



THE 3RD NATIONAL ADAPTATION FORUM PROGRAM

2017

May 9-11, 2017 | Saint Paul, MN

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A COMPLETE, SEARCHABLE AND SORTABLE PROGRAM IS AVAILABLE ONLINE AT:
www.NationalAdaptationForum.org



WELCOME TO THE 3RD NATIONAL ADAPTATION FORUM!

Spending a week with your adaptation peers is both a necessity and a luxury. The field of adaptation has been steadily growing to help society address the challenges of climate change. This growth was due to work by each of you to explore, learn, innovate and share your concerns, expertise and ideas. You represent activities happening at all scales across the country and even around the world. While politics may cause the course of adaptation to change, the need will not diminish. I look forward to working with all of you over the next three days, and for years to come, as we continue to do the work that is needed to support resilient ecosystems and durable communities. While you are here at the Forum please take the time to:

- Make new connections beyond your usual cohort and outside your professional sector,
- Soak in the rich program created by your peers,
- Consider an aspect of adaptation that you did not think applied to you and develop a way to make it part of your work from here forward, and
- Appreciate that you are part of a broad coalition that we all need to connect with in order to achieve enduring solutions so everyone benefits.

Huge thanks to the many fabulous committee members (see next page), sponsors, and partners who make the Forum happen. The Forum really is a community event and it would not happen were it not for the commitments and contributions of everyone in attendance and behind the scenes.

Make the most of the week in Saint Paul and keep up the good work when you get back home!

Lara J. Hansen, Ph.D.

Steering and Program Committees
Chief Scientist and Executive Director, EcoAdapt

STEERING AND PROGRAM COMMITTEES

The Steering and Program Committees have toiled diligently over the past 18 months to create a rich opportunity for each of us to meet and interact with colleagues from around the country...some you may have never met before! We want to thank the committees for their contribution and dedication to the Forum. The hours they spent volunteering ensured that funding was secured, proposals were reviewed, the venue was suitable, and travel support was awarded fairly and effectively. Committee members also participated in an Equity Working Group and led the effort to create each of the plenaries.

The contribution of committee members was even greater for the 2017 Forum owing to the unprecedented submission of over 400 proposals requiring hundreds of hours of review. Their input created 5 plenaries, 88 symposia, 13 training sessions, 15 working groups, 121 posters and 20 tools presentations that you will have the opportunity to experience over the next three days. If you see a committee member, please give them your thanks.

STEERING AND PROGRAM COMMITTEE

STEERING COMMITTEE

Lara Hansen, EcoAdapt, SC Chair (PC, HP Chair, EWG, PWG)
Denise Fairchild, Emerald Cities Collaborative (SC Co-Chair, CP Co-Chair)
Garrett Fitzgerald, Urban Sustainability Directors Network (SC Co-Chair, PC, MP Co-Chair, EWG, PWG)
Paul Moss, Minnesota Pollution Control Agency (SC Co-Chair, NRP, HP)
Christina Becker-Birck, Meister Consultants Group
David Behar, San Francisco Public Utilities Commission (MP)
Margaret Davidson, National Oceanic and Atmospheric Administration
Aimee Delach, Defenders of Wildlife (NRP, HP, PWG)
Barney Dickson, United Nations Environment Programme
Paul Fleming, Seattle Public Utilities
Mike Goldstein, U.S. Forest Service (NRP)
Kimberly Hall, The Nature Conservancy (NRP, PC, SC)
Elsa Haubold, U.S. Fish and Wildlife Service, National Landscape Conservation Cooperative
Jessica Hellmann, University of Minnesota (PC, SC, CP, BP Co-Chair, EWG Co-Chair)
Anne Hunt, Office of Mayor Chris Coleman Saint Paul, MN (MP, BP, HP)
Randy Johnson, U.S. Department of Agriculture Climate Hubs
Jennifer Jurado, Broward County, (MP, HP)
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Nile Malloy, Climate Justice Consultant (SC, PC, CP, EWG, PWG)

Carlos Martin, Urban Institute (BP, EWG)
Kris May, Silvestrum Climate Associates (MP, NRP, HP)
Michael McCormick, California Governors Office of Planning and Research
Shannon McNeely, Colorado State University (NRP, EWG)
Miriam Morrill, Bureau of Land Management, NRP, HP
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Amber Pairis, California Landscape Conservation Cooperative (SC, PC, NRP Co-Chair, HP)
Kim Penn, National Oceanic and Atmospheric Administration (PC, SC, BP)
Rachel Steele, U.S. Department of Agriculture Climate Hubs
Laurie Schoeman, Enterprise Community Partners, Inc.
Amy Snover, University of Washington Climate Impacts Group
Paul Wagner, U.S. Army Corps of Engineers (NRP Co-Chair)
Jordan West, U.S. Environmental Protection Agency (HP Co-Chair)
Kathryn Wright, Meister Consultants Group (BP)
Elizabeth Yeampierre, UPROSE (CP Co-Chair)

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Alex Score, EcoAdapt, (PC Chair, CP, NRP, EWG, PWG)
Chris Hilke, National Wildlife Federation (PC Co-Chair)
Sascha Peterson, Adaptation International (PC Co-Chair, MP, PWG)
Susan Asam, ICF International
Kristin Baja, Baltimore City Department of Planning, Office of Sustainability
Astrid Caldas, Union of Concerned Scientists (EWG)
Molly Cross, Wildlife Conservation Society
Samantha Danchuk, Broward County's Environmental Planning and Community Resilience Division
Christa Daniels, Center for Community Resilience and Climate Preparedness; Antioch University New England
Melissa Deas, Georgetown Climate Center (EWG)
Mike Durglo, Confederated Salish and Kootenai Tribes
Katherine Egland, National Association for the Advancement of Colored People
Amanda Farris, Carolinas Integrated Sciences and Assessments
Garrett Fitzgerald, Urban Sustainability Directors Network (SC Co-Chair, PC, MP Co-Chair, EWG, PWG)
Kate Freund, U.S. Fish and Wildlife Service
WendyKay Gewiss, EcoAdapt (BP Co-Chair, MP)
Elizabeth Gibbons, American Society of Adaptation Professionals (MP, CP)
David Gibbs, Environmental Protection Agency (MP, NRP)
Ashlee Grace, City and County of Denver's Public Works Department
Jessica Grannis, Georgetown Climate Center (MP, CP, PWG)
Roger Griffith, National Oceanic and Atmospheric Administration Fisheries Service (NRP)
Shalini Gupta, Center for Earth, Energy and Democracy (EWG)

Kimberly Hall, The Nature Conservancy (NRP, PC, SC)
Lara Hansen, EcoAdapt (SC Co-Chair, PC, HP Co-Chair, EWG, PWG)
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Jessica Hitt, EcoAdapt (EWG)
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Darren Long, Wildlife Conservation Society
Nile Malloy, Climate Justice Consultant (PC, SC, CP, EWG Co-Chair, PWG)
Laura Millberg, Minnesota Pollution Control Agency
Paul Moss, Minnesota Pollution Control Agency (SC Co-Chair, PC, NRP, HP)
Kelly Muellman, City of Minneapolis, (MP)
Rachael Novak, Bureau of Indian Affairs (PC, SC)
Megan O'Grady, Abt Associates
Melissa Ocana, UMass Amherst (HP)
Amber Pairis, California Landscape Conservation Cooperative (PC, SC, NRP Co-Chair, HP)
Davia Palmeri, Association of Fish and Wildlife Agencies (NRP)
Britt Parker, NOAA Office for Coastal Management Coral Reef Conservation Program
Kim Penn, National Oceanic and Atmospheric Administration, (PC, SC, BP)
Shannon Pinc, City of St. Louis Park
Kif Scheuer, Local Government Commission (MP, EWG)
Ana Vang, Office of Mayor Chris Coleman Saint Paul, MN (EWG)
Jason Vogel, Abt Associates, (MP, CP, PWG)
Lara Whitely Binder, Climate Impacts Group University of Washington
John Wiener, University of Colorado Institute of Behavioral Science (CP, NRP, PWG)

KEY

SC: Steering Committee • PC: Program Committee • MP: Municipal Plenary • CP: Community Plenary • BP: Business Plenary
NRP: Natural Resources Plenary • HP: Holistic Plenary • EWG: Equity Working Group • PWG: Proposal Working Group

- ▶ **7:00 am to 8:00am** **BREAKFAST** (Grand Ballroom A,B,C,F,G)
- ▶ **7:00 am to 5:30 pm** **REGISTRATION/EXHIBITS**
(Ballroom Concourse)
- ▶ **8:00am to 9:40am** **OPENING** (Grand Ballroom A,B,C,F,G)

Opening Prayer: Tribal Elder
Opening Remarks: Lara Hansen, EcoAdapt
Saint Paul Proclamation and Welcome Remarks:
 Mayor Chris Coleman
City of Minneapolis Proclamation and Welcome Remarks:
 Mayor Betsy Hodges
Welcome Video: Senator Al Franken
Climate Generation: A Will Steger Legacy's Youth Environmental Activists Minnesota (YEA! MN)
 Climate Generation's YEA! MN program features emerging voices from the youth climate movement. During the opening plenary at National Adaptation Forum participants will hear from local youth on why their voices are critical for achieving sustained momentum on climate solutions.

Youth will share inspiring stories of how they're responding to climate change and lead the audience in an interactive dialogue on youth engagement.

- ▶ **9:40 am to 11:00 am** **MUNICIPAL PLENARY**
(Grand Ballroom A,B,C,F,G)

This exciting plenary kicks off the 2017 Forum, just after the opening welcome. The theme of this plenary is *Advancing Climate Adaptation Through the Lens of Local Government*. It is the first of five plenaries occurring over the three days of the Forum.
Moderator: Denise Fairchild, President and Chief Executive Officer, Emerald Cities Collaborative
Panelists:
 Mayor Chris Coleman of Saint Paul, MN
 Timothy Burroughs, Assistant City Manager and Chief Resilience Officer, City of Berkeley, CA
 Kristin Baja, Climate and Resilience Planner, City of Baltimore, Office of Sustainability, MD

Minnesota Climate Adaptation Partnership

11:10am to 12:40pm

ADAPTATION STRATEGIES TO ADDRESS CLIMATE IMPACTS TO NATURAL SYSTEMS (Grand Ball Room - Section D)

Symposium Organizer: Robert Alan Cline, University of Minnesota's Regional Sustainability Development Partnership

Minnesota and other northern states with similar ecosystems have been seeing climate impacts on our natural systems. Work is underway to develop adaptation strategies in a number of areas. This session highlights three of those systems where work is underway: Forests, as demonstrated by the Northern Larch Beetle's impacts on tamaracks; Wetlands and aquatic biodiversity; Lake warming and impacts on fish communities.

Presentations:

- Susan Galatowitsch, University of Minnesota's Fisheries, Wildlife and Conservation Biology Department
- Brian Aukema, Department of Entomology at the University of Minnesota
- Gretchen Hansen, Minnesota Department of Natural Resources

12:40pm to 1:40pm LUNCH (Grand Ballroom A,B,C,F,G)

1:40pm to 3:10pm

BUILDING CLIMATE RESILIENCE BY CONNECTING TO HEALTH (Grand Ball Room - Section D)

Symposium Organizer: Kristin Raab, Minnesota Department of Health

Climate change is the greatest global health challenge of the 21st century, as it threatens the very basics — our air, food, water, shelter, and security — that we depend on for life and well-being. Building climate resilience for Minnesota communities in the face of climate change requires collaboration across multiple stakeholders and disciplines, working at all levels of influence to share knowledge and coordinate adaptation strategies.

The circumstances of climate change challenges present opportunities for new thinking, broader collaborations, and greater impacts. Leaders across government agencies are coming together to develop best practices, stimulate action, and coordinate with stakeholders to help build the foundation for

climate resilience into the day-to-day fabric of our communities. Many of these collaborative initiatives connect to public health at the core, helping build a more equitable climate resilience framework for Minnesota.

Attend this session to learn about initiatives that are connecting with health to promote the ability for our environments and communities to adapt and thrive in the face of climate change.

Presentations:

- Kristin Raab, Minnesota Climate and Health Program, Minnesota Department of Health
- Brenda Hoppe, Minnesota Department of Health
- Daniel Dix, Minnesota Pollution Control Agency
- Eric Wojchik, Metropolitan Council

3:10pm to 3:30pm BREAK

3:30pm to 5:00pm

PROMOTING GREEN INFRASTRUCTURE AS AN ADAPTATION OPTION IN THE BUILT ENVIRONMENT (Grand Ball Room - Section D)

Symposium Organizer: Leslie Yetka, Freshwater Society

Incorporating green infrastructure into our built environment increases a community's resilience to both evolving landscapes and our changing climate. Whether implemented at a landscape scale for floodplains, wetlands, or open natural areas, or instead focused on constructed practices that integrate natural features into urban development, green infrastructure plays an important role in managing stormwater runoff, mitigating urban heat, and improving air quality. This session includes presentations that illustrate the benefits and uses of green infrastructure as an adaptation option in urban areas, including watershed-level assessments of vulnerability, the economics of green infrastructure related to climate adaptation, and the importance of trees and the urban canopy as an elegant solution to climate change in the built environment.

Presentations:

- Brandon Barnes, Barr Engineering Company
- Jesse Schomberg, University of Minnesota and Minnesota Sea Grant
- Gary Johnson, Department of Forest Resources, University of Minnesota

▶ 11:00 am to 11:10 am BREAK

▶ 11:10 am to 12:40 pm CONCURRENT SESSION 1

CLIMATE EQUITY IS CLIMATE-SMART: SEEKING EQUITABLE ADAPTATION THROUGH URBAN GREENING (Meeting Room 2/3)**Symposium Organizer:** Lida Aljabar, The Trust for Public Land

Climate change impacts all of us. Rising temperatures and seas, shifting precipitation patterns and stronger storms pose risks to each of our livelihoods. However, low-income communities and communities of color are often hurt first and worst by the impacts of climate change. In these communities, climate change is a new, complicating environmental challenge stacked on top of histories of pollution, disinvestment, and discrimination.

Adaptation professionals across the country hope to leverage investments in climate action for achieving climate equity. But the concept's incorporation into practice ranges from simply identifying vulnerable populations to engaging and empowering these individuals. This panel poses the questions, "How can we understand and employ the concept of climate equity through a more transformative paradigm in practice? What is the difference between climate equity and climate justice, and why does that matter?"

In a facilitated conversation, Panelists will discuss predominant concepts of equity as they relate to climate adaptation. Panelists will debate the merits and weaknesses of institutionalizing these concepts into practice in communities on the ground, as well as discuss best practices in defining, monitoring and evaluating success. As exercises for thought, the panel and audience will walk through analytical and decision-making cases.

This panel is comprised of a diverse set of professionals involved in the field of climate adaptation through urban greening. Panelists represent national and local non-profit, federal and local government interests in environmental conservation and justice, city planning, and public works. Panelists work across the United States, including Ohio, Colorado, and California.

Panelists:

Ernesto Arevalo, Communities for a Better Environment
 Freddy Collier, City of Cleveland
 Jad Daley, The Trust for Public Land
 Ashlee Grace, City of Denver
 Jacqui Patterson, National Association for the Advancement of Colored People (NAACP)
 Carey Whitehead, U.S. Dept. of Housing and Urban Development (HUD)

WEATHER: A NUISANCE TO A PROBLEM. ARE COMMUNITY DEFINED CRITICAL THRESHOLDS MAKING CLIMATE MEANINGFUL? (Meeting Room 4)**Symposium Organizer:** Sascha Petersen, Adaptation International

The session will start with an interactive discussion with the audience. This will be followed by short remarks from the Panelists about how they are approaching critical thresholds in their work (20 minutes). This will be followed by a facilitated fire side chat to draw out what is working and why or what isn't working and why not (20 minutes). The final 30 minutes will be dedicated to a large group discussion with the audience.

Panelists:

Dan Brown, Massachusetts Audubon (formerly with Great Lakes Integrated Sciences and Assessment Center)
 James Done, Capacity Center for Climate and Weather Extremes
 AJ Fawver, City of Amarillo, TX (formerly with City of San Angelo, TX)
 Paul Fleming, Seattle Public Utilities
 Sascha Petersen, Adaptation International

COMMUNITY-LED PROACTIVE RELOCATION: COMMUNITY-BASED PROCESSES AND EXPERIENCES (Meeting Room 5)**Symposium Organizer:** Julie Maldonado, Livelihoods Knowledge Exchange Network

Climate change impacts, such as sea level rise, coastal erosion, and extreme weather events, are already causing, and will continue to cause, the displacement of entire communities as the land on which people dwell either disappears or becomes uninhabitable. Experiencing climate impacts first and foremost, Indigenous communities and partners are among those leading efforts to employ their agency and take proactive measures to ensure the continuation of their culture, practices, and community in the face of extreme changes.

This session brings together tribal community members, researchers, and agency workers who have been pursuing or supporting proactive, community-led relocation efforts. Presenters will consider: When extreme climate change effects force communities to consider relocation, what mitigation and adaptation resources are available to tribes? What strategies are used to overcome the challenges of adapting to and mitigating climate change impacts? What is the decision-making process and whom does it include? How can traditional knowledge and Western science be incorporated to assist in climate adaptation and mitigation planning?

Given that indigenous peoples' identity and culture are deeply tied with their surrounding environments, the relocation process must honor that relationship and the collective rights of a community. Additionally, presenters will consider: how do communities ensure that their cultural values remain intact and leverage these values to guide the relocation process? How can communities strengthen their core identities as they plan to relocate? The aim is for participants to learn, share, and dialogue about their experiences in working on community-led and driven relocation efforts.

Panelists:

Chantel Comardelle, Isle de Jean Charles Band of Biloxi-Chitimacha Choctaw
 Kelsey Moldenke, Quinault Indian Nation
 Denise Pollock, Alaska Institute for Justice
 Vanitha Sivarajan, Department of Interior
 Stanley Tom, Newtok Village
 Charles Warsinke, Quinault Indian Nation

URBAN-RURAL COLLABORATIVE SOLUTIONS FOR BUILDING CLIMATE RESILIENCE (Meeting Room 6)**Symposium Organizer:** Steve Frisch, Sierra Business Council

The effects of climate change span political boundaries and jurisdictions, exposing the connections people share with ecosystems and other communities around them. These surrounding ecosystems are the connective tissue, containing plants, animals, and other living organisms which interact with nonliving elements to work together as a contained unit. In turn, healthy ecosystems provide external benefits to humans, including abundant clean air and water, vibrant economies, biodiversity, agriculture and aesthetic beauty. The reach of these benefits, commonly referred to as ecosystem services, makes it increasingly necessary to focus beyond the scope of individual cities or counties to look at the impact of an ecosystem service at a regional scale, from its beginning to its end.

Because climate impacts recognize no boundaries urban metropolitan communities (the downstream beneficiaries who rely on these resources) have just as much at stake in protecting the areas where their resources originate as the rural communities who live there. The urban-rural connection is an acknowledgment that everyone's life is affected by ecosystems and the service they provide. Within this assumption also lies the interconnectedness of every community. This symposium panel will explore urban-rural collaborative solutions for building climate resilience through case studies on different system approaches touching on water, food, forests, policy and natural disasters.

Panelists:

Julia Kim, Local Government Commission
Lacy McManus, Greater New Orleans, Inc.
Daniel Williams, USDA Forest Service, Rocky Mountain Research Station

SETTING CONSERVATION PRIORITIES IN A CHANGING CLIMATE: NEW TOOLS FOR IDENTIFYING AND CONNECTING CLIMATE REFUGIA (Meeting Room 7)

Symposium Organizer: Carlos Carroll, Klamath Center for Conservation Research

The unprecedented challenge of climate change has led planners to search for new types of information for identifying climate refugia and other areas whose conservation would facilitate persistence of biodiversity under climate change. This symposium will feature presentations by researchers who are working to compare and combine different approaches to devise regional conservation plans that identify key refugia and connect them to maximize landscape-level adaptive capacity. Speakers will describe several approaches for identifying potential refugia, including a focus on areas of diverse geophysical settings (land facets), and a focus on climatic refugia for particular species, and will show how regional planners can integrate data from a variety of sources to identify a conservation network resilient to threats operating at multiple scales. Speakers will discuss strategies for identifying and conserving both macrorefugia (areas where broad-scale climate is suitable for persistence) and microrefugia (small areas with locally favorable environments), as well as methods for identifying climate corridors, and approaches for communicating climate resilience information. The goal of the session is to help build connections between researchers, planners, land managers, and others interested in conserving adaptive capacity across broad landscapes.

Presentations:

Carlos Carroll, Klamath Center for Conservation Research
Julia Michalak, University of Washington
Diana Stralberg, University of Alberta
Meade Krosby, University of Washington
Caitlin Littlefield, University of Washington
Travis Belote, The Wilderness Society

USING ASSESSMENT PRODUCTS AND TOOLS TO INFORM LOCAL ADAPTATION AND RESILIENCE (Meeting Room 8/9)

Symposium Organizer: Tess Carter, US Global Change Research Program
How do we connect science assessments, especially national-level ones, to applications at the state and local scale? How have and can assessment products and tools from the US Global Research Program (USGCRP) and other federal resources and initiatives inform local adaptation and resilience-building efforts? This symposium pairs speakers from the USGCRP with state and local practitioners working on adaptation and resilience. Presenters will discuss existing assessment products and tools (e.g., National Climate Assessment, Climate Resilience Toolkit, the Climate Data Initiative, the Partnership for Resilience and Preparedness, and other ongoing USGCRP resilience activities) and materials, programs, and resources currently under development that are particularly relevant for local concerns. Panelists will also address how local-scale groups are using federally-produced assessment products, and how local needs can be better integrated into the planning and development of products and processes. This symposium will end with a panel discussion on how communities working on adaptation and resilience efforts at all scales can integrate assessment products into actual implementation and successful use on the ground.

Presentations:

Tess Carter, US Global Change Research Program contractor
Sarah Zerbonne, US Global Change Research Program contractor
Jennifer Jurado, Broward County

SERENDIPITY VS STRATEGY: THE NEED FOR NATIVE SEED FOR ECOLOGICAL RESILIENCE, ADAPTATION AND EMERGENCY PREPAREDNESS (Meeting Room 10)

Symposium Organizer: Peggy Olwell, USDI Bureau of Land Management

Extreme weather events are increasing in frequency, intensity and impact across the United States. With Hurricanes Sandy and Matthew in the East and serious drought conditions and altered fire regimes in the West ecological restoration practitioners must be able to respond quickly to landscape-scale ecological changes with appropriate native seed resources. The National Seed Strategy provides a plan for restoration of public and private lands at all scales and a coordinated approach for federal, tribal, state, and private entities, to develop and deliver genetically appropriate plant materials for restoring resilient native plant communities and sustainable ecosystems. It guides coordination of efforts to achieve four major goals: (1) Assess seed needs and ensure the reliable availability of genetically appropriate seed reserves, (2) Identify basic and applied research needs and conduct research to aid users in seed sourcing to meet current and projected future conditions and to improve technology for seed production and ecological restoration, (3) Develop science delivery tools and monitoring applications that will enable managers and practitioners to make timely and informed decisions for ecological restoration, and (4) Formulate plans for internal and external communication that engage all stakeholders, including interested publics, in the shared goals of the Strategy. The Strategy ultimately benefits landscapes by supporting ecosystem services provided by plant communities (e.g. clean air and water, temperature regulation, carbon storage, ecological resilience, habitat for diverse organisms). This session will address the need to restore degraded ecosystems and build ecological resilience and adaptation in response to extreme weather events.

Presentations:

Peggy Olwell, USDI Bureau of Land Management
Nancy Shaw, USDA Forest Service
Kay Havens, Chicago Botanic Garden
Ed Toth, Mid Atlantic Regional Seed Bank
Greg Houseal, University of Northern Iowa

WATER FOR PEOPLE AND NATURE: ADAPTING RESOURCE MANAGEMENT STRATEGIES TO ADDRESS ECOLOGICAL SENSITIVITIES TO DROUGHT (Meeting Room 11)

Symposium Organizer: Kimberly R. Hall, The Nature Conservancy

As global temperatures continue to rise, the intensity and frequency of droughts in North America are expected to increase, leading to a wide range of social and ecological impacts. Over the past 1.5 years, we have convened a Science for Nature and People Partnership (SNAPP) working group to frame key relationships between ecological drought sensitivities, human well-being, landscape characteristics, and resource management actions. Building upon this framing, we have been synthesizing information on multi-year drought impacts to ecosystems, biota, and ecological services, and connecting these sensitivities to on-the-ground strategies for increasing the ability of natural and human systems to thrive in the face of climate change-driven drought. Our working group includes ecologists, social scientists, resource managers, and conservation practitioners, and a key goal of our partnership is to integrate information and methods across these disciplines, and develop products that are targeted to stakeholders that are ready to use them. The work we will describe is national in scope, but also includes an in-depth look at ways to enhance consideration of ecological drought sensitivities in the Upper Missouri Headwaters (UMH) region of Montana, which is a pilot project for the National Drought Resilience Partnership. Five speakers will describe our project from concept through case study, emphasizing on-the-ground application and communication approaches. In our remaining time, we

will seek feedback from the audience on our approach and framing, and help connect people with resources that can help promote drought risk reduction strategies in their own work.

Presentations:

Kimberly Hall, The Nature Conservancy
 Aaron Ramirez, National Center for Ecological Analysis and Synthesis
 Ann Schwend, MT Department of Natural Resources and Conservation
 Jamie McEvoy, University of Montana
 Shelley Crausbay, National Center for Ecological Analysis and Synthesis

RESILIENCE APPROACHES FOR GULF COAST COMMUNITIES

(Meeting Room 12)

Symposium Organizer: Ira Feldman, Greentrack Strategies

This symposium brings together presentations by practitioners who are focusing on resilience challenges in the Gulf Coast region. The session will explore a range of adaptation, resilience and preparedness approaches being advanced by the New Orleans-based Institute for Local Innovations (ILI). These presentations are complementary because they were developed concurrently by members of ILI's interdisciplinary network of practitioners around the theme of building capacity for community-based organizations.

Presentations:

M. Von Nkosi, Institute for Local Innovations (ILI)
 John E. Nelson, Wall Street Without Walls
 Valerie Hill Rawls, Marie Hill, Inc.
 Adam Saslow, Institute for Local Innovations (ILI)
 Ira Feldman, Greentrack Strategies

RESEARCH AND COMMUNICATION ON EMERGING ISSUES IN CLIMATE AND HEALTH (Meeting Room 13)

Symposium Organizer: Julie Blue, Eastern Research Group, Inc. (ERG)

The effects of climate change on human health are many and varied, including for example, the direct effects of more frequent and more severe extreme weather events on human health and safety, the effects of deteriorating air quality, and the impacts of vector-borne disease as well as water-borne and food-borne pathogens. Extreme heat events are increasingly seen as a threat comparable to intense hurricanes. Research on the mental health effects associated with climate impacts is at a nascent stage. Increasingly, the public health sector is seen as the focal point for communication climate change risks to vulnerable communities and in turn the cornerstone for building resilient communities. This symposium will present the work of leading researchers working at the public health/ climate change nexus. Topics covered will focus on health risks in cities (with a focus on air quality), indicator-based assessments of health sector vulnerabilities, health hazard mitigation in coastal areas, and vector-borne diseases, but all topics related to climate change and human health will be covered during the latter part of the session. The session will include a maximum of four brief presentations on emerging issues, followed by a panel discussion with audience participation to discuss questions arising from the topic presented as well as charge questions developed by the session conveners. The session conveners will produce a summary document that includes an overview, key session conclusions, and a discussion of next steps.

Presentations:

Julie Blue, Eastern Research Group, Inc. (ERG)
 Elizabeth Rhoades, Los Angeles County Department of Public Health
 Arleen O'Donnell, ERG
 John Balbus, National Institute of Environmental Health Sciences

HELP US HELP YOU: MOVING ADAPTATION FORWARD WITH BOUNDARY ORGANIZATIONS (Meeting Room 14/15)

Symposium Organizer: Eric Hartge, Center for Ocean Solutions

Communities currently engaged in climate adaptation planning have access to an abundance of resources including scientific information and a burgeoning cadre of "adaptation service" professionals. Within this growing field, boundary organizations bridge the gap between various stakeholders to catalyze rapid exchange of distilled, salient information. In this session, we will describe how California-based boundary organizations are addressing the most challenging questions communities face in adaptation planning.

The Center for Ocean Solutions will discuss their role in distilling ecosystem services science for coastal land use policy and law. Point Blue will discuss their experience developing science-based decision-support tools intended to enable stakeholders to assess climate change vulnerabilities and develop adaptation strategies that benefit both people and ecosystems. Surfrider will discuss how local Chapters and coastal advocates are working with communities and resource agencies to implement progressive adaptation strategies. USC Sea Grant will discuss the how boundary organizations can help translate technical and scientific information, and appropriately communicate science to different types of stakeholders.

We will begin with an interactive icebreaker in which audience members respond to questions regarding the perceived role(s) of boundary organizations in their work. The Panelists will then each deliver brief presentations designed to spark discussion around how boundary organizations can best serve communities' adaptation planning efforts. We will use the remaining time in café-style discussions focusing on topic areas noted in the ice breaking session and addressed during Panelists' presentations.

Presentations:

Eric Hartge, Center for Ocean Solutions
 Stefanie Sekich-Quinn, Surfrider
 Maya Hayden, Point Blue Conservation Science
 Nick Sadrpour, USC Sea Grant

- ▶ 12:40pm to 1:40pm LUNCH (Grand Ballroom A,B,C,F,G)
- ▶ 12:40pm to 1:40pm COMMUNITY LUNCHEON (Grand Ballroom H)

COMMUNITY LUNCHEON: RACIAL EQUITY AND CLIMATE RESILIENCY

(Grand Ball Room - Section H)

Symposium Organizer: Shalini Gupta, Center for Earth, Energy and Democracy (CEED)

This is a space for community organizations working on justice, vulnerability and climate resiliency to network and learn from each other about successful projects and practices. The focus of the luncheon is to examine the intersections of racial equity and climate resiliency, locally and nationally. Co-hosted by the Center for Earth, Energy and Democracy; sponsored by the Institute on the Environment and the National Adaptation Forum.

