



**Dialogues on Centering Justice in the
5th National Climate Assessment**

Thursday, February 17th, 2022

EVENT SUMMARY REPORT

<https://risingvoices.ucar.edu/>

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This report is an overview of the event. It is not meant to be exhaustive of the breadth and richness of the conversations and discussions, but rather to provide a summary context of the dialogues.

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BACKGROUND CONTEXT

[The Rising Voices Center for Indigenous and Earth Sciences](#) (RV) facilitates intercultural, relational-based approaches for understanding and adapting to extreme weather and climate events, climate variability, and climate change. RV supports a growing network of Indigenous, tribal, and community leaders, atmospheric, social, biological, and ecological scientists, students, educators, and other experts from across the United States, including Alaska, Hawai'i, and the Pacific and Caribbean Islands, and around the world. It functions as a boundary network among diverse individuals and knowledge systems, and fosters relationship building based upon mutual trust and respect. RV acknowledges the inherent value of Indigenous knowledge systems and Indigenous science, including but not limited to traditional ecological knowledge and adaptive practices and processes, honoring them equally with Earth sciences.

RV's mission is to center Indigenous knowledge systems in the Earth sciences for more innovative responses to extