New Hampshire Groundwater Level Monitoring

December, 2020

New Hampshire Geological Survey
29 Hazen Drive, PO Box 95
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January 6, 2021

GROUNDWATER CONDITIONS SUMMARY

According to the Northeast Regional Climate Center (NRCC) at Cornell University, New Hampshire received an average of 5.07 inches of precipitation during the month of December, which is 1.30 inches above normal or 134% of normal based on the 1981-2010 precipitation records. Precipitation was unevenly distributed across the northern and southern portions of the state (Figure 1). Southern NH received 5.61 inches and northern NH received 3.98 inches, respectively 146% and 110% of normal precipitation. Figure 2 shows the percent of normal precipitation from November 29th to December 30th. See more precipitation figures here.

Figure 1. Northern (1) and Southern (2) portions of NH, courtesy of NRCC.

As of December 29th, only 48% of the state was abnormally dry, and 12% was in moderate drought (Figure 3). This month's precipitation and subsequent snowmelt has significantly reduced drought conditions across the state compared to the end of last month. However, many groundwater wells are still below their monthly average.

Figures 2 and 3 show the monthly status of groundwater levels for both bedrock and overburden wells in the network. Only wells with a period of record (POR) 10 years or more are placed within statistical categories of low through high (symbols red through blue, respectively). Bedrock wells are installed into bedrock and overburden wells are installed in the unconsolidated materials above bedrock.

A slight majority of the wells in the network are experiencing normal to high groundwater levels (Table 1). Low to below normal water levels persist in the overburden wells of Deerfield, New Durham, Ossipee, Franklin, and Lancaster. The bedrock well in Deerfield also remains low. Compared to last month, groundwater levels in all of the network wells have risen except the overburden wells in Greenfield and at the Concord airport (CVW-02.1). Groundwater levels in overburden wells in Campton, Concord (CVW-04), and Lisbon have recovered to normal from low to below normal levels since last month. Water levels in both of the overburden wells in Newport have risen nearly two feet, placing one within normal conditions. The bedrock wells in East Kingston and Hooksett have also recovered to normal.

The New Hampshire Geological Survey's groundwater monitoring network (Figures 2 and 3) currently includes 11 bedrock and 20 overburden observation wells, all of which are measured monthly by hand. Using the monthly hand readings, monthly averages and percentile statistics were calculated and are summarized in Figures 2 and 3, the following hydrographs*, and in Table 1.

*The hydrographs show the following data over a period of 12 months: (1) monthly groundwater depths in red, (2) the monthly average over the period of record (POR) of the well in black, and (3) color-coded statistical ranges over the POR of the well. Note the POR is listed below each month's column on the chart and reported as the number of measurements for that respective month. This might include multiple readings in the same month and does not include any gaps in data so therefore may not represent a continuous period.

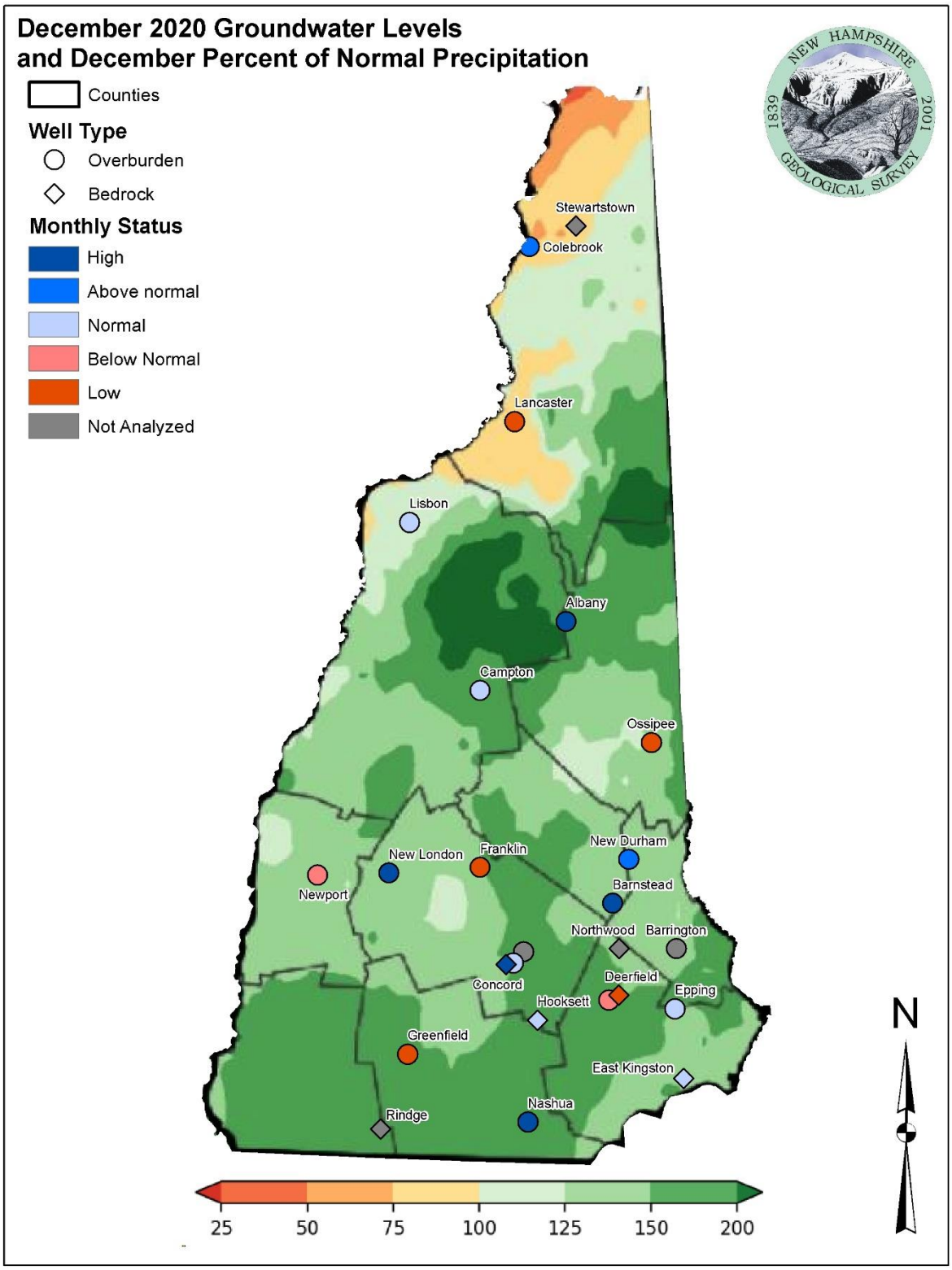


Figure 2. Groundwater Monitoring Network showing groundwater levels relative to statistical envelopes calculated over each well's period of record (POR) and percent normal precipitation map for November 30 – December 29, 2020 (Northeast Regional Climate Center).

