COLLABORATIVE SCIENCE IN A VIRTUAL WORLD: RECOGNIZING LIMITS AND LEVERAGING OPPORTUNITIES

WEBINAR SUMMARY REPORT | JULY 2020

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About the NERRS

The National Estuarine Research Reserve System (NERRS) is a national network of 29 coastal reserves located in 24 states and Puerto Rico. Each site includes programs focused on land stewardship, research and scientific monitoring, training programs for the public and local officials, and education.

About the NERRS Science Collaborative

The NERRS Science Collaborative is a NOAA-funded program that provides grants and other support for user-driven collaborative research, assessment, and transfer activities that address critical coastal management needs identified by the reserves.

About this document

The individuals featured in this brief participated in a panel webinar on May 28, 2020 to discuss some of the implications of planning and conducting collaborative science virtually. This document was prepared by NERRS Science Collaborative staff, with input from James Arnott, Julia Wondolleck, Kristen Goodrich, and Shannan Lewinski.

BACKGROUND AND INTRODUCTION

Collaborative science involves working closely with partners at every stage - from conceptualizing a new project, to conducting the research, to refining tools to best meet a management need. As a result, it can be challenging to imagine how to adapt collaborative science practices to a new, socially-distant reality. On May 28, 2020, the Science Collaborative hosted a webinar in which panelists with expertise in collaborative processes, stakeholder engagement, and virtual meeting design explored some of the implications of planning and conducting collaborative science virtually.

To better understand current concerns and promising strategies for virtual engagement, the Science Collaborative evaluated and binned responses to questions posed to participants before, during, and after the webinar. Feedback from the webinar exit survey suggested that the most common elements that need to adapt to a virtual environment relate to one, or a combination, of three major areas: **building new partnerships (56%); coordinating diverse teams (25%); and soliciting end user feedback (13%).** Some examples of the needs articulated by participants are listed below:

Building partnerships

- How do you build trust and gather input from communities who may have limited access to technology or the internet?
- How do you develop a research community from only loosely affiliated members?

Coordinating diverse teams

- How do you get the ball rolling without an in-person launch?
- How do we create space for ideation, big thinking, and strategic planning in a virtual environment?

Soliciting end user feedback

- Is there a way to conduct participation-based, user-feedback workshops online?
- What should or shouldn't be expected in terms of participation/feedback when adapting a meeting from in-person to virtual?
- How do we solicit input to our regional plan from multiple organizations and communities virtually, rather than in-person, as we'd usually do?

National Estuarine Research Reserve System Science Collaborative

ABOUT THE SPEAKERS

Kristen Goodrich, Coastal Training Program Coordinator, Tijuana River NERR

Kristen Goodrich is the Coastal Training Program Coordinator at the Tijuana River National Estuarine Research Reserve. There, she provides training and technical assistance to coastal decision-makers in Southern and Baja California. Working on the U.S.-Mexico border has provided her with a unique perspective on the challenges and opportunities for collaboration and boundary-spanning and inspires her research on psychosocial resilience.

Shannan Lewinski, Instructional Designer and Learning Specialist, NOAA Office for Coastal Management

Shannan Lewinski is an instructional designer and learning specialist with NOAA's Office for Coastal Management. In this role she helps design training and offers guidance and production support for a range of virtual meetings and workshops.

Julia Wondolleck, Professor, UM School for Environment and Sustainability & NERRS Science Collaborative

Julia Wondolleck has spent the past 30 years researching and writing about collaborative processes in the management of natural resources. She is a professor at the University of Michigan where she teaches courses in collaborative resource management, alternative dispute resolution, and integrative negotiation and mediation.

Moderator: **James Arnott,** Executive Director, Aspen Global Change Institute & NERRS Science Collaborative

James Arnott is the Executive Director of the Aspen Global Change Institute. James' research seeks to understand how to better link scientific knowledge with decision-making through research on collaborative science and science funding. James is also a visiting scholar at the University of Michigan's Graham Sustainability Institute.

DISCUSSION SUMMARY

Before responding to participant questions, each panelist provided brief introductory comments related to their experiences and respective areas of expertise.

What are we learning and what do we need?

