

TAHOE SCIENCE ADVISORY COUNCIL

NOTES | March 2023 COUNCIL MEETING

Date: Friday March 24, 2023

Time: 10:00 AM - 1:00 PM

Location: [Zoom](#)

Participants: Sudeep Chandra (UNR), Geoff Schladow (UCD), Steve Sadro (UCD), Max Moritz (UCSB/DANR), John Melack (UCSB), Jonathan Long (PSW), Ramon Naranjo (USGS), Joe Domagalski (USGS), Jason Kuchnicki (NDEP), Ashley Conrad-Saydah (CNRA), Tamara Wall (DRI),

Robert Larsen (CNRA), Alison Toy (UCD), Jose Sanchez (USFS), Meredith Gosejohn (NDSL), Dan Segan (TRPA), Brian Garrett (USFS), Michelle Carr (USFS), Katie Senft (UCD), Derek Kauneckis (DRI), Melissa Thaw (Lahontan), Laura Patten (KTB), Darcie Collins (KTB), Cole Dickison (KTB), Jenessa Gjeltema (UCD)

1. Welcome and Agenda Review (Sudeep)
2. SNPLMA Project Selection – Update (Bob/Review Teams)
 - a. Thank you to review teams!
 - b. Proposals scored (criteria included at the bottom of this document)
 - c. Final decisions
 - i. Uplands
 1. Tahoe Environmental Observation Network pilot implementation
 - a. Working with Pat Manley
 - b. Relationships with USFS and with Thresholds
 - c. Good to have a larger conversation
 2. Spatial temporal tracking of priority of overstory hardwood stands. Using remote sensing to look at cottonwood and aspens
 - a. Jonathon Long (PSW) and Joe Stewart (UCD) leading this project
 - ii. Aquatic – projects selected due to their alignment with drivers of water quality and clarity.
 1. Characteristics, composition, and relative sources of very fine sediment particles affecting clarity (DRI)
 2. Zooplankton ecology of Lake Tahoe: composition, migration, and influence on clarity and phytoplankton particle size (UNR)
 - iii. Working on Work Orders
 - iv. Have Aquatic meeting happening next week
 - v. NWR supporting conference effort
 - vi. Facilitation for Strategic Planning
 - vii. Some funding still available to be decided by Program Officer and Co-chairs
 - d. Feedback needed to people who did not receive funding, vetted by review team. (John) Explain how the decisions were made, this should be a priority, and should be done asap.
 - i. Bob has some notes that could be provided to the review team, but this should not be Bob's job.
 - ii. Tamara is happy to review my notes and formalize them as needed to support a panel review.
 - iii. Explain why they didn't rank as high, 1-2 page, have review team put down thoughts in an organized document (Sudeep) Shouldn't be too much of a burden. Section headers of positives, negatives, etc. to be filled in. A starting template to

be populated by reviewers.

- e. How did everyone feel about Conflicts of Interest with this process? (Sudeep) Was this part of the review process? What were the positives/negatives?
 - i. (Steve) reviews can provide critique of proposals. The review committee didn't make the decisions, that was from the agencies. Committees were made up of researchers and agencies. There was contribution from both sides and should be included in the document.
 - ii. Guidelines to make sure there is no COI. Steve was able to review a proposal that had UCD involved but was not a PI. But is that sufficient? Don't think the current process would pass the bar for other organizations.
 - iii. Did not feel pressure to decide either way and felt the review process was fair (Ramon)
 - iv. Max led the Uplands conversation. Felt like the managers had a lot of good input and guidance. As far as a conflict, if there was a gap in the proposal, there was potentially more knowledge from some reviewers that were already familiar with this person and project. This was acknowledged and part of the conversation.
 - v. Tamara suggests a good practice to increase separation, even if they are not directly part of the project should not be part of review process.
 - vi. Ramon suggests now that proposals have been selected, 5-minute presentation given to the Council to better understand questions and scope. Sudeep likes this idea, make some space in the coming quarter meetings.
 - vii. Bob has been focused on the review groups, have more regular conversations. Seeing the dialogue between researchers and managers was the best part. We should be having same conversations with the Uplands.
 - viii. From the standpoint of transparency make sure we address criticism of the process, even if anonymous. (Steve)

