

Maryland Department of Natural Resources
Resource Assessment Service
MARYLAND GEOLOGICAL SURVEY
Richard A. Ort, Jr., Director

HYDROGRAPHS AND TABLES SHOWING GROUNDWATER LEVEL AND
PUMPAGE RECORDS FOR SELECTED OBSERVATION WELLS
IN ANNE ARUNDEL COUNTY, MARYLAND

AND

HYDROGRAPH SHOWING SURFACE-WATER FLOW
IN SAWMILL CREEK

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Prepared in cooperation with the
Anne Arundel County Department of Public Works

August 2022

SUMMARY

This report presents water-level data for 41 observation wells in Anne Arundel County updated through June 2022. Water-levels are tabulated for measurements from July 2021 through June 2022. Hydrographs are shown for the entire period of record at each site. Data, collected by the Maryland Geological Survey (MGS), are stored in the National Water Information System (Groundwater Site Inventory database), maintained by the U.S. Geological Survey. Current and historical groundwater data may be obtained from the U.S. Geological Survey website at <http://waterdata.usgs.gov/nwis/gw> or through an interactive map on the MGS website at http://www.mgs.md.gov/groundwater/water_level_mapper.html. This report also presents groundwater withdrawals correlated with water levels in 8 observation wells in the Crofton Meadows and Arnold well fields from July 2021 through June 2022. Pumpage data were obtained from Anne Arundel County Department of Public Works.

Aquia aquifer. Water levels were measured in one well in this aquifer. The water level in Southern Anne Arundel County at the Deale Athletic Field (AA Fe 92) was 31.96 ft below sea level in September, 2021. While fluctuating seasonally by as much as ~5 feet as a result of local pumpage, the overall water-level trend since about 2006 has been relatively flat. The flattening of the trend is largely a result of the reduction of withdrawals from the Aquia aquifer in St. Mary's County as pumpage was shifted to the deeper Upper Patapsco aquifer to avoid elevated arsenic concentrations in the Aquia aquifer.

Magothy aquifer. Water levels were measured in 6 wells in this aquifer. Current levels range from 3.47 ft above sea level west of Annapolis (AA Dd 42) to 23.65 ft below sea level in Broad Neck (AA Cf 99). Overall, water levels show a relatively flat trend with seasonal fluctuation due to water use over the last ten years.

Upper Patapsco aquifer. Water levels were measured in 8 wells in this aquifer. Current levels range from 72.35 ft above sea level in northern Anne Arundel County (AA Ad 108) to 30.98 ft below sea level at the Broad Creek Water Treatment Plant (AA De 95). Overall, water-levels in the Upper Patapsco aquifer exhibit a flat to slightly increasing trend in most of the county.

Lower Patapsco aquifer. Water levels were measured in 19 wells in this aquifer. Current levels range from 76.93 ft above sea level in northern Anne Arundel County (AA Bd 160) to 66.70 ft below sea level in the Arnold well field (AA Cf 167). Recent pumpage in Crofton ranged from 4.66 million gallons per day (Feb 2022) to 6.75 million gallons per day (Sept 2021) (tab. 2). In Arnold, recent pumpage ranged from 3.54 million gallons per day (March 2022) to 7.18 million gallons per day (July 2021) (tab. 4). Figures 6, 7, 12 and 13 show plots of water levels and pumpage within the Lower Patapsco aquifer. Overall, water level trends are flat to slightly increasing in all wells except at Kings Heights (AA Cc 82), where a slightly declining trend is observed.

Patuxent aquifer. Water levels were measured in 7 wells in this aquifer. Current levels range from 17.14 ft above sea level south of Ft. Meade (AA Cb 1) to 110.50 ft below sea level in the Arnold well field (AA Cf 166). Recent pumpage in Crofton ranged from 5.53 million gallons per day (Oct 2021) to 6.40 million gallons per day (June 2022) (tab. 1). Recent pumpage in Arnold ranged from 1.03 million gallons per day (March 2022) to 3.79 million gallons per day (July 2021) (tab. 3). Figures 3, 4, 9 and 10 show plots of water levels and pumpage within the Patuxent aquifer. Overall, water levels in wells in the Patuxent aquifer have declined in the last 10 years, with the exception of those at Glen Burnie (AA Ad 90) and Arnold (AA Cf 166) which have shown a flat and increasing trend, respectively.

The daily discharge in **Sawmill Creek** remained above approximately 5 cubic feet per second over the past year, with the exception of late summer and early fall months when discharge was slightly less.

GROUND-WATER MONITORING WELLS

<u>Well Number</u>	<u>Location</u>	<u>Aquifer</u>
AA Ad 90	Aviation Blvd., Glen Burnie	Patuxent
AA Ad 102	Aviation Blvd., Glen Burnie	Lower Patapsco
AA Ad 108	Aviation Blvd., Glen Burnie	Upper Patapsco
AA Ad 109	Dorsey Road, Glen Burnie	Lower Patapsco
AA Bc 215	Telegraph Road	Lower Patapsco
AA Bd 152	Woodside School, Glen Burnie	Lower Patapsco
AA Bd 155	State Highway Administration, Glen Burnie	Lower Patapsco
AA Bd 156	Baltimore-Annapolis Bike Trail, Glen Burnie	Lower Patapsco
AA Bd 157	Rippling Woods Elementary School, Glen Burnie	Lower Patapsco
AA Bd 158	Center for Applied Technology, Glen Burnie	Lower Patapsco
AA Bd 159	Rippling Woods ES, near Glen Burnie	Upper Patapsco
AA Bd 160	Queenstown Park, near Glen Burnie	Lower Patapsco
AA Cb 1	Patuxent Wildlife Refuge Center	Patuxent
AA Cc 82	King Heights Water-Treatment Plant	Lower Patapsco
AA Cc 89	Crofton Water-Treatment Plant	Lower Patapsco
AA Cc 102	Crofton Water-Treatment Plant	Patuxent
AA Cc 115	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Cc 116	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Cc 135	Crofton Meadows Water-Treatment Plant	Patuxent
AA Cc 137	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Ce 117	Severndale Water-Treatment Plant	Patuxent
AA Cf 99	Traffic Engineering Building, Broad Neck	Magothy
AA Cf 134	Amberly Water-Treatment Plant	Upper Patapsco
AA Cf 137	Arnold Water-Treatment Plant	Lower Patapsco
AA Cf 166	Arnold Water-Treatment Plant (remote site)	Patuxent
AA Cf 167	Arnold Water-Treatment Plant (remote site)	Lower Patapsco
AA Cg 22	Sandy Point State Park	Patuxent
AA Cg 23	Sandy Point State Park	Lower Patapsco
AA Cg 24	Sandy Point State Park	Upper Patapsco
AA Dd 42	Route 50 and Howard Grove Road	Magothy
AA De 1	City of Annapolis Water Works Building	Magothy
AA De 95	Broad Creek Water-Treatment Plant	Upper Patapsco
AA De 128	Central Avenue well field	Upper Patapsco
AA De 206	Broad Creek Water-Treatment Plant	Lower Patapsco
AA De 219	City of Annapolis	Upper Patapsco
AA De 232	City of Annapolis	Lower Patapsco
AA Df 19	U.S. Navy Radio Station	Upper Patapsco
AA Df 20	U.S. Navy Radio Station	Magothy
AA Df 79	U.S. Naval Academy	Magothy
AA Fe 92	Deale Athletic Field	Aquia
AA Fe 93	Deale Athletic Field	Magothy

SURFACE-WATER MONITORING GAGE

<u>Gage Number</u>	
01589500	Sawmill Creek

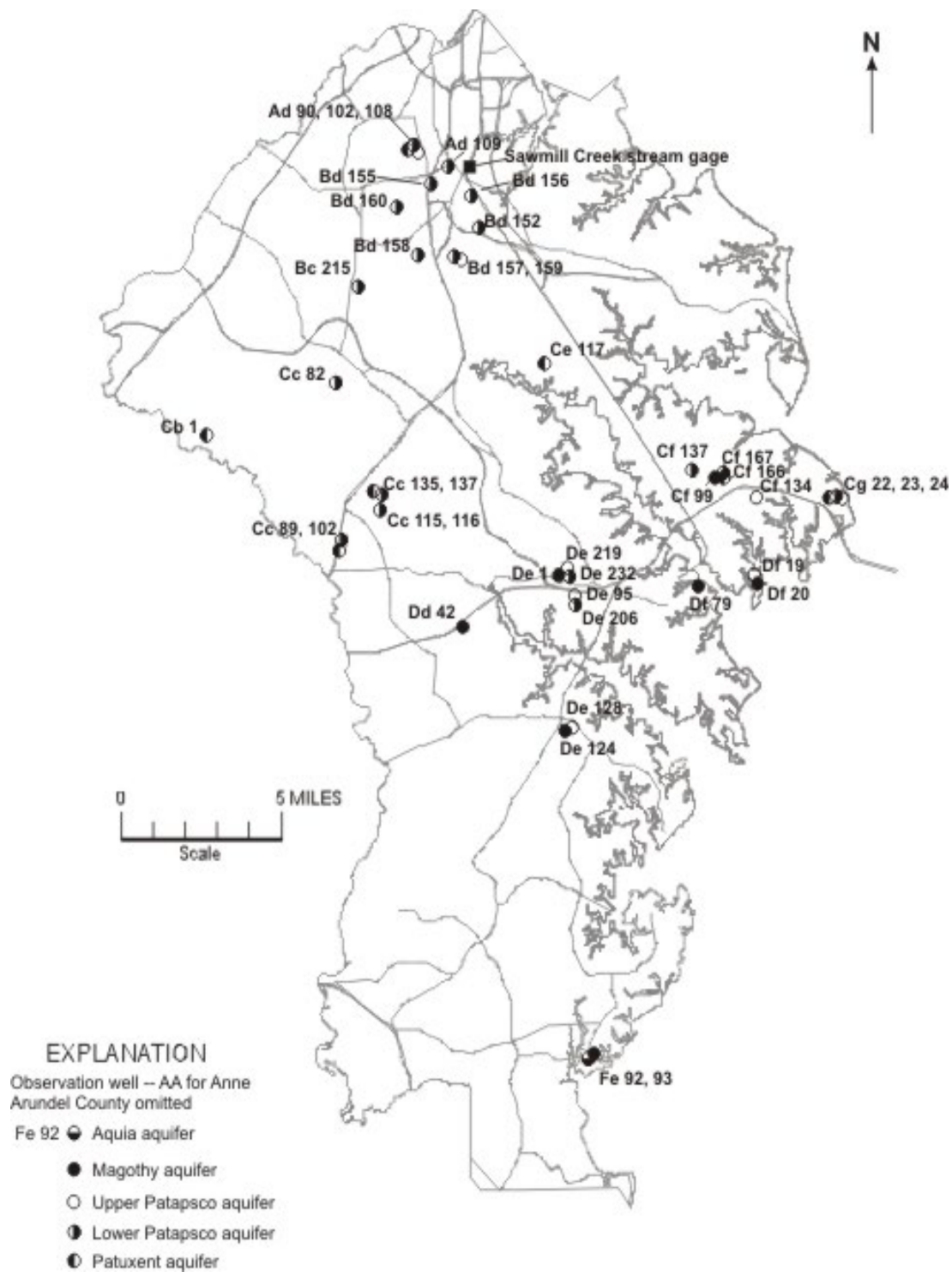


Figure 1. Location of observation wells and stream gage.

WELL NUMBER: AA Ad 90

PERMIT NUMBER: AA-04-0298

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39°10' 32", LONG. 76°38' 59"

AQUIFER: Patuxent Formation of Lower Cretaceous age

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 453 ft;

Casing diameter: 6 in. to 443 ft;

Screen diameter: 6 in. from 443 to 453 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 77.85 ft above NGVD of 1929.

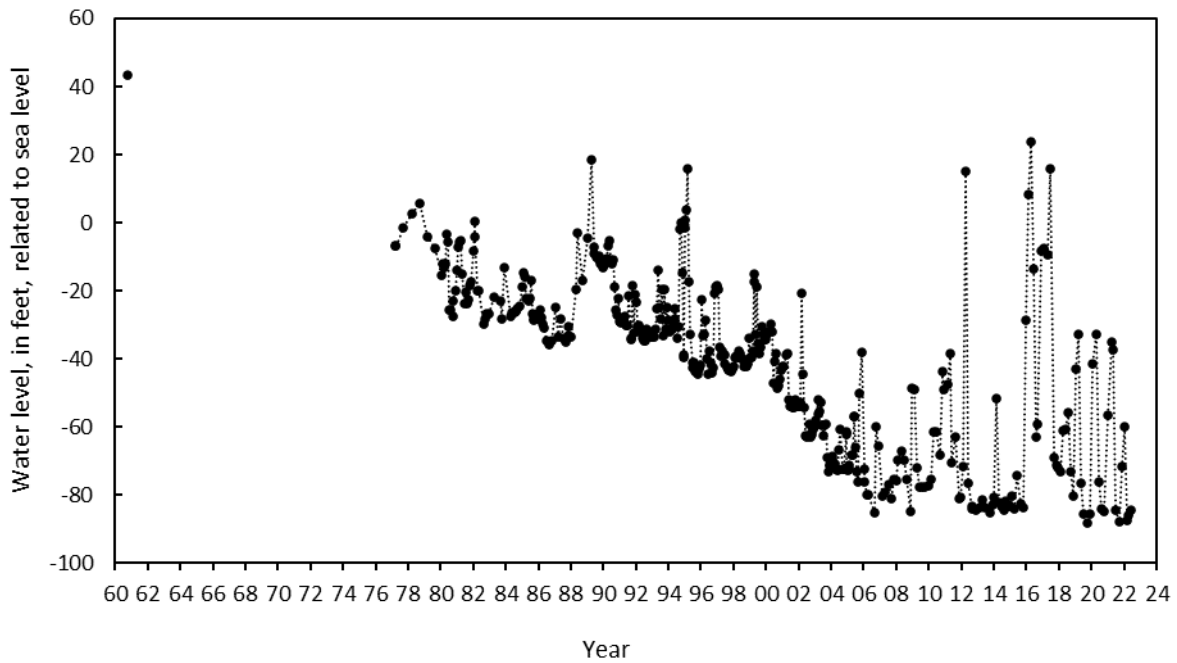
MEASURING POINT: Top of casing 1.47 ft above land surface.

PERIOD OF RECORD: October 1960 to current year.

EXTREMES FOR RECORD: Highest water level measured, 34.4 ft below land surface, on October 8, 1960; lowest measured, 165.9 ft below land surface, on September 18, 2019.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	165.76	Jan 24, 2022	137.65	Apr 20, 2022	163.84
Nov 18, 2021	149.30	Mar 21, 2022	165.07	Jun 10, 2022	162.24



WELL NUMBER: AA Ad 102

PERMIT NUMBER: AA-81-2641

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39° 10' 32", LONG. 76° 38' 59"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 108 ft;

Casing diameter: 6 in. to 80 ft;

Screen diameter: 6 in. from 80 to 90 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 76.72 ft above NGVD of 1929.

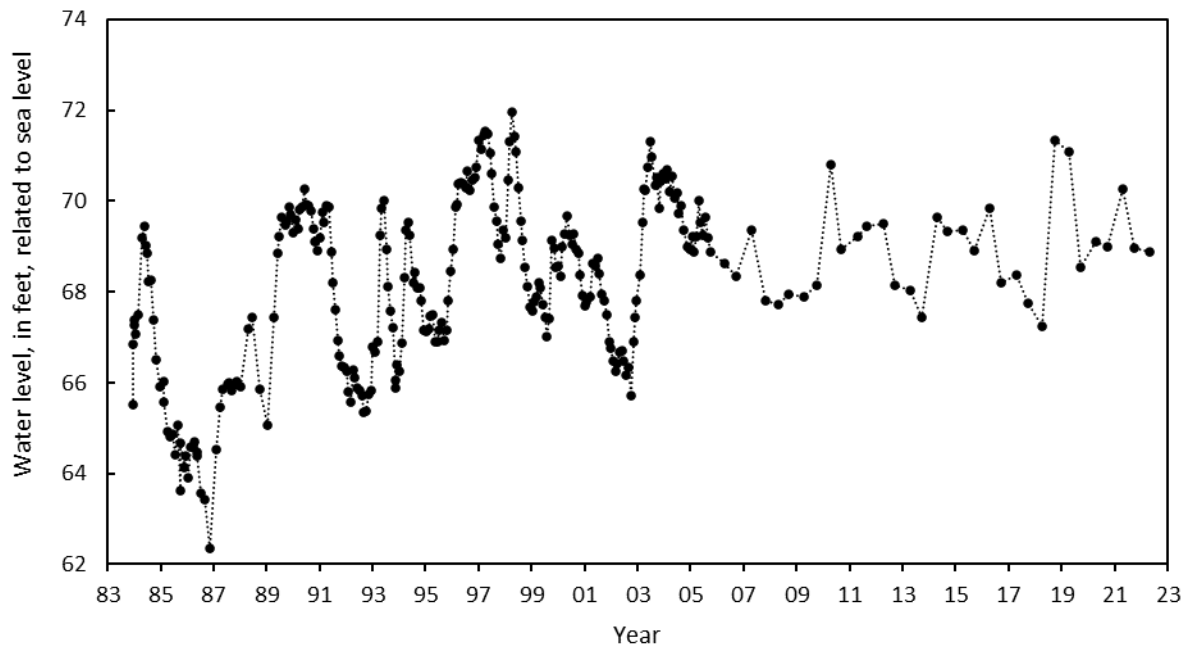
MEASURING POINT: Top of casing 5.27 ft above land surface.

PERIOD OF RECORD: December 1983 to current year.

EXTREMES FOR RECORD: Highest water level measured at 4.75 ft below land surface, on April 3, 1998; lowest measured at 14.36 ft below land surface, on November 3, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 27, 2021	7.75
Apr 20, 2022	7.83



WELL NUMBER: AA Ad 108

PERMIT NUMBER: AA-81-3475

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39°10' 32", LONG. 76°38' 59"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, water-table well, depth 11.5 ft;

Casing diameter: 4 in. to 6 ft;

Screen diameter: 4 in. from 6 to 11 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 78.31 ft above NGVD of 1929.

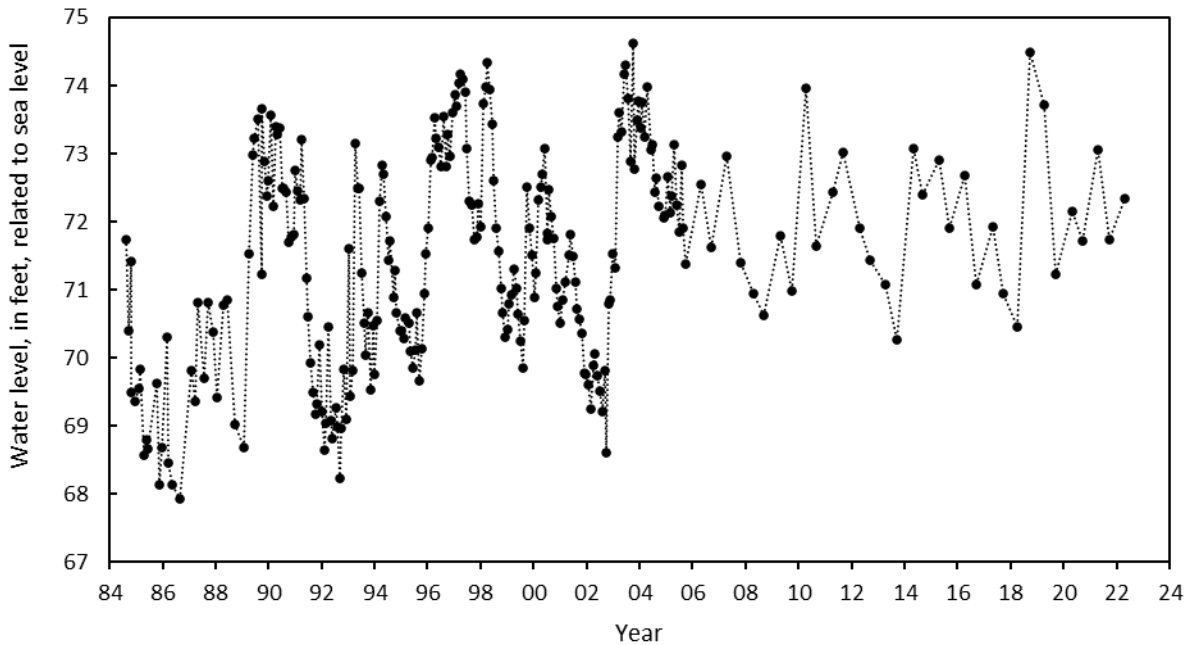
MEASURING POINT: Top of casing 5.5 ft above land surface.

PERIOD OF RECORD: August 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 3.68 ft below land surface, on August 22, 1985; lowest measured at 10.38 ft below land surface, on August 25, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 27, 2021	6.58
Apr 20, 2022	5.96



WELL NUMBER: AA Ad 109

PERMIT NUMBER: AA-81-4890

LOCATION: Dorsey Road, Glen Burnie

LAT. 39° 0' 06", LONG. 76° 38' 01"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 46 ft;

Casing diameter: 4 in. to 36 ft;

Screen diameter: 4 in. from 36 to 46 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 35.78 ft above NGVD of 1929.

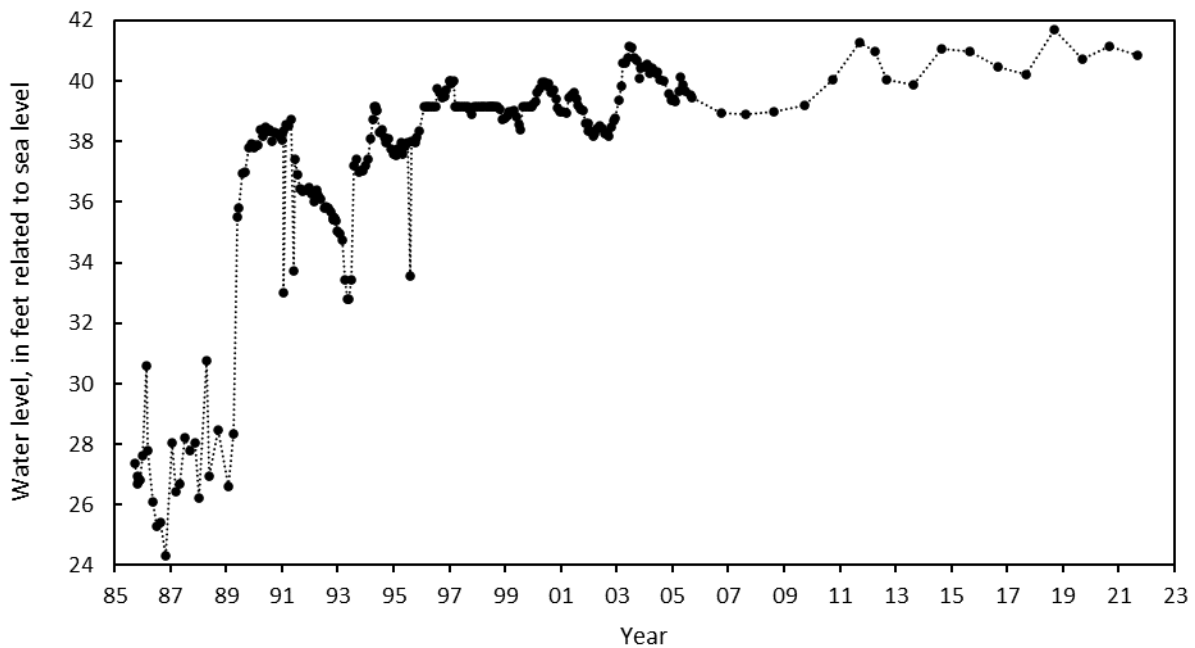
MEASURING POINT: Top of recorder platform 4.29 ft above land surface.

PERIOD OF RECORD: October 1985 to current year.

EXTREMES FOR RECORD: Highest water level measured at 5.90 ft above land surface, on September 6, 2018; lowest measured at 11.45 ft below land surface, on November 3, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM (READINGS ABOVE LAND-SURFACE INDICATED BY "-")

DATE	WATER LEVEL
Sep 13, 2021	-5.09



WELL NUMBER: AA Bc 215

PERMIT NUMBER: AA-81-1035

LOCATION: Telegraph Road

LAT. 39°07' 00", LONG. 76° 41' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, production, artesian well, depth 325 ft;

Casing diameter: 16 in. to 236 ft

Screen diameter: 10 in. from 235 to 239 ft, 250 to 284 ft, and 288 to 316 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 124 ft above NGVD of 1929.

