

## Blue Ribbon Committee for the Rehabilitation of Clear Lake

### Technical Subcommittee

Meeting #9  
10:00- 12:00 pm  
April 24<sup>th</sup> 2020

### Meeting Summary #9

#### Attendees:

See Attachment A

#### Action Items:

1. CPP will:
  - a. Add the edits provided by Jim Steele to the March 26<sup>th</sup> Technical Subcommittee Meeting Summary
  - b. Circulate the links on SPARROW to provide additional information to the Subcommittee (complete)
  - c. Continuing to work with Resources on procedures to ensure ADA compliance (ongoing)
  - d. Update the spread sheet of proposed monitoring sites and resend it to the Subcommittee (complete)
  - e. Reach out to a contact in the Forest Service and connect him to the Subcommittee to discuss the impact of off-road vehicles (complete)
2. BRC Subcommittee will:
  - a. Provide any revisions or edits to the March Subcommittee Meeting Summary to CCP by Tuesday, April 28th
  - b. Look at the spread sheet of proposed monitoring sites as well as the sediment fingerprinting document and provide comments to Charlie Alpers and Joe Domagalski before the May Subcommittee meeting
3. Broc Zoller, Charlie Alpers and Joe Domagalski will:
  - a. Discuss technical details related to the proposed monitoring sites and report back to the Subcommittee
4. Angela DePalma-Dow and Sarah Ryan will:
  - a. Share a link about Clear Lake County data with Charlie Alpers
  - b. Continue the discussion related to data management, with an open invitation to other members of the Subcommittee
  - c. Discuss ongoing projects taking place at Molesworth Creek
5. Angela will:
  - a. Follow up with TERC to ensure their research team has access to Clear Lake and can continue to collect data

6. Charlie Alpers will:

- a. Share a link on topological data with CCP to add it to the database

7. Margaret Donoghue will:

- a. Follow up with the CSIRO research team to find responses to the Subcommittee's unanswered questions

## **Welcome and Introductions**

Sam Magill (Facilitator), Sacramento State Consensus and Collaboration Program (CCP), opened the Technical Subcommittee (Subcommittee) meeting. The Subcommittee is a subset of stakeholders associated with the Blue Ribbon Committee for the Rehabilitation of Clear Lake (Committee). A full list of Subcommittee meeting participants is included in Attachment A.

The Facilitator noted there were two meeting objectives: to have two informational presentations and continue discussion on the monitoring and modeling plans for Clear Lake and the Clear Lake watershed. The first presentation focused on data management and was to be given by Angela DePalma-Dow (Lake County Water Resources Department); the second presentation was developed by Tim Malthus and given by Margaret Donoghue, both from Australia's Commonwealth Scientific Industrial Research Organisation (CSIRO) and focused on the data cubes and analyzing data.

## **Confirm Meeting Minutes from March 26<sup>th</sup> Technical Subcommittee Meeting**

The following edits/modifications to the March 26<sup>th</sup> Subcommittee summary include:

- Jim Steele, Lake County resident, noted that he had emailed some corrections to the Facilitator, who confirmed he had received them and will integrate these into the final meeting summary (**Action Item 1a**).

The Facilitator requested that all edits be sent to him by Tuesday, April 28<sup>th</sup> (**Action Item 2a**).

## **Review of March 26<sup>th</sup> Action Items**

The Facilitator reviewed and provided updates on the agenda items from the March Subcommittee meeting. Furthermore, he stated that the Subcommittee and Committee should be prepared for the State of California to have reduced funding for projects not directly related to Covid-19 and/or wildfire. He also recommended that when looking at the monitoring sites, Subcommittee members are encouraged to identify the most essential sites in the event that funding is less available than formerly anticipated.

## **Presentation: Data Management**

Angela DePalma-Dow provided a presentation on data management needs of the Blue Ribbon Committee for the Rehabilitation of Clear Lake (Committee). The presentation and webinar will be posted to the [Committee Website under "Technical Subcommittee Meeting #9"](#).

