

TAHOE SCIENCE ADVISORY COUNCIL

AGENDA | APRIL COUNCIL MEETING

Date: Thursday April 8, 2021

Time: 10:00 AM – 1:00 PM

Location: [Zoom](#)

In attendance: Sudeep Chandra (UNR), Adrian Harpold (UNR), Alan Heyvaert (DRI), Adam Watts (DRI), Geoff Schladow (UCD), Max Moritz (UCSB/DANR), John Melack(UCSB), Joshua Wilson (PSW), Ramon Naranjo (USGS), Paul Work (USGS), Paul Comba (NDEP), Elizabeth Williamson (CNRA), Jim Lawrence (DCNR), Dan Segan (TRPA), Jack Landy (EPA), Laura Patten (League), Jason Kuchnicki (NDEP), Jan Brisco, Mary Fiore-Wagner (LWQCB), Laura Korman (LWQBC), Julie Regan (TRPA)

Robert Larsen (CNRA), Alison Toy (UCD)

- I. Welcome and Agenda (Geoff)
- II. Project Updates
 - a. Data Synthesis and Analysis (Alan)
 - i. Composed of Geoff, Alan, Ramon, Sudeep, John, and Shohei Watanabe
 - ii. Evaluate changes and conditions to meet in a workshop with agency partners as to what we know, don't know, agency perspectives, both sides understanding of the data.
 - iii. Couple of meetings underway, we (science team) have met with agency partners, half-day meeting next to present findings and discussion on May 28th. Preceded by short draft science summary report to get to the Council as a formality to let the council know what's going on.
 - iv. Any council member is welcome to listen in if interested.
 - v. Late June or early July will have a briefing with the Tahoe executive committee
 - vi. Coming along well, short time frame, didn't start until March
 - vii. This is all about establishing process as we intend this to be annual, have some preliminary questions, assembling data, organizing data that makes it accessible, have the metadata so that people understand what's there and why.
 - viii. Geoff adds that a large part of work is deciding what data, something that only needs to be done this year. Which of this data and what level of processing is needed. This committee and future committees have appropriate data without reprocessing.
 - ix. Bob asks about the coordination plan.
 - x. Alan says workshop scheduled in May, all agency partners (8-10 people) have been invited. Will have short summary sent out advance so people can respond. Workshop is to take the time to work with agency partners as to where we are at in terms of understanding data, what was the pattern of annual data (clarity), caveats associated with data, and work with agencies to draft up an executive briefing. Identify what we want to communicate to the basin executives about lake clarity and lake condition data. A science perspective and agency perspective combined to identify priorities to address and share with executive members.
 - xi. We are not releasing clarity numbers officially yet, looking at developing context

as to what we are saying, officially release by UCD will happen after the workshop and ideally after executive briefing hopefully late June.

