

Meeting Notes  
Tahoe Science Advisory Council

Thursday May 11, 2017  
10:00 AM – 4:45 PM

Tahoe Center for Environmental Sciences, first floor Rm 215  
291 Country Club Drive  
Incline Village, NV 89451

Participants: Alan Heyvaert (DRI), Mark Pitchford (DRI), Sudeep Chandra (UNR), Scott Tyler (UNR), Geoff Schladow (UCD), Steve Sadro (UCD), John Melack (UCSB), Max Moritz (UCB), Pat Manley (PSW), Ramon Naranjo (USGS), Ed Parvin (USGS), Todd Ferrara (CNRA), Zach Hymanson (CNRA), Jennifer Carr (NDEP)

Draft Agenda

1. Welcome, agenda review, introductions (Co-chairs) 5 minutes
2. Update on Council contracting, meeting per diem, and operations (Zach) 10 minutes

Zach discusses contracting issues; operations support contract from UC Davis in place and have even received an invoice. 3 of 5 technical service contracts in place, but still working UC Davis. PSW has had one go around but it is with Dan at the moment and Pat doesn't know where he's at now. The plan is once there is a model contract from Davis it will be given to UC Santa Barbara and Berkeley and have them pursue contract through their separate entities. John Melack explains the issue at UCSB there needs to be specific tasks/activities defined, it's currently too generic.

Regarding per diem, Zach explains if you want travel reimbursement there is a new spreadsheet that he will distribute. There will be instructions included for applying for travel reimbursement and meeting fee as well in lieu of honorariums. Everyone is encouraged to apply so that the TRPA can see that the money is being spent.

Alison explains that TahoeScienceCouncil.org domain name has been obtained. New web design software needs to be purchased. There will be draft webpages available by the July meeting. Scott suggests that on the letterhead state agencies first because they cover cost and are major players and then lumps universities and federal agencies. Jennifer to send Alison new logo for conservation rather than NDEP. Contact info: Address: 291 Country Club Dr., Alison's phone, and [info@sciencecouncil.org](mailto:info@sciencecouncil.org). Alan proposes coming up with a draft final and everyone can look/print it on their end and approve of their logo. Drop the header down. Smaller TSAC at the top and then the logos on the bottom. A new draft letterhead will be created and sent out to council members, if you don't like the way your logo looks send an updated one to Alison.

Based on the governor's budget there will be another 150k allotted for the science council, so Zach wants to revise work plan to incorporate these new funds. Zach wants to discuss emerging issues. Science needs or issues identified by council members. Is there is something worthy for the council to start working on before the end of the year. He will be reworking the draft prior to July meeting and then working during that meeting to go over new draft.

Alan wants to start spending funds on the projects that we come up with. Need to start spending funds to show that we are working and using funds. So that funds aren't taken away. Need to identify larger in scale high priority projects.

June 30, 2018 is the current TRPA contract end date, but it can be changed. We have 3 years to spend the monies. New money would be brought in through a new addendum, and therefore may have an extension.

1. Council co-chairs one-year anniversary: continue with the status quo or pursue elections?

(Co-chairs) 15 minutes

Alan addresses schedule of co-chair rotation. Do we want to create a staggered effect of 2 years and one person 3 years? Is there an argument for doing a 2 and 3 year appointment vs. a 1 and 2 year appointment? Zach says Marc P has said if you had warm bodies in the chair leave them there, so he would vote for 2 and 3. Pat clarifies that this would only happen the first time in order to create the staggering of chairs rotation, subsequently in the future it will be two year rotations.

The MOUs allow for the council to select its members but they let the executives know. Searching for new co-chairs, people want to throw their hat in the ring. John pushes for 2/3 because for the first year, it's just starting, the first year just being administrative. Geoff and Alan agree but admit to bias. Pat inquires who wants to be rotated out first, Geoff or Alan? Geoff points out that the only constraint, is to make sure that the two people who are chairs are not from the same organization. Pat indicates that the same individual could be re-elected if they choose to and it's valuable to have the same continuity and if they like the work and are doing a good job then they should continue doing it.

