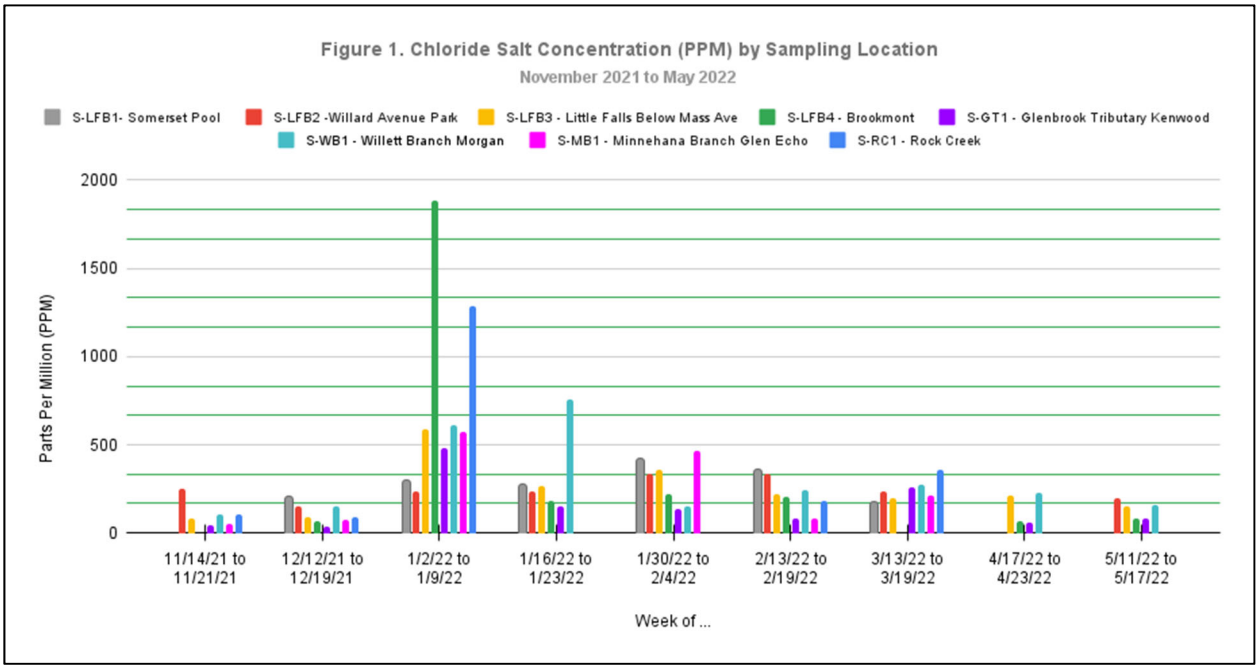
LITTLE FALLS WATERSHED ALLIANCE

EDUCATION - ACTION - STEWARDSHIP

Little Falls Branch Watershed
2021-2022 Salt Monitoring Report

The results for winter salt monitoring in the Little Falls Branch watershed are shown in Figure 1 below. Samples were collected at 8 different locations between November 2021 and May 2022. Chloride (i.e., salt) concentration levels are reported in parts-per-million (PPM) on the vertical or y-axis. The month and week in which the samples were collected is shown on the horizontal or x-axis. The results are being reported as the "Week of..." because the samples were not collected on the same day. Instead, they were typically collected over a span of 3-4 days during the week.



The highest readings were recorded following the snow storm on January 2nd. The results were lower at most locations during the other weeks that were sampled. However, many of the samples exceeded the threshold of 230 PPM, which is the level at which the diversity of biological life in the watershed streams is impacted by chronic exposure to salt. For Maryland

Class 1 recreational waters, aquatic organisms should not be exposed to this level more than twice over a period of 3 years.[1] Repeated surveys of benthic life at LFB-3 by LFWA volunteers show that the watershed is unable to support a variety of biological life.[2] The lack of diversity is likely due, in part, to chronic exposure to salt used on roads, sidewalks, and other facilities located within the watershed in the winter months.

As shown in Table A, the readings that most frequently exceeded 230 PPM were at S-LFB-1 Somerset Pool (57%) and S-LFB-2 Willard Avenue Park (62%).

Table A. Percent (%) of time chloride salt levels exceeded the chronic level of 230 PPM by sample location (based on a total number of readings at each site)

Sample Location	#Readings	Count > 230 PPM	Percent of Readings
S-LFB1- Somerset Pool	7	4	57%
S-LFB2 -Willard Avenue Park	8	5	62%
S-LFB3 - Little Falls Below Mass Ave	9	3	33%
S-LFB4 - Brookmont	8	2	25%
S-GT1 - Glenbrook Tributary Kenwood	9	2	22%
S-WB1 - Willett Branch Morgan	9	4	44%
S-MB1 - Minnehana Branch Glen Echo	6	2	33%
S-RC1 - Rock Creek	6	2	33%

In addition, we monitored other water quality parameters (i.e., pH, dissolved oxygen) and air/water temperature at a single location – LFB3 – at the same time as the salt readings on a monthly basis. Based on the same water quality standards, pH should remain between 6.5 and 8.0. Dissolved oxygen should be maintained at 5.0 ppm or greater at all times The results are shown in Table B.

