

# TAHOE SCIENCE ADVISORY COUNCIL

## AGENDA | September 2021 COUNCIL MEETING

**Date:** Thursday September 16, 2021

**Time:** 10:00 AM – 1:00 PM

**Location:** [Zoom](#)

**Council Members:** Sudeep Chandra (UNR), Adrian Harpold (UNR), Alan Heyvaert (DRI), Tamara Wall (DRI), Steve Sadro (UCD), John Melack (UCSB), Pat Manley (PSW), Ramon Naranjo (USGS), Jim Lawrence (NDCNR), Brian Judge (LWQCB), Jennifer Carr (NDEP), Laura Patten (KTB), Max Moritz (UCSB), Monica Arienzo (DRI), Jaques Landy (EPA), Mary Fiore-Wagner (LWQCB), Ken Kasman (TRPA), Dan Segan (TRPA), Whitney Brennan (CTC), Jason Vasques (CTC), Laurie Scribe, Rita Mustatia (USFS-LTBMU)

Robert Larsen (CNRA), Alison Toy (UCD)

1. **Welcome and Review** (Sudeep)
2. **Council Business** (Geoff, Ramon, Sudeep)
  - a. Welcome new council members
    - i. Monica Arienzo will be replacing Alan Heyvaert for DRI – Thank you to Dr. Heyvaert!
    - ii. All scientists are welcome to attend despite council member status
3. **State Updates** (Jim, Bob)
  - a. Jim does not have a lot of updates, NV inbetween end of legislative session, Caldor topic of discussion, work being done around utility lines by Nevada Energy particularly at Kingsbury, Sisolak is not from here but is very engaged and asked lots of question about response and impacts, maybe an opportunity for greater support and engagement.
  - b. Lizzie Williamson has taken another position, which is a great loss but congrats to her. Received a new opportunity at Dept of General Services perhaps a new ally there.
  - c. Bob in discussion with CNRA to figure out a replacement for Lizzie, will keep Council posted.
  - d. Jennifer just got annual EPA funds (319) so request for proposals will be coming soon.
  - e. NV state lands license plate also looking for requests as well.
  - f. Bob sent out brief summaries of work orders available for review
4. **Upcoming Work - Projects** (Sudeep, Ramon)
  - a. Integrated Science to Action Plan (Adrian)
    - i. Combine lake plan with upland to optimize clear management plans
    - ii. Pat, Tamara, Sudeep, Bob, Ramon discussion working backwards to determine outcome of this and who is the target audience.
    - iii. Plan will look like 10-30 page document targeted at management with a summary targeted to higher up policy makers.
    - iv. Push the science forward, but didn't do a good job previously interacting with managers, so internal discussion about bring managers early and hear their ideas to better incorporate it into the plan.
    - v. Many topics in the original Aquatic plan are being currently addressed, need for others to get involved with the in-lake processes so we can mesh them well with the uplands workplan.
    - vi. Jim: Managers and regulatory agencies need to identify folks early to engage in

the process. Might need a little chat or dialogue for what your needs are for engagement. Suggest using TIE as a good forum for presenting what we are doing and getting people to participate, Dan to send Adrian information for joining the TIE meeting.

- vii. Just going and presenting the two plans and starting that as we are integrating these at the start of the conversation, but something to discuss with the group.
  - viii. Sudeep: Are there other plans for the conservation of the watershed and lake, sustainability plans, please send examples to assist with us that might improve our process and guide how we integrate our science questions. I have seen one for Lake Michigan.
  - ix. Bob: Co-Chairs sit on the TIE steering committee. This is on their radar, but agree with Jim, what skill set we need, who are the managers, and also echo Sudeep we need a team, would be great to start drafting a work order, what does this project look like and start identifying a management approach. Looking to Adrian and Tamara to draft what this project looks like.
  - x. Since we are shifting our work process, what is the best process?
  - xi. This is something council members should appropriately engage with, will share an example work order, don't think this is something that rises to an RFP level. Drafting a work order consistent with previous process makes sense to Bob.
  - xii. Council Members that may be interested in participation in this integrations of plans: Adrian, Pat, Steven, Tamara, John, and Sudeep. Can ask Geoff who is not here as well.
  - xiii. Have an empty seat with PSW, bringing in a forest ecologist expertise/restoration specialist might be useful. Pat will work with Bob and Council to figure out the appropriate perspective to the Council. Pat has already identified a few potential people.
- b. Wildfire smoke response (Sudeep)
- i. Feedback provided by John, Ramon, and Pat.
  - ii. Understand effects on the lake and where the smoke is distributed in the basin and nutrient contributions into the lake and seeing algal response through bioassays.
  - iii. Looking at nearshore, particle sized distribution in the lake. Proposal has been circulated over the last few weeks. The League jumpstarted the funding with \$211k, States of NV and CA, TRPA, and Tahoe Fund providing additional funding.
  - iv. John: Reminder for everyone this is in the need for rapid response to events, which was discussed at the last meeting, this is a test to this. You started sampling already, still dealing with funding issues, but people were able to mobilize measurements already.
  - v. Tension of science community, those of use interested in the conservation we are trying to mobilize quickly, but sometimes how we motivate those types of response with funding is uncertain.
  - vi. This has come up in discussion prior to Caldor, getting in the field under highly dynamic changing conditions, this is the tip to understanding what is going on. The analysis is decoupled from the actual sampling. Not sure how well this gets across to agencies when they see a work order that extends into November or December for the Caldor fire for example.
  - vii. Tamara wondering about fire retardant getting into the lake if that is being tested?
  - viii. It is not being looked at for this particular study. To keep costs low we did not