Geoff tells that group that if Zach should choose to leave we would need to think of the process TSAC would go through in order to replace him. But it is just something to think about and not necessarily to discuss right now.

Zach points out that next year is an election year and so there will be a new governor, so that means the resources agency will experience changes based on the election result. Council members can be changed based on the discretion of the higher ups. Both people at an entity leaving at the same time is not preferable.

Alan declares we have come to a consensus that we are starting off with a 2/3 year staggered co-chairs appointment following a rolling 2 year appointment cycle after.

1. 2017 Exec. Comm. meeting agenda (Geoff) 15 minutes

Meeting attendance is not required by council members, but the Zoom system will be up and running so potentially everyone could attend remotely on Aug 21. Jim Thomas is replacing John Gertler. Everyone is attending so far with exception to Helene Dillard who we haven't heard back from but Geoff will follow up with her.

Geoff presents a draft agenda. Goes through the different points of the draft agenda. Important points: TRPA threshold update summary allowing for questions. Hopefully from this meeting we will have a better idea of what projects we would like to take on, and hopefully the committee will endorse what we do. The money has been around for 2-3 years and we're still getting contracts into place, so it is worthwhile to discuss if we are meeting the goals and expectations? It is our job to make the points that we are and why it's worthwhile.

Opening up to comments and discussion.

Alan think it looks like a fine draft, doesn't see anything to add. Points out that we want to keep this short. There will be a varying amount of knowledge of Tahoe and what is going on, so we want to keep it focused. This agenda hits the main points. If there are any suggestions speak to it now and then we will send it around to get feedback.

Patrick thinks that it is missing after going to TIE meetings and talking to Feinstein. LTRA implementation is going to be a big thing at the summit. Lake Tahoe Restoration Act has finally been enacted and as part of that are science-related provisions. Agencies are annually or biannually supposed to submit science based projects, but we have no definition of what that means. Unfunded mandate that requires the development of a science plan in the basin. Do we ignore because it's unfunded? Do we try to find the funding? Check the box, we've already done it, one option. New requirement that all funded through LTRA, must spend money (no specific amount) set aside for program level science associated with that project. How do we do that? Previously the LRTA there was \$30 mil set aside for science, but that's all that is gone. Programs are now funded through hope

that there is some science element. Working hard to get the language included to assure that science is always included but currently it is undefined.

Alan says that because there was separate science funding, ultimately that money was used more for implementation monitoring to demonstrate that they implemented the requirements of the project. Set the conversation so that it moves down the line in the direction of a more integrated larger problematic approach for research and science to support advances and progress in projects we're doing in the basin. We need to start the conversation now.

Zach inquires in what context is this conversation brought up to the executive committee.

Informational? Are we looking for them for direction?

LTRA gives opportunity to fundamentally influence how science is used in the basin (Patrick) or just ignore the language and go on as business as usual. In relation to is TSAC meeting its goals this gives the opportunity for TSAC to do more the one off projects, all this body does is acts like a consulting firm as opposed to institutionalizing science in everyday agency activity and programs. Between now and August, there isn't time to develop options and recommendations, but it time to start how we will implement science mandate, science requirements, assure science is being used in priority setting, come up with recommendations for each of those would be too much but it's reasonable to create that expectation and get the ok from the executive committee to develop options and recommendations on LTRA implementation.

Geoff proposes integrated monitoring which gets to LTRA. If this is something everyone on the council wants to pursue. This might take several years, integrated monitoring no system has completed or gotten correct. Worries about going too deep into LTRA with reasonable expectation that it will never get any appropriation. Coming up with monitoring protocol across the basin is timeless. But Patrick argues the value of this despite a lack of appropriation, whether or not you get money or not, you can still have the influence with where the science goes

Jennifer says that there is a common thread between LRTA and TSAC and offer to monitor or track or share. This is part of our central charge so we could volunteer to track the LTRA.

Zach thinks the LTRA should be more informational in terms of the draft agenda for the executive committee meeting. We know about this and there is a science mandate.

