Sea Grant
Oregon

Coastal Resilience
Assisting Communities in the Face of Climate Change

A PANEL DISCUSSION

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Contents

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Oregon Sea Grant

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Executive Summary

A special grant to Oregon Sea Grant from the National Sea Grant Office enabled planning for a panel discussion on the topic of coastal community resilience in the face of climate change. This topic has generated considerable interest and some new government funding in recent years, particularly in the wake of the highly destructive hurricanes Katrina and Ivan. But despite the interest in federal agencies and in academia over the sophisticated concept of "resilience," examples of U.S. communities that are constructively working toward climate resilience in a systematic way (much less having achieved it) are comparatively few. Yet, preparing coastal communities for greater resilience in the context of a changing climate is a legitimate, even crucial role for state Sea Grant programs—thus Oregon Sea Grant's particular interest in convening the discussion.

On November 23, 2010, Oregon Sea Grant facilitated a teleconference discussion among 13 coastal resilience experts to exchange information, experience, and ideas that ultimately could help coastal communities become more resilient, in short by identifying some roles and strategies for both research and community practice. The 13 discussants are all actively involved in coastal resilience work in various regions of the U.S. and were selected to represent a diversity of professional experiences.

The discussion began with participants expressing how they conceptualize or frame "resilience." Most agreed that the term is subject to individual interpretation and that major differences exist between the academic definitions and community perceptions. To set the stage, two dominant definitions in resilience studies—engineering resilience and ecological resilience[1]—were recapped. Participants voiced several concerns over the limitations of these definitions, such as: certain socioeconomic groups may be marginalized by looking at the entire system and not its subcomponents; too much emphasis may be placed on returning to a previous state, rather than adapting and evolving to a new state; and focusing too much on immediate hazards may not adequately address the longer and slower variables that will make for greater resilience over time.

Discussants expressed a variety of factors that influence how resilient individual communities can be, including social variables at different scales—for example, social capital (e.g., networks) and national,

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[1]*Holling (1973) originally made this distinction between the two types of resilience. Moser (2008) then distinguished between these as (1) the capacity to return over a short period of time after disturbance to a prior (relatively stable) state (engineering resilience, emphasizing qualities such as efficiency, control, constancy, stability, and predictability) or (2) the capacity to self-organize into a new configuration after disturbance (ecological resilience, emphasizing qualities such as persistence, adaptability, variability, sustainability, regime shifts, and unpredictability).*

state, and local policies and laws. Zoning laws determine where both homeowners and businesses build, for example; people want and need to live where amenities are present. In addition, insurance rates and property taxes both potentially encourage or reinforce detrimental behaviors, such as building in areas prone to inundation or erosion. For some communities—those that have already been hit hard or are disproportionately vulnerable to climate change impacts—outside assistance may be necessary. This last point raised a difficult ethical question: how much of a financial burden is too much for coastal communities to extend to the rest of society, particularly for risky and costly coastal actions (e.g., siting buildings in hazardous areas)?

In discussing what resilience means to people and communities, several cited examples from their own work. Most agreed that the term itself is not particularly useful outside of professional discourse; rather, framing discussions around taking actions that support a community's ability to adapt to change is what is important. Some felt that the communities they encountered approached resilience quite insightfully from a human-centered perspective. One discussant stated that several members of a community she worked with thought of resilience as having control over one's future. A few pointed to structured engagement and participation processes as important components of dealing successfully with resilience. This led to a conversation thread on communication strategies.

How do we assist communities and individuals in talking about coping with change? Discussants shared frustration with ideological disputes over "climate change," and it was suggested that conversations with the public should be opened without that term, as it tends to invite resistance. Focusing on climate change also has a tendency to raise concerns over the frequently cited lack of local data and of downscaled climate models. People may demand greater scientific information because they feel legitimately concerned about costs of adaptation and investing under uncertainty, particularly if they are faced with more-immediate economic concerns. Though several in the group stressed the importance of eventually acquiring and presenting such scientific information, all agreed that some of the most crucial steps can be taken without extensive local data or downscaled information. For example, measures that increase flexibility can be taken now.

The problems posed by the changing climate and the solution proffered by resilience thinking have captured the imagination of many specialists. But for many nonspecialists, including coastal professionals and community members, the problem and the solution both are irrelevant to the problems they face. Our future climate is very unlikely to look like the past, and humans may have to change dramatically— and these are not easy ideas for people to assimilate. Thus, it's critical to initate dialogues with communities about adapting to change.

The discussion closed with ideas for next steps, such as pursuing further similar discussions (including with additional specialists from such groups as the insurance industry), drafting one or more white papers, and convening the group at a relevant conference.

Coastal Community Climate Resilience Discussion
Information on Discussants and Facilitators

F. Stuart (Terry) Chapin
Associate Professor, Department of Biology and Wildlife
University of Alaska Fairbanks
http://terrychapin.org/

Terry primarily conducts research on the effects of changes in climate and wildfire on Alaskan ecology and rural communities. He is especially interested in ways that communities and agencies can develop options that increase sustainability of ecosystems and human communities over the long term in spite of rapid climatic and social changes.

Patrick (Pat) Corcoran
Coastal Hazards Outreach Specialist
Oregon State University Extension Service, Clatsop County
http://extension.oregonstate.edu/clatsop/coastal-hazards

Pat helps communities build resilience to coastal hazards by providing them information on physical processes, their impacts, and what the recent research suggests can be done to lessen those impacts. The idea is that increased understanding will help people "bounce back better." Shoreline erosion impacts and earthquake and tsunami preparedness are his areas of focus.

Kirstin Dow
Associate Professor, Department of Geography
University of South Carolina
www.cas.sc.edu/geog/research/cisa/

Kirstin's research involves vulnerability to climate variability and change. She works with decision-makers to identify issues of concern and with climate scientists to tailor information to meet decision-makers' needs. She views understanding vulnerabilities and impacts of concern as critical steps in developing risk assessments and strategies to address priorities in increasing resilience.

Timothy (Tim) Frazier
Assistant Professor, Geography & Bio-Regional Planning
The University of Idaho
www.uidaho.edu/sci/geography/faculty/timfrazier

Tim's current research seeks to enhance society's ability to plan for and respond to contemporary natural hazards and impacts associated with future climate change. His research often couples GIS based climate change and hazards modeling with stakeholder interaction to examine issues, opportunities, and constraints related to reducing vulnerability and enhancing resilience.

