Climate Resiliency Workgroup Special Meeting

Community Resilience Working Meeting

June 17th, 2024

11:00 AM – 1:00 PM

Event webpage:
https://www.chesapeakebay.net/what/event/climate-resiliency-workgroup-meeting-community-resilience-working-meeting-june-2024

Minutes

Workgroup Action Items

- Reach out to CBP's Local Leadership Workgroup to provide feedback on Elizabeth Andrew's draft guide and discuss outreach to local officials.
- Review resource, "Enagaging with Stakeholders to Produce Actionable Science: A Framework and Guidance," shared by Krista Romita Grolcholski.

Partner-to-Partner Action Items

- John Wolf requested that any folks interested in serving as beta-testers for his 3D Visualizations or know of individuals or communities who would be interested to please email him (jwolf@chesapeakebay.net).
- Elizabeth Andrews requested that if any folks are interested in reviewing a draft of the guide she is developing, to please reach out to her.
- Amy Freitag requested that if folks are interested in reviewing the Vulnerability Assessment they are putting together for Baltimore, MD, to please reach out to her.
- Ryland Taylor (MD DNR) offered to share the recording of their Adaptation and Resiliency Working Group's panel on utilizing community liaisons for effective community engagement.
- Kate Vogel (MD DNR) offered to discuss climate flood-related tools further with folks who are interested.

11:00 AM Welcome & Introduction – Jamileh Soueidan (CRC/NOAA) [5 Minutes]

Goal of the Meeting:
To inform current community resilience efforts occurring within Virginia and Maryland, with discussions focused on informing development of best practices guide for engaging communities on climate resilience and understanding and identifying common themes around the utility of current tools and metrics to inform decision making and engagement with communities to discuss thresholds or tipping points for resilience actions.

11:05 AM Lightning Talks: Brief Project Overview & Objectives for Meeting [15 Minutes]

Proactive Planning for Resilience (Elizabeth Andrews, UVA) [5 Minutes]
My research project is entitled Proactive Planning for Resilience: Protocols for Community-Led Climate Adaptation in Virginia. My goal is to develop Protocols/Best Practices for: fostering resilience planning at the local level with full community engagement; using various tools and approaches to identify vulnerable areas and minimize community risk; and enabling economic drivers and robust planning to support community relocation when it becomes necessary. The research will include case studies discussing resilience planning successes and lessons learned, including some international approaches such as Cuba's "Tarea Vida" and the Netherlands' "Room for the River" program.

Baltimore Community Climate Vulnerability Assessment (Amy Freitag, NCCOS) [5 Minutes]
The Baltimore Community Climate Vulnerability Assessment is a multi-disciplinary, spatial approach to measuring climate vulnerability at the regional scale. We intersect three types of vulnerability (social, structural, and ecosystem service) with two types of risk (combined flooding and urban heat) to determine areas of intersecting risk. The effort relies heavily on pulling together existing data. The team has developed indicators for each of the categories of risk and vulnerability and is now in the process of determining the best data source for each one. Expanding the risk layers to the counties surrounding Baltimore will require stitching together existing research efforts for a region-wide model, namely for stormwater and urban heat. Perspective on research in these areas is most helpful. In addition, we will eventually publish these layers as interactive maps, and we'd like feedback on how to color code these maps to depict thresholds of concern (i.e. when a seawall may be overtopped or a critical highway floods).

3D Mapping and Climate Resiliency (John Wolf, USGS) [5 Minutes]
Digital twins, including three-dimensional (3D) landscape visualizations, have shown to be an effective approach for communicating the impacts of climate change. They can be used to promote user engagement and facilitate what-if scenarios both visually (through landscape visualization) and quantitatively (through interactive dashboards) from multiple perspectives. As a result, digital twins are increasingly used in decision support and scenario planning applications. Example digital twins have been created for Crisfield and Ellicott City,

Maryland. This effort will involve participating in user engagement activities for web-based interactive landscapes to evaluate their effectiveness for communication purposes.

Summary

Elizabeth Andrews briefly provided a project overview of her efforts around developing a guide for community-centric adaptation planning and her goals for this meeting specifically. This best practices guide examines how to approach communities about the topic of community resilience and to provide them with a framework for developing adaptation strategies that best fit their community needs. The goals of the project are to foster full community resilience planning at a local level, minimize the flooded areas in where communities must retreat, and enable economic drivers to supported planned relocation when it becomes necessary. Elizabeth then posed two questions to the group, to help inform and guide the discussions for the meeting. The first one acknowledged that there are an overwhelming number of tools for localities to choose from when engaging in adaptation planning, so rather than developing a specific list of tools, she was interested in understanding if there are specific issues and challenges that communities need to address when engaging with adaptation planning. The second question aimed to understand how to assist communities in determining their "tipping points" for adaptation strategies (e.g., strategic relocation). She also commented that she would be interested in hearing the group's thoughts around California's Adaptation Pathways approach that focuses more on employing adaptation strategies based on when they become necessary and not based on a timeline or specific dates.

Amy Freitag reviewed her current efforts around conducting a climate vulnerability assessment for Baltimore, MD and the surrounding areas. This assessment looks at climate vulnerability across a number of different disciplines (i.e., social, structural, and natural resource vulnerabilities). For social vulnerability, they are looking at downscaled and updated data to understand impacts at a finer scale. For structural vulnerability, they are looking at impacts to important community infrastructure (e.g., schools, farms, places of worship). For natural resource vulnerability, they are looking at where there is important natural infrastructure. Lastly, they are looking at combined flooding and urban heat as climate related risks. Their analysis is a geospatial approach to layering these considerations on top of each other to understand areas that are more vulnerable. At this meeting, Amy was hoping to understand the most useful kinds of mapping products and if there are any important thresholds and tipping points that folks utilize for community resilience planning.

John Wolf provided an overview for his 3D mapping and climate communication effort. He reminded folks that he shared 3D flooding visualizations for Crisfield, MD, Oxford, MD, and Ellicott City, MD at the March Meeting. These 3D visualizations are intended to help communicate increased climate vulnerability and risk. He is hoping that these tools are locally relevant and engaging to communities and stakeholders as a decision-support tool. With the amount of accessible 3D mapping data, he was hoping to develop products that use these features to help communicate climate issues for localities. He commented that previous discussions around these tools have raised interesting considerations when engaging with

communities. (e.g., approaching sharing this content with sensitivity). During this meeting, John was hoping to better understand the decision contexts where visualizations can enhance other topics or concerns, and to identify interested test-users for this product to support user research (i.e., identification of topical and geographically distributed use cases) and inform user experience (i.e., informing design of 3D landscapes). He commented that 3D visualizations allow end-users to also understand the vertical competent of climate change impacts and to visualize future scenarios. He provided his contact information (jwolf@chesapeakebay.net) in the chat so folks who are interested in being test-users can reach out to him.

Discussions

11:20 AM Steps for Engaging Communities in Climate Resilience Discussions [30 Minutes]

For this portion of the meeting, we will be conducting an activity focused on reviewing and providing insights for the "Community-Centric Adaptation Planning" seven-step process, which is the foundation for the "Proactive Planning for Resilience" best practices guide. Discussions will focus on what would be most helpful in a best practices guide, what is missing from the steps highlighted in the process, and what order the steps would provide the greatest decision-support for community resilience planning.

