

THE 4TH NATIONAL ADAPTATION FORUM PROGRAM

2019

Monona Terrace
April 23-25, 2019 | Madison, WI



ACTION TODAY for
a **BETTER TOMORROW**

THE 4TH NATIONAL ADAPTATION FORUM

WELCOME 3

PLANNING COMMITTEE 4

PROGRAM: TUESDAY, APRIL 23 5-16

- Welcome and Opening Plenary 5
- Concurrent Sessions 1 5-7
- Concurrent Sessions 2 8-10
- Concurrent Sessions 3 10-13
- Margaret A. Davidson Networking Reception, CAKE Tools Café and Poster Session 13-16

PROGRAM: WEDNESDAY, APRIL 24 17-29

- Working Groups and Trainings 1 17-19
- Concurrent Sessions 4 19-22
- Luncheon Sessions 22-24
- Special Session: The Commons Climate Adaptation Hackathon 24
- Concurrent Sessions 5 24- 26
- Concurrent Sessions 6 26-29
- Special Evening Sessions: 29
 - The Commons Hackathon
 - Rising to the Occasion: Brainstorming Opportunities for Cross-boundary Collaboration to Address Sea Level Rise
 - Iceland’s Vanishing Beauty Lecture

PROGRAM: THURSDAY, APRIL 25 30-37

- Working Groups and Trainings 2 30-32
- Concurrent Sessions 7 32-34
- Luncheon Sessions 34-35
- Concurrent Sessions 8 35-37
- Closing Plenary: Hip Hop Caucus “Think 100% – The Coolest Show on Climate Change” 37

SPONSORS 38-46

VENUE MAP AND EXHIBITOR FLOOR PLAN 47-49

SCHEDULE OF EVENTS AT A GLANCE 49

A complete, searchable and sortable program is available online at: www.NationalAdaptationForum.org



WELCOME TO THE 4TH NATIONAL ADAPTATION FORUM!

A biennial week of “all adaptation, all the time.” Wouldn’t it be great if that were true every day? Then we’d be living in a climate savvy country. We haven’t gotten there yet, but this week you will get to hear from your colleagues on how they are striving to ensure that climate change is included in how we design communities, restore wetlands, deliver public health services, conserve our oceans, create jobs and everything else on our collective work plans. The Forum gives us all the opportunity to share our experiences, learn from others, and meld it all together to create the new approaches we can take home to strengthen our efforts toward that climate savvy society.

In order to promote the tenets of good adaptation, here are some assignments for the week:

- Make your work holistic. Start by attending a session and exploring a poster outside of your normal focus. Consider how to apply the ideas presented in your own work.
- Plan for uncertainty. Seek out other adaptation practitioners in your region or who work in your field to compare notes with and identify back up strategies to strengthen your work.
- Reduce the rate and extent of local climate change. Support the local adaptation project (Center for Resilient Cities Badger Rock Center) the Forum has designated for the Travel Guilt Offset.
- Share the learning to advance the field. During the Forum, or when you get home, let other people know about what you learned at the Forum. **#NAF2019**

Make sure to give special thanks this week to the planning committee and equity working group volunteer members who support, advise and collaborate with EcoAdapt in creating this genuinely community event. This would not happen without their commitment.

From everyone at EcoAdapt and on the Forum planning committees, thank you for join us in Madison. Enjoy the Forum and make sure your experience here this week enriches your work at home.

Sincerely,

Lara J. Hansen, Ph.D.
Co-Chair National Adaptation Forum Steering Committee
Chief Scientist and Executive Director, EcoAdapt



4TH NATIONAL ADAPTATION FORUM PLANNING COMMITTEE

KEY: SC: Steering Committee, PC: Program Committee, EWG: Equity & Climate Justice Working Group, PWG: Plenary Working Group

Lara Hansen, EcoAdapt [SC Co-Chair, PWG]
Michael McCormick, Harris and Associates [SC Co-Chair, PWG]
Aimee Delach, Defenders of Wildlife [SC Co-Chair]
Adrienne Hollis, Union of Concerned Scientists [SC Co-Chair, EWG, PWG]
Alex Score, EcoAdapt [PC Co-Chair, EWG Chair, SC, PWG]
Astrid Caldas, Union of Concerned Scientists [PC Co-Chair]
Melissa Ocana, University of Massachusetts Amherst [PC Co-Chair, PWG]
Peter Adams, NYC Mayor's Office of Recovery and Resiliency [SC]
Brian Ambrette, Eastern Shore Land Conservancy [PC]
Susan Asam, ICF International [PC]
Kristen Baja, Urban Sustainability Directors Network [SC, PC]
Ann Baughman, Freshwater Future [PC]
David Behar, San Francisco Public Utilities Commission [SC]
Gustavo Bisbal, Northwest Climate Adaptation Science Center [SC]
Michael Boswell, California Polytechnic State University [SC]
Joshua Brown, NOAA Sea Grant [EWG]
John Bolduc, City of Cambridge [PC]
Maya Buchanan, ICF International [PC]
Ellie Cohen, Point Blue Conservation Science [SC]
Samantha Danchuk, Broward County [PC]
Melissa Deas, District Department of Energy and Environment [EWG]
Josh DeFlorio, The Port Authority of New York & New Jersey [SC]
Abigail Derby Lewis, Keller Science Action Center, The Field Museum [SC, PWG]
James DeWeese, World Resources Institute [PC]
Barney Dickson, United Nations Environment Programme [SC]
Michael Durglo Jr, Confederated Salish and Kootenai Tribes [SC, PC]
Denise Fairchild, Emerald Cities Collaborative [SC]
Amanda Farris, Carolinas Integrated Sciences & Assessments [PC]
Charlene Felkley, USDA Midwest Climate Hub [SC]
Garrett Fitzgerald, Urban Sustainability Directors Network [SC, PC]
Paul Fleming, Seattle Public Utilities [SC]
Steven Frisch, Sierra Business Council [PC]
Aaron Ferguson, Michigan Climate and Health Adaptation Program [EWG]
Jill Gambill, UGA Marine Extension and Georgia Sea Grant [PC, PWG]
Nancy Gassman, City of Fort Lauderdale [PC]
Elizabeth Gibbons, The American Society of Adaptation Professionals [SC]
David Gibbs, ORISE Fellow at the US EPA [PC]
Lisa Graichen, UNH Cooperative Extension and NH Sea Grant [PC]
Jessica Grannis, Georgetown Climate Center [PC]
Roger Griffiths, NOAA National Marine Fisheries Service [SC, PC]
Kimberly Hall, The Nature Conservancy [SC]
Nina Hall, UNC Asheville's National Environmental Modeling and Analysis Center [SC, PC]
Sarah Hammitt, The Port Authority of New York & New Jersey [SC]
Elsa Haubold, USFWS, National Landscape Conservation Cooperative [SC]
Jessica Hellman, University of Minnesota Institute on the Environment [SC]
Victoria Herrmann, The Arctic Institute [SC, PWG]
Chris Hilke, National Wildlife Federation [SC]
Margaret Hiza Redsteer, U.S. Geological Survey [SC, PC]
Andrew Jameton, UMN Center for Bioethics [PC]
Kate Johnson, D.C. Department of Energy & Environment [SC]
Maggie Johnson, Association of Fish & Wildlife Agencies [PC]
Molly Johnson, EcoAdapt [SC, PC, EWG, PWG]
Jennifer Jurado, Broward County [SC, PC]
Nuin-Tara Key, California Governor's Office of Planning and Research [EWG]
Julia Kim, Local Government Commission [PC, EWG]
Yoon Kim, Four Twenty Seven [SC, PC, EWG]
Kathy Lynn, University of Oregon [EWG]
Lauren Lynch, EcoAdapt [SC, PC, EWG, PWG]
Julie Maldonado, UC Santa Barbara [EWG]
Kelly Malinowski, California State Coastal Conservancy [PC, PWG, EWG]
Mia Mansfield, City of Boston [PC]
Carlos Martin, Urban Institute [SC, PC]
Kris May, Silvestrum Climate Associates LLC [SC]
Shannon McNeeley, North Central Climate Adaptation Science Center [SC]
Emily Mead, Institute for Sustainable Communities [PC, EWG]
Curt Meine, Aldo Leopold Foundation & Center for Humans and Nature [SC]
Laura Millberg, Minnesota Pollution Control Agency [PC]
Robert Newman, University of North Dakota [PC]
Rachael Novak, Bureau of Indian Affairs [SC, PC]
Arleen O'Donnell, Eastern Research Group, Inc. [PC]
Megan O'Grady, Abt Environmental Research [PC, PWG]
Robin O'Malley, North Central Climate Adaptation Science Center [SC]
Amber Pairis, Climate Science Alliance [SC]
Jacqui Patterson, NAACP [SC]
Davia Palmeri, Oregon Department of Fish & Wildlife [PC]
Britt Parker, NOAA National Integrated Drought and Information System [PC]
Kim Penn, NOAA's Office for Coastal Management [SC, PWG]
Sascha Petersen, Adaptation International [SC]
Kelly Pflücke, NJ Department of Environmental Protection [PC, EWG, PWG]
Cara Pike, Climate Access [PC, EWG]
Shannon Pinc, City of St. Louis Park [PC]
Queen Quet Marquettea L. Goodwine, Gullah/Geechee Nation [EWG, PWG]
Stacie Reece, City of Madison [SC]
Keith Reopelle, City of Madison [SC]
Kif Scheuer, CA Local Government Commission [SC, PC, EWG]
Lisa Schiavinato, California Sea Grant [SC, PC]
Karl Schrass, National Wildlife Federation [PC]
Amy Snover, University of Washington [SC]
Sherry Stout, National Renewable Energy Laboratory [PC, PWG]
Missy Stults, Independent [PC]
M. Kalani Souza, The Olohana Foundation [SC]
Lily Swanbrow Becker, Florida Fish and Wildlife Conservation Commission [SC]
Pandora Thomas, Earthseed Consulting [EWG]
Forbes Tompkins, The Pew Charitable Trusts [SC, PWG]
Steve Traxler, U.S. Fish & Wildlife Service [PC]
Nissa Tupper, Minnesota Department of Health [PC]
Susannah Tuttle, NC Interfaith Power & Light [SC]
Jessica Turba, Iowa Homeland Security & Emergency Management
Dan Vimont, UW Center for Climatic Research [SC, PC]
Jason Vogel, Abt Associates [SC]
Paul Wagner, U.S. Army Corps of Engineers [SC]
Emily Wasley, The Cadmus Group LLC [PC]
Jordan West, U.S. Environmental Protection Agency [SC, PWG]
Alex Westhoff, Marin County Community Development Agency [PC, PWG]
Lara Whitely Binder, King County [PC]
John Wiener, CU Institute of Behavioral Science [SC, PC, PWG]
Kathryn Wright, The Cadmus Group LLC [SC]
Emily York, State of Oregon Health Authority [PC]

- 7:00am to 8:00am **BREAKFAST**
Lakeside Exhibition Hall
- 7:00am to 10:00am **EXHIBITOR SET-UP**
Grand Terrace and Capital Promenade
- 7:00am to 5:30pm **REGISTRATION**
Registration Desk
- 8:00am to 10:30am **WELCOME/OPENING PLENARY**
Lakeside Exhibition Hall

WELCOME

Opening Remarks Lara Hansen, EcoAdapt

Ho-Chunk Nation Land Acknowledgment and Climate Initiatives

Erik Lincoln, Ho-Chunk Gaming Madison

Welcoming Remarks

Preston Cole, Wisconsin Secretary of Natural Resources
 Joe Parisi, Dane County Executive
 Tia Nelson, Outrider Foundation
 Marcia Canton Campbell and Sarah Karlson, Center for Resilient Cities Badger Rock Center
 Aimee Delach, Defenders of Wildlife & Adrienne Hollis, Union of Concerned Scientists

OPENING PLENARY

Human Ingenuity in Climate Action-Stories from across the Nation

Moderators:

Michael McCormick, Division President/Strategic Advisory Services, Harris and Associates
 Jessica Hitt, Lead Scientist and CAKE Program Manager, EcoAdapt

Plenary Guests:

Queen Quet, Chiefess of the Gullah/Geechee Nation
 Cynthia Naha, Santo Domingo Tribe
 Rick Cruse, Iowa State, University Department of Agronomy
 Serge Dedina, Mayor of Imperial Beach, CA

- 10:30am to 11:00am **BREAK**
- 11:00am to 12:30pm **CONCURRENT SESSIONS 1**

CLIMATE JUSTICE SOLUTIONS FROM THE GROUND UP: STRATEGIES TO BUILD EQUITABLE, RESILIENT AND HEALTHY COMMUNITIES *(Madison Ballroom A)*

Symposium Organizer/Moderator: Cathleen Kelly, Center for American Progress

During this interactive symposium co-hosted by the Center for Earth, Energy and Democracy (CEED) and Center for American Progress (CAP), participants will engage in discussion with a diverse panel of environmental justice and resilience advocates on how to work with communities to design and elevate effective state, local and federal climate justice solutions. This expert panel will share successful and emerging efforts to infuse equitable mitigation and resilience solutions into state and local planning and policies in the Midwest, Southeast and Northeast regions. Panelists will highlight community-driven and cross-sectoral strategies to curb carbon and local air pollution; build resilient communities and infrastructure; improve access to clean transportation, energy and efficiency options; and create good jobs and investments that lead to a more inclusive economy. The panel will also highlight strategies to make progress on solutions in the absence of federal leadership, including through state and local climate policy and advocacy, community and voter education and engagement, and capacity building for community-led energy and resilience planning. Lastly, the panel will discuss ongoing efforts to develop equitable national climate solutions in the lead up to 2020 and beyond. This symposium is well-suited for policymakers and their staff, climate and environmental justice advocates, and policy and science experts who wish to develop and implement equitable solutions to help frontline communities.

Panelists:

Cecilia Martínez, Center for Earth, Energy, and Democracy
 Caroline Lewis, The CLEO Institute
 Nicky Sheats, New Jersey Environmental Justice Alliance

ESTABLISHING COMMUNITY RESILIENCE HUBS — WHAT ARE THEY AND HOW TO GET STARTED *(Madison Ballroom B)*

Symposium Organizer: Kristin Baja, Urban Sustainability Directors Network

Resilience Hubs are community-serving facilities enhanced to support residents, enhance community connectivity, and coordinate resource distribution and services before, during, or after a natural hazard event. Resilience Hubs can come in a variety of shapes, sizes and locations however their overall purpose remains the same, to act as focal points for neighborhood revitalization that provide the resources residents need to enhance their own individual capacity while also supporting and strengthening their neighborhood and neighbors.

The Urban Sustainability Directors Network (USDN) has been working with local governments around the country to develop Resilience Hubs. In this session, USDN staff will help participants better understand what a Resilience Hub is, how it provides climate mitigation, adaptation and equity benefits, and what elements are needed for a Resilience Hub to be established. Additionally, partners from American Microgrid Solutions and the Clean Energy Group will provide more in-depth information about the solar and storage components of a Resilience Hub and share their work on incorporating resilient energy systems into Resilience Hubs.

Participants will leave with: 1) a better understanding of how to develop a Resilience Hub in their community, 2) a list of common challenges faced by USDN cities working to develop Resilience Hubs, 3) a solar and storage technical feasibility assessment, and 4) step-by-step guidance for how to get started.

Presenters:

Kristin Baja, Urban Sustainability Directors Network
 Geoff Oxnam, American Microgrid Solutions
 Seth Mullendore, Clean Energy Group

PEOPLE IN FIRE-PRONE LANDSCAPES — RETHINKING HOW WE ADAPT AND MITIGATE RISK FROM EXTREME WILDFIRE *(Madison Ballroom C)*

Symposium Organizer: Britt Anderson Parker, NOAA National Integrated Drought Information System/CIRES CU-Boulder

Across the Western U.S. there is increasing evidence that the occurrence of extreme fire behavior is increasing, driven by rising temperatures, earlier melting of winter snowpack, and insect-related tree mortality. While wildfires continue to increase in numbers and acres burned, the opportunities for fuel mitigation through prescribed wildfire are constrained by environmental and cultural factors, and people continue to move into wildfire-prone areas. The need to successfully adapt communities to reduce wildfire risk is increasingly relevant to public and wildland firefighter safety. In this dynamic of extreme fire behavior and risk to communities, drought is a common climate phenomenon that impacts fire planning, fire behavior (during events), fire effects (post-event), and subsequently fire management overall. This session will focus on discussing the primary drivers of risk from extreme fire behavior in western communities and sharing how communities are approaching wildfire risk mitigation and adaptation. Additionally, this session will also use small group breakout practices, and will serve as a learning tool for attendees to add to their facilitation tool kit.

Presenters:

Britt Anderson Parker, NOAA National Integrated Drought Information System
 Tamara Wall, Western Regional Climate Center/Desert Research Institute
 Daniel McEvoy, Western Regional Climate Center/Desert Research Institute
 James Webster, Wildfire Partners
 Crystal Raymond, Climate Impacts Group, University of Washington

NATURE-BASED SOLUTIONS FOR COASTAL RESILIENCE—PROTECTING INFRASTRUCTURE, NATURE, AND PEOPLE *(Madison Ballroom D)*

Symposium Organizer/Moderator: Brenda Dix, ICF

This symposium will highlight recent and ongoing efforts to increase nature-based solutions to improve coastal resilience. Lessons will be shared from two Federal Highway Administration (FHWA)-funded pilot projects (Mississippi Department of Transportation [MDOT] and Oregon Department of Transportation [ODOT]), The Nature Conservancy, and the U.S. Army Corps of Engineers (USACE), which may be transferable to protecting other coastal infrastructure and communities. The five presentations in this symposium will focus on the following topics:

- FHWA, ICF, and South Coast Engineers are developing an implementation guide on the use of nature-based solutions for transportation practitioners, to be released in Summer 2019. This guide will draw lessons learned from five pilot projects, a white paper on the current state of knowledge and practice, and four regional peer exchanges held to solicit local expertise.
- MDOT will present on the causes of vulnerability of a bridge damaged by storm surge during Hurricane Katrina, and potential adaptation options, including nature-based adaptation options.
- ODOT will present nature-based conceptual designs that would protect the Oregon Coast Highway from exposure to coastal bluff erosion under 2050 sea level rise scenarios.
- The Nature Conservancy will present the ecological benefits of nature-based solutions and how they can provide environmental and restoration advantages.
- The USACE's Engineering with Nature program will present best practices for integrating nature into infrastructure design to maximize economic, social, and environmental benefits.

Presenters:

Rebecca Lupes, Federal Highway Administration
Bret Webb, South Coast Engineers
Geoff Crook, Oregon Department of Transportation
Kelly Leo, The Nature Conservancy
Jeff King, U.S. Army Corps of Engineers

MOVING FROM ASSESSMENTS INTO ACTION: INNOVATIVE PROJECTS TO ADDRESS URBAN HEAT *(Hall of Ideas E)*

Symposium Organizer: Mark Hartman, City of Phoenix

Local government sustainability practitioners from Phoenix, Alameda County, Louisville, and Richmond will share how they used data on heat exposure and vulnerability to spur action. Though their geographies vary, all recognize the danger that more frequent and more extreme heat waves pose to their residents. Attendees will learn about four different approaches to urban heat reduction. This session will highlight citizen science efforts, cross-agency workshops on heat preparation, walk-shed mapping, and development of a heat ready certification framework that can help move local governments through the steps they need to prepare for hotter weather. The symposium will explore how these four organizations are using data to prioritize neighborhoods, outdoor workers, and residents most vulnerable to the impacts of extreme heat events in order to most effectively deploy scarce resources. We'll also look at how local governments are participating in membership networks to learn from each other and facilitate collaborative projects.

Panelist:

Mark Hartman, City of Phoenix
Sarah Church, County of Alameda
Alicia Zatzoff, City of Richmond
Maria Koetter, Louisville Metro Government

FROM SEA TO SHINING SEA: BRIDGING SCIENCE AND DECISION-MAKING ACROSS THE COASTAL ADAPTATION PLANNING LANDSCAPE *(Hall of Ideas F)*

Symposium Organizer: Elizabeth A Carnahan, University of Florida IFAS Extension

Due to a lack of coordinated state and federal guidance, many coastal local governments are initiating their own adaptation planning efforts. When cities and counties lack staff, fiscal and scientific resources to evaluate risks and plan for adaptation, they often turn to boundary organizations for assistance. In this session, Sea Grant Extension Agents and Specialists will share their best practices in helping communities bridge the gaps in climate change adaptation. Each

program tailors engagement to help coastal communities plan for short and long-term impacts of climate change and sea-level rise. Nationally, Sea Grant finds that common keys to success are (1) placing trusted Sea Grant Agents in a convening role for community conversations; (2) tailoring scientific information, tools and resources from partner Universities, government agencies, and nonprofit organizations for local relevance; and (3) establishing integrative partnerships and regional networks to foster collaboration and information sharing between decision makers and stakeholders. The session will include an overview of the national Sea Grant Extension and Legal Programs, brief overviews of case studies (Tampa Bay, FL; Erie, PA; northeastern North Carolina; Maryland's Eastern Shore; and coastal communities in Connecticut and Santa Barbara, California), and a facilitated discussion with audience input sharing lessons learned and best practices for co-productive adaptation planning.

Presenters:

Libby Carnahan, UF IFAS Extension
Jessica Whitehead, North Carolina Sea Grant
Lisa Graichen, New Hampshire Sea Grant Extension
Monique Myers, University of California, San Diego, Scripps Institution of Oceanography
Lisa Schiavinato, California Sea Grant
Juliana Barrett, Connecticut Sea Grant

ADAPTING ACROSS SCALES: LEARNING FROM REGIONAL ADAPTATION PRACTICES *(Hall of Ideas G)*

Symposium Organizer: Annie Bennett, Georgetown Climate Center

Over the past decade, regional climate collaboratives have proven to be effective models for catalyzing and advancing climate adaptation efforts at the sub-state level. At the same time, those efforts are providing deeper insight on challenges and considerations relevant to adaptation practice across a range of scales and geographies.

This session will draw on the experiences and perspectives of regional climate collaboratives from across the country to share what we are learning about adaptation practice at a regional scale as we strive to build connections, expand stakeholder engagement, and develop cohesive cross-jurisdictional adaptation solutions. These experiences include:

- Moving beyond the networking and planning phases to implementing larger-scale, cross-jurisdictional solutions;
- Addressing equity at the regional scale to ensure that the benefits of enhanced resilience accrue to frontline communities without displacing them;
- Better integrating economic resilience and public/private sector partnerships into adaptation planning and implementation;
- Harnessing the collective power of local jurisdictions to speak with a unified voice, particularly when advocating to the state; and
- Identifying, funding, and implementing adaptation solutions in rural communities.

Following presentations on how these different issues are being considered in diverse regions from across the U.S., practitioners will have an opportunity to dive deeper into these issues, share firsthand experiences, and explore opportunities to advance regional solutions in their own jurisdictions at both local and regional scales. Participants will engage in facilitated discussion on effective strategies for tackling challenges at different scales through collective action.

Presenters:

Jamie Stroble, King County, WA
Brian Ambrette, Eastern Shore Land Conservancy
Jason Liechty, Broward County
Marc Draisen, Metropolitan Area Planning Council

ADVANCES IN UNDERSTANDING AND APPLYING ADAPTIVE CAPACITY TO IMPROVE ADAPTATION OUTCOMES *(Hall of Ideas H)*

Symposium Organizer: Bruce A Stein, National Wildlife Federation

Nature's response to climate change is full of surprises, and understanding the ability of species and systems to cope with or adjust to these changes — adaptive capacity — is key to effective adaptation. Although adaptive capacity is a core component of many climate-vulnerability frameworks, the

concept has proven challenging to apply in practice. This symposium will explore advances in understanding and applying the concept of adaptive capacity in vulnerability assessments and adaptation planning. In 2016, a workgroup convened at a previous National Adaptation Forum published a highly cited paper offering new insights into the interplay between intrinsic and extrinsic factors in species adaptive capacity. Research since has focused on understanding which species-level attributes may confer an ability to cope with or adjust to changing conditions, and how to operationalize these concepts. This symposium will highlight new research and emerging findings on the nature of adaptive capacity, and how these can be translated into real world adaptation applications. The symposium will start with an introduction and review of key concepts underlying adaptive capacity, including its historical development and usage, and the application of ecological niche theory as an analog for distinguishing between the “fundamental” and “realized” adaptive capacity of species. Speakers will then describe a new attribute-based framework for evaluating adaptive capacity and for operationalizing the concept for species; the role of evolution and genetics in adaptive responses; and the translation of these concepts for management application for enhancing the intrinsic and extrinsic adaptive capacity of species.

Presenters:

Bruce A Stein, National Wildlife Federation
Lindsey Leigh Thurman, U.S. Geological Survey
Laura M Thompson, U.S. Geological Survey
Christopher Hoving, Michigan Department of Natural Resources

CLIMATE CHANGE AT THE INTERSECTIONS: ADDRESSING CROSS-SECTORAL CONCERNS IN INDIAN COUNTRY *(Hall of Ideas I)*

Symposium Organizer: Shasta Gaughen, Pala Band of Mission Indians

Climate change planning requires taking into account how varying adaptation needs overlap and intertwine. This is an especially keen concern in Indian Country, as Tribes develop adaptation plans that involve both environmental and cultural concerns. Tribal planning must consider how to address the intersection of multiple sectors that share overlapping dimensions of environment, community, culture, and resilience. This symposium begins with an overview of the Fourth National Climate Assessment's chapter on Tribes and Indigenous Peoples, and is supplemented with presentations focused on planning for Indigenous agriculture, forestry, and health. The symposium will concentrate on recent research findings on climate change impacts that form the basis of sectoral climate planning, and will discuss how that research can be applied in climate change planning in Tribal communities.

Presenters:

Shasta Gaughen, Pala Band of Mission Indians
Caitriana Steele, USDA Southwest Climate Hub
Rachael Novak, Bureau of Indian Affairs
Lesley Jantarasami, Oregon Department of Energy
Christopher Swanston, Northern Institute of Applied Climate Science
Rob Croll, Great Lakes Indian Fish and Wildlife Commission

NORTH CENTRAL MIDWEST REGIONAL CLIMATE COLLABORATION: IMPROVING DECISION-MAKING THROUGH REGIONAL COLLABORATION *(Hall of Ideas J)*

Symposium Organizer: Charlene Regina Felkley, USDA Midwest Climate Hub

Success in obtaining resilient and sustainable agroecosystems within the Midwest Region can only be obtained through collaborative efforts. This symposium will bring together a well-oiled, climate-science-focused and information-sharing team from the Midwest Region to better understand the importance of and efficiency in working together: Working together, sharing and formatting climate information for many different sectors to improve decision-making in a changing climate. The symposium will address:

- The impact of collaboration at the regional scale
- How collaboration influences adaptation
- The efficiencies gained in collaboration
- How collaboration improves information transfer

The Symposium will include presentations with examples of collaborative efforts and impacts from working together and opportunities to become better connected through information sharing (i.e. CoCoRAHS, drought monitor reporting etc.) Survey results from past collaborative events will be shared and a discussion on how to better measure impacts and improve customer service will take place. We want people to walk away with concrete collaboration ideas for their own regions/sectors.

Presenters:

Dennis Today, USDA Midwest Climate Hub
Tonya Haigh, National Drought Mitigation Center
Beth Hall, Indiana State Climate Office
Douglas Kluck, National Oceanic and Atmospheric Administration
Molly Woloszyn, NOAA National Integrated Drought Information System
Adam Dowling, USDA Natural Resources Conservation Service

CLIMATE ADAPTATION IN THE MIDWEST: WHAT'S HAPPENING, WHERE WE'RE GOING, AND LESSONS LEARNED *(Meeting Rooms KLOP)*

Symposium Organizer: Daniel Vimont, University of Wisconsin - Atmospheric and Oceanic

The Midwest United States faces a unique set of physical, social, and political issues in adapting to climate change. Within this varied landscape, a number of efforts at understanding and implementing climate adaptation have emerged. This session will summarize some of the historical and expected future climate changes in the Midwest, and introduce some of the efforts at understanding, motivating, and carrying out climate adaptation in the region. The session will focus on co-production of actionable climate science, cross-sectoral adaptation efforts, and developing partnerships between organizations in the Midwest to catalyze knowledge generation and adaptation. The session will include a question-and-answer panel discussion on lessons learned and future directions for climate adaptation in the region.

Presenters:

Keith Reopelle, Office of Energy and Climate Change, Dane County
Daniel J Vimont, University of Wisconsin - Madison, Atmospheric and Oceanic Sciences
Dreux Watermolen, Wisconsin Department of Natural Resources
Chris Swanston, Northern Institute of Applied Climate Science, USDA Forest Service

NOT NEW YORK CITY? ADDRESSING ADAPTATION CHALLENGES IN AMERICA'S SMALL CITIES AND TOWNS *(Meeting Rooms MNQR)*

Symposium Organizer/Moderator: Tonya Graham, ClimateWise

Small communities across the nation face both the impacts of the climate change crisis as well as technical and financial capacity constraints that often leave them without the resources to hire consultants or the staff capacity to lead essential planning and implementation processes.

In this session, participants will hear about the challenges experienced by local leaders in small cities and towns and how they are overcoming them. Community leaders from Warren, MN; Mt. Shasta, CA; and the Arastook Band of MicMacs - Presque Isle, ME; will share how they are leveraging assistance and bringing local resources to bear in order to adapt to climate change.

After short presentations, the room will be divided into breakout groups to identify typical challenges for communities with fewer than 5,000 people, between 5,000 and 20,000 people, and over 20,000 people. Participants will then brainstorm how communities can address the challenges identified in order to successfully adapt to climate change.

After brief report backs to the full room, participants will leave with the insights collected across the three sizes of small communities. After NAF, the Geos Institute will synthesize the results of these discussions and make that synthesis available to the larger adaptation field.

This session is for local leaders who struggle because their community is not as big as Chicago or New York and/or they do not have the financial resources to hire a consultant to build their adaptation plan. It is also for the adaptation practitioners who serve these communities.