- ▶ 1:40pm to 2:40pm COMMUNITY PLENARY (Grand Ballroom A,B,C,F,G)

Building a bold inclusive climate movement and more meaningful partnerships requires adaptation leaders to be mutually supportive of creating well-designed climate policies that can strengthen the capabilities of the least well-off and the most vulnerable. Climate justice and equity institutions have forged ahead to link the challenges facing low-income communities and communities of color to building livable local solutions

that all communities strive in the transition to a cleaner and healthier economy. With the potential threat to climate change solutions in the new administration, our collective political moment requires climate adaptation engagement strategies to break out of silos and create opportunities for local decision-making in cities, regions and states to influence the types of investment needed to prepare and adapt our community for climate impacts. This session will lift up community-led solutions that strengthens vulnerable communities and how as climate adaptation leaders and encourage government and community partnership to advance the climate-ready equitable communities through grants and other funding mechanisms.

Moderator: Elizabeth Yeampierre, Executive Director, UPROSE

Panelists:

Cecilia Martinez, Director of Research Programs, Center for Earth Energy and Democracy (CEED), MN

Miya Yoshitoni, Executive Director, Asian Pacific Environmental Network, Bay Area and State of California

Jerilyn Nicole Jourdain, Environmental Specialist, Red Lake Department of Natural Resources

▶ 12:40pm to 12:50pm **BREAK**

▶ 12:50pm to 4:20pm **CONCURRENT SESSION 2**

REGIONAL VARIATION IN ENGAGING SOCIALLY VULNERABLE POPULATIONS: SEA GRANT PERSPECTIVES ON SUPPORTING ADAPTATION

(Meeting Room 2/3)

Symposium Organizer: Joshua E Brown, NOAA Sea Grant

Planning for climate change entails helping communities envision their future. Communities must decide what is vulnerable, what is a priority to protect, how to respond to threats and how funding should be acquired and spent. To do this fairly and equitably, it is important to understand how different people in the community are affected by climate change. While quantitative tools, such as models, maps and cost-benefit analysis, provide valuable information, it is also critical to incorporate a diverse range of voices in the planning process to assess how vulnerability manifests through lived experiences and what barriers must be overcome to make the community more resilient.

We will highlight the limitations and challenges of supporting climate change adaptation in socially vulnerable locations throughout the country, featuring on-the-ground perspectives from the geographically diverse National Sea Grant College Program. This university-based network is a federal-state partnership that specializes in generating and translating science to address coastal and Great Lakes needs.

Presenters from around the country will highlight the unique vulnerabilities of communities in their region and address how their organizations have used science-driven outreach to engage and empower socially vulnerable populations. Presenters will highlight the critical role of partnerships in building capacity within these communities. Speakers will also outline specific methodologies for engagement, such as participatory GIS, real-time polling, focus group style discussions, qualitative interviews, social media and mobile phone apps. Attendees will engage in a robust discussion with the Panelists and share their own experiences around these issues.

Panelists:

Joshua E Brown, NOAA Sea Grant

Michelle Covi, Old Dominion University

Jill Gambill, University of Georgia

Davin Holen, University of Alaska, Fairbanks

Amanda McCarty, NOAA Sea Grant

Melissa Poe, University of Washington and Northwest Fisheries Science Center

LOCAL LEADERSHIP IN COMMUNITY RESILIENCE (Meeting Room 4)

Symposium Organizer: Cooper Martin, National League of Cities

The private sector and all levels of government are embracing resilience as a holistic, proactive framework to reduce risk, improve services, adapt to changing conditions, and empower citizens.

Recent high profile programs, such as the \$1 billion National Disaster Resilience Competition initiated by the US Department of Housing and Urban Development and the Rockefeller Foundation's 100 Resilient Communities, have helped define and advance this resilience framework for local government.

However, in a nation of over 18,000 municipal governments, much of this assistance has been limited to a handful of cities with multiple advantages in population, market conditions, and staff expertise. The lessons and practices developed by these programs are not yet being adopted at scale, and small to mid-sized municipalities facing significant environmental, economic, and social challenges are at risk of being left out of the conversation.

In 2016, the National League of Cities (NLC) launched a Leadership in Community Resilience program to help elected officials, city staff, and community partners share their experiences and advance local resilience efforts. The pilot initiative is providing technical assistance and professional development opportunities for 10 cities by supporting local resilience initiatives that have been prioritized by each city. This workshop will spotlight 4 of those cities and share their process for planning, building engagement, and implementing resilience initiatives with limited resources.

Panelists:

Leah Bamberger, City of Providence

Braden Kay, City of Tempe

Cooper Martin, National League of Cities

Penni Redford, City of West Palm Beach

HOW TO START AND CONDUCT A TRIBAL/INDIGENOUS CLIMATE CHANGE VULNERABILITY ASSESSMENT (Meeting Room 5)

Symposium Organizer: Shannon McNeeley, Colorado State University, North Central Climate Science Center

This symposium will focus on indigenous climate change vulnerability assessment identification of need, finding a partner, design, implementation, and oversight for tribes and indigenous communities. In addition to common climate vulnerability data needs, tribes and indigenous peoples have a range of adaptation management concerns for understudied species and cultural use resources. This session will feature speakers with experience in tribal/indigenous climate change vulnerability assessment design, contracting and process oversight. The speakers will share lessons learned, challenges, and best practices to guide tribal staff and potential assessment providers to produce high quality vulnerability assessments that incorporate unique tribal concerns. Speakers will also discuss how the analysis process informed the development of effective adaptation options to reduce their vulnerabilities to enable tribal managers to prioritize climate resilience considerations and management investments. Speakers will discuss approaches used, incorporation of traditional ecological knowledge, partnerships with academic, tribal organization, or agency partners, and tips for starting and conducting assessments. They will also discuss how vulnerability assessment contract design should include analysis of current appropriate adaptation management options in order to inform climate adaptation planning and implementation.

Presentations:

Shannon McNeeley, Colorado State University/North Central Climate Science Center

Tyler Kaspar, 1854 Treaty Authority

Sascha Petersen, Adaptation International

Gloria Tom, Navajo Nation

Queen Quet, Gullah/Geechee Nation

CHALLENGES AND OPPORTUNITIES FOR URBAN NATURE IN A CHANGING CLIMATE (Meeting Room 6)**Symposium Organizer:** Leslie Brandt, Northern Institute of Applied Climate Science, USDA Forest Service

Urban nature, which includes developed and natural green spaces and associated wildlife in urban areas, can play an important role in helping cities adapt to climate change through both biophysical and social mechanisms. For example, trees and other green infrastructure can help reduce urban heat island effects, control stormwater, and store carbon. Urban nature can also facilitate social adaptive capacity to climate change by giving communities a sense of place and providing healing following large scale disturbance events. However, plant and animal species in urban areas can also be vulnerable to climate change. For example, many existing urban canopy trees are vulnerable to storms, heat stress, and pest outbreaks that may be exacerbated by climate change, and thus their capacity to help communities adapt may be reduced in the coming decades. In this symposium, we will discuss how connections between people and nature in urban environments relate to climate change vulnerability and adaptation. We will begin by framing the concept of what we mean by urban nature and why it is important for cities in a changing climate. Then, we will highlight two multi-city initiatives that are using urban nature to facilitate adaptation and adapt urban nature to climate change. Finally, we will provide examples from communities across the United States that are working to implement adaptation in urban nature and green infrastructure at the municipal and neighborhood scale.

Presentations:

Abigail Derby Lewis, The Field Museum

Holly Bostrom, The Trust for Public Land

Leslie Brandt, Northern Institute of Applied Climate Science,
USDA Forest Service

John Bolduc, Cambridge Community Development Department

Jen Kullgren, Hennepin County, MN

SUPPORTING DECISIONS WITH NATURAL RESOURCE VULNERABILITY ASSESSMENTS (Meeting Room 7)**Symposium Organizer:** Jessi Kershner, EcoAdapt

The forests, grasslands, waters, fish, wildlife, and other natural resources that people care about and depend on are being affected by climate change in a variety of ways. Vulnerability assessments improve understanding about the impacts of climate change on these important natural resources and are a key first step in developing strategies to better prepare for and respond to impacts. However, there are many factors involved in implementing a successful assessment including: identifying what information to use; which assessment approaches and tools are most appropriate; and selecting what scale to apply the assessment to best inform management decision-making needs.

This session starts with a brief introduction to vulnerability assessment terminology and concepts (5 min). Panelists will share examples of their vulnerability assessments (40 min) and attendees and Panelists will then engage in a facilitated discussion (45 min) to tackle questions such as:

- What are the strengths and weaknesses of some key vulnerability assessment approaches and tools?
- What are the opportunities or limitations for using assessment results at different scales to support management decisions?
- How do you account for uncertainty in both designing vulnerability assessments and using results?
- How do we better coordinate and communicate results of different vulnerability assessments?

Come join the conversation and hear from representatives from the US Forest Service (NIAACS), Washington Department of Fish and Wildlife, National Wildlife Federation, EcoAdapt, Shoshone-Bannock Tribe, and the Upper Snake River Tribes Foundation.

Panelists:

Patty Glick, National Wildlife Federation

Scott Hauser, Upper Snake River Tribes Foundation

Lynn Helbrecht, Washington Department of Fish and Wildlife

Jessi Kershner, EcoAdapt

Chris Swanston, U.S. Forest Service Northern Institute
of Applied Climate Science**RESEARCH INTO ACTION: CITIES AND UNIVERSITIES COLLABORATING TO SOLVE CHALLENGES AND PILOT CLIMATE CHANGE SOLUTIONS**

(Meeting Room 8/9)

Symposium Organizer: Michele Crim, City of Portland, OR

US cities are partnering with universities to turn academic theory into meaningful on the ground climate action progress. These partnerships seek to match university resources, including student and faculty research interests, with the goals and actions outlined in a city's climate action work. Three cities will share case study projects of how they have leveraged local academia to produce replicable climate-related research that is immediately actionable to address the challenges they and other cities face.

- The City of Portland, OR, will share a project with Portland State University focused on mapping Portland's urban heat islands and human vulnerability. Portland is using the findings to identify effective mitigation measures for different neighborhood types and to inform multi-family building development codes aimed at reducing urban heat impacts.
- The City of Austin, TX, will share a project with Texas State University where faculty and graduate students are working with city staff to conduct climate hazard mapping as part of class project. Austin is using student deliverables as a foundation for their vulnerabilities assessment and climate resiliency plan.
- The City of Phoenix, AZ, will share about a five-year \$12M project with Arizona State University to identify the "Climate-Adapted Phoenix of the Future" under various future climate scenarios. The research evaluates climate-adaptive and transformative models that are resilient to heat, drought and flooding, and identifies the policy frameworks required to achieve those outcomes.

Panelists:

Zach Baumer, City of Austin, Office of Sustainability

Michele Crim, City of Portland, Bureau of Planning and Sustainability

Ron Hagelman, Texas State University, Department of Geography

Mark Hartman, City of Phoenix, Office of Sustainability

INNOVATIVE FINANCING TOOLS FOR ADAPTATION: TOWARD SMARTER, STRONGER COASTAL COMMUNITIES (Meeting Room 10)**Symposium Organizer:** Kim Penn, NOAA Office for Coastal Management and Morgan Richmond, Cadmus Group, Inc.

Across the country, communities, private sector organizations, and governments at all levels are taking action to improve their ability to withstand and recover quickly from extreme weather events and adapt to the impacts of climate change. The need to access the best available information and leverage diverse investment streams to support complex adaptation and resilience projects in communities is clear. To enable those efforts, the public and private sectors are developing tools and financing mechanisms that reduce the cost of action and incentivize resilience. Programs that leverage tax credits, insurance premium reductions, and other financial tools to help communities, businesses and families take action now.

Through an interactive panel discussion, we will make the case for working across sectors to build partnerships and networks that can help finance climate adaptation and community resilience. With the help of the moderator, Panelists will discuss geographically diverse examples that highlight the leveraging of funding sources and innovative tools for successful climate adaptation. Whether used independently or

concurrently, these approaches demonstrate an efficient and cost-effective way to address risks and vulnerabilities, identify opportunities and develop creative finance mechanisms to implement a sustainable plan for coastal community adaptation actions.

Panelists:

Debra Ballen, IBHS
Jaimey Bavishi, City of New York
Angela Gladwell, FEMA
Alan Okagaki, Craft3
Kelly Pflücke, NJ Department of Environmental Protection
Morgan Richmond, Cadmus Group, Inc.

CLIMATIZING YOUR STORMWATER AND WASTEWATER UTILITY

(Meeting Room 11)

Symposium Organizer: Kirsten Evans, The Nature Conservancy

While progress has been made in climate adaptation for water utilities, less progress has been made in other municipal water sectors. In an era of increasingly stringent water quality requirements, rapid urbanization and deteriorating infrastructure, cities across the US are investing billions of dollars to control flooding, control combined sewer overflows and tackle water quality concerns. However, planning and design decisions for capital investments in managing stormwater continue to be made based on historical rainfall patterns, resulting in investments that may not be right-sized for future conditions. One oft-cited constraint has been the lack of adequately scaled information on likely changes in rainfall patterns and/or ability to access it. The affordability implications of funding and the challenges of thinking outside the box to find cross-sectoral and non-traditional solutions also inhibit action.

In this “un-panel” session, the participants will be the experts, engaging in small-group “world café” discussions to dive deep on specific topics, generating the most promising approaches and practices while learning first hand from each other. Topics will include: gaining access to ‘good enough’ science and using it effectively; driving the policy changes needed to adopt innovative solutions that work; leveraging tacit knowledge of utility managers to identify system vulnerabilities and considering them in light of a changing climate; managing equity and affordability issues; successful interdepartmental and intrasector collaboration; developing the internal capacity to sustain and adapt the climatization strategy over time. The organizers will capture the key discussion points in a written summary following the Forum.

Panelists:

Alan Cohn, New York City Department of Environmental Protection
Kirsten Evans, The Nature Conservancy
Paul Fleming, Seattle Public Utilities

THE RESILIENCE SONGSHEET: EXPLORING ALIGNMENT OF PLANNING PROCESSES FOR COASTAL COMMUNITIES (Meeting Room 12)

Symposium Organizer: Juliette Finzi Hart, USGS

In a novel approach to support community resilience efforts across California’s coastline, six state and federal agencies are jointly helping local governments navigate and integrate adaptation and hazard-related planning processes. The California Coastal Commission (CCC), State Coastal Conservancy (SCC), NOAA’s Office for Coastal Management, USGS, and USC Sea Grant are partnering with FEMA Region IX to co-deliver resilience workshops. This collaboration provides much needed clarity on the alignment of state and federal processes, guidance, and models for considering flooding and sea level rise in planning efforts, such as Hazard Mitigation Plans and local coastal plans.

Initial workshops focused on coastal communities at opposite ends of the planning spectrum. The September 2016 pilot event in San Luis Obispo County, where cities are in the early stages of long-range planning, inspired

insights on alignment messaging and communication between local hazard mitigation, emergency response, and adaptation planning leaders at the local level. The January 2017 event was in San Mateo County, which developed long-range plans through intensive community-driven processes. Workshops are underway or upcoming for the rest of California’s coastal counties.

State and federal Panelists will share perspectives on collaboration and resilience planning alignment. Representatives from San Luis Obispo and San Mateo Counties will provide insights on local stakeholder perspectives and needs. Following presentations, we will lead break-out discussions with symposium attendees to discuss if and how other states are aligning federal/state policies, guidance, and science, and explore the larger picture of pursuing local resilience beyond flooding and sea level rise.

Panelists:

Juliette Finzi Hart, USGS
Juliette Hayes, FEMA Region IX
Rebecca Lunde, NOAA Office for Coastal Management
Hilary Papendick, San Mateo County Office of Sustainability
Sumi Selvaraj, CA Coastal Commission

HEAT, FLOODS, AND DISEASES – INTEGRATING CLIMATE CHANGE WITH HUMAN HEALTH (Meeting Room 13)

Symposium Organizer: Ellu Nasser, Adaptation International

While impacts to human health from climate change have long been recognized, rarely do they receive the attention that impacts on natural systems or urban infrastructure do. The release of the recent U.S. Global Change Research Program’s Climate and Health Assessment report demonstrates the increased need to respond to health impacts from climate change. In practical matters, this shift has already begun as local, state, federal, and tribal governments and the private sector are taking action to reduce human health risks and prepare for the most pressing health-related climate concerns.

This session brings together representatives from across sectors—the Centers for Disease Control and Prevention, Michigan Department of Health and Human Services, Los Angeles County Department of Public Health, Yurok Tribe Environmental Program, and HealtheWeather, Inc. Speakers will provide an overview of their work, discuss key challenges and successes in their approaches, and present innovative ways in which they are integrating human health into their climate efforts.

The session focuses on active learning and starts with audience identification of key health-related climate concerns with which they are grappling. The speakers then provide an overview of their work (35 minutes) and circle back to facilitate discussion. The panel will select issues identified earlier by the audience and lend their expertise to share possible innovative approaches and solutions (25 minutes). The session ends with a “group brainstorm” including the audience to provide additional perspectives into possible solutions for the issues discussed by the panel, and concludes with discussion and question/answer (30 minutes).

Panelists:

Aaron Ferguson, Michigan State Department of Health
Joe Hostler, Yurok Tribe Environmental Program
Eric Klos, HEALTHeWeather
George Luber, Centers for Disease Control and Prevention
Elizabeth Rhoades, Los Angeles County Department of Public Health
Emily York, Oregon Health Authority

ONE SIZE DOESN'T FIT ALL: WHY COLLABORATIVE ADAPTATION IS MESSIER THAN THEORY IN SMALL COMMUNITIES (Meeting Room 14/15)

Symposium Organizer: Kirsten B Howard, New Hampshire Coastal Program

This symposium takes participants on the 8 year journey of the New Hampshire Coastal Adaptation Workgroup (NHCAW), sharing our lessons and our challenges moving forward. A 22 organization

collaborative, NHCWA assists small coastal watershed communities prepare for the impacts of extreme weather and long-term climate change by providing resources, facilitation and guidance. NHCWA has developed its own model for adaptation in small communities with limited resources. Since 2009, NHCWA has worked directly with 19 communities and participated in over 70 research, outreach, planning, and implementation projects worth \$6.5 million in grant funding. In addition to municipal progress, NHCWA catalyzed cross-sectoral coordination through the NH Coastal Risk and Hazards Commission (CRHC), resulting in a blueprint for next steps at multiple levels of government and law requiring agencies to consider climate science in their activities. Presenters will share the key tenets of the NHCWA model, apply the model to municipal case studies and the CRHC, discuss why practice is messier than theory, and explain how the NHCWA model is being transferred to inland communities. Following presentations, participants will engage in group discussions focused on: 1) whether and how the NHCWA model for adaptation aligns with their own work; 2) what enabling factors make their work similar/different to NHCWA's experience; and 3) suggestions for how to transition small communities from planning to implementation. Participants will better understand how to: 1) support adaptation in small communities; 2) build regional capacity and instigate state policy changes; and 3) transfer lessons to their own context.

Presentations:

Sherry Godlewski, NH Department of Environmental Services
Steve Miller, City of Portsmouth, NH Fish and Game Department
Nathalie Morison, New Hampshire Coastal Program
Kirsten Howard, New Hampshire Coastal Program

- ▶ 4:20pm to 4:30pm **BREAK**
- ▶ 4:30pm to 5:30pm **CONCURRENT SESSION 3**

TRACKING EQUITABLE ADAPTATION PRACTICES: INDICATORS, METRICS, AND MEASURING SUCCESS (Meeting Room 2/3)

Symposium Organizer: Julia Kim, Local Government Commission

Climate change presents great threats but also great opportunities to revamp our approaches and systems to build resilient, livable communities that actively engage low-income communities of color and vulnerable, hard-to-reach populations. As we work to accelerate adaptation efforts and fully integrate climate risk into our decision making and investment processes, it is imperative that we intently strengthen the fundamental link between adaptation and equity. This session will explore the evaluation and measurement of equitable adaptation through the development of strong metrics, as well as the challenges that community organizers face in measuring success. Presenters will highlight important indicators and considerations, sharing concrete strategies that bridge the concept to implementation gap. Participants will also engage in discussions and design thinking activities to identify opportunities to integrate equity metrics into their work.

Panelists:

Colin Bailey, The Environmental Justice Coalition for Water
Ms. Margaret Gordon, West Oakland Environmental Indicators Project
Julia Kim, Local Government Commission
Steve Frisch, President, Sierra Business Council

WHAT DOES RESILIENCE LOOK LIKE? URBAN RESIDENTS' COMMUNITY-LEVEL RESILIENCE STRATEGIES (Meeting Room 4)

Symposium Organizer: Ann Baughman, Freshwater Future

Vel Scott with New Image Life Skills Academy, Inc. will share how her community-based urban farm, Vel's Purple Oasis, situated on one acre of land and a rescued home in the neighborhood - directly across the street from the garden are used as an educational center to prep fresh food

from the garden, and also as a place that cooking classes can be held for residents to learn how to prepare healthy meals from foods not only from the garden, but from local food banks.

Rev Joan Ross with Northend Woodward Community Development Corporation will share her experience with the Detroit's community benefits agreements that equips block clubs, community groups and small businesses with the information and tools they need to be at the table when huge corporations ask for huge public dollars for private development and how it can be used to reduce vulnerabilities from climate change and build resilience.

Ramont Bell with Faith in Place will share how their collaboration with the Chicago Metropolitan Water Reclamation District, distributed over 100 one hundred rain barrels along with education programming. The rain barrels support a social movement toward water conservation and sanitation awareness along with reducing stormwater runoff pollution and beginning of green infrastructure awareness for flood reduction.

Following, the facilitator will lead an interactive discussion about hurdles and barriers to community level projects, how to involve municipalities and other partners, and what is needed to encourage more of these initiatives.

Panelists:

Ramont Bell, Faith in Place
Rev. Joan Ross, North End Woodward Community Coalition
Vel Scott, New Image Life Skills Academy

WHEN RESISTANCE IS FUTILE: ADAPTATION IN THE FACE OF SYSTEM TRANSFORMATION (Meeting Room 5)

Symposium Organizer: Bruce Stein, National Wildlife Federation

Accelerating climate change is already beginning to transform the structure, composition and function of ecosystems, with attendant consequences for the services and benefits these systems provide to people. Unfortunately, much of the climate adaptation currently underway still focuses on efforts to resist change as a means of retaining the persistence of current conditions. Natural resource managers increasingly will be confronted by situations where such persistence-oriented approaches are untenable: in other words, when resistance is futile. This symposium will focus on adaptation in the context of change management, and specifically the challenges of preparing for and adapting to system realignments and transformations. The session will address the conceptual basis for transformation-oriented adaptation, including the challenges of identifying ecological thresholds and tipping points, and the cyclical nature of managing for persistence and change. Symposia talks will also review the historical context for ecosystem transformation, drawing lessons from the paleo record and major ecological transitions in the past. Finally, the symposium will focus on a system undergoing major ecological transformations, and explore various management options for responding to, or even facilitating, such transitions, along with policy issues that may constrain or promote such change-oriented responses.

Presentations:

Bruce A Stein, National Wildlife Federation
Stephen Jackson, US Geological Survey
John Morton, US Fish and Wildlife Service

ADAPTATION ACTORS: LESSONS LEARNED FROM STATE GOVERNMENT, ACADEMIA AND NONGOVERNMENTAL ORGANIZATIONS WHILE ADVANCING COASTAL ADAPTATION (Meeting Room 6)

Symposium Organizer: Stefanie Sekich-Quinn, Surfrider Foundation

Many distinct actors contribute to the implementation of climate change adaptation planning along the coast. Three actors in particular regularly play a role in defining, designing, and implementing adaptation work. This panel will focus on how state government, academia, and nongovernmental organizations (NGOs) work independently and in concert

to grapple with coastal adaptation planning while specifically focusing on success stories, “lessons learned,” and recommendations to further improve coastal adaptation planning.

Dr. Charles Lester, former Executive Director of the California Coastal Commission will examine how state government can advance adaptation planning—and the challenges to doing so—drawing on examples from the California coastal management program. Eric Hartge, Research Development Manager at Stanford University’s Center for Ocean Solutions will discuss how this ‘academic boundary organization’ is helping synthesize scientific and policy information for timely, resilient adaptation planning decisions. Stefanie Sekich-Quinn, Coastal Preservation Manager with Surfrider Foundation, will examine on-the-ground advocacy and community engagement efforts geared toward planning and implementing adaptation measures that ultimately build political support for ‘resilient communities’ and advance meaningful policy formulation.

We will begin the session with an introduction to the three representative ‘policy actors’ and the ways in which each works independently and collaboratively towards a resilient coast. The Panelists will then each deliver brief presentations designed to spark discussion on how multiple actors advance coastal adaptation planning. We will use the remaining time in an interactive dialogue with audience members focusing on topic areas noted during the Panelists’ presentations.

Presentations:

Charles Lester, Institute of Marine Sciences University of California, Santa Cruz

Eric Hartge, Center for Ocean Solutions

Stefanie Sekich-Quinn, Surfrider Foundation

DESIGNING FOR CLIMATE CHANGE: ADAPTATION IN THE BUILT ENVIRONMENT (Meeting Room 7)

Symposium Organizer: Ariane Laxo, HGA Architects and Engineers

The built environment is highly vulnerable to the impacts of climate change. Several architecture and engineering firms have been leading their industry in the field of design for climate change adaptation. This panel discussion will illustrate how these firms are approaching this new frontier, establishing new best practices in the face of uncertainty. These practices include accessing, interpreting and utilizing future climate data to inform design, establishing tools and resources for industry-wide use to help guide design teams in their efforts to design for climate change, and collaborating across sectors, both within the architecture engineering construction (AEC) industry and beyond. Panelists will present their firm’s approach, and discuss the implications of climate change on the built environment, the architect’s role in climate change solutions, opportunities and challenges resulting from a complicated project decision-making process, and the knowledge-gaps that remain in their field and how those gaps might be filled through cross-sector research and collaboration. Participants will leave the session with an in-depth understanding of the AEC industry’s approach to climate change adaptation, and how architects can be engaged to better prepare our buildings and cities for a different future. In the face of climate change, our built environment must adapt so that our communities can continue to thrive.

Panelists:

Ariane Laxo, HGA Architects and Engineers

Mark Meaders, HDR

Douglas Pierce, Perkins + Will

Cole Roberts, ARUP

ORAL PRESENTATION SESSION 1 (Meeting Room 8/9)

Canadian Collaborative Actions on Coastal Adaptation, Dominique Auger, Natural Resources Canada

Connecticut Climate Adaptation Academy - an outreach tool for adaptation issues, Juliana Barrett, University of Connecticut

A resilience assessment of Puerto Rico’s coral reefs, David Gibbs, US Environmental Protection Agency

Fishing communities, social vulnerability and adaptation: research in the context of ecosystem-based policy and management, Karma C Norman, NOAA Fisheries

ORAL PRESENTATION SESSION 2 (Meeting Room 10)

Who Stays and Who Goes? Managed Retreat Decision Criteria, Anne Siders, Stanford University

Property law and policy challenges of climate-induced community relocation, David Flores, Center for Progressive Reform

The potential for climate change-driven migration to the Northwest: What we’ve learned, Lara Whitely Binder, UW Climate Impacts Group

Managed retreat: a global analysis of drivers, barriers, and outcomes, Miyuki Hino, Stanford University

ORAL PRESENTATION SESSION 3 MEETING (Room 11)

Increasing Ecosystem Resilience to Climate Change One Rock at a Time, Carianne Campbell, Sky Island Alliance

Strengthening adaptive capacity at a landscape-scale: a case study on the Grand Canyon’s North Rim, Cerissa Hoglander, Grand Canyon Trust

Floodplain Restoration with Woody Material - A Climate Adaptation Super Hero, Scott Nicolai, Yakama Nation Fisheries

Climate Impacts on Glaciers, Hydrology, and Fish Habitat Adaptation Planning for the Nooksack River, Oliver Grah, Nooksack Indian Tribe

ORAL PRESENTATION SESSION 4 (Meeting Room 12)

Stormwater Management in Allegheny County: Building Climate Resilience across the Pittsburgh Metropolitan Region, Jordan R. Fischbach, RAND Corporation

Evaluation of a threshold-based warning system for managing temperature-related health risks, Yang Liu, University of Minnesota School of Public Health

Warning Watch Advisory: The social science of communicating extreme weather hazards, Arleen O’Donnell, Eastern Research Group, Inc. (ERG)

Cooling our Cities: Saving Lives Today and Adapting to a Warmer Tomorrow, Laurence S Kalkstein, University of Miami

ORAL PRESENTATION SESSION 5 (Meeting Room 13)

Kauai Kakou! Lessons Learned from Kauai’s 2035 General Plan Update, Ruby Pap, Hawaii Sea Grant

An Army of Data Collectors: Using Citizen Science to Track King Tides, Storm-Damage, and More, Wesley Shaw, Blue Urchin, LLC

Navigating Coastal Climate Adaptation: Connecting People to Each Other and to Resources Through Training, Gwen Shaughnessy, The Baldwin Group for NOAA’s Office for Coastal Management

What Local Governments Need from Climate Sciences: Results from a National Survey, Derek Kauneckis, Voinovich School, Ohio University

ORAL PRESENTATION SESSION 6 (Meeting Room 14/15)

Shifting a paradigm: adaptation-inspired policy examination and evolution in a large land management agency, Gregor W Schuurman, National Park Service

Applying Social Science to Overcome Communication Challenge, Stephanie Fauver, NOAA Office for Coastal Management

Resident to Resilient: Application of the ASERT Framework to Engage a Diverse Military Base Neighborhood, Michelle Covi, Old Dominion University/ Virginia Sea Grant

The New York State Climate Change Science Clearinghouse, Megan O’Grady, Abt Associates

MARGARET A. DAVIDSON NETWORKING RECEPTION



Networking is the added value of any in person meeting. And few people know how to network better than Margaret A. Davidson. Not only is Margaret a leader in the field of adaptation but more of you probably know her than anyone else at this meeting because she is the consummate networker. Therefore, when we heard Margaret would be unable to attend the Forum this year we wanted to make sure she was here in spirit, so we've named the Tuesday Night Networking Reception in her honor—The Margaret A. Davidson Networking Reception.

This honor for Margaret is even more fitting as she is one of the progenitors of the Forum. She not only joined the first planning call to create the Forum but she signed on to the Steering Committee and helped guide the process forward, helping to make it what it is today. Thank you, Margaret. Tuesday night we will network in your honor and hopefully live up to your example.

► **5:30pm to 8:00pm** **POSTER SESSION, CAKE TOOLS CAFE AND MARGARET A DAVIDSON NETWORKING RECEPTION**

CAKE TOOLS CAFÉ (West End Ballroom Concourse)

- Collaborative systems thinking for community-driven adaptation planning,** Jessica Ruvinsky, Bellwether Collaboratory
- EPA Tools for Water Quality Decisions,** Karen Metchis, USEPA Office of Water
- My RainReady, Our RainReady: Using Data-Driven Tools to Educate Stakeholders and Create Livable, Resilient Communities,** Molly Oshun, Center for Neighborhood Technology
- Climate risk screening tools for international development,** Peter Schultz, ICF
- Cutting through the Case Studies to the Adaptation Actions,** Sascha Petersen, Adaptation International
- Philadelphia Flood Risk Viewer,** Cassandra Snow Bhat, ICF
- Naturally Resilient Communities Siting Guide,** Nathan Woiwode, The Nature Conservancy
- NOAA's Lake Level Viewer: United States Great Lakes,** Brandon Krumwiede, NOAA Office for Coastal Management
- USDA Forest Service Climate Change Resource Center: an Online Resource for Land Managers,** Hannah Abbotts, Northern Institute of Applied Climate Science

- Building Capacity for Sustainability and Resilience Planning in a Desert City,** Lauren Keeler, School for the Future of Innovation in Society, ASU
- The Massachusetts Climate Action Tool,** Melissa Ocana, University of Massachusetts Amherst
- Historical Climate Trends Tool,** Rachel Riley, Southern Climate Impacts Planning Program
- Leveling the Playing Field: Actionable Climate Information for Communities from NOAA's Digital Coast,** John S Rozum, NOAA Office for Coastal Management
- Surging Seas Risk Finder: Climate Central's Sea Level Rise and Coastal Flood Mapping Tool,** Tim Grandia, Climate Central
- Georgetown Climate Center's Tools: The Adaptation Clearinghouse, Adaptation Progress Tracker, and Green Infrastructure Toolkit,** Melissa Deas, Georgetown Climate Center
- The Adaptation Workbook: a Climate Change Tool for Land Management and Conservation,** Stephen Handler, NIACS/ US Forest Service
- Federal-wide Tribal Climate Resilience Resource Guide,** Margaret T Herzog, BIA Tribal Climate Resilience Program
- Climate Change Resilience Roadmap,** Dan Billello, National Renewable Energy Laboratory
- Creating Resilient Water Utilities: Tools for Building Long-Term Adaptation,** J. Stephen Fries, U.S. EPA
- Connect, Cool, Absorb, Protect,** Chris David, The Trust for Public Land

POSTERS (Grand Ball Room - Section A/E)

NATIONAL

- 1** Temperature and Emergency Room Visits from Mental-Health Related Outcomes in California
 - Rupa Basu, Cal EPA/Office of Environmental Health Hazard Assessment
- 2** Amplification of Flood Frequencies with Local Sea Level Rise and Emerging Flood Regimes
 - Maya K Buchanan, Princeton University
- 3** Spurring the Adaptation Field in Challenging Times
 - Joyce Coffee, Climate Resilience Consulting
- 4** Yurok Tribe Climate Change Adaptation Plan for Water and Aquatic Resources
 - Karen Cozzetto, Institute for Tribal Environmental Professionals, Northern Arizona University
- 5** HUD's National Disaster Resilience Competition: Empowering Local Adaptation
 - Katrina Durbak, U.S. Department of Housing and Urban Development
- 6** A Framework for Assessing and Addressing Climate Vulnerability of Transportation Assets
 - Gina Filosa, US DOT Volpe Center
- 7** Incorporating Multiple Knowledge Systems Into Climate Planning: The Case of Tribal Adaptation Plans Miles Gordon, Ohio University
 - George V Voinovich School of Leadership and Public Affairs
- 8** Strive for (Less than) Perfect in a World of Uncertainty
 - Kimberly Gotwals, Leidos
- 9** Integrating Hazard Mitigation Planning and Comprehensive Planning • Robert Graff, Delaware Valley Regional Planning Commission
- 10** Whole Community Adaptation for Local Champions
 - Tonya Graham, ClimateWise
- 11** Implementation of Climate Solutions: What Leads to Taking Meaningful Actions?
 - Gwen Griffith, Cumberland River Compact
- 12** Mapping Strongholds for Nature Under a Changing Climate in the Central U.S.
 - Kimberly R. Hall, The Nature Conservancy
- 13** Bureau of Indian Affairs Tribal Climate Resilience Program - Nationwide Showcase
 - Margaret T Herzog, BIA Tribal Climate Resilience Program

- 14** Climate Adaptation for the Makah Tribe
 • Forrest L Howk, Makah Tribe
- 15** How do Climate Science Boundary Organizations Matter to Local Climate Policy?
 • Alexander Davis Hurley, George V Voinovich School of Leadership and Public Affairs, Ohio University
- 16** Resilience AmeriCorps Training and Technical Assistance Program: Deploying federal climate resilience resources in local communities
 • Rachel Ilyse Jacobson, NOAA
- 17** Evaluating County-Level Heat Vulnerability and Social Inequity in the United States through Climate and Socioeconomic Indices
 • Yoon Hui Kim, Four Twenty Seven
- 18** Are we Resilient? Comparing Climate Resiliency Building Efforts Across the US
 • Christine Kirchhoff, University of Connecticut
- 19** Watching the waves: An analysis of climate policy responses by US coastal communities
 • Jacqueline Kloepfer, Ohio University
- 20** Building Tribal Capacity for Climate Change Vulnerability Assessment
 • Meade Krosby, University of Washington
- 21** Tools for Climate Change Adaptation: State Climate Summaries and New Climate Scenarios
 • Kenneth E. Kunkel, CICS-NC/NC State/NOAA NCEI
- 22** Building a Resilient Community through Data & A Dashboard: Nashua, NH's Experience
 • Kim Lundgren, Kim Lundgren Associates, Inc.
- 23** Climate Change Communication: Sharing Science, Tools, and Adaptation Actions Online
 • Kailey Marcinkowski, Northern Institute of Applied Climate Science
- 24** USDA Forest Service Climate Change Education: Interactive Modules Sesigned for Everyone
 • Kailey Marcinkowski, Northern Institute of Applied Climate Science
- 25** Shifting Vulnerability: Quantifying the Success of Buyout Programs, A Staten Island Case Study
 • Devon J McGhee, Duke University
- 26** The Collider: Turning Climate Risks Into Business Opportunities
 • James McMahon, The Collider
- 27** Minnesota GreenStep Cities: A Model for Advancing Climate Adaptation and Community Resilience Through Best Practices
 • Laura Millberg, MN Pollution Control Agency
- 28** Enabling Local Governments to Optimize Resources for Resilience: Introducing the Climate Response Planning Process
 • Sam P Milton, Climate Resources Group
- 29** Use of Web Applications to Incorporate Climate Change Impacts into Inland Hydrologic Analysis
 • Chanel Mueller, USACE
- 30** Transitioning Appalachia to a Sustainable Future – Adapting to New Energy Economies
 • Jonathan Allen Norris, Ohio University, Voinovich School of Leadership and Public Affairs
- 31** Tribal Climate Science Liaisons- An Introduction to the New Initiative
 • Rachael Novak, Bureau of Indian Affairs
- 32** Forest Adaptation in Action: Lessons Learned from Regional Climate Adaptation Projects
 • Todd A Ontl, Northern institute of Applied Climate Science
- 33** Connecting Science and Decision Making in Natural Areas Recreation
 • Wincenty M Pawlowski, Association for the Tree of Life <http://www.tree-of-life.works/>
- 34** Perception of Time and Climate Warming
 • Hugh Gilbert Peach, Adapt Global Inc.
- 35** Climate Adaptation Toolkit for Fisheries Management
 • Alex Score, EcoAdapt
- 36** USDA's Climate Hubs: Building Landscape-Level Resilience in a Changing Climate
 • Rachel Steele, USDA
- 37** Understanding Ecosystem Services through an Organizational and Policy Analysis: Application to the Truckee-Carson River System
 • Azamat Tashev, George Voinovich School of Leadership and Public Affairs, Ohio University
- 38** Tough Question! Using Real World Scenarios to Teach Effective Climate and Risk Communication Techniques
 • Sarah Watson, Bloustein School for Planning and Public Policy, Rutgers University
- 39** Blue Carbon Modeling: Mapping and Valuating the Carbon Sequestration Potential of Coastal Habitats
 • Jessica Williams, Center for Ocean Solutions
- 40** Climate Planning through the Resilient Chicago Initiative
 • Molly Woloszyn, IL-IN Sea Grant/Midwestern Regional Climate Center
- 41** Understanding How Regionality Impacts Public Health: An Analysis of Urban Climate Change Policy
 • Kerri Yandrich, State of Delaware
- International**
- 42** Incorporating Evolutionary Considerations into Climate Adaptation Plans: A Decision Framework
 • Andrew Battles, USGS, NCCWSC
- 43** Using Phenology to Assess Species Vulnerability for Climate Adaptation Planning
 • Stephan P Carlson, U of MN
- 44** Accelerating Nature-Based Solutions for 'Negative Emissions' and other Benefits
 • Ellie M Cohen, Point Blue Conservation Science
- 45** Education for Adaptation in the Republic of the Marshall Islands
 • Daniel Fahey, Independent Consultant
- 46** Issue Linkage: Mainstreaming Gender in Adaptation Finance
 • Peder Garnaas-Halvorson, University of Minnesota
- 47** The Staying Connected Initiative: Linking People and Nature across Two Nations
 • Melissa Gaydos, National Wildlife Federation
- 48** Wetlands or Walls? Engaging the Private Sector in Ecosystem-based Adaptation
 • Allie Goldstein, Conservation International
- 49** Climate Change Vulnerability and Human Migration
 • Martina Grecequet, University of Minnesota Institute on Environment
- 50** After the Vulnerability Assessment: Identifying Adaptation Strategies and Using Benefit-Cost Analysis from a Planner's Perspective
 • Timothy Grose, Cambridge Systematics
- 51** Developing a Rapid Vulnerability Assessment Tool
 • Lara Hansen, EcoAdapt
- 52** Network Weaving to Build Resilience and Better Cope with Shocks
 • Margaret T Herzog, BIA Tribal Climate Resilience Program
- 53** Does Discussing Adaptation "Subtract from Prevention"? Perceived Tradeoffs between Adaptation and Mitigation-based Policy Planning
 • Erza M. Markowitz, University of Massachusetts Amherst
- 54** Indianapolis Climathon: INvision Resiliency
 • Jeffrey Meek, City of Indianapolis
- 55** Education on Energy, Environment and Society
 • Ned Mohan, University of Minnesota and Minnesota Sea Grant
- 56** Public-Private Partnerships to Empower Data-Driven Climate Resilience
 • Ana Pinheiro Privette, USGCRP
- 57** Pilot Study on Effects of Occupational Heat Exposure on Traffic Police Workers in Ahmedabad, India
 • Ameer Raval, Asian Pacific Environmental Network
- 58** Big Problems Need Big Solutions: Advancing the Practice of Conservation at the Landscape Scale
 • Melly Reuling, Center for Large Landscape Conservation
- 59** Global Connectivity Conservation: Adaptation Through Designation
 • Melly A Reuling, Center for Large Landscape Conservation
- 60** Distributed Generation for Climate Resilience
 • Sherry Stout, National Renewable Energy Laboratory
- 61** Is Your Tribe's Waste Management Program Climate Ready?
 • Dolly B Tong, U.S. EPA Region 5
- 62** Cultivating Resilience at the Personal Level
 • Martha Turner, Fossil Free California
- 63** Climate Resilience and Vulnerability of Two Indigenous Communities in Global North and South
 • Karl G Van Orsdol, The Rockies Institute
- 64** Integrated City-Scale Climate-Action Plans?: Exploring Challenges and Opportunities to Assess Synergies Between Mitigation & Adaptation
 • Alexa Kate Weiland, Western State Colorado University
- 65** Adaptation Planning for Rural Character
 • Joanna Wozniak-Brown, Antioch University New England
- Alaska**
- 66** Tribal Climate Change Adaptation Planning in the Chugach Region, Alaska
 • Willow M Hetrick, Chugach Regional Resources Commission
- 67** Perceptions of Success: A Case Study in Planning for Climate Change in Rural Alaska
 • Stefan Gabriel Tangen, University of Alaska Fairbanks
- Caribbean**
- 68** Climate Change and Coffee: Assessing Vulnerability by Modeling Future Climate Suitability in Puerto Rico
 • Nora Alvarez-Berrios, USDA Caribbean Climate Hub, Forest Service
- 69** Delivering Climate Services For Tropical Forestry And Agriculture
 • Isabel K Parés Ramos, USDA Caribbean Climate Hub
- Great Plains**
- 70** Agricultural Conservation Practices to Restore Ecosystem Functions in the Central US
 • Michael A Wilson, USDA-NRCS

Hawaii & Pacific Islands

- 71** From Mauka to Makai: Assessing Vulnerabilities and Identifying Climate Adaptation Actions in the Hawaiian Islands
• Rachel M Gregg, EcoAdapt
- 72** Kauai Kakou! Lessons Learned from Kauai's 2035 General Plan Update
• Ruby Pap, Hawaii Sea Grant

Mid-Atlantic

- 73** Mapping Natural Solutions for Resilient Maryland Communities
• Nicole Carlozo, Maryland Department of Natural Resources
- 74** Whole of Government Planning for Resilience: Challenges and a Path Forward in Hampton Roads
• Carol E Considine, Old Dominion University
- 75** SAGE: Building Partnerships for Coastal Resilience in Barnegat Bay, New Jersey
• Bari Greenfeld, US Army Corps of Engineers, Institute for Water Resources

Midwest

- 76** Climate Change Mitigation and Adaptation in Dairy Production Systems of the Great Lakes Region
• Carolyn R Betz, University of Wisconsin-Madison
- 77** Enhancing Human Motivation in Group Settings Relative to Climate Change
• Peggy Ann Burkman, Stages of Change
- 78** Utilizing Real-time Automated Controls to Minimize Cost and Maximize Performance of a Flood Control BMP
• Bob Fossum, Capitol Region Watershed District
- 79** Sustainable Stormwater Analysis for the Ford Site Redevelopment, Saint Paul, MN
• Bob Fossum, Capitol Region Watershed District
- 80** Vulnerability of Specialty Crops to Climatic Variability and Adaptation Strategies in the Midwestern USA
• Erica Jean Kistner, USDA-ARS
- 81** Planning for Coastal Hazards in Coastal Indiana Communities
• Kaitlyn McClain, Indiana Department of Natural Resources
- 82** Manage Urban Flooding from the Grassroots: The RainReady Approach
• Molly Oshun, Center for Neighborhood Technology
- 83** A Climate Change Vulnerability Assessment for the 1837 and 1842 Ceded Territories: Integrating Ojibwe Perspectives
• Hannah Panci, Great Lakes Indian Fish and Wildlife Commission
- 84** Narratives of Climate Preparedness in a Lake Superior Coastal Community
• Vanessa Perry, University of Minnesota
- 85** Qualitative Inquiry as a Tool for Centering Local Knowledge in Community Based Adaptive Management
• Jenn Shepard, University of Minnesota
- 86** Lessons in Conservation, Economics, and Sustainability from a Student Housing Experience
• Larry Zazzera

Northeast

- 87** A Policy Framework for Creating Wetlands Using Dredge Materials for Coastal Resiliency in Connecticut
• Rebecca A French, UConn, Connecticut Institute for Resilience and Climate Adaptation

- 88** Extreme Event Targeted Toolkits: Post-Event Learning and Macro-Adaptation
• Erin Friedman, The Graduate Center, CUNY
- 89** Collaborating for Resilience: The New Hampshire Coastal Adaptation Workgroup
• Lisa Graichen, UNH Cooperative Extension and NH Sea Grant
- 90** Economic Assessment of Local Coastal Protection Strategies in the Face of Sea Level Rise
• Allyza Lustig, Yale School of Forestry and Environmental Studies
- 91** Promoting Aquatic Connectivity in a Changing Climate Through Culvert Improvements
• Melissa Ocana, UMass Amherst Dept of Environmental Conservation
- 92** Coastal Vulnerability Index for Ecological, Cultural, & Recreational Assets at a Massachusetts Land Trust
• Jennifer Ryan, The Trustees
- 93** Climate Smart Cities-Boston
• Darci Anne Schofield, The Trust for Public Land
- 94** A Holistic Approach to Coastal Resiliency Enhancement and Community Risk Reduction: Upper North Shore, Massachusetts
• Taj Schottland, National Wildlife Federation
- Northwest**
- 95** Working Together to Address Climate Change Across Borders: The Importance of Actionable Science and Diversity
• Anne A Carlson, The Wilderness Society
- 96** A Three-Step Decision Support Framework for Linking Climate Science to Adaptation Action
• Molly Cross, Wildlife Conservation Society
- 97** Hazards in Oregon: Insights from Providing Local Climate Services in Practice
• Josh George Foster, OSU/OCCRI
- 98** AgClimate.net – A New Model for Climate Change Extension
• Roesch-McNally Gabrielle, Northwest Climate Hub
- 99** Climate Change Adaptation: Moving From Plans to Action in the Nooksack River Basin, WA
• Oliver Grah, Nooksack Indian Tribe
- 100** EPA Climate Change and TMDL Pilot Research Project in the South Fork Nooksack River, WA
• Oliver Grah, Nooksack Indian Tribe
- 101** Climate Adaptation for Wildlands: Lessons and Challenges from Yellowstone
• John Gross, NPS
- 102** Decision Support Tools to Help Resource Managers Evaluate and Prioritize Adaptation Options
• Laura Hilberg, EcoAdapt
- 103** Tribally-Based Climate Adaptation and Resiliency Workshop in the Pacific Northwest
• Clarita Lefthand-Begay, University of Washington
- 104** Balancing and Optimizing Climate Adaptation, Mitigation, and Equity Priorities in Climate Action Planning
• Andrea Laura Martin, Cascadia Consulting Group
- 105** The Available Science Assessment Project (ASAP): Evaluating the Supporting Science Behind Climate Adaptation Actions
• Whitney Reynier, EcoAdapt
- 106** Engaging Local Communities in Sea Level Rise Adaptation
• Tina Whitman, Friends of the San Juans

Southeast

- 107** Fort Lauderdale's Seawall Ordinance - How Community Engagement Shapes Adaptation Policy
• Nancy J Gassman, Fort Lauderdale
- 108** Moving Toward Resilience: A Structured Resilience Planning Process in Asheville, North Carolina
• Karin Rogers, UNC Asheville's NEMAC

Southwest

- 109** Assessing the Distribution of Civic Environmental Stewardship and its Relationship to Demographics in Los Angeles
• Krystle Golly, Loyola Marymount University
- 110** Using Long-Term Climate Information for On-Farm Adaptation Planning: Farmers' Needs Versus Modeling Capabilities
• Kripa Akila Jagannathan, UC Berkeley
- 111** From Planning to Implementation: Best Practices from California
• Julia Kim, Local Government Commission
- 112** Assessing the Integration of Climate Change into BLM Planning Documents in Colorado
• Julia Nave, Western State Colorado University Master in Environmental Management
- 113** Engaging Stakeholders in Developing Social-Ecological Adaptation Strategies in Southwestern Colorado
• Betsy Neely, The Nature Conservancy
- 114** Linking Community and Ecosystem Health in Shoreline Vulnerability Studies: The Richmond Community Visioning Process
• Heidi Nutters, "San Francisco Estuary Partnership
- 115** San Diego Resilient Coastlines Project: Expanding Local Capacity to Implement Innovative and Creative Solutions
• Amber Pairis, Climate Science Alliance-South Coast
- 116** Climate Change Vulnerability Assessment of Tribal Lands in the American Southwest
• Anna Elisabeth Palmer, Ohio University
- 117** Supporting Climate-Informed Natural Resources Management in Southern California
• Whitney Reynier, EcoAdapt
- 118** Building Climate Resilience in Mountain Ski Communities
• Russ Sands, Brendle Group
- 119** Implementation of the California Coastal Commission Sea Level Rise Policy Guidance and Next Steps
• Sumi Selvaraj, California Coastal Commission
- Coasts**
- 120** Teaching Climate Justice in the Public Schools: Extreme Weather Events in Disadvantaged Communities
• Carl C Anthony, Breakthrough Communities
- 121** Resilient Communities Initiative Equity Lens on Adaptation
• Paloma Pavel, Resilient Communities Initiative

- ▶ **7:00am to 8:00am** **BREAKFAST** (Grand Ballroom A,B,C,F,G)
- ▶ **7:00 am to 5:30 pm** **REGISTRATION / EXHIBITS**
(Ballroom Concourse)
- ▶ **8:00am to 9:00am** **BUSINESS PLENARY**
(Grand Ballroom A,B,C,F,G)

A panel of local private sector leaders will discuss the need for sustainability and adaptation as underlying principles when it comes to considerations of climate change and how they will affect our natural resources, societal infrastructure, and the future of products and services in the highly competitive corporate world.

Moderator: Raj Rajan, RD&E Vice President, Ecolab

Panelists:

Jean Bennington Sweeney, Chief Sustainability Officer, 3M
Greg Page, Retired Chairman and CEO, Cargill

- ▶ **9:10am to 10:40am** **CONCURRENT SESSION 4**

ADAPTATION LEARNING EXCHANGES: THE VALUE OF FACE-TO-FACE CONTACT
(Grand Ball Room - Section D)

Symposium Organizer: Barney Dickson, UN Environment

In 2016, the UN Environment's Global Adaptation Network (GAN) launched a pilot initiative designed to facilitate learning among practitioners facing similar adaptation challenges. The most useful knowledge for adaptation practitioners is often practical knowledge of how to address and overcome particular adaptation challenges and barriers. This type of practical, day-to-day knowledge is not easily acquired from the scientific literature or from typical online sources. It is best obtained through direct, face-to-face exchanges with other practitioners who have faced similar challenges. Learning of this sort takes time and resources. As the field of adaptation grows, it is vital to explore methods of knowledge transfer and growth to ensure scientists and practitioners alike are communicating effective lessons learned from the field. This initiative allows us to explore how exchange visits between groups of adaptation practitioners provide effective adaptation training, and will help develop best practices in adaptation science. Throughout this initiative, we will consider under what circumstances such exchanges are likely to be successful, whether exchange visits need to be supplemented by other types of learning, and how to measure the success of these exchanges. We will also look at how to increase the impact of these exchanges beyond the participants and ensure the knowledge gained is put to work in the real world (or actualized). The session will present the early results from the pilot exchanges and discuss the scaling up of the initiative in 2017 and beyond.

Panelists:

Essey Daniel, UN Environment
Jessica Hitt, EcoAdapt
Sean O'Donoghue, City of Durban Environmental
Planning and Climate Protection Department
Efraín J Leguía Hidalgo, Programa de Investigación del CGIAR
en Cambio Climático Agricultura y Seguridad Alimentaria

LEVERAGING SERVICE AND VOLUNTEERISM AS EFFECTIVE MEANS TO INCREASE CLIMATE RESILIENCE AND IMPROVE EQUITY (Meeting Room 2/3)

Symposium Organizer: Cristina Mae Vilella, Minnesota Pollution Control Agency

This Symposium Presentation will share case studies of state and local cutting-edge initiatives that address priority environmental challenges and improve community resilience through highly structured, partnership-

based programs. Utilizing federal, state and local resources, communities are implementing both adaptation and mitigation measures by mobilizing citizens and local organizations through service and volunteerism. As climate impacts increasingly occur and deepen inequalities for the most vulnerable populations, community-based service and volunteer programs provide critical resources for the planning and implementation of resilience actions and offer a means to better assist disadvantaged communities. Following speaker case studies, attendees will share resilience and adaptation initiatives taking place in their local communities and explore how they might benefit from partnerships with volunteer-based programs.

Panelists:

Clare Croteau, Minnesota Pollution Control Agency
Hollis Emery, Conservation Corps Minnesota
Cristina Vilella, Minnesota Pollution Control Agency
Leslie Yetka, Freshwater Society

CLIMATE CHANGE IMPACTS ON FIRST FOODS AND FOOD SECURITY: ADAPTION OPTIONS FOR TRIBAL COMMUNITIES (Meeting Room 4)

Symposium Organizer: Caitriana Steele, USDA SW Climate Hub

Food security is defined as the access by all people at all times to sufficient food for an active, healthy life. This definition does not account for the cultural importance of First Foods and raising traditional crops to native societies. First Foods embody the reciprocity between Native American Creation beliefs and the natural environment. Likewise, cultivated foods such as corn, beans and squash play a central role in the culture and mythology of many tribes. First foods were also part of indigenous diets before colonization and provide physical, spiritual, ceremonial and cultural meanings. These traditional foods are at risk from climate change through changes in precipitation, temperature and extreme weather events. Indirect threats include increased exposure to invasive species, pests and disease as well as changes in the availability and quality of traditional plant and animal species. Maintaining or restoring ecosystem health, in partnership with tribal communities, for hunting and gathering, or cultivation not only ensures a sound cultural future but also contributes to future food security.

This symposium will host a panel of up to 8 speakers. A discussion round table will also invite audience participation. Primary objectives of this session are (i) to highlight best practice and innovation in developing adaptation initiatives that have incorporated first foods and food security, demonstrating where these efforts are achieving success; (ii) to discuss challenges in developing and adopting adaptation initiatives; (iii) to identify gaps in research and outreach.

Panelists:

Nikki Crowe, 13 Moons Program
Courtney Kowalczak, Fond du Lac Tribal and Community College
Linda Kruger, Pacific USFS Northwest Research Station
Jerry Pardia, United South and Eastern Tribes, Inc.
Melissa Poe, University of Washington
Cheryl Shippentower, Umatilla Department of Natural Resources
Tony Skrelunas, Grand Canyon Trust

ADAPTATION TO MAINTAIN AGRICULTURAL PRODUCTIVITY (Meeting Room 5)

Symposium Organizer: John D Wiener, University of Colorado

Urban adaptation success demands increased support for agricultural adaptation, rather than short-term enabling of unsustainable practices. Major farm support programs presently provide substantial disincentives to adaptation, as shown in the 2015 National Adaptation Forum, and additional information is available from sources such as Environmental Working Group, and Union of Concerned Scientists. Agricultural adaptation to climate change in the US demands coping with changes in farming technology and farming systems, capacity to change,

support and reduction of obstacles from outside, and some difficult changes in policy at national and sometimes other levels.

This session will feature leaders from the Land Grant universities, US Department of Agriculture, renewable agriculture research, and agroforestry/agroecology, with discussants from research and policy leaders. What is needed to address soil degradation? What does US Department of Agriculture science indicate is needed? What policies interfere with transition toward renewable food systems? The science of agroforestry and agroecology is strong; why is it not followed?

This session is intended to be in sequence as first of three related sessions; the second is “Cultivating Cities and Stakeholder: Engaging Support and Markets”; these two sessions set the stage for a working group session on “Accelerating Adaptation: Improving the Transfer of Knowledge across Subsectors of Agriculture” which is intended to be on the Agriculture and Food Security Track AND the Tribal/Indigenous Track.

Presentations:

Jerry Hatfield, USDA, Agricultural Research Service
Gary Bentrup, USDA, National Agroforestry Center
John Hendrickson, USDA Agricultural Research Service

NATURE-BASED SOLUTIONS FOR PROTECTING COMMUNITIES FROM SEA LEVEL RISE AND STORM SURGE (Meeting Room 6)

Symposium Organizer: Tina Hodges, US Department of Transportation

Coastal communities face serious risks from rising sea levels and storm surges. Federal policy encourages the use of ecosystem-based approaches in adapting to climate change. Ecosystems provide valuable services that help to build resilience and reduce the vulnerability of people, livelihoods, and infrastructure to climate change impacts while at the same time providing environmental and other benefits.

Coastal nature-based solutions include dunes, wetlands, living shorelines, oyster reefs, beaches, and artificial reefs. These features can protect coastal communities from the brunt of storm surges and open water waves. Some can adapt to sea level rise by accreting sediment or migrating inland.

More communities are looking into how they can use nature-based solutions as an alternative to, or in addition to, traditional hard infrastructure such as sea walls, levees, and revetments.

Learn about how public agencies from diverse sectors can integrate nature-based solutions into their projects in coastal areas.

Presentations:

Bhaskar Subramanian, Maryland Department of Natural Resource
Tina Hodges, Federal Highway Administration
Paul Wagner, US Army Corps of Engineers
Rick Bennett, US Fish and Wildlife Service
Bari Greenfeld, US Army Corps of Engineers

CITY-BUSINESS COLLABORATION ON BUILDING RESILIENCE TO CLIMATE CHANGE (Meeting Room 7)

Symposium Organizer: Katy Maher, Center for Climate and Energy Solutions

Cities are engaging in planning, analysis, and policy development aimed at strengthening their resilience to climate risks. Likewise, many businesses are facing strategic and operational decisions where climate risks play a critical role. Despite facing similar risks, businesses and cities do not frequently collaborate on resilience planning. C2ES has been working together with cities and businesses around the country to develop guidance on how local governments can collaborate with their business community.