3. Integrated Science to Action – Status and review (Bob/All)

- a. Draft has been completed and reviewed by co-chairs.
- b. Tamara has been editing draft based on comments from co-chairs. Thank you to Pat and Sudeep for comments.
- c. Working on draft for mid-April distribution, may be able to dig into this for the May Strategic Planning meeting. Tamara is hoping for it to be finalized no later than mid-June.
- d. It will be a core document for the Council moving forward to be used for future planning.
- e. There are big over arching themes Tamara is working through. How does this document live in the hierarchy of other plans that are already in existence? Does it supplant the Uplands plan? Aquatic plan? What level of detail should it have? How much detail to include in this plan? What is the intention going forward?
- f. Sudeep: I hope the plan has sufficient detail in reference to either plan with their content and pulling from that content and being very specific. Especially from the Upland plan, the Aquatic is a little old, but there are many technical documents to draw from. This plan will be the modern plan for both older plans. For Tahoe we've always been the Lake versus other things, love the idea of thinking about connections and process. Thinks this plan will supplant other plans, but still refers to those older plans.
- g. John has read some version; it should be integrated and strategic rather than tactical. Dollar values assigned to activities, seemed inappropriate at this stage, can lead to misinterpretation of value and priority. Categorical difference between Uplands and Aquatic so there is difficulty in uniting the two different styles.
- h. The dollar amounts can be important to managers, may need to justify the money the science council needs. (Bob)

4. Water Quality Working Group – Update (John)

- a. Subgroup of TSAC plus agency managers, meet every two weeks, standing meeting set to deal with arising topics. Seems to be working well. Everyone participates, it's a small group. Geoff, Steve, Sudeep, Ramon, John, Joe, Jason Kuchnicki, Dan Segan, Lahontan reps, Alan Heyvaert, etc.
 - i. Topics include: TMDL annual cycle and how we can better integrate, nearshore processes and related projects, etc.
 - ii. The goal is to have more in depth conversations about aquatic-related topics. What would you like to hear from a group like this? No minutes, meeting notes, or recordings available.
 - iii. Sudeep would like Uplands group to participate, several other needs to be addressed. Streamflow, loading, nearshore processes, this may help to formalize integration document.
 - iv. This group is not focused only on clarity, but also deals with watershed impacts, climate change impacts, etc. Everyone is looking at it from their own science and their own impact, but this group has historically been very cognizant of multidisciplinary aspects and a whole range of forcing factors (Geoff).
 - v. What is helpful is that we can get some the relevant management folks with the folks with the science perspective in the same room. Rather than everybody hearing about everything, get the people most focused on these topics in the same room. Would like to see is more (on the Uplands side) get together the appropriate science with agency partners. Especially forest and fire management. Then when it's right for more interdisciplinary conversation, bring it back to the group. (Bob) Finding a path for more focused dialogue would be helpful.
 - vi. Couple of initiatives that are concrete opportunities to talk about these connections. 1) Pods planning process with Brian Garrett and folks from our enterprise team. Pods are areas within forest landscape where people are talking about how to manage fire, building on that concept to talk about using large, prescribed fire and cultural burning with the Washoe Tribe. Part of this is an assessment values of risk, there is a lot of opportunity to talk about how to tune those projections of where fire will be beneficial or harmful. Will be doing wet modeling. The other opportunity is the Tahoe Central Sierra Initiative, Adrian Harpold is involved modeling a lot of water yield quantities dimensions in relation to water quality and wildfire. Discuss trade out between water yield and water quality, especially in relation to use of fire or wildfires. Is this a conversation for the whole group or subteams and when the right time would be. Working with Adrian on this. (Jonathan)
 - vii. Melissa thinks the meetings are very useful. It's good to have targeted conversations. Haven't had the opportunity to list topics, but in the future, it will/can be more interdisciplinary.
 - viii. Meredith would like more information on the WQ working group meetings and time commitment and would find value in participating. One example that I see as fitting is the watershed issues, we are currently encountering with the extreme precipitation year (e.g. Marlette Lake outflow to Marlette Creek and ultimately to Lake Tahoe) that would be excellent to have the scientist perspective on and one where those may influence management actions, such as control of CFS and the hydraulic capacity of the channel. Just one example.
- b. Engagement with proposal review – Last 3-4 months, John has been involved with several proposal reviews. SNPLMA and part of the nearshore RFP from the TRPA and NV license

plate funds. That effort on John's end was about 2-3 days of work.

