New Hampshire Groundwater Level Monitoring

August, 2020

New Hampshire Geological Survey
29 Hazen Drive, PO Box 95
Concord, New Hampshire 03302-0095

September 2, 2020

GROUNDWATER CONDITIONS SUMMARY

Neither NOAA nor the Northeast Regional Climate Center (NRCC) at Cornell University have released their August precipitation statistics, which are expected to be released next week and will be crucial data to consider during the current drought. In the absence of those summaries, NRCC reports that precipitation across New Hampshire between July 27th and August 25th was much below average (Figure 1).

As of August 25th, moderate drought affects 92.85% of the state with severe drought affecting 23.44% of the state in the Seacoast and Merrimack Valley regions (Figure 2). Drought conditions expanded significantly on August 18th compared to the end of July.

Figures 1 and 2 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.

The majority of the state is experiencing below normal to low groundwater levels. Exceptions include a high well reading in Colebrook, and normal conditions in Albany, Barnstead, Epping, New London, and in one bedrock well in Concord. All but one of the monitoring wells in the network (CTW-73 in Colebrook) show that groundwater levels are lower compared to last month and are also below their monthly average over their POR (Table 1). For many wells, negative departures are increasing in magnitude due to below-average amounts of precipitation since May (see precipitation figures here).

The New Hampshire Geological Survey's groundwater monitoring network (Figures 1 and 2) 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 1 and 2, 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.

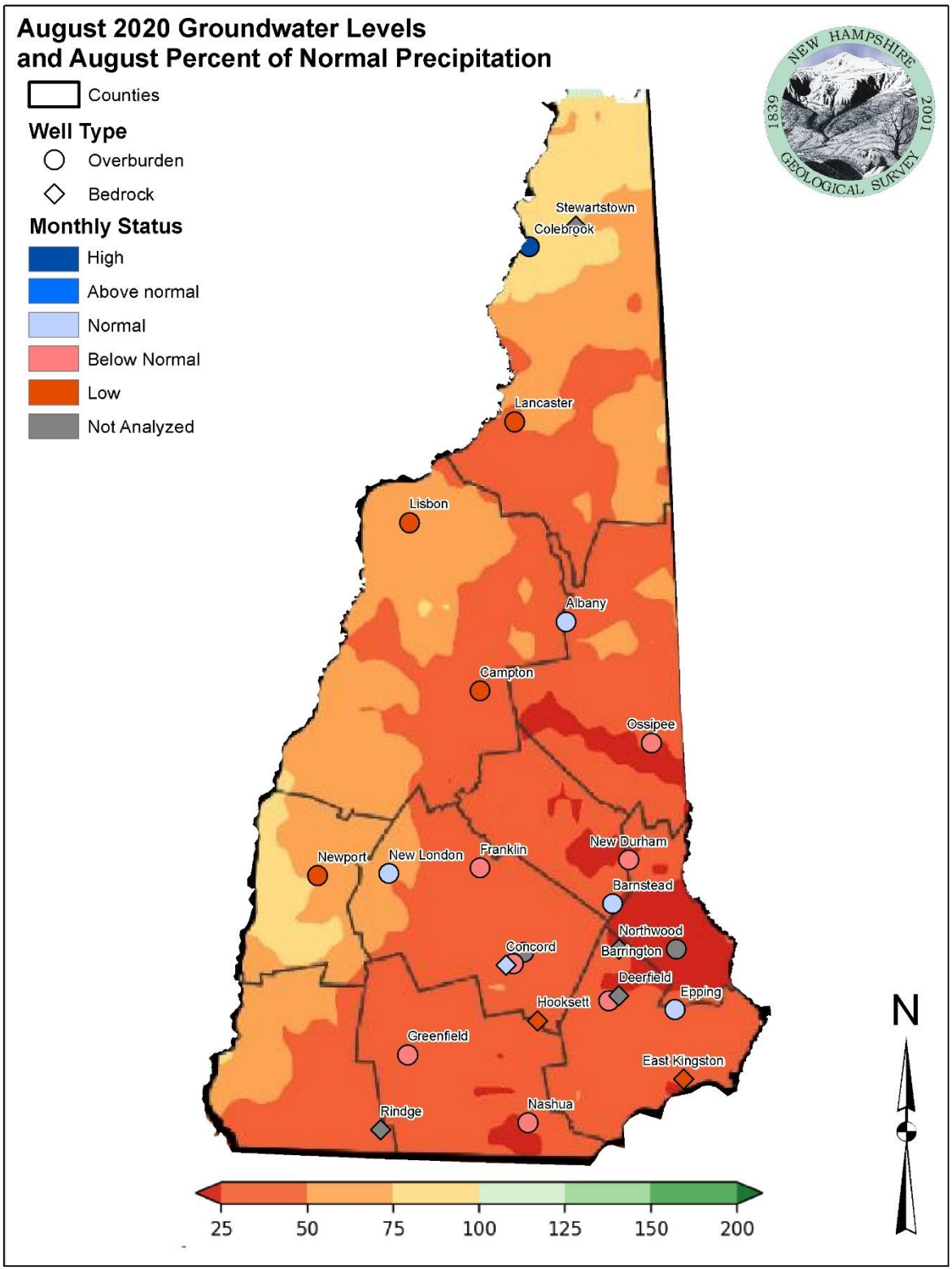


Figure 1. Groundwater Monitoring Network showing groundwater levels relative to statistical envelopes calculated over each well's period of record (POR) and percent normal precipitation map for July 27 – August 25 2020 (Northeast Regional Climate Center).

