Scientific, Technical Assessment and Reporting (STAR) Meeting
Theme: Local Action Science Needs

Thursday, April 27, 2022
9:30 AM – 12:00 PM

Meeting Materials: Link
This meeting was recorded for internal use only to assure the accuracy of meeting notes.

AGENDA

9:30 AM **Welcome, Introductions & Announcements – Bill Dennison** (UMCES), **Ken Hyer** (USGS) and **Kimberly Van Meter** (Penn State) - STAR co-chairs and vice chair, **Breck Sullivan** (USGS) STAR Coordinator, **Peter Tango** (USGS) CBP Monitoring Coordinator

Announcements

Strategic Engagement Team (SET) Update - Marisa Baldine (CRC)

Summary

Marisa shared the team recently met with the Local Action Team and will be evaluating their first year of action in June.

Marisa shared a suite of blogs have recently come out, including the following:

- Six key programs that monitor the health of the Chesapeake Bay watershed - https://www.chesapeakebay.net/news/blog/six-key-programs-that-monitor-the-health-of-the-chesapeake-bay-watershed
- A federal agency recounts two big wins in Chesapeake wildlife conservation (guest blog from U.S. Fish & Wildlife Service) - https://www.chesapeakebay.net/news/blog/a-federal-agency-recounts-two-big-wins-in-chesapeake-wildlife-conservation
- New Bay Program report offers a roadmap for combating rising water temperatures - https://www.chesapeakebay.net/news/blog/new-bay-program-report-offers-a-roadmap-for-combating-rising-water-temperatures
- From the fish kills to Conowingo Dam, USGS investigates the Bay watershed's most complex issues (USGS partnership blog) - https://www.chesapeakebay.net/news/blog/from-the-fish-kills-to-conowingo-dam-usgs-investigates-the-bay-watersheds-most-complex-issues
- Bay scientists evaluate reasons for the blue crab's population decrease - https://www.chesapeakebay.net/news/blog/bay-scientists-evaluate-reasons-for-the-blue-crabs-population-decrease

Marisa shared Chesapeake Bay Awareness week is coming soon, and the communications team will share information, social media tool kits, and event information for restoration site visits in Baltimore and Lancaster County. Bill Dennison said awareness week is great for media coverage and a good opportunity to take a step back and assess actions Bay wide.

STAR Accessibility Survey

Upcoming Conferences, Meetings, Workshops and Webinars

- Happening now: National Water Quality Monitoring Council's 13th National Monitoring Conference - April 24-28, 2023, Virginia Beach, VA.
- Species on the Move – May 15-19, 2023, Everglades National Park, FL.
- Interagency Conference on Research in the Watersheds (ICRW8) – June 5-8, 2023, Corvallis, Oregon.
- Citizen Science Association conference, C*Sci 2023 - May 22-26, 2023, Arizona State University campus in Tempe/Phoenix, Arizona.
- CERF 2023 Conference: Resilience & Recovery – November 12-16, 2023, Portland, Oregon. Abstracts due May 10, 2023.
    - Bill emphasized the origins of CERF started in the Chesapeake Bay community and encouraged attendees to submit an abstract.

Summary

Bill Dennison said STAR leadership should meet with David Campbell, the new interim Bay Program Director, to explain STAR's mission and role. Bill said he hopes Kandis's new role at EPA Region 3 will strengthen relationships between the Chesapeake Bay Program (CBP) and the EPA Region 3 office.

Bill shared he will be serving as interim UMCES President for a year until a permanent president has been selected. Bill will be focusing on climate change initiatives and the new collaborative computing center.

Breck Sullivan shared UMBC, USGS, and EPA signed a memorandum of understanding on Friday, April 21st to collaborate on addressing science needs and supporting the hiring of diverse talent into the USGS and EPA workforce.

Bill suggested the May STAR meeting take place in person.

Ken Hyer asked what the next steps for science needs are after their presentation to STAR. Breck said the STAR team then works with the outcome leads to wordsmith and add detail to the needs, before updating the database

accordingly. These revised science needs are requested to be sent to STAR no later than two weeks after the science needs check in meeting. However, an outcome can update their science needs at any time by reaching out to the STAR team: Breck Sullivan (bsullivan@chesapeakebay.net), August Goldfischer (agoldfischer@chesapeakebay.net), and Alex Gunnerson (agunnerson@chesapeakebay.net).