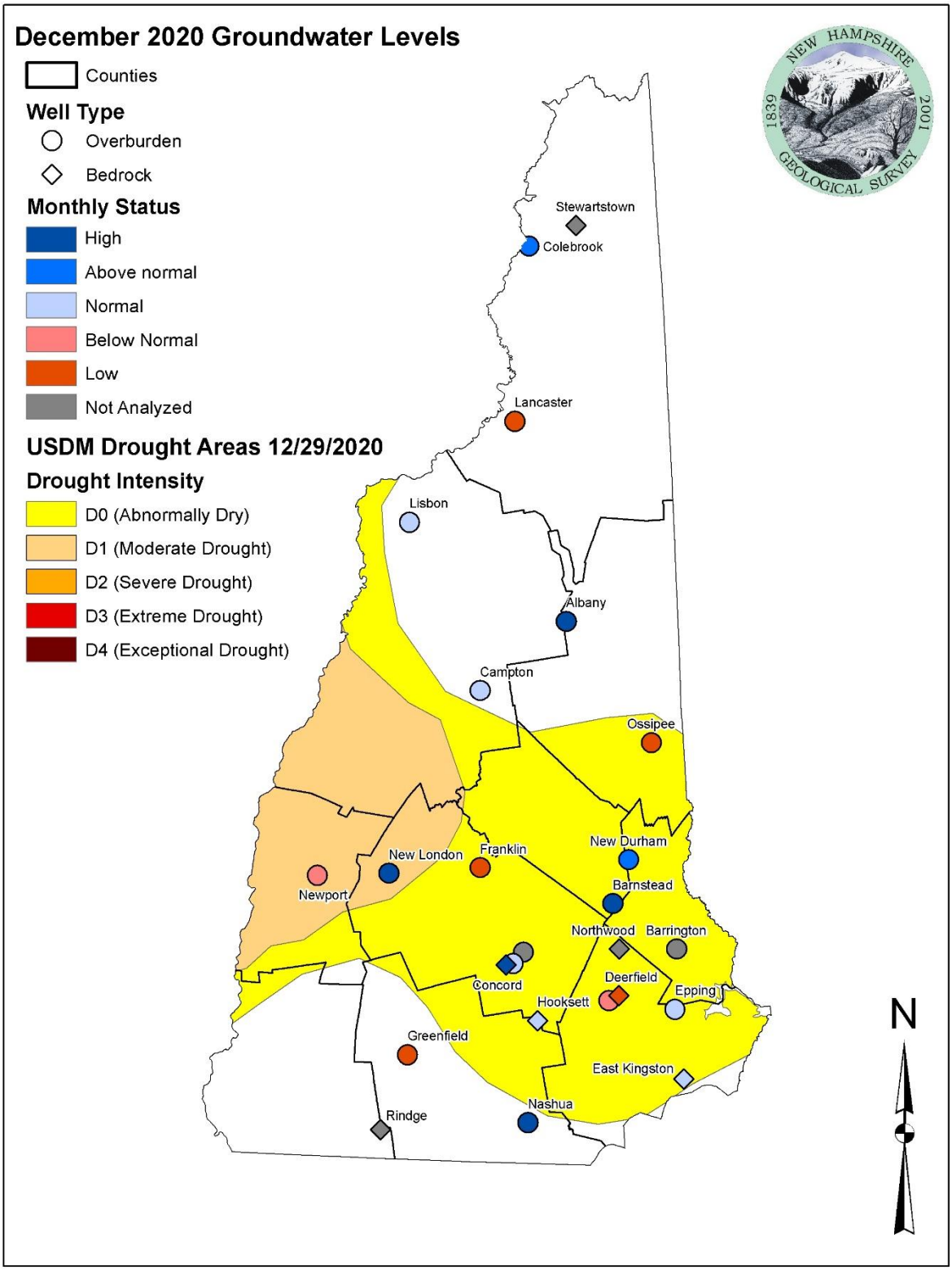
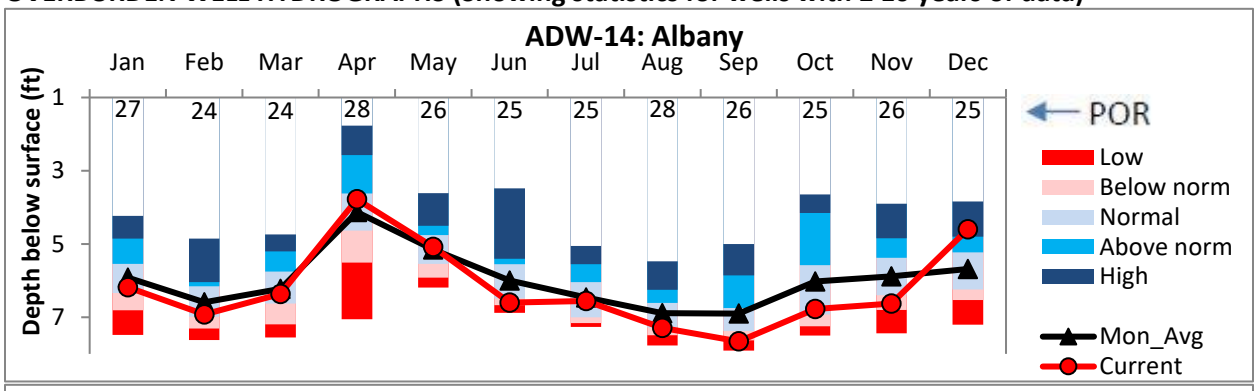
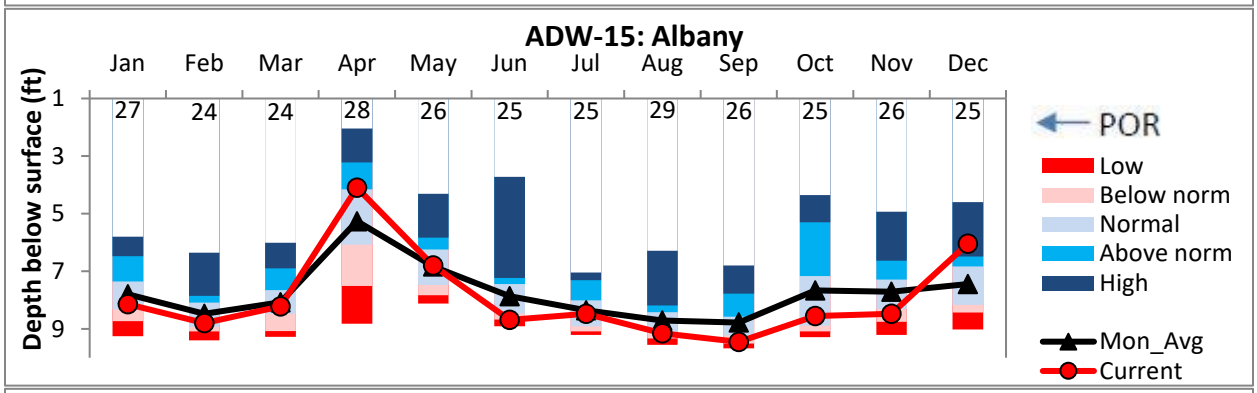
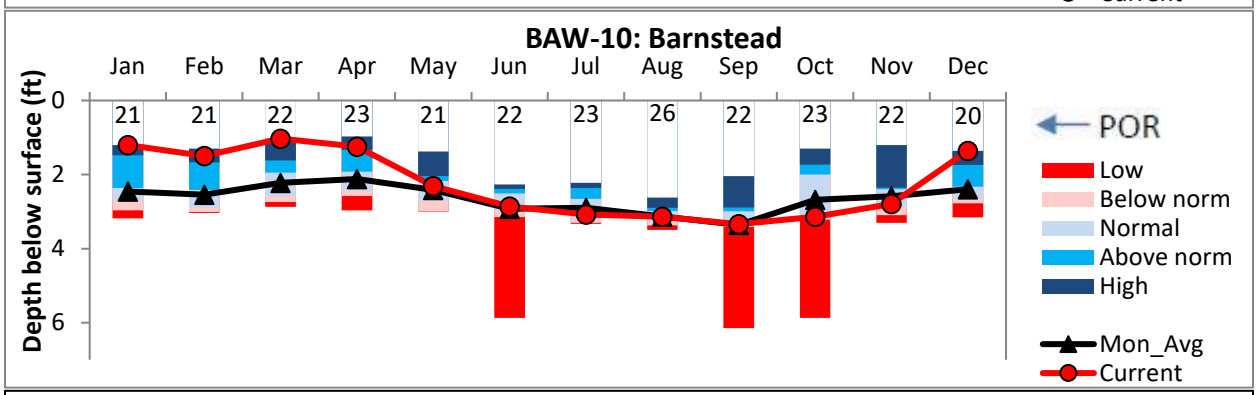


