



Briefing Transcript

Bridging the Gap Between Science and Decision-Making

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Daniel Bresette

Good afternoon everyone, hope everyone is having a nice Thursday so far. It's a little unseasonably chilly in D.C. today, like I would know, as if I've been outside today. Maybe take a venture out a little bit later this afternoon. Thanks for joining us today for day four of our Climate Adaptation Data Week online briefing miniseries. I am Dan Bresette, the executive director of the Environmental and Energy Study Institute. This miniseries is part of our work to highlight coastal resilience issues for policymakers and the general public, and highlight climate change solutions and resilience strategies. On Monday, we heard from two experts about data needs in the state of Washington. Tuesday we heard about the use of vulnerability and sensitivity analyses to evaluate the risks to our national parks. Yesterday we were treated to a presentation about cultural heritage sites. If you were unable to join us for any of the briefings so far this week, or if you've missed any of our briefings to date, be sure to visit us at www.eesi.org for video recordings and written summaries. Our miniseries has two more installments. Today we have Bridging the Gap Between Science and Decision-Making, followed tomorrow with Weather and Social Data to Inform Participatory Planning Initiatives. After this week, in combination with the rest of our briefing series, our audience, and that includes policymakers, will have a complete picture about coastal community resilience, or at least as complete as possible.

Be on the watch for briefing from two more areas coming up in the near future: Alaska Coastal Resilience next Tuesday, April 21st, and later in the month TBD on Puerto Rico and the U.S. Virgin Islands. When you visit our website, www.eesi.org, take a moment to sign up for our bi-weekly Climate Change Solutions newsletter. It really is the best way to stay informed about all of our briefings coming up. As I described yesterday, this briefing miniseries format is new to us. It's an innovative way to provide briefings and stay focused on the urgency of climate change. Our goals for this week-long regularly scheduled briefing miniseries are to explore topics in greater detail and then recreate online, but with a more conversational dynamic that we would have in person. You can find a complete schedule and this briefing miniseries, like I said, and catch up on those that you've missed at www.eesi.org. While you're there, please also take a moment to complete our survey. Thanks to everyone who's already shared your feedback about this format; it has been extremely helpful.

The topic of today is Bridging the Gap Between Science and Decision-Making. After the presentation, as we've done all week, my colleague Amber Todoroff and I will co-moderate a discussion with our expert speaker, and you can participate too by following us on Twitter @EESIOnline or by sending us your questions by email to EESI@EESI.org. To help us learn how to bridge that gap, today we will hear from Dr. Amy Snover. Amy connects science and decision-making to help society prepare for the impacts of climate change, and she leads innovative efforts to link climate adaptation science with the work of resource managers, planners, and policymakers, people whose day-to-day decisions can help reduce climate risks facing people in the northwest. Amy's the director of the University of Washington Climate Impacts Group, University Director of the Department of the Interior Northwest Climate Adaptation Science Center, and she was recognized as a White House Champion of Change for Climate Education and Literacy in 2015. We are really happy to have you with us today, Amy. I can't wait for your presentation, thanks so much.

Amy Snover

Thank you very much, Dan. I am very excited to be here with everyone I would call it this morning, you can call it this afternoon, since I'm here on the west coast. I'm very honored to have the opportunity to share my perspective and some recent examples of the work we're doing here in the northwest to connect science and decision-making to facilitate climate resilience.

As we all know, the urgency of addressing climate change, both the urgency of reducing greenhouse gas emissions and preparing for the impacts, has never been greater. The window of time for avoiding dangerous human interference with Earth's climate continues to narrow at an alarming rate. At the same time, continued emissions commit us to increasingly severe global and local impacts. I'm going to share some stories from the two programs that I direct that aim to improve our preparation for and ability to cope with the changes in climate that are already underway. I need to mention that the work I'm presenting here actually represents the efforts of many individuals, both on my team and beyond. It represents deep and collaborative partnerships across academia and with federal, state, local governments, with tribal entities, with nonprofit organizations, and others, some of whom are listed here.