James Arnott, the session moderator, began with an introduction of the topic and opening comments about the unique advantages of collaborative research programs that foster interaction and learning among researchers, sponsors, and users. Reflecting on the implications for sustainable practices, he noted that the current challenges offer an opportunity to experiment, learn, and share ideas about how we do collaborative research, and how we can adapt approaches to be as efficient and effective as possible with limited resources. He encouraged participants to think about when it makes sense to replace a video call with a phone call, email or letter, and how to select among a broader set of approaches when social distancing is no longer essential.

Essential ingredients for successful collaboration

Julia Wondolleck, a scholar of collaborative processes, explained that we know what makes collaborations work, and that we now just need to learn how to foster those elements in a virtual world. Julia identified and explained the factors that contribute to successful collaboration by classifying them into two categories: bricks and mortar. "Bricks" refer to tangible factors including memoranda of understanding (MOUs), charters, decision rules, meeting agendas, advisory councils, and working groups. "Mortar" refers to intangible factors that hold the bricks together, and describe the behaviors and motivations of the people involved. Julia noted that while both are required, mortar may be more tenuous in a virtual world.

She concluded by describing **four factors** that emerged from a study of factors that sustain successful collaboration:

1. **Commitment** - the partnership sustained its commitment to the process;
2. **Continuity** - the partnership's purpose didn't waiver or become vague, and transitions in personnel were carefully managed;
3. **Compelling focus** - the process objectives, goals, and purpose mattered to those involved;
4. **Communication** - a structure existed to foster sustained communication, including regularly-scheduled meetings and having someone in charge of the process who checks in with partners, is available to answer questions, and maintains needed communication.

Key takeaways on collaboration from Julia:

- **Effective process** comes from well-managed meetings where roles are clearly defined, and logistics are managed efficiently; i.e., participant time is "well spent."
- Pay attention to what is **particularly threatened** when all of the collaborative interaction occurs virtually.
- Look for different ways to **fulfill and sustain** these vital attributes of collaboration in a virtual world.

Sustaining partnerships and meeting the needs of decision makers virtually

Kristen Goodrich provided a collaboration practitioner's perspective, and described how she and other coastal training program coordinators are tasked with spanning boundaries across science, policy, and decision making through training and technical assistance. Kristen noted how collaborators have rapidly had to rise to new challenges in the face of a global pandemic, and to facilitate and participate in virtual events in ways they never have before. She also provided examples of groups that have been leading by example, such as the Local Government Commission, which produced a virtual engagement guide in May 2020 that provides key considerations, specific advice, and some tools and resources for virtual meetings.

Key takeaways on training and facilitation from Kristen:

- Whether for an in-person or virtual collaborative process, the IAP2 Spectrum of Participation can help you develop your approach to engagement and participation based on objectives.

- Post-workshop evaluations indicate that participants value the **ability to network**. The challenge then becomes how to overcome this shortcoming of virtual meetings, such as finding creative ways to overcome distance (look to pre-COVID strategies with remote partners) and **foster a feeling of togetherness.**

- Engaging virtually can be taxing for facilitators and participants for a number of reasons. Not all meetings necessitate a virtual platform. **Self care and compassion** are important as we continue to navigate adapting to a virtual world.

Tools & techniques for effective virtual meetings

Shannan Lewinski shared technical tools and tips she has developed through her experiences producing virtual meetings and webinars. She began by highlighting some key differences between virtual and in-person meetings, and some common mistakes in adapting a meeting or event for a virtual setting. In particular, she explained how adapting a meeting originally intended to be held in-person can be more complicated than following an agenda on a virtual platform, and time should be built into the planning process to test tools and techniques, and troubleshoot any technical issues. She also noted that virtual meetings have a limited amount of time, which requires producers to think about what tools are available, and when to use them (e.g., in real time or ahead of the session) to gather input.

Best practices for virtual meetings from Shannan:

- Clearly **establish the objective** of what you want to accomplish in the session.

- Create a **virtual process agenda** to keep everyone organized throughout the meeting. Visit the Office for Coastal Management's website to see a sample process agenda.

- **Identify roles** for facilitators, producers, and moderators (if needed) ahead of time.

- Design participant **interactions based on objectives,** and use tools with a specific purpose in mind. Examples include polls, chat boxes, breakout rooms, whiteboards, or other collaborative tools.

- **Plan ahead**, schedule a dry run before your meeting, and establish contingency plans for

audio and internet issues. Facilitators and producers should always log in 20 to 30 minutes early.

- To facilitate welcomes and orientations, provide **icebreaker or welcome activities.** Provide logistics and explain platform tools being used, and set expectations for engagement up front.

