

Meeting Notes
Tahoe Science Advisory Council

Tuesday May 29, 2018
10:00 AM – 2:00 PM

Tahoe Center for Environmental Sciences, first floor Rm 119
291 Country Club Drive Incline Village, NV 89451

Participants: Sudeep Chandra (UNR), Scott Tyler (UNR), Alan Heyvaert (DRI), Adam Watts (DRI), Geoff Schladow (UCD), Steve Sadro (UCD), Max Moritz (UCB), John Melack (UCSB), Pat Manley (PSW), Ramon Naranjo (USGS), Ed Parvin (USGS), Todd Ferrara (CNRA), Zach Hymanson (CNRA), My-linh Nguyen (NDEP), Alison Toy (UCD)

Meeting Summary:

A. Council Operations (pages 2 – 4):

- A guide for new Council members has been completed. Information on processes for new projects should be useful for existing members.
- Information about existing and completed Council projects is now posted on the Council website (www.tahoesciencecouncil.org).
- Some of the current funding available to the Council will revert back to the source account at the end of June. These funds are not permanently lost to the Council, but there is a budget process for requesting re-appropriation of these funds. The current proposed budget does include a new appropriation of \$150,000 for the Council. These funds would become available when the new budget is fully approved.
- Geoff Schladow will be stepping down as Council Co-chair at the end of June. Alan will continue on for another year. Other members were asked to consider filling the Co-chair vacancy.

B. Preparing for Executive Committee Meeting (pages 4 – 8):

- Council members were briefed on the purpose and basic plans for the annual Executive Committee meeting. Most importantly, the Committee will review and approve the Council's work plan. The approved work plan is used to guide the Council's overall work efforts, including its substantive projects. The meeting is expected to occur the day before the annual Tahoe summit.

C. Substantive Projects (pages 8 – 16):

- Project leads provided updates for each of the Council's seven substantive projects. Projects are: 1) Peer Review Committee (lead: Scott); 2) criteria for evaluation of redundant threshold standards (lead: Ramon); 3) data specifications for use in adaptive management (lead: Alan); 4) Decision support framework for the UTR (lead: Geoff); 5) technical evaluation of SEZ standards (lead: Steve); 6) examination of ecological impacts from sustainable recreation (lead: Zach); 7) technical evaluation of VMT standard (lead: Eric). More details for each project can be found beginning on page 8.

D. Council member updates on relevant science topics (pages 17 – 20):

- Discussions under this agenda item focused on the new Lake Tahoe Restoration Act bill, particularly the language related to new science and monitoring plans.

Meeting Notes:

1. Welcome, agenda review, introductions:

Alan welcomed all meeting participants. No changes were made to the meeting agenda.

2. Council operations:

- a. New member guide created by Zach, needs to be reviewed by Geoff and Alan and then will be sent out to everyone. One thing is included that should be useful to all Council members: a flow chart takes principles investigators thru steps from concept to implementation for Council projects. Identifying members, contracts in place, funding in place. Helpful to anyone involved in projects. Look for in email soon.
- b. Alan notes that if Josh has any suggestions or if anything is unclear any suggestions, send to co-chairs and Zach and then will be sent out to all members. (ACTION) Josh has been through it and thought it was helpful, will go back and take a look for anything that requires focused comments.
- c. All Council members are encouraged to reach out to the co-chairs or Zach at any time with questions or concerns.
- d. Project descriptions on TSAC web site; working on putting projects all on the website. All other projects are there. Waiting for one report from Alan. Just received information from Steve about SEZs will be on the website soon. Let us know thoughts or comments for change (ACTION)
- e. Budget that the council operates under comes entirely from CA from special account that's funded through lease revenues from the CA side of Lake Tahoe. Every year there is a 150k allocation used to launch council, hopefully new monies will be coming in, and funding will grow. So far, council is entirely reliant on this funding. There's at least 2 years between when the account was established and the establishment of the council itself. Money was accounted for during this time, but the monies were made available as part of an agreement between natural resources and TRPA. This is 3-year money, could be 1 year to commit and 2 years to spend, you can spend sooner but no longer than 3 years. Some projects were slated for the 2015-16 fiscal year, that money's timeline will be up 3-year timeline up by June. Anticipate a little more than half of the initial funds will revert and go back to special funds. It's not lost, but puts in a position of re-requesting money. Got an appropriation at the beginning of July of 2017 available to council. New contract in process now, resources agency coming up with and will include the appropriation of \$150k. Starting at the middle of this month. 3-year agreement again ending in June 2021. Asked all projects to bill as much as possible beginning of May, bills received in an expedited manner. TRPA will be using to provide invoice to resources agency to try and capture as much money as possible based on the work that has happened. Work in the queue but has not begun, Geoff and Pat's projects in various stages of completing work

orders, getting people involved, and getting agreements in place. No work to begin until new agreement in place.