I'm going to begin by introducing you to the Climate Impacts Group. The Climate Impacts Group at the University of Washington is a non-partisan, non-advocacy, academically based boundary organization. We've been working since 1995 as an integrated research and engagement team. We work across sectors and across disciplines to build climate resilience in the U.S., and in particular in the Northwest, and we do this by advancing awareness of climate risks and enabling science-based action to manage those risks. The Climate Impacts Group was the first NOAA RISA, and now we are the hosts of the Northwest Climate Adaptation Science Center.

The Climate Adaptation Science Center is one of eight regional Climate Adaptation Science Centers that are joint federal/university partnerships. On the federal side is the Department of the Interior, USGS, and on the university side, in the northwest we are a consortium of six universities hosted by the Climate Impacts Group at the University of Washington. Our partners are Western Washington University, Washington State University, Oregon State University, Boise State University, and University of Montana. As I mentioned, these Climate Adaptation Science Centers serve every state in the nation, and our objective is to support sound resource management in the face of changing climate conditions. We do this by advancing understanding of the implications of climate change and variability for fish, wildlife, water, land, and people.

Both the Climate Impacts Group and the Northwest CASC produce relevant and accessible science on climate change impacts and adaptation actions. Both of our groups develop science that is not only useful, but is actually used, and this means that we need to work directly with stakeholders and partners in the community to develop shared understanding of why climate matters to local ecosystems and community, to co-identify knowledge gaps that impede climate risk management, and to co-produce the needed additional scientific research, data, products, and resources that are necessary for effectively managing this risk.

I want to say one more thing about our focus on climate resilience and adaptation. We do this for the simple reason that every single day people are making decisions and investments that will either exacerbate or ameliorate the impacts of climate change for decades to come, so we're working with today's professionals to enable inclusion of the best available climate and climate impact science and climate resilience thinking in those decisions. People every day are shaping our future, and we are acting to help them shape that future in a way that builds climate resilience into it. Between the Climate Impacts Group and the Northwest CASC we do research and

engagement across virtually all climate-sensitive sectors in the northwest. We work on coasts, as I'll be describing today, but we also work in inland deserts, we work in remote wilderness ecosystems, and we will also work in our urban communities.

Despite this variety of efforts and variety of stakeholders and partners, we have a handful of common approaches that we use for connecting science and decision-making. First of all, we focus on educating key actors about climate risks and response options. We do this by developing succinct, user-friendly briefs on major issues, we develop State of the Knowledge synthesis and reference documents, we brief elected officials and policymakers, and we train current practitioners and educators in the current science of climate impacts. We also work to enable the use of climate science in risk assessment and management, and my examples that I've been providing today are good examples of that. We do targeted research, we translate science for you, we innovate with science delivery, and we support local adaptation. Our third E here: educating, enabling, and embedding, is embedding. We also work to embed scientists in management contexts and science in management processes. We have lots of good examples; we could describe another time about how science has been embedded in ongoing processes for toxic waste site cleanups in Washington State, and how it's beginning to be embedded in funding criteria for major capital investments in recreation and conservation.

That's enough of the background; let's get to the real stories. I have two specific stories to tell you about. First, I want to talk a little bit about Washington State's Sea Level Rise Planning Toolkit, the work that we've done to develop that. This story is about the Washington Coastal Resilience Project, which was a three-year multi-partner effort to rapidly increase our state's capacity to prepare for coastal hazards, such as flooding and erosion, that are related to sea level rise. For this work, the Climate Impacts Group partnered with a large number of other entities. You saw their logo on the second slide, but they included Washington Sea Grant, Washington State Departments of Ecology, and Fish and Wildlife. This project was funded by NOAA's National Ocean Services Regional Coastal Resilience Grants Program, and the overall aim of it was to improve risk projections, provide better guidance for land use planners, strengthen capital investment programs for capital restoration and infrastructure, but more simply put the project aims to help coastal communities, planners, and decision-makers better answer these three questions: What will happen here, in my place, because of sea level rise? What is my specific risk, and how does that change depending on how greenhouse gas emissions evolve or my desire for confidence in the answer? And what can I do about it? I'm going to talk you through each one of these.

