New Hampshire Groundwater Level Monitoring

November, 2020

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

December 2, 2020

GROUNDWATER CONDITIONS SUMMARY

Neither NOAA nor the Northeast Regional Climate Center (NRCC) at Cornell University have yet released their November 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 October 26th and November 24th was below average across much of the state (Figure 1). More precipitation figures here.

As of November 24th, percentages of drought intensity across the state are: 99% in moderate drought, 19% in severe drought, and 11% in extreme drought (Figure 2). Compared to the end of last month, the area affected by drought is similar, although both severe and extreme drought now cover slightly less area. Extreme drought contracted slightly in early November but rebounded again on November 17th, where it remains.

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 wells in the network are experiencing below normal to low groundwater levels, although water levels in about half of the wells in the network have risen since last month. Overburden well CVW-04 in Concord, and overburden wells in Campton, Deerfield, Franklin, and New Durham have been below normal to low for a 6-month period. The overburden wells in Newport have been below normal to low for almost a year. The bedrock wells in East Kingston and Hooksett have been below normal to low for a 6-month period. The dug well in New London and the overburden well in Barnstead have recovered to normal since last month.

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.

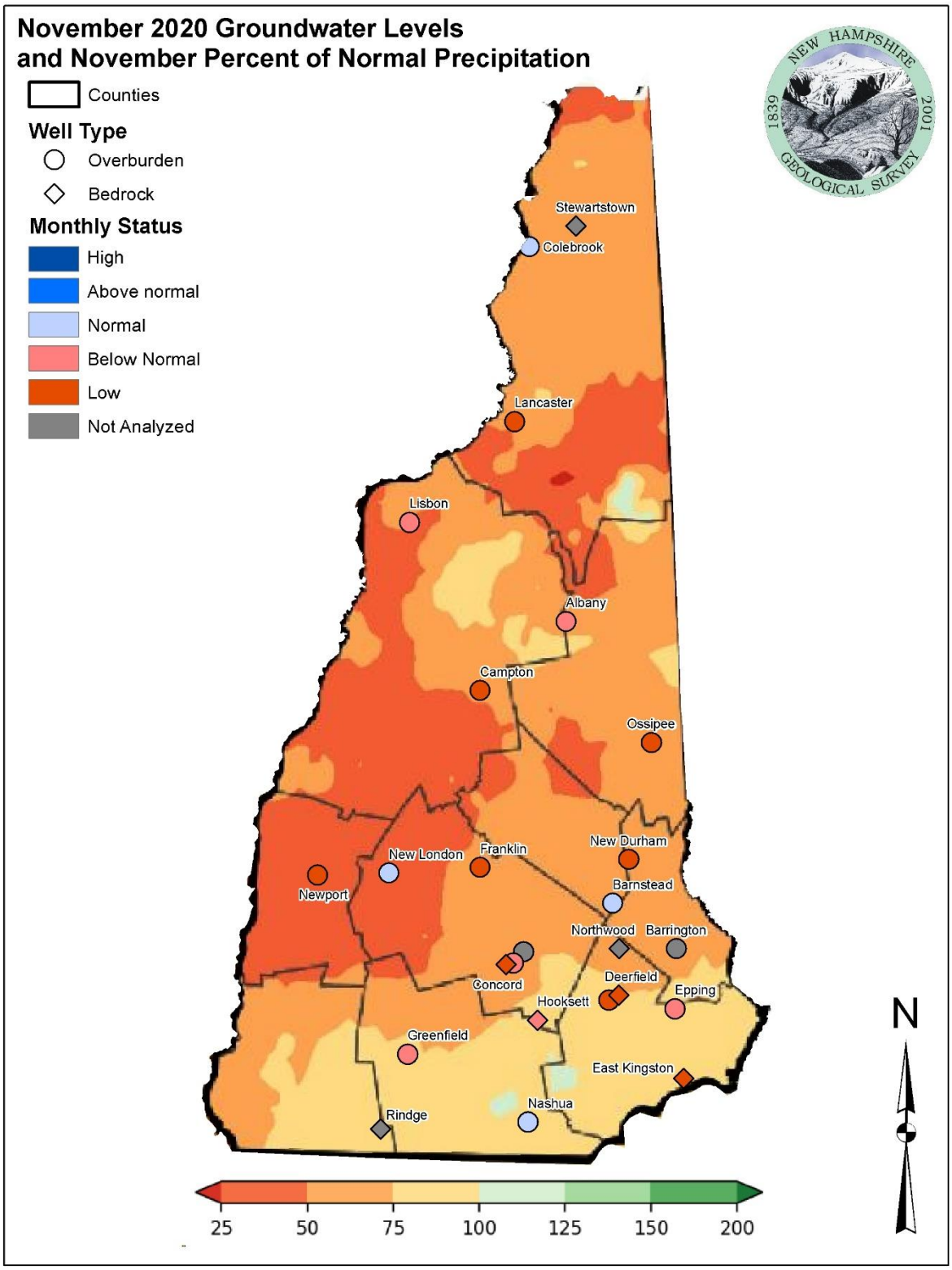


Figure 1. Groundwater Monitoring Network showing groundwater levels relative to statistical envelopes calculated over each well's period of record (POR) and percent normal precipitation map for October 26 – November 24, 2020 (Northeast Regional Climate Center).