Susanne (Susi) Moser
Director and Principal Scientist
Susanne Moser Research & Consulting
www.susannemoser.com/about.php

Susi's work focuses on adaptation to climate change, vulnerability, resilience, climate change communication, social change, decision support and the interaction between scientists, policy-makers and the public. She is interested in how social science can inform society's responses to this global challenge. She has worked in coastal areas, urban and rural communities, and with forest-reliant communities.

Pamela (Pam) Rubinoff
Coastal Management Extension Specialist
University of Rhode Island Coastal Resources Center and Sea Grant
http://sgccnetwork.ning.com/profile/PamRubinoff

Pam leads the CRC's program on Climate Change and the Coast, specializing in community resilience, advancing efforts that link coastal management and natural hazards. In addition, as an extension specialist, she is working with communities and state agencies to apply smart growth and coastal adaptation tools to both built and natural environments.

Courtland (Court) Smith
Emeritus Professor
Oregon State University, School of Language, Culture, and Society
http://oregonstate.edu/cla/anthropology/smith

Court's research on resilience focuses more broadly on adaptive capacity, which is more of a cultural mechanism that includes the values, knowledge, leadership, and flexibility to adjust to unforeseen and unpredictable events. His top priority is to instill the understanding that life is a continual process of adapting to change.

Matt Spangler
North Coast Regional Representative
Oregon Department of Land Conservation and Development, Community Services Division
www.oregon.gov/LCD/OCMP/index.shtml

Matt serves as the Oregon Coastal Management Program's primary contact for local governments. He provides technical assistance on a variety of land use planning and community development issues to cities and counties on the north coast. Increasingly, local municipalities are exploring ways in which to incorporate resilience strategies into their overall land use planning efforts.

Heidi Stiller
Human Dimensions Specialist
NOAA Coastal Services Center
www.csc.noaa.gov/

Heidi's work currently focuses on land use planning that incorporates hazard mitigation and natural resource sustainability. Previously she has been involved in efforts to identify resilience factors and provide data and tools to help communities address and communicate coastal inundation risks. She has also worked on long-term post-disaster recovery planning.

David (LaDon) Swann
Director
Mississippi-Alabama Sea Grant Consortium, Auburn University
http://masgc.org/climate/cop/index.html

LaDon is involved in advancing MASGC's involvement in hazard resilience in coastal communities. MASCG recently began the second 3-year NOAA Coastal Storms Program, which works with the Gulf of Mexico Alliance's resilience priority issue team; together, they have coordinated the development of a Community Resiliency Index and Storm Smart Coast websites for every Gulf of Mexico state.

Heather A. Triezenberg
Social Scientist
NOAA National Sea Grant College Program
www.seagrant.noaa.gov/focus/scd_page.html

Heather is the program leader for both the National Sea Grant College Program's social science portfolio. She also leads the Sustainable Coastal Development initiatives, which help communities anticipate and respond to potential hazards. She has researched the role of community social networks for information transmission, issue framing, and development of public issues.

Seth Tuler
Research Fellow
Social and Environmental Research Institute, Inc.
www.seri-us.org/projects/CCmodeling.html

Seth's current work seeks to improve the process by which communities plan for managing coastal hazards associated with climate change and provide guidance to practitioners and local officials about how to integrate adaptation into their plans. The project develops scenarios using a computer diagramming program, which identifies resilience challenges and opportunities.

Jessica (Jess) Whitehead
Regional Climate Extension Specialist
North Carolina Sea Grant
www.scseagrant.org/Content/?cid=251

As a part of the Regional Coastal Climate Change Initiative, Jess is developing outreach programs for decision makers along the Carolina coasts that provide them with tailored information about the impacts of climate variability and long-term climate change on coastal areas. She is currently conducting a climate information needs assessment for potential information users.

Facilitator:
Joseph (Joe) Cone
Assistant Director & Communications Leader, Oregon Sea Grant
http://seagrant.oregonstate.edu/research/ClimateChange/index.html

Joe is a communication practitioner (books, documentaries) and university communication program leader. He has been closely involved in the last several years as a PI on NOAA-funded climate engagement projects, deploying the resources of Sea Grant programs in several states to assist coastal communities in climate-change planning.

Facilitator:
Bridget Brown
Climate Engagement Coordinator
Oregon Sea Grant

Bridget recently joined the Oregon Sea Grant team as a faculty research assistant focused on climate change and stakeholder engagement. She is currently involved in a project that will assess attitudes and barriers to climate change adaptation and resilience across several coastal states.

Coastal Community Climate Resilience Discussion

Via Telephone Conference Call
November 23, 2010

The transcript that follows is from a 90-minute panel discussion on the topic of coastal community resilience in the face of climate change. The 13 discussants are all actively involved in coastal resilience work in various regions of the U.S. and were selected to represent a diversity of professional experiences. The purpose of the discussion was to exchange information, experience, and ideas that could ultimately help coastal communities become more resilient. Discussants were not asked to prepare statements in advance but rather to respond to one another in a free-form manner. Therefore, this transcript is intended to offer very targeted thoughts on the topics that arose in the context of the discussion, not to sum up the expertise and experience of each discussant.

Joe Cone Jess Whitehead has graciously offered to start off our thinking with some observations.

Jessica Whitehead My position really straddles the world of research versus practice, especially on a local level. And to start off, I thought, like any good Extension agent, I'd pretty much share a story, briefly.

For a project that we've been working with Joe [Cone] on in Plymouth, North Carolina, in August we were doing interviews. And this particular project is ultimately focused on climate change, but given that it's in a small coastal Carolina community, perhaps not always the best, most-effective way to deal with it as such. So, the interviews that we were doing, we very deliberately asked about the environment and flooding, instead of climate change. And we did one interview with a gentleman who was a leader in the African-American community there, so he had a very different perspective from a lot of the other folks we'd interviewed in the town government. And when we asked him about the environment, what it meant to him, he started talking a lot about things in the community—not having a youth center, how the young people are just bleeding out of this community, they're leaving as quickly as they are physically and financially able. And when we were finished with the interview, my colleague afterward in the parking lot was somewhat disappointed. She was very much afraid that maybe we should have asked more about flooding and climate outright. And I said to her, "No, I don't think I am disappointed in this, because the things that he was talking about are all things that are going to impact how resilient this community is, should floods become more frequent, should tropical storms be more intense, when sea-level rise starts to accelerate."

And so I thought that I would throw in there that, for me, I could talk to you about the academic definitions of resilience. But what really matters is what works in a community. And what helps, what aspects of resilience are there that work for them and help them to prepare for coastal climate change. And they may not necessarily be the things that we first think of. But they're incredibly important to those communities, and they don't really care what the terminology is, so much as they can get things done and keep their community going. So I thought that I would throw that out to start the discussion.