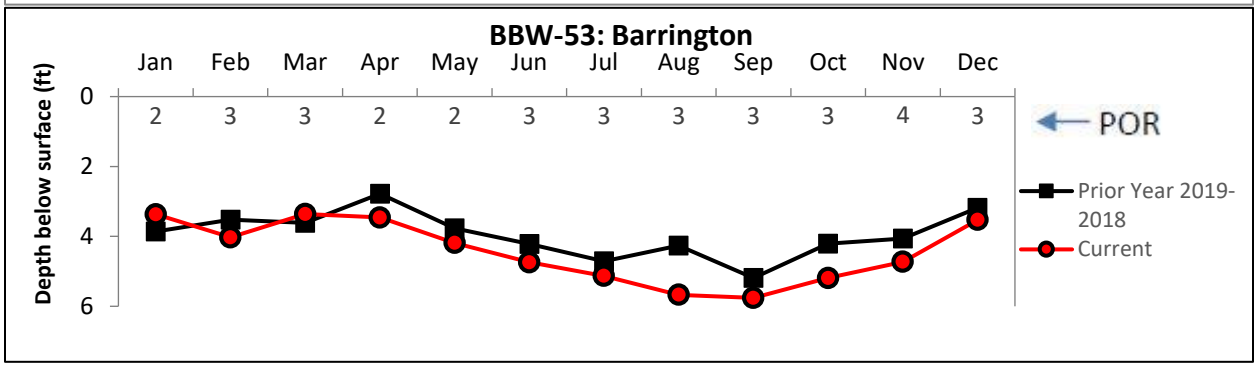
Figure 3. Groundwater Monitoring Network showing groundwater levels relative to statistical envelopes calculated over each well's period of record (POR) and drought areas according to data released by the U.S. Drought Monitor on December 29, 2020.

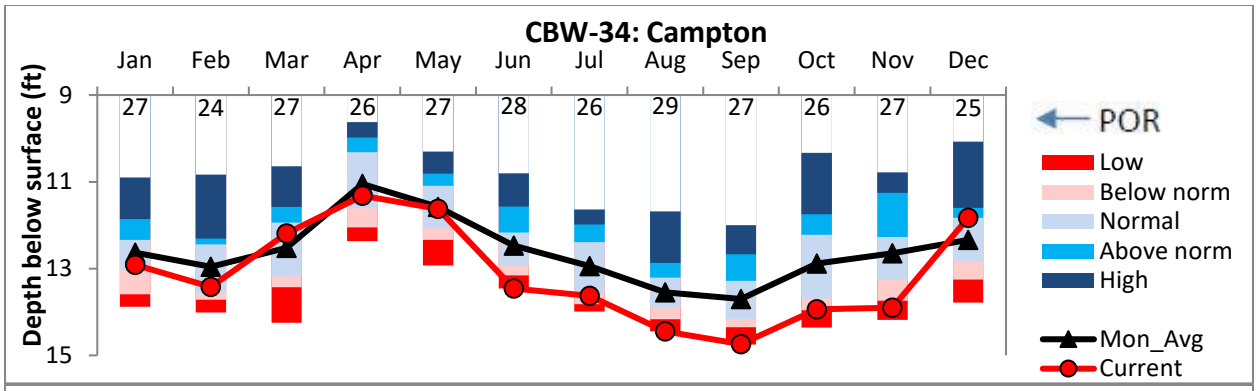
OVERBURDEN WELL HYDROGRAPHS (Showing statistics for wells with ≥ 10 years of data)