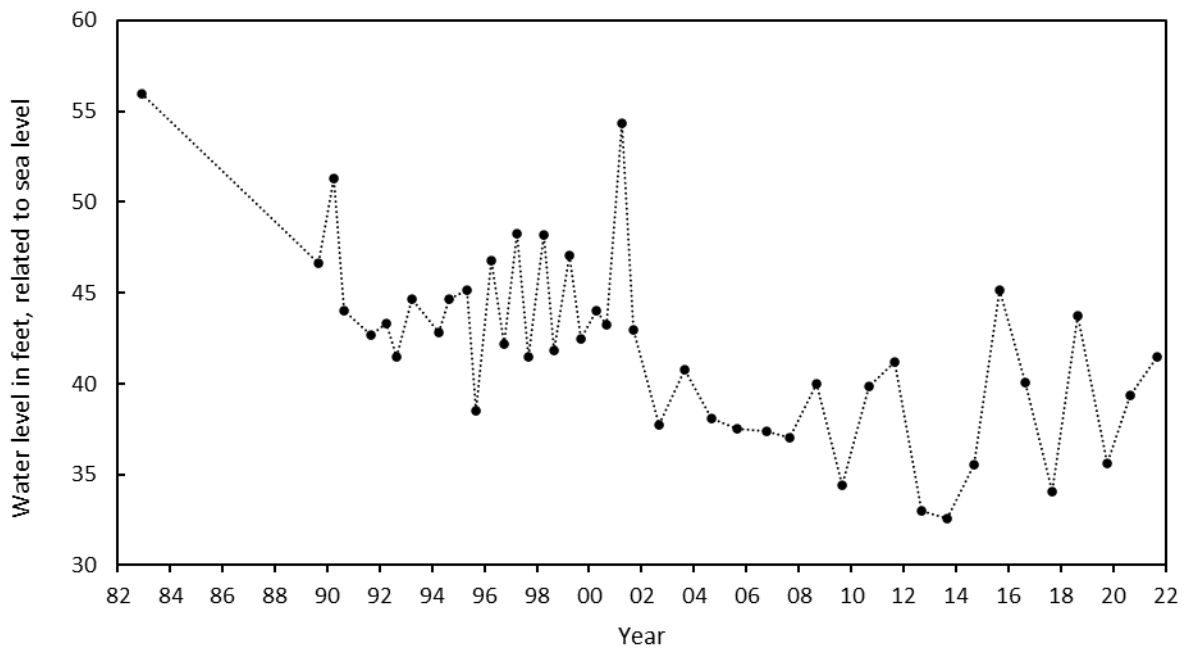
MEASURING POINT: Top of riser pipe 1 ft above land surface.

PERIOD OF RECORD: December 1982 to current year.

EXTREMES FOR RECORD: Highest water level measured at 68.03 ft below land surface, on September 6, 1982; lowest measured at 91.40 ft below land surface, on September 13, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 14, 2021	82.50



WELL NUMBER: AA Bd 152

PERMIT NUMBER: AA-81-3463

LOCATION: Woodside School, Glen Burnie

LAT. 39° 08' 21", LONG. 76° 36' 54"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 103 ft;

Casing diameter: 6 in. to 90 ft;

Screen diameter: 4 in. from 90 to 100 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 53.29 ft above NGVD of 1929.

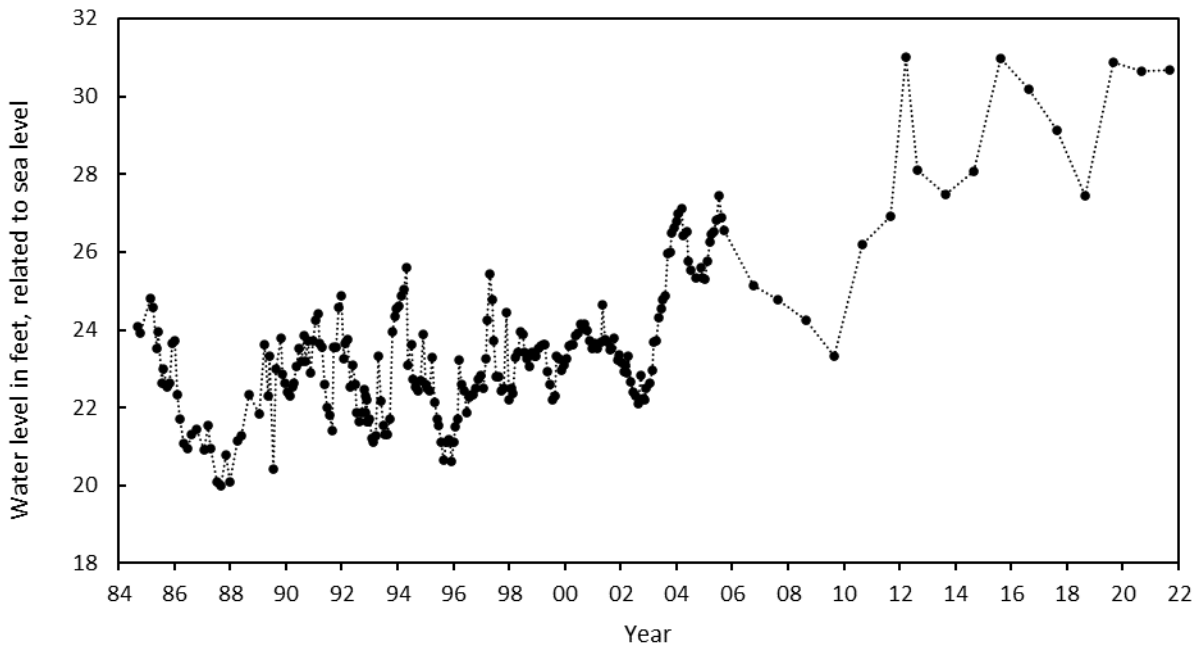
MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

PERIOD OF RECORD: September 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 22.29 ft below land surface, on April 9, 2012; lowest measured at 33.30 ft below land surface, on September 14, 1987.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 13, 2021	22.61



WELL NUMBER: AA Bd 155

PERMIT NUMBER: AA-81-3460

LOCATION: State Highway Administration, Glen Burnie

LAT. 39° 09' 38", LONG. 76° 38' 37"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 159 ft;

Casing diameter: 6 in. to 145 ft;

Screen diameter: 4 in. from 145 to 155 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 57.50 ft above NGVD of 1929.

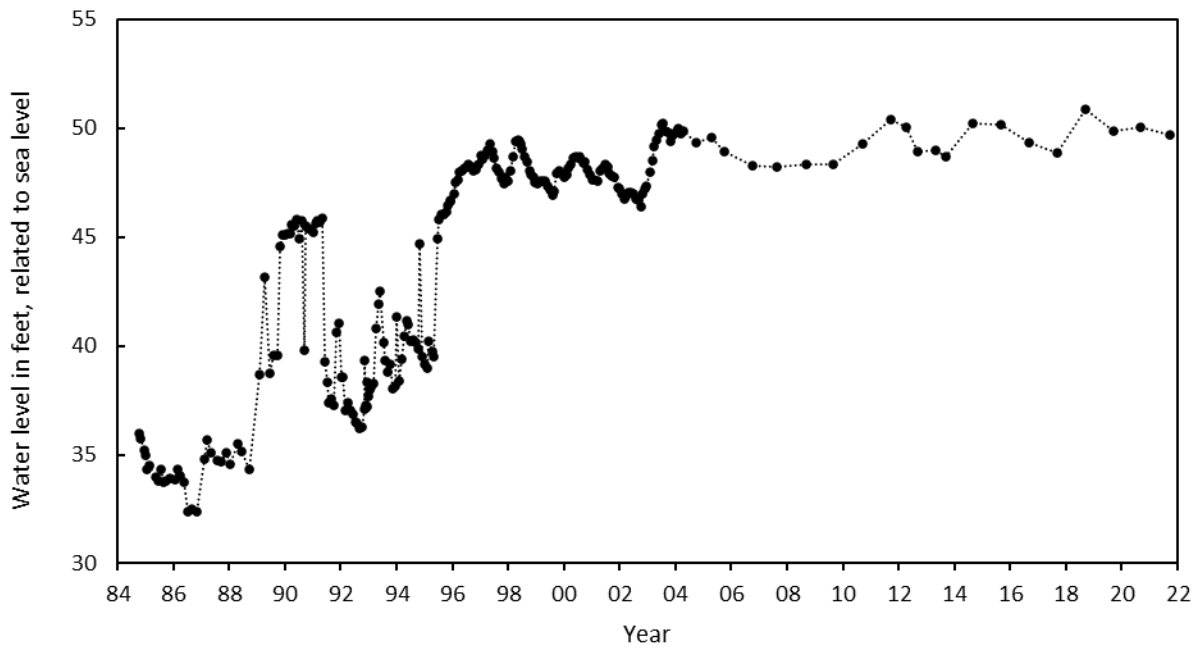
MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: October 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 6.62 ft below land surface, on September 6, 2018; lowest measured at 25.11 ft below land surface, on November 3, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 20, 2021	7.83



WELL NUMBER: AA Bd 156

PERMIT NUMBER: AA-81-3462

LOCATION: Baltimore-Annapolis Bike Trail, 0.3 mi. north
of Aquahart Rd., Glen Burnie

LAT. 39° 09' 22", LONG. 76° 37' 10"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 173 ft;

Casing diameter: 6 in. to 160 ft; 4 in. from 170 to 173 ft;

Screen diameter: 4 in. from 160 to 170 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 68.99 ft above NGVD of 1929.

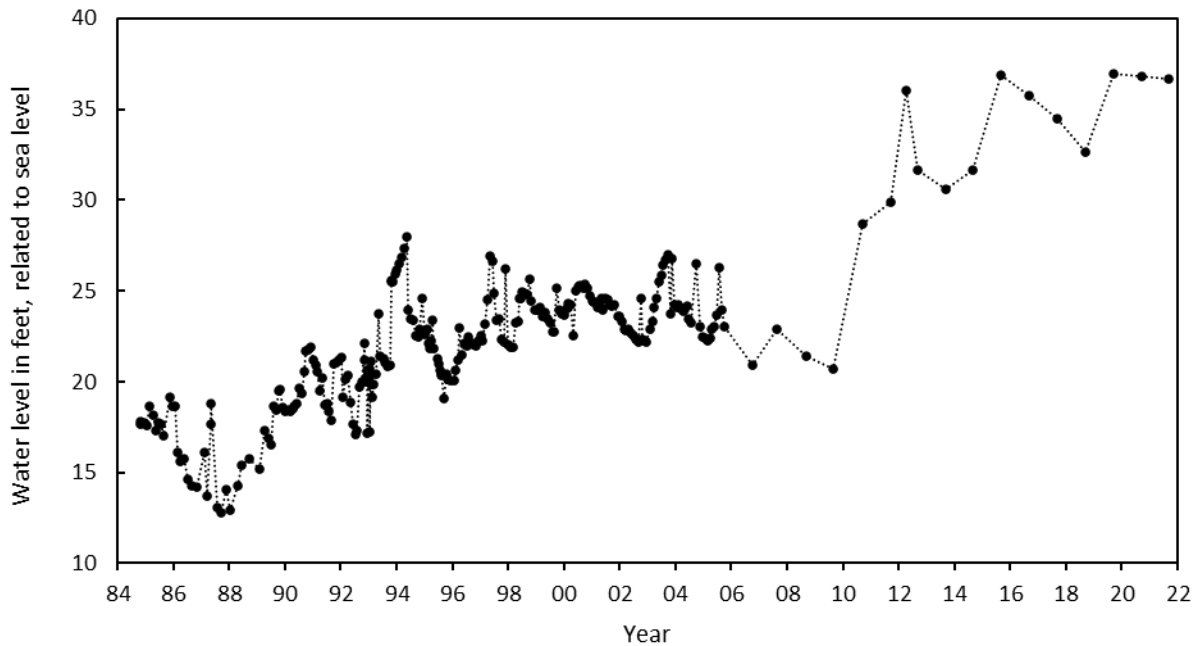
MEASURING POINT: Top of recorder platform 2.26 ft above land surface.

PERIOD OF RECORD: October 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 32.04 ft below land surface, on
September 10, 2019; lowest measured at 56.23 ft below land surface, on September 14, 1987.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 13, 2021	32.34



WELL NUMBER: AA Bd 157

PERMIT NUMBER: AA-81-3464

LOCATION: Rippling Woods Elementary School, Glen Burnie LAT. 39°07' 37", LONG. 76° 37' 44"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 180 ft;

Casing diameter: 6 in. to 167 ft;

Screen diameter: 4 in. from 167 to 177 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 75.75 ft above NGVD of 1929.

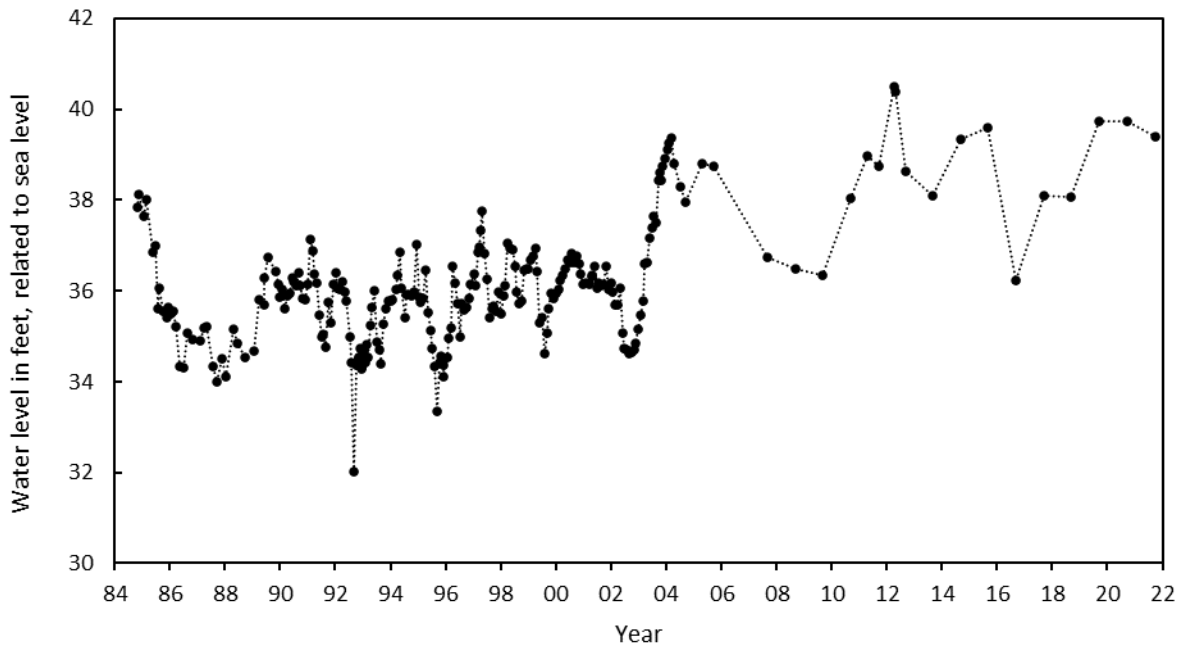
MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: October 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 35.25 ft below land surface, on April 19, 2012; lowest measured at 43.73 ft below land surface, on September 4, 1992.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 20, 2021	36.35



WELL NUMBER: AA Bd 158

PERMIT NUMBER: AA-81-3459

LOCATION: Center for Applied Technology, Glen Burnie

LAT. 39° 07' 44", LONG. 76° 37" 00"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 187 ft;

Casing diameter: 6 in. to 174 ft;

Screen diameter: 4 in. from 174 to 184 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 108.25 ft above NGVD of 1929.

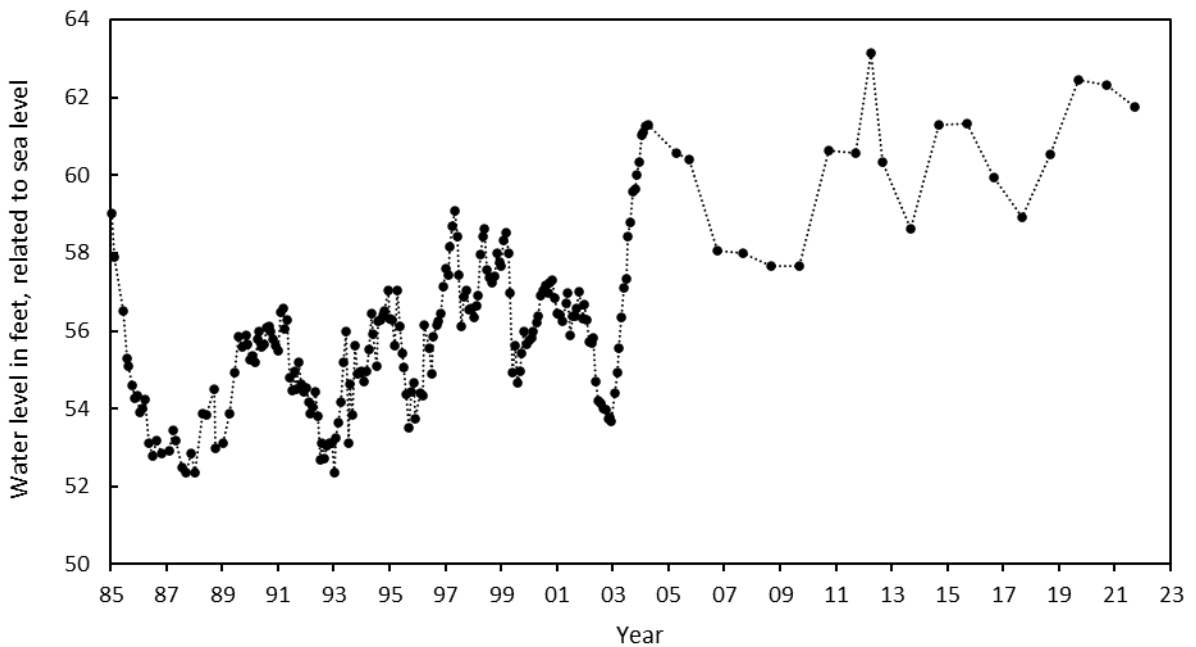
MEASURING POINT: Top of recorder platform 2.6 ft above land surface.

PERIOD OF RECORD: January 1985 to current year.

EXTREMES FOR RECORD: Highest water level measured at 45.12 ft below land surface, on April 9, 2012; lowest measured at 55.90 ft below land surface, on September 14, 1987.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 14, 2021	46.48



WELL NUMBER: AA Bd 159
LOCATION: Rippling Woods Elementary School,
near Glen Burnie

PERMIT NUMBER: AA-81-3949
LAT. 39°07' 37", LONG. 76°37' 44"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 100 ft;

Casing diameter: 6 in. to 89 ft;

Screen diameter: 4 in. from 89 to 99 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 75.48 ft above NGVD of 1929.

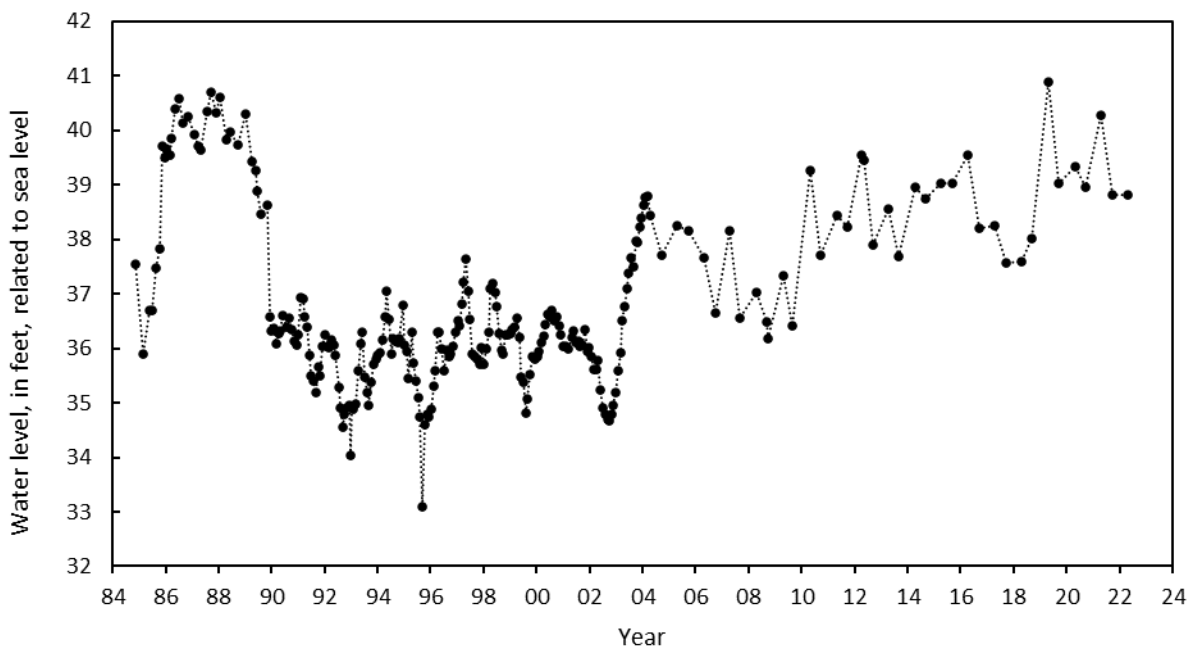
MEASURING POINT: Top of casing 2.5 ft above land surface.

PERIOD OF RECORD: November 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 34.58 ft below land surface, on
April 26, 2019; lowest measured at 42.38 ft below land surface, on September 7, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 14, 2021	36.67
Apr 27, 2022	36.65



WELL NUMBER: AA Bd 160

PERMIT NUMBER: AA-81-3461

LOCATION: Queenstown Park, near Glen Burnie

LAT. 39° 09' 08", LONG. 76°39' 44"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 118 ft;

Casing diameter: 6 in. to 105 ft;

Screen diameter: 4 in. from 105 to 115 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 88 ft above NGVD of 1929.

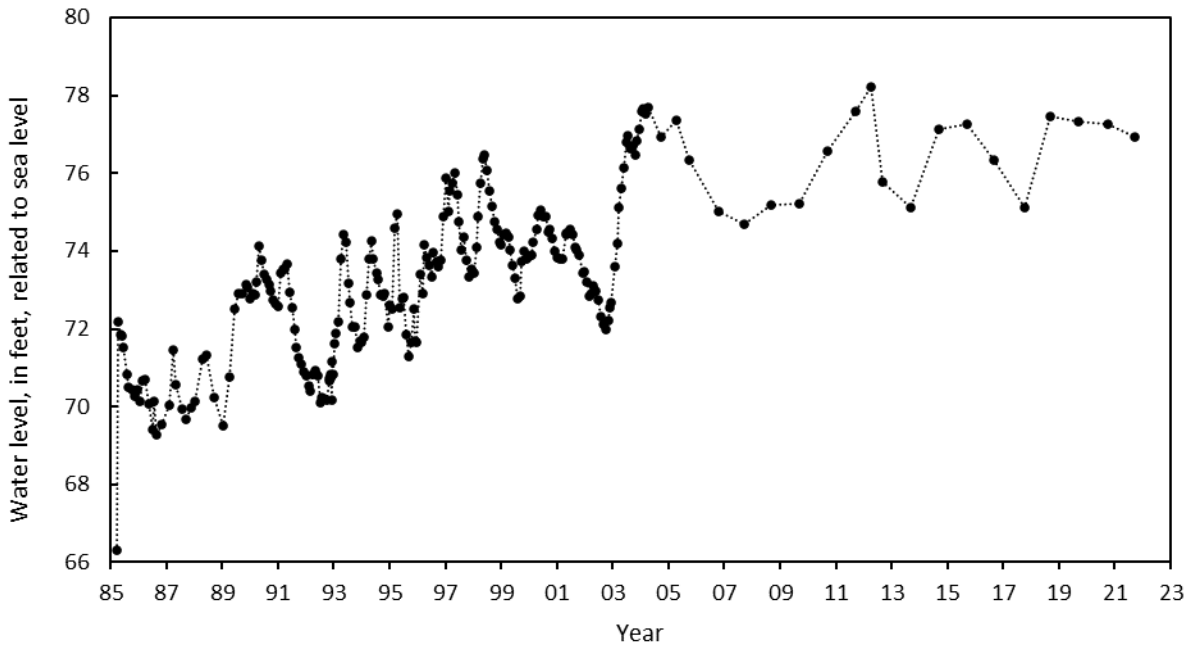
MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: March 1985 to current year.

EXTREMES FOR RECORD: Highest water level measured at 9.77 ft below land surface, on April 9, 2012; lowest measured at 21.7 ft below land surface, on March 20, 1985.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 14, 2021	11.07



WELL NUMBER: AA Cb 1

PERMIT NUMBER: AA-03-5695

LOCATION: Patuxent Wildlife Refuge Center

LAT. 39°03' 03", LONG. 76°46' 32"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 505 ft;

Casing diameter: 6 in. to 485 ft;

Screen diameter: 6 in. from 485 to 505 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 129.10 ft above NGVD of 1929.