- f. Alan points out should be able to start by July.
- g. Zach says we can put late June dates but want to make sure the work orders are in place. Pick a date that is reasonable in terms of starting work. Implications going forward, working with Todd and co-chairs and thinking about budget for next year and if we want to re-request some of these funds or just continue on the current path. Dependent on the work that we do.
- h. Filling co-chair vacancy
 - i. Zach says Geoff's term will end this June, Alan will continue. Looking to create a staggered appointment so both spots aren't vacant. Nominations? Self-nominations are encouraged. Looking for a person ready to step into the position. Voting if there are multiple candidates if necessary.
 - ii. Staggered rotation works well, Alan says. Gives incoming chair to get familiar with nuances of how we are managing these programs. Would really like another co-chair and would appreciate anyone to indicate their interest.
 - iii. Zach says it should be easier for the incoming co-chair, because Alan, Geoff, and I have dealt with the initial necessary admin foundational work.
 - iv. Alan just wants to know who's interested and move from there.
 - v. Missing Pat.
 - vi. Timeframe for needing to know: Next meeting is July and need to confirm by then. By the Exec meeting in August will need to step that person forward as new co-chair.
 - vii. Ed is wondering if the position has been formally defined? How many hours of work was Geoff committing?
 - viii. Alan estimates on average a day a month, varies when it's much busier, 2-3 days over course of the month and that's not including the meeting happening every other month. As Zach has pointed out much of groundwork is already established, so should be a little less. You can contribute to the direction that TSAC goes in.
 - ix. All committee members are invited but the co-chairs are required to go to the exec meeting to represent TSAC. Need to attend executive steering committee meeting that Zach has covered occasionally. Potentially some

extra meeting time, where we need a council representative to attend another organization's meeting.

- x. Alan says 1.5 days per month counting the meetings. We could put everyone on the list and have everyone vote.
- xi. Sudeep says that we can do a poll, an invitation via email to serve as co-chair, self-nominate possible.
- xii. Alan says he will not be doing this next year and this is the year to step in get comfortable and figure it out.
- xiii. Interdisciplinary, having co-chairs is an indication of it, Zach.
- xiv. Indicate interest or constraints via email that Alison will send out and will affirm decision in July meeting.
- xv. Meeting notes, Alison and Zach have done for every meeting, long notes, stream of consciousness. Zach traditionally reviews to put in order and clear. Have not been used a lot. Good record of what TSAC has been doing, range of discussion. Meeting summary to distribute to colleagues, done for last meeting. 1st page of last notes sent out. Can be sent out to colleagues to share what TSAC is up to. Allows you to get feedback from institutional colleagues. We would like to hear the feedback from colleagues. Hopefully provide for next meeting. Don't send the entire notes, but feel free to send out the first page as a summary. Make sure that what we are sharing across institutions is consistent. Let us know how well it works.

3. Prep for 2018 Exec. Comm. Meeting

(Alan/Zach/Dan)

- a. In Aug. Tahoe Summit, began in 1997 with Clinton and Gore and kicked off the whole federal program here. Laid groundwork organized collaborative approach to the management of Tahoe. Organized by a state senator, this year it will be Heller. Aug 21st on a Tuesday. Sand Harbor more than likely. All day event. A day or two in advance we have the exec. Committee meeting. Geoff and Alan will have to be there. Representatives, regional directors, etc. High level meeting, we as co-chairs present the work of TSAC over the year. Propose work plan. The meetings are getting better each year. Approval of the Council work plan is an important agenda item. Once approved the Council can begin implementing work orders. In the past we didn't develop the work orders until after the executive meeting. This year we aim to have drafts to share with Committee members, including funding requirements. Things will be pretty active here the next couple of months. We will be working with Dan Segan on the Threshold Initiative information. Background on exec. Comm. Mtg. Any questions?
- b. Zach says important things is the review and approval of the work plan. That is the work plan that we have for working the next year. Opportunity for other

discussion, operations update, some aspect of Lake Tahoe ecology, some time that can be used for that.

- c. If TSAC thinks there is a topic of importance to raise to the committee.
- d. Zach says it's focused on the theme of the summit, revolved around the EIP. Hopefully by June we will have some sort of clarity. This is the last year for Secretary Laird and perhaps Director Crowell, so there could be some special guests to be determined. Last year there were spontaneous unplanned visits by high level people.
- e. Alan addresses the process, working with the TRPA to identify areas of importance. Developed projects and will talk about later today, worked on thresholds and standards, SEZs and how the TRPA looks at them in their thresholds, better ways of approaching management. Questions about VMT and how that affects... Sustainable recreation was also done about that. Decision support frame work that Geoff is leading, threshold overview by Pat, still on the books, but have not started in terms of a funding state. Will stay.
- f. Dan direct funding through the EIP has worked thus far, can continue expansion Discussion of implementation around better structure of reporting system and threshold system, to enhance transparency and responsiveness of system. Digg deeper in the water quality load education, identified as redundant. Last focus with regard to wildlife, largely focused on raptor species, when standards first adopted in 1982, looking for council for guidance on that.
- g. Work with TSAC to identify interested individuals to distribute work load. Had a different lead on each project. Engage directly with TSAC members. Not work on just one-offs, but to reach out to their institutions, not just within TSAC but all expertise. Little heavy on water quality. Looking for a variety of expertise, and individuals that can contribute. For example, if there is someone at UCD, doesn't matter if they are with TSAC, because it is easier to set-up contract with master agreement in place. Work order is issued with each individual. If we need to reach out to individuals outside of member institutions that is definitely possible. Hired someone on a temporary basis. Chris Knopp for example retired, but has been brought on as someone to lead work on sustainable rec, the TRPA was happy with the products they got. DRI hired him temporarily to bring him on. In the long run, we will need to look for ways to hire out the appropriate expertise. The leads are the leads and are expected to find the best expertise. There are probably going to have other ideas of what will become a substantive project. Send out updates to TSAC members. On the other hand, we try to nominate a TSAC topic of particular area of importance, last year was the decision support framework, that could benefit from the scrutiny of TSAC. One of the things that came out of the meeting last, not science just for science sake. They have to be relevant to management in the basin to keep in mind. Anything in mind that is coming up as visibly important. Send co-chairs and Zach and email to be compiled with work order topics.

