memo

Project Name |	Groundwater Monitoring Program	**Date** |	05/05/2026
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Karen Kill, District Administrator		
From / Contact info |	Stu Grubb, PG; Ali Stone, EOR		
Regarding |	2025 Groundwater Elevation and Trends		

Summary

BCWD has been monitoring a network of wells for groundwater levels since 2012. The data is used to identify trends in groundwater levels and changes to groundwater flow over time.

Groundwater elevation trends are shown on Figures 3-6. Groundwater elevations increased from 2024 to 2025 with an average increase of 0.56 feet. The increase is not surprising considering there was a shift from a few years (2000-2023) of below average rainfall to two years (2024-2025) of above average/average rainfall and snowfall. Current groundwater levels are generally midway between the lowest levels recorded in 2012 and highest levels recorded in 2020.

EOR and BCWD are working to add more wells to the network, particularly near the landlocked basins in the north part of the watershed that are susceptible to groundwater flooding. Ongoing regular monitoring is important so that the watershed can recognize trends and extremes in groundwater levels that affect water resource management.

Background

BCWD has established a network of wells for measuring groundwater levels. The network includes residential wells, golf course wells, and DNR observation wells. Water level measurements are collected annually at the residential wells and golf course wells. Water level measurements are recorded hourly at the DNR observation wells using data loggers.

The data has been collected since 2012. The data is used to identify trends in groundwater levels and changes to groundwater flow over time. Changes to levels and groundwater flow can have significant effects on Brown's Creek and other groundwater dependent natural resources, flooded areas such as Kimbro Basin, and stormwater infiltration basins.

The well network was established to cover the entire watershed district, and also to monitor each of the major drinking water aquifers in the watershed district. The distribution of wells by aquifer is:

- Quaternary (Glacial) – 7
- St. Peter - 1
- Prairie du Chien – 10
- Jordan/St. Lawrence – 2
- Tunnel City Group – 4
- Multi-Aquifer – 1

See Figure 1 for a cross-section of the aquifers underlying the BCWD.