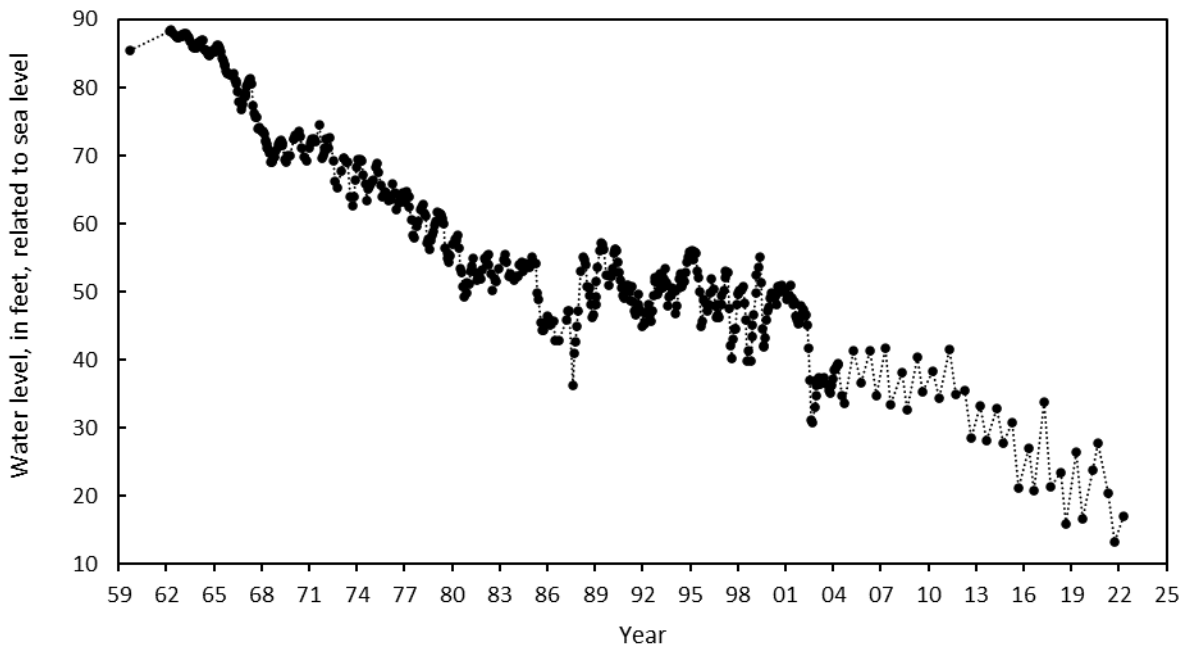
MEASURING POINT: Top of recorder platform 3.35 ft above land surface.

PERIOD OF RECORD: September 1959 to current year.

EXTREMES FOR RECORD: Highest water level measured at 40.6 ft below land surface, on May 1, 1962; lowest measured at 115.82 ft below land surface, on September 27, 2021.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 21, 2021	115.82
Apr 20, 2022	111.96



WELL NUMBER: AA Cc 82

PERMIT NUMBER: AA-04-6965

LOCATION: Kings Heights Water-Treatment Plant

LAT. 39° 04' 22", LONG. 76° 41' 45"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 458 ft;

Casing diameter: 1 in. to 455 ft;

Screen diameter: 1.25 in. from 455 to 458 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 177.96 ft above NGVD of 1929.

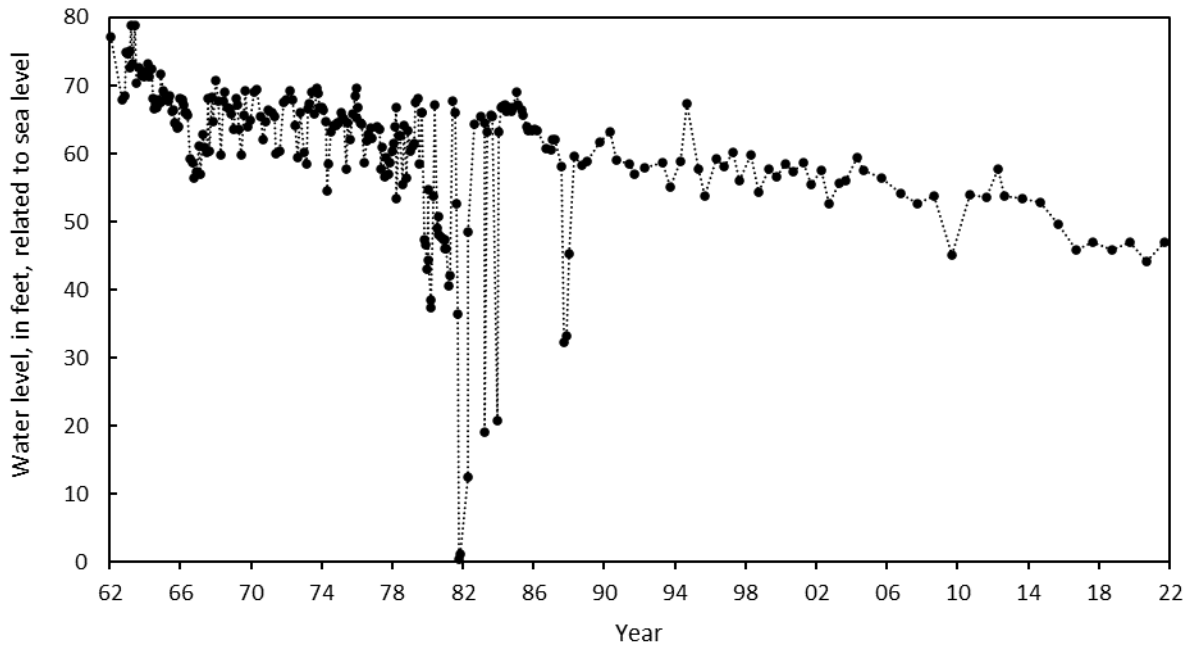
MEASURING POINT: Top of casing 0.5 ft above land surface.

PERIOD OF RECORD: January 1962 to current year.

EXTREMES FOR RECORD: Highest water level measured at 99.08 ft below land surface, on June 4, 1963; lowest measured at 177.45 ft below land surface, on October 9, 1981.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 20, 2021	131.04



WELL NUMBER: AA Cc 89

PERMIT NUMBER: AA-65-0672

LOCATION: Crofton Water-Treatment Plant

LAT. 39° 00' 10", LONG. 76° 41' 57"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 605 ft;

Casing diameter: 4 in. to 575 ft;

Screen diameter: 4 in. from 575 to 605 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 52.77 ft above NGVD of 1929.

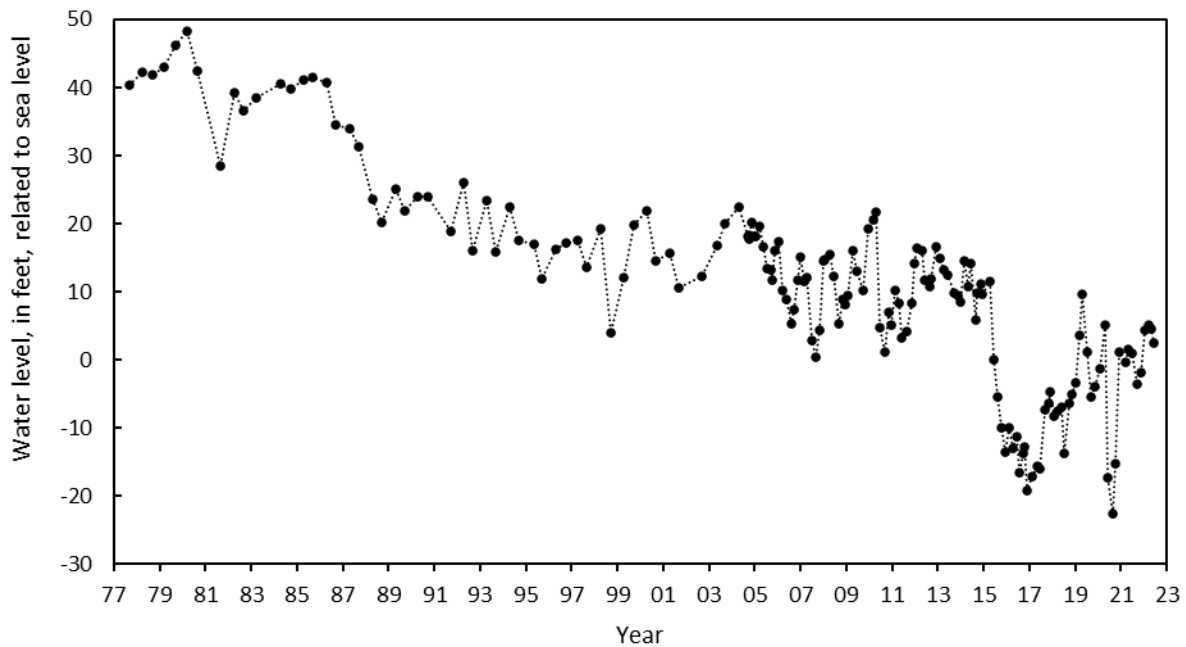
MEASURING POINT: Top of casing 3.54 ft above land surface.

PERIOD OF RECORD: September 1977 to current year.

EXTREMES FOR RECORD: Highest water level measured at 4.45 ft below land surface, on March 12, 1980; lowest measured at 75.35 ft below land surface, on August 20, 2020.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	56.35	Jan 24, 2022	48.46	Apr 20, 2022	48.12
Nov 18, 2021	54.69	Mar 21, 2022	47.71	Jun 15, 2022	50.23



WELL NUMBER: AA Cc 102

LOCATION: Crofton Water-Treatment Plant

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 960 ft;

Casing diameter: 4 in. to 850 ft;

Screen diameter: 4 in. from 850 to 960 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 53.96 ft above NGVD of 1929.

MEASURING POINT: Top of casing 3.3 ft above land surface.

PERIOD OF RECORD: December 1972 to current year.

EXTREMES FOR RECORD: Highest water level measured at 21 ft below land surface, on

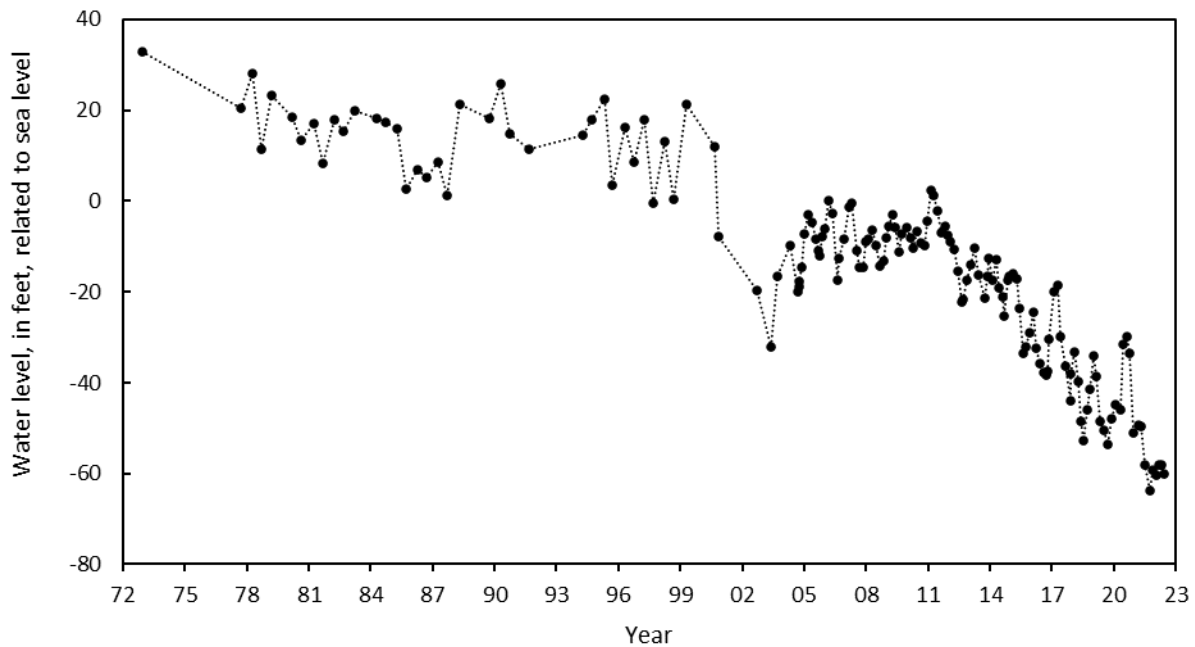
December 1, 1972; lowest measured at 117.69 ft below land surface, on September 27, 2021.

PERMIT NUMBER: AA-72-0907

LAT. 39°00' 04", LONG. 76°42' 00"

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	117.69	Jan 24, 2022	114.28	Apr 20, 2022	112.18
Nov 18, 2021	113.18	Mar 21, 2022	112.17	Jun 15, 2022	113.97



WELL NUMBER: AA Cc 115

PERMIT NUMBER: AA-73-9755

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 03", LONG. 76° 40' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 671 ft;

Casing diameter: 4 in. to 661 ft;

Screen diameter: 4 in. from 661 to 671 ft;

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 134.38 ft above NGVD of 1929.

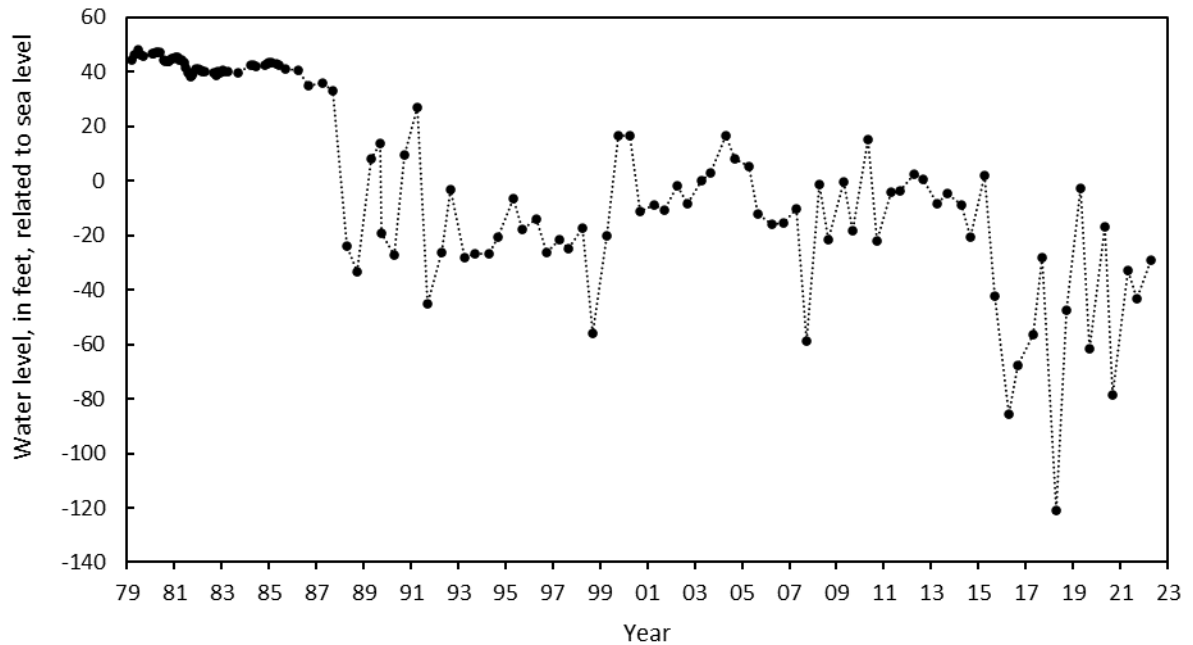
MEASURING POINT: Top of recorder platform 3.55 ft above land surface.

PERIOD OF RECORD: March 1979 to current year.

EXTREMES FOR RECORD: Highest water level measured at 86.26 ft below land surface, on June 28, 1979; lowest measured at 255.41 ft below land surface, on April 23, 2018.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 20, 2021	177.69
Apr 20, 2022	163.54



WELL NUMBER: AA Cc 116

PERMIT NUMBER: AA-73-9756

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 03", LONG. 76° 40' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 483 ft;

Casing diameter: 4 in. to 473 ft;

Screen diameter: 4 in. from 473 to 483 ft;

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 134.35 ft above NGVD of 1929.

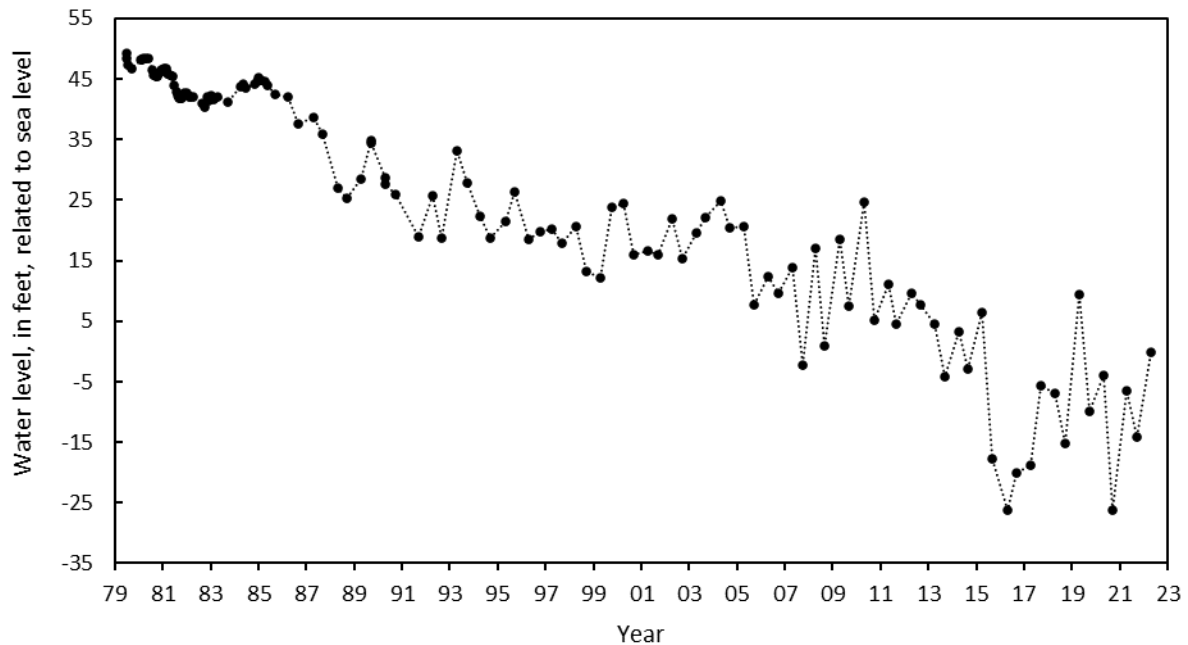
MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

PERIOD OF RECORD: June 1979 to current year.

EXTREMES FOR RECORD: Highest water level measured at 85.04 ft below land surface, on June 28, 1979; lowest measured at 160.55 ft below land surface, on April 15, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 20, 2021	148.50
Apr 20, 2022	134.46



WELL NUMBER: AA Cc 135

PERMIT NUMBER: AA-93-0998

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 26", LONG. 76° 40' 30"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,100 ft.

Casing diameter: 4 in. to 299 ft; 2 in. from 299 to 985 ft, and 1,035 to 1,070 ft;

Screen diameter: 2 in. from 985 to 1,035 ft, and 1,070 to 1,100 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 114.81 ft above NGVD of 1929.

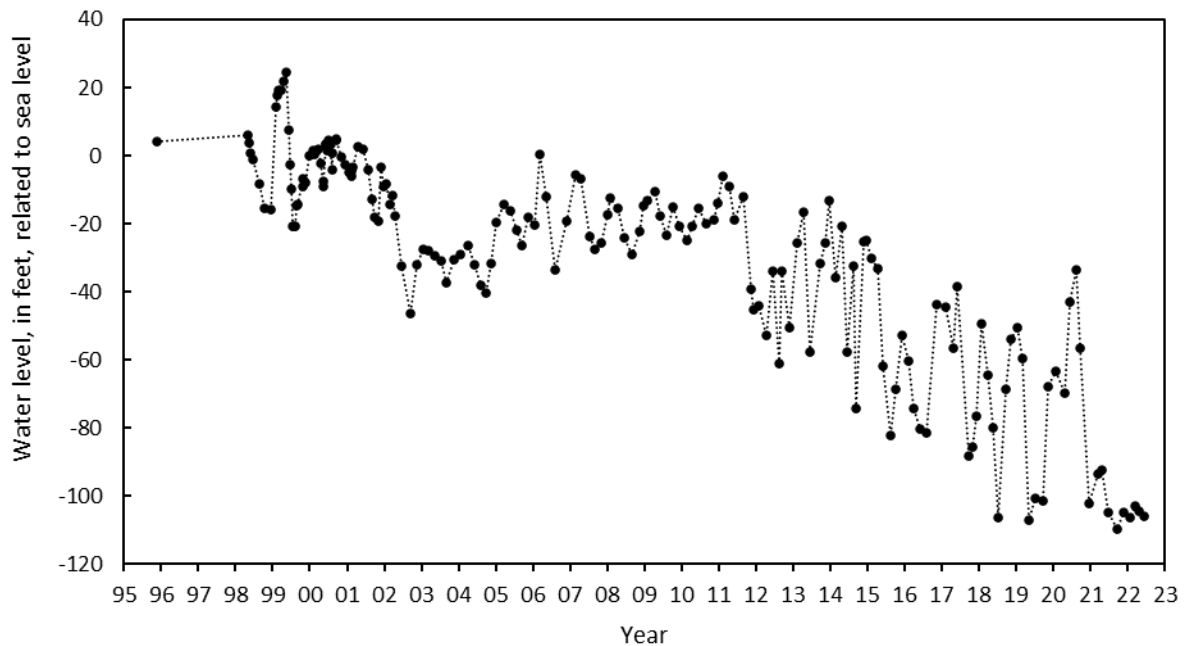
MEASURING POINT: Top of casing 3.48 ft above land surface.

PERIOD OF RECORD: November 1995 to current year.

EXTREMES FOR RECORD: Highest water level measured at 90.42 ft below land surface, on May 19, 1999; lowest measured at 224.60 ft below land surface, on June 10, 2022.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	224.60	Jan 24, 2022	221.23	Apr 20, 2022	219.36
Nov 18, 2021	219.48	Mar 21, 2022	217.70	Jun 10, 2022	220.64



WELL NUMBER: AA Cc 137

PERMIT NUMBER: AA-93-0993

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 26", LONG. 76° 40' 29"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 690 ft.

Casing diameter: 4 in. to 300 ft; 2 in. from 300 to 476 ft, 506 to 536 ft, and 576 to 606 ft;

Screen diameter: 2 in. from 476 to 506 ft, 536 to 576 ft, and 606 to 686 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 115.34 ft above NGVD of 1929.

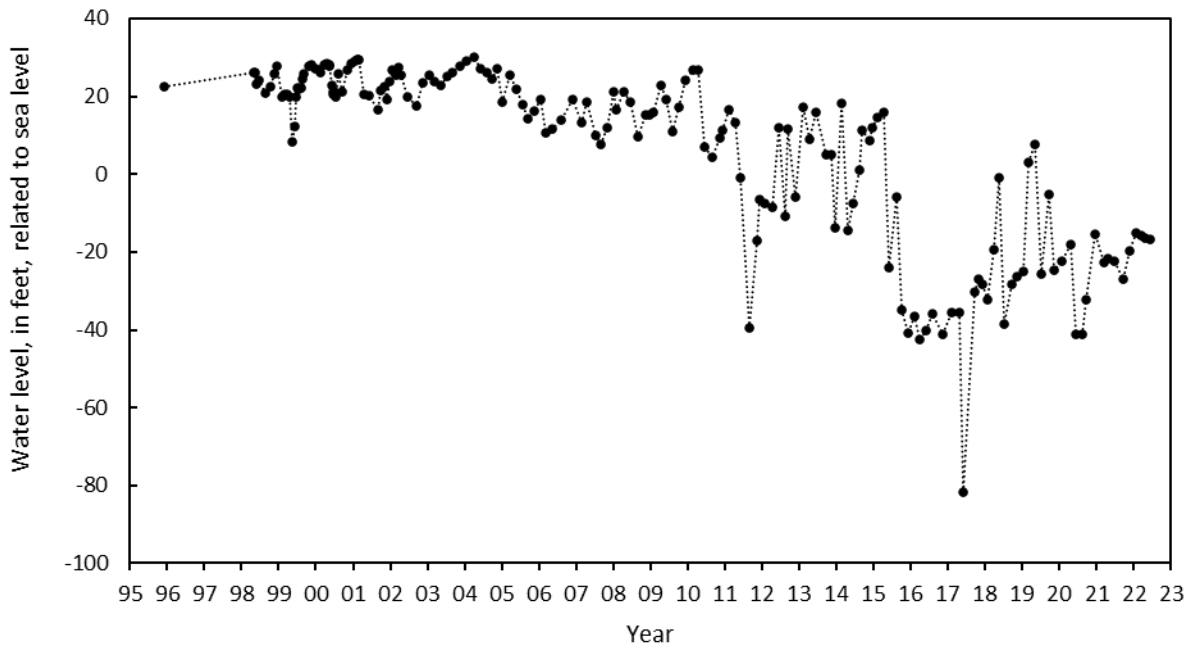
MEASURING POINT: Top of 4-inch PVC casing 2.2 ft above land surface.