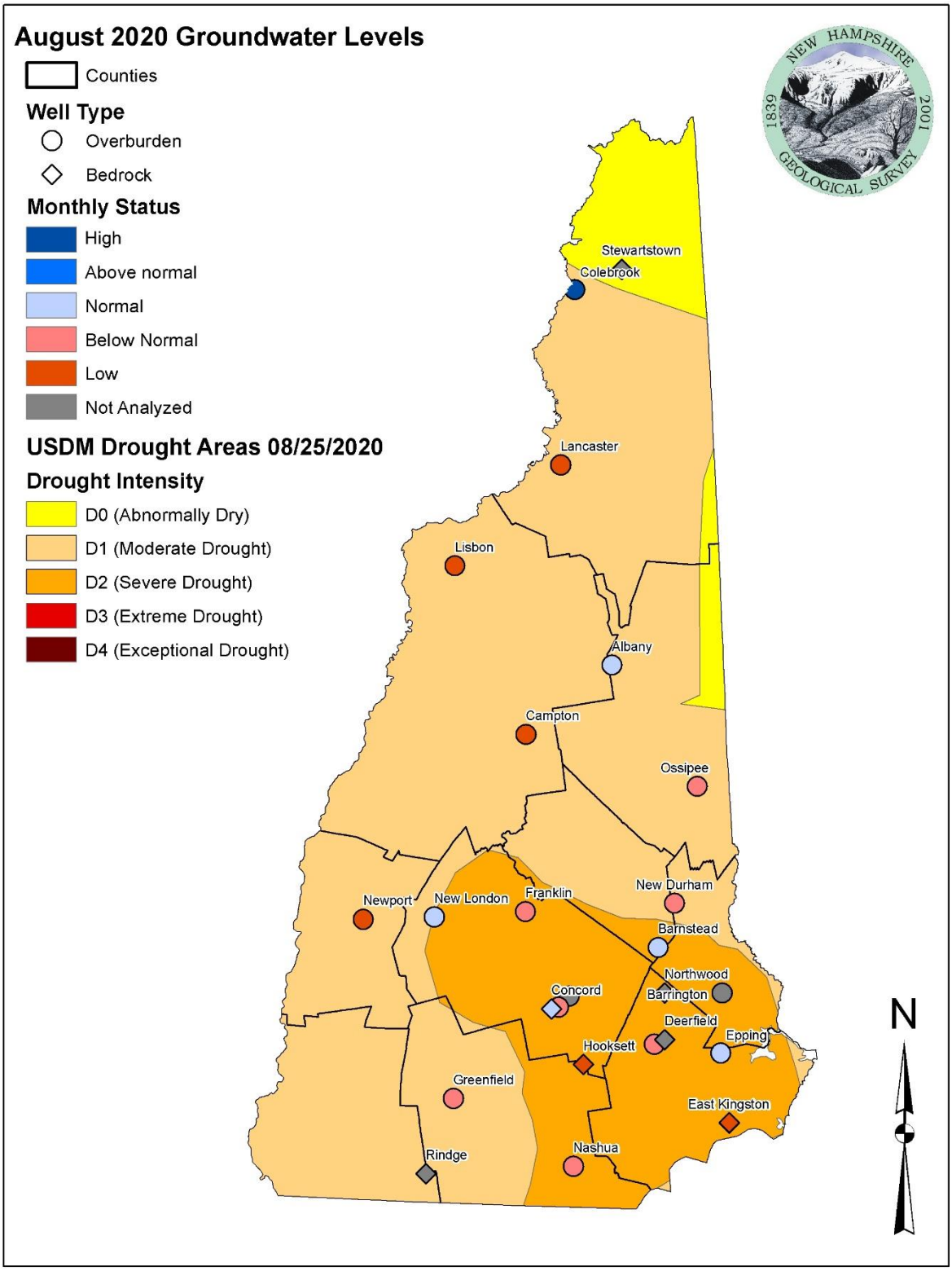
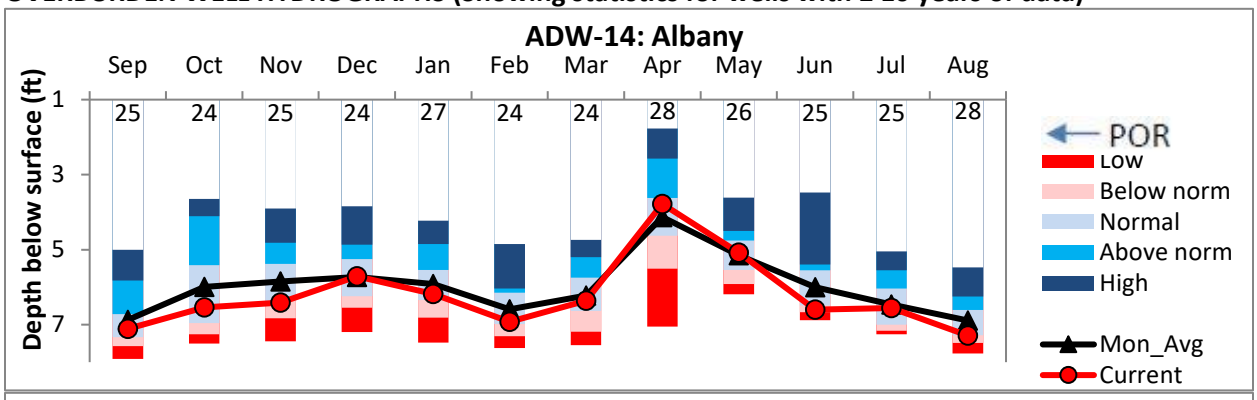
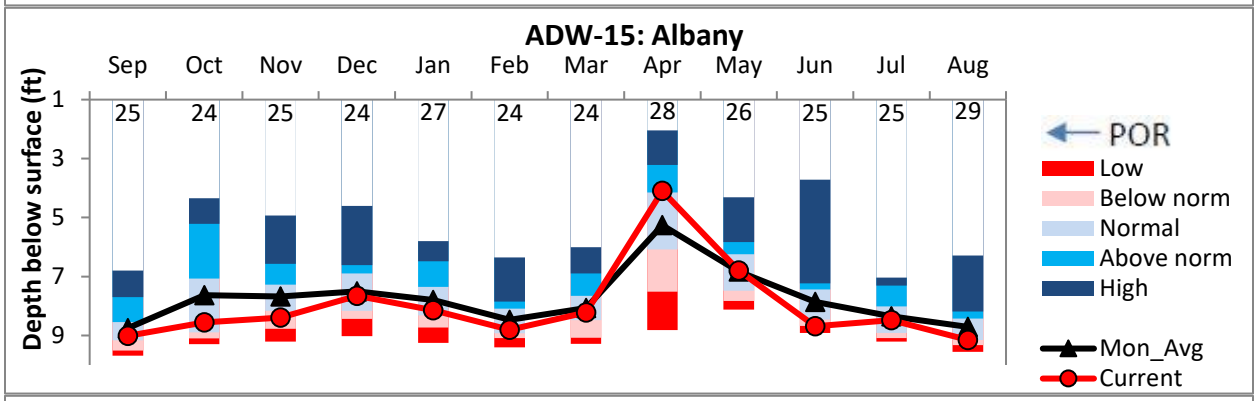
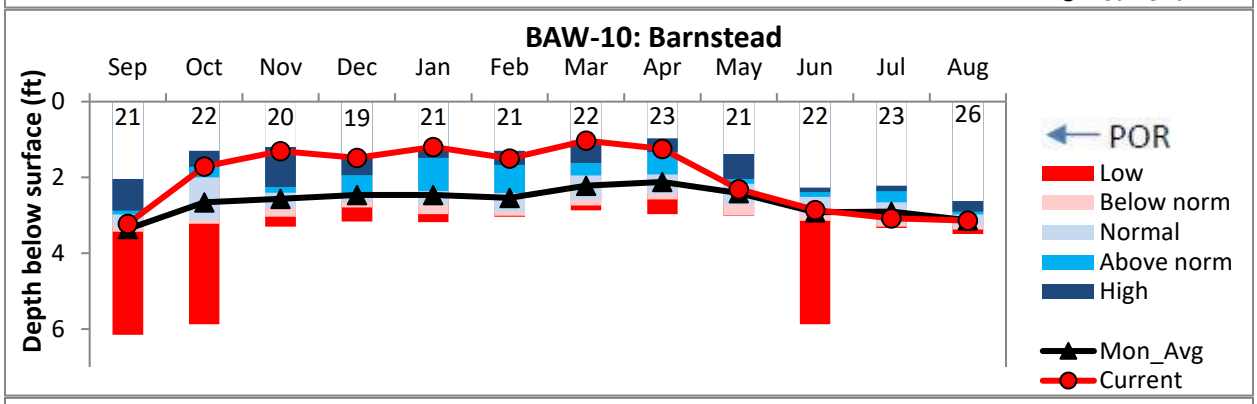


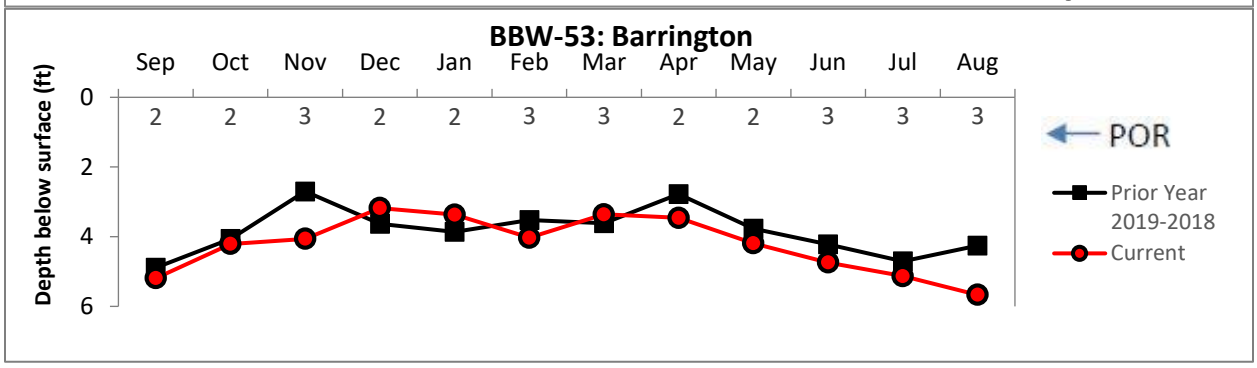
Figure 2. Groundwater Monitoring Network showing groundwater levels relative to statistical envelopes calculated over each well's period of record (POR) and drought areas according to data released by the U.S. Drought Monitor on August 25th, 2020.