- xii. Geoff asks Bob about the late June being too late for release of clarity data. If there are any concerns about the release, please provide feedback.
 - xiii. Bob says there is just some uncertainty in the unknown but understands that the coordination takes time and just wants to encourage communication with TRPA.
 - xiv. Lizzy says this is helpful for understanding the timeline, do you anticipate that there won't be recommendations for next steps out of the executive briefing.
 - xv. Alan explains the executive briefing will come out of the workshop and given to executive committee, and will provide opportunity to have execs discuss needs and recommendations with the science team. There will be recommendations for where we had issues with data or looking at other ways of collecting information, so some will be provided. In terms of timing, it was laid out in the work order and the TRPA signed that, so they should be aware, but will make sure Bob lets them know we are sticking to that schedule. In future years we could be doing this a lot earlier.
 - xvi. Geoff as a recap, this is focusing on clarity and factors contributing to clarity.
 - xvii. Jim heard about the schedule about working with agency partners, who are they, how many people. Is the executive meeting for data synthesis and clarity the same thing? Yes. Is it a broader discussion or focusing on 2020 clarity? Let's set up a process so that the agency partners aren't scrambling before the summit to make sense of clarity data.
 - xviii. Alan explains
 - xix. Jim assumes agency members:
 - xx. Alan welcomes Jim to join the meeting if he is available.
- b. Lake Clarity Model Assessment (Geoff)
- i. Sudeep, Geoff, and John Melack have been meeting regularly and exchanging documents at a high frequency. The challenge we have is developing a 3D model with all the features that we all recognize it needs to have is a long, expensive undertaking and we currently do not have that time and funds, so we are focusing on prioritization. In the next couple weeks we will have short-, mid, long term goals.
 - ii. Bob highlights the lake clarity model report was done in December and there is interest in advancing priorities. Agencies want to make sure that it's not just focused on modelling, need a broader road map to put this in the larger context. Have the investments to fit the need.
 - iii. John says that Sudeep is going to produce that plan, we hear that and will keep it in mind.
 - iv. Geoff says model isn't just modelling, it's about encapsulating the known and unknown. We are respectful of the agency needs and concerns.
- c. Urban runoff trends (John, Adrian, Bob)
- i. Bob says there was no trend in urban runoff ... may be useful for assessing how much loading is going into the lake. Bottom line is that tool is used for... not useful for basin-wide assessment... secondard discussion as to what
 - ii. Adrian thinks there is an opportunity to ...
 - iii. Jim in order to try to find more funding and advance council, all fits with Science to Action plan, appreciates John's comment about finding a road map. Is there something that takes all three projects and... this is the priority and this is how it

fits in a bigger picture. For the larger to science to action plan for the lake, it would be really helpful.

- iv. Geoff says the aquatic S2A plan with a lack of specificity. Higher priority for the upcoming year. We are aware for the need for a broader roadmap.
- v. Ramon asks about the broader question of urban loading and Bob says it is not considered by the Council as a priority and is not consistent with investments.
- vi. John is saying we are all the same thing, we need to integrate the loading with the lake.

III. Council Membership and Structure (Bob)

a. Science/management coordination

- i. Reached out to different organizations with similar mission to determine issues and lessons learned. Three best practices: purpose, diversity, and transparency and objectivity.
- ii. Opportunities for the Council, great purpose from the MOU to guide agency decisions with the best science, we are making good progress but need to make sure we are still focused on that purpose. Look at the process to separate projects and advisory capacity.
- iii. It is very common to have two groups, advisory and science.
 - 1. Science/Working: Research and monitoring. Focus on the science and leveraging institutional expertise. It is happening with Shohei with clarity and the transportation project.
 - 2. Advisory: Project prioritization and management coordination. Focus working group on the science. Facilitate partner coordination, support the RFP process that can be scaled to solicit different proposals.
- iv. Here at the council we are trying to do both. Try to split function with an Advisory and Working groups.
- v. Little change in council membership, since its inception has remained the same.
- vi. Start thinking of the council as guiding the science, just because you're not on the working groups doesn't mean you're not doing the science.
- vii. Our function as how meetings should go, topical conversations (Transportation, water quality, upland ecosystem, etc.) to offline meetings... keep these council meetings at a higher level maybe move to quarterly.
- viii. We have a good opportunity to grow and some of these structural... lots of uncertainty as to how we implement these.
- ix. Lizzy now we've learned a lot and looking to move forward, this is a good step in the right direction, we are eager to move forward. This is a big part of getting us there.
- x. John says engagement on this discussion is important. The issue of funding, the Council is not a funding organization, the idea of issuing RFPs with not having funds flow through the council, don't have a good sense of that. A middle ground of working groups focused on research, the data producers those are the people who are generating data like UCD and USGS, the Council just does analysis, I think what you're calling research is analysis. Treating partners as agency members, funding, working group, data analysis are three separate pieces of the puzzle.
- xi. Bob for funding we are not a funding organization but indications that this will be changing. Two types of projects that the Council should and will be taking on, coordination and synthesis of what is out there... SNPLMA could advance priorities in the S2A plans. Agency members are looking to the council to guide investments,

where...