Presenters:

Juliana Lucchesi, City of Mt. Shasta, CA
Dena Winslow, Arastook Band of Micmacs, MA
Shannon Mortenson, City of Warren, MN

■ 12:30pm to 2:00pm

LUNCH*Lakeside Exhibition Hall*

■ 2:00pm to 3:30pm

CONCURRENT SESSIONS 2**EFFECTIVELY SHIFTING POWER- USING EQUITY AS A LENS TO ENHANCE COMMUNITY RESILIENCE** *(Madison Ballroom A)***Symposium Organizer/Moderator:** Kristin Baja, Urban Sustainability Directors Network

In this session, local government leaders will share their work on how they are shifting power to low-income communities of color in planning, designing, and implementing climate resilience plans, policies and programs. Rather than ascribing to the common practice of extracting information from communities, these five leaders are using innovative partnerships, initiatives, and tools to radically transform climate planning. They are working to ensure community respect, needs, and well-being are the backbone of government efforts, and that communities are an active partner and play a powerful role in every phase of decision making. This session will highlight a range of approaches including co-development and use of a racial equity evaluation tool in Seattle; an inter-departmental initiative to advance current planning practices towards equitable community-driven climate adaptation and action planning in San Francisco; use of a POC community-developed framework in all decision-making in Providence; building of community capacity through a racial equity lens on a smart city platform in Charlotte; and development of a combined Climate Action and Adaptation plan with a Climate Equity Technical Working Group in San Antonio. This session will focus on ways to move from engagement to ownership.

Presenters:*Leah Bamberger, City of Providence**Tracy Morgenstern, City of Seattle**Elizabeth Felter, City of San Francisco**Rob Phocas, City of Charlotte***FLOODING ON THE DOCK OF THE BAY** *(Madison Ballroom B)***Symposium Organizer:** Astrid Caldas, Union of Concerned Scientists

How can historic waterfront districts adapt to rising seas? While these irreplaceable resources safeguard stories of our nation's past and are often valued by locals and visitors alike, at the water's edge they are first in line for storms and waves. With piers, docks, and bulkheads constantly exposed to saline conditions, and aging seawalls not designed to withstand accelerating climate change impacts, these sites are particularly vulnerable. Furthermore, integrity considerations add to resiliency challenges, with rigid design standards that limit elevation and other adaptation strategies for historic resources. This session will showcase efforts underway in three historic bayside communities. Annapolis, Maryland recently completed the nation's first Cultural Resource Local Hazard Mitigation Plan under the partnership-based Weather it Together program to identify adaptation measures for the Annapolis National Historic Landmark District abutting Chesapeake Bay. Financing options are being explored to retrofit San Francisco's Embarcadero, threatened by both earthquakes and sea level rise, including an infrastructure financing district and community facilities districts. Miami Beach, lying at ground zero of the nation's sea level rise challenges is developing design guidelines to adapt their vulnerable historic districts. With few existing precedents of historic resource flood hazard mitigation, this session will overview tools to minimize catastrophic losses to our nation's coastal landmark communities.

Presenters:*Lisa Craig, Michael Baker International**Lindy Lowe, Port of San Francisco**Thomas Mooney, Miami Beach Planning Department**Astrid Caldas, Union of Concerned Scientists***MANAGING LANDSCAPES FOR ADAPTIVE CAPACITY: TOOLS AND STRATEGIES FOR IDENTIFYING, CONSERVING AND CONNECTING CLIMATE REFUGIA** *(Madison Ballroom C)***Symposium Organizer:** Carlos Carroll, Klamath Center for Conservation Research (KCCR)

The unprecedented challenge of climate change has led managers to seek new ways to identify areas where conservation could facilitate persistence of biodiversity. However, the novelty, uncertainty, and coarse spatial scale of climate science results make them difficult to translate into practical action on-the-ground. Using climate-change refugia conservation as an adaptation strategy requires identifying areas that are relatively buffered from warming temperatures. However, many other components of climate change must also be considered, including changing patterns of hydrology, disturbance (e.g., fire, drought, pests/pathogens), population demographics and genetics, species interactions, dispersal/migration patterns, and adaptive responses to changing environmental conditions. In this session, speakers will present the cutting edge in our ability to identify, manage, and connect climate change refugia and to maximize landscape-level adaptive capacity. The session will provide information on a suite of emerging techniques and foster a conversation about the role of climate-change refugia in adapting our management of ecosystems as a response to changing environmental conditions. Speakers from federal and state agencies, academia, and the non-profit sector will present examples from the US and Canada of how climate-change refugia are being integrated into regional planning. 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.

Presenters:*Toni Lyn Morelli, USGS**Carlos Carroll, Klamath Center for Conservation Research**Diana Stralberg, University of Alberta**Jennifer Cartwright, USGS**Meade Krosby, University of Washington**Travis Belote, The Wilderness Society***ULTIMATE TEAM BUILDING: HOW BOUNDARY SPANNING ORGANIZATIONS FILL THE GAP BETWEEN SCIENCE AND SOLUTIONS** *(Madison Ballroom D)***Symposium Organizer/Moderator:** Amber Pairis, Center for Climate Change Impacts and Adaptation- Scripps Institution of Oceanography

Boundary-spanning organizations can help translate science in real time, build trust among partners, and have enough influence to garner support for action. Creating these kind of collaborative partnerships is continually being highlighted as a foundation for advancing climate adaptation strategies yet creating, maintaining, and funding these kinds of unique organizations can be difficult if not impossible. This session will bring together several individuals with diverse sets of experiences to lead a group conversation about the unique attributes that can make these organization succeed or fail and why these kinds of endeavors are so difficult to create, fund, and maintain over time. Learn from a lifetime of good and bad experiences of individuals who are working at the interface of science and application and add your voice and experience on the pitfalls and hurdles of pursuing new and often difficult solutions to advance adaptation actions. This session will highlight how scientific experts are emerging as key adaptation leaders and the unique skill set that is helping them advance their work as science messengers. Leaders will speak about their efforts to build trust and proliferate the idea that we are in this all together. This session will also include a focus on how tribal nations in the Southwest view climate change challenges and how boundary spanning organizations are helping integrate climate information, awareness, and buy in through innovative youth and family experiences. This session will start with some perspective presentations but then open to a more interactive discussion and hands on science-art project.

Presenters:*Amber Pairis, Climate Science Alliance**Tamara Wall, Desert Research Institute**Megan Jennings, San Diego State University**Nicolette Cooley, Institute for Tribal Environmental Professionals**Shasta Gaughen, Pala Band of Mission Indians**Kathy Jacobs, Center for Climate Adaptation Science and Solutions*

USGCRP'S COORDINATED FEDERAL CLIMATE RESILIENCE ENTERPRISE SUPPORTS INDIVIDUALS AND COMMUNITIES ACROSS THE U.S. (Hall of Ideas E)

Symposium Organizer: Fred Lipschultz, U.S. Global Change Research Program

Building resilience requires assembling a diverse range of data, information, and knowledge while working closely with many different stakeholders, actors, and decision-makers. This session will highlight the suite of coordinated activities that the U.S. Global Change Research Program (USGCRP) has developed to support resilience. Starting with the National Climate Assessment, practitioners, policy-makers, and citizens can gain information on the range of potential threats and impacts associated with climate change, as well as adaptation actions planned and underway across the Nation. As part of the assessment process, scenario storylines were developed (comprising coordinated climate, population, sea-level, and land-use datasets) to explore three different potential climate futures for impact or vulnerability assessments and planning. Further knowledge can be sought using the Climate Resilience Toolkit and its Climate Explorer tool, both of which derive from, and build on, the NCA. Communities seeking connections with local and national subject matter experts to interpret climate risks and point to relevant tools can participate in the Resilience Dialogues. The experts, in turn, can utilize other components of the resilience enterprise. Finally, decision-makers can conduct customized analyses using the open-source Partnership for Resilience and Preparedness platform that permits fusing locally-relevant datasets with commonly shared datasets from Federal and other partners to create 'dashboards' with custom graphics to embed in reports and websites. And underpinning the entire enterprise is a Global Change Information System (GCIS) that provides the strongest possible provenance for these linked components. Attendees will learn how to utilize these Federal coordinated resources for their needs.

Presenters:

Fred Lipschultz, U.S. Global Change Research Program
David Herring, National Oceanic and Atmospheric Administration
Laura Satkowski, Future Earth
Sarah Zerbonne, U.S. Global Change Research Program

US FOOD SECURITY: BIG TROUBLE, BIG NEEDS, BIG OPPORTUNITIES (Hall of Ideas F)

Symposium Organizer: John D Wiener, University of Colorado

Agricultural markets and farming systems are, as J.K. McIntyre said at the Soil Health Institute, optimized for the sale of inputs, to which we add, and the reduction of labor by dramatically misguided simplification of systems and concentration of the profitable parts of the supply chain. Small and medium commercial farming (as distinguished from hobby farms and low-density residential land conversion) are rapidly losing ground and income, though the smaller scale operations have been much more willing to adopt conservation measures when able to do so. Urban interests in open space amenity and recreation, water quality, food quality and local food, and opportunities to dramatically improve water sharing with mutual benefit can be better satisfied with partnerships that stabilize farms to meet the goals of survival, stewardship, and succession. If we fail, productivity losses and losses of ecosystem services may be largely irreversible, subjecting the US to far more market pressure from global competition from governments and businesses serving livestock growers and consumers whose desperation may in large measure increase along with a few more years or decades of growing demand for higher quality food.

Presenters:

John Wiener, University of Colorado
Jerry Hatfield, USDA-ARS, National Laboratory for Agriculture and the Environment
John Hendrickson, USDA
Gary Bentrup, USDA National Agroforestry Center
Rick Cruse, Iowa State University

ENGAGING FOREST OWNERS IN CLIMATE-INFORMED MANAGEMENT (Hall of Ideas G)

Symposium Organizer: Lisa Hayden, New England Forestry Foundation

So many audiences to reach, so little time! There is a great need for outreach and education to communicate with different stakeholders about climate adaptation. This symposium focuses on strategies and tools created to engage people about adaptation at the hyper-local level — their own private, forested property. How can we motivate stakeholders to take specific actions that will benefit not only their own lands, but the larger landscape and community? Partners will share work in the MassConn Woods of central Massachusetts and northeastern Connecticut to integrate the science of forest adaptation planning from Northern Institute of Applied Climate Science, with emerging best practices of landowner outreach and extension fields used by New England Forestry Foundation and American Forest Foundation. Working with foresters and land trusts, the project promotes parcel-level climate adaptation assessments to foster long-term resilience of a 2-state, forested wildlife corridor.

Presenters will review "training the trainer" climate communications for practitioners who are meeting 1 on 1 with the public, as well as steps for crafting outreach strategies to motivate stakeholders to action about the places they love. Providing examples from the MassConn Woods, the symposium will include discussion of social marketing to develop peer leaders, as well as demonstration sites providing on-the-ground examples of adaptation. Speakers will share climate messaging developed for outreach campaigns, and tactics for starting the conversation about adaptation. For organizations interested in your own outreach to promote adaptation actions, a group exercise will allow participants to relate content to your own work. Visit: <https://www.forestadaptation.org/massconn>

Presenters:

Lisa Hayden, New England Forestry Foundation
Madelene Jennison, American Forest Foundation
Maria Janowiak, Northern Institute of Applied Climate Science

FLOODPLAIN ACQUISITIONS: MAXIMIZING OPPORTUNITIES FOR HAZARD MITIGATION, HABITAT RESTORATION, AND COMMUNITY BENEFIT (Hall of Ideas H)

Symposium Organizer: Rebecca Kihlsinger, Environmental Law Institute

Disaster costs hit a record high in the U.S. in 2017. According to NOAA, 16 major disasters resulted in over \$306 billion dollars in damages and cost 362 lives. One of the most effective disaster mitigation strategies is getting people out of flood-prone areas through voluntary buyouts. Over the past 30 years, FEMA has funded the acquisition of more than 55,000 properties from willing landowners. Buyouts permanently remove people and property from hazardous areas (deed restrictions required for acquired properties prevent future development on the land), thus reducing or eliminating future property damage and emergency response costs. Because acquired land must be permanently dedicated to open space, recreational, or wetland management uses, buyouts also provide an opportunity for communities to create public assets while restoring the ecological integrity of the floodplain. Restoration projects on acquired lands can thus further strengthen the community's resilience to future disasters. This session will highlight work across the country aimed at helping local governments optimize selection and management of floodplain buyouts to increase resilience and make communities more livable for all residents. The presentations will include a review of recommendations for how local governments can prioritize, fund, and manage acquired properties; case studies of communities that have implemented floodplain buyouts; and a review of the fiscal impacts of buyouts on local governments in North Carolina.

Presenters:

Andy Buehler, Kenosha County Department of Public Works and Development Services
Rebecca Kihlsinger, Environmental Law Institute
David Salvesen, University of North Carolina, Institute for the Environment
Karen Hyun, National Audubon Society

CONDUCTING A TRIBAL/INDIGENOUS CLIMATE CHANGE VULNERABILITY ASSESSMENT AND DEVELOPING A TRIBAL ADAPTATION PLAN *(Hall of Ideas I)*

Symposium Organizer: Shannon McNeeley, Colorado State University

Indigenuity Session 1 of 3: This symposium will focus on indigenous approaches to climate change adaptation planning and vulnerability assessment. Tribes and indigenous peoples have a range of adaptation planning and management concerns for understudied species and cultural use resources. There is also a critical need to identify strategies that will leverage limited resources and capacity to ensure a holistic understanding of climate vulnerability, as well as existing data and information that will inform assessment and planning. This session will feature speakers with experience in tribal/indigenous climate change adaptation planning and vulnerability assessment. The speakers will share lessons learned, challenges, and best practices to guide tribal staff and potential partners to produce high quality plans and vulnerability assessments that incorporate unique tribal concerns and lead to effective implementation. Speakers will discuss approaches used, incorporation of traditional knowledges, partnerships with academic, tribal and non-tribal organizations, or agencies, and tips for starting and conducting assessments. Speakers will also talk about the relationship between vulnerability assessment and adaptation planning to ensure that there is effective use of resources and partnerships so that these processes are supportive of each other. We conducted a national survey through ITEP, Rising Voices, and other networks of the Indigenous peoples and climate change community to ask what sessions they wanted for NAF2019, and this was one of the top requested sessions.

Presenters:

Shannon McNeeley, Colorado State University
Chas Jones, Northwest Climate Adaptation Science Center
Eric Chapman, Lac du Flambeau
Joe Hostler, Yurok Tribe
Stefanie Krantz, Nez Perce Tribe
Genelle Winter, Metlakatla Indian Community

DISSECTING COMMUNITY ADAPTATION PROJECT DEVELOPMENT AND IMPLEMENTATION — WHAT DOES IT TAKE TO MOVE TO ACTION? *(Hall of Ideas J)*

Symposium Organizer/Moderator: Kathryn Wright, Camdus

Local governments, businesses, neighborhoods, and others have conducted vulnerability assessments and developed adaptation plans. However, moving from planning to implementation has often proved challenging. The goal of this symposium is to provide participants with a behind the scenes look into the development of adaptation initiatives in three cities to help assess their own readiness and resources to move to action. The session will include a presentations to discuss how communities have overcome challenges, developed solutions and successfully implemented adaptation projects. Presentations from Matt Gray (Cleveland), Melissa Deas (Washington D.C.), and Alisha Pegan (Boston) will focus on adaptation projects in their communities, which will preliminarily include resident-led and neighborhood-based resilience projects in Cleveland, the implementation of the Climate Ready D.C. plan in DC, and street scape elevation and other resilient design strategies in Boston. The presentations will be followed by a moderated and audience Q&A. The session will conclude with an in-depth peer consultation exercise and group discussion facilitated by Cadmus (Kathryn Wright). The exercise will help an audience member work through a challenge they are experiencing implementing adaptation projects and provide lessons learned for all parties.

Presenters:

Melissa Deas, Washington D.C. Department of Energy and Environment
Matt Gray, City of Cleveland
Alisha Pegan, City of Boston

CLIMATE ADAPTATION IN WISCONSIN PART 1: IMPACTS AND ADAPTATION FOR NATURAL RESOURCES *(Meeting Rooms KLOP)*

Symposium Organizer: Daniel Vimont, University of Wisconsin - Atmospheric and Oceanic Sciences

Climate change poses a unique set of challenges for natural resource and habitat management in Wisconsin and the Midwest. The natural landscape of Wisconsin is rich with a variety of land- and

water-scapes, including forests, unique plants and natural areas, lakes, waterways, and wetlands. Understanding climate impacts to natural resources, and developing adaptation efforts, requires understanding the connections within this varied landscape, as well as the influence of extensive agricultural activities, and urban and rural land uses. In this session, we will hear about climate impacts and adaptation efforts for management of natural resources and habitats in Wisconsin. While the focus will be on Wisconsin natural resources, the activities and techniques can be generally applicable. Time will be allotted for a question and answer period at the end of the session.

Presenters:

Madeline Magee, Wisconsin Department of Natural Resources
Stephen Handler, USDA Forest Service and the Northern Institute of Applied Climate Science
Benjamin Zuckerman, University of Wisconsin - Department of Forest and Wildlife Ecology
Nicholas Miller, The Nature Conservancy, Wisconsin Field Office

ECONOMICS OF CLIMATE CHANGE *(Meeting Rooms MNQR)*

This session will explore the economic impacts of climate-related hazards on businesses and communities, and share strategies to minimize future losses and maintain continuity of operations. The presentations will highlight the role of private sector companies in developing products to allow for climate-informed decision making and describe innovative financing options to support adaptation.

Presentations:

Not Just a Nuisance: The Economic Impact of High-Tide Flooding
Samanthe Tiver Belanger, Stanford University
State of Rhode Island's Risk Reduction Guides for Small Business Climate Resiliency
Kelly Knee, Technical Director
Industrial Business Resiliency Planning in New York City
Dylan Sandler, NYC Department of City Planning
Investing in Resilience: How do we finance coastal community adaptation?
Kim Mikita Penn, NOAA Office for Coastal Management

■ 3:30pm to 4:00pm **BREAK**
■ 4:00pm to 5:30pm **CONCURRENT SESSIONS 3**

EQUITABLE URBAN FLOOD RESILIENCE: LESSONS FROM KRESGE'S CLIMATE RESILIENT AND EQUITABLE WATER SYSTEMS (CREWS) INITIATIVE *(Madison Ballroom A)*

Symposium Organizer: Brad Spangler, Meridian Institute

This symposium will present and build on the findings of a July 2018 report produced by Meridian Institute for American Rivers, Building a Community of Practice at the Intersection of Water, Climate Resilience, and Equity: Insights and Opportunities from an Assessment of The Kresge Foundation's Climate Resilient and Equitable Water Systems (CREWS) Initiative. The session will draw from the work of CREWS grantees and partners, to highlight the importance of strong, trusting partnerships to tackle procedural, distributional, and structural inequities associated with urban flooding in low-income communities and communities of color. In the context of climate resilience, water, and equity work, the session will explore lessons learned and best practices for forging partnerships to build local capacity for: community organizing; policy analysis and advocacy; understanding and using climate science in decision making; and fundraising. Ideas will be conveyed via a series of joint presentations and discussion with presenters.

Participants will:

- Learn about needs and opportunities in the emerging community of practice at the intersection of urban flooding, climate resilience, and equity;
- Hear case examples highlighting the key elements of strong partnerships aimed at addressing climate-driven flooding in low-income communities and communities of color; and
- Take away practical lessons about how to create capacity-building alliances with community leaders working to address equity dimensions of urban flooding.

This training is open to all NAF participants; those interested in or working on issues related to the intersection of urban flooding, climate resilience, and equity are especially encouraged to attend.

Presenters:

White-Newsome, The Kresge Foundation
Brad Spangler, Meridian Institute
Gary Belan, American Rivers
Kirsten Shead, Milwaukee Water Commons
Harriet Festing, Anthropocene Alliance
Sarah Wilkins, American Geophysical Union

LEVERAGING INFORMAL SCIENCE LEARNING CENTERS AS COMMUNITY HUBS FOR CLIMATE RESILIENCE AND ADAPTATION *(Madison Ballroom B)*

Symposium Organizer: Jeremy Scott Hoffman, Science Museum of Virginia

Informal science learning centers (including aquariums, zoos, museums, and science centers) are viewed by the public as one of the most trustworthy sources of scientific information in America. In fact, these institutions are rated more trustworthy than daily newspapers, nonprofits, federal and state governments, and institutions of higher education. Since the mid-2000s, federal agencies such as the National Oceanic and Atmospheric Administration's Office of Education have begun investing considerable resources into informal climate science, adaptation, and resilience education efforts at dozens of informal science learning centers around the country. These projects have been initiated across a wide variety of geographical contexts and have developed communication strategies and content for a broad spectrum of climate stressors - including but not limited to sea-level rise, urban heat islands, extreme weather events, and ocean acidification. However, informal science centers are not yet assessed as a major contributor to or a cross-sectoral participant in the climate change adaptation field. In this session, we will explore how 5 climate resilience education programs undertaken at informal science education centers spanning urban and rural contexts as well as a variety climate stressors have connected with and added value to ongoing efforts at their municipality or state-level adaptation planning scale. At the end of this symposium, we hope to guide our session participants through generating a plan for connecting and collaborating with their local informal science education center or some other neutral space in order to broaden their adaptation program's ability to engage new and diverse audiences and publics.

Presenters:

McDougall, National Oceanic and Atmospheric Administration
Jeremy Hoffman, The Science Museum of Virginia
Erin Griffin, Wild Center
Gayle Bowness, Gulf of Maine Research Institute
Billy Spitzer, New England Aquarium
David Sittenfeld, Museum of Science

OVERCOMING FLOOD AMNESIA: HOW TWO CITIES AND TWO STATES ARE BECOMING RESILIENT *(Madison Ballroom C)*

Symposium Organizer/Moderator: Penny Loeb, Self

A flood happens, clean up is costly and exhausting, but finally normalcy returns. Surely this will never happen again, Flood Amnesia. But waters can come again, as in the well-known case of two hurricanes two years apart in Lumberton, NC. Flood amnesia can be the toughest challenge to funding and building sufficient protection from damage from the next flood. But around the country, there are government officials whose lives were forever altered by a flood, who will never give up. These four presenters, three government officials and one scientist, live at ground zero, determined to build flood resilience. They plan, map, fund and build. How they do it, and what challenges still need to be solved are vital lessons for all communities, rich and poor, facing flood threats.

Presenters:

Brandon Love, City of Lumberton NC
Holly Wallace, Austin, MN
Pat Lynch, Minnesota Department of Natural Resources
Nathan Young, Iowa Flood Center

A MATCH MADE IN HEAVEN? — INTEGRATING CLIMATE CHANGE INTO HAZARD MITIGATION PLANNING *(Madison Ballroom D)*

Symposium Organizer: Sascha Petersen, Adaptation International

The field of emergency management has been helping communities assess, plan for, and respond to extreme weather events and other disasters for decades. However, the approaches developed to help communities assess the risk and the potential impacts of extreme weather events have rarely been updated to include climate change. While requirements at a local level vary state by state, there is a great opportunity to mainstream adaptation planning and preparedness into the hazard mitigation process. If only we can find ways to effectively merge these two fields and ensure that communities are preparing for both current and future hazards. This interactive session starts with an overview of the field (former chief of staff for FEMA under President Clinton - Ms. Bullock) and the value of investing in preparedness (ASFPM-Mr. Larson). Then, three speakers, the Climate Resilience Officer from the Urban Sustainability Directors Network (Ms. Baja), FEMA Region X coordinator (Mr. Schelling), and the disaster management coordinator for a tribal community (Mr. Chapman) provide examples of where and how disaster preparedness is being used to improve resilience across the country.

While there is a lot of potential, the differing traditions, languages, and approaches mean that integration isn't necessarily easy. The session concludes with an interactive panel and audience discussion. Join us for an honest conversation addressing the opportunities and challenges of integrating climate change into hazard mitigation planning.

Presenters:

Jane Bullock, Bullock and Haddow
Larry Larson, Association of State Flood Plain Managers
Kristin Baja, Urban Sustainability Directors Network
Jonathan Olds, FEMA Region
Eric Chapman, Lac du Flambeau Tribe

ADVANCING PRACTICAL APPLICATION OF INDICATORS FOR URBAN RESILIENCE AND ADAPTATION PLANNING *(Hall of Ideas E)*

Symposium Organizer/Moderator: Jordan M West, U.S. Environmental Protection Agency

Indicators can be a powerful tool for communities to use in detecting status, rates, and trends of environmental and social variables (GlobalChange.gov). Often used as a means of monitoring the condition of (for example) the economy or the environment, indicators are also increasingly being developed and considered in multiple stages of adaptation planning and implementation, to support effective mitigation and adaptation measures and to inform research, education, and management decisions. Indicators related to climate change drivers and impacts can be used to assess risks and vulnerabilities, evaluate resilience, inform adaptation design, and monitor effectiveness after adaptation actions have been implemented on the ground. This symposium explores how we might improve practical application of physical, ecological, and socio-economic indicators as inputs to vulnerability assessment and adaptation planning tools and frameworks. Speakers will present case studies from cities and communities working to improve uptake and utility of indicators for meeting adaptation challenges in urban environments, and present frameworks for using indicators that are applicable to cities across the nation. Also addressed will be challenges common to all sectors regarding how best to identify and use indicators of different types for combined multi-sectoral/cross-sectoral assessments and to inform decisions at multiple scales. The final segment of the session will be devoted to an interactive moderated discussion of how the use of urban indicators for adaptation on the ground can continue to be improved, and how their use nationally — across more communities and with greater equity — can be supported.

Presenters:

Susan H Julius, EPA Office of Research and Development
Julie Blue, Eastern Research Group, Inc.
Rae Zimmerman, New York University
Maria Koetter, Louisville Metro Government, Louisville, KY

LETTERS FROM THE CARIBBEAN: APPROACHES TO CLIMATE RESILIENCE AND WHAT THE US CAN LEARN *(Hall of Ideas F)*

Symposium Organizer: Arianne Neigh, The Cadmus Group

Small Island Developing States in the Caribbean are both some of the most exposed and vulnerable countries to climate change, and, in many ways, have developed some of the most ground breaking adaptation techniques. Many of the adaptation measures taken in Caribbean nations are examples of ways coastal countries around the world can prepare for climate change. The symposium will discuss actions taken in the Caribbean to build local climate resilience through policy, data acquisition and analysis, planning, capacity building, and then, implementation. This proposed symposium includes brief presentations from practitioners and scientists working on climate change adaptation in the Caribbean, and a discussion about how these results can be used in the United States. To begin, we will discuss data collection and comparative analysis of vulnerabilities and stressor distribution across 33 countries in the Caribbean. Then, we will review the approach USAID uses to integrate climate risk management through the project life cycle. UNDP will introduce the National Adaptation Programmes of Action in five island states where resources are limited but needs both align and differ. Moving to the energy sector, we will discuss capacity building in Antigua and Barbuda to embed resilience goals into their energy plan and the development of an ask an expert resource. Finally, The Nature Conservancy will discuss their work on the ground to implement adaptation practices with communities in the region.

Presenters:

Colin Quinn, The Cadmus Group

Kyle Rearick, USAID

Donna Gittens, United Nations Development Programme Barbados

Kathryn Wright, The Cadmus Group

Montserrat Acosta-Morel, The Nature Conservancy

A MORE RESILIENT RURAL AMERICA: ACCELERATED RURAL ACTION FOR CLIMATE ADAPTATION *(Hall of Ideas G)*

Symposium Organizer: Gwen Griffith, Model Forest Policy Program

Climate resilience can only be fully realized when the rural natural resources are managed to prevent, respond to, and recover from climate impacts to farms, forests, fisheries, waters, infrastructure, and wildlife. Less than 20% of the U.S. population manages 95% of our land. Yet our rural communities are the least prepared for the impacts of extreme weather, fires, disease, invasive species, and more.

To meet this challenge, the Resilient Rural America Project (RRAP) is taking a new approach (www.mfpp.org/rrap). The goal is to accelerate rural climate adaptation by understanding rural priorities and strengthening the ability of climate service providers to meet the needs of underserved rural communities. The project uses a co-production process with rural leaders engaged in design and beta-testing of a training module - Rural Resilience to Extreme Weather: Integrating Land Use Strategies in Comprehensive Plans. This collaborative effort draws on expertise from the Model Forest Policy Program, International City/County Management Association, EcoAdapt, Geos Institute, and NOAA. In the symposium, service providers discover a new approach for rural adaptation; rural leaders find new pathways to natural resource adaptation; and urban leaders see the value of collaboration with rural partners.

Presentations and interactive exercises explore these topics:

- Scale and importance of rural resilience to all communities
- Adaptation priorities and capacity needs of rural community leaders
- Integration of rural adaptation into existing planning processes
- Co-production process to create and beta-test rural training module
- Use of existing adaptation resources in the Climate Resilience Toolkit

Presenters:

Gwen Griffith, Model Forest Policy Program

Tonya Graham, Geos Institute

Edward Gardiner, NOAA Climate Program Office

RESILIENT LAND USE AND ZONING: LESSONS LEARNED FROM THE BOSTON METRO REGION *(Hall of Ideas H)*

Symposium Organizer: Sasha Shyduroff, Metropolitan Area Planning Council

Land use planning, zoning, and design guidelines are critical tools that local governments have to shape the future of cities, including how to adapt and increase resilience in the face of climate change. Several communities in the Boston Metro area, including the members of the Metro Mayors Coalition Climate Preparedness Taskforce, the City of Boston, the City of Cambridge, and Town of Natick have worked to develop a suite of land use tools to address climate change impacts from sea level rise, extreme precipitation, and urban heat. Strategies include: resiliency checklist for new development and major retrofits; use of flood overlay districts; resilient infrastructure standards; and the development of a regional model-zoning ordinance/toolkit. This session will include presentations from the field on the best practices and lessons learned that may applied outside the region. The session will include a facilitated Q&A and discussion with audience participation.