Within the State of California there has been a major push, and often a requirement for, recipients of state funding to provide open source data related to state funded projects. In the case of the Committee, the goal is to provide open source data that on water quality that is accessible and

replicable, to best enable the monitoring and management of Clear Lake and the surrounding watershed both currently and in the future.

There has already been an extensive amount of data collected by a variety of entities (these include federal, state and local governments, academic institutions, NGOs and tribal nations) over the past decades, however, this data is disbursed (mostly found on a variety of websites) and often lacks metadata (information on who and how the data was collected). The Committee's goal is to develop a centralized data management strategy and implement data management before, rather than after, data collection related to the Committee takes place. Lake County has acquired a grant to begin work on data management, since the goals of this grant overlap with those of the Committee, it is ideal that both sets of goals be served by employing a consultant that can consolidate available data in a centralized location, to ensure the open source data platform is well organized, publicly accessible and well maintained.

Ms. DePalma-Dow highly recommends using the California Environmental Data Exchange Network (CEDEN) as a data management platform, this platform is commonly used at both the state and federal level. The data can be collected locally in Clear Lake, reviewed by CEDEN, then edited locally and then cleaned up and finally, shared with and posted by CEDEN.

Discussion:

Ms. DePalma-Dow provided a brief update on the status of allowing research vessels on Clear Lake. The County will allow research boats; boat ramps for use by the general public remain closed. Staff from the Tahoe Environmental Research Center (TERC) asked if their research team access Clear Lake for research purposes?

- Ms DePalma-Dow stated that while there are currently restrictions on large boat craft on Clear Lake due to Covid-19 social distancing measures, she considers the work TERC is doing essential and thus, the research team should be allowed access to the lake with appropriate safety measures. A member of the TERC team agreed to follow up with her to ensure they can continue research (**Action Item 5a**).

There is concern that collecting data in a manner that is compliant with CEDEN will require additional work by part of the county and local entities that are already strained and do not have sufficient resources to organize, update and maintain a data base.

- The county is already required to collect water quality data and in many cases they are doing so, however that data is currently not being shared on a unified database or publicly. Employing data management through CEDEN would correct that. As to formerly collected data, the county does not have the capability to organize, update and maintain all that data, the proposal is to hire a consultant to do this specialized work, so that portion should not add work on the county level.

There has been a good deal of data collected on Clear Lake already, including a sediment study dated as far back as the 1960s. Is there a way to integrate this kind of formerly collected data into the CEDEN database?

- Yes, the idea is to hire an external consultant to comb through data formerly acquired by the county and integrate it into the proposed database.

The Committee expressed general support to use CEDEN for data management, however there are technical and specific questions about how to implement this plan and organize around it. Ms. DePalma-Dow and Sarah Ryan of Big Valley Rancheria will talk offline to continue discussion of CEDEN use for Clear Lake data (**Action Item 4b**).

**Presentation: Optical Technologies for Observations of Water Quality and Algal Blooms**

Ms. Margaret Donoghue presented on behalf of Tim Malthus and their research team, all members of the Ocean and Atmosphere branch of CSIRO, in Australia. The presentation and webinar will be posted to the [Committee Website under "Technical Subcommittee Meeting #9"](#).

The CSIRO team has been successful in studying toxic algal blooms using data cube and remote sensing technology. Their team uses information on spectral reference and satellite detections of harmful algal blooms to manage and service water bodies in Australia. Data cube organizes spatial and analysis-ready data by stacking it into cubes that are scalable. This allows for data visualization by using special data and illustrating areas in red, yellow or green in accordance with harmful algal levels. This information can then be used for management and decision making.

Some of the benefits of data cube are that it is an open data platform and it is processed in the cloud, making it more affordable and accessible than commercial options. It is paired with the use of HydraSpectra monitors that are used to for bloom alerting and satellite validation; these monitors are designed for continuous deployment above water surface access, both of which result in a relatively low costs while maintaining high spectral resolution and allowing for monitoring at numerous sites. All of these specific conditions make the use of both of these methods ideal for prolonged water quality monitoring because they are low cost and have a low barrier to entry.