- move in that direction. Did not have the clean techniques to put in to do that.
- ix. Tamara doesn't think it's too late or too costly or time consuming. First seasonal event perhaps in Tahoe, now would be the time. The other is erosion and sediment coming from these fire, Post-fire debris flow, it would be ideal to have some work done pre-Atmospheric River events this fall.
  - x. Water has been collected and frozen but it is not part of this project at this time. Hope that things will work out.
  - xi. Jennifer there may be other ways to tackle the chemistry of the retardant, look at nitrogen content of fire retardant that might be helpful.
  - xii. Alan: Related to the Atmospheric proposal, it doesn't have to be done immediately, fine temporal special resolution of ash deposition at the lake. Not rapid response but so where does this fit in the context of the larger proposal.
  - xiii. Bob: Acknowledge this project moving forward, Council is responding to fire quickly. Super grateful for funding partners, good group for this project. There is a ton of other work that needs to be done, but need to make sure the Council is comfortable with this particular project. Keep moving forward, this is just one of many projects, but there will be future discussion of other related projects.
  - xiv. Jim: Fire Retardant piqued interest, a conversation later? I think it is important to figure out where that fits.
  - xv. Sudeep: Acknowledging the importance, broader topic down the road. But there are frozen samples of a snapshot that has information, we can figure out how to move forward appropriately.
  - xvi. Ramon: Flame retardant might have to be considered the daughter products based on how they react to water and soils and in the air. It is important to look at Clarity during the Data Synthesis Analysis report (for pelagic water quality). Fire impacts to the DSA report? Not the first major fire near the basin, didn't have data to bring into the conversation other than Purple Air and other station collecting PM2.5 and PM10 data. Could vary based on wind data and more. May have an immediate but could also have a lag impact. Analyzing for this fall period, last year's data, fire discussion for next two years of DSA efforts.
  - xvii. Dan: USGS will be doing expanded sampling on the LTIMP streams, including sampling for fire retardant, starting with this weekend storm (assuming it materializes)
  - xviii. Sudeep was already thinking how this will inform next year's DSA report, hopefully most of them will be together and data ready by February/March, especially ash quality and particle size, hopefully to be thinking of things in terms of water years.
  - xix. Jennifer notes that NDEP is interested sooner rather than later of the effects of ashfall in relation to turbidity in the lake with intake at Edgewood creek.
  - xx. Interest in qualitative information?
  - xxi. Tamara: There might be a nice opportunity to engage with the BAER team for the Caldor Fire—topic of discussion after the break, perhaps.

## 5. **Upcoming Work – Programmatic** (Sudeep, Ramon)

- a. Data coordination and management
  - i. Bob: Started with seasonal clarity analysis and the DSA, housing/organizing and distribution of data, not easy to get data to do these analyses. Start a committee in terms of identifying monitoring and doing a better job of making the data available. Wait for DSA to finish? This is something the council continues to consider, but need to know how this committee gets started and start putting together a proposal for how this gets done. Ramon and TRPA have presented

ideas for how to display data. But first we need to coordinate data.

