

Blue Ribbon Committee for the Rehabilitation of Clear Lake

Technical Subcommittee

11:00 am-1:00 pm

December 5, 2019

Meeting Summary #6

Attendees:

Attendees are listed In Attachment A.

Action Items:

1. Mr. Zoller will look into the cost of adding a rain gauge to the Cow Mountain meteorological station
2. CCP will forward documents from Drs. Cortes Cortes and Alpers regarding analyzed constituents to the entire Subcommittee
3. USGS and TERC will meet to discuss model options in depth, as well as a work plan and more specified cost estimate for a bathymetric survey
4. CCP will schedule a USGS presentation on the SPARROW modeling in early 2020
 - a. CCP will invite Taran Sahota to the SPARROW modeling presentation
5. CCP will contact Resources about the TERC contract and their continued role after 2020
6. Dr. Alpers will compile a list of resources for sediment fingerprinting to discuss within the Subcommittee
7. CCP will bring to the Committee the suggestion to include bio-assessments in their monitoring under Recommendation 2
8. Dr. Alpers and Ms. DePalma-Dow will discuss, with their respective agencies, the potential for installing temporary rain gauges in the new year
9. Ms. DePalma-Dow will send CCP an existing spreadsheet of County sampling locations and constituents
10. Ms. Kennedy will send CCP locations of the seasonal tributaries near the City of Clearlake
11. Ms. DePalma-Dow will send CCP GIS layers for the Clear Lake watershed boundary
12. CCP will send the Subcommittee the [OneDrive Clear Lake database link](#)
13. Dr. Schladow will look into sharing the UC Davis Amazon Web Services data

Welcome and Introductions

Sam Magill (Facilitator), Sacramento State Consensus and Collaboration Program (CCP), convened by webinar the sixth meeting of the Technical Subcommittee (Subcommittee) of the Blue Ribbon Committee for the Rehabilitation of Clear Lake (Committee). A full list of participants is included in Attachment A.

The Facilitator outlined the following meeting objectives:

- Confirm the Technical Subcommittee meeting #5 summary
- Review Recommendations updates to the Committee's Annual Report (Report) to the Governor and California Legislature based on Committee feedback
- Confirm existing and needed monitoring/sampling resources in the Clear Lake watershed

Confirm Meeting Minutes from November 6th Technical Subcommittee Meeting

No edits were provided to the Summary from the previous Subcommittee Meeting. Edits can be sent to the Facilitator at s.magill@csus.edu until December 11th.

The Facilitator reviewed the previous meeting's action items with the group.

1. Charlie Alpers, US Geological Survey (USGS) will share the schedule for 3-Dimensional Elevation Program (3DEP) Light Detection and Ranging (LiDAR) data release, if it will be part of a time series of surveys, when the data was taken, and survey resolution information.

Dr. Alpers said that the 3 DEP LiDAR scan is attempting to make a topographical map of the entire country, and because of the fires, Northern California is a very high priority. He inquired to the 3 DEP team manager at USGS about the resolution and the date for data acquisition for Clear Lake and is waiting for a response. The data could be released as early as January.

2. Broc Zoller, Lake County Farm Bureau, will provide the locations of the County Fruit Frost Program rain gauges and meteorological stations.

The locations and data from the rain gauges and meteorological stations is available here:

<https://lake.westernweathergroup.com/>. Mr. Zoller will look into the cost of adding a rain gauge to the Cow Mountain meteorological (see Action Item 1).

3. Angela DePalma-Dow, Lake County Water Resources Department (WRD), will request sampling location and constituent information from California Department of Transportation (CalTrans).

Ms. DePalma-Dow sent CCP the CalTrans 2015-2018 Total Maximum Daily Load Progress Reports. She said that she remembers having seen a document in the past indicating two monitoring stations and some sampling data from CalTrans, but was unable to find it recently. She said CalTrans has two Best Management Practice (BMP) projects in place on Highway 20, near Middle Creek, but she has not found monitoring data paired with the BMPs.

4. Ms. DePalma-Dow will provide the costs for the stream gauges on Middle, Kelsey, and Scotts Creeks.

CCP incorporated Ms. DePalma-Dow's cost estimates for stream gauges into the Committee's Report. Ms. DePalma-Dow noted that those estimates do not include the cost of analyzing data.

