Stephanie Otts:

Great. Good afternoon everyone. My name is Stephanie Otts. I'm the director of the National Sea Grant Law Center. Thank you so much for joining us for our first installment of our 2024 webinar series, which we're excited to use to share our new state marine aquaculture policy dashboard. This is a collaborative project with the National Sea Grant Law Center and researchers at Florida State University, Dr. Sarah Lester and Dr. Bess Ruff, who are with us today. And so we'll be tag teaming the presentation, and also giving you a tour of our new dashboard. So just first, a couple of quick housekeeping items. We do have everyone muted on entry to reduce background noise. You are welcome to use the chat to ask questions at any time. If we see them and can answer them in real time, we'll do so, but there should be plenty of time at the end for Q and A.

Depending on how large of a group we have at the end, we often have the opportunity for participants to raise their hand virtually and ask a question verbally during the Q and A at the end. And also the webinar is being recorded and will be posted on the National Sea Grant Law Center website for future viewing as soon as we can get that up. It usually takes a few days to get all of our ducks in a row.

So for those who are new or maybe not familiar with the National Sea Grant Law Center, we're one of 34 Sea Grant programs around the country. We were founded in 2002 to conduct legal research, education and outreach for the Sea Grant Network and their stakeholders. We're housed at the University of Mississippi School of Law. And I encourage you to follow us on Twitter, Facebook, and LinkedIn, as well as our website for any information about our projects and what we're working on. As I mentioned, this is a collaboration with Lester Lab at Florida State University, and the team includes a number of folks, and I'll let Sarah introduce her lab a little more.

Sarah Lester:

Thank you, Stephanie. Yeah, so I'm Sarah Lester, an associate professor in the Department of Biological Science at Florida State University. And the aquaculture research team within my lab includes myself, postdoctoral researcher, Dr. Bess Ruff, a PhD student, Haley Lemoine, and a former postdoc and now collaborator, Dr. Rebecca Gentry. And our group collectively conducts research on topics such as global patterns of aquaculture expansion, state aquaculture policy in the US, and that's some of the work that we're going to be talking about today, and also social perceptions of aquaculture. And feel free to follow us on Twitter or check out our lab website.

So first I just wanted to give a little bit of context of what led us to the database that we're going to be sharing with you today. And so in an earlier version of the policy database, which was published in the journal reviews in aquaculture in 2021, you can see the citation on the slide, was a product of a Sea Grant funded project that was co-led by myself and Holly Froehlich at UC Santa Barbara. And this work was motivated by the knowledge that effective policy can play a critical role in supporting the development of new and growing industries, marine aquaculture included. And although the vast majority of existing marine aquaculture production in the United States occurs within state waters, and is therefore regulated by a potentially complex collection of state policies, we realized that we lacked a more holistic understanding of the status of state marine aquaculture regulations and policies across the US. And so we were interested in starting to systematically compile policy information with the goal of better understanding how different state policies and management may be either enabling or impeding industry development across the US.

And so our team synthesized state level mariculture policy, categorizing and documenting a range of policy attributes, both for aquaculture broadly and also marine aquaculture specifically. And this included state legislation, government initiatives, regulatory frameworks and management structures. And we assess these various attributes for the 23 coastal marine states that are shown on the map here. And in this work we focused in particular on what we hypothesized could be enabling attributes for marine aquaculture. So aspects of policy that could support or facilitate sustainable development or could reduce

existing barriers to development. And the expanded version of the database, that we'll talk about more in a minute, has a broader focus beyond just these enabling factors.

So the attributes that we compiled for this initial database included factors such as whether states had an overarching aquaculture development act or some sort of similar comprehensive legislation, whether states have specific regulations regarding marine aquaculture leasing, whether there's an aquaculture best management practices document, either produced or officially endorsed by the government, just as a few examples, and then in addition to what we hypothesize could be these enabling factors, we also examined a few other attributes, such as whether a state's right to farm statute applies to aquaculture or whether the same agency had jurisdiction over a freshwater and marine aquaculture.