Pat was looking at the legislation and likes the idea of identifying for the executive committee how this body addressed things as they come along and serves the needs of the basin. Threshold is one thing and LTRA is a very big one. There's a language in here to develop an implemented plan for integrating monitoring and assessments of applied research to determine the effectiveness of EIP. We have specific contributions we want to make towards this and it is identified as a priority contribution and it's something as opportunities come along this is we would be very supportive of. Integrated monitoring and applied research, like the adaptive management approach.

Geoff asks Patrick is one of our emerging issues, a task, is to determine how science relates in the LRTA framework?

Patrick explains it's all about how we implement the language 1) focus integrating this piece as phase one, but it seems reasonable to take each of these LRTA provisions and ask ourselves collectively what is our approach towards implementation.

Zach and Alan bring up Jack Landy who is the EPA constituent has been tasked to develop a proposal for how to accomplish having integrate science program of research and monitoring. He will be here this afternoon. Have opportunity to talk to him about how he addresses the LRTA language. If this is an agenda item it would be worthwhile to have Jack present to speak on it.

Zach wants to know who is leading the discussion and content of each point of the agenda. It's not something that needs to be discussed now, but will need something to send on to Jim Lawrence and Todd.

Scott wants to know about the workplan, will the executive committee have already seen it beforehand seems disjointed to have it at the end. Zach says they will get it in advance of the meeting

but no guarantee that they will look at it before. Geoff says it's last on the agenda so that they have the knowledge of the other points ahead of time. Pat says maybe switch 7 and 8 have because you might not close on 7. Scott says it makes more sense to tie it to number 4 rolling expectations work plan review goals and approval. Something like that. Make 7 part of 8 would be appropriate. Geoff would rather have it there rather than someone ask it. Alan says yes, but bundle it as part of 8 and allow for more time. Pat says yes, we want feedback and make sure we're still on track. Zach and Geoff will work to incorporate suggestions that were mentioned today. A draft will be sent out to the group in the next couple of weeks. Give any final comments to Geoff and Zach. Zach says they will identify some potential presenters which will be included on the next draft agenda to be sent around for council members comments.

1. Council member updates on NEW relevant science topics (All) 45 minutes  
 Scott has nothing particular, but will be talking to Geoff on applications of unmanned aircraft that could be tie into the meeting on the 21st. But open up to people to consider if they need surface topography, multi-spectral imagery looking an Vegetation density could potentially through the water column, and thermal mapping. 10-50 hectares or 1-50 hectare scenarios, there is time and they're always looking for opportunities. Unmanned vessel that could drive through the water doing underwater video and it hasn't been used much.  
 Max wonders if it is interesting if the group is interested in a fire hazard study and risk mapping effort that was mandated by the Public Utilities Commission of California. After fires were created from utility infrastructure failure looking for fine scale hazard mapping, and weather mapping to fill in gaps where hot dry winds or other fire weathers like sun downer, diablo winds. Next several months should have products that would include the California side of Tahoe, could be interested for different decision making and potentially applicable to the Nevada side.  
 Todd adds on that this relates to what Patrick was talking about. LTRA has a significant forest and fuels tee to it so there is a nexus there that we might want to look at.  
 Steve is working on white paper proposals to use this nearshore work and put together prioritized research questions. They are exploring that more broadly. A post-doc position is funded to look at temperatures/climate affects at small sierra lakes, that person will start really soon.  
 Geoff and Alan are part of the technical advisory committee that is coming up with new stormwater management plans. They are representing science there are two plans being created one for the greater Tahoe area, implementing agencies need to applying for Ca bond money. The other the Tahoe Conservancy is more interested in has an enhanced plan to quantitatively demonstrate multiple benefits. Alan and Geoff are engaged in the 2nd one, represent the case where science can play a role. Has just submitted a prop 1 and one thing included a peer review of outcomes to be organized by this body, doesn't mean that people have to be reviews, but Zach or Alison would be given funds to find the appropriate person to say whether or not the work was sound with a focus on the control of invasive species.

