

## Draft: Preliminary Lake Evaluation (PLE) Initiative

**Draft: Developed largely by Bill Taylor, in consultation with the Mitigation Subcommittee of CCHAB.**

**Concept:** Lake Managers often have limited knowledge, experience or resources for characterizing, and then managing or reducing harmful cyanobacterial or algal blooms. This program is designed to provide focus for lake managers and enable them to enact effective monitoring and management strategies, and guide them towards cost-effective and environmentally acceptable mitigation approaches. To a large degree, the objectives contained in this Initiative dovetail with the goals outline in the HAB Strike Force Initiative (also developed by the Mitigation Subcommittee of CCHAB).

**Objective:** The purpose of this Initiative is to develop a mechanism to assist Lake Managers in preventing and managing cyanobacterial and algal blooms, make monitoring recommendations necessary to understand root causes driving HAB events in the lake, and help guide Managers in their choice of appropriate mitigation approaches. The PLE is designed to gather sufficient information about a water body to provide guidance and clarity to Lake Managers on the use of the mitigation options flow-chart developed by the Mitigation Subcommittee of CCHAB (see attached flowchart).

**Rationale:** This concept emerged from discussion within the CCHAB Mitigation Subcommittee involving how lake managers choose among the many mitigation approaches that are presently available. Lake managers often possess only a rudimentary understanding of cyanobacterial or algal blooms, and methodologies that are available for mitigation and/or prevention. Poorly chosen mitigation strategies yield a low chance of success and therefore result in lost revenue, a continuing problem, and potential ecological damage if inappropriate methods are employed. The Mitigation Subcommittee of the CCHAB Network has been summarizing approaches to assist lake and reservoir managers in preventing or mitigating bloom events (see attached flow diagram). The PLE is designed to assist lake and reservoir managers to better understand the underlying issues related to the development of cyanobacterial and algal blooms in their lakes, and provide guidance in their choice of various prevention or mitigation approaches.

The Initiative is predicated on the assumption that most lakes are either unstudied or have inadequate monitoring programs, technical expertise and often general limnological background are often lacking, and limited funds are available for characterizing or managing bloom events. Many lake managers would benefit significantly from assistance in identifying the presence and nature of a harmful blooms, and guidance among the many existing mitigation options that exist. This is particularly true for small lakes, which are often understudied.

**Overview of Preliminary Lake Evaluation Activities:** The primary components of the Initiative are:

- 1) A PLE spreadsheet/questionnaire that is filled out by the lake manager based on available information (see draft of the spreadsheet, attached); (2) review of the spreadsheet by the PLE team. The primary goal of the questionnaire is to characterize the problem or issue in the lake with respect to type of bloom,

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frequency, magnitude, areal extent and duration, if known. These data, and readily available water quality data gleaned from online searches will allow the PLE team to gain an initial understanding of lake's trophic status, identify potential watershed sources, in-lake conditions, existing water management activities, and broadly define the patterns, trends and historical changes that have occurred in the lake.

- 2) The PLE team will review the available information and questionnaire filled out by the Lake Manager, and the follow-up with the Manager. It is anticipated that that this team will consist of a few members of the mitigation subcommittee, including experienced lake managers. A follow-up call (at a minimum) and/or a site visit to ask additional questions and to fill in gaps or clarify details will be conducted by the PLE team after review of the questionnaire.
- 3) Based on the evaluation, the PLE team will produce a summary document that provides monitoring suggestions or improvements, and a pathway towards mitigation of the CyanoHAB problem (see [flowchart](https://mywaterquality.ca.gov/habs/resources/docs/algae_mitigation_tech_select_proc_lakes.pdf) at: [https://mywaterquality.ca.gov/habs/resources/docs/algae\\_mitigation\\_tech\\_select\\_proc\\_lakes.pdf](https://mywaterquality.ca.gov/habs/resources/docs/algae_mitigation_tech_select_proc_lakes.pdf)). The document will briefly summarize existing conditions, identify critical knowledge gaps and, if possible, identify root causes. Recommendations for infrastructural modifications that might reduce recurrence of blooms will be included, to the degree possible. Feedback from the Lake Manager will be evaluated by the Mitigation Subcommittee to improve the PLE process.

**Preliminary Lake Evaluation Recommendations:** A small team of experts will evaluate the information provided by the lake manager on the PLE spreadsheet, augmented by their own in-person observations (if conducted), and produce a summary document specific to the lake. Ideally, the team might include three people with complementary expertise in lake ecology or management (e.g. biology, chemistry, engineering). NB: If carried out in conjunction with that activities of the HAB Strike Force Initiative, activities of the latter group could provide much richer information for the report generated by the PLE team. Some overlap of personnel on these teams would be ideal.

The report from this group will confirm the presence of a cyanobacterial/algae bloom, summarize existing lake conditions and operations, identify critical knowledge gaps (e.g. key measurements that should be made such as toxin analyses), and comment on root causes of blooms in the lake. It will also provide guidance regarding a monitoring plan going forward, appropriate mitigation strategies that might be applied (and those that are inappropriate given the specific conditions of the lake), and provide useful links to information. The flowchart posted on the CCHAB Network website will provide the framework for conclusions and recommendations, supported by the additional in-depth references as warranted.