Interviewer 1: Then, okay, so our plan is to start with biodiversity as a fixed concept in our model, as we have it here. And we recognize that the term biodiversity means different things to different people, and it can be measured in multiple different ways. And so, as a starting point to building our mental model today, we want to know what you see as the key aspects of biodiversity.

BD005: I think the aspects of biodiversity that our systems perspective recognizes, like, the different ways of assessing and thinking about how diversity exists within our natural world. We think about more traditional Western approaches and definitions to biodiversity than with local knowledge or traditional ecological knowledge of environmental management. Perspective moves away from aspects of like single species management, or management towards a single indices, and sort of embraces the complexities and nuances that exist within our natural world. It's - I know that's pretty philosophical. But I'm a social scientist.

Interviewer 1: No, I'm right there with you. It's probably similar to how I would answer. Okay, so when thinking about that answer and how to translate it into some concepts for a model, I see [Interviewer 2] added systems perspective, which is great. I heard you talk about, you know, western approaches versus traditional ecological knowledge. Are those specific concepts that we should bring in as well? Or do you think that that is captured within the system's perspective concept?

BD005: I think it depends on who you interview.

Interviewer 1: Okay. Well, so for your perspective in particular, because we're building out your model.

BD005: Oh, if we're building up my model, I'm white female scientist who has been trained through traditional academic approaches, even though I do community engagement scholarship.

Interviewer 1: Great.

BD005: I have no claim of expertise in, you know, traditional ecological knowledge though.

Interviewer 1: Oh, no, absolutely. So in terms of, like, incorporating what you see as you know, the important aspects that we need to be considering about biodiversity for management. It sounds like you think traditional ecological knowledge and Western approaches both have a place in that systems perspective. Is that - am I interpreting that correctly?

BD005: Yeah, I think there's lots of approaches and knowledge generation and understanding. And there needs to be sort of a recognition of the importance of that, and that I mean, in a way that's actually reflected in things like Federal justice for the initiatives that require integration of local perspective, including, you know, tribal perspectives. If you're within any kind of environmental management, you should be including, you know, tribal perspectives. If you're within any kind of environmental management, on your network. So it's not inconsistent with some of the Federal regulations that are now. So, yeah.

Interviewer 1: Yeah. Okay. Great. The other thing I heard you mentioned… you were talking about environmental management briefly, and moving away from single species to more of a management approach that embraces complexity. Is there a concept that we can incorporate to the map that reflects that notion in a more concise way?

BD005: I mean, we could add environmental management. But I think that wouldn't get at, you know, the point that you're trying to make through that description. You know, the way that we we included it in things like decision making frameworks, is through multiple objectives. And being that you're able to capture all of the objectives because oftentimes we'll work with decision makers, and they’re unwilling to remove objectives. But if you can capture a broader range of the things that matter within those natural environments, then you can say how to optimize where it might not maximize a particular species’ numbers, but it's still, to me, sorts through species recovery goals, while not degrading other aspects of environmental human condition. So it recognizes trade offs in history that we already have made within our lived spaces and doesn't sort of require sort of, like, false optimization of a particular end goal. Does that make sense? So for the concept could we add in, you know, like environmental management with multiple objectives, something like that? Would that make sense?

Interviewer 1: Okay. Yes, I think that makes sense. Okay, perfect. So for the next portion of the map building, our previous research has generalized 4 key components of marine biodiversity and so we're gonna add in those 4 concepts. And so they are habitat forming species…

BD005: Habitat forming species, like coral?

Interviewer 1: Yeah, I mean, so that'll be part of - part of the map building is asking you, you know, yeah, that's a good example.

BD005: Okay.

Interviewer 1: Yeah, habitat forming species, species of conservation concern, harmful organisms, and then key food web supporting species. So those are the 4 key concepts of marine biodiversity that our previous work has, you know, built out as a framework for how to, you know, incorporate biodiversity as a whole.

BD005: Okay.

Interviewer 1: So we'll - we'll incorporate those into the map. So, then, the next portion. So we'll start by building out the relationships that we see between system components. As, you know, we do an FCM. So let's start -

BD005: What did you say? Did you say you're using structured or inflation modeling?