1. TRPA threshold assessment: briefing on work-group examination of existing evaluation programs (Alan) 60 minutes  
 Chris (Delta Stewardship Council and more) and Casey (professor for DRI, with wife working for TRPA) are participating via Zoom. Ten different programs reviewed by subcommittee of Chris, Casey, Alan, and Ed Parvins. Each of them got in touch with Program Managers and sent out questionnaire/survey to all programs. Outline of structure and then example of what we're bringing together and how we're bringing it together. First few pages of outline summarizes what was learned. What are the differences and commonalities with the Tahoe Thresholds. What are the perceived strengths and weaknesses. What are strategies and for managing and tracking well. Everyone has too many things to track, Tahoe is not unique in having this problem of working with too many

standards. How to develop goals and thresholds that are cost-effective to monitor and feasible to achieve? Summarize how to do that as well as principles of continued program evolution. That's the first few pages, then there are about 4 pages summarize the individual programs. Example that was sent out was the SF estuary partnership, what is the program how big is the area of the program, population of the area, history, how it started, what they are focused on and whether not the program has shifted over time. Finally something about how the program interacts with partners and stakeholders. Map shows where the program location and the area it is responsible. Answering the 3rd page questions in the outline now and then adding to the appendix and replace with a 1 page narrative about the characteristics programs that are relevant to the threshold system at Tahoe. What did we find that was relevant to the thresholds system at Tahoe and how does this give the TRPA guidance in changes they can make. On the back page of 4, some sort of graphic or reporting page to show how they report out on their metrics. Then after the program description we have the appendix with a questionnaire that was filled out by the organization with our own answers for comparison. Communicate better if we summarize main differences and strengths relative to Tahoe, doing this for each program by diving into the available documentation of each program and contacting their program managers.

What Chris, Casey, and Ed have found...

Chris explains while he can still create an effective short term picture of how each program functions, unfortunately the detail that is required for TRPA really requires more time. With 100 or more indicators, how are they collected, what protocols are being used, how that data is assembled? It's pretty complicated. It's amazing how alike the programs are even though the context is so different.

Casey agrees this will be somewhat superficial but useful. Glean a lot more information from conversations thru program managers. Generally all program managers while busy are interested in helping out. Spoke with the everglades people and their program manager was paid to come over here see how things were done in Tahoe. Puget sound organization really likes the Tahoe structure and is trying to follow our model.

Alan agrees there has been a lot of interest from Program Manager. Cast a wide net in the beginning and caught too much, can't manage it and looking for narrowing it down. Looking for ways to better communicate progress and actually demonstrate progress. Hasn't met anyone who feels like they're doing it well. Try to summarize what we see are the differences but let the TRPA know that they are not alone. This is something that is on-going for many big national programs probably due to financial restriction that is decreasing over time. How do you keep the program going well with dwindling funds.

Ed explains that Lake Champlain is the opposite. They started with very focused 3 threshold and 9 indicators since 1996. Because they decided nutrients, AIS and harmful algal blooms were the big issues. The program manager was interested seeing our thresholds and thinking they should be looking at other issues. Lake Champlain watershed is 16 times the size of the Tahoe Basin. Plus huge agricultural area and recreation, more thresholds would be tough to deal with. No response from Gasket Bay.

Alan explains this is why we're diving in more ourselves simply because we are not always getting responses. So we look into details and program information from online sources. We are inquiring about program costs, sometimes we get percentage break down. Costs have been broken down into several categories. What is the total cost, the program itself, what's coming in from stakeholders. Chevron refinery throwing another million is different from California throwing in 1 million. Geoff. Alan says internal discussion of diverse programs is there some way to create a standard based on population or land area, haven't gotten that far. Funding is important to capture. The TRPA is interested in seeing if there is any kind of general accepted best practices towards implementation of



tracking goals and objectives as well as the evolution of changing goals and metrics and trying to capture that in this document. Julie agrees.

Alan says getting into this threshold update initiative where you have 9 thresholds that were developed many years ago and this is an opportunity to modernize approach in an incremental way. Larger wholesale changes that are more beneficial, TRPA can strategize ways to incorporate these changes. A lot of this doesn't incorporate science directly in reply to Todd stressing this is based on best science. Todd emphasizes the effort really needs to be cast around science based recommendation. Correct, based upon the best available science.

