

TAHOE SCIENCE ADVISORY COUNCIL

Notes | July 2021 COUNCIL MEETING

Date: Thursday July 15, 2021

Time: 10:00 AM – 1:00 PM

Location: Tahoe Environmental Research Center/[Zoom](#)

Council Members: Sudeep Chandra (UNR), Alan Heyvaert (DRI), TamaraWall (DRI), Geoff Schladow (UCD), Steve Sadro (UCD), Max Moritz (UCSB/DANR), John Melack (UCSB), Pat Manley (PSW), Ramon Naranjo (USGS), Paul Work (USGS), Paul Comba (NDEP), Elizabeth Williamson (CNRA), Jim Lawrence (DCNR)

Robert Larsen (CNRA), Alison Toy (UCD)

1. 10:00 am: Welcome and Agenda Review
 - a. Geoff says the agenda is very open ended to spend most of the time talking about where we want to go.
 - b. Ramon, Geoff, Bob, Jim, and Lizzie have been discussing this at length
 - c. What science wants to do over the varying lengths of time
 - d. Maybe we can reach a consensus amongst ourselves today
 - e. Figure out what the science questions and needs are and if it fills the wants of Agencies and states.
 - f. Introductions
2. 10:05 am: Current Projects
 - a. Clarity Data Synthesis and Analysis
 - b. Clarity Modelling
 - i. Non-linear modelling to look at long-term data trends if there are patents that have been overlooked.
 - ii. 3D approach is essential and it is a significant undertaking, agencies agree to do but to start with the ecological approaches
 - iii. Geoff, Sudeep, and John are working on it with a UCD modelling team, deciding who is doing what, what data we have, and reaching out to have a larger meeting
 - iv. A quick project, funds must be extended by first quarter of next year.
 - v. Work requires subcontract for Ethan, but have that in place now. UCSB contract should be straightforward.
 - vi. Data is pretty good but still needs some work, data needs to be available
 - vii. Not starting analysis until September
 - viii. Meet to go over data
 - ix. John planning to come to Davis in late August to coordinate with Shohei, some in person interaction will be good, sort that offline
 - x. Upland Science to Action
 1. Made 4-5 major suggestions of things to move forward with
 2. The idea was that the first starting point of info relates to management and clarity, trying to move in that direction
 3. Had some post-meetings to try and implement a workshop/working group to discuss components of the plan
 - a. Health-like topics

- b. Forests
 - c. One more
 - 4. Met with Tamara and Bob to see if we can get some summer workshops before summit, but don't have bandwidth
 - 5. Looking at workshops alternatively in the fall and have it similar to what data synthesis team did, want the management community to tell us their needs.
 - 6. Not trying to recreate the s2a plan
 - 7. A lot of questions from stakeholders and others, have a convo about how these two things interrelate and get feedback in what way, design and implementation to maximize existing management efforts.
 - 8. 1-2 key players that provided feedback from management community, need assistance from Bob to encourage more management to participate
 - 9. One of the goals of TSAC to bridge the gap between Management and Science, Jim is here to help out.
 - 10. There are transitions, so it's taking a little extra time.
 - 11. Dave Fournier is the new deputy of USFS through August
 - 12. Have an opportunity with a retreat to engage further
 - 13. Clearly articulate in a paragraph or less, the value of the land manager participation, what will we get out of it, thinking of that context will help drive engagement
- xi. Tahoe Keys Peer Review
- 1. Project to evaluate control of weeds in Tahoe Keys
 - 2. Sudeep and Alex Forrest provided feedback late last week
 - 3. Lahontan Waterboard wants a specific section peer reviewed
 - 4. Look at charge to evaluate how all other organisms would return to unperturbed state
 - 5. Question proposed to us, is it feasible for a few of us to do this by the end of August.
 - 6. Need an offline discussion about this?
 - 7. With the timeline not feasible for Sudeep to participate, sees this as a consulting project
 - 8. We can deal with this internally, having our students or post-docs review, might get through it faster.
 - 9. Suggests bring Alumni like John Reuter in, John agrees
 - 10. A few Council members, email suggestions of reviewers like John Reuter or students to John Melack (ACTION)
 - 11. Really bad time because students are in the field etc.
 - 12. Is there any reason to think that is you got rid of 99% of invasives and keep it a weakly connected system, that you wouldn't eventually just get back to where you were. Would you get a recovery? Is the monitoring plan sufficient to know.
 - 13. Urgent to the public, managers, etc. Lot of frustrations with agencies, sitting on our hands waiting for science. Taking a long time.
 - 14. Now that it's our problem it's not fair

15. Entering the territory of Upland s2A looking at effects of upland on aquatic ecosystem. It's about biodiversity system as a whole. This particular element is a crossover element, bring the holistic perspective to it to change what the objectives how they are tasked and accomplished.
16. There will be opportunities for how to engage more moving forward, but the application of herbicides does need to be addressed by August