This session will highlight some of the challenges in resilience planning, and will discuss best practices and frameworks for cities to work together with businesses to address climate risks. Lessons learned from this panel can help other cities identify tools for collaborating with the private sector.

Panel speakers will include city officials, business leaders, and other stakeholders who will share their experiences in developing resilience plans collaboratively.

Examples of questions that the panel will cover include:

How can cities and businesses best work together to identify critical areas for building community resilience?

What can businesses provide to cities to help with resilience planning, and how can cities help to address business resilience needs?

How can updates to building codes, zoning, and policies make each community and its businesses more resilient?

What are the options for financing resilience investments, and how have these been leveraged?

What lessons are being learned by cities and business that collaborate successfully?

How can these lessons be implemented and replicated more broadly and enshrined in policies at the local, state, or federal levels?

Panelists:

Leah Bamberger, City of Providence, RI
Ashley Lawson, Center for Climate and Energy Solutions
Katy Maher, Center for Climate and Energy Solutions
Dennis Murphey, City of Kansas City, MO

COMMUNITY AND REGIONAL APPROACHES TO CLIMATE RESILIENCE FOR THE WATER AND WASTEWATER SECTOR (Meeting Room 8/9)

Symposium Organizer: Curt Baranowski, U.S. EPA

Climate conditions and natural hazards pose an immediate and long-term threat to the continuity of water and wastewater utility operations and water resource quality and availability for communities. Since some of the impacts from climate change cross-cut multiple sectors, drinking water, wastewater and stormwater utilities across the country have to actively work with regional partners and community leaders to protect their facilities, as well as coordinate their responses.

The Environmental Protection Agency’s (EPA) Creating Resilient Water Utilities (CRWU) initiative has provided drinking water and wastewater utilities and communities of all sizes with the practical tools, training, and technical assistance needed to adapt to climate change by promoting a clear understanding of climate science and adaptation strategies.

This session will communicate the real-world challenges and accomplishments of water sector utilities that have used CRWU tools and other resources to adapt to the impacts of climate change, as well as the value of peer-to-peer information sharing. The Panelists will discuss the diverse challenges that utilities, regional organizations, and community leaders face in managing their response to climate change, including regional variations in climate hazards and projections, financial and technical resource constraints, and community support.

Each Panelists: will also provide a short presentation highlighting the innovative solutions that they have implemented to help them overcome the challenges listed above. The moderator will also direct a panel discussion to elicit additional information from the Panelists related to lessons learned and best practices that may be broadly applicable to attendees.

Panelists:

Travis Block, City of Faribault, Minnesota
Russell Clayshulte, Bear Creek Watershed Association
Steve Fries, U.S. EPA
Andrew Kricun, Camden County Municipal Utilities Authority
Hassan Rad, Los Angeles Sanitation District

LANDSCAPE CONSERVATION COOPERATIVES AT THE INTERFACE OF CLIMATE SCIENCE, ADAPTATION, AND COLLABORATION FOR COASTAL RESILIENCE

(Meeting Room 10)

Symposium Organizer: Megan Cook, U.S. Fish and Wildlife Service

Climate change is already affecting coastal communities throughout the United States and its neighbors. Landscape Conservation Cooperatives (LCCs), which bring together many partners in pursuit of the vision of landscapes and seascapes capable of sustaining natural and cultural resources for current and future generations, are working across scales and geographies to establish shared pathways toward more resilient and adaptive coastal communities. This session will highlight work in four regions: Alaska, the Pacific Coast, the Pacific Islands, and the Gulf of Mexico. Common themes addressed in each regional presentation will include: (1) planning and adaptation to sea-level rise and coastal erosion and inundation, (2) co-designing a path towards resilient communities and ecosystems by connecting managers and community stakeholders in joint adaptation efforts, and (3) identifying priority science needs and translating science in meaningful ways. The session will close with a panel discussion with the representatives from all the regions in the session to answer questions and discuss lessons learned.

Presentations:

Amy Holman, NOAA

Kat Powelson, California Landscape Conservation Cooperative

Jeff Burgett, Pacific Islands Climate Change Cooperative

Steve Traxler, Peninsular Florida Landscape Conservation Cooperative

Megan Cook, U.S. Fish and Wildlife Service

WORKING IN TANDEM – TWIN CITIES CLIMATE VULNERABILITY AT CITY, COUNTY AND REGIONAL SCALES

(Meeting Room 11)

Symposium Organizer: Kelly Muellman, City of Minneapolis

Three climate trends—rising temperatures, extreme storms and higher dew points—are driving the frequency and intensity of extreme weather in Minnesota. Between 2014 and 2016, three levels of government conducted climate change vulnerability assessments to identify the potential impact of climate change on infrastructure and populations. The Metropolitan Council, Saint Paul-Ramsey Public Health Department, and City of Minneapolis will share their experiences with using different processes and data sets, and the challenges with data and how to represent findings in a manner that is useful. The Metropolitan Council, the regional planning body, conducted a regional assessment of flood impacts and heat extremes, which can serve to screen and then target areas of mitigation and adaption on a more localized scale, tailored to community resources and in concert with neighbors. At the city level, Minneapolis focused on the landscape vulnerability to extreme heat and landscape factors that lead to flood risk, utilizing urban heat island data from the University of Minnesota and highly granular vegetation and impervious surface data to identify areas most in need of intervention. Saint Paul – Ramsey County Public Health conducted a climate change vulnerability assessment to identify populations and geographic areas that may be especially susceptible to the negative effects of climate change at the local level and serve as a guide for decision makers developing effective public health adaption strategies. All three assessments have been a valuable starting point in discussions with local policy makers and community members.

Panelists:

Zack Hansen, Saint Paul-Ramsey Public Health Department

Kelly Muellman, City of Minneapolis

Eric Wojchik, Metropolitan Council

STATE WILDLIFE ACTION PLANS: A TOOL FOR COLLABORATIVE CLIMATE ADAPTATION (MEETING ROOM 12)

Symposium Organizer: Davia Palmeri, Association of Fish and Wildlife Agencies

Climate change is a significant threat to fish and wildlife across the United States. As such, all 56 of the 2015 revised State Wildlife Action Plans (SWAP) have incorporated climate change. SWAPs outline the steps that are needed to conserve wildlife and habitat before they become too rare or costly to restore by assessing the health of each state's full suite of wildlife and habitats, identifying the problems they face, and outlining the actions needed to conserve them over the long term. Taken as a whole, SWAPs present a national action agenda for addressing threats, like climate change, to prevent wildlife from becoming endangered and are a resource for partners that want to engage in conservation.

This symposium will start with a short presentation on the variety of ways that states have addressed climate change in their respective revised plans. We will then focus on state case studies, selected to highlight and contrast different climate adaptation approaches and opportunities. Panelists will be asked to respond to a series of questions in order to quickly surface key takeaways, lessons learned, and opportunities in SWAPs that will benefit natural resources, people, and communities. There will be a facilitated group discussion following the presentations, encouraging session attendees to share their own experiences with addressing climate change in fish and wildlife management and ideas for ensuring that the creative and innovative ideas in SWAPs can be implemented across sectors.

Panelists:

Chris Burkett, Virginia Department of Game and Inland Fisheries

Lynn Helbrecht, Washington Department of Fish and Wildlife

Davia Palmeri, Association of Fish and Wildlife Agencies

Bill Reeves, Tennessee Wildlife Resources Agency

ROWING IN THE SAME DIRECTION: COORDINATING ACROSS SECTORS ON RESILIENT ADAPTATION

(Meeting Room 14/15)

Symposium Organizer: Nancy Schneider, Institute for Sustainable Communities

Climate change impacts are real in southeast Florida, where sea level rise has already caused erosion, saltwater intrusion leading to contaminated drinking water wells and impacts on natural systems, as well as new and increased flooding due to increased storm surge and higher than historic level high tides; all compounded by extreme rain events.

The complex water management relies on intricate systems of canals, retention ponds, pumps, and much needed upgrades to traditional gravity driven infrastructure. The region is "living with water" more so now than ever and this will increase in the future as sea levels increase, but due to the breakdown of silos due to cooperation and collaboration between the Southeast Florida Regional Climate Change Compact, South Florida Water Management District, counties, municipalities, academia, and other experts, the region has dodged several disasters or learned lessons for the future on disasters not dodged.

This panel discussion will tell the real story of what has happened (lessons learned) and what is happening in southeast Florida.

Panelists:

Steve Adams, Institute for Sustainable Communities

Nancy Gassman, City of Ft. Lauderdale

Jennifer Jurado, Broward County, Florida

Jim Murley, Miami-Dade Count

▶ 10:40am to 10:50am BREAK

▶ 10:50am to 12:20pm CONCURRENT SESSION 5

BUILDING CLIMATE RESILIENCE ALONG 2,500 MILES OF MISSISSIPPI RIVER CORRIDOR (Grand Ball Room - Section D)**Symposium Organizer:** Colin Wellenkamp, Mississippi River Cities and Towns Initiative

Come learn about the geographically largest non-federal climate resilience project in the U.S. The Mississippi River basin serves all fifty states by providing food and shipping goods through the American Midwest. It is also the keeper of a good portion of our nation's shared cultural and ecological heritage. Because of the region's importance and the increasingly severe natural disturbances occurring within it, building resilience throughout the mainstem corridor to protect people, natural systems, and economies from the impacts of climate change is of utmost importance.

The Mississippi River Cities and Towns Initiative, a regional organization comprised of 64 cities located along the river, is developing a collaborative effort to address climate change impacts and build resilience throughout the corridor. This effort involves state government, federal agencies, nonprofit partners, academic institutions, and a wide array of topical experts throughout the corridor.

The partnership will complete a climate science synthesis and vulnerability assessment as well as convenings to address specific vulnerabilities at the regional, sub-regional, state, and local levels. The goal is to create guidance for as many shared challenges as possible to ensure that resilience building efforts are consistent and integrated across the corridor.

This is an ambitious scale, but it is the approach that holds the most potential for long-term success given the complexities of the Mississippi River basin.

The session will involve several short presentations and robust conversations between the presenters and participants.

Panelists:

The Honorable Chris Coleman, City of Saint Paul, Co-Chair of the Mississippi River Cities & Towns Initiative
 Tonya Graham, ClimateWise
 Lara Hansen, EcoAdapt
 Ryan Janda, FEMA Mitigation Directorate
 Jennifer Nelson, MN Department of Public Safety
 Olivia Stinson, Rockefeller Foundation
 Colin Wellenkamp, Mississippi River Cities and Towns Initiative

COMMUNITY-BASED ADAPTATION IN PRACTICE: THE INTERSECTION OF POLICY AND ACTION (Meeting Room 2/3)**Symposium Organizer:** Jason Vogel, Abt Associates

This symposium will profile work done by four U.S. communities to reduce their vulnerability to climate risks. We will synthesize insights across the four communities through the cross-case findings and tactical recommendations of a Kresge Foundation-funded project titled "Climate Adaptation: The State of Practice in U.S. Cities."

Lois DeBacker of the Kresge Foundation will set the context for the panel in opening remarks and introduce the project. Jason Vogel from Abt Associates will then frame the rest of the symposium by introducing four themes, or tactical recommendations, that emerged from the project. These themes will then be elaborated upon by individual presenters from four U.S. municipalities as they discuss how and why they were able to implement a particular adaptation action in their community. Jason will then synthesize across all four presentations through the lens of the findings of the Kresge-funded project. We will then offer the opportunity

for audience members to engage the community representatives in an in-depth ½ hour dialog. Leading local government climate champions will share experiences and lessons from specific steps their communities have taken to enhance climate preparedness and resilience.

Panelists:

Lois R. DeBacker, Kresge Foundation
 Mia Goldwasser, City of Boston
 Jenny Niemann, City of Flagstaff
 Jason Vogel, Abt Associates

MANAGING FOR CLIMATE CHANGE: TRIBAL CLIMATE CHANGE POLICY PRIORITIES AND OPPORTUNITIES FOR CO-MANAGEMENT (Meeting Room 4)**Symposium Organizer:** Kathy Lynn, University of Oregon

As climate change continues to shift the range and composition of culturally important habitat and species, the obligations of the United States toward American Indian and Alaska Native tribes must be upheld. These obligations include trust responsibilities, those stemming from treaty and other reserved rights, and government-to-government relationships. Tribal co-management of culturally important species in ceded and ancestral territories is one pathway to ensure that the federal trust responsibility is met in climate adaptation efforts. Co-management refers to the degree of tribal and federal influence on land management in an area. Panel topics will include:

What are the impacts of climate change on treaty and reserved rights (including fishing, hunting, and gathering rights, as well as impacts to the exercise of religious practices, sacred sites and archaeological resources, stemming from loss or damage due to flooding, erosion, wildfire, etc.)?

How can tribal co-management facilitate cooperative monitoring of species changes across the landscape including the movement, replacement and displacement of species, and alteration of spatial/temporal distribution and migration patterns?

Why is tribal engagement in collaborative management necessary. What are examples of strategies for sharing mechanisms and best practices for co-management (ex. Fisheries, traditional use of fire and the Tribal Forest Protection Act)?

What are the key national policy issues that must be addressed to strengthen the government-to-government relationship between federal agencies and tribes in addressing climate adaptation?

What are the administrative and legislative pathways for advancing co-management in climate change adaptation strategies in the future?

Panelists:

Mike Durglo, Confederated Salish and Kootenai Tribes
 Elizabeth Kronk Warner, University of Kansas
 Don Motanic, Intertribal Timber Council
 Don Sampson, Affiliated Tribes of Northwest Indians
 Kyle Powys Whyte, Michigan State University

FROM PILOTS TO BIG BOLD VISIONS: RAPID SCALING OF CARBON FARMING (Meeting Room 5)**Symposium Organizer:** Sigrid Wright, Community Environmental Council

Attention is increasingly turning to carbon farming as an important tool in the climate change toolkit. Analysis shows that a worldwide goal to increase carbon in soils by less than a half percent a year could stop the present increase in atmospheric CO₂ and achieve the long-term objective of limiting the global temperature increase to the 1.5°C to 2°C threshold. Our analysis shows that a one-time application of compost on just 15% of available and appropriate rangeland in Santa Barbara County can offset all the county's Ag Sector emissions, and a similar analysis reaches the same conclusion for the state. This strategy also improves the water holding capacity of soil, decreases soil erosion and runoff, and builds up a

reservoir of nutrients underground – vital measures to ensuring agricultural sustainability in a changing climate.

Carbon farming is facing a pivotal moment between shifting from trials and test-plots to implementation at full-scale. Santa Barbara County, a place rich in environmentalism and one of the top agricultural producers in the state, is working to tip the scale. Our panel will explore how a robust partnership — including landowners, NGOs, universities, private foundations, and state and federal agencies — is navigating rapidly-developing research and policy landscapes to recruit ranchers in the fight against climate change. This project includes an NRCS-backed research pilot on one of the largest private ranches in the region, as well as an analysis of how best to capture existing organic waste and convert it to low-cost, high-quality compost.

Panelists:

Aeron Arlin-Genet, Santa Barbara County Air Pollution Control District
Russell Chamberlin, Ted Chamberlin Ranch
Anne Coates, Cachuma Resource Conservation District
Calla Rose Ostrander, Marin Carbon Project
Sigrid Wright, Community Environmental Council

CREATING RESILIENT COMMUNITIES: CALIFORNIA'S FRAMEWORK FOR RESPONDING TO CLIMATE CHANGE (Meeting Room 6)

Symposium Organizer: Nuin-Tara Key, CA Governor's Office of Planning and Research

California is committed to reducing greenhouse gas emissions and adapting to a changing climate - hear the latest developments on the State's implementation approach to Safeguarding California.

In 2006, California enacted the world's most comprehensive GHG emissions reduction program, which set in place a roadmap towards meeting ambitious reduction targets. The State is on track to meet these targets, while maintaining a healthy economy and investing in disadvantaged communities. The State reiterated its leadership in 2016, when it adopted an emission reduction goal for 2030 that is the most ambitious in the country.

However, these emission reduction successes tell just half the story. In 2009, California developed the first cross-sectoral climate adaptation strategy in the nation. In 2015, Executive Order B-30-15 established an integrated approach to climate mitigation and adaptation while prioritizing protection of the State's most vulnerable populations.

This session will cover four foundational elements of California's approach to adaptation.

Strategy: The Safeguarding California Plan is the guiding document for the State's adaptation strategy.

Planning: The Adaptation Planning Guide assists local and regional jurisdictions and state agencies with developing robust adaptation plans in response to a changing climate and new requirements that come with it.

Implementation: Implementation is guided by the Integrated Climate Adaptation and Resilience Program, which focuses on strategies that align state, regional and local efforts, advance climate equity, and reduce GHG emissions.

Research: California's Fourth Assessment Report links the best available science to policy and invests in actionable research to inform long term policy decisions.

Panelists:

Jonathan Parfrey, Climate Resolve
Tina Curry, CA Governor's Office of Planning and Research
Nuin-Tara Key, CA Governor's Office of Planning and Research
Michael McCormick, CA Governor's Office of Planning and Research

INTEGRATING CLIMATE CHANGE PROJECTIONS INTO TRANSPORTATION ENGINEERING DESIGN IN THE RIVER ENVIRONMENT (Meeting Room 7)

Symposium Organizer: Robert Hyman, Federal Highway Administration

For transportation engineers, a major issue in trying to incorporate climate considerations into infrastructure design is that the uncertainty surrounding future weather and climate makes it difficult to settle on appropriate design assumptions regarding natural hazards such as flood levels, high intensity and/or duration rainfall quantities, and tropical and extra-tropical storm effects. As a result, FHWA recently released a technical guide for engineers on how to consider future changes in precipitation and riverine flooding in the design of transportation assets, called Hydraulic Engineering Circular (HEC) 17: Highways in the River Environment – Floodplains, Extreme Events, Risk and Resilience (<http://www.fhwa.dot.gov/engineering/hydraulics/pubs/hif16018.pdf>). This guide details a flexible approach to incorporating climate science with five levels of effort, recognizing that high cost, long life assets require more robust assessments than lower cost infrastructure with shorter lifetimes. The first presentation will describe these five levels of effort for considering climate change impacts. It will be followed by presentations on three case studies that illustrate differing levels of effort: a culvert in Colorado susceptible to flooding from wildfire-induced changes in hydrology; an examination of highway bridges in a large river basin in Iowa, and a culvert and a roadway in Minnesota vulnerable to flash flooding from future heavy precipitation events.

The session will close with an interactive Q&A session. In addition to questions from the audience, the presenters will ask audience members for their thoughts on how the different approaches described could apply to projects or systems they are involved in.

Presentations:

Brian Lee Beucler, Federal Highway Administration
Justin Lennon, WSP | Parsons Brinckerhoff
Dave Claman, Iowa Department of Transportation
Andrea Hendrickson, Minnesota Department of Transportation
Philip Schaffner, Minnesota Department of Transportation

FAITH-BASED PERSPECTIVES AND ACTION PLANS ON CLIMATE CHANGE ADAPTATION (Meeting Room 8/9)

Symposium Organizer: Mark Warren Seeley, University of Minnesota

Faith-based discussions of creation care have become more widely common in the context of vulnerabilities to climate change and the disproportionate consequences that will fall upon the poor and less developed nations and cultures. Though the scientific data evidence is overwhelming that human disturbance of the land, oceans, and atmosphere are driving much of the change in climate, it is the impact stories and observations of many people that provoke us to come together in dialogue and action to mend planet Earth, even if it is one community at a time. Creation theology teaches us that we are all connected, and what we do affects directly and indirectly the world's capacity to sustain us through future generations. A faith-based dialogue is an approach that draws us together around values, ethics, and beliefs so that we see more commonality than divisiveness, and recognize the need to lead through role modeling where we practice and value stewardship on an everyday scale both individually and corporately. These are the discussion topics which our faith-based panel can illuminate.

Panelists:

Paul Douglas, Aeri Weather, LLC
Jessica Hellman, Institute on the Environment, University of Minnesota
Teddie M. Potter, University of Minnesota
Erin Pratt, MN Interfaith Power and Light
Mark Seeley, University of Minnesota

NEXT ERA OF MARKET FINANCE FOR RESILIENCE

(Meeting Room 10)

Symposium Organizer: Joyce Coffee, Climate Resilience Consulting

Reliable infrastructure and thriving small and medium enterprises are critical assets. However, they are more and more vulnerable due to outdated designs and poor siting in the case of infrastructure, and limited capital to invest in innovation in the case of small and medium enterprises.

A new era of market finance has the potential to play a critical role in advancing resilience by ensuring that necessary investments are made in these pillars of the economy.

This panel will examine innovative tools emerging in the debt and equity marketplace that make resilience projects interesting to investors.

Panelists:

Joyce Coffee, Climate Resilience Consulting
Yoon Kim, Four Twenty Seven Climate Solutions
Jay Koh, Global Adaptation and Resilience Investment Work Group
Sanjay Wagle, Broadscale Group

POLITICS, PARTNERSHIPS, AND PARCEL TAXES: SECURING REGIONAL FUNDING FOR WETLAND RESTORATION AND SHORELINE FLOOD PROTECTION

(Meeting Room 11)

Symposium Organizer: David A Lewis, Save The Bay

In June 2016, San Francisco Bay Area voters across nine counties approved a new regional parcel tax to create a tidal marsh restoration fund of \$500 million over 20 years. Grants from this fund will accelerate habitat restoration to adapt the Bay ecosystem to climate change and protect at-risk shoreline communities and infrastructure from flooding. This session provides lessons learned from the decade-long effort to pass Measure AA, through a dynamic panel discussion among participants who worked together to conceive and secure its passage by an unprecedented super-majority. Panelists will explain these aspects, and highlight relevant lessons for other regions seeking to raise local adaptation funds:

How a stakeholder case statement for the bay's ecological and financial needs helped create a new regional agency with taxing and granting authority to restore bay marshes

The economic study and public education campaign about the region's vulnerability to an extreme storm event, and how marsh restoration could provide green infrastructure to mitigate risk

The scientific report establishing ecological imperatives to accelerate marsh restoration as climate change increases sea levels

How a broad coalition of environment, business, government and labor interests coalesced around Measure AA

The public campaign emphasizing shared values and shared benefits; the messages and methods used to secure 70 percent voter support for Measure AA

Mechanisms to produce maximum restoration benefits from \$500 million raised locally, provide grants to restoration projects, and leverage additional federal and state money to match the new bay fund

Panelists:

David A Lewis, Save The Bay
Sam Schuchat, San Francisco Bay Restoration Authority

GREEN INFRASTRUCTURE TO MANAGE HEAT AND STORMWATER: EQUITABLE SOLUTIONS IN URBAN SETTINGS (Meeting Room 12)**Symposium Organizer:** Sara Pollock Hoverter, Harrison Institute for Public Law

Green and cool infrastructure, installed on a large scale, can manage runoff, reduce temperatures, and improve public health by improving air quality, water quality, and reducing heat illness. These strategies will be particularly benefit low-income and disadvantaged communities, which

tend to have less vegetation and greater vulnerability to heat illness and death. This panel presentation will highlight efforts to align stormwater management and urban heat reduction goals, with a special focus on strategies for equitable adaptation. Panelists will cover their efforts to integrate urban heat island mitigation and stormwater management with green infrastructure. Each will also cover their strategies to target built environment interventions to areas of highest social vulnerability, in addition to high temperatures and stormwater runoff. Louisville has modeled the square acreage of greening and cooling techniques that will effectively reduce the city's urban heat island and manage stormwater, and is developing strategies to deploy them to the city's most at-risk areas. Los Angeles has adopted residential cool roof requirements and a temperature reduction target. The city is about to undertake a massive sidewalk replacement initiative that will have significant impact on the nation's largest urban forest. Sean Williamson from University of Maryland's Environmental Finance Center will discuss strategies to pay for these interventions from a variety of sources. Kurt Shickman (Global Cool Cities Alliance) and Sara Hoverter (Georgetown Climate Center) will bring in additional examples of local governments leveraging their dollars to do more for neighborhoods and people who are most vulnerable to heat and localized flooding.

Panelists:

Edith de Guzman, Tree People
David Fink, Climate Resolve
Sara Pollock Hoverter, Harrison Institute for Public Law
Maria Koetter, Louisville Metro Government
Kurt Shickman, Global Cool Cities Alliance
Sean Williamson, Environmental Finance Center

CONTINUING THE MOMENTUM: ADAPTATION WORK WITH A NEW ADMINISTRATION (Meeting Room 14/15)**Working Group Organizer:** Jessica Grannis, Georgetown Climate Center

In this session, participants will discuss anticipated changes in federal policy and how those changes may affect adaptation work at the state and local level. The Georgetown Climate Center will provide a brief overview of changes (past and anticipated) in federal policy that are likely to affect state and local adaptation efforts and will facilitate a discussion with partners and participants about strategies for navigating these changes – including filling likely gaps in continued federal support. Actions that will be discussed include Presidential Executive Order(s), budget proposals, and changes to climate-adaptation related federal policy and rules. In break-out groups, participants will discuss strategies regarding how the adaptation community of practice can continue to make progress, leverage new resources and partnerships to support resilience work, and fill potential gaps. Break-out groups will focus on: (i) funding to support state and local adaptation planning and implementation, (ii) ways to continue to provide needed technical support, climate science and assessments, and (iii) strategies for communicating the needs of cities and states. Staff from relevant agencies and nonprofits have been invited to participate and share observations. All take-aways will be shared with the full group as well as partners to ensure that our conversation contributes to strategic action focused on advancing adaptation activities in the coming years.

Co-Organizers:

Vicki Arroyo, Georgetown Climate Center

WEDNESDAY, MAY 10

► 12:20pm to 1:20pm LUNCH (Grand Ballroom A,B,C,F,G)

“ONE STICK AT A TIME” IN PURSUIT OF CLIMATE ADAPTATIONS FOR A MORE SUSTAINABLE FUTURE (Grand Ball Room - Section A, B, C, F, G)

Organizer: Kent Woodruff, Methow Beaver Project,
USFS Methow Valley Ranger District

This film follows land managers in the Methow Valley, Washington for over a year, from forests to rivers, from fires to snowfall, from beaver capture to release as they try to come to grips with the impacts of climate change and the possible adaptation options right in front of them. It is a conversation starter for answering the question “What can I do?” With support from the best climate experts in the Northwest, it is a chance for each of us to think about what our landscapes will be like ten decades from now. It is a nudge to start today to make our surroundings better than they would be if we did nothing. The film was conceived as part of the 10 Decades Project, the goal of which is to inspire thousands of us to take measurable, concrete steps for climate adaptation in every area for which we are responsible.

► 12:20pm to 1:20pm WORKING GROUP LUNCHEON

LEARNING COMMUNITIES: WEAVING GENERATIONS INTO THE STORY

(Grand Ball Room - Section D)

Symposium Organizer: Bonnie J Murray, NASA

For Indigenous Communities adaptation begins with wisdom shared by elders through stories. Cultural relevance and placed based education bring generations together and supports development of adaptation strategies. During this session members of Tribal Colleges and Universities will share their experiences in working with communities and partnering with NASA to engage multiple sectors and generations in the challenge of climate change mitigation and adaptation.

Panelists:

Bull Bennet, Kiksapa Consulting LLC.
Courtney Kowalczyk, Fond Du Lac Tribal Community College
Adrian Leighton, Salish Kootenai College
Caroline Montgomery, NASA
Bonnie Murray, NASA
Dan Wildcat, Haskell Indian Nations University

SUPPORTING CLIMATE NETWORKS THROUGH REGIONAL ADAPTATION FORUMS TO INCREASE ADAPTIVE CAPACITY (Meeting Room 2/3)

Working Group Organizer: Amanda Farris, Carolinas Integrated Sciences and Assessments

While climate change may be a global issue, its impacts are felt on a local level and vary region to region, making cities and other local entities well positioned to take action. Regional adaptation forums provide practitioners, researchers and decisions makers the valuable opportunity to come together to discuss local knowledge, share best practices, and brainstorm pathways towards more resilient communities and regions. This symposium is designed to support a network of regional forum organizers to capitalize on these unique opportunities. Activities will include report outs from past forum organizers and a panel discussion. Discussion topics may include, but are not limited to, challenges and successes from past events, strategies for moving forward with future events, coordination and collaboration between regional forums, and connections to the national forum. NAF participants who may be interested in hosting their own regional forums are encouraged to attend to learn more about the process of organizing these events as well as to discuss how such an event might support adaptive capacity in their region.

Co-Organizers:

Abigail Abrash Walton, Center for Climate Preparedness and Community Resilience, Antioch University
Amanda Farris, Carolinas Integrated Sciences and Assessments
WendyKay Gewiss, EcoAdapt, National Adaptation Forum
Beth Gibbons, American Society of Adaptation Professionals
Jenna Jorns, Great Lakes Integrated Sciences and Assessments
Kif Scheuer, Local Government Commission

► 1:20pm to 2:20pm NATURAL RESOURCES PLENARY (Grand Ballroom A,B,C,F,G)

Innovative adaptation that conserves and protects natural resources only happens when we come together and integrate unique perspectives into one common vision for the future. This session will help to decode some of the unique challenges and benefits that result from working with non-typical partners and the benefits of mainstreaming natural resource conservation into a broader spectrum of climate adaptation activities. A panel of presenters will share their experiences on how they have broken out of their traditional professional circles to embark on unique and innovative partnerships and projects that bring natural resource adaptation to a new level. Participants will discuss their successes and challenges in engaging non-typical partners in adaptation followed by an interactive facilitated discussion with the audience to allow participants to share their own experiences.

Moderator: Amber Pairis, Director, Climate Science Alliance-South Coast
Panelists:

Ann-Marie Chischilly, Executive Director, Institute for Tribal Environmental Professionals
Dan Ashe, President and CEO, Association of Zoos and Aquariums
Jerry Hatfield, Laboratory Director, USDA-ARS National Laboratory for Agriculture & Environment Director, Midwest Climate Hub

► 2:20pm to 2:30pm BREAK ► 2:30pm to 4:20pm CONCURRENT SESSION 6

A MINI-TOWN HALL ON PERSISTENT ADAPTATION: HOW DO WE OVERCOME CHALLENGES TO INFORMATION ACCESS AND EXCHANGE?