When we started this project, there was incomplete and confusing sea level rise data that was available to communities. There was a 2012 National Academies report that developed sea level rise projections for California, Oregon, and Washington, but it wasn't sufficiently detailed to inform local planning. You may not know, but we have a complex coastline here on the west coast that is actually moving vertically up or down at different rates in different places because of complex tectonic processes. So, despite the fact that sea level rise along the Washington coast will be significantly different in different places, the National Academies study only provided one point-specific projection for the entire state of Washington. After the National Academies report, also, there was more emerging science on the rapid disintegration of the polar ice sheet, and lots of questions from communities about how that would affect local risk.

The sea level rise projections that were developed under this study are now currently the best available sea level rise science for Washington, and they have four significant innovations. They were the first to incorporate the science on changing polar ice sheets for Washington. They are highly localized, they account for local differences and relative sea level rise along the coastline. They are probabilistic: this is an advance over our previous approaches where we just were able to give people ranges of potential future sea level rise. Now we can give ranges with estimates of the probability of the various rates of rise. And they're also long-term, they don't stop in 2100. We developed projections through 2150 in response to our tribal partners' desire for scenarios that would support their longer-term planning.

To make the information even easier for community planners to use, we've developed an online data visualization tool that allows users to easily select their location, there are 171 specific locations along the coast. They can determine how the anticipated amount of sea level rise depends on future greenhouse gas emissions, and then they can visualize the range of plausible future amounts of rise, including the likelihood of any specific amount of sea level rise occurring. For example, this would allow a user to answer the question, "How likely is it that we see a foot and a half of sea level rise here by 2050?"

In order to support risk-based decision making, we developed a second way of visualizing these data that has allowed users to easily determine when they might experience the specific problematic amount of sea level rise at various levels of confidence. For example, a user might know that their development or infrastructure would be able to withstand up to a foot and a half to sea-level rise, and then they might ask the question “When am I likely to experience one and a half feet of sea level of rise here?” and they can see the answers for different greenhouse gas emission scenarios, as I've shown here, or different levels of confidence.

A common theme across our work is that we shape the science we do by the evolving needs of our community partners, but we also recognize that supporting the use of that science is just as important and requires just as significant an investment as does developing that science in the first place. Therefore, as part of this Coastal Resilience Project, in addition to developing and delivering these data and tools I was just describing, we also deliver technical advice on how to evaluate and decide among the different scenarios. How do I know which greenhouse gas scenario to use in my planning? How do I know what level of confidence to use? There's actually ways to think through this depending on the decision context, and that's our “how to choose” guidance. We also provided information about how to use these data in GIS mapping of sea level rise impacts, and how to use these projections in coastal ecosystem restoration projects.

I want to highlight one actual application of the sea level rise data here. This is a really interesting story from MetroParks in the City of Tacoma, south of Seattle. They were in the process of redeveloping a coastal park, and they had done the development plans not considering sea level rise, but when we were working with them to share the sea level rise projections, they redesigned their redesign of the park. They relocated new buildings away from the future shoreline, they reoriented access and parks designed to accommodate the rising seas, and even more importantly, to demonstrate how important planning for coastal resilience is to MetroParks. Construction on the park renovation is scheduled for later this year. In the information that I've provided the EESI to put on their website about this talk I've provided a bunch of links to all of these tools, but also to some of the media stories about things like this MetroParks redevelopment.

Example number two is about co-producing tribal resources for climate change vulnerability assessments. This work was developed as a direct response to a survey that was completed in 2015 by the Affiliated Tribes of Northwest Indians. AT and I surveyed Columbia Basin tribes to assess their capacity to respond to climate change. They found that there were significant disparities among tribes in their capacity for climate change response, with some making significant progress already and others having difficulty getting started. They identified a bunch of different barriers to preparedness. Some were social, some were political, and some were technical. The technical barriers were ones that the Northwest CASC and Climate Impacts Group were able to step in to provide on a project that was led by Meade Krosby and funded by the Northwest CASC.

This project aimed to help Northwest and Great Basin tribes answer these questions: What will happen here due to climate change? What can I do about it? And what are some best practices amongst my peers who are also facing similar challenges? This scope of work was designed in partnership with a tribal advisory board, including representatives from tribal organizations that were affiliated with a Northwest CASC stakeholder advisory committee. At the time this project started, the only climate data being delivered specifically to Northwest and Great Basin tribes was information about how annual average temperature and precipitation might change averaged over tribal reservations. However, tribes are concerned, like all of us, about a great deal of diverse climate impacts, not just how annual average temperature will change, but impacts on plants and animals, wildfire, heat waves, water availability. And, they evaluate climate risks and make decisions across multiple geographic areas, not just reserved land, but also the watersheds in which they are living, counties, their traditional territories, and their ceded lands.

Based on input from 84 tribes choosing to participate in the tool development, Meade Krosby and her team developed an online tool that provides climate summaries and climate information that was specifically tailored to the needs of tribes. It provides spatial information about where impacts are smaller and larger across the specific geographies of interest, that were defined by each tribe, it provides summaries of information about changes expected for each geography of interest, and even more importantly, I think, it provides the information in multiple formats. It provides it in data, it is data, and it provides it in a map format, in graphical format, and in text format. Another innovation is that the tool provides a downloadable custom report that summarizes all of the changes.

A key to the success of this tool was the heavy focus on soliciting iterative user testing and feedback and revising the tool along the way. One of the things that makes this a little different than some other resources is that it actually helped provide some interpretation and language describing the impacts. They are easily used in reports and analyses. We provided a curated online collection of available tools, guides, statuses, and approaches for tribal vulnerability assessments. There's a ton of information out there, as everyone working on climate adaptation knows, and trying to find resources can feel like drinking out of a fire hose. This effort aims to actually provide a drinking fountain instead of a fire hose with a curated, high-quality example of every different stage and different aspect of climate vulnerability assessment by tribal communities.

Finally, as I said before, providing information on its own isn't enough. It's really important to provide support in order to ensure its use, and so another part of this project was the provision of what we called a Tribal Climate Technical Support Desk, which was a hotline, an email, and a phone that tribal community members could call for help on any aspect of their vulnerability assessment work or their use of the data. This Tribal Technical Support Desk remains open. Another really important part in building climate resilience is providing sustained support for climate data interpretations that are used even long after the funded project that developed that data and maybe developed those partnerships in the first place is over.

I want to wrap up by commenting on some key roles for both the federal government and regional boundary organizations like the Climate Impacts Group and the Climate Adaptation Science Centers and some key roles that both levels play, as they are both essential partners in the effort to build climate resilience for the people and ecosystems of this nation. If I was going to say one thing about the important role of federal government right now, I would say that it is to both motivate sophisticated climate-based decision making and also prepare to enable this decision-making. By that, I mean on the motivation side that the federal government has a role in folks requiring and incentivizing science-based action to address climate risk. There are plenty of places where, as I said before, decisions are being made, investments are being made, that are still based on the climate of the past. It's a simple matter to remind people, and in some cases to implement requirements that they do consider, how the climate is already changing and how the landscape will differ as their decision or investment plays out. In order to support that kind of marriage, it's important to promote large-scale and targeted research, especially observation and modeling at all scales. The federal government has a very important role in building and sustaining regional and local capacity to connect science and practice, and I also think it's very intensive. For that one, I'm thinking about things like on the Climate Adaptation Science Centers and the NOAA RISA program and the local partnerships that they support and enable. It's also important to recognize the local specificity of needs and to relinquish somewhat these expectations that all projects will be universally transferable to other places, other communities, other sectors, because it's really in the heterogeneity and specificity that climate resilience will be developed.