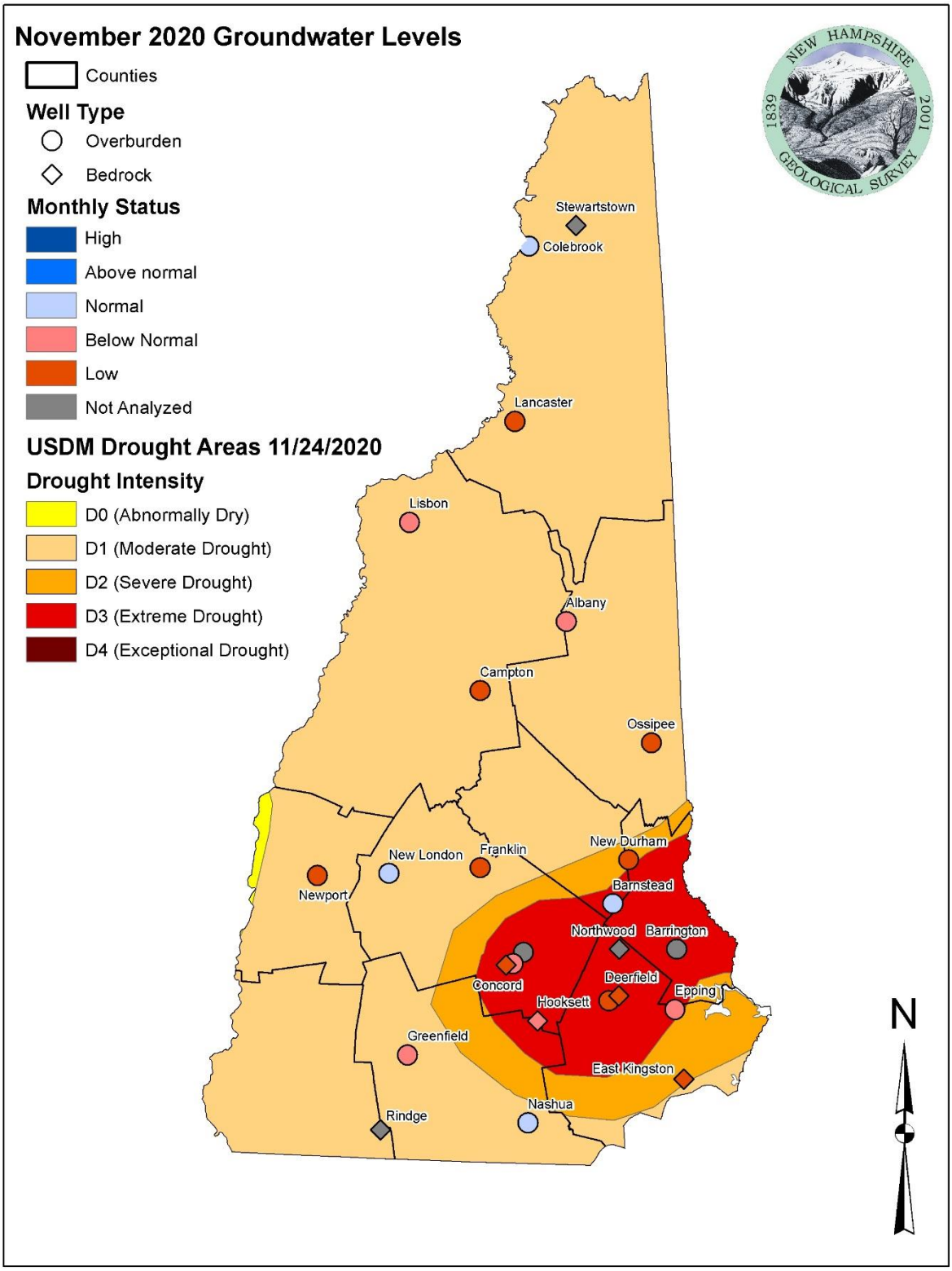
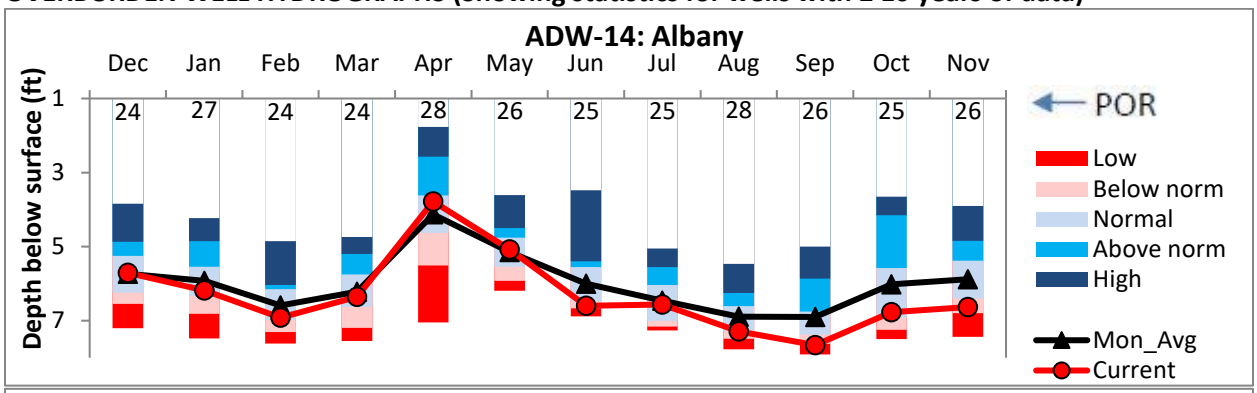
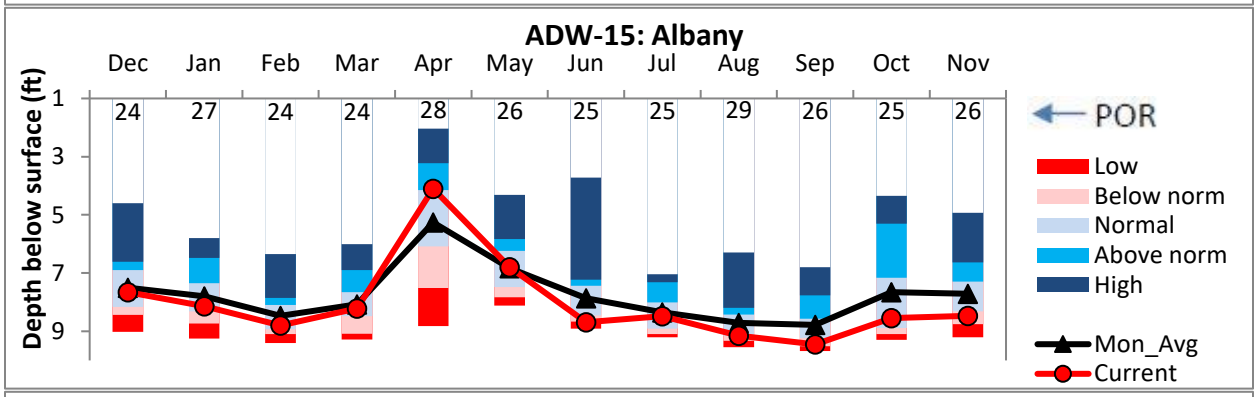
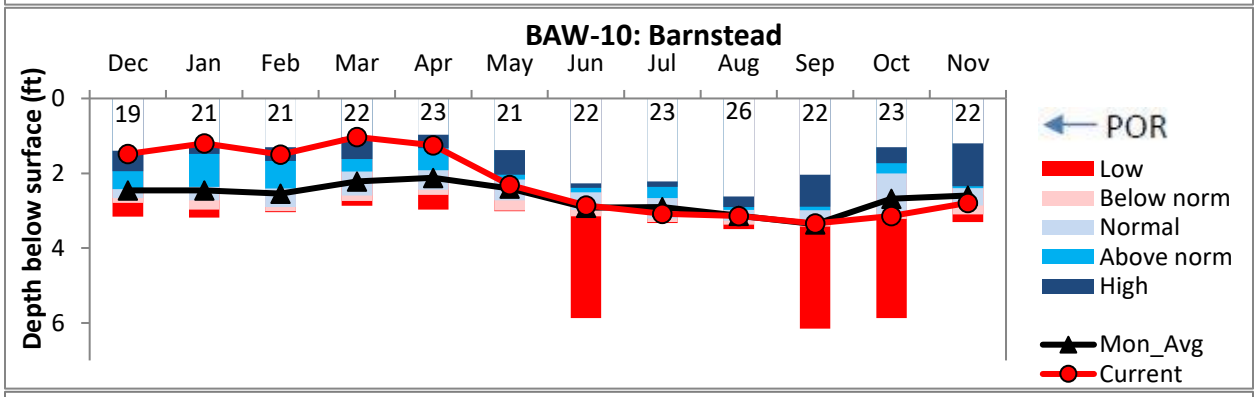