PERIOD OF RECORD: December 1995 to current year.

EXTREMES FOR RECORD: Highest water level measured at 85.28 ft below land surface, on March 30, 2004; lowest measured at 196.93 ft below land surface, on June 5, 2017.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	142.24	Jan 24, 2022	130.56	Apr 20, 2022	131.84
Nov 18, 2021	134.93	Mar 21, 2022	131.25	Jun 10, 2022	131.96



WELL NUMBER: AA Ce 117

PERMIT NUMBER: AA-73-0172

LOCATION: Severndale Water-Treatment Plant

LAT. 39° 04' 50", LONG. 76° 34' 34"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 922 ft;

Casing diameter: 6 in. to 836 ft, 851 to 870 ft, and 890 to 907 ft;

Screen diameter: 6 in. from 836 to 851 ft, 870 to 890 ft, and 907 to 922 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 86.0 ft above NGVD of 1929.

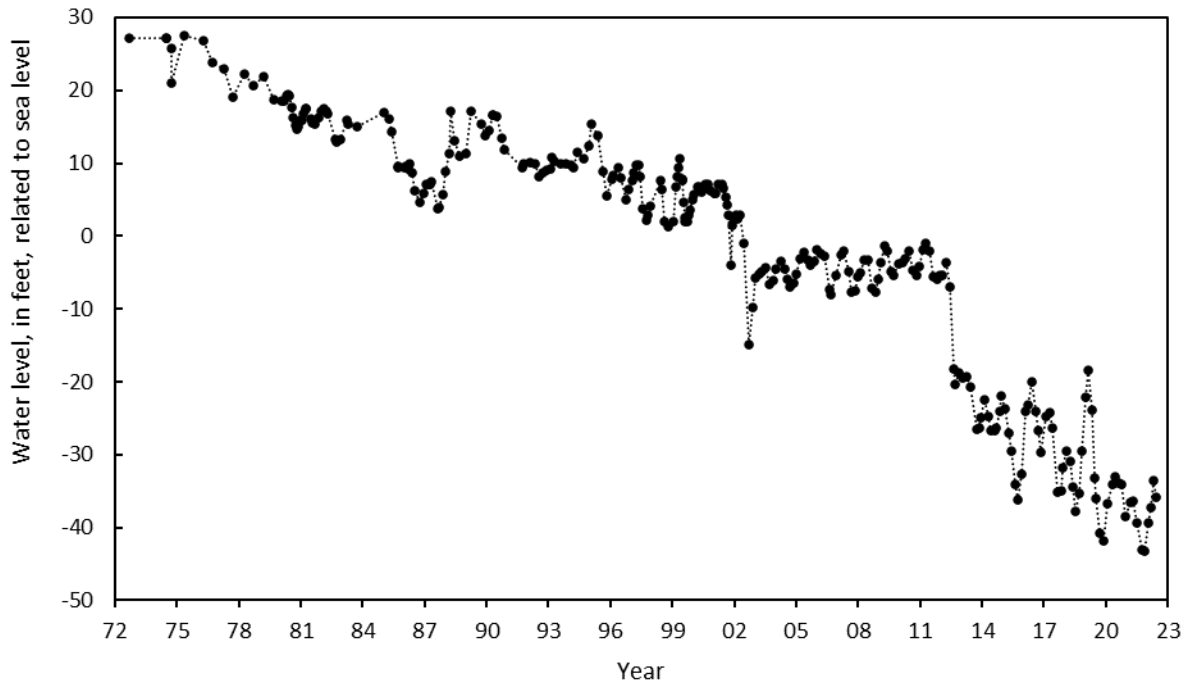
MEASURING POINT: Top of casing 0.5 ft above land surface.

PERIOD OF RECORD: September 1972 to current year.

EXTREMES FOR RECORD: Highest water level measured at 58.48 ft below land surface, on May 15, 1975; lowest measured at 129.30 ft below land surface, on November 18, 2021.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	128.97	Jan 24, 2022	125.32	Apr 20, 2022	119.59
Nov 18, 2021	129.30	Mar 21, 2022	123.20	Jun 10, 2022	121.77



WELL NUMBER: AA Cf 99

PERMIT NUMBER: AA-70-0199

LOCATION: Traffic Engineering Building, Broad Neck

LAT. 39° 01' 50", LONG. 76°28' 30"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 220 ft.

Casing diameter: 2 in. to 210 ft.

Screen diameter: 2 in. from 210 to 220 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 93.70 ft above NGVD of 1929.

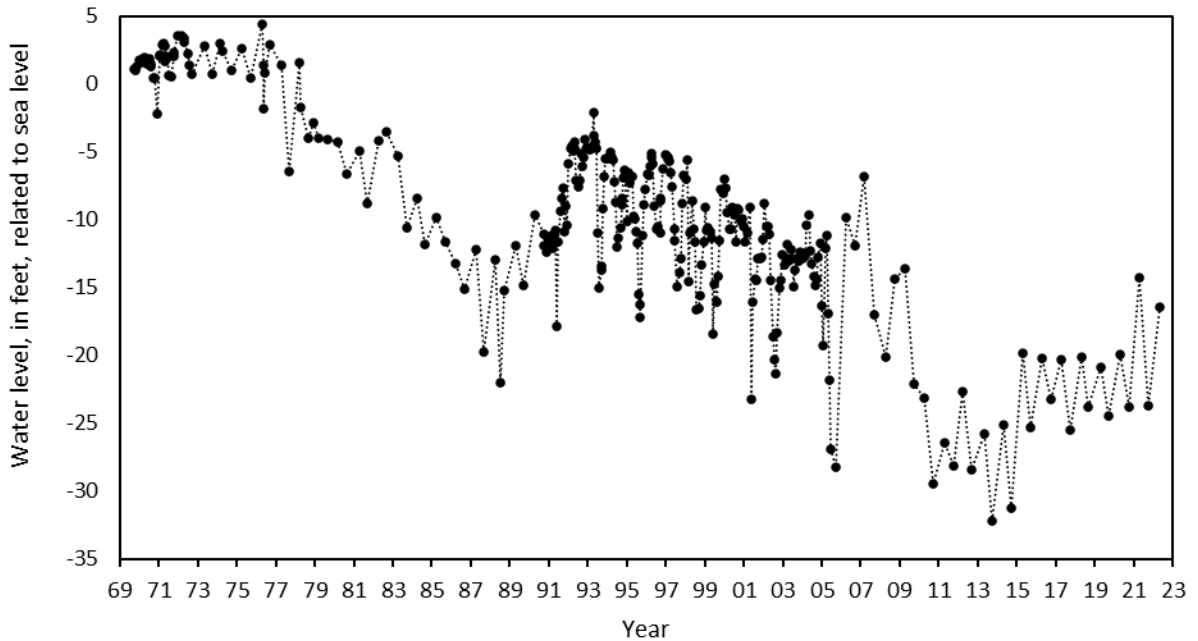
MEASURING POINT: Top of casing 3.60 ft above land surface.

PERIOD OF RECORD: September 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 89.29 ft below land surface, on April 13, 1976; lowest measured at 125.88 ft below land surface, on September 20, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 27, 2021	117.35
Apr 26, 2022	110.17



WELL NUMBER: AA Cf 134

PERMIT NUMBER: AA-70-0171

LOCATION: Amberly Water-Treatment Plant

LAT. 39° 01' 21", LONG. 76° 27' 05"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 590 ft.

Casing diameter: 24 in. to 370 ft; 16 in. from 270 to 360 ft, 363 to 370 ft, 392 to 455 ft, 495 to 502 ft, 528 to 542 ft, 560 to 566 ft, and 580 to 590 ft.

Screen diameter: 16 in. from 360 to 363 ft, 370 to 392 ft, 455 to 495 ft, 502 to 528 ft, 542 to 560 ft, and 566 to 580 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 24 ft above NGVD of 1929.

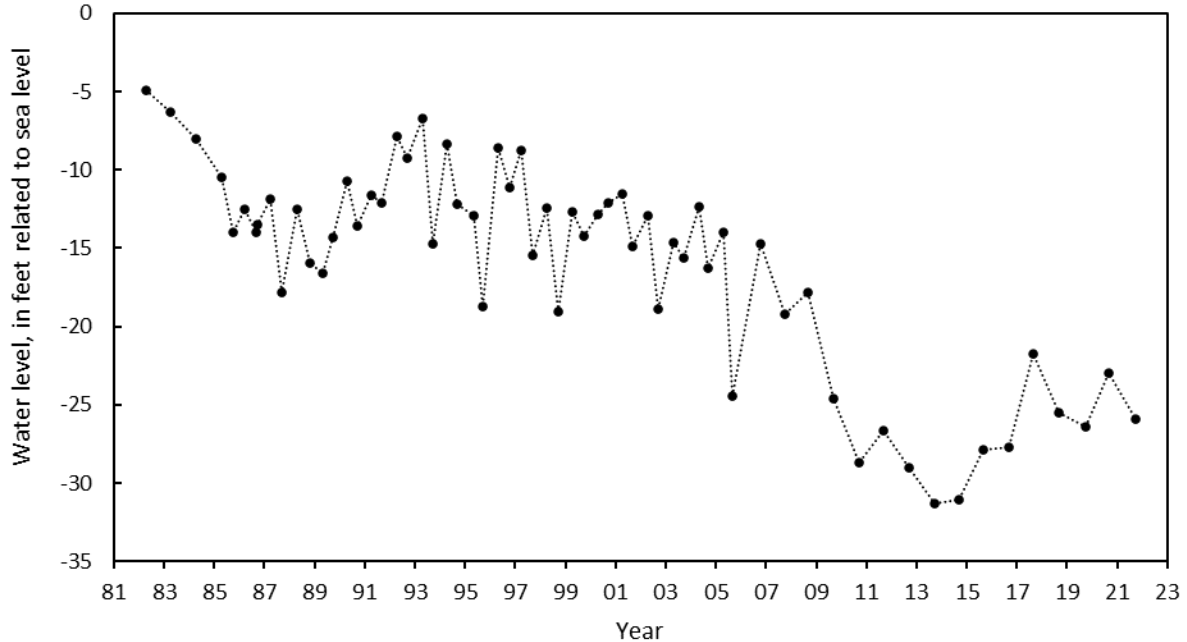
MEASURING POINT: Top of riser pipe 1.45 ft above land surface.

PERIOD OF RECORD: April 1982 to current year.

EXTREMES FOR RECORD: Highest water level measured at 28.88 ft below land surface, on April 14, 1982; lowest measured at 55.27 ft below land surface, on September 12, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 20, 2021	49.87



WELL NUMBER: AA Cf 137

PERMIT NUMBER: AA-86-0401

LOCATION: Arnold Water-Treatment Plant

LAT. 39°02' 05", LONG. 76°29' 27"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,030 ft.

Casing diameter: 6 in. to 543 ft, 4 in. from 543 to 791 ft, 816 to 826 ft, 856 to 876 ft, 896 to 916 ft, and 966 to 976 ft.

Screen diameter: 4 in. from 791 to 816 ft, 826 to 856 ft, 876 to 896 ft, and 916 to 966 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 124.3 ft above NGVD of 1929.

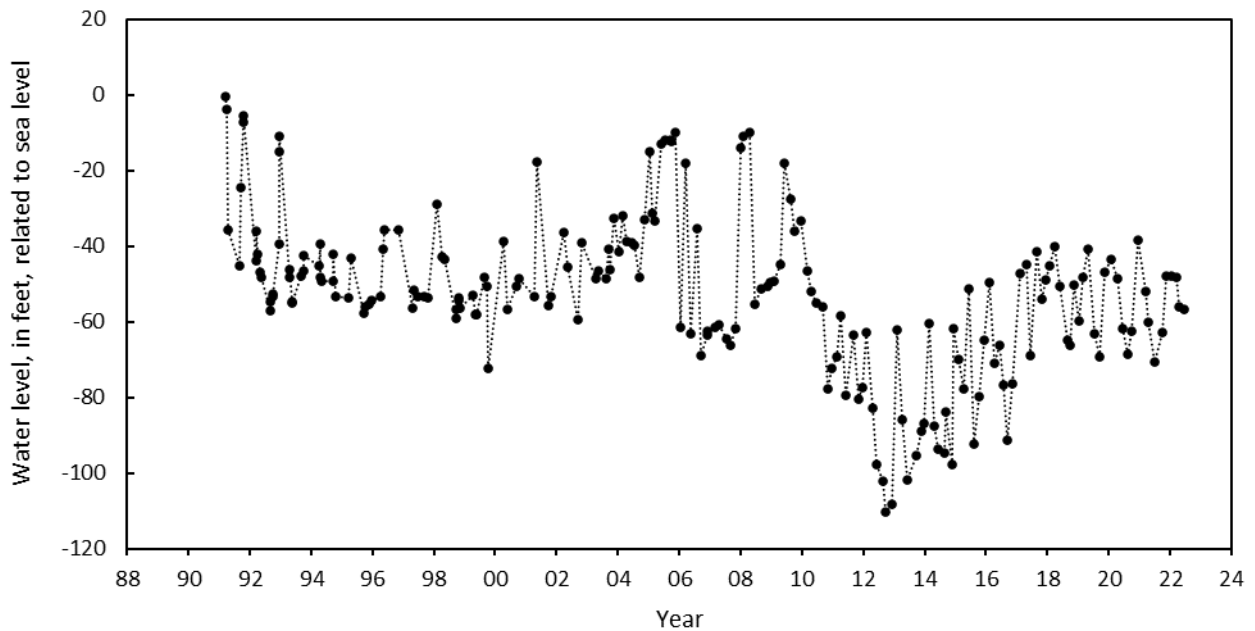
MEASURING POINT: Top of casing 0.5 ft above land surface.

PERIOD OF RECORD: April 1988 to current year.

EXTREMES FOR RECORD: Highest water level measured at 124.54 ft below land surface, on March 22, 1991; lowest measured at 234.61 ft below land surface, on September 17, 2012.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	187.01	Jan 24, 2022	172.10	Apr 20, 2022	180.42
Nov 18, 2021	172.18	Mar 21, 2022	172.55	Jun 15, 2022	181.03



WELL NUMBER: AA Cf 166

PERMIT NUMBER: AA-95-3107

LOCATION: Arnold Water-Treatment Plant

LAT. 39° 01' 54", LONG. 76° 28' 29"

AQUIFER: Patuxent aquifer in the Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,535 ft.

Casing diameter: 6 in. to 420 ft, 4 in. from 420 to 1,320 ft, 1,340 to 1,360 ft, and 1,400 to 1,500 ft.

Screen diameter: 4 in. from 1,320 to 1,340 ft, 1,360 to 1,400 ft, and 1,500 to 1,530 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 105.93 ft above NGVD of 1929.

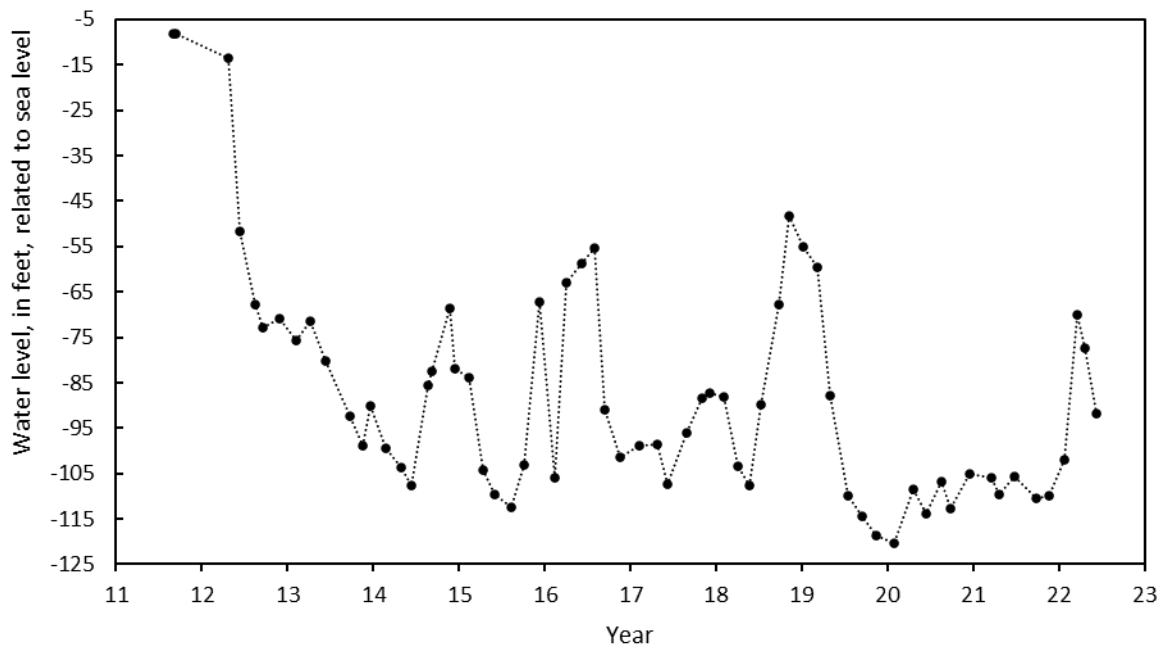
MEASURING POINT: Top of access cover 0.0 ft at land surface.

PERIOD OF RECORD: August 2011 to current year.

EXTREMES FOR RECORD: Highest water level measured at 114.15 ft below land surface, on August 30, 2011; lowest measured at 226.31 ft below land surface, on January 30, 2020.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	216.43	Jan 24, 2022	207.82	Apr 20, 2022	183.43
Nov 18, 2021	215.89	Mar 21, 2022	176.05	Jun 10, 2022	197.74



WELL NUMBER: AA Cf 167

PERMIT NUMBER: AA-95-3108

LOCATION: Arnold Water-Treatment Plant

LAT. 39° 01' 54", LONG. 76°28' 29"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,505 ft.

Casing diameter: 6 in. to 420 ft, 4 in. from 420 to 750 ft, 775 to 815 ft, 840 to 855 ft, 865 to 880 ft, 890 to 915 ft, 925 to 935 ft, 945 to 960 ft, and 1,000 to 1,032 ft.

Screen diameter: 4 in. from 750 to 775 ft, 815 to 840 ft, 855 to 865 ft, 880 to 890 ft, 915 to 925 ft, 935 to 945 ft, 960 to 1,000 ft, and 1,032 to 1,047 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 105.89 ft above NGVD of 1929.

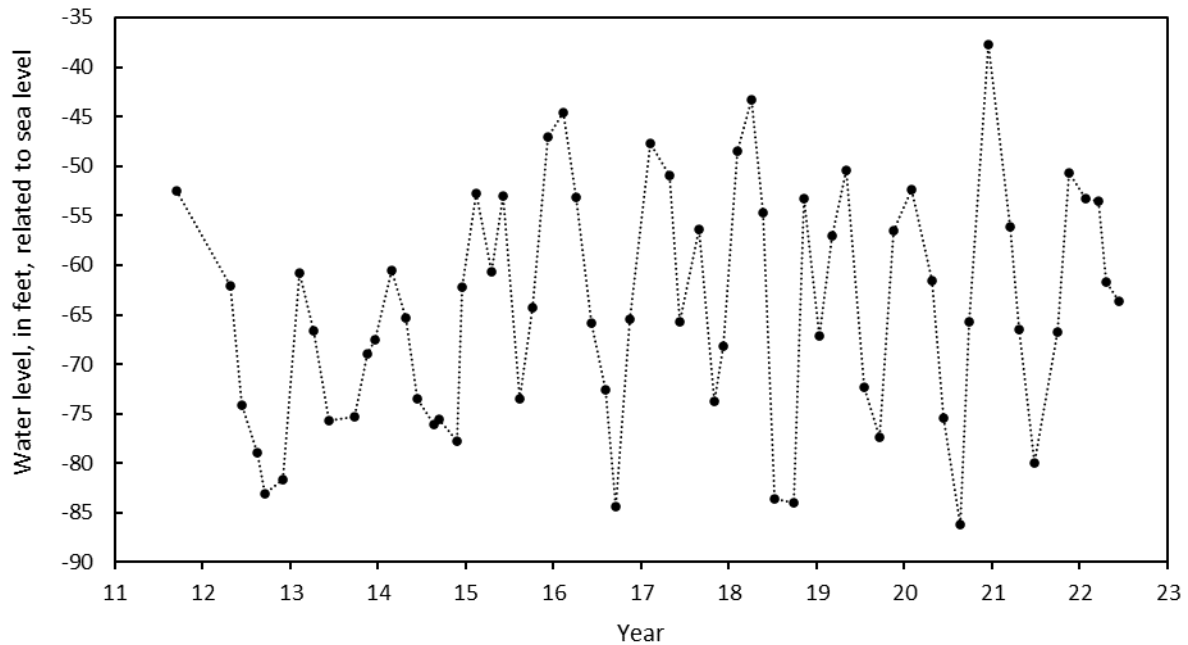
MEASURING POINT: Top of access cover 0.0 ft at land surface.

PERIOD OF RECORD: September 2011 to current year.

EXTREMES FOR RECORD: Highest water level measured at 143.62 ft below land surface, on December 18, 2020; lowest measured at 192.07 ft below land surface, on August 20, 2020.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Sep 27, 2021	172.59	Jan 24, 2022	159.15	Apr 20, 2022	167.63
Nov 18, 2021	156.58	Mar 21, 2022	159.37	Jun 10, 2022	169.59



WELL NUMBER: AA Cg 22

PERMIT NUMBER: AA-73-8606

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76° 24' 16"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,760 ft.

Casing diameter: 10 in. to 163 ft; 4 in. to 1,735 ft, and from 1,755 to 1,760 ft.

Screen diameter: 4 in. from 1,735 to 1,755 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 12.61 ft above NGVD of 1929.

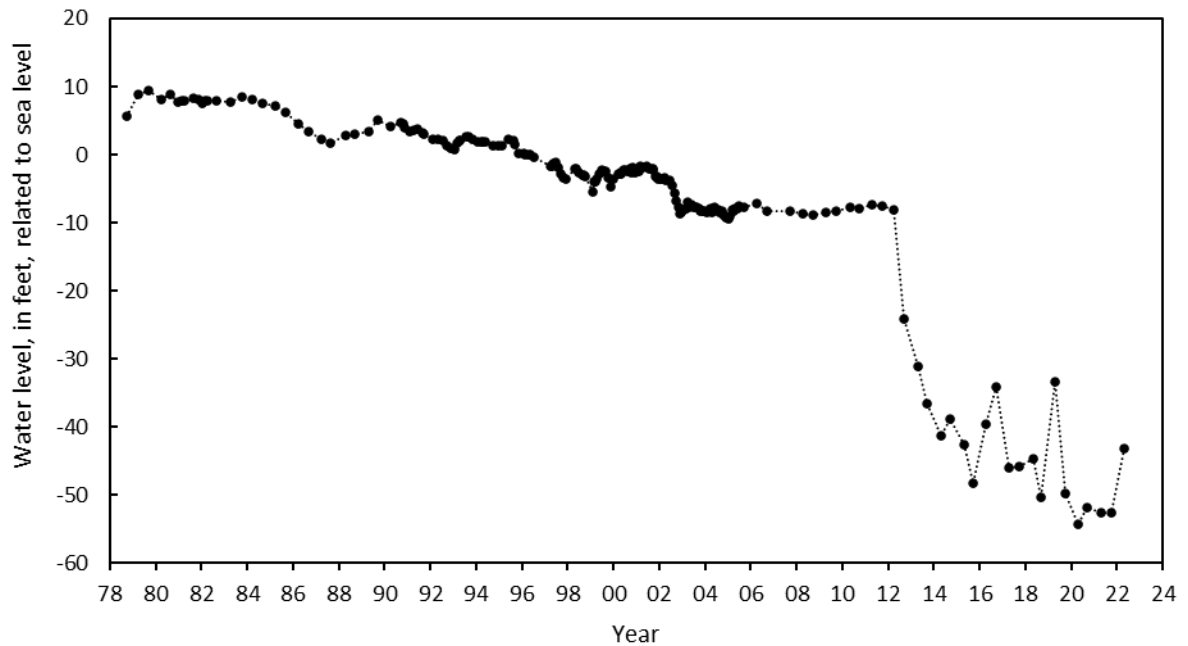
MEASURING POINT: Top of casing 3.44 ft above land surface.