- Evaluate each session through **participant and self evaluations.**

- Give attendees some headspace to think about things **on their own time** by using other collaborative tools to gather feedback either before or after a virtual meeting. This can help prevent "virtual fatigue."

NEXT STEPS

Moving forward, the Science Collaborative is considering ways to build on this session and serve the needs of collaborators and project teams that are just starting to grapple with how to re-envision aspects of their work in light of the pandemic. We plan to continue to weave some of these key themes into our work - focusing on bricks and mortar of good collaboration, embracing new ways to network and build connections, building in lots of advance planning, and formalizing and sharing our learning during these unprecedented times.

Visit our new Virtual Engagement Resources page for an updated list of resources that may be useful to collaborative science practitioners.

CHALLENGES, ADVICE, AND RESOURCES

The following tables were developed based on webinar attendee feedback provided in the registration questionnaire, during the live discussion, and through a post-webinar exit survey. Table 1 lists and categorizes common challenges and considerations of virtual collaboration. Table 2 lists some useful strategies and techniques for successfully collaborating in the current environment. Table 3 describes useful tools and resources suggested by participants.

DISCUSSION AND SUMMARY

TABLE 1. COMMON CHALLENGES IN VIRTUAL COLLABORATION		
Technological	• Limited or unreliable internet access. • Limited internet bandwidth. • Finding the right platform for sharing files.	• Limited access to reliable technology. • Hardware or software not behaving as expected.
Platform Limitations	• Skills and experiences with different virtual platforms and associated tools. • Organizational requirements (e.g. bans on use of certain platforms).	• Large number of choices in platforms. • Finding the right tools to collect input (e.g. polls, surveys, data, images).
Planning and Designing Meetings	• Assessing time needed to plan, prepare for, and host a virtual event. • Encouraging attendance.	• Creating effective breakout rooms. • Providing technical support or demonstrations remotely. • Building in sufficient time and approaches for decision-making within a meeting.
Engaging Participants and Stakeholders	• Facilitating and achieving real dialogue. • Maintaining participant attention for prolonged periods of time. • Making sure people feel heard.	• Managing conflicts remotely. • Getting people to speak up. • Maintaining contact after a meeting. • Getting collaborators to dedicate time to virtual engagement.
Accessibility and Equity	• Promoting equity and encouraging participation by all attendees. • Ensuring access for under-represented groups. • Ensuring content is accessible to all relevant audiences.	• Varying levels of access to virtual platforms. • Lack of familiarity with virtual platforms. • Reaching people with or without social media.
Emotional and Psychological	• Virtual fatigue. • Differences in non-verbal cues. • Sensory overloads/triggers. • Personal/professional boundaries blurred.	• Lack of energy and inspiration compared to in-person meetings. • More distractions in remote settings.
Interpersonal	• Loss of casual networking opportunities. • Less one-on-one and side conversations. • Conversations may be more likely to feel stilted.	• Less organic brainstorming. • More challenging to foster genuine connections. • Difficult to asses the meaning of silence. • New rules needed to avoid talking over others.
Other Collaboration Challenges	• Making initial contact with partners who may be difficult to reach. • Maintaining momentum, creativity, and engagement. • Convincing some researchers to dedicate time to virtual engagement when time and resources are limited. • Adapting all project engagements to virtual methods is daunting and time consuming.	• Importance of follow-up communication. • Building trust and developing relationships. • Having too many virtual meetings. • Designing a thoughtful process to facilitate decision making in a virtual setting.