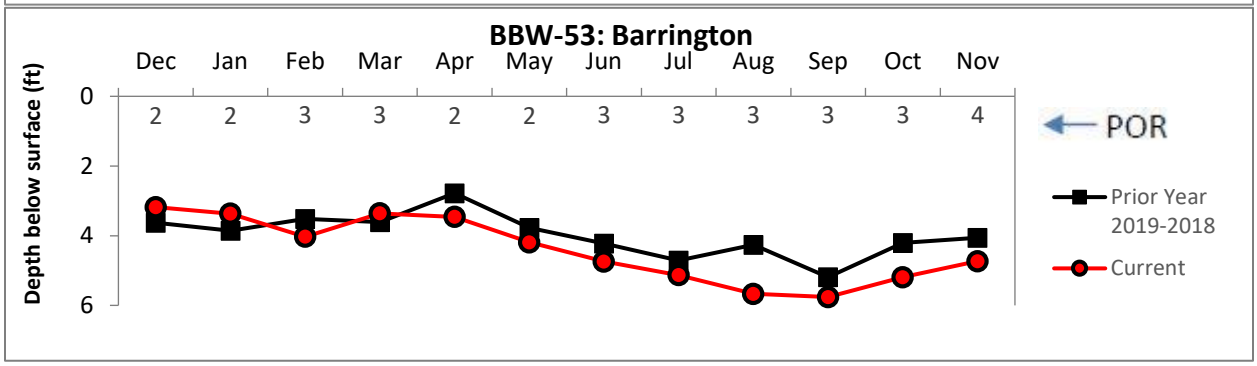
Figure 2. Groundwater Monitoring Network showing groundwater levels relative to statistical envelopes calculated over each well's period of record (POR) and drought areas according to data released by the U.S. Drought Monitor on November 24, 2020.

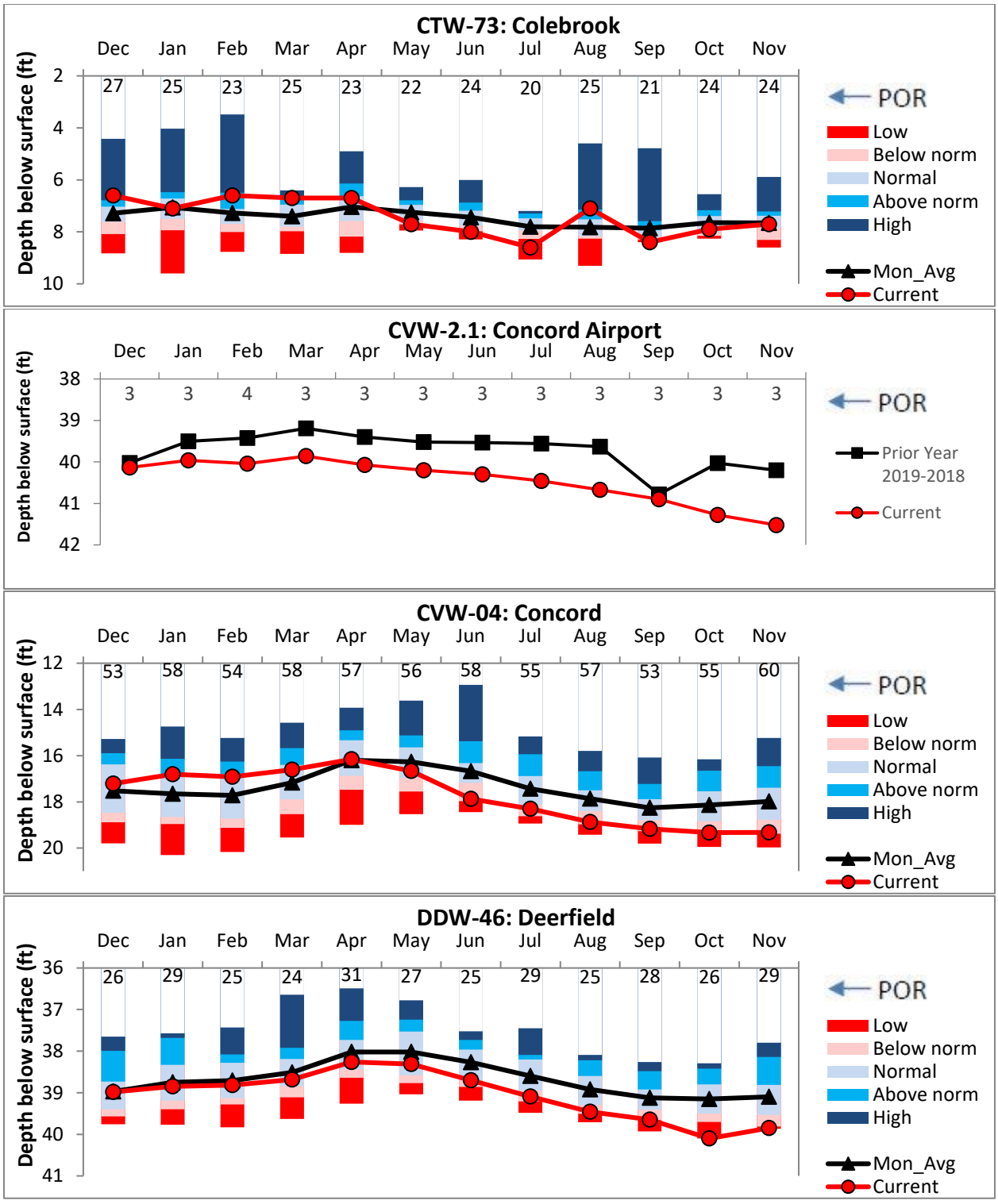
OVERBURDEN WELL HYDROGRAPHS (Showing statistics for wells with ≥ 10 years of data)

