

1
2 **For Consideration: Outreach Special Project Proposal**

3 **Project Title:** Assessing the public’s perceptions, attitudes, and knowledge gaps towards water
4 quality can improve education, outreach, and scientific communication to the Clear Lake
5 community.

6 **Project Goal:** The purpose of this project is to identify the public’s current perceptions and
7 attitudes towards water quality, and related impacts, in Clear Lake and to identify any
8 knowledge gaps and research information needs. Listed within Assembly Bill 707, Chapter 842
9 in section 22091, one of the charges of the Blue Ribbon Committee is to identify “barriers to
10 improved water quality in Clear Lake and contributing factors to poor water quality”. The
11 proposed project helps to address this charge by identifying what barriers exist from the
12 public’s perspective, or how the public’s attitudes and perceptions may be driving behaviors
13 that can both negatively and positively impact water quality. It’s important for managers,
14 researchers, and policy makers to be able to understand how to clearly communicate
15 sometimes complex scientific information about water quality to the voting public.
16 Additionally, policy decisions driven by community consensus determine the available
17 resources for managing water resources, such as funding for watershed scale non-point source
18 pollution control. Local and state managers can better focus educational and outreach efforts
19 towards the public if it’s clear what the public understands about the causes and impacts of
20 water quality, and can better communicate how management or policy practices, like those
21 produced by the Blue Ribbon Committee and other efforts, can be beneficial for Clear Lake
22 water quality.

23 Results from this proposed project can be used to educate and promote specific actions that
24 can alter attitudes and change behaviors to those which can improve water quality. Specific
25 tailored messages addressing identified knowledge gaps can provide maximum effect on
26 public’s reception and acceptance of management implications and policies geared towards
27 water quality. Both of these actions can help to increase the stewardship consciousness of the
28 public in protecting Clear Lake now and into the future. This information can also be used to
29 facilitate the transfer of scientific information to meet the needs of the Lake’s users, residents,
30 stakeholders, and managers, such as the expected information derived from the Blue Ribbon’s
31 technical subcommittee and research components.

32 Some example outcomes and actions from this proposed assessment might include:

33 1) Does the public have a clear understanding of current water quality in Clear Lake and what
34 landscape and lake factors contribute to that water quality? Knowledge gaps in this
35 understanding can help managers communicate the relevant science more clearly, including the
36 role and capabilities of the Blue Ribbon Committee itself. *For Ex. If the public perceives that the*
37 *Blue Ribbon Committee is going to get “Clear Lake clear in two years, managers can promote*

1 *educational materials that specifically address that while Clear Lake was never “clear”, a lake is*
2 *still healthy even if it looks slightly green, turbid or cloudy, and full of plants and animals.*

3 2) The perception of water quality in Clear Lake directly impacts tourism, water uses, and
4 economic investment in the Lake County area. *For Ex. If people are*
5 *nervous/uncertain/uniformed about swimming in green, toxic lake water they are less likely to*
6 *visit or purchase properties on Clear Lake. The perception of poor water quality can perpetuate*
7 *this trend and a cohesive outreach strategy is needed to address misconceptions.*

8 3) Identifying what people perceive to be important when it comes to water quality can be
9 useful when outreach efforts strive to influence or change attitudes or behaviors. *Ex. Specific*
10 *marketing or outreach campaigns that promote the benefits of a natural, native shoreline*
11 *include improved water quality and reductions in cyanobacteria concentrations, might lead to*
12 *the shifting of behavior in individual shoreline management and residential lakeside landscapes.*

13 **Approach**

14 **Part 1:** To assess the public’s attitudes, perceptions, and knowledge gaps of water quality
15 issues, we propose to administer a combination multiple-choice and Likert-scale questionnaire,
16 perhaps with some free-response questions, however these will be limited as their analysis
17 includes individual coding of assigned themes and can be time-consuming and subjective, and
18 can contain high variation when analyzed by many different people. The questionnaire can be
19 distributed in both digital and hard copy formats for maximum distribution. Digital can be
20 administered via Google Forms or Survey Monkey accessed via links or QR code. Hard copies
21 can be downloaded and printed or sent via snail USPS. It is recommended to offer some
22 incentive for taking the survey (i.e. chance to win a gift card etc.)