- i. COI some rules are no reviews from home institution, but that is difficult for the Council.
 - ii. Didn't know anyone submitting proposals for NV license plate
 - iii. Lots of managers as part of the review process in SNPLMA
 - iv. Tradition is honoraria for this type of work, but we reimburse ourselves through work orders which go through the university which is inefficient and has overhead. Honoraria is better, it's a waste of time.
 - v. The review process with managers has been great.
- c. How can TSAC address the billing issue? (Ashley) Given that I am on both TRPA and TSAC without an honorarium or per diem, this discussion feels very administrative to me.
- d. TRPA serving as our fiscal agent has been flexible. We tried the institutional engagement work order, the other complicating factor right now is staff at TRPA have shifted, and so we're dealing with new management there. (Bob)
- e. Tamara suggests bringing this conversation up at the Strategic Planning Meeting. Look for more traditional review panels outside of the Council members. This should be a part of a larger conversation about the role of the TSAC and if we should continue to rely entirely on the council for proposal reviews but begin to pull from the larger academic community for review panels.
- f. Sudeep: We have one planning document for scientific endeavors, but another process based document for our activities and things that we undertake on a Council level and how we implement those. This is a process, having mechanisms in place is one thing and then how to support this with resources and asking for resources to implement is helpful.
5. 2023 Science Conference (Sudeep/Bob)
- a. Location: Lake Tahoe Community College
 - b. Dates preferences for the first week of October. Looking for feedback on these dates. Three days, the first day would be just an afternoon session.
 - c. Format for conference, "traditional" science conference style, scientists come in and share science directly, science activities and sessions, topically presented ideas with expert panels, poster session, etc.
 - i. Higher level keynote speaker that would resonate with the public. Can be ticketed separately. Duke Theater has 200-person seating.
 - ii. Use this opportunity to highlight the Council and the Council role and the science, management, partnership, and the importance of the relationship between science and resource management in Tahoe. Focused topics, sharing information, where have we been? What information is ongoing? Where is this happening? Where are we headed with future investments?
 - d. Worth reiterating, to give some name recognition and notoriety for the Council. What has science done for management? What questions have not been answered? What has science contributed and what do we need to know moving forward? (Darcie)
 - e. John wants to know in terms of planning the meeting for people staying overnight? Hoping logistical information is going to be included. With the UC academic calendar, 1st week of October is like the first full week of class. We're not the key audience but we should be there. Something to keep in mind there's a fair number of people in the UC system that will be affected.
 - f. We will have this discussion again with the subcommittee if we must move dates again (Sudeep) Who is planning to participate? Seeing some thumbs up and some nods. The audience will be broader, but we do want engagement from the science community.

- g. Steve wondering the difference between his engagement or his group's engagement. Are there ideas you want to emerge from this? Do you imagine framing our science thematically? Or is it more just if you can engage?
- h. 6 topics in 2 days? Possible, dependent on how in depth you want to go. If there are themes you want to suggest, this is the opportunity. Example: small lakes and streams like what are people's responses to hiking and experiencing the actual back country?
- i. Key is to identify the audience. General public or management? Who is giving up a Monday-Wednesday to participate? For management standpoint, Thursday-Friday, it is a different community.
- j. Ashley: As more of a manager type, I think it would be great to think about science to policy as applied science. How has science been applied in a policy context? How did science increase certainty in policy setting? How did science increase the reach of Tahoe knowledge in a policy context?
- k. Ashley: I think these science to action meetings can sometimes miss the mark, so the more specific we can be in offering case studies and examples, the more the messages will hit home. CCST does a nice job with their webinar series connecting science to policy outcomes.

6. Strategic Planning Session (Bob)

- a. Conversations have been very enlightening with Caelan.
- b. Bring a charter for this group, have a document that brings everyone's ideas together. Find some common ground as to where we are heading.
- c. There is disagreement as to the role of this group. Encourage engagement from everyone in the Council.
- d. Lots of good intel gathering.
- e. We will not solve everything in a half day conversation.
- f. Suggestions for maintaining a facilitator for this group. Expect more facilitated discussion for moving forward.
- g. Tamara: I believe a facilitator for these conversations of the role, scope, and responsibilities for TSAC in its next phase is critical and I fully support the use of resources in support.
- h. John had a good conversation with Caelan. What are the expectations from this meeting? What is Caelan's role?
- i. Serve you, to have good discussions. Agenda would be focused on the charter, comments on that charter, mission and purpose, roles and responsibilities, and start with themes would be captured in the document. Caelan would be more responsible for where we are in the conversation, notetaking, tracking agreements, and managing time. (Caelan)
- j. What are the strengths? What's not working?
- k. It would be good to know, a written statement from maybe Bob and co-chairs, why we need a charter, what's broken, what could be achieved by going this route? (Geoff)
- l. A consistent role and goals for this group could be captured. Who we are and what we are doing. The MOU is too vague and crafted years ago in different circumstances. Have this group go through the charter process and bring it to the TIE steering committee. (Bob)
- m. Thinks difference of opinions are good. Do we no longer have an executive board? TIE steering committee is outlined under MOU.
- n. Tamara: My experiences work with several programs that work in five-year cycles suggest that there are natural points in the lifecycle of an entity/organization that require

reflection on what has changed and where the needs are, and the direction of the entity—it feels like TSAC is at one of those inflection points. This is an opportunity to reflect and being deliberate about that reflection is critical. Bob agrees, it's good timing for this reflection.