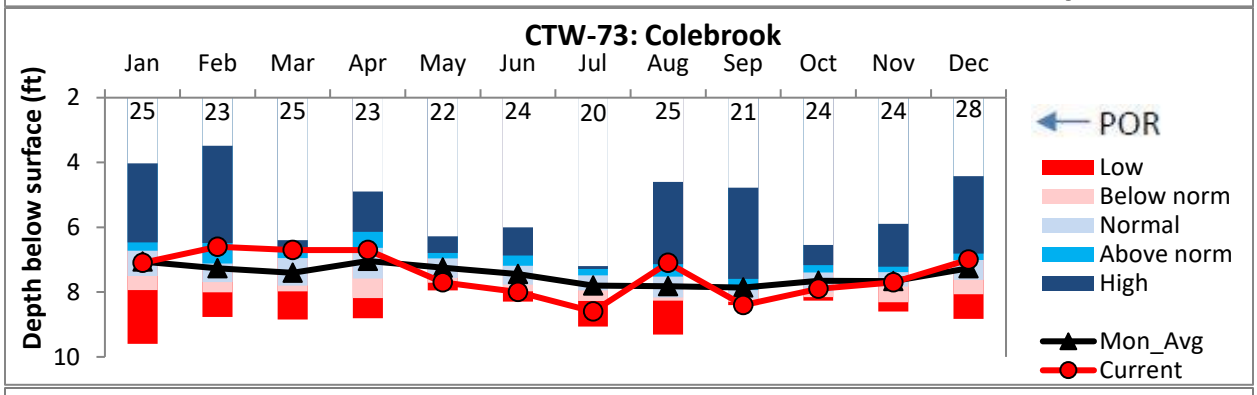


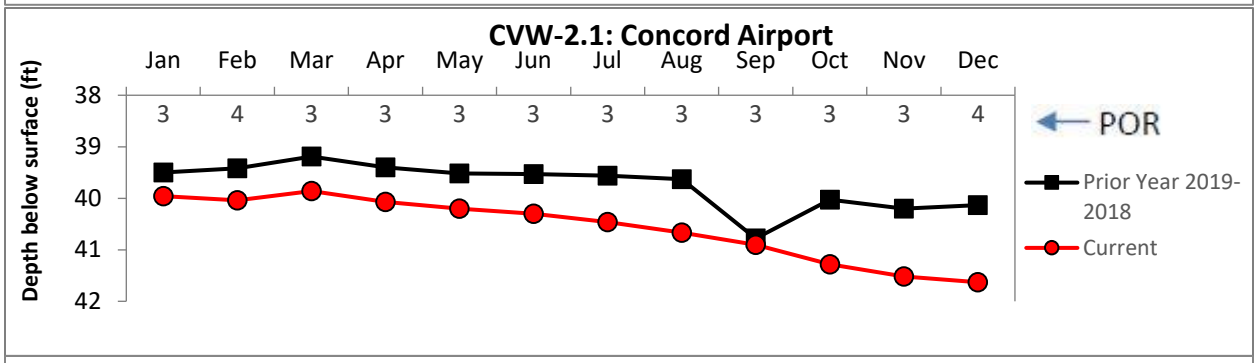


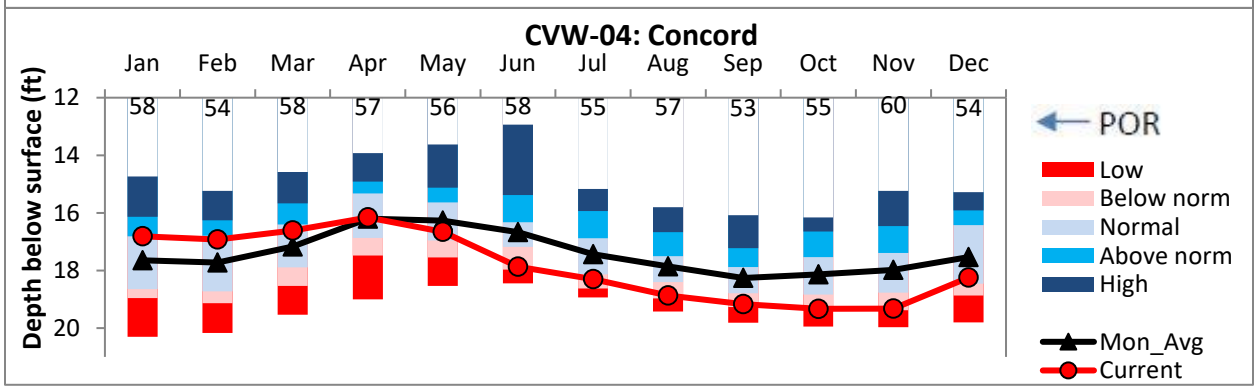


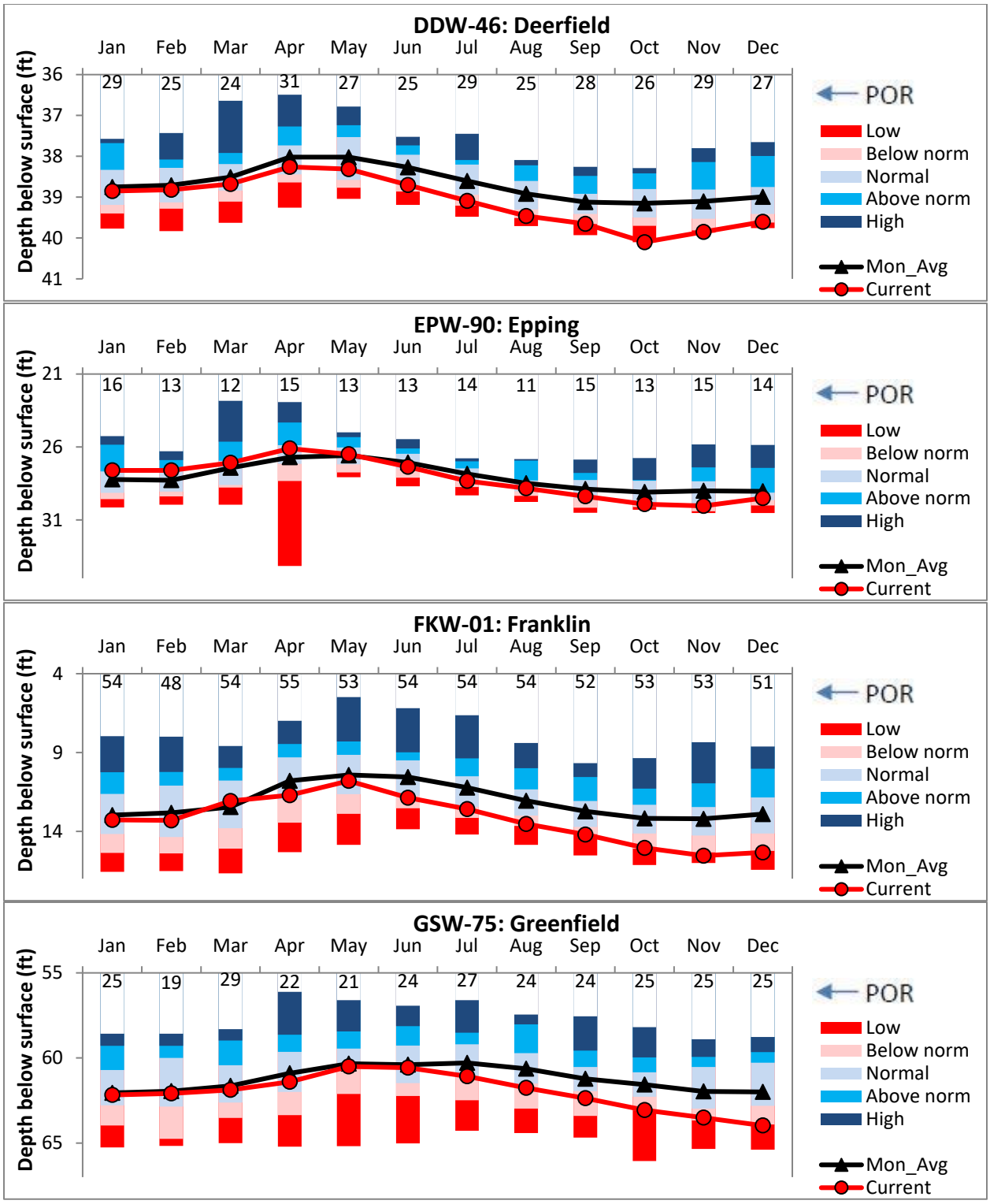


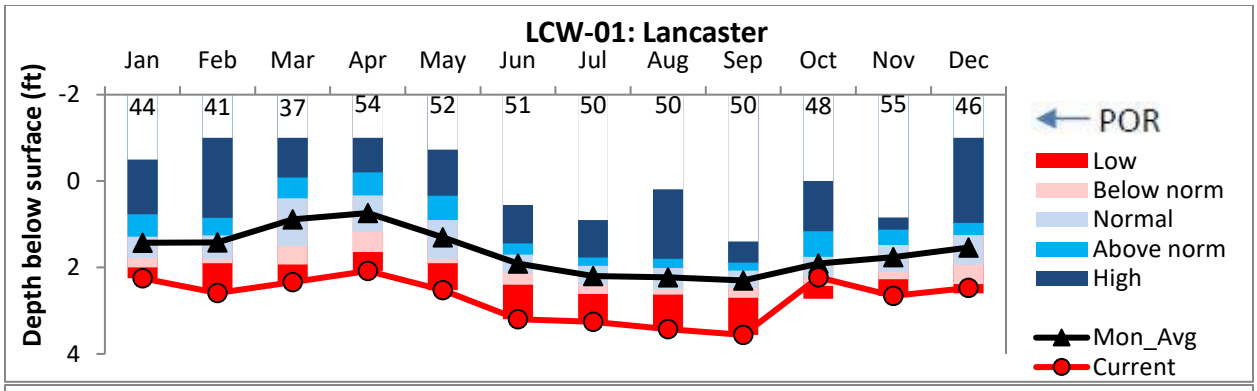

CBW-34: Campton
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
27 24 27 26 27 28 26 29 27 26 27 25
Depth below surface (ft)
9
11
13
15
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

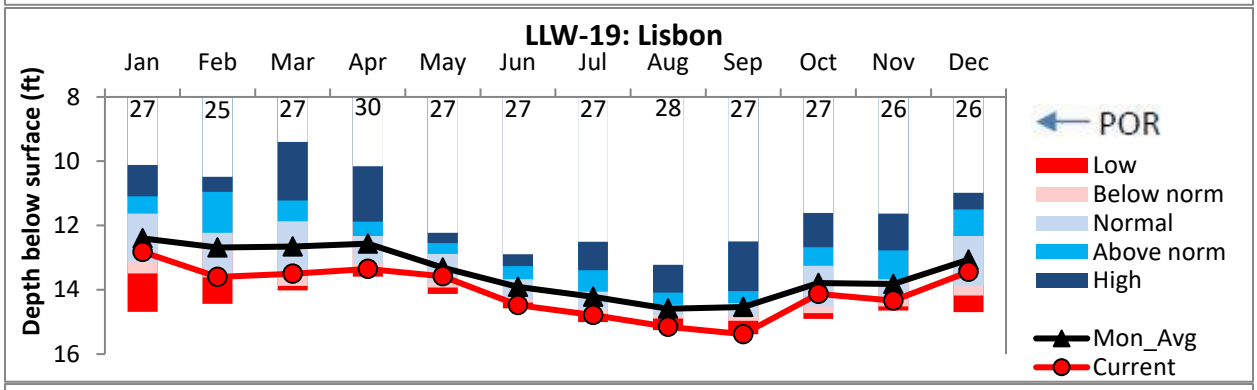

CTW-73: Colebrook
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
25 23 25 23 22 24 20 25 21 24 24 28
Depth below surface (ft)
2
4
6
8
10
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