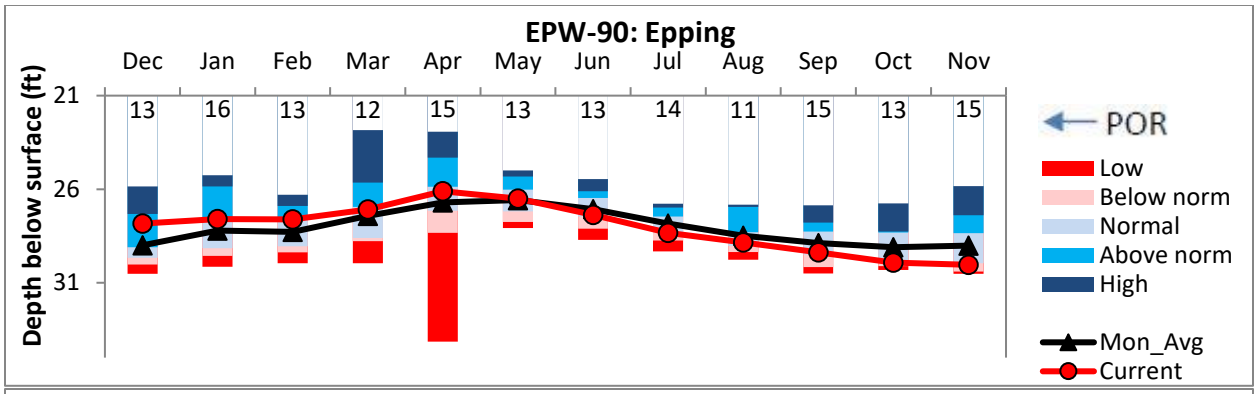


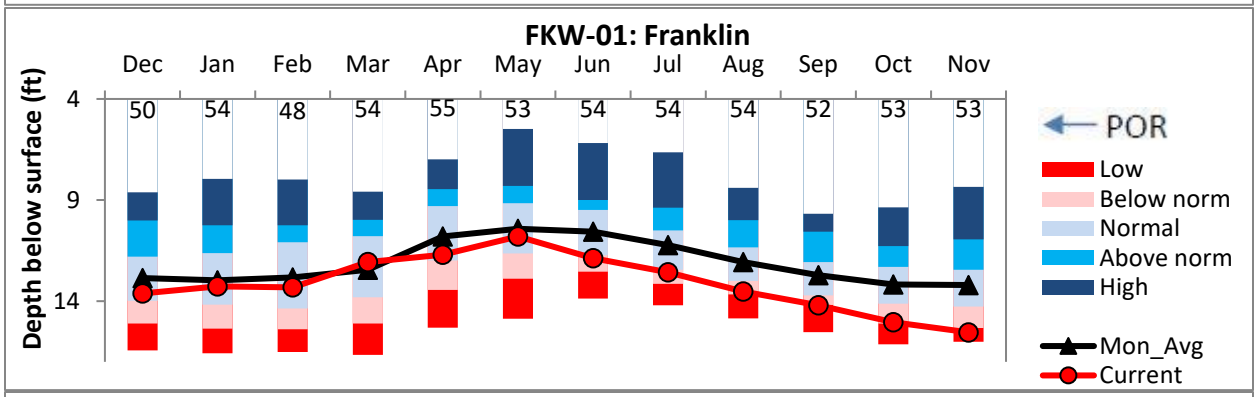


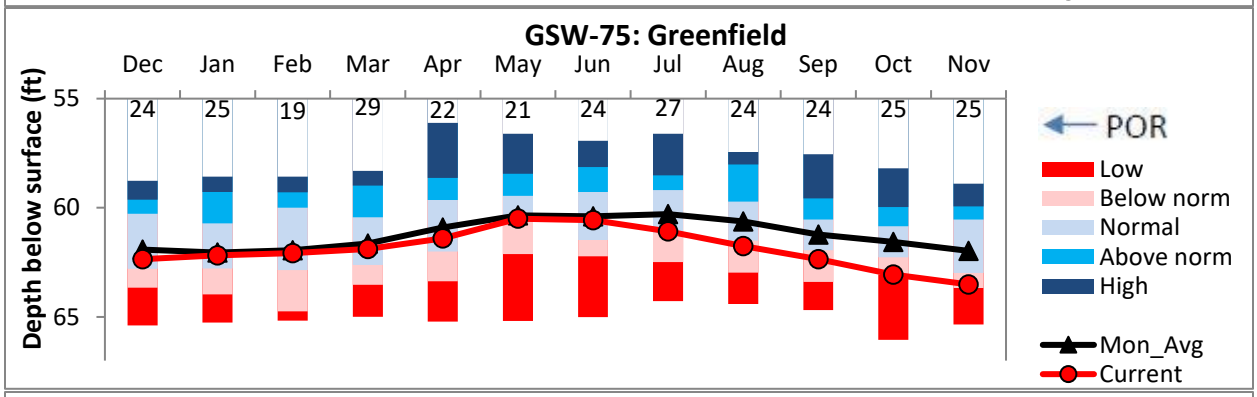


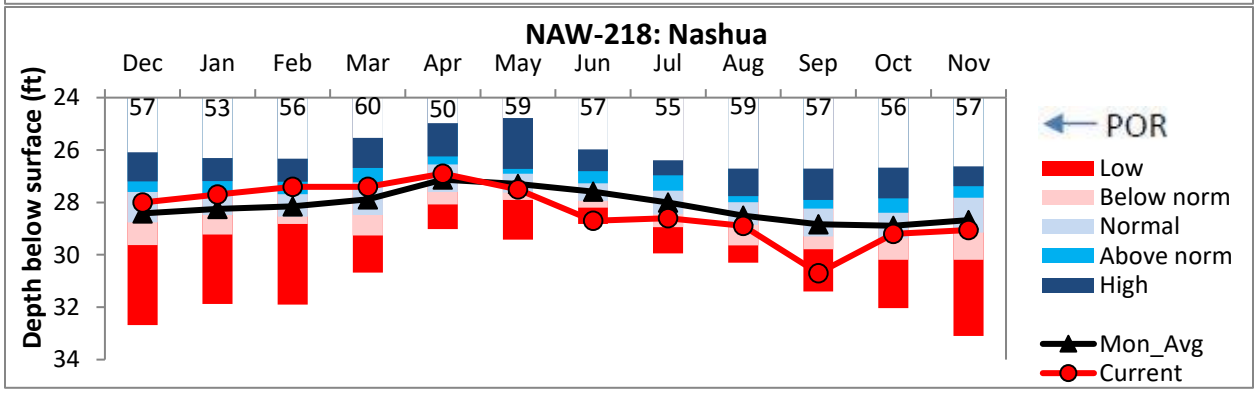


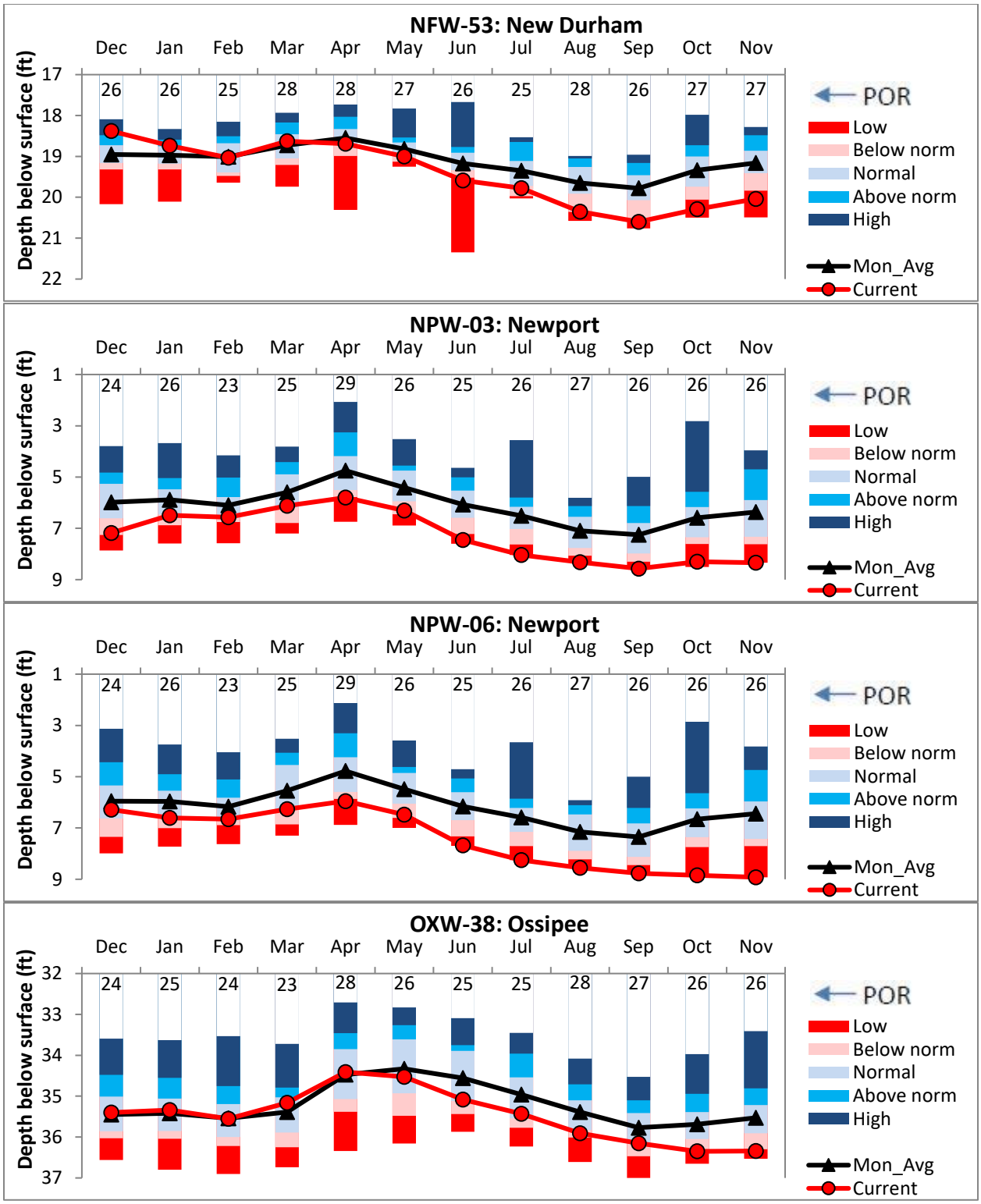

CTW-73: Colebrook
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
2 4 6 8 10
27 25 23 25 23 22 24 20 25 21 24 24
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
CVW-2.1: Concord Airport
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
38 39 40 41 42
3 3 4 3 3 3 3 3 3 3 3 3
POR
Prior Year 2019-2018
Current
CVW-04: Concord
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
12 14 16 18 20
53 58 54 58 57 56 58 55 57 53 55 60
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
DDW-46: Deerfield
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
36 37 38 39 40 41
26 29 25 24 31 27 25 29 25 28 26 29
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