Zach revisits this idea. If you have a threshold like lake clarity, understand why you monitor it in a science context because it is part of the system which the science community knows. The knobs that are turned by agency people are known. Connectivity spending money controlling stormwater pollution because we have a scientific understanding that it affects clarity.

Look at the 3rd page questions, those are the main questions that they are striving to answer. Jennifer reflecting on how we got to this project which was the conceptual model that we started with. Trying to see if anyone is doing a better job than us. Want to make sure if we see if anyone is doing a better job of managing the web of metrics rather than the stovepipe of metrics because the better we can use our data to inform other areas like Environment might inform sustainable rec might inform this and this. Our we teasing any of this information out? Is there a program that has better conceptual models?

Alan says that it isn't practical to get conceptual models from different programs based on our time frame. We have sometimes asked if there is a conceptual model available. A lot have incorporated conceptual models only into aspects of their programs.

Looking to TSAC for recommendations for thresholds. But this is just what has been found and its going merely a piece of a whole bunch of things that come together.

Feeling like it's going to be a bit superficial based on the time scale says Jennifer, she agrees with Chris and Casey. But it is important and it's on the right track, we're still learning from all the programs.

We did share this outline with TRPA and we went thru several iterations with them says Alan. These are what we came up and what we are answering with the time available. Developing answers to the 3rd page questions now to be assembled on Monday. Combines all results of looking at programs, to go out to TSAC members by the end of next week (Friday 19th) we need comments back from TSAC members by the end of the day of the 23rd. Incorporate all comments and deliver to TRPA on the 25th.

It occurs to Pat when we talk about incorporating science, it might be helpful to parse that into environmental science – how do you determine indicators? Indicators to represent conditions and how to better understand and highlight relationships. How do you better highlight cause and effect relationships? Then there is decision science – structure decision making and all kinds of things in that field of science and as applicable how to TRPA or other agencies, how to roll up this information to understand how to act on this. Might be good to think about that. The decision science side is fundamental, get to the point where you're ready to change but don't have the structure or process. The conceptual model really lives on both sides. Summarize it in that way.

How evaluation results makes changes to (Alan) include something in summary in findings and recommendations that strikes the point of having social science aspect. It would be important to include. Would Pat be willing to draft a small paragraph explaining this, it would be important to include in summary. To be included in area council meeting materials and then come back with a new draft based on TRPA feedback, there will be opportunities to tweak what we have and bring up emergent issues. It will bring them up to speed about the program and add more over time. We are running so fast it almost dissatisfying to not have the time to look at it in a holistic way, really this is more of a quick survey of what's happening with different programs.

Geoff asks Julie how will TRPA use the info as it's not quite actionable intelligence.

Julie says they met with TIE meeting, first stop in a series consultations talking about what a threshold update looks like, what are the milestones along the way. Stakeholders and the 2 states and the governing board will coalesce around an update process. Been through this before and looked at everything and it was overwhelming, and really the community isn't ready to change everything. There's only so much willing to take on. This will inform the next steps involved between various working groups, stakeholder input, TIE steering committee, governance of EIP. Next governing board meeting is June where TRPA will have discussion with board about moving this along. Many different actions in the basin that could benefit everyone as well look at all the thresholds. TRPA is open to chat today with how TSAC fits, but we don't have every step mapped out, there are room for input and change. We will not be updating all 178, it's just not possible. TBD. There is a need to show value in this process and we're just getting warmed up.

Patrick wonders if anyone will notice the changes to the thresholds? Bar isn't very high. It's an interesting question are these status-style indicators or are they performance measures and the whole role of these things. Needs more discussion before the effort goes too far because depending on your purpose you'll develop them differently.

Zach wants to know what will the council be involved with post-governing board? Julie thinks after threshold update report. Best practices report. The whole country is engaged in ecosystem restoration. Hoping this report can demonstrate that people are looking to us and we're looking to them, that we're not so completely different and unusual based on feedback about program managers. In the future for TSAC...