- ii. Ramon: an on-going topic for 3-4 years, where is data is housed and how accessible it is to scientists and the community at large. Made some strides in sharing DSA data, will be continuous issue as we get more data. Need available data in a transparent way.
  - iii. Interested people: Ramon,
  - iv. John: USGS posts real-time discharge sites turbidity. Then they do quality control and release official data. We don't have the same process, a cultural issue that cuts across agencies and academics.
  - v. Adrian: Involved in a lot of data collection, storage, and release. These are indefinite project which means you need indefinite resources. Things change and have seem a lot of repositories that are maintained well or coordinated with the community. If we were to wrap these efforts into the S2A plan then it would force us to reinforce the goals of this data. Let's not underestimate the amount of work that has gone into the current data storage.
  - vi. Ramon: A lot of effort in focusing representing the clarity data and instream data to interpret data for DSA. Something needs to happen with foundational data that we look at all the time, wherever this group decides to take it, should be encompassed with this DSA efforts. Effort of data integration, lots of data, but how it's interpreted for different things that need to be considered as well.
  - vii. Tamara: Use-cases working with a variety of stakeholders and managers, good time to develop use-cases and pull these things together.
  - viii. Bob: Might be appropriate for something to consider with the S2A integration in terms of how we move forward, don't want to burden that project.
  - ix. Sudeep: Have a subcommittee smaller working group on this subject and start putting a working group, and start discussing next steps. **Bob has a list and can share with co-chairs and Sudeep wants his name off this list.**
  - x. Steven: Echoes lots of data needs avoid compiling such a big individual work that can delay other workable projects. Maybe avoid adding this to different use groups.
- b. Threshold support (Bob/Dan)
- i. Make sure the council continues to make space for this ongoing effort that was what started the initiation of this Council
  - ii. Broad goals of TRPA for the entire Tahoe partnership, guide EIP efforts, vast goals are over 40 years old. TRPA is aware goals need revisiting when they were initially geared towards the control of development. Regional plan capped development. Development controls are consistent with long-term goals. Looking for goals not captured, like impacts of climate change and wildfire. We will look at "emerging threats" although we have been dealing with Climate Change for 20 years now, revisit what are goals are now.
  - iii. Pat: time to take a fresh look especially now. Lens for terrestrial side, wants to know what are the next steps. To what degree can TSAC take the lead. Helpful way to refresh and how we can proceed based on what we know the threats are.
  - iv. Updating VMT standards with a lot of Council support and that worked with why we care about VMT today and what are goals are. Concerns have shifted and discussed climate change and sustainable communities. Overdue for really what the goals are today and how they link to the EIP. How we spend our money and how that helps us achieve our goals.
- c. NDSL proposal peer review (Sudeep)

- i. Interpretive review of what has been submitted to the NV license plate plan. Is the council prepared to review proposals? An opportunity that is very valuable to try and facilitate assisting management community as to which projects rise to the top. Not sure how much work this would be, but want Council feedback.
- ii. Adrian wants to know if there is a review committee, logical process to check in with the peer-review committee and this gives us the ability to look outside the council for review.
- iii. John: We have done this twice, a climate related proposal and then just finished one for the treatment of the Tahoe Keys. Found outside reviewers and had it completed, what is the question?
- iv. Sudeep: Is there a capacity or interest to do so? Either within the council or searching for outside.
- v. Bob: This is different because these are projects being submitted for grant funds, so we would help inform their distribution of grant funds. Slightly different element of peer-review. So making sure the bandwidth is there and if we are interested.
- vi. John: We had said previously we wanted to see this before you funded it, it seems like we have to work out the logistics, this is what we claimed to be doing, it's not whether to do it, it's how to do it.
- vii. Jim: Science proposals from a variety of institutions and as an administrator, I don't know if this is needed or if it's relevant. So it is critical in my mind to have this sort of service to help allocated limited resources to the most important projects. This is what we have wanted to do and at the same time it doesn't matter the source, I already push this is something vetted with the Council, so it's already happening, can it be structured when there is not conflict of interest.
- viii. Adrian: Maybe there is need a process for how to review proposals. This is new for us.
- ix. Alan: I have the one for the Consortium from 2010, was there a different one?
- x. Pat: Agreed.. Caldor fire is likely to precipitate funding opportunities including funding the LTRA beyond current levels.. a standing process would be very helpful..
- xi. Bob: the scale is pretty small, we have some proposals we want to know if the science is sound.
- xii. Jim: An advisory committee to rank the projects, but it's just knowing that these proposals are sound or not. Something from the Council to say, this is well thought out, it's useful. \$450k maybe \$75K goes to science.
- xiii. Sudeep proposes we move to take this on and maybe kick it to the peer-review committee. Trusts Adrian and John. Would need to happen in the next few months, let the Council know if they have greater assistance.
- xiv. Jennifer: It will also be interesting to see what we may be able to do with the Infrastructure Bill that comes to us out of Congress "soon" (assuming it does). We are brainstorming and I welcome input off line.
- xv. Adrian worrying about the separation of interests with peer reviewing proposals.
- xvi. Bob: need a advisory committee that is not going to be invested, a conflict of interest could be there, if Adrian is submitting then we would have someone else to lead the review. If there are Council Members submitting we just need to make sure to not have a self-review. Can coordinate to talk about process and is consistent with council purpose.
- xvii. Ramon: Evaluating interpretation of findings has been a large part of what we

have done, will our efforts be a part of these projects moving forward in addition to a review of proposals, the review of the completed projects later.