(Grand Ball Room - Section D)

Symposium Organizer: Lara Hansen, EcoAdapt

Even the best adaptation efforts can be stymied by changes in priorities and politics. Add this complexity on top of the existing need for services, infrastructure and information to make adaptation happen, and in some cases we see backward rather than forward progress. Decision makers in every sector and region of our nation are seeking actionable science-based information to help them understand their climate-related risks and better manage their systems. The challenge is to provide data products, tools, and expertise that are relevant, easy to access and use, and scaled appropriately (in time and space) to help guide and inform strategic planning and risk management decisions. American citizens have traditionally looked to federal science agencies to provide authoritative science data and information but, today, the accelerating pace of change in Earth's climate system, information technologies, and the U.S. “political climate”—in which federal climate science budgets appear likely to flatten or decline—all point to the need for a paradigm shift in how our nation meets its citizens’ needs for climate information. This session will discuss the emergence of a new “resilience ecosystem”—a facilitated community of collaborators from academia, businesses, federal science agencies, and NGOs—who will work interoperably together for two main goals:

(1) to help U.S. communities, resource managers and businesses build resilience to climate change and (2) to foster the emergence of a large and robust “marketplace” for science-based data, tools, and decision services for climate adaptation.

Panelists:

David Herring, NOAA Climate Program Office
Missy Stults, private contractor

TRAIN-THE-TRAINER EXERCISES FOR ENGAGING PROFESSIONAL COLLEAGUES AND OTHERS IN CLIMATE ADAPTATION THROUGH THEIR ROLES (Meeting Room 2/3)

Training Organizer: Claire Bonham-Carter, AECOM

Role-playing time! Join us for a unique double headed train-the-trainer session. This session will give a briefing on two versions of the ‘Game of Floods’ and give you the opportunity to test one out. The first is designed for working with communities in public workshops and high schools on sea level rise adaptation and the second is designed to help internal climate champions in cities and other institutions to train their colleagues to consider future climate change in the context of their own roles and responsibilities.

The facilitated activity for community groups challenges small groups acting as planning commissioners to develop a 2050 vision for a hypothetical vulnerable landscape. The conceptual board highlights future conditions with sea level rise and increased storms causing loss or deterioration of homes, roads, utilities, habitats, and other resources. The Game was launched early in Marin’s adaptation process because an educated citizenry is critical to successful planning and implementation.

This game was adapted, and piloted by AECOM and some local governments part of the Urban Sustainability Directors Network for internal city use. Exercises include a vulnerability assessment and adaptation strategy game that considers a fictitious city facing sea level rise and riverine flooding. This training toolkit includes customizable presentation templates, facilitator guides, and example scenarios. The training team will teach participants how they can use these tools to deliver training in their own cities, with several cities that have used these tools sharing their experiences on how to tailor the material for their own use.

Co-Organizers:

Kristin Baja, City of Baltimore
Nancy Gassman, City of Fort Lauderdale
Tracy Morgenstern, City of Seattle
Justin Vandever, AECOM
Alex Westhoff, County of Marin Community Development Agency

DE WATA RISIN, BUT DE CULCHA THRIVIN: GULLAH/GEECHEE CULTURAL COLLABORATION ENGAGEMENT CIRCLE (Meeting Room 4)

Training Organizer: Queen Quet Marquetta L Goodwine, Gullah/Geechee Sea Island Coalition

“De Wata Risin, but de Culcha Thrivin: Gullah/Geechee Cultural Collaboration Engagement Circle” will be a 3.5 hour interactive training session that teaches methods of engaging with indigenous coastal cultural communities. Queen Quet, Chieftess of the Gullah/Geechee Nation (www.QueenQuet.com) will lead the session along with community collaborators. They will show how traditional methods from the indigenous communities can assist in building capacity which thereby provides for better informed research to be used by community members, academia, and to educate those in the political arenas. These communities are often discussed by others, but are not engaged in the climate change discussions and adaptation plans enforced by county, state, and federal entities.

The unique Gullah/Geechee cultural community exist on the Sea Islands in the Atlantic Ocean from Jacksonville, NC to Jacksonville, FL. This group of people of African and indigenous American descent are continuing to keep

their cultural traditions alive in spite of the fact that they are faced with sea level rise, ocean acidification, and a myriad of other climate change issues. In spite of “de wata rising, de culcha thriving!” Those that live the traditions have been actively engaging in assisting others with communicating the science of climate change to those within their community and communicating community traditions and concepts to the scientists, academics, and policy makers and will now engage a broader national audience in a traditional engagement circle to show them how their methods can lead to sustaining community involvement in adaptation planning.

Co-Organizers:

Kate Cell, Union of Concerned Scientists
Kate Derickson, University of Minnesota
Glenda Simmons-Jenkins, Gullah/Geechee Cultural Heritage Committee of Northeast Florida
Carlie Towne, Gullah/Geechee Angel Network
Annette Watson, College of Charleston

CAKE TOOLS TRAINING: GET TRAINED TO USE THE FIELDS LEADING AND CUTTING EDGE ADAPTATION TOOLS AND RESOURCES! (Meeting Room 5)

Organizer: Jessica Hitt, CAKE, EcoAdapt

Join us at the CAKE Tools Training and learn to use the field’s leading and cutting edge adaptation tools and resources. When faced with using tools to process climate change information or make adaptation decisions practitioners are often stumped with how use, incorporate, or approach these tools. We have gathered top tools from across the field to help you move past your adaptation roadblocks. Tool managers will give a brief demo, highlight case studies of how others used their tool in their adaptation work, and give the audience plenty of time for questions. Our session will feature tool providers from federal agencies, nonprofits, and the private sector. Don’t miss an opportunity to learn how get the most out of leading tools providers! Bring a professional quandary or curiosity and get in person guidance and training on how to use these online tools and resources!

Presentations:

Dan Rizza, Climate Central
John Rozum, NOAA Office for Coastal Management
Curt Baranowski, U.S. EPA
Karen Metchis, USEPA Office of Water

FORGING DEEPER COLLABORATION BETWEEN LOCAL GOVERNMENTS AND COMMUNITY ON EQUITABLE CLIMATE PREPAREDNESS PLANNING (Meeting Room 6)

Working Group Organizer: Melissa Deas, Georgetown Climate Center

Join us for a discussion exploring how local governments and community organizations can collaborate to advance equitable climate resilience. As an interactive working group, this session will provide both an overview of equity focused work across the country, and a space for peer learning and dialogue.

City governments and community partners in several cities are exploring opportunities to apply an equity lens in climate preparedness planning, and to work together on more community-driven approaches. We will invite several cities and organizations to briefly present on their equitable adaptation priorities, including: building trust with frontline-community members, implementing a plan drafted by a community-based organization, and using equity as a lens for flood-specific planning.

Following this overview, we will dig deeper into the real challenges these individuals face in building equitable adaptation in their own community. Through a facilitated peer dialogue, we will explore a couple real-world case studies, offer session organizers and the audience the opportunity to ask clarifying questions, and provide space for a discussion that will offer feedback, advice, and ideas on how to tackle these challenges.

This working session builds on related workshops and projects that

have occurred over the last two years among cities and community organizations convened by the Urban Sustainability Directors Network (USDN), Georgetown Climate Center (GCC), Kresge Foundation's Climate and Urban Opportunity Initiative, and others.

Co-Organizers:

Nathaly Agosto Filion, City of Newark
Leah Bamberger, City of Providence
Victoria Benson, Movement Strategy Center
Beth Gilden, Portland State University
Melissa Suzel Deas, Georgetown Climate Center
Taj James, Movement Strategy Center
Aurash Khawarзад, Center for Social Inclusion
Leila Mekias, Detroiters Working for Environmental Justice
Miranda Peterson, Center for American Progress
Linda Warren, Cleveland Neighborhood Progress

MONITORING ADAPTATION PROGRESS: FROM ASSESSING CLIMATE IMPACTS TO EVALUATING IMPLEMENTATION SUCCESS (Meeting Room 7)

Working Group Organizer: Rachel M Gregg, EcoAdapt

Climate change is having far-reaching effects on natural resources and human communities, and decision makers often struggle with how to identify, prioritize, and evaluate the effectiveness of climate adaptation actions. In order to determine what is and is not working, monitoring and evaluation is a much needed - although less developed - adaptation discipline. This session will explore ways to improve our success in adaptation planning from identifying how climate change will affect our goals and what adaptation actions should be prioritized to determining the effectiveness of implemented actions. Incorporating monitoring and evaluation into the adaptation planning process from the beginning will allow us to improve our long-term success.

This 2-hour session format includes case study presentations on how monitoring and evaluation has been integrated into on-the-ground adaptation projects, as well as small and large group discussions to (1) identify key aspects of best practices on climate adaptation (e.g., evaluating processes of climate impacts and vulnerability assessments, how to prioritize actions for implementation, and how to evaluate if the actions are working or not), and (2) examine ways to measure success at each step of the climate adaptation process. Attendees will leave with individual adaptation monitoring and evaluation plans to guide consideration of effectiveness, efficiency, equity, and sustainability of adaptation strategies and actions.

Co-Organizers:

Alex Score, EcoAdapt

REDESIGNING FOR RESILIENCE: A CASE STUDY WORKSHOP EXPLORING POSSIBILITIES (Meeting Room 8)

Working Group Organizer: Nancy Schneider, Institute for Sustainable Communities

The Southeast Florida Regional Climate Change Compact, a collaboration among the four counties of southeast Florida representing nearly six million residents and many other stakeholders, has worked since 2010 to advance climate mitigation and adaptation strategies. In 2014, with the assistance of the Miami Consulate of the Kingdom of the Netherlands, the Compact convened the first Southeast Florida Resilient Redesign, an intensive four-day charrette style workshop to develop innovative design strategies for three archetypal southeast Florida land use scenarios which could serve as models of resilience throughout the region. Following the success of the 2014 exercise, a second and third Resilient Redesign workshop were held in 2015 and 2016 —this time organized with the assistance of four Florida universities—for three new communities. Designs and concepts have been carried forward by Compact partners.

The Resilient Redesign events generate creative community resilience strategies through engagement with the local governments, academia, stakeholders and experts. By following the Resilient Redesign model, other communities can capitalize on local and outside knowledge to address their specific sets of climate challenges.

In this exercise, participants will duplicate the Resilient Redesign process with a selected site, to develop their own creative concepts. By participating in this process, participants will understand how to duplicate this program in their region.

MAKING CLIMATE-INFORMED DECISIONS FOR WATERSHED MANAGEMENT: A WORKING GROUP TO DISCOVER NEEDS FOR TOOL DEVELOPMENT (Meeting Room 9)

Working Group Organizer: Danielle Shannon, Northern Institute of Applied Climate Science

The Northern Institute of Applied Climate Science (NIACS) and the USDA Northern Forests Climate Hub (NFCH) wish to convene a workgroup for water resource managers to discover how practitioners are integrating climate change considerations in their land management activities. NIACS and the NFCH will use a 2 hr session to creatively explore how this community is adapting to climate change, as well as to identify gaps in the climate change resources currently available. Through activities and discussion, practitioners will be introduced to a set of climate adaptation resources and a decision-making process for considering climate change in water resource management and planning. Attendee feedback from this session will have direct influence on the on-going development of this practical tool for other users.

This session will introduce a new tool built upon a previously published NIACS adaptation toolkit for forest managers, which includes a “menu” of adaptation strategies and approaches and a structured framework for developing customized adaptation actions for implementation (<http://forestadaptation.org/far> and <http://adaptationworkbook.org/>). These resources are currently focused on forest management; however in the fall of 2016 NIACS kicked off a new initiative to expand the adaptation toolkit to explicitly address goals and adaptation actions appropriate to water resource management. NIACS will engage partners across the water resources community to expand the scope of its tools and resources. This workgroup will be an early opportunity to connect with collaborators and potential users of these tools.

Co-Organizers:

Stephen Handler, Northern Institute of Applied Climate Science
Todd Ontl, Northern Institute of Applied Climate Science
Kristen Schmitt, Northern Institute of Applied Climate Science
Chris Swanston, Northern Institute of Applied Climate Science / USDA Forest Service

UNDERSTANDING THE PSYCHOLOGY OF RESISTANCE: EFFECTIVELY COMMUNICATING AND ENGAGING COMMUNITIES ON ADAPTATION (Meeting Room 10)

Training Organizer: Meredith Herr, Climate Access

Climate change adaptation, to be politically feasible and socially acceptable, will not happen without broad public support. Yet, the public is barely engaged on finding timely and effective solutions to the challenges posed by climate disruption in their communities. Building political and public support is one of the greatest barriers facing government agencies at all levels and community organizations that are taking the lead on climate preparedness and resilience planning.

This training session will provide participants with a conceptual model of people's common resistance to learn about (climate) change, and then provide hands-on opportunities to practice overcoming the various levels of resistance to taking on the needed changes. The training will

culminate in exercises focused on how to deal with the most egregious types of climate contrarianism. Participants will learn ways to understand and address emotional responses, foster realistic hope, and motivate involvement among internal and external stakeholders.

Co-Organizers:

Susi Moser, Susanne Moser Research and Consulting
Cara Pike, Climate Access

WHEN ARMAGEDDON IS YOUR DAY JOB: COPING STRATEGIES

(Meeting Room 11)

Training Organizer: Sara S Moore, Climate Science Alliance-South Coast
Change has psychological impacts such as anxiety and uncertainty that can be felt directly (e.g., through the experience of extreme weather events or natural disasters), and indirectly (e.g., through in our daily work). Climate change also affects us psychosocially (e.g., through chronic social and community effects) (Doherty and Clayton, 2011). This is particularly important to address in the adaptation field among practitioners, but also in “frontline” communities where livelihoods and natural and cultural resources can be directly affected by natural disasters or degrading/ed environments.

Coping strategies, among other interventions and tools, can help to support the crucial work of professionals, lessening commonly experienced frustration, apathy, and burnout in the work sphere while fortifying innovation and strength for those whose job function includes repeated exposure to uncertainty and negative information related to environmental and community conditions. For community members, these approaches may bolster the much-needed energy and optimism necessary for self-efficacy, engagement, and action related to improving human health and well-being. This session will bring together scientists, climate adaptation practitioners, and community organizers in order to: (1) summarize and share the state of current research on the topic of psychological and social impacts of global climate change; (2) share personal stories and coping strategies including examples of visual art and storytelling; and (3) assess the potential for initiating a community of practice around this issue.

Co-Organizers:

Kristen Goodrich, Tijuana River National Estuarine Research Reserve/
University of California, Irvine
Amber Pairis, Climate Science Alliance-South Coast

INNOVATIVE STRATEGIES FOR ORGANIZING, IMPLEMENTING AND FUNDING CLIMATE ADAPTATION (Meeting Room 12)

Training Organizer: Michael H Simpson, Center for Climate Preparedness and Community Resilience

The Center for Climate Preparedness and Community Resilience and community-based and state partners will introduce tested tools to engage and support local stakeholders and decision-makers in responding to the impacts of a changing climate. Topics are based on applied research associated with stakeholder engagement processes implemented during the last two years as well as a new state-based adaptation funding model. The training session will specifically focus on an innovative facilitated community of practice model delivered in partnership with NOAA for both face-to-face settings at the local-level for four counties on Maryland’s Eastern Shore, as well as using a virtual platform for inclusion of local participants over a broad geographic region from Maine to Virginia. Participatory models for inclusion of vulnerable populations and moving plans to action will also be addressed using a case study of a recent project in Bridgewater Connecticut, as well as the use of visualization tools and techniques to motivate local response to projected threats in Marin County, California. This training session will be introduced with the results of two years of research on what local decision-makers have communicated regarding specific information and support they require, both for those initiating a climate adaptation process and for those that

need to translate their plans to effective implementation. The findings to be shared are based on information from more than 600 respondents from 48 U.S. states and 19 other countries working on local adaptation.

Co-Organizers:

Abigail Abrash Walton, Center For Climate Preparedness and Community Resilience
Brian Ambrette, Eastern Shore Land Conservancy
Jennifer deMooy, State of Delaware

TOWARDS CLIMATE RESILIENCE: WORKING GROUP ON FRAMEWORK AND PRINCIPLES FOR SCIENCE-BASED ADAPTATION (Meeting Room 13)

Working Group Organizer: Astrid Caldas, Union of Concerned Scientists
Communities and nations of the 21st century face a great challenge: to protect people from harm caused by an increasingly volatile climate. The damaging impacts of climate change will grow, unless societies take steps to increase their resilience through aggressive action on climate mitigation and adaptation.

In 2015, the National Adaptation Forum put forward a “Good Adaptation Pledge”, informed in part by the Union of Concerned Scientists’ work. UCS recently released a report expanding on these guiding principles: Towards Climate Resilience: A Framework and Principles for Science-Based Adaptation. It outlines initial principles to help ensure that actions taken in the United States in the name of climate adaptation are scientifically justified, ambitiously conceived, and equitably implemented. The framework and principles were developed to be useful to decision makers, practitioners, and citizens engaged in adaptation work.

They were meant to grow in specificity and number as real-world lessons are learned. Under the current political context, and as the community of practitioners has learned much in the intervening two years, this session is meant to capture lessons learned, challenges, and successes, using those to refine this set of principles so that they can better serve the community going forward. This will be an interactive working group, where participants in breakout sessions will make recommendations on how to improve existing principles, or suggest new ones to support successful adaptation. The output of the working group will inform the 2.0 version of these principles and, at participants’ discretion, be cited as a collaborative effort.

Co-Organizers:

Erika Spanger-Siegfried, Union of Concerned Scientists
Shana Udvardy, Union of Concerned Scientists

MOVING US FORWARD: IDENTIFYING CROSS-CUTTING CHALLENGES AND SOLUTIONS TO COASTAL NATURE-BASED ADAPTATION (Meeting Room 14/15)

Working Group Organizer: Karl Schrass, National Wildlife Federation
The National Wildlife Federation will convene stakeholders to identify the key challenges and solutions to wider implementation of coastal nature-based solutions. This working group will be based on the outcomes of recent work NWF has undertaken to advance the use of natural and nature features at a regional scale in the Mid-Atlantic by working with hundreds of stakeholders across multiple sectors. The outcome of this working group will be a roadmap of current hurdles and potential cross-sector solutions. During the first section of this working group, participants will discuss challenges they face in attempting to implement nature-based solutions including: building demand for their use; permitting; pre- and post-implementation assessment and monitoring; and including environmental justice and equity in their work. Following this discussion, participants will rotate through breakout groups where they will collaboratively develop solutions to these challenges. Finally, participants will be encouraged to share lessons learned and best practices from their experiences with others engaged in similar work across the country. The findings of this working group will be analyzed and distributed to participants after the conclusion of the National Adaptation Forum.

▶ 4:20pm to 4:30pm

BREAK

▶ 4:30pm to 5:30pm

CONCURRENT SESSION 7

CULTIVATING CITY AND STAKEHOLDER ACTION: ENGAGING SUPPORT AND MARKETS FOR AGRICULTURAL ADAPTATION (Grand Ball Room - Section D)

Symposium Organizer: John D Wiener, University of Colorado

This session is about city-agriculture relations, focusing on a nationally watched case, and a new program that will help. The session will present a brief outline of the social roots of sustainability for US agriculture and focus on the critically important case of the Des Moines Waterworks lawsuit and an emerging adaptation program in Iowa to help water quality, farming, and reduce flood risks. The CEO of Des Moines Water Works will provide the best possible insider view of the situation.

The declining water quality reaching Des Moines, Iowa in the heartland of U.S. agriculture increased treatment costs until a lawsuit was brought. There was high public support and great outrage in farming. The lawsuit was dismissed on March 17 this year. Continuing and accelerating changes in precipitation and seasonality make farm drainage an increasingly important problem that may require voluntary efforts. The next presentation will be by a prominent water engineer who will describe a solution, if it can be used enough. This is an emerging adaptation program in Iowa to help water quality, farming, and reduce flood risks. The Des Moines problem and this kind of solution are both paradigms that illustrate problem and potential.

Successful agricultural adaptation requires decision support for both the farmers/ranchers whose livelihoods and posterity are at stake, and also increased awareness among urban and peri-urban interests of what is at stake.

Presentations:

John D Wiener, University of Colorado
William Stowe, Des Moines Water Works
Larry J Weber, IIHR
Richard M Cruse, Iowa State University

COMMUNITY CONNECTIONS—LOCAL ADAPTATION DIALOGUE EXAMPLES

(Meeting Room 2/3)

Symposium Organizer: Jenni Lansing, Minneapolis Health Department

We have all been there. Empowering communities to take climate adaptation actions is easier said than done. Fostering public dialogue and gathering community input is critical for improving the quality of adaptation solutions and achieving buy-in on decisions made. Our group of presenters will share tips from successful forays into community engagement on climate adaptation planning with a variety of groups who were chosen due to their particular vulnerability to climate changes.

Macalester College professors will share insights gained from a project with 3 neighborhoods in the City of Saint Paul. Action plans and project ideas resulting from the dialogues produced opportunities for mini-grants to the neighborhoods and agencies for adaptation implementation.

City of Minneapolis staff will reveal lessons learned from their adaptation of the Macalester project with 3 diverse neighborhoods. The project focused on neighborhoods most affected as determined by a climate change vulnerability assessment. It takes community recommendations for program ideas and project changes to policy makers for implementation.

The Minnesota Freshwater Society will share lessons learned in engaging suburban communities using a facilitated public planning process within the Riley-Purgatory-Bluff Creek watershed as part of community resilience planning efforts.

See how the Rural Climate Dialogues, organized by the Jefferson Center and the Institute for Agriculture and Trade Policy, have depoliticized climate change, have empowered three rural communities forward to address their unique concerns, and identified cross-agency opportunities for improving programs and policies to enable local governments to mitigate and adapt to climate change.

Panelists:

Anna Claussen, Institute for Agriculture and Trade Policy
Jennifer Lansing, City of Minneapolis Health Department
Christie Manning, Macalester College Department of Environmental Studies
Kelly Muellman, City of Minneapolis Sustainability Office
Leslie Yetka, Freshwater Society

INCORPORATING CLIMATE CHANGE INTO SUPPLY CHAIN RISK MANAGEMENT

(Meeting Room 4)

Symposium Organizer: Susan Asam, ICF

Climate-related weather events, such as heat waves, hurricanes, and flooding, have disrupted the movement and provision of goods and services throughout the United States and abroad, increasing operational costs for Federal agencies. To help Federal agencies manage climate-related supply chain risks, General Services Administration (GSA) collaborated with ICF to develop a framework for assessing climate and weather-related risks to supply chains and developing plans to minimize those risks (available on SFTool.gov). The panel will be moderated by Susan Asam, ICF (framework development lead). The Panelists will discuss supply chain risks faced by federal agencies (Amanda); introduce the framework; and discuss its application and early findings. The moderator will engage Panelists and audience in a discussion of: (1) challenges related to assessing and addressing supply chain risks due to climate change; and (2) ideas for enhancing the framework to make it more effective and user-friendly.

Panelists:

Susan Asam, ICF
Amanda Rycerz, Acclimatise North America
Kathleen White, U.S. Army Corps of Engineers

CAKE TOOLS TRAINING: GET TRAINED TO USE THE FIELDS LEADING AND CUTTING EDGE ADAPTATION TOOLS AND RESOURCES! (Meeting Room 5)

Organizer: Jessica Hitt, CAKE, EcoAdapt

Join us at the CAKE Tools Training and learn to use the field's leading and cutting edge adaptation tools and resources. When faced with using tools to process climate change information or make adaptation decisions practitioners are often stumped with how use, incorporate, or approach these tools. We have gathered top tools from across the field to help you move past your adaptation roadblocks. Tool managers will give a brief demo, highlight case studies of how others used their tool in their adaptation work, and give the audience plenty of time for questions. Our session will feature tool providers from federal agencies, nonprofits, and the private sector. Don't miss an opportunity to learn how get the most out of leading tools providers! Bring a professional quandary or curiosity and get in person guidance and training on how to use these online tools and resources!

Presentations:

Melissa Deas, Georgetown Climate Center
Ana Pinheiro, USGCRP
David Herring, NOAA Climate Program Office

CLIMATE ADAPTATION AND COMMUNITY RESILIENCE PLANNING

(Meeting Room 6)

Symposium Organizer: Laura Millberg, Minnesota Pollution Control Agency

Climate change is a long-term process that necessitates governmental organizations manage uncertainty by planning for climate adaptation, resilience and equity. This session will present innovative new research about the current extent of such planning in Minnesota, used to develop a statewide indicator with a methodology that is applicable everywhere. Best practices for climate adaptation and community resilience assessment, planning and implementation at the local level will be explored, along with case studies of Minnesota cities engaging vulnerable populations and assessing equity issues for local Comprehensive Plans. An exchange of ideas with attendees will be sought throughout the session.

Panelists:

Beth Bibus, Minnesota Management and Budget
 Abby Finis, Great Plains Institute
 Anne Hunt, City of Saint Paul
 Laura Millberg, Minnesota Pollution Control Agency
 Eric Wojchik, Metropolitan Council

ORAL PRESENTATION SESSION 7 (Meeting Room 7)

Square Pegs and Round Holes: Mismatches Between Adaptation Conceptualizations and Actions in Western Canada, Heike Lettrari, Royal Roads University

Community Leadership in Resilience Planning: Tools for Equity and Partnership, Phoenix Armenta, Rooted in Resilience

Are We Coordinating Plans for Climate Adaptation? Sierra Woodruff, University of North Carolina at Chapel Hill

Evaluating Climate Change Vulnerability and Readiness to Adapt with Social Equity Focus in US cities, Meghan Doherty, ND-GAIN

ORAL PRESENTATION SESSION 8 (Meeting Room 8)

Integrating Socio-Ecological Climate Change Adaptation Strategies in Public Land Management and Decision-Making, Bruce H Rittenhouse, Bureau of Land Management

Climate-informed Habitat Conservation Plans: Bringing climate change into Section 10 of the Endangered Species Act, Jennie Hoffman, Adaptation/Insight

Identifying Climate Change Impacts and Adaptation Opportunities in Tennessee's 2015 State Wildlife Action Plan, Sally Palmer, The Nature Conservancy

Benefit-Cost Analysis of Flood Mitigation for Critical Infrastructure: A Case Study at a Coastal Airport, David Ryder, ICF

ORAL PRESENTATION SESSION 9 (Meeting Room 9)

Assessing Climate Vulnerabilities and Adaptations in Southeast Florida Using An Integrated Modeling Framework, David G. Groves, RAND Corporation

Building Resilient Communities with Green Infrastructure One Code at a Time, Julia Noordyk, University of Wisconsin Sea Grant Institute

Engaging Municipalities for Increased Resilience to Climate Extremes in the Missouri River Basin, Natalie Umphlett, High Plains Regional Climate Center

Evaluating Floodplain Vulnerability and Engaging the Communities in Building Resilience, Claire Serieyssel Bleser, Riley-Purgatory-Bluff Creek Watershed District

ORAL PRESENTATION SESSION 10 (Meeting Room 10)

It's Not All About the Roads: Public Transit Vulnerability to Nuisance Flooding in Charleston, Sumi Selvaraj, California Coastal Commission
An Engineering-based Climate Vulnerability and Risk Assessment Process for Transportation Infrastructure, Amruta Sudhalkar, AECOM

Greening the Green Line: Improving Water Quality and Community Resiliency, Anna Eleria, Capitol Region Watershed District

Resilient By Design: Agency Engineering Guidelines for Climate Resilient Infrastructure, Josh DeFlorio, Port Authority of NY & NJ

ORAL PRESENTATION SESSION 11 (Meeting Room 11)

Bridging the Boreal: Implementing Shared Adaptation Strategies Across Alaska and Northwest Canada, Amanda Sesser, Holistic Adaptation
When Adaptation Planning is an Oxymoron: Learning from Agency Restructuring and Complex Adaptive Systems, Christopher L Hoving, Michigan DNR

Adaptation Design Tool for Natural Resource Management: Demonstration for Coral Reefs of Puerto Rico, Jordan M West, US Environmental Protection Agency

Integrating and Implementing Climate Change Into State Wildlife Action Plans, Toni Lyn Morelli, DOI Northeast Climate Science Center

ORAL PRESENTATION SESSION 12 (Meeting Room 12)

Addressing Climate Change when Controlling Combined Sewer Overflows and Managing Stormwater in King County, Washington, Jim Simmonds, King County Department of Natural Resources and Parks

Natural Shoreline Infrastructure Case Studies for Coastal Resilience in California, Jenna Judge, NOAA Sentinel Site Cooperative for San Francisco Bay and Outer Coast

Bridging the Gap Between Data and Design in New York City, Peter Adams, NYC Mayor's Office of Recovery and Resiliency

Climate-Smart Capital Investment Planning for Resilient Municipalities, Adrienne I. Greve, Cal Poly – SLO

ORAL PRESENTATION SESSION 13 (Meeting Room 13)

Increasing Resilience of Tribal Communities through Climate Data Training and Production of Climate Summaries, Crystal J Stiles, High Plains Regional Climate Center

Tribes and Climate Change - Adaptation Considerations at the Tar Creek Superfund Site, Kaylene Ritter, Abt Associates

Changing Coastal Geomorphology And Vulnerability of Subsistence Foods, Linda E Kruger, USDA Forest Service Pacific Northwest Research Station

Minnesota American Indian Rights Research Tour: Past, Present, Future Lessons on Adaptation in Climate Changes, Kate Flick, Institute on the Environment Sustainability Education

YOUTH EMPOWERED: TOOLS FOR EQUITY AND RESILIENCE

(Meeting Room 11)

Training Organizer: Colin Miller, Rooted in Resilience

Students from Oakland's Emiliano Zapata Street Academy, presumed to be on their last chance to finish high school, have proven to be effective resilience leaders in their community. Learn directly from Street Academy students about how they redesigned their urban school for resilience, reduced asthma risk by blocking coal exports through the Port of Oakland, advocated for local clean energy, and inspired their families. Resilience is a deeply rooted cultural practice in communities of color, and youth are ideally positioned to link this rich history to today's challenges of adapting to climate change. In this hands-on training you will learn to use the Community Resilience and Build Your Future toolkits to lead youth and/or community groups through 1) evaluating the climate resilience of local food, water, energy, housing, transportation, and social services systems, 2) build on cultural histories of resilience, 3) map assets and re-envision the built environment, 4) create a plan, and 5) implement it.