DISCUSSION AND SUMMARY

TABLE 2. USEFUL STRATEGIES AND TECHNIQUES		
Technology	• Pick up the phone - not all meetings have to be video conferences. • Record virtual meetings so people can return to the content at their leisure. • Designate a staff person to manage tech support for the meeting (a "producer").	• Use open-access software to solicit feedback and collaborate remotely (e.g. Google docs, jamboard, or other publicly available tools). • Provide a call-in number for people who may have an unreliable internet connection.
Planning and Meeting Design	• Test all technology ahead of time. • Develop detailed process agendas and share with all meeting planners. • Build in ample time for breaks and troubleshooting. • Provide an agenda for attendees prior to the meeting and stick to it. • Build check-in and decision points into the agenda. • Come ready with recommendations on which to seek input, instead of vice versa.	• Set clear expectations and goals prior to the meeting and share with attendees. • Be ready to answer questions • Give people real work before or between meetings. • Keep meetings to a manageable size (e.g. number of participants, length of meeting) and plan on fewer topics in order to focus discussion. • Consider holding multiple smaller meetings instead of one larger or longer one. • Include sufficient breaks - e.g., one short break every hour - to ease fatigue.
Engagement and Communication	• Communicate early and often. • Pick a platform with chat functionality for Q&A and to encourage more introverted people to "speak up". • Share summaries and action items after meeting.	• Use low-tech icebreakers at the beginning of a session and after breaks (e.g. typing responses into chat boxes). • Consider switching from in-person interviews to web-based or mailed surveys.
Accessibility and Equity	• Incorporate better visual elements to reduce on-screen text and overly technical language. • Use a variety of modes to gather input during and after meeting - chat, polls, follow-up emails, Google docs, phone calls.	• Use platforms that are widely accessible and trusted across generations. • Provide documents and resources in cross-platform formats (e.g. PDFs, URLs).
Emotion and Psychology	• Play music during breaks. • Meetings don't always have to be an hour. • Add elements of humor, fun, and empathy.	• Be flexible and open-minded. • Begin with a mindfulness activity. • Include photos that fill the screen rather than text.
Interpersonal	• Ask people to turn on video but give them permission to turn it off at less critical times.	• Role call at the beginning, with introductions.

TABLE 3. SUGGESTED TOOLS AND RESOURCES		
Webinar and Conferencing Platforms	• Zoom - Host up to 100 participants with a free account. Group meetings limited to 40 minutes. Note: Many federal employees are not permitted to use Zoom. • GoToWebinar / GoToMeeting - Sophisticated subscription webinars and virtual meetings with drawing tools and polling for engagement. No free account option. • Google Meet - Free, simple, web-based video call platform.	• 8x8 - Free and subscription video and audio conferencing up to 50 participants. • Adobe Connect - Sophisticated subscription meeting, learning, and webinar platform with whiteboard and other drawing tool options for engagement. Pricing varies by services on plan. • Cisco WebEx - Host up to 100 participants for up to 50 minutes with a free account. • BlueJeans - Subscription video conferencing platform. Host up to 50 participants with a basic account starting at $9.99/month.
Storage and Sharing Tools	• Google Drive - Store, share, and collaborate on files and folders from any mobile device, tablet, or computer. Supports all file types. • DropBox - Up to 5 TB of file storage, starting at $12.50 per user per month.	• GitHub - Free and premium account options. Store, share, and collaborate on code. • SharePoint - Web-based, collaborative document storage and management platform from Microsoft that integrates with Microsoft Office suite.
Collaboration and Access Computer Tools	• Google Suite (Docs, Sheets, Slides). Google account not required to collaborate. Customizable access options. • Jamboard - Sketch ideas as a team on an interactive digital Google whiteboard. • Monday Task Manager - Customizable project and workflow manager for teams. • Ideaflip - Simple web application for team brainstorming. • Padlet - Make fun, visually appealing boards, documents, and webpages. Free and premium options available. • Mural - Digital workspace for visual collaboration. Paid subscription required.	• Adobe Acrobat - Using a universal file format such as PDF is a good method for promoting equitable access. Adobe Acrobat is free to download, works in all operating environments, and integrates with most existing file types and software. • Microsoft Teams - Free and premium team messaging, video calling, file sharing, and coauthoring, all with Microsoft suite integration. • Smartsheet - Team process organization and workflow management. Paid subscription required. • Lucidchart - Free and premium data visualization and diagramming web tool.
Survey Platforms and Data Collection Tools	• Google Forms -Free survey and registration forms, minimal bells and whistles. • SurveyMonkey - Free and subscription survey software. • Mentimeter - Implement interactive polling and quiz questions into presentations.	• Qualtrics - Advanced survey web application, subscription required. • Survey123 - Desktop and mobile survey platform that integrates data with ArcGIS applications.
Engagement, Communication, and Networking Tools	• MailChimp - Free and subscription customized HTML emails. • Discord - Free web- or application-based voice and text chat servers. Now with options for screen sharing and video calls. • Slack - Free or premium team chat and workflow organizer. Integrates with external software. • LinkedIn - Web-based professional networking.	• Telegram - Secure encrypted messaging application tied to a phone number. • 2nd Life (or other virtual or augmented reality tools) - Vast, virtual, shared world. • Kahoot - Free web and application based learning, quiz, and trivia platform.