- o. Endeavor to do two things: 1) describe why the charter is useful and 2) what it's context is. The goal of this charter is to get more specific and what that actually looks like, the MOU points to TIE, and it speaks fairly generally about collaborating with them. And the goal of this charter is to actually do something more specific, and then ask all of you in a truly open-ended question, is this reasonable? is this possible? Is this what we want the group to look like? Useful for discussion. (Caelan)
 - p. Bob echoes Tamara every 5 years or so in the Indies and organizations it's. It's a good time to reflect on kind of where we are and what's changed. And agree that this group is probably at that point, and so it's just a good timing in terms of that reflection.
 - q. Would like everyone to be able to participate in person (Sudeep)
 - r. Sort logistical planning with Alison, Bob, Geoff, and Sudeep.
7. Sustainable Recreation Monitoring and Evaluation (Derek Kauneckis)
- a. Background in public policy, most work is on environmental policy, quite a bit of interdisciplinary.
 - b. Other team members are Jose Sanchez, Research Economist with USFS-PSW and Michelle Carr, MS ORISE Fellow at USFS-PSW
 - c. Talking about future orientation.
 - d. Develop monitoring program for TRPA to evaluate the impacts, great jump start (Bob)
 - e. Utility of using info from Twitter and other social media outlets. Is it possible to divide information of local versus larger visitation. Is this a broader approach and then narrow down? Twitter is politicized. The broad picture of activity without a division of visitors and locals. With emerging tech, to look at the next generation, trail access, overnight stays, start local then look at cellphone mobility data. Look at how to make that work in the future.
 - f. Bob to share the slides, feel free to email Derek with any follow-up.
8. UCD Microplastics study (Katie Senft/Jenessa Gjeltema)
- a. One big challenge working with microplastics is the methods are not standardized across the field, still a young field of study. When comparing this study to others, there are quite a few differences. Field has not agreed on how to sample surface waters or microplastic consumption in fish.
 - b. Plastic is everywhere, so quality control measures in place to make sure there is non-plastic materials worn and non-plastic materials used.
 - c. Look at surface waters (horizontal and vertical), municipal water, deep water sediments, and consumption of different aquatic species (Asian clams and Kokanee salmon)
 - d. Lake Tahoe has greater microplastic surface abundance than other lakes according to comparative studies. Stormwater is treated differently from place to place. Mesh sizes vary in manta trawls. Some studies did not do the digestion method. One study entirely excluded fibers. No study was done exactly the same. Combined sewage systems remove microplastics from household wastewater and storm water.
9. Round Robin (All)
- a. Geoff: Lake Tahoe mixed from top to the bottom earlier than usual. Emerald Bay froze over. Water clarity is at very high levels.
 - b. John: Restarted a project at Mono Lake. We've been a rest respective on the transparency of like of Mono lake. Mono usually gets really clear in summer (contrary to