5. Alicia Cortes Cortes, University of California (UC) Davis Tahoe Environmental Research Center (TERC) and Dr. Alpers will share literature showing the connection between total nutrients in streams and relationship to productivity in lakes for chlorophyll, total suspended solids, and total phosphorous. Dr. Cortes Cortes will also share a table with the constituents TERC analyzes in Clear Lake.

Via e-mail, Dr. Cortes Cortes had shared a table of the constituents TERC analyzes in Clear Lake and Dr. Alpers had provided a list of forms of phosphorous (P) and nitrogen (N) that USGS National Water-Quality Assessment (NAWQA) Program and many other USGS projects typically analyze for. Both sent CCP documents justifying the connection between total nutrients in streams and relationship to productivity in lakes for chlorophyll, total suspended solids, and total phosphorous. CCP will forward these documents to the entire Subcommittee (Action Item 2).

6. CCP will send out the map of current and suggested monitoring sites.

CCP had sent the map to the Subcommittee and the group spent a portion of this meeting reviewing and refining the locations.

Presentation: BRC Feedback on Annual Report Recommendations

The Facilitator reviewed the final five 2019 Report recommendations from the Committee to the Governor and State Legislature:

- Develop a distributed model of the upper watershed
- Implement a comprehensive watershed-wide monitoring plan
- Conduct a bathymetric survey of Clear Lake
- Review the implementation and efficacy of existing tribal, local, State, and federal programs, Best Management Practices (BMPs), and other management requirements in the Clear Lake Basin
- Assess the public's perceptions, attitudes, and knowledge gaps towards water quality in order to improve education and ultimately human impacts on Clear Lake

He reiterated that the December 11th Committee meeting will be the last opportunity for the Committee to provide input on the Report, after which CCP will work with Resources to format and submit the document. Three proposed recommendations have been moved to the Committee's 2020 Work Plan for further refinement:

- Conduct remote sensing analysis of nutrients and algal blooms throughout the watershed

- Compile Clear Lake data in an accessible unified database, with database management staff
- Analyze existing Clear Lake data

Karola Kennedy, Koi Nation and Committee representative, characterized the five recommendations as “critical,” saying that the Report is a good path forward for the rehabilitation of the lake. Geoff Schladow, TERC, noted that a bathymetric survey would cost around \$400,000, and TERC hopes to receive a \$50,000 to \$100,000 contribution to that. Dr. Alpers noted that USGS and TERC intend to schedule a meeting in January to discuss a work plan and more specified cost estimate for a bathymetric survey (Action Item 3).

Dr. Alpers conveyed an offer from Joe Damagalski, USGS, to present to the Technical Subcommittee about the Spatially Referenced Regression on Watershed attributes (SPARROW) model. After the Technical Subcommittee presentation, a higher level presentation could be given to the Committee. Dr. Alpers expressed a desire to discuss model options in depth with the TERC team before such a presentation (Action Item 3). The SPARROW model has been around for decades, was first developed for Chesapeake Bay, uses geographic information system (GIS) attributes, land use, land cover, and characteristic nutrient sources such as agriculture, waste water treatment, and urban run-off. The model is calibrated to different regions, and the next generation of the model is now available.

Mr. Zoller expressed an interest in understanding how the model reflects nutrient sources from agricultural runoff. Ms. DePalma-Dow strongly supported the presentation, as she is interested in modeling the County’s stormwater impacts. Ms. Kennedy characterized the model as a good option for Clear Lake. CCP will schedule a USGS presentation on the SPARROW modeling in early 2020 (Action Item 4). Ms. DePalma-Dow requested that Taran Sahota, Central Valley Regional Water Quality Control Board (Regional Water Board) be invited to attend the technical presentation to the Subcommittee (Action Item 4a).

Dr. Schladow reminded the group that TERC’s funding for Assembly Bill (AB) 707 is separate from funding for the Committee and ends at the end of 2020. The Facilitator offered to schedule a conversation for early 2020 with Resources about the TERC contract and their continued role in the effort (Action Item 5).

Mapping Exercise: Confirming Existing and Needed Monitoring/Sampling Resources

Current Monitoring

Dr. Schladow and Dr. Alpers responded to questions from the group about the components that TERC and USGS, respectively, sample for:

- Are TERC’s particulate phosphorus (P) and particulate nitrogen (N) the same as USGS’s total P and total N?