Employing data cube and HydraSpectra are ways to complement existing sampling and publicly available spatial data; furthermore, they allow for continued monitoring while improving the ability to deliver satellite applications and can be used to monitor, predict and manage harmful algal blooms.

Discussion:

Is the primary utility of these tools long-term monitoring?

- Yes, relative to other methods using data cube is inexpensive and any easy way to bring in assessment and research. Additionally, it results in predictions of harmful algal blooms and this information can be used for management and decision-making.

Can this model incorporate Landsat data?

- Yes, it can use Landsat data to ground truth models and it can chart algal blooms going back in time. This information gives a better picture of what former algal regimes have looked like and will aid in developing better prediction tools.

What tools can be used to look at validation? There has been some use of drones and AEV in water and tissue sampling and there is a desire to keep evolving these ideas.

- Data cube can pull in other data sources in addition to the ones that were discussed in the presentation, so integrating that data is possible.

In Australia, has the CSIRO team seen any correlations between geological units and algal blooms?

- The answer to this was unknown to Dr. Donoghue, who promised to check in with her team and follow up via email after the Subcommittee meeting.

Considering the delays in satellite data processing, how can these methods be used to predict algal blooms? Can you elaborate more about how an early warning system would work?

- Ms. Donoghue acknowledged this was not her area of expertise but she would follow up with CSIRO staff for an answer (**Action Item 7a**).

### Monitoring and Modeling Plan Review

The Facilitator asked the Subcommittee to review and discuss the edited Monitoring Plan Spreadsheet bearing in mind the following questions: 1) Have all of the appropriate new locations been identified? 2) What are the highest priorities? And if possible can these be paired down to a top five sites for monitoring.

#### Discussion:

- The Facilitator asked Committee Chairman, Eric Sklar (California Department of Natural Resources) about whether he had any funding updates, given the developments with Covid-19, and if so, should the Subcommittee consider prioritizing monitoring sites to prepare for potential cuts to the expected funding?
  - Mr. Sklar encouraged the Subcommittee to proceed planning for funding to be provided in full, although there is no guarantee this will happen, efforts are being made to that end. Furthermore, he and the Facilitator is planning on meeting with several environmental groups next week. In the case that funding is not provided from by the state there may be opportunities through other means.
- There was general agreement by the Subcommittee that priority areas for monitoring include: Scott's Creek, Middle Creek and Clover Creek. Additionally, any stream that would be a good reference to give information from Big Valley. Schinler Creek is also a point of interest and curiosity.
- Generally speaking, monitoring sites located further down the watershed, that directly flow into Clear Lake have the potential to provide data on the entire watershed and likely are the most ideal sites for monitoring. This is because they can be used to validate the proposed model by applying gauges and looking at sediment fingerprinting.
- Dr Alpers noted that there is some interest by the Bureau of Land Management (BLM) to monitor a site on Scott's Creek; BLM is looking into using sediment fingerprinting as it pertains to fire and burn severity. This is notable because there may be overlap between monitoring by the Committee and the BLM and thus the Committee could use funding and data provided by BLM and reduce their budget expenses.
- Sampling on Middle Creek, at the inflow to Clear Lake is a priority. However, sampling on the bridge is not recommended due to several concerns about backflow, safety and convenience (high flows, the narrowness of the bridge, vehicle use and traffic). There was a strong preference to sample upstream at the confluence of Scott's and Middle Creek or a few hundred yards upstream from the bridge, although this would need to happen via cableway.
- Lucerne Creek, at the inflow into Clear Lake, is an existing cyanotoxin monitoring site, although it was not included on the spreadsheet. This site is likely a big producer of cyanobacteria due to off road vehicle use upstream. The results of this can be seen as much of this material has filled in the harbor to the east of Lucerne Creek's inflow to Clear Lake. This monitoring site will be added by CCP (**Action Item 1d**).
- Burns Creek and Molesworth Creek are the highest priority areas within the City of Clear Lake. The latter is particularly a point of interest because it is connected to waste management. The rest of the proposed monitoring sites located within the City of Clearlake (Baylis Avenue and Beach Avenue) are points of interest as stormwater runoff sites, thus should be considered for "Schedule C".