Discussion Questions:

- *Are these the steps the correct order for engagement?*
- *Do any of these steps resonate as "must-haves" and/or are there any steps that are not needed?*

Summary

This portion of the discussion focused on informing the development of the Community-Centric Adaptation Planning Framework that Elizabeth Andrews is developing. The framework is a seven-step process to engage with communities on the topic of adaptation planning. The overall discussion sought to better understand how this framework could be adjusted to better meet the community engagement and planning needs and if the appropriate steps are identified and/or should they be adjusted or combined.

The first portion of the discussion examined the sequential ordering of the steps to help inform the ordering of the framework. In Mentimeter, meeting attendees ordered the steps in the sequence that they felt would be most effective and appropriate (*slide one*). From the results, meeting attendees felt that *Community Engagement to Establish Priorities and Timeline* should be the first step.

Elizabeth Andrew's initial thoughts from the results highlighted two points. The first was that she originally started with *Community Engagement to Establish Priorities and Timeline* as the first step, but then she switched it to second because she felt like it would be a more informed community engagement if they have already assessed conducted an assessment of vulnerabilities and what is already being implemented. The second point she made is that she

highlighted that the attendees put *Funding: Select and Seek Funding Sources* ahead of *Detailed Planning: Develop Adaptation Action Plan*, underscoring how much funding influences adaptation planning. Kevin Du Bois commented that he thinks different kinds of funding come into play at different times, and that there may be a need to seek funding for community engagement, other funding for plan design, and other funding for plan review and adaptation.

Kate Vogel commented that she understands the questions around how this process should be ordered, and in her own work has identified similar steps in adaptation planning. In her work, she found that the engagement piece as the first step is important for trust building in communities to ensure that they feel like they are not getting information after the fact. She found that through this, communities have been more likely to engage throughout the entire process. Engagement in the beginning helps create community ownership in the effort. Ryland Taylor added in the chat that communities are tired of being studied first without their input.

Kristin Saunders commented that she feels similar sentiments to what Kate shared. She commented that in her role, she has seen examples of this conundrum around community engagement and where to place it in the process. She commented that she has seen efforts in the past feel like they need to do pre-engagement work and walk in with identified strategies to react to, and she underscored that across the board, this approach was met with a lack of trust. She also has found that approaching communities with an open discussion around what the communities' needs and challenges are has been more effective. She added that this initial conversation can be used to identify the issues facing communities and work backwards to identify strategies that align with the efforts priorities as well as the identified needs. She underscored the need to align with trusted sources and leaders within the community to also build trust. Ryland Taylor commented that the Adaptation and Resiliency Working Group just hosted a panel on utilizing Community Liaisons for effective community engagement and that the meeting was recorded for anyone who might be interested. Krista Romita Grolcholski commented that providing funding for communities and community liaisons/organizations is also critical.

Lauren Taneyhill commented that she likes having the assessments before establishing community priorities, but has felt there was a step missing -- between assessing vulnerabilities and establishing community priorities, she recommends adding a step for initial relationship building with a community that includes the activities Kate and Kristin shared. Amy Freitag agreed in that community engagement should come in many forms and at many different stages and should be involved in every step as partners.

Taryn Sudol commented that she thinks that communities should be approached with enough flexibility and other connections/partnerships to be able to respond if the community asks for something that is outside the scope of the organization leading the effort.

Joe Galarraga commented that if you want to get to the point of implementing and selecting funding then often times the community (however they are defined) will likely be a sub-

awardee on whatever funding is awarded, so it is important to build the partnerships early. He commented that engagement needs to happen first to even get to the subsequent steps.

Michael Maddox commented that he has had experience with how communities may respond to being approached by academic institutions. He underscored that to build that trust, they have had to be out in the community to establish the relationship. He added that without the relationship, they cannot even start talking about the science or vulnerabilities.

Jackie Specht commented that engagement can mean a lot of different things to different people, so it needs to be clear about what type of engagement the community is interested in (e.g., engaging with discussions and then coming back with a product or including a member of the community on the project team). She also commented that it is important to understand how these communities are being identified (e.g., are they self-identifying or is the government identifying communities). She underscored that to inform ordering of the steps, it is important to understand how the engagement is being initiated in the first place. Elizabeth commented that this is being written from the perspective of best practices for local governments who are working on launching adaptation planning. She added that this is helpful for her as she realizes she needs to parse through step one and step two of the framework better.

Kristin Saunders commented that the CBP's Local Leadership Workgroup have been successful at building curriculum for local leaders. She commented that once Elizabeth has a more complete draft of this guide, it might be good to seek out their feedback as well as talk about how to incorporate the best practices guide into the curriculum that is being delivered to local officials through their trusted sources like association of counties and planning conference. Jamileh commented that they have reached out to the Local Leadership Workgroup for this meeting and have made a connection for this effort.

The second question in the discussion focused on understanding which of the framework's steps resonated as "must-haves" and if there are any steps that might not be necessary. From the responses, there were common themes around initial and continued community engagement as well as the development for metrics for evaluation and to conduct iterative evaluations throughout the process (*slide two*).

Julie Reichert-Nguyen comment that she thinks that there are a couple comments in the Mentimeter that were not touched on in the last conversation. She highlighted the comment about creating a long-term engagement plan with the community to avoid "parachuting." She thinks that is so important, since the grant cycles are set up for only a short amount of time. It will be important to address this in the adaptation planning framework. She added that she has struggled finding opportunities that support long-term engagement with current grant structures.

Krista commented that in terms of evaluation, the Climate Adaptation Program (formerly RISA program) folks have done a lot of work on evaluating approaches for community-engaged and community-driven work. She commented that there are a lot of different approaches to

evaluation, included approaching social science and information gathering for evaluation in different formats (e.g., structured interviews versus surveys). She added that the work includes understanding how folks are not only evaluating the plan/implementation but also how they do their community engagement. Krista shared an article about the effort and a resource that could be helpful.

Lauren Taneyhill commented that she thinks that the Community-Centric Adaptation Planning framework could have an entirely separate circle of steps for the community engagement actions that complement every step of developing the adaptation plan. She added that looking at the Mentimeter comments, she realized that the topic of engagement was coming up for a number of times as necessary at different steps in the framework, so there is a potential for creating a separate, parallel community engagement framework that synthesizes what was commented. Julie and Kristin both commented that the idea was a great one, with Kristin adding that they have heard that communities are unhappy when they are engaged initially but not kept involved throughout the process.

11:50 AM Community Resilience Data and Metrics: Identifying Must-Haves and Gaps in Existing Decision-Support Tools [30 Minutes]

This portion of the meeting will focus on a discussion around common factors that local governments should consider when assessing their risks and vulnerabilities to climate change impacts. We will use the community resilience decision-support data, tools, and metrics identified from the pre-meeting questionnaire to inform this conversation. The outcome of the discussion will be an understanding of the decision-support tool considerations, gaps, and needs for localities to make informed climate resilience decisions.

Discussion Questions:

- *What factors do localities need to evaluate to undertake a comprehensive climate change risks, impacts and vulnerabilities assessment?*
- *Have you identified or encountered a gap in community resilience decision support tools that can support your work if filled?*

Summary
(*A list of tools with links can be found at the end of the minutes*)

This discussion focused on data, tools and metrics and to gain a better understanding of the common factors that local governments consider when assessing their risks and vulnerabilities to climate change. Jamileh prepopulated the Jamboard activity (*slide 3*), which focused on understanding preferred metrics and tools as well as preferred factors that respondents look for in a tool with the results from the pre-meeting survey. Respondents of the survey found that EJ Screen and similar environmental justice tools, tools around flooding and infrastructure, data and metrics that integrate climate change predictions are helpful. Furthermore, common

factors that they look for in tools include community-specific data, detail of the data (e.g., local, regional data and metrics), prediction ability and ability to visualize changes, and inclusion of social vulnerability metrics.