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Patrick Corcoran I think that [people interpret] "resilience" kind of like "sustainability"—real individually. And certainly the notions that I have going into [it] are often much different than the other folks.

Terry Chapin That story that you told about the North Carolina community is really similar to what I see in Alaska, where in Native communities people think about the problem in a much more holistic way than we often do in

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* Ellipses indicate where secondary elements of the original conversation have been removed—such conversational features as asides or digressions. The facilitators believe that this improves the flow of the transcript and its focus on resilience.
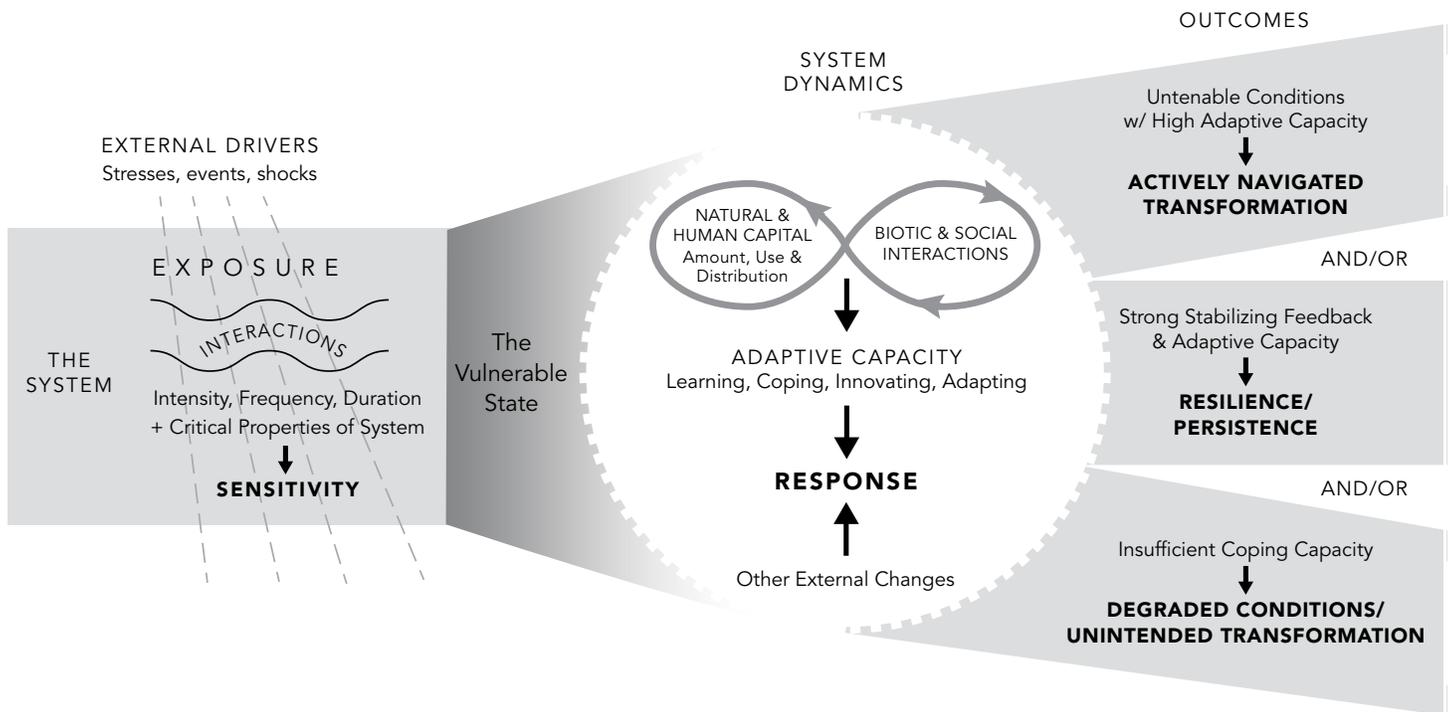
A conceptual framework that puts resilience in context shows, from the left, that the System of interest (e.g., household, community) responds to a suite of interacting Drivers (stresses, events) that may put it into a Vulnerable State in which the Adaptive Capacity of the system will determine potential outcomes: (1) actively navigated transformation to a new, potentially more beneficial state; (2) persistence of the existing system through resilience; or (3) unintended transformation to a new state (often degraded) due to vulnerability and the failure to adapt or transform. Graphic and caption adapted from Chapin, Folke, and Cofinas (2009, p. 21). Graphic: Patricia Andersson

academia. And they think about the things that are impacting—the whole range of things that are impacting—community. I think it really just nicely brings us to resilience, because in a way they're thinking about what is it that makes their system as a whole, their community, able to respond to some sort of surprises that may or may not be what people are planning for. So it's really all about adaptive capacity and a diversity of options of things to do.

Kirstin Dow   The questions about the resilience of a community sometimes seem a little different to me than the definitions that we have in academia that focus on systems. I work often with vulnerability, and I'm concerned that as we talk about resilience and about recoveries of systems, some of the most-vulnerable people are marginal to the systems, and their recovery is not necessary—it's not required for this—to meet the technical definition of a system recovery. And I want us to think about resilience and the equity dimensions of it.

…

Timothy Frazier   People often are concerned about their resilience, but they're really concerned about their ability to mitigate based on their kind of economic list of priorities that they have for those different communities. Especially given the current economic situation. So people are often very reluctant to kind of engage in long-term projects that might mitigate or adapt in order to enhance their resilience. [They] will fear that they are compromising the present for an event that may or may not occur in the future.

Susanne Moser   I just wanted to throw in from one experience I've recently had doing research in forest-reliant communities on resilience. And we asked them to define the term, and it had some resemblances to the sort of more common academic definition, sort of engineering resilience, or what in ecology would be considered more ecological resilience. But the aspect that no one in academia that I had heard of before associated with that term, but that was actually quite common in our interviews, was the ability to self-determine one's future as a critical aspect. Having the resources—human, natural, social, intellectual—to basically have con-

trol over one's life, and to determine the future, was an aspect that I hadn't heard, at least in the academic literature. And I thought that was really an interesting aspect.

…

Joe Cone   And how much of that do you think is related to the Native community and their particular worldview, for example? Or isn't that a factor, from your perspective?

Terry Chapin   I would think it would be true of fishing communities along the [Alaska] coast too, that are not native-dominated. I think people really want to be able to take control of their lives, like Susi [Moser] was saying.