- h. Ramon is wondering if anyone has reached out the NDEP or other agencies to ask about topics of importance.
- i. Lahontan water board the review of the pelagic water program of the Tahoe basin. Zach says this was put on hold, will check back in with Bob Larson and see where that work is and where that request is. That has been the only other agency request that there's been interest expressed.
- j. Not that we have reached out, not sure if that's what we want to do. Alan suggest maybe in the future, but it might be up to the TRPA to reach out.
- k. Zach says it's tough because we expect them to come up with their own money. SNPLMA secondary funds, might be a better source of funding for TRPA sustainable rec funds. Project description was vague and open so there is potential for change.
- l. Alan says we are trying to expand the pool of sources for funding, currently we are reliant on the state of Ca, we will need funding from other sources. SNPLMA secondary funding. Actively solicit ideas from other agencies. There's an expectation that if there is interest there is funding, at least some sort of match.
- m. Adam says he like the idea of responding to agency needs. Maintaining our value to stakeholders in the area. This is a good way of reminding people of the value of TSAC. If there are priorities with funding, we can show ourselves capable of responding. Warrants its own project in the future. Framework that if agency has a problem then we can address.
- n. Funding needs to go to Alison, room, basic infrastructure. New agreement with UCD, working with Scott Tyler to est. peer review committee, just under 1000 earmarked for the committee, carve out funds
- o. This will be very important as we do threshold update, evaluation
- p. 2019 evaluation released in 2020 says Dan.
- q. Alan points out that TRPA would want some review from TSAC.
- r. Zach says that it's a reasonable expectation of the standards for it to be handed off. End of 2019?
- s. Dan says finished the report sent and would be sent out in May 2020.
- t. Alan says we will have to set it up next year.
- u. Dan says all projects have been addressing to coordinate with broader science needs. Biggest impediment to the basin. TRPA has not discussed the items and new role taken on by TRPA. Doesn't think that the TRPA wants

- v. Alan thinks it's a valid point, do we want to reach out to other agencies to see if they have specific questions or need. If we do? How do we do it?
- w. Zach thinks start with the TIE steering committee meeting. One of the operating principles of TSAC that it needs to address needs of both states. Good starting place.
- x. Tahoe Interagency Executive (TIE) leads for each state agency. One of the more active high-level groups. We have a seat at the Table. We have a core group of executives; this is the time to engage. Alan says we will figure out a way to bring up at the next meeting bringing questions and concerns to councils.
- y. Of the topic areas that Dan has raised have the council members think about the topics and what they are interested, as a PI or collaborator, we want a council lead for all of them. Zach will work with Dan to draft work orders.
- z. Josh as we approach exec. Com. Mtg. is there a way of identifying work orders, development of new work plan and getting ready for next year? Look back?
- aa. Much of the work this year has been aimed at the threshold evaluation. Programmatically here's how they've gone and how TSAC has contributed. This is the springboard for where we go next year.
- bb. Josh asks so there's not paper that we publish. 250K an opportunity to re-request that. Is there a worry about why we weren't able to spend the money? Leaving that money on the table
- cc. Zach agrees it is a liability, the group is identifying, use the funds. Reality is that the story is the victim of setting up, delays of getting things up and running and this is 3-year money. This is a reflection of getting the council up and going.
- dd. Alan shows the timeline of how things have developed.
- ee. Josh wonders if it's better to show that we have a plan of how we're spending this money going forward. That lead time that allowed us to assess the priorities and then have a proposal to show how to spend that money going forwards Happy to think more about it and develop a work plan going forward
- ff. Alan says we do try to not spend it all down. Annual allocation is \$150k each project is somewhere in the range of 30k, it goes pretty quickly. Thinks Josh is right to take this proactive, we didn't want to spend frivolously, projects we have prepped for spending as moving forward.
- gg. Josh says we look at the federal level to spend to the last penny. Thinks moving forward, working with agencies will be good for working collaboratively. Excited to be a part of it.

hh. Meet with Dan and put together a draft list of topics for projects to be sent out. Wants TSAC feedbacks about interest and other potential topics. The science council is looking out for other topics that are detrimental to the Tahoe basin in the long run. Wants comments from everyone.