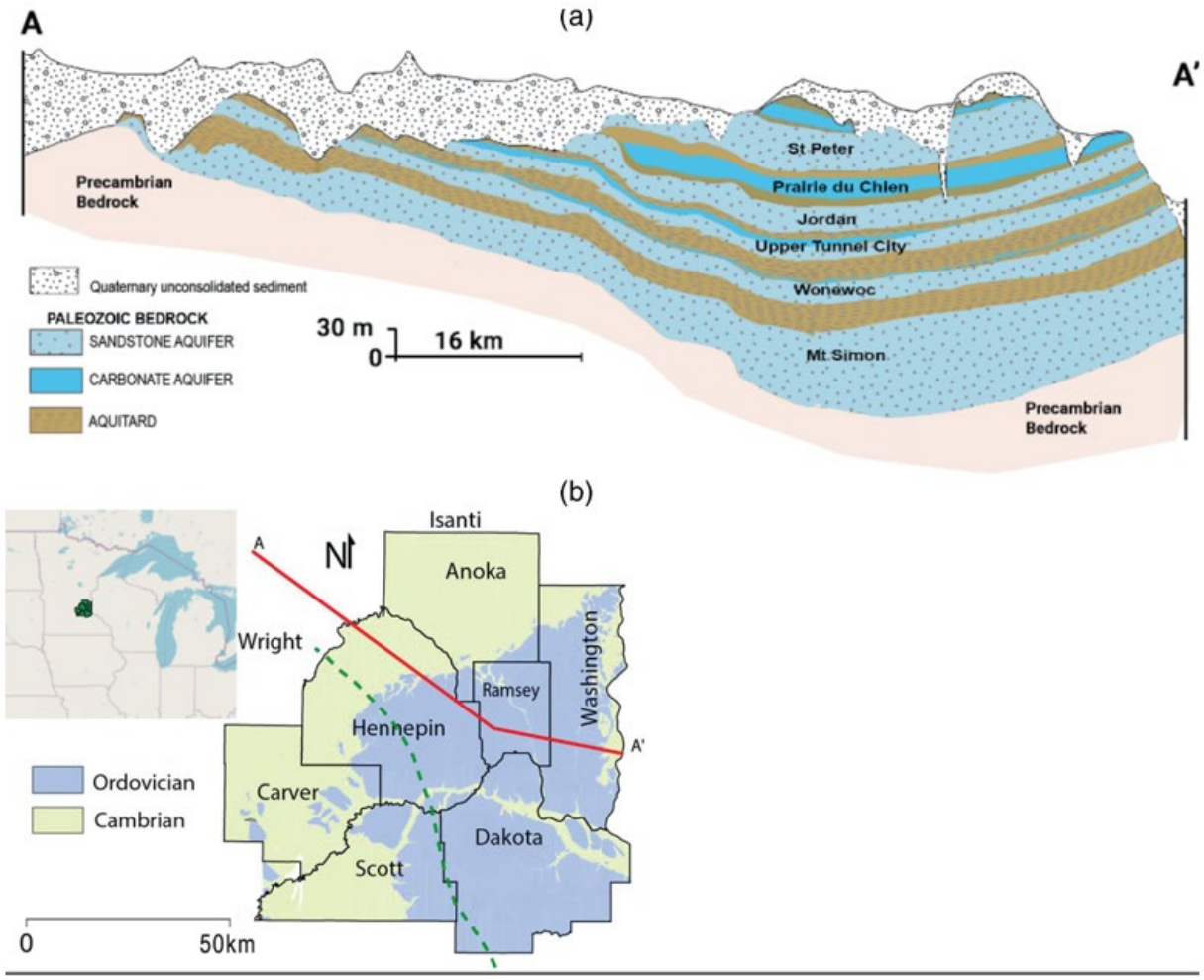

Figure 1. (a) Cross-section of Aquifers and Aquitards in the Twin Cities Metro Area; (b) Location of Cross-section. Aquifers are the underground layer of water-bearing material, consisting of permeable or fractured rock, or of unconsolidated materials such as gravel, sand or silt. Aquitards are any geological formation that transmits water at slower rates than an aquifer.

Analysis

Residential Wells

Groundwater elevation data from the golf course wells, residential wells, and DNR observation wells are shown in Table 1. Groundwater elevations increased from 2024 to 2025 with an average increase of 0.56 feet. The increase is not surprising considering there was a shift from a few years (2000-2023) of below average rainfall to two years (2024-2025) of above average/average rainfall and snowfall.

DNR Observation Wells

DNR measures water elevations monthly in four observation wells:

- Brown's Creek Park – Deep well completed in the Jordan aquifer

- Brown's Creek Park – Middle well completed in a confined Quaternary aquifer
- Withrow School – Well completed in the Prairie du Chien aquifer
- Kimbro – Shallow well completed in the Quaternary (glacial) aquifer

A fifth observation well was abandoned in 2021, but provides useful historic data:

- Brown's Creek Park – Shallow well completed in the Quaternary (glacial) aquifer

Groundwater elevation data from the DNR observation wells are shown on Figure 2. The data for the Withrow well shows that the water level had been dropping since reaching a high level of 960.05 in June 2020, but increased in 2024 and remained stable at that increased elevation through 2025. The Brown's Creek Park – Deep well groundwater elevations can fluctuate by as much as six feet over short time periods. This observation is the result of pumping from a nearby well (probably Oak Glen Golf Course) and will be investigated when the District obtains pumping data from the Oak Glen Golf Course. The Brown's Creek Park – Middle well shows dropping groundwater elevations since the beginning of the observation period in October, 2020 but increased in 2024 and remained at that increased level through 2025. The Kimbro – Shallow well became part of the monitoring program in 2021 and generally shows a trend of decreasing water levels corresponding to the decreasing surface water levels in the Kimbro Basin. The deeper DNR observation wells (Browns Creek – Deep and Withrow) showed little change in groundwater elevations in 2025.