Presenters:

Sasha Shyduroff, Metropolitan Area Planning Council

John Bolduc, City of Cambridge

Chris Busch, Boston Planning and Development Agency

Victoria Parsons, Town of Natick

MOVING FROM PLANNING TO IMPLEMENTATION: HOW INDIGENOUS COMMUNITIES ARE ACTING TO BUILD RESILIENCE *(Hall of Ideas I)*

Symposium Organizer: Shannon McNeeley, Colorado State University

Indigenuity Session 2 of 3: While communities have long been leaders in assessing the risk of climate change and planning to reduce those risks, there has always been a gap between planning and implementation. Now, thanks to the actions of a number of Indigenous communities and tribes from different regions of the country that gap is closing. Indigenous resilience and climate preparedness actions are generally built off a solid assessment and planning foundation that incorporates both traditional knowledges and western sciences. These actions take on varying forms and include everything from detailed forest restoration and infrastructure redesign projects to developing training programs and funding mini-resilience action grants. Come participate in a session that focuses specifically on implementation and hear directly from five different tribes on how they are turning adaptation plans into on the ground action. The session will start with a brief overview and engagement activity. That will be followed by short (8-10min) presentations by five different tribes and a moderated panel discussion highlighting opportunities for implementation, identifying and overcoming barriers to action, and how best to find funding and enhance community support for action. The session will conclude with 15 minutes of Q&A with the participants. We conducted a national survey through ITEP, Rising Voices, and other networks of the Indigenous peoples and climate change community to ask what sessions they wanted for NAF2019, and this was one of the top requested sessions. All speakers are confirmed except one.

Presenters:

Shannon McNeeley, Colorado State University

Michael Durglo, Confederated Salish and Kootenai Tribes

Tansey Smith, 1854 Treaty Authority

Scott Hauser, Upper Snake River Tribes Foundation

Jeff Grignon, Menominee Tribal Enterprises

Walter Nelson, Native Village of Napakiak

CREATING, MODELING AND SHARING INSIGHTS FROM RESILIENT AGRICULTURE AND FORESTRY SYSTEMS *(Hall of Ideas J)*

Presentations in this wide-ranging session include case studies on agriculture and forestry resilience from across the U.S. and Puerto Rico, new computational methods and frameworks to analyze food system resilience (including within cities), and a new virtual demonstration tool that allows farmers and land owners to share innovative adaptation practices. Food system resilience is discussed within both urban and rural contexts. The information that will be shared will be relevant to policymakers and practitioners as well as academics.

Presentations:

Developing an Urban Food System Resilience Framework to Assess Vulnerabilities to Extreme Weather Events,

Kimberly Zeuli, Initiative for a Competitive Inner City

Lessons from Ridge To Reefs' efforts supporting small farmers in Puerto Rico after Hurricane Maria,

Phal Mantha, Ridge to Reefs

Touring Climate-Informed Practices in Agriculture and Forestry 'As If You Were There',

Erin D Lane, USDA Forest Service

Modeling Change: A Computational Social Science Approach to Climate Change Adaptation in Agriculture,

Karen D Buchsbaum, Antioch University New England

CLIMATE ADAPTATION IN WISCONSIN PART 2: CLIMATE AND EXTREME EVENT IMPACTS TO HEALTH, INFRASTRUCTURE, AND CULTURE *(Meeting Rooms KLOP)*

Symposium Organizer: Daniel Vimont, University of Wisconsin - Atmospheric and Oceanic Sciences

Climate change has both direct and indirect impacts on society and the built environment. Impacts to—and interactions among—human health, energy production and transmission, and hydrological infrastructure, are some of the most visible and significant manifestations of climate change. Many of these impacts arise due to changes in extreme events, such as heat waves, drought, or extreme precipitation. In this session we will discuss expected changes to extreme climatic events, impacts of those events, and efforts at developing adaptation strategies for expected changes. While the focus will be on Wisconsin natural resources, the activities and techniques can be generally applicable. Time will be allotted for a question and answer period at the end of the session.

Presenters:

Stephen J Vavrus, Nelson Institute Center for Climatic Research

Colleen Moran, Wisconsin Division of Public Health

Catherine A Techtmann, University of Wisconsin Extension

Adam Bechle, Wisconsin Coastal Management Program

HOW A FOCUS ON HEALTH CAN EXPAND COLLABORATIONS AND ENHANCE CLIMATE RESILIENCE *(Meeting Rooms MNQR)*

Symposium Organizer: Ellu Nasser, Adaptation International

Focusing on the health impacts of climate change has potential to bring together diverse partners and enhance resilience in frontline communities. Collaborations built around health can address both systemic underlying resource and equity issues that create differential risk in these communities and acute climate-related stressors that turn vulnerabilities into health disparities. Health focused collaborations can span horizontally across sectors and provide a framework for vertical integration between local and state departments and agencies. This interactive session brings together experts from local to state health departments, federal agencies, national funding organizations, and frontline communities who aim to answer salient questions about coalition building in the climate and health realm. Through a discussion with experts and interactive break out groups we will collectively answer:

1. How do we leverage existing public health infrastructure to build climate resilience, particularly for frontline communities?
2. What is the greatest opportunity to move the needle by focusing on health?
3. Who is missing from our coalitions? How can we expand or adapt our engagement to bring new partners into the discussion?
4. How can we engage with and serve frontline communities who will be impacted first by impacts from climate change?
5. What are some of the biggest challenges we face in developing partnerships and coalitions to work on climate and health?
6. What can we learn from past successful public health or health equity campaigns and apply to climate resilience work?
7. What existing resources aid us in these coalition building efforts?

Presenters:

John Balbus, National Institutes of Health

Paul Schramm, Centers for Disease Control and Prevention

Aaron Ferguson, Michigan Department of Health and Human Services

Shamar Bibbins, The Kresge Foundation

Rahwa Ghirmatzion, PUSH Buffalo

Nicholas Tomaro, City of Milwaukee Health Department

■ 5:30pm to 8:00pm MARGARET A. DAVIDSON NETWORKING RECEPTION, CAKE TOOLS CAFÉ, AND POSTER SESSION

MARGARET A. DAVIDSON NETWORKING RECEPTION, CAKE TOOLS CAFÉ AND POSTER SESSION

Networking is the added value of any in person meeting. And few people know how to network better than Margaret A. Davidson. Not only was Margaret a leader in the field of adaptation but you probably knew her more than anyone else at the Forum because she was the consummate networker. In 2017, when we heard Margaret would be unable to attend the Forum, we wanted to make sure she was here in spirit, so we named the Tuesday Night Networking Reception in her honor — The Margaret A. Davidson Networking Reception. It is with deep sadness that we share that she passed away later in May 2017. While we will deeply miss her leadership, friendship, and vision, we encourage you to honor her memory by moving climate adaptation forward — networking and collaborating to build the practitioner base.

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.



■ CAKE TOOLS CAFÉ

Mezzanine Community Terrace

Compendium of Adaptation Approaches - USDA FS Climate Change Resource Center, Hannah Abbotts, Northern Institute of Applied Climate Science

US Coastal Property at Risk from Rising Seas - an interactive tool, Astrid Caldas, Union of Concerned Scientists

EcoDIVA: A Tool for Integrating Drivers of Ecological Drought to Support Pro-active Planning, Shelley Crausbay, Conservation Science Partners

What's Your Exposure?: Explore Past, Present, and Projected Climate Stressors with the Climate Explorer and Other Tools, LuAnn Dahlman, NOAA Climate Program Office

Climate Ready Communities: An assisted do-it-yourself climate adaptation program for small to mid-sized communities, Marni Koopman, Geos Institute

Hedging Bets for Biodiversity: TNC's Resilient Land Mapping Tool, Kimberly R. Hall, The Nature Conservancy

Bay Shoreline Flood Explorer: A Tool to Engage Governments and the Public in SLR Planning, Todd Russell Hallenbeck, San Francisco Bay Conservation Development Commission

Gulf TREE: Your Ultimate Climate Tool Selection Guide, Mikaela Heming, Northern Gulf of Mexico Sentinel Site Cooperative

Touring Climate-Informed Practices in Agriculture and Forestry 'As if You Were There', Erin D Lane, USDA Forest Service

Climate Assessments and Indicators from the U.S. Global Change Research Program, Allyza Lustig, US Global Change Research Program

Collaborative Cross-sector Systems Modeling with the Elephant Builder, Jessica Ruvinsky, Bellwether Collaboratory
Adaptation Workbook, Danielle Shannon, Northern Institute of Applied Climate Science

A Preview of the Georgetown Climate Center's Managed Retreat Toolkit, Katie Spidalieri, Georgetown Climate Center

City Data Explorer: Tools for Increased Resilience to Climate Extremes in the Missouri River Basin, Natalie Umphlett, High Plains Regional Climate Center

cake

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■ POSTER SESSION

Mezzanine Community Terrace

NATIONAL

- Fostering Just Community Resilience, Equitable Climate Change Adaptation and Mitigation Policies and Comprehensive Action Plans
 - Huda Alkaff, Wisconsin Green Muslims
- Assessing the State of Climate Adaptation in the Marine and Coastal United States
 - Kathryn Braddock, EcoAdapt
- Design and Planning Strategies for Climate Resilience
 - Gary Brown, American Society of Landscape Architects
- The iCASS Platform: Nine principles for landscape conservation design
 - Robert M. Campellone, U.S. Fish and Wildlife Service
- Expanding the role of human behavior in climate change adaptation: Proposed framework and practices
 - Jennifer Carman, University of Michigan
- The Role of Parks and Recreation in Extreme Environmental Events
 - Liliana Elizabeth Caughman, Institute for Sustainable Solutions, Portland State University
- Catalyzing Adaptation Projects In Your Agency: A Half-Day Workshop Model
 - Sarah Church, Alameda County
- Developing Case Studies and the Adaptation Resources for Agriculture: Responding to Climate Variability and Change
 - Adam W Dowling, USDA-NRCS
- Climate Planning with Multiple Knowledge Systems: The Case of Tribal Adaptation Plans
 - Miles Gordon, Ohio University George V. Voinovich School of Leadership and Public Affairs
- Resilience in the Built Environment: Building Design and Control in Uncertain Conditions
 - Sheila Hayter, American Society of Heating, Refrigerating and Air-Conditioning Engineers
- Inland Flooding: Challenges and Strategies for Identifying and Addressing Future Risk
 - Anne Herbst, Metropolitan Area Planning Council
- Vulnerability Assessments: Different Approaches, Outcomes, and Applications
 - Laura Hilberg, EcoAdapt
- Leveraging climate policy networks to improve adaptation
 - Derek Kauneckis, Voinovich School of Leadership and Public Affairs, Ohio University
- Legal Strategies to Promote Solar Energy, Public Health, and Climate Adaptation
 - Jill Krueger, Network for Public Health Law
- Leveraging Law to Reduce Public Health Consequences of Climate Change
 - Betsy Lawton, Network for Public Health Law - Northern Region
- Leveraging Network Analysis to Increase Equity and Inclusion: Ideas and Implications for Research and Practice
 - Ward Lyles, University of Kansas
- Tools and resources from the National Water Quality Monitoring Council
 - Madeline R Magee, Wisconsin Department of Natural Resources
- A review of vulnerability assessments conducted for the natural resources of the U.S. National Parks
 - Julia Michalak, University of Washington
- Resilient Water Infrastructure: Change at the District Scale
 - Pete Munoz, Biohabitats
- Planning to be Resilient: Climate Change Adaptation through Local Comprehensive Planning
 - Stacey Justus Nordgren, Foresight Partners Consulting
- Tribal Resilience Liaisons 2.0: Lessons Learned
 - Rachael Novak, Bureau of Indian Affairs
- Normal Weather and Utility Costs
 - Hugh Gilbert Peach, H. Gil Peach & Associates LLC
- Choose Your Own Adventure: Using climate fiction reading groups to promote equity and climate adaptation
 - Penn Pannel, University of Kansas
- A Small Business Disaster Resilience Study with Implications for Adaptation Planning across Geographies and Sectors
 - Jon Philipsborn, AECOM
- Improving Disclosure Laws so Home Buyers are Not Kept in the Dark about Flood Risk
 - Joel T Scata, NRDC
- Managing Managed Retreat
 - Stefanie Sekich-Quinn, Surfrider Foundation
- Resilient Power: Clean Energy Solutions for Vulnerable Communities Before and After Disasters
 - Annie Shapiro, Meridian Institute
- Assessing Community Vulnerability to Pollutant Releases from Waste Management Facilities Due to Extreme Events
 - Paramita Sinha, RTI International
- Exploring the Power of Story, Local Knowledge to Leverage Hazard Mitigation Plans for Holistic Adaptation
 - Kate Skaggs, Michael Baker International
- Curating a multi-agency set of Federal climate indicators
 - Laura Stevens, NCSU/CICS-NC
- Energy Planning for Community Resilience
 - Sherry Stout, NREL
- Climate Ready Communities
 - Geoff Weaver, Geos Institute
- Building Regional Adaptation Capacity and Expertise (BRACE) in Canada
 - Mary-Ann Wilson, Natural Resources Canada
- Tribal Soil Climate Analysis Network Outreach and Support for Agriculture and Forestry
 - Michael A Wilson, USDA-NRCS
- How resilient are our cities? Comparing 101 Resilient Cities' Policies and Programs
 - Sierra C Woodruff, Texas A&M University

☞ Student Posters

POSTER SESSIONS CONTINUED

INTERNATIONAL

36. Apples to Elephants: Assessing and Prioritizing Climate Risks Across Sectors in British Columbia
• Susan Asam, ICF
37. From the ground up: Simulating farmer socio-cognition and adaptive capacity in response to climate change ☞
• Karen D Buchsbaum, Antioch University New England
38. Dry Farming Collaborative: Developing global participatory climate adaptation research network
• Amy Garrett, Oregon State University Extension Service
39. New trends in reduction of CO2 emissions and climate vulnerability
• Martina Grecequet, University of Minnesota IonE
40. Showcasing Adaptation Examples in the Transportation, Buildings and Energy Sectors
• Sarah Hendel-Blackford, Navigant
41. Resilient and Vibrant - Case Studies Linking Adaptation and Mitigation Co-Benefits
• Rodrigo Leal, Navigant
42. Adaptation Finance in the Paris Agreement Era: Tracing the Adaptation Fund from negotiations to implementation
• Anna McGinn, University of Maine
43. Stakeholder Driven Climate Adaptation in the Lao People's Democratic Republic Power Sector
• Sherry Stout, National Renewable Energy Laboratory
44. Improving results through enhanced engagement in Canada's national assessment process
• Fiona Warren, Natural Resources Canada

CARIBBEAN

45. DUNAS: Descendants United for Nature, Adaptation, and Sustainability
• Amber Pairs, Center for Climate Change Impacts and Adaptation-Scripps Institution of Oceanography

GREAT PLAINS

46. Austin's Plan for Climate Resilient Assets and Operations
• Zach Forrest Baumer, City of Austin, Texas
47. Evaluating the Utility of a New Local Climate Risk Assessment Tool
• Rachel E Riley, Southern Climate Impacts Planning Program

HAWAII & PACIFIC ISLANDS

48. Knowledge Co-production Helps a National Assessment to have Local Relevance in the Pacific Islands
• Zena N Grezni, East-West Center

MID-ATLANTIC

49. Assessing Risk Posed to Large Marine Container Terminal Stemming from Sea Level Rise and Severe Storm Inundation
• Tom Allen, Old Dominion University
50. A Path to Trans-disciplinary Collaborative Design for Adaptation to Sea Level Rise
• Mason Andrews, Hampton University

51. Adapting Forest Management for Climate Change: A Framework for Building Adaptation into Practice
• Katy Barlow, The Nature Conservancy
52. Pivoting to the Future: Planning for Flood Resilience in Virginia Beach, Virginia
• Brian K Batten, Dewberry
53. Creating Green Space: A Process to Guide Acquisition of Residential Parcels in an Urban Landscape
• Joshua G Behr, Virginia Modeling, Analysis and Simulation Center
54. Using ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) Framework to Engage Coastal Residents
• Michelle Covi, Old Dominion University and Virginia Sea Grant
55. Building Partnerships for Coastal Resilience in Barnegat Bay, New Jersey
• Bari Greenfeld, US Army Corps of Engineers, Institute for Water Resources
56. Decision analysis of adaptation strategies managing heat island effects and increasing risks of heat waves ☞
• Rui Shi, Johns Hopkins University
57. The CCRFR - Applied Research for Decision Makers in Coastal Virginia, an Overview
• Emily E Steinhilber, Old Dominion University

MIDWEST

58. Climate Change Vulnerability Assessment in a Great Lakes Archipelago National Park
• Peggy Burkman, National Park Service
59. Will Relocation be the most Sustainable Adaptation Option for Banjul City in The Gambia? ☞
• Nfemara K Dampha, Natural Capital Project (Institute on the Environment, Uni. of Minnesota)
60. A Case Study Review: How climate indicators inform adaptation decisions at city, state, and regional scales
• Michael Kolian, U.S. EPA
61. Strategies across Scales - Adaptation Planning from Indiana Dunes to the greater Chicago Wilderness
• Katherine Moore Powell, The Field Museum
62. Community Resilience, Health Equity, and preserving our WEALTH (Water, Energy, Air, Land, Transportation, Health)
• Rachel Mysliwy, Climate + Energy Project
63. Mapping the Connections: Environment, Equity, Economics and Solutions for WEALTH (Water, Energy, Air, Land, Transportation, Health)
• Rachel Mysliwy, Climate + Energy Project
64. BLUEdot Adaptation Toolkit –case study review of a scalable project approach for rapid vulnerability assessments
• Ted Redmond, paleBLUEdot LLC
65. 100% Renewable Madison Report
• Stacie Reece, City of Madison
66. The "Bite, Snack, Meal" Approach to Climate & Health Communications
• Nissa A Tupper, Minnesota Department of Health

NORTHEAST

67. Integrated vulnerability assessment methods across natural resources, cultural resources and facilities, piloted at coastal parks
• Amanda Babson, National Park Service
68. Incorporating adaptation into traditional land protection programs
• Alison Branco, The Nature Conservancy
69. Building Climate Change Adaptation Capacity in Latinx Communities in Queens, NY
• Ellis Calvin, Regional Plan Association
70. Delaware's Climate Ready Workforce Pilot Project
• Jennifer de Mooy, Delaware Division of Climate, Coastal & Energy
71. A framework: creating community profiles for adaptation professionals to understand and engage in resilience planning
• Shameika N Hanson, The Nature Conservancy
72. MA Division of Ecological Restoration Partners with Local Organizations for Climate Adaptation and Habitat Restoration
• Beth Lambert, MA Division of Ecological Restoration
73. Building Bridges: How to create resilient transportation infrastructure through partnerships and other essential ingredients
• Jessica M Price, The Nature Conservancy
74. Maryland's Initiative: Building Resiliency through Restoration
• Bhaskaran Subramanian, MD Department of Natural Resources
75. The drinking water resilience gap: When is today's resilience rigidity tomorrow?
• Galen Treuer, University of Connecticut
76. Strategies to Advance Investments in Coastal Resilience Solutions in Boston ☞
• Angela Wang, Massachusetts Institute of Technology

NORTHWEST

77. Pacific Northwest Just Transition Listening Sessions: Reclaiming Regenerative Economy and Climate Resiliency
• Pah-tu Pitt, Confederated Tribes of Warm Springs
78. Adapting to wildfire in non-fire adapted forest systems
• Crystal L Raymond, UW Climate Impacts Group
79. Setting the Stage for the Adaptation of High-Elevation Pines
• Austin Rempel, American Forests
80. Development of a comprehensive sea level rise preparedness strategy in King County, Washington
• Jim Simmonds, King County Department of Natural Resources and Parks
81. Culturally Relevant Climate Communications in Immigrant & Refugee Communities
• Jamie Stroble, King County
82. Blackfeet Climate Change Adaptation: Building a Coalition of People Committed to Collaborative Preparedness
• Gerald O Wagner, Blackfeet Environmental

SOUTHEAST

83. Use of Actionable Climate Information for Water Supply Operation and Planning
• *Tirusew Asefa, Tampa Bay Water*
84. North Coast Resilience - Nature Based Flood Projects in Horry and Georgetown Counties, South Carolina
• *Joy Brown, The Nature Conservancy - South Carolina Chapter*
85. Collaborative Coastal Resilience Planning in the Tampa Bay region of FL
• *Libby Carnahan, University of Florida IFAS Extension*
86. Keeping Miami Above Water: Translating Sea Level Rise Science Into Budgets and Capital Plans
• *Karina Castillo, Office of Resilience, Miami Dade County*
87. Climate Change and Conservation in the Southeast: A Review of State Wildlife Action Plans
• *Patty Glick, National Wildlife Federation*
88. After the assessment: Informing and prioritizing projects and strategies to build resilience
• *Matt Hutchins, NEMAC+FernLeaf*
89. Focusing the Frame: Engaging and Connecting with Your Resilience Audience
• *Karin Rogers, UNC Asheville's NEMAC*
90. Transferring Climate Adaptation Knowledge and Tools from New England to Georgetown, South Carolina
• *Maeve Snyder, North Inlet - Winyah Bay NERR*
91. Exploring Integrating Adaptation into a State Wildlife Agency with the Climate Adaptation Explorer
• *Lily Swanbrow Becker, Florida Fish and Wildlife Conservation Commission*
92. The Science and Art of Building Community Resilience
• *Katelyn Widness, Kimley-Horn and Associates*
93. Achieving Sustainability through Education and Economic Development Solutions (A SEEDS) Initiative
• *Romona Taylor Williams, North Montgomery Citizens United for Prosperity (MCUP)*

SOUTHWEST

94. Evaluating Social Resilience Capacity through Networks in Maricopa County, AZ
• *Karina French, Institute for Sustainable Communities*
95. Connecting Wildlands and Communities: Planning for climate-ready landscapes in southern California
• *Megan K Jennings, San Diego State University*
96. Fort Collins Municipal Sustainability and Adaptation Planning Process
• *Katy McLaren, City of Fort Collins, Colorado*
97. From Metaphor to Measurement: Modeling Climate Change Vulnerability and Resilience on Tribal Lands
• *Anna Elisabeth Palmer, Ohio University Voinovich School of Leadership and Public Affairs*
98. The Art of Change: Inspiring Climate Engagement Through Community Art Initiatives
• *Alexandria Warneke, Climate Science Alliance*

COASTS

99. Gulf of Mexico Climate and Resilience Outreach Community of Practice: A Model for Adaptation Dialogue
• *Libby Carnahan, University of Florida IFAS Extension*
100. Restoring Regulation - San Francisco Bay Plan Amendment to Improve Permitting for Wetland Restoration
• *Megan Hall, San Francisco Bay Conservation and Development Commission*
101. California Coastal Conservancy Climate Ready Program
• *Kelly Malinowski, California State Coastal Conservancy*
102. Virtual Reality Exploration of coastal flooding in future climate projections 🏠
• *Alexandre Martinez, University of California, Irvine*

103. Emergent Groundwater and Sea Level Rise, the Silent and Largely Unknown Underground Threat
• *Abby Mohan, Silvestrum Climate Associates*
104. Climate- Health, Wholeness and Faith- praying our future
• *Kristina Joy Peterson, Lowlander Center*
105. A habitat vulnerability assessment tool as a starting point for land managers creating adaptation plans
• *Jennifer Plunket, North Inlet-Winyah Bay National Estuarine Research Reserve*
106. Community Resilience in West Palm Beach, Florida: Investing Today for a Better Present and Future
• *Penni Redford, City of West Palm Beach*
107. Sea Level Rise and Polar Ice Sheets: How to deal with 'What If?'
• *Ted Scambos, ESOC/CIRES University of Colorado Boulder*
108. Canadian Collaborative Actions on Coastal Adaptation under Canada's Adaptation Platform
• *John Sommerville, Natural Resources Canada*
109. A League of Our Own: Delaware's Resilient And Sustainable Communities League (RASCL)
• *Danielle Swallow, DE Sea Grant*
110. Salt marsh vulnerabilities to sea level rise: linking assessment to adaptation in the Delaware Estuary
• *Jordan M West, U.S. Environmental Protection Agency*
111. Building Coastal Resilience in Georgia: Camden County's 'Rise Ready' Flood Risk Decision Support Tool
• *Ashby Nix Worley, The Nature Conservancy*



Student Posters

Posters will be up for the duration of the Forum.



- 7:00am to 8:00am **BREAKFAST**
Lakeside Exhibition Hall
- 7:00am to 5:30pm **REGISTRATION**
Registration Desk
- 7:00am to 5:30pm **EXHIBITS**
Capital Promenade and Grand Terrace
- 8:00am to 10:30am **WORKING GROUPS AND TRAININGS 1**

PRIORITIZING SOCIAL EQUITY IN BUILDING CLIMATE — SAFE INFRASTRUCTURE *(Madison Ballroom A)*

Working Group Organizer: Juliette Finzi Hart, US Geological Survey

Through recent legislation in California, the state established the Climate-Safe Infrastructure Working Group, which was tasked with identifying barriers to and strategies for how CA state architects and engineers can incorporate forward-looking climate information in their infrastructure planning, design and implementation. It became evident quickly that this was not a project just about science. Lack of infrastructure investment and deferred infrastructure maintenance has plagued the state for decades. Due to underinvestment and redlining, low-income communities and communities of color often confront the most outdated school buildings, the leakiest pipes, and the worst connectivity to modern transportation, communication and other infrastructure. Similarly, inadequate engagement during the infrastructure planning and decision-making processes, systemic disadvantages through misguided decision criteria and cost-benefit requirements, and long-standing institutionalized racism further exacerbate inequitable investment in infrastructure. We will provide an introductory presentation about the “Climate-Safe Path for All” framework developed by the working group. We will have a brief panel with leading experts who will provide insights on how to ensure social inclusion in all aspects of infrastructure planning, financing and implementation. We will then have world café-style discussions in which attendees will work through the five parts of our framework to action: 1) what science is needed; 2) how do we ensure inclusivity in planning; 3) what are key governance barriers; 4) what are key financing barriers; 5) how do we implement equitably? Discussions will be shared among attendees. We will close with brainstorming on how to bring these discussions back to each attendees’ respective states.

Co-Organizers:

Omar Carrillo Tinajero, Center for Community Investment
Chione Flegal, PolicyLink
Susanne Moser, Susanne Moser Research & Consulting
Christy Veeder, Jobs to Move America

AGRICULTURAL ADAPTATION FOR CLIMATE RESILIENCE: CHALLENGES AND OPPORTUNITIES FOR TECHNICAL ADVISORS *(Madison Ballroom B)*

Working Group Organizer: Julie Doll, Michigan State University

Farmers and ranchers have managed weather risk for thousands of years, but new risks associated with climate change necessitate more proactive, directed adaptation efforts. Agricultural adaptation offers unique opportunities and barriers to effective climate change adaptation. Despite the growing awareness of the potential for agriculture to deliver climate solutions, adoption of conservation practices to realize this potential remains low. Research points to a number of barriers to adaptation: perceptions of climate change, advisors’ lack of confidence communicating about climate change and effective adaptation options, few opportunities for collaborative adaptation programming, and insufficient return on agricultural resilience investments. Farmer advisors — including extension, agency, and private sector consultants — are uniquely positioned to help crop and livestock producers reduce risks and capture new opportunities through ecosystem-based, climate-resilient adaptation strategies. As trusted sources of information, advisors can help farmers identify new weather-related challenges, plan adaptive responses, and advocate for increased public and private investments in agricultural climate solutions. This workshop brings together technical advisors working with crop and livestock producers to explore barriers and opportunities for reducing climate risk and enhancing climate resilience for their clientele. Framed by an overview of adaptation resources that reduce climate risk and enhance the resilience of agricultural businesses, panelists

will facilitate discussions on three topics: 1) effective outreach and coaching strategies; 2) useful agricultural adaptation resources; and 3) gaps in resources, programming, and networks. The insights gained through this working group will be published as an article in a journal in order to inform agricultural extension and outreach more broadly.

Co-Organizers:

Jeffrey Andresen, Michigan State University
Tim Boring, Michigan Agri-Business Association
Adam Dowling, Natural Resource Conservation Service-USDA
Laura Edwards, South Dakota State University Extension
Monica Jean, Michigan State University Extension
Laura Lengnick, Cultivating Resilience, LLC.
Hans Schmitz, Purdue Extension
Marilyn Thelen, Michigan State University Extension

ARE FEDERAL LAND MANAGERS READY AND SET FOR STEWARDSHIP ECOLOGICAL TRANSFORMATION? *(Madison Ballroom C)*

Working Group Organizer: Gregor W Schuurman, National Park Service

Global change-driven ecological transformations on federal lands increasingly challenge traditional resource management approaches and paradigms. In this rapidly changing world where managers often have limited ability to control ultimate drivers or resist/reverse ecological responses, longstanding concepts of historical range of variability (HRV) and naturalness are less and less useful for decision making. Managers in this “brave new world” face difficult choices and important opportunities to influence ecological trajectories at local, regional, and continental scales, as they work along a management spectrum from resisting, to accepting, to actively directing ecological change. What a natural resource manager seeking to work with change most fundamentally lacks, however, are goals and objectives that are more specific and realistic than naturalness, HRV, and biodiversity conservation. Managers need clear concepts and training in stewarding ecological transformation (SET), and mechanisms to coordinate transformation management across agencies and management units. The SET working group (composed of representatives from federal land management agencies, plus the USGS) is working to help federal land managers understand, plan for, and respond to ecological transformation—based on the best available science—to maximize conservation of species, ecosystems, and ecosystem services. We intend to develop concepts, frameworks, and training opportunities to help managers navigate the “who, why, where, when, how, and what” of SET and coordinate transformation stewardship across scales. NAF-2019 is an important opportunity to share these preliminary products with a broader audience in a participatory session; we want to hear from you about where we should be going.