4. Substantive project updates¹: Status and next steps (Various)

- a. Peer Review Committee update from Scott, populated with Johnny Moore from University of Montana and John Melack. Contract through UNR 6 weeks ago. Ready to go, should a peer request project come in. Conflict of interest rules, then we will go outside. Ups to \$19900. Put in a little time for administrative support at UNR. Don't know if overhead rates are changing, UNR is 35% but no money has been spent yet.
- b. Zach says the rate in use at time of the contract is used during the duration of the contract and will be adjusted if appropriate.
- c. Scott wonders if there is anything coming down the pipe. Don't think we will be reviewing the Upper Truckee River
- d. Alan thinks that quite a few of these projects will go out for review. We don't want to give the impression that reviewing our own work. Some things can be done internally with people who aren't conflicted, other things will require an external review. What Scott has in place will give us legitimacy. Have not discussed yet the one Eric is leading VMT project, because it's more technical may want some level of peer review, we can discuss more once we cover other substantial project. This is to review not only TSAC projects but also any outside project or paper that would like a peer review.
- e. Through a separate grant from the EPA a SEZ monitoring plan. Would like to send to council for peer review. Also around Lahontan's contract with the nearshore quality, what the monitor and suggestions to changes of what to monitor. Review of the pelagic monitoring program. Depending on the structure of what UC Davis produces, council review. That's what TRPA has on the radar right now.
- f. Scott wonders about things that fall into the grey area and then will bring to council. One of the reasons why Johnny Moore was brought in, someone truly neutral.
- g. Project 1: Administrative, technical clean-up of threshold standards. Ramon is the lead. Part of this work was TRPA's evaluation of their thresholds and looking in part at the overlapping standards. Develop a typology that describes the

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overlap and what those thresholds original intent was. Goal develop typology, describe overlap, provide examples, and how TRPA will implement these to mitigate the types of overlap and is ongoing in terms of implementing this typology to alleviate this overlap. Overall intent, some interest to go into the overall provided examples and provides some admin recommendation how to mitigate. Done at the end of March, when Mark Howsner was representing TRPA. Provided latest document that describes document itself and

- h. Very successful, TRPA went through a re-organization that went through the governing board meeting. Some of the things that came out seem silly. Numbering the standards within the system. It was difficult to talk about standards without have a specific identifier. That was actually really useful, that suggestion was carried forward. Combined 21 stands. So that means 21 less standards. Within TRPA and amongst partners really eventuated into obtaining standards and target underlying questions we have going forward.
- i. Zach says with project ideas addressed for next year. Water quality, is that overlap analysis is that true?
- j. WE id one of the primary overlap of standards is water quality. No policy decision made. Lot of load standards that overlap each other. We have 3-4 load constituents, nearshore standard x or y. Suspended loading. Generally said in the science council. Perhaps we don't need all 6 standards but only the strictest standard. Reduce standard by 50%. As part of discussion, what decisions need to be made? This is where we will re-engage TSAC to look about loading pollutant and better track progress for where we're going.
- k. Alan says this project deals with admin, but management changes were made. Any sense that this product needs peer review?
- l. Ramon said that peer-review went out to council members. Leave it up to Zach, to see if it's useful for peer-review. The nature of this work, is primarily threshold overlap, don't know if the reviewers have time to go through the different spreadsheets that identify all this overlap. The product completed before peer-review in place, so it is up to the council, it is up to review post-completion.
- m. Alan says maybe look at this project as how we decide the necessity of peer-review per project.
- n. Zach says felt like it didn't require external peer review. Important to give TSAC members review because it has the TSAC name on it. What type of review did agencies think is needed? What was the header? There was time for reviews from council.
- o. Ramon says only comments from Zach.
- p. This is the current MO for this group. Zach says that he learned a lot from this group. Chris Knopp's literature review of rec impacts. Wasn't a request from the

agencies for a review. It didn't go out under the council heading. It was just a technical literature review. In general, for the upcoming projects, when developing work orders, we will want to include some review time in the budget.

- q. Alan says we want to know when to request peer-review support.
- r. Ramon suggests as these work orders are being developed a decision is made about the level of peer-review needed for the budget. In this situation, we didn't allow for peer-review early on. Dedicate some time in the future to the review project in terms of schedule and in terms of hours needed.
- s. System for structuring data for adaptive management, let by Alan, reviewed environmental management systems in place, Chesapeake, Puget sound, etc. Extensive piece of work, take their lesson and work on developing data structure for the TRPA threshold system. Thinks we're getting close. Dan is nodding head yes. Exceeded time commitment substantially. Turned out a lot more interested than expected. Linked policy makers, needs to happen to track progress. Focused on 3-4 prime components. One is developing a conceptual framework, state response framework on environmental management. Last couple of decades is used around the world. Allows a large, diverse stakeholder to feed into the process and collectively determine decision directions and strategies to take with identifying problems and addressing them. Part of an iterative project which is adaptive management. 1) 2) conceptual modeling allowing how specific of the system works. Looking at largely each threshold areas. 3) developing results chains, looking at the different programs, use of results chains for identifying how your expected outcomes are linked to the actions you take. We provide examples and look at putting them into context of a specific conceptual network of interactions. Bay Delta Science Council uses this method to identify specific actions, what are the expected outcomes, what the ancillary effects are going to be. This is something where the management and science agree on the approach, will be sent out to the science council. Should be completed by the end of June. Dan and Alan meeting later today and hopefully get out to the membership and get feedback and then have final product. Does not think there is any change in approach. Is internal review sufficient? Does it need to go out to a different review?
- t. Dan thinks internal review is sufficient.
- u. Alan says yes he wants the TSAC letterhead so send out to everyone.
- v. Zach recommends sending out a warning email.
- w. Pat's project largely looking at frameworks for thresholds and how they're organizes. And how to consider linkages are across the thresholds. It remains on the table. The TRPA is very interested in this. Pat was waiting until Geoff's project was underway so there is not duplication. Wants the projects to complement each other. These two projects are one of the reason the funds are

returning. Hopeful that once Geoff is back, he will get the decision support framework going forward.