Susanne Moser   In the interviews that we did, there were no Native groups part of that. Rural folks, African American, quite a few Hispanic communities, but no Native communities. So I certainly couldn't chalk it up to a particular worldview that they hold uniquely.

Joe Cone   Susi, you alluded to a couple of standard definitions—the engineering notion of resilience and the more ecological one. Would you quickly highlight the key differences between those, so we've got those in our head?

Susanne Moser   Well, the engineering one typically is defined as sort of the time to bouncing back to the previous state before the disturbance. Whereas ecological resilience involves a sort of a systems view of maintaining essential functions and sort of the whole space of what does it take to stay within the state that you can recognize, as the typical state for this system. Essentially it looks at the entire dynamic that maintains it in that place, rather than just how fast can you get back up to your feet.

…

LaDon Swann   I think the way we apply "resilience" really is going to depend on what our interest is. At one point I thought we maybe had an accepted framework of what resilience was. And it's really at the community level. And it's very simple—it's both the built and natural environments bouncing back. And that entails everything from social networks to infrastructure to the ecosystems as well. So that's kind of where we come from, I think, in the Gulf of Mexico, when it comes to resilience.

Joe Cone   You've produced that community resiliency index, LaDon. Could you say a little bit about that?

…

After hurricanes Katrina and Ivan, face-to-face social networks were key to community recovery, said LaDon Swann.

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LaDon Swann We looked at critical infrastructure and facilities, transportation and community plans, mitigation measures, business plans, and social systems. Those are the areas that we looked at. So it was focused primarily on the built environment. But the natural environment plays a key role in that as well. The reason that we left out the natural was that, to a certain extent, communities didn't have as much control over the natural environment as they did the built environment.

Susanne Moser It always concerns me a little bit that we focus on the things we can more easily control or measure. And the things that seem to be at the heart of holding a community together—i.e., the social aspects of resilience and the interpersonal relationships, and things like that—they are very hard to track, very hard to capture, certainly to get in a quantitative assessment, if you will, to compare communities. And hence we tend to forget them. But when it comes down to it, it's the challenge of how do you weigh and integrate? And maybe how do the different aspects of resilience—economics, natural, infrastructure, social—how do they even compensate partially for each other? But how do we integrate that? That, to me, is a really critical thing.

> "…measuring resilience is not just about having a list of variables that you check off [but also about] having communities that go through a process to talk about where they're strong and where they're vulnerable."
>
> *—Heidi Stiller*

LaDon Swann We did, we looked at five different things. We looked at the face-to-face networks, the cultural identity, neighborhood associations, business cooperatives and working relationships, and strong civic organizations, as some of the criteria that we looked at from a social resilience standpoint.

Kirstin Dow Can you say more about how you did that?

LaDon Swann At the time we put this together, [hurricanes] Katrina and Ivan were very fresh on our minds. And we started by looking at what was working. And face-to-face networks [were] key to recovering after Ivan and Katrina down here. And I'm sure as it is in other places. So, that's how we started. And then this was refined through a series of pilot testings in, I think, 16 different communities around the Gulf.

Heidi Stiller We knew that social networks, and some of those social variables that you were just speaking about, are absolutely critical. But as you say, they're hard to measure. And so, the index really tries to pick things that people can at least give a sort of rough estimate for where they're at. And figuring out which variables those were did happen through the course of those pilots. So I think that's sort of a step down that path. But I think it sort of hints at this issue that measuring resilience is not going to be just about having sort of a list of variables that you check off and you get the data. I really think there's process variables. And you're having communities that actually go through a discussion and a process to talk about where they're strong and where they're vulnerable, that's part of the picture, I think. … I think there's external world variables. If you think about a group, where it's one person that has to demonstrate their worth to the group in order to sort of get some of those support factors. And I think that some of that we see in resilience too, that a community, they need external support. But you have to demonstrate your worth to get that. And I think that communities in the Gulf are not going to be able to be resilient all by themselves.

Joe Cone So you're expressing a perspective about scale that local communities alone can't be totally robust on their own? Is that the idea?

Heidi Stiller Yes. And the Alaska communities that are having to relocate because of climate change. That's another example. They can't do it on their own.

Joe Cone How [are] people thinking about weighing and integrating all the elements of a multidimensional social and ecological system? If that's how people are thinking about it. I'm curious.

Susanne Moser Let me just add to it. And for me there's also a question, one that I haven't answered for myself. But I think there's something there about tradeoffs between, very concretely, if you have say, nice wetland buffers, or dunes, or whatever. That gives you a bit of a compensation, if you will. If you had weak coastal protection, infrastructure-wise or if you had really great leadership, but aren't so great with economic resources, maybe that will make up for some of that. So to what extent do the different components of resilience compensate and can be traded off?

LaDon Swann And I'll just add, we did just that. And we didn't want to get down into the weeds so much that we had to have a tool that was extremely precise. And so how you determine if you have a good evacuation route,—is that two times more valuable than having a strong face-to-face network? We did what we could with that. But in the end, it really was just a self-assessment. And in the pilots, we found that getting those people together working—"those people" being the community leaders, whether it's local government or whatever—was as valuable as a tool, because they walked away and they had kind of a holistic view of their community. And there was a great deal of value in that itself. They were asked to rank their community as being low, medium, or high. And what we found was, they knew where they were strong before we got together with them. But what I think the index and working together through our process, how it helped them was it allowed them to see some of the areas where they were weak.

Seth Tuler Resilience, in part, is also related to the processes that people have, or the capacity that people have to engage in a process of thinking about these big-picture issues and the tradeoffs, and all that. It's not just about the kinds of material assets that they have. In some of the work that we do, too, it's about helping people develop the capacities for engaging in those processes of thinking. Taking the big-picture view.

> "…in the pilots, we found that getting those people together working— "those people" being the community leaders, whether it's local government or whatever—was as valuable as a tool, because they walked away and they had kind of a holistic view of their community. And there was a great deal of value in that itself."
>
> *—LaDon Swan*

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An aspect of the way we think about resilience is the ability to kind of engage in those discussions. Susi brought up people wanting to have self-control, or control over their futures. But, they have to be able to then be able to talk about that. Talk about those issues.

…

Court Smith I am not particularly enamored with phrasing this around "resilience." My experience is that people don't really understand what the term means. Secondarily, I think it emphasizes too much of a returning to something, whether it's ecological or engineering. My view is that communities really need to think about how they can adapt to the future, which is full of change. Whether it's economic change or environment change, or whatever. And so, I'm a little concerned about the framing of the whole issue, that there is some kind of point that you can hold onto. I just really find that very difficult to see. … If you take a long-term view, there are very few communities that have stayed as they are for a long period of time. … So this kind of stability focus, as opposed to the fact that there are no stable equilibria—we live in an ever-expanding universe, and so on—it kind of bothers me about our discussion of resilience.