TABLE 3. SUGGESTED TOOLS AND RESOURCES		
Training and Best Practices	• Running Good Virtual Meetings (Habitus Incorporated) • 9 Tips for Engaging Virtual Meetings (Climer Consulting) • Beyond Inclusion: Equity in Public Engagement (Simon Fraser University) • Virtual Meeting Engagement Job Aids (NOAA) • How to Facilitate a Virtual Meeting (NOAA) • Center for Scientific Collaboration and Community Engagement	• Cathy Angell Training • Techniques for Facilitating Virtual Meetings (NOAA OCM) • Own the Room Zoom training • Impact by Design • Are you r(EDI) to Zoom? (The Justice Collective) • Best Practices for Virtual Engagement (Local Government Commission) • 10 Tips for Improving Online Meetings (CBI) • IAP2 Spectrum of Public Participation

QUESTION AND ANSWER SESSION

After their introductory remarks, panelists responded to participants' questions as detailed below.

Collaboration, Communication, and Facilitation Questions

Q: Can you talk more about what a good communication structure would be?

- **A:** It would have these characteristics:
  - There would be clarity about the purpose of the meeting or process (so people are on the same page, not going in different directions). Agendas would be compelling to those involved; they need to be interested in the topics/issues and motivated to work on them together.
  - There would be clarity about the roles and responsibilities of those involved (so people tend to the tasks they are responsible for, and understand what others are doing).
  - There would be a coordinator or point-person so people know who to reach out to with questions or needs
  - It would be respectful and civil, with those involved participating with an open-mind and a willingness to listen (ground rules — and good facilitation — can help instill these qualities).
  - Those involved should feel free to ask questions if they don't understand something, and feel safe to offer a differing perspective.
  - George Bernard Shaw once said: "The greatest problem with human communication is the illusion that it has taken place." Wise words. Effective communication structures are mindful of this challenge and make it easy for people to listen and hear and be heard and make meaningful progress on the issues that have brought them together. Hence, one of the strategies for building a good communication structure is to first remove the barriers that impede effective communication. And those barriers can be structural (timing of meetings; unmotivating agendas; poor meeting management), perceptual (people have blinders, preconceptions, a litany of factors that challenge their ability to listen and learn), and personal (family/work distractions, etc).

Q: What do you recommend for field trip work during this emergency?

- **A:** Virtual field trips can be helpful at times, and certainly better than no field trips at all. Visit the site with a video camera in advance of a meeting and take short video clips of key areas, issues, systems, etc. that warrant discussion. Show the video clips as a stepping stone to prompt and inform the virtual discussion.

Q: For Kristen, what's the organization that you showed the slide of the spectrum of participation?

- **A:** That image comes from the International Association for Public Participation.

Q: **So much of collaboration rests on having trusting relationships. Any advice about how to build connections virtually?**

- **A:** Old-fashioned technology (phone) is still very effective. Make time for a call to check in with people individually and see what issues they're struggling with and what they'd like to see on the agenda. Maintain one-on-one relationships.

  Virtual social events can also be very effective alternatives to the classic in-person networking events, even if they can be somewhat uncomfortable at first.

  Try to offer different communication tools, as some people are more likely to open up if they can type thoughts instead of unmuting to say something. If bandwidth allows, use webcams. Otherwise use headshots so people can feel like they're getting to know one another.

Q: **I appreciate the idea of calling someone directly, but our current working-from-home situations makes phone calls seem challenging, since it's likely to result in asynchronous message-leaving and message-returning.**

- **A:** Yes, all communication has become more complicated during our current working-from-home reality. The best advice is to make it as simple as possible. If you leave a message, make it brief but to the point: "I just want to check-in with you briefly to hear about xxx. What would be a good time for you? I promise it won't take more than 10 minutes." A quick email after leaving a voice message can help avoid the phone tag problem, same message: "I just want to check-in with you briefly to hear about xxx. What would be a good time for you? I promise it won't take more than 10 minutes."

Q: **This question is for Julia related to her previous answer: Are pre-meetings/phone calls with individuals one-on-one a "mortar" aspect of the "brick" of consistent meetings?**

- **A:** They are both! It is possible to construct processes that both capitalize on existing mortar (relationships, etc.) while at the same time building new mortar (commitment, value, etc.) Effective process structures — bricks — (i.e. clear objectives, well-managed meetings, agendas, charters, task groups, clarity about roles and responsibilities, decision-making rules, etc.) can all help to instill the needed mortar (i.e. relationships, sustained commitment, respectful engagement, problem-solving mindsets, etc.) that are needed for collaboration to be productive and worthwhile for those involved. Two chapters in our book (Marine Ecosystem-based Management in Practice, Island Press, 2017) are devoted to the details of what comprises the bricks and mortar of collaboration.