Regional Boundary Organizations like the CASCs and the RISAs and the Climate Impacts Group, their important role is to leverage federal resources and science programs for local benefit, and to provide a conduit for information about local to make it back to the federal level. Our job is to develop and sustain mutually-beneficial long-term relationships with local partners to elicit local knowledge, needs, and adaptation priorities, and innovate to meet these needs, to develop, deliver, and support the use of actionable climate information, and to develop capacities for both researchers and practitioners to apply this information in planning and implementation activities across the region. With that, I am ready to move on to questions and answers, and I thank you again for the opportunity to share this work with you.

Bresette

Great, thanks, Amy. That was a really excellent presentation. One thing that stuck out to me on your acknowledgment slide were the two names of our Monday panelists, Ian Miller and Nicole Faghin of Washington Sea Grant. One thing I really like about this miniseries format is that it lends itself to callbacks and that really helps us round out the story of climate change and coastal community resilience, and it's indicative not just of the challenges faced by Washington and the Pacific Northwest but also the incredible amount of great work and research being done there by you and your colleagues and your partners and how aimed it is at finding solutions, which, of course, is what EESI is all about, so I'm happy to see their names. It's only been a couple days, but I kind of miss them. If anyone else missed Ian and Nicole on Monday, just a quick reminder that video recordings and

written summaries are already online on EESI.org. There's lots of detail in their presentations, just like in Amy's, so please, if you missed anything, go back.

Now we're going to move to Q&A. If our audience would like to participate in Q&A, you can email us at EESI@EESI.org or you can follow us on Twitter @EESIonline and ask us questions that way. For the Q&A I'm going to turn it over to my colleague Amber Todoroff. Amber is on our policy team, she's a policy associate with us, and is going to get us started.

Amber Todoroff

Thanks, Dan, and thank you, Amy. I'm completely blown away by the breadth of the Climate Impacts Group's work. It seems like you have a lot of work cut out for you, but you guys are doing an amazing job. One thing that stuck out to me was your work with the tribes. Could you elaborate on some of the resilience actions being taken with the tribes with CIG's assistance?

Snover

Certainly. As I mentioned, when Affiliated Tribes of the Northwest Indians did their survey, they discovered the tribes are at all different levels, like all communities are at all different levels of engaging in climate change. There are stories of examples that reflect that whole range. One of our longest-standing partners is the Swinomish Indian tribal community north of Seattle. In the mid-2000s they embarked on a very detailed vulnerability assessment using the guidebook that we have written for local governments for preparing for climate change. They really showed what a gold standard of thoughtful, detailed analysis of vulnerability could be and followed it up with an adaptation plan, and have since then been thinking about all kinds of things from relocating some of their important infrastructure to developing innovative community health programs that think about climate change impacts on community and individual health risks. That's an example of a huge effort that the Swinomish embarked on, and it can provide us an example to their tribal colleagues.

Another great example is an inland one. Even though we're on the coast, I'm going to tell an inland story. The Colville Nation developed a really interesting set of materials for educating youth on climate change. They have a bunch of different brochures and activities for students to think about impacts of climate change on many of the species that Colville tend to collect and rely on. They have a whole handful of summaries of tribal impacts on wildlife, but also activities and brochures for tribal use at different levels that they're using in some of the schools, so it really runs the gamut.

Todoroff

One of the big issues with this planning process is its communicating risk and science to these decision-makers. How does Climate Impacts Group overcome those barriers to the people that need it?