Dr. Schladow: Some of these are interchangeable; we refer to P as soluble reactive phosphorus (SRP).

- With TERC's constituents, are they able to derive what is bioavailable in P and N?
Dr. Schladow: What Dr. Alpers is calling phosphate is immediately available. Nitrogen and ammonium is available. Particulate P is not as unavailable as people think, though phosphate is the most immediately available.
- Because relationships are strong between different P species, if we have monitoring that includes different nutrients, can we keep with the total P based on that strong relationship?
Dr. Schladow: Maybe. If you have a few years of a full suite of monitoring, you could define a relationship between P and total phosphate.
- Is there variation across sites for shallow, polymictic type lakes?
Dr. Schladow: Lakes are very site-specific. We are talking about what to monitor for in streams. The P in the lake isn't always reflective of what comes in from streams. Most of what comes in from streams is not during peak growing season for algae in the spring. It's important to know what's coming in, but you can't establish a one to one relationship between that and what's in the lake six months later.

Ms. DePalma-Dow reiterated that, to create a sustainable monitoring plan, resources should be spent on full species sampling in the lake rather than in the streams, since that is what indicates the blooms and resources may not be available in the future. Dr. Schladow agreed, saying that monitoring done well is expensive and also noted that current monitoring results may be products of the fire and not reflect normal periods of time.

At Lake Tahoe, as resources became restricted, TERC decreased the number of sites to monitor rather than the number of constituents they monitor for, reducing from thirteen to seven sites, but the previous data is still available for reference. Ms. DePalma-Dow said that California Department of Water Resources stopped sampling for dissolved species because of limited financial resources, but resuming that could be part of the long term monitoring plan. Dr. Alpers suggested seasonal monitoring for certain constituents, such as dissolved P in the summertime, to save costs. He suggested the Regional Water Board might want to know load study results, as well. Dr. Alpers also suggested utilizing sediment fingerprinting to identify sediment sources and offered to compile a list of resources to discuss within the Subcommittee (Action Item 6).

Ms. DePalma-Dow recommended that for the comprehensive watershed monitoring plan recommendation, she hopes the Committee chooses to monitor for not only physical-chemical conditions, but also biological and include bio-assessments where applicable. The State will want bio assessment monitoring for the Surface Water Ambient Monitoring Program (SWAMP) and the County has grants that can support collecting that data. CCP will make a note on this suggestion and bring it to the Committee (Action Item 7).

Regarding the weather monitoring stations, Dr. Schladow said that there may not be enough data on rainfall at the north end of the lake to drive a hydrologic model to the point it can be calibrated and validated for predictions in the future. Dr. Alpers and Ms. DePalma-Dow will discuss with their respective agencies the potential for installing temporary rain gauges in the new year (Action Item 8).

Ms. DePalma-Dow commented that there is no work being done in Lake County for debris flow hazard and predictions for flood potential, and the need for those things might provide opportunities for partnerships for weather stations.

Additional Monitoring Locations

The Facilitator reviewed the new monitoring sites proposed at the November 6th Subcommittee meeting, noting that these sites will be included as an appendix in the draft Committee Report to the Governor and State Legislature:

- Upstream location on Middle Creek below the US Forest Service (USFS) Off Highway Vehicle (OHV) area
- Along the lake shore near the City of Clearlake
- Below the paper subdivisions along Highway 20
- On Scotts Creek between Cow Mountain and the County, at the input to Tule Lake.
 - Last year there was a USGS location at a bridge that would be a good place to continue to monitor
- On Scotts Creek before the convergence with Middle Creek, below Tule Lake along Highway 20
 - There is a County grab sample site here for stormwater, but it is dependent on funding

Sophie Carrillo-Mandel, CCP, proposed a spreadsheet be created that includes all existing and proposed monitoring locations and monitoring types. Ms. DePalma-Dow will send CCP an existing spreadsheet of County sampling locations and constituents (Action Item 9).