3. 10:45 am: Proposed Projects (2021/22)

- a. Integrated Science-to-Action, we don't want to rewrite the upland plan, there is a lot of call of not have two separate plans. Look at both upland and aquatic and come up with one plan. Nothing wrong with either. Come up with some prioritization, where will be in 3-years, 10years, etc.
 - i. Things like fire can be part of it, Max's expertise will be welcome
 - ii. Is there someone who wants to pick this up? Should we be looking within institutions or outside? Get work order in place in the coming months. Trying to find a way to advance this.
 - iii. Complete by June 2022
 - iv. Sudeep supports this plan, are we also thinking of the management convo and prioritizing need in the plan?
 - v. Lizzie says that will be helpful. Road mapping when we want the points of engagement to understand needs.
 - vi. There may be different priorities that management doesn't care about.
 - vii. Have a document in June that has had multiple iterations with agencies
 - viii. Pat wants to maintain the progress that was made in the Upland, would like to build on it rather than rebuild. Invest in the system in a synergistic manner, what is floating to the top across the board and then tiers that are facets of the system, a prioritization such as that would show the positive contributions to restorations. Rather than just a list. Geoff fully agrees.
 - ix. Need further management engagement to refine priorities
 - x. How do we prioritization work needed in the upland without agency involvement, what specific question in broader context to clarity. How do we engage upland agencies and formulate questions.
 - xi. Seasonal clarity had agency involvement and it was rough. Data synthesis was smoother, we are getting better. Getting more agencies involved we will get better. If we don't do this, we run the risk of losing state support.
- b. Basin-wide urban load assessment: don't know the loads from the urban areas, under TMDL are considered the largest source of clarity reducing sources.
 - i. Informed by empirical data, not sure if we can measure
 - ii. Model needs to be validated, has been validated previously, but things change.
 - iii. Clearly a need to revisit, how have our investments in urban stormwater treatments affected the lake? How we are tracking from a regulatory sense, there is some simplicity that is useful for management but not from a science stance.
 - iv. RFP needs how to tackle this

- v. Making sure it is consistent with regulatory stance in place from TMDL
- vi. Jim agrees, never thought of TMDL as a stagnant product, too focused on urban loads and not enough for streams. Does urban loads take into account streams? That's what we were asked to do with the summer winter clarity, both times we can access contributions from streams, but little can be done with the other.
- vii. Maybe urban isn't as important, since 2017 looks like streams have changed, maybe what we have done to the urban loads is masked by these changes to the streams. Need urban and streams done on a regular basis, making sure the data produced is consistent with data for both for comparison purposes. Urban loads are not done on a regular basis. Bring stream program along at the same time. Annual or quarterly loading data for both.
- viii. Rebrand as a TMDL adaptive story, having a conversation with Lahontan and NDEP, this is what we think is important. Broader loading.
- ix. A basin-wide load assessment, Sudeep suggests knowing workloads, talk about as a 2021-22 project, second year is about assessments. It's going to take 6 months to a year. A two-step process starting with initiation.
- x. Setting up a monitoring program that can be used to make periodic assessments, hoping this will inform which urban areas should be monitored and how. We will have wet and dry periods and loads will change.
- xi. TMDL was an annual. How can we assess annual values...
- xii. Has to be in a hydroclimate context.
- xiii. Lizzie question
- xiv. Revisiting the TMDL is not trivial, make sure we are doing adaptive management to understand. 5-10 years.
- xv. Originally wetting up TMDL, discussed making this a process, the agencies and scientists recognized at the time, can't even think about it being a program. We are seeing the repercussions of not having done that. At the time it couldn't have been sold as a program. Things just need regular data, that's the message we're going to sell now. Not changing TMDL but tracking changes.
- xvi. In order to be successful... (Jim)
- xvii. If we come up a new number, how will we respond? Something that might come up that shows up we aren't going to reach our points. Do we focus on clarity when we need affordable housing?
- xviii. Drivers of clarity, management is on track,
- c. Continued Threshold Support: two items at top of the list for TRPA. As far as projects moving forward these will be the threshold focus.
 - i. Vegetation
 1. In discussion with Dan Segan, have been preoccupied with VMT.
 2. Lot of work from Tahoe West
 3. Needs: packaging, structure and the way we set-up thresholds
 4. Jim more interested in this than sustainable recreation. Brad is looking for a metric of overall basin health, don't know if clarity can carry that. Need something that points to the overall health of forests.