Interviewer 1: So at this point, at this stage, we're just building out the fuzzy cognitive map by asking participants how each component relates to one another.

BD005: Okay. Okay, great!

Interviewer 1: And if there is a relationship between 2 components, if it's a positive relationship, and then we'll ask if those relationships have a low, medium, or high impact on the other system component relative to the rest of the system that we've drawn out.

BD005: Okay. I will preface - everything I will say is like, as a scientist. I know how to build maps with people. I am literally gonna be pulling from, like, some of the stuff based on the conversations or like pushwork that's 20 years old. So, in terms of my expertise, I would not consider myself an expert in anything other than the method that you were describing.

Interviewer 1: Okay, well, that's still great, especially for this phase of doing the pilot interview to get your perspective on this. Alright. You know how to improve this method, and how to better build these maps with individuals. That's still great. And if we can, you know what you said makes absolute sense. If we can, you know, attempt to build out a model just so that we can show kind of, you know, have that model to then build from that would be really great. But I totally hear what you're saying, and I would be the same way if I was you. Okay. So you know, given that from your perspective, maybe let's start with environmental management, with multiple objectives. Because we were just talking about that. How does that relate to these other components in the system? If it does at all. So how would environmental management with multiple objectives impact these other components of biodiversity that we've discussed?

BD005: In 2 ways. One is through policies or existing decisions that - these are existing decisions that influence the environment or conditions by which existing… decisions that influence the environment or conditions by which like different species can survive or not within these systems. The other is through future choices and how those feature choices are made, and what the priorities are, and how that structure looks like. So it's all structured through human choices that either dictate, you know what is expected or feasible given the existing decision boundaries that are under the influence of particular decision makers, whether that’s the organizations or individual people. I mean, usually we talk in the Federal government organizations, but it's a complicated marine space, depending on whether it's like international or US.

Interviewer 1: Yeah, okay. So you kinda jumped to some questions that we'll talk about in the future. So, as you know, our goal of this project is to better understand the role of biodiversity or future biodiversity approaches to marine resource management. And so one thing that we're planning on asking later on in the interview is how these components of biodiversity are explicitly considered in management. If they are, and if so, in what management approaches or policies are they? Are they currently considered? So I think maybe let's jump there again. And so you were talking about, like, policies and existing decisions that influence the environment. Are, are there specific policies or management approaches that currently are considering these concepts about diversity that we've been talking about?

BD005: Gosh! A second more about sort of that policy landscape, I mean the ones that come to mind that have a linkage to it, that I'm not sure to if it’s extend their managing biodiversity explicitly, or if they're just linked to biodiversity is things like the marine protection at some of the fisheries. Regulations, I mean by NOAA, and some of those are related to sort of other things which would be more single species management, which again, like in certain regulatory settings, that's not a bad thing. I mean you have to have some very specific ways of being able to create some rules and boundaries with those with some of that kind of management. I mean, there's some intersecting ones, especially near coast, related to coastal regulations that might have some impact on like - especially near shore marine environments, there's like a lot more things. Like Maryland has a regulation related to green infrastructure, sorry infrastructure which has impacts on like habitat opportunities. Like, yeah, so. And so there's also potentially some types of regulations that might be…

Interviewer 1: Okay, great. So one thing that we've been - this is part of the process that we've been going back and forth on, how to narrow in these maps so that they are encompassing, you know our broader research question of biodiversity and management, but also can relate back to that specific participant’s area of expertise to give some examples for specific ecosystem services and stressors and management actions. And so, after incorporating the biodiversity components, our plan is to then ask the participant what specific system they're working in or what system they're most knowledgeable in, based on, you know, their area of expertise. So, is there, you know, when you think about your area of expertise, is there an answer that you could give to that specific system that you work in? Then we continue to build the map in a more specific space.

BD005: I mean, I worked a lot in the region for a number of years, so that was probably most familiar to me.

Interviewer 1: Okay, perfect.

BD005: So, I do a lot of deep ocean work. I mean, I certainly had conversations about why they need to be thinking about the social side with deep ocean people, but I am far from an expert. And like, deep ocean - I've worked predominantly in areas where there's a more significant, like human decisions and things that are much more prevalent.