Julie asked if those who are actively working with communities have “must haves” for visualization tools, indicators, data and metrics when engaging in climate resilience conversations. Krista commented that she is data oriented and appreciates seeing maps and plots when having these conversations; she thinks that it is dependent on who they are engaging with. She added that without providing supporting materials that discuss what those visualizations are and why they are relevant, then the visualization might not be as effective. She commented on the overwhelming number of tools can be a hindrance to communities engaging with the tools, since they do not know where to start. She commented that what is lacking is supporting materials to help guide how to use tools. Julie commented that in the questionnaire that someone mentioned having the supporting materials to help interpret the tools is important. She provided an example with the NOAA Sea Level Rise Viewer which has video tutorials. Kristin Saunders added in the chat that they have been hearing similar comments: too many tools, no way to understand them all. To that point, they have been talking about "navigators" or "concierges" who can translate what these tools are showing or saying and help people utilize the data. John Wolf commented that he would love to chat more with Kristin on this topic, as they have a C-StREAM intern this summer developing a knowledge graph visualization of decision support tools in use by the Partnership.

Elizabeth Andrews commented in the chat that another challenge she has heard from local communities is that maps and models tend to show when roads will be inundated (e.g., by 2040, or 2050...) but not necessarily how many hours a day they will be inundated - which can really impact people's decision about if/when to relocate. Amy Freitag added that it’s a huge deal with stormwater. Rain models are probabilistic, which gets treated very differently than deterministic climate models

Kate commented that MD DNR hosts the MD Coastal Atlas which has metrics around flooding and sea level rise, however users cannot go to finer details and My Coast which shows on the ground information around flooding and incorporates precipitation, tidal cycles, and river stages. She commented that they have funding to create a flood visualization tool for the state of MD. The tool will have updated LIDAR data for finer detail than what the NOAA Sea Level Rise Viewer provides. They are gathering feedback on what different state, local, federal, and NGO partners find most helpful about the tool. She commented that it is important to understand how community is being defined when discussing tool use (e.g., local governments or home owners). Different end-users will have different preferences and needs with how the information is conveyed. She commented that she has seen tools down to parcel level, where users can put in their addresses and then have recommended adaptation strategies provided. She commented that that for mapping, the MDOT Climate Change Vulnerability Viewer allows users to understand nuisance flood inundation when clicking on specific points on the map. She said, for example, that could be helpful for local governments making decisions around critical infrastructure. She also highlighted Flood Adapt (not yet publically available), which is being

piloted in Calvert County, through a grant procured by the Department of Homeland Security, and in this tool, users can change the characteristics (e.g., adjusting precipitation, wind, or even storm paths) to understand impacts on communities. She added that Flood Factor is also a good tool that gives site specific information as well, and it gives a high level overview of climatic risks. She commented that they heard a lot from the state agency groups that the site specific data, with detailed sea level rise numbers is really important; she did add that, what really engaged people was the ability to visualize flooding at a site specific level. She described that My Coast does have this feature and can be brought into other mapping tools, but other state's tools have the ability to incorporate imagery of what that location might look like under different flooding projections. Her last point touches on the tool, Flood Vision, where people will be driving around to take pictures, similar to Google Maps, and show what flooding and sea level rise looks like throughout the East Coast. She provided a form to provide sites for the tool development. Kate added that she would be happy to discuss these ongoing efforts further, and to reach out to her if interested.

In the chat, Kevin Du Bois asked Elizabeth Andrews if the Middle Peninsula have a tool that identifies funding for climate resilience projects based on a property address search. Elizabeth commented that Middle Peninsula Planning District Commission has Fight the Flood, where property owners can put their own addresses into the tool to see what types of challenges they may face when it comes to flooding and get matched with potential loans and grants.

Kristin Saunders thanked Kate for the list of resources. She commented that something she sees as the biggest struggle is selecting which tools to use or understanding how to use the tools. She was curious if folks had a sense about whether or not technical service providers have people who are trained in these tools that are being developed. She was wondering if that is a potential group that can be trained on these tools to bring a multidisciplinary perspective, so when they are talking to stakeholders about different kinds of projects to implement in communities, they can serve in a translator role. She added that it could be a way to connect the gap that has formed with tool usage.

Joe Galarraga commented that his experience with the tools is that communities that are on the forefront of thinking about adaptation planning do not always have the resources or capacity to use the tools. He added, like Kristin said, is that there needs to be a liaison for the tools to provide hands-on technical assistance. There is some level of familiarity/literacy that needs to happen to use these tools.

Jamileh commented that both Kristin's and Joe's comments set the conversation up for the next part of the discussion, which focused on understanding gaps in community resilience decision-support tools. In the pre-populated portion of the jamboard (*slide 4*), gaps included better strategies for communicating about the tools, climate change impacts to infrastructure, near-term refinement of prediction, linking to strategies and solutions, and visualizations of community level impacts. She added that these comments tie in nicely with what Joe and Kristin said, in terms of needing liaisons to help communities use and interpret tools.

Kristin Saunders commented in the chat that as the Beyond 2025 steering committee seems poised to recommend investing in community liaisons, there is the opportunity to explore whether training technical service providers, land trusts and community liaisons could bridge the gap with resilience tools.

Kate Vogel commented that that Delaware has created an adaptation decision support tool where the community members' answer questions around what they are experience, and then the tool recommends solutions based on input provided to the tool. Ryland Taylor added that the CoastSmart meeting, taking place on August 28th, 2024, will have someone from North Carolina come and talk about their coastal hazards mapping tool that provides a menu style list of adaptation strategies for specific locations. Both Julie Reichert-Nguyen and John Wolf expressed interest in attending the meeting.

Krista Romita Grocholski commented that she and her colleague, Dr. Michelle Miro, wrote about our experience with speaking to folks in the Mid-Atlantic about what they needed to operationalize the information in the MARISA IDF curve tool. Several of the points we made are reflected in the responses she's seeing in the Jamboard. Kate Vogel commented that she loves the MARISA tool and is one of the only precipitation tools that they have. Jamileh Soueidan asked if there are ways they addressed the responses they heard when operationalizing the IDF curve tool. Krista commented that they are currently working on this. She highlighted the fact that they heard from a number of folks they talked to that they needed case studies as it is a useful way to convince folks. She added that she found local governments did not want to use the IDF curve tool unless they knew the state wanted them to. Conversely, the state did not want to make local governments use the tool, unless they wanted to. Both local and state governments/agencies wanted examples of its use. She also commented that responses highlighted the need for supportive materials to help with tool use. She added that it hard to find the funding for all the additional tool support so they can be operationalized.

Amy Freitag commented that boundary organizations like Sea Grant are really important, consistent points of context for communities too, in figuring out how to use all these tools.

12:20 PM Engaging with Communities on the Topics of Tipping Points and Thresholds [30 Minutes]

This discussion will focus on how to engage communities on the topic of shifts in adaptation strategies. Discussion topics include indicators for when adaptation strategies should shift, how to approach communities and engage with them, and sharing pitfalls and success stories on engaging with communities.