Dan from TRPA the individual thresholds that move forward TSAC would be engage in targeting the questions for what it takes to move those forward. What does a real world situation look like? 9 categories hopefully the best practices report will help to narrow focus. Love TSAC to help define how to best go about accomplishing this and this, prioritizing what happens first.

Julie says it's all about being realistic to what can be accomplished in the next year. Prioritizing as is what is right or important to improve today versus what can hold off. Looking at the lens at what to people working on the ground now, need?

Dan provides the real world examples. Loose definitions of Stream Environment Zone, referring to Wetlands plus. Calls for restoration of disturbed degraded or sub divide. Recognize difference between restored and enhanced. The question is whether we have the correct definition and gaining the benefits we want. Don't distinguish between broad SEZ categories, currently they are treated all the same: aspen stands, wet meadows, wetlands, beach, parts of the 100 year flood plan regardless function. But there are significant functional differences between all of these but our definition defines them the same. As we approach a problem like this we hope TSAC to assist determine the best way of going about this, are their options for measuring quality and condition, standard to quantify and set a target to achieve.

Zach wants to know other priority areas other than SEZ, are they being covered by other groups and do you see a role where TSAC works with these other groups?

Alan says this is all related to the TSAC workplan. We are looking to get a picture of the role that TSAC will play subsequent to this warm up exercise. Thresholds is envisioned the dominant factor for TRPA and the basin as what has to be addressed. In order to ultimately represent this to the committee we need to pin down specifically what we do next year.

June 4th advisory meeting for TRPA. June 14th APC meeting. Final documents need to be in TRPA hands by June 5th. Governing board meeting. Wrap this up completely by about the 5th of June.

Next year's workplan will be more specific. Science Council has new funding in the government budget.

1. Agenda items for July 20th meeting (Co-chairs) 10 minutes

Zach has notes, stepped out for lunch

1. Lake Tahoe Basin Environmental Improvement Program (EIP) overview and discussion (Invitees) 180 minutes  
Zach explains emerging issue of where science informs. Be sure to define acronyms. The council may be able to come up with a prioritized list.
1. EIP overview -- Kim Caringer
2. Stormwater Quality Implementation Committee – Dan Kikkert/Kansas McGahan
3. Aquatic Invasive Species Coordinating Committee – Dennis Zabaglo/Mollie Hurt
4. Nearshore Working Group – Bob Larson/Dan Segan
5. Upper Truckee River Working Group – Stuart Roll
6. Sustainable Recreation Working Group – Joe Flower/Devin Middlebrook (presented by Kim Caringer)
7. Tahoe Fire and Fuels Team – Forest Schafer
8. Take Care Stewardship Group – Adam Jensen/Amy Berry

Alan initiates discussion as to what the key science questions that we can begin thinking about collectively and are there any intersections or connections between different groups and topics. Opens it up to the Zoom participants.

Scott thinks from a standpoint of wetland restoration and management there a lot of tools are evolving at a low cost that agencies can pick up and use. There are lots of good science questions out there but Management can use them for tools of assessment.

Geoff says we met with NDEP to talk about metaphyton impacting the nearshore working group and the potential for using drones for that. Dennis has looked at using drones for finding a species underwater. So lots of issues with reflection, it's remote sensing below satellite area.

Scott says there's also an opportunity for public engagement, if they can see things from space, videos, or visuals available lots of public education opportunities. Floating observatory could serve as a science platform.

Alan agrees one the main points that there are simultaneous things to be done. One is just getting the information and the research developing new approaches and ideas but then there's also engaging the public. Combine and benefit from both fronts. Struck by how well-organized the Tahoe West group, one of the defining characters is that it has been in development for awhile so they have been able to take a strategic approach to implementing a lot of different impacts and actions in a strategic way. In the Tahoe Basin, Science is often the bottom of the food chain and we end up with leftovers and take on projects that are disjointed from everything going on. Tahoe West demonstrates an alternative approach by connecting with working groups and through EIP, TSAC has the opportunity to integrate more broadly and the way in which it become applicable to stakeholders in the basin. One of my recommendations is to support the broader scale strategic approach so that we end up on a deliberate road map and end up where we want to be, rather than doing separate projects as we find funding to them.