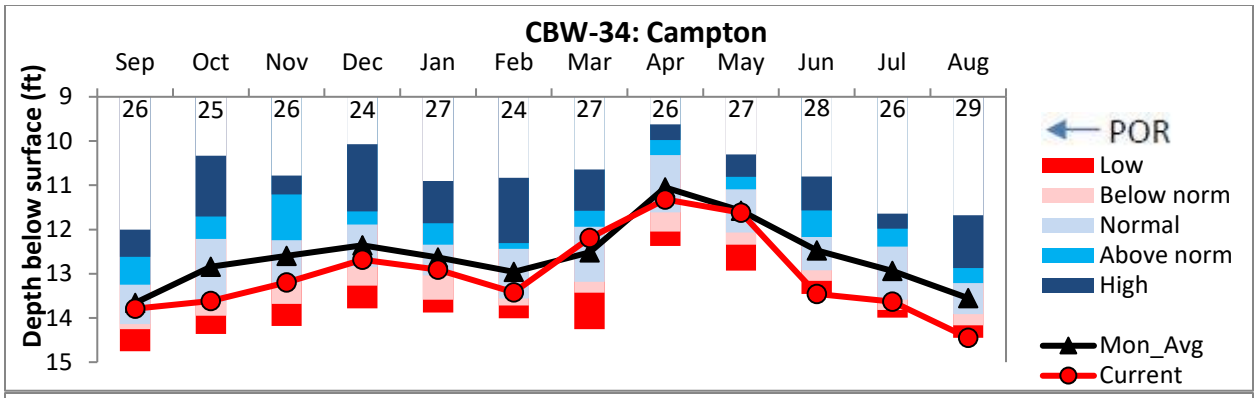
OVERBURDEN WELL HYDROGRAPHS (Showing statistics for wells with ≥ 10 years of data)

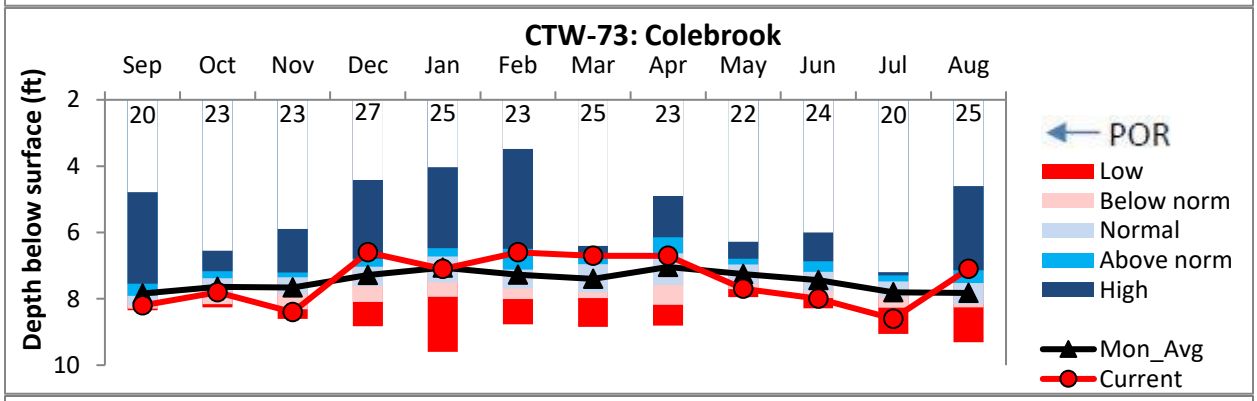


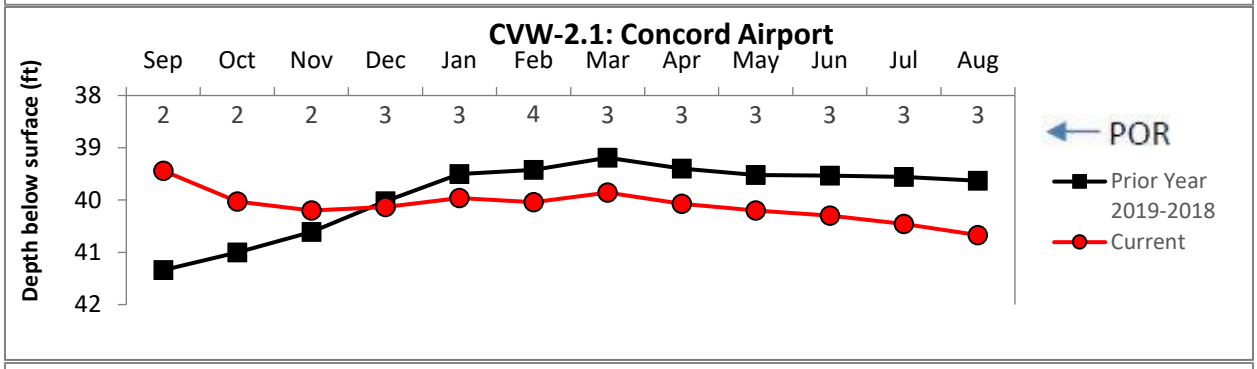


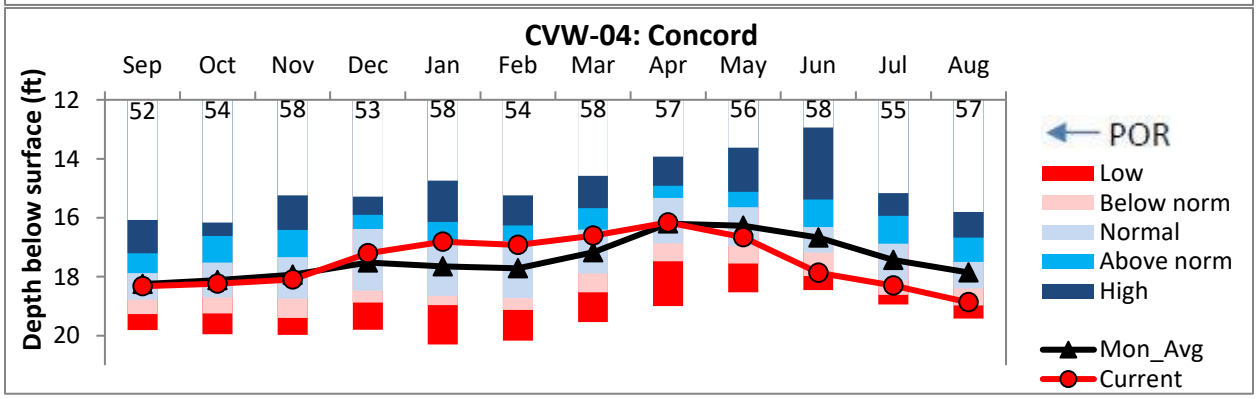


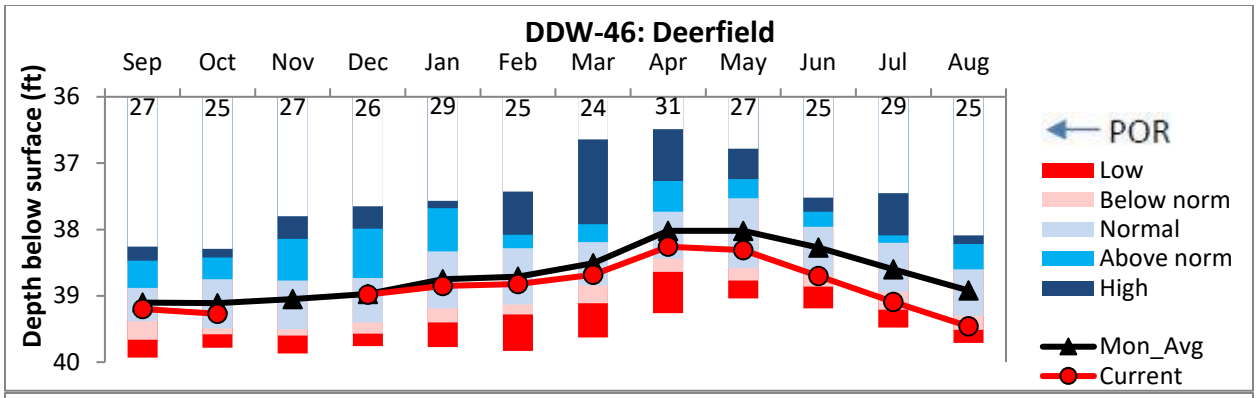


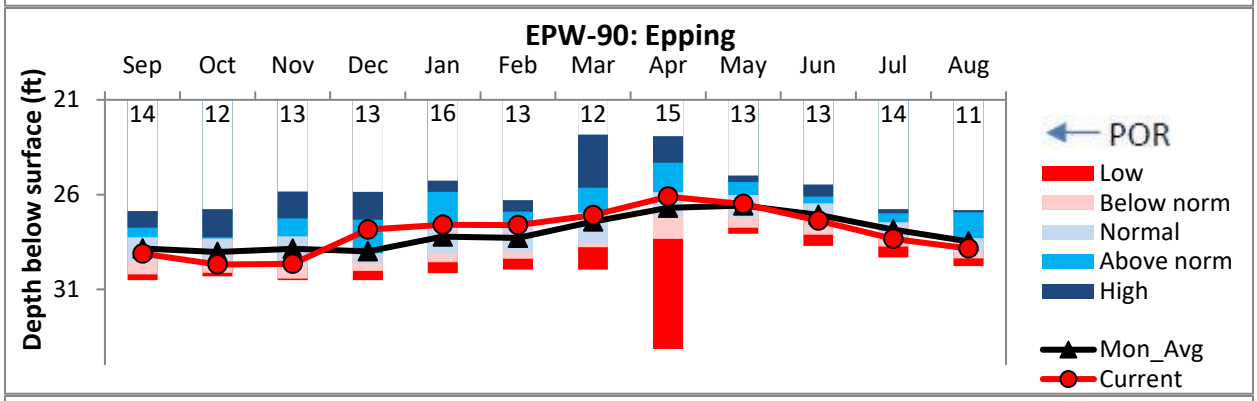

CBW-34: Campton
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
26 25 26 24 27 24 27 26 27 28 26 29
Depth below surface (ft)
9 10 11 12 13 14 15
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

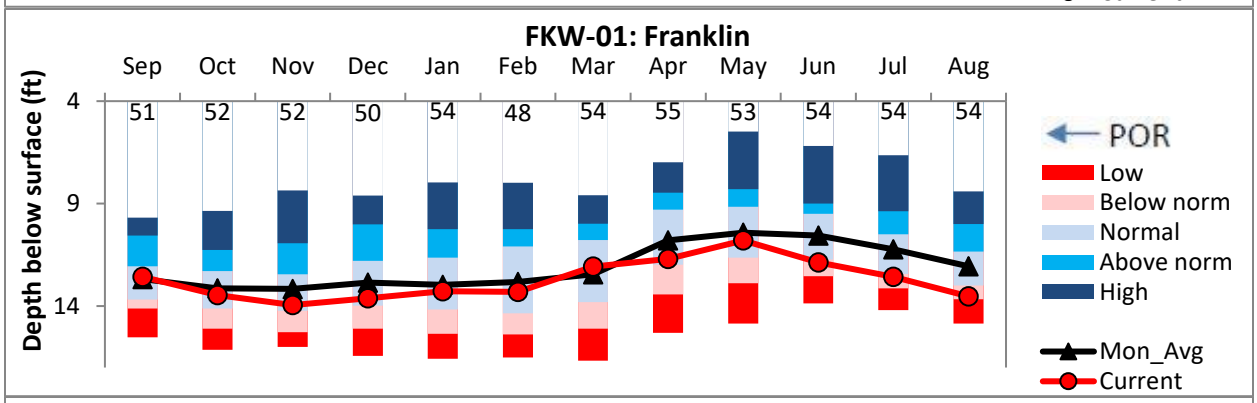

CTW-73: Colebrook
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
20 23 23 27 25 23 25 23 22 24 20 25
Depth below surface (ft)
2 4 6 8 10
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

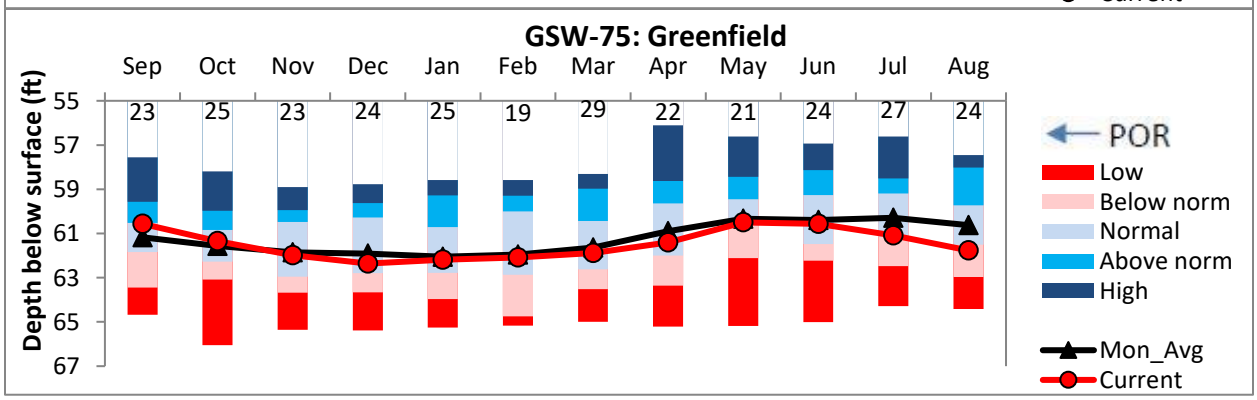

CVW-2.1: Concord Airport
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
2 2 2 3 3 4 3 3 3 3 3 3
Depth below surface (ft)
38 39 40 41 42
POR
Prior Year
2019-2018
Current

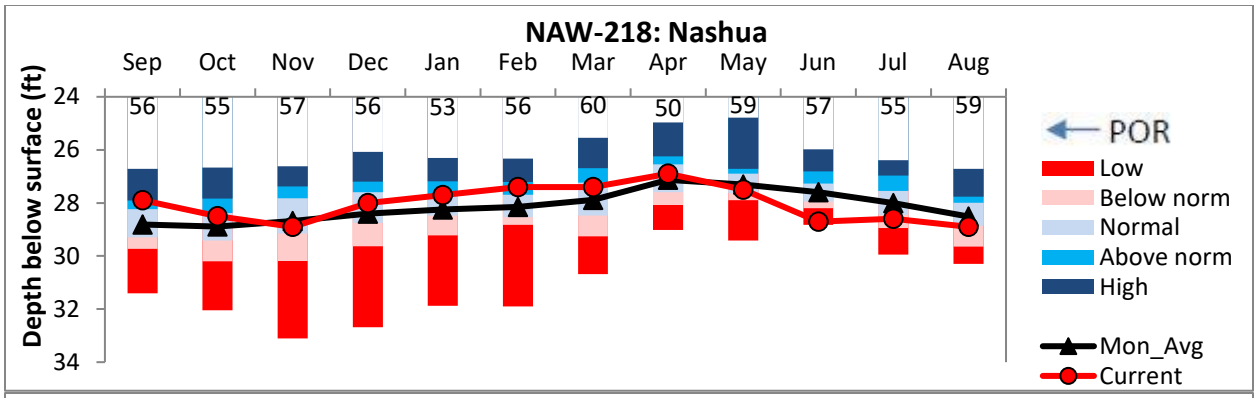

CVW-04: Concord
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
52 54 58 53 58 54 58 57 56 58 55 57
Depth below surface (ft)
12 14 16 18 20
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

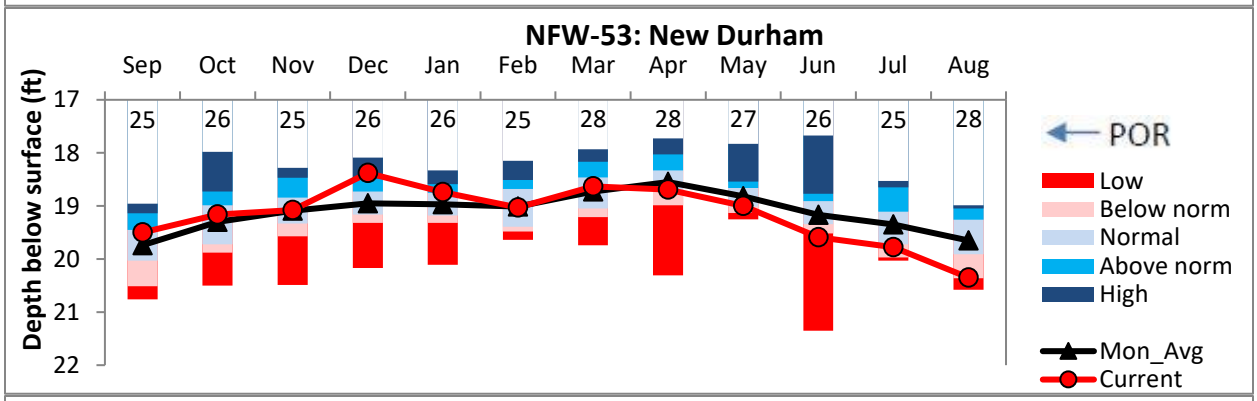

DDW-46: Deerfield
Depth below surface (ft)
36
37
38
39
40
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
27 25 27 26 29 25 24 31 27 25 29 25
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