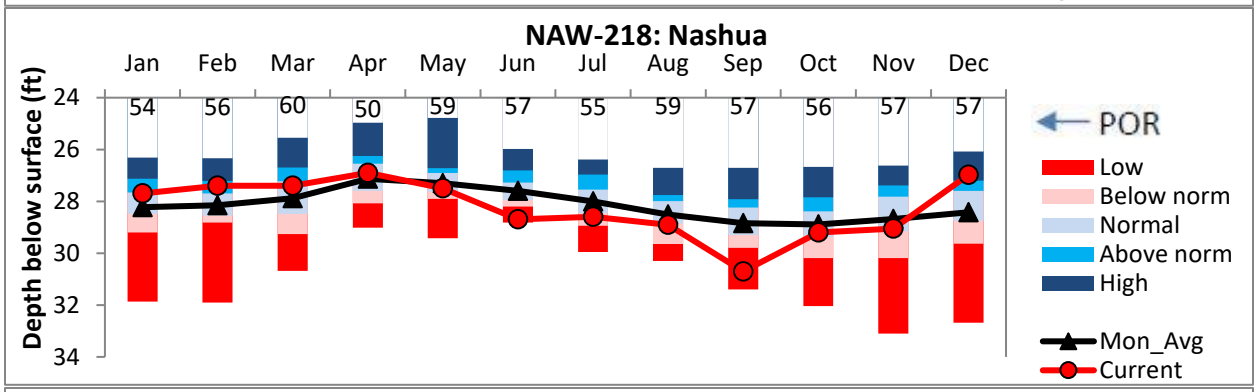

CVW-2.1: Concord Airport
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
3 4 3 3 3 3 3 3 3 3 3 4
Depth below surface (ft)
38
39
40
41
42
POR
Prior Year 2019-2018
Current

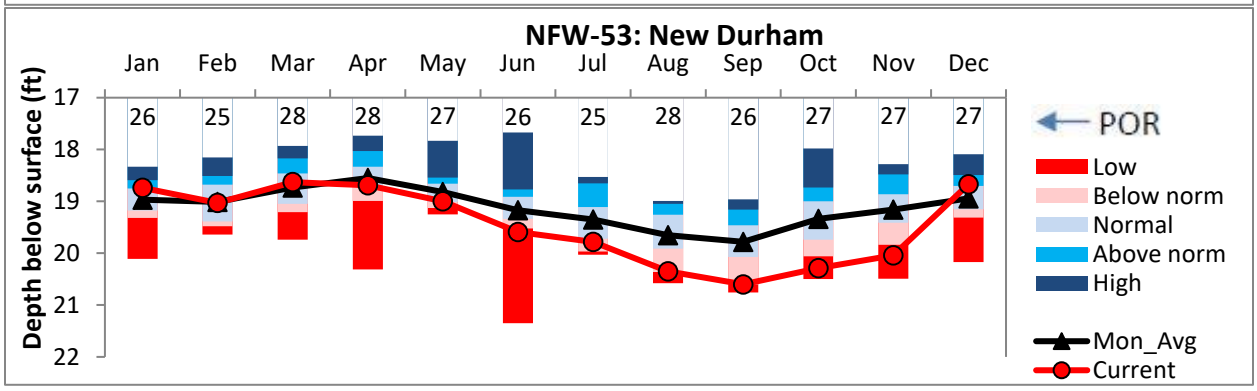

CVW-04: Concord
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
58 54 58 57 56 58 55 57 53 55 60 54
Depth below surface (ft)
12
14
16
18
20
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

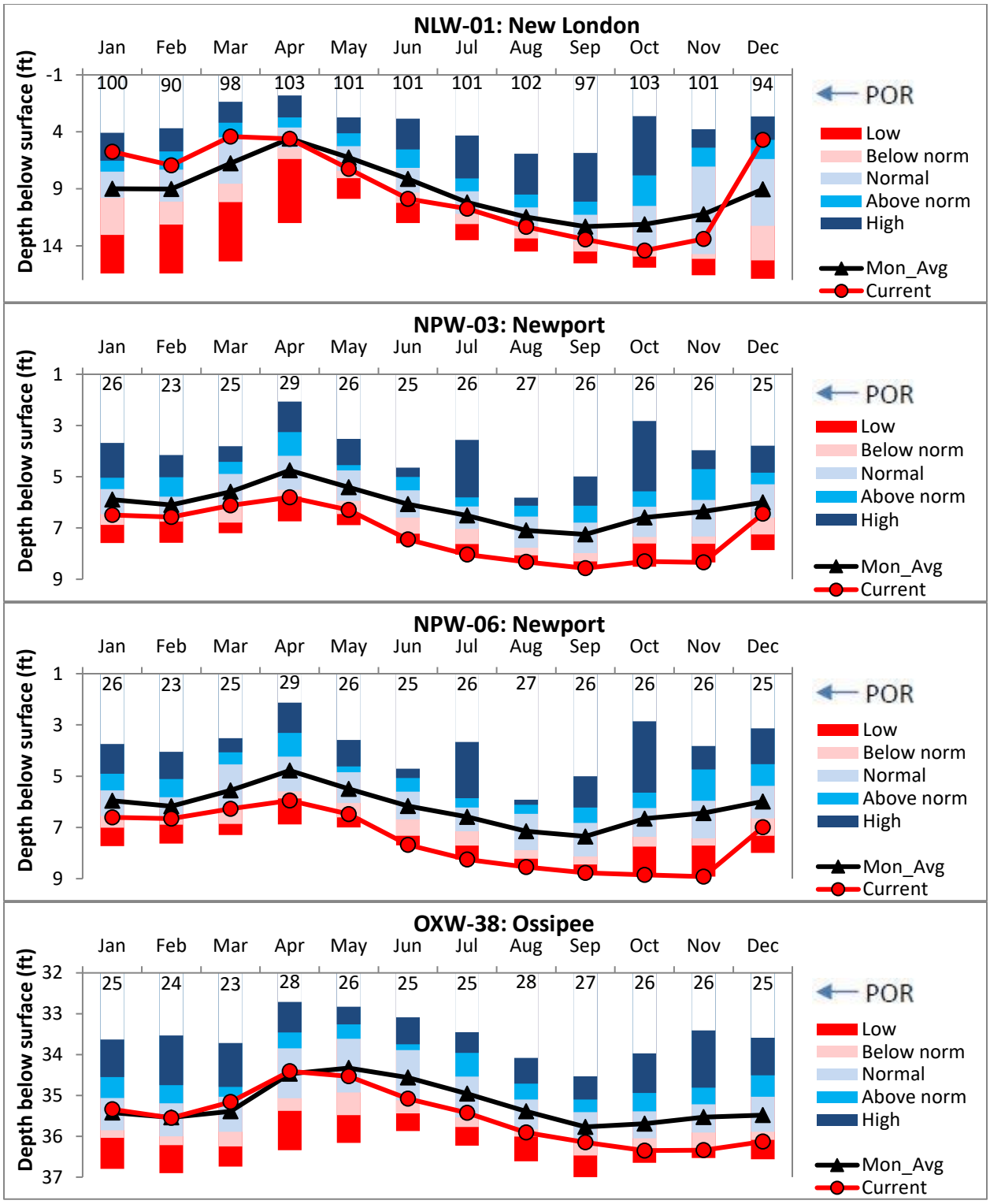

DDW-46: Deerfield
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
29 25 24 31 27 25 29 25 28 26 29 27
Depth below surface (ft)
36 37 38 39 40 41
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
EPW-90: Epping
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
16 13 12 15 13 13 14 11 15 13 15 14
Depth below surface (ft)
21 26 31
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
FKW-01: Franklin
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
54 48 54 55 53 54 54 54 52 53 53 51
Depth below surface (ft)
4 9 14
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
GSW-75: Greenfield
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
25 19 29 22 21 24 27 24 24 25 25 25
Depth below surface (ft)
55 60 65
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