Co-Organizer:

Dawn Magness, U.S. Fish and Wildlife Service

LEARNING & EVALUATION TOOL: MOVING FROM COMMUNITY ENGAGEMENT TO OWNERSHIP *(Madison Ballroom D)*

Training Organizer: Victoria Anne Benson, Movement Strategy Center

Local government staff and elected officials play critical roles in helping facilitate systems changes to elevate community priorities and decrease inequities in low-income communities and communities of color. Community leaders must also play central roles in determining the solutions and outcomes in their own communities. This session focuses on how collaboration between community-led organizations/committees and local governments can accelerate solutions implementation and solution viability. This training session focuses on a framework for “Collaborative Governance” and the application of a tool for building collaborative governance called the Spectrum of Community Engagement to Ownership. The tool was co-developed by Movement Strategy Center, Facilitating Power, and the National Association of Climate Resilience Planners through a collective learning and evaluation process with local government staff, community-based organizations and committees, and non-governmental organizations. In this interactive session, participants will have a chance to engage with the tool, which acts as a guide for stakeholders working to progress developmentally towards community-driven governance models for more effective adaptation efforts. Community leaders and local government staff will share examples of their work to build collaborative governance in order to co-develop solutions grounded in a shared

analysis of root causes that promote community ownership over the future for their communities. Participants will also learn the benefits of collaborative governance as it increases capacity and leadership of stakeholders within and outside of government to develop more holistic, effective adaptation plans rooted in a community-strengths based approach. Panelists will also share how collaborative processes cultivate commitment for moving beyond planning to implementation.

Co-Organizers:

Leah Bamberger, City of Providence,

Melissa Deas, District of Columbia

Vatic Kuumba, Racial and Environmental Justice Committee of Providence

Sarah McKinstry-Wu, Urban Sustainability Directors Network

Jonna Papaefthimiou, City of Portland

Pol Tavares, Racial and Environmental Justice Committee of Providence

Clyde Thompson, Equity Advisory Group of Ward 7, Washington, D.C.

CULTURAL COMPETENCY, COLLABORATION & ENVIRONMENTAL EQUITY IN ADAPTATION: ISLAND AND SEA LIVING EXAMPLES OF THE GULLAH/GEECHEE *(Hall of Ideas E)*

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

Members of the Gullah/Geechee Sustainability Think Tank will provide an interactive training session that incorporates the traditional knowledge of the Gullah/Geechee Nation and current electronic tools that they are using to engage the Sea Island community. This multi-disciplinary group teaches ways to collaborate that insure cultural competency and equity in adaptation. In the face of sea level rise, increasing intensity of hurricanes, and other effects of climate change, this group has been able to increase community capacity and engagement amongst the indigenous population in adaptation planning and continued resilience. There are a variety of strategies that research teams have successfully employed, and there are also some common pitfalls to avoid in order to build research communities and co-produce knowledge. Participants in this interdisciplinary interactive training will come away with the tools that they can use to successfully co-produce knowledge and provide equity in their adaptation strategies.

Co-Organizers:

Astrid Caldas, Union of Concerned Scientists

Kate Derrickson, University of Minnesota

Dan Rizza, Climate Central

Glenda Simmons-Jenkins, Gullah/Geechee Cultural Heritage Committee of Northeast Florida

SAILING THE RESILIENCE SEAS—HANDS-ON TRAINING WITH NEW TOOLS FOR EVERY STEP OF THE RESILIENCE JOURNEY *(Hall of Ideas F)*

Training Organizer: Sascha Petersen, Adaptation International

Indigenuity Session 3 of 3: When it comes to climate change vulnerability assessments and adaptation plans, you've seen the presentations and read the reports, but that isn't the same as getting your hands dirty and starting your own assessment. The session starts with an orientation to the steps for building resilience and resources designed specifically for and available to enhance tribal resilience. Speakers then lead a discussion and training session focused on each phase of the resilience process. Participants will work with their colleagues in a series of mini-workshops.

- Getting Started - Nikki Cooley (Institute for Tribal Environmental Professionals)—summarizes how to get started in adaptation, identifying a vision and goals for the tribe's efforts, and highlights ITEP's adaptation toolkit.
- Considering Integration of Traditional Knowledges - Joe Hostler (Yurok Tribe)—provides an overview of how to use the Guidance for Using Traditional Knowledges in Climate Change Project throughout the resilience building process.
- Gathering Information and Assessing Vulnerability - Meade Krosby (University of Washington)—describes approaches and resources available to assess vulnerability.
- Plan for Action - Sascha Petersen (Adaptation International)—highlights how to gather, assess, and prioritize adaptation actions.
- Taking Action - Kyle Powys Whyte (Michigan State University)—describes what it takes to move into implementation and monitoring actions as well as in-person learning opportunities such as the Tribal Climate Camp.

The training session will end with cross-group sharing and discussion of key challenges and opportunities with different approaches to adaptation.

Co-Organizer:

Nikki Cooley, Institute for Tribal Environmental Professionals

TRANSFORMATIONAL RESILIENCE AND THE ADAPTIVE MIND *(Hall of Ideas G)*

Training Organizer: Emily Ann Wasley, The Cadmus Group

We are headed into a world of rapid change, great uncertainty, surprises and in some instances outright not-knowing; we are also collectively headed into a world of more frequent, traumatic disruptions; and we are seemingly barreling down a road of transformative change. Adaptation professionals have chosen to support adaptive, sometimes transformative, change through their work, and they themselves live in the very communities that are affected by climate change and other acute and chronic stressors. Thus, they are asked to serve those in need at the same time that they themselves must adjust to and cope with the change afoot. Few if any, however, are explicitly trained in the necessary skills to do so. In this interactive session, we will introduce the research behind personal resilience, the importance of practicing preventative self-care and available tools, the American Society of Adaptation Professionals (ASAP) Personal Resilience year-long cohort, and a new multi-year project, called the Adaptive Mind.

Co-Organizer:

Susanne Moser, Susanne Moser Research & Consulting

USING CITIZEN SCIENCE, COLLECTIVE LEADERSHIP, AND LOW-COST MEASUREMENTS TO ASSESS AND ADDRESS EXTREME HEAT *(Hall of Ideas H)*

Training Organizer: Jeremy Scott Hoffman, Science Museum of Virginia

This session will introduce participants to a collective leadership model for conducting urban heat island assessments (UHIA) using low-cost measurements. Concerns about extreme heat can activate communities to find solutions. Our assessment technique offers a means to identify hazards and advance targeted mitigation efforts. We will review extreme heat, its implications, and trends in its assessment. We will share lessons learned from two case studies: The City of Richmond Urban Heat Island Collective, a group of government, museum, non-profit, and university organizations advancing local climate resilience; and the City of Portland's Climate Action Collaborative, a city-university partnership to build resilience to local climate change impacts. Following the overview, participants will collaboratively co-develop a UHIA plan for a city within geographically-themed groups. Participants will simulate a collective leadership framework to plan their local UHIA, which includes identifying collaborations, forming shared goals, and coordinating action. Emphasis will be given to co-producing the campaign with community groups, recruiting diverse volunteers, and communicating using accessible, policy-relevant language. Technical skills will include mapping target areas for conducting the heat campaign using a novel Google Earth platform. Participants will be introduced to tools and methods that support an UHIA in their own region. Goals include participants effectively engaging with citizen scientist volunteers, co-creating maps and visualizations, leveraging youth resilience education initiatives, and identifying opportunities to engage with citywide planning. Finally, participants will leave this session with the roots of a proposal to assess extreme heat in their locality during the summer of 2019.

Co-Organizers:

David Herring, National Oceanic Atmospheric Administration

Vivek Shandas, Portland State University

Alicia Zatzoff, City of Richmond

THE WIND TUNNEL TOOL: NAVIGATING UNCERTAINTY AND VULNERABILITY TO MEASURE RESILIENCY *(Hall of Ideas I)*

Training Organizer: Sarah M Diefendorf, EFCWest

How do we know where we are most vulnerable to climate change? What stakeholders do we need in the room? How proposed strategies impact diverse stakeholders? What strategies are most likely to allow communities to adapt to climate events, and bounce back when they occur? Join us in this fun and active training session to learn and apply a four-part tool that will help you guide communities through the vulnerability assessment process.

First, we prioritize our community assets — stakeholders and resources that are most important and relevant to the group. Next, participants consider what strategies they would like to test with the highest prioritized community assets (groups select from proposed strategies that have been cultivated from the Green New Deal, and they may also create their own). Using a systemic tool, participants then imagine how the community assets behave under the different strategies. Finally, we explore how the different assets performed in our test of different strategies, and identify where the strategies were effective, and where vulnerabilities still exist. This exercise often reveals unintended consequences, both positive and negative.

Co-Organizer:

Elaine McCarty, EFCWest

HOW TO INCORPORATE HUMAN HEALTH EXPOSURES, IMPACTS, AND STRATEGIES INTO ADAPTATION PLANNING FOR TRIBAL COMMUNITIES (Hall of Ideas J)

Training Organizer: Angie Hacker, Prosper Sustainably

Some of the most tragic impacts of climate change are projected to come in the form of illness, injury, and death, which will disproportionately impact the most vulnerable members of a community. A comprehensive tribal climate change adaptation plan can help a Native American tribal community better understand, prepare for, and protect against such impacts. However, many adaptation plans place greater emphasis on environmental, infrastructural, or other issues and do not adequately analyze human health concerns. This may be because there can be an overwhelming amount of potential human health impacts and limited resources to obtain, understand, or analyze this information. This training will provide steps, tools, templates, and other resources that seek to streamline the adaptation planning process and make it easier for tribal health and environmental professionals to understand and address human health exposures and impacts within tribal communities. This training will summarize the latest data and literature on the exposures and impacts of climate change that may impact the health tribal community members. It will also describe how to identify and select appropriate strategies to address these exposures and impacts. This training originates from the Tribal Climate Health Project (TCHP) (www.tribalclimatehealth.org), a grant funded project being administered by the Pala Band of Mission Indians to help tribal communities across the country build capacity to address the health impacts of climate change. The TCHP is developing a comprehensive online training course and platform for this purpose which includes an extensive and growing clearinghouse of relevant information and resources.

Co-Organizer:

Shasta Gaughen, Pala Band of Mission Indians

INSTITUTIONALIZING CLIMATE CHANGE INTO DECISION-MAKING: DISCUSSIONS ON ORGANIZATION-WIDE TRAINING STRATEGIES & OVERALL WORKFORCE STATE (Meeting Rooms KLOP)

Working Group Organizer/Moderator: Daniel M Kreeger, Association of Climate Change Officers

Successful organizations will design programs and products, build cities and infrastructure, and run businesses and institutions with an eye toward planning and preparing for prospective and likely changes to climate norms. Doing so requires forward-thinking organizations to re-evaluate governance, job descriptions, performance expectations and training requirements—and standardization of those efforts across institutions and sectors.

The Association of Climate Change Officers (ACCO) invites you to a session that will:

- Provide insights for an organization-wide approach to building climate literacy and competencies and sustaining that capacity over the long-term
- Share findings from recent research contracted by the U.S. Department of Homeland Security on climate preparedness in critical infrastructure sectors; and
- Discuss the state of professional credentialing, workforce development, training and practice standardization.

Panelists:

Matthew Fleming, Maryland Chesapeake & Coastal Service
Nancy Gassman, Public Works, Sustainability, City of Fort Lauderdale
Erin Cummings, U.S. Department of Homeland Security
Gavin Dillingham, Clean Energy Policy, Houston Advanced Research Center

Richard DeVoe, South Carolina Sea Grant Consortium
Jeff Yorzyk, International Society of Sustainability Professionals & HelloFresh
Daniel Kreeger, Association of Climate Change Officers

TOOLS TRAINING (Meeting Rooms MNQR)

Training Organizer: Jessica Hitt, EcoAdapt

The CAKE Tools Training is your opportunity to learn about the field’s preeminent climate change tools from the experts themselves! During this interactive session, you’ll receive a hands-on lesson about the best ways to use each tool as well as opportunity to pose questions to the experts themselves. Experts will guide you through examples and best practices through a hands-on lesson you simply can’t get from reading a user manual. Whether you are interested in visualizing data or making adaptation decisions, the Tools Training will have something for you!

Co-Organizer:

Tera Johnson, EcoAdapt

- 10:30am to 11:00am **BREAK**
- 11:00am to 12:30pm **CONCURRENT SESSIONS 4**

CLIMATE & HEALTH ADAPTATION IN THE HEARTLAND (Madison Ballroom A)

Symposium Organizer: Nissa A Tupper, Minnesota Department of Health

Climate change is occurring in the Midwest with serious consequences for human health and wellbeing. America’s Heartland is becoming measurably warmer and precipitation patterns have become more erratic. Air pollution, extreme heat, flooding, drought, and ecosystem threats are increasing in frequency and severity and threatening our health. These hazards can impact health in acute and chronic ways, yet many of the impacts are best reduced or adapted to by sectors outside of traditional public health. This symposium will showcase how four Midwest states are bridging from health to other sector professionals to build local climate resilience through partnership. Grantees from the Centers for Disease Control and Prevention’s (CDC) Climate Ready States and Cities Initiative, including Illinois, Michigan, Minnesota, and Wisconsin, will each highlight a climate and health adaptation intervention implemented at state and local levels that was made possible by working with cross-sector partners. By building working relationships with built environment professionals, emergency preparedness and management professionals, clinicians, and community partners to champion climate and health, these Midwest states are helping close the gap between climate vulnerability and climate resilience. Now, more than ever, is a critical time to pursue these coordinated adaptation interventions and build cross-sector capacity, as many of these climate hazards are expected to increase in the future, occurring more often and with greater magnitude.

Presenters:

Elana Grossman, University of Illinois at Chicago, School of Public Health
Aaron Ferguson, Michigan Department of Health and Human Services
Nissa A Tupper, Minnesota Department of Health
Megan Christenson, Wisconsin Department of Health Services

COMMUNICATING THE VALUE OF CO-PRODUCTION AND SOCIAL NETWORKS FOR CLIMATE ADAPTATION (Madison Ballroom B)

Symposium Organizer: Chelsea Combest-Friedman, NOAA Regional Integrated Sciences and Assessments

Climate information alone rarely impacts decisions, making long-term, sustained engagement between researchers and decision makers important for the integration of science into decision contexts. Significant investments made by U.S. federal agencies in the co-production of climate science demonstrate the perceived value of this relatively new and evolving area of research and practice. Demonstrating the value of these efforts is important for the continuation of public funding and to better understand opportunities for improving the practice. However, appropriate methods to demonstrate the value of investments in co-production and social networks are not well understood, can be difficult to implement and the results are challenging to communicate effectively. This session will open a dialogue about opportunities and strategies for communicating the value

of co-produced climate science and efforts to build social networks for climate adaptation. We will support the discussion by showing two short videos that describe the value of co-production processes through the lens of local actors. The videos aim to convey the personal experiences and the scientific context behind how decision-makers and communities are facing, dealing with, and adapting to the realities of a changing climate, while highlighting a given intermediaries' role in helping them to do so. Short presentations will describe some of the challenges encountered in communicating the value of this work, including at local to regional scales, and describe some opportunities to do so through story telling. A discussion will be facilitated in small groups to capture additional experiences and strategies.

Presenters:

Ned Gardiner, National Oceanic Atmospheric Administration
Sarah Watson, Carolinas Integrated Sciences & Assessments/Sea Grant
Chelsea Combest-Friedman, NOAA Regional Integrated Sciences and Assessments

PART I - ADAPTATION FINDINGS FROM THE FOURTH NATIONAL CLIMATE ASSESSMENT AND LOCAL EXPERIENCES (*Madison Ballroom C*)

Symposium Organizer: Susan Herrod Julius, US Environmental Protection Agency

This is the first of a two-part Symposium. Part I focuses on the Fourth National Climate Assessment (NCA4) (Volume 2) Urban, Coastal, and Regional chapters' adaptation findings, and interactive poster session (all regional chapters) and discussion with attendees. The NCA4 (Volume 1) reports that changes in average climate conditions and climate extremes are happening and are expected to continue. Adaptation is key to instilling resilience into our cities, rural areas, regions, and nation. Volume 2 identifies climate-related risks facing society, and examines the state of adaptation science and practice across the country. Cities, states, businesses, and other stakeholders are looking for proactive and innovative measures to comprehensively address risks from unprecedented climate conditions and rates of change. This session showcases three themes about adaptation that emerged from NCA4: risk management approaches, cross-sectoral coordination, and social equity. It begins with short introductions to key messages from NCA4 related to the science and state of practice for adaptation generally, and for the coasts, Midwest region, Pacific Northwest, and cities, specifically. An interactive learning session follows, with participants viewing and discussing posters with NCA4 authors on report findings related to the three themes. Participants will share pressing problems and solutions related to the themes. In the second session, local practitioners present case studies, followed by a large group discussion of recurrent themes and synthesis of lessons learned.

Presenters:

David Reidmiller, U.S. Global Change Research Program, Moderator
Robert Lempert, RAND Corporation
Juliette Finzi Hart, United States Geological Survey
Kris May, Silvestrum
Jim Angel, University of Illinois
Keely Maxwell, U.S. Environmental Protection Agency

UNCHARTED WATERS: LEGAL RISKS AND PATHWAYS FOR CLIMATE ADAPTATION (*Madison Ballroom D*)

Symposium Organizer: Deanna Moran, Conservation Law Foundation

In this symposium, practitioners will discuss the evolving legal landscape government entities face in the age of climate change and potential liabilities for acting or failing to act on climate risks. Preparing for and addressing these risks will require a transformation of existing regulatory frameworks and rethinking decades-old approaches to land use, risk management, and other considerations. Practitioners will discuss cutting-edge research and case studies about overcoming these legal obstacles to proactively adapt to climate change and discuss how government entities can leverage non-governmental partners to achieve adaptation goals. This symposium will allow for interactive discussion about how local governments can navigate and overcome legal barriers to adaptation. During the interactive portion, participants will have an opportunity to share adaptation policies and projects they are considering and discuss the legal and policy questions they are navigating as well as social and political barriers.

Presenters:

Elena Mihaly, Conservation Law Foundation
Deanna Moran, Conservation Law Foundation
Jessica Grannis, Georgetown Climate Center
Julia Wyman, Roger Williams University School of Law/Rhode Island Sea Grant Program

LINKING THE SCIENCE OF ECOLOGICAL TRANSFORMATION TO RAD DECISIONS (*Hall of Ideas E*)

Symposium Organizer: Shelley Crausbay, Conservation Science Partners

Climate change has the potential to transform ecosystem composition, structure, function, and services in profound ways that persist. However, the climate-adaptation community to date has largely focused on plans that anticipate resistance and resilience. As managers shift toward making decisions about managing ecological transformation, the best available science must be ready. A working group comprised of several US Federal land management agencies (Stewarding Ecological Transformation [SET]) is developing a framework to address this challenge. This framework defines a decision space in which managers choose RAD pathway(s) to resist, accept, or direct (RAD) change. This session will showcase how different scientific approaches can support different RAD decisions points. We will highlight models from paleorecords to show where the risk of ecological transformation is high, to map where directing change might be most needed and equitable. We will explore early warnings of ecological transformation from monitoring data to understand when transformation might happen and how to link advance notice to decisions. We will explore demographic models of recruitment after disturbance to better understand how transformation happens, and how disturbance creates opportunities to direct transformation if plans are ready. Finally, we will explore state-and-transition models to understand what systems may transform into, to help managers determine whether to accept autonomous change based on whether it is congruent with socio-ecological goals. Our symposium will end with a 30-minute session on how to effectively link science to RAD decisions. Now is the time to co-produce transformation science to support decision-making in land management agencies.

Co-Organizers:

Stephen Jackson, Southwest Climate Adaptation Science Center
Robin O'Malley, North Central Climate Adaptation Science Center

Presenters:

Stephen Jackson, Southwest Climate Adaptation Science Center
Robin O'Malley, North Central Climate Adaptation Science Center
Shelley Crausbay, Conservation Science Partners
Steve Carpenter, University of Wisconsin-Madison
John Bradford, USGS Southwest Biological Science Center
Brandon Bestelmeyer, USDA Agricultural Resource Service
Karen Prentice, U.S. Bureau of Land Management

MEASURING THE CLIMATE RESILIENCE OF AFFORDABLE HOUSING STOCK (*Hall of Ideas F*)

Symposium Organizer: Melissa Deas, Government of District of Columbia

In 2016 the District of Columbia released Climate Ready DC, a plan to make the District more resilient to future climate change. Recognizing that climate change will have the greatest impact on the most economically and physically vulnerable residents, the DC Department of Energy and Environment set out in 2017 to create and implement a tool to assess the vulnerability of the District's affordable housing stock to the impacts of climate change. A grant was awarded to a team led by Enterprise Community Partners to develop an assessment tool that would enable users to evaluate a property's potential vulnerability, identify resilience upgrades, including the installation of solar plus battery storage systems, and deploy the tool on 20 properties across the District. The tool has since been completed and is available as a public resource. Join staff from DC's Department of Energy and Environment and the grant team who developed and implemented the tool with representatives from Enterprise and New Ecology for an interactive workshop. You will learn about how the tool was developed and lessons learned along the way, with a chance to apply the assessment tool to a sample building. Attendees will leave ready to apply this tool to properties in their own community or portfolio.

Presenters:

Kathleen Berube, National Housing Trust
 Melissa Deas, District of Columbia Department of Energy and Environment
 Frederick Zindell, Enterprise Community Partners
 Tom Chase, New Ecology Inc.

BREATHING LIFE INTO MANAGED RETREAT: ACCOUNTING FOR HUMAN AND NATURAL RESOURCE MIGRATIONS IN COASTAL RELOCATION DECISIONS *(Hall of Ideas G)*

Symposium Organizer: Katie Spidalieri, Georgetown Climate Center

As sea levels rise and hurricanes become more frequent and intense, state and local governments will increasingly be confronted with questions about relocating coastal development out of harm's way through "managed retreat." This session will identify gaps in emerging land use strategies to move development out of vulnerable coastal areas where the two "living" elements of humans and natural resource management may be "siloed" and explore ways to better integrate those two elements into holistic land use decisions. Featuring presentations on federal, state, and local efforts from across the country that are addressing questions of shifting human, wildlife, and plant species in response to sea-level rise, this session will initiate discussion on how existing processes can be improved, or where innovation may be needed, to proactively prepare for, acquire, and protect upland properties and provide necessary community (e.g., housing, jobs, infrastructure) and ecosystem (e.g., flood resilience) services for different types of people relocating because of the effects of climate change. This session will also share examples and first-hand accounts of how sea-level rise, floods, and home buyouts are directly impacting people and habitats on the ground and how state and local governments can minimize the impacts of managed retreat on communities and maximize benefits for natural resources and systems.

Presenters:

Katie Spidalieri, Georgetown Climate Center
 Colette Pichon Battle, Gulf Coast Center for Law and Policy
 Sherri Brokopp Binder, BrokoppBinder Research and Consulting
 Chris Hilke, National Wildlife Federation
 Fawn McGee, New Jersey Blue Acres Program, Department of Environmental Protection

TRANSFORMING DATA INTO ACTION: BEST PRACTICES FOR INTEGRATING SEA-LEVEL RISE SCIENCE INTO DECISION-MAKING *(Hall of Ideas H)*

Symposium Organizer: Katy Hintzen, Hawaii Sea Grant

NOAA Sentinel Site Cooperatives (Cooperatives) are place-based partnerships focused on integrating sea-level rise science into stakeholder decision-making. There are five Sentinel Site Cooperatives across the United States functioning at a landscape scale: Chesapeake Bay, Hawaiian Islands, North Carolina, Northern Gulf of Mexico, and San Francisco Bay. Each Cooperative includes a collection of "sentinel sites", geographic locations where long-term coastal and environmental data collection allow for intensive research, outreach, and education focused on sea-level rise and coastal hazards. Each Sentinel Site Cooperative has a Coordinator, responsible for facilitating partnerships and advancing common goals across the sentinel sites for enhanced coastal resilience. These partnerships include a diverse mix of local, state, and federal government agencies, research institutions, non-profit and non-governmental organizations, and other regional and local stakeholders and organizations. Established in 2012, the NOAA Sentinel Site Cooperatives can now offer six years of case studies and lessons learned for integrating sea-level rise into decision-making from a network that spans diverse ecological, cultural, and economic contexts across the country. This session will provide examples from Sentinel Site Cooperative partners on coastal resilience initiatives across the science to stewardship continuum. Case studies will include efforts from natural resource management, community planning, communication tool development, and research syntheses. The session will further explore how the challenges and successes faced by the NOAA Sentinel Site Cooperative network can serve as a model for other adaptation professionals seeking to develop and sustain nation-wide communities of practice focused on coastal resilience.

Presenters:

Renee Collini, Northern Gulf of Mexico Sentinel Site Cooperative
 Katy Hintzen, Hawaiian Islands Sentinel Site Cooperative

Brenna Mahoney, San Francisco Bay and Outer Coast Sentinel Site Cooperative
 Taryn Sudol, Chesapeake Bay Sentinel Site Cooperative
 David Kidwell, NOAA National Center for Coastal Science

THE BUSINESS CASE FOR CRITICAL INFRASTRUCTURE CROSS DEPENDENCY INVESTMENT *(Hall of Ideas I)*

Symposium Organizer: Rohan Hamden, XDI Cross Dependency Initiative

Critical infrastructure is highly interdependent, which means the ability to contain climate related disruptions to services and assure resilience is quite limited without a system-wide view. Often infrastructure owner's biggest climate change risks lay in its supply chain services, rather than in its own systems and services. For example, a water utility that relies on a functioning power network. Until recently there has been a lack of a suitable mechanism to identify cross dependent impacts and develop the business cases for co-investment in infrastructure resilience. At the same time, there is currently a perfect storm for financing for climate change adaptation projects. Interest rates are at relative historical lows and there is a diversity of investment funds available for worthy projects. Evidence still supports that there is more money waiting for investment than there are projects to invest in (Climate Bonds Initiative, 2017). There is, however, plenty of investable projects that will generate reasonable returns but have proved difficult to unlock. This is creating an adaptation deficit where more action on the ground could be undertaken if the institutional and cultural barriers can be overcome. The projects are typically for assets held by municipal governments such as sea walls, transport and water networks. This session will outline a series of projects and initiatives that are delivering solutions to issue of unlocking finance for climate change adaptation projects.

Presenters:

Daria Smeh, XDI Cross Dependency Initiative
 Rohan Hamden, XDI Cross Dependency Initiative

NATURAL RESOURCE MANAGEMENT VULNERABILITY AND ADAPTATION EFFORTS: EXAMPLES FROM ACROSS THE COUNTRY *(Hall of Ideas J)*

Natural and working lands are vital for providing intact habitats and connectivity, supporting high biodiversity and healthy species, and delivering ecosystem services that neighboring, non-neighboring, and non-local visitors depend on. These lands also play a critical role in climate change mitigation and adaptation. This session will highlight efforts across the country to integrate climate change vulnerability and adaptation into natural resource management decision-making and on-the-ground projects. Featured projects include an effort in Colorado to conduct state- and local-level vulnerability assessments to inform management planning and develop actionable adaptation strategies for Bureau of Land Management natural resource managers; the Forest Adaptation Resources decision-support tool, which gives land managers "menus" of adaptation strategies and approaches that can be used to implement site-specific actions; a decision support framework that helps natural resource managers select appropriate adaptation actions for use in on-the-ground projects; efforts by park and recreation agencies across the country to implement community-based, collaborative, and holistic adaptation solutions; and an effort to plan and implement climate adaptation actions on the ground across 830,000 acres of public lands on the Grand Canyon's North Rim.

Presentations:

Co-Producing Actionable Climate Science and Adaptation Strategies for Landscape Assessment and Planning on Public Lands

Tyler A Beeton, Colorado State University

Beyond Forests: Developing Menus of Adaptation Strategies and Approaches to Address Diverse Planning Needs

Kristen Schmitt, Northern Institute of Applied Climate Science

A Decision Support Framework for Integrating Climate Vulnerability and Adaptation into Natural Resource Planning

Jessi Kershner, EcoAdapt

The Role of Local Parks in Climate Adaptation

Serda Ozbenian, National Recreation and Park Association

Restoring Riparian Habitats: A Case Study of Adaptation Actions on the Grand Canyon's North Rim

Cerissa Hoglander, Grand Canyon Trust

RELOCATION AND INNOVATIVE SOLUTIONS FOR MANAGING FUTURE FLOOD RISK *(Meeting Rooms KLOP)*

This session concerns different policies and solutions for managing flood risk in a changing climate. It starts by outlining experiences with and outcomes of the FEMA buyout program, the largest form of managed retreat implemented in the US to date. Two proposals for future solutions follow, one builds on the existing buyout program, and the other focuses on innovative community involvement. The session concludes by showing ways to bridge the science-policy divide for sea level rise assessments. Equity and social justice will be a major theme throughout.

Presentations:

The Landscape of Voluntary Property Buyouts to Manage Flood Risk in the United States

Carolien Kraan, Stanford University

Case studies of Community Relocation and Managed Retreat Policies in U.S. Floodplains

A R Sidors, Harvard University

Flood, Rebuild, Repeat

Rob Moore, Natural Resources Defense Council

Public Sediment Overview + Moderator

Gena Wirth, SCAPE Landscape Architecture

Bridging the Science-Practice Divide: Washington's Sea Level Rise Planning Toolkit

Harriet Morgan, University of Washington Climate Impacts Group

BUILDING RESILIENCE WITH MORE HOLISTIC TRANSPORTATION DECISION-MAKING *(Meeting Rooms MNQR)*

Symposium Organizer: Annie Bennett, Georgetown Climate Center

Transportation and related infrastructure systems are an important component in fostering resilient and sustainable communities, while also affecting the resilience and health of natural systems. While the transportation community has increasingly made efforts to plan and prepare for the impacts of climate change to physical infrastructure and operations, there are still many opportunities for improvement, particularly in efforts to engage other sectors and communities in more holistic planning and decision-making for resilience. This is particularly important to ensure that investments are also sustainable, not contributing to emissions, and are equitable and inclusive. This session will highlight unique experiences and perspectives on examining transportation resilience more holistically by bringing in representatives from research, local and regional government, and practitioner communities. Speakers will highlight strategies and approaches for modifying transportation research, decision-making, and design in ways that foster greater community and natural resilience and sustainability, in addition to more resilient transportation infrastructure and systems. The session will conclude with facilitated discussion among panelists and the audience to identify additional gaps and opportunities for enhancing the role of transportation decisionmakers in fostering community and natural resilience.