Interviewer 1: Okay, perfect. So are there some specific examples of ecosystem services that your research directly relates to within the Chesapeake Bay region. So moving forward, thinking about that specific region of the Chesapeake Bay. Are there specific ecosystem services that your research relates to, or that you know your research informs management for the -

BD005: We developed work on adaptation indicators in those regions. So we were doing more assessments of what exists in that region, and data sets and things that can be leveraged. We’re linking it to a resilience framework, to understand what aspects of adaptation and resilience are well represented versus one that we're not. And I mean, there's a lot of environmental data and it's interesting, there's a lot of, like, hybridity species. It's a very well studied region, and there's a very long historic legacy related to, like, both sort of the natural environment, and the symmetry and things for the water quality as well as, like, the species and the evolution of species over time. I mean Grace Brush’s work at John Hopkins University - I mean it's a foundational understanding for the long history of, like, species shifts and invasive species. And how that's impacted it plus climate change and sea level rise. So there's a deep knowledge by other people that when we think about indicators, it's really a word thinking about it from these processes of knowing between scientists and other experts who don't consider themselves scientists and the development of these kinds of tools, like indicators for particular purposes, and that might be just a general understanding of sort of the state of what exists. It might be related to very specific kinds of management decisions which then link to particular objectives. It might be related to indicators of success which has a particular value, lens, and bias, and has an answer that it has predetermined, and how it wants to do that, or it might be focused on learning, which then means you are structuring even if it's the same data indicators that are going to deliberately, push you to think about things and ways that are different from how you think about it now. Because learning only happens if you're getting things that don't confirm what you are already know, and that helps you to make choices that might be different from what you have already decided. You are doing so within that kind of context like - that's the thing that I worked in. So we collaborated with a lot of people who have expertise in those areas, and our expertise here was really, like, how do you structure or design something. Given the use of that information, what exists, not constraining it, based on what already exists, and thinking about that broader perspective and what needs to be collected. And yeah, we just kind of structure something that understands the landscape, more a little bit more holistically. So sorry, I haven't been paying attention to if you've been adding anything so… But I think, okay, so that's really great. So, I think, adding in adaptation, indicating that perfect, and then. Yeah. And there's a whole range of like ecosystem services that, like, bucket under that, I mean. If I were to try and like mentally list all of them, it would be an incomplete representation.

Interviewer 1: Yeah, that. I mean, we want - it's, you know, it's a balance at this at this stage of you know, ensuring that it's semi-structured and everyone's having the same questions so that the models can be comparable, but also having the models represent the individual's expertise, and how they see this broader research question of biodiversity management. So that's what we've really been going back and forth on. Because really, our sample will be, you know, researchers and managers are kind of the 2 groups that we will be targeting. And some of these questions about specific services and stressors and specific species and habitats will be a lot more intuitive for researchers to answer, and not necessarily managers. So, you know, we have an interview coming up with someone who, you know, works in the fishery space and, you know, is on the forefront of EBFM. And so we've been thinking about, how do we capture his model accurately, because there'll be so much great information that he'll have towards answering these research question that might not fit within the same structured interview as a researcher who works in seagrass ecology, you know, and so that's where we're at.

BD005: Why did the models have to be comparable? Like what's the - what's the research philosophy around that?

Interview 2: Yeah, I mean, normally, what we do is we will aggregate individual models into a stakeholder or a community model. In this case it would be like a research model and a manager model, that we'd be comparing to see how researchers think about this question and what issues emerge in the eye of a researcher compared to a manager.

BD005: Uhhuh.

Interviewer 1: But I think this part of the - and ultimately with the case studies the goal is to compare the models across the different study systems to see how similar themes emerge, and then how they can inform broader decision making. But I think at this stage, that's something that we've been going back and forth on. Like, what - what is the goal of this first phase? Is it just to inform themes for those case studies?I think we actually want to do some data analysis.

And with traditional FCM analysis, you know, aggregation of individual models is usually an important component to that analysis. And so that's kind of where - that's what we're still trying to figure out. So your thoughts on that would be greatly appreciated at this stage.