Co-Organizers:

Jesus Cruz, Emiliano Zapata Street Academy
 Pa Dwe, Emiliano Zapata Street Academy
 Corrine Van Hook-Turner, Rooted in Resilience
 Carlos Zambrano, Rose Foundation

- ▶ **7:00 am to 8:00 am** **BREAKFAST** (Grand Ballroom A,B,C,F,G)
- ▶ **7:00 am to 5:00 pm** **REGISTRATION** (West End Concourse)
- ▶ **8:00 am to 9:30 am** **CONCURRENT SESSION 8**

ENVIRONMENTAL JUSTICE-BASED CLIMATE RESILIENCY PLANS

(Grand Ball Room - Section D)

Symposium Organizer: Shalini Gupta, Organizer, Center for Earth, Energy and Democracy (CEED)

This panel looks at how local and state climate adaptation planning efforts can incorporate the policy concerns of communities of color and low income communities, that are on the front lines of climate change. This requires a discussion of both process (how the most vulnerable communities to climate change are part of the plan development process) and content (the analysis and policy solutions that are formulated and structured). We will present a framework for a community-based lens to climate resiliency planning, city and state best practices on climate resiliency, community chemical infrastructure safety considerations, and a case study on the New Jersey's integrated efforts to post-Sandy recovery planning and climate change policy efforts.

Panelists:

Laureen Boles, New Jersey Environmental Justice Alliance
 Shalini Gupta, CEED
 Cathleen Kelly, Center for American Progress
 Michele Roberts, Environmental Justice Health Alliance

RELEVANT RESEARCH, COMMUNITY CONVERSATIONS, REAL RESILIENCE: SEA GRANT! (Meeting Room 2/3)

Symposium Organizer: Joshua E Brown, NOAA Sea Grant

Whether it's helping people find new opportunities in the wake of fisheries collapse or preparing governments for future storms, resilience is not about the specific disaster, it's about the community. The National Sea Grant College Program works with communities in coastal states to ensure they have the knowledge, tools, and capacity to address the diverse challenges they face. Sea Grant helps communities weather changes supporting understanding of what has changed and options for responding to the disruption.

The National Sea Grant College Program is a national network of 33 university-based programs that develop, integrate, and deliver research and outreach to serve coastal and Great Lakes communities. Sea Grant staff live and work in the communities they serve. With its capacity to generate and transition high-quality research to address critical challenges, Sea Grant is able to help communities adapt on their own terms.

This round table will highlight how Sea Grant's capacities have helped communities prepare for and address crises as diverse as coastal storms, harmful algal blooms, oil spills, fisheries collapse, and tsunamis. After Panelists briefly discuss their experiences, attendees will be invited to discuss and compare their own challenges, to share experiences and generate key lessons learned.

Panelists:

Joshua Brown, NOAA Sea Grant
 Lisa Graichen, New Hampshire Sea Grant
 Amanda McCarty, NOAA Sea Grant
 Ian Miller, Washington Sea Grant
 Tara Owens, University of Hawaii Sea Grant
 Steve Sempier, Mississippi-Alabama Sea Grant
 Chris Winslow, Ohio Sea Grant

INDIGENOUS COMMUNITIES AND YOUTH: INTERGENERATIONAL TRANSFER OF KNOWLEDGE FOR ADAPTATION SOLUTIONS

(Meeting Room 4)

Symposium Organizer: Bob Gough, Intertribal COUP

Bob Gough (Secretary, Intertribal COUP) will moderate a panel of those involved in the convening of both Rising Voices of Indigenous Peoples (primarily educators, community leaders, climate and extreme weather scientists, active in working with indigenous communities) and the IPCCWG (The Indigenous Peoples Climate Change Working Group) which has at its core tribal college and university faculty and students and science educators preparing the next generation of indigenous scientists, scholars and activists, to better understand the challenges we face from the rapidly changing climatic conditions that our rural and reservation communities are experiencing. Drawing on examples from throughout indigenous America (American Indian, Alaska Native, Native Hawaiian and Pacific and Caribbean Islanders) the Panelists will discuss how educators, elders and community leaders can contribute to, and provide the context for preparing youth for developing roles in climate adaptation through the inter-generation transfer of indigenous /scientific knowledges required for the co-creation and functional collaboration of relevant actionable adaptational strategies. Community institutions, both indigenous and conventional, have always attempted to prepared the coming generation to function in viable futures, which most often looked much like the past. Given the uncertainty introduced by climate variability into natural and anthropocentric ecosystems and the life ways that depend upon them, youth must now be consciously and deliberately guided in how to navigate unknown and extremely uncertain futures. How can we cultivate conscious and informed villages to raise alert and intuitive youth with the ability to navigate through this coming century?

Panelists:

T. "Bull" Bennett, Kiksapa Consulting LLC
 Paulette Blanchard, University of Kansas
 Heaher Lazrus, UCAR
 M. Kalani Souza, Olohana
 Dan Wildcat, Haskell Indian Nations University

BUILDING PUBLIC HEALTH CLIMATE ADAPTATION CAPACITY: APPROACHES FROM CLIMATE-READY STATES AND CITIES INITIATIVE GRANTEES (Meeting Room 5)

Symposium Organizer: Aaron Ferguson, Michigan Department of Health and Human Services

Human health impacts associated with climate change are expected to worsen over the 21st century; particularly for the most vulnerable populations. Climate changes are likely to result in increasingly variable weather, heat waves, intense storms, flooding, droughts, and decreases in air and water quality. Health outcomes related to these changes are wide ranging; from morbidity and mortality related to extreme heat and water supply impacts, to changes in illness transmitted by food, water, and disease vectors such as increases in range of West Nile virus and Lyme disease. This session explores the various strategies of the Centers for Disease Control and Prevention (CDC) Climate Ready States and Cities Initiative grantees in Michigan, Minnesota, Rhode Island, and Oregon to identify the priority climate related public health issues for their respective jurisdictions and implement cross-sectoral adaptations that will measurably and equitably increase community resilience.

Each state will present on their adaptation activities and the audience will have an opportunity to discuss how the examples relate to what they are facing in their own communities. They will then be guided through an interactive team based activity in which presenters will provide mini-

training sessions based on the lessons learned through their respective adaptation work. Participants will walk away from this session with a greater understanding of the range of health risks imposed by climate change, how to identify and measure indicators of socioeconomic and biophysical vulnerability, and develop collaborative and holistic strategies to reduce health disparities for at-risk populations while increasing overall community resiliency.

Presentations:

Aaron Ferguson, Michigan Department of Health and Human Services
Kristin Raab, Minnesota Department of Health
Emily York, Oregon Health Authority

A HOLISTIC APPROACH TO COASTAL RESILIENCY ENHANCEMENT AND COMMUNITY RISK REDUCTION IN NORTHEASTERN U.S. (Meeting Room 6)

Symposium Organizer: Taj Schottland, National Wildlife Federation

Located along the north shore of Massachusetts, the Great Marsh is New England's largest contiguous barrier island and saltmarsh. The Marsh provides critical habitat to state and federally listed species, sportfish, shellfish, and thousands of birds migrating along the Atlantic flyway. The area is also home to 29 municipalities and millions of visitors that benefit from the ecosystem services provided by the marsh. However storm surge, sea level rise, and accelerating erosion have contributed to decreased marsh health and increased community vulnerability. As is the case in many coastal areas, adaptation planning in the Great Marsh must navigate a web of complex interconnections between conservation, economic and political priorities as well as multiple land-owners and diverse management values. To address these cross-cutting challenges, the National Wildlife Federation is leading a large coalition of federal, state and local partners in a holistic and multi-faceted approach to enhance the ecological resiliency of the marsh and reduce municipal vulnerability. The \$2.9 million dollar project includes five components: sediment transport and salinity modeling, hydrological barrier assessment, marsh restoration, dune nourishment and revegetation, and community planning. Presentations on the project components will highlight this framework for a systems approach to coastal adaptation and its transferability to other geographies. Following the presentations there will be a panel discussion to stimulate dialog between the audience and speakers. The Panelists will share lessons learned, best practices, and will further highlight the complex interconnections that drive the need for a holistic approach to coastal adaptation.

Presentations:

Taj Schottland, National Wildlife Federation
Matt Shultz, Woods Hole Group
Gregg Moore, Jackson Estuarine Laboratory, University of New Hampshire
Alyssa Novak, Boston University

PEOPLE CENTERED PLANNING FOR RESILIENT COMMUNITIES

(Meeting Room 7)

Symposium Organizer: Adam Fullerton, SF Bay Conservation and Development Commission

Developing vulnerability assessments and adaptation responses for resilient communities requires looking at assets at risk, and how sea level rise and other hazards will impact each and the communities that rely on them. This process usually begins with reviewing and analyzing the assets, followed by evaluation of how damage or loss of their services will impact the people that rely on them. In a new region wide project The San Francisco Bay Conservation and Development Commission's Adapting to Rising Tides (ART) Program, along with the Bay Area Regional Collaborative (BARC); the Metropolitan Transportation Commission and

other partners are changing this paradigm by beginning our analysis with the people and communities to understand which assets are most important to them. The project will conduct a vulnerability assessment and develop adaptation strategies for transportation assets and services, Priority Development and Conservation Areas and communities with characteristics that could make them more vulnerable to sea level rise. To identify communities and geographies at risk from flooding and sea level rise, the ART Program produces sea level rise and shoreline maps, which are verified by stakeholders. Part of this assessment includes a locally developed community vulnerability assessment methodology, which illustrates the diversity of needs and resources. Extensive public input, and ART Program analyses, mobilizes a people centered and equitable planning process that focuses on the people and communities most at risk. Similar people first approaches have been employed in many regions including the Rebuild By Design program in the New York region.

Panelists:

Allison Brooks, Bay Area Regional Collaborative
Amy Chester, Rebuild by Design
Lindy Lowe, SF Bay Conservation and Development Commission

TEACHING CLIMATE ADAPTATION: REGIONAL CLIMATE SCIENCE CENTER NETWORK ACTIVITIES ON EDUCATION AND TRAINING (Meeting Room 8/9)

Symposium Organizer: Josh George Foster, OSU/OCCRI

The Department of the Interior's Climate Science Center (CSCs) network has launched a series of experimental learning activities to develop and inform the next generation of climate scientists and practitioners. Education is a priority across the CSC network for graduate and undergraduate students, early-career professionals, and stakeholders with trainings used to build broader community capacity to adapt to climate change. CSCs have designed and implemented a diversity of educational and training activities from research fellowships, projects, and professional skills development (e.g. science communication) to networking and knowledge exchange, sharing and integrating "ways of knowing", understanding management challenges, and co-creating implementable solutions among researchers and practitioners. CSCs student education activities provide opportunities for sharing research, and learning from outside researchers and practitioners via seminars, webinars, workshops, and conferences. Regional trainings have been convened on specific topics such as climate modeling, climate vulnerability assessments, and structured decision-making (SDM). Broader skills trainings have included introduction to climate science or climatological practices, conducting interdisciplinary and trans-disciplinary research, science communications and storytelling, field experiences for place-based natural resource management, and integrating knowledge to address climate problems and explore solutions in the context of a changing climate. Some education and training experience specifically have engaged tribal, minority, youth, or women students and early to mid career professionals. Drawing on a diverse set of education and training experiences from across the eight regional centers, the CSC network is proposing a NAF symposium on teaching of climate adaptation, science communications, knowledge coproduction, and translational and actionable science.

Presentations:

Toni Lyn Morelli, Northeast Climate Science Center
Scott Laursen, Pacific Islands Climate Science Center
Aparna Bumzai, USGS North Central Climate Science Center
Cari S Furiness, Southeast Climate Science Center
Jill Lackett, North Central Climate Science Center, Colorado State University

CHICAGOLAND COLLABORATIVE: MODELS FOR CLIMATE RESILIENCE

(Meeting Room 10)

Symposium Organizer: Molly Oshun, Center for Neighborhood Technology

The Chicago region floods from small, frequent storms causing damage to property, infrastructure, and quality of life. Damages disproportionately affect low to moderate-income communities, where under resourced public and private coffers create barriers to investment in preventative measures. Yet flood risk is poorly understood and communities are not prepared for increasingly intense storms. Addressing existing and future flooding requires a new level of coordination across government agencies, non-profit organizations, and residents.

In response, the Metropolitan Planning Council (MPC) formed the Calumet Stormwater Collaborative (CSC) in 2014 to convene stakeholders in south Chicago and its suburbs. MPC and the Chicago Metropolitan Agency for Planning (CMAP) presented on the CSC at the 2015 National Adaptation Forum. This session will feature the exciting accomplishments to-date of the CSC through a moderated discussion with MPC and 2 members brokering cross-sector collaborations: CMAP and the Center for Neighborhood Technology (CNT).

With guidance from expert CSC members, CMAP designed a low cost, GIS-based approach to identify areas within communities that are susceptible to urban flooding in order to prioritize the placement of green infrastructure and other land use based interventions. The approach aims to incorporate climate science into municipal decision-making and identify synergies with other community goals.

CNT's RainReady program empowers local decision makers, including residents and municipal leaders, to plan and implement flood solutions across public and private land. RainReady has adapted CMAP's GIS approach to merge resident reported data with traditional engineering to develop green and grey infrastructure solutions that increase community livability and resilience.

Presentations:

Danielle Gallet, Metropolitan Planning Council
Jason Navota, Chicago Metropolitan Agency for Planning

A GAME OF FLOODS – THE ADAPTION REALITY BEHIND THE METAPHOR

(Meeting Room 11)

Symposium Organizer: Jack Liebster, County of Marin

Marin County's award winning "Game of Floods" is a fun, engaging activity to help officials and citizens confront the complexities and challenges of adapting to Sea Level Rise. The simulated, fictitious "Marin Island" game board is used to show how nature-based protections, land use policy changes and traditional engineering could address future sea level rise. Staff developed the Game because an educated citizenry is critical to successful planning and implementation in a county where the stakes are high: the second most vulnerable of nine Bay Area counties with potential asset losses of \$8.5 billion+. Flooding associated with high tides and storms already impacts infrastructure and disrupts people's lives.

In this session a number of the players will discuss the actual leading edge work of the reality behind the Game. The USGS will set the stage through their modelling of future flood risks, the "game obstacles". County staff will describe Marin's ocean and bay side's vulnerabilities and adaptation efforts, the "game strategies". The Center for Ocean Solutions explore "the rules of the game" by distilling legal and policy considerations to implementing resilient adaptation strategies. San Francisco Estuary Institute will describe the "playing pieces" - nature-based adaptation strategies being proposed and piloted on the Marin shoreline. The Coastal Conservancy discuss how these adaptation pilot projects will be fueled by the Bay's "Community Chest", funding such as the recent Bay-wide ballot measure. The County wrap up with describing tradeoffs necessary to

win the real game, overviewing conflicts, collaboration, compromises and consensus building.

Presentations:

Juliette Finzi Hart, U.S. Geological Survey
Eric Hartge, Center for Ocean Solutions
Jeremy Lowe, San Francisco Estuary Institute

IMPROVING WASTEWATER SYSTEM RESILIENCE AND STORM PREPAREDNESS IN THE NORTHEASTERN USA

(Meeting Room 12)

Symposium Organizer: Christine Kirchhoff, University of Connecticut

Extreme precipitation events are growing more frequent and severe putting wastewater infrastructure at risk; storm surge and sea-level rise compound these risks for coastal systems. Damage from past storms, including Sandy and Irene, brought these risks into sharp focus in the northeastern USA. In response, federal, state, regional, and local government agencies are undertaking efforts to improve wastewater resilience and storm preparedness through research, information support, funding, and, in some cases, new design standards aimed at identifying needs and implementing mitigative measures. However, few opportunities exist to bring different perspectives together to share and learn from different approaches and understand how Federal and/or state efforts dovetail (or not) in synergistic ways with regional and local efforts and vice versa. We also need a better understanding of how various states and local governments interpret and implement recent federal resiliency requirements. Bringing this session together offers an important opportunity to begin to uncover areas in which federal, state, regional, and local agencies might work together in better or different ways to more effectively support and implement resiliency efforts. Beyond presentations from different perspectives - state, local and university - we will organize a presenter roundtable and facilitate audience engagement. The presenter roundtable and audience engagement are essential to learning about other approaches and drawing a more comprehensive set of lessons learned and more robust set of insights on cross-scale interactions.

Presentations:

Thomas Groves, RAND Corporation
Carlos Esguerra, Connecticut Department of Energy and Environmental Protection
Christine Kirchhoff, University of Connecticut
Bill Patenaude, Rhode Island Department of Environmental Management
Alan Cohn, New York City Department of Environmental Protection

COASTAL CLIMATE ADAPTATION PLANNING: BEST PRACTICES FROM SEA GRANT PROGRAMS IN THE SOUTHEAST

(Meeting Room 14/15)

Symposium Organizer: Lisa Schiavinato, California Sea Grant

The Southeastern U.S. is frequently cited in case studies as a region that needs increased resilience from storm surge and sea level rise to protect local economies, critical infrastructure, and life and property. A 2015 University of Georgia study reported that, based on year 2100 population forecasts, a rise of six feet in sea level will expose approximately 13 million people in the U.S. to flooding and other hazards, many of them in the Southeast. This study identified Hyde and Tyrrell Counties, NC as two of the three communities most vulnerable to sea level rise and flooding. Moreover, the study stated that approximately 10 percent of coastal Georgia counties would be impacted by coastal flooding. The October 2015 flood event in South Carolina brought national attention to the increased flood vulnerability of Charleston, in which areas outside FEMA-designated flood zones nevertheless experienced flooding. This symposium will present case studies from the Town of Nags Head and Hyde and Tyrrell Counties, NC, Charleston, SC and St. Marys, GA on how urban and rural coastal communities are utilizing decision-support tools such as the Vulnerability Consequences and Adaptation Planning

Scenario to identify barriers and potential actions for adaptation planning and incorporating the latest science into local plans and policies to increase resilience. This symposium also will discuss best practices from Southeast Sea Grant programs for assisting communities with using climate science in decision-making, grappling with uncertainty in the science, and with executing strategies to engage partners and the public during the planning process.

Presentations:

Lisa Schiavinato, California Sea Grant
Jill Gambill, Georgia Marine Extension/Sea Grant
Kirstin Dow, University of South Carolina
Matthew Jurjonas, North Carolina State University

▶ **9:30 am to 9:40 am BREAK**

▶ **9:40 am to 11:10 am CONCURRENT SESSION 9**

FROM RESEARCH TO ACTION: LESSONS LEARNED FOR DEVELOPING AND IMPLEMENTING CLIMATE SERVICES IN UNDERSERVED COMMUNITIES

(Grand Ball Room - Section D)

Symposium Organizer: Allyza Lustig, Yale School of Forestry and Environmental Studies

A community's vulnerability to the impacts of climate change is largely determined by social, economic, and political processes. Underserved and marginalized communities are especially vulnerable to the impacts of climate change and variability, which are likely to exacerbate existing vulnerability/inequity. Furthermore, their interests are often underrepresented in planning processes. The development of climate services in collaboration with these groups is thus important for fostering adaptive capacity and resilience.

Community-based research and the provision of climate services in underserved communities are complex. Limited human, financial, and infrastructural capacity may determine the nature of the climate services appropriate and feasible for a particular community. Historical relationships between research institutions and communities may invoke power hierarchies and thus shape local willingness to engage with researchers. The potential for tokenism is also pervasive across community-based service development and has a longstanding precedent in underserved communities.

This panel brings together researcher and stakeholder representatives from three different communities: 1) the African American farming community in the Southeastern U.S., 2) Native stakeholders in Nome, Alaska, and 3) the Latino community of East Boston. In all three contexts, researchers and stakeholders have collaborated on efforts to manage climate extremes. Panelists will share their experiences, and the majority of the session will center around discussion. Participants will share their own experiences, pose questions, and discuss best practices. By including both researchers and stakeholders, this session will elucidate lessons learned and next steps for developing and implementing collaborative climate services in underserved communities.

Panelists:

Nancy Beller-Simms, Climate Program Office, National Oceanic and Atmospheric Administration
Marcus Bernard, Federation of Southern Cooperatives Land Assistance Fund
Carrie Furman, College of Agriculture and Environmental Sciences, University of Georgia
Nathan Kettle, International Arctic Research Center, University of Alaska Fairbanks
Paul Kirshen, School for the Environment, University Massachusetts Boston

Allyza Lustig, Yale School of Forestry and Environmental Studies
Jacob Martin, Nome Eskimo Community
Melinda Vega, Neighborhood of Affordable Housing, East Boston

METHOD TO THE MAINSTREAMING MADNESS (Meeting Room 2/3)

Symposium Organizer: Sascha Petersen, Adaptation International

All across the country, communities are looking at how to better incorporate adaptation into long-term plans, existing policies, and other city planning processes. This "mainstreaming" of adaptation into existing frameworks has the potential to unlock significant funding and help integrate resilience building efforts into the existing duties of a local government. Yet, all mainstreaming approaches are not created equal. Come join us for a candid discussion and interactive exercise on what is and is not working in the approaches being used by four communities: Ann Arbor, MI; Baltimore, MD; Huntington Beach, CA; and San Antonio, TX. The session will discuss:

- How do we effectively apply lessons learned from the approaches being used in different parts of the country?
- How can you be as proactive as possible?
- How do the answers to these questions vary based on scale, department, or other factors?

The session starts with general polling of the audience and a quick 7-minute presentation by each Panelists highlighting how they are moving forward with mainstreaming. Themes include: hazard mitigation, employee training, economic development, and long-term planning. The introductions are followed by 20 minutes of moderated discussion focusing on what works and where the Panelists have run into and overcome barriers. In the final 40 minutes of the session, participants will split into breakout groups led by the Panelists and the moderators and walk through a series of questions in a decision tree framework to help them determine which approach makes the most sense for their community.

Panelists:

Kristin Baja, City of Baltimore
Dan Kalmick, City of Huntington Beach
Kim Lundgren, Kim Lundgren Associates
Doug Melnick, City of San Antonio
Matt Naud, City of Ann Arbor
Sascha Petersen, Adaptation International

BUILDING RESILIENCE THROUGH ENERGY EFFICIENCY (Meeting Room 4)

Symposium Organizer: Kate Johnson, District of Columbia Department of Energy and Environment

In 2015, energy utilities invested more than \$7 billion in energy efficiency. These investments include programs that provide incentives to homeowners and businesses through technical assistance and investments in energy efficient appliances, weatherization, and other upgrades. At the same time, recent natural disasters demonstrate that buildings designed and constructed for energy efficiency have inherent features that make them more resilient. What if those program investments also helped to make electricity supply more resilient in the face of rising temperatures and more severe storms? What if traditional energy audits included building resilience to flooding and power outages? What if the case for energy investments included reducing burden of high energy bills on low-income families to improve economic resilience? This session will explore the ways that cities, utilities, and building owners are actively connecting the dots between energy efficiency and climate resilience in order to maximize the benefits and "future proof" their investments. Speakers will provide examples of programs and strategies including microgrids, solar and battery storage, passive design, and neighborhood based approaches to energy efficiency that are simultaneously saving energy and helping communities become more resilient.

Panelists:

Krista Egger, Enterprise Community Partners
Wendy Goodfriend, City of San Francisco, Department of Environment
Kate Johnson, District of Columbia Department of Energy and Environment
David Ribiero, American Council for an Energy-Efficient Economy

ENGAGING COMMUNITIES IN CLIMATE ADAPTATION PLANNING IN MARINE PROTECTED AREAS (Meeting Room 5)

Symposium Organizer: Catherine Marzin, NOAA/National Marine Sanctuaries

Managers of Marine Protected Areas (MPAs) around the country are evaluating how climate change will impact the resources they are entrusted with and what strategies can be implemented to build resilient marine and associated human communities. Communities rely on MPAs for food production, recreation, cultural identity and are struggling with how to adapt to climate change. Although the MPA ecosystem may differ, the process and strategies for building resilient communities are similar. Three case studies will be presented demonstrating how to create partnerships and engage diverse groups in developing adaptation strategies targeted at addressing local impacts. These case studies are 1) engaging of county managers, local stakeholders and state and federal partners at Greater Farallones National Marine Sanctuary, 2) engaging traditional Samoan village chiefs, territorial government agencies and federal partners in the NMS of American Samoa, and 3) engaging tribal representatives in tackling climate change in Olympic Coast NMS.

Questions to be discussed include the common themes for addressing climate change at the community level, lessons learned, and success stories.

Panelists:

Maria C. Brown, Greater Farallones National Marine Sanctuary
Kevin L Grant, Olympic Coast National Marine Sanctuary
Catherine G. Marzin, NOAA/Office of the National Marine Sanctuaries
Atuatasi Lelei M. Peau, National Marine Sanctuary of American Samoa
Alex Score, EcoAdapt

IMPLEMENTING ADAPTATION ACTIONS THAT ADDRESS CLIMATE ISSUES FACED BY BOTH PEOPLE AND NATURE (Meeting Room 6)

Symposium Organizer: Molly Cross, Wildlife Conservation Society
The Wildlife Conservation Society's Climate Adaptation Fund, made possible by the Doris Duke Charitable Foundation, supports projects that implement on-the-ground interventions to increase the adaptive capacity of ecosystems and their ability to support biodiversity as climate changes. The Fund's goals are to make the integration of adaptation considerations into all conservation work a standard practice and to communicate lessons learned from our projects to encourage broad adoption of climate adaptation practices.

While our programmatic and communications efforts have focused on wildlife and ecosystem impacts, many of our projects have positively influenced the human communities that are supported by those ecosystems. What is especially important about our projects that address climate challenges faced by both people and natural systems is their potential to manage human responses to climate change that may inadvertently decrease the adaptive capacity of the ecosystems that support them. Our program's approach can help orient human communities towards the use of 'nature-based solutions' that are likely to maintain the functionality of ecosystems as climate changes, thus strengthening the long term resilience of human communities that receive beneficial services from those ecosystems.

The real-world implementation projects that will be presented in this symposium offer tangible examples of climate-informed conservation that

can serve as inspiration for others that are tackling similar climate change challenges that affect both people and nature. Presenters will describe projects from around the United States that address climate change issues related to wildfire, flooding, water availability, storm-water management, vegetation changes and sea level rise.

Presentations

Molly Cross, Wildlife Conservation Society
Rebecca Esselman, Huron River Watershed Council
Meredith Cornett, The Nature Conservancy
Karl Schrass, National Wildlife Federation

RESILIENT POWER, COMMUNITY PREPAREDNESS AND CITIZEN EMPOWERMENT (Meeting Room 7)

Symposium Organizer: Deb Perry, Institute for Sustainable Communities

The installation of solar panels on community buildings and critical facilities is of growing interest in cities across the country. In October 2012, New York City was hard hit by Hurricane Sandy, causing widespread power loss across the city. In the days and weeks following the storm, 672 solar arrays installed throughout NYC were unable to provide power. These systems were grid connected and not allowed to function while the grid is down. If these systems had been installed differently more than 6,500kWh could have been powering power critical loads across the five boroughs.

This session will explore how three cities - New York, Baltimore and Duluth - are integrating solar into their emergency management and community resiliency planning. The session will highlight specific tools and models, including community solar road map templates, mapping, financing tools, a critical load calculator and community engagement strategies that are available to communities. We'll explore the role of local governments in supporting and enabling solar + storage projects and provide specific examples of how solar can be incorporated into emergency management plans and processes.

In this forum, Panelists will present three case studies, provide time for Q&A, and lead an activity to help attendees think critically about putting a value on storage for resiliency in their own community.

Panelists:

Erica Helson, Sustainable CUNY
Bret Pence, Ecolibrium3
Deb Perry, Institute for Sustainable Communities
Kathryn Wright, Meister Consultants Group, Inc.

MANY PATHS TO ROME: THE DISCIPLINARY AND UNDISCIPLINED SKILLS ADAPTATION PRACTITIONERS CAN'T (SHOULDN'T?) LIVE WITHOUT (Meeting Room 8/9)

Symposium Organizer: Paul Moss, Minnesota Pollution Control Agency
Adaptation as a fact of life is as old as evolution. But adaptation as a professional field is still quite new and unfolding. It does not yet have a clearly defined educational path for professionals. We work in and across all sectors and at all levels, and we come to it from a wide range of disciplines and professional backgrounds. What essential skills, knowledge and training have we picked up along the way? Which do we consider "must have" skills? Is there knowledge from various fields that those working in climate adaptation should be familiar with and be able to use in practice? Are there common gaps in knowledge and experience that should be filled? A diverse panel of adaptation professionals representing different disciplines and educational backgrounds (urban planning, geography, psychology, business, biology, economics, etc.) will share insights about skills and knowledge that they deem "core" or "essential" in their work. They will highlight formal "book" knowledge as well as the soft skills and on-the-job learning ("street" knowledge) that helped them become more effective. Session attendees will then engage in active

discussion with the Panelists and each other to identify key elements of the “ideal” training of the adaptation professional. They will share useful approaches and venues for formal and informal training to become effective, “adaptive” adaptation professionals.

Panelists:

Steve Adams, Institute for Sustainable Communities
Beth Gibbons, American Society of Adaptation Professionals
Katharine Jacobs, University of Arizona Center for Climate Adaptation Science and Solutions
Susanne Moser, Susanne Moser Research and Consulting
Paul Moss, Minnesota Pollution Control Agency
Missy Stults, Climate Adaptation Specialist

HEALTHY HEADWATERS: ADAPTING WESTERN WATER SYSTEMS THROUGH FOREST RESTORATION AND PROTECTION (Meeting Room 10)

Symposium Organizer: Holly Hartmann, Carpe Diem West

The cities of the American West rely on forested watersheds for over 60% of their drinking water supply. Natural watershed processes in these forests filter pollutants, control erosion, regulate temperature, attenuate floods, and buffer human activities from drinking water sources.