Golf Course Wells

There were some notable changes in groundwater levels from 2024 (See Table 1). Oak Glen Golf Course (151580) showed a decrease of 19.16 feet. This suggests a measurement error as new equipment was installed and became operational after two years of no pumping. Oak Glen Golf Course (151581) saw an increase of 18.73 feet and Logger's Trail Golf Course (761112) saw an increase of 9.53 feet from 2024 to 2025. In both instances these sites had large decreases of similar magnitude in 2024. Last year that the wells apparently had not recovered from their most recent pumping event, and the 2025 monitoring likely represents their steady state.

Change in Water Levels in Each Aquifer

Groundwater levels in each aquifer were compared to identify trends over time. Residential well and DNR observation well levels were used for the year-to-year analysis. The golf course wells have not been measured for as long, and the individual water level readings tend to be less reliable due to the large pumping volume. Data from the golf course wells are useful for identifying long term trends in groundwater levels near those high-volume water users.

Quaternary (Glacial) Aquifer

Groundwater levels in the shallow Quaternary aquifer wells are shown on Figure 3. Two of the wells show an increase of about 6 feet since 2012 (slightly up from 2023, but down from 2020). Two of the wells show significantly less increase since 2012, about 0-2 feet. Out of the five Quaternary wells that were measured this year, two showed decreasing water levels and three showed increasing water levels. The variations seen this year are smaller than those seen last year. Variations across the aquifer may indicate a number of influences, including changes to discharge/recharge areas, changes in pumping rates, and variable precipitation and snowmelt rates. It is important to have multiple sampling locations to see not only the general gradient of groundwater flow, but also differences

between aquifers (vertical) and areas within the aquifer (horizontal). These local differences can result in challenges that require special solutions as well as larger trends that may warrant changes to watershed management policies.

Prairie du Chien Aquifer

Groundwater levels in the Prairie du Chien aquifer are shown in Figure 4. Most of the wells showed a consistent increase of 8 to 10 feet from 2012 to 2020, a decrease from 2020 to 2023, and an increasing trend from 2023 to 2025. Almost all aquifers in the Prairie du Chien saw small increases (approximately 0.5 ft) from 2024-2025 with one exception, the Wiersma property that decreased about 1 ft from 2024-2025.

Other Aquifers

Groundwater levels from the St. Peter, Jordan, and Tunnel City Group aquifers are shown on Figure 5. The wells show similar trends over time, a rise from 2012 to 2020 followed by a drop from 2021 to 2024, then a slight increase from 2024-2025. Only one well followed a slightly different trend of having an increase from 2023-2024 and decrease from 2024-2025, the Brown's Creek Park Well in the Tunnel City Group aquifer. Note that the Olien well was not available for measurement again this year. We will try to investigate the apparent decline in the water level. However, the new landowner has not responded to our recent requests for access to the well.

Adding network wells

BCWD has been working to add additional wells to the monitoring network. More groundwater data is needed in the northeast part of the watershed district where landlocked basins may be subject to groundwater flooding. EOR identified 23 residences with wells suitable for adding to the network. Karen Kill sent a letter to each residence to gauge their interest in the monitoring program. There were no responses. We will continue to try to contact these well owners and other well owners using other methods until we have added at least five wells to the monitoring network.

Ann Meyers volunteered her will for the monitoring program. The well is in a deep pit and is not easily accessible. EOR is working with WCD to find a way to get reliable water level measurements from the well.

Recommendations

It is recommended that the BCWD continue to collect groundwater elevation data on an annual basis. The long-term data and analyses are important for understanding groundwater conditions and groundwater/surface water interactions throughout the District. The data will be particularly useful for understanding the thermal impairment of Brown's Creek and water level fluctuations in landlocked areas such as the Kimbro Basin. The addition of well locations will be useful in developing a more accurate picture of regional groundwater levels and may help the BCWD predict when groundwater flooding is likely to become an issue in the future.