- xii. Adrian same thoughts as John, we want to broaden the people who contribute to Council projects, but we are constrained because of our bylines, don't know if we want to touch that. How do change membership if we are limited to two, to make them feel involved and rewarded. If we have funding, that is key to that happening.
- xiii. Bob's vision is that the Council should be utilizing viewpoints outside of the council, should not be limited to just the council. Recognize people in the advisory role. See... Council members are helping to bring outside perspectives in and grow the science community in Tahoe. What does that cost? There is funding. Has had this conversation multiple time, people do this all the time and bring expertise for at most honorarium and often times for free. Support this type of coordination and organization is a role of many academics, we will see about the cost, we should open up and be more inclusive, be able to tap into different networks and not be able to expect to know all the answers.
- xiv. Geoff thinks that most of the projects that have happened so far have had people outside of the council working on it. Does not think this is not as big of an issue, this is not something we are not aware of.
- xv. Bob emphasizes the difference between separating of the groups. Not looking to solve anything broken, some things are working really well. Room for advisory.
- xvi. Geoff what kind of advice and from whom and what level experience the council and the agency want.
- xvii. Alan likes what Lizzy says, we are in an intermediary phase right now and potentially looking for ways to expand. In this transition to anticipate what is going to happen but don't have resources to support additional process. Always a perennial issue of the people engaged in Tahoe have a vested interest and raising the question of transparency. There might be several ways to solve needs, like an outside group of expertise that meets with council once a year, pull together plans and trajectory and needs and meet with outside experts. Provide outside input and objectivity. Longer-term we will need to address funding issues. Need someone to review our strategic planning.
- xviii. Sudeep couple different reflections, fourteen people and smaller groups can get more done with less people and less interactions, it's just the nature of scheduling. There's a lot of power in a smaller group, but with the smaller group we miss out on the inclusion discussion. One thing that we have done and run it through a process of what it looks like if we do this project, what would that model look like? How would that question look like in the new model. Might end up losing some technical expertise.
- xix. John thinking about membership issue, there's usual a biannual review of membership and an overall term limit. Two or three cycles because a lot of us has been there from the beginning, there is an inherent turn over built into the process. John thinks we need a defined process. Just because you're not on the board doesn't mean you're not part of the process.
- xx. Bob agrees with the idea of finding a way to institutionalize turnover. Appreciates Sudeep's question of what does this look like. Clarity comes to mind, advisory committee comes into people who have knowledge and understanding who aren't doing the work but can be doing the guidance. Ramon, Paul and Adrian meet with agency partners to figure priorities and loosely build an RFP and brings to Council

to solicit proposals. Council members will form teams and create proposals. The advisory group and agencies meet to discuss to review proposals to discuss where the funds go. Right now we are asking the same group who developed the report to make decisions where to go, there's a perception that the agency partners aren't... there's a disconnect we need to figure out how to support that, so part of the council will facilitate that discussion.

- xxi. Sudeep no we have individuals that are part of the process but not part of the work. Is there questions of objectivity with the individuals or the institutions? Back end conflict? Five institutions in our area, how does that play in?
 - xxii. Bob says there might be, my vision is that the institutional conflict will be less than individual. Depending on the amount, perhaps the RFP process is a bit more robust. Don't have the answer but...
 - xxiii. Geoff thinks the whole point of conflict of interest was discussed at the initial formation of TSAC. Todd Ferrara had said, it was ok.
 - xxiv. Ramon funds are coming from external sources, when it comes to making the decision for funding no member of council should be part of that decision and that will eliminate conflict of interest, that should be sent out to peer review membership.
 - xxv. Bob explains that the expectation is that the Council will help to guide where funds go. If members sitting on the Council, don't think they can do that without conflict of interested. The idea of RFPs and funding should be all done outside the council, defeats the purpose.
 - xxvi. Jim has reviewed the document with Crowell and he thinks it's really important. Look into getting more of a formal structure in place, ... Conflict of interests are always hard, struggled in SNPLMA, ...
 - xxvii. Alan two quick comments, there are a variety project that TSAC has done historically and types of projects coming up some are review and some are implementations in the capital improvement world. Two types of projects that don't have to go through the same process, some could go through the same way they have, some may need other steps. Part of the role of TSAC is to encourage basin-wide collaboration. Sending out RFPs will fragment collaboration between institutions.
 - xxviii. Adrian the review process that I have led have been very successful. A mdel where we have discretionary fundings to pay for small projects where there are some clear conflicts and then other funds... discretionary funding to pay other institutions.
 - xxix. Bob next steps, try to schedule working group meetings to try and focus water quality, transportation and upland. To focus conversation, full council meetings not necessary.
 - xxx. Geoff says a working group... taking into points during the day. Straw man implementation of that.
- b. Written agency feedback on recommendations
 - c. Discussion with Council members
- IV. State updates (Jim, Lizzy)
- a. Lizzy: Last month had Secretary Speaker Series with Geoff and Pat discussed. Looking forward to continue to amplify the Council's work. Have a clearer picture of what is getting into the budget next month.
 - b. Bob: the secretary speaker series was the initiation of a broader interview series that the