BD005: I mean, my sort of my quick thought on this is even if you have systems thinkers, there's - first you're gonna talk to a bunch of researchers, most likely, who do not think in systems. They know one narrow, specific thing and they can tell you different ways that it relates, but they are only going to be able to tell you some of those ways that it relates. If you specifically are able to prompt them, because they are still experts in their scope - and you need them because they have a very deep knowledge of particular things. But they don't have that, like, breadth. And there was a great article that came out over the holidays that described these kinds of researchers as divers versus surfers, or your system surfers. They're the ones that think about, like, the entire landscape and the different components that exist. They, like, don't - they have to get a little bit deep to get like, maybe the fish they need to scoop up to like bring as part of their project or collect for the dive. But like, they are not divers themselves. Divers are people that go out in a boat in the middle of the study for one particular thing, and go with a dive team as they start graduate school, and they go deeper and deeper until ultimately they are in the deep ocean, where they see no one else. And that's how they know they've made it. Which then means they have no sense of what's going on above the water. And so one of the ways that we kind of worked on this is like when we did some conceptual modeling with the - I had, like these 14 different teams, like 200 people where we were doing conceptual models to help to shape indicator development, because what we wanted to do was we wanted to do things for the US National Climate Assessment, and we wanted to have a system framework that helped us decide what will be included versus excluded in some of the relationships between the engineers. Not that the indicators were creating a system model, but that we had a sense for why we were including things, and whether it was a main component, or whether it was actually trying to describe a relationship between 2 things that were important for a particular, like, natural system, like natural terrestrial system or whatnot. There were things I would do differently 10 years later. But I mean the one thing I learned from that is, like, there were some people who are really good at doing some of the conceptual modeling, and most of the people look forward at it. But if we weren't able to give them a starting point, like we were able to do like an initial conceptual model that was wrong, like… And this is the thing about scientists. They’re really good at something, and anything that someone else does, they don’t agree with. So we got a starting point. Then it wasn't - it wasn't that blind page phenomenon, and they could see what we were trying to do, and they were really good at critiquing and refining and helping us to shape that. They were just horrible, and whether it was individual or as a group, at trying to construct those kinds of conceptual brandings because most of them are just, not systems thinkers, and they're not required to be in order to be considered, like, the best in their field. Because they don’t reward systems within, sort of, the research spaces. I would expect managers are gonna be a little bit more intuitive with that kind of, like, systems landscape. They just will likely be very unfamiliar with these ideas of conceptual modeling, and even like the box and arrow flow diagrams. That's usually not how they engage and interact, or even are used to having their insights represented. So if they see a diagram like that, even if it is a reasonable representation of that, they don't… they're not always good at taking the diagram like that, dissecting that, like scientists are because they're used to viewing information in a different way.

If they were training scientists, maybe, but usually we had better luck with folks who were more in those kinds of practitioner spaces by literally taking aspects of the model and then prompting with questions like, you know, one of the things that we're. you know, here's our general overview. Are you? Do you prefer visuals? Does a diagram like this like - does that relate to you or not? Okay. It doesn't. This is not something that you engage with. We're just gonna disappear that. What I wanna do is I wanna ask you a bunch of questions about how different things relate to each other. And what you were then able to do is you knew that everyone was working towards a common goal because you had a basic framework. And so you already had, like an initial thing that, you know, is not right, but because people are really good at pointing out all the things that are wrong, they are usually really good at helping you to get it more right. And then, if you did a bunch of those interviews with that kind of like, purposeful, like, you know, starting point, a thoughtful but wrong starting point, then what you would be able to do from that kind of set of interviews is, you would actually have comparable models. So then what you could do is say, like, basically what we had was our research teams, a priori model. We did a bunch of interviews where we stressed that a priori conceptual model was developed based off of the literature. And then it got refined individually in these particular ways, and that then helped us develop a sort of like new version of the model, which then you could then send out or share. And, you know, even do a - sometimes you can do a second round of interview.

Interviewer 1: Right.