PERIOD OF RECORD: September 1978 to current year.

EXTREMES FOR RECORD: Highest water level measured at 3.14 ft below land surface, on September 6, 1979; lowest measured at 66.81 ft below land surface, on April 28, 2020.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	65.18
Apr 22, 2022	55.77



WELL NUMBER: AA Cg 23

PERMIT NUMBER: AA-73-8959

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76°24' 16"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 986 ft.

Casing diameter: 10 in. to 163 ft; 4 in. to 968 ft and 978 to 986 ft.

Screen diameter: 4 in. from 968 to 978 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 12.57 ft above NGVD of 1929.

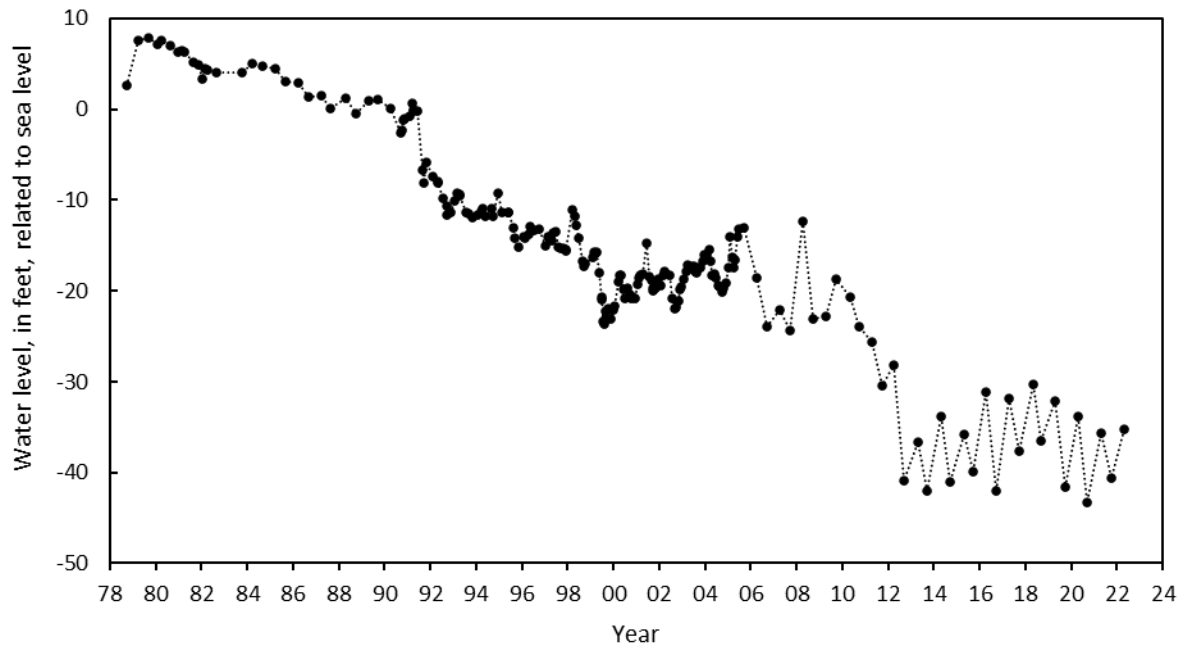
MEASURING POINT: Top of recorder platform 3.43 ft above land surface.

PERIOD OF RECORD: September 1978 to current year.

EXTREMES FOR RECORD: Highest water level measured at 4.65 ft below land surface, on September 6, 1979; lowest measured at 55.91 ft below land surface, on September 18, 2020.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	53.12
Apr 22, 2022	47.81



WELL NUMBER: AA Cg 24

PERMIT NUMBER: AA-73-8960

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76° 24' 16"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 664 ft.

Casing diameter: 12 in. to 68 ft; 6 in. to 158 ft; 4 in. from 158 to 605 ft, 615 to 648 ft, and 658 to 664 ft.

Screen diameter: 4 in. from 605 to 615 ft, and 648 to 658 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 12.68 ft above NGVD of 1929.

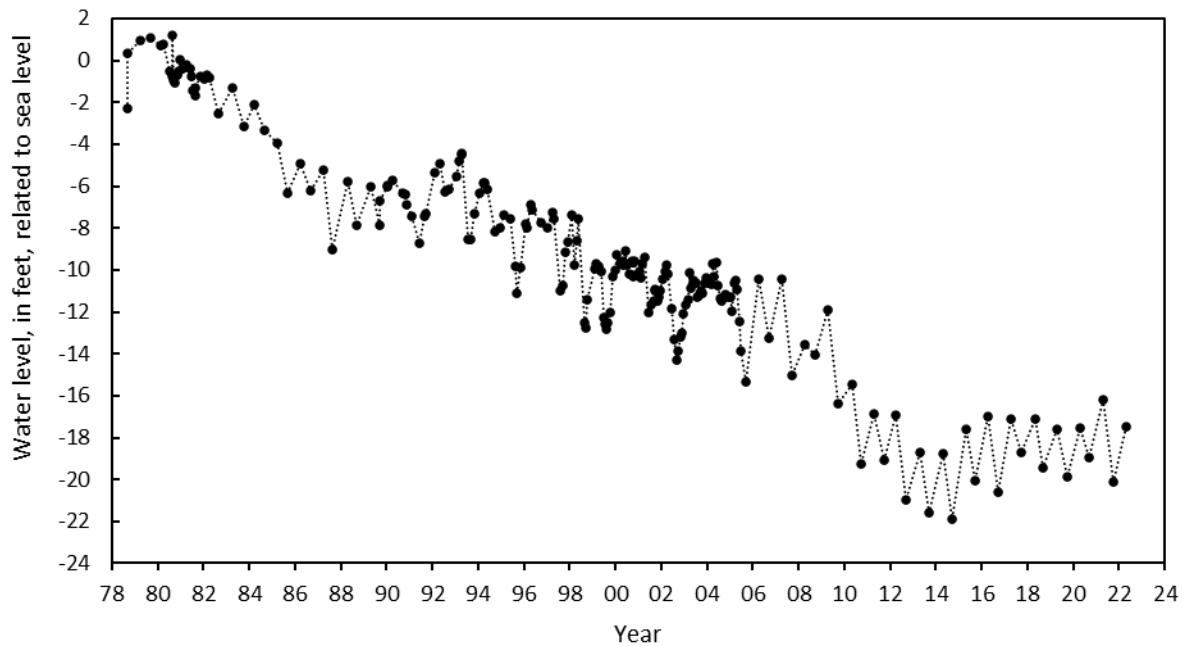
MEASURING POINT: Top of recorder platform 3.16 ft above land surface.

PERIOD OF RECORD: September 1978 to current year.

EXTREMES FOR RECORD: Highest water level measured at 11.47 ft below land surface, on August 15, 1980; lowest measured at 34.59 ft below land surface, on September 26, 2014.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	32.78
Apr 22, 2022	30.15



WELL NUMBER: AA Dd 42

PERMIT NUMBER: AA-71-0231

LOCATION: Route 50 and Howard Grove Road

LAT. 38° 58' 08", LONG. 76°37' 35"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 275 ft.

Casing diameter: 4 in. to 190 ft; 2 in. from 220 to 225 ft, and 235 to 265 ft.

Screen diameter: 2 in. from 190 to 200 ft, 225 to 235 ft, and 265 to 275 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 105.48 ft above NGVD of 1929.

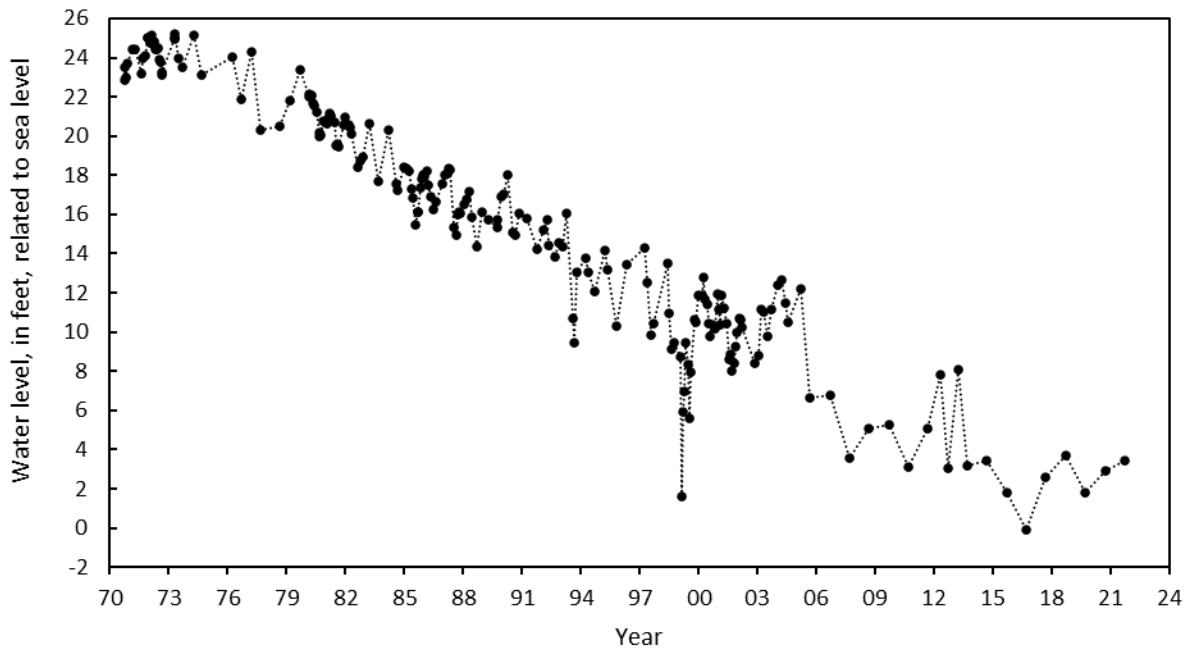
MEASURING POINT: Top of casing 0.72 ft above land surface.

PERIOD OF RECORD: October 1970 to current year.

EXTREMES FOR RECORD: Highest water level measured at 80.25 ft below land surface, on May 4, 1973; lowest measured at 105.58 ft below land surface, on September 16, 2016.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	102.01



WELL NUMBER: AA De 1

PERMIT NUMBER: --

LOCATION: City of Annapolis

LAT. 38° 59' 15", LONG. 76° 34' 03"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 237 ft.

Casing diameter: 10 in. to 207 ft.

Screen diameter: 6 in. from 207 to 237 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 13.72 ft above NGVD of 1929.

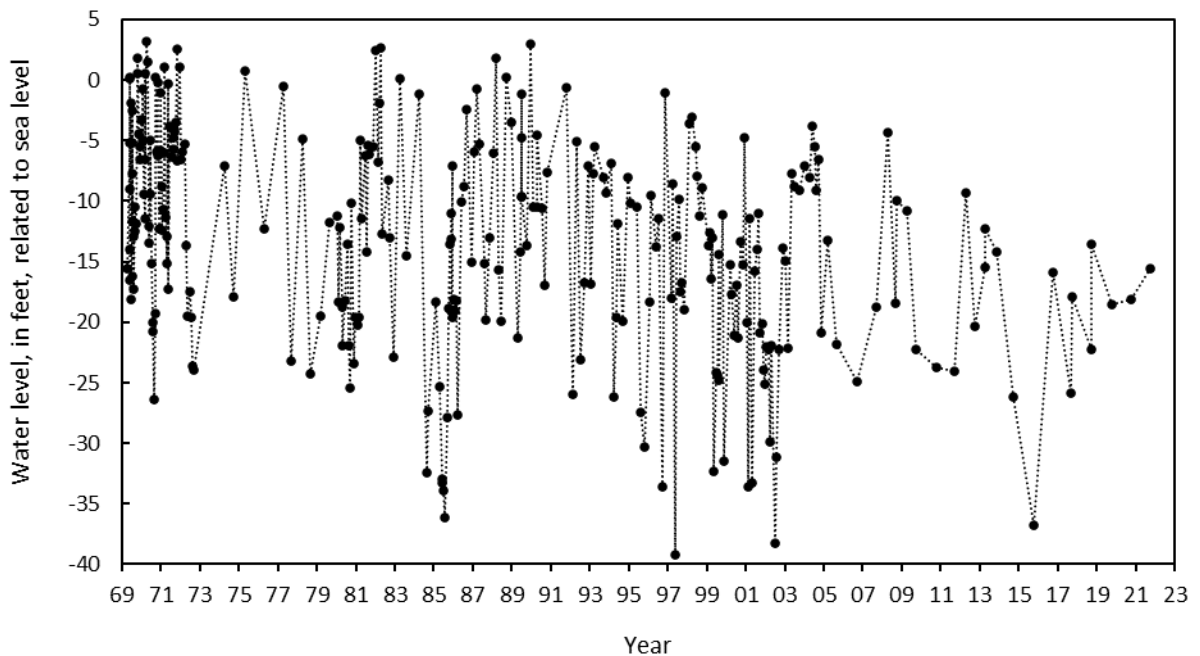
MEASURING POINT: Top of recorder platform 2.0 ft above land surface.

PERIOD OF RECORD: April 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 10.57 ft below land surface, on April 15, 1970; lowest measured at 52.9 ft below land surface, on May 18, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Oct 4, 2021	29.27



WELL NUMBER: AA De 95

PERMIT NUMBER: AA-68-0175

LOCATION: Broad Creek Water-Treatment Plant

LAT. 38° 58' 53", LONG. 76°33' 30"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 480 ft.

Casing diameter: 6 in. to 465 ft.

Screen diameter: 6 in. from 465 to 480 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 73.2 ft above NGVD of 1929.

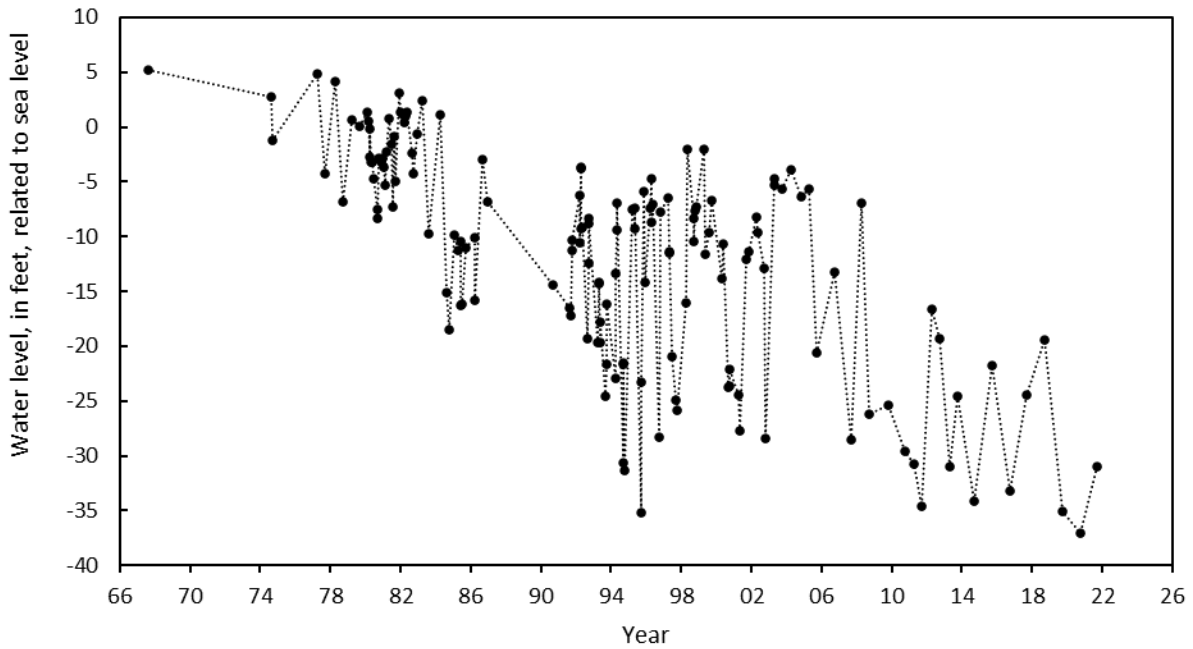
MEASURING POINT: Top of recorder platform 5.3 ft above land surface.

PERIOD OF RECORD: August 1967 to current year.

EXTREMES FOR RECORD: Highest water level measured at 68 ft below land surface, on August 11, 1967; lowest measured at 110.27 ft below land surface, on September 24, 2020.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	104.18



WELL NUMBER: AA De 128

PERMIT NUMBER: AA-73-8278

LOCATION: Central Avenue well field

LAT. 38°55' 30", LONG. 76° 33' 47"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 708 ft;

Casing diameter: 24 in. to 547 ft; 12 in. to 554 ft, and 644 to 686 ft;

Screen diameter: 12 in. from 554 to 644 ft, and 686 to 708 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 28.31 ft above NGVD of 1929.

MEASURING POINT: Top of 24 in. casing 3.65 ft above land surface.

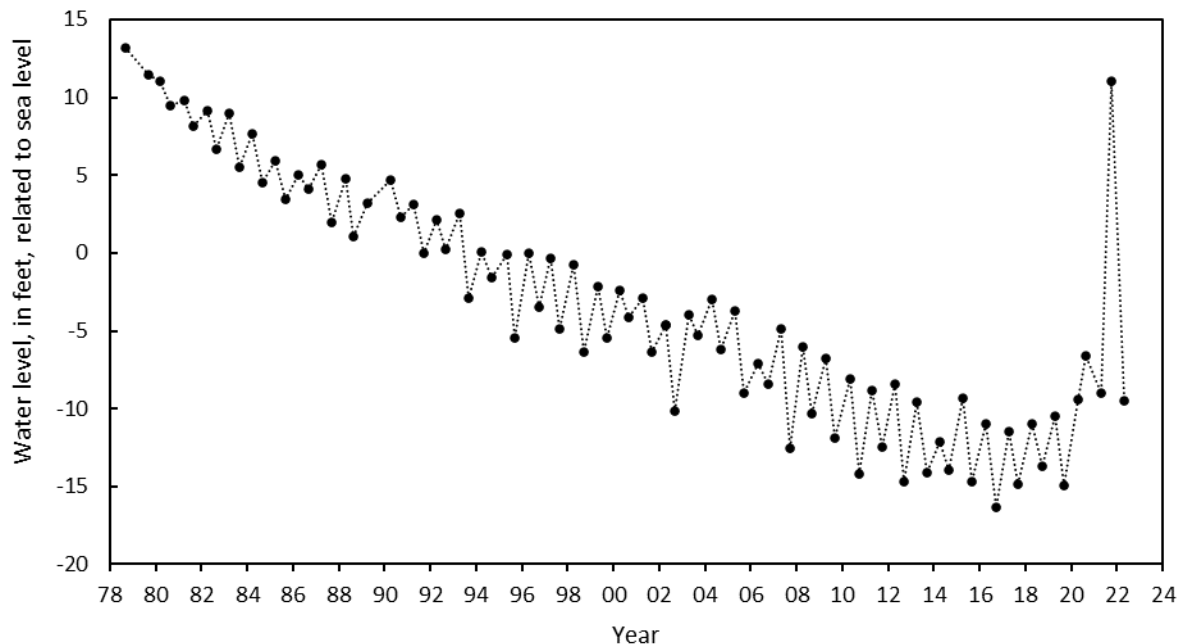
PERIOD OF RECORD: September 1978 to current year.

EXTREMES FOR RECORD: Highest water level measured at 15.15 ft below land surface, on September 1, 1978; lowest measured at 44.66 ft below land surface, on September 13, 2016.

REMARKS: The measurement from September 28, 2021 is much higher than the general trend in the time series, but it appears to be an accurate measurement. USGS states that the cause could be decreased water usage at school during COVID precautions.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	17.27
Apr 20, 2022	37.82



WELL NUMBER: AA De 206

PERMIT NUMBER: AA-88-9908

LOCATION: Broad Creek Water Treatment Plant

LAT. 38° 58' 33", LONG. 76°33' 28"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,013 ft;

Casing diameter: 4 in. to 288 ft; 2 in. from 288 to 775 ft;

Screen diameter: 2 in. from 775 to 1,013 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 81.74 ft above NGVD of 1929.

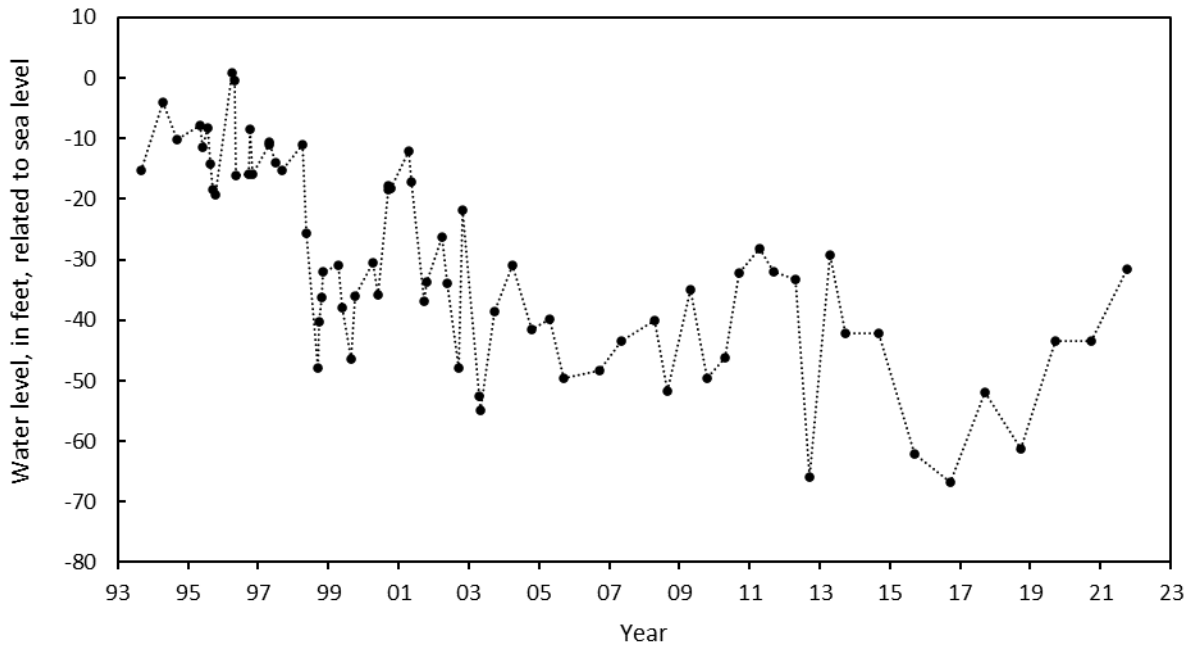
MEASURING POINT: Top of hole in flange 2.8 ft above land surface.

PERIOD OF RECORD: September 1993 to current year.

EXTREMES FOR RECORD: Highest water level measured at 80.88 ft below land surface, on April 4, 1996; lowest measured at 148.43 ft below land surface, on September 16, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	113.38



WELL NUMBER: AA De 219

PERMIT NUMBER: AA-94-8258

LOCATION: City of Annapolis

LAT. 38° 59' 15", LONG. 76° 33' 53"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 520 ft;

Casing diameter: 24 in. to 436 ft; 12 in. from 367 to 427 ft.

Screen diameter: 12 in. from 427 to 432 ft, 440 to 460 ft, 466 to 472 ft, 476 to 482 ft, 492 to 500 ft, and 506 to 515 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 120 ft above NGVD of 1929.