- Molesworth Creek is a particularly high priority and high benefit monitoring site because it has been experiencing erosion at accelerated rates. There are some large projects going on to secure its banks. One major concern is area that this erosion may be disturbing human remains, which are culturally. Ms. DePalma-Dow and Ms. Ryan will connect to discuss these efforts **(Action Items 4d)**.
- Ms. Ryan also has further questions and thoughts on monitoring parameters and frequency, she will discuss these further with Ms. DePalma-Dow **(Action Item 4b)**.
- Additionally, to the proposed monitoring sites included on the spread sheet, there is interest in including Adobe Creek to gauge the stream flow. This site is an important contributor to Clear Lake as well as groundwater. Adobe Creek has been proposed for a different project, but several Subcommittee members support including it within the BRC Subcommittee monitoring plan as well.
- Charlie Alpers (USGS) shared information with the Subcommittee on sediment fingerprinting, in the form of a document circulated to all members. He requests the Subcommittee consider it and share feedback on whether they think the representation of land use is appropriate **(Action Item 2b)**.
  - In terms of land use, there is an agricultural land use classified as “row crops” but within Lake County these are not very common, they are mostly orchard crops. In terms of the commonly applied fertilizers phosphorous is not a common input, but nitrogen application is more common.
  - The model used National Land Cover Database (NLCD) as the primary data source for crop and fertilizer data, as well as general county sales. However, there is interest in sharing and discussing more granular data **(Action Item 3a)**.
- Ms. Ryan and Ms. DePalma-Dow offered to share information with Dr. Alpers. Information includes some key Lake County Data and information on burn severity **(Action Item 4a)**.
- Dr. Alpers has some key information on Clear Lake topography (2015) that he hopes to share with the Subcommittee, he will circulate a map to CCP **(Action Item 6a)**.
- There is a request that all Subcommittee members clarify and verbally state what acronyms represent as they are introduced
- The Subcommittee is interested in acquiring information on the intensity of off-road vehicle in the area. There are contacts at both the Forest Service and the Water Board who may be able to help with that. CCP agreed to but Subcommittee members in touch with the former **(Action Item 1e)**.
- Ms. DePalma-Dow noted that in her work for Lake County, they had applied for funding from the state that could be used to restore shorelines and habitat. She highlighted that many of these sources of funding align with the goals of the Committee and requests the Committee support in these efforts. She also offered to share the grant package with the Subcommittee.

The Facilitator agreed to update the monitoring spread sheet as discussed **(Action Item 1d)** and clarified that at this point the goal is to come forth with a specific proposal of the model (at this point consists of the SAPARROW/HSPF/LSPC proposed model) and a finalized list of monitoring sites to present to the Committee in the June meeting.

All Subcommittee members are encouraged to provide feedback to the monitoring spread sheet **(Action Item 2b)**. Action Items were reviewed by Cristina Murillo-Barrick, CCP.

## Public Comment

No public comments were provided.

**Adjourn**

**Attachment A: Meeting Participants**

<b>Participants</b>		
<b>First</b>	<b>Last</b>	<b>Organization</b>
Charlie	Alpers	United States Geological Survey
Alicia	Cortes Cortes	UC Davis Tahoe Environmental Research Center
Angela	DePalma-Dow	Lake County Water Resources Department
Doug	Jagger	USGS Denver
Karola	Kennedy	Koi Nation
Michelle	Stern	
Margaret	Donoghue	CSIRO
Sarah	Ryan	Big Valley Rancheria
Dina	Saleh	United States Geological Survey
Geoffrey	Schladow	University of California Davis, Tahoe Environmental Research Center
Eric	Sklar	Natural Resource Agency Blue Ribbon Committee & California Fish and Game Commission
Jim	Steele	Lake County Resident
Broc	Zoller	Lake County Farm Bureau
Sam	Magill	California State University, Sacramento
Cristina	Murillo-Barrick	California State University, Sacramento

Joe Domagalski