Presenters:

Susanne DesRoches, New York City Mayor's Office of Recovery and Resiliency

Jennifer Jacobs, Infrastructure and Climate Network; University of New Hampshire

Danielle Boudreau, Tijuana River National Estuarine Research Reserve

Kristin Tremain, AECOM

■ 12:30pm to 2:00pm

LUNCH

Lakeside Exhibition Hall

■ 12:45pm to 1:45pm

LUNCHEON SESSIONS

CONNECTING PEOPLE TO CLIMATE RISKS: MEANINGFUL ENGAGEMENT IN ADAPTATION PLANNING *(Madison Ballroom A)*

Symposium Organizer: Zoe Siegel, Resilient by Design

How can adaptation can be an opportunity to leverage unique community assets, establish non-traditional partnerships and make a community more resilient? A community can only truly be resilient only when it ensures that its efforts to adapt to climate impacts and other vulnerabilities protect and benefit all residents especially children, lower-income neighborhoods, communities of color and those who have historically borne the greater burden of unhealthy pollution, environmental

injustice and social disinvestment. We recognize that building a more comprehensive and climate-smart future requires an inclusive community of practice that addresses equity and climate justice in our policies. This session will discuss how adaptation and resilience planning can be used to catalyze transformative, community solutions to address climate risks and build community resilience. We will center the conversation around tactics for inclusive community engagement from Resilient by Design in the San Francisco Bay Area.

Presenters:

Claire Bonham-Carter, AECOM

Marquita Price, East Oakland Collective

WHAT'S NEW IN ADAPTATION FINANCE *(Madison Ballroom B)*

Symposium Organizer: Joyce Coffee, Climate Resilience Consulting

How is the market driving investors towards resilience projects? Consider the latest in credit ratings, insurance, big data and liability as levers for more resilience funding and finance. Learn the basics about finance tools being used for resilience projects - from green bonds for infrastructure modernization to equity investments in new tech and consider use cases that are financing the latest in adaptation for America's communities. The panelists are all science and engineering bridgers - we work with experts and are expert at interpreting their expertise for other experts.

Presenters:

Rebecca Herst, Sustainable Solutions Lab

Feliz Ventura, AECOM

Joyce Coffee, Climate Resilience Consulting

Jesse Keenan, Harvard Graduate School of Design

Matt Talley, Jacobs

BEYOND THE LITERATURE REVIEW: PUTTING CLIMATE ADAPTATION SYNTHESSES TO WORK FOR MANAGERS *(Madison Ballroom C)*

Working Group Organizer: Nicole DeCrappeo, Northwest Climate Adaptation Science Center

Due to limited resources and capacity in their agencies or departments, many resource managers do not have access to, nor time to read, the latest scientific literature on topics that are relevant to their jobs. As a result, EcoAdapt, the Department of the Interior Climate Adaptation Science Centers (CASCs), and the University of Washington's Climate Impacts Group often hear requests for synthesis reports, fact sheets, and other distilled forms of known information on climate change impacts and adaptation options. But it can be difficult to put even the best literature review or state-of-science report into action: how can busy resource managers convert synthesized scientific information into climate-smart conservation or restoration measures on the ground? Contributing further to the challenge is that scientific studies on the effectiveness of climate adaptation actions are scarce and, when they do exist, may not be appropriate for the environmental conditions, spatial and time scales, or predicted future climate that any one resource manager faces. In this working group session, we'll collectively explore methods for creating climate adaptation syntheses that can be used directly by a wide array of managers and scientists. Participants will learn about processes that EcoAdapt, the CASCs, the University of Washington's Climate Impacts Group and others have developed for producing management-relevant syntheses. They will also be invited to evaluate these methods and suggest improvements or alternatives to collecting, compiling, analyzing, and presenting synthetic information on the effectiveness of climate adaptation actions.

Co-Organizers:

Rachel Gregg, EcoAdapt

Amy Snover, Climate Impacts Group, University of Washington

ADVANCING THE DATA LIFECYCLE *(Madison Ballroom D)*

Working Group Organizer: Hoi-Fei Mok, ICLEI USA

Among the diverse actors working in climate adaptation there are diverse information needs. Accelerating action among these actors requires that data and knowledge flows seamlessly across individuals and institutions working at different scales. Strides have been made to ensure shared information architectures among curators of tools and datasets to better connect science providers, boundary organizations, and practitioners. These can be extended to build bridges between the work of practitioners to finance institutions, researchers, and movement building campaigns. Connecting

the latter players in the data lifecycle is crucial for informing and supporting further development of the next generation of tools and resources. By incorporating the information needs of others, the value of the work each actor performs becomes more valuable to the field. The session will be facilitated by ICLEI USA, Azavea, EcoAdapt, Adaptation International, UNC Asheville, Georgetown Climate Center, American Society of Adaptation Professionals, and others.

Co-Organizers:

Jessica Cahail, Azavea
Beth Gibbons, American Society for Adaptation Professionals
Jessica Grannis, Georgetown Climate Center
Sascha Petersen, Adaptation International
Mike Steinhoff, ICLEI USA
Sierra Woodruff, Texas A&M University

WHAT DOES SUCCESSFUL ADAPTATION LOOK LIKE IN YOUR COMMUNITY? (Hall of Ideas E)

Working Group Organizer: Dani Boudreau, Tijuana River National Estuarine Research Reserve

How do we know actions to adapt to climate change are good, useful, and effective? And because the desired outcome of adaptation may not be apparent for many years, how do we assess progress? Decision-makers and investors need these questions answered because of legitimate concerns over the long-term safety, prosperity, equity, and sustainability of their communities. The Successful Adaptation Indicators and Metrics (SAIM) project—a collaboration of the National Estuarine Research Reserve System's Science Collaborative, multiple reserves, and their communities - addressed these challenging questions through interactive community workshops in Alaska, California, Maine, New Jersey, and New York. These discussions explored: (1) what adaptation success means, (2) what social and ecological dimensions need to be considered and how they could be measured, and (3) how to approach tracking progress toward each case's shared vision. During this session, participants will learn about the project, and help further develop an adaptation indicator-focused toolkit designed to assist professionals—along the coasts and elsewhere—to define, track, and work toward success.

Session participants will have direct impact on the design and contents of the toolkit by partaking in a group discussion that will address a number of guiding questions, including: (1) what types of adaptation projects do you anticipate using indicators and metrics to show progress and success? (2) How can indicators and metrics be used and by whom? (3) What types of supporting resources would help you develop indicators specific and unique to your efforts?

Co-Organizers:

James Arnott, University of Michigan School for Environment & Sustainability
Lisa Auermuller, Jacques Cousteau National Estuarine Research Reserve
Sylvaine Bentz, Kachemak Bay National Estuarine Research Reserve
Annie Cox, Wells National Estuarine Research Reserve
Christine Feurt, Wells National Estuarine Research Reserve
Kristen Goodrich, Tijuana River National Estuarine Research Reserve
Susanne Moser, Susanne Moser Research & Consulting

ADVANCING CLIMATE NETWORKS THROUGH REGIONAL ADAPTATION FORUMS: LESSONS LEARNED FROM 2018 EVENTS AND FUTURE PLANS (Hall of Ideas F)

Symposium Organizer: Jenna L Jorns, Great Lakes Integrated Sciences & Assessments, University of Michigan

While climate change is a global problem, adaptation solutions must be tailored to the assets and constraints of the individual place, making local and regional entities well positioned to take action. Regional adaptation forums provide practitioners, scholars, and decision makers the valuable opportunity to discuss local knowledge, share best practices, and brainstorm pathways towards more resilient communities, ecosystems and economies. This symposium is designed to share lessons learned through the 2018 Regional Adaptation Forums, grow the network of regional forum organizers and participants, and support the dissemination and scaling of best practices across North America. Session speakers will cover highlights and unique aspects from 2018 events, a summary of the regional similarities and differences reflected in forum content and participant reflections, and connections to the National Adaptation Forum. A subsequent panel discussion

will build on the conversations Regional Adaptation Forum organizers have been having in network coordination calls over the past year, such as: how to focus on equity and engage diverse partners, how to design future events which speak to practitioner needs, how to grow and strengthen regional networks through these types of events, and how to amplify coordination and collaboration across regions to collectively strengthen the adaptation field as a whole. If you have planned or participated in a regional adaptation event in the past, or are thinking about doing so in the future, we encourage you to join us to help leverage our shared experiences.

Panelists:

Rachel Jacobson, American Society of Adaptation Professionals (Moderator)
Jenna L Jorns, Great Lakes Integrated Sciences & Assessments
Jason Liechty, Broward County
Julia Kim, Local Government Commission
Michael Simpson, Antioch University New England
Amanda Farris, Carolinas Integrated Sciences & Assessments
Carolyn Enquist, Southwest Climate Adaptation Science Center
Lauren Lynch, EcoAdapt

BUILDING THE COMMUNITY OF PRACTICE TO SUPPORT NATURAL AND NATURE-BASED APPROACHES TO RESILIENCE (Hall of Ideas G)

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

Natural and nature-based features provide effective solutions for adapting to climate impacts and building resilience in communities. Communities are employing these approaches to address sea level rise, mitigate coastal flooding, enhance public health and protect critical infrastructure. Employing these solutions requires science to test the effectiveness of different approaches, policies that enable implementation, and funding to support projects. Over the past 5 years, NAF has provided an important venue for the SAGE (Systems Approach to Geomorphic Engineering) community of practice to communicate, connect, and collaborate to build new partnerships across sectors to advance science, policy and finance in support of natural infrastructure. In parallel, an NSF-funded Research Collaboration Network, known by the same acronym, Sustainable Adaptive Gradients in the coastal Environment (SAGE), has also been working across geographies and disciplines to build a community to better inform and advance resilient coastal infrastructure decisions. These two networks have begun to explore how to build a more robust network together. Many of the practitioners engaged in the SAGEs actively participate in NAF, and would value an opportunity to develop a coordinated and strategic plan for the future through a facilitated workshop. A small group of individuals who are active in both SAGEs have identified a project (evaluating natural infrastructure projects pre- and post- implementation in Maryland) to use as a focus for the planning. Membership in both networks is open to individuals across sectors and disciplines, and so a workshop would also provide a venue to grow the larger community.

Co-Organizers:

Elisabeth Hamin, University of Massachusetts
Chris Hilke, National Wildlife Federation
Melissa Kenney, University of Maryland
Kim Penn, National Oceanic and Atmospheric Administration
Bhaskar Subramanian, Maryland Department of Natural Resources
Susan Taylor, Taylor Resilience LLC

DEVELOPING A REVOLVING LOAN FUND AND A COOPS INCUBATOR MODEL WITH A JUST TRANSITION FRAMEWORK (Hall of Ideas H)

Training Organizer: Cristina J. Cabrera, Environmental Justice League of Rhode Island

This training will show how a Just Transition framework can be effectively implemented as a practice and as a process in the development of community wealth and community leadership by:

- 1) Establishing revolving loan funds and coops incubators with a climate justice lens
- 2) Working with frontline community members, parents, students and alumni of schools to create a feasible Fork to Table Food Service model to feed school kids - A Community Designed & Community Operated Healthy Food Service Project for Feeding School Children & Youth.
- 3) Partnering with local black, brown and indigenous farmers to support (parents & youth) cooperative businesses for the purpose of implementing a radical Healthy Food Service Model

(Note: Definition of Frontline = black, brown, indigenous, (im)migrants, low income families who are the first and most impacted by Climate Change and Climate Injustice and consistently excluded from the decision-making table, actionable plans and funding - among other things).

NAVIGATING CURRENT ADAPTATION CHALLENGES (Hall of Ideas I)

Regardless of the system, scale, or region you working, the path to the taking climate adaptation action is often rife with challenges. This session seeks to identify and offer solutions to current adaptation challenges at multiple scales. Learn about: (1) efforts to safeguard vulnerable federal tools and resources, (2) the ways environmentally focused organizations can enhance civic engagement, and (3) practitioner's perspectives on successful resilience.

Presentations:

- Safeguarding Climate Adaptation Resources & Tools in a Shifting Political Climate
Jessica Hitt, EcoAdapt
- Climate + Energy Voters Take Action: Integrated Voter Engagement and Relational Organizing
Rachel Myslivy, Climate + Energy Project
- Practitioner's Perspectives on Successful Resilience
Missy Stults, City of Ann Arbor

CLIMATE ADAPTATION IN INDIGENOUS LANDS (Hall of Ideas J)

Adapting to climate change in Indigenous lands brings a unique set of challenges, including overcoming a legacy of environmental injustice. This session will bring together perspectives from Pueblo de San Ildefonso, Blue Lake Rancheria Tribe as well as the Na'ah Illahee Fund to discuss examples of climate change adaptation through three innovative projects. Each project addresses climate change along with community needs to encourage a resilient future.

Presentations:

- Pueblo de San Ildefonso Climate Change Adaptation Planning, with a Focus on LANL Legacy Contamination
Michael Chacon, Pueblo de San Ildefonso
- Developing a Cross-Sectoral, Public-Private, Regional Resilience Campus
David Narum, Blue Lake Rancheria Tribe
- Pacific Northwest Just Transition Listening Sessions: Reclaiming Regenerative Economy and Climate Resiliency
Pah-tu Pitt, Na'ah Illahee Fund

NATURE-BASED ADAPTATION FROM DESIGN TO EXECUTION: EXAMPLES FROM JAMAICA TO JAMAICA BAY (Meeting Rooms KLOP)

This session will explore nature-based adaptation efforts in a range of ecosystems and locales. Learn the range of considerations and strategies for promoting adaptation through conservation and restoration from Jamaica to Jamaica Bay.

Presentations:

- Resilient Islands: Advancing Ecosystem-based Climate Adaptation in SIDS of the Caribbean
Montserrat Acosta-Morel, The Nature Conservancy
- Integrated, Participatory Planning to Evaluate Coastal Resilience Investments in Jamaica Bay, New York
Jordan R. Fischbach, RAND Corporation
- Embracing Change: The "4 Ws" Framework for Adapting Conservation Approaches to Address a Changing Climate
Liz Tully, Wildlife Conservation Society

12:30pm to 3:30pm SPECIAL SESSION

THE COMMONS CLIMATE ADAPTATION HACKATHON (Meeting Rooms MNQR)

Take a creative lunch break or session break! Come help local students and young professionals kick off The Commons Climate Adaptation Hackathon with an ideation session dedicated to coming up with new ways to drive action towards adapting to climate change.

2:00pm to 3:30pm CONCURRENT SESSIONS 5

SEA LEVEL RISE GETS REAL (ESTATE) (Madison Ballroom A)

Symposium Organizer: Erika Spanger-Siegfried, Union of Concerned Scientists

As sea levels rise, a ballooning number of U.S. homes will experience frequent, disruptive flooding that makes everyday life impossible, drives down property values, and strains coastal real estate markets—some to the point of collapse, with potential reverberations throughout the national economy. New research by UCS finds more than 300,000 of today's coastal homes face this chronic flooding within the lifetime of a 30-year mortgage. Individual homeowners, banks, lenders, investors, developers, insurers, and taxpayers are poised to sustain large losses. Shrinking property tax bases could spell decline for many coastal cities and towns. We need to head off this challenge where we can, even as we brace our communities, and our local and national economies for impact, making wise use of the limited time we have. But how? While there are no easy solutions, knowing our risk and using that knowledge to create bold new policies and market incentives will help protect coastal communities. Our speakers will explore leading-edge challenges ranging from how flood risk can be better disclosed in the marketplace; how we must reform flood insurance rates and flood mapping to better reflect the risk of rising seas; how development that puts people and property at risk can be brought to heel; how buyouts do, don't, and could (if done better) help; and how policies can be reformed to serve coastal communities with greatest need, not greatest clout.

Presenters:

- Rachel Cleetus, Union of Concerned Scientists*
Joyce Coffee, Climate Resilience Consulting
Jack Davis, RE Tech Advisors
Robert Moore, Natural Resources Defense Council

COMMUNITY OWNERSHIP, COMMUNITY RESILIENCY: MOVING EQUITABLE ADAPTATION INTO ACTION (Madison Ballroom B)

Symposium Organizer: Jennifer W. Li, Georgetown Law

This session will explore how climate resilience planning processes across the country are prioritizing moving equitable adaptation ideas into action. Practitioners will share a range of strategies, case studies, and tools that have emerged from community-driven planning processes and actions cities and community-based organizations are taking to implement those solutions on the ground. Hear community members' perspectives on the ways in which community engagement processes have contributed to their stewardship, as well as ideas for continued collaboration in their respective communities to help advance implementation of local adaptation plans. Discussion will focus on how climate resilience planning is addressing the disproportionate climate risk "frontline communities" face and how planners and community-based organizations are creating accessible processes that allow for frontline community leadership to shape adaptation decision making from the early stages of planning through implementation. Panelists will discuss specific examples of programs and policies that have emerged from these processes, many of which address not only climate risks, but also pervasive stressors such as pollution and lack of educational and economic opportunity. Panelists will discuss real-world examples and challenges of translating adaptation planning into community-based solutions. They will share examples of community-driven planning from around the country (D.C., Seattle, Portland, Providence); government and community perspectives on lessons learned from the D.C. engagement process and ongoing challenges for implementing community-centered policies; opportunities and challenges for incorporating equity in non-urban communities through the CivicSpark Fellows program; and lessons for ongoing engagement through Adapting to Rising Tide in California.

Presenters:

- Jennifer Li, Georgetown Climate Center*
Melissa Deas, D.C. Department of Energy and Environment
Corrine Van Hook-Turner, Movement Strategy Center
Julia Kim, Local Government Commission
Dana Brechwald, Association of Bay Area Governments
Clyde Thompson, Equity Advisory Group

COURAGEOUS CLIMATE ACTION IN SOUTHCENTRAL: HOW NOT LEADING WITH “CLIMATE CHANGE” IS MAKING A DIFFERENCE *(Madison Ballroom C)*

Symposium Organizer: Ellu Nasser, Adaptation International

Droughts, floods, extreme heat, and more, the Southcentral has a little bit of everything when it comes to climate change and extreme weather. How can communities begin the conversation and start building resilience when the state and local politics make it nearly impossible to start a conversation with the words “climate change”? It takes courage and creativity. Come learn from three leading cities (San Antonio, TX; Las Cruces, NM, and Stillwater, OK) and one boundary organization (the Southern Climate Impacts Planning Program) as they share insights in how they are addressing climate change in their states, many of which are deeply red. A series of short presentations will be followed by an interactive discussion that provides a deep dive into the challenges of building momentum, encouraging action, and creating a movement in these communities and across the region. Equity, economic disparity, and the needs of frontline communities all play a role in how these communities are addressing their climate challenges and taking action. Join this session for an honest look at the challenges and opportunities that come with reframing the climate conversation, finding common ground, and sticking up for approaches that can make a difference, even in the middle of the country where preparing for climate change can be hard sell.

Presenters:

Sascha Petersen, Adaptation International
Rachel Riley, Southern Climate Impacts Planning Program
Lisa LaRoque, City of Las Cruces, NM
Douglas Melnick, City of San Antonio, TX
Paula Dennison, City of Stillwater, OK

THE RESILIENT INFRASTRUCTURE SPECTRUM: INNOVATIVE OPPORTUNITIES AND COMPLEX CHALLENGES IN CITIES *(Madison Ballroom D)*

Symposium Organizer: Nishant Parulekar, City of Portland Bureau of Environmental Services

Developing climate resilient infrastructure is a critical issue facing municipalities today. Local governments experiencing impacts from extreme heat, precipitation variability, sea level rise, and other natural disasters are working to implement innovative solutions that span from small-scale building retrofits to large-scale levees and sea walls. Although often faced with common challenges such as political will and funding, local governments are actively prioritizing efforts that both reduce greenhouse gas emissions while also enhancing community resilience. Participants in this session will share their successes and challenges related to the planning, design, and implementation of resilient infrastructure projects. Join USDN members from Portland Bureau of Environmental Services, Providence, the Philadelphia Water Department, and San Diego to learn more about innovative approaches to resilient water, stormwater, and urban heat projects. Learn about ways cities are using scenarios to better prepare community members and elected officials to make a significant investment in infrastructure such as hurricane barriers and better understand the complex process to rebalance power and center decision-making with those who are most at-risk so infrastructure investments won't exacerbate inequities.

Presenters:

Nishant Parulekar, City of Portland, Bureau of Environmental Services
Leah Bamberger, City of Providence
Julia Chase, City of San Diego
Julia Rockwell, Philadelphia Water Department

PART II - ADAPTATION FINDINGS FROM THE NATIONAL CLIMATE ASSESSMENT AND LOCAL EXPERIENCES *(Hall of Ideas E)*

Symposium Organizer: Susan Herrod Julius, US EPA, Organizer

This is the second of a two-part Symposium on Adaptation in the Fourth National Climate Assessment (NCA4) and Local Experiences. This second part focuses on local case studies and interactive group discussions of risk management approaches, cross-sectoral coordination, and social equity to understand better how to put these three themes into practice. The NCA4 (Volume

1) reports that changes in average climate conditions and climate extremes are happening and are expected to continue. Adaptation is key to instilling resilience into our cities, rural areas, regions, and nation. Volume 2 identifies climate-related risks facing society, and examines the state of adaptation science and practice across the country. Cities, states, businesses, and other stakeholders are looking for proactive and innovative measures to comprehensively address risks from unprecedented climate conditions and rates of change. Part I provided an overview of the state of science and practice of adaptation from the NCA4, showcasing the three themes above. An interactive learning session followed, with participants viewing and discussing posters with NCA4 authors on report findings related to the three themes. Participants shared pressing problems and solutions related to the themes. In the second session, a panel of local practitioners will present case studies and discuss the practical aspects of how to address these themes in adaptation efforts. At the end of this 2-part symposium, all panelists will reconvene for a large group discussion to synthesize ideas and lessons learned, and hear more from audience experiences and how these themes can be put into practice.

Presenters:

Jesse Keenan, Harvard University, Moderator
Zena Grecni, East-West Center
Eliza Berry, Eastern Research Group
Gregor Schuurman, National Park Service
Michael Chang, Makah Tribe

CLIMATE ADAPTATION DECISION MAKING UNDER DEEP UNCERTAINTY *(Hall of Ideas F)*

Symposium Organizer/Moderator: Joel B. Smith, Abt Associates

Decision Making Under Deep Uncertainty (DMDU) describes an approach to making decisions on climate change adaptation given the fundamental difficulties predicting climate change and the need to make long-lived decisions, such as on infrastructure. This session will explore what DMDU is, how it is being applied by some prominent American water utilities, and where DMDU may be heading in the future. The session will include presentations by leading theoreticians of DMDU and leading practitioners who are applying its principles. Joel Smith of Abt Associates will chair the session and give opening remarks introducing the topic. Lurna Kaatz, Denver Water and David Behar, San Francisco Public Utilities Commission, will introduce current adaptation problems their utilities face that are characterized by deep uncertainty. Kaatz will speak about how Denver Water is adopting scenario planning to develop a flexible, adaptive, long-term plan that will guide utility decisions. Behar will address how SFPUC is using DMDU to help make long-term decisions regarding the effect of warming on its water supply, and discuss how new developments in sea-level rise science are driving coastal decision makers toward DMDU approaches. Robert Lempert, RAND Corporation, will present how DMDU tools and methods are being applied to help decisions makers address the kinds of problems posed by Kaatz and Behar. Casey Brown, University of Massachusetts-Amherst, will look into the future to see how DMDU may evolve and how it may be applied to help the field of adaptation to climate change. The session will conclude with questions and answers.

Presenters:

Joel B. Smith, Abt Associates
Robert J. Lempert, RAND Corporation
Casey Brown, University of Massachusetts Amherst Department of Civil and Environmental Engineering
David Behar, San Francisco Public Utilities Commission
Lurna M. Kaatz, Denver Water

A TRIBAL ADAPTATION MENU FOR INDIGENOUS-LED CLIMATE ADAPTATION, INCLUDING BACKGROUND AND CASE STUDIES *(Hall of Ideas G)*

Symposium Organizer: Robert W Croll, Great Lakes Indian Fish & Wildlife Commission

Traditional and Indigenous knowledge and perspectives have not often been recognized in planning resources for climate adaptation in natural and cultural resource management. This symposium will introduce participants to a new Tribal Adaptation Menu, designed to assist in developing specific adaptation actions that recognize and incorporate tribal perspectives. The Tribal Adaptation Menu was

created to help integrate tribal and traditional values with climate adaptation planning processes, such as the Northern Institute of Applied Climate Science Adaptation Workbook. This first version of the Tribal Adaptation Menu was intentionally created from Ojibwe and Menominee perspectives, languages, concepts, and values. Future versions will be co-developed by other Indigenous peoples, with their languages, concepts, strategies and approaches. The Tribal Adaptation Menu may be used as a tool to help bridge communication barriers for non-tribal persons or organizations interested in indigenous approaches to adaptation and the needs and values of diverse tribal communities. This symposium will consist of a series of presentations that introduce the concept of an adaptation menu, describe the Tribal Adaptation Menu, introduce a Guiding Principles document which describes a general process for working with tribal communities, and provide two case studies of real-world projects that have used the menu.

Presenters:

Stephen Handler, Northern Institute of Applied Climate Science
Melonee Montano, Great Lakes Indian Fish & Wildlife Commission
Katy Bresette, Red Cliff Band of Lake Superior Ojibwe
Gerald Jondreau, Michigan Tech, School of Forest Resources and Environmental Science
Tanya Aldred, Great Lakes Indian Fish & Wildlife Commission
Christopher Caldwell, College of Menominee Nation, Sustainable Development Institute

TEN YEARS OF ADAPTATION PROGRESS IN THE STATES: WHAT HAVE WE LEARNED AND WHAT'S NEXT? (Hall of Ideas H)

Symposium Organizer/Moderator: Jessica Grannis, Georgetown Climate Center

Marking the ten-year anniversary of the adoption of the first statewide adaptation plans in Maryland (2008) and California (2009), this session will bring together a diversity of state leaders to reflect on the progress their states have made in pursuing adaptation and the advancements that will be needed over the next ten years. First, the Georgetown Climate Center will present an overview of state adaptation progress and a summary of the types of activities and initiatives that are being pursued at the state level, drawing from the Center's adaptation progress tracking tool. The Center will then facilitate a discussion among state leaders from CA, FL, MD, MN, and NY to reflect on the approach their state is taking to promote adaptation, the innovative practices they are pursuing, the challenges they are encountering, and what more will be needed over the coming decade to prepare our communities for the impacts of climate change.

Presenters:

Jessica Grannis, Georgetown Climate Center
Nuin-Tara Key, California Governor's Office of Research and Planning
Mark Lowery, Office of Climate Change, New York State Department of Environmental Conservation
Laura Millberg, Minnesota Pollution Control Agency
Catherine McCall, Maryland Department of Natural Resources
Whitney Gray, Florida Department of Environmental Protection

SUSTAINABLE AND RESILIENCE PLANNING FOR WATER IN THE FACE OF CLIMATE CHANGE (Hall of Ideas I)

Presenters will share how communities are confronting climate risk by finding ways to better engage, understand, plan, act, and sustain their climate adaptation efforts in the water sector.

Presentations:

Climate Adaptation Best Practices for Water Utilities
Julie Vano, National Center for Atmospheric Research
Climate Conversations with Water Sector Engineers: Building Trusted, Credible Sources of Climate Change Information
Kavita Heyn, Portland Water Bureau
Water Forward: Austin's 100 Year Integrated Water Resource Plan
Marisa Raquel Flores Gonzalez, Austin Water
Adaptation Planning for Sea Level Rise and Extreme Storms: Lessons from the Philadelphia Water Department
Abby Lauren Sullivan, Philadelphia Water Department
Community Response to Water Scarcity after Maria and Long-term Strategies for Resilience
Paul Edward Sturm, Ridge to Reefs

PUBLIC HEALTH AND ADAPTATION (Hall of Ideas J)

This session explores adaptation strategies in the public health sector. With a range of perspectives, from mental health to urban heat issues, the session will explore methods for addressing these climate-related health concerns.

Presentations:

Health and Urban Heat: Applied Research and Lessons from Implementation
Kurt Shickman, Global Cool Cities Alliance
Advancing Climate Adaptation in State Public Health Agencies
Rachel M Gregg, EcoAdapt
Cross-Sector Engagement as a Means to Developing Community Resilience-Building Strategies in Maricopa County, AZ
Emily Mead, Institute for Sustainable Communities
Navigating Mental Health Care in a Changing Climate
Katie Hayes, University of Toronto
Integrating Public Health Service Delivery, Health Equity and Local Climate Adaptation Planning
Yoon Kim, Four Twenty Seven

IMPLEMENTING RESILIENCE ACROSS SCALES FROM YOUR HOME TO YOUR REGION (Meeting Rooms KLOP)

There is no one-size-fits-all solution to protect communities against climate change. Resiliency and sustainability measures need to be implemented at all scales to ensure true resiliency: from considering resiliency in regional land use plans to installing measures to protect individual homes and businesses. This session will explore different methods to of approaching resilience across scales. It argues that to fully protect a region, climate change adaptation must become standard practice and steps must be taken at the regional, city, community and structure-level. Attendees will hear from experts from government, academia and private business implementing resiliency at a variety of scales including small communities and major metropolitan areas. Presentations will cover a wide-array of solutions including: protecting public health through community heat action planning; exploring the Boston metro region's journey to becoming net zero; reducing barriers to climate change adaptation planning in small towns and rural communities; evaluating resilience planning efforts in municipalities across the country; and, identifying measures to protect individual homes and structures against natural disasters.