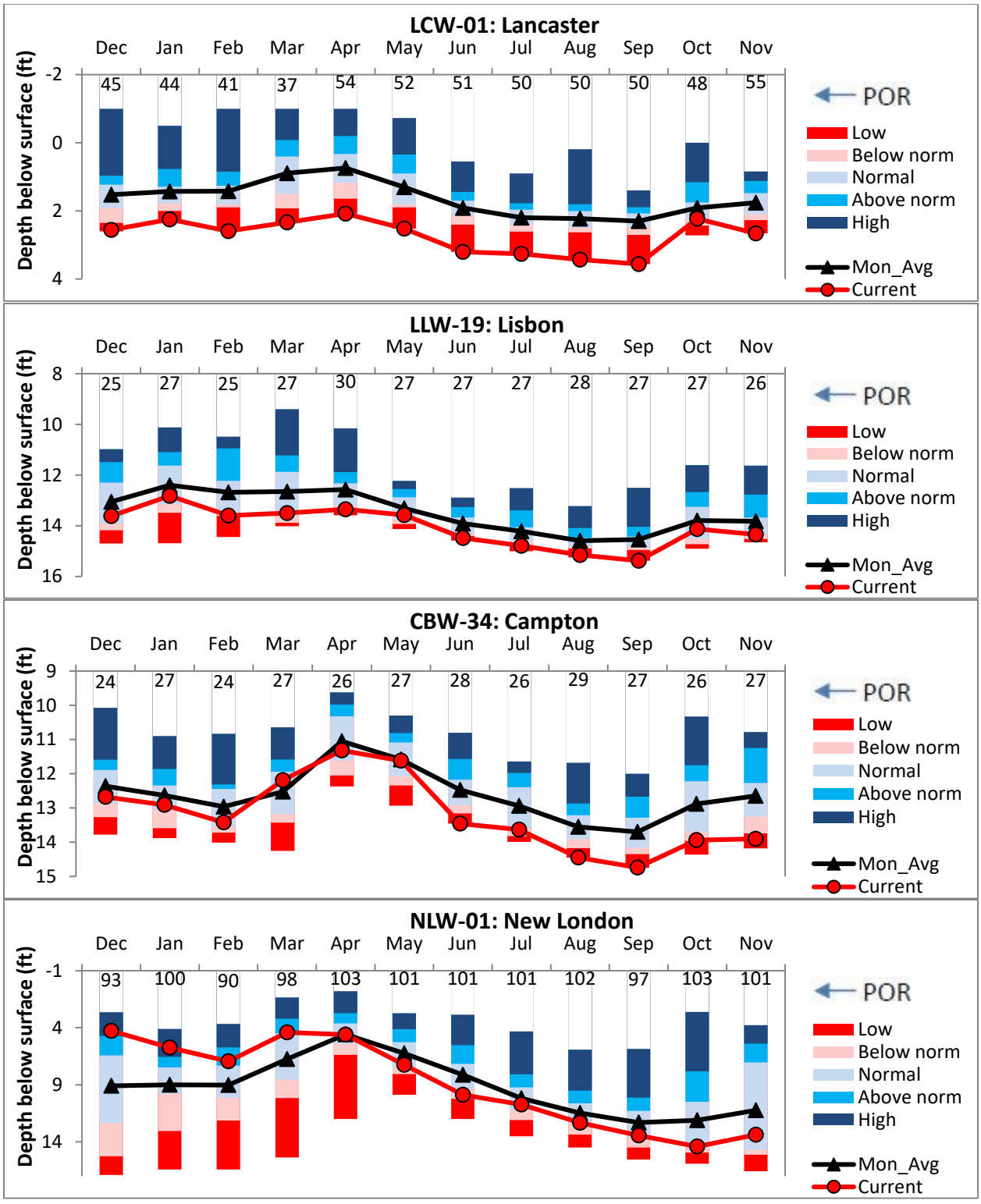

EPW-90: Epping
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
21
26
31
13 16 13 12 15 13 13 14 11 15 13 15
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current


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

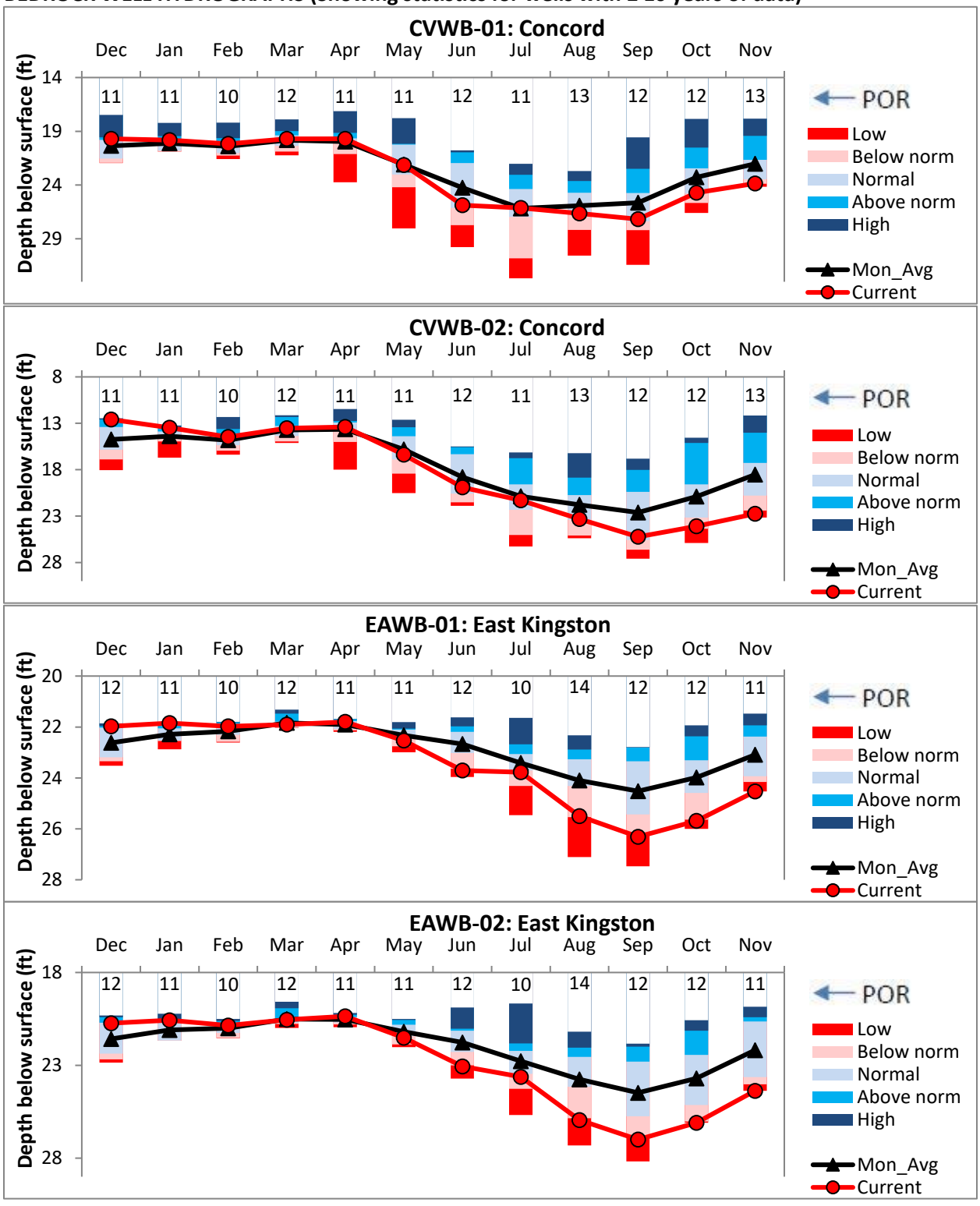

GSW-75: Greenfield
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
55
60
65
24 25 19 29 22 21 24 27 24 24 25 25
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