And so here, this table just shows the percentage of coastal states that had each attribute at the time that we conducted this synthesis. And you can see that we found a lot of variability among states when examining these policy attributes. So just as a couple examples, only 13 states had a climate change adaptation plan or policy that included considerations for aquaculture, while over 90% of states had leasing regulations for marine aquaculture. And of course while these percentages are interesting, what is also very useful is all of these individual examples of how different states are approaching or implementing these various aspects of policy. And so we ended this initial project feeling like we'd compiled a lot of valuable information, but we didn't have an effective way to make that information more accessible to a range of users, nor a way to keep it really up to date.

Stephanie Otts:

Yeah. So while that project was going on, the National Sea Grant Law Center was also starting to work with an emerging group, a State Marine Aquaculture Coordinator Network, which is being led by Florida Department of Agriculture and Consumer Services and North Carolina Division of Marine Fisheries. And they have been working to bring state aquaculture managers together to learn from each other, and have also been working to compile inventories of state aquaculture program information. And the NOAA Office of Aquaculture has also been compiling inventories of state regulations. So there was a 2018 report about shellfish permitting and leasing, and that was updated in 2021 to include other states and territories, as well as finfish and seaweed.

And there's a massive amount of information in those inventories, but they are pretty big Excel spreadsheets or large PDF narrative reports, and they can be a bit clunky to navigate and to figure out, and often duplicative of some other efforts. And so we started to talk about how do we mesh these things together and, in a sense, stop reinventing the wheel, right? Every time someone decides to do a new research project for aquaculture, you'd have to go and ask the states for information about their programs, and it is hard to keep the things updated. And so the thought was to create a one-stop-shop, living database that's easily accessible with this policy information. So we were really lucky to have an opportunity to submit a proposal to the builders initiative, which is a foundation, and to receive a grant award in 2022 to develop this database.

And obviously we were really seeking to leverage the data from Sarah's previous project, but also the other efforts by NOAA and the State Marine Aquaculture Coordinator Network. So we had pretty clear goals. We wanted to make the data much more accessible and user-friendly. We wanted to create a database that was living, which by that we meant keeping it current, regularly updated. And we also wanted to expand it, if we could, to include new attributes. So we have a range of audiences for the project: state and federal personnel, academics, Sea Grant extension agents, and the aquaculture industry broadly. And so, one of the very first steps that we had to do before we could build the dashboard was to really get a handle on the data that was going to go into it. And so with that, I'm going to turn it over to Dr. Ruff, who really led our data management efforts.

Bess Ruff:

Awesome. Thanks Steph. So the first thing we did to expand the database was actually to review the original policy attributes from Sarah's original paper, Dr. Lester, and include any updates to the information from that paper. And even though it had only been two years, at that point, from the original paper, there were several updates, which is indicative of how dynamic the policy landscape can be for this industry, and also why it's super important to have a database that can be updated quite frequently and easily. So after updating that information, we identified 38 potential new attributes, and these are attributes that we brainstormed based on information that we thought would be useful to have on every state, based on conversations with industry managers as well, excuse me, as general questions we had regarding state level mariculture management. So after that we came up with 38 potential new attributes, and then we ranked these attributes based on data availability, practitioner relevance, as well as academic interest, selfishly a little bit.

And in terms of data availability, a lot of times there were attributes that would get dropped, not just because the data weren't available, but because we weren't sure we could have consistent data across states. So for example, one of the attributes that we were really excited about were things like startup costs for a farm, but that ended up getting left out, because what was included in those costs and how they were quantified varied quite drastically across states. So with those rankings, we narrowed it down to 26 new attributes to add to the dataset. And I am going to summarize those in the following slides. So, in the top left-hand corner, overall, we grouped all of these attributes based on key policy themes, and you'll see these reflected also in the dashboard when we walk through that in a couple slides.

So in the top left-hand corner, we have farming operations, and these are attributes that are related to the starting and running of a farm. So things like active use requirements, which could include production minimums or yearly production improvements, insurance requirements, which could be anything from liability insurance or natural disaster insurance, bonding requirements. So will farmers have to pay a security bond in order to obtain a permit or lease as well as public access? So will farmers be able to use public boat ramps to conduct their operations? In the top right-hand corner, we have management authority. So these were attributes related to who oversees what, and that includes lead agencies for permits and leasing, as well as websites that contain permitting and leasing information. And these are important to understand who oversees what, and as well as making it easier to identify where to start with regard to the permitting and leasing processes.

