



Volunteer Lake Assessment Program Individual Lake Reports

CRESCENT LAKE, ACWORTH, NH

MORPHOMETRIC DATA

| | | | | | |
|-----------------------|-------|---------------------------|-----------|----------------------------------|------|
| Watershed Area (Ac.): | 2,925 | Max. Depth (m): | 7.3 | Flushing Rate (yr ¹) | 3.7 |
| Surface Area (Ac.): | 116 | Mean Depth (m): | 3.2 | P Retention Coef: | 0.53 |
| Shore Length (m): | 5,100 | Volume (m ³): | 1,526,500 | Elevation (ft): | 1215 |

TROPHIC CLASSIFICATION

| Year | Trophic class |
|------|---------------|
| 1979 | MESOTROPHIC |
| 1992 | MESOTROPHIC |

KNOWN EXOTIC SPECIES

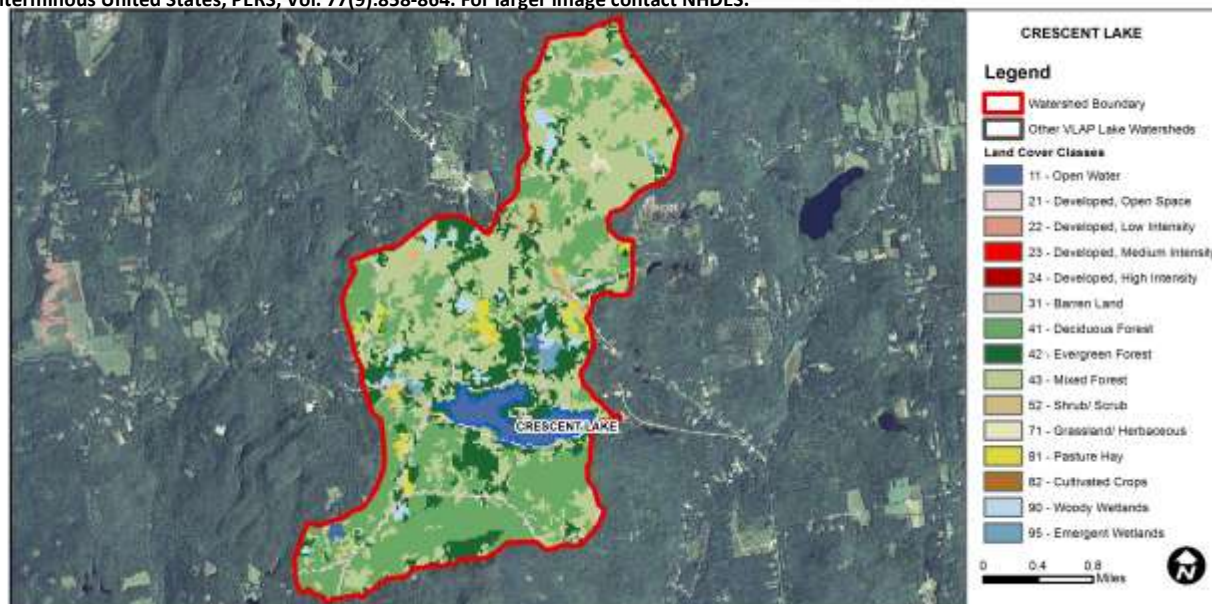
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The Waterbody Report Card tables are generated from the DRAFT 2018 305(b) report on the status of N.H. waters, and are based on data collected from 2008-2017. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm

| Designated Use | Parameter | Category | Comments |
|----------------------------|-----------------------------|--------------|--|
| Aquatic Life | Phosphorus (Total) | Good | Sampling data is better than the water quality standards or thresholds for this parameter. |
| | pH | Slightly Bad | Data periodically exceed water quality standards or thresholds for this parameter by a small margin. |
| | Oxygen, Dissolved | Encouraging | Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter. |
| | Dissolved oxygen saturation | Cautionary | Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter. |
| | Chlorophyll-a | Good | Sampling data is better than the water quality standards or thresholds for this parameter. |
| Primary Contact Recreation | Escherichia coli | Cautionary | Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter. |
| | Chlorophyll-a | Very Good | All sampling data meet water quality standards or thresholds for this parameter. |

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



| Land Cover Category | % Cover | Land Cover Category | % Cover | Land Cover Category | % Cover |
|----------------------------|---------|---------------------|---------|----------------------|---------|
| Open Water | 3.91 | Barren Land | 0 | Grassland/Herbaceous | 0.16 |
| Developed-Open Space | 3.56 | Deciduous Forest | 31.76 | Pasture Hay | 1.93 |
| Developed-Low Intensity | 0.55 | Evergreen Forest | 16.45 | Cultivated Crops | 0.1 |
| Developed-Medium Intensity | 0 | Mixed Forest | 36.96 | Woody Wetlands | 2.58 |
| Developed-High Intensity | 0 | Shrub-Scrub | 1.31 | Emergent Wetlands | 0.76 |



