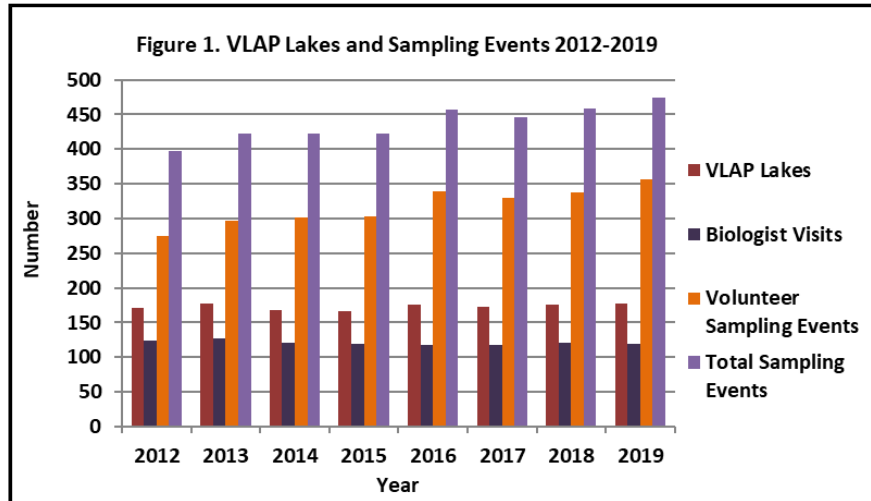
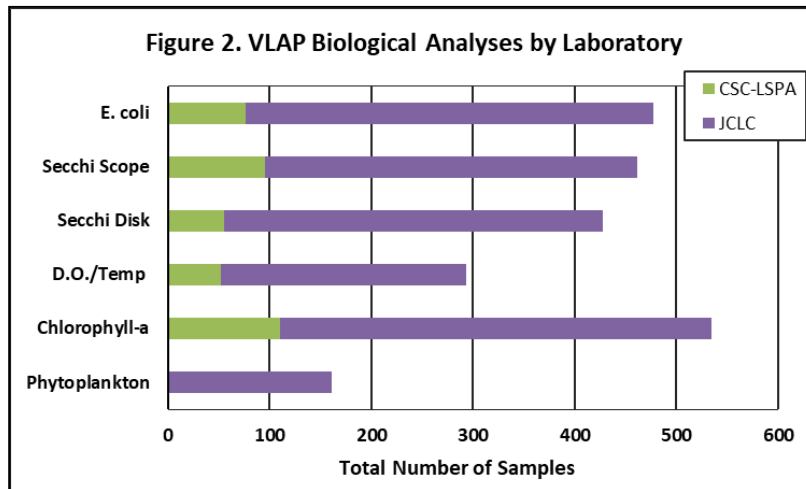


2019 VLAP Season Overview

The Volunteer Lake Assessment Program (VLAP) experienced another busy year for volunteers and staff in the Jody Connor Limnology Center (JCLC). Approximately 500 volunteers monitored 178 lakes throughout New Hampshire, an increase of three lakes from the 2018 sampling season. A total of 475 individual sampling events were conducted at VLAP lakes. Volunteers conducted 356 individual

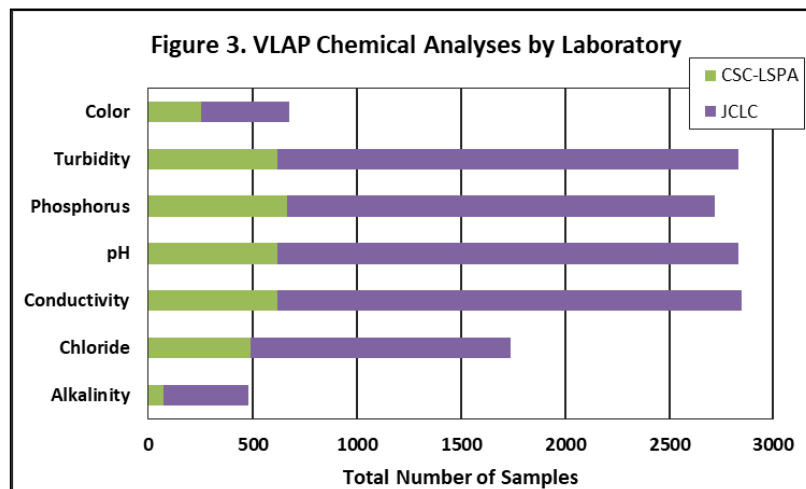


sampling events, and biologists assisted volunteers for an additional 119 sampling events (Figure 1). The dedication and hard work of volunteer monitors has led to a steady increase of sampling events and samples collected; great job volunteers! Approximately 185 deep spots and 500 river/stream stations were sampled. Continuing with the biennial biologist visit schedule, lake names M-Z received a biologist visit in 2019 and lake names A-L will receive a biologist visit in 2020.