In the bottom left, we have leasing information. So in Dr. Lester's original paper, there were policy attributes related to the regulations around leasing, but we wanted to have additional information related to maximum lease terms, annual lease fees, renewal costs, as well as whether leases could be transferred or sublet. And this offers a better understanding of the dynamics of property and rental rights in the marine space. And then the bottom right, we have spatial management. So this expands on whether a state has zoning for mariculture, which was included in Dr. Lester's original paper. And thinking about additional tools that are available to farmers to identify potential farm areas, as well as user conflicts and potential environmental conflicts that could arise from trying to establish a farm. So that's where siting tools comes in. And then we also included existing lease sites, so maps of existing lease sites, to show where people are already farming or where there are established leases that are available for bid or for sale.

And then the last three are related to biosecurity. So thinking about some of the parameters that farmers have to operate within related to the types of species they farm and whether they have to be native, whether there's any species that are prohibited entirely from being farmed, as well as genetic requirements. So whether seed stock has to come from local populations or whether there are reproductive requirements related to farming diploids or triploids. And then tribal authority in the upper right hand. Thinking about some of the other governance systems that practitioners or farmers might have to operate within. So whether they'll have to consult with local tribal authorities or receive approvals from those local authorities.

And then whether there's a specific leasing system related to tribal lands. And then lastly, we had attributes related to capacity building. So in addition to supportive initiatives and policies, which were highlighted in Dr. Lester's paper, we wanted to focus on strategies and resources that can support sustainable development within the industry as well as industry diversification. So not just from a production standpoint and having different species and different culture methods, but also encouraging diversity in terms of who's participating in the industry. So in addition to these individual policy attributes, we also compiled, what we're calling, composite keys, which are groupings of related attributes. And we thought of these as a useful and quick way to see how states are performing in key policy areas.

So right now we have three composite keys that we've developed. The first being environmental safeguards, so native species requirements, species moratoriums, genetic requirements, reproductive requirements, best management practices, and bonding requirements. And these attributes are meant to reflect the strategies that are currently employed by states to reduce some of the negative impacts of marine aquaculture. And we also have spatial management tools, so zoning for marine aquaculture, aquaculture siting tools, and a map of existing lease sites. And this was an important key for us because it dictates how easy it is to identify potential farm sites, and how much information is already collected to inform those decisions.

So is there data related to environmental and ecological conditions, as well as potential user conflicts. And then lastly, we have industry tools and resources. So regulatory guidance, government websites related to permitting and leasing, a centralized government website where all this information can be accessed easily. Aquaculture siting tools and maps of existing lease sites as well as training programs. So these are related to the availability and accessibility of important guidance for operationalizing marine aquaculture farms. So we'll walk through the composite keys and how we depict them on the dashboard in a couple slides. But just to give you a general sense of how these keys work, is that each attribute, within a specific key, contributes 1.2 a composite key score. So for example, with environmental safeguards, there's six attributes, and the possible state scores range would therefore be from zero to six, depending on how many of those attributes they have.

So as important as the expansion of the original data set is the process for verifying we have the most up-to-date information possible. So one of the things that we've done is developed online data templates that can be easily accessed and reviewed by state aquaculture contacts. We trialed them at the [inaudible 00:19:13] workshop in May of last year, and made a couple of tweaks to make sure that they were just as easy to work through and review as possible. And then for state aquaculture contacts that weren't at the workshop, and didn't have an opportunity to review their data, I have been hounding people, hopefully as nicely as possible, to review the data. And people have been very responsive. We have most states reviewed. There's just a couple of people, a couple of states that haven't been reviewed yet, but overall, the vast majority of states have been reviewed by state aquaculture contacts, and that information has been updated in the dashboard. So the benefit of these data templates is that they can be adapted and updated for annual review, which will be super important for keeping the dashboard up to date.

Stephanie Otts:

Great. Thanks. Yeah, so now we're going to turn to what we did with all of this data, and hopefully what everyone was here to see. And so just we were able, with the funding that we received, to contract with a software development company to help us build the dashboard. We didn't really know what we were asking for or looking for when we went into the process, but based on their guidance, they suggested that we actually use publicly available data visualization tool, which is Tableau, but a Tableau public, which makes it available easily on the web. And so this, we think, is really a good route for us to go, because once it is built, it is integrated into a Google Sheet template, and that is easy to access, and it integrates well, right? We don't need a lot of continued expertise to be able to maintain the site moving forward, which was really important for us.