Patrick Corcoran cautioned about the "huge magnetic pull" of the status quo and the way that concepts like sustainability and resilience may become "co-opted." Thus, sustainable harvest morphs to sustainable supply of logs to the mill.

Susanne Moser I definitely concur with you that, for a vast number of people, including lay folks, it often means going back to normal.

Terry Chapin Ecological resilience has to do with sort of the sustaining of the things that people really care about. Things like their cultural roots, the way they connect to the land, and so forth. And so, it's not necessarily a static thing. … And also, I think in talking about resilience, it's often a useful term as a shortcut for talking about things. But in talking to communities, it may not be all that important to use that word [resilience].

Patrick Corcoran I'm in general agreement with both the usefulness of the notion but also the downside of the notion. And what I'm seeing here in coastal Oregon is "hazard-resilient communities" [may mean] "How can we maintain the status quo under the rubric of resilience?"… There's a good analogy to "sustainability" and how words get co-opted by a sort of status-quo thinking. And the notions around timber supply and timber ecology, where the idea started with a sustained harvest based on the amount of trees that were grown in any given time. And that got co-opted to be a sustainable supply of logs to the mill. I think what we've been talking about, the notion of resilience, is to really be honest about the willing—or, even the unwillingness of the realization that major change may well happen. But there's a huge magnetic pull back to the status quo and co-opting the language to maintain that.

…

Heidi Stiller I think in general we get way too wrapped around the axle, trying to define the various terms. … But whenever you get down on the ground and you actually work with a community to help them, they're going to have to define it themselves. And they may decide to use a different word. And I think it's good to keep that in mind. … The other thing to keep in mind is that sometimes new terms, just some sell better than others. And I think that resilience really emerged after the '05 hurricane season, because resilience was fundable. And it was sort of the new sustainability, but it was a lot easier to get funded. And so all of those aspects are wrapped up in sort of how we define and use terms.

…

Joe Cone Heidi, I'm curious: from what you said, would it be beneficial to have a generally agreed on and appropriately publicized definition of community resilience, under climate change? At least for practitioners? Would it be useful?

Heidi Stiller No. Because every time you get a new group, they're going to have to—either they're going to argue about it, or they're just going to accept any one of five or six definitions and move on. … I'll give you a little vignette—and I thought this was fascinating: we did three resilience salons that Margaret Davidson [direc-

tor of the NOAA Coastal Services Center] organized after that '05 storm season. And one salon was with folks from the research community. One salon was with folks that are sort of on-the-ground practitioners, floodplain managers and CZM [Coastal Zone Management] folks. And then the third group was business executives. And the research academic group spent way too much time arguing about the definition of resilience. And the group on the ground, sort of practitioner types, they debated what all is part of resilience, and what all is wrapped up in that. So they spent some time on it. Not as much. And then the business folks, they didn't spend any time on it. They were ready to just say, "O.K., yep, that's a general definition of resilience. We're moving on. Let's talk about how we can fix it." And that was really interesting.

> ## "...one of the key differences between vulnerability and resilience is that resilience reflects potential responses to all kinds of things. Many of which you wouldn't guess ahead of time."
>
> *—Terry Chapin*

Pamela Rubinoff   I think when we first started using "resilience," it was after the tsunami in Asia and we were looking at coastal community resilience. And we soon became very clear that this was about resilience to a variety of factors, not only to hazards. So I'm just wondering if this is about climate resilience or coastal community resilience, which has been potentially a broader theme for which climate change and adaptation fit into. But if you look at some of the key resilience factors, just even economic diversity, or something like that, which would be necessary under climate change conditions, as well as for resilience under economic stresses, then it starts to make sense. Are we looking at only resilience to climate change or resilience in more of a general coastal community resilience sense?

Susanne Moser   I strongly vote for multiple hazards.

Terry Chapin   I would agree. It seems like that's one of the key differences between vulnerability and resilience is that resilience reflects potential responses to all kinds of things. Many of which you wouldn't guess ahead of time.

Susanne Moser   I don't know if it [resilience] contrasts with vulnerability, actually. It seems to me that if you think about the components of vulnerability and the sensitivity or adaptive capacity, you could only make sense of that truly if you understand what other things are going on, be it the economic stressors or previous hazards, how long ago that happened. That totally affects how sensitive the system is, or how well they still have resources to respond to it. So I don't know if it's really a contrast to vulnerability.

…

Kirstin Dow   But I do think that when you do the vulnerability analysis, you probably would break it down to a separate kind of hazard, so you'd understand the differences between a heat event or coastal erosion. And maybe— there's certainly a different kind of resilience to different sorts of events. If we wanted to take the analysis a step further, I'm not sure we're so far apart.

Patrick Corcoran   And for me, sort of underneath it all, in my observation, is a resistance to changing from status quo. And one thing that resilience means to me is operating with the understanding that this is a shifting playground. And if you're updating your 30-year floodplain ordinance, based on the last 100 years of rainfall data, you're going to be wrong. And yet it seems like there's this overwhelming drive to reframe things such that we can do things the way we did before. … To my folks in a coastal community, their definition of community resilience to coastal hazards is building the riprap higher. And so for me, underneath this all is helping people really get the big picture that the future ain't what it used to be. And that's very unsettling.

LaDon Swann   And I agree completely. One of the things that we chose to do, and is really based on the pilot testing, I think we started out by asking for their benchmarks, storm of record. And in Mississippi it was Camille in

1968, and everyone said, well, if we build higher than the surge for Camille, we're good. And then along came Katrina, and there was 15 more feet of water, or 20 more feet of water. So we tried to deal with the future by letting them identify what their storm of record was. And then helping them to understand, or to define what would happen if you added 50 percent to that storm of record—50 percent of anything, surge or winds, or anything to that storm of record. And then asking them to answer questions like with infrastructure questions, what's their storm of record? And then, would that infrastructure still be safe if you added 50 percent to that? So, to get them to think into the future was a little bit of a challenge, because we're so used to thinking, well, this was the storm of record and nothing will be worse than that. But I think their minds were open after Katrina that, well, our benchmark in the past wasn't appropriate, and thinking out into the future is a good idea.

Patrick Corcoran   But don't their minds close right away when you ask the question, what is the threshold upon which we will not rebuild? Our New Orleans or our Mobile? It seems like that would be a very difficult conversation, to actually articulate a place at which, or after which, we would give up on infrastructure and relocate.