d. Communications

i. Defer to discuss via email or another time

6. **Caldor Fire Impact Assessment (Ramon):** Impacts of smoke and other more regional wide impacts to Tahoe. The idea is to have these convos to get priorities set in terms of what the science needs are. The topic areas are below but perhaps they can be expanded upon, if there is a need. Have a general discussion the impacts of the Caldor and how we set up the subcommittees for the sub-topics. Early stages of efforts and hoping the Council to collectively start having the discussion and how best to create directed science questions for these topics. Bob has shared the Tahoe Hydromapper (<https://webapps.usgs.gov/laketahoemap/>), the idea of sharing real time data from a number of agencies through the LTMIP program. Red Xs are previous inactive monitoring sites, data no longer be collecting at this time. Comes from instaweb, responsible for daily maps. Make sure people are aware of these data at these locations.

a. Science ideas

i. Pat has shared a document

ii. Adrian wants a more forward-thinking approach, be careful about these ideas and don't want to start from scratch when there has already been so much effort with the S2A. Look at things that actually change management.

iii. John: The USFS did a review of the Rocky Mountain Research Station, Wildfire effects back in 2005. Obviously more to be done, let's not start from scratch, there has been a good amount of science has already been done. Realize there is a lot of science that has already been done all over the world. Setting priorities is hard, we know a lot already, what is specific to Tahoe that is hard or new?

iv. Pat: Might be worth looking over document sent out, to improve management efforts into the future, would like to consider in how we look at value of different investments. Can go over the quick list that have been brought up, that might be the most efficient way for me to bring this up.

b. Council advisory committee (Bob)

i. Bob: the council has funding now, there is operational funding that can be used right now, the most pressing question is what are the time sensitive needs in response to this fire? Advisory committee needed that don't have horses in this race to really inform this conversation and help prioritize needs.

c. Water Quality

d. Forest Management

i. Ramon: It would be interesting to know if the previous forest management played into the survival of structures.

ii. Pat: The feedback I got is what is in the document, looking at it from a multi-scale perspective, what do we already know. Building a better model, strengthening our understanding and ability to make inferences from fire. Fires the first thing and beetles are probably next. Fire scale, watershed scale, basin scale, etc. Helping us better understand function of the system and understand how things change in situ, what is the condition before and now. What do they look like now? Have they move towards desirable or undesirable conditions? Does thinning work? Not specific to the basin, but will improve modeling. Strengthen model and density of trees. Fire footprint itself, fire scale, how did it burn through the landscape and why? Remeasurements of sites before. A topography that repeats itself in the basin with different faces. Watershed scale, look at questions like how did it burn

through various watersheds, sediment and wildlife and habitat and plant responses issues. Learn a lot about what way these linkages are expressing themselves, is it what we expected? What are the down stream conditions and across these watersheds do these components relate to one another? Would expect variability across the burns. Final part is basin scale, what sort of good work did it do and undo and where does that leave us for management, ecological and social question. Relates directly to the uplands S2A, we had these focuses. Monitoring is the last thing, an opportunity to think of what degree we would have wanted monitoring set-up and what we want it to tell us.

- iii. Alan: Similar to the lake smoke impacts project, there is a time element in what needs to be done for evaluating upland impacts from the Caldor Fire. That is, what needs to be addressed immediately to get data useful for evaluating management actions, versus what can be studied later and over the longer term to improve our scientific understanding of forest and fire management?
- iv. Jennifer: Alan read my mind, what we are most interested in, is there will be plenty of money moving in different directions for these science efforts, we need some money to see what we need to do to act and take it to the next level. Priorities should be shorter-term. What can we learn immediately to drive on-the-ground action that can have benefits and ensure health in the near-term. Don't just look at clarity, but what is the health of the basin and this directly relates. Seven items on Bob's quick list. Fire fighting effects, fire fuels reduction what that looks like by creating new fire service roads, for fuel reduction efforts with BMPs applied and then we have a bulldozer line that is far more impactful than a fire service line.
- v. Ramon: Do you feel strongly about having something about mitigation?
- vi. Ben: Lots of different concerns. What extent are we seeing additional loading. You know in those tributaries stream about background, and, and will be useful to know for a variety of reasons, and may be able to then, if we see changes and clarity in the next few years, I don't know at least will be a data point, or that we can look back to and point to unsaved well we did see this additional loading and we did our best to mitigate, that from happening, but we can't be 100% successful. And the other thing that I would just offer is from the Lahontan perspective we are so supportive forest health initiatives, because we understand that the real existential, one of the existential threats to the lake is from these types of catastrophic fires, especially when they burn at really high levels, so it'd be really interesting to know from sort of more of an academic standpoint, like what additional loading may occur of those pollutants, and to really support and provide our support for those really important forest projects. In other words, if the other portions of the water of the basin burn, you know, this one is what could happen, and so it just provides us additional leverage to try to you know work with our partners on both the California-Nevada side to support those forests projects. Looking to further the discussion with Jennifer, Jim and others. we have concerns about how ash and smoke, and also does nutrient and fine sediment loading, will you know affect the near shore. Because that's another one of our big focuses is the nearshore environment. And then in terms of public health will grow this additional atmosphere comes from smoking ash and other sources, and create additional harmful algal blooms, which we already see in our region but also seeing more frequently in the basin, especially with increased temperatures and low water levels. This year is the aquatic invasive species, I'll