So now we're going to go to the dashboard and we're going to give you a bit of a tour. So this is our dashboard and the landing page. I know from conversations I've had with others, many people come to this and they're like, "Oh, this is great. I don't know what to do with it." So the point of this webinar is to show how we think the dashboard can be used, but we'll also mention later on, we have developed resources to help everyone navigate the dashboard and get to the information that they need. So what we're looking at right now is the default home page, landing page, for the dashboard, and it contains the dynamic filters for exploring the data. This particular view is best for users that are already familiar with the policy attributes that Bess was walking through, and are interested in exploring connections between states and those attributes.

For people who are new to the dashboard, we don't recommend starting here, because this is one of the most interactive parts of the dashboard. So if you're new to the dashboard, we'd recommend that you start... So there's also three databases, or not databases, directories that are available, and I'm going to walk through each one. But we recommend starting with the policy specific dashboards. So as Bess mentioned, we have divided the policy attributes up into nine different categories. And so when you navigate to this particular directory, you can decide what aspects of state aquaculture policy you are most interested in. So say you want to learn more about tribal authority, so it will take you to a page that has the three policy attributes that we've categorized under tribal authority, so tribal consultation, the tribal leasing, and the tribal approval. So these boxes, what I think is really cool about the dashboard is that this is where we get to the interactive features.

So it says, "The data reveals that 87% of states do not have a tribal consultation, but 13% do." So if you want to know what those states are, you click on the yes box and that will filter the map so it identifies this three states that have tribal consultation requirements. And when you roll over the state, a popup will generate that gives you more information about that attribute. Same with Washington and California. And just to let you know, there's navigation buttons on the bottom that you can undo your last action or you can completely reset the view. If you want to go back, and just to let you know, these navigate between the policy attribute categories, these are not traditional back buttons. And the three lines will take you back to the policy attribute dashboard homepage. So the tribal authority page only has three categories.

Wanted to just show a page that has more categories, so there's a little more going on, on this page, but it all works the same. So say you're interested in the states that do have a comprehensive legislation. So you click on that and you can see that the map changes and the other boxes change as well. So it's filtering the data. So then you can look at, okay, what states have a comprehensive legislation that has marine aquaculture provisions? And that gives you nine states, and you can continue to filter down until you've selected all the ones that you want to select. And that gives you six states that are now highlighted, based on all of the categories that have been checked off. So it's just a way to help users navigate and explore the data in the database.

And the big home button will take you to the landing page. So now that you're somewhat familiar, quickly, with the policy attributes that we have. I think it might be a little easier to navigate the landing page. And so this is set up to allow you to build upon different types of policy attributes to help see how it's looking across the country. Oh, and yes, I see a question in the chat about... Yes, currently it does not have US territories. But hold that thought because we'll circle back to that as we wrap up the webinar. So say you are, again, interested in states that have comprehensive legislation, so you can select that on the first filter. And I'm like, "Well, I really want to know about the ones with marine provision." So again, you click on that box that turns that filter on, it starts to narrow down the map. And then you can build on, you can stop here if you want.

You can just say, "Okay, now I'll just look at New Hampshire and Maryland and all the states," but you can layer on if you want to. So say, "I'm curious, what states have aquaculture BMPs with marine provisions?" And out of these 39 states, 33 have specific to marine. So we're getting narrower right now. We're down to only three states. And then say, "I'm curious about a training program." And that has now filtered you down to just two states. So we think that this is really helpful, especially for state aquaculture

managers that may be like, "Okay, someone's asked me to do a training program, but I don't know where to start." They could filter it down to find states that are similar to their situation and then know, "Okay, I can start by reaching out to my colleagues in North Carolina and Florida."

This also helps you identify... Now I've got a couple of states that I might want to dig into more and to really see what that state has, from a comprehensive perspective. So if you are just interested in one state, you want to come down to this directory, Policy Detail Links. You're going to see the same nine categories of policy attributes, but there's now a dropdown menu that you can select the states that are in the database. So say you're just interested in Florida. So then you can go... And this will take you to state specific pages for each policy attribute. So biosecurity, capacity building, farming operations. If it's blank, that means that there's no data or it's not applicable in that state. And then these are hyperlinks that will then... Some of these are popup menu, and then some are hyperlinks that take you directly to the source of that information.