LCW-01: Lancaster
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
44 41 37 54 52 51 50 50 50 48 55 46
Depth below surface (ft)
-2
0
2
4
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

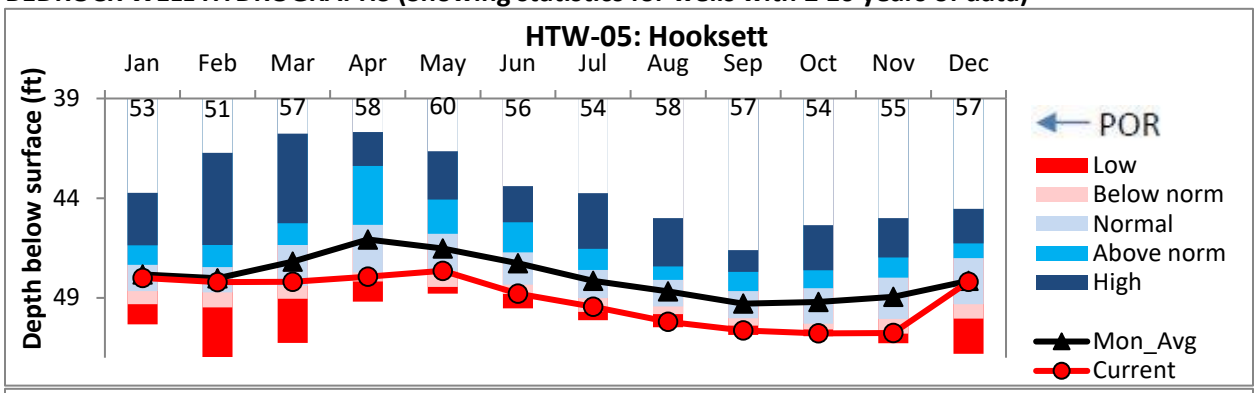

LLW-19: Lisbon
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
27 25 27 30 27 27 27 28 27 27 26 26
Depth below surface (ft)
8
10
12
14
16
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

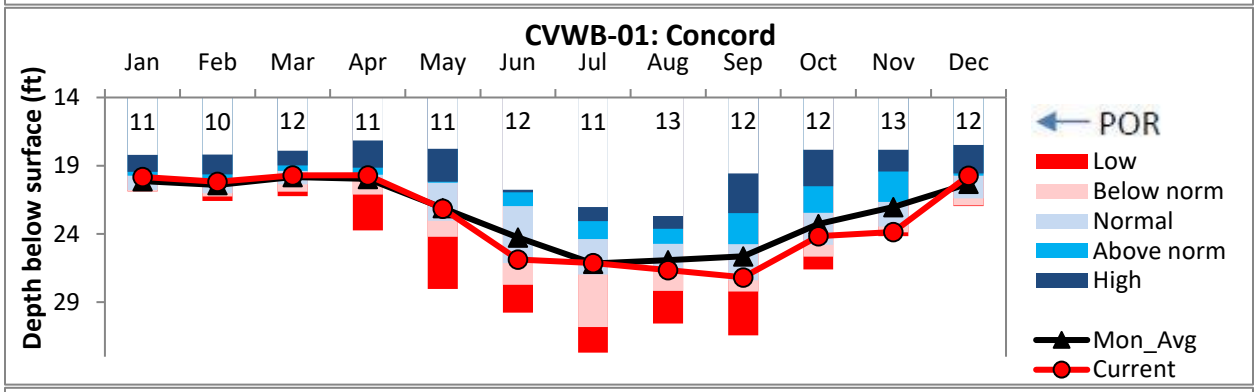

NAW-218: Nashua
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
54 56 60 50 59 57 55 59 57 56 57 57
Depth below surface (ft)
24
26
28
30
32
34
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

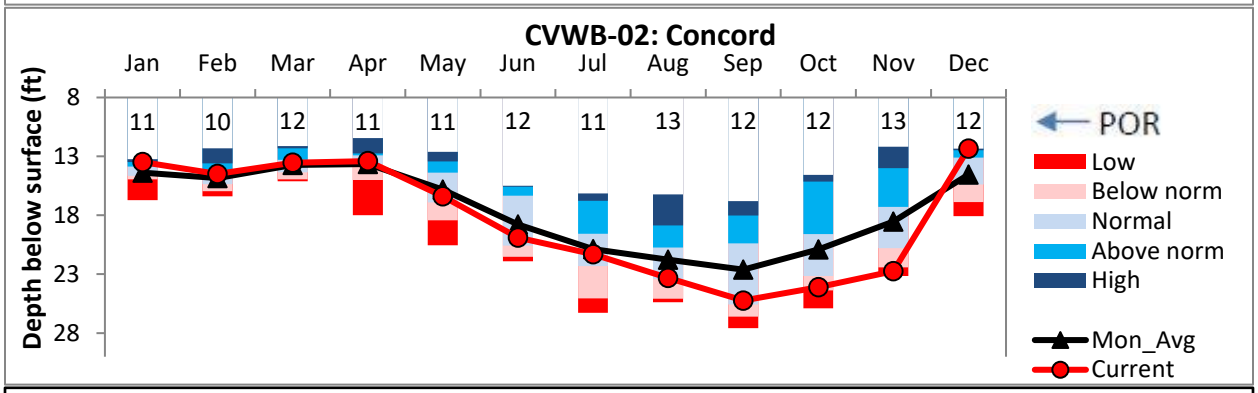

NFW-53: New Durham
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
26 25 28 28 27 26 25 28 26 27 27 27
Depth below surface (ft)
17
18
19
20
21
22
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

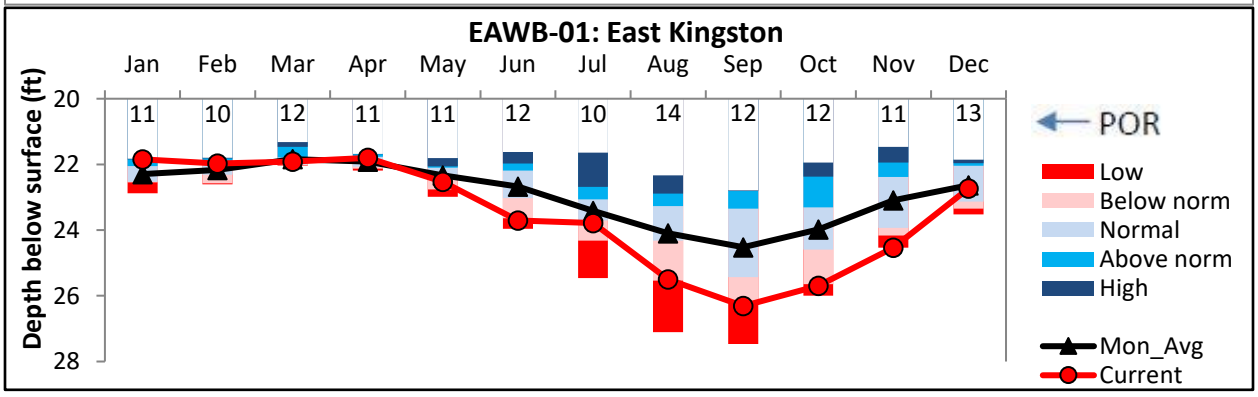

NLW-01: New London
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
100 90 98 103 101 101 101 102 97 103 101 94
Depth below surface (ft)
-1
4
9
14
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NPW-03: Newport
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
26 23 25 29 26 25 26 27 26 26 26 25
Depth below surface (ft)
1
3
5
7
9
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NPW-06: Newport
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
26 23 25 29 26 25 26 27 26 26 26 25
Depth below surface (ft)
1
3
5
7
9
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
OXW-38: Ossipee
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
25 24 23 28 26 25 25 28 27 26 26 25
Depth below surface (ft)
32
33
34
35
36
37
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