Discussion Questions:

- *How can we approach community conversations about tipping points with sensitivity?*
- *Are there identifiable tipping points or thresholds at which different decisions should be made, like retreat?*

Summary

This discussion focused on how to engage with communities around the topic of tipping points and thresholds. The first portion of the discussion examined how to approach these conversations with sensitivity and what are some thresholds that meeting participants use in their work (*slide 5*), while the second half of discussion sought to understand experiences and case studies on the topic (*slide 6*).

Julie Reichert-Nguyen commented that this topic is challenging for her. She told a story about one of the first community meetings she attended; when the topic of resilience came up, the community viewed it as the ability to rebuild as being resilient. She added that some of the tools that were discussed connect with an adaptation strategy, so she is also curious as to how they defined the thresholds. She also added that she has found a lack of information around thresholds when recommended adaptation strategies would no longer be effective in the face of changing climate conditions. Amy Freitag commented that this is a demand that she has heard through the Baltimore Vulnerability Assessment. She added that it would be really nice to have a menu of options, giving the example of having specific options for different levels of sea level rise. She added there is even more complicating factors even when having those "bands of feasibility" for specific adaptation strategies, including cost of implementing them.

Taryn Sudol commented that her work with coastal farmers makes it seem that this is an individual choice. When approaching the conversation, they feel like there are near-term day-to-day conditions that they are dealing with, which are a different set of circumstances from what they anticipate happening in the future. She said she discussed strategies they could implement now, with the caveat that conditions might get more intense in the future and the strategies may no longer be effective. She asks them to identify the threshold at when they would change strategies, which helps increase commitment to implementing the thresholds. Amy Freitag asked at what point Taryn is identifying these tipping points. Taryn responded that the non-pressure why to approach these conversations is to not put a hard number on it, rather hoping to address impacts as thresholds, however they did say that they defined long-term as more than 5 years into the future.

Elizabeth Andrews commented a summary, written by her research assistant, of the California Adaptation Pathways approach in the chat. In order to develop a useful list of strategies, there are four steps outlined in the CA plan. First, stakeholders must narrow the definition of the impact to be addressed and decide what a successful outcome would be with respect to this impact. Hopefully, narrowing the scope and definition of both the problem and objective alleviate some of the uncertainty. The second is identifying a range of strategies that could be used to create this outcome. It is important to have variance among the strategies in cost, duration, and impact, with flexibility for the climate scenario they address. The third is the evaluation and organization of strategies proposed in the previous step based on their benefits, costs, ease of implementation, and longevity of effectiveness through a feasibility assessment. Each strategy must have a designated point where it has lost its effectiveness to signal the need to choose another strategy. Finally, the compatibility of all these strategies should be assessed

together. She thought it is interesting that they start with the impact they want to address and define what a successful outcome would look like, and then they develop a number of different strategies to address it. She found it interesting that if they cannot figure out how to express the tipping point as an exact range, then they can talk about the impact they are experiencing or will experience as the trigger point for a strategy.

Elizabeth added another comment in the chat discussing how to determine tipping points. Many adaptation pathways plans refer to tipping points interchangeably as thresholds or triggers. These points indicate that the current management strategies are no longer sufficient and the next strategy, which already should have been decided, is needed. In order to see these coming, there is often a step before it which is referred to as a signpost, indicator, or signal. These are meant to occur before a threshold is reached and indicate that the next strategy will need to be ready to implement when a threshold is reached. While a community may not be able to define tipping points for themselves at the moment, setting clear thresholds based on measurable metrics is how most adaptation pathways clear this up. If a community is having trouble scientifically defining an exact range, it is possible for them to describe an impact they would likely experience and find a close analog that can be measured, either in demographic or scientific change. She cited this article, which informed the comment.

Julie commented some interesting takeaways from the jamboard (*slide 5*). She highlighted that repeated loss was written as threshold/tipping point that can be used to trigger adaptation strategies. She linked back to the discussion around tools, mentioning that they could possibly inform the potential for repeated loss in the future.

Elizabeth commented that she has had discussions with localities, hearing that people might not find future flood projection maps helpful, as they are usually bounded by certain factors (e.g., at high tide only). She has found that communities tend to adapt to limitations like periodic and predictable flooding (e.g., commuting only when it is low tide and a main road might be accessible). She did highlight that her work in rural communities underscored the issue of reliable transportation, and having nuisance flooding impact roadways exacerbated the issue. She added that a takeaway from the discussions was that social and economic situations will also inform the timeline for implementing strategies (e.g., retreat).

Another comment on the Jamboard (*slide 5*) focused on utilization of virtual reality and visualizations to help inform a discussion around tipping points with communities. Jamileh highlighted that some of the feedback that they received during the CRWG's March Meeting was to approach use of visualizations and virtual reality carefully, as it could be jarring for communities to visualize future impacts of climate change on their homes and communities. John Wolf commented that it was a point that Joe Galarraga had mentioned at the meeting. John added that the more realistic these visualizations become, the more impactful they can become and it is a real concern moving forward. He asked about what degree should visualizations be represented schematically or in ways that might not be as threatening. Joe responded that he completely agrees and that there is a lot of power in representing the impacts realistically, but it can be both scary and could lead to action. He thinks that having

built trust within the community would be imperative before employing use of realistic tools. Without the trust, using realistic visualizations could damage the relationship with the community and hinder progress. He thinks that there is a place for these tools. John commented that he interested in the ideas and suggestions from the group as well as identifying a community of practice who might be interested in the specifics of the 3D visualizations to test out some of these ideas. He added that if folks have names of people or communities who might be interested in helping to reach out to him. Joe commented in the chat to connect via email, as he thinks this could be something to bring to the City of Crisfield, MD's local government to beta test. Amy Freitag also mentioned that she can connect with John, as St Michaels, MD might also be interested.

The last discussion question aimed to solicit case studies on how folks have approached the topic of tipping points with communities. Julie commented that she knows that there is a lot of work occurring in the City of Crisfield in looking at resilience strategies for flooding. She wondered if John or Joe had any insights.

Joe commented that due to the nature of co-developing solutions with the City of Crisfield, the community actually ended up selecting adaptation strategies that were primarily hardened infrastructure (e.g., tide gates, berms, elevating roads). He also thinks that through this work, it has led to these conversations around what different types of strategies (hardened versus nature-based) can provide. He also highlighted that this was a community that was reluctant to use the terms climate change and sea level rise. He also highlighted that the more frank conversations around tipping points did not resonate as much with the community in the same way. The way they ended up approaching the conversations was to focus on very specific issues, and he provided an example around the community's choice to move their volunteer fire department due to flooding. He noted that it takes a lot of time and capacity to have these discussions especially as every community is different, with different issues and dynamics. He also commented that on a community level, this is the type of effort that needs sustained support to work, and that can be impacted by local administrations changing.

Julie commented at the end of the discussion that what she heard over the course of the meeting is that there needs to be increased support for climate-community liaisons and experts working with the communities. She highlighted that there is a mismatch with the limited workforce who has this expertise and the sheer number of communities who need support. Julie commented on previous efforts to develop a resilience assessment framework that communities could implement, but when they heard back from the communities, they were told that there is no capacity to implement the framework. Elizabeth commented that her previous work also included developing a resilience assessment tool by request from the state of Virginia, and when the tool was complete, they found that the communities of interest did not have the capacity to actually use it.