LaDon Swann   That's a great discussion. But that's not really what we're trying to accomplish with this [community resiliency] self-assessment.

…

First they have to identify that all their infrastructure will be flooded if you added 50 percent. And then hopefully they would recognize that maybe their infrastructure's in the wrong place and they need to move it back, and up.

Timothy Frazier   The group that I work with in Florida, what we often saw was a willingness to accept the fact that a larger-extent coastal event might be possible. But at the same time, not willing to invest the kinds of dollars that we need to invest, or make the kinds of changes that need to be made. Because of the way that their perception was that it was still a very low probability that that could happen.

LaDon Swann   Or that the government would then pay for putting it back right where it was. That's part of the problem too.

Court Smith   I have a question—to what extent do you think it would be possible to get people's attention by really talking more about some of the costs of not thinking ahead? It seems to me that we have a continual process of

Court Smith asked if coastal communities that develop infrastructure in vulnerable locations are imposing inappropriate costs on society as a whole.

particularly county and city land-use planning not really paying much attention to the costs of the decisions they're making long term, particularly in the coastal zone. … We're very interested in debt these days, so to what extent in pointing out to people, this is the kind of debt you're building for the future, if one of these events happens. And it's a debt that probably you, as a community, can't cover. So, is it worthwhile maybe being more careful in the planning process?

> "…the work we've done suggests that there was an interest and a willing-ness to look at land-use planning as a means for kind of hazard mitiga-tion or climate-change mitigation or adaption. But, again, it goes back to many of the communities felt like they were crippled by their current economic situation."
>
> *—Timothy Frazier*

Jessica Whitehead And I think that that answer would depend on what community you're in. We've gone out and we've asked that in a couple of different communities in the Carolinas. And the most common answer seems to be, well, we can think about that now, but, there's just no money for us to deal with it, even if we know that it would be cheaper to do it now. … I think that current economic health of the community will determine whether they're just thinking about it, whether they're willing to think about it or whether they could actually act on it.

Timothy Frazier And I do want to agree with Jess. Because the work we've done suggests that there was an interest and a willingness to look at land-use planning as a means for kind of hazard mitigation or climate-change mitiga-tion or adaption. But, again, it goes back to many of the communities felt like they were crippled by their current economic situation.

…

Matt Spangler I would agree with the previous observations of Jess and Tim. The local communities, while they have de-veloped, I think, an increased understanding of the potential long-term impacts of, say for example on the Oregon coast, a subduction-zone tsunami, which is going to happen but it's a very long recurrence-interval type of event, or the long-term picture of climate change impacts—they just have a hard time wrapping their arms around that, because it is kind of so far out there on the horizon. And so they're much more focused on what can we do in the next five years, or one year, to deal with the issues that are on our plate right now?

Court Smith What happens if we follow this line of thought is that then these communities are essentially imposing their risks on society as a whole. Now, I don't like to be harsh on Oregon communities, but let me be a little bit harsh. Part of the problem they're in is because they didn't think long ago how they might diversify their economies for a future change. So it seems that we're in kind of a vicious circle here, where the pleading of poverty is leading to the problems that we're facing. And it seems that, for coastal communities, if they really want to impose these costs on society as a whole, then society might have more interest in pay-ing attention to how they make certain land-use decisions. Because a lot of these land-use decisions are, quote-unquote, "not very costly at the present," communities will argue that you're taking away our oppor-tunities for economic growth. But if you're building economic growth by increasing your risk profile, that's really not probably sustainable. So is there a way that communities can be encouraged to kind of wake up to their own deficits? That's kind of harsh, but anyway…

Susanne Moser I think this is the absolutely hard question and honest question we have to ask. And it seems to me that raises the question about the role of financial institutions. It seems like as long as the financial incentive is to have the highest property-tax income from the shorefront, we're screwed. If building in the most risky zone is the great-

est source of income for a local community that depends on the tax base, I think we're in not good shape. So, somewhere I think insurance mechanisms, banking rates for mortgages, and things like that, need to somehow reflect the risk. So the question for me is, how do we bring those folks into this conversation?

Patrick Corcoran   I often tell people that one change in a State Farm insurance policy will do way more in changing local behavior than all the workshops that I could possibly do. And so, where is that financial incentive? And I like what Court was pointing to, is sort of a broader communitywide economic analysis. What is the cost to Portland for Newport doing things in a silly way? Of course, Portland does things that are silly. … But this broader community cost to local expense would be maybe a useful sort of function. … All of this, though, bumps up against human nature and our neurology. And we are hardwired to be afraid of lions and tigers and bears jumping out on the path in front of us. We are not hardwired to worry about long-term contextual changes, like climate change—or things like tsunamis that are long recurrence intervals. But, we should be smart enough to know that they're going to happen anyway.

Pamela Rubinoff   I think that our neurology goes straight up to the statehouse and to our legislators. Because what happens every time that the insurance companies want to—after we have hurricanes or something like that here in the Northeast or in Florida, they try—to raise rates. And then the insurance commissioners will not allow them to. And so, because it's the cry from people saying, oh, I can't afford to live here, and such like that. So it's these inequities of these people who have lived there forever and their insurance goes up. … Every time we start to talk to communities about rebuilding after a big hurricane, and say, "How can we be more resilient and get these people out of these high hazard zones?" they say, "That's where 80 percent of our tax revenue comes from." So it's a bigger picture that we need the economics for.

> "Every time we start to talk to communities about rebuilding after a big hurricane, and say, 'How can we be more resilient and get these people out of these high hazard zones?' they say, 'That's where 80 percent of our tax revenue comes from.'"
>
> *—Pamela Rubinoff*

Jessica Whitehead   Down here, there's groups involved in creating these tools for places where insurance companies have tried to pull out. But, to be fair, and open this up on the other side, where would those people go? In South Carolina, if folks were to move to where insurance was cheaper, up towards I-95, there are no services there. There are no towns there. There are no jobs there. And so it's not just as simple a thing as you can move or that the state is going to have to jump in and save people.

Timothy Frazier   I saw a similar kind of issue when I was in Florida, in that the notion that they built this urban-service corridor, or urban-growth boundary and they didn't want to allow development on the other side of that boundary. And the reality was, what they were doing was constricting all their growth and developments within a hazard zone. And so, there was this huge reluctance to relax that boundary, because they wanted to limit those nasty things that come along with urban sprawl. … And the only way in which we saw a little bit of relaxing with this, was this kind of public/private partnership where there was a little bit of relaxing of zoning and then allowing private developments to go in. And then we followed the basic planning tenet that if you build it, they will come. And once you put the shopping center, the Starbucks, there, that people want to live in that area now. So maybe Starbucks is the answer.