So there's a lot to explore in here for each state. Also, there are ways to download the information out of the database. I should have mentioned that earlier. If you navigate back here, we still have this. You filter down. You can download that image out of the database. For instance, if you were doing this and wanted to show it in a PowerPoint presentation or put it in a report, you could export your work as you want to. Yeah, and I see another question in the tab. "So how are the links to the publications updated?" So as Bess mentioned, we are working on doing annual updates of the database through that Google Sheet vetting with state aquaculture coordinators, and as well as if they notify us that something has changed with their data, then we can go and update the spreadsheet and would then push an update in real time.

But that's how the links would be updated. I'll show in a minute what our data table looks like. Okay. All right. So the third directory is the composite keys that Bess mentioned. So again, going back to the homepage and clicking on the composite keys will take you to that section of the dashboard. And you can see how this works. So as the color goes from blue to green, you get a higher score, which, as Bess mentioned, each attribute in the key gets you one. So if you had... The highest score here would be seven. So the states that are darker green have more of the attributes that are within these categories. So if you were looking for states that appear to have more resources available for developing the industry, these dark green states would be the states that have the higher scores.

And then just to navigate through the environmental safeguards, again, it's the same thing as you go from blue to darker. Are those higher scores? So states that may have more attributes that relate to environmental safeguards. So for instance, Virginia has five. And then spatial management tools is the final one. So it's just a different way to look at the data and to see some of the relationships among states and the attributes. And so... I'll just reset the view. And finally, if you come here to the landing page and you're like, "I can't handle this, this is too much stuff, there's too much going on," you can just come down here and navigate to our supporting data table.

So this is the Google Sheets that feeds the dashboard. So this has all of our data in it. This is what has been reviewed by the state aquaculture contacts. The Google Sheets version is read only. Obviously we don't want anything inadvertent to happen to our data, but you can scroll through and see all of the information that is behind the dashboard. If you like Excel spreadsheets, if you'd rather work with that, we don't have any protection set up. You can come and you can download this data table in Excel, and you can crunch your own numbers and explore the hyperlinks that way as well. So that's the basic walkthrough. I think go back, just to wrap up quickly before we open it up for questions. As I mentioned, we do have a number of resources available.

We have developed a user guide that is a narrative, a written document that attempts to do what I just did on the fly, to give you a walkthrough of the database. We've also recorded a walkthrough that was done a couple weeks ago and is available. This walkthrough will also be posted on our website and is available. But we really encourage new users, when they first come to the dashboard, to download our user guide and look through it and keep it handy as they're working to navigate the site. Lauren just dropped the link

to our project page in the chat. So from the project page, you can get to the dashboard, you can get to the user guide, and the existing video walkthrough.

And so just before we wrap up, and this should address some of the questions that I've seen so far in the chat, is that we do have future plans for the dashboard. We had always intended it to be living. We want to continue to build on it. We are working towards our plans for doing a global update this year, working with the state aquaculture contacts to do our first annual update. We are considering what additional policy attributes might be useful to add, and thinking about funding opportunities to do that. We have also been looking at expanding the geography of the dashboard. There has been interest in adding the US territories, so we have been talking about that. We have been approached about adding the Great Lakes to the dashboard. That's a more complex, complicated conversation, because we would then be taking marine aquaculture policies and trying to figure out how to work in freshwater Great Lakes policies. So not impossible, but would take a lot of brain power to think about how best to do.

But our team is interested in hearing about users' experiences, and what else might be valuable to add into the dashboard, and to try to find some money to make that happen. Oops, I think I went backwards. Yep. So just wanted to end with our contact information, and we also wanted to leave time for questions, so please feel free to add your questions in the chat. I can navigate back to the dashboard if that would be easier to answer some questions. And while we're waiting for people to add those questions, just want to thank everyone for being here and for joining us at the webinar today. Yeah. Oh, thanks. Yeah, we were excited to see the layout come together. Okay. All right. Well, I don't see any other questions, and so I just want to reiterate that we have recorded the webinar. We will post it on our website later this week or early next week. We will send an email to all registered participants, letting them know when the recording will be available, so you can share with your colleagues and...