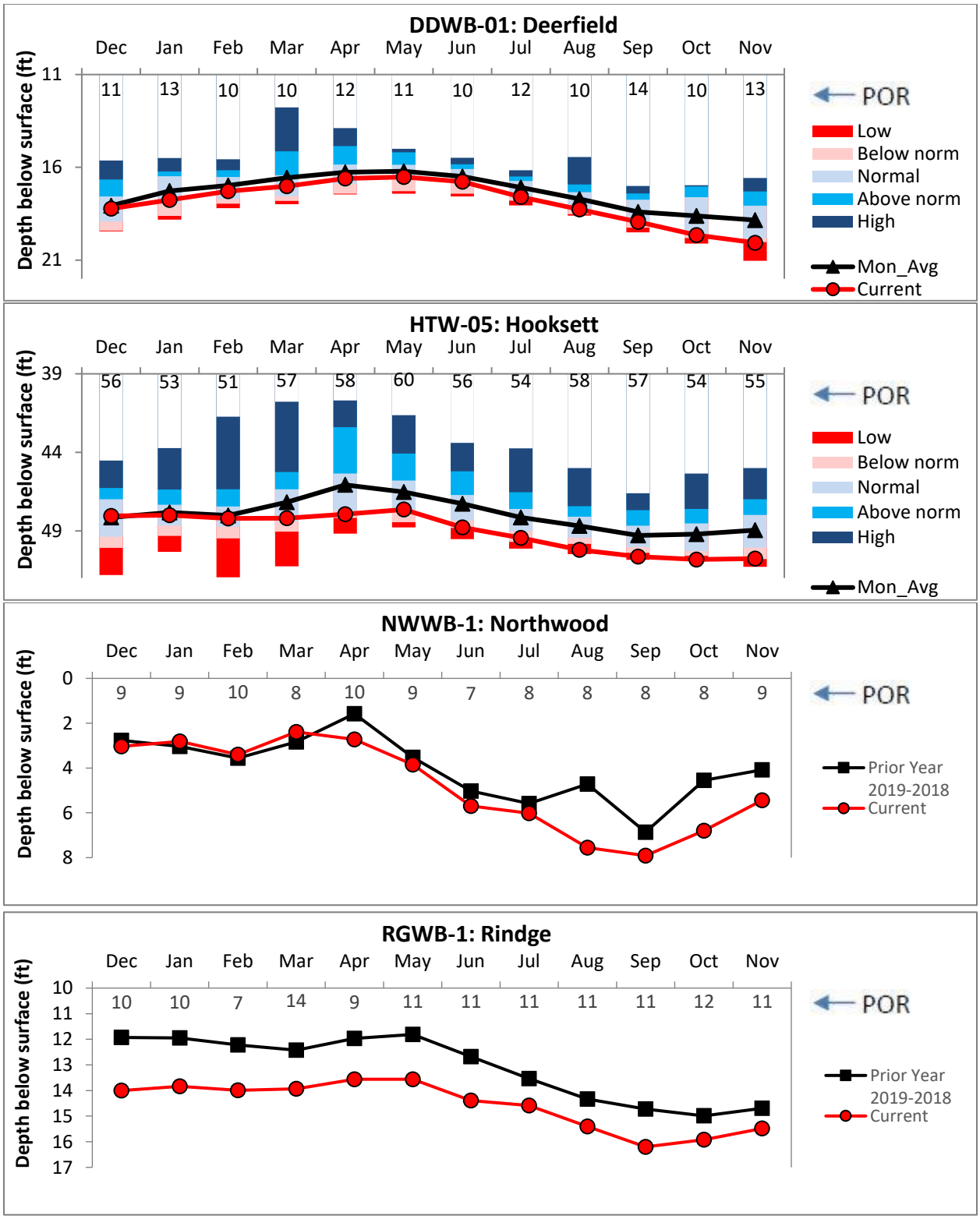

NAW-218: Nashua
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
24
26
28
30
32
34
57 53 56 60 50 59 57 55 59 57 56 57
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

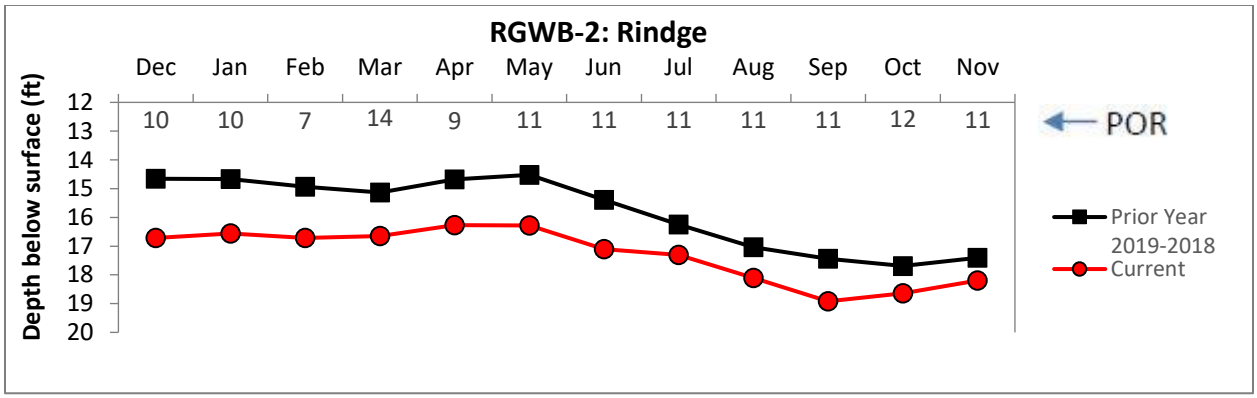

NFW-53: New Durham
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
17 18 19 20 21 22
26 26 25 28 28 27 26 25 28 26 27 27
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NPW-03: Newport
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
1 3 5 7 9
24 26 23 25 29 26 25 26 27 26 26 26
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NPW-06: Newport
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
1 3 5 7 9
24 26 23 25 29 26 25 26 27 26 26 26
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
OXW-38: Ossipee
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
32 33 34 35 36 37
24 25 24 23 28 26 25 25 28 27 26 26
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

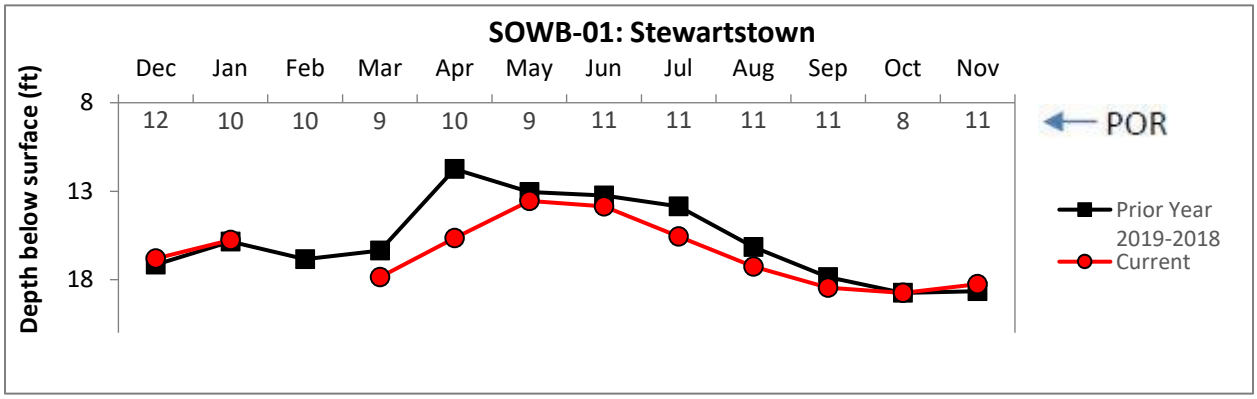

LCW-01: Lancaster
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
-2 0 2 4
45 44 41 37 54 52 51 50 50 50 48 55
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
LLW-19: Lisbon
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
8 10 12 14 16
25 27 25 27 30 27 27 27 28 27 27 26
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
CBW-34: Campton
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
9 10 11 12 13 14 15
24 27 24 27 26 27 28 26 29 27 26 27
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
NLW-01: New London
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Depth below surface (ft)
-1 4 9 14
93 100 90 98 103 101 101 101 102 97 103 101
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current