12:50 PM Closing Thoughts, Recap, Next Steps [10 Minutes]

Summary

Julie asked Elizabeth, Amy, and John if there were any more next steps that could be helpful to inform these efforts. Julie commented that Jamileh would be drafting minutes and that there is the potential for another community resilience working meeting to follow up and continue this discussion if there is interest.

Elizabeth commented that she would be interested to have folks review the draft of the guide she is developing, which should be near-complete by the end of July. Amy commented that the feedback from the meeting has been the most helpful for her, but she commented that as they are developing their vulnerability assessment for Baltimore, it would be helpful to have folks who are interested review it. She is also interested in seeing if folks from other districts would find this kind of assessment helpful for their region. Lastly, John commented that in addition to the 3D visualizations, they have a number of activities around the topic of targeting work, so he was interested in the overall conversation regarding the abundance of targeting tools and how they can be more findable for end-users.

1:00 PM Adjourn

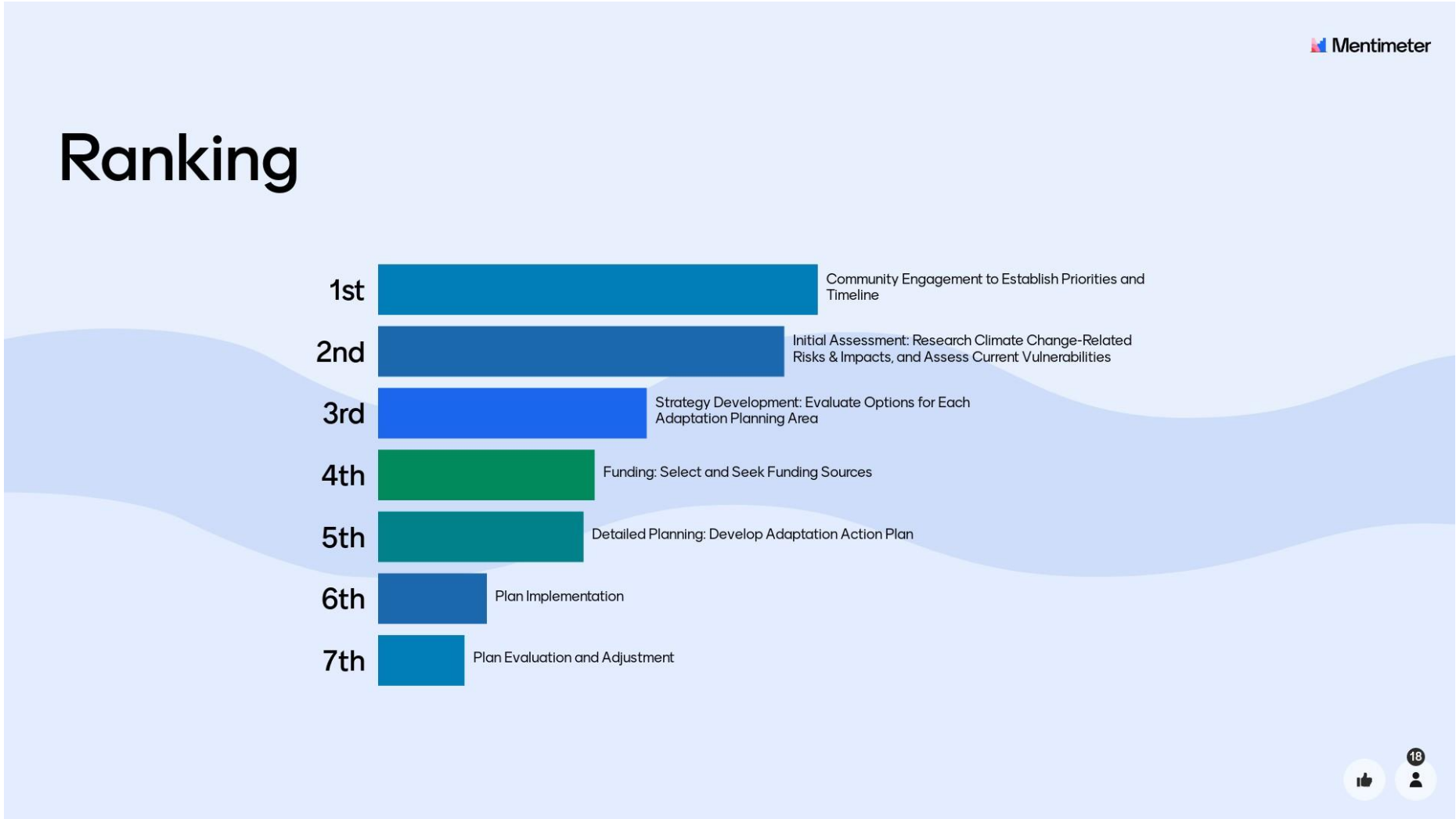
Participants

First Name	**Last Name**	**Affiliation**
Amy	Freitag	NCCOS
Arianna	Johns	VA DEQ
Bill	Ball	JHU Emeritus Professor
Bria	Pope	NOAA
Bryn	Kearney	NCBO
Cindy	Dyballa	Takoma Park City Council
Debbie	Herr Cornwell	MDP
Elizabeth	Andrews	UVA
Emma	Corbitt,	HRPDC
Jackie	Specht	MD DNR
Jamileh	Soueidan	CRC
Jim	George	MDE
Joe	Galarraga	TNC
Joe	Rieger	MIDLANT
John	Wolf	UGSG
Julia	Staranowski	NCBO
Julie	Reichert-Nguyen	NCBO
Kate	Vogel	MD DNR
Kayle	Krieg	MD Sea Grant
Ken	Hyer	USGS
Kevin	Du Bois	DoD
Krista	Romita Grocholski	RAND/MARISA

