that serve public-supply systems and agricultural or industrial facilities. The authors are grateful for the cooperation of well-owners in obtaining the water-level measurements necessary to produce this map.

The 2023 potentiometric surface of the Crouch Branch aquifer shows a general southeastwardly groundwater flow affected by potentiometric lows in the eastern half of the State. In comparison to the previous map created using water levels collected in 2020 (Czwartacki and Wachob, 2021), only minor changes in water levels have occurred in the western half of the Coastal Plain and in the updip regions of the eastern part of the State. Changes to potentiometric contours in Dillon and Marion Counties are the result of the inclusion of two wells in that area not measured in 2020.

The most prominent feature on the map remains the cone of depression centered in Georgetown County, but for the first time in decades, water levels in the center of the Georgetown County cone of depression have recovered from earlier levels. All wells located within the -150 foot contour line showed some degree of rebound from 2020, with one well recovering 21 feet. This recovery is the result of reduced pumping in this area, as the well that previously defined the deepest part of the cone was out of service (and not measured) in 2023, and a major water user in the City of Georgetown stopped withdrawing water from two wells in mid-2023. However, away from the center of the cone of depression, potentiometric levels continue to decline, and the cone is expanding inland toward Williamsburg County and northward along the coast.

The most significant water level declines relative to the 2020 map occurred in coastal Horry County, where Crouch Branch wells saw a decline of about 2.7 feet per year. Water level data from continuously measured monitoring wells in this area confirm the potentiometric decline.

References

Czwartacki, B. and A. Wachob, 2021, Potentiometric Surface of the Crouch Branch Aquifer in South Carolina, November–December 2020: South Carolina Department of Natural Resources, Water Resources Report 66, 1 plate.

Wachob, A., J.A. Gellici, and B. Czwartacki, 2017, Potentiometric surface maps of the South Carolina Coastal Plain Aquifers, November–December 2016: South Carolina Department of Natural Resources, Water Resources Report 60, 35 p., 3 plates.

Well ID	2023 potentiometric elevation (ft NAVD88)	2023 water level (ft)*	Change in water level (ft) since 2020**
AIK-497	329	167	2
AIK-824	236	182	1
AIK-846	270	27	-2
AIK-847	270	28	-2
AIK-849	255	43	-1
AIK-859	218	42	n/a
AIK-863	146	5	0
AIK-874	153	-2	1
AIK-888	168	97	-1
AIK-2378	164	56	n/a
AIK-2379	165	60	-1
AIK-2450	309	179	2
AIK-2468	337	148	0
ALL-367	150	95	0
ALL-368	150	95	0
ALL-369	150	91	0
ALL-376	136	145	0
BAM-27	147	2	4
BRK-89	-38	72	-4
BRN-324	187	106	0
BRN-325	187	106	0
BRN-328	165	83	0
BRN-331	171	81	0
BRN-353	157	50	-3
BRN-355	158	50	-3
BRN-363	231	119	n/a
BRN-365	201	62	-1
BRN-368	201	63	-1
BRN-375	186	101	2
BRN-377	160	22	2
BRN-380	179	94	0
BRN-389	210	121	0
BRN-393	176	120	0
BRN-402	158	48	1
BRN-406	167	48	0
BRN-418	176	137	0
BRN-424	166	98	0
BRN-432	179	94	0
BRN-437	170	125	0
CAL-81	106	58	n/a
CAL-95	99	75	n/a
CAL-195	100	86	-2
CHN-182	-58	68	-5
CLA-33	98	54	-1
CLA-36	59	36	n/a
CLA-61	25	71	-7
CLA-148	143	41	-3
CLA-213	66	36	-3
CLA-270	45	52	n/a
DIL-70	64	70	n/a

Well ID	2023 potentiometric elevation (ft NAVD88)	2023 water level (ft)*	Change in water level (ft) since 2020**
DIL-169	329	109	6
DIL-172	30	52	n/a
FLO-276	-15	93	2
FLO-473	114	19	n/a
FLO-474	21	59	n/a
FLO-475	18	89	n/a
FLO-490	83	25	n/a
GEO-50	-156	171	21
GEO-93	-113	132	-2
GEO-153	-123	140	-4
GEO-186	-164	192	6
GEO-210	-109	124	-5
GEO-232	-174	194	4
GEO-233	-166	188	3
GEO-282	-125	150	-3
GEO-296	-69	74	-1
GEO-382	-119	128	-2
GEO-383	-122	130	-4
GEO-390	-163	181	-1
HOR-207	-81	113	n/a
HOR-225	-7	108	0
HOR-290	-82	104	-10
HOR-304	-88	107	-7
HOR-307	-52	78	-6
HOR-309	-88	129	-11
HOR-332	-88	112	-5
HOR-548	-80	96	-6
HOR-666	-65	81	n/a
HOR-1327	-88	105	-14
LEE-180	170	27	-3
LEX-823	289	17	0
MRN-70	29	63	n/a
MRN-77	-27	61	-3
ORG-385	157	16	-1
ORG-388	152	18	n/a
ORG-393	143	113	1
ORG-509	177	22	0
ORG-548	226	175	n/a
RIC-776	91	59	-2
SUM-288	116	28	-10
SUM-296	70	87	0
SUM-297	58	99	-5
SUM-497	153	24	-1
SUM-506	150	16	-5
SUM-507	150	16	-6
SUM-508	150	16	-6
WIL-12	-10	73	-4
WIL-16	-40	92	-4
WIL-51	2	69	-1
WIL-360	-45	95	n/a

* Depth to water from land surface. Negative value indicates flowing well.
** Change in water level from measurement made for 2020 potentiometric map. Positive number indicates higher water level in 2023.