Q: **Any tips for creating spaces and conversation focused on the "mortar" building trust, relationship, connection in this new context?**

- **A:** Good question. This may be the greatest challenge in this new virtual world. Only time will tell what strategies work best for instilling essential mortar in a virtual context. As a meeting manager, I would not explicitly say "let's now focus on building mortar!" [That would likely get me booted out of the virtual room!] Instead, I would try to provide opportunities for people to interact one-on-one or in smaller, less formal groups on different tasks. These smaller

and less formal interactions inevitably provide opportunities for informal conversations and personal connections to be developed; for shared interests to be recognized; and for trust to be established. Brainstorming (in both small and larger groups) can also develop mortar. Brainstorming elicits new ideas and new issues; it gives participants an opportunity to meaningfully contribute in a substantive way to a discussion, thereby building their sense of ownership and commitment to the process and its products (and ownership and commitment are important mortar attributes).

Q: **What do you think about adding mindfulness or other types of engagement that address emotional aspects of participation?**

- **A:** Be mindful that it's not going to be perfect. Practice patience with one another, and know that not every session is going to go smoothly. Learning all this different technology is challenging. Schedule meetings to be 45-50 minutes instead of an hour, to allow transition time to the next task; don't pack people's schedules.

  We've found success with short exercises to ground ourselves before we jump into these sessions. Body scans, deep breathing, and acknowledgement of how difficult these sessions can be goes a long way.

  Daily meditation and yoga sessions help people think about self care and provide opportunities for people to practice mindfulness. Echo others...this is hard, let's be empathetic, civil, and patient. Meetings don't have to be an hour; they just need to be efficient and use the tools at your disposal.

  The American Geophysical Union has four ground rules for its meetings: we are audacious, we are persistent and patient, we are respectful, and we are inclusive. Establishing these kinds of guidelines can help people stay focused on their common goals in sessions.

Q: **Any suggestions or techniques for organizing introductions in virtual workshops where it is important for participants to know who else is in attendance?**

- **A:** For a multiple day meeting, break up the intros and do a few each day. If you don't have that option, find a way to do intros as people are logging in using a chat box or short answer poll so that you aren't eating into the meeting time. Think about using some of your tech tools to limit that. Note that some platforms hide chat from latecomers, so people may miss responses. Alternatively, consider sharing bios in advance.

Q: **I am curious to hear how the panelists think about organizing collaborations that include people who have limited access to the platforms for collaboration - whether they are virtual or in person. How do we make sure everyone can participate fully and feel comfortable?**

- **A:** There may not be an easy answer. Having ground rules about not sharing screens if possible and working with the process will help equalize the playing field, as will knowing about disparities and arranging meetings in a way that doesn't elevate those disparities. Identifying areas where there are public wifi

hotspots (like libraries or parks) in advance for your participants and ensuring a call-in number accompanies the virtual platform can be helpful.

In addition, establish meeting objectives, look at the platforms available to your organization, and then think about what platforms are available to partners. Consider including a conference call line for people who may have limited internet bandwidth. Share powerpoints ahead of a meeting in case someone is kicked out of the virtual platform. Make sure the facilitator is aware of the number of participants who have to connect via the phone and ensure that those participants are asked for their input before those who are visible on the web platform.

Finally, never underestimate the impact of a phone call. The phone still works very well in places where internet service may be unreliable.

Technical Questions

Q: **Any technical tips for managing multiple meetings / breakout rooms happening at the same time (certain participants can only have access to certain meetings)?**

- **A:** Recommend that each breakout room or concurrent meeting have a designated facilitator or session lead. This needs to be established prior to the meeting(s). Based on meeting content and who is attending, identify people that make sense to take on this facilitation or session lead role. Be sure to engage them in the meeting planning process to ensure they understand what content is needed to meet the intended objective or outcome. No matter what software is used, a best practice is to have a PowerPoint slide with instructions, expectations, and/or goal for the meeting(s) or breakout sessions. The designated facilitator or session lead will cover this at the start of the meeting(s) or breakouts to ensure participants know what to expect and how to participate.