just kind of link in there to an extent, does this create better conditions perhaps for additional proliferation of AIS which is another big issue and one of my main focuses right now for protecting the way. And then I'll just add one thing and that is from a drinking water perspective on the public health side of things, you know, we've I've already been coordinating with NDEP and drinking water which is under the umbrella of state board, and we feel pretty good about that there's not an immediate threat to the drinking water supply for those in the south portion of the basin.

- vii. Sudeep: Is there an issue with permitting? Wanting to keep that in the back of heads because it's been a headache. LTMIP mobilization of getting more monitoring happening, what is the update? We are seeing an indication of algal growth, seeing clogged pipes below the surface of the water. Could we put out samplers ([https://www.usgs.gov/centers/cerc/science/passive-sampling-using-spmqs-and-pocis?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/centers/cerc/science/passive-sampling-using-spmqs-and-pocis?qt-science_center_objects=0#qt-science_center_objects)) that look for passive chemicals, to get some integrated view of chemicals in the nearshore area and stream areas? Also look at getting some grab samples, but have USGS and other folks design sampling. What I remember from Angora fire work, there were these sensitive zones that helped prevent debris from entering the lake. Can we see how they have worked in their area?
- viii. Max: The point I was trying to bring up which was that in many cases our restoration efforts, just by, by design, are somewhat backward looking right where we're taking a historical range of variation and landscape. That was resilient to conditions. Decades ago, presumably when some of these trees established and regenerated, and maybe we need to be thinking more about desired future conditions which there are some question marks around right we there's a fair amount of uncertainty but there's, there's some agreement that many places may or may not be able to sustain the same types of forests, down the road. And so this might provide us an opportunity to actually test out some of those ideas and not be too experimental about it but there are some who argue that we should be actually facilitating some of the screen shifts, and type called type conversions but basically trying to move things in the, in the direction so that they can keep up with their, their climate velocity, so that organisms have a chance to track their suitable conditions. And this is quite a different perspective from sort of a restoration and backward somewhat backward looking perspective. So that was, yeah, that was my, my comment about a possible opportunity here.
- ix. Ramon: Wondering if there if anyone on the USFS side that can assist expediting the process for permitting. Are there anyone or any other agencies on board that can work with the Forest Service to try to streamline the permission, access, that is needed to try to get some of these sensors in place before. What are your starts in October so we would expect some low flow conditions and all our preset and snow accumulation in the higher elevations to start this in the coming weeks. Trying to get on the ground quickly. If we can get those was permission to access issues addressed rather quickly. On behalf of the USGS what we're currently proposing the idea of establishing or collecting more data we currently have 21 samples collected at our sites that were shown on that map on the hydro map in those active monitoring locations on trout and other Truckee, however, there's a lot of tributary streams. There's also tributary data that we've collected over time that we're looking into re-establishing those sites to monitor the effects of the impacted areas, which include, as I mentioned the disturbance caused by the



access roads that were created. The fire suppression activities, as well as the burden areas. So we're actively working with our TRPA partners and Lahontan to try to get on the ground quickly because it's happening. And if there's data to be collected as it relates to fire suppression compounds, now's the time to get the baseline data and installed some of these turbidity sensors, and so forth but those all are very expensive to deploy even continuous discharge is, it's quite expensive so we're trying to try to seek out what we can do internally within the US she has funding to support that, but also, we're in the early phases of those discussions with TRPA to try to get outcome going in terms of fundamental base baseline data that will be perhaps use to address these longer short term science questions related to the impacts of the fires but could it be important that a lot of, we hear from the science community as well as the, the agencies as the white as gaffer pointed out the mitigation is going to be hugely important to try to minimize the impacts but all attempts center network is going to be supportive of the short term and the long term, science questions that are needed, but there's a lot of times questions that are needed to be either. As time goes but there's some time critical things that need to happen very quickly so I think it's important that we try to work out these science, groups, or advisory committees to work with the council from a council to work with the agencies to help encourage those efforts in those focused research focused research topics that are on the agenda or instead of having the mitigation one is something that's hugely important.