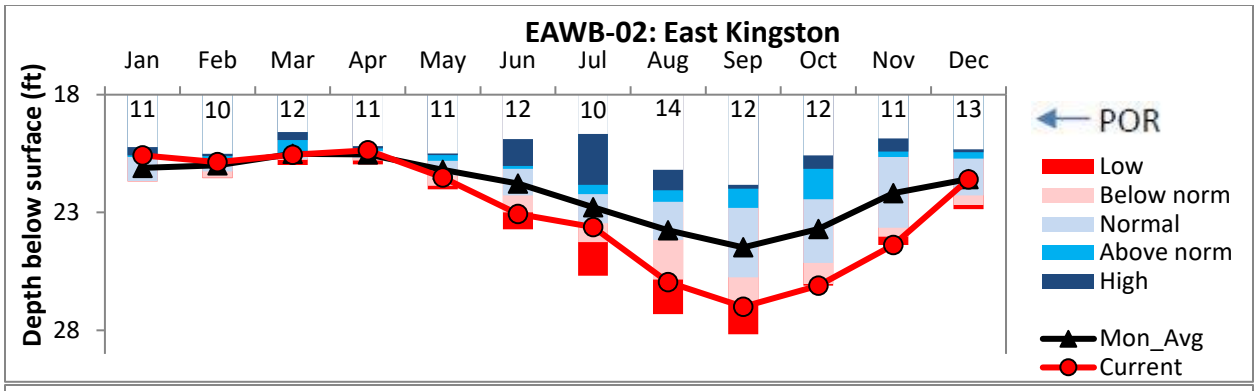
BEDROCK WELL HYDROGRAPHS (Showing statistics for wells with ≥ 10 years of data)

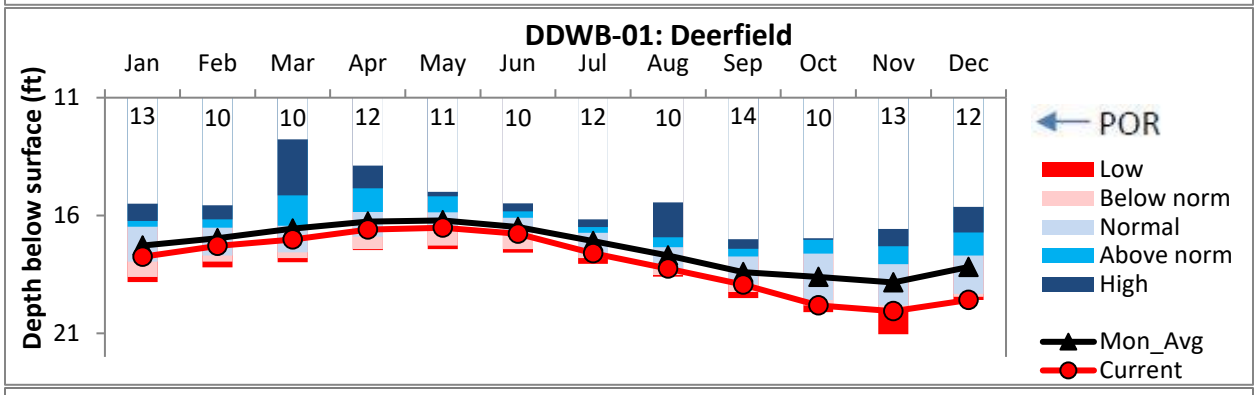


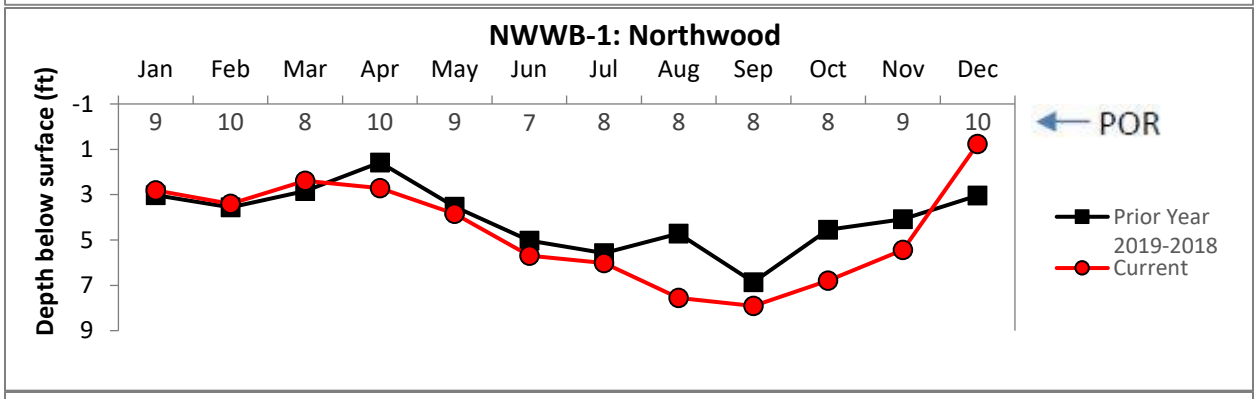


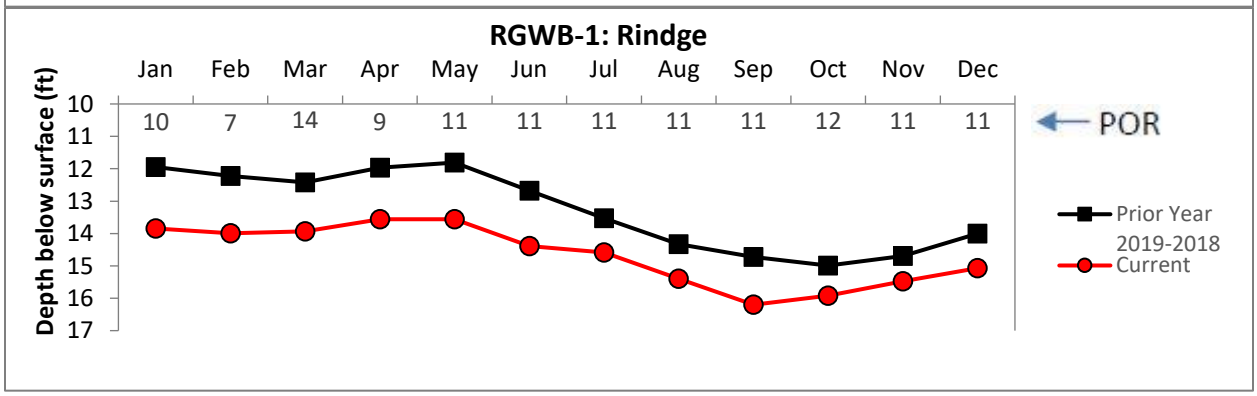





EAWB-02: East Kingston
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
11 10 12 11 11 12 10 14 12 12 11 13
Depth below surface (ft)
18
23
28
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


DDWB-01: Deerfield
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
13 10 10 12 11 10 12 10 14 10 13 12
Depth below surface (ft)
11
16
21
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


NWWB-1: Northwood
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
9 10 8 10 9 7 8 8 8 8 9 10
Depth below surface (ft)
-1
1
3
5
7
9
POR
Prior Year
2019-2018
Current


RGWB-1: Rindge
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
10 7 14 9 11 11 11 11 11 12 11 11
Depth below surface (ft)
10
11
12
13
14
15
16
17
POR
Prior Year
2019-2018
Current