BD005: Sometimes you can. Some people are willing to do that. Some people aren't, but that I mean - regardless, you can share it back out as a representation. Here's what we heard from you, and here's how we synthesize that with other experts. We took into account conceptual and new versions of the conceptual model that we are now exploring with these case studies and will be further refining. So that's - given my experience, trying to do this from the ground up with a bunch of experts, if I were to go back and do that indicator process again… because we kind of discovered that, you know, as we were doing it, we could have more efficiently used some of our experts. That's how I would do it. Because you kind of have a - you all have been working in this space for a while, so you already probably have an a priori mental model of how you think some of the key pieces relate within these systems, and maybe even some of the high-level concepts. Is that right? You're basically trying to develop, like, a generic conceptual model that then you can take to case study 1, 2, and 3, and then refine it and then also contextualize it based off of those places.

Interviewer 1: Yeah. Yup, exactly. Yup.

BD005: That's how I would do it. Because then from the interviews, you'll get what you need. Right? Because you get very concrete things and limited time to talk about what's wrong with your model, and how that people think you need to change it.

Interviewer 1: Okay, so what were your - just… I know this is, you know. You might not have an answer right now, which would be understandable, but given what you know about the project, and like how we've talked through this interview so far today, like, what would be your suggestion? Could you give an example of what that starting point was that you showed the participants in terms of what that base model was? Like for our project, you know, I'm thinking of these 4 key components of biodiversity that came out of the precursor project to this one, the Emmett Marine Dialogues Project. That's where these 4 components of biodiversity came from. And so, you know, right up the bat when you were talking, I was thinking about building a base model with those 4 concepts. Asking, you know, Emmett, from the literature, from the Dialogues project, to build out a model with those components, asking them to refine that and then asking them to bring in the management components. But is that, like, is that how that process works for you? Do you have suggestions?

BD005: Yeah, I mean, basically we - I mean, we didn't have like a single paper that we were basing it off of. What they usually did was I worked with, we had teams for each topic, like ocean and marine systems, and then I'd work with the chairs of each of those teams who are experts. What we would do is I had a student who was like helping to coordinate those teams, helping support like literature reviews and other things. And we would kind of, like - depending on the expertise of this student, because we had some undergrad, some graduates, some who were more senior undergrads. We had some who were like, hey, ask researchers like, we would basically - sometimes the students would take a first crack at developing a conceptual model. Sometimes I ended up doing something which then was like, you know, usually mediocre at best. But then again, like, it's that blank page syndrome, like people have no idea where to start or how to structure something that's going to be useful if you have a blank page. But if you have a starting point, what comes out after a couple of sessions looks really different. It gave a focus to the conversation. And so what we would do is we'd start breaking down the pieces of the conceptual model, and we'd start by… we could start in a couple of ways. Like for some of them, we had particular definitions we wanted to use, because there might have been intersections, like dependencies, based off of the other teams. So we were adopting some common definitions for, like, some of the boxes. Then what we would do is we would make sure we had a clear understanding of how those boxes were defined and what was missing. So we might develop some more boxes, and what was being - what might be important, what we were explicitly excluding. And some of those boxes were hierarchical, and things like harmful organisms might have been, like - you might have seen things related to invasive species, and potentially over predation, or like, you know. I don't know, sort of those skewed numbers, or something else like, that of sort of like a over abundance of predator species versus price species. Or there might be some particular definitions that end up getting encompassed in there, and then we would talk about some of those relationships. Because if you're using some of those boxes just as burden to find - that's not a problem, you just have to be really clear as you're structuring those models what the plus and minus signs are. How that gets interpreted can be different. And if you're using a particular definition, then usually the best way of doing it is by getting the sense of the relationship between those boxes, and then if you're using, like, positive or negative impacts, what that relationship is. Because what we found is that even in the same diagram, if someone's assigning positive and negative, and you ask them why they're using different definitions because of how they think about positive and negative given how the norms are adopted within these sub-disciplinary fields, you'll get these incorrect relationships being represented. And then you know, a community of researchers is adopting a particular definition and representing that definition in the model. Then you usually have that consistency that's needed, and you also have some of the rhetoric they want around what that is. So what I would do is I'd have them do less of the model building, but prompt them on some of the specific pieces that allow you to make sure that you have those relationships correct. So like, right. You could say like, right now, we have a relationship between biodiversity. And you know, habit forming species like what is - can you describe that relationship to me? And that then allowed us to make sure that we were thinking about things.