August Goldfischer said STAR can work on improving the science needs template. STAR welcomes feedback on how to improve the science needs template.

9:35 AM **Introducing New STAR Co-Chair and Vice Chair, Ken Hyer and Kim Van Meter**

Summary

Ken Hyer introduced himself, saying he is associate coordinator for Chesapeake Bay Science Studies and worked closely with Scott Phillips. Ken views STAR's mission as trying to connect science needs with the goal teams needs to facilitate getting science done. Ken currently spends most of his time doing science facilitation but comes from a hydrological background. On a more personal note, he spent most of his life in the watershed in both Pennsylvania and Virginia.

Bill introduced Kim Van Meter, emphasizing the importance of having both agency and academic science represented in STAR leadership. Kim said she works at Penn State in the department of Geography and her focus is on water quality. She comes from the Midwest, where she worked on upper Mississippi-Gulf of Mexico harmful algal blooms at the University of Illinois at Chicago, and her focus has been on the legacy effects of nutrients in watersheds. Kim uses remote sensing in her work and has a project focusing on Pennsylvania reservoirs.

9:50 AM **Biennial Meeting Feedback – *All***

The upcoming SRS Biennial Meeting comes at a unique and consequential time as we approach the 2025 deadline, and the partnership has recognized the need for planning on both how to accelerate towards achieving our current goals as well as the necessary reflection and strategizing for post-2025. In recognition of this, the theme has been structured around the Executive Council Directive and the conversations have been designed to contribute recommendations to the EC. One primary session covers the charge of identifying and providing recommendations for emerging science and challenges. In order to structure the discussion so that it can meet this charge, STAC and STAR have collaborated to identify ten overarching science challenges to structure the discussion. We

would like your input on if there are any red flags to the 10 challenges or any critical items missing.

- *Are there any red flags to the 10 challenges or any critical items missing?*
    - *Please note the biennial meeting will cover other topics that we may not have listed in the 10 challenges, and the challenges are not ranked in any particular order.*
- *Is there someone who would be best to lead these topics?*

Summary

Breck and Denice emphasized the SRS Biennial meeting is the only time that the entire partnership convenes, so this is a key opportunity. Breck provided some background on the schedule of the SRS Biennial meeting, explaining that for the session Breck and Denice are leading on the first day, the discussion will focus on two of the science points outlined in the Executive Council charge. The goal of this session is to produce recommendations for the Beyond 2025 committee in addressing this charge. Ten current and emerging challenges will be presented in the session, which were derived from the SRS synthesis document shared with the partnership and the science needs database. Particular attention will be paid towards topics where a long term vision is needed and short term action is feasible. Denice noted the list is not exhaustive – it is an attempt to identify the key science topics and then generate discussion for moving forward at the world café. The goal is to motivate the partnership by letting them know we have tools and need to get started on moving forward. Kristin added these challenges are topics that attendees can carry into the second day of the Biennial meeting as focus areas that we want the Beyond 2025 steering committee to keep front and center.

Some comments were left on the Jamboard: STAR Meeting 4/27/23 - Google Jamboard.

Bill Ball said he sent comments in via email about the ten challenges. Those comments have been copied below for referencing:

In reference to the challenges section at the end of the document, Bill suggested re-organizing the challenges into a list of more clearly defined "challenges", perhaps all of which should begin with the word "To". In suggesting this, Bill took the perspective that the EC really is looking to understand the deep challenges and that a "challenge" is a "difficult thing to be done". (Hence the "To...." idea.) Bill assumed that the top ten challenges are meant to be the ten most important to solve, and not just those that are easy to identify and go after.