Mark thinks that the video system was working very well. Gave good competition to local distraction.

Max thinks that fire is the glue that ties a lot of issues together. State wide project thru the public utility district to do high resolution mapping and it could provide fire simulations and weather



modeling. In general, wants to raise an issue of how does climate change play a role in the whole process because resilience in the context of climate change, has a couple of different ways to view it. One is a restoration perspective, that relies on historical conditions providing guides and thresholds. The new emerging thought is that there is adaptive resilience needed because our world is changing and what happened historically cannot necessarily predict what will happen. What does the trajectory look like as you move forward? Could this be something that helps to frame what TSAC is doing for thresholds. Are we looking at possible factors/decisions? Such as the effects of climate change on the trees and growth based on elevation correlated to climate change, species shifts, etc.

Patrick there is a lot of things underway to look at this. Surprised at how many SNPLMA funded science projects on the topic forest-health related projects going on to address climate change. State of California is putting out its 4th edition of the climate adaptation plan, but it is just thoughts and ideas for what needs to be done but does not get to the action, so it's not really usable. Some extent you deal with it globally but also... find a balance. Sustainability and resiliency is going to be a big theme and how will we deal with it.

Stuart says it's an ongoing conversation.

Pat this integrated research approach there's all this interconnectedness so you must study in an integrated way. Tahoe just exemplifies resilience, ties back to a whole bunch of things, that we need to look at this as a whole ecological system. What are the whole range of values that benefit from restoring an ecological system. Thinking of all these linkages and how we portray them. Social science is often lacking, how does a riparian system respond or the whole range of values that ecosystem has. Set goals for measuring desired outcomes. Thinks that we have the opportunity to look at Lake Tahoe as a whole, Tahoe West has already begun doing this, going basin wide. Look at things like climate responses and footprints. Every 4 years you move into a new sector around the lake. There's science as a collective that should apply basin wide and that can address issues and needs that are very proximate. Systems-approach is key to how we evaluate the thresholds.

Alan says yes, we need to make sure we are approaching in a socio-economic systems approach of managing our resources. Engage across the working groups and different science disciplines. Having a more comprehensive view and making sure that what we try to fix doesn't affect something else.

Pat talks about the Natural Capital Project project scales to an entire country scale. Ecological and economic models that show how systems work. Look at it not just monetarily, but how you value things. How do you place values on everything? Create a common platform to how you manage across different values. Something that might be interested to everyone present. Build quantitative information into the software they provide.

Zach asks about the key performance threshold measures, is there a similar interest to have better EIP performance measures? Two systems that are not just coordinated but integrated.

Kim thinks this is definitely something worth looking into, how can we better show the linkages? Some of that is underway. All the EIP data is going into a bigger database that will be tied into threshold. Dan think that this is the long-term goal for LT data, used to assess effectiveness. It has not gone that far out to integrate but it is the overall long-term goal. Zach asks if there are other performance measures that can be tracked? Think about a portion of the build environment that has BMPS how that is changing over time, the average effectiveness. Not just an output of mileage but a deeper understanding of how things have changed. TSAC could definitely help with that.

Julie agrees that Zach has a good point, but that the point of the measures was to evolve over time. Maybe there is a new measure to look at, at the end of the day we need a common set that everyone can rally around because you have so many entities with their own needs of reporting. The group is very much open to evolve.

Jennifer says that we measure what we care about. The social perspective is that we care about we can measure and that we communicate about. Reframing things in ways so that we can communicate them better.

Pat says to build a comprehensive monitoring approach. What do we want to monitor? What is going to make people do anything differently? Bringing the ecology and social aspect together to make it a more holistic and integrative approach. How to make a large leap in the basin? Incumbent upon us to the next few steps ahead how science and research can make the assessment or what's a big step. It might be something that looks crazy too big of a bite. Try to define what socio-economic resilience looks like in the basin. What does that mean and what does it look like? Be revolutionary rather than evolutionary. How do you accelerate innovation?