Table 1. Groundwater Elevations from 2017 to 2025

Unique Number	Name	2018 Water Elevation	2019 Water Elevation	2020 Water Elevation	2021 Water Elevation	2022 Water Elevation	2023 Water Elevation	2024 Water Elevation	2025 Water Elevation	Change since last measure
Approximate Date		Oct-18	Oct-19	Oct-20	Oct-21	Oct-22	Oct-23	Sep-24	Sep-25	
Golf Course Wells										
515171	Applewood	894.14		897.65	895.58	891.45	890.67	890.53	891.31	0.78
151580	Oak Glen	823.56	826.12	825.63	823.00			844.32	825.16	-19.16
151581	Oak Glen	828.16	828.23	828.78	829.19	827.95	828.41	810.96	829.69	18.73
208038	Stillwater	>200	>200							
Stillwater Oaks 1	Stillwater Oaks	910.11	912.41							
Stillwater Oaks 2	Stillwater Oaks	909.05	913.60	913.72	909.95					
Stillwater Oaks 3	Stillwater Oaks	910.07	911.90	912.46	911.02					
Stillwater Oaks 4	Stillwater Oaks	957.69	970.29	970.16	970.81					
566145	Logger's Trail	904.16	905.93	907.20						
667998	Logger's Trail	905.10	907.34	908.40	905.30	905.08	903.48	904.48	905.23	0.75
761112	Logger's Trail	900.09	901.94	903.55	900.71	899.18	898.15	889.32	898.85	9.53
Domestic Wells										
428563	Ed and Laurie	900.91	903.36	906.14	903.71	900.80	898.79	899.46	899.45	-0.01
410987	Dan and Lori	905.62	907.22	910.22	908.10	905.35	903.18	903.88	904.05	0.17
196839	Louis J. Bruno	866.75	866.40	870.28	868.23	931.72				
Leiser	Craig Leiser	933.99	935.85	937.65	934.01	932.67	931.34	930.78	932.53	1.75
James	Alan and Molly	940.20	942.14	944.20	940.56	938.70	937.55	938.87	939.15	0.28
184049	Kirk and Tracy	942.48	944.77	945.61	941.11	939.87	939.12	938.99	940.04	1.05
Thatcher	Jyneen	953.19	957.18	958.63	953.89	951.60	950.91	952.35	952.78	0.43
138188	Rick Vanzwol	939.36	941.45	943.96	940.84	937.81	936.11	936.68	937.07	0.39
479665	John and	906.86	907.77	908.87	907.23	905.85	907.22	905.91	906.17	0.26
493250	Mark and	721.50	721.54	721.89	721.01	711.66		0.00		
525197	James and	913.02	914.69	917.18	914.69	912.42	910.66	909.23	911.26	2.03
505390	Larry J and	929.18	932.29	933.50	932.93	930.09	927.93	927.96	928.23	0.27
153485	John P and	898.47	899.31	901.08	897.14	896.83		895.76	897.29	
138904	Duane and Margaret	828.41	830.33	832.27	828.69	827.62	827.55	825.59	828.54	2.95
406204	Michael and	940.98		942.78	940.28	939.17	938.86	940.98	940.23	-0.75
Boughten	Larry	951.32	954.28	956.81	949.52	948.51	947.53	950.52	949.11	-1.41
DNR Observation Wells										
595649	Brown's Creek	865.81	868.11	868.20	866.17	865.21	864.38	866.10	865.73	-0.37
623066	Brown's Creek	875.05	876.84	876.88	875.30	875.01				
551565	Withrow	954.91	958.64	959.50	954.83	951.99	951.10	953.31	953.47	0.16
834170	Brown's Creek			875.59	874.15	873.43	873.09	874.8	875.03	0.23
281129	Kimbro -				929.73	926.75	926.82	926.84	926.72	-0.12