Interviewer 1: Okay, that makes sense. Yeah, that's the struggle as well. You're talking about like having definitions across interviews - I think one of the things that we've talked a lot about is that the people, experts and managers, all conceptualize biodiversity in different ways. And you know, like I said at the same there's different ways to measure it, and everyone thinks about it in different ways, and has different components of adversity that they see as important. And so we didn't want to give a definition for biodiversity. We wanted people to tell us how they think about it, and then bring in these 4 species. So you know, highlighting what our previous research has showed, and making sure that - I think, Ariana, one of her concerns, when we met as a task force, was that if we didn't have some sort of fixed component like these 4 components of biodiversity, then if people aren't thinking about biodiversity, or it's not a direct component in their research. Then biodiversity wouldn't actually be represented at all in the models. And then that's not answering our research question. And so, yeah.

BD005: Yeah, yeah, well, and you, you can still structure things. Because one of the things people wanna do is establish our expertise from the beginning. And if you don't give them an opportunity to do that, they will find ways of doing that until they feel like you have heard what they are really good at, and then what you need… so I mean, if you guys do like the 5 minute intro of the project, and then you just say, like, you know, would you be willing to describe, like who you are and what your expertise is, and you know, a little bit about yourself professionally. Then they're able to say what they think they're good at, and how they wanna describe themselves. And then you could have a couple of questions that allow them to sort of establish their expertise within these spaces. You know one of the reasons why we contacted you, is because you have this expertise in this esoteric area of particular biodiversity management. When you think a little bit broader, when I say the term biodiversity, what does that mean to you? And how do you specifically define it? So then you can get even before you share, like, you know, a priori model. You know how they think about it and define it for themselves. And maybe there might be a few other sort of, like, high level questions that you think are really important to establish without, you know, setting a status quo of what you're gonna ask them to break down and go back up. Because then once you do that, and that's like probably 20 min of time, like, total. Between, like, you introducing and then them establishing their expertise. That might be 15. By allowing 20 min, and I usually get the long talkers within that time period, then you have 40 minutes of super productive time. If it's a 60 min interview, then you can really structure things related to that. And you can ask them, like, even within that, like, what aspect of this model do you feel you like? What do you feel qualified to talk about today, and what do you feel like is less within your area of expertise? Because then you're not putting people on the spot. You'll get certain, like, especially white men who are way over competent at their own expertise, who will just tell you answers. Then you'll get an incredibly highly qualified, like female or person who has been historically excluded, who will, like Caveat. Every aspect of their own expertise, and so asking them to define, sort of this, you know, what they are most expert in, and then focusing, and on that within a model, then, when you're creating a more comprehensive model, you also know, like, this person really knows this piece. This person really knows this piece. As we pull these things together, we have a really good representation of this, or you know, we really didn't have anyone who was really comfortable about, you know, this one piece related to key food web supporting species, and we might need to see if we can find a person or two who would have particular expertise in that area.

Interviewer 1: Yeah. Yeah, a lot of what you're saying is what we - you know, different versions of our protocol have had that pre-interview questionnaire. We ask them to describe their area of expertise exactly like you have. And the hope there is that then [Interviewer 2] and I can review that before the interview, and so we can, exactly like you just said, like, we can go in and say, Okay, like we read your questionnaire. We know you're an expert in this. Can you expand on that a little bit and talk about how within that you'd define biodiversity? Exactly like you just said.

And go through those steps. So we - and, you know, that's something we talked about with Steven Gray about as well, is like when we first started to pilot this, and we were just so zoomed in about biodiversity. It was making people uncomfortable because they were like, you know. Well, that's - I'm not expert about biodiversity. It's not what I think about, and that's important to quantify. But we - like exactly like you're saying, we want to make them feel comfortable and be able to talk about what they know. And really use that to be able to capture something useful.