league is starting for the concept of between two states, starting from the last time at the last Council meeting. I understand they've, they've actually completed one of the interviews that are serving, starting with the editing process. And so, I'll be bringing or distribute to the council a draft, I'll work with co chairs to figure out process there but there's another another interview that has been completed.

- c. Jim: in the middle of the legislative session
- V. Recent research products
 - a. USGS Sediment and Nutrient Trends (Ramon)
 - i. Just published this year.
 - b. UCD Seiching; Periphyton; Climate Change (Geoff)
 - i. Seiching
 - ii. Periphyton
 - iii. Climate Change
 - c. UNR Zooplankton (Sudeep)
 - d. Questions?
 - i. Dan asks about the decreasing trend in nitrate faster in the 70s, 80s, and early 90s. How that squares as forest aggregation and why we are seeing a slowing?
 - 1. Ramon was not part of this study but would imagine in the early 80s finally starting to pump effluent of the lake. Recommend reaching out to the author especially Bob Coats.
 - 2. Geoff talked to Bob Coats and his hypothesis is that it is a result to the forest maturing, so might be a forest timescale.
 - ii. John says ammonium values are extremely low, at detection limits, would be cautious about evaluating those trends. In terms of the lake, when you look at the plankton, do you think the ammonium levels would matter?
 - 1. Geoff says they could, generally a low nutrient system. What we know about Tahoe is that nutrient limitation is variable throughout the year.
 - 2. Sudeep it fits into the context of loads versus quality of nitrogen. Ammonium is better for algal growth. 2-3m down, something worth thinking about, how low of an amount... last part, often these animals become important for facilitating, zooplankton excretion...
 - iii. Adrian a burst of recent papers, there are some sierra wide papers that are relevant. Obvious upland connections to the lake indicated in the first paper. ...Sentinel watersheds. There is some work with the climate change model, global circulation modal with statistical models (LOKA) ...be aware of the best projections we have. Here is a link to the climate projection paper. Figure 3 and 4 show differences in projections.
<https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2020JD032812>
 - 1. Important point, these are all models with limitations (Geoff)
 - iv. Geoff wants to know the difference between the conclusions, differences in Emerald Bay and Lake Tahoe primary productivity, now it looks like similar primary productivity,
 - 1. Chlorophyll was different, double when we did this experiment, only did this experiment once. PPR maybe even lower... is it the whole water column or just the water column that just the zooplankton are influencing. In Tahoe, 13 depths down to 100 meters, in Emerald Bay 7 depths down to 50 meters, photic zone.
 - 2. Sudeep what would be helpful...