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




DDWB-01: Deerfield
Depth below surface (ft)
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
11 16 21
11 13 10 10 12 11 10 12 10 14 10 13
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
Current
HTW-05: Hooksett
Depth below surface (ft)
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
39 44 49
56 53 51 57 58 60 56 54 58 57 54 55
POR
Low
Below norm
Normal
Above norm
High
Mon_Avg
NWWB-1: Northwood
Depth below surface (ft)
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
0 2 4 6 8
9 9 10 8 10 9 7 8 8 8 8 9
POR
Prior Year
2019-2018
Current
RGWB-1: Rindge
Depth below surface (ft)
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
10 11 12 13 14 15 16 17
10 10 7 14 9 11 11 11 11 11 12 11
POR
Prior Year
2019-2018
Current


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


SOWB-01: Stewartstown
Depth below surface (ft)
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
8 13 18
12 10 10 9 10 9 11 11 11 11 8 11
POR
Prior Year
2019-2018
Current

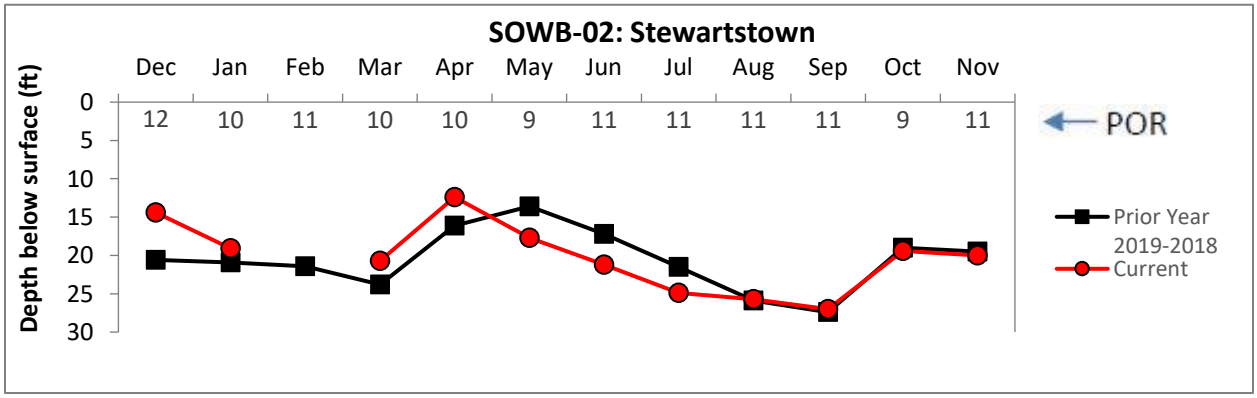

SOWB-02: Stewartstown
Depth below surface (ft)
Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
0 5 10 15 20 25 30
12 10 11 10 10 9 11 11 11 11 9 11
POR
Prior Year
2019-2018
Current

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	6.63	5.88	Below norm	-0.75	0.14
ADW-15	Albany	Overburden	16-18	8.47	7.71	Below norm	-0.76	0.08
BAW-10	Barnstead	Overburden	23-25	2.79	2.59	Normal	-0.2	0.35
BBW-53	Barrington	Overburden	21-23	4.73	-	Not Analyzed	-	0.46
CBW-34	Campton	Overburden	21-23	13.9	12.65	Low	-1.25	0.04
CTW-73	Colebrook	Overburden	105-107	7.7	7.66	Normal	-0.04	0.2
CVW-02.1	Concord	Overburden	59.8-61.8	41.52	-	Not Analyzed	-	-0.24
CVW-04	Concord	Overburden	25-27	19.32	17.98	Below norm	-1.34	0.01
DDW-46	Deerfield	Overburden	59.8-61.8	39.85	39.1	Low	-0.75	0.25
EPW-90	Epping	Overburden	39.45-40.7	30.04	29.01	Below norm	-1.03	-0.11
FKW-01	Franklin	Overburden	45.5-47.5	15.54	13.2	Low	-2.34	-0.5
GSW-75	Greenfield	Overburden	35.8-37.8	63.51	61.97	Below norm	-1.54	-0.45
LCW-01	Lancaster	Overburden	28-30	2.66	1.76	Low	-0.9	-0.43
LLW-19	Lisbon	Overburden	49.8-52.3	14.34	13.82	Below norm	-0.52	-0.21
NAW-218	Nashua	Overburden	66-68	29.05	28.68	Normal	-0.37	0.15
NFW-53	New Durham	Overburden	28-30	20.04	19.16	Low	-0.88	0.25
NLW-01	New London	Overburden	40-42	13.39	11.23	Normal	-2.16	1.02
NPW-03	Newport	Overburden	40.5-42.5	8.34	6.36	Low	-1.98	-0.04
NPW-06	Newport	Overburden	58-60	8.92	6.44	Low	-2.48	-0.07
OXW-38	Ossipee	Overburden	0-22.55	36.34	35.53	Low	-0.81	0.01
CVWB-01	Concord	Bedrock	470-480	23.86	22.03	Below norm	-1.83	0.86
CVWB-02	Concord	Bedrock	0-315	22.74	18.53	Low	-4.21	1.35
DDWB-01	Deerfield	Bedrock	0-300	20.06	18.84	Low	-1.22	-0.41
EAWB-01	East Kingston	Bedrock	463-473	24.53	23.09	Low	-1.44	1.16
EAWB-02	East Kingston	Bedrock	0-323	24.38	22.18	Low	-2.2	1.72
HTW-05	Hooksett	Bedrock	0-102.7	50.76	48.95	Below norm	-1.81	0.06
NWWB-01	Northwood	Bedrock	0-130	5.44	-	Not Analyzed	-	1.36
RGWB-01	Rindge	Bedrock	391-401	15.48	-	Not Analyzed	-	0.44
RGWB-02	Rindge	Bedrock	0-285	18.2	-	Not Analyzed	-	0.44
SOWB-01	Stewartstown	Bedrock	443-453	18.25	-	Not Analyzed	-	0.5
SOWB-02	Stewartstown	Bedrock	0-303	20	-	Not Analyzed	-	-0.6