5. Does it have to be about the forest itself or is about the water health as related to... (Sudeep)
 6. TRPA EIP performance measures, here are the things we are monitoring and focus on thresholds. Things monitored should include these more integrated things. Making sure investments are meaningful.
 7. Alan doesn't think that clarity will replace overall basin health, but adding to that.
 8. Benthic Macroinvertebrates decline assess the health
 9. In the process of doing this, we can define how interpret these in relation to other thresholds. How we interpret these from a systems perspective. Excited to jump into these thresholds and see how the forest and wildlife can be connected, finding these connections.
- ii. Sustainable Recreation
 1. Share any qualifications for people among your institutions
 2. Set-up the opportunity to be ready to respond
 3. Seems like funding is disappearing
 4. Looking for USGS to be a different federal sponsor
 - iii. Algae monitoring RFP support, performed peer-review on periphyton monitoring and reviewed recommendation in terms of design. Entering next phase for feedback on how to do that. John and Steve help guide the RFP so council members can weigh in. Dan Segan is working as a rep for agencies. More to come.
4. 11:30 am: 3-year vision
- a. First few years were pretty painful, but now we are talking about really challenging science questions. Talk about what our vision should be, what should be the goals of our science plan going forward.
 - b. Alan: Look to the big changes and prep for those, climate is a big driver. It is changing faster than expected.
 - c. Sudeep thinks might be a nice science-management having a rapid task force to deal with it. If we had a wildfire in the basin would we have sensors ready to deploy without management hurdles. We should be working on the permitting side. Are we ready to understand what the fire does to the lake? Are we ready to study it? It would take a couple months for permitting. Tie it to the big disturbances.
 - d. Geoff says Climate change is not a topic, it is a part of everything and a part of that is extreme events. The Angora fire people wanted to put instruments in the lake and streams but couldn't because of the forest service procedures. Managed to get some sensors out there, but thinking about the events. There was a pot of money for TSC for that purpose. Apply for external money they will ask if we have permits ready to go.
 - e. Having mechanisms in place to react rapidly.
 - f. Alan says that there had been something in place for TSC. We know the lake is going to change, need to be ready to work with managers to develop a response plan. Not reacting, but anticipating them.
 - g. How does this tie to the observatory network having that type of monitoring in place? Before and after the fire, how to initiate that? If we're talking about vision,

- what do we envision a airshed, watershed monitoring, etc.
- h. Pat says design it as a precision of measurements for events. Emerald fire was responded to with the funds. (Pat)
 - i. Alan says we are seeing the big picture, but a bigger part is understanding how the system works and what changes could be introduced in the landscape to mitigate these problems. Tahoe West has done a lot of work estimating spatial distribution other management decisions, fostering the right kind of changes. Move things in a direction that would be healthier in the lake. Then the monitoring is supplemental to that. Ecosystem engineering.
 - j. Lizzie, TRPA still needs to be part of the conversation
 - k. Tamara senses a lot of change in the air and how the council will support that change, is the role of the council providing science and understanding and service, where is the council's role right now and where does it want to be?
 - l. Made just for informing managers. Given that times are changing and we need to be looking at climate resilience, how do we set that trajectory?
 - m. Need the science and understanding to be of service. The funding is there to provide science as a service. We need to widen our funding to support or research and understanding of the system.
 - n. Funding: 50k/year for admin needs, \$230k/year to go with science needs/projects, seed money to move us forward
 - o. More funding with nearshore investments with \$300k/year
 - p. Thinking SNPLMA funds are gone, Bob to talk to Dave Fournier
 - q. Filling a need for the community, makes it easier to bring in that funding (Alan) trying to do basin research and the service for management with the monies we have. In the process of developing this integrated plans, identify with management how we are going to support this effort.
 - r. Bringing science information back and describing the importance of it. Council doesn't have the money to do it all, but how can we guide what's available.
 - s. Data analysis project is an excellent example of the direction to move in. Think of Tahoe as an integrative system. How can we move in that direction?
 - t. Coordinating science and disseminating the science.
 - u. Lizzie can help triage questions as they come up.
 - v. This is where the science plan helps. We tend to get focused on projects. Going back to extreme events. What do we do? Is there a way for an emergency fund, the last thing we want are contracts. What are the assurances to have that funding available, unplanned experiments that we can learn so much of.
 - w. Spend money upfront to get this that includes the permit would be money well spent.
 - x. What does the physical emergency response look like? Articulate what it looks like to get the agency members to buy in on it. Get the document that TSAC collectively endorses, will help. At one time SNPLMA held onto funds with AIS, you don't want to hope for an emergency.
 - y. Maybe the fund is held at a university as indirect and rolls over.
 - z. Build it now and see what it looks like. Something there, but might take some creative thinking.
 - aa. Response predicated on the climate conditions that followed. The impacts might occur over time, wondering if what we know about the long-term implications of the angora fire, what geomorphological changes happen in the nutrient transport

in the area today. May not have a very rapid response depending on the climate conditions that follows, so conditions may not be present for years. More broadly not just rapid assessments, we need broad baseline data to measure what those different implications are.