- x. By July meeting we will need projects on the table. Plus 300k total. See how that breaks down and we will maybe need to make some choices.
- y. DRI already signed on the decision support framework work plan, but don't start working on it yet. Bring these forward at the next meeting. Along with new projects and topics to work on developing.
- z. Josh pointed out, maybe it becomes a basis for special request.
- aa. Project 4 VMT – Eric background on where we're at. Atmospheric Sciences at DRI. Nitrogen deposition and fine dust from road way emission, Several deliverables, 6 were topic briefs (largely literature review) in the process of developing. 2 meant to link vehicle miles traveled to emissions of fine sediment. 2 topic briefs related to nitrogen deposition, from outside the basin and historical projected auto emissions. 7th deliverable is a technical report, do a demo of water transport modeling, implemented and demonstrated that it produces a result. Coupling CMAC and weather, standard weather transport model sanctioned by the EPA> Brief simulation demonstrate it works and used in sensitivity subjects.
- bb. Topic Briefs. 1) link between VMT and conditions on road 2) Historical and projected auto nitrogen emissions. Still in lit review for these. The other 4 have drafts in various forms. 1) Roadway conditions and fine sediments, extensive studies led by DRI, reviewing that literature, a draft measuring the emission rates from the roadway, substantially greater by a factor of 5 or more in the winter. Treatment of the road is large contributor. Beyond salting or sanding the road, the emission factors for the west shore, unpaved road or significantly degraded road, least traffic, heavily in SLT even though in better conditions. Assembled into a draft this week, hopefully by the end of the week. 3) IN basin emissions draft has been submitted to the TRPA and looking over comments, new draft will be resubmitted. 4) Historical and projected 5) regional local nitrogen sources, a draft is completed and just reiterated with Sandra Rimes, and will be submitted this week. 6) bouncing back and forth between Sandra and myself. Did have a departure for maternity leave, short time line project, still planning to have wrapped up by original schedule.
- cc. Additional contexts VMT and VMT standards flash in basin for last couple of years. Transportation metrics working group. Number of questions where stakeholders were not on the same place, or highlighted areas of disagreement about what the science was telling us. Each topic brief, council advises a synthesized idea for decision making. Context for everyone on the council for how we id projects we ask for the council to engage with.
- dd. Eric says just to highlight, needing to resolve seasonal numbers. Deposition rates are greater in the summer time. One example where there isn't a complete picture in the literature. Contrast between local and regional, trying to tease out

what the conclusion is. Not a complete agreement within the literature. Come up with firm conclusions and where things are totally dissolved in literature.

- ee. Alan says that is what the council wants to go. Highlight important questions where the science isn't settled.
- ff. In order to demo sensitivity studies with a modeling system, can be brought to bear on the questions that are not fully resolved in the literature yet. The system has been built. A rube Goldberg of software tools to give a result. Actual emission of moving vehicle, app called moves. Most efficient way to calculate emission miles. Found an approach that works to analyze several scenarios. Reeducation of VMT, it's a know you can turn. A sensitivity study, short time line and limited funding, 6-day weather period of summer time weather as meteorological standards. Comparing a 1981 simulation to a 2014 simulation with 15% in VMT and then compute deposition rate for various nitrogen species on the lake. 1-3% reduction of nitrogen emission. Based on a short period of meteorology variability. A proper study with require a much longer period of time, proof of concept to show that we can do that kind of study. Seasonality taking weather from different seasons, removed vehicles together 11-16% reduction of nitrogen by removing all vehicles. Regional transport as well, have not dug in too deep. By constructing domain of model, turning off sources, we can do those sensitivity studies and evaluate local v. regional sources. Modeling lead by John Mekea and Jose Grad student. They have also been working on using this system to study fire emissions in the Tahoe basin. Good for analyzing all air quality analysis in the basin. Draft ready by next week, maybe? Very technical report, trying to pare it down, for this project. They are writing a big comprehensive document. Draft that describes this modeling system and shows the response of this proof of concept.
- gg. Dan thinks we should flag the different sources transportation team to be brought in. Spur additional ideas we go through the results of the project.
- hh. Zach wonders what peer-review is in order?
- ii. Dan says we haven't discussed peer-review specifically.
- jj. Those topic briefs are just literature review and working this week on a future projection, project out in terms of VMT. Not sure what scenario is being tested. Hopefully having a draft next week auto emissions next week. Caution based on preliminary of model calculations, wouldn't expect those modeling result to stand up to peer review. Think about it, as tried to develop it as a tool, if some future study to follow-up project. Presume from the start those will be sent out for peer review.
- kk. When does something come with the seal of approval? Is this only peer review projects? Are there other projects? Applications that advise to policy shifts should be peer review. Other projects may not require peer review.