Snover

I could tell you the general story, and then a very specific one. In general, the way that we handle this is that we work on really being really clear to ourselves and then to our partners what we know really well with certainty, and what we are less sure about. For example, in the Northwest, I didn't tell you a lot about the impacts we're facing, but a big one, like a lot of the Western U.S., is impact on water supply. We depend on mountain water and mountain snowpack for our summer water, and we know it's going to get warmer. Every single scenario shows warming, which means every single scenario shows less snowpack and then less natural summer water. There, the question is just how much and how fast that happens, not whether it happens.

There are other kinds of impacts that are less easy to predict with specificity that maybe have to do with how much rain changes in the spring, and we just don't know as much about that. There's more possible futures. If we're really clear about what we know well and what we don't know well, then we focus our communication on that and help people focus their planning on that. Plan with certainty for some certain risk, and plan more generally for the possibility that multiple futures could happen, and we have to be prepared for both.

That's the general way, and then in the sea level rise example we actually have this projection of a range of sea level rise curves. For example, if you want to be 99 percent sure that the sea level rise I told you to expect is going to happen, then I can tell you what number to plan for. But, if you're really worried because you have very expensive infrastructure on the coast and you want to know the 0.1 percent chance that that billion-dollar

investment is going to be at risk, I can tell you that too. The big innovation in the sea level rise work is being able to put quantitative probabilities on it.

Bresette

You've talked about, and you even had some slides that showed your partners to the south and the east of Washington, but what about your partners to the north? Does the Climate Impacts Group work with Canadian partners, and are there any sort of ongoing projects that help build climate resilience where there are benefits that accrue in the U.S. as well as in Canada?

Snover

That's a great question, and I think I showed a map that had a hard line north of us. We have long worked across the region, and we define the region that we work on based on the problem we're working on, not based on lines on a map. We began in 1995 by focusing on the Columbia Basin water resource impacts, and so something like 60 percent of the water in the Columbia River (I made that up, that's probably the wrong number) originates in Canada. There's no way to study a massive watershed like that without looking across the border, so we continue to do that kind of work for both water resources and salmon and other things.

We have a really strong partnership with a similar organization to ours that's in British Columbia called the Pacific Climate Impact Consortium. We have created all kinds of things over the years and collaborated on projects. We have another specific example that was also led by Dr. Meade Krosby, who's leading the tribal work, to look at trans-boundary wildlife habitat connectivity. That's another example, wildlife don't know political borders, and as climate changes we need to have wildlife habitat not just connected today, it's already fragmented and people are trying to reconnect it. We need the habitat of today connected to the habitat of tomorrow, and that involves lots of collaborations across borders including the Canada-U.S. border, but also across federal lands and tribal lands and state lands.

Bresette

Thanks. We have a question that came in by email that I'm going to ask. How do you evaluate the effectiveness of the tools and services that you provide to decision-makers? Are there things that you look for in your work that tell you that one approach or one service or one tool is more effective than others, and how do you and your colleagues evaluate your approach on an ongoing basis?

Snover

That is a wonderful question. First of all, I would say that we work on being really clear up front about what we're trying to achieve with a tool or a resource: who is it for, what purpose, what are we trying to achieve, because there's a whole range of reasons. I think a lot of climate tools that are out there right now are still very focused on the raising awareness stage. They allow people to explore does climate change really matter to me, and how warm might it get, but they're not designed in a way to actually inform decision-making. What is the basis for the information that went into this, and what is the actual range of possibilities, and can I download actual numbers that I could put in a model? That's not to say it's a failure to say that it wasn't the purpose, and so we work on being really clear with who are we trying to inform to do what, and we tend not to do a lot of exploratory public-focused visualization tools because we're so focused on working with the people making decisions now.