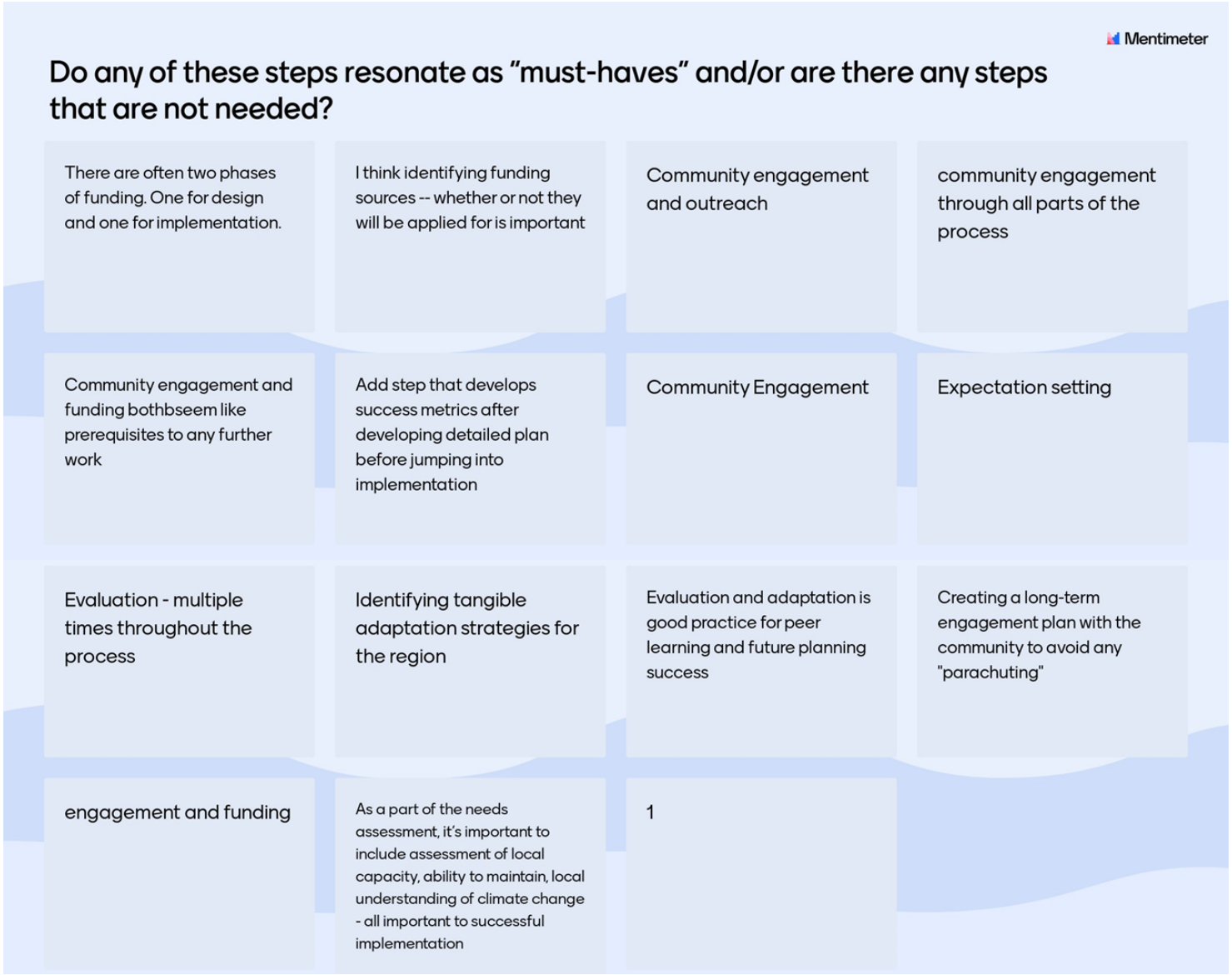
Kristin	Saunders,	UMCES
Krysta	Hougen-Ryall	NCBO
Lauren	Taneyhill	NCBO
Mark	Bennett	USGS
Meredith	Lemke	CRC
Michael	Maddox	UMD
Michele	Berry	Chesapeake Stormwater Network
Ryland	Taylor	MDNR
Sophie	Waterman	CRC
Taryn	Sudol	MD Sea Grant
Virginia	Tippie	Eastport Yatch Club

Tools and Links:

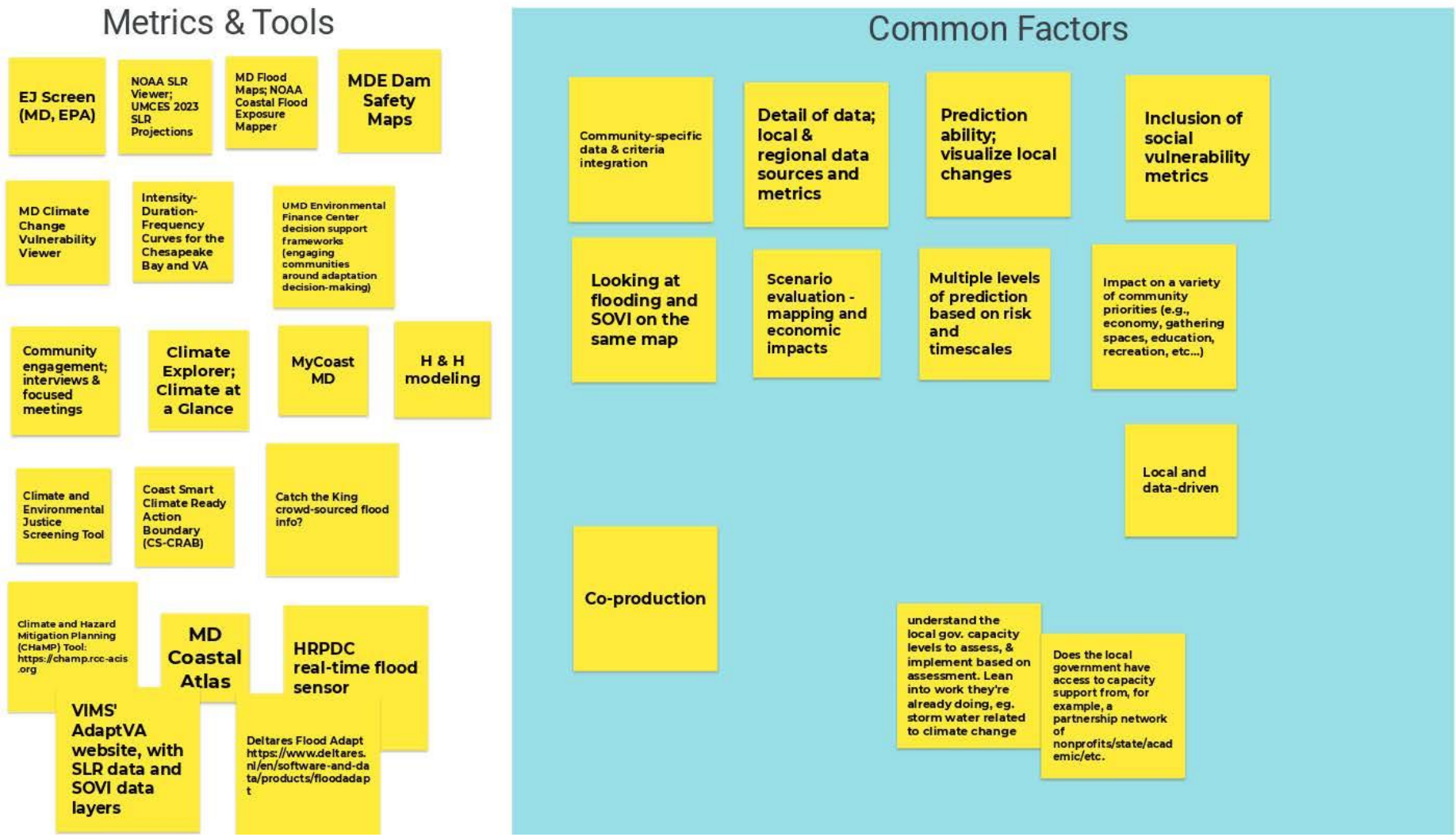
Data & Tools
MD EJ Screen
EPA EJ Screen
NOAA SLR Viewer
UMCES 2023 SLR Projections
NOAA Coastal Flood Exposure Mapper
MDE Dam Safety Maps
MD Climate Change Vulnerability Viewer
Intensity-Duration-Frequency Curves
Climate Explorer
Climate at a Glance
MyCoast MD
Catch the King
Coast Smart Climate Ready Action Boundary
Climate and Hazard Mitigation Planning Tool
MD Coastal Atlas
HRPDC Real-Time Flood Sensor
AdpatVa
Deltares Flood Adapt
I-Adapt