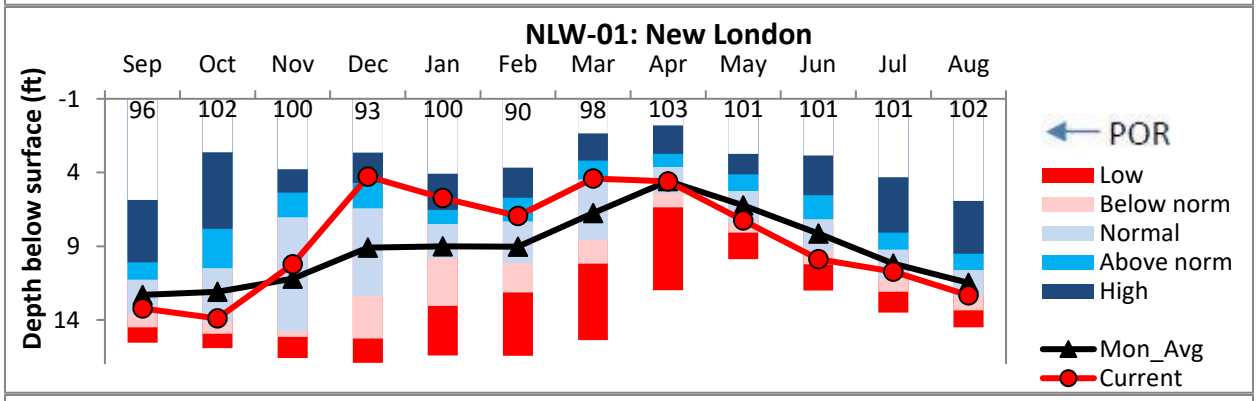

EPW-90: Epping
Depth below surface (ft)
21
26
31
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
14 12 13 13 16 13 12 15 13 13 14 11
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

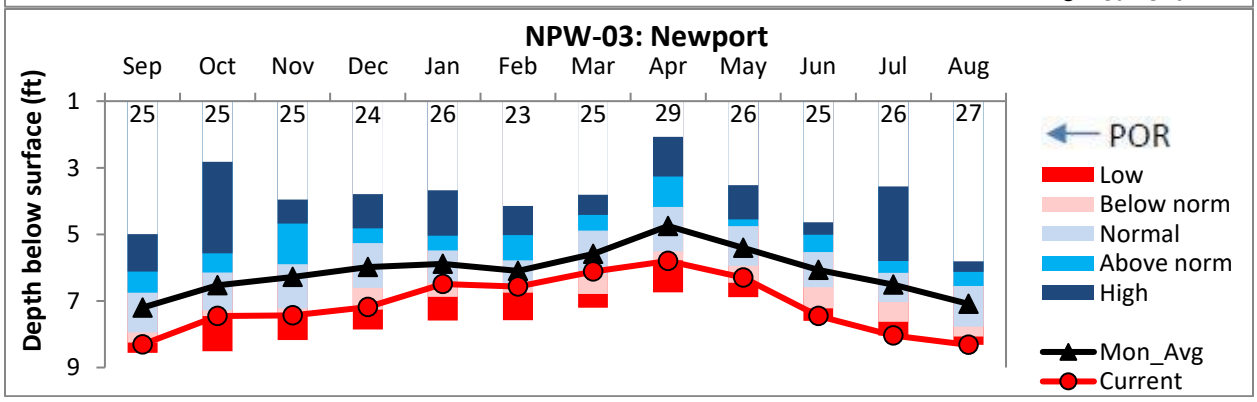

FKW-01: Franklin
Depth below surface (ft)
4
9
14
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
51 52 52 50 54 48 54 55 53 54 54 54
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

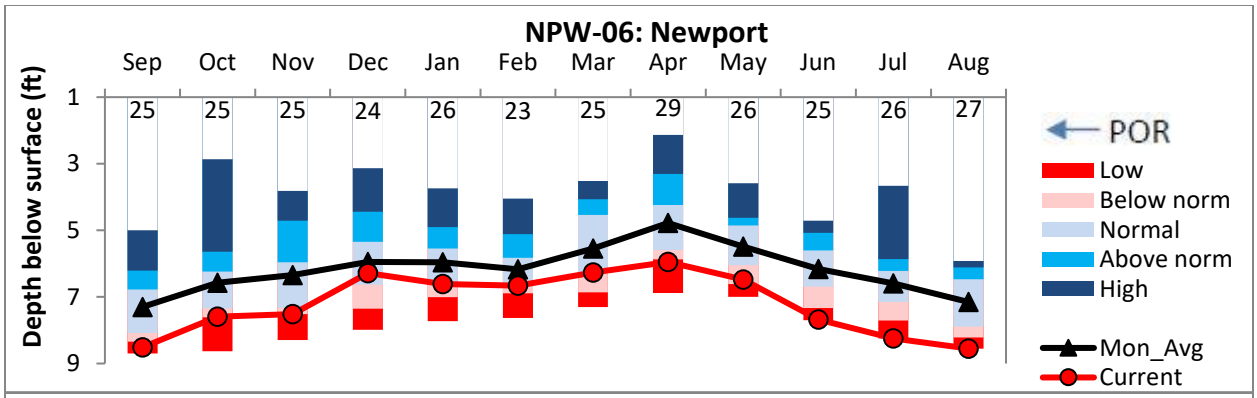

GSW-75: Greenfield
Depth below surface (ft)
55
57
59
61
63
65
67
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
23 25 23 24 25 19 29 22 21 24 27 24
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

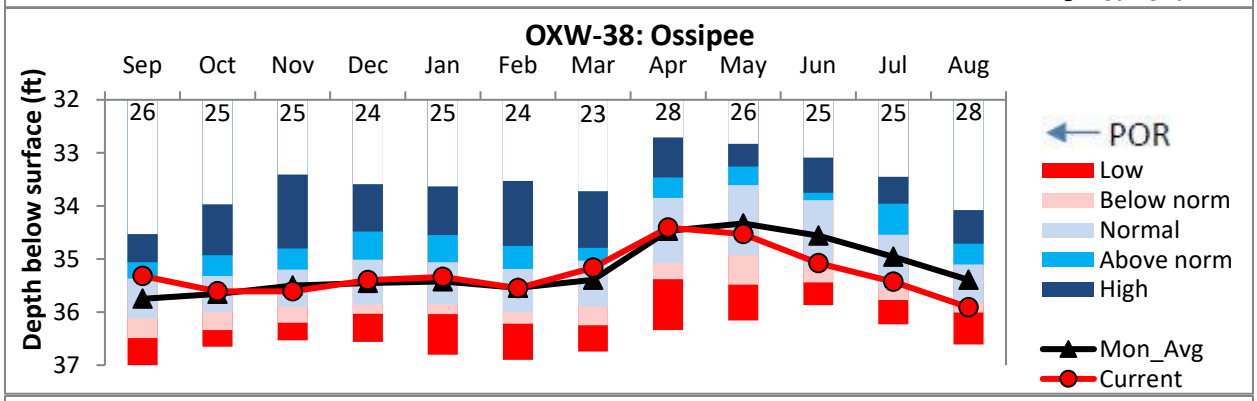

NAW-218: Nashua
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
56 55 57 56 53 56 60 50 59 57 55 59
Depth below surface (ft)
24 26 28 30 32 34
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

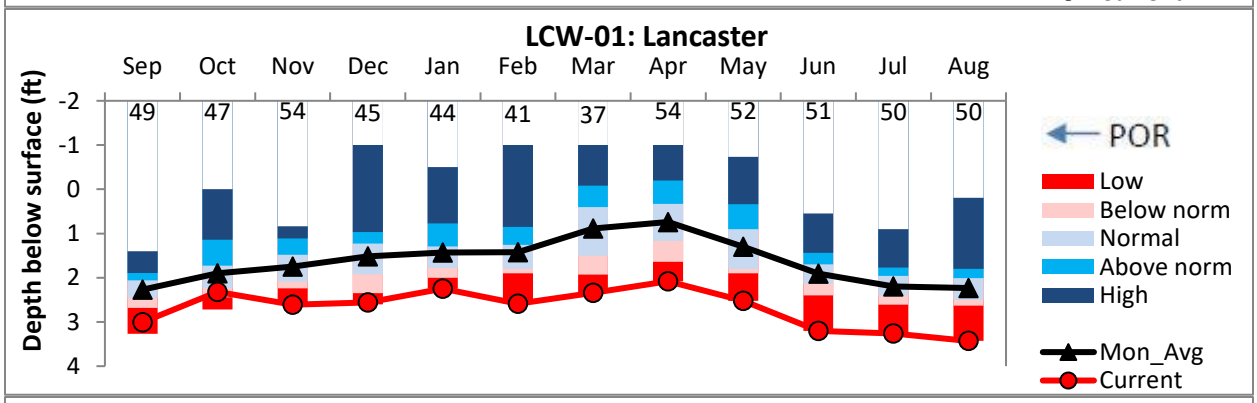

NFW-53: New Durham
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
25 26 25 26 26 25 28 28 27 26 25 28
Depth below surface (ft)
17 18 19 20 21 22
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