As climate change exacerbates extreme weather patterns, forests, and the water supply that comes from them, are at an ever-increasing risk to wildfires, sediment problems, and flooding. Carpe Diem West’s Healthy Headwaters network has had groundbreaking success in implementing headwaters restoration and protection initiatives to adapt to these threats from climate change and help ensure water security for downstream communities.

On this panel, leaders of the Healthy Headwaters network will discuss:

- How restoration and protection of headwaters are being used as strategies to adapt to climate change, and what tools are available to help water and land managers incorporate these strategies into their adaptation planning
- How water utilities and other resource managers are financing headwaters restoration and protection efforts – including a discussion of the different types of available funding sources and specific grant opportunities
- How leaders in Utah are pioneering a new approach to watershed protection. The region’s Mountain Accord was an unprecedented collaboration of public and private interests established to preserve the legacy of the Central Wasatch mountains and to agree on an integrated, comprehensive, landscape-scale framework for current and future decision-making.

Panelists:

Carly Castle, Salt Lake City Public Utilities
Holly Hartman, Carpe Diem West
Cathy Kellon, Geos Institute

NATURAL DEFENSES IN ACTION (Meeting Room 11)

Symposium Organizer: Stacy Small-Lorenz L., National Wildlife Federation

National Wildlife Federation, along with Association of State Floodplain Managers and Allied World Assurance, recently released a report on Capitol Hill entitled Natural Defenses in Action which has received widespread attention for its cutting edge approach to ecologically-sound risk reduction measures. It highlights the role ecological approaches play in reducing mounting risks to communities from climate-related natural hazards and how properly managed ecosystems and well-designed policies can help reduce disaster risk in ways that benefit people and nature. We profile a dozen case studies that represent best-in-class examples of natural defenses being deployed to reduce flood, coastal

storm, erosion, and wildfire risks. Our cross-sector panel will feature floodplain management, insurance industry, ecological restoration, community resilience, and wildlife conservation representatives, including spokespeople for regional case studies who will share examples of natural defenses in action and discuss relevant state and federal policy recommendations. Case study representatives will cover lessons learned and novel contributions to best practices in the field of climate adaptation and community resilience, giving attention to considerations of social equity in designing and evaluating project success. All case studies chosen for the report are notable for their strong science foundations and monitoring of ecological and social outcomes. Speakers will address the scientific underpinnings of their projects, including climate change projections and monitoring practices as they inform adaptive management. We will examine issues of social equity in policy-making, in particular, how do comprehensive floodplain management efforts and flood insurance reforms take into account urgent issues of social equity.

Panelists:

Tom Bradley, Allied World Assurance
Alan Luloff, Association of State Floodplain Managers
Simone Maloz, Restore or Retreat
Bruce Stein (Moderator), National Wildlife Federation
Jessica Turba, Iowa Homeland Security and Emergency Management

CLIMATE HERITAGE AND CULTURAL COGNIZANCE (Meeting Room 12)

Symposium Organizer: Alex Westhoff, Marin County Community Development Agency

From Arctic fishing villages to tropical islands, climate change impacts are damaging culturally important places throughout the world. Sea level rise, increased storms, coastal erosion, wildfires, droughts, and extreme heat yield unprecedented threats to sacred archaeological sites, historic architecture and monuments, and intangible living heritage such as festivals, foods, and crafts. To protect lives and property, decisions are being made: to defend, accommodate, or retreat? As communities adapt to changing conditions, cultural resource considerations can guide protection of history and present heritage from both climate change and maladaptation.

This multi-scalar panel will spotlight efforts underway to integrate cultural cognizance into adaptation. First, the Union of Concerned Scientists, United Nations Environment Programme, and UNESCO’s recent report “World Heritage and Tourism in a Changing Climate” will be spotlighted to overview climate change impacts on iconic World Heritage Sites, some of the globe’s most naturally and culturally significant landmarks, as well as important tourism destinations. Secondly, National Park Service’s climate guidance documents which prioritize archaeological and historic preservation throughout the United States will be presented. Next, San Francisco Bay Area local government efforts to integrate cultural resources into adaptation planning will be showcased. Finally, the sobering topic of “dislocation” will be addressed through presenting indigenous relocation efforts, including America’s first “Climate Refugees” with lost resources disrupting longstanding tribal practices and ways of life.

Global climate change is yielding tough local decisions. While implications are dire, this session will shed light on tools and methods to minimize cultural heritage losses.

Presentations

Adam Markham, Climate and Energy Program at Union of Concerned Scientists
Marcy Rockman, US National Park Service
Alex Westhoff, Marin County Community Development Agency
Victoria Hermann, Arctic Institute and National Geographic Explorer

ENHANCING ENERGY RESILIENCE: PRACTICAL POLICY AND IMPLEMENTATION STRATEGIES FOR MANAGING CLIMATE CHANGE RISKS

(Meeting Room 14/15)

Symposium Organizer: Judsen Bruzgul,

The energy sector faces a multitude of challenges to ensuring the resilience of critical energy services in a changing climate. This session will bring together leaders in energy infrastructure resilience from utilities, a State regulatory agency, and the Department of Energy to discuss their first-hand perspectives on addressing these challenges, providing practical lessons. Through a moderated discussion, this session will highlight recent and upcoming efforts that identify infrastructure vulnerabilities and develop approaches for bolstering resilience.

Specifically the panel will provide a forum for discussing:

- Utility-led initiatives to identify infrastructure vulnerabilities, to take adaptive measures that support service to the diverse customer base, and to promote community resilience;
- State-level policy and outreach programs seeking to promote and inform state-wide approaches for implementing resilience planning that considers a broad definition of assets and interconnections across systems; and,
- National resilience efforts including the Department of Energy's tools, guidance, and partnerships.

Session participants will have the opportunity to engage in facilitated dialogue with the Panelists following brief opening remarks. Participants will gain an understanding of methods for identifying critical energy infrastructure assets and developing a robust portfolio of adaptation options that consider interconnections with other sectors and the costs and benefits of investments. In addition, participants will learn about how stakeholder engagement and support for community resilience can influence utility resilience, and how state regulators and the Department of Energy are shaping the landscape for adaptation.

Panelists:

Kathleen Ave, Sacramento Municipal Utility District
Christopher Benjamin, Pacific Gas and Electric
Judsen Bruzgul, ICF
Ananda Kanapathy, Public Service Electric and Gas Co.
Kristin Ralff Douglas, California Public Utilities Commission

▶ **11:10 am to 11:20 am BREAK**

▶ **11:20 am to 12:20 pm HOLISTIC PLENARY**
(Grand Ballroom A,B,C,F,G)

The Holistic Plenary will convene a panel of experts from around the country, working both in urban and rural environments, to discuss how their climate adaptation work views humans and the environment as a single system. They will address how the issues of climate justice, equity and poverty alleviation are integrated into their innovative approaches to climate adaptation.

San Francisco Bay Area Integrated Regional Water Management Disadvantaged Community Involvement Program

A nine-county, multi-sector effort to address climate adaptation and community resilience concerns by coordinating and improving water supply reliability, protecting water quality, managing flood protection, maintaining public health standards, protecting habitat and watershed resources, and enhancing the overall health of the San Francisco Bay.

Southeast Florida Regional Climate Change Compact

A collaboration among four counties focused on shared climate mitigation and adaptation strategies, with efforts toward regional policy and planning

with business leadership to advance integration of urban and natural system needs such as development of a regional surface water reservoir for flood mitigation, augmentation of water supplies, saltwater abatement, and environmental enhancements.

Community Risk Reduction Through Comprehensive Coastal Resiliency Enhancement for the Great Marsh Ecosystem, Upper North Shore Massachusetts

Five synergistic project components to reduce economic, socio-economic, and infrastructure vulnerability and increase the resiliency and adaptive capacity of the ecological systems which communities depend upon, including sediment transport and salinity modeling; hydrological barrier assessment; marsh restoration; dune nourishment and revegetation; and community resiliency planning.

Tribal Climate Adaptation Planning in the Crown of the Continent

The Blackfeet Climate Adaptation Planning effort is addressing 9 sectors, ranging from public health, to fish and wildlife, to agriculture; this includes engaging in planning as a "family" process on the reservation, by educating children and also influencing managers in cooperation with reservation managers, federal agencies and Canadians.

Spoken Word

Presentation: Heather Higinbotham, Energy Conservation Technician, City of Bozeman

Moderator: Jordan West, U.S. Environmental Protection Agency
Panelists:

Nahal Ghoghaie, San Francisco Bay Area Program Coordinator,
The Environmental Justice Coalition for Water
Colin Bailey, Executive Director, The Environmental Justice Coalition for Water
Jennifer Jurado, Director and Chief Resiliency Officer, Broward County
Chris Hilke, Program Manager Climate Change Adaptation Program,
National Wildlife Federation
Gerald Wagner, Director, Environmental Department, Blackfeet Nation
Melly Reuling, Deputy Director, Center for Large Landscape Conservation

▶ **12:20 pm to 1:20 pm LUNCH** (Grand Ballroom A,B,C,F,G)

▶ **12:20 pm to 1:10 pm WORKING GROUP LUNCHEON**

WORKING GROUP LUNCHEON: WHAT WOULD AN EFFECTIVE NATIONWIDE CLIMATE CHANGE ADAPTATION SERVICE DELIVERY SYSTEM LOOK LIKE?

(Grand Ball Room - Section D)

Working Group Organizer: Elizabeth Gibbons, American Society of Adaptation Professionals

As interest in adaptation grows, the question facing the field is how to best serve the needs of local leaders from all different sectors who are ready to take action?

What if there was a coordinated nationwide system that helped ensure high quality adaptation resources were readily available, people who needed them knew how to find them, and end users were efficiently guided toward resources that helped them move toward holistic and equitable adaptation solutions?

We aren't there yet, but with your help we can get one big step closer. Join a consortium of your adaptation colleagues in developing this collaborative system by participating in this hands on workshop. Three areas crucial to success have emerged from early work by consortium members: 1) identifying and promoting the field's leading adaptation practices, 2) strengthening connections within the adaptation field, and 3) understanding local leader and service provider needs.

This working group will begin with an overview of the process that is underway to build on the resources already available in creating this adaptation delivery system. We will then share current understanding

of each of the three areas listed above. Participants will actively respond to and expand on these topics through a series of facilitated small group and large group discussions. This session will conclude with an interactive design charrette process the results of which will be incorporated into the ongoing effort to develop this nationwide system. Participants will leave the session knowing how they can be involved going forward.

Co-Organizers:

Tonya Graham, Climatewise
Kathy Jacobs, University of Arizona
Eric Mielbrecht, EcoAdapt
Raj Pandaya, American Geophysical Union
Sascha Petersen, Adaptation International

► **12:20 pm to 2:30 pm TRIBAL WORKING LUNCHEON**

TRIBAL CLIMATE CHANGE ADAPTATION: CHARTING THE COURSE FORWARD
(Meeting Room 13)

Working Group Organizer: Rachael Novak, Bureau of Indian Affairs
Indigenous communities in the United States are leaders in addressing climate change. Many American Indian and Alaska Native communities are actively engaging climate change policy development, developing vulnerability assessments and adaptation plans, and taking actions to address the impacts of climate change on their communities. Indigenous approaches to climate change adaptation often bridge western scientific assessments with traditional knowledges and are embedded within indigenous efforts to protect and strengthen tribal sovereignty and cultural resources. This working group session will examine the current efforts and future needs to ensure that climate issues affecting indigenous communities in the United State are included within federal policies and programs, including the 4th National Climate Assessment and the Sustained National Climate Assessment, and that climate initiatives involving traditional knowledges are done so with the free, prior and informed consent of indigenous governments and traditional knowledge holders. The working group session will begin with brief presentations about Tribal Climate Change Policy Principles, tribal engagement in the National Climate Assessment and the Guidelines for Considering Traditional Knowledges in climate change initiatives. After the brief presentations, there will be three facilitated breakout groups for each of these three topics, as well as any additional topics identified by working group participants to discuss critical needs and opportunities.

Co-Organizers:

Nikki Cooley, Institute for Tribal Environmental Professionals
Karen Cozetto, Institute for Tribal Environmental Professionals
Kathy Lynn, University of Oregon
Julie Maldonado, UC- Santa Barbara
Rachael Novak, Bureau of Indian Affairs
Garrit Voggeser, National Wildlife Federation

► **1:20 pm to 2:50 pm CONCURRENT SESSION 10**

TRANSLATIONAL CLIMATE SCIENCE: RESOURCE MANAGERS AND SCIENTISTS PARTNERING IN THE FACE OF CLIMATE CHANGE
(Grand Ball Room - Section D)

Symposium Organizer: Toni Lyn Morelli, US Geological Survey, Northeast Climate Science Center

Many resource managers and conservation organizations are looking to help their ecosystems, habitats, and species adapt to anthropogenic climate change. To accomplish this, the process of translational climate

science enables scientists and practitioners to work together to translate understanding of the novel, uncertain, and complex effects of climate change into practical action. In this symposium, speakers will describe the process of translational science and how institutions can improve its efficacy. Speakers will share examples of projects in which scientists and resource managers worked together throughout the research process, including examples from management in urban areas, national parks, and elsewhere. In this session, we plan to (1) share examples of successful science-management partnerships, (2) identify information and techniques that can inform resource management decisions, and (3) demonstrate application of best available science to management and conservation planning at various organizations through the translational process. Given the scope, magnitude, and the scientific and social complexity of managing the effects of climate change, translational climate science can play an increasingly important role in policy, natural-resource management, and conservation.

Presentations:

Stephen T Jackson, US Geological Survey, Southwest Climate Science Center
Toni Lyn Morelli, US Geological Survey, Northeast Climate Science Center
Aaron R Ramirez, National Center for Ecological Analysis and Synthesis
Gregg Garfin, University of Arizona
Amber Pairis, Climate Science Alliance-South Coast

BEYOND THE CHOIR: ENGAGING HARD TO REACH COMMUNITIES EFFECTIVELY
(Meeting Room 2/3)

Symposium Organizer: Cara Pike, Climate Access

Community engagement and outreach on climate adaptation is hampered twofold by psychological distancing of impacts and the communities most at risk being least likely to engage with local government through traditional methods. Hear from innovative projects being undertaken across different locales and sectors (including in Baltimore, Marin County, San Mateo County and elsewhere in urban and rural contexts). Project leaders will share experiences and demonstrate the success of these outreach methods through different approaches and tools from cutting edge virtual reality technology to storytelling and board games. Panelists will also engage the audience in a facilitated Q&A session where participants can vote on questions using the Poll Everywhere technology.

Panelists:

Kristin Baja, City of Baltimore
Tania Ellersick, National Forest Service
Susanne Moser, Susanne Moser Research and Consulting
Cara Pike, Climate Access

COMMUNITY ORGANIZING TO BUILD RESILIENCE TO THE WATER-RELATED IMPACTS OF CLIMATE CHANGE (Meeting Room 4)

Symposium Organizer: Nahal Ghoghaie, The Environmental Justice Coalition for Water

Climate Change will continue to exacerbate the growing risks from rising seas and what we now consider “extreme” water weather. Whether drought, flood, fire, or famine, the threats are clear and present. Front-line Native Nations and communities throughout the nation, are organizing to build resilience to the water-related impacts of Climate Change. We are utilizing environmental justice organizing and advocacy toolkits, Traditional Indigenous Knowledges and sustainability practices, as well as advancing new strategies to address these challenges.

We are calling attention to the need for more resources and policy attention to help protect and prepare communities, especially those that face additional challenges because of socioeconomic disparities, on the front lines of climate change. We are engaging Tribal, state, and local

government entities, and are acting as leaders, planners, engineers, developers, and policy-makers in our efforts to prepare for the water-related risks that Climate Change will bring to our communities, in ways both predictable and unpredictable.

What is your community doing to build resilience to the water-related impacts of Climate Change? Join us as we share diverse stories and discuss examples of grassroots communities taking charge of our water destiny and pushing for a more just society through its creative re-making. Justice and equity in adaptation are our societal imperative.

Panelists:

Colin Bailey, The Environmental Justice Coalition for Water
Tameeka Bennett, Youth United for Community Action
Catherine Flowers, Alabama Community Development Corporation
Nahal Ghoghaie, The Environmental Justice Coalition for Water
Pompahatot Tuiimiyali, Winnemem Wintu Tribe

UNDERSTANDING AND OVERCOMING BARRIERS TO CLIMATE CHANGE MITIGATION AND ADAPTATION FOR HISTORIC AND CULTURAL RESOURCES

(Meeting Room 5)

Symposium Organizer: January Marie Tavel, ICF

As stakeholders within the historic preservation and cultural resource management communities endeavor to address the impacts of increased frequency and intensity of sea level rise, tropical storms, drought, wildfire, and flooding as threats to culturally and historically significant resources, a deeper understanding of the barriers that inhibit their response is essential to spurring successful, strategic action. To better understand and help their constituents overcome these barriers, the National Trust for Historic Preservation has partnered with ICF on a nationwide survey to determine awareness, needs, and priorities among stakeholders most likely to address climate change impact on cultural resources or historic buildings and places. This symposium will feature a presentation about the survey's goals, approach, expectations, and next-steps. A moderated panel discussion will also explore (1) perceived needs and challenges; (2) efforts to overcome barriers to mitigating and adapting historic and cultural resources to climate change; and (3) desired opportunities for collaborating with the climate change adaptation community. This discussion, features perspectives from panel participants, including:

Moderator: Anthony Veerkamp, Field Director, San Francisco Office, National Trust for Historic Preservation

Panelists:

Juliette Hayes, FEMA Region IX
Victoria Herrmann, The Arctic Institute
Marcy Rockman, National Park Service
Carmalita Sylve, Grand Bayou Tribe
January Tavel, ICF
Anthony Veerkamp, National Trust for Historic Preservation
Jeana Wiser, Preservation Green Lab, National Trust for Historic Preservation

TAKE ACTION! INTEGRATING CLIMATE CHANGE INTO MUNICIPAL ACTIVITIES

(Meeting Room 6)

Symposium Organizer: Brenda Dix, ICF

This session will highlight recent and ongoing efforts that Cities are taking to integrate climate science into decision-making and every day practices. The examples demonstrate that municipal-level decision makers need: (1) accessible climate information on the impacts that they need to prepare for; and (2) clear guidance on how to integrate that information into both strategic and tactical decision making.

Philadelphia's Office of Sustainability developed a sea level rise and storm surge visualization tool, a climate change risk assessment, and a process to integrate climate change into routine planning (now being

applied to FY2017 capital planning activities). A City guidance document identifies recommendations for integrating climate change considerations throughout the Capital Program and budgeting process.

New York City has brought together climate scientist and infrastructure owners to create a more resilient city. The City uses local climate change projections developed by climate scientists to develop and implement policy, and the Climate Change Adaptation Task Force works to develop coordinated infrastructure action plans to reduce climate risks. The City has proposed a \$20 billion resiliency program, which is expanded and accelerated in its recent plan, OneNYC.

The Bay Area has developed the Adapting to Rising Tides (ART) Program to tackle climate change impacts at the neighborhood, local, county, regional and sector scales. The approach brings together multiple agencies, organizations, and communities to identify vulnerabilities through the lens of the residents and identify the consequences of the risk to people's homes, jobs, quality of life, and the natural areas and ecological services.

Moderator: Anne Choate, ICF

Presentations:

Lindy Lowe, San Francisco Bay Conservation and Development Commission
Peter Adams, New York City Mayor's Office of Recovery and Resiliency
Sarah Wu, Philadelphia Office of Sustainability

TOWARD CROSS-SECTORAL AND INTEGRATED ENERGY SECTOR RESILIENCE: FROM NATIONAL TO COMMUNITY (Meeting Room 7)

Symposium Organizer: Natasha Sadoff, Battelle

The Energy Sector is experiencing increasing impacts from severe weather and shifting climatic trends, as well as facing a changing political climate, adding uncertainty for stakeholders as they make short- and long-term planning investments. Climate changes such as prolonged extreme heat and drought (leading to wildfire spread, for example), sea level rise, and extreme storms are changing the ways that utilities operate. Energy infrastructure located in coastal or flood-prone areas faces inundation risks, such as damage to energy facilities. The use of renewable energy resources is increasing, requiring more information about their intermittency and spatial patterns. In light of these challenges, public and private stakeholders have collaborated to identify potential data sources, tools, and programmatic ideas. For example, utilities across the country are using cutting-edge technology and data to plan for and adapt to these changes. In the Federal Government, NASA has invested in preliminary work to identify needs and opportunities for satellite data in energy sector application, and the Department of Energy has similarly brought together stakeholders to understand the landscape of climate vulnerability and resilience for utilities and others. However, have these efforts improved community-scale resilience and adaptation efforts? Further, some communities are more vulnerable to climate change and infrastructure impacts than others. This session has two goals. First, Panelists seek to share existing and ongoing efforts related to energy management. Second, the session seeks to engage with attendees via group knowledge exchange to connect national energy management efforts to local practice for increased community resilience.

Presentations

Richard Eckman, NASA Headquarters, Washington, DC
Erica Zell, Former Battelle
Craig Zamuda, Office of Energy Policy and Systems Analysis, US Department of Energy
Melanie Dickersbach, Exelcon Corp.
Jodi Slick, Ecolibrium3

FEMA'S RISK MAP PROGRAM – UTILIZING MULTI-HAZARD RISK ASSESSMENTS TO INCREASE RESILIENCE (Meeting Room 8/9)**Symposium Organizer:** Kate Skaggs, Michael Baker International

The Federal Emergency Management Agency (FEMA) produces a variety of analyses and products to help communities understand, prepare for, and mitigate risk through the Risk Mapping, Assessment, and Planning Program (Risk MAP). In addition to flood risk products, Risk MAP produces multi-hazard risk assessments and outreach for geographically similar areas, including but not limited to earthquake, tsunami, flood, landslide, and climate change to paint a more comprehensive picture of risk. In this session, FEMA's Community Engagement and Risk Communication (CERC) team, along with FEMA representatives, present a variety of multi-hazard risk reduction approaches from Regions VIII, IX, and X, as listed below:

- Incorporating future conditions into coastal flooding analyses;
- Developing risk reduction Implementation Plans that link the goals of sustainability and resiliency described in existing Tribal, State, and local planning processes; such as Comprehensive Plans, Local Coastal Plans, Climate Adaptation Plans, Climate Action Plans, and Hazard Mitigation Plans to identify a holistic approach to increasing community resilience;
- Producing multi-hazard risk reports and risk assessments based on community needs and using the community's best available data rather than national datasets;
- Coordinating with Universities to produce local sea level rise projections;
- Coordinating with other federal agencies to assess post-wildfire flood risk.

The presentation will describe the above examples as well as best practices/lessons learned from the case study approaches across the Regions.

Presentations will be a collaboration of FEMA planners and representatives from the CERC contract, representing public-private partnerships.

Presentations:

Anne Kuechenmeister, Michael Baker International
Maryam Hariri, Ogilvy
Kate Skaggs, Michael Baker International

NO SILVER BULLET: VARIED APPROACHES FOR BUILDING WATER RESILIENT COMMUNITIES (Meeting Room 10)**Symposium Organizer:** Ashlee Grace, City and County of Denver

Join us to learn about three different scales and approaches communities are taking to become more water resilient. Starting at the urban redevelopment scale, an engineer from Biohabitats will discuss the Hassalo on 8th project in Portland that takes an on-site one water approach known as NORM: Natural Organic Recycling Machine, and includes planning for water from the tap, to use, to treatment, to reuse, to groundwater discharge. Next, Saint Paul's Water Resource Coordinator will discuss the City's experience constructing a five-mile long integrated stormwater tree trench system serving 100-acres in a highly impervious and diverse transit corridor. This landmark capital project catalyzed the City to complete a strategic green infrastructure framework plan. Learn the efforts together have accelerated Saint Paul's water resiliency by using rain as resource in redevelopments. Finally, Denver's Water Quality Planner will discuss the City's new, comprehensive approach to building water resilient communities at the drainageshed level and what this approach looks like for the Upper-Montclair Basin. The Upper-Montclair Basin is home to some of Denver's most significant water-related issues but strategic engagement with residents and local businesses has resulted in aggressive community-driven solutions. Panelists will touch on the role equity and social justice play in their respective efforts and will highlight the lessons learned as a result of their approach. The session will conclude with time for questions and answers and an opportunity to brainstorm solutions to some of the challenges Panelists and other audience members face in building water resilient communities.

Panelists:

Ashlee Grace, City and County of Denver
Pete Munoz, Biohabitats
Wes Saunders-Pearce, City of Saint Paul

URBAN RESILIENCE: ADDRESSING CLIMATE CHANGE'S DISPROPORTIONATE IMPACTS ON AFFORDABLE HOUSING AND LIVABLE COMMUNITIES (Meeting Room 11)

Symposium Organizer: James Taylor DeWeese, Georgetown Climate Center

Affordable housing in safe and livable neighborhoods is already in critically short supply in cities across the country. Climate change promises to exacerbate the shortage, especially for the low- and moderate-income communities who will feel impacts most acutely. In this session, Panelists from a wide range of professional and personal backgrounds, including city officials, community advocates, architects, lawyers will offer diverse perspectives on how and why low- and moderate-income individuals, their homes, and neighborhoods are uniquely at risk to some of climate change's principal effects, including flooding and heat waves. The session will provide examples of the innovative steps cities and communities are taking to equitably address these challenges while working to enhance social, economic, and physical resilience among lower-income residents. These initiatives include: (1) using new techniques and tools to identify assets and vulnerabilities in low- and moderate-income neighborhoods and plan for climate impacts; (2) reducing risks through innovative financing programs for housing retrofits, neighborhood community-building efforts, and—when necessary—voluntary relocation that preserves community cohesion through land swaps; and (3) improving post-disaster recovery capacity by promoting insurance affordability through participation in programs such as the federal Community Rating System and providing direct assistance to rebuild and return home.

Panelists:

James DeWeese, Georgetown Climate Center
Seth Holmes, University of Hartford
Kate Johnson, District Dep't of Energy and Environment
Kimberly Hill Knott, Detroit Climate Action Collaborative/ Detroiters Working for Environmental Justice

THE RURAL CLIMATE DIALOGUES: ENGAGING RURAL COMMUNITIES IN CLIMATE CHANGE PLANNING AND ADAPTATION (Meeting Room 12)

Symposium Organizer: Tara Ritter, Institute for Agriculture and Trade Policy

Rural communities will be disproportionately impacted by climate change. Their economies are often tied to natural resources (agriculture, forestry, mining), and they will be directly affected by solutions and policies that increase energy or transportation costs. At the same time, rural areas are integral in creating a climate-friendly economy through energy and food production and natural resource management. This means that rural communities will bear the brunt of climate impacts, but will also be responsible for much of the nation's adaptation and mitigation efforts.

To address this challenge, the Institute for Agriculture and Trade Policy and the Jefferson Center organized three Rural Climate Dialogues across the state of Minnesota. Each Dialogue was grounded in the "Citizen's Jury" process, which convenes rural residents for three days to hear from local expert speakers, engage in deliberative discussions about local climate change impacts, and draft a community adaptation plan of challenges, opportunities, and actions. Each Dialogue generated a shared community response and provided a productive, educational, and inclusive approach to address the complex and divisive challenge of climate change.

In this panel, you will hear from Dialogue organizers, community participants, and people elevating Dialogue outcomes to state and federal policy levels. Learn about how this approach has authentically engaged rural citizens, built leadership, and produced concrete actions to boost rural community resilience, as well as informed state and federal policy development.

Panelists:

Anna Claussen, Institute for Agriculture and Trade Policy
Troy Goodnough, University of Minnesota - Morris
Whitney Kimball Coe, Center for Rural Strategies
Andrew Rockway, Jefferson Center
Kathy Sublett, Winona Community Member

MOVING COMMUNITIES TO SOLUTIONS: FEDERAL RESOURCES TO SUPPORT CLIMATE ACTIONS WITH NATURAL AND NATURE-BASED INFRASTRUCTURE

(Meeting Room 14/15)

Symposium Organizer: Bethney Ward, NOAA

President Obama's Climate Action Plan directs federal agencies to support local climate-resilient investments with preparedness tools and information. In this symposium, participants will hear from four federal agencies that are providing valuable resources to build community capacity to explore and implement natural, or green, infrastructure solutions to improve their resilience. The National Oceanic and Atmospheric Administration will highlight a new searchable literature database on the effectiveness of green infrastructure to provide resilience to coastal hazards. NOAA will also cover guidance it has developed for communities to assess the costs and benefits of using green infrastructure for flood reduction. The Environmental Protection Agency will present a new publication that summarizes four community charrettes focused on using different types of green infrastructure for a range of climate change issues. They will also share tools, strategies and lessons learned about green infrastructure from past EPA technical assistance projects. The Department of Interior will highlight their efforts to increase beach ecosystem resilience to storms and sea level rise by integrating monitoring, modeling, and tools that prioritize beach restoration, conservation, and management actions. They will also highlight their ecological and socioeconomic metrics developed after Hurricane Sandy that communities can use to evaluate how ecosystem services gained from implementing natural infrastructure will help achieve coastal resilience goals. Finally, participants will hear from SAGE (Systems Approach to Geomorphic Engineering), a community of practice that includes multiple federal agencies and other organizations, about a searchable online mapping tool that provides information for natural and nature-based shoreline resilience.