Dennis thinks it kind of seems revolutionary to see these working groups together and sharing what everyone is working on and where there is overlap. At least we're having the conversations together. Having the conversations to piggyback off people to see what is going on.

Adam is just excited to hear about science research.

Kim is curious about thoughts about social science. Do we not have the local expertise? If so, how do we access that.

Zach explains TSC came in and the big thing was to develop a science plan, which was completed but most difficult was the social aspect. It's not clear who is responsible for gathering the info and how the info will be used. The experience has been that the scientists have shied away, not wanting to deal with it, and not wanted to take it on. In the original science plan social science was always included. Alan says it didn't go over way, but they're seeing a different perspective now. If you want the scientists reengaged, you need an environment that is welcoming to them. Some serious efforts into communicating that this is a place where social science is needed to be recognized and we invite you to come and help us. Alan points out that TSAC has the funding to do that.

Pat clarifies that while economics are high on the list the atmosphere has changed a bit that it's not about a dollar sign it's about value. We need to integrate that in a natural resource context. If we touch one we have to touch them all water, forest, recreation, etc. It's coming along and it's more important and more relevant than others.

Amy Berry, would it make a difference to call recreation... people? That's all we're really talking about.

Zach says it wouldn't make a difference because it's social science, it just isn't the right environment for scientists to feel comfortable.

It's not for a lack of scientists. (Pat)

Amy wonders if it is useful to do an assessment of research that already exists. What science already exists?

Zach says Sierra Business Council has already done a lot of work. Has reviewed some of the literature.

Amy says that it is just easier to deal with land forest and water because they don't talk back to you. Zach says that it's more expensive to deal with people. Just to get approval to do these surveys. The type of data, who collects it, who owns it, how it will be used? There was a lot of push back.

Alan says there is definitely an interest in incorporating the socio-economic aspect into the environmental plan and if that's the case we'll start to see the opportunity to bring more of that in. TSAC can be a resource to identify individual who have the expertise and can help out.

Mollie says that environmental degradation is occurring because of increasing population. That is known. How is that not enough to bring interest in?

Alan says the only thing to bring Scientists into the basin is funding. Usually everyone is committed based on their funding that is used for very specific projects. Maybe we're at that point now where we have to bring that into it. There is info out there and we could incorporate that.

Patrick says that if you say that people are the problem then you lose half your audience. Sustain an economy of 30,000 people, while protecting national jewel while dealing with 50 million visitors. National parks you can frame that and limit. Sustainable recreation is the start. A place like Tahoe is different. Broad spread agreement that we need to tackle this but it needs a home.

It's maybe not necessarily people causing damage but it's the agencies are not managing the people.

Geoff suggests a free workshop to get people to working across the social spectrum.

Patrick says that there is no social science program the way you have stormwater programs. But there is funding there now.

Alex says that people have their favorite recreation and are attached to that activity. Can we walk into that? Maybe first bring in some expertise to see how to manage the potential conflicts.

Dan says there is a federal working group, collaboration between BLM, national parks, USFWS etc. to synthesize information to what works what hasn't worked in the past. Could be a point of engagement Visitor use management, link can be sent out by Dan.

Julie Reagan has a study that she can share with the group. Our national policy hasn't even been ready to move in this direction. Outdoor recreation act working to quantify the impact of outdoor education 600 billion dollars of economic activity. There is a shift to recognize this on a multiple level. Ecosystem services and economic impacts because of visitation to public lands and can get interest based on what we have.

Jen thinks there's a real opportunity for collaboration with local corporations. Tap into the resource of Vail's scientists. We need to start this conversation with the recreation providers, so that

everybody collectively agree that there is a problem. There is a problem with traffic, lowering the values of things, but the trick is to get them in right away and make them integrated in the project.

Alan says it would be a great way to talk to everyone about all issues. Recreation is one you can get people involved in. Tougher with stormwater and AIS.

Alan wraps up to ask our guests to provide any feedback to TSAC as we begin to draft up conclusions from today. We would like to capture your thoughts, so feel free to write/email to any one of us. Couple of short bullets, things that you thought were important to your program, more generally about integration, etc.