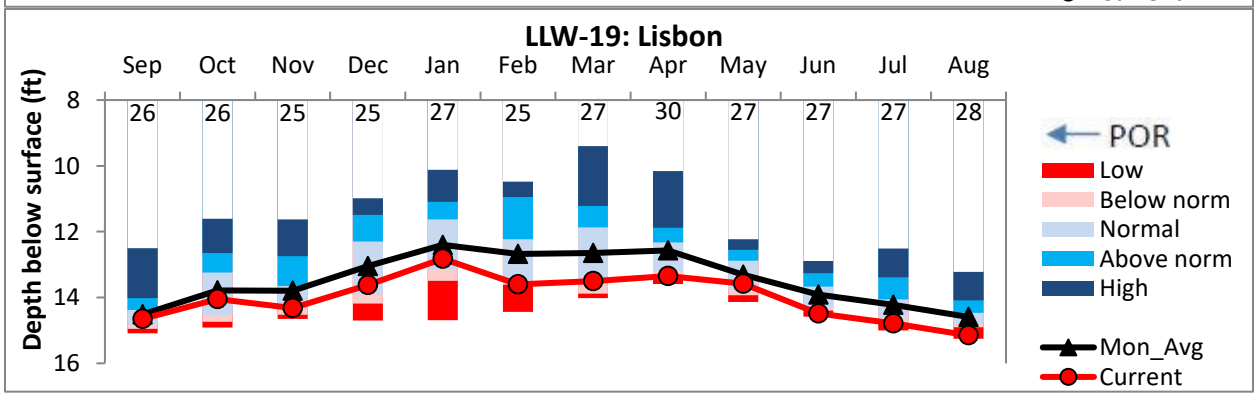

NLW-01: New London
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
96 102 100 93 100 90 98 103 101 101 101 102
Depth below surface (ft)
-1 4 9 14
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


NPW-03: Newport
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
25 25 25 24 26 23 25 29 26 25 26 27
Depth below surface (ft)
1 3 5 7 9
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

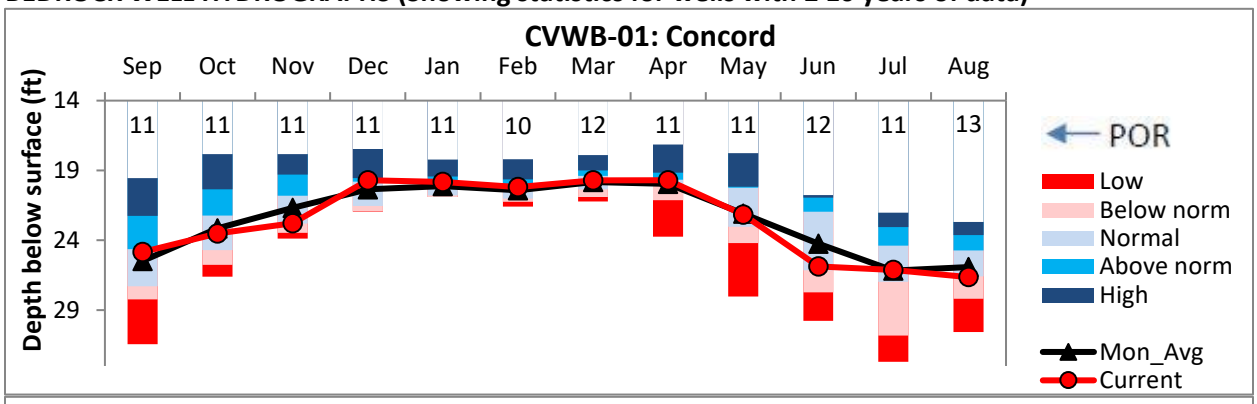

NPW-06: Newport
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
25 25 25 24 26 23 25 29 26 25 26 27
1 3 5 7 9
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

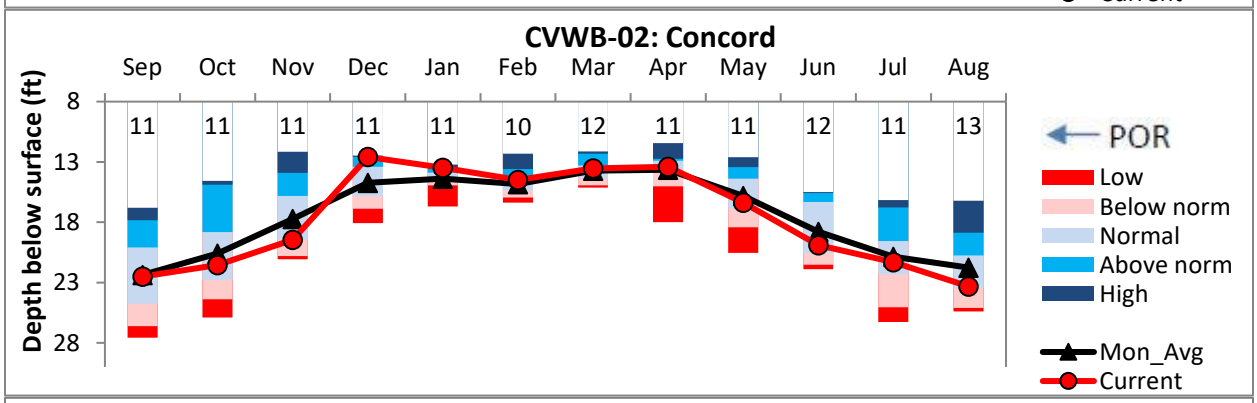

OXW-38: Ossipee
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
26 25 25 24 25 24 23 28 26 25 25 28
32 33 34 35 36 37
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

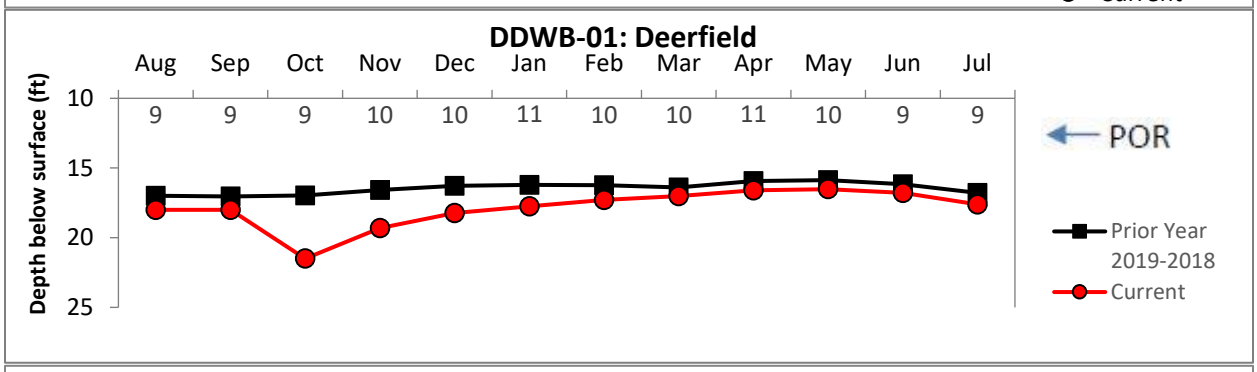

LCW-01: Lancaster
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
49 47 54 45 44 41 37 54 52 51 50 50
-2 -1 0 1 2 3 4
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

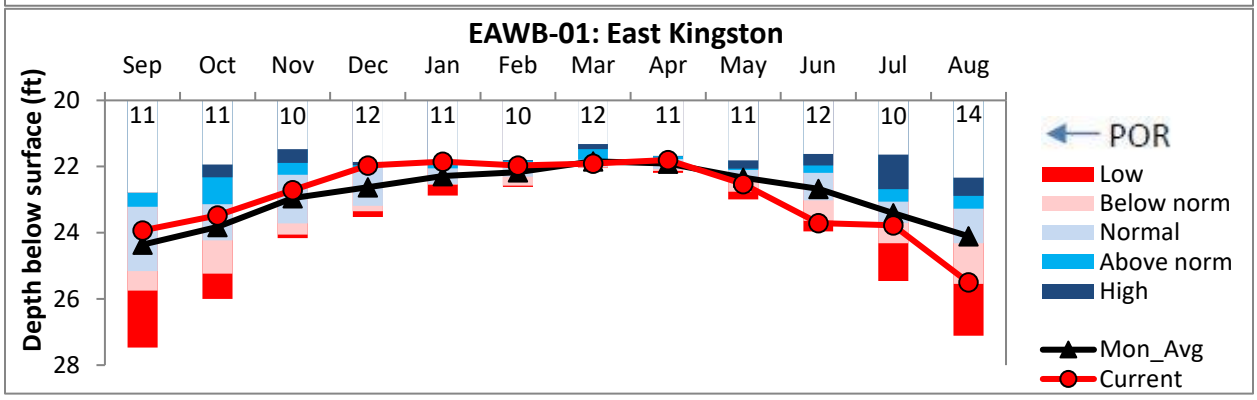

LLW-19: Lisbon
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
26 26 25 25 27 25 27 30 27 27 27 28
8 10 12 14 16
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