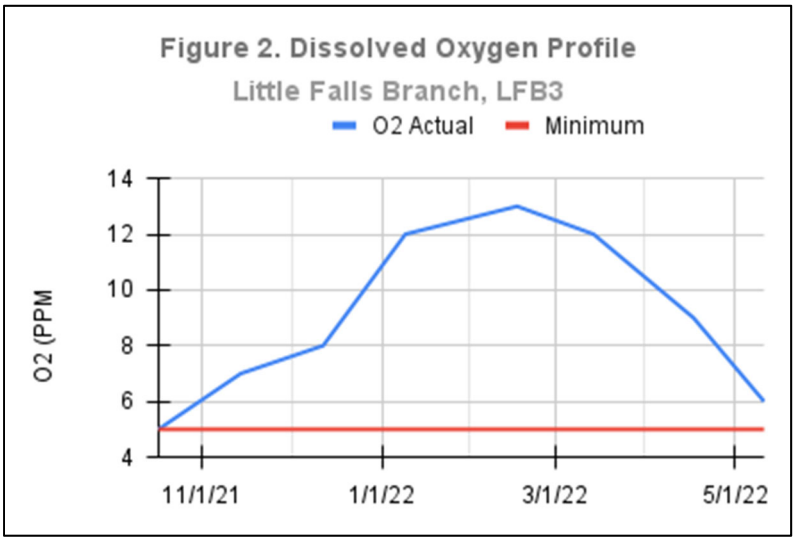
Table B. Results for water quality parameters at LFB-3, October 2021 to May 2022.

Parameter	10/17	11/14	12/12	1/9	2/16	3/14	4/17	5/12
pH	7.0	7.0	6.5	6.5	7.0	7.0	7.0	7.0
Dissolved O2	5	7	8	12	13	12	9	6
Air Temp (C)	18	10	13	4	3	14	18	23
Water Temp (C)	16	8	9	3	4	5	16	15

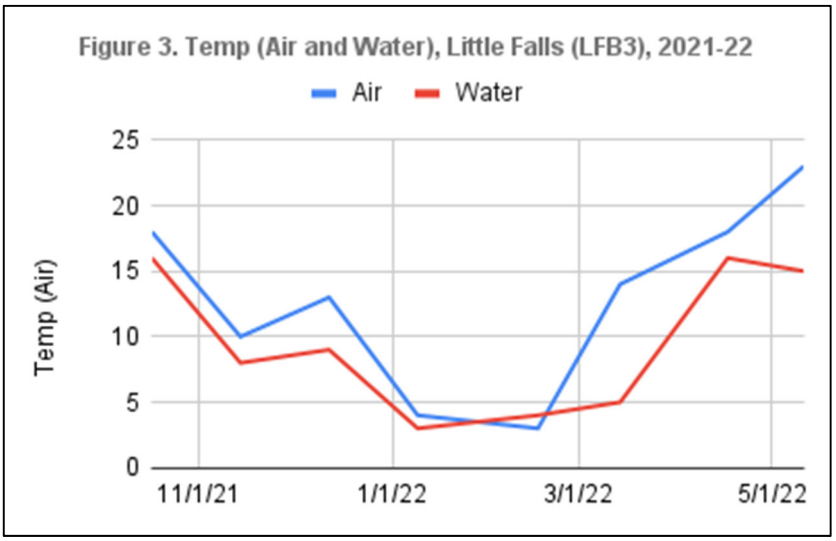
[1] See http://www.dsd.state.md.us/comar/comarhtml/26/26.08.02.03-3.htm and https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table

[2] See https://www.lfwa.org/macroinvertebrates

Trends in dissolved oxygen and air and water temperature are shown in Figures 2 and 3. As shown in Figure 2, dissolved oxygen is highest in the winter months (i.e., supersaturated) due to low water temperatures and less biological activity. As expected, dissolved oxygen levels drop as the water temperature increases and more biological activity occurs. [3] To date, levels below 5 ppm have not been observed.



As shown in Figure 3, air temperature typically exceeded water temperature, except on one occasion; and the differences were more pronounced in the fall and spring.[4] Minerals are more soluble in water in warmer temperatures, which helps to explain why there is always some amount of measurable salt in a stream even during the summer months. Monitoring of all water quality parameters will continue during the summer.



[3] See https://www.usgs.gov/special-topics/water-science-school/science/dissolved-oxygen-and-water
[4] See https://www.usgs.gov/special-topics/water-science-school/science/temperature-and-water

Below is a summary of other developments that came from the effort this year.

Expanded effort. During the winter of 2021-22, sampling efforts expanded from 1 person sampling at a single location (LFB3) on a quarterly basis in 2017-18 to a total of 14 volunteers sampling at 8 different locations on at least a monthly basis during 2021-22. More than 60 samples were collected at seven different occasions, including during the week of January 2nd when the area received more than 5 inches of snow. All of the locations are in the watershed except one at Rock Creek Park which was monitored periodically for comparison.

Measuring at higher levels. This winter was the first year where we were able to measure salt concentration levels above the upper limit of the HACH "LO" test strips. In previous years, we were only able to report that salt levels exceeded this upper limit, which is approximately 600 PPM depending on the test strip calibration. By purchasing "HI" test strips, we were able to measure higher concentrations. While the readings were generally below the upper limit of the "LO" test strips, we were able to measure how high the salt concentrations reached when salt or salt brine was being applied to the roadways.

Using a reporting software app. We posted the readings using the Water Reporter software app after which they were quickly uploaded at the LFWA website page. Because we were using this app, our results were also posted at Isaak Walton League's Winter Salt Watch page. While most of us had never used the app before this year, we became proficient and some of us were even able to post results in the field at the sampling site.

Report prepared by Woody Stanley, May 15 2022.

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