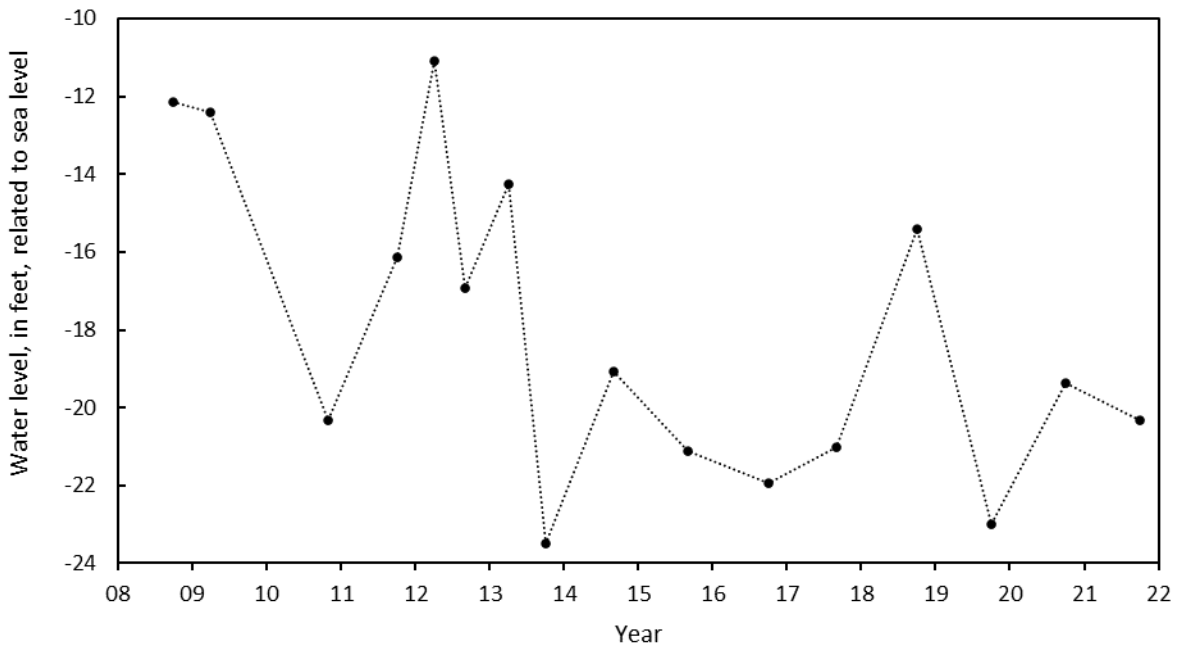
MEASURING POINT: Top of 2-inch measuring tube 3 ft above land surface.

PERIOD OF RECORD: October 2008 to current year.

EXTREMES FOR RECORD: Highest water level measured at 131.1 ft below land surface, on April 24, 2012; lowest measured at 143.48 ft below land surface, on October 1, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Oct 5, 2021	140.32



WELL NUMBER: AA De 232

PERMIT NUMBER: AA-95-4626

LOCATION: City of Annapolis

LAT. 38°59' 18", LONG. 76°33' 53"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,173 ft;

Casing diameter: 24 in. to 829 ft; 14 in. from 739 to 834 ft, 856 to 871 ft, 878 to 886 ft, 894 to 902 ft, 936 to 958 ft, 970 to 1,009 ft, 1,014 to 1,070 ft, and 1,120 to 1,130 ft.

Screen diameter: 14 in. from 834 to 856 ft, 871 to 878 ft, 886 to 894 ft, 902 to 936 ft, 958 to 970 ft, 1,009 to 1,014 ft, 1,070 to 1,120 ft, and 1,130 to 1,146 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 119 ft above NGVD of 1929.

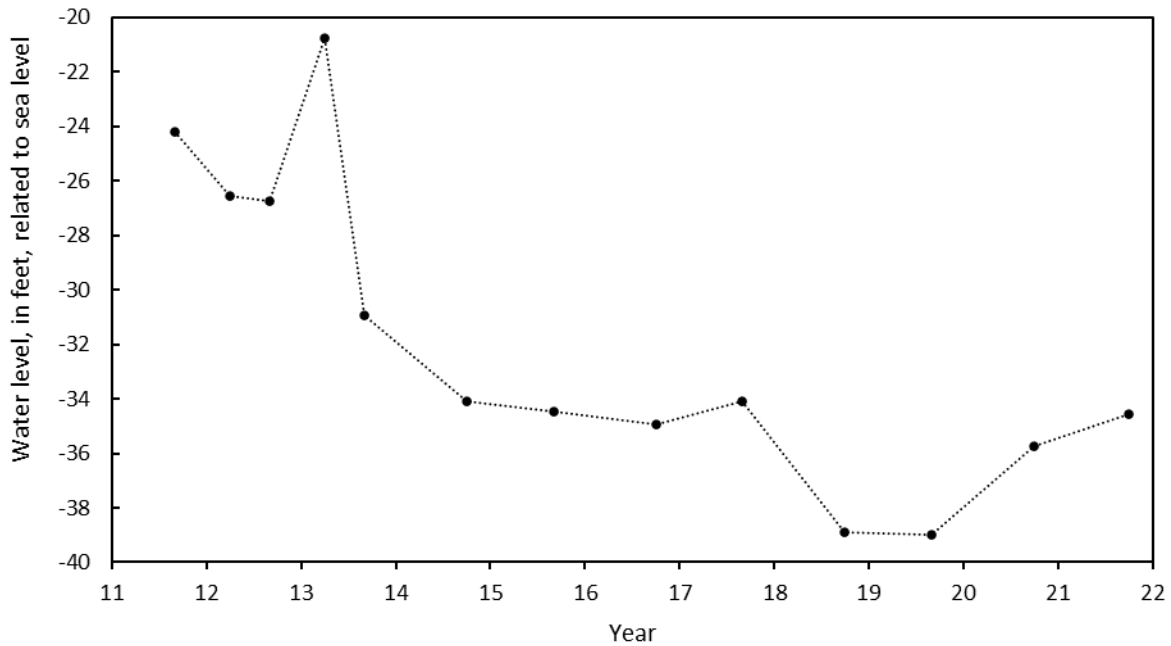
MEASURING POINT: Top of 2-inch measuring tube 1.8 ft above land surface.

PERIOD OF RECORD: September 2011 to current year.

EXTREMES FOR RECORD: Highest water level measured at 139.74 ft below land surface, on April 17, 2013; lowest measured at 157.98 ft below land surface, on September 30, 2019.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Oct 6, 2021	153.58



WELL NUMBER: AA Df 19

PERMIT NUMBER: --

LOCATION: U.S. Navy Radio Station

LAT. 38° 59' 22", LONG. 76° 27' 04"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 590 ft;

Casing diameter: 10 in. to 565 ft;

Screen diameter: 10 in. from 565 to 590 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 15.84 ft above NGVD of 1929.

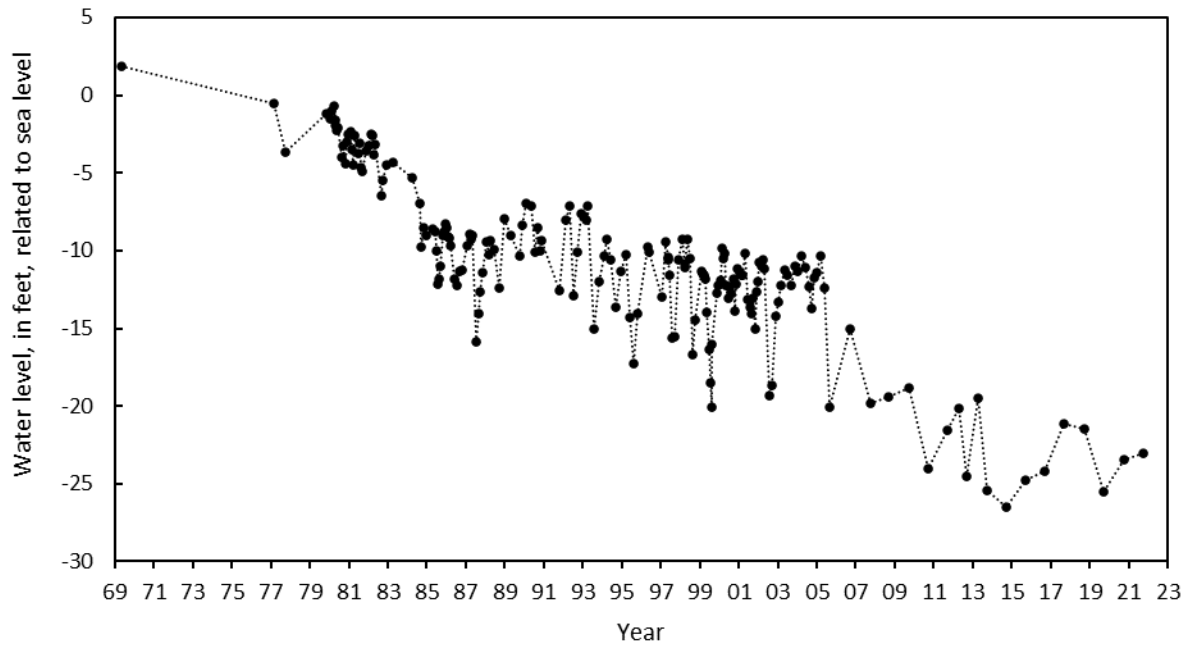
MEASURING POINT: Top of flange 2.5 ft above land surface.

PERIOD OF RECORD: May 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 14 ft below land surface, on May 1, 1969; lowest measured at 42.37 ft below land surface, on September 10, 2014.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	38.86



WELL NUMBER: AA Df 20

PERMIT NUMBER: --

LOCATION: U.S. Navy Radio Station

LAT. 38° 59' 16", LONG. 76° 27' 07"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 255 ft.

Casing diameter: 10 in. to 150 ft; 8 in. from 135 to 233 ft;

Screen diameter: 8 in. from 233 to 253 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 21.87 ft above NGVD of 1929.

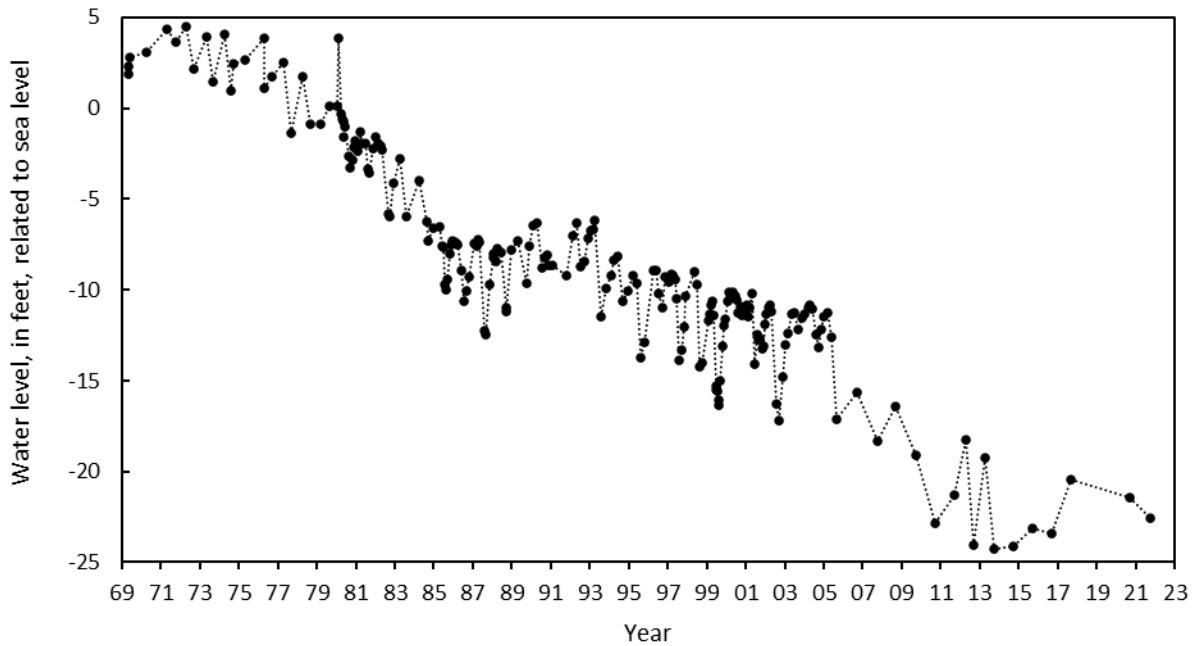
MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

PERIOD OF RECORD: May 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 17.35 ft below land surface, on April 25, 1972; lowest measured at 46.12 ft below land surface, on September 23, 2013.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	44.43



WELL NUMBER: AA Df 79
LOCATION: U.S. Naval Academy

PERMIT NUMBER: AA-03-7867
LAT. 38° 59' 05", LONG. 76° 29' 36"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 705 ft.

Casing diameter: 6 in. to 300 ft; 320 to 572 ft, and 592 to 675 ft;

Screen diameter: 6 in. from 300 to 320 ft, 572 to 592 ft, and 675 to 695 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 5.17 ft above NGVD of 1929.

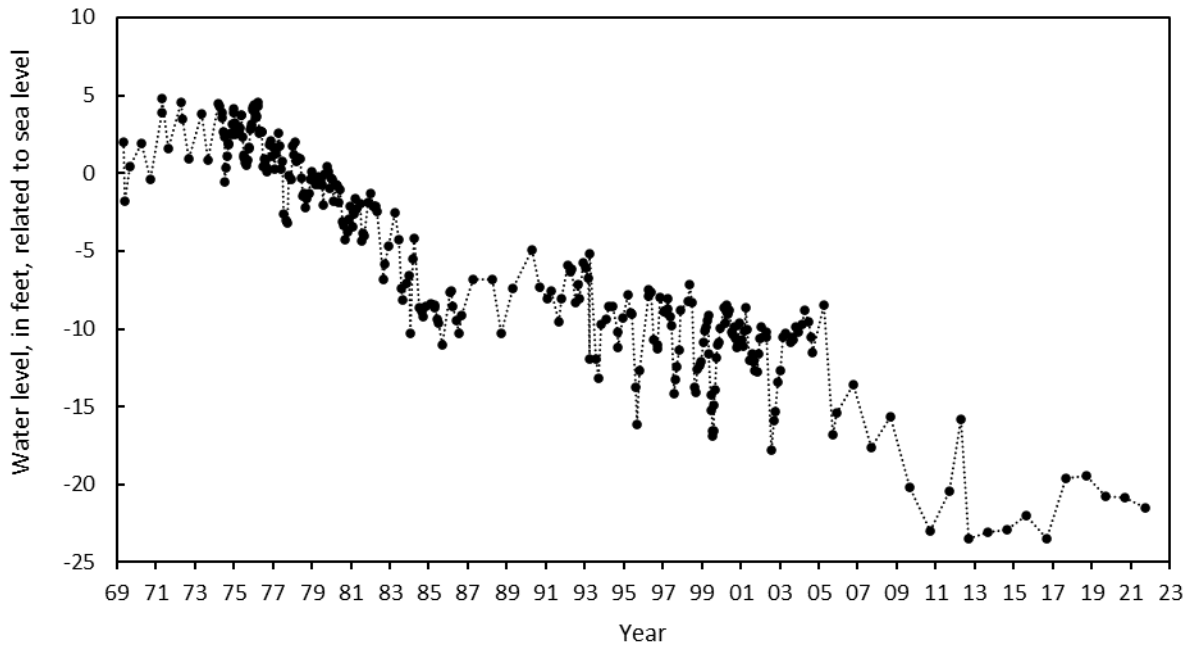
MEASURING POINT: Top of recorder platform 2.8 ft above land surface.

PERIOD OF RECORD: May 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 0.33 ft below land surface,
on April 29, 1971; lowest measured at 28.65 ft below land surface, on September 12, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 20, 2021	26.70



WELL NUMBER: AA Fe 92
LOCATION: Deale Athletic Field

PERMIT NUMBER: AA-94-5386
LAT. 38° 46' 44", LONG. 76° 33' 12"

AQUIFER: Aquia Formation of Upper Paleocene age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 205 ft.

Casing diameter: 4.5 in. to 170 ft, and 200 to 205 ft.

Screen diameter: 4.5 in. from 170 to 200 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 9 ft above sea level from topographic map.

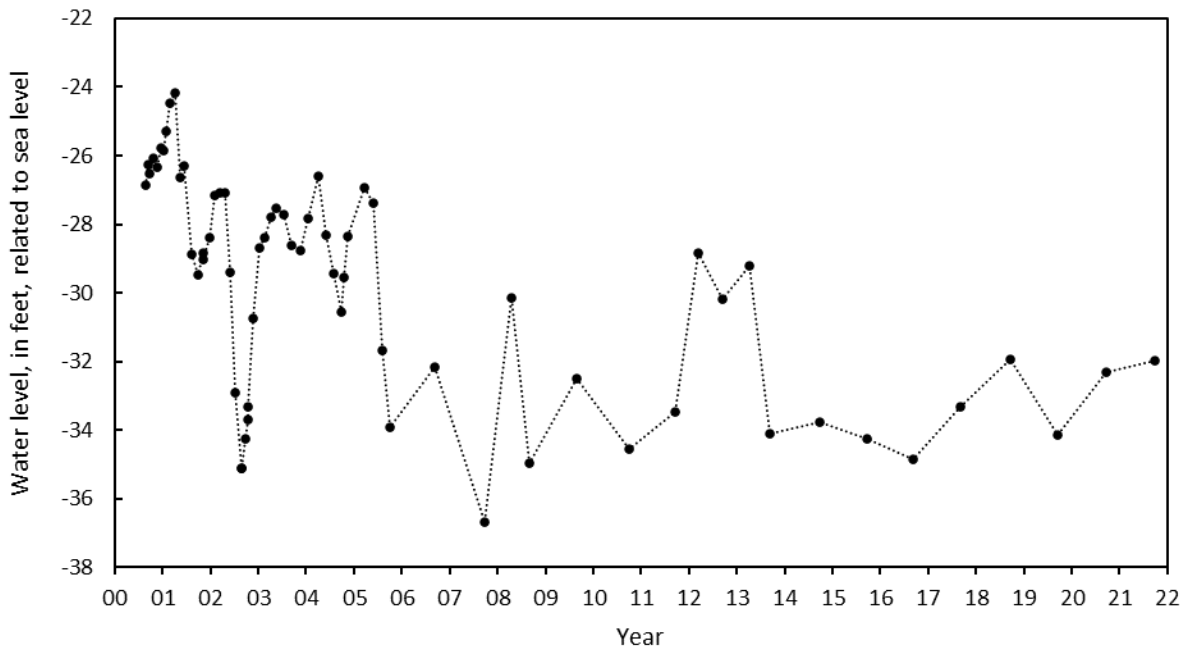
MEASURING POINT: Top of recorder platform, 3.0 ft above land surface.

PERIOD OF RECORD: September 2000 to current year.

EXTREMES FOR RECORD: Highest water level measured at 33.17 ft below land surface, on April 6, 2001; lowest measured at 45.7 ft below land surface, on September 20, 2007.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	40.96



WELL NUMBER: AA Fe 93
LOCATION: Deale Athletic Field

PERMIT NUMBER: AA-94-5391
LAT. 38° 46' 44", LONG. 76° 33' 12"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 470 ft.

Casing diameter: 4.5 in. to 429 ft, 449 to 454 ft, and 464 to 470 ft.

Screen diameter: 4.5 in. from 429 to 449 ft, and 454 to 464 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 7.22 ft above sea level from topographic map.

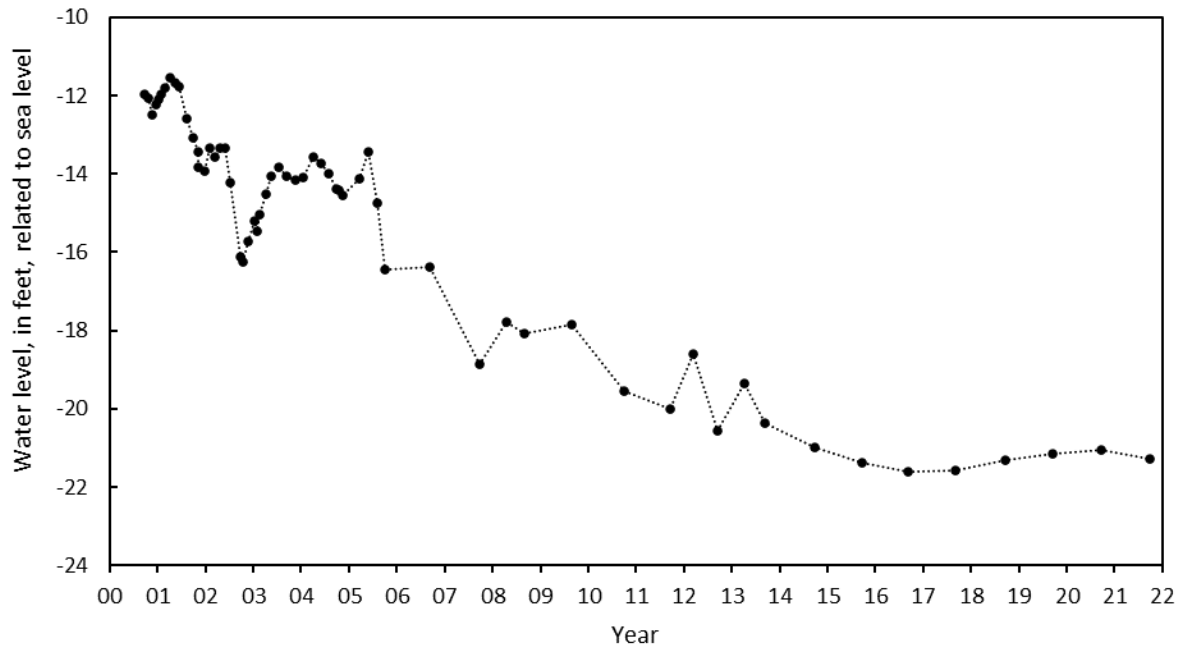
MEASURING POINT: Top of recorder platform, 3.35 ft above land surface.

PERIOD OF RECORD: September 2000 to current year.

EXTREMES FOR RECORD: Highest water level measured at 18.75 ft below land surface, on April 6, 2001; lowest measured at 28.82 ft below land surface, on September 12, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 28, 2021	28.50



GAGE NUMBER: 01589500

LAT. 39° 10' 12", LONG. 76° 37' 51"

LOCATION: Sawmill Creek

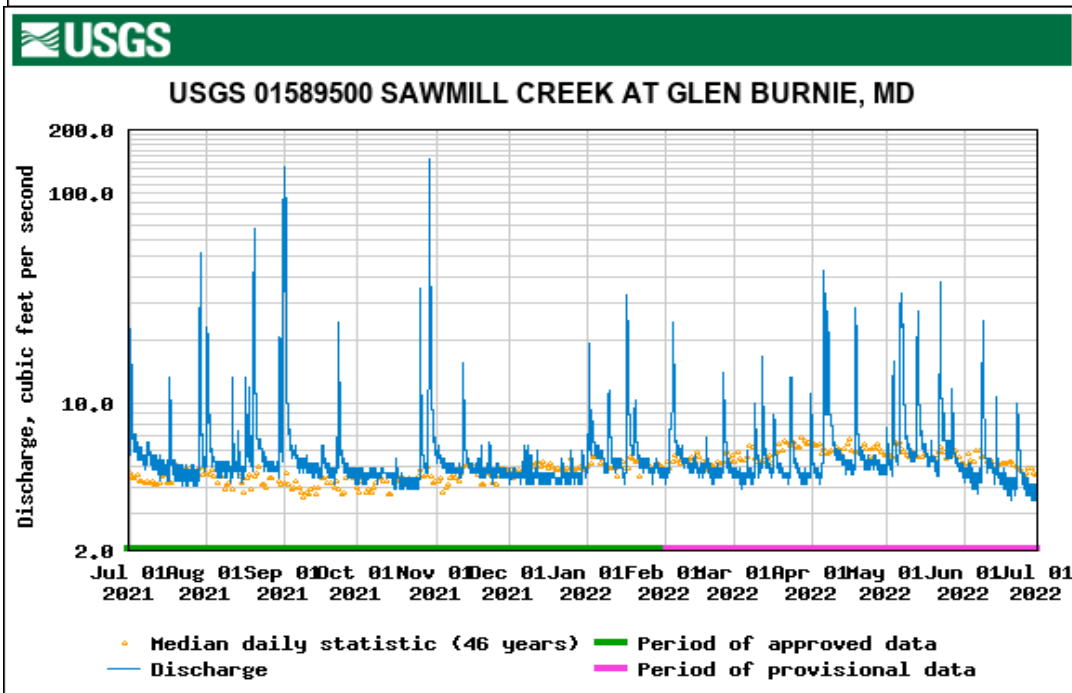
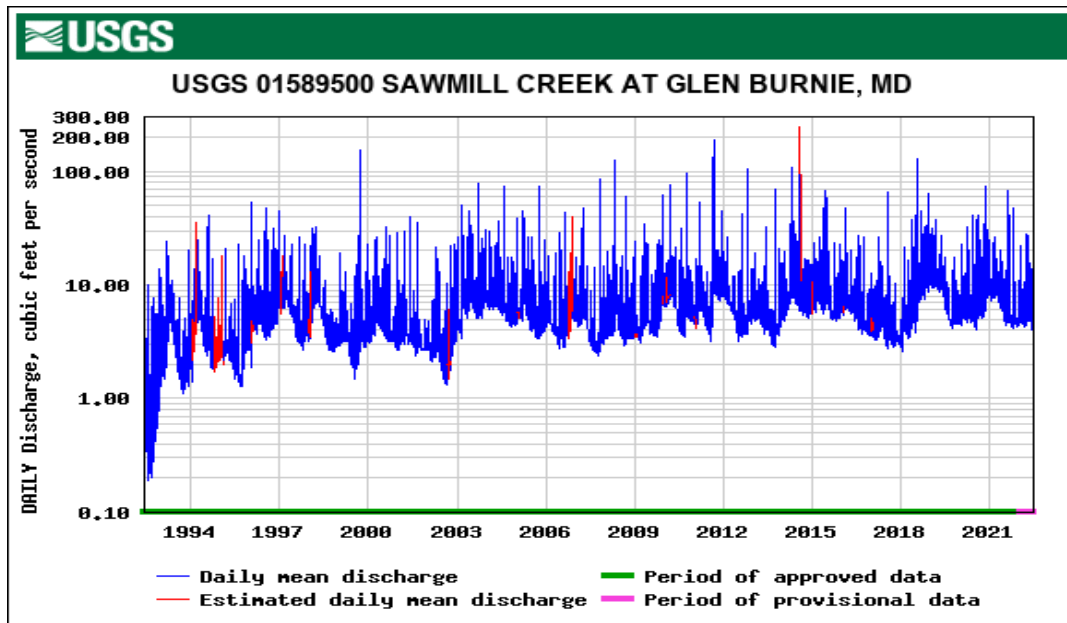
DRAINAGE AREA: 4.97 mi².