Bill offered the following language as a start:

Challenges for the Chesapeake Bay Program partners (Challenges to tackle moving forward through 2025 and especially beyond):

1. To estimate (*i.e.*, to determine/estimate/imagine as best we can) what the future Bay will look like in 2025, 2035, 2050, and 2100, under at least 4 different scenarios:

(a) if we (the CBP partnership) does nothing beyond what we have done to date

(b) if we take all actions necessary to meet the currently recognized tributary TMDLs to the Bay (by some realistically possible date)

(c) if we meet *all* goals defined within the current Watershed Agreement (by some realistically possible date)

(d) in an idealized world: That is: What collective vision do we have (as a partnering society of jurisdictions and citizens) for the Bay and its watershed in the long-term. Perhaps this could be framed in terms of some imaginarily sustainable long-term steady-state for the entire natural-human ecosystem of the Bay and its watershed, in terms of population, land-use, and natural resources. Note: Imagining" (estimating) what this might be would likely require a very large-scale and very carefully planned "design charrette" involving all partners and as many citizens as possible.

2. To estimate how the "effectiveness" of our various current approaches will vary with alternative scenarios of what the "Bay of the Future" looks like and to imagine and assess new approaches as needed and appropriate.

3. To estimate how our scenarios (and the "effectiveness" of our various current approaches) will vary with different scenarios of population growth, climate change, and societal inclusivity. (That is, with assumptions regarding these unknowns that are different than those assumed under challenge #1.)

4. To advance monitoring and assessment techniques in ways that will help us to more effectively understand and predict thresholds and tipping points.

5. To advance monitoring and assessment techniques in ways that will help us better understand and predict the impact of management actions on shallow waters.

6. To advance monitoring and assessment techniques in ways that will allow us to better track impacts of management practice on multiple outcomes.

7. To improve science communication (perhaps particularly in relation to understanding and managing uncertainties) in ways that can improve both community buy-in and societal implementation of perceived "best" practices.

8. To improve our understanding of the linkages between other types of outcomes and overall Chesapeake Bay and tributary ecosystem health as measured by the state of living resources within those systems.

9. To develop and apply the necessary social science tools to effectively involve and serve citizens in ways that are equitable, fair, and just among citizens, irrespective of their race, gender, history, or ethnicity.

10. To develop and apply the necessary decision-science and social-science tools to allow effective and appropriate assessment of tradeoffs, as well as effective means to make equitable, fair, and just decisions in the face of such tradeoffs.

Bill Ball emphasized the need to have a visioning workshop with all the partners to develop a vision for the future of the Bay, recognizing the Bay of the past is not the Bay of today or the future. Bill Ball said the population of the Bay watershed needs to be represented, by organizations including non-profits, to ensure this framing conversation is had. Bill Dennison said UMCES has a grant to do visioning workshops for comparing Tokyo Bay, Manilla Bay, and Chesapeake Bay through Belmont Forum, whereby the Global Sustainability Scholars set up listening sessions to learn about constituents' visions for the Bay. The results of the listening sessions will be collated and shared. Bill Dennison emphasized we need to bring in previously unheard voices to provide critical feedback on what the future of the Bay should look like, and this means meeting the community where they are. Bill Dennison agreed the Bay of the future is not the Bay of the past. Ken commented instead of saying "What will the ecosystem look like?" the CBP should be asking "What do we want the ecosystem to look like?" so there is more ownership from the partnership in envisioning that future. Bill replied this is a good point. Bill noted sometimes it feels like we are monitoring for monitoring's sake, and despite the importance of long term monitoring, people do not care about dissolved oxygen in the deep trench. Kaylyn replied we need to be better about being more definitive in what we recommend and say in the CBP. Kaylyn acknowledged this can be difficult in general and very difficult in certain areas, but we generally have the information to identify causality, direct linkages, and then communicate relevant information to the public. Breck said we need to look at how the stakeholders use the science.