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

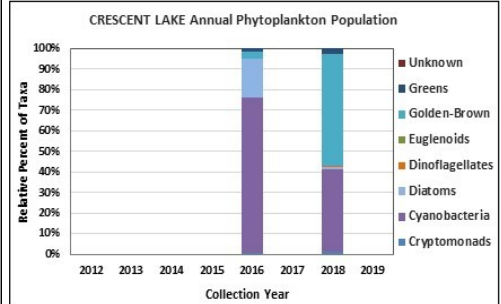
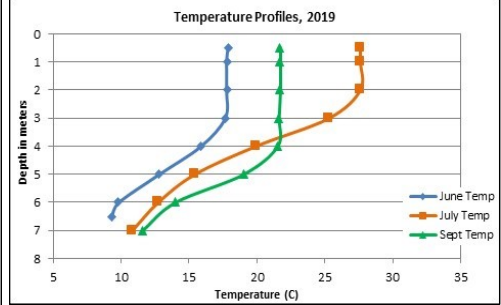
CRESCENT LAKE, ACWORTH

2019 DATA SUMMARY

RECOMMENDED ACTIONS: Lake quality is generally representative of mesotrophic, or average conditions, and the improving hypolimnetic phosphorus levels are a positive sign. The worsening lake clarity is likely related to the increased frequency and intensity of storm events flushing wetland systems rich in dissolved organic matter that impart a “tea” or brown color to the water, combined with stormwater erosion and runoff. Continue measuring apparent color of the water to better understand how it relates to water clarity. The increasing conductivity levels may be a result of road salting or the application of calcium chloride as a dust suppressant on dirt roads. Continue to measure chloride levels to build a baseline data set to better understand how these practices may impact lake conductivity. Lake pH levels appear to be recovering from the impacts of historical acid precipitation. For more information on how New Hampshire’s waters are recovering see the NHDES “Acid Rain Status and Trends” report. Keep up the great work!

OBSERVATIONS (Refer to Table 1 and Historical Deep Spot Data Graphics)

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels were low in June and increased to slightly elevated levels in September. Average chlorophyll level increased slightly from 2018 and was approximately equal to the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Hypolimnetic (lower water layer), Outlet, and Northeast Inlet conductivity and chloride levels were slightly greater than the state medians, yet less than a level of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. West Inlet conductivity and chloride levels were slightly greater than the other stations and increased as tributary flow decreased.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the lake water was moderately tea colored, or brown.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic and Outlet phosphorus levels were within a low range and decreased as the summer progressed. Average epilimnetic phosphorus level remained stable with 2018 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus levels fluctuated within a low to moderate range and historical trend analysis indicates significantly decreasing (improving) hypolimnetic phosphorus levels since monitoring began. Northeast Inlet and West Inlet phosphorus levels were elevated in July and lab data noted colored water with organic matter.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in June and then decreased (worsened) as the summer progressed and algal growth increased. Average NVS transparency increased (improved) slightly from 2018 and was approximately equal to the state median. Historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. VS transparency was generally much higher (better) than NVS transparency and a better measure of actual conditions.
- ◆ **TURBIDITY:** Epilimnetic turbidity levels were low in June and July and increased in September when algal growth was higher. Hypolimnetic turbidity levels were slightly elevated in July and September and lab data noted colored water. Outlet turbidity levels fluctuated within a normal range for that station. West Inlet and Northeast Inlet turbidity levels were elevated in July and lab data noted colored water and organic matter in the samples.
- ◆ **PH:** Epilimnetic, West Inlet, Outlet, and Northeast Inlet pH levels were within the desirable range 6.5-8.0 units, however epilimnetic pH levels have historically fluctuated below the desirable range. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Hypolimnetic pH levels were slightly less than desirable.



| Station Name | Table 1. 2019 Average Water Quality Data for CRESCENT LAKE - ACWORTH | | | | | | | | | |
|-----------------|--|---------|----------|-------|-------|---------|--------|------|-------|------|
| | Alk. | Chlor-a | Chloride | Color | Cond. | Total P | Trans. | | Turb. | pH |
| | mg/l | ug/l | mg/l | pcu | us/cm | mg/l | NVS | VS | ntu | |
| Epilimnion | 4.1 | 4.75 | 8 | 50 | 47.8 | 9 | 3.18 | 3.64 | 0.96 | 6.71 |
| Hypolimnion | | | 9 | | 52.3 | 11 | | | 1.97 | 6.29 |
| #4 West Inlet | | | 12 | | 74.1 | 24 | | | 3.57 | 6.54 |
| Dam Outlet | | | 9 | | 46.9 | 7 | | | 1.23 | 6.63 |
| Northeast Inlet | | | 9 | | 55.6 | 15 | | | 2.93 | 6.89 |

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

- Chloride:** > 230 mg/L (chronic)
- E. coli:** > 88 cts/100 mL – public beach
- E. coli:** > 406 cts/100 mL – surface waters
- Turbidity:** > 10 NTU above natural level
- pH:** between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

- Alkalinity:** 4.5 mg/L
- Chlorophyll-a:** 4.39 ug/L
- Conductivity:** 42.3 uS/cm
- Chloride:** 5 mg/L
- Total Phosphorus:** 11 ug/L
- Transparency:** 3.3 m
- pH:** 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

| Parameter | Trend | Explanation | Parameter | Trend | Explanation |
|-----------------|-----------|---|-------------------------|-----------|---|
| Conductivity | Worsening | Data significantly increasing. | Chlorophyll-a | Stable | Trend not significant; data show low variability. |
| pH (epilimnion) | Stable | Trend not significant; data show low variability. | Transparency | Worsening | Data significantly decreasing. |
| | | | Phosphorus (epilimnion) | Stable | Trend not significant; data moderately variable. |