New suggestions by the Subcommittee included:

- A precipitation gauge higher up in the Middle Creek drainage
 - For security reasons, it is best for private landowners to install these on their land, or somewhere on public land where they can be looked after, like a ranger station. Frank Aebly, US Forest Service, would be a good person to contact about locations
 - Installation and maintenance of these is inexpensive relative to stream monitoring
- Monitoring near Clear Lake Oaks where agricultural land drains into the lake
- Monitoring more than one location capturing urban runoff
 - The County has to monitor urban area runoff for their municipal separate storm sewer system (MS4) permit, but they do not have the funding to do so and are therefore out of compliance. The Cities of Lakeport and Clearlake are very supportive, as well.
 - The four rainy-season tributaries near Clearlake, including Burns Creek and Molesworth Creek. Karola Kennedy, Koi Nation, will send these locations to CCP (Action Item 10)
- Three locations on Scotts Creek and three along Middle Creek will provide information about different inputs of land use
- There is a County/USGS flow height and discharge gauge on Kelseyville at the USGS station that would be good to add a turbidity sensor to. This is a nonburn area.
- Near drinking water intakes

- Amy Little, State Water Resources Control Board, could not share specific intake locations, but previously shared general locations

Ms. DePalma-Dow will send CCP GIS layers for the Clear Lake watershed boundary (Action Item 11). She also has a County ArcGIS culvert map, but it is difficult to read because of the high level of detail.

Mr. Zoller commented that it might be of value to monitor the depths of streams, as he sees them channelizing and becoming deeper. Ms. DePalma-Dow noted that reconnecting floodplains is the number one way to remedy the channelization. Dr. Schladow noted that the 3DEP LIDAR by USGS would have the resolution to quantify how much incision has taken place in these streams.

The Facilitator will include the map of these indicated monitoring locations in the Report. He noted that the cost estimate in the Report for Recommendation 2, the basin-wide monitoring plan, is for installation but not for maintenance and operation.

Subcommittee Process

The Facilitator requested feedback on the function of the Subcommittee, asking if there are ways that CCP can improve their support of the Subcommittee's work. Ms. DePalma-Dow suggested a teamwork file to make the information the Subcommittee shares more accessible to everyone. Participants made the following comments:

- Basecamp is one option
- Some government agencies use Huddle
- USGS uses Confluence
- UC Davis uses Box, which is file storage
- CCP has kept a database in a file on OneDrive
 - CCP will send the [OneDrive Clear database link](#) to the Subcommittee (Action Item 12)
- A collaborative work space might be more helpful than file storage
- The Federal and State Governments have restrictions on what file sharing and collaborative platforms they can use

Dr. Schladow will look into sharing the UC Davis Amazon Web Services data with the rest of the Subcommittee (Action Item 13).

Ms. DePalma-Dow asked if the Committee might write letters of support for other projects as they are doing for the Middle Creek Restoration Project; such a letter would be helpful for many grants the County applies for. The Facilitator suggested she connect with the County's representatives on the Committee, Eddie Crandell or Jan Coppinger, to bring any projects to the Committee's attention. Any letters of support would have to be approved at a meeting of the Committee and must be included in an agenda posted publicly ten business days before the meeting. Ms. Kennedy suggested Ms. DePalma-Dow submit a generic letter of support for Committee approval that could be used for a variety of grants. Ms. DePalma-Dow posed that perhaps the Committee could pre-emptively sign letters of

support to various agencies that might offer grants. The Facilitator urged Ms. DePalma-Dow to begin arrangements now to present to the Committee on the topic in early 2020.

Adjourn

The Facilitator thanked the Subcommittee for their participation. Ms. Kennedy expressed appreciation for the mapping exercise. Dr. Schladow noted that the conversations in the Subcommittee have been very valuable and could not have happened at the broader Committee meetings.

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ATTACHMENT A: Roster of Participants

Subcommittee Members Present		
First	Last	Organization
Charlie	Alpers	United States Geological Survey
Angela	DePalma-Dow	Lake County Water Resources Department
Karola	Kennedy	Koi Nation of Northern California
Geoffrey	Schladow	University of California Davis, Tahoe Environmental Research Center
Broc	Zoller	Lake County Farm Bureau

Public Attendants, Committee Members, and Staff	
Name	Organization
Alex Forrest	University of California Davis, Tahoe Environmental Research Center
Sam Magill	California State University, Sacramento
Sophie Carrillo-Mandel	California State University, Sacramento