



## Chautauqua Current No. 13

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Figure 1. The Town of Busti's swales stabilization project, seen above along Summit Avenue in Lakewood, includes stormwater management work designed to reduce the causes of harmful algal blooms in Chautauqua Lake.

### **SEEKING THE RIGHT RECIPE**

#### **Many Factors At Play For HABs**

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The researchers who study harmful algal blooms are like chefs looking at a recipe. HABs come from a certain set of ingredients mixed together in the proper proportions, both in the short and long term. Individual lakes can have traits that make them productive environments for algae, and there are related short-term ingredients that can lead to the formation of blooms. A lot of the ongoing work in this field is aimed at getting a clearer picture of these different recipes, so that we can understand how and why HABs form and what we can do to combat them. The good news is we are not talking about *all* types of algae, many of which are beneficial for a lake, and we *are* talking about an issue that affects certain parts of lakes for certain periods of time. Stakeholders also have some useful cookbooks to help them along the way—guidance documents like the Chautauqua Lake Harmful Algal Bloom Action Plan and the HAB's Research Guide.

New York State published these in 2018 and 2021, respectively, and they inform much of the work done in the lake and watershed. When there is a bloom, and water might begin to look like spilled paint, it is understandable that people ask "what are we doing to fix this?" These documents contain

some important answers to that question. Before we get into those, it can be helpful to remember that a lot of people are asking themselves that same question all over the world. A quick internet search for *algae bloom* will kick back dozens of recent stories confirming this. This is a large and growing problem for a lot of people.

The lake's HAB plan is an extensive document that outlines many different topics. Taking a look at statewide trends, it gives us an idea of the different factors that can make a lake susceptible to excess algae growth. This recipe includes things like high nutrient levels, the presence of certain mussel species, climate, sunlight, wave and wind action, water temperature, dissolved oxygen, etc. Some of these variables are generally stable from year-to-year, while others can change from day-to-day or hour-to-hour. Our lake's particular geography, nutrient levels, plant and animal populations, and human activities give us a recipe that is generally good for algae growth. The HAB plan is a great source of information on these variables, and the monitoring and research that is done to understand them.

This leads us back to the question that we started with, "*what are we doing to fix this?*" A lot of work is being done locally and at the state level to address the problem. Chautauqua Lake is fortunate to host multiple leading-class research teams working to increase our understanding of HAB and lake dynamics. Generally speaking, most in-lake solutions to reduce HABs are still in the research and development phase in New York State. A number of different approaches, such as ultrasonic technology, chemical treatments, or aeration, are under consideration at the state level to help disrupt algae growth or manage nutrients. We have even seen some of these innovative techniques tested on the lake. There is still a degree of uncertainty when it comes to the effectiveness and state regulation of these tools. The HABs Research Guide notes that "DEC is actively researching innovative HABs treatments and will use the findings from these and future mitigation pilots to further evaluate the use of several mitigation strategies." Because of this, local stakeholders tend to follow recommendations from the HAB plan that use existing, or we might say *traditional*, best management practices. These recommendations often focus on projects in the watershed (the area of land that drains to the lake) and related work to reduce nutrients.

Many of these are described by the lake's plan as Priority 1 Projects, those that are "considered necessary to manage water quality and reduce HABs in Chautauqua Lake..." This list includes a broad range of techniques, as well as recommendations for funding, prioritizing, and administration. It is encouraging to see many of these Priority 1 Project types already completed, underway, or planned in our community. Public sewer extension to reduce nutrient loading is a prescribed action, and is currently underway along the west side of the lake. Recommendations include swale construction work to reduce the speed of storm water and promote sediment and nutrient capture through check dams and native plants. This includes Alliance-partnered work on the Busti Swales Stabilization Project, which was recently completed, as well as the upcoming Chautauqua Roadside Swales Stabilization Project. Ditch features like check dams and native plantings help to reduce erosion and improve the quality of water sent to the lake. Stream stabilization and wetland conservation are a main part of the HAB Action Plan, and are pillars of the watershed management strategies that are currently in use. The Chautauqua County Soil and Water Conservation District and Chautauqua Watershed Conservancy are among the organizations working on this front, with Soil and Water focusing on many of the important agricultural management practices prescribed in guidance documents.

Algae are a natural and fundamental part of freshwater environments like our lake, but more and more often we are seeing the negative impacts of their excessive growth and the ability of certain

species to produce toxins. We are not the only ones wondering what is going on and what we can do to change it. Today, even some lakes we thought had bad recipes for algae growth are seeing blooms. Lake's in the Adirondacks, some of which feel virtually no impact from human development, have experienced HABs. Understanding these problems is complex, like so many related lake and watershed issues, and implementing effective solutions introduces another level of complexity. Guidance documents are not perfect prescriptions for what we should do, but they are valuable resources and give us a common framework to follow in both the short and long term. These documents and other HABs resources can be found at [chautauquaalliance.org/harmful-algal-blooms-habs/](http://chautauquaalliance.org/harmful-algal-blooms-habs/).