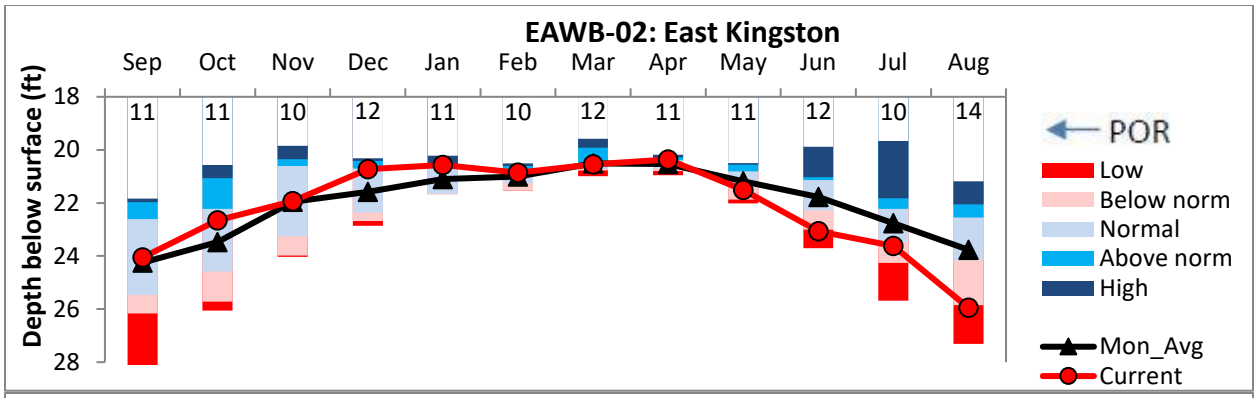
BEDROCK WELL HYDROGRAPHS (Showing statistics for wells with ≥ 10 years of data)