GAGE: Water-stage recorder, crest-stage gage and concrete control. Datum of gage is 25.28 ft above North American Vertical Datum of 1988, from digital elevation model.

PERIOD OF RECORD: May 1944 to September 1952. Annual maximum, water years 1965-70. September 1983 to current year.

EXTREMES FOR RECORD: Maximum discharge, 1,180 ft³/s, Aug. 12, 2014, gage height, 7.61 ft; minimum discharge, 0 ft³/s, Sept. 6, 7, 1985, July 29, Aug. 2, 1986.

REMARKS: U.S. Geological Survey satellite data-collection platform at station. Low flow affected by groundwater diversions from Anne Arundel County municipal well fields upstream from station; spring and summer periods affected by discharge and withdrawal from unknown source.



TABLES AND GRAPHS SHOWING GROUNDWATER WITHDRAWALS AND
WATER LEVELS

CROFTON MEADOWS

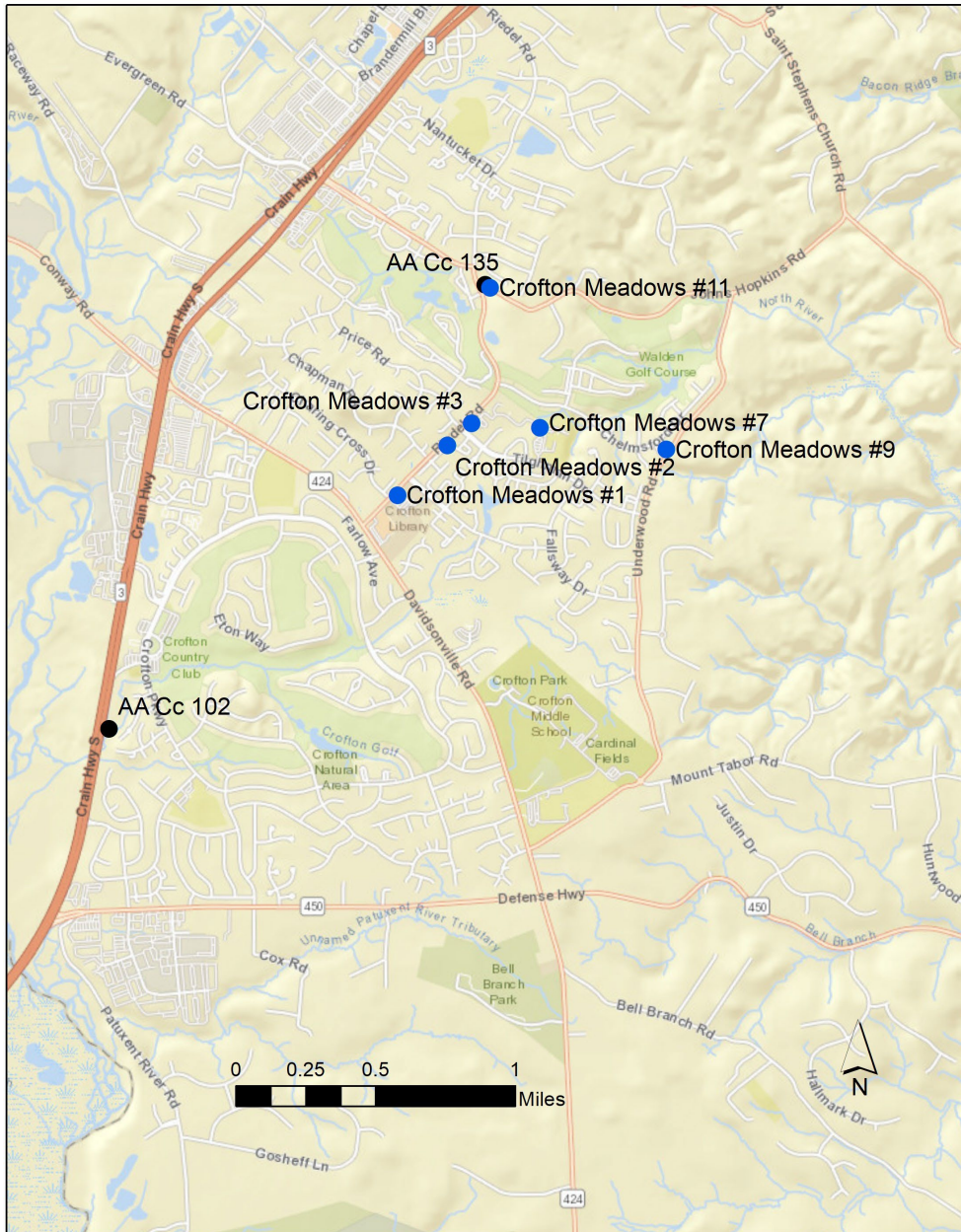


Figure 2. Location of Patuxent aquifer observation wells (black) and Patuxent aquifer well fields (blue) at Crofton Meadows.

Table 1. Monthly pumpage data for the Patuxent wells in the Crofton Meadows area.

DATE	AVERAGE WITHDRAWALS IN GALLONS PER MONTH	AVERAGE WITHDRAWALS IN GALLONS PER DAY
Jul 2021	190,999,000	6,161,258
Aug 2021	192,205,000	6,200,161
Sep 2021	187,279,000	6,242,633
Oct 2021	171,574,000	5,534,645
Nov 2021	173,187,000	5,772,900
Dec 2021	190,362,000	6,140,710
Jan 2022	190,717,000	6,152,161
Feb 2022	172,087,000	6,145,964
Mar 2022	190,017,000	6,129,581
Apr 2022	189,453,000	6,315,100
May 2022	197,096,000	6,357,935
Jun 2022	191,967,000	6,398,900

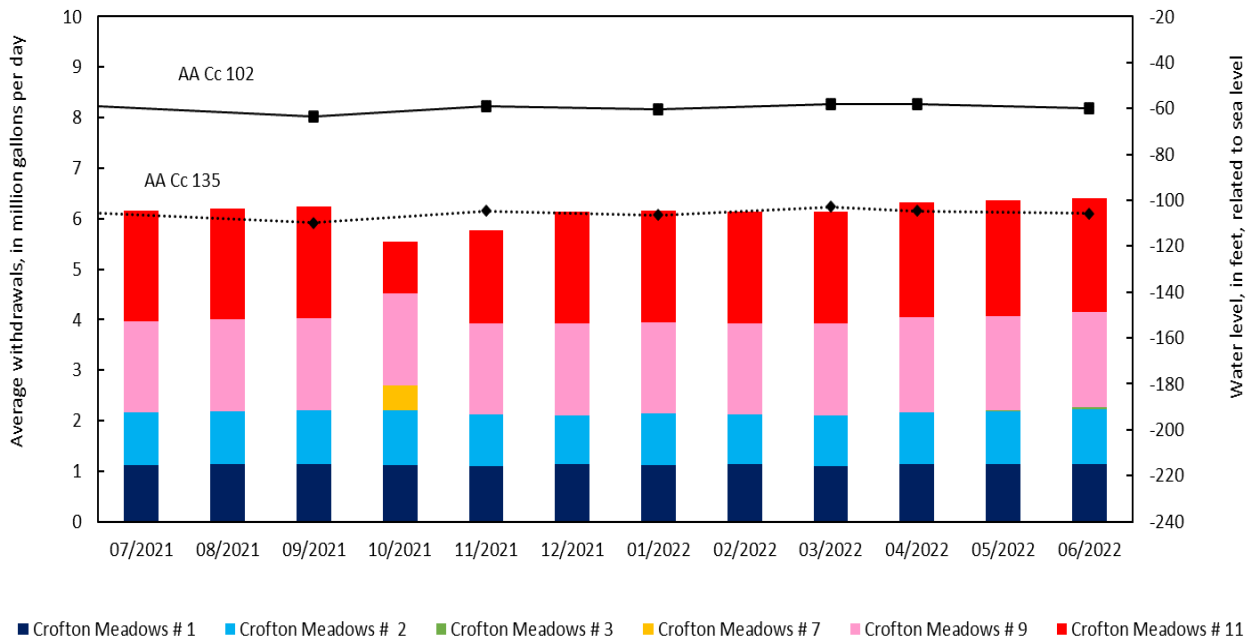
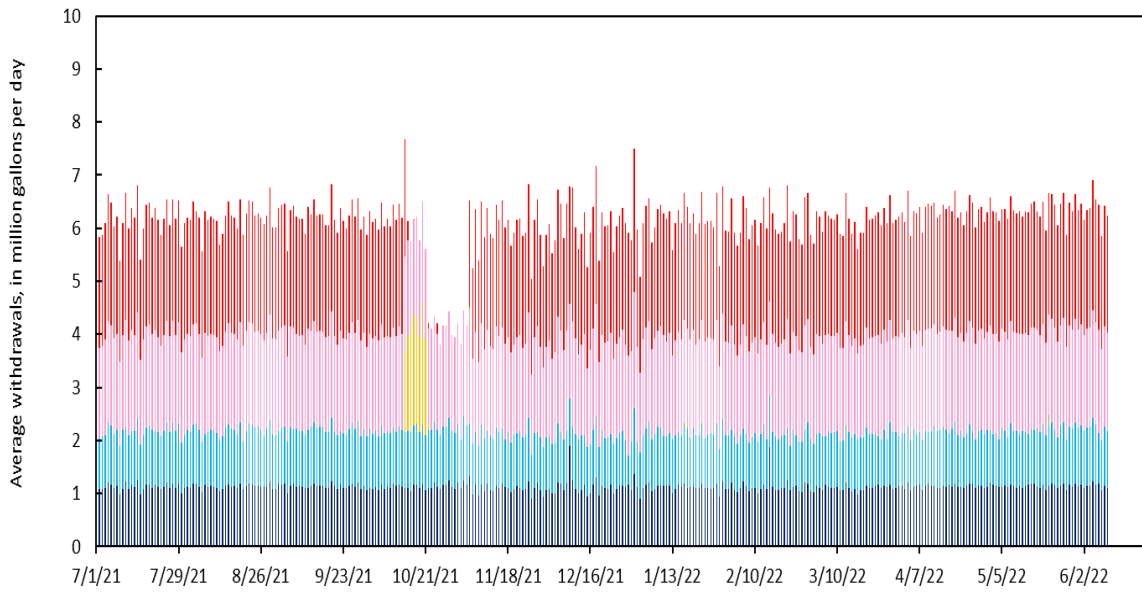
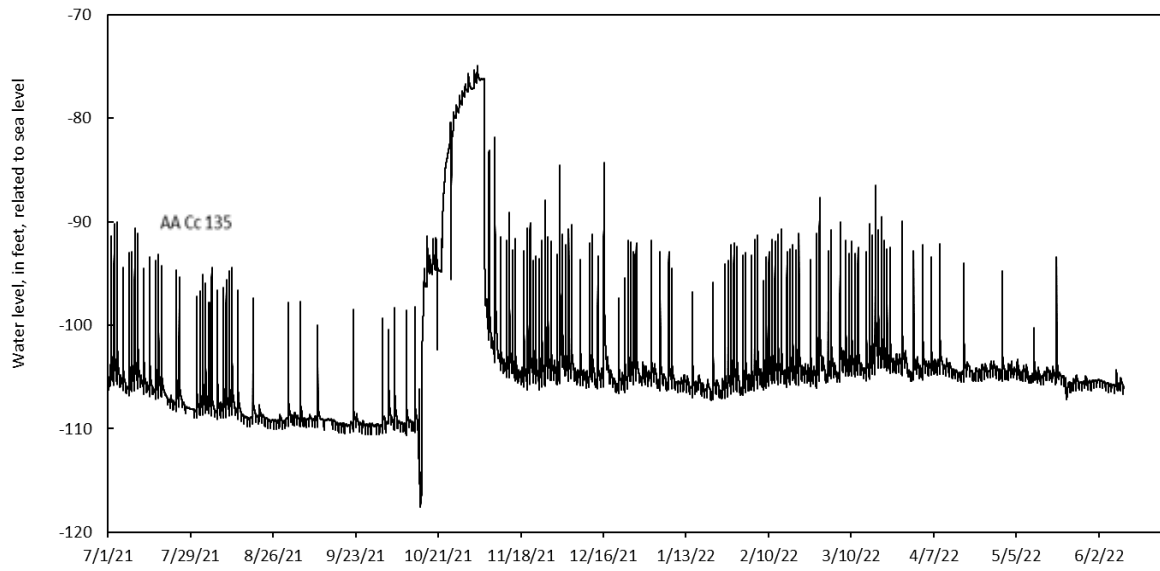


Figure 3. Monthly water level and pumpage trends in the Patuxent aquifer in the Crofton Meadows area.



■ Crofton Meadows # 1 ■ Crofton Meadows # 2 ■ Crofton Meadows # 3 ■ Crofton Meadows # 7 ■ Crofton Meadows # 9 ■ Crofton Meadows # 11

Figure 4. Daily water level (AA Cc 135) and pumpage trends in the Patuxent aquifer in the Crofton Meadows area.

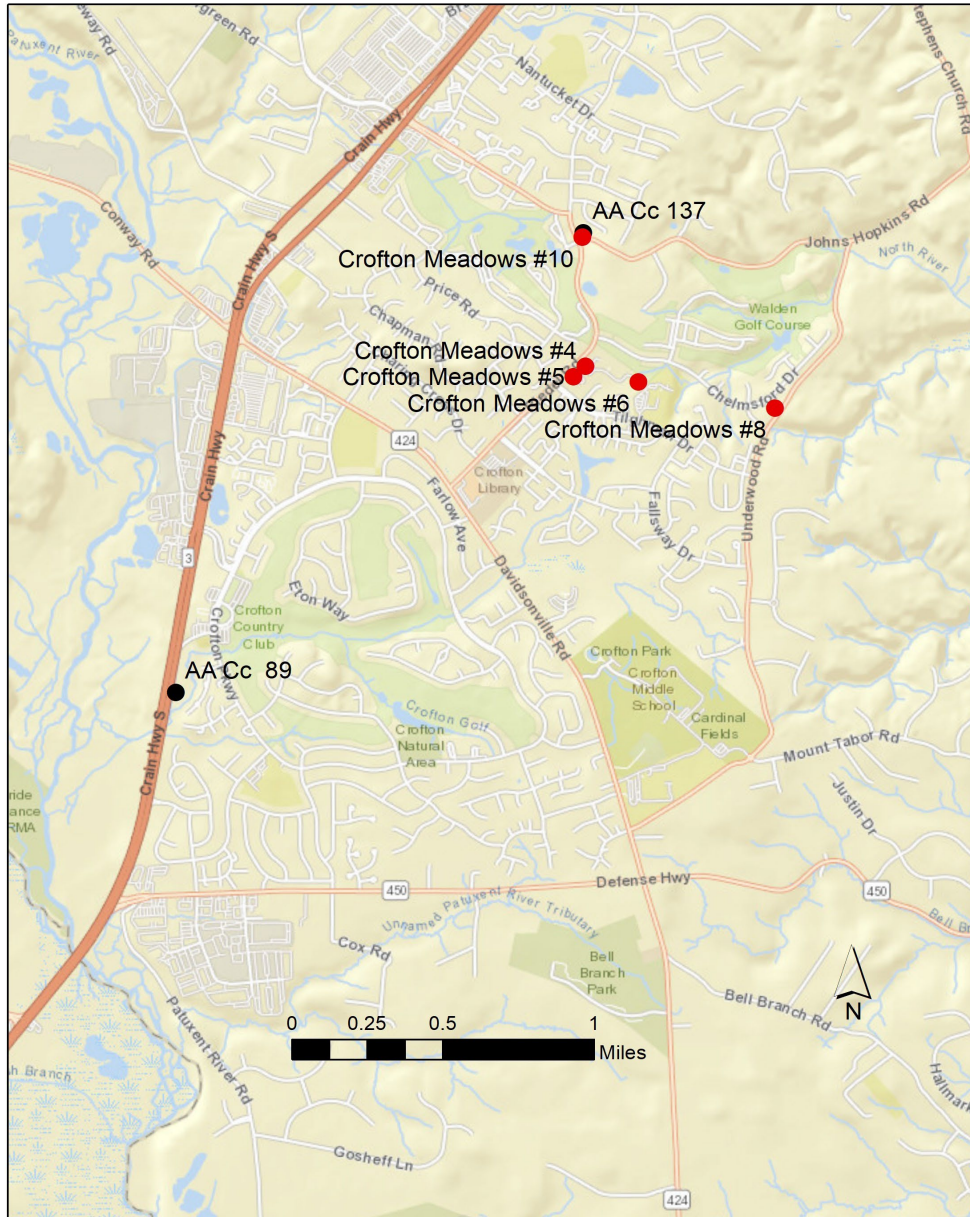


Figure 5. Location of Lower Patapsco aquifer observation wells (black) and Lower Patapsco aquifer well fields (red) at Crofton Meadows.

Table 2. Monthly pumpage data for the Lower Patapsco wells in the Crofton Meadows area.

DATE	AVERAGE WITHDRAWALS IN GALLONS PER MONTH	AVERAGE WITHDRAWALS IN GALLONS PER DAY
Jul 2021	193,627,000	6,246,032
Aug 2021	193,842,000	6,252,968
Sep 2021	202,500,000	6,750,000
Oct 2021	204,353,000	6,592,032
Nov 2021	165,290,000	5,509,667
Dec 2021	153,029,000	4,936,419
Jan 2022	151,205,000	4,877,581
Feb 2022	130,558,000	4,662,786
Mar 2022	150,723,000	4,862,032
Apr 2022	149,295,000	4,976,500
May 2022	160,545,000	5,178,871
Jun 2022	178,032,000	5,934,400

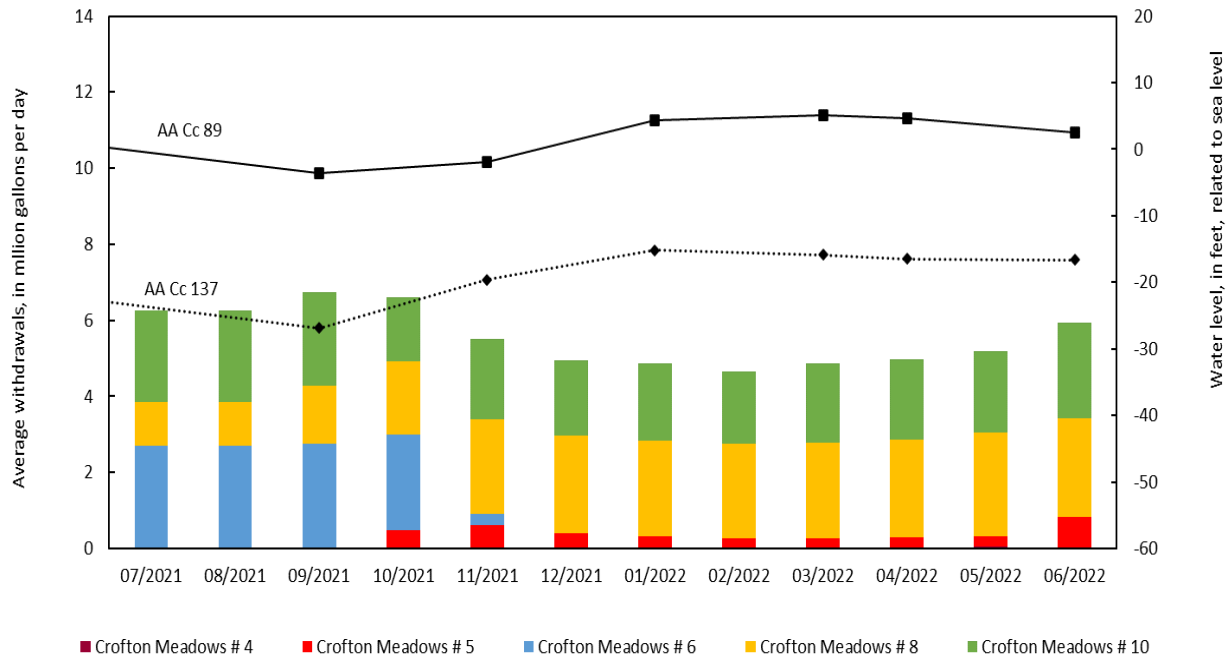


Figure 6. Monthly water level and pumpage trends in the Lower Patapsco aquifer in the Crofton Meadows area.

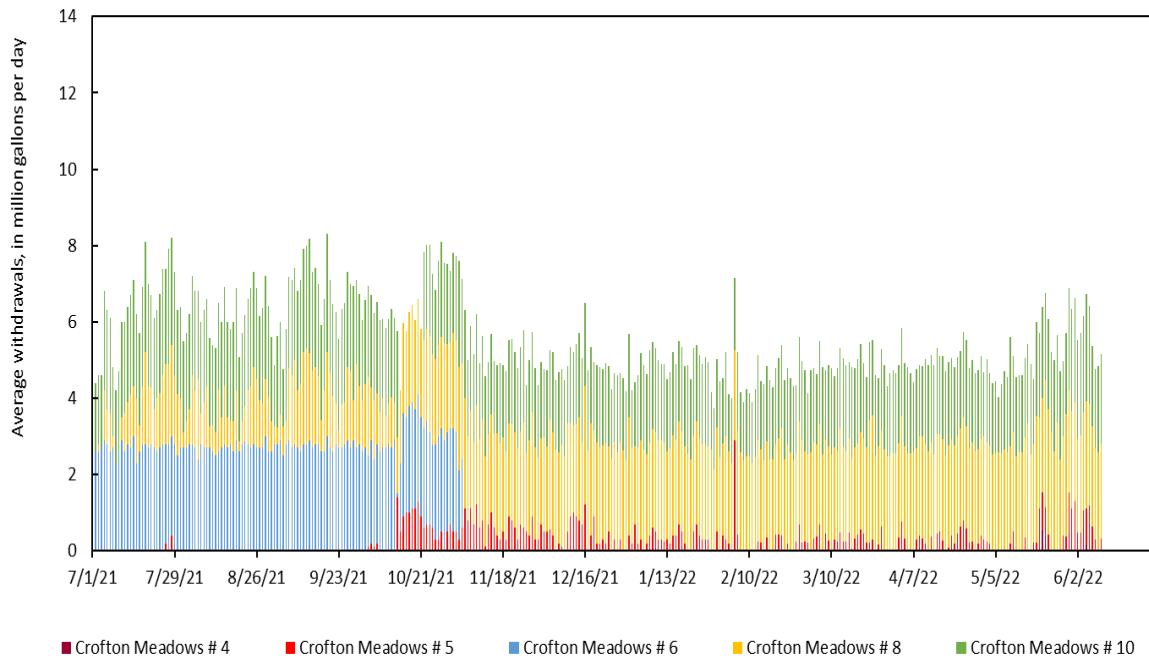
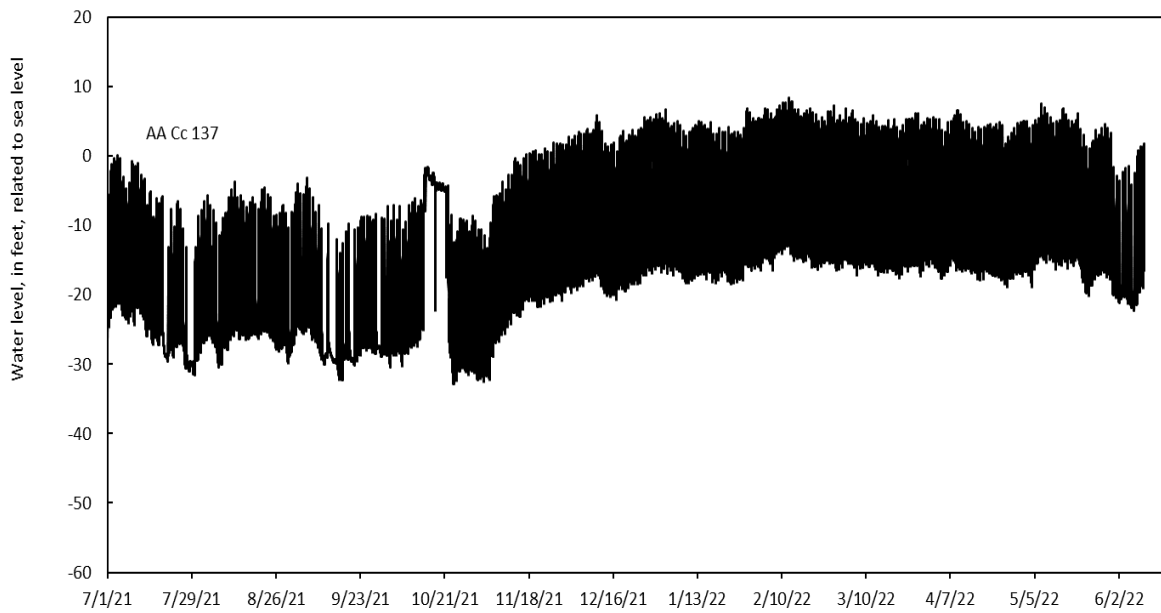


Figure 7. Daily water level (AA Cc 137) and pumpage trends in the Lower Patapsco aquifer in the Crofton Meadows area.