- ll. Alan says if there is something relevant out of the monitoring You may want to mention it, and point to the technical source. This was a pilot proof of concept project. A caveat that describes that the product has been peer reviewed. Not even the technical document.
- mm. On. the same page of the potential applications of this pilot project. Then future money will be earmarked for peer review. If you're moving from this stage, maybe there's a technical workshop, bringing on experts, what the uncertainties are, not trying to tear model apart, what the tool is and how it's being applied.
- nn. Imperative to make sure people know the limitations involved. No confusion or over application of that work. Will bear on where you fall on some of these topic briefs. Refer to the technical report, but make sure it isn't misapplied. Wrapped up by June.
- oo. Project 5 SEZs Steve is the TSAC lead. Project focusing on critical review of SEZ modeled as it's being employed by the TRPA, whether or not the ecosystem is being managed appropriately monitored in the future. Big part is reviewing SEZ conceptual model and updating it. Topic briefs are separate deliverables, one that is evaluating the utility of the SEZ model, approach that TRPA has been using for quantifying SEZ function primary as area, historic mapping SEZs and reviews the utility of different approaches, potential impacts of climate change of SEZs in a general area, types of habitats that fall within the Tahoe Basin. Didn't begin until Mid-Feb due to contract issues. Still on track for a June completion date. Ramon and Steve have been helping with Jerry Qualls. Working closely with Dan from TRPA. About 80% complete. Drafts submitted 4 of 5 and working on final drafts on 3 of the 5. Will start submitting finalized documents soon.
- pp. Model itself had a meeting with Dan to determine what structure would benefit TRPA, seeing a reconceptualize model. Based on that interaction, came up with a model 17-page document that identifies all the components of the model, how they interact with each other, how to draw conclusions with that model. 4 deliverables are all topic briefs; drafts are written 4 of 5. 1) tracking SEZ conditions- surface area as a metric tracking SEZ restoration and degradation. Had meeting with TRPA about this. Developed step by step process to prioritize areas for restoration 2) Historic mapping of SEZs providing an overview of options for mapping and assess how it's been done in the past. Jerry and Ramon met with TRPA. The method TRPA has been using is good and matches well with the management, draft has been submitted. 3) Climate change other habitats that fall into the SEZ designations, brief has not yet begun. Steve needs to start working on it, still thinks it will be done by the end of the month.
- qq. Historic SEZ mapping Ramon says based on meeting with Dan and Mason at TRPA. Some level of assessing all info TRPA has types of historic SEZs, approach being taken is unique and has merit. Jerry has come up with different approach about the logic behind the regression. Soils map, 2 different mapping, some maps are duplicative, maps being proposed are being complete view of the areas of review. Areas that have been impacted by development, those are

priority not a lot of information of it is a riparian, etc. Mapping out SEZs using LIDAR provided stream channels and soils maps. Have a good handle of where those areas would have been specified as a previous SEZ.

- rr. Dan adds additional context. Part of the EPA grant. Update SEZ management plan. Intention to use the metrics within the plan. Use of area as a metric to establish a new target, not area based and responses to the system overall. Lot of talk of historic SEZ mapping. 4 different SEZ zone maps floating around the basin. Ramon just brought in someone else from USGS, to get a suggestion for timeframe, census map, technical advisory overlooking EPA grant. Where are restoration opportunities in the basin that aren't on any other map. Number of higher level conversation between TRPA and USFS, suite of SEZ restoration projects, this is one, decision support framework, some under TahoeWest, what goals are there for SEZs, Sierra Partnership working on streams. Decision TIE meeting about how to unify efforts.
- ss. Projects for SEZ work, is there any advisory with the technical advisory committee? Zach
- tt. No, it's scope is limited to the EPA grant. Partial discussion at TIE when do you share these discussions. Talking to Stu as using UTRWG as the venue for discussion, not sure if that group wants to lead that. Laird mentioned that last LTRA, reviewed SEZ restoration project and prioritized them on the LTRA group. Looking at all the projects and prioritize.
- uu. Zach says you want to watch the scope of the technical advisory committee. Same with TSAC.
- vv. Although there is option of providing that function in July.
- ww. Mindful of expectation to complete in June
- xx. With follow on work order we could add that in.
- yy. Just trying to manage expectation
- zz. Steve says never had a discussion of review needed. What would TRPA like? Thinks review might be overkill.
- aaa. Alan says TSAC member review is appropriate unless Dan thinks it's useful for additional review.
- bbb. Dan says he turns it back to the council what carries the council stamp of approval. Council produced this. Of the highest quality. Consensus of member review. Does it always carry the cost-analysis basis we will advocate if we think it's important?

- ccc. Alan says it thinks it requires a conversation between Geoff, Zach, Steve, Alan, and Scott.
- ddd. Would be good to review the model? But potentially not the topic briefs. Something to follow up with everyone, requires a little more thought.
- eee. Especially around the conceptual model, has frame of overall structure of the. More decisions are made based on conceptual models. Discussion about what role conceptual models or what other frameworks. Make sure effective communication piece. How management responses are to specific drivers. Under-riding concern about the structure of the framework.
- fff. May work on this with Scott, if this is new material or product it may take a greater level of peer review. What resources need to be there to support this. It wouldn't need to happen between now and June. In the meantime, establishing relevance of historical and present, on the right path and need to find out what how to fine tune. Alan
- ggg. Decision Support Framework based on Upper Truckee. Look at developing conceptual models to provide a mechanism for prioritization of projects. Geoff is the lead with several members participating. Larger project, Geoff will speak to it when he gets back.
- hhh. Zach says there was a work order written, Geoff identified team members, each member identified budget, all sent to Dan, some new contracts needed to be in place. PSW and UCB are not in place.
- iii. Dan thinks USGS, DRI, contacts are in place
- jjj. Nothing will get started until Geoff comes back into the country
- kkk. Changes might be motivated by the SEZ study.
- III. PSW and UCB participants cannot yet work, with no contract in place. Council will need to revisit project in lieu of budget and the projects related to it. Plan for this.
- mmm. Sustainable Rec, Chris Knopp did all the work. Developed a series of briefs summarizes the impacts of resource and management.
- nnn. Did not have a science council lead. Zach is the lead. First work order has multiple efforts but the initial efforts were literature review, identifying impacts to recreation aquatic and terrestrial. Participate in stakeholder workshop, go and listen and answer questions. Chris and Zach were there for that. Science Council will bring in specific experts deemed to have the greatest impacts and do a deeper dive about the how to deal with them and identify indicators and strategies for those indicators. Did not get into the impact discussion. Useful in the context of the group but didn't get into the topics that the TSAC has been