Bridget Brown   Kirstin, because I asked you to prepare a few thoughts on our second question with problems…even as we've already gotten started on that, did you want to put in some of those thoughts right now?

Kirstin Dow   Well, I think we're doing really well on those. We'd had an earlier conversation about the barriers to resilience, and identified that there's a kind of a common list that includes the financial barriers and sometimes

If interpretations of value focused on the future rather than the past, people might develop in places that are more climatically safe, Terry Chapin suggested.

the leadership barriers, and existing laws. … I do like the question, though, of what the appropriate scale of resilience is. We've been framing it as a community question, knowing that communities depend on the wider society to assure that resilience. And it's a classic hazards question, but to what extent should people in other parts of the state be supporting coastal lifestyles?

Patrick Corcoran The conversation we're having about the fact of the highest property tax, properties being in kind of the worst places, and sort of in having our service corridors kind of promoting a growth in hazard areas. I don't know that that conversation has been mainstreamed enough. I don't think this conversation, this narrative, is out there enough for people to even perceive how what we're currently doing is adding to the problem.

…

Joe Cone So who is it who needs to have this conversation?

Patrick Corcoran Everybody. …I think that's a real important conversation. And I guess I started a little bit with realtors. When they're like, oh, what are you doing scaring all my best customers away? And I reply, don't think of it as losing the value of your front-row properties; people will always move there. Think of it as increasing the value of your second-tier properties that are out of the inundation zone, for example. And I think that's a reasonable economic argument that makes sense, that provides some breathing room for people who are directly economically impacted.

…

Terry Chapin If the conversation can focus on, say, the next 10 to 20 years, rather than today's hazards, then we can begin talking about the benefits of developing in places that are more climatically safe than where the current development is. And that might be in terms of siting of schools or siting of sort of public infrastructure, things of that sort. And then I think people would then catch on to the fact that they're living in places that don't have that kind of safety.

Timothy Frazier And I kind of want to echo this, as well. Because I think a more educated public on the topic, especially if you start to think about 20 years into the future, will do wonders because, it seems to me in most of my work, that the amount of resilience or mitigation or adaptation that a community is willing to put forth prior to any kind of massive or major event is based on the election interval of the local politicians. And without the kind of support—the perceived support, if you will—of the people for these kinds of actions, then what we'll tend to get is the small-scale placating kind of events.

Seth Tuler There's this kind of barrier that emerges of just how people within the local and state governments even are communicating with each other; let alone the folks outside, the rest of the community.

Joe Cone   So, if the capacity of whatever system we're looking at, to adapt depends on whether the actors in the system can learn from experience and, as you're saying, learn from each other in the present, what do we need to do? Or, what needs to be done about learning? For instance, how can we improve the science and extension and practice conversation? Thoughts about that? How can we improve that? Or how can we foster and develop it?

…

Susanne Moser   Well, there's at least two levels. One is the one that we're just having and how to maintain that. I would think the most important way to maintain it is around specific questions. And with infusion of various experts, like we raised already a bunch of interesting questions about finance or the economic side of things. And maybe to keep it interesting and to really learn, would be to bring folks like that in. But then there's sort of the layer of how do we begin these conversations in communities. And I think that is really where Sea Grant plays a huge role. And you're working in communities. And you can really begin and initiate these conversations. Maybe work with initial champions, who really get the idea in general. And then invite the conversation. … Once you start getting communities involved, if they're really interested and they get the concept really quickly, they don't want to spend a lot of time on definitions. They just want to think about, "So what do we do?" And I think that's the conversation to foster. And to really have that, maybe not overshadowed by expert knowledge in terms of definitional stuff, but certainly infused with what we know. Of what the elements are that foster it. So they don't have to reinvent it quite from the beginning again.

"…there are so many things we could do to improve our resilience and to reduce our vulnerability, for which you do not need a single bit of climate-change information."

—Susanne Moser

Patrick Corcoran   The two big things that I bump against is the obvious elephant in the living room, which is the political context, and every other person I talk to is a [climate change] nonbeliever. … And then the other piece is the one thing they asked for was localized, downscaled information on the future for their community, which we can't give them. We say, "Well, we can't really tell you that, but it's really real and you should really persuade the other half of the people in your community to get on the bandwagon here."

Matt Spangler   Yeah. There's a lot of awareness that things are going to change. But the data available is at such a macroscale that a lot of the local decision-makers are frustrated that they don't feel like the information they have is at a scale that allows them to really identify concrete things they can actually go do.

…

Susanne Moser   Recently I was involved in two projects, one in San Luis Obispo, which is on the coast, and one in Fresno, which isn't. The point that I'm trying to make here is about communication and the downscaling of climate information. We started the conversation in both places around vulnerability and resilience and the goals that a community already have. We did not begin, especially not in Fresno, we did not open the conversation with climate change. And to at least initiate the conversation, to open the door, it was absolutely not necessary to have the downscaled data. … The more I hear that, the more I get actually quite impatient with it. Because there are so many things we could do to improve our resilience and to reduce our vulnerability, for which you do not need a single bit of climate-change information. Certainly not the kind of downscaled information everyone says. My experience again and again is, those who ask for it to be downscaled all the way down to their garden plot, will in the end not use it.

…

People in both places actually were interested in, "Oh, you mean we could do something to improve the life we want? We could create the community we want?" That was the conversation we had. It was quite phenomenal. And I wouldn't have guessed that beforehand.

Timothy Frazier I have a project going now, what we're looking at is hazard mitigation plans, and we're looking for holes in their hazard mitigation plan and ways in which we could enhance the communities' resilience by strengthening the community planning for hazards. And so I agree with both notions—that we do need better climate downscaled data, but also that there are things we can do in spite of that.

…

Terry Chapin In Alaska we have this downscaled climate information. And it's been useful for sort of engaging in conversations. But it hasn't been important in finding solutions. So I think Susi is right that you can find other ways to open the conversation that relate to people's concerns. Like downscaled information isn't essential, but sometimes it's a useful way to open the conversation, if you have it available.

"…one way to think about resilience is enhancing our decision-making capacity around making good adaptation decisions. Timing of investments."

—Kirstin Dow

Patrick Corcoran And my original point was, the large bulk of people who are resistant to even having a conversation about climate change, or impacts of, always ask, "Well, you always come in with the data for other stuff. Where's the data for this?" So for me, I actually agree that they don't really particularly need the downscaled data for the future to do some proper things. But as we go out from the university and we don't have local science like we do for other things, it doesn't help persuade the folks that need some persuading.