- x. Alan: Can USGS provide more frequent load estimates from LTIMP streams than currently done, which is at the end of each water year (thus anything after October 1 this year would not give loads until after September 2022)?
- xi. Ramon: In the same manner is the streamflow data that is displayed online is to have that in real time so you would have real time fine sediment predictions and that we hope to have the upper Truckee come online later this year. In terms of what is the objectives of the find the data synthesis and analysis that has encompass both find sediment in suspended sediment loads nutrient modes which is typically done as the data is being processed QA, QC, is a much longer process that even data availability from clarity and other profile data that is done for data synthesis, it's usually done around the same time as when the USGS releases their final approval data but preliminarily we will have. We hope to have fine sediment estimate loads for upper Truckee and trout. At the Help tab active gauges. What we need to do is get funding to support the real time find sediment load for these upper sides, which are no longer being monitored, and there's a lot of work that takes place in order to establish the regressions associated with fine sediment load and the turbidity sensors that are deployed for continuous measurement. So as these upland sites get we instrumented there'll be some time in order to develop the relationships between grab samples the fine sediment samples are collected and more frequent turbidity measurements that are taken on a hairball 15 minutes. In order to establish with the fine sediment. Turbidity load regressions would look like, and establish the continuous record of fine sediment load to the lake and that's something that we, we should be thinking about in terms of the upland areas because as soon as, as winter moves in and we get precipitation events, there's gonna be some tributary streams that we just don't have the information about how they're responding on so that's one of the things that we're currently working with RPA behind them through the LTMP program to get those established.

- xii. Rita: Is the one receiving requests for permits. There is a process/a form for contractors to fill out because of the closures. This is considered an active fire still. Need application for access, then run by the basin people to grant that permission. Have this brought up at FLT meeting and see if we can streamline process. Who should I contact once I get more information? Bob from TSAC and USGS in general.
- xiii. Dan: More of a general point, one of the biggest challenges is the coordination and collaboration with all other agencies that are collecting information and doing rehabilitation of landscape. There are processes in place and my fear is that there are things missed, would like this group to synthesize and look at a comprehensive look. Need to go into this understanding that people are asking the same question and make sure we are not being redundant.
- xiv. Sudeep: Make sure there is no redundancy but also trying to get there immediately. Is there a solution for this? Should there be a management team that discusses how we approach this redundancy. Science staff management team integrating, making sure we know what other people are doing.
- xv. Jacques: The Flagstaff Watershed Protection Project is addressed in a USFS PPT (<https://www.summitcounty.org/DocumentCenter/View/10555/Forest-Service-Presentation> , see slides 21-22) that relates to this effort as an example of "Innovative Finance for Nature-Based Solutions."
- xvi. Bob: Scott Stevens with UC Berkeley, that is seeking permission to work on the forest and evaluate management so there's not only the group here, but it's trying to make sure that we're capturing the universe of things that are, that are coming from other from outside and kudos to path and if she's probably feeling a lot of these folks, and so hopefully the PSW can help us sort of manage that, but I think the question is a good one is how do we how do we make sure that the counselor is at least aware of everything that's going on, and making sure that we can do that synthesis that Dan's talking about and make sure that we aren't overlapping and that we're also not missing something.
- xvii. Jennifer: how does the TSAC function as a clearinghouse of what everybody's doing, not necessarily having their fingers in what everybody's doing or how do we at least know what everybody's feeling, and to be accepted it can prevent overlap that's great, but they're very naturally very much could be overlap. And that's probably okay too. And speaking of overlap, and I think someone touched on earlier as well as is, you know, the basin is the basin and everything we've got going on here is very Tahoe-focused, but how does it fit maybe, or how does it intersect with other things going on with fire research throughout the West. And I would just know that I've been spending the last three days with the Western States Water Council. And, of which there is something called West fast which is the Western States federal agencies support team. And I don't know if Pat is still on with us but there's a gentleman named Chris Carlson, with the US Forest Service. That said that they are embarking on plan to investigate, or at least have discussions about the intersection of wildfire and water supply, or water resources, and so they are in the process of starting a multi part webinar series this fall, that's going to run into 2022 that talks about the various challenges of the intersection of forest fire, and, and water supply, pre fire during fire, and post fire.
- xviii. Sudeep: one of the things we're worried about both within our action emerged in our conversations about the upload action plan and then modification of the rate plan is to try to understand your short dynamics and how water quality could be

affected, or how one of the dynamics of water quality in the near shore including algal growth. And I guess my question to my colleagues would be any. Do we have a lot of historical data on the southern shelf Tahoe, that we could try to understand the influence direct flows and waterfall the new changes to the southern show Tahoe both water quality impacts but algal growth. Should we try to get sensors out to the South of the Lake sooner or water quality grabs?