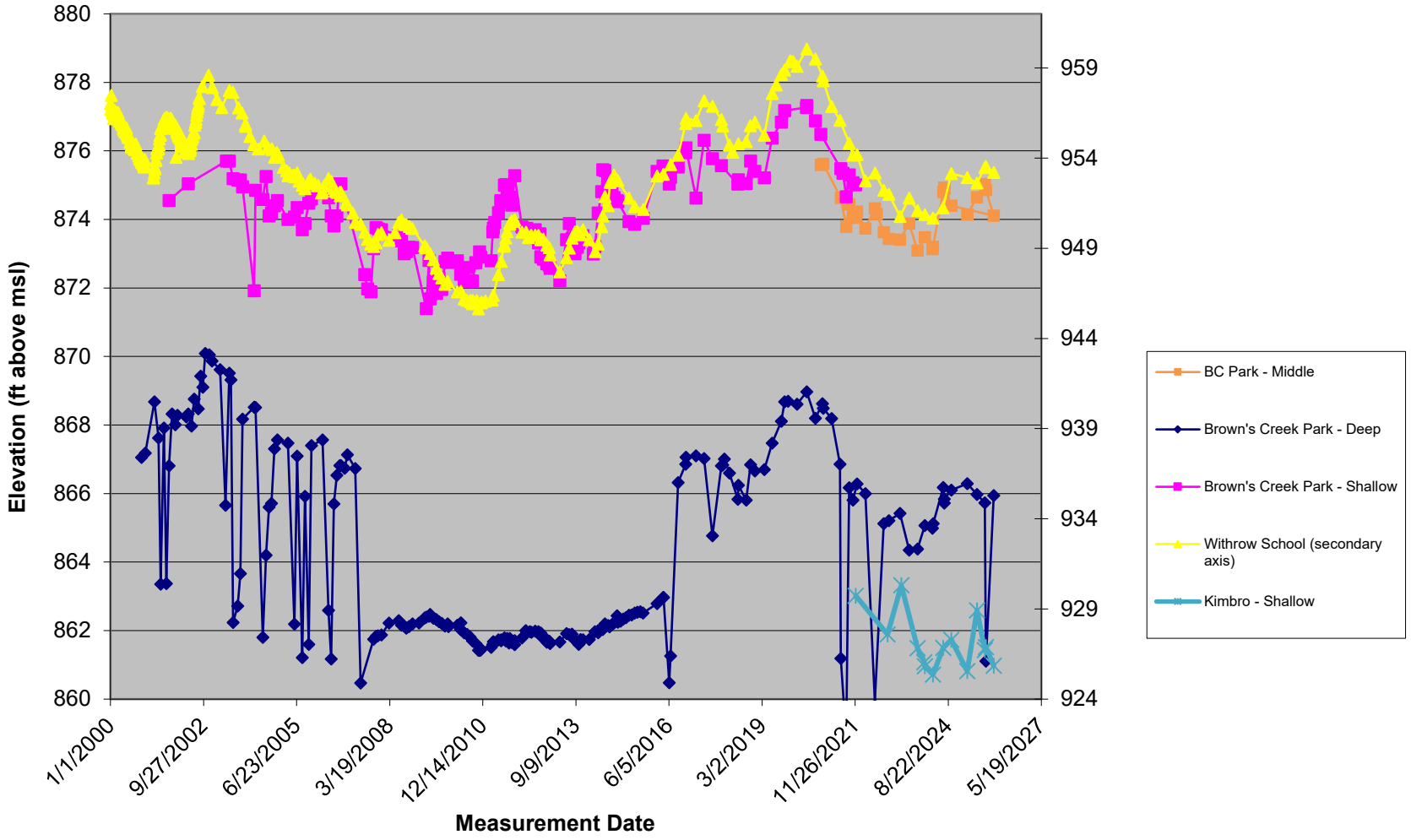

Figure 2. Groundwater Elevations - DNR Observation Wells