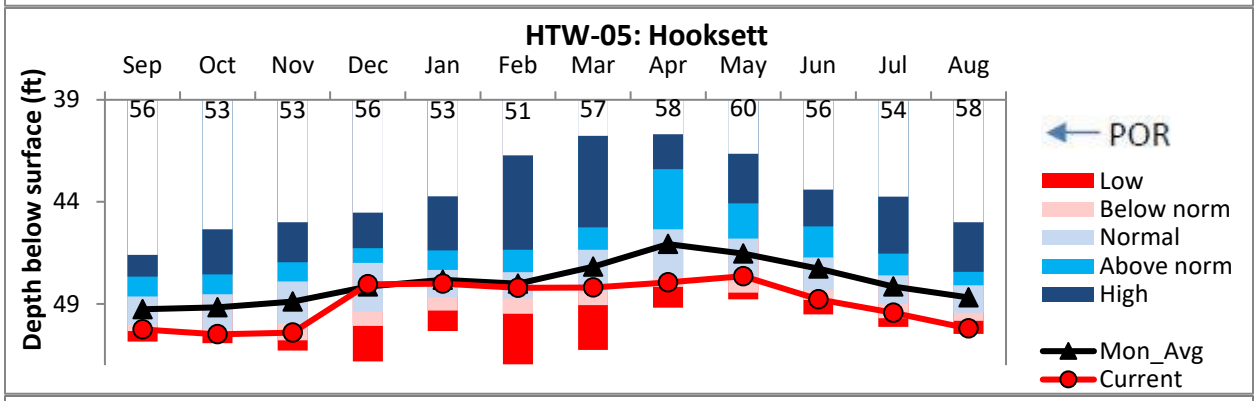


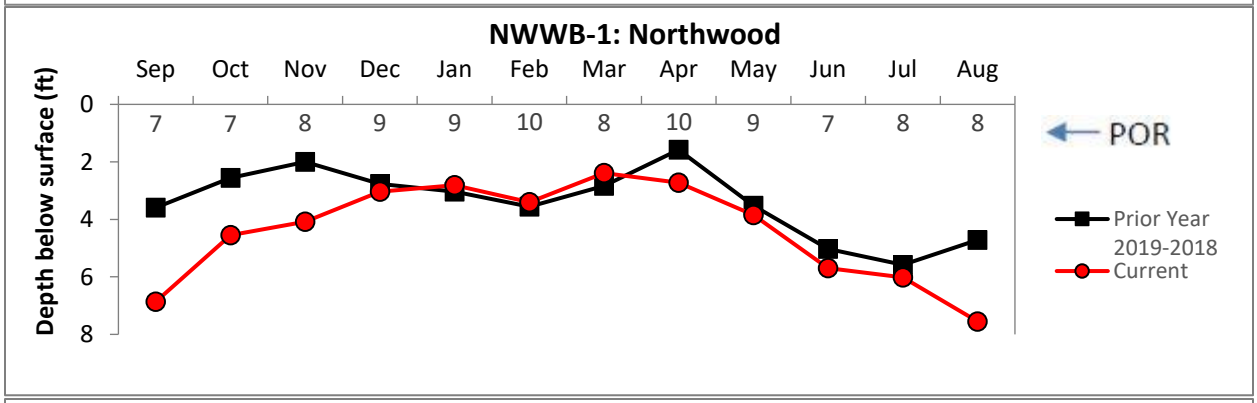


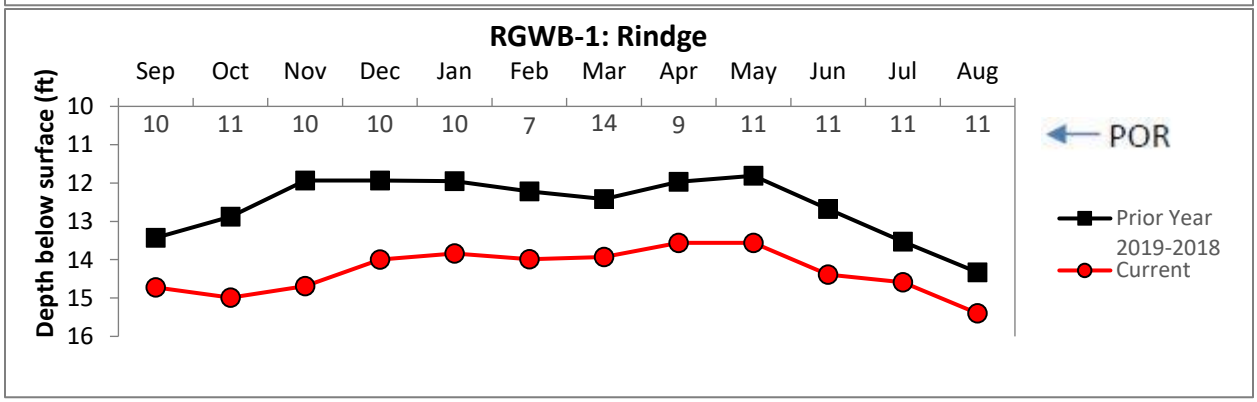


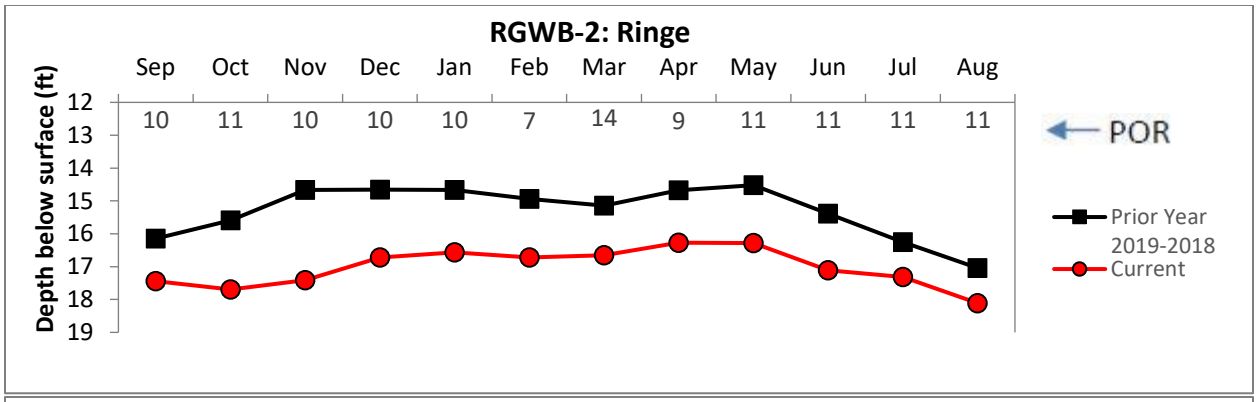


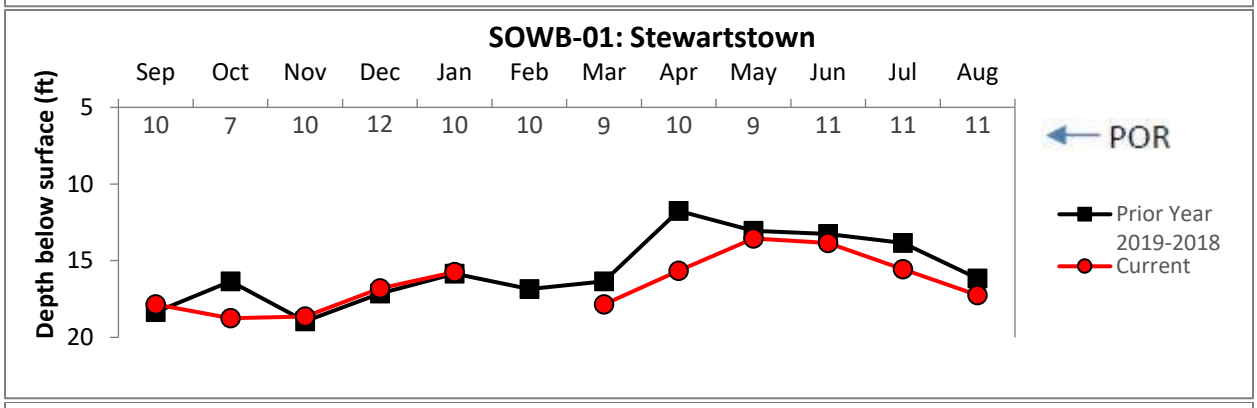

EAWB-02: East Kingston
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
18 20 22 24 26 28
11 11 10 12 11 10 12 11 11 12 10 14
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


HTW-05: Hooksett
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
39 44 49
56 53 53 56 53 51 57 58 60 56 54 58
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


NWWB-1: Northwood
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
0 2 4 6 8
7 7 8 9 9 10 8 10 9 7 8 8
POR
Prior Year
2019-2018
Current


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


RGWB-2: Ringe
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
10 11 10 10 10 7 14 9 11 11 11 11
12 13 14 15 16 17 18 19
POR
Prior Year
2019-2018
Current


SOWB-01: Stewartstown
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
10 7 10 12 10 10 9 10 9 11 11 11
5 10 15 20
POR
Prior Year
2019-2018
Current

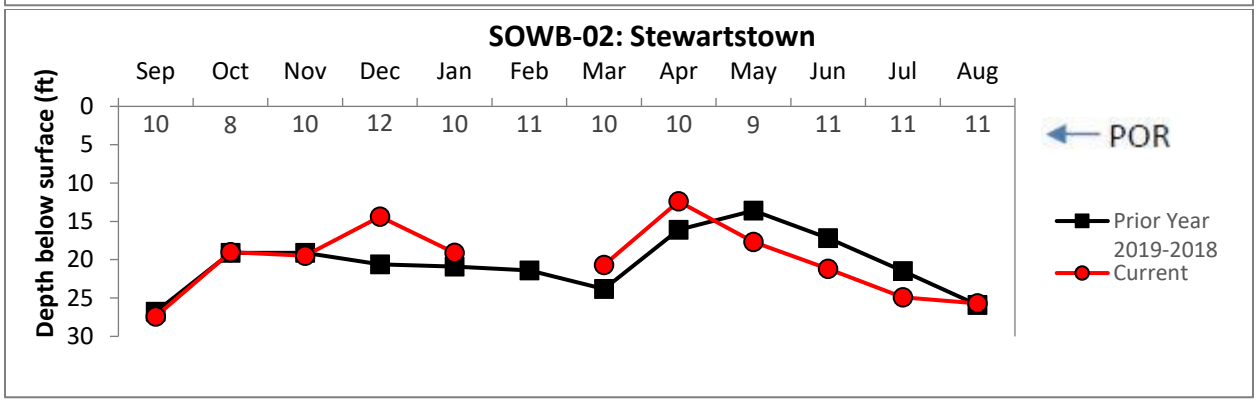

SOWB-02: Stewartstown
Depth below surface (ft)
Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
10 8 10 12 10 11 10 10 9 11 11 11
0 5 10 15 20 25 30
POR
Prior Year
2019-2018
Current

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	6.56	6.89	Below Normal	-0.4	-0.73
ADW-15	Albany	Overburden	16-18	8.48	8.71	Normal	-0.44	-0.67
BAW-10	Barnstead	Overburden	23-25	3.08	3.13	Normal	-0.01	-0.06
BBW-53	Barrington	Overburden	21-23	5.13	-	Not Analyzed	-	-0.54
CBW-34	Campton	Overburden	21-23	13.63	13.55	Low	-0.9	-0.82
CTW-73	Colebrook	Overburden	105-107	8.6	7.82	High	0.72	1.5
CVW-02.1	Concord	Overburden	59.8-61.8	40.46	-	Not Analyzed	-	-0.21
CVW-04	Concord	Overburden	25-27	18.3	17.86	Below Normal	-1.01	-0.57
DDW-46	Deerfield	Overburden	59.8-61.8	39.09	38.92	Below Normal	-0.54	-0.37
EPW-90	Epping	Overburden	39.45-40.7	28.33	28.48	Normal	-0.36	-0.51
FKW-01	Franklin	Overburden	45.5-47.5	12.58	12.06	Below Normal	-1.47	-0.95
GSW-75	Greenfield	Overburden	35.8-37.8	61.08	60.63	Below Normal	-1.13	-0.68
LCW-01	Lancaster	Overburden	28-30	3.26	2.23	Low	-1.2	-0.17
LLW-19	Lisbon	Overburden	49.8-52.3	14.79	14.59	Low	-0.56	-0.36
NAW-218	Nashua	Overburden	66-68	28.6	28.51	Below Normal	-0.39	-0.3
NFW-53	New Durham	Overburden	28-30	19.78	19.65	Below Normal	-0.7	-0.57
NLW-01	New London	Overburden	40-42	10.73	11.48	Normal	-0.85	-1.6
NPW-03	Newport	Overburden	40.5-42.5	8.04	7.09	Low	-1.23	-0.28
NPW-06	Newport	Overburden	58-60	8.25	7.15	Low	-1.4	-0.3
OXW-38	Ossipee	Overburden	0-22.55	35.43	35.39	Below Normal	-0.52	-0.48
CVWB-01	Concord	Bedrock	470-480	26.13	25.92	Below Normal	-0.72	-0.51
CVWB-02	Concord	Bedrock	0-315	21.3	21.77	Normal	-1.55	-2.02
DDWB-01	Deerfield	Bedrock	0-300	17.6	-	Not Analyzed	-	-0.66
EAWB-01	East Kingston	Bedrock	463-473	23.78	24.1	Below Normal	-1.4	-1.72
EAWB-02	East Kingston	Bedrock	0-323	23.62	23.76	Low	-2.19	-2.33
HTW-05	Hooksett	Bedrock	0-102.7	49.44	48.68	Low	-1.52	-0.76
NWWB-01	Northwood	Bedrock	0-130	6.02	-	Not Analyzed	-	-1.53
RGWB-01	Rindge	Bedrock	391-401	14.59	-	Not Analyzed	-	-0.81
RGWB-02	Rindge	Bedrock	0-285	17.31	-	Not Analyzed	-	-0.8
SOWB-01	Stewartstown	Bedrock	443-453	15.55	-	Not Analyzed	-	-1.7
SOWB-02	Stewartstown	Bedrock	0-303	24.9	-	Not Analyzed	-	-0.8