Mentimeter
Ranking
1st
Community Engagement to Establish Priorities and Timeline
2nd
Initial Assessment: Research Climate Change-Related Risks & Impacts, and Assess Current Vulnerabilities
3rd
Strategy Development: Evaluate Options for Each Adaptation Planning Area
4th
Funding: Select and Seek Funding Sources
5th
Detailed Planning: Develop Adaptation Action Plan
6th
Plan Implementation
7th
Plan Evaluation and Adjustment
18

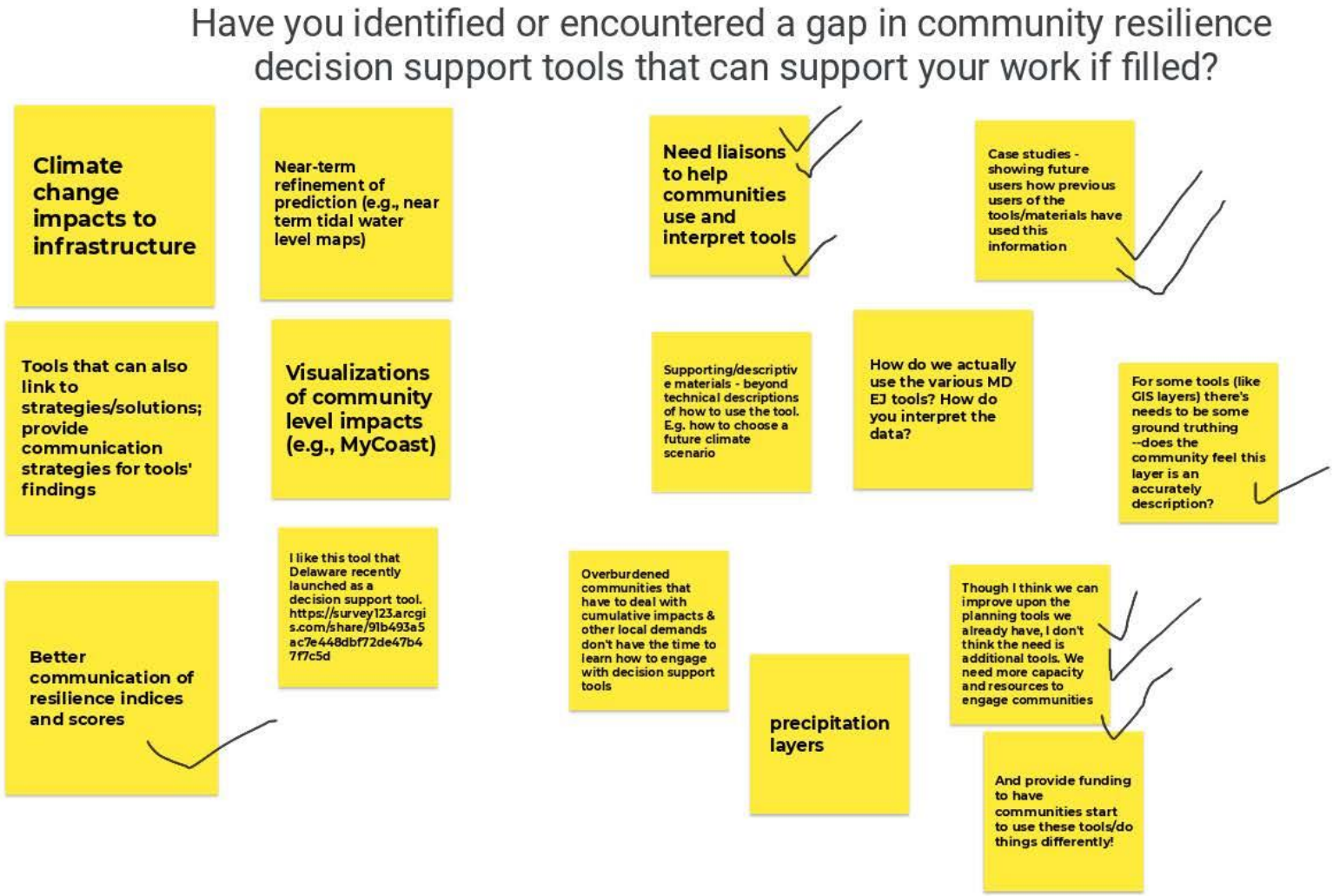
Slide 1


Mentimeter
Do any of these steps resonate as "must-haves" and/or are there any steps that are not needed?
There are often two phases of funding. One for design and one for implementation.
I think identifying funding sources -- whether or not they will be applied for is important
Community engagement and outreach
community engagement through all parts of the process
Community engagement and funding bothbseem like prerequisites to any further work
Add step that develops success metrics after developing detailed plan before jumping into implementation
Community Engagement
Expectation setting
Evaluation - multiple times throughout the process
Identifying tangible adaptation strategies for the region
Evaluation and adaptation is good practice for peer learning and future planning success
Creating a long-term engagement plan with the community to avoid any "parachuting"
engagement and funding
As a part of the needs assessment, it's important to include assessment of local capacity, ability to maintain, local understanding of climate change - all important to successful implementation
1

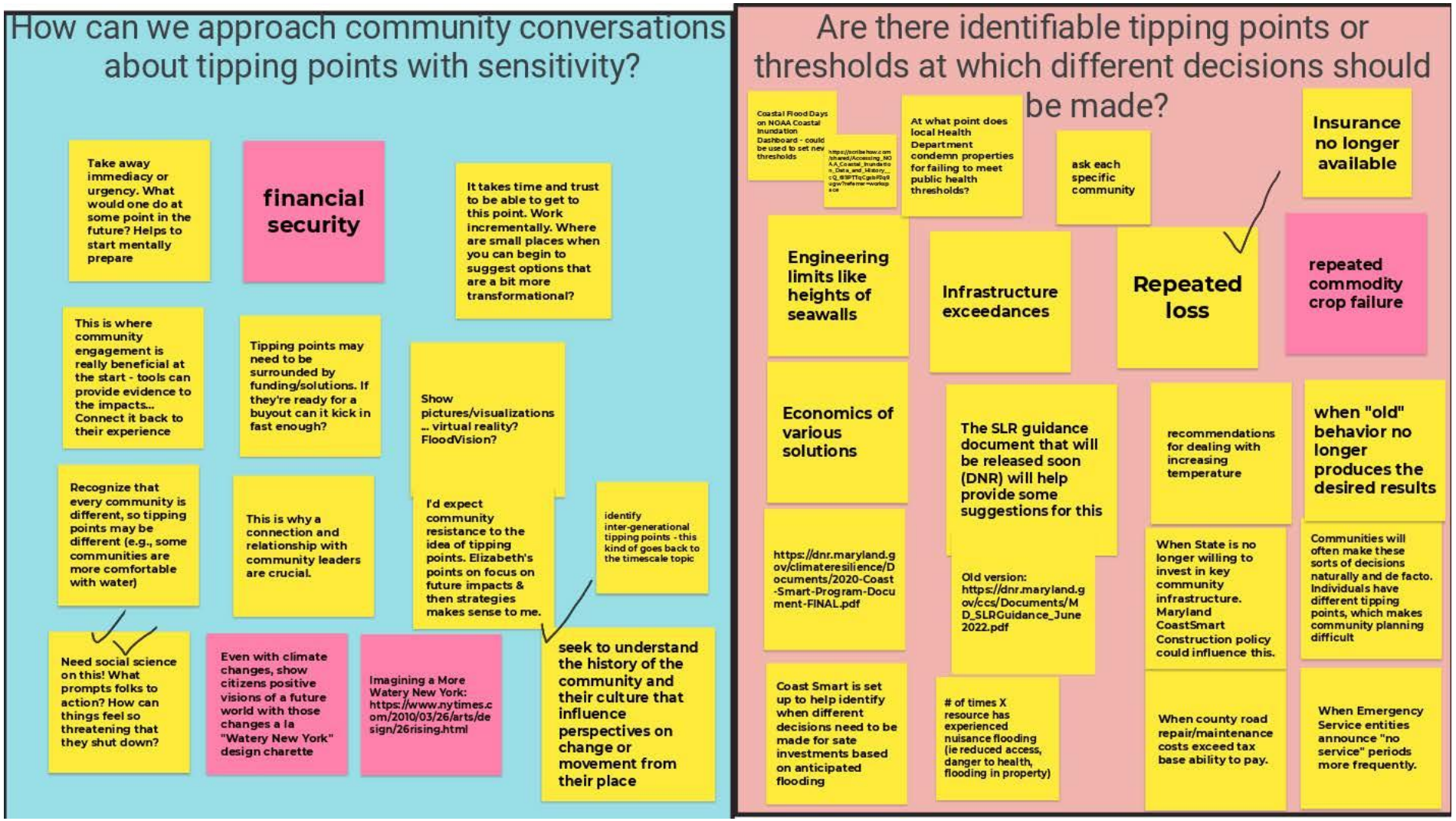
(Slide 2)