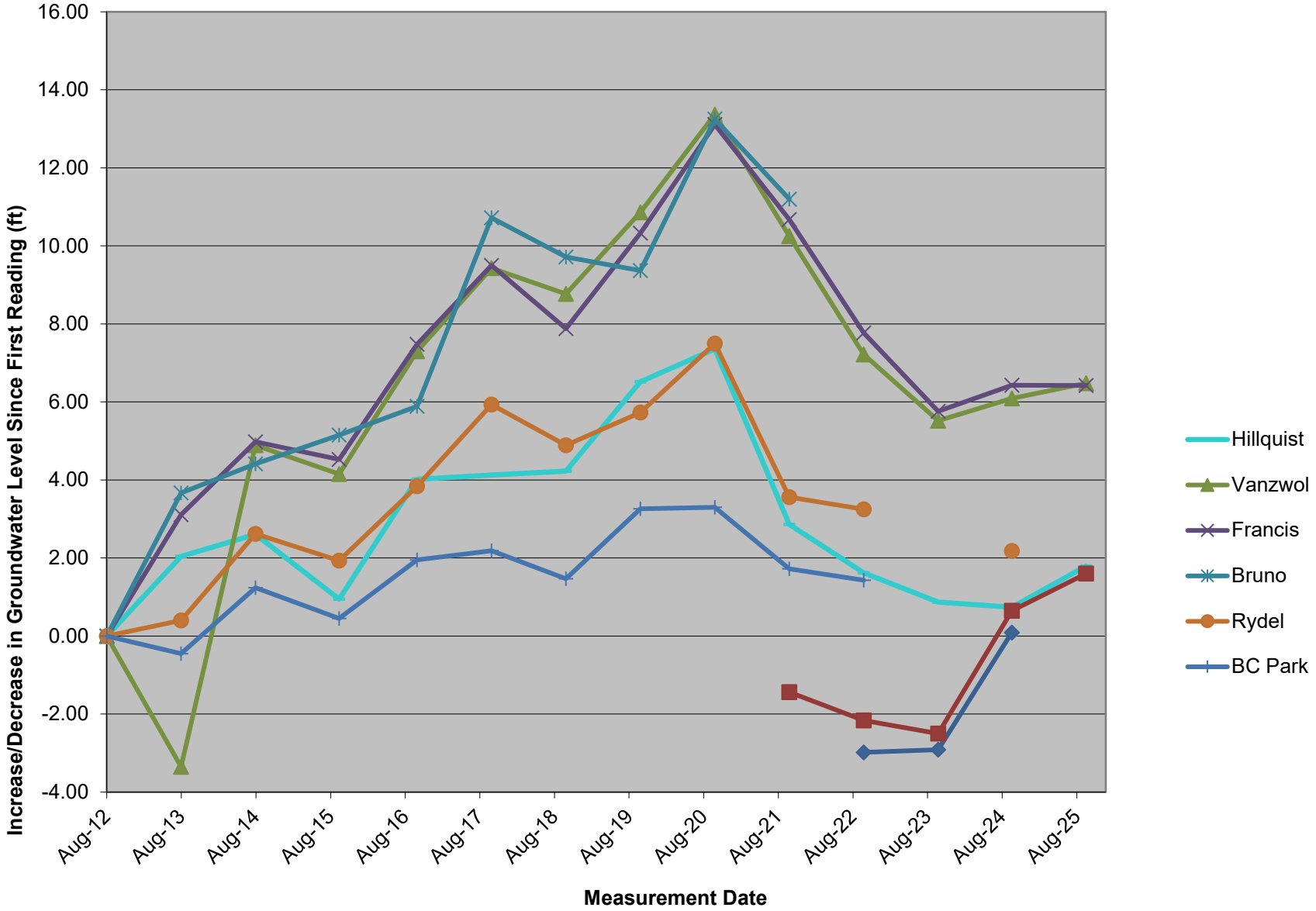

Figure 3. Groundwater Level Change Over Time – Quaternary (Glacial) Aquifer Wells.