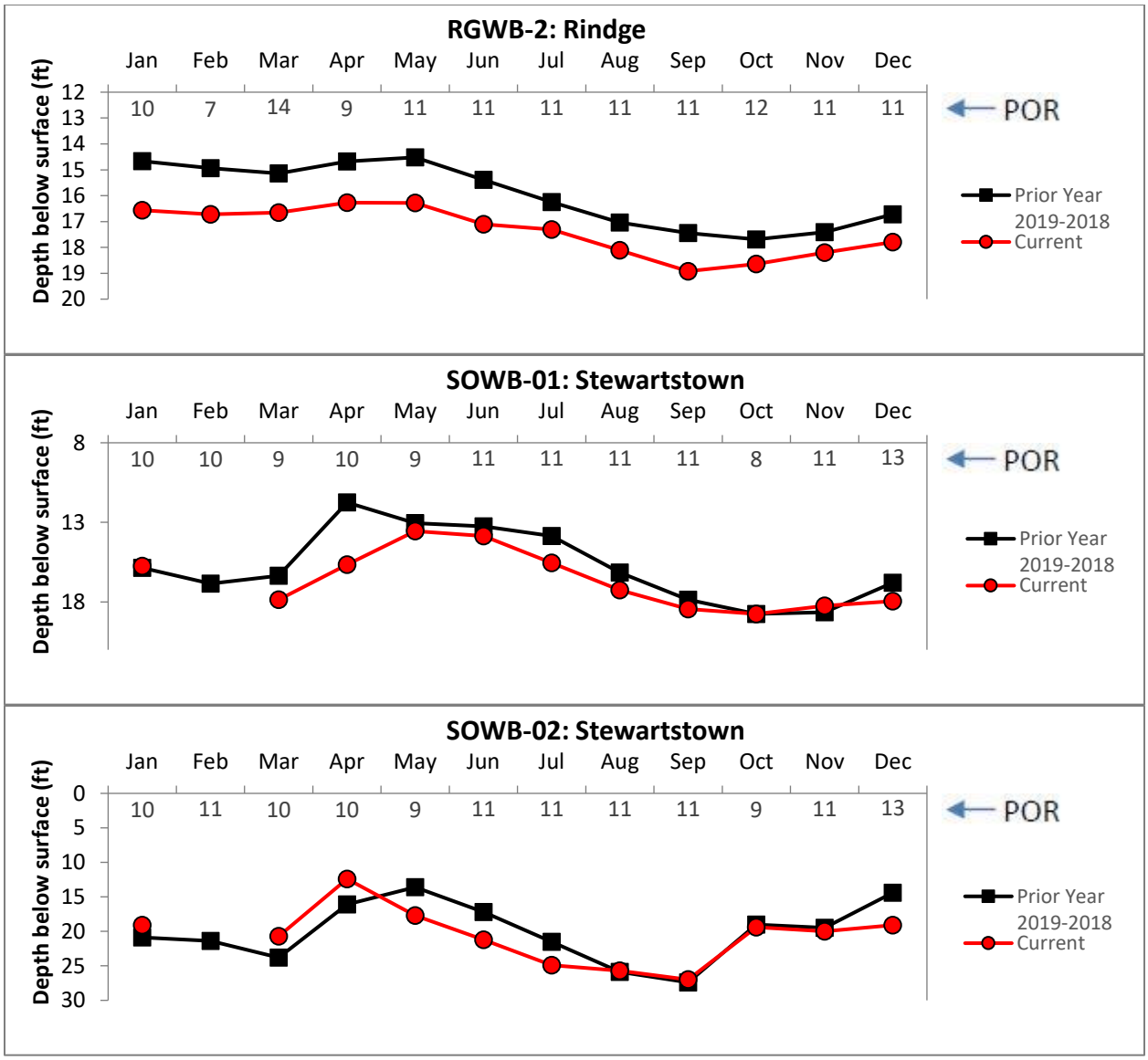

RGWB-2: Rindge
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
10 7 14 9 11 11 11 11 11 12 11 11
POR
Depth below surface (ft)
12 13 14 15 16 17 18 19 20
Prior Year
2019-2018
Current
SOWB-01: Stewartstown
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
10 10 9 10 9 11 11 11 11 8 11 13
POR
Depth below surface (ft)
8 13 18
Prior Year
2019-2018
Current
SOWB-02: Stewartstown
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
10 11 10 10 9 11 11 11 11 9 11 13
POR
Depth below surface (ft)
0 5 10 15 20 25 30
Prior Year
2019-2018
Current

Table 1. Summary of groundwater levels sorted by region (dark blue – high, blue – above normal, light blue – normal, pink – below normal, red – low.

Well	Town	Well type	Screen/ open Interval (ft)	Depth to Water (ft)	Monthly Average (ft)	Current Status	Departure from Avg. (ft)	Change since last month (ft)
ADW-14	Albany	Overburden	77.5-79.5	4.6	5.68	High	1.08	2.03
ADW-15	Albany	Overburden	16-18	6.04	7.44	High	1.4	2.43
BAW-10	Barnstead	Overburden	23-25	1.36	2.4	High	1.04	1.43
BBW-53	Barrington	Overburden	21-23	3.53	-	Not Analyzed	-	1.2
CBW-34	Campton	Overburden	21-23	11.83	12.34	Normal	0.51	2.07
CTW-73	Colebrook	Overburden	105-107	7	7.27	Above norm	0.27	0.7
CVW-02.1	Concord	Overburden	59.8-61.8	41.63	-	Not Analyzed	-	-0.11
CVW-04	Concord	Overburden	25-27	18.25	17.53	Normal	-0.72	1.07
DDW-46	Deerfield	Overburden	59.8-61.8	39.6	38.99	Below norm	-0.61	0.25
EPW-90	Epping	Overburden	39.45-40.7	29.51	29.04	Normal	-0.47	0.53
FKW-01	Franklin	Overburden	45.5-47.5	15.33	12.91	Low	-2.42	0.21
GSW-75	Greenfield	Overburden	35.8-37.8	63.97	61.99	Low	-1.98	-0.46
LCW-01	Lancaster	Overburden	28-30	2.47	1.54	Low	-0.93	0.19
LLW-19	Lisbon	Overburden	49.8-52.3	13.44	13.06	Normal	-0.38	0.9
NAW-218	Nashua	Overburden	66-68	26.98	28.42	High	1.44	2.07
NFW-53	New Durham	Overburden	28-30	18.67	18.94	Above norm	0.27	1.37
NLW-01	New London	Overburden	40-42	4.69	9.04	High	4.35	8.7
NPW-03	Newport	Overburden	40.5-42.5	6.44	6	Normal	-0.44	1.9
NPW-06	Newport	Overburden	58-60	6.99	5.99	Below norm	-1	1.93
OXW-38	Ossipee	Overburden	0-22.55	36.13	35.48	Low	-0.65	0.21
CVWB-01	Concord	Bedrock	470-480	19.73	20.31	Normal	0.58	4.13
CVWB-02	Concord	Bedrock	0-315	12.33	14.53	High	2.2	10.41
DDWB-01	Deerfield	Bedrock	0-300	19.58	18.19	Low	-1.39	0.48
EAWB-01	East Kingston	Bedrock	463-473	22.73	22.63	Normal	-0.1	1.8
EAWB-02	East Kingston	Bedrock	0-323	21.6	21.58	Normal	-0.02	2.78
HTW-05	Hooksett	Bedrock	0-102.7	48.19	48.15	Normal	-0.04	2.57
NWWB-01	Northwood	Bedrock	0-130	0.77	-	Not Analyzed	-	4.67
RGWB-01	Rindge	Bedrock	391-401	15.07	-	Not Analyzed	-	0.41
RGWB-02	Rindge	Bedrock	0-285	17.79	-	Not Analyzed	-	0.41
SOWB-01	Stewartstown	Bedrock	443-453	17.95	-	Not Analyzed	-	0.3
SOWB-02	Stewartstown	Bedrock	0-303	19.1	-	Not Analyzed	-	0.9