Metrics & Tools
EJ Screen (MD, EPA)
NOAA SLR Viewer; UMCES 2023 SLR Projections
MD Flood Maps; NOAA Coastal Flood Exposure Mapper
MDE Dam Safety Maps
MD Climate Change Vulnerability Viewer
Intensity-Duration-Frequency Curves for the Chesapeake Bay and VA
UMD Environmental Finance Center decision support frameworks (engaging communities around adaptation decision-making)
Community engagement; interviews & focused meetings
Climate Explorer; Climate at a Glance
MyCoast MD
H & H modeling
Climate and Environmental Justice Screening Tool
Coast Smart Climate Ready Action Boundary (CS-CRAB)
Catch the King crowd-sourced flood info?
Climate and Hazard Mitigation Planning (CHaMP) Tool: https://champ.rcc-acis.org
MD Coastal Atlas
HRPDC real-time flood sensor
VIMS' AdaptVA website, with SLR data and SOVI data layers
Deltares Flood Adapt https://www.deltares.nl/en/software-and-data/products/floodadapt
Common Factors
Community-specific data & criteria integration
Detail of data; local & regional data sources and metrics
Prediction ability; visualize local changes
Inclusion of social vulnerability metrics
Looking at flooding and SOVI on the same map
Scenario evaluation - mapping and economic impacts
Multiple levels of prediction based on risk and timescales
Impact on a variety of community priorities (e.g., economy, gathering spaces, education, recreation, etc...)
Local and data-driven
Co-production
understand the local gov. capacity levels to assess, & implement based on assessment. Lean into work they're already doing, eg. storm water related to climate change
Does the local government have access to capacity support from, for example, a partnership network of nonprofits/state/academic/etc.

(Slide 3)


Have you identified or encountered a gap in community resilience decision support tools that can support your work if filled?
Climate change impacts to infrastructure
Near-term refinement of prediction (e.g., near term tidal water level maps)
Need liaisons to help communities use and interpret tools
Case studies - showing future users how previous users of the tools/materials have used this information
Tools that can also link to strategies/solutions; provide communication strategies for tools' findings
Visualizations of community level impacts (e.g., MyCoast)
Supporting/descriptive materials - beyond technical descriptions of how to use the tool. E.g. how to choose a future climate scenario
How do we actually use the various MD EJ tools? How do you interpret the data?
For some tools (like GIS layers) there's needs to be some ground truthing --does the community feel this layer is an accurately description?
I like this tool that Delaware recently launched as a decision support tool. https://survey123.arcgis.com/share/91b493a5ac7e448dbf72de47b47f7c5d
Overburdened communities that have to deal with cumulative impacts & other local demands don't have the time to learn how to engage with decision support tools
Though I think we can improve upon the planning tools we already have, I don't think the need is additional tools. We need more capacity and resources to engage communities
Better communication of resilience indices and scores
precipitation layers
And provide funding to have communities start to use these tools/do things differently!

(Slide 4)


How can we approach community conversations about tipping points with sensitivity?
Take away immediacy or urgency. What would one do at some point in the future? Helps to start mentally prepare
financial security
It takes time and trust to be able to get to this point. Work incrementally. Where are small places when you can begin to suggest options that are a bit more transformational?
This is where community engagement is really beneficial at the start - tools can provide evidence to the impacts... Connect it back to their experience
Tipping points may need to be surrounded by funding/solutions. If they're ready for a buyout can it kick in fast enough?
Show pictures/visualizations ... virtual reality? FloodVision?
Recognize that every community is different, so tipping points may be different (e.g., some communities are more comfortable with water)
This is why a connection and relationship with community leaders are crucial.
I'd expect community resistance to the idea of tipping points. Elizabeth's points on focus on future impacts & then strategies makes sense to me.
identify inter-generational tipping points - this kind of goes back to the timescale topic
Need social science on this! What prompts folks to action? How can things feel so threatening that they shut down?
Even with climate changes, show citizens positive visions of a future world with those changes a la "Watery New York" design charette
Imagining a More Watery New York: https://www.nytimes.com/2010/03/26/arts/design/26rising.html
seek to understand the history of the community and their culture that influence perspectives on change or movement from their place
Are there identifiable tipping points or thresholds at which different decisions should be made?
Coastal Flood Days on NOAA Coastal Inundation Dashboard - could be used to set new thresholds
At what point does local Health Department condemn properties for failing to meet public health thresholds?
ask each specific community
Insurance no longer available
Engineering limits like heights of seawalls
Infrastructure exceedances
Repeated loss
repeated commodity crop failure
Economics of various solutions
The SLR guidance document that will be released soon (DNR) will help provide some suggestions for this
recommendations for dealing with increasing temperature
when "old" behavior no longer produces the desired results
https://dnr.maryland.gov/climateresilience/Documents/2020-Coast-Smart-Program-Document-FINAL.pdf
Old version: https://dnr.maryland.gov/ccs/Documents/MD_SLRGuidance_June2022.pdf
When State is no longer willing to invest in key community infrastructure. Maryland CoastSmart Construction policy could influence this.
Communities will often make these sorts of decisions naturally and de facto. Individuals have different tipping points, which makes community planning difficult
Coast Smart is set up to help identify when different decisions need to be made for sate investments based on anticipated flooding
# of times X resource has experienced nuisance flooding (ie reduced access, danger to health, flooding in property)
When county road repair/maintenance costs exceed tax base ability to pay.
When Emergency Service entities announce "no service" periods more frequently.

(Slide 5)


Engaging Communities on Thresholds and Tipping Points:
Pitfalls & Success Stories
Stories from buy out programs (maybe NJ)
Oxford 2100 project
https://oxfordmd.net/oxford-2100/
St. Michaels -- using MyCoast
Imaging a more watery New York: https://www.nytimes.com/2010/03/26/arts/design/26rising.html
Deal Island Peninsula Partnership (DIPP) -- now using MyCoast
Lead the Shore Initiative - Community Empowerment
possible pitfall - using urban examples with rural communities. falls flat in my experience.

(Slide 6)