- xix. Ramon: The data collection efforts around the southern part actually went around both shore in the west shore in the South Shore parts of the lake, where we obtained chlorophyll-*a*, we did the biomass sampling and stable isotope sampling of the biomass, fingerprints, the sources of nitrogen and phosphorus, both in firefighting, and in groundwater, and some of the areas that we sampled were downgradient of the Caldor fire, so they could possibly use as a recent snapshot of what the near shore groundwater conditions as of late 2020. Work that UC Davis is doing in terms of verifying data collection efforts that they do seasonally, is probably the only one that I'm aware of that. I don't know that they are collecting lake water samples for example, core, you know stream sample stream inputs, around, around the same areas where they're collecting periphyton grab samples but that is a good question.
- xx. Monica: It's very about infiltration versus runoff so cyano hydrophobicity to help inform perhaps where we should be monitoring. In the future where we expect the worst, or the most extreme or the least extreme.
- xxi. Ramon: We're thinking about things across these multiple scales, and in the nearshore environment maybe one of those skills that will respond within this year within pretty quickly, either to the lowest onto the lake, or even the spring release and subsequent rainfall events that are going to happen in the urban areas are there anybody within the agencies currently can speak to what activities that are happening within the urban areas, because we as we know the urban areas are a major contributor defined sediments is streams into the lake. And, and I think it's important for us to kind of include the urban areas into the discussion because for all-intensive purposes.
- xxii. Jennifer: I don't know what the Urban's are doing right now but actually just by saying that it gets me thinking about, what, like street sweeping activity might be going on out there to try to collect some of the ash from the roadway as much as they do for materials. So that's, that's a that's a question that I'll ask Jason to follow up on.
- xxiii. Dan: Are there additional things we should be monitoring within the urban areas? Some will be captured with regular LTMIP sampling.
- xxiv. Ramon: we have plans to look at the Urban monitoring program, at least to work a task order to look at the review of the current monitoring strategy for the urban areas, and make recommendations on how they can improve. It's difficult to seek out what more should be monitored. Alan may have some recommendations.
- xxv. Alan: Have been in touch with RSWMP, far from burn scar so this would be more ash depositions and associated compounds. If it was an urban area it would be a different question, but fortunately it was confined to the forested areas. So not as much toxic compounds coming out of urban areas. Being able to account for what is coming out of urban areas in terms of ash fall and that's something we will be looking at.
- xxvi. Mary: Ash deposition and what RSWMP are looking in are what we are interested in. Retardant though, we will have some info from private areas, will have more

information that we can add to the RSWMP element.

- xxvii. Jacques: What urban jurisdictions are involved. Weekly conference call by Cal Emergency services debris task force, will start participating next week, seems to be a good forum for getting that information, contact Jacques if you want to be tied into the convo.
- xxviii. Sudeep: Immediate need for proposal, aerosolized smoke and deposition in other areas, might suggest a monitoring program at burn site and around burn site. Thinking about sensors at south end in terms of direct inputs. We may not see any effects. I think an "immediate need" would be to purchase and deploy water quality sensors in the Southern shores of Tahoe from Emerald Bay towards Zephyr to collect lake responses to loads from nutrients and particles (if any). Also deploying passive organic samplers for contaminants and collecting the surficial sediment in the streams and Lake Tahoe's bottom to see what enzymatic activity is occurring now. We would need to sample again in the future since there is little historical data. Another immediate need would be to sample the potential aerosolized materials from winds in the burned area after the fire and how it is transported to the lake.
- xxix. Another immediate need would be to sample the potential aerosolized materials from winds in the burned area after the fire and how it is transported to the
- xxx. Tamara: My mind goes to increased COVID cases due to respiratory stress from wildfire smoke particulate, but that is likely outside of the scope of this group.
- xxxi. Pat: something that has come up in our conversations was the need to staff up to enable the council to be responsive and engaging the range of research efforts and agency needs. I think this investment right away would help us keep pace with the need to be responsive and track the range of activities that will be getting underway
- xxxii. Sudeep: We should staff up, or put some funds towards hiring someone on the upland and lake side to pull these ideas together and formalizing our connection with our agency colleagues.
- xxxiii. Pat: I could see this staffing need being a 12 month appointment to see us through a full funding and ramp up cycle, but could easily be envisioned as a 2-year role.
- xxxiv. Ramon: So if those of you who want to be a part of this mitigation group, I believe, Steve, if, if that worked out for you, were you taking notes in terms of those people who are interested in the mitigation. From the Science Council, and those folks who are within the agencies who are going to be dealing with rapid response, as it relates to implementations of BMPs, and those sorts of things that just need input from the council. I would suggest that you raise your, your hand currently in your wishes to be involved in those mitigation type level. However, maybe we can narrow that a little bit to Ramon and say, anyone who's interested in that topic in the next two to four weeks more immediately of connecting with managers to understand their needs and do some rapid response development on ideas
- xxxv. Sudeep: I hear, let's separate into two groups, the science community that wants to interface with the management community on a more regular basis, immediate actions related to restoration forest ecology water quality, or other topics in the next. It's kind of one rigid group in the next two to four weeks. Monica, Sudeep, Pat, Tamara, Rita, and Ramon. And then second group that thinks the kind of vision structure, ideas that need the ground in relation to science to management

action plans that can kind of pull some these ideas together Pat, Steve, and Sudeep.