We tend to evaluate our tools and resources based on whether they're being used. You can tell in the development stage with the testing and the feedback of okay, we think we're making something that's easy to use, and that clearly you would be able to make these inferences and go from this page to that page and get the data, and then we sit down with people and watch them try to use it. That's a humbling experience, right, when she's realized that it doesn't make any sense to them that it makes you. That's part of the evaluation, that rigorous testing. Another big part of it is that you have to set it up early in the stage. When we did our first major development of downscaled hydrologic scenarios for use in Columbia Basin watershed management and planning, the audience and partners were technical federal agencies, so we have a fairly technical website that other people don't find very user-friendly. I don't find that a failure, because it was designed to meet the technical needs.

It's a complicated story of defining the purpose, defining the users well, and seeking the iterative feedback from them that in the near term is how is it working? and in the longer term is are the data showing up in an analysis that they've done? Are the data being reported or the tool being used in plans that they are publishing? We see that evolve over time, too.

Todoroff

This more involves your role as director of the Climate Adaptation Science Center. We've had a couple speakers before from Climate Adaptation Science Centers. I think they're super interesting bodies of work, so if you could tell our audience how these regional centers work together, and if there's a top three things that policymakers should know about what these centers do? That would be a great way to end this.

Snover

Great. As I mentioned, the Climate Adaptation Science Center program consists of eight regional CASCs. We are the one for the Northwest, but there's also Alaska, Pacific Islands, Southwest, North Central, South Central, Northeast, Southeast, and there's a national office too that's located in Reston. The power of this system is that each of the regional centers is who is at home in a region, is an organization that already has deep roots and connections with stakeholders, managers, and folks on the ground to understand what the needs are, because they're very different from region to region. The reasons that climate change matters on the ground are different for different ecosystems, are different for different managed systems, and the state of climate science is really different in different parts of the country. You need to have this local partnership to understand what do we know now? What could we know next? What are the needs? The centers collaborate to share our approaches, to talk about best practices in connecting science and decision-making. All of us play a big role in educating graduate students and early career folks to engage not only in applied climate science, but more importantly in the co-production, in the work across practice and academia.

Some of the most important things to share about the network are that we are your ears to the ground. We are the ones who are seeing the need. My last slide about federal [inaudible], prepare to compare to be able to meet. There's a rapidly increasing need for decision-relevant science. That need is exploding. We are underwater trying to meet it. There are so many people from our federal to state to tribal resource management agencies, our cities, our towns, and our businesses who are calling us up saying, what's happening? What are the projections? What's the best science? How do I use it? How do I prepare? There's more demand than we can meet, and so we're your ear to the ground telling you that that need is there, but also telling you that the opportunity is right now to meet that need and to help support the decision-making that is better aligned to the emerging point of realities that we're facing.

Bresette

We've come to the end of our 45 minutes, but really tremendous talk, so informative, and your perspective is really helpful. I learned a lot, and I really appreciate taking some time during your morning, even though it's afternoon here, time is relative. Thank you very much, and let me also compliment you on your background and your flowers, a little bit nicer than my dark blue. Thanks so much, this was really great.

Before we wrap up, I'm just going to say another reminder tomorrow at noon Eastern, 9 Pacific: *Weather and Social Data to Inform Participatory Planning Initiatives*. It's the last of our 5 online briefings from this week, so hopefully everyone will come back to us tomorrow, same time, and join us to wrap up this miniseries. Thank you to our audience, but special thanks to everyone at EESI who pulled these off in addition to Amber, Ellen, Amaury, Dan O'Brien, Abby, Sydney, Uma. It's a big team, and we're really lucky to have them, and they do such a great job. This briefing series has been so great, and we owe it all to them. I hope everyone has a great rest of your day, and hope to see you back tomorrow on Friday for *Weather and Social Data to Inform Participatory Planning Initiatives*.

the climate and ensure a healthy, secure, and sustainable future for America through policymaker education, coalition building, and policy development in the areas of energy efficiency, renewable energy, agriculture, forestry, transportation, buildings, and urban planning.