Presentations:

#Zero101: Clean Energy and Nature-Based Solutions toward Net Zero in Metro Boston
Darci Anne Schofield, Metropolitan Area Planning Council
Adaptation to Resilience Planning: Alternative pathways to prepare for climate change
Sierra Woodruff, Texas A&M University
Nature's Cooling Systems: Community Heat Action Planning (Part 1)
Melissa Guardaro, Arizona State University
Nature's Cooling Systems: Community Heat Action Planning (Part 2)
Maggie Messerschmidt, The Nature Conservancy
Hurry Up, Y'all! Lessons Learned from Mainstreaming Climate Change Into Rapid Land Use Plan Updates
Jessica Chenault Whitehead, North Carolina Sea Grant
Beyond Infrastructure: Resiliency at Home
Anastasia Roy, APTIM

■ 3:30pm to 4:00pm

BREAK

■ 4:00pm to 5:30pm

CONCURRENT SESSIONS 6

BUILDING INNOVATIVE PARTNERSHIPS FOR ADAPTATION WORK IN RURAL COMMUNITIES (Madison Ballroom A)

Symposium Organizer: Troy J. Goodnough, University of Minnesota Morris

We will present an exciting case study about a community in rural west-central Minnesota and how partnerships at the state, national, and local level, work together in creative ways to catalyze progress. The city of Morris, the University of Minnesota Morris (UMM), Institute for Agriculture and Trade Policy (IATP), and Second Nature, are working together to advance community adaptation efforts. Rural communities are stewards of vast amounts of land in various forms of production that

will be greatly impacted by climate change. There are also many institutions of higher education in rural locations. The partnership of cities and universities in rural locations to advance adaptation is critical. As a higher education leader, Second Nature has created a framework (through the Presidents' Climate Commitment) that commits colleges to campus-community adaptation planning. IATP created the award-winning Rural Climate Dialogues (RCD) initiative in partnership with Jefferson Center. The RCD is helping communities make progress in climate adaptation planning. The first RCD event was held in Morris, MN, and now events have been held across the State. Taken together, we have created an ecosystem of adaptation effort, with each organization playing a role towards the larger goal. The city, UMM, and local partners, have created the Morris Model initiative. A key focus of the Morris Model (morrismodel.org) is climate adaptation framed as community-resilience building. The city and partners have earned recognition, including the Minnesota Climate Adaptation Partnership Award, the Environmental Initiative Award for Community Action, Local Government Innovation Award from the Humphrey Institute.

Presenters:

Troy J. Goodnough, University of Minnesota Morris
Ruby Woodside, Second Nature

RESILIENT WATERSHEDS: ADAPTIVE STORMWATER MANAGEMENT FOR WATERS AND WILDLIFE (*Madison Ballroom B*)

Symposium Organizer: Gwen Griffith, Model Forest Policy Program

Mill Creek is a high priority urban stream flowing through Nashville in the rapidly developing Middle Tennessee region. This urban watershed is at risk from development and increasingly frequent extreme weather events, including heat, storms, floods, and drought. As the watershed converts to impervious roads and roofs, the natural hydrology is changing. The increased volume of runoff and reduced groundwater recharge is leading to more severe floods and more intense drought. This in turn degrades water quality and stresses aquatic life, including the endangered Nashville crayfish found only in Mill Creek. Fortunately, there is a growing body of knowledge about adaptive stormwater management that addresses these watershed stressors. This symposium puts a spotlight on a Mill Creek climate adaptation project as a practical demonstration of restoring the natural hydrology with a suite of adaptive stormwater practices. The project aims to protect headwater streams by encouraging replication across the watershed. A special focus is on Regenerative Stormwater Conveyances, an innovative step-pool technique that benefits flood and drought conditions by slowing runoff and maximizing groundwater infiltration on steep slopes in ways not previously possible. The symposium offers presentations and interactive exercises for the following:

- Principles and practices of adaptive stormwater management
- Design and construction of regenerative stormwater conveyances
- Scaling up adaptive stormwater management to watershed scale benefits
- Outcomes and benefits for watershed health, biodiversity, socio-economic equity
- Co-benefits of education with outdoor classrooms and school curriculum
- Co-benefits with professional education for engineers, managers, and policy makers

Presenters:

Gwen Griffith, Model Forest Policy Program
Steve Casey, Civil & Environmental Consultants, Inc.
Catherine Hoffman Price, Cumberland River Compact

IMPROVING CLIMATE RESILIENCE IN THE INTERMOUNTAIN WEST THROUGH RESEARCH AND PRACTITIONER NETWORKS (*Madison Ballroom C*)

Symposium Organizer: Colin Quinn, Chair of the Town of Carbondale Environmental Board; Mountain West Climate Services Partnership

How can climate researchers and practitioners, such as municipal decision makers, work together to produce relevant and scalable solutions to adapt to climate change? And how can communities with similar climate risks share knowledge and experience to improve resilience?

For example, In the Intermountain West region many communities rely on snow and snowmelt for water supply, recreation, and to support local economies. These communities are increasingly

vulnerable to higher temperatures and extreme events in both wet and dry periods. Higher temperatures and subsequent earlier snowmelt, for example, could create drought conditions in even normal precipitation years, leading to risks for communities to manage. Despite a shared urgency, there remains a disconnect between the actions and decisions these communities take to improve resilience and the scientific community. Furthermore, it is difficult to sustain networks between the scientific community and municipal decision makers to improve resiliency efforts, particularly in small and medium sized communities. In this session, we will explore examples of how partnerships between scientists and communities in the Intermountain West region are forming to provide useful and practical tools and services to help build resiliency. This purpose of this symposium is to share and improve resiliency efforts in towns that are extremely vulnerable to climate change. The format will be a panel, with each panelist briefly discussing their work on this topic, followed by a robust, moderated, and interactive discussion with the audience. This panel will include municipal decision makers, who are often left out of the broader adaptation conversation.

Panelists:

Corrie Knapp, University of Western Colorado
James Arnott, Aspen Global Change Institute
Benet Duncan, Western Water Assessment
Julie Vano, National Center for Atmospheric Research
Margaret Medellin, City of Aspen

TRANSFORMATIONAL CLIMATE ADAPTATION TOOLS FOR EQUITABLE, COMMUNITY-DRIVEN CLIMATE RESILIENCE (*Madison Ballroom D*)

Training Organizer: Jacqueline C Patterson, NAACP Environmental and Climate Justice Program, Organizer/Moderator

More and more, local adaptation climate resilience planning is becoming an essential process for scaling up solutions that build resilience for everyone. Centering social, economic and racial equity is key to understanding the deeply rooted, cultural practice in communities; connecting rich histories to today's challenges of thriving in the face of climate change. Given stakes are high and climbing, how do we accelerate the pace of climate solutions that adequately meets the impact climate disruptions have on our communities? How do we do so while ensuring that the solutions are rooted in systems change towards a regenerative, independent and democratic society and economy? This session will lift up key concepts from four resources:

The NAACP's Equity in Resilience Building for Climate Adaptation Toolkit, the NAACP Transformational Climate Adaptation Finance Toolkit, the National Association of Climate Resilience Planners Community-Driven Climate Resilience Framework and the Urban Sustainability Directors Network and Raimi + Associates guide to Equitable, Community-Driven Climate Preparedness Planning. These tools complement each other, describing authentic, effective collaboration between community leaders/experts and local planners. Additionally, this multi-stakeholder, interactive session will feature a training on racially-equitable, community-driven climate resilience planning principles, practices, and models.

Co-Organizers:

Victoria Benson, Movement Strategy Center
Corrine Van Hook-Turner, Movement Strategy Center

WHEN IT RAINS, IT POURS: ORGANIZATIONAL LEARNING IN THE FACE OF MORE EXTREME PRECIPITATION (*Hall of Ideas E*)

Symposium Organizer: Lara Whitely Binder, King County

Preparing for more heavy rain is difficult, even when rain is your claim to fame. As the largest regional government in western Washington, King County is responsible for a considerable amount of stormwater, wastewater, and flood infrastructure that protects human health and the environment. Understanding climate change impacts on that infrastructure and the differing agency missions driving infrastructure investment is essential to ensuring effective service delivery now and in the future. In 2016, King County, Washington, partnered with the University of Washington to develop updated precipitation scenarios to guide long-term decisions related to stormwater management, wastewater conveyance, and flood risk reduction. The new scenarios, and the subsequent hydrologic and hydraulic analyses based on those scenarios, suggest that current

infrastructure design standards may be significantly undersized relative to future conditions. This is an important consideration, as most infrastructure is typically intended to last several decades — if not “indefinitely” if well maintained. The work also pointed to important differences in rural versus urban approaches to managing changes in heavy precipitation. This session provides a case study of how an organization moves from knowledge to action on climate preparedness, and how that journey can drive deeper organizational learning. The session will explore how King County has used its investments in research to deepen its understanding of climate impacts on stormwater, wastewater, and flood management. The session will also discuss adaptation approaches to addressing these impacts and how this work prompted the development of a new adaptive management framework for managing more intense precipitation.

Presenters:

John Phillips, Parametrix
Lara Whitely Binder, King County

SCIENCE AND ENGAGEMENT CO-PRODUCTION AROUND COMPOUNDING CLIMATE RISKS AND IMPACTS IN THE CHARLESTON, SC REGION *(Hall of Ideas F)*

Symposium Organizer: Kirstin Dow, Carolinas Integrated Sciences and Assessments/ University of South Carolina

Communities in the Charleston S.C. region are collaborating with scientists to understand how sea level rise and flooding will continue to increase. As municipalities grapple with adaptation planning and implementation, they seek a more detailed and realistic view of the challenges and how various hazards interact to cause community disruption and property damage. This session will share experiences from an integrated research and engagement strategy based on high resolution flood modelling that distinguishes and combines SLR, tidal, and rainfall flooding. This feeds into impact analyses of transportation disruption, infrastructure damage, and an assessment of how sea level rise will expand seismic liquefaction zones in a region at high risk of earthquakes. This cutting-edge research and modeling are subject to technical review and community ground-truthing throughout all phases. Innovative approaches to more effectively engage with communities are co-designed with community leadership and work to address multiple dimensions in helping communities begin to collaborate to identify adaptation pathways. We will share our lessons learned with supporting engagement with siloed city departments, frustrated community residents, and racially and economically diverse neighborhoods within the Charleston Metro region. We will also share our reflections on the challenge of communicating multiple and compounding risks in a situation where flooding and SLR are already viewed by some as an existential threat. Engagement designs are based on emerging knowledge and research, and subject to adaptive redesign based on community needs and feedback.

Presenters:

Sarah Watson, Carolinas Integrated Sciences and Assessments/ SC Sea Grant
Norm Levine, College of Charleston, Lowcountry Hazards Institute
William Davis, The Citadel
Simon Ghanat, The Citadel
Kirstin Dow, Carolinas Integrated Sciences and Assessments/University of South Carolina

ALIGNING ECONOMIC DEVELOPMENT WITH RESILIENCE *(Hall of Ideas G)*

Symposium Organizer: Kristiane Huber, CZES

Cascading economic impacts from climate change are coming to light, and cities are preparing for these risks. Businesses are also weighing climate impacts as they make business decisions. Both cities and their local business communities can use resilience planning to position themselves to address climate threats, attract new investment and stimulate economic development. This symposium will feature stories from communities and regions that are considering climate threats while seeking economic opportunity.

Presenters:

Meg Arnold, GSD Consulting
Mark Hartman, City of Phoenix
Scott Hemmerling, The Water Institute of the Gulf

UTILIZING PARTNERSHIPS TO ENHANCE CLIMATE MONITORING AND DROUGHT MANAGEMENT ON TRIBAL LANDS *(Hall of Ideas H)*

Symposium Organizer: Molly Woloszyn, National Integrated Drought Information System

Drought poses a serious threat to communities nationwide, and regularly impacts the lives of millions and the nation's economy. Since 1980, drought has been the second-costliest natural disaster in the U.S. according to NOAA, with the average cost per drought at \$9.6 billion. Drought's complex nature poses unique challenges, which include its impact on all sectors of the economy, its large-scale footprint, and its tendency to cross political boundaries. Tribes face distinct and extensive drought impacts due to the value tribes place on relationships with the natural world, the importance of those relationships for cultural and spiritual practices, and because of the tribes' often high reliance on agriculture, fishing, and subsistence for livelihoods. Addressing impacts may be complicated by jurisdictional, financial, and technical challenges. By taking steps to prepare for drought, tribes can reduce the negative effect on their critical water supplies, lifeways, and the environment, and increase the effectiveness of emergency response actions. This session will provide a broad perspective on the planning process for drought, highlighting projects that have focused on several important pieces of that process: increasing the capacity of tribes to monitor local climate and drought conditions, assess their short- and long-term drought vulnerabilities, and identify culturally appropriate resilience actions to address these vulnerabilities. The session will also provide attendees with resources that they can use to pursue drought planning and implementation, including potential funding options. A facilitated discussion with presenters and the audience will focus on best practices and lessons learned.

Presenters:

Derek Kauneckis, Voinovich School of Leadership and Public Affairs, Ohio University
Crystal J Stiles, High Plains Regional Climate Center
Anna Palmer, Ohio University Voinovich School of Leadership and Public Affairs
Miles Gordon, Voinovich School of Leadership and Public Affairs, Ohio University
James Rattling Leaf, Sr, Great Plains Tribal Water Alliance
Cody Knutson, National Drought Mitigation Center, University of Nebraska-Lincoln

RIGHTS, RESILIENCE AND COMMUNITY-LED RELOCATION *(Hall of Ideas I)*

Symposium Organizer: Robin Bronen, Alaska Institute for Justice

This session focuses on the work of an interdisciplinary team of fifteen Alaska Native coastal communities, geophysical and climate scientists, lawyers and state and federal government agencies to address coastal retreat and relocation. This work includes the design and implementation of community-based environmental-social monitoring methodologies, such as erosion, permafrost thaw, and storm event monitoring, to inform multiple levels of institutional governance about environmental change and its impact on community health and well-being. The right to self-determination is the foundation upon which this work is being implemented. Through this work we are co-producing knowledge, facilitating adaptation workshops and informing policy makers on the research-informed solutions to implementing coastal adaptation strategies. The identification of a new environmental hazard, *usteq* (Yup'ik word meaning land collapse caused by the combination of thawing permafrost, erosion and flooding) to be included in the Alaska Hazard Mitigation Plan is an example of our work's success. This session will showcase how the co-production of knowledge at multiple levels of governance can lead to policy-level changes to support community-based adaptation, including relocation.

Presenters:

Robin Bronen, Alaska Institute for Justice
Patricia Cochran, Alaska Native Science Commission

POLAR ICE LOSS, SEA LEVEL RISE, AND COASTAL FORECASTS THROUGH 2100 *(Hall of Ideas J)*

Working Group Organizer: Ted Scambos, NSIDC/CIRES University of Colorado

Successful adaptation to rising sea levels requires discussion and exchange between on-the-ground decision makers and planners and sea level scientists. This workshop will bring together these groups to discuss best practices for connecting these communities, to outline community needs,

and to map out a plan and structure for forward progress. The workshop is hosted by the NSF-funded Study of Environmental Arctic Change (SEARCH) action group on Land Ice and Sea level, and will include a brief review on the current state of knowledge on Polar ice loss of ice and other factors contributing to global sea level rise (SLR), the current state of science in projecting SLR and how that science is evolving, and a review of approaches in use and proposed for use in evaluating the potential impacts of SLR on coastal infrastructure over the next 100+ years. The workshop will seek to transform how stakeholders and decision makers can exchange information with researchers—and will provide an opportunity for planners and decision makers to discuss forecasts and their potential impacts. Interactive discussion and activities will help to identify decision maker and planner needs to inform scientific activities and products and decision-making approaches and techniques, with an emphasis on building a community for knowledge co-production.

Co-Organizers

Waleed Abdalati, University of Colorado
 Twila Moon, NSIDC/CIRES University of Colorado

URBAN HEALTH INEQUITIES AND CLIMATE CHANGE (Meeting Rooms KLOP)

Working Group Organizer: Marc Francois Coudert, Office of Sustainability, City of Austin

Climate change poses a serious health risk for groups impacted by inequity. Communities affected by environmental injustices and socioeconomic inequities are (and will increasingly be) disproportionately impacted by the health impacts of climate change. Local governments and their partners are uniquely positioned to identify and communicate the human health risks of climate change and develop interventions that reduce these risks to improve health and promote equity. This workshop will provide the local perspectives on the impacts of climate change on community's health from three American cities: Seattle and King County, WA; Chicago, IL; and Austin, TX.

Co-Organizers:

Margaret Eaglin, Chicago Dept. of Public Health (IL)
 Robin Pfohman, Seattle and King County (WA)

ASAP MEMBERS LEADING AND TRANSFORMING THE ADAPTATION PROFESSION (Meeting Rooms MNQR)

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

In this session we will celebrate our accomplishments as a network, be inspired by visionary climate leadership, and get down to work together to addressing a diversity of urgent climate adaptation needs. First, learn what we have accomplished together over our first 18 months as an independent organization. Next, be inspired by ASAP Regional Adaptation Leadership Award (RALA) winners as they illustrate how they embody ASAP's Living Guide to the Principles of Climate Change Adaptation (Living Guide)—the field-spanning principles which have emerged through over a decade of experimentation, research, and on-the-ground work in the climate adaptation field. Then channel that inspiration into motivation, getting down to work with your virtual collaborators from ASAP member led interest groups, working groups, and advisory groups. Finally, join us for informal networking, food, and drinks at a venue at or near NAF.

Co-Organizers:

Missy Stults, American Society of Adaptation Professionals
 Chris Swanston, Northern Institute of Applied Climate Science

■ 5:30pm to 5:45pm **BREAK**

■ 5:45pm to 7:30pm **SPECIAL EVENING SESSIONS**

5:45pm to 6:15pm THE COMMONS CLIMATE ADAPTATION HACKATHON (Madison Ballroom B)

Watch students from Wisconsin and professionals from the Commons present their findings from the first ever National Adaptation Forum Hackathon. Help determine the winner through a popular vote. Learn more: <https://www.thecommonswi.com/adapt>

5:45pm to 7:00pm RISING TO THE OCCASION: BRAINSTORMING OPPORTUNITIES FOR CROSS-BOUNDARY COLLABORATION TO ADDRESS SEA LEVEL RISE (Meetings Rooms KLOP)

A loosely structured conversation intended to elicit ideas about collaborating on sea level rise adaptation planning and practice. Hear about initiatives seeking to contribute to best practice development related to sea level rise adaptation and help think about steps the community of practice might take to advance learning and collaboration.

Who should attend:

- Decision makers/planners/stakeholders in city, county, regional, and state government
- Boundary organization professionals
- Scientists interested in the development and dissemination of "actionable science"

Conveners:

Water Utility Climate Alliance, Sea Level Rise Committee
 David Behar, Climate Program Director, San Francisco Public Utilities Commission
 Abby Sullivan, Environmental Scientist, Climate Change Adaptation Program, Philadelphia Water Department

Sponsor:

Christine Kirchhoff, Assistant Professor, University of Connecticut, Department of Civil & Environmental Engineering



6:15pm to 7:30pm ICELAND'S VANISHING BEAUTY LECTURE (Madison Ballroom B)

Lecturer: Michael Kienitz

Join us for an evening lecture by Michael Kienitz to learn about the changing climate induced landscape in Iceland. Iceland's Vanishing Beauty, is a photography and video collection which has been gathered in Southeast Iceland, at Vatnajökull National Park. Using conventional digital cameras and drones equipped with cameras this five year project documents the glacial geomorphology which covers over 8 % of the country. The imagery shows wide immersive shots of the glacial terrain which has been dramatically impacted by climate change. This unusual beauty is elusive due to climate change, volcanic eruptions and other environmental factors. Those who attend this presentation will come away with a visual reminder of at least two things. The impact of climate change on Iceland's glaciers and the continual change and transformation of Iceland's dramatic beauty.

The project was done by Michael Kienitz, a photojournalist for 46 years whose work has appeared in Time, Newsweek, Life, Rolling Stone, The New York Times Sunday Magazine and many other publications. His award winning work has also been exhibited in the United States and Europe.

- 7:00am to 8:00am **BREAKFAST**
Exhibition Hall
- 7:00am to 5:30pm **EXHIBITS**
Capitol Promenade/Grand Terrace
- 7:00am to 12:00pm **REGISTRATION**
Registration Desk
- 8:00am to 10:30am **WORKING GROUPS AND TRAININGS 2**

CO-PRODUCTION IN ACTION: BUILDING COLLABORATIVE CAPACITY FOR ADAPTATION IN NATURAL RESOURCE MANAGEMENT *(Madison Ballroom A)*

Working Group Organizer: Gabrielle Elan Roesch-McNally, Northwest Climate Hub

The U.S. Department of Agriculture (USDA) Climate Hubs were developed in 2014 to deliver science-based, region-specific information and technologies to enable climate-informed decision making by owners and managers of farms, ranches, and forests. Along with partners and stakeholders, we strive to co-produce knowledge that serves communities facing increasing climate-change related challenges. These efforts are nascent and require much learning, reflection, and evaluation. This working group offers a space to share lessons learned from diverse stakeholder engagement in climate adaptation efforts from across the U.S. in the agricultural, rangeland, and forestry sectors. We will use these case studies to guide a participatory and engaging discussion with participants to share panelist and group perspectives on coproduction to improve our collective knowledge about doing this work with communities. As a result of this working group, we will produce a synthesis of our collective knowledge and WG discussion to facilitate co-production efforts and community-based research. As a part of this working group, we will share lessons learned from a number of region-specific projects: (1) Climate change curriculum for adult learning audiences in Northeastern agriculture and forestry; (2) Partnerships to engage Northern Plains ranchers in climate change adaptation; (3) Participatory on-farm adaptation research with Willamette Valley farmers; (4) Farmer-to-farmer education in the Caribbean through collaborative, multi-stakeholder workshops and educational videos; (5) Communicating weather impacts to Midwestern farmers; and (6) Working with diverse partners to adapt managed and natural Northern forest ecosystems to a changing climate.

Co-Organizers:

Erica Kistner-Thomas, USDA Midwest Climate Hub
Todd Ontl, USDA Northern Forests Climate Hub
Julian Reyes, USDA Southwest Climate Hub
Caitlin Rottler, USDA Southern Plains Climate Hub
Rachel Schattman, USDA Northeast Climate Hub
Sarah Wiener, USDA Southeast Climate Hub

CROSS-CULTURAL SCIENTIFIC INVESTIGATION: CONNECTING INDIGENOUS KNOWLEDGE WITH SATELLITES *(Madison Ballroom B)*

Working Group Organizer: Bonnie J Murray, National Aeronautics and Space Administration

Indigenous knowledge systems include a deep understanding of natural environments that has evolved over generations of lived and spiritual experiences and observations. This understanding is passed down from generation to generation through storytelling, songs and other ceremonial practices. This knowledge has been used by indigenous communities to manage natural and cultural resources and develop adaptation strategies for changing climate conditions, but these knowledge systems have been undervalued by non-indigenous western scientists. Earth observation data from satellites and other sources provide useful insight into the nature and characteristics of changing climate conditions, but need in-situ data to provide a complete picture. Recognizing and including indigenous knowledge as a valid form of in-situ data would provide an enhanced understanding of the natural environment. There is a distinct need to 1) develop ways to incorporate different knowledge systems into monitoring natural resources and developing adaptation strategies; 2) identify climate change uncertainty across different cultures; and 3) discuss strategies to build cross-cultural collaborations between Sovereign Tribal Nations, government agencies and

academia. Building collaborations with Sovereign Nations requires an emphasis on indigenous empowerment and self-determination, as well as recognizing indigenous historical and cultural practices. This working group will bring together scholars, Indigenous Knowledge Holders, and multiple government agencies for a discussion on addressing these needs. Outcomes will include protocols for collaborations, specific ways to use indigenous knowledge with Earth observations for natural resource monitoring and a better understanding of the meaning and importance of uncertainty in climate projections.

Co-Organizers:

Amber McCullum, Bay Area Environmental Research Institute/NASA
Kalani Souza, Olohana Foundation

ENGAGING THROUGH GAMING: FIVE GAMES TO FURTHER YOUR ADAPTATION GOALS *(Madison Ballroom C)*

Training Organizer: Claire Bonham-Carter, AECOM

Game play is an excellent medium through which to introduce themes of climate adaptation to different audiences including communities, local and state governments and NGOs. In particular games allow players to step into other people's shoes, and understand the potential trade-offs that are often required in adaptation planning. Game play can also provide an opportunity for discussing complex topics in an applied way. In this session participants will learn about how this type of training is working across the country to help advance understanding and action on climate change. Game developers will be available to discuss how games could be tailored for different community situations. Participants will be given the opportunity to try out the 'Game of Floods' most often used by community groups; 'Game of Extremes' which is primarily aimed a local government audience and covers extreme heat as well as flooding, and 'In it Together' addressing sea level rise as well as social inequity. Finally, two video games, 'Aqua Republic' and 'Flood Fighter: Nevada' focusing on water resources management will be available. Come and play!

Co-Organizers:

Kristin Baja, Urban Sustainability Directors Network
Braden Kay, City of Tempe
Hunter Merritt, U.S. Army Corps of Engineers
Kelly Muellman, City of Minneapolis
Bridgit Van Bellingham, BVB Consulting LLC

PLANNING FOR THE FUTURE: BEST PRACTICES FOR USING CLIMATE PROJECTIONS IN ADAPTATION PLANNING *(Madison Ballroom D)*

Training Organizer: Derek Rosendahl, South Central Adaptation Science Center

Effective climate adaptation planning often requires the use of model-based future climate projections to make well-founded management decisions. But many practitioners struggle with balancing the large number of climate projections available, the choice of the most useful information for a particular application, and the need to have a scientifically robust set. This training will walk through the process of selecting and interpreting climate projections. It will help decision makers from any sector gain a better understanding of how climate projections can be used to inform future management decisions. The target audience will be practitioners having limited to no experience working with climate projections. The training structure and content has been developed and improved based on feedback from practitioners over the past two years. Our team will provide a brief overview that highlights the strengths and limitations of climate projections and then conduct a hands-on activity in small breakout groups using a real-world management challenge as an example. Climate scientists will answer questions about the climate projections and offer advice as they facilitate the small groups. Throughout the activity, attendees will be encouraged to share insights from their experiences and ask questions related to any challenges they currently face. Attendees will leave the training feeling more confident in their understanding of climate projections and the resources available to help them include these in future planning efforts.

Co-Organizers:

Emma Kuster, South Central Climate Adaptation Science Center
Renee McPherson, South Central Climate Adaptation Science Center
Adrienne Wootten, South Central Climate Adaptation Science Center

CLIMATE KIDS: UTILIZING ART, STORYTELLING, AND SCIENCE TO EMPOWER CLIMATE RESILIENT COMMUNITIES *(Hall of Ideas E)*

Training Organizer: Alexandria Warneke, Climate Science Alliance

Our communities comprise the keystone to effectively integrating adaptive management techniques and building climate resilience. Climate Kids, a program of the Climate Science Alliance and the primary focus of our community engagement effort, is a multi-generational collaborative that supports K-12 youth education on climate resiliency through hands-on science activities, storytelling, field trips, and art. We nurture the budding scientists and stewards in students from all socioeconomic backgrounds with activities that demonstrate local climate impacts in the form of ocean acidification, sea level rise, drought, coastal storms, and temperature extremes. Since 2015, the Climate Kids program has successfully inspired over 22,000 students and trained 2,000 formal and informal educators on consistent climate messaging. Through strategic partnerships with climate scientists and qualified educators, this program encourages curiosity about the natural world while providing the tools necessary to take educated action on how to protect our community and planet now. During this interactive and hands-on Climate Kids training session, participants will come away with lessons on how to effectively deliver climate messaging and activities, facilitation techniques on how to navigate challenging climate conversations and integrate adaptive community-based solutions, and access to a network of resources that supports dynamic climate engagement efforts.

Co-Organizer:

Amber Pairs, Climate Science Alliance

HONING ENGAGEMENT AND COMMUNICATION SKILLS TO CATALYZE LOCAL CLIMATE ADAPTATION WORK: LESSONS FROM THE RESILIENCE DIALOGUES *(Hall of Ideas F)*

Training Organizer: Rachel Jacobson, American Society of Adaptation Professionals

This training is an opportunity for climate change professionals from a variety of backgrounds (e.g. natural science, social science, policy, communications, planning, engineering) to strengthen their knowledge and skills for providing effective, locally-relevant technical assistance. The Resilience Dialogues connects Community Leaders to a network of Subject-Matter Experts (SMEs) through an online platform to explore community-specific climate resilience questions, and identify next steps and resources to help local leaders move from dialogue to action. Resilience Dialogues SME alumni and newcomers alike will learn strategies and approaches that will improve their effectiveness as adaptation professionals both within the Resilience Dialogues and in other community engagement contexts. Participants will: Learn about the Resilience Dialogues process and platform, including principles, best practices, and lessons learned regarding community engagement in an online, asynchronous setting; Reflect on and share experiences, expectations, and objectives for engaging with communities to build climate resilience; and Use real-life scenarios from past dialogues to strengthen skills for responding to communities' climate resilience questions. This training is open to all NAF participants; those who are interested in volunteering as a Resilience Dialogues SME, and those who have volunteered in the past, are particularly encouraged to attend. Workshop Leaders: Natalie Bennett Brad Spangler Rachel Jacobson

Co-Organizers:

*Natalie Bennett, U.S. Global Change Research Program
Brad Spangler, Meridian Institute*

Presenters:

*Juliana Lucchesi, City Planner, City of Mt Shasta, CA
Patrick Marchman, Mitigation Champion, Resilience Action Partners
Justin Kates, Emergency Management Director, City of Nashua, NH*

TAKING STOCK AND STAYING ON THE VANGUARD: CLOSING THE RESILIENCE GAP *(Hall of Ideas G)*

Training Organizer: Joyce Coffee, Climate Resilience Consulting

The objective of this session is to inspire resilience field leaders to scale their work deep, out and up. It will be based in part on insights from the 2017 report *Rising to the Challenge, Together* (in part informed by a NAF2017 workshop). Participants will inspire one another through an agenda that will include:

- Recent facts and observations from the field about the persistent Resilience Gap
- Hard-won insights from field leaders (panelists and workshop attendees) on what the field is doing to close this gap
- Resilience in action - suggestions for what field builders need to do to prevent the Gap from continuing to widen.
- An exploration of transformative capacities and assets to ensure the field's future work really makes inroads to improving lives and livelihoods, justly and effectively.
- Action planning for all, including what can be shared, leveraged and collaborated among workshop participants.

Co-Organizer:

Susi Moser, Susanne Moser Research & Consulting

CLIMATE CHANGE ADAPTATION AND OUTDOOR RECREATION: CHALLENGES AND OPPORTUNITIES *(Hall of Ideas H)*

Working Group Organizer: Leslie Brandt, Northern Institute of Applied Climate Science, USDA Forest Service

This working group session will focus on the role of outdoor recreation to serve as an agent of climate adaptation. During the first half of the workshop, we will present a new tool that has been developed for adapting outdoor recreation to climate change: an adaptation strategies menu for outdoor recreation developed by the Northern Institute of Applied Climate Science, the USDA Northern Forests Climate Hub, and the USDA Forest Service. After the presentation, a structured information exchange will allow participants to provide feedback on this tool and their application to the outdoor recreation sector, with a particular focus on natural areas and temperate climates. Participant feedback will be used to refine the tool and develop a national toolkit for adapting recreation to climate change.

Co-Organizers:

*Tom Beery, Kristianstad University, Sweden
Maria Janowiak, Northern Institute of Applied Climate Science, USDA Forest Service
Daniel O'Toole, USDA Forest Service*

RESILIENCE NOW, RESILIENCE TOMORROW: TRIBAL/INDIGENOUS COMMUNITY EMERGENCY PREPAREDNESS *(Hall of Ideas I)*

Working Group Organizer: Nikki Cooley, Institute for Tribal Environmental Professionals—Climate Change

Emergency response and preparedness are fundamental in resilient communities and are key in climate adaptation planning. As Tribal nations and Indigenous communities we must plan for emergencies and build resilience while considering our unique histories, cultural priorities, jurisdictions and often remote locations/rural populations. Resilience and emergency response are not new concepts to Tribal nations and Indigenous communities. Many have endured both natural disasters and profound historical events such as pandemics, forced land cessation and relocation. Resiliency has been demonstrated through the survival of our cultures and communities, through multi-century environmental, political and social changes. Today, our resilience is again tested by Climate Change. The goal of this working group is to empower Tribal nations and Indigenous communities to improve emergency preparedness in the face of climate change. The session will start with a short climate briefing to summarize anticipated climate changes around the country necessitating increased emergency preparedness. This will be followed by four presentations. Topics will include community food security and preparedness, use of local-traditional knowledge

in planning, federal resources available for emergency planning and implementation, and the development of a multi-hazard mitigation and climate adaptation plan by a Tribal nation. During subsequent facilitated breakout sessions, working group participants will be able to share stories of community resilience and lessons learned and will identify potential next steps to increase their community's emergency preparedness. A large group discussion at the end will summarize key points made.

Co-Organizers:

Leanna Begay, ITEP: Tribes & Climate Change Program
Sid Caesar, Bureau of Indian Affairs Emergency Management
Karen Cozzetto, ITEP: Tribes & Climate Change Program
Taylor Hall, Sac and Fox Tribe's Environmental Department
Kalani Souza, Olohana Foundation
Casey Thornbrugh, NE & SE Climate Adaptation Science Center & USET
Margeau Valteau, Tribal Partners Branch, FEMA HQ | Intergovernmental Affairs Division

TOOLS TRAINING (Meeting Rooms KLOP)

Training Organizer: Jessica Hitt, EcoAdapt

The CAKE Tools Training is your opportunity to learn about the field's preeminent climate change tools from the experts themselves! During this interactive session, you'll receive a hands-on lesson about the best ways to use each tool as well as opportunity to pose questions to the experts themselves. Experts will guide you through examples and best practices through a hands-on lesson you simply can't get from reading a user manual. Whether you are interested in visualizing data or making adaptation decisions, the Tools Training will have something for you!

Co-Organizer:

Tera Johnson, EcoAdapt

COMMUNITY RESILIENCE BUILDING WORKSHOP INTERACTIVE TRAINING SESSION (Meeting Rooms MNQR)

Training Organizer: Adam W Whelchel, The Nature Conservancy

The need for municipalities, corporations, organizations, institutions, and government agencies to build community resilience and adapt to extreme weather and hazards is now strikingly evident. Ongoing events continuously reinforce this urgency and compel leading communities to proactively plan and act. In response to this ever-increasing need and urgency, the Community Resilience Building (CRB) Workshop was created. The CRB Workshop is a unique, "anywhere at any scale", community-drive process, rich with information, experience, and dialogue to equitably improve resilience to all natural and climate-related hazards; today and in the future. This session provides training on the CRB Workshop approach which has been tried, tested, and is now trusted by over 200 communities across 7 states. The training will walk participants through all steps of the CRB Workshop process including core team establishment, goal setting, defining top hazards (past, current, future), participatory mapping of strengths and vulnerabilities, development of actions cross-walked against multiple hazards, and prioritizing solutions in a collaborative and supportive environment. This learning exchange will be reinforced with real world, cross-sectoral examples from municipalities (over 142 in Massachusetts alone) and academic campuses where CRB has been implemented. An interactive educational exercise will follow to ensure the participants successfully experience and implement key steps in the CRB process using diverse situational case studies. Community Resilience Building Guidebooks will be provided to help accelerate continued utility and application by participants in their own ongoing efforts.

■ 10:30am to 11:00am BREAK

■ 11:00am to 12:30pm CONCURRENT SESSIONS 7

TOWARD A COMMON POLICY AGENDA FOR CLEAN, CLIMATE-RESILIENT AND EQUITABLE INFRASTRUCTURE INVESTMENTS (Madison Ballroom A)

Working Group Organizer: Rachel Cleetus, Union of Concerned Scientists

A reliable, safe and equitable infrastructure system is the backbone of a healthy economy, public safety, and quality of life. Climate change and extreme weather events are increasingly threatening already strained infrastructure systems across the nation. This workshop will bring together a diverse group of participants from various sectors (e.g., energy, transportation, water), disciplines and perspectives to: 1) develop a common set of criteria for clean, climate resilient infrastructure that benefits all communities and then 2) apply those criteria to evaluate policy proposals across several sectors with direct relevance to potential federal and state infrastructure investment packages. Speakers will kick off the conversation by presenting several sets of principles from a science-based and equity perspective. Organizers will identify opportunities for building a collaborative framework with a common policy agenda informed by the perspectives of this diverse group of participants.

Co-Organizers:

Jamesine Rogers Gibson, Union of Concerned Scientists
Jacqueline C. Patterson, NAACP Environmental and Climate Justice Program

HOPE AND THE CLIMATE CHANGE IMPERATIVE—BUILDING STAKEHOLDER SUPPORT FOR EQUITABLE SOLUTIONS (Madison Ballroom B)

Training Organizer: Cara Pike, Climate Access

Americans are more concerned about climate change than ever yet few are optimistic we will (be able to) address it. Solutions such as renewable energy and green infrastructure are popular, yet to many they still seem far off in the future, inaccessible, and/or not on the scale of the problem. This sense of fatalism and the lack of a clear pathway forward limits engagement in adaptation and resilience efforts. This training will explore how Americans view climate change and climate solutions, barriers to action, and the role hope plays in social change. Through hand-on exercises, participants will learn how to balance the threat with hope when framing the issue, as well how to engage internal and external stakeholders in advancing equitable and accessible climate solutions.

Co-Organizers:

Susanne Moser, Susanne Moser Research and Consulting

FROM AWARENESS TO ACTION: USING RISK VISUALIZATION, BEHAVIORAL SCIENCE, AND STORYTELLING TO ENCOURAGE RESILIENCE (Madison Ballroom C)

Symposium Organizer: Devon J McGhee, Resilience Action Partners/Michael Baker International

Natural disasters — particularly flooding — continue to be among the costliest threats facing our nation. But too often, resilience planning for an unknown future is a tough choice for communities facing competing priorities in the here and now. To help Americans overcome these barriers, FEMA has put greater emphasis on innovative community engagement approaches and more sophisticated risk communication, including using behavioral science, virtual reality, and effective storytelling. The purpose of these initiatives is to build belief within communities that flood risks are real and powerful, and to give communities the tools and ability to channel awareness into action. Success requires not only credible flood risk data — it also requires meeting customers where they are. This session will allow attendees to explore firsthand FEMA's recent initiatives to help communities understand and plan for their risk, including:

- FEMA's virtual reality experience IMMERSED and augmented reality product Floodwalk which put users at the center of a flood crisis, allows them to assess damage, see the benefits of mitigation, and make resilient decisions.

- FEMA's growing suite of interactive story map resources working to expand their ability to reach diverse audiences and provide online learning tools.
- FEMA and the Economist Intelligence Unit created the Flood Economics web resource highlighting the challenges and benefits of flood mitigation through 21 nationwide case studies.
- FEMA's new video, "Worth Fighting For: Profiles in Resilience," uses storytelling to put a face on resilience in Cape Girardeau, MO; Leon Valley, TX; and Miami Beach, FL.

Presenters:

Peter Herrick, Jr., Federal Emergency Management Agency
Francie Israeli, Resilience Action Partners
Devon McGhee, Resilience Action Partners
Cara Spidle, Resilience Action Partners

PROGRESS, CHALLENGES, AND OPPORTUNITIES IN IMPLEMENTING THE NATIONAL FISH, WILDLIFE, AND PLANTS CLIMATE ADAPTATION STRATEGY *(Madison Ballroom D)*

Symposium Organizer: Maggie Ernest Johnson, Association of Fish & Wildlife Agencies

Published in 2012, the National Fish, Wildlife, and Plants Climate Adaptation Strategy (Strategy) was the first unified approach among federal, tribal, and state government agencies to address the effects of climate change on America's valuable natural resources and the many people, businesses, and communities that depend on them. The Strategy was designed to enable decision-makers at multiple levels to take action to reduce impacts and increase resilience to a changing world. It called for advancing seven core goals, identified specific actions to address them, and was intended to be implemented by multiple entities across a variety of sectors. A review of the Strategy was recommended within five to ten years. In this Symposium, leading experts from federal, state, tribal, and non-governmental organizations will assess the progress, challenges, and opportunities to implementing the Strategy over the past six years and beyond. Through individual presentations and a facilitated discussion, experts will provide information on the current state of practice, priority needs and future directions to advance sound adaptation actions at appropriate scales over the next five to ten years.

Presenters:

Tom Olliff, National Park Service
Roger Griffiths, National Oceanic and Atmospheric Administration
Lynn Helbrecht, Washington Department of Fish and Wildlife
Megan Granato, Maryland Department of Natural Resources
Rob Croll, Great Lakes Indian Fish and Wildlife Commission
Bruce A Stein, National Wildlife Federation

RAPID CLIMATE VULNERABILITY ASSESSMENTS FOR EQUITABLE ADAPTATION: CROSS-SECTORAL LEARNING & TOOLS *(Hall of Ideas E)*

Training Organizer: Sara Hutto, Greater Farallones Association

Climate Vulnerability Assessments (CVA) are used to evaluate how climate change will affect a particular resource, project or process in order to identify and support the implementation of specific climate adaptation strategies to reduce vulnerability to climate change. Rapid Climate Vulnerability Assessments (RCVA) are focused, 1-day versions of the CVA, designed to allow practitioners to rapidly assess their resources' vulnerabilities to climate change, while engaging with stakeholders to design climate-informed solutions that ensure the long term success of investments and benefit of outcomes. Natural resource managers use RCVAs to develop common understanding of the joint impact of climate stressors and non-climate stressors to identify multi-benefit adaptation actions. Community leaders use RCVAs as a platform to advance the intersection between climate, and non-climate stressors (such as human health and racial equity) to identifying and implementing equitable climate resilient solutions that place people and human development in the forefront, increasing equity and multi-benefit outcomes. In addition to improved project durability, the RCVA enhances participant skill sets in climate resilience and adaptation, builds a team of climate leaders, and increases community resilience and financial stability for current and future systems. Participants in this session from any sector will have the opportunity to learn how to use an RCVA, garner key

insights from pilot RCVAs in natural systems and human communities across the country, compare and contrast two different RCVA methods, and find the common themes and priorities that unite all climate-resilient planning efforts.

Co-Organizer:

Marissa Ramirez, Natural Resources Defense Council

BUILDING RESILIENCE THROUGH TRAINING: WATER UTILITY DECISION SUPPORT *(Hall of Ideas F)*

Training Organizer: Steve Fries, US Environmental Protection Agency

The decisions that identify and support effective adaptation strategies for water utilities require an appreciation and understanding of the available climate science and uncertainty inherent in this information. This training session is based on workshops being provided by the Water Utility Climate Alliance (WUCA), in partnership with the U.S. Environmental Protection Agency's (EPA's) Creating Resilient Water Utilities (CRWU) and the National Oceanographic and Atmospheric Administration (NOAA), to highlight important strategies for applying climate science and embracing this uncertainty. Each section, detailed below, will include a technical presentation, a case study from the sector, and an opportunity for discussion where participants will be asked to document takeaways from the session. By learning about specific techniques and experiences from water sector professionals who have applied them, participants will gain the perspective of how complicated concepts fit into their real-world decisions.

Co-Organizers:

Kavita Heyn, Portland Water Bureau
Laura Kaatz, Denver Water
Rob Lempert, RAND Corporation
Joel Smith, Abt Associates
Julie Vano, National Center for Atmospheric Research

LOUISIANA'S STRATEGIC ADAPTATIONS FOR FUTURE ENVIRONMENTS: SUPPORTING COMMUNITY-BASED DESIGN, ENGAGEMENT AND DECISION-MAKING THROUGH MULTI-SECTOR COLLABORATION *(Hall of Ideas G)*

Symposium Organizer: Liz Williams Russell, Foundation for Louisiana

With efforts beginning in 2016 and continuing to implementation to 2018 and beyond, Louisiana's Office of Community Development (OCD) and Foundation for Louisiana (FLL) worked with local and regional partners to develop and implement an inclusive and equitable planning process to address the effects of land loss and increased flood risk to communities and economies. Prior to the launch of the program, FFL supported the creation and launch of a community-based leadership development program across Southeast Louisiana, enabling local leaders to connect their personal experiences of environmental change to broader, regional action. Graduates of that LEAD the Coast program would go on to play pivotal roles in the rollout of the program, through outreach, engagement, facilitation, organizing and advocacy. Throughout the LA SAFE (Louisiana's Strategic Adaptations for Future Environments) process, OCD and FFL co-hosted and co-managed 71 community meetings between March and December of 2017. FFL and OCD collaborated with public, private, philanthropic, NGO and community partners to ensure opportunities for those most impacted by environmental risks to be designers and key decision makers in the best ways to address them. As ten projects and programs selected by resident participants receive ~\$47.5 million in public investment, regional partners and allies support efforts to ensure projects and programs to address the impacts of land loss and flood risk continue to expand, initial investments catalyze additional funding at multiple scales, and community power builds towards inclusive and equitable responses, policies and practices over time. Visit lasafe.la.gov to learn more.

Presenters:

Robert Habans, The Data Center
Colette Pichon Battle, Gulf Coast Center for Law and Policy
Donald Bogen, Bayou Interfaith Shared Community Organizing
Mathew Sanders, Louisiana Office of Community Development
Camille Manning-Broome, Center for Planning Excellence

EQUITABLE ADAPTATION *(Hall of Ideas H)*

Session presentations describe several strategies and tools used by communities across the country to develop equitable climate adaptation efforts for those most vulnerable to the effects of climate change. Session leaders will share their experiences working in Miami-Dade County, Minnesota, the San Francisco Bay, and Duck Hill, MS. The session will also provide a national perspective on community-based approaches to equitable adaptation.

Presentations:

Current City Approaches to Inclusive Climate Planning

Stefen Pablo Samarripas, American Council for an Energy-Efficient Economy

Minnesota Adaptation Toolkit — case study review of a scalable project approach for rapid vulnerability assessments

Ted Redmond, paleBLUEdot llc

Building grassroots climate leadership in vulnerable communities: Lessons from a Miami-based climate justice program

Zelalem Adefris, Catalyst Miami

Equitable Shorelines - San Francisco Bay Plan Amendment for Social Equity and Environmental Justice,

Dana Brechwald, San Francisco Bay Conservation and Development Commission

Achieving Sustainability through Education and Economic Development Solutions (A SEEDS) Initiative,

Romona Taylor Williams North Montgomery Citizens United for Prosperity (MCUP)

SUPPORTING LOCAL ADAPTATION TO CLIMATE-DRIVEN RISKS: FROM ASSESSMENT TO ACTION *(Hall of Ideas I)*

Although climate change is global, much of adaptation is local. But adaptation can be a daunting task for communities. During this session we'll be exploring different approaches to supporting community adaptation based on work supporting Los Angeles, Hampton Roads, New York City and communities in New York State. Our session will conclude with a group discussion about community adaptation—What's working? What is not? Where is there room for improvement?

Presentations:

Municipality and University Collaborations: Developing Adaptive Solutions

Carol Lynn Considine, Old Dominion University

Integrating Vulnerability and Risk for Climate Adaptation in Los Angeles County

Chloe Fleming, NOAA/CSS, Inc.

Preparing for Extreme Rain Events in New York City

Alan Cohn, NYC Department of Environmental Protection

A hydrologist and community leader walk into a bar...Lessons on community-focused inland flood planning

Megan O'Grady, Abt Associates

Coastal Adaptation in Hampton Roads: Practice, Engagement, & Education

Carol Lynn Considine, Old Dominion University

COLLABORATIVE CLIMATE ADAPTATION PLANNING: NEXT STEPS FOR INDIGENOUS TRAINING, POLICY AND PROGRAMMING *(Hall of Ideas J)*

Working Group Organizer: Kyle Powys Whyte, Michigan State University

Over the last 30 years, Indigenous peoples, including staff, organizers and leadership in U.S. federally-recognized Tribes and Alaska Native entities, have developed strategies for training, policy and programming with climate scientists aimed at improving Tribes' capacities to plan for climate change. In fact, all the previous NAFs convened Indigenous and allied environmental professionals and scientists who eventually formed 3 working groups that created policy reforms, designed ethical guidelines for collaboration (including the Guidelines for Considering Traditional Knowledges in Climate Initiatives), and spurred numerous collaborative programs. Given changes in political climate, it is an important time to have a working meeting to take stock of what has been achieved in the last 30 years and craft plans and a set of formalized guidelines for collaborations. At a recent meeting of Tribal and allied professionals hosted by the Menominee Tribe, participants recommended the development of more detailed and formal guidelines for tribal engagement, case studies, and educational programs for promoting greater collaboration between Indigenous peoples and climate scientists. This working group session seeks to engage a wider array of Tribal and allied climate adaptation professionals to gain greater specificity for how these ideas can be implemented as part of new efforts to build on previous Tribal work and create new initiatives in training, policy,

and programming. Intended outcomes and products include a formal set of guidelines for tribal engagement on climate change adaptation as well as program development for an agency to indigenous community cultural exchange program.

Co-Organizers:

Malinda Chase, Alaska Climate Adaptation Science Center/Aleutian Pribilof Island Association

Robin Clark, Inter-Tribal Council of Michigan

Julie Maldonado, Livelihoods Knowledge Exchange Network / Rising Voices

Shannon McNeely, Colorado State University / NC Climate Adaptation Science Center

HAWAII'S ADAPTATION EFFORTS: PERSPECTIVES FROM COMMUNITY, COUNTY AND THE STATE, MOVING FORWARD ON MULTIPLE FRONTS *(Meeting Rooms KLOP)*

Symposium Organizer: Daniele Spirandelli, University of Hawaii-Manoa,

Over the past several years, Hawai'i has been at the center of climate adaptation efforts by state, county, indigenous and NGO partners. This symposium will highlight several efforts and approaches implemented across multiple scales and sectors, each engaging actors from research and practice to develop strategies that integrate climate change science into decision-making. Three presenters highlight statewide efforts to address (1) climate impacts to terrestrial and freshwater systems, and (2) sea level rise impacts to coastal communities. All three will discuss the development, dissemination, and use of guidance and tools developed to support resource managers and planners to identify and implement adaptation actions. Two presenters will discuss county responses that are currently under way, each effort taking place at different levels and using different approaches. The first is at the community scale in West Kauai and integrates climate science with local knowledge and expertise using a mediated modeling approach. The second presentation focuses on adaptation responses by the City and County of Honolulu, a member of the 100 Resilient Cities network. All of the work described involves working closely in partnership with communities, state and local governments, and non-profits to build a shared understanding of vulnerabilities, priorities and strategies for adaptation. Presenters will reflect upon issues that arise when translating climate science into useable knowledge, working across sectors and different knowledge domains.

Presenters:

Wendy Miles, East West Center

Brad Romine, University of Hawai'i Sea Grant and Pacific Islands Climate Adaptation Science Center

Catherine A. Courtney, Tetra Tech, Inc.

Ruby Pap, University of Hawai'i Sea Grant College and County of Kauai Planning Department

Zena N. Grecni, East-West Center

■ 12:30pm to 2:00pm

LUNCH

Level 1: Exhibition Hall

■ 12:45pm to 1:45pm

LUNCHEON SESSIONS

ADAPTATION UNDER UNCERTAINTY: ADVANCES IN SCENARIO PLANNING FOR ADAPTATION PROFESSIONALS *(Hall of Ideas E)*

Working Group Organizer: Brian W. Miller, U.S. Geological Survey, North Central Climate Adaptation Science Center

Despite the daunting uncertainty associated with adapting to a changing climate, adaptation professionals must make plans and implement actions to meet their goals. Scenario planning is a structured process that works with uncertainty by identifying and describing a small set of plausible futures that capture the range of conditions an institution, landscape, or resource might face. These future scenarios can be used to understand vulnerabilities and develop strategies and actions to succeed. This interactive session will highlight recent advances in developing usable information related to scenarios, and applications of scenario planning with brief examples from state resource management agencies, NOAA Fisheries protected species recovery, National Park Service planning efforts, and more. Through these case studies, the working group will articulate barriers, best-practices, and recommendations for conducting and applying scenario planning. We will synthesize these insights into practical guidance on scenario planning and its use by resource management agencies to facilitate adaptation under uncertainty.

Co-Organizers:

Aparna Bamzai-Dodson, U.S. Geological Survey, North Central Climate Adaptation Science Center
 Diane Borggaard, NOAA Fisheries Service
 Dori Dick, Ocean Associates Inc. in support of Office of Protected Resources, NOAA Fisheries
 Carolyn Enquist, U.S. Geological Survey, Southwest Climate Adaptation Science Center
 Cat Hawkins Hoffman, National Park Service
 Chris Hoving, Michigan Department of Natural Resources
 Toni Lyn Morelli, U.S. Geological Survey, Northeast Climate Adaptation Science Center
 Imtiaz Rangwala, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder
 Gregor Schuurman, National Park Service

FROM RISK TO RESILIENCE: NEW KNOWLEDGE, TAKEAWAYS, LESSONS AND QUESTIONS (Hall of Ideas I)**Working Group Organizer:** Huda Alkaff, Wisconsin Green Muslims

The National Adaptation Forum offers opportunities to learn, share and advance knowledge about how to effectively, equitably and wisely adapt to climate change. While the issues and impacts grow more acute every day in our communities, it can be challenging to synthesize new learnings and apply them to our work quickly. This session provides a platform for participants to reflect on what we have learned thus far, and the key questions we need to answer at macro and micro levels. We will focus on a few themes that emerged in the 2019 NAF such as equitable adaptation; community resiliency and vulnerability; displacement, retreat and relocation; and other topics suggested by participants. Participants will join discussion clusters on their topic of choice where they will share their takeaways from the NAF, the questions that have emerged for them, and their thoughts on advancing knowledge on the issue in the next year or two. Outcomes will include: 1) the articulation of key learnings on topics that participants plan to apply and build on in their work, 2) identification of some of the big questions—new ones or those that remain unanswered—that participants want to explore and answer through their work, 3) connections made or strengthened between members of the adaptation community.

Co-Organizers:

Elaine McCarty, EFC West
 Liz Perera, Sierra Club
 Erika Spanger-Siegfried, Union of Concerned Scientists

ENGAGING IN RESILIENCE: BUILDING TRIBAL ADAPTIVE CAPACITY TO CLIMATE CHANGE (Hall of Ideas J)

Climate impacts can be felt across the board in these three unique Tribal communities. This session features ways that each Tribe is developing and building their capacity to address the climate disruptions they are seeing and feeling. As each Tribe continues to establish their adaptive capacity, they are creating a process of resilience and adaptation that works for their region, ecosystem, culture and most importantly, their Tribal members.

Presentations:

Beyond Speculation: An Indigenous Alaskan People's Adaptation in the Face of an Ecological Catastrophe,
Patricia K. Schwaltenberg, Chugach Regional Resources Commission
 Learning to Braid: Weaving Traditional Knowledge and Western Science in a Climate-Smart Restoration Toolkit,
Stefanie L. Krantz, Nez Perce Tribe
 Circle of Resilience: A Pueblo Model of Adaptation
Cynthia Naha, Santo Domingo Tribe

HOW ARE WE ADAPTING TO COASTAL THREATS? EMERGING MANAGEMENT APPROACHES TO SUPPORT COASTAL RESILIENCE (Meeting Rooms KLOP)

Symposium Organizer: Michelle Dana Staudinger, DOI Northeast Climate Adaptation Science Center
 Sea level is on the rise globally, causing coastal storm impacts to become more intense, enhancing erosion of shorelines, shrinking estuarine and brackish water ecosystems, and increasing flooding - even on sunny days - as rising waters interact with tidal cycles. Gradual and acute threats from sea level rise (SLR) require innovative, holistic and collaborative approaches to reduce risk including coastal adaptation strategies that consider short- and long-term climate scenarios, uncertainty, and cost-benefit analyses. This symposium will highlight a range of approaches being implemented in

coastal areas throughout the United States to assist natural and human communities sustain and adapt to SLR, storms and flooding. Presentations will provide perspectives from the Pacific Islands to the Gulfs of Maine and Mexico on emerging techniques and tools that help prioritize actions, utilize natural infrastructure techniques, identify and design conservation reserves, and support robust decision making to maximize ecosystem services and resilience. A panel discussion will consider the greatest successes, opportunities and remaining challenges that practitioners face in adapting socio-ecological systems to current and future impacts.

AVOIDING PITFALLS AND SHORTFALLS: MONITORING AND EVALUATION OF CLIMATE ADAPTATION (Meeting Rooms MNQR)**Working Group Organizer:** Rachel M Gregg, EcoAdapt

Climate change is having far-reaching effects on natural and cultural resources, communities, and infrastructure, and decision makers are challenged to make informed choices to alleviate the environmental, financial, physical, and emotional costs. Because the field of adaptation has grown so quickly, decision makers often struggle with how to identify, prioritize, and evaluate the effectiveness of climate adaptation actions. Monitoring, evaluating, and sharing lessons learned about successes and failures is the adaptation field's Achilles heel. Investing in monitoring and evaluation helps create an evidence base to support better long-term outcomes and reduced risks and investment costs. This session will explore ways to embrace monitoring and evaluation as standard adaptation practice through group discussions and exercises.

2:00pm to 3:30pm CONCURRENT SESSIONS 8**TOOLKIT LAUNCH: TRANSFORMATIONAL CLIMATE ADAPTATION FINANCE — FROM THE “MASTER’S TOOLS” TO THE POWER OF THE PEOPLE (Madison Ballroom C)****Symposium Organizer:** Jacqueline C Patterson, NAACP Environmental and Climate Justice

Join us as we launch an initiative to equip frontline communities with technical and financial resources for adapting to climate change impacts by building resilience to conditions including extreme weather, sea level rise, and food and water insecurity. At the launch event we share an overview of the training we plan to conduct regionally and online throughout 2019, including sessions on: 1) How to survive in the current economic system in the context of climate change, while paving the path for transformation from systemic economic oppression; 2) Advancing reforms to existing policies and funding streams and spearheading transformational, new economy policies; 3) Ins, outs, pros, and cons of various financing mechanisms; 4) Models for Inclusive Climate Action Planning; and 5) Existing Models for Equitable Climate Adaptation Financing. During this session, we will launch the toolkit, “Transformational Climate Adaptation Finance Toolkit”, written in a collaboration between the NAACP and the University of Maryland School of Law's Small Business & Community Equity Development Clinic and Environmental Law Clinic.

Presenters:

Atty. Dorcas Gilmore, University of Maryland School of Law
 Denise Abdul Rahman, Indiana NAACP
 Besse Odom, Anchorage, AK Climate Action Plan Community Advisory Group

ADAPTING STRATEGIC LAND CONSERVATION AS A CLIMATE ADAPTATION STRATEGY (Hall of Ideas E)**Symposium Organizer:** Melissa Ocana, UMass Amherst Extension

Strategically protecting and conserving land can be an important climate adaptation strategy with many co-benefits for human and natural systems. For example, conserving a salt marsh can buffer communities from increased storm surge. When floodplains along a river are intact and undeveloped, they can reduce flooding during intense storms and increase water storage during drought. As the climate changes, plants and wildlife will need to move to more suitable habitats and protecting an interconnected network of complex habitats can allow more species to adapt. The implementation of strategic land conservation happens through strong partnerships among many stakeholders across sectors, including land trusts, state agencies, regional authorities, and

municipalities. In this session, leaders from the land sector will provide an overview of the relevance of land conservation to adaptation practice. Each year land trusts conserve 1.8 million acres of land and we will share examples of land trusts leading the way. We will point to successful partnerships that use existing tools to prioritize and strategically plan land conservation for resilience. We will also consider some of the challenges to this work and point to resources, such as best practices on how to communicate about climate change developed for land trusts. The session organizer will provide a 5 minute introduction and closing, with 15-20 minutes for each speaker in between. Finally, we will have a discussion with the audience to consider their local partners and places that could benefit from using land conservation to advance climate adaptation.