- xxxvi. Pat: I know that there's been discussions about, you know, finding availability for immediate actions and I just, I just thought that, while we have the council engaged the full council engaged. It's all about money, but you can't get a lot done without it. So, I think, is there dollar figure and totally, you know, take this off the table or chairs we think this is the wrong question to be asking, but is there dollar figure that the council would either recommend or, or say like hey we're comfortable with this subset of folks, whatever saying like, we know there's an immediate need, that actually means immediate need. So, is there a part of that group would be sort of a power to kind of come up with an investment or maybe you don't need it all or maybe there's more but to sort of say, there's a threshold below which come up with the priorities and, you know, get things going. My only reason I mentioned that is that a couple of weeks to sort this out and then how do we come back and this whole process of prioritization can eat a fair bit of time and maybe even lose the opportunity for some of these very time sensitive investment so I'm just kind of curious if that would help to say like hey, Here's \$1 figure, you know, within that the council's comfortable with this subset of folks, you know, making some decisions about the most high priority investments or not. So things.
- xxxvii. Bob: Yeah, so thanks for bringing that backgrounds I think that's, that's what I was looking at in terms of trying to focus right now, so I'll mention again the council operational. But let's just call it \$150K, roughly, and then yes, having a group that can help guide the prioritization of those immediate needs, I think is what is what is needed right now. I also want to be sensitive to the fact that we don't want a group of people saying the immediate needs are for me to go out and collect some data, you know that we've, so that was why I wanted to try to make sure that we have the right folks in the room that can inform the conversation, but also some folks in the room that also can be a little bit more objective and help guide that discussion. Again, you know, whether it's a USGS or P SW or these, you know, There's great information. And, and, and knowledge that needs to be brought to bear, but we also just need to be aware of the fact that not everybody is going to advocate for their own stuff. So how do we how do we make that make that clear to so also acknowledging that we're in a tight space, and we need to make things happen quickly so I don't want to let you know the perfect video or anything good here. We want to make sure that that you know that we can make those decisions so \$150,000 Let's get a group together that can help inform where the dollars goes tomorrow, because, with you know with everybody in the room with, with the council institutions we can get work orders together quickly. And so I want to make sure that that group has some discussion and I'm happy to work with the co chairs to help set up a meeting in the next week of that group. And then we need to coordinate that group with you know with our agency partners with Dan with Lahontan with Rita with other folks and try to have that discussion about do these priorities resonate and make sense, and are we missing anything. And, you know, we've talked about, again, UC Berkeley coming up and already you know going to be doing some work and there's other folks in Region Five. Let's make sure, you know, how are we gonna capture that universe of what's happening. And so we can move forward quickly that also thoughtfully. Who is the science coordinator to lead the charge?
- xxxviii. Alan: Does that TSAC 150k include the 50k for smoke project? No, separate

- xxxix. Bob: if we don't get out and gather data now whether it's water quality, or, or forest conditioned or burn severity or atmospheric deposition or what are the things that we need to do now that we don't want to miss. And I realized that that's a big ask, but that's what we need to be responsive to our management partners I think we just need to make sure that we were thinking about that and providing some guidance there. Don't have a priority there, I drew out that idea of like I feel like there's a water quality question there's a forest question there's a mitigation question. And so maybe within those we can identify what the immediate data, data gathering needs are and then put those in the context of a larger plan or trajectory for research so we can say, it's going to cost us \$100,000 to get up, get the data now, and then we're going to need a \$200,000 to analyze and assess as those data and synthesize things that's a conversation that we need to have a little bit more, have a more focused conversation about that and put it in the context of everything else that's going on.
- xl. Pat: Don't feel like I can take the lead, but happy to make a contribution and support this effort in terms of the forest sector.
- xli. Bob to circle back with the co-chairs to find a lead.
- xlii. Jacques: Back in the days of SNPLMA there was a Rapid Response Fund that was established accumulated to the level of \$100,000 and apparently it's still available for rapid response, there's a whole process by which those funds can be authorized which involves the approval of two executives, I'm not sure on what committee. So, I do need to look into the procedural aspects but perhaps excellence can be lumped with those you mentioned but subject to those procedural constraints.
- xliii. Bob: the next steps right now I see are to essentially get a meeting together of the interested parties, and have a more focused conversation about, about some of the details and make sure that we have this discussion.
- xliv. Jennifer volunteers Jason and Paul.