- bb. Storm never hit after setting up for Angora Fire, by the time precipitation hit, the ground was stabilized. Monitored for a few years, but were lucky because there was baseline info from the USFS about the angora meadow project. Not sure how we get good baseline information for localized areas.
 - cc. Ramon: Talking about disturbances crossing thresholds and mobilizing sediments and nutrients, perhaps we already caught thresholds not by extreme event, because of 2017 we might be in a new threshold already. So something catastrophic like a fire would be local changes, but think we need to look at the entire basin for baseline information
 - dd. Sudeep: Envision a stronger healthier Council with greater diversity. Within this vision we can be intentional to get additional participations with trainees and maybe in the end of three years our science colleagues would like to participate. Science conferences and other activities, we should try to implement science updates, activities, and engagement.
 - ee. Lizzie suggests March meeting as a conference, large or small. Bring in younger people early in their career. Jim likes the idea of tying this into the March meeting.
 - ff. Tamara thinks about the idea of a workshop that focuses on extreme events and what they look like as a way of getting at the gaps in knowledge. Allow for younger faculty to participate and is of interest to management. Concrete way for the council to shift focus towards an advisory role.
 - gg. It makes it more than just a basin focus.
5. 12:00 pm: Break
6. 12:15 pm: Council direction
- a. Science/Management Best Practices: Workshops and conferences great step forward
 - i. Program Purpose
 - ii. Diversity: hoping with Sustainable rec find folks with other ideas.
 - 1. Expertise
 - 2. Perspective
 - 3. Career Stage: Sudeep just chatting with Steve about it, allocate funds to get them to listen to our conversation and see if they want to participate. Compensation is key. Internships, working or partnering with us.
 - a. Have them organize the conference or workshops. Pair person/council member with senior person to organize conference session. What does it look like? What are the topics? They must have an interest to working in Tahoe. FastTrack to get knowledge and network for people in the basin, something for the CV.
 - b. Are there people in order? Bob will get a WO together.
 - c. People who are post-docs are different from new faculty. Making it clear for opportunities of papers for them. Aligning and advertising what we do to people who may

not know.

- d. A unique entity, experience to put on a resume, messaging and marketing piece. Diversity and expertise, someone with a communication focus.
 - e. Tamara has a lot of experience coordinating and communicating science. Not just project by project but from a programmatic standpoint. Start with an outcome mapping exercise, for the short-term, mid-, and long-term. Need an outcome driven logic model and then you can start working towards outcomes.
 - f. John thinks that being part of this is an opportunity, it's a service, it's interesting. Thinks there are a lot of people in the UC system, it's not about paying them, not a big deal just look around our own institutions. Lots of young people want to apply their knowledge. If we wanted to expand council and rotate membership, we can do it.
 - g. Communicating to the public, used to be Leo Popov who wrote articles regularly. Alan wonders if contacting journalism department to have students engage with scientists. Materials for website, for local papers, etc.
 - h. Ramon wants to make a pitch for increasing diversity by involving the tribe onto the council. They provide a unique perspective and might have some insight for how to communicate the work we are doing.
 - i. Clarification a tribal representation for part of the stakeholder/agency representation, not a council member. Would require a joint letter from Brad and Wade or maybe asking them how they would like to engage.
 - j. Tamara definitely values traditional values and science and thinks it says something to add tribe representation to council. Bob is in talks with Susan Jamison and will start them.
 - k. Lizzie thinks Susan can provide some guidance. Lizzie and Jim would be happy to write a formal letter and see how they would like to engage, which is key rather than assuming they want a role. Thinking this convo of expanding the council, what are the gaps, what will change in the MOU.
 - l. Bob's initial thoughts are who to bring into the conversation. Reached out to the USFS and got no response.
4. Gender
 5. Ethnicity
- iii. Transparency and Objectivity: We have implemented this to some degree. Really testing out this idea with Steve and John...
 1. Demo some minor structural changes
 2. Purpose highlight partnerships...
 3. Annual science coordination or workshop can advance that, have

some good messages for August

- iv. Any ideas for agenda items for August meeting with executive committee, we have them for one hour. Bob will be drafting an agenda.
 - 1. Capture some things we had in our 3-year vision
 - 2. Linking it to the march meeting
 - 3. How we can get to the next phase of the council
 - 4. Rapid understanding of big disturbances, let them know we are talking about that
 - b. Co-chair rotation
 - i. Geoff will be stepping down, Sudeep will be stepping up, this will be announced in August
 - ii. Jim provides his greatest appreciation to Geoff and Alan and it's due to the leadership that the Council is where it's at. The Council is in a good state. It's changing. Lizzie echoes sentiments.
7. 1:00 pm: Adjourn
- a. Reach out if you have agenda items for the September Meeting