23 The subcommittee will identify the specific topics to include in the questionnaire, but examples
24 could include, but are not limited to, some of the following:

- 25 • Causes and impacts of cyanobacteria
- 26 • Stormwater
- 27 • Current threats to Clear Lake water quality
- 28 • Current land use practice impacts on water quality
- 29 • Impacts of historical and present mining activities
- 30 • Wetland and flood infrastructure
- 31 • Current management or monitoring
- 32 • Non-point and point sources of pollution
- 33 • Recognition of current outreach campaigns or messages
- 34 • Others?

35
36 A focus group can be utilized to identify the validity of the surveys and identify any areas for
37 improvement in questionnaire structure, clarity or participant comprehension. Surveys or

1 survey question blocks will be tested for internal reliability using Cronbach’s Alpha or similar
2 validation.

3 **Project 2:** With information gathered from the public questionnaire, the subcommittee shall
4 summarize and review findings. Specific themes and trends in perceptions and attitudes will be
5 identified, and any significant and recurring knowledge gaps will be summarized and presented
6 to the committee at large.

7 After reviewing questionnaire results, the subcommittee will then identify some specific
8 management or communication actions to address knowledge gaps and attitudes and provide
9 those recommendations to the Blue Ribbon Committee and / or current Lake Managers. The
10 purpose of implementing specific, targeted, and data-driven outreach campaigns is to improve
11 overall water quality via behavioral / attitude shifts in the Clear Lake community.

12 **Part 3 (optional):** Evaluation of directed actions from part 2. If possible, post-surveys will be
13 conducted, following the same structure and question set as the pre-surveys to identify if the
14 implemented actions were successful in improving attitudes, addressing negative perceptions,
15 or addressing knowledge gaps. If directed actions and educational/outreach campaigns were
16 successful, then post questionnaire scores should reflect an improvement in the understanding
17 of water quality issues. If needed, water quality field monitoring outcomes can be discussed
18 within the subcommittee and coordinated with current research components of the Blue
19 Ribbon Committee.

20

21 **References and Survey examples:**

22

23 Brisson, G. K. Dube, S. Doyon...et al. (2017) Social Construction of Cyanobacteria Blooms in
24 Quebec: A Matter of Perceptions and Risk Management. Sage Publications 2017:1-10
25 Accessible: <https://journals.sagepub.com/doi/pdf/10.1177/2158244017697361>

26 Codd, G. (2000). Cyanobacterial toxins, the perception of water quality, and the prioritization of
27 eutrophication control. Ecological Engineering 16:51-60.

28 Fore, L. (2013) Effectiveness of Public Education and Outreach Programs for Reducing Impacts
29 of Storm water on Rivers and Streams. Storm water Workgroup of the Puget Sound Ecosystem
30 Monitoring Program.

31 Hutton, B. (2014) Clark County’s NPDES Phase 1 Storm water Management Effectiveness
32 Monitoring: Targeting Environmental Outcomes. Clark County Department of Environmental
33 Services Clean Water Program.

34 Nanayakkara, L. (2018). In lakes but not in minds: stakeholder knowledge of invasive species in
35 prairies lakes. Biological Invasions 20:633-652

1 Nanayakkara, L. and B. Wissel. (2017). Preliminary investigation of lake-use patterns in prairie
2 lakes, stakeholder perceptions, and resulting management implications. *Lake and Reservoir*
3 *Management* 33:49-61

4 Ryan, C.M. (2009) Managing Nonpoint Source Pollution in Western Washington: Landowner
5 Learning Methods and Motivations. *Environmental Management* 43:1122-1130. Accessible:
6 <http://courses.washington.edu/esrm304/pdfs/RyanNPSEM.pdf>

7 Voigt, B., J. Lees, and J. Erickson. (2015) Final Report: An Assessment of the Economic Value of
8 Clean Water In Lake Champlain. The Lake Champlain Basin Program Technical Report No. 81.
9 Accessible: [https://www.clf.org/wp-content/uploads/2016/07/Economic-Value-of-Clean-Lake-](https://www.clf.org/wp-content/uploads/2016/07/Economic-Value-of-Clean-Lake-report-.pdf)
10 [report-.pdf](https://www.clf.org/wp-content/uploads/2016/07/Economic-Value-of-Clean-Lake-report-.pdf)

11

12