- v. Sudeep can't detect difference in chlorophyll a, what is maintaining the benthic algae over time.
 1. Geoff says upwellings have been happening for a while, that source of nutrients have always been there. Urban and stream flow also been there. But before the monitoring started... reductions in nutrients will help the nearshore, the fluctuations have not been that... biomass and chlorophyll.
 2. Sudeep thinks it's a eu-littoral zone, lot of action... areas of eutrophication
 3. Dan the agencies have been struggling... indicating there was no trend, the common dogma of stakeholders around the lake that we see more and more algae in the nearshore. What the data says versus what people see.
 4. Anecdotal data seems to be increasing... looking at records of google earth where you didn't see it and now you do.
 5. Ramon, the nearshore data that we have been collecting, from our observations we see how the dynamic between lower and higher lake levels, how nutrients might be recycling as a result of decomposition...
 - e. USGS Hydromapper (Ramon)
 - i. Real-time data: real-time tool that allows you to see the stream flow conditions, and the SNOTEL data and climate and fires, any data that's real time that we can pull from. Goes methodically through the features of Hydromapper including:
- VI. Data Availability and Organizational Needs (Sudeep, all)
- a. Jack: I think presenting future forecasts visually is a great idea!
 - b. John: Already an ongoing effort among us of data synthesis that probably doesn't require necessarily more funding, or it may require funding with talking business planning and we're in the process. The second comment is that the kind of analysis that we are currently talking about with data sets as Project though, you know there's analyses with a requires a different kind of data, I think, and so I'm going to talk in a more traditional way many. There's a, is a couple of efforts one by the now some national science foundation called the ground truth data initiative. NCS has a very well established portal for doing data storage archiving and metadata data one is another example, those are designed primarily for academic scientists who, when we publish papers now we almost always required to post our data in a form that people can use. And the beauty of those, those kinds of things, data one or e di or the MCS program is, is that they basically walk you through in a very fairly straightforward way. The metadata data formats. And then, you know, the people that tend to do data analysis are well attuned to using those data so I think I would put on the table that we should look at those existing portals, which are designed for the kind of datasets that we're talking about, not to discount the value of hydromorphone I think that's a very good purpose but I think it's a different, a different purpose than what some of us need. Currently, But there I would call them complimentary.
 - c. Geoff:
 - d. John: Doesn't require creating anything, just put it in a place that is publically available, a publically funded portal that is widely used by scientists and widely accepted by journals.
 - e. Geoff: People who, part of the discussion is making the appropriate level and types of data to people like agency folks who don't synthesize data, goal of who uses this data and what purpose does it serve.
 - f. John: Agreed there are two parts of this, what Ramon presented was how data can be used and visualize, but for Tahoe all data is scattered. Just getting data sets with proper meta data.

- g. Alan: Thinks what Ramon presented with be very useful data. John is right, other things that require us to log data where people have access to it, data repository is a great short-term solution. When we are looking at data and doing analyses,... get a start at it with DSA.
- h. Sudeep:
- i. Mary: Any familiarity... not set-up for continuous data. This is something available now and wondering if some have used it and thoughts on it.
- j. Geoff says that UCD has used it, unfriendly and rigid. For periphyton doesn't haven't the breakdown of species to exist, so it's difficult, no way to put in blanks or duplicates. Serves a wonderful purpose, meant to a repository of that data in a public format, in Tahoe we bridge between routine and non-routine monitoring, so far it doesn't have the flexibility for that.
- k. Mary: Have heard that for algae and MST data, ... can be input.
- l. Ramon: Other agencies have given USGS data to post, pcode for periphyton data... could host your data and provides a portal for people to access that data.
- m. Sudeep: Sounds like general agreement, enough interest in pursuing this, start process now so we can report a year from now, subcommittee for (Geoff seconds).
- n. Bob has Chandra and Schladow on the committee. Lots of overlap with... make sure all these things are connected and synergistic.
- o. Dan volunteers to be part of the data organization meeting.
- p. Geoff asks for any particular issues or topics of interest to hear at next meeting.
- q. Dan like the quick summary of data, whether Tahoe specific or relevant to topic areas of interest.
- r. Sudeep thinks fire effects on watershed and lakes.
- s. Geoff says maybe Max can address that at the next meeting. Max charged to present with other presenters next meeting.
- t. Bob: Currently no placeholders for future meetings, what do Council members think about future meetings. Looking at May with current schedule. Next meeting scheduled May 20.
- u. Alan: let Bob know if that presents insurmountable problems or various plus also I think he said members should feel free to suggest topics of discussion as well as maybe recent research to the co-chairs and to so that we can select folks feel free to pitch ideas for our agendas going forward.