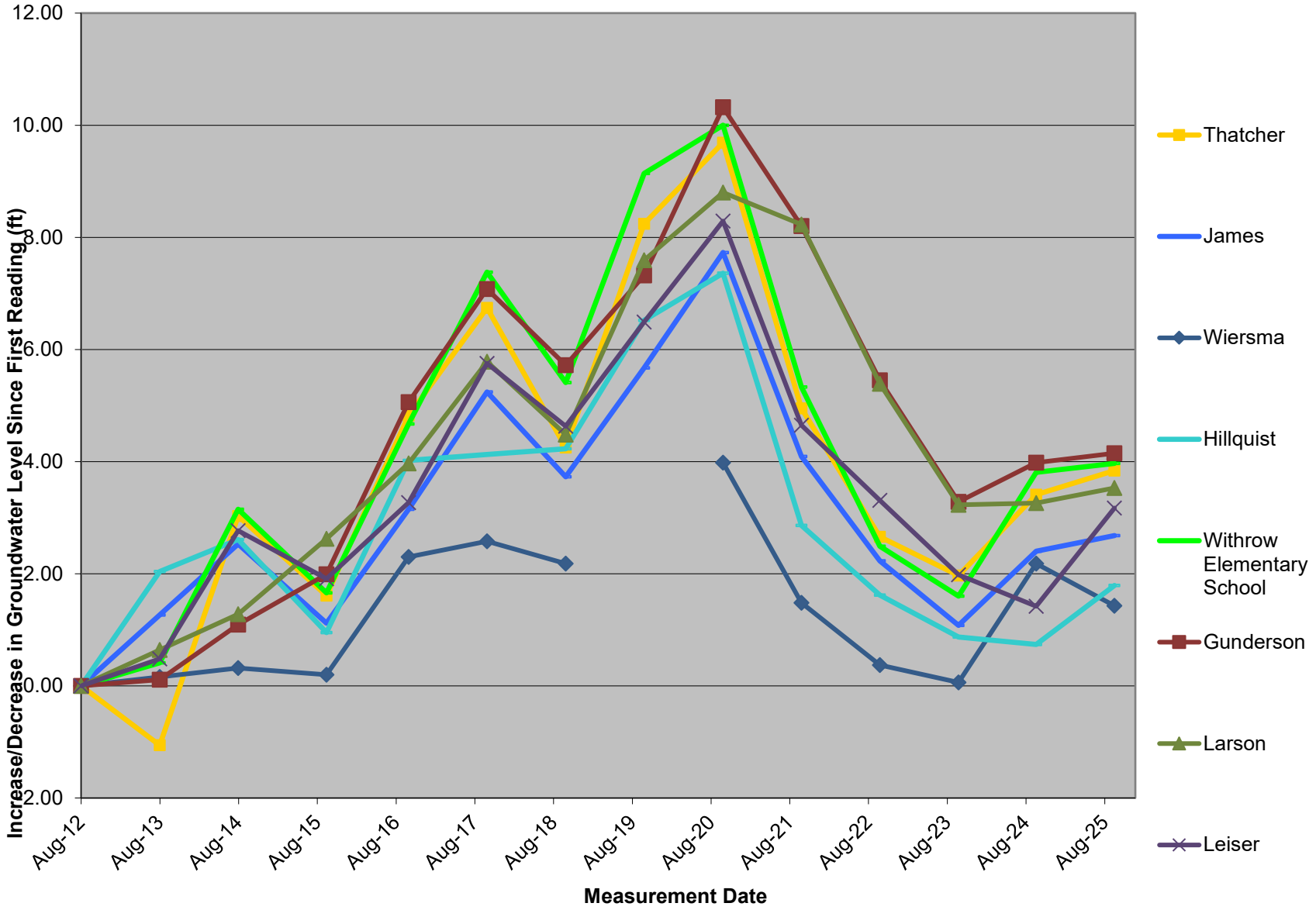

Figure 4. Groundwater Level Change Over Time – Prairie Du Chien Aquifer Wells.