- Tahoe) due to grazing of brine shrimp. In the last 5-6 years it has stayed very green. Why has this lake become persistently high in chlorophyll.
- c. Joe: Manages the biology of chemistry and Contaminants Group at us Geological Survey in Sacramento and doing a lot of water quality sampling on the tributaries leading to Clear Lake. Will be spending a lot of time analyzing that data and will be putting together some water quality models for that watershed.
 - d. Steve: Wrapping up NSF rapid proposals of the effects of wildfire smoke on lake or aquatic metabolism. Clear Lake, lots of little mountain lakes, and some estuary sites in the delta. Modeling the rates of production and respiration associated with different smoke events. Finding a cool pattern where water clarity is lower than other sites. Match some of our theoretical expectations from the standpoint of smoke differentially affecting aquatic system, productivity depending on the clarity of the water of the system.
 - e. Jonathan: Pods project, already mentioned. Delineate the Pod boundaries. Working another group doing the same on the Tahoe National Forest. Engage with Washoe Tribe and understand opportunities at Meeks Meadow, how we can use the pods to support cultural burning and evaluate the effects of reintroducing cultural fire. TREX events for Fall of 2024.
 - f. Tamara: Just hired a Tribal Land Stewardship Coordinator, Marissa Weasel, part of the Shoshone tribe, keen to start working with more tribes to do more cultural burning in the basin. Put in touch with Jonathan.
 - g. Sudeep: Paper submitted looking at plastics across freshwater lakes using similar methods. If this paper gets published, we could validate this study. Look at macroplastics in Southeast Asia and their influence on water quality. Seeing the macroplastic colonization of bio films on those macroplastics drops oxygen within 48 hours between 10-80% in bottles of water. We have 15 different institutions working on an engineering research center, proposal is due May 15, trying to understand wildfire resilience in the West from Idaho into California and into Northern Arizona.
 - h. Ramon: 6 different USGS activities in Tahoe, 3 related to long-term fine sediment trends and particle and nutrient loads. Use turbidity data to develop regressions for real time, monitoring of a fine sediment fraction in our LTMP streams. Looking at things like road salts. It has been difficult getting access to streams. Looking at dynamics of springtime, late summer into fall precipitation events. Some loading information will be provided on the hydromapper, content will be able to summarize the loading information on a season monthly and annual basis. Impact of Climate change on saline lakes in the Great Basin.

SNPLMA Project Selection

The review teams reviewed submitted proposals and numerically scored them based on (1) how the project met management needs (problem statement, justification, objectives, hypotheses); (2) the project approach (tasks, schedule); (3) how the project findings will be communicated and the project's commitment to management coordination; and (4) the budget and potential scaling options. The teams then met to discuss the submitted material and selected projects to be funded:

1. Tahoe Environmental Observation Network Pilot Implementation (Upland, PSW)
2. Automated Spatio-Temporal Tracking of Priority Overstory Hardwood Stands in the Tahoe Basin (Upland, UCD)

3. Characteristics, Composition, and Relative Sources of Very Fine Particles Affecting Water Clarity in Lake Tahoe (Aquatic, DRI)
4. Zooplankton Ecology of Lake Tahoe: Composition, Migration, and Influence on Plankton Particle Size (Aquatic, UNR)

The review groups had questions for some project to refine and guide work plan development. The review groups will have the opportunity to review and comment on project work plans before they are executed.

Integrated Science to Action

The project team has completed an initial Integrated S2A Plan draft. As discussed previously, the document is structured around three science program needs: (1) Data collection; (2) System understanding (models and research); and (3) Science delivery. The team will distribute the draft after additional review and editing. We will discuss next steps for review, editing, and finalizing the plan.

Water Quality Working Group

The Council's Water Quality Working Group meets twice a month, as needed, to coordinate on ongoing issues. Group members participated in SNPLMA proposal review and supported TRPA in developing an RFP for algal monitoring, among other topics. The group met March 13 to discuss the 2022 clarity values and UC Davis's initial interpretation of last year's conditions.

2023 Science Conference

There is a small group guiding conference planning. The event will tentatively be October 2-4, 2023 at the Lake Tahoe Community College. It has also been suggested to adjust the dates to October 4-6. The first day/evening will be a keynote speaker and reception at the Duke Theatre (200-person capacity). The following two days will be a combination of panels/conversations in the Theater and smaller group engagement in the adjacent Lisa Maloff University Center (two rooms, 50 people each, along with a foyer and patio). We'll take this time to discuss the intended audience and possible program details.

Council strategic planning session

The planning session will be May 12, 2023 at the Tahoe Environmental Research Center. Caelan McGee with Zephyr Collaborations has initiated individual interviews in advance. We are hoping everyone can attend in person.

Sustainable Recreation Monitoring and Evaluation

The Desert Research Institute and the Pacific Southwest Research Station are leading work to (1) understand recreation and visitation changes, (2) develop a conceptual model of tourism and relevant factors impacting its sustainability, (3) produce a "Recreational Quality and Public Access Best Practices" report, and (4) recommend indicators that can help guide management in the Lake Tahoe Basin. Derek Kauneckis will share a presentation on the project.

UCD Microplastics study

UC Davis and its partners examined and documented the status of microplastic pollution within Lake Tahoe. The team quantified, identified, and characterized plastics, conducted a preliminary investigation of microplastic fate, and evaluated municipal water samples for the presence of microplastic particles. Katie Senft with UC Davis will present.

Round Robin

Each member will be asked to briefly (1-2 minute) share highlights from their current work, Tahoe-related or otherwise.