BD005: Yeah. If you're using this framework - and I'm a big fan, like, of fully in existing frameworks. There's so many frameworks that exist that it's a good starting point. Like, I'm a huge fan of that because it's already been sort of round through through the literature. So then, people are either adding nuance to that framework, or they have to be quite specific about why that framework is inadequate. And so that's one thing I would push people on, especially the academics. You know the thing about critiquing, like, they're really good. That's what we're taught to do. Push them on the solutions piece of it and ask them, how would you represent this? Like, because if they don't offer any solution, then they haven't given you anything to replace it with.

Interviewer 1: Right.

BD005: They've just said, like, it's not good enough. But not being good enough is not a reason not to use it or include it unless they have something better. And so that's the thing. I would push. Because on the management side, people still have to make decisions and if they don't have something, they're going to revert to whatever information they have. And so, academics always push for perfection, but in management it's really critical to not let perfection be the enemy of the good. And also for what is structured, to actually be useful and deployable. Because if it's just theoretical, like I mean, I don't do theoretical research. We have applications that might have, like, led to theory. This seems to be one of those projects where the application process is driving and refined things, developing, and not the reverse.

BD005: Right, right? Absolutely. Yeah. And that's yeah - and that's why you know, it's so important. Like you were saying to get the latter part, asking academics to give solutions, because that's the whole point of the project right? And that's something, again, that the task force kept going back to. Like, what is the goal of this project? What do we want the output to be? And how can I actually inform, you know, management in some way. So I - that's in part the members of the task force saying, I don't want a blank page. What I want you to do is I want you to give me a starting point, and I don't tell you what I think could be refined. So those kinds of comments impart our reflection, of sort of a recognition, that there's already some like going and priorities here. Ad one of the - I mean, I don't even know if they realize that they mean this when they say it. But we've heard this a lot. And basically it's that, like, page, like, if you give a starting point of a conceptual model. And then you engage them around that - I'm sure there's other ways of doing it. But if you are time limited, and you get an hour or 2 with an expert, I haven't found a better way of doing it when you're time limited. The only way, or our only way of constructing it with a bank page is one to 2 years. And all you're doing is building a conceptual model, and it's a true code production process for the significant amount of relationship building. And that I don't know. I don't know it, it was a little bit of a wake up call for me a decade ago when we started with that blank page, because we kept getting… we had people who were frustrated with us, and that frustration was happening on both ends, and it was in part because they didn't want to start with a blank page. But they didn't know how to articulate that, and once I figured that out, the dynamic completely shifted in. It made things a lot better.

Interviewer 1: Yeah, for my last - I know, it was exactly the same thing. You know, I was doing these expert based interviews, and people kept saying, well, this is already published. This is in the literature. This is in our stock assessments, like, why are you asking me? Go read. That was basically the answer I kept getting. So that makes a lot of sense.

BD005:I think the one - of the thing is that the task force… some people, the task force kept going back and saying we don't want to lead them. We don't want to lead them, and you know we've been trying to, you know. If you know, Emmett and I have talked about this a lot too, like it - it all comes down to what the output is and what the research question is. Because, you know, there are different approaches and if there's literature out there that already exists, and we're working with experts, you know, I think it's a little different than capturing a community member's perceptions, and not telling them what to think, and biasing them in that way. I think it depends on the process.

Interviewer 1: Yeah, there's a difference between like perception and evidence.

BD002: And this is an area where there has been a lot published before, and so giving an informed apriori and perfect starting point, I don't think… well, i think it will resolve what you're talking about, which is, folks feeling like it's such a rich literature. How in the world am I gonna, like, represent that in a very complex contextual model?

Interviewer 1: Right, right, right, exactly. In 40 min time like, that's why, like, what we were talking about ecosystem services. I was like. Well, honestly, I go back to my one paper and I see, like, what we had developed there, because we spent, you know, weeks working on that. Figuring out how to represent various pieces and things. And that was a multi year project, so I wouldn't rely on my memory. That’s exactly, what I was told over and over again in Alaska.

BD005: Yeah, yeah.