Q: **How do you manage participants who are not able to or do not know how to participate in virtual meetings well (not sure how to work audio, using their phone zoom when they should be on a computer ideally, bad internet etc)?**

- **A:** Add instructions in the calendar invite or via an email addressing: which virtual platform you are using; how to join the meeting; tips for how to navigate the audio for the platform selected (e.g., how to connect the microphone or change the audio input and output devices); and steps for how to be in the virtual platform and call in on the phone without feedback noises occurring. NOTE: Offering the phone option should only be used for people who are known to have issues with poor internet connections.

Another suggestion is to have the meeting originator, facilitator, or producer take a moment at the beginning of the session to remind participants about the best practice of remaining on mute when not speaking, whether they are on the virtual platform or on the phone. Share how to mute and unmute based on the platform you are using. If the platform allows, have the producer or meeting facilitator mute participants who forget or are having issues muting themselves. A gentle verbal reminder on how to mute if a disturbance occurs during a meeting is also effective.

Q: One of the main problems we are running into is about the internet quality with our partners in developing countries. Do you have any ideas on how to deal with constant pauses resulting from these interruptions?

- **A:** If you have access to a toll free conference call line, you can have participants call in using the phone, but also attempt to be on the virtual platform. Only do the phone/computer combination if you are sharing slides or important documents, or using webcams. If internet bandwidth is a major issue, then avoiding using webcams will cut down on bandwidth use, which could help with internet quality issues. If you are using a phone line, make sure that the facilitator remembers to check-in with the people on the phone for their input during the discussion.

  Another option would be to make use of a virtual collaborative platform (e.g., jam board, padlet) that partners can interact with on their own, but still share ideas or participate in a discussion outside of a formal virtual meeting. When it's just one person online, even with poor bandwidth, people are more likely to successfully interact with any one of the virtual group collaborative platforms.

Resource Sharing

Q: Do you have suggestions for a good virtual online participatory mapping tool?

- **A: Survey123** - Desktop and mobile survey platform that integrates data with ArcGIS applications.

Q: What whiteboarding platform do you prefer (or what are best aspects of each platform) - Jamboard, mural, padlet?

- **A:** Choose the platform that meets the needs of the meeting, training, or workshop. Not everyone has access to every platform. Try using the free trials that various platforms offer to see which has the features that might work best to get the information you desire out of your virtual meetings.

- **Jamboard** is part of the Google Suite, so anyone with an account on the Google platform should be able to access it. Locate it in the "9-dots" menu of apps at the top of your screen. Jamboard is a collaborative whiteboard where you can use sticky notes, images, and write/draw with your mouse. Share access to a Jamboard the same way you do with a Google doc. Jamboard is very simple to use as there is rather limited functionality, but there are a lot of ways to apply it - for example, be creative with icebreakers, collect and organize (concise) ideas, make roving flipcharts (each frame --or page-- is a chart), prepopulate visual templates. You can download your Jamboard as a pdf.

- **Mural** can do anything Jamboard can do... and a *whole lot* more, including voting, icons, facilitator powers (timers, etc), and so on.

- **Padlet** can make beautiful boards, documents, and web pages that are easy to read and fun to contribute to. Invite collaborators to add content, comment, like and make edits in real-time.

QUESTION AND ANSWER SESSION

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Q: **What tools and resources can we use to establish a culture of care above all in these experiences?**

- **A:** Establish basic ground rules for using any virtual platform. For example, when having a discussion in a virtual meeting, have the facilitator or moderator preface that there are no bad ideas, and that this is a safe space to share and brainstorm. If using a virtual collaborative platform like Jamboard, set a ground rule to interact with respect for others' thoughts and opinions.

Q: **Any suggestions for tools or platforms for sharing resources and allowing participants to upload or share their own resources?**

- **A:** Learning Management Systems or LMS is a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs. The LMS is a popular tool. The software can be basic or come with lots of bells and whistles. Based on the question it sounds like an open source LMS, like Moodle, might work best as it is open to everyone to inspect, modify, and enhance according to their business/education needs.

More Information

This summary report is available online in the Science Collaborative resource library. Visit the webinar page to access the recording and slide deck. To learn more about ongoing work on this topic, visit our Virtual Engagement Resources page. Have additional questions or ideas? Email Nick Soberal (nsoberal@umich.edu).

QUESTION AND ANSWER SESSION