ARNOLD

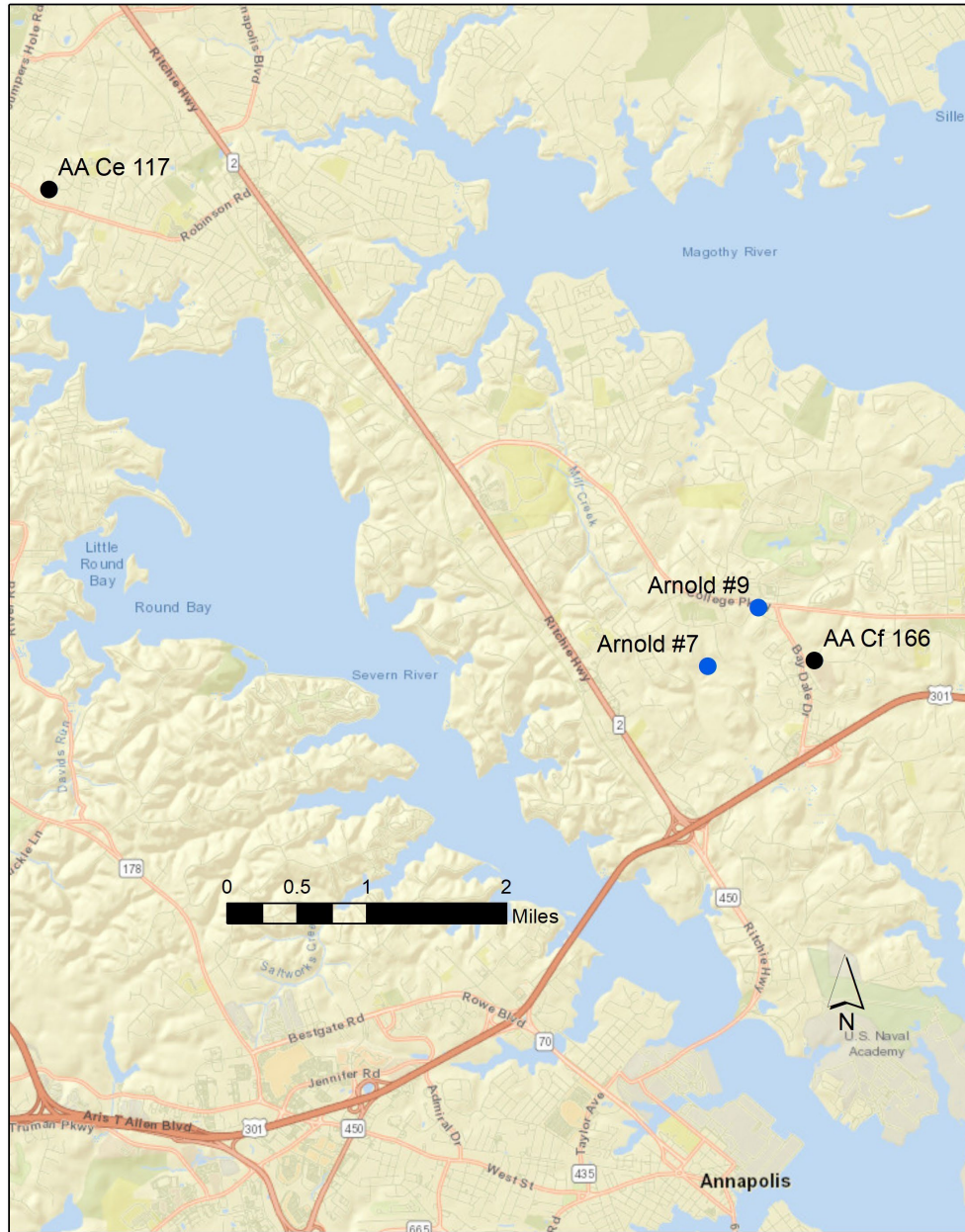


Figure 8. Location of Patuxent aquifer observation wells (black) and Patuxent aquifer well fields (blue) on the Broadneck Peninsula.

Table 3. Monthly pumpage data for the Patuxent wells in the Arnold area.

DATE	AVERAGE WITHDRAWALS IN GALLONS PER MONTH	AVERAGE WITHDRAWALS IN GALLONS PER DAY
Jul 2021	117,419,000	3,787,710
Aug 2021	108,561,000	3,501,968
Sep 2021	99,083,000	3,302,767
Oct 2021	114,411,000	3,690,677
Nov 2021	107,752,000	3,591,733
Dec 2021	109,737,000	3,539,903
Jan 2022	84,627,000	2,729,903
Feb 2022	59,821,000	2,136,464
Mar 2022	31,838,000	1,027,032
Apr 2022	41,137,000	1,371,233
May 2022	74,800,000	2,412,903
Jun 2022	75,157,000	2,505,233

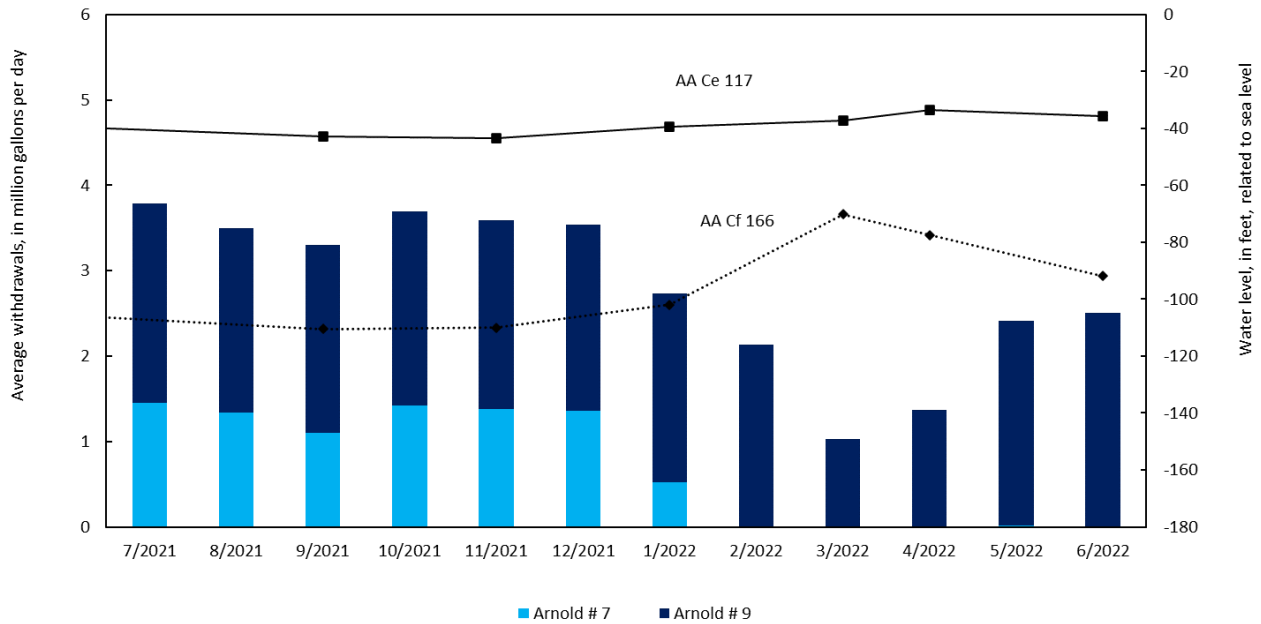


Figure 9. Monthly water level and pumpage trends in the Patuxent aquifer in the Arnold area.

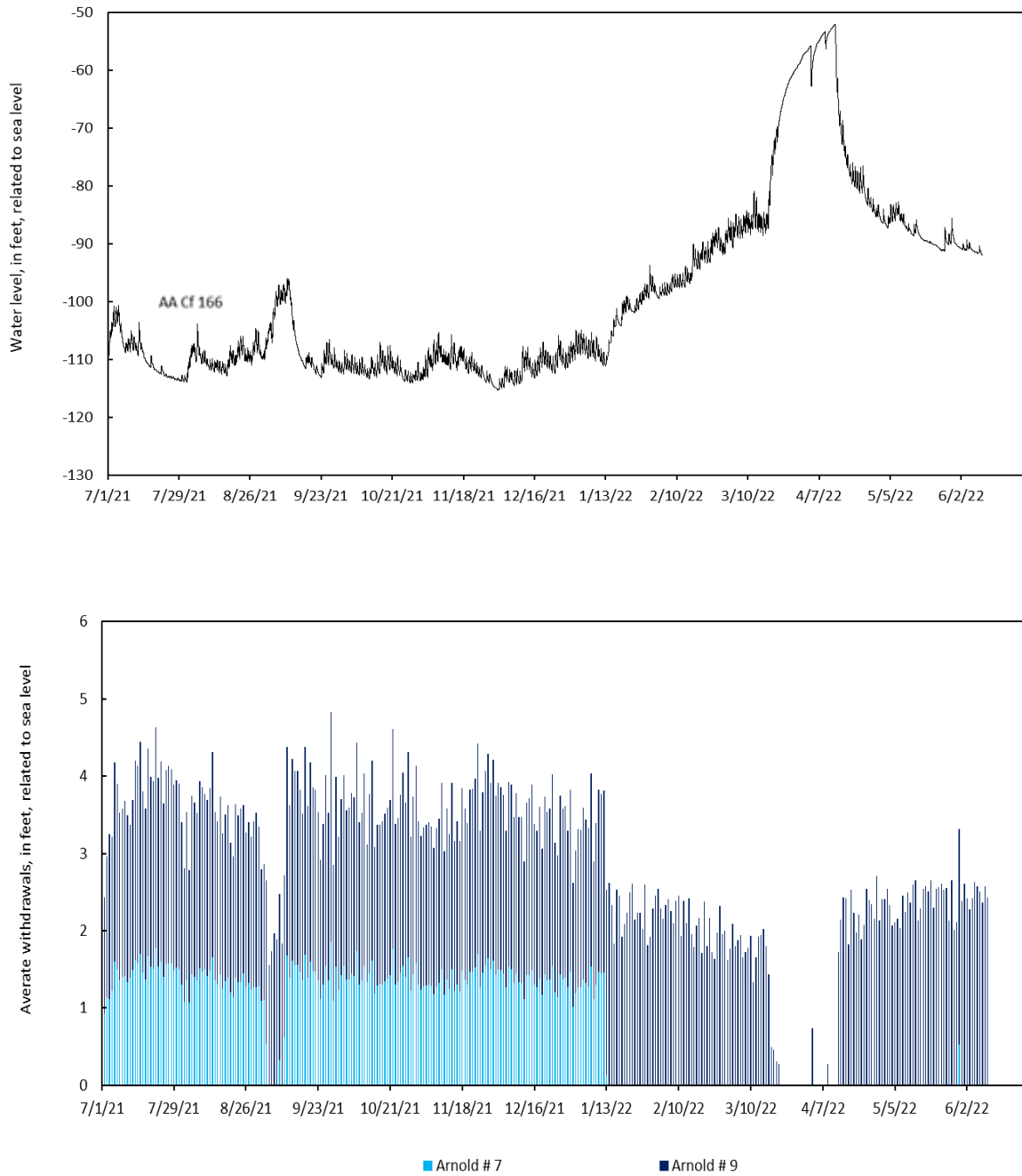


Figure 10. Daily water level (AA Cf 166) and pumpage trends in the Patuxent aquifer in the Arnold area.

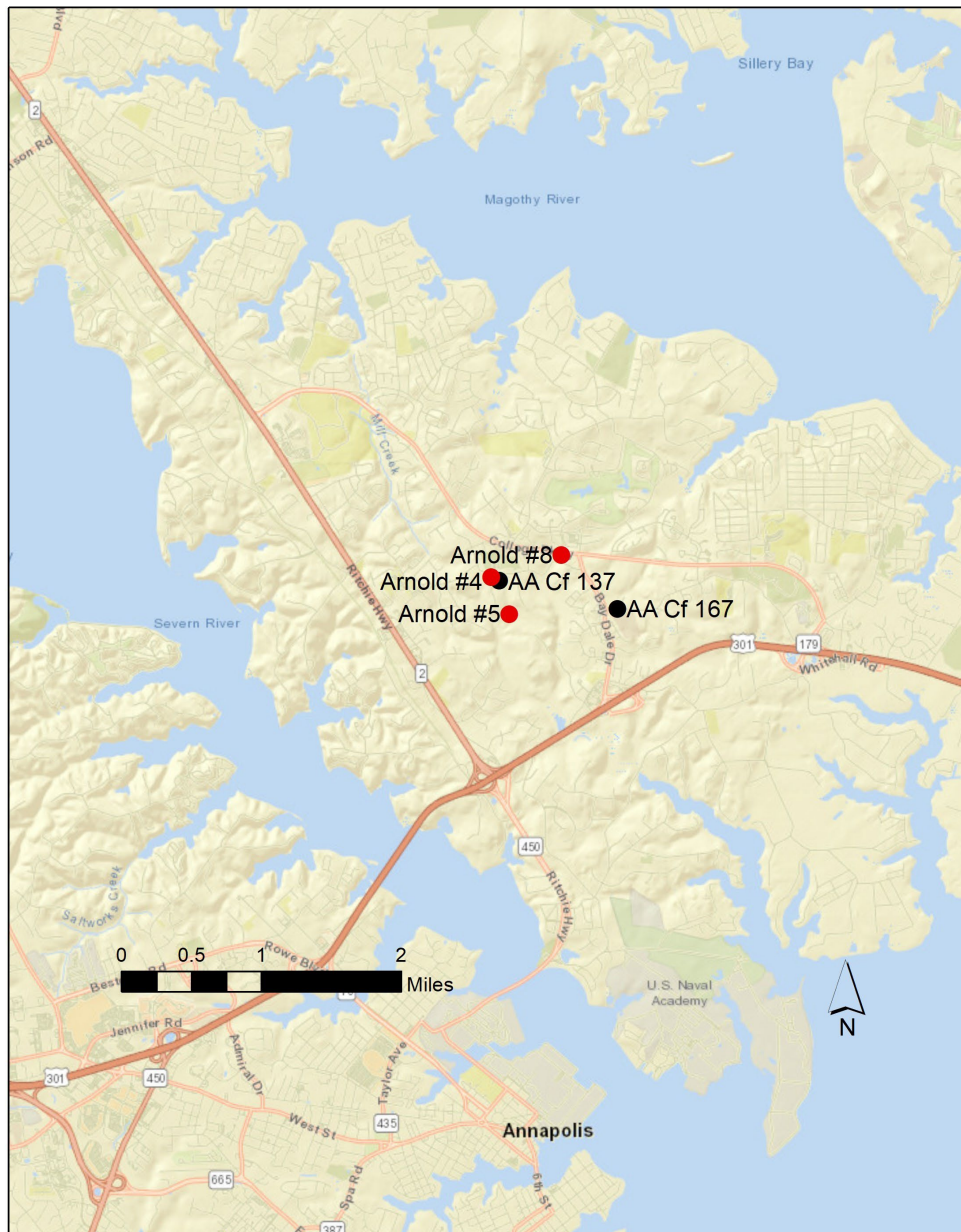


Figure 11. Location of Lower Patapsco aquifer observation wells (black) and Lower Patapsco aquifer well fields (red) on the Broadneck Peninsula.

Table 4. Monthly pumpage data for the Lower Patapsco wells in the Arnold area.

DATE	AVERAGE WITHDRAWALS IN GALLONS PER MONTH	AVERAGE WITHDRAWALS IN GALLONS PER DAY
Jul 2021	222,523,000	7,178,161
Aug 2021	181,042,000	5,840,065
Sep 2021	147,946,000	4,931,533
Oct 2021	134,671,000	4,344,226
Nov 2021	113,052,000	3,768,400
Dec 2021	113,352,000	3,656,516
Jan 2022	111,360,000	3,592,258
Feb 2022	101,765,000	3,634,464
Mar 2022	109,798,000	3,541,871
Apr 2022	150,221,000	5,007,367
May 2022	175,584,000	5,664,000
Jun 2022	175,898,000	5,863,267

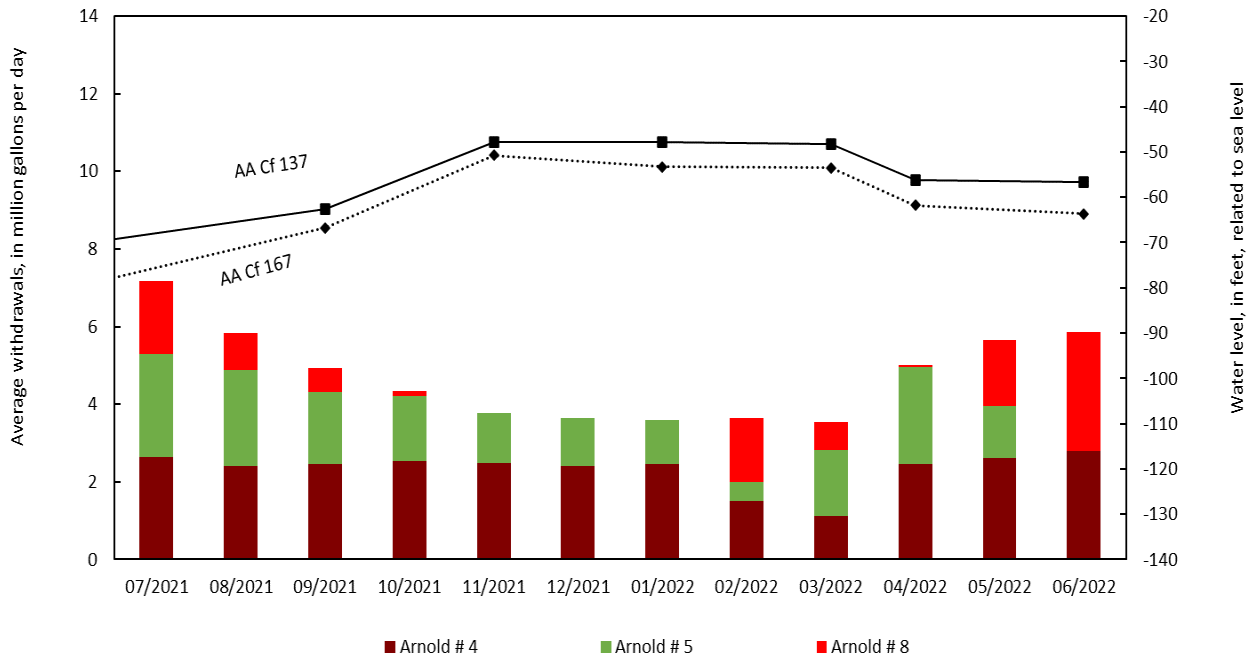


Figure 12. Monthly water level and pumpage trends in the Lower Patapsco aquifer in the Arnold area.

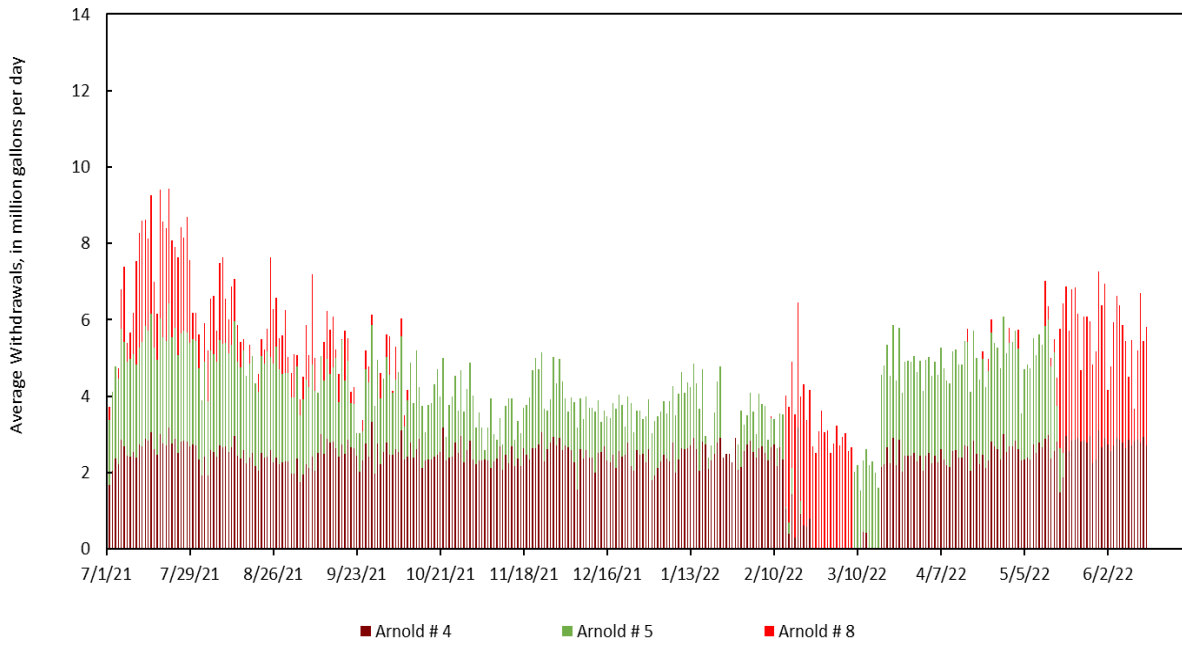
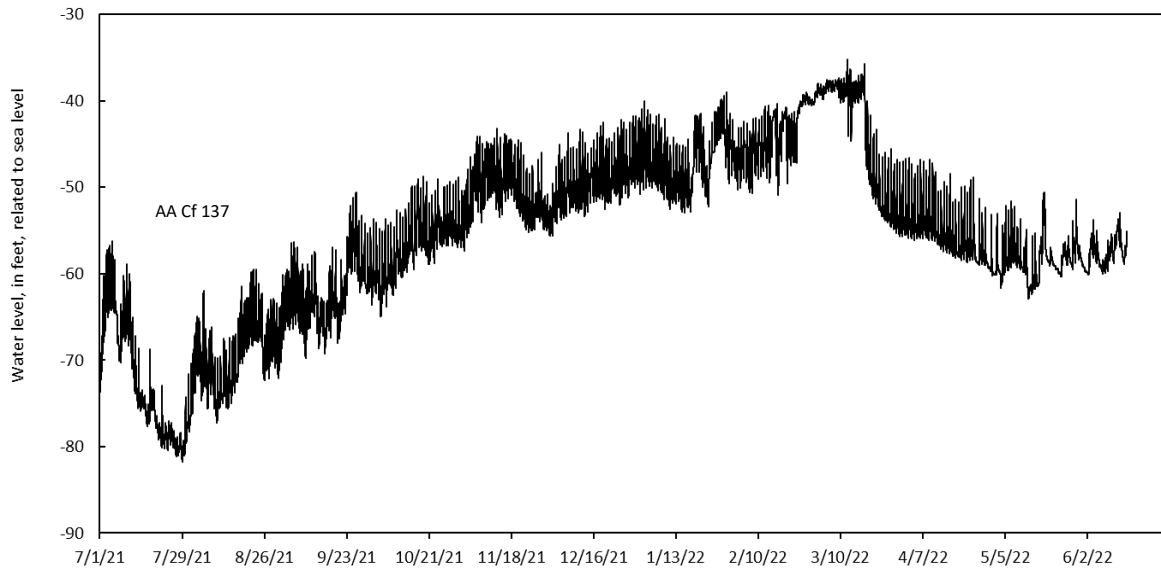


Figure 13. Daily water level (AA Cf 137) and pumpage trends in the Lower Patapsco aquifer in the Arnold area.