Interviewer 1: Yeah, yeah, and yeah, and also, I think you're the fifth person that we've done this pilot with. And I don't think that we've had a complete model created in an hour. We have one complete model, and it took over 2 h. Yeah.

BD005: Okay. Yeah, no, I'm not surprised by that. Like initial conceptual model building, like whenever I've done it with teams, it's usually 4 h of time. And when it's been shorter, it's because basically, like, my team has picked up a massive amount of like free legwork, like post-meeting like work and basically made it as easy as possible for that first time, you know, we find and engage and point out on this thing. So yeah, I know that this means, that you have no conceptual model here. Instead what you have is my strong opinion. How we might - how you might wanna think about structuring this in order to have comparable models by the end, with limited time. But if you start working on this and some of the things that I said are helpful, and you want to go back and forth, I'm happy to work with you on that. Conceptual models like, someone else. But methods, like, I gotcha. So.

Interviewer 1: That that would be really helpful. Yeah, thank you. I appreciate it. Is there any paper that you could send us based on what you've been talking about of yours or others? That would be useful for us to look at.

BD005: Yeah, give me 1 s, what I'll do is… alright. There in the chat is my CV, and then… I still need to update something. So if you see, like, various comments, I keep it as a Google doc, so that people always have the most recent version. But it - but it also means that it's out of date. So here's one where we built out a framework conceptual model for resilience that was based on the literature. And then we did exactly what you talked about, which is we did some - like we had an advisory board, and we did some structured conversations as a group to figure out whether or not we had gotten it right. That one's a fairly simple one. You wanna know, multi attribute assessments… this is a paper we did on was related to chemical alternatives. But that's, like, structured decision making. That's a very typical multi-attribute approach. And then.

Here's the one. There's a whole special issue on this. So here's the paper where we structured the overall conceptual model, the special issue has conceptual models for each of the topics, and then as indicators, and then I'm gonna give you 2 others. This is a process based paper that came before our recommendation that described how we structured this. And then the summary of all of the papers that were part of the special issue is this one. And we had one on oceans and coasts as part of that special issue. Aspects of biodiversity across, embedded in it… I can't remember exactly how it's represented. Some of the indicators they pick - I think there's opportunities to refine them over time. I wasn't… I thought there were some really joint ones, and then I thought, with some opportunities for improvement, anything that involves people is always a challenge. So that's the biggest area of challenge with that. And these kind of environmental climate adaptations, there's usually really good information on biophysical indicators, data information, things like that. I’m late to latent concepts socioeconomic status resilience, things that rely on human data, a lot trickier and if they're not structured in thoughtful ways, have have the ability to perpetuate perceptions or actual like racist decisions and actions like vulnerability indices that are are aggregate can be pretty pretty racist depending on how they're aggregated, so.

Interviewer 1: Okay, that makes a lot of sense. Okay, well, thank you so much for sending all that. That'll be informative.

BD005: Yeah, yeah, anything I can do to help. I know in the first paper that I sent you, there's a description of that conceptual model I don't know if we - I can't remember. It's been a while. I don’t remember if we described it in this kind of structure of a priori, like researcher, base model.

But if we did it, that's how we approached it.

Interviewer 1: Yeah, okay, yeah. I know that. Steven Gray and Steven Scyphers have done our project in the oil and gas industry where they produced a model with the literature and then presented it. And that worked really well for that project, and that was, I think, the most concrete example of how our group has used FCM to actually help informed decision making. And so we've been kind of circling on that project, and how to incorporate part of that into this one. So.

BD005: Oh, awesome!

Interviewer: Okay. Well, I know we've been on the phone for over an hour, so I don't wanna take up any more of your time.

BD005: Yeah, no, this is great. Let me know if I can be helpful with helping to refine any of the methods. I think you're on the right track, and I love the structure based off of existing frameworks. And yeah, feel free to to send me a note if if I can be helpful. I kind of do any of my deep work between 5 and 7 A. M.

Interviewer 1: Okay.

BD005: If there were things that need to be the in response, let me just let me know the timing of it, so that I don't get it to you too late.

Interviewer 1: Okay, sounds great. Thank you so much. Again, we really appreciate it. Thank you.