Presentations

Kim Penn, NOAA
Jamie Piziali, US EPA
Rick Bennett, US FWS
Susan Taylor, Abt Associates

▶ **2:50 pm to 3:00 pm** **BREAK**

▶ **3:00 pm to 5:00 pm** **CONCURRENT SESSION 11**

USING THE U.S. CLIMATE RESILIENCE TOOLKIT'S 'STEPS TO RESILIENCE'

(Meeting Room 2/3)

Training Organizer: Edward Gardiner, NOAA Climate Program Office

One of the pillars of the U.S. Climate Resilience Toolkit is a process, the Steps to Resilience, drawn from diverse sectors and which emphasizes a common sequence of procedures and decisions for local decision-making. Participants will learn practical options for inventorying assets and their associated climate-related hazards; conducting vulnerability and risk analyses; examining options to build resilience; and prioritizing climate adaptation decisions and investments prior to taking action. This training session will include hands-on exercises, targeted lectures, and group discussions that will highlight how toolkit resources support bottom-up approaches to improving resilience at your location. We will distinguish the unique roles of federal tools and data, expertise within boundary organizations, analyses by private consultants, and decisions by local

teams and individuals. We will demonstrate how to find and use federal tools and data to explore your own climate hazards. Another pillar of the toolkit is our collection of case studies about how people like you are taking a stepwise approach to building resilience. Although the steps are complex and may take months to develop in practice, you don't have to start from scratch. We use real-world, grounded examples to move from exposure to vulnerability to risk. Case studies also provide a range of options to consider before prioritizing, planning, and enacting your vision for climate resilience. This training session will include discussions about how to take next steps at your location, including how to work with others in the national resilience ecosystem of data, tools, and services.

Co-Organizers:

Jim Fox, National Environmental Modeling and Analysis Center, UNC-A
David Herring, NOAA Climate Program Office
Dan Kreeger, Association of Climate Change Officers

INCORPORATING FUTURE CLIMATE PROJECTIONS IN ADAPTATION PLANNING: A LAYMAN'S GUIDE

(Meeting Room 4)

Training Organizer: Derek Rosendahl, South Central Climate Science Center

Many types of climate projections exist, each with their own unique strengths and limitations that can affect the integrity of adaptation decisions. These decisions can be improved when decision makers develop working relationships with climate scientists and organizations who can assist them with the use of climate projections. Through this interactive training, participants will gain confidence in using climate model projections in their decision making process. This will be accomplished by helping management planners across all sectors better understand the projections that inform their decisions. Additionally, managers will learn how to communicate their decision making context so that climate scientists can provide appropriate guidance and products for current and future decisions. The session will be led by researchers from the network of regional Climate Science Centers across the U.S. who will walk through the basic types of climate projections and discuss how the decision context influences their use. Additionally, the session will include a hands-on activity in which participants will explore the application of climate projections to real-world decisions.

Co-Organizers:

Jessica Blackband, South Central Climate Science Center,
University of Oklahoma
Alex Bryan, US Geological Survey, Northeast Climate Science Center
Jeremy Littell, US Geological Survey, Alaska Climate Science Center
Renee McPherson, South Central Climate Science Center,
University of Oklahoma
Esther Mullens, South Central Climate Science Center,
University of Oklahoma
Adrienne Wooten, South Central Climate Science Center,
University of Oklahoma

ADAPTATION DESIGN TOOL FOR NATURAL RESOURCE MANAGEMENT: BOOST YOUR CLIMATE-SMART 'IQ' FOR PLANNING AND IMPLEMENTATION

(Meeting Room 5)

Training Organizer: Jordan M West, U.S. Environmental Protection Agency

Ready to get practical with adapting your natural resource management activities in light of climate change, but wondering how to organize what can be a complicated 'adaptation design' process? This 3.5 hour training will provide an interactive introduction to an Adaptation Design Tool that walks practitioners through steps for adjusting the design of their management activities to be more climate-smart. Developed as a collaborative project of the interagency U.S. Coral Reef Task Force and The Nature Conservancy, the tool has been extensively piloted for coral reef management planning, but is also fully transferable to and

beginning to be used in other systems and applications such as wetland and watershed management planning. We will start with a brief 'how to' on the tool, along with an illustrative case study presentation, followed by practical exercises that allow participants to apply adaptation design to example management activities for various systems such as coral reefs, wetlands and salmon habitat. You are also encouraged to bring your own management activities so you can practice making them climate-smart. If you work in another sector besides ecosystem management, such as water resources, infrastructure or social sciences, this tool can also help you. This training will provide participants with a fun preview of a more extensive version of the Adaptation Design Tool that will be launched in the summer of 2017 in the form of an online learning module and instructor-led training as part of The Nature Conservancy's Reef Resilience Toolkit.

Co-Organizers:

Britt A Parker, The Baldwin Group, Inc. on Contract with the NOAA Coral Reef Conservation Program
Cherie Wagner, The Nature Conservancy

ADDRESSING CLIMATE RISK ACROSS SECTORS IN CITIES (Meeting Room 6)

Working Group Organizer: Ana Maria Medina, City of Toronto

This working group will discuss how cities are working to manage climate risks across sectors. Cities are composed of complicated networks of infrastructure and service providers. Failures in one sector can result in cascading impacts to others. To address the evolving risks associated with climate change and extreme weather, cities need to engage their own infrastructure groups and external partners that they depend upon. The working session will identify pathways for city staff to successfully approach and work with organizations that manage public infrastructure (e.g. water, transportation, energy, telecom) on a voluntary basis, taking into account sensitivities such as confidentiality, competition, public trust, and the goal of synergistic support across sectoral lines.

Case study briefings by representatives from C40 (from cities outside North America), New York City, Washington DC, Toronto and Philadelphia will be provided. A working discussion will seek consensus on a set of successful strategies and tactics that local governments can use to work effectively with infrastructure groups addressing climate related vulnerability. The working conversation will focus on how to build relationships between champions within interdependent organizations as a mainstream practice to encourage adaptation planning and action.

Participants will also have the opportunity to ask the leading city representatives questions and to provide comments. The working session will culminate in a facilitated discussion to identify next steps that can be taken through the C40 and / or USDN networks of cities to bring the practice of interdependency climate risk assessment into the mainstream for all cities.

Co-Organizers:

Peter Adams, NYC Mayor's Office of Recovery and Resiliency
Garrett Fitzgerald, Urban Sustainability Directors Network
David MacLeod, City of Toronto
Alfredo Redondo, C40

CLIMATE CHANGE AND RESILIENCE WITHIN SUSTAINABLE REMEDIATION

(Meeting Room 7)

Working Group Organizer: Barbara Helene Maco, Sustainable Remediation Forum

Contaminated site cleanup remedies (especially long term) should be designed, implemented, and monitored to withstand fires, floods, storms, rising sea levels, long-term stress on water availability, and dynamic groundwater levels. In other words, clean-up should be planned with climate change in mind.

The Sustainable Remediation Forum (SURF) recently began an initiative to evaluate the necessary planning, research, and activities to (1) ensure the long-term sustainability of site remediation and reuse from climate change impacts, and (2) examine the benefits of rehabilitated land to strengthen community and ecosystem resilience.

SURF co-hosted the July 2016 National Adaptation Forum webinar on Climate Change and Resilience within Sustainable Remediation. The webinar generated 200 registrants, 108 participants, and positive feedback from a diverse audience that included a global environmental technology firm and a tribal climate change coordinator. A second webinar in November 2016 highlighted the EPA Superfund Climate Change Adaptation Program.

The working group will discuss progress in SURF's research, including:

- State and Federal regulatory requirements and priorities;
- Legal, liability, and insurance implications;
- Site conceptual model; mini-vulnerability assessment of the sustainable remediation model to identify required augmentation to incorporate climate change impacts;
- Redevelopment impacts and benefits;
- Monetizing carbon;
- Quantifying natural capital and restoration benefit;
- Community enterprise application; and
- Local, state, federal, and international incentives.
- Project financing; public/private partnerships.

Research findings, recommendations and case studies will form a white paper planned for SURF publication December 2017 and shared with the Climate Adaptation Knowledge Exchange (CAKEx.org).

LET US COUNT THE WAYS: QUANTIFYING BENEFITS OF NATURAL INFRASTRUCTURE USING ECOSYSTEM SERVICES METRICS

(Meeting Room 8/9)

Working Group Organizer: Kim Penn, NOAA Office for Coastal Management

In recent years, interest in using natural and nature-based infrastructure to create more resilient coastal ecosystems and communities has increased. In the aftermath of coastal storms, there has been anecdotal evidence that coastal communities with a buffer of healthy ecosystems were provided some degree of protection, however, quantitative evidence is lacking at many sites. These shoreline protection approaches are being explored and rapidly implemented by governmental and non-governmental organizations, with the dual goals of protecting human communities and providing ecosystem goods and services. To evaluate the efficacy of such efforts and guide implementation, there is a need for metrics that can quantify how natural infrastructure approaches perform in terms of provisioning habitat and key ecosystem services to coastal communities, such as wave attenuation, water quality, and flood protection. Over the past two years, the National Infrastructure Metrics Workgroup (NIMS), part of the SAGE community of practice, has developed a standardized suite of metrics that can be used to assess the effectiveness of natural and nature-based infrastructure. Metrics are aligned with ecosystem services, coastal features, and ease of collection/methodologies. The NIMS report will provide the basis for the workgroup session, which will be used to identify opportunities to expand implementation of the metrics and brainstorm ways to share information collected through these monitoring efforts.

Co-Organizers:

Rick Bennett, US FWS
Susan Taylor, Abt Associates

PLACE-BASED ART, SCIENCE, AND AGENCY: TOWARDS TRANSFORMATIVE ACTION FOR ADAPTATION (Meeting Room 10)

Training Organizer: Kate Flick, Institute on the Environment Sustainability Education

This training session is inspired by a successful art-science collaboration featuring an adorable silver camper (the "Climate Chaser") serving as a tiny natural history museum and recording studio to capture stories of changing seasons and cycles of nature. The presenting team draws on the integrated nature of this new, Minnesota-based citizen-science project, Backyard Phenology: Tracking Nature's Cycles in a Changing Climate, to demonstrate how art, science, and place-based observations can be mobilized to catalyze awareness of and action on climate change and adaptation. We will facilitate a creation session and also have an opportunity for discussion on community engagement, educational outreach, audio recording, and art-science fusions. In our framing of adaptation, we use phenology—the study of seasonal changes in the life of plants and animals, such as flowering, budburst, emergence of insects and migration of birds, especially in relation to climate change—as a tool and method to bring people together towards community adaptation and capacity building through the observation of place and local knowledge. The solution becomes one of ethics, creative inquiry, civic engagement, and transformative action. We approach these challenges through the intersection of science, arts, and community action. How can we use creative inquiry to move beyond data or disciplinary silos to tell a new story about place and solutions within place? Adaptation challenges facing humans must be addressed by collective action with concerted efforts across a range of societal sectors. A critical question is how can society build capacity for collective action?

Co-Organizers:

Christine Bauemler, University of Minnesota Art Department
Randy Duerr, Independent Contractor
Beth Mercer-Taylor, Institute on the Environment
Rebecca Montgomery, University of Minnesota Department of Forest Resources

INCLUSIVE CLIMATE ADAPTATION AND RESILIENCE BUILDING

(Meeting Room 12)

Working Group Organizer: Susannah Tuttle, NC Interfaith Power and Light

The impacts of climate variability and change affect everyone, but they disproportionately affect socially vulnerable populations, as they are the ones with the least resources to prepare and recover from impacts. Understanding where these concerns sit within a broad spectrum of stressors and challenges is important in order to identify opportunities to effectively communicate challenges and increase community resilience. In this session, participants will engage in dialogue about their experiences with climate-related impacts that are anticipated to affect vulnerable or marginalized communities. Proven examples of programs and adaptation models will be shared to demonstrate successes in preparing communities to face these challenges.

The workshop is intended for conference attendees who live in or work with communities with socially vulnerable populations. The workshop will facilitate dialogue between community members and climate professionals seeking to provide communities with information and support. Participants will work to develop action steps to incorporate considerations for these impacts and communities.

GOALS:

- To help participants consider how they can bring more inclusivity into their climate adaptation work
- To identify action steps that climate professionals and communities can use to incorporate considerations for relevant impacts to vulnerable

populations into their work

- To discuss climate-related impacts within the broader spectrum of challenges faced by vulnerable populations
- To explore common language among community members, extension professionals, and scientists that can further foster collaborative engagement among these groups

Co-Organizers:

Nakisa Glover, Hip Hop Caucus
Jacqui Patterson, NAACP
Danielle Purifoy, NC Environmental Justice Network
Leo Woodberry, Kingdom Living Temple

SUPPORTING TRIBAL AGRICULTURE AND NATURAL RESOURCES IN A CHANGING CLIMATE (Meeting Room 13)

Working Group Organizer: Julian Reyes, USDA Southwest Climate Hub

The U.S. Department of Agriculture (USDA) Climate Hubs were created in 2014 to deliver science-based, region-specific information and technologies to enable climate-informed decision-making. Our stakeholders include agricultural and natural resource managers (i.e. farmers, ranchers, forest land managers), USDA agencies, and cooperative extension among others. The Climate Hubs have a unique opportunity to facilitate dialogue on challenges to implementing USDA programs for conservation or technical assistance in tribal communities. Conversely, it is also important to share examples of adaptation projects that have been successful at navigating USDA and other federal programs.

The overarching objective of this working group is to build partnerships and collaborations among land management organizations (including USDA), cooperative extension, academic/research community, and Tribal members to effectively manage Native American agricultural and natural resources in a changing climate. Specifically, we invite various officials from the following land management agencies that work with Tribal communities: (1) USDA: Agricultural Research Service (ARS), Farm Service Agency (FSA), Natural Resources Conservation Service (NRCS), Rural Development (RD), U.S. Forest Service (USFS); and (2) Department of Interior: Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM). We invite participants from around the country to compare and contrast stakeholder engagement and projects by geographic region. Ultimately, we hope that the constructive sharing of experiences improves how USDA programs collaboratively supports Tribal agriculture in a changing climate.

Co-Organizers:

Helena Deswood, USDA Southwest Climate Hub
Windy K Kelley, USDA Northern Plains Climate Hub and University of Wyoming Extension
Erin Lane, USDA Northeast Climate Hub
Rachael Novak, Bureau of Indian Affairs
Dannelle Peck, USDA Northern Plains Climate Hub
Matt C Reeves, US Forest Service Rocky Mountain Research Station and USDA Northern Plains Climate Hub
Kristen Schmitt, Northern Institute of Applied Climate Science and USDA Northern Forests Climate Hub
John D Wiener, University of Colorado

EXPLORE, CREATE, AND COLLABORATE: APPLYING SPATIAL DATA TO CLIMATE ADAPTATION CHALLENGES USING DATA BASIN (Meeting Room 14/15)

Training Organizer: Kai Foster, Conservation Biology Institute

When using spatial data to inform natural resource climate adaptation planning, time and resources are routinely depleted in the effort to find and acquire climate data, review data quality, modify file formats, and purchase and learn proprietary software. In this session, we will give a tour of Data Basin, an open-access, online mapping and analysis

platform that allows users to explore, upload, and download a vast library of biological, physical, and socioeconomic datasets. Users can collaborate in working groups and produce customized maps that can be easily shared. Data Basin's tools are designed to give access to all users, most notably those who do not have access to or experience with other desktop GIS software. Data Basin is designed for people from a spectrum of backgrounds who are interested in integrating spatial data into their daily work. We will use a real world case study, the Washington Connected Landscapes Project, to demonstrate how spatial data in Data Basin can facilitate adaptation planning. Following the case study, attendees will participate in a series of activities to learn how to use spatial information and Data Basin in their own adaptation planning

efforts through identifying potential vulnerabilities to their natural resources of interest, developing adaptation strategies and actions, and identifying where actions can feasibly be implemented. By the end of the workshop, participants will know how to explore existing data, create custom maps, convene collaborative working groups, and use publication functionality on Data Basin to inform their adaptation planning and management decision-making.

Co-Organizers:

Tosha Comendant, Conservation Biology Institute

Gwynne Corrigan, Conservation Biology Institute

Jessi Kershner, EcoAdapt

Meade Krosby, University of Washington, Climate Impacts Group

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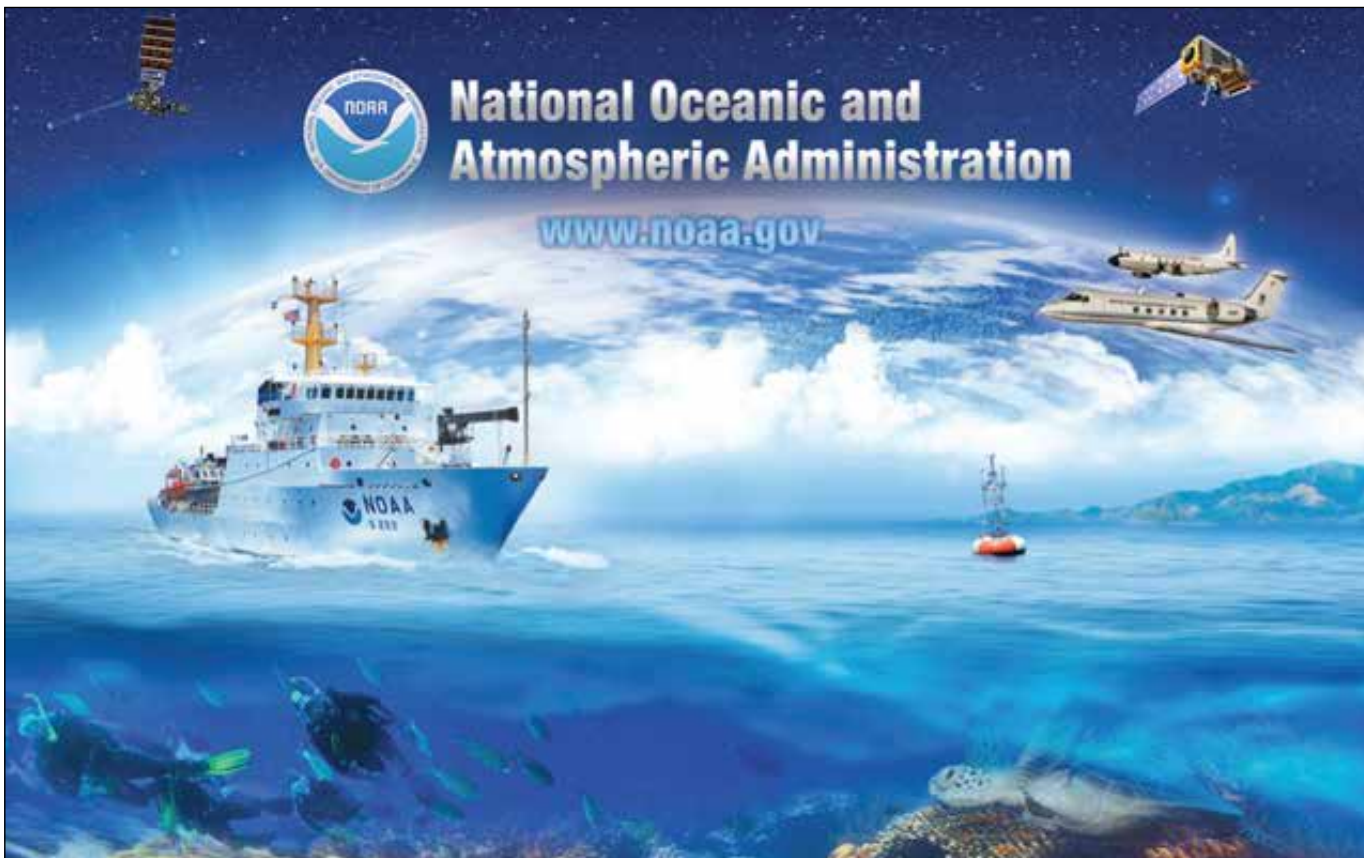


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The Global Adaptation Network (GAN) promotes the mobilization and sharing of climate change adaptation knowledge and experiences that are critical for informing decision making, planning and practice. GAN links regional networks established by UN Environment in Asia-Pacific (APAN), Latin America and the Caribbean (REGATTA), Africa (AAKNet), West Asia (WARN-CC), as well as partners with EcoAdapt's CAKE network and the Environmental Protection Agency (EPA) in the United States, helping them exchange knowledge, experiences, and lessons learned.



Together with the Regional Networks and UN Environment Regional offices, GAN aims to build bridges between new and already existing adaptation networks through various initiatives including:

- **Regional Forums:** Gathering regional practitioners to collaborate, build partnerships, and build capacity.
- **Learning Exchanges:** Facilitating the exchange of practical adaptation information.
- **City-University Linkages:** Creating university and city partnerships to build a more resilience future.

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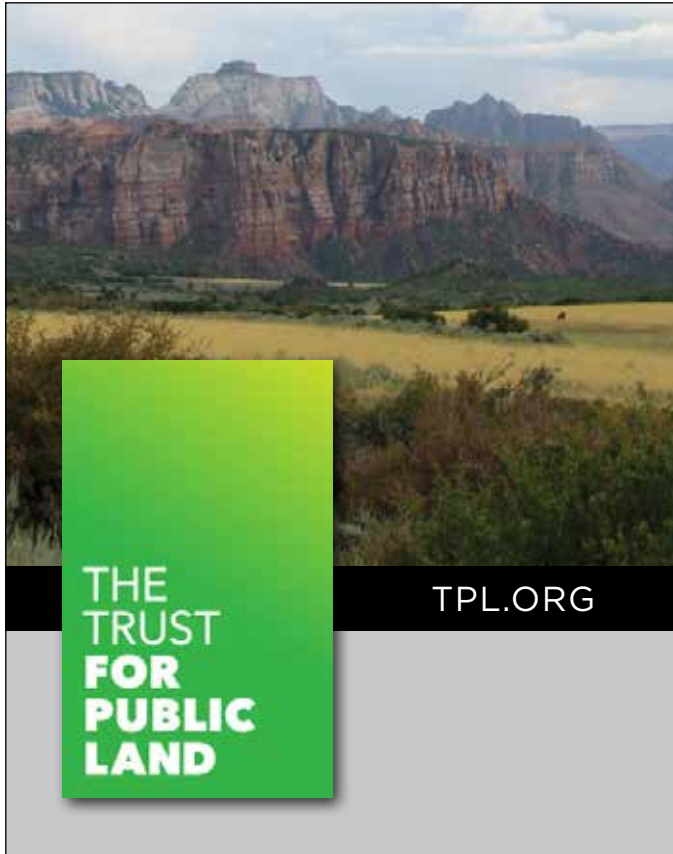
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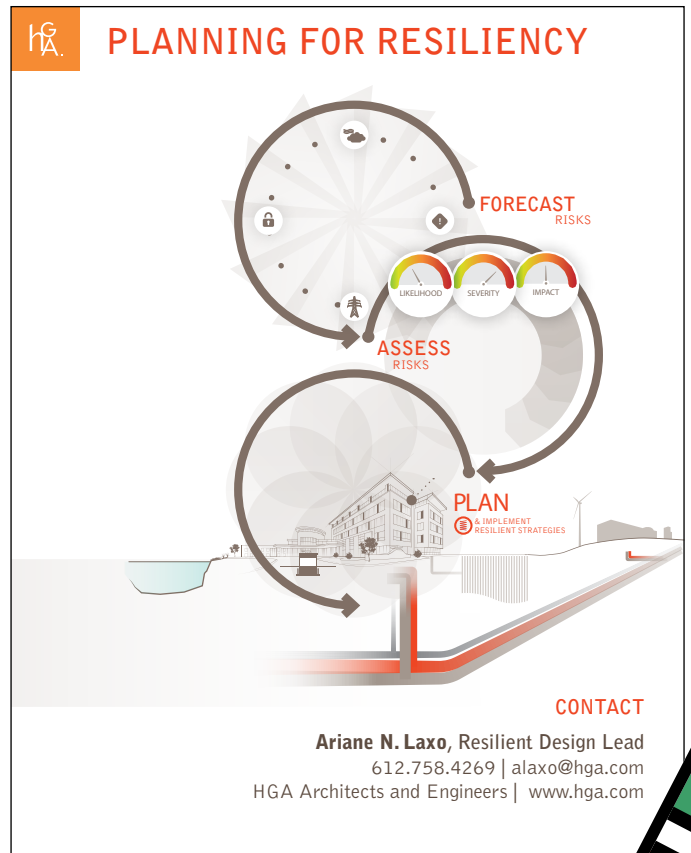
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to EcoAdapt and everyone who made this year's NAF possible, and to all our local leaders responding to the threat of climate change.

Thank you for your work.



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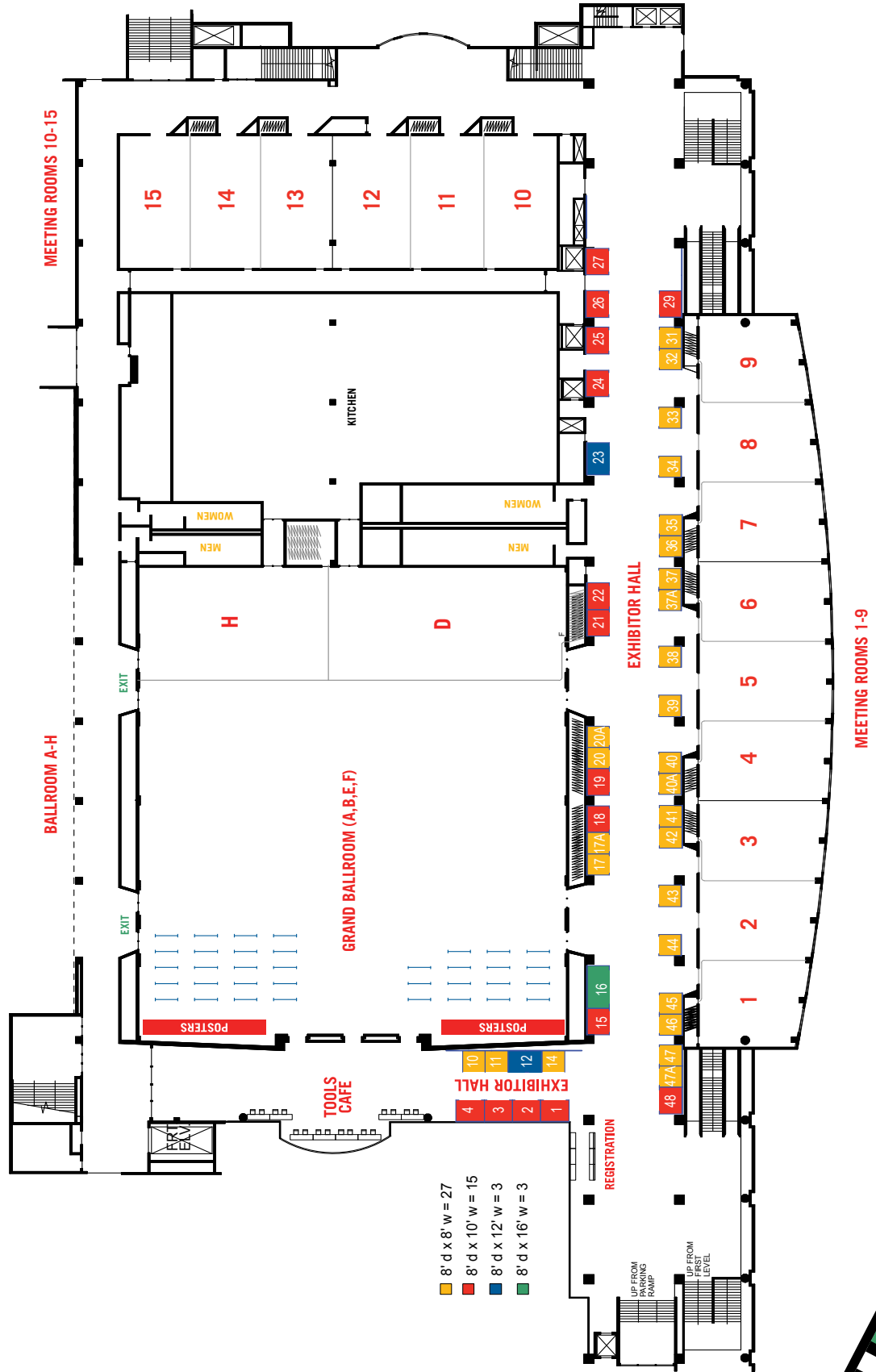


NOTES

A series of horizontal dotted lines for taking notes, spanning the width of the page.

EXHIBITOR FLOOR PLAN AND VENUE MAP

- 1 Rand Corporation
- 2 National Wildlife Foundation
- 3 Conservation Biology Institute booth generously provided by the Wilburforce Foundation
- 4 available
- 10 Minnesota Department of Health
- 11 The Adaptation Partner booth is generously provided by Kris May, Silverstrum Climate Associates LLC
- 12 United Nations Global Adaptation Network
- 14 Wildlife Conservation Society
- 15 Minnesota Climate Adaptation Partnership
- 16 Local Community booth generously provided by the Kresge Foundation
- 17 American Society of Adaptation Professionals
- 17A Institute for Sustainable Communities
- 18 HGA Architects and Engineers
- 19 Landscape Conservation Cooperatives /U.S. Fish & Wildlife Service
- 20 USGS National Climate Change and Wildlife Science Center & Climate Science Center Network
- 20A North Central Climate Science Center
- 21 The Nature Conservancy
- 22 Institute on the Environment, University of Minnesota
- 23 The National Oceanic and Atmospheric Administration
- 24 Minnesota Pollution Control Agency
- 25 The Trust for Public Land
- 26 NOAA Sea Grant
- 27 Minnesota Audubon
- 29 San Francisco Public Utility Commission available
- 31 available
- 32 Springer Nature
- 33 UNC Asheville's National Environmental Modeling and Analysis Center
- 34 BARR Engineering
- 35 College of Food, Agricultural and Natural Resources Sciences
- 36 The Collider
- 37A Abt Associates
- 38 Georgetown Climate Science Center
- 39 Northern Institute of Applied Climate Science
- 40 ClimateWise
- 41 Bellwether Collaboratory
- 42 Bureau of Indian Affairs
- 43 Adaptation International
- 44 Defenders of Wildlife
- 45 ICF International
- 46 Union of Concerned Scientists
- 47 Resilient San Diego: Science-Community-Art booth generously provided by the MacArthur Foundation
- 47A Climate Generation booth generously provided by the MacArthur Foundation
- 48 EcoAdapt





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