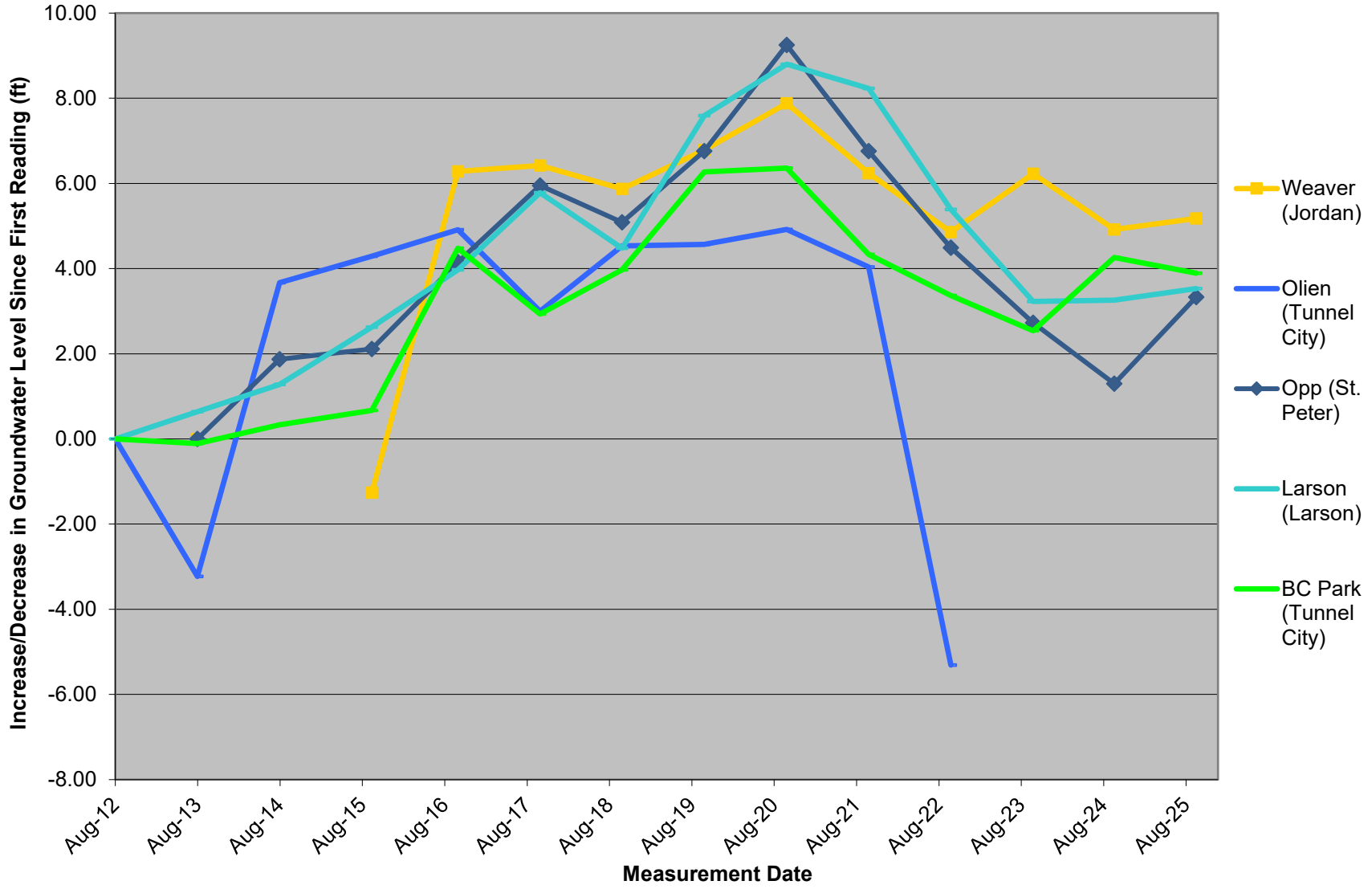

Figure 5. Groundwater Level Change Over Time – Wells in All Other Aquifers