asked to address. Two classes of impacts, nearshore recreation (beaching, boating, swimming) and non-motorized terrestrial impact (hiking biking, horses) identify experts Nearshore (Alan and Geoff) Non-motorized (David Rolloff from Sac State, is willing to participate). Talking to Devin Middlebrook, Jennie Herbert from USFS co-chairs of working group, next steps. Initial step, types of recreation and impact, now rethinking that maybe a workshop is not as helpful, more focused sessions. Devin will have response this week. 1st working session in July, might not be a public workshop. Intent for experts to develop more in-depth topic briefs. Monitoring approaches, working together to id threshold standards. That work is expected to occur mid-late June and would end in October. Other dimension to this, related to sustainable rec, what are the impacts from human use, the other side is the human experience? Come up several times in the working group meeting. Right now in waiting mode, identify experts, Elizabeth Colby from UNR also came to the workshop. Right now socio-economic is not being evaluated by TSAC.

ooo. Lots of projects. A lot has been done in the last 6 months. Do we continue this level of investment of work? Now that we've established this groundwork, should we have a greater focus with less projects.

ppp. Depends on funding. Exponential approach of these thresholds, so that mode of operation will continue into next year. Dan identified 2 new things water quality load standards and wildlife standards. Pat's project and continued work on sustainable rec. Budget is a constraint, it really depends on what TSAC wants to do. Its within the capacity of the council to decide what to do.

qqq. Alan says something to keep in mind as we solicit ideas for future project. We have maxed out Council assistance. How to make this work effectively?

rrr. Larger council, future meeting discussion, two different modes/ Truly advisory, not a lot of money but providing high level advice. Here's the project we think you should do and how technical experts can help. What the council is currently doing is a lot of the work itself. Not trying to say either one is right or wrong. Decide how the council wants to move forward. Maybe the council doesn't do the work. Here are experts to do that.

sss. Alan proposes that we discuss this at the next meeting. Continue where we are heading currently, but definitely worth a discussion for the longevity of this council.

5. Council member updates on relevant science topics (Various)

- i. Special topics relevant to the TRPA, interested in part because we are interested in doing Science. LTRA has been developed to bring new funds to Tahoe, Kim will speak to that.

- ii. Kim Carringer with Jack, how the LTRA works and orchestrated by agencies at Tahoe. Jack will talk about federal partnerships, developed in science and research funding.
- iii. Kim LTRA basics: 2nd LTRA, there was one passed in early 2000s, this 2nd one was passed in 2016, 400 million to support EIP. 2 years in now. That was an authorization not an appropriation. Trying to get dollars to support that act. Lot of different EIP working groups, under TIE committee to help guide the EIP worked quickly to put together priority projects. Act authorizes funding categories: forest health, water restoration, LCT, accountability provision. Authorized amount each one. Science isn't directly called out. In the original LTRA science was called for, dedicated stream of funding for science, New LTRA science is not called out for a specific category. It does say that the purpose of the act the Science community work together to develop and implement a plan, to develop effectiveness, project on-going decision making resource management in basin. Refers to science but does not specify. Work on priority list of projects, required to be submitted to congress. 1st list: 46 million, no science specified, basin wide agreed upon, not too much time, big win if list gets funding, no funding immediately for this list. March of 2017. Partners work on March 2018 list, agreed to do a more comprehensive list, worth thru partnership, maintain relevance. This list has specifics of Science. Lake Tahoe West under Fire project modeling and how large scale will effect resiliency. Watershed erosion control and effect, applied nearshore linkages, refers to Nearshore related to recreation activities, studying fish dynamics, remote sensing, investigation between Asian clams and metaphyton, water quality related to boating, catch all for nearshore 500k. Accountability category, EIP monitoring project 500k speaks to that language we referred to, purpose of act to ensure the collaborativeness of the project, left it broad on purpose. Over time first no science. Second list science specific. Interesting process, the federal budget is behind, two months ago just release 2019. They were still working off the original list. Now it's looking at both lists. Now we are too ahead of the game. Geoff talks about how to incorporate science in next iteration of list. Not sure what the plan is for the 3rd list, don't want to generate too much confusion. Depends on how we engage in the next budge cycle. Will be a conversation at next TIE meeting, what has been funded and what will happen going forward.
- iv. Alan asks 1) 1st list, nothing got funded. 2nd list is there is an appropriation for that list, when would that happen and when would the money become available?
- v. Depends on the federal budget, depends how quickly and effectively congress can agree on a budget. A guessing game