…

Kirstin Dow One of the interesting things here is the lack of agreement in the global models about futures for the Southeast, particularly in terms of precipitation. And one of the questions that I'm interested in is helping people think strategically about when to take on certain adaptations. Right now, if someone were to suggest to me that they actually did want to build something taller or revise local ordinances, simply based on expectations of wetter seasons, I might discourage them and say, "You could hold on a little while and see if that's the way this is going to go." … So I think one way to think about resilience is enhancing our decision-making capacity around making good adaptation decisions. Timing of investments.

Jessica Whitehead I'll build on that a little bit in saying that there are also things that we can suggest that they be looking at in the meantime. … But let's have a plan to come back and look at this in four years or five years and revisit it, and see if we have better information.

Susanne Moser I think a lot of folks have said this. I think it came out of America's Climate Choices, where a risk-management approach was suggested, or described in more detail, and the basic pieces of that were that you start out with the things you can do that keep your future options open, i.e., the near-term decisions are about flexibility. And the ones where you would put down a lot of money, on a lot of hard structures, those ones have to be robust under a range of scenarios. And so, probably most things that we could do to enhance resilience right now, we wouldn't need to do the latter. … The more global climate-change impacts will manifest, the more people will feel, in a very real sense, threatened by the issue. And they will tend to want to go to self-defensive mode of protecting themselves against it and not necessarily work for the common good. And right now, this is at a level of cognitive threat, emotional threat.

Patrick Corcoran Yes. Ideological threat.

Coastal Resilience: Assisting Communities in the Face of Climate Change

Heather Triezenberg argued that community resilience might be framed as the need to learn how to work together and how to adjust to changing conditions.

Susanne Moser The issue that this thing could possibly be true, that we might have to change, that you're telling me maybe I'm doing something wrong. All of these things are perceived as threats. And we're running into that kind of resistance, and I think it is a matter of applying the best psychology and communication insights that we have to begin the dialogue in which people move away from this resisting stance, if you will, to open this conversation.

…

Jessica Whitehead I would add that we need to get better at, I think, explaining that to communities, that there are different scales. So many people come up to me and assume that because we're talking about climate issues, there needs to be this immediate huge response.

…

Pamela Rubinoff We're working on a research project, looking at behavior change in communication for adaptation in particular, using this specific transtheoretical model that's been used in public health. … What is the behavior that we want to change? I think that one of the biggest communication challenges is, what do we want people to do? And those are the people—again, are they the people just on the shoreline? Or are they the people throughout the state? So we are now in the challenges of trying to say, "What would you, as individuals do?" I think that we're much further along with how would we describe what municipal officials and state decision-makers ought to do. But we're not really good about what you can do for climate adaptation and community resilience.

Susanne Moser Adaptation will affect everything and, therefore, every behavior will be affected. I think you have to simply pick a few, say with water-related behavior, home building-related behavior, gardening behavior. The things that individuals in their households or in their small environment can do. You just have to pick a few and focus on those. And if you find that those are not sufficient anymore, then you move to something else. But essentially, adaptation will affect everything. That's the whole problem, why it's now getting spread out, and it's going to be a lot harder to communicate and to engage people, in some ways, because it's so distributed. On the other hand, it gives you a lot more options.

…

Patrick Corcoran But coming from the other angle, though, for identifying specific adaptation actions, is working on the framing piece. It seems everybody can receive the message that the future ain't what it used to be. And that when you look to the future, we have to start expecting it to be different than the past, not the same as the past. And maybe bump it up a bit to the framing piece and really start talking about the framing piece that all the adaptation measures can come under, that might be another angle to help people out.

Heather Triezenberg Pam, I appreciate your perspective on the challenge from the behavioral-change model of what is the behavior that we're trying to change. … There kind of seems to be this progression of, first you look at the technical

learning, the technical types of behavioral things or strategies to address a particular problem, and then it moves to this larger conceptual level. And then kind of the next few series are the social learning, how they learned to think about the problem and then how they learned to engage politically in the problem. … It kind of seems like we're moving through that spectrum. Pat, you just mentioned the framing of this and how we communicate. I think there are specific behaviors that we can target. For example, you listed the coastal plain there. But I think we also need to keep in mind the opportunity to frame this as the need to learn how to work together and to learn how to adjust these issues, how to interact together with dealing with these.

…

Pamela Rubinoff   We need to communicate in ways that people can relate to. I think that even in the public health we were talking about, as you get older it's going to be harder to change. And it's going to be harder to see the health benefits, like for osteoporosis and stuff like that. So that if you don't start taking your calcium now, you can't go backwards. And so, some of these analogies with the public health have been really instrumental in us understanding it. And that I think that coming back to the communication of that, maybe we could look at some other examples that have been really successful, and those that haven't been, and try to understand how we could communicate better.

Heidi Stiller   Some of this discussion is making me thinking about the scale issue again. And I think behavior change theory, like the transtheoretical model that Pam was talking about, and community-based social marketing. Those point to the necessity for identifying very, very specific target audiences and behaviors. And then really working on crafting a message that works on that one specific thing. But once we get that figured out and we have something that works, then everyone needs to be saying the same thing. And Meletti's risk-communication work really demonstrated that if all the different entities that are trying to encourage people to be more resilient would say exactly the same thing and encourage the same exact behavior, that goes a long way. So it's like we need to work small and then we need to really scale up, and be on message. And we're not good at that.

Pamela Rubinoff   And what is the message? You're absolutely correct, Heidi. Are we talking about accommodate, retreat, or protect? Is that what we do? Protect, accommodate, retreat. What is the clear message that we want to give people?

Joe Cone   Time is now running short. Would another discussion among this group, or some portion of this group—perhaps with others, as has been suggested a couple of different times—be beneficial? Thoughts about continuing this conversation about community resilience under climate change?

Susanne Moser   Well, I'd just quickly say that I think the questions raised just now are really interesting—and, I think, incredibly important. And so I would love to see that continue at some point.

…

Joe Cone   Would meeting at a conference, for example, and having a discussion in that sort of a context make sense to this group? Thoughts about that?

Tim Frazier   Yeah, I think it's a great idea. I would love that. And even working towards some possible series of white papers, or something like that, based on some of the conversation that we've had today.

…

Joe Cone   Anything else for the good of the conversation at this particular moment?

…

I want to thank all of you for volunteering your time.

[End of Discussion]

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