Presenters:

Melissa Ocana, University of Massachusetts Amherst
Kelly Watkinson, Land Trust Alliance
Nava Tabak, Scenic Hudson
Darci Schofield, Metropolitan Area Planning Council

COORDINATION AND COLLABORATION IN THE CLIMATE RESILIENCE ECOSYSTEM *(Hall of Ideas F)*

Working Group Organizer: John R Nordgren, Climate Resilience Fund

The "Resilience Ecosystem" (RE) is the open and inclusive community of public and private entities working to sustain and evolve science-based tools, information, and expertise — "climate services" — that can help city and regional planners, resource managers, businesses, and others build resilience to climate-related impacts and extreme events. In January 2018, NOAA's Climate Program Office and the Climate Resilience Fund co-sponsored and organized, with EcoAdapt, a workshop in which we asked the ~70 participants to identify opportunities to collaborate on synergistic projects that build on existing resources within the broader RE. Project ideas generated by workshop participants were considered, along with others solicited through an RFP process, in a grants competition led by CRF. This 2.5-hour Working Group session will feature presentations by the six successful grantee teams, each comprised of three or more organizations, on the results of their projects and plans for evolving or scaling their services or resources. Working group participants will be invited to engage with the grantee teams to explore new opportunities and applications for services or features that increase access to, or utility of, resources. The organizers will also present a virtual map of the Resilience Ecosystem, demonstrate how it can be used by participants to discover connections and opportunities for collaboration, and engage working group attendees to edit the map in real time. NOAA and CRF will report on their ongoing collaboration, including a status update on year two of the Coordination and Collaboration in the Climate Resilience Ecosystem grants competition.

Co-Organizers:

Lara Hansen, EcoAdapt
David Herring, NOAA Climate Program Office

COASTAL AND MARINE PROTECTED AREAS AS CATALYSTS FOR ADAPTATION ACTION *(Hall of Ideas G)*

Symposium Organizer: Lauren Wenzel, NOAA Marine Protected Areas Center

Coastal and marine protected areas are actively engaged in assessing and implementing climate adaptation strategies. These areas are natural test-beds for adaptation: they are cross-sectoral, involving representatives of many different sectors in decision-making; they rely on science-based decision-making; they incorporate monitoring into project design for assessment; and they engage the public—emphasizing that climate change is impacting coastal and ocean resources, communities and businesses now and that strategic action is needed. This session will feature speed presentations from USFWS National Wildlife Refuges, USFWS Coastal Program, NOAA's Climate Program Office, and NOAA's National Marine Sanctuaries. The primary focus will be a discussion with the audience addressing:

- How can we encourage more cross-sectoral information-sharing to inform adaptation implementation?
- How can we work more effectively at the landscape scale to better align urban and suburban adaptation efforts with work within marine and coastal protected areas?
- How can we bring in new partners to help us address new climate impacts and adaptation challenges?
- As natural resource managers, what is our role in addressing large-scale changes that may be climate-driven?

Natural resource managers, urban planners, practitioners, scientists, etc., are invited to join this lively and interactive session on marine and coastal protected area adaptation efforts. The goal is to share lessons and experiences from coastal and marine protected areas and better align community and protected area adaptation actions. This session will be linked to sessions by EcoAdapt on Rapid Vulnerability Assessment and by NOAA Climate Program Office on coastal adaptation.

Presenters:

Scot Covington, U.S. Fish and Wildlife Service
Samantha Brooke, U.S. Fish and Wildlife Service
Sara Hutto, Greater Farallones Association
Adrienne Antoine, NOAA Climate Program Office
Lily Swanbrow Becker, Florida Fish and Wildlife Conservation Commission

COLLABORATION AND ADAPTATION ACROSS WORLDVIEWS: CASE STUDIES IN CO-PRODUCING AND IMPLEMENTING SCIENCE FOR MANAGEMENT *(Hall of Ideas H)*

Symposium Organizer/Moderator: Aparna Bamzai-Dodson, USGS/North Central Climate Adaptation Science Center

As ecosystems, wildlife, and people are increasingly affected by changes in factors such as land use, invasive species distribution, and climate, there is a growing call for adaptation science products that can be directly utilized by resource managers. The National and Regional Climate Adaptation Science Centers (CASCs), managed by the U.S. Geological Survey, bring together scientists and natural and cultural resource managers to produce science that can be applied to decision and planning processes in support of adaptation to change. Knowledge co-production is a collaborative approach that has been shown to greatly increase the adoption of science products by managers, leading to implemented adaptation actions. Knowledge co-production simultaneously allows the integration and utilization of multiple forms of knowledge (analytical, rational, visceral, experiential, etc.) and multiple disciplinary perspectives. This session explores diverse case studies across the CASC network in which scientists and managers have engaged in knowledge co-production, and in some cases, have begun to track and evaluate the use of their products by managers. The session will invite the audience to further explore knowledge co-production by ending with an open panel discussion with all presenters. This session will include 5 presenters (15 minutes each) and a 15 minute discussion afterwards that will include all 5 presenters as a panel interacting with the audience. A moderator will take 2-3 minutes to open the session with introductory context, introduce each presenter, guide their Q&A, and ensure the session is kept on schedule.

Presenters:

Aranzazu Lascrain, North Carolina State University, Southeast Climate Adaptation Science Center
Scott Laursen, University of Hawai'i at Hilo, Pacific Islands Climate Adaptation Science Center
Tamara Wall, Desert Research Institute, Western Regional Climate Center
Amy Snover, University of Washington, Climate Impacts Group
Renee McPherson, University of Oklahoma, South Central Climate Adaptation Science Center

LESSONS FOR MANAGED RETREAT FROM POST-DISASTER BUYOUTS *(Hall of Ideas I)*

Symposium Organizer: Amanda Whittemore Martin, SE Disaster Recovery Partnership,

The United States is far from consensus on fair or wise processes to relocate vulnerable communities. Post-disaster buyouts are one of the few extant practices that provide a model for managed retreat

from climate hazards. This panel examines the latest research on design, effectiveness, experiences and equity of post-disaster buyouts. Participants are invited to explore the following questions alongside our panelists:

- How well do our current buyout programs reduce risk?
- What are the effects of buyouts beyond issues of risk? Are they positive or negative, and for whom?
- How do buyout programs integrate community needs and social equity?
- How do these findings translate to the context of climate hazards, especially those with slow onset?

Presenters:

Devon McGhee, Michael Baker International
Amanda Martin, UNC / SE Disaster Recovery Partnership
A.R. Siders, Harvard University
Sherri Brokopp Binder, BrokoppBinder Research & Consulting.
Gavin Smith, DHS Coastal Resilience Center of Excellence, UNC Chapel Hill

TRADITIONAL KNOWLEDGE IN ADAPTATION (Hall of Ideas J)

Relationships between plants, animals and Native peoples are changing as environmental conditions change. Through a film and four papers we explore vulnerability, resilience, adaptive capacity and appropriate methods for managing culturally important resources to ensure cultural traditions and legacies of indigenous groups continue. Traditional, cultural, and indigenous knowledges applied in climate adaptation planning and action are presented broadly across the country, on the Olympic Peninsula in Washington State, in the Great Lakes region and Southeast Alaska.

Presentations:

Inhabitants Film, Anna Elisabeth Palmer, Ohio University Voinovich School of Leadership and Public Affairs
Expressions of Native American Cultural Heritage in Response to Changes in Environmental Setting
Gus Bisbal, National Climate Adaptation Science Center
A Culturally-relevant Plant Phenology Study in Northern Wisconsin Ceded Territories
Hannah Panci, Great Lakes Indian Fish and Wildlife Commission
Makah Cultural and Traditional Resource Assessment: A preliminary framework to utilize traditional knowledge into climate change planning
Danielle Edelman, Makah Tribe/Washington Sea Grant
Eelgrass, clam gardens and beach asparagus: facilitating community adaptation strategies in Southeast Alaska
Linda E Kruger, USDA Forest Service Pacific Northwest Research Station

FROM SEA TO RESILIENCE SEA AND HIGH POINT IN BETWEEN—RESILIENCE ACROSS GRADIENT AND SCALES (Meeting Rooms KLOP)

From sea to resilient sea, come experience firsthand the ground-breaking approaches and solutions being advanced across this great country. From coastal highway adaptation in San Francisco Bay to community resilience building in Massachusetts to adaptation feasibility tools in rural Virginia to a climate change atlas for the Chesapeake Bay watershed to future flood resilience along the Gulf of Mexico. This session is guaranteed to round out your NAF experience and fill your resilient task list with experts, examples, and projects you can replicate and leverage back home. Come join us!

Presenters:

Resilience to Future Flooding in the Gulf of Mexico
Mikaela Heming, Northern Gulf of Mexico Sentinel Site Cooperative /Mississippi State University
Incorporating Resilience into Coastal Highway Adaptation Planning and Design: A San Francisco Bay Case Study
Kristin Tremain Davis, AECOM
Municipal Vulnerability Preparedness Program—Community Resilience Building from the Ground Up across Massachusetts
Adam W Whelchel, The Nature Conservancy
Engaging Rural Virginia Communities in Coastal Resilience using the RAFT (Resilience Adaptation Feasibility Tool)
Michelle Covi, Old Dominion University/ Virginia Sea Grant Extension Partner
A Climate Change Atlas for the Chesapeake Bay Watershed: Climate Past, Present, Future(s)?
Todd M. La Porte, George Mason University

CATALYZING CROSS-SECTORAL ADAPTATION (Meeting Rooms MNQR)

This session will frame the need for cross-sectoral adaptation and share case studies of collaborative approaches to adaptation planning in New York, Boston, Anchorage and Baja California. Presentations will cover engaging diverse stakeholders, cost-benefit analysis and evaluating adaptation. They will also share resources for designing resilient capital projects and methods for private sector stakeholders to understand their own climate risks through the lens of communities' adaptive capacity.

Presentations:

NYC- Climate Adaptation Tools for the Built Environment
Mathew Mampara, Dewberry
Climate Ready Boston? Identifying indicators to evaluate Boston's climate adaptation initiatives
Kara Runsten, Kim Lundgren Associates, Inc.
Adaptation on the U.S.-Mexico Border: Challenges, Costs and Strategies
Serge Dedina, WILDCOAST
Development of an Anchorage Climate Action Plan through a Municipality-University of Alaska collaboration
Micah Hahn, University of Alaska
Assessing Local Adaptive Capacity to Understand Corporate and Financial Climate Risks
Natalie Ambrosio, Four Twenty Seven

■ 3:30pm to 4:00pm

BREAK

■ 4:00pm to 5:30pm

CLOSING PLENARY
Madison Ballroom A&B

HIP HOP CAUCUS “THINK 100% – THE COOLEST SHOW ON CLIMATE CHANGE

Join the Hip Hop Caucus in a special closing plenary with a live episode of “Think 100%—The Coolest Show on Climate Change” with hosts Antonique Smith, a Grammy nominated singer and actress, Mustafa Santiago Ali, a national environmental and climate leader, and Rev Lennox Yearwood Jr., President & CEO of Hip Hop Caucus, on-stage for an engaging conversation focused how climate change can build stronger communities.

Guests include:

Zelalem Adefris, Climate Resilience Director, Catalyst Miami
Victoria Benson, Program Manager, Movement Strategy Center
Lara Hansen, Executive Director and Chief Scientist, EcoAdapt





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Discussions on Organization-Wide Climate Change Capacity Building & the State of the Workforce
8:00am - 10:30am (Meeting Room KLOP)

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Urban Adaptation
Assessment



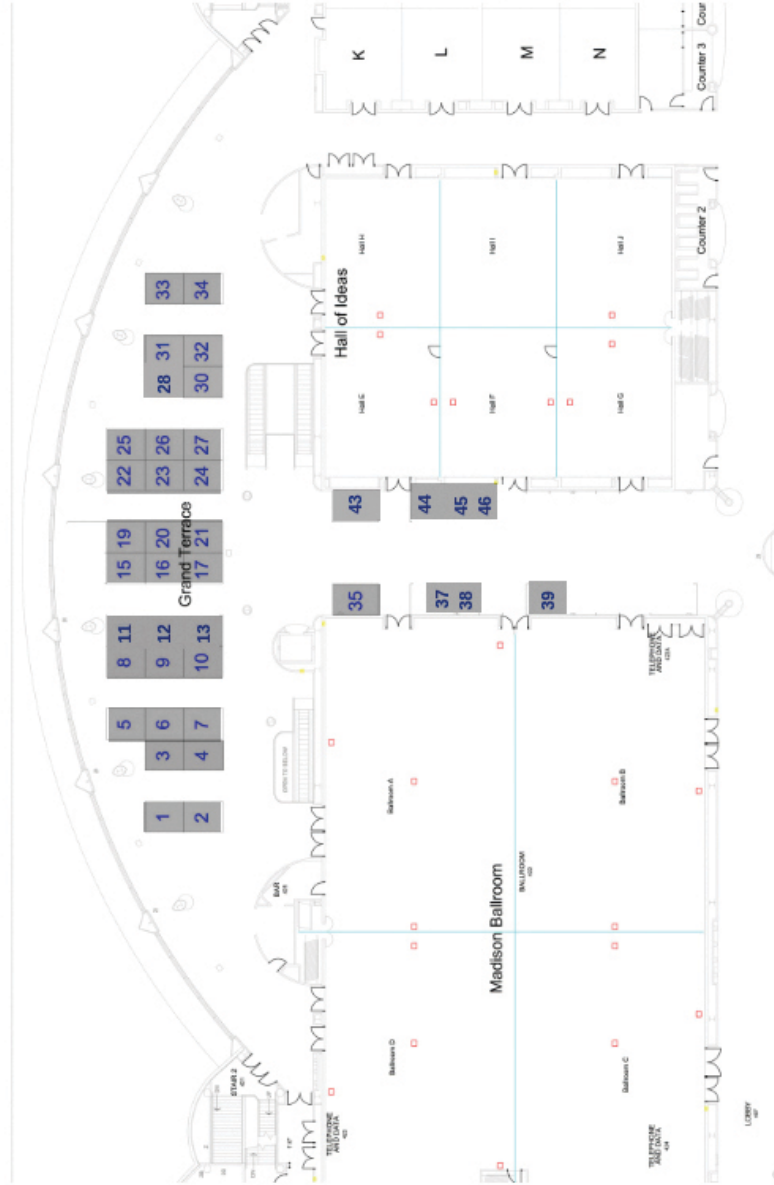
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ADAPTATION ADVOCATES



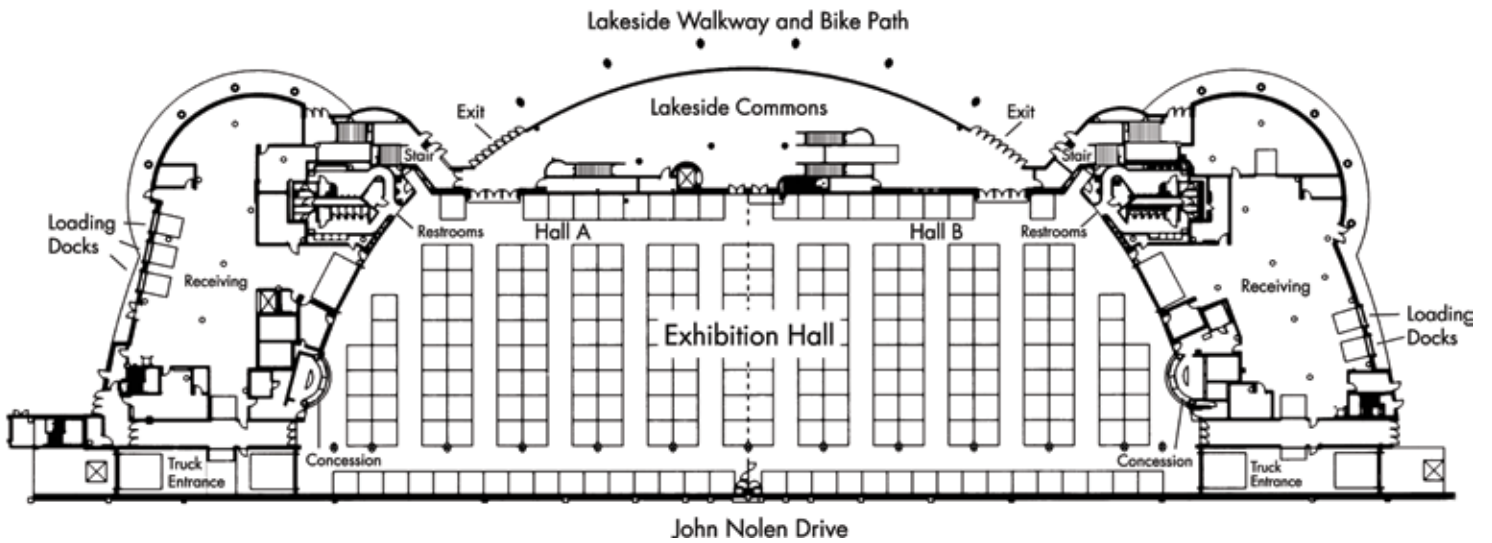
NATIONAL ADAPTATION FORUM BOOTH FLOOR PLAN AT THE MONONA TERRACE



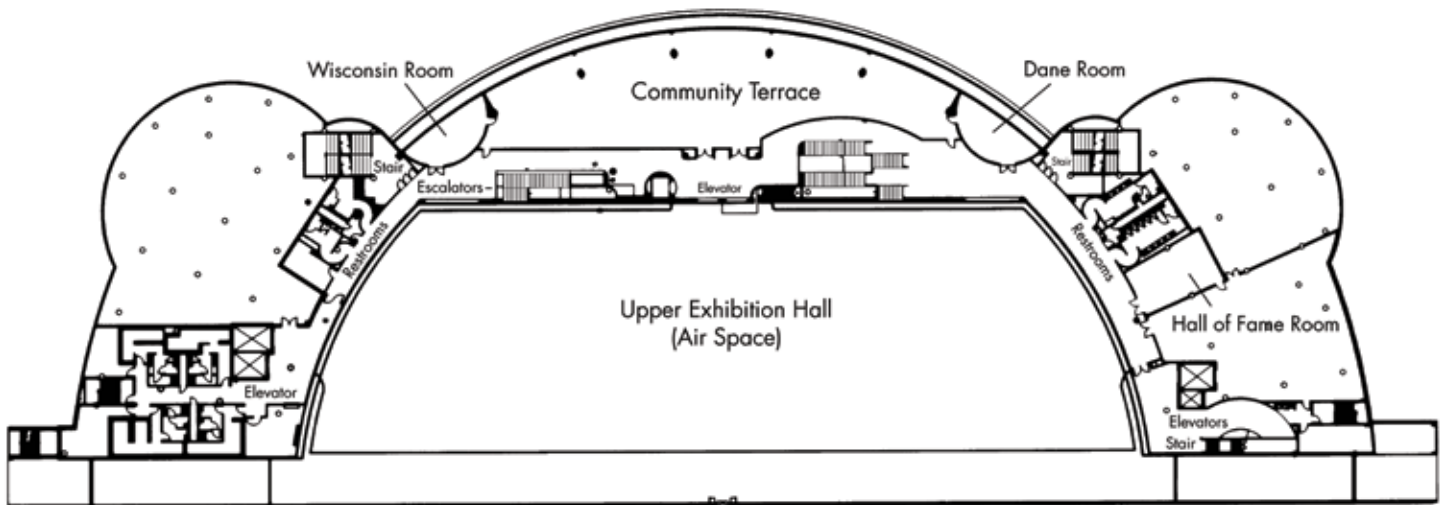
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8. Trust for Public Land
9. XDI Cross Dependency Initiative
10. WCS Climate Adaptation Fund
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12. Natural Resources Defense Council
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15. National Wildlife Federation
16. Abt Associates
17. EcoAdapt
18. USGS National and Regional Climate Adaptation Science Centers
20. National Center for Appropriate Technology
21. ICF
22. Association of Floodplain Managers
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38. Wicked Questions
39. Outrigger Foundation
43. Kresge Foundation
44. National Oceanic and Atmospheric Administration
45. Association of Climate Change Officers
46. National Oceanic and Atmospheric Administration SeaGrant

LEVEL 1 - LAKESIDE

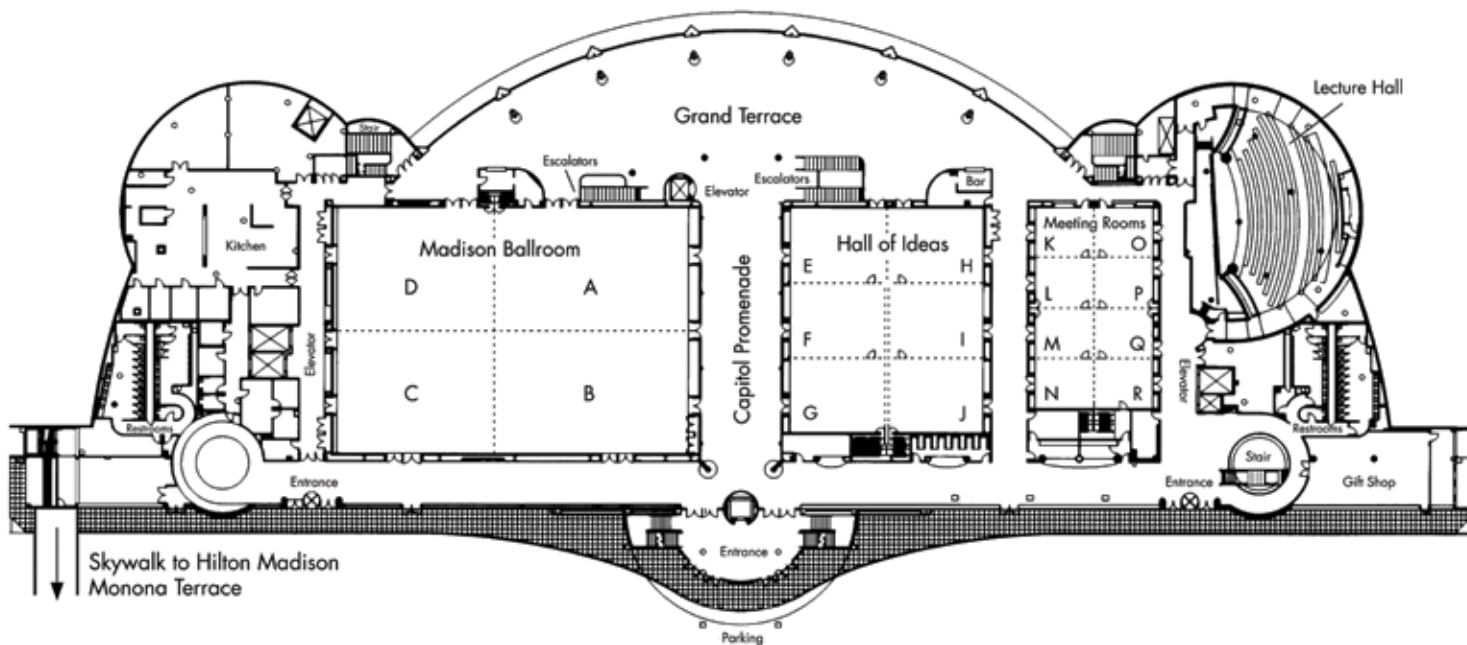


LEVEL 2 - MEZZANINE



EXHIBITOR FLOOR PLAN AND VENUE MAPS

LEVEL 4 - MEETING ROOMS / GRAND TERRACE

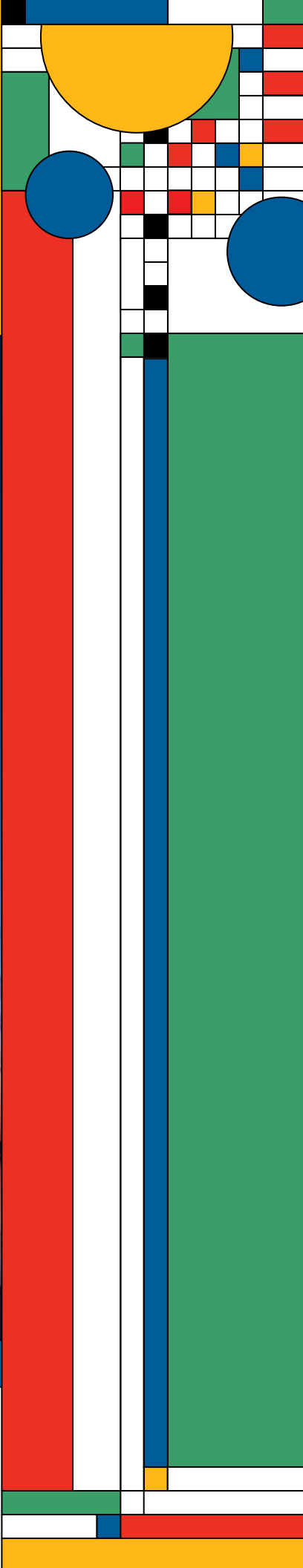
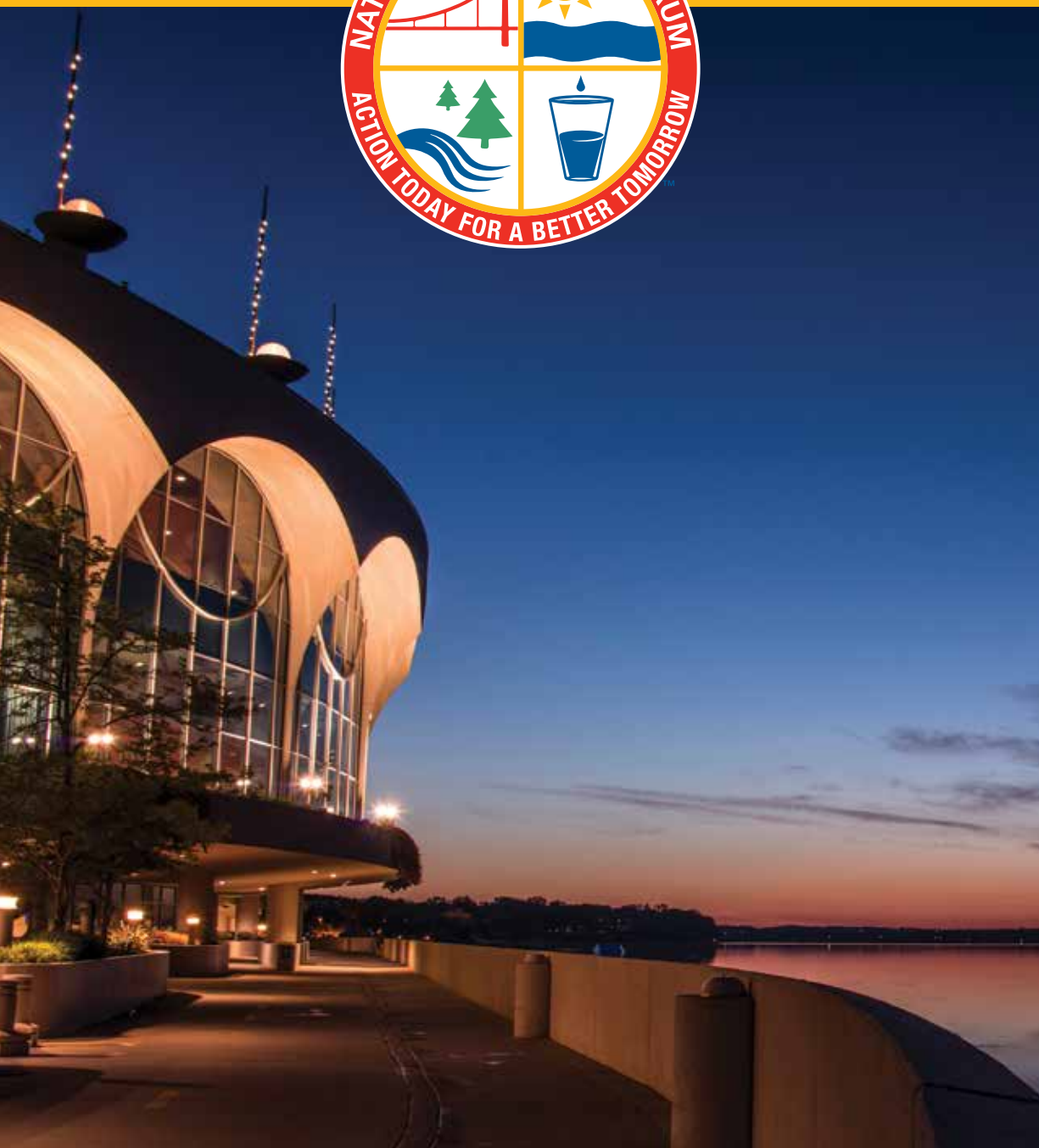


SCHEDULE OF EVENTS AT A GLANCE

TIME	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
6:00am		Iyengar Yoga		
7:00am		Registration/Exhibits/Breakfast		
8:00am	OPENING PLENARY	Working Groups and Trainings	Working Groups and Trainings	Post Forum Workshops from 7:00am to 1:30pm
10:30am	BREAK			
11:00am	Concurrent Session 1	Concurrent Session 4	Concurrent Session 7	
12:30pm	LUNCH/ LUNCHEON SESSIONS			
2:00pm	Concurrent Session 2	Concurrent Session 5	Concurrent Session 8	
3:30 pm	BREAK			
4:00pm	Concurrent Session 3	Concurrent Session 6	CLOSING PLENARY	
5:30pm	Evening Poster and Tools Café Reception	The Commons Hackathon Iceland's Vanishing Beauty Lecture Sea Level Rise Brainstorming Session	Exhibit Breakdown	

THANK YOU FOR JOINING US IN MADISON!

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