- vi. And whether or not they appropriate funds for this. Agencies and representatives at coordinating with congress and how that's been managed and orchestrated
- vii. Kim says it has been an extensive collaborative project EIP. Pretty functional working groups. Really started at staff level, working on implementing what priorities should be put forward as part of this list. About 500 projects, tin project to large scale. Start and prioritize, working off that list. This next list is the extra of that bigger list. Working groups work on prioritizing on what people's capacity is. Threshold attainment. EIP coordination up to management level. After that Tahoe Partnerships representing EIP list, went back with this group Steve Teshera, Andrew Strain, Julie and Kim, took lists and let them know the amount of collaboration. Jack will talk about Federal partnership. Jeff Marshallay official agency that submits list on our behalf. Worked hard to make sure all categories are on the list and agencies can. Not enough science incorporated in the first list, tricky because there isn't specific allocation in LTRA.
- viii. Alan says we are here to work with you. Tahoe Basin collectively with TIE consistent message to take with them to Washington. No conflicting messages from Tahoe representatives.
- ix. Jack Landry EPA working with TSAC to strategize keeping science involved. As Kim mentioned this was a more concerted subject process of project prioritization. Each working group that Kim mentioned, varied between different. From highly developed long standing groups to the more recently formed, less formal groups. Storm water quality improvement group, guided by TMDL directed to highest level of removal projects. Discussion of science needs. Project that came out, storm water monitoring effectiveness program, comes out of project effectiveness to be monitored and reported on. Focus on what his entails. Effectiveness reporting back to congress. Degree of science varied between working groups. Capacity between working groups, when each working group prioritize, really utilize some monitoring as the LTRA calls for. Standalone project, helps as a whole. Initiatives like Lake Tahoe West which are science based, planning rather than capital based. Work in progress. Not too much to add in terms of the federal partnership role. All the individual EIP working group has done. And then the work that Kim did, that went to the, last step after TIE looks at the list and gives blessing, then the list goes back to federal partnership for review. Consultation with Washoe tribe that SUFS will conduct. Science was acknowledged as not being adequately recommended. A challenge of how to work science in. More science projects being done. Last year the meeting had each EIP working group where had a representative spoke about needs. That was a valuable exercise. Would be useful for working group meeting times and bring science perspective with subject experts that can bring perspective.

- x. Lake Tahoe Federal Partnership: led by USFS, all agencies that have sponsored projects under previous LTRA. USGS rep between LTFP and TSAC, good linkage. USGS helped organize meeting with Jack and USFS-LTBMU, fairly good number of leads in fires and fuels and water quality. PSW has a role in outreaching to their USFS counterparts. USGS properly wants to promote BLMA, reintroduce LCT, Army Corps of Engineers which has own obscure funding sources shoreline management and nearshore. Land Reclamation, meet as needed, must less structured than the first LTRA. Came out of TIE steering committee meeting. TIE is really where all sectors meet. Most hands on forum for discussion.
- xi. People are hearing about LTRA 415 million over 7 years. How do we apply for science funding?
- xii. If you or your colleagues have specific projects that fall under research or monitoring that address a specific area. Present to those working groups, attend working group meeting, AIS, Fires and Fuels, Storm water, etc. No standard Watershed, UTRWG, EPA has provided grant to TRPA to provide ambient stream SEZ trend management program for basin. Restoration plan, EIP expresses a draft for EPA to do this. A plan to inform the sub project of EIP. Best things Scientists can do is attend working group, maybe present view of need in the basin.
- xiii. Working groups meeting was very useful and we will look into doing that again. Bringing colleagues useful to understand what's working in the basin and how management can improve.
- xiv. Kim EIP leads came and presented to TSAC, great exchange and learning on both side. Seconds the idea of having the meeting again. What's happening now, what are working now? Where are their science priorities?
- xv. Alan asks if we had another meeting in the fall, can we have interested parties from institutions involved. Specific projects can contribute to the priorities of the working groups. When would those ideas could lead to funding? Year out, 2 years out?
- xvi. Kim says fall is good, list started compilation in Fall, gave guidance of what to look at. Update list came from November for first ideas for list, if we follow same process of 3rd iteration of list. Could be 6 months could be another year, but regardless good idea to have.
- xvii. At least a year for the project. Return on investment.
- xviii. Looking to Ramon more for USGS partnership input. See if we can get updates periodically.

- xix. Jack says one area of progress between last and this time. The nearshore agency workgroup. Nearshore resource allocation plan has been developed, under the data center portal on LT info that describes that process and the areas of interest, nearshore algae, trash, invasive species, clarity. Adaptive cyclical project evaluating state of knowledge and prioritizing incomplete information to produce information needs. Gone through one iteration of this project, how funding will be sought and allocate. Asked for letters of interest, conceptually this is how agencies are looking for approach.
- xx. Please keep us posted as those become public. Through TSAC we can get that out through institutions.
- xxi. DRI, Alan was working NZ working on water shed management and paleolimnology, productive and rainy. Anxious to get traction with TSAC work. Don't forget to get nominations in for co-chairs.
- xxii. Ramon USGS had meeting with USFS to discuss collaborative work, there was some overlap mentioned on EIP. One things mentioned looking closely at restoration of blackwood. Interesting federally allocated funds, separated science from actual implementation. Always looked at Science and Implementation going hand in hand. Look at trends and hydrographs as a supplement of what Bob Coats did this as a function of climate change. Would be great to discuss with TSAC about what's being seen in perspective to climate. Loading and sediments. Didn't get an opportunity to share with the meeting but happy to discuss with meeting.
- xxiii. Jack says he welcomes that discussion.
- xxiv. Todd Ferrara no report.
- xxv. Scott Tyler nothing to report.
- xxvi. End of meeting, notes and updates to be sent out. Drafts include on work plan. Review. Resend doodle poll to people who have not responded. Will be meeting in July.