Figures 2 and 3 provide a summary of VLAP sample parameters analyzed by the JCLC and Colby Sawyer College-Lake Sunapee Protective Association (CSC-LSPA) satellite laboratory for the 2019 sampling year.

Approximately 16,200 sample results were generated by VLAP in 2019 which increased by approximately 700 over 2018. This large increase was due to a relatively new parameter, Apparent Color, as well as the CSC-LSPA laboratory adding the capability for Chloride analyses. This resulted in Apparent color analyses increasing by 200, while chloride analyses increased by 500 from 2018.



Annual data collection is essential in establishing long-term water quality trends. These trends help determine whether water quality is getting better or worse and aid in watershed management decisions to protect and restore waters. Trend analyses are performed on VLAP lakes with ten or more consecutive years of data collection. In 2019, trend analyses were performed on approximately 165 lake deep spots for the following parameters: chlorophyll-a, transparency, total phosphorus, pH, and conductivity to determine if water quality improving, stable or getting worse over time.

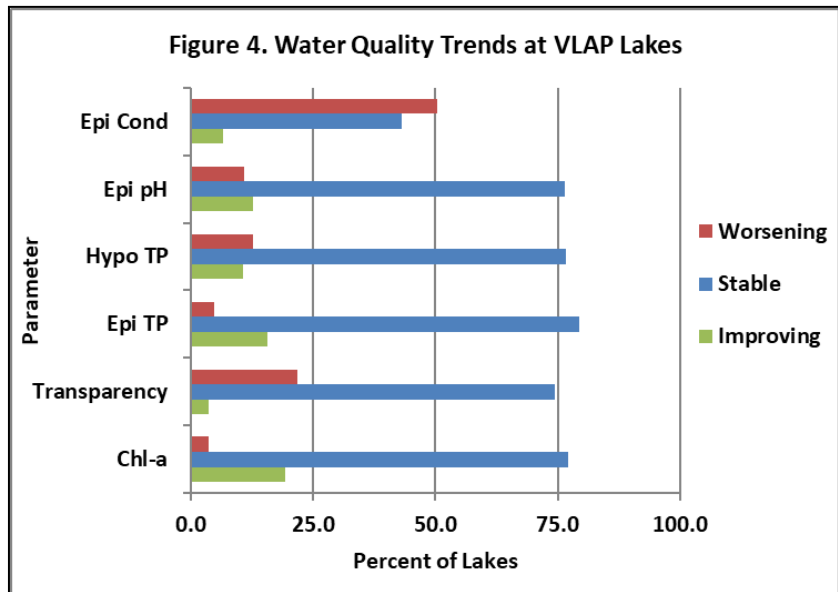


Figure 4 indicates the percent of lake deep spots with improving, stable or worsening trends in 2019. All parameters combined, 71 percent indicate stable conditions, meaning water quality has not changed significantly over time while 11 percent indicate improving conditions, and 17 percent indicate worsening conditions. However, when looking at specific parameters, epilimnetic (upper water layer) conductivity shows a worsening trend at approximately 50 percent of lakes, and approximately 22 percent of lakes show worsening trends for transparency or water clarity. The use of road salt as a de-icing agent for roads, parking lots and driveways has contributed to the increased conductivity levels in our lakes. The worsening lake clarity trends may be linked to increased algal growth in some lakes, but also an increase in dissolved organic matter flushed in during the increased frequency of high intensity precipitation events. The worsening lake clarity trends are cause for concern as lake clarity is linked to recreation, tourism and property tax revenues. The good news is that a majority of lakes show stable and improving trends for epilimnetic phosphorus and chlorophyll levels, and 16 percent of lakes have increasing (improving) pH trends which highlights the state’s recovery from historical acid deposition through rainfall and the importance of the Clean Air Act.