Britt Slattery agreed with the discussion and said the structure of the CBP needs to be reframed to center people and the public. Britt said perhaps the CBP needs to hire a management consultant to see how to change our model of engagement and science communication. Britt said she thinks the CBP has the tools it needs at its disposal, but the human networks are not organized the way they need to be. Currently, the science is siloed and one directional, so many people do not feel it is useful to them. Britt emphasized the need for meaningful engagement and co-production of strategy with public buy in from the start of visioning. Denice said this is the underlying theme of day 2. Britt said while that is the case, it seems to her there is still a disconnect between when the CBP says "people and DEIJ need to be a bigger focus", but the CBP does not follow through on making meaningful change. Britt said a better model is needed to integrate the science, people, and implementation. Jeremy added we do not just need a better model to merge those planes, we need bandwidth to follow-through on that intention. Denice asked what an example of true change/successful engagement might look like. Denice also noted one challenge not on the list but discussed is human potential, which gets at some of these topics. Britt said this is a good question, but she cannot articulate an example at this time. Britt will think on the question and get back to Denice. Amy Handen said while she is pleased to see the bullet on integrating social science under improved decision making, the advanced monitoring and assessment category should also have social science considerations. Amy suggested data collection on social science indicators to complement the natural resources data. Kaylyn agreed with Amy's point. Breck said those monitoring considerations were drawn from outcomes who had specific data requests, so social science can be included but it will require more detail. Ken said he is hearing the CBP needs to focus on co-production of science with stakeholders throughout the entire process, where feedback is consistently gathered and incorporated. Denice replied there are recognized five levels of stakeholder engagement, which Ken referred to. Denice said the CBP typically utilizes the lowest level, informing.

Denice asked Bill to contribute a poster to the Biennial Gallery Walk that is on the listening sessions. Bill said yes, he would.

Peter Claggett said the benefits of a clean bay or land conservation may not be apparent or tangible to many of the Bay residents except for scientists if there is not opportunity for access and recreation. If the TMDL was met today, it might be a while before living resources rebound. Peter said we need to have a hard look at how all this investment really affects watershed residents' lives.

Bill Dennison said it appears there is a strong endorsement for creating an inclusive, shared vision for the future of the Bay.

Ken Hyer said one red flag for the listed challenges is cross-outcome linkages listed under improved decision making, but more and more, he is thinking this is (1) a critical item, and (2) should be moved up into the Advancing monitoring and assessment. In short, we need to think about these connections across outcomes earlier - not just during decision making. Kaylyn said this is a good point. Bill said he agrees cross-outcome linkages need to be considered at the beginning and end.

Britt shared one red flag from her point of view, which is that some of the K-12 school districts (at the county level) have amazing sustainability programs in place, saving millions of dollars in energy, water, etc. It is not yet the norm, far from it. We could more 'formally' enlist places such as facilities at schools and universities, parks, visitors centers, government buildings, etc. - in a more coordinated manner. There is huge potential to make a significant difference for climate change, water and air quality, as well as for human health. This could utilize and build on some existing programs such as LEED / Green Building Council as well as new programs. This could also make those models which enlist the community of people working and learning in those spaces in more sustainable practices. Britt said we need to think about how we massively scale up what is being done in different ways.

10:20 AM **Local Action Cohort Science Needs**

10:20-10:30 Local Leadership – *Laura Cattell Noll (Alliance for the Chesapeake Bay)*

Summary

Laura began with a reminder of the local leadership outcome language and how local leaders are defined: as planning commission members, senior staff, and elected officials at the county and municipal level. Bill asked if a comprehensive list of these people exists. Laura said such a list does not exist because of how many people this would entail and the high turnover rate for these officials.

Laura focused on the new science need, which is to pilot a more rigorous sampling method in 2024 for the local leadership survey. The survey is conducted every two years and a baseline assessment was completed in 2022, but due to limited funding and logistical hurdles the methodology included a convenience sample. Laura hopes to utilize contract support through the CBP Partnership and Accountability Branch as a potential resource for developing a more rigorous sampling method and evaluating the baseline.

Breck said Laura's work with the Partnership and Accountability is a great example of leveraging resources to conduct this survey. Breck said she is working

with the Science, Analysis, and Implementation Branch to better support indicator needs and the indicator team in the sister branch. Laura said there is a lot of previous work to build on, including the diversity survey.

10:30-11:20 Combined Land Use Outcomes: Land Use Methods/Metrics & Land Use Options – *Peter Claggett (USGS)*

Summary

Peter reminded attendees that the land use outcomes do not commit to reducing or preventing land conversion, but instead focus on providing information in the hope that better decisions will be made. In some ways this is realistic because land use decisions are made at the local level and the partnership has very little control over this sector. The partnership can only provide incentives, disincentives, information, and science – having this make a difference is a perennial challenge.

Peter and Renee noted these science needs are still in draft form and will be condensed in the near future.

Peter said the in-progress science needs fall into three categories: 1) continued support of the development of very high-resolution land use/land cover metrics and data beyond 2024, 2) develop metrics related to change in land use informing other Outcomes, and 3) engagement from individual outcome representatives to help relate LUMM and interpret what rates of change mean to individual outcomes. Peter said they are on target to produce the data needed to inform this outcome, which will inform many more outcomes. For need number 1, the major challenge is going to be finding the $7.5 million needed for high resolution imagery collection. EPA may be able to provide $5 million, and the additional $2.5 million would likely need to come from other federal agencies. Breck asked about the current status of finding funding. The Management Board expressed their support, but no organization has stepped up with the money or intentions to produce the money. Peter said the agency budgets are opaque and it is hard to influence the federal funding. Non-federal parties will need to advocate for those resources. Breck said the PSC monitoring team can advocate for addressing the funding need in their follow up conversation. Bill said we need to emphasize and invest money in longitudinal studies to provide a reality check for CBP goals. Ken suggested communicating the funding need as an annual cost instead of a one-off cost, as this will be similar to how other monitoring networks are funded and an annual cost becomes expected.

For the new and emerging science needs, Peter said a major one is communicating the science to land managers and local governments. This is going to require funding for translator positions, similar to Jennifer Herzog-Miller at the Land Trust Alliance, so the science being produced by the CBP can be translated into relevant information for local decision makers. Kaylyn said part of the engagement needs to be directly connecting the results with land use information. Breck asked what skills are needed for communicating this data to the community and what needs to be done to find more communicators. Peter said Jennifer's position at the Land Trust Alliance was to integrate water quality concerns into conservation, so they found funding to do this as part of her job. These translators need to know the interests of local governments, landowners, and decision makers and be able to advise them on land use matters with an environmental spin.

Kristin Saunders said the land conversion information is a somewhat sleeping giant that has not been put squarely in front of decision makers or as an outcome in the current agreement, so few track it. As we focus on our progress and water quality BMP reporting for the outcomes and what those indicators tell us, very few people have their eyes on the conversion happening across the watershed that is undoing or potentially will undo all the BMP implementation as impervious surface grows and trees, wetlands, etc. disappear. Bill agreed with Kristen that this information on land use change is really important to get in front of decision makers.

For the science need "Quantify impact of land conversion on communities", Peter said no resources have been available in the past, but this year GIT Funding was secured for a test project with four communities. Peter said it is unclear if engaging with four communities meets this outcome. Bill asked how the communities were selected. Peter said the proposed methodology would include looking at areas where land use transitions could benefit from management and where there is an opportunity to engage with underrepresented communities. Bill said the new UMCES report card will be focusing on DEIJ and socioeconomic indicators, so it may be of interest. Peter noted that local governments like economic development more than anything, and that is often what land use change represents. Peter said he has been sensitive about not presenting land use change as a purely negative phenomenon. Breck suggested adding some language from the GIT funding project in the need detail so that partners can see an actionable idea of how to address this need. For the GIT funding project, Renee said she will utilize the existing suite of CBP tools and resources to identify the communities. Breck said it is not just a strategy but tools to help with that communication. August asked if Peter has identified specific communities they would like to engage with. There was no response.

For the science need “Strategy on how to involve locals, using the existing Local Engagement Strategy for guidance, so they may be provided data, resources and information related to land use change in a more efficient and effective manner”, Peter said a good example they would like to follow are the US Forest Service’s tree canopy fact sheets which are local and specific to each county. The goal is to use the fine spatial resolution data to develop tools that provide information at the local level and encourage communities to take action.

For the science need “Support local decisions on flood hazard mitigation, land use and climate resiliency planning”, Peter said we need to know what local decision makers and communities care about, because right now that is a data gap. Certain themes like flood hazard mitigation are important, but the CBP needs to have a better picture of local priorities. The CBP needs to meet people where we are, and from Peter’s perspective the CBP rarely ever does that.

For the science need “Collate and curate local spatial data on building permits to assess and map near-term development potential”, Peter said we might not be able to get this information from local governments, but this could improve CBP projections of land use change so it can be provided to decision makers before the change has happened. Kaylyn asked if Peter sees this as a communication need. Breck said it seems the GIS analysis could be an easier task, but the issue is data accessibility. Kaylyn said ongoing communication/relationship building/conversations with planners at the start, rather than after local development plans are approved could be helpful.

For the science need “Develop improved ways to value water quality benefits associated with land conservation and land use planning”, Peter said the partnership needs to make a political decision about the importance of land conservation, especially incentivizes for land conservation. This is one of the few ways the CBP can have a more direct effect, especially through the land use model which currently assumes growth will happen wherever it can. Peter said this often means land that is conserved gets very little credit, even if we know it was previously planned for development. This is not how the Nature Conservancy runs its land use models, which gives full credit for land conservation. The CBP should consider these incentives in the context of the TMDL. There was wide agreement this needs to be a big topic of discussion and is more than a science need. Kristin Saunders said remember, if you are going to the Biennial Meeting, you can add these items – do not just rely on Peter to speak to the issue. And if you are not going to the Biennial meeting, talk to people who will be there and speak to these issues along with other topics that you have concerns about getting lost Beyond 2025. We want to hear from a broad cross section.

For the science need “Community assessments to determine how underserved communities can be helped by data and resources related to policies, incentives and planning tools to reduce land conversion”, Peter said this can be combined with previous needs emphasizing the importance of knowing local priorities.

Peter said the models of the Bay Program may be less suited for capturing transitional land uses with long lasting legacy impacts or sediment impacts. The CBP needs a parcel level spatial data so we can tailor programs to farmers who are not adopters, because putting a ton of BMPs only on progressive farmers’ lands will not help meet the goals.

Ken suggested combining funding for the communication strategy with the data collection, as it may be easier to secure the necessary monies for translators and it is logical to have an associated plan for data dissemination. Peter said that is a good point.

Kim said this work is incredibly valued and connects with the biennial meeting topic of the future of the watershed. Breck said this is a good point to add ecosystem and watershed to the challenge topics list. Kim added for the outreach need, this kind of data would be very interesting and relevant for students. Peter said he can share the links to the data with Kim so she can access it. Peter said he is not sure if story maps is the right approach, but the CBP team could complete 90% of educational modules on how to build strategies for communities with the data, depending on their interests. Peter said the problem is tools are expensive to create and expensive to maintain. The audience is important, because while a broad audience would merit tool development, a small audience would most likely not.

Denice said she left land conversion off the biennial challenge list by mistake and it will be included. Denice asked Renee and Peter if they can articulate these land use outcomes science needs into a pithy science challenge for the list. Renee said we will be doing that soon with the community response to land use change and she is also focused on this within our healthy watersheds assessment (identifying the intersection of healthy watersheds, threat to land conversion and in underserved communities). Consolidation and prioritization is their next step. An example “science challenge” would be helpful. Denice replied adding a point under Bay of the future that talks about including trajectories of LULC in our visioning and alternative futures would be interesting. Peter said he will work with Renee on crafting a challenge statement. It will include an understanding of the past, present, and alternative future land use scenarios.

Peter said the CBP needs to consider climate mitigation and impacts like solar conversion in the watershed. Peter said solar development could overcome impervious cover in terms of land use expansion in the coming years. In Virginia,

projections suggest 500,000 acres may be converted to solar, although that is an anomaly in the watershed. Peter said it may be time to bring a climate mitigation goal or outcome to the table. Bill asked about the imperviousness of solar fields and if there has been research on changes in runoff and groundwater percolation. Bill said he knows they are semi-impervious. Denice said in April there was a STAC workshop on solar fields in agriculture. Peter said there is not a lot of field research that has been done, although Penn State and Virginia DEQ just set aside $6 million for research on this topic. The biggest factor for runoff is not the panels themselves, but construction techniques like soil compaction and how quickly it is revegetated.

Peter said $1.5 million is needed annually for not just the four-year snapshot provided by high spatial resolution imagery, but also analyzing freely available satellite imagery at a monthly scale to identify seasonal shifts in soil bareness, dryness, and precipitation events. Bill agreed this is important.

11:20-11:45 Tree Canopy – *Julie Mawhorter (USDA)*

Summary

Julie began with the context that the science needs are still in the process of being formulated since the outcome team is taking feedback from the tree canopy roundtable in March and reflecting on that information.

Julie said one science need has been completed, which was the creation of a community tree cover indicator using the high-resolution land cover/land use change analysis with support from the CBP GIS team. This indicator identified a net loss of 2400 acres in urban areas, despite 8000 acres planted.

For the one ongoing science need, Julie emphasized the point Peter made about the need for funding high resolution satellite imagery and said this need is tied to the bigger request Peter made about funding those datasets and change detection. Without this data, the urban tree canopy indicator cannot be updated, and the forest buffer outcome will suffer. Breck said this context should be added to these needs in the database.

Julie identified five emerging science needs:

- Share models / best practices for effective incentive-based and regulatory approaches to protect urban tree canopy.
    - Julie emphasized a mix of strategies that are tailored to each location will likely be necessary.

- Develop and share data, tools and best practices for advancing tree equity.
    - Julie said the focus will be on providing accessible, easy to use tools to communities.
- Develop a Trees & Climate Resilience best practices technical guide with analysis on which tree species are thriving or struggling in the face of climate change.
    - Julie said this need will build on previous work and is utilizing GIT Funding through the project on scaling up regional tree supply.
    - Breck asked if this would be watershed wide or more local, given variance in climatic conditions and suitability for different tree species. Julie said while the specific trees will vary from region to region, the general practices will be applicable watershed wide.
    - Bill commented this need connects to the STAC rising temps report since trees have such an important part in mitigating temps. Julie said she and Katie Brownson were involved in this project, and are making appropriate linkages to science needs.
- Develop suite of Tree Canopy outreach materials for local governments, non-profits, and other community organizations to aid in public outreach work.
    - Julie said GIT Funding was utilized to hire OpinionWorks to complete a study, and the main upcoming efforts will include distilling the top priorities from the upcoming report. Once this has been done, the science needs will be articulated.
- Understanding the key drivers of tree canopy loss in different parts of the watershed.
    - Julie said this is a key science need because it hints at potential solutions for addressing tree canopy loss and is the first question many stakeholders ask when shown tree canopy loss in their neighborhoods.
    - August Goldfischer asked if this could be a need targeted towards academic institutions or student research projects.
        - Julie said this is a good idea and Peter has done some of this. Working with academia could include methodological framing or training for partners who wish to engage with the data. Local knowledge would be needed, but we would need more capacity to do this. Peter said we could envision having many changes on the ground be documented by the public since these changes would be identifiable by humans. Options to generalize the input into broader categories, like disease or pests could be developed. To leverage a citizen science initiative would be a great educational and engagement opportunity. August and Breck

shared the conference they are at has a lot of information on how to leverage citizen science and start up those projects.

12:00 PM Adjourn

Participants: Alex Gunnerson, Amy Handen, Andy Cole, Angie Wei, August Goldfischer, Auston Smith, Bill Ball, Bill Dennison, Breck Sullivan, Britt Slattery, Cara Johnson, Chris Guy, Cindy Johnson, Denice Wardrop, Doug Bell, Gary Shenk, Jackie Pickford, Jamileh Soueidan, Jennifer Starr, Jeremy Hanson, John Wolf, Julie Mawhorter, Julie Reichert-Nguyen, Kaylyn Gootman, Keith Bollt, Ken Hyer, Kim Van Meter, Kristin Saunders, Laura Cattell Noll, Marisa Baldine, Meg Cole, Melissa Fagan, Peter Claggett, Qian Zhang, Renee Thompson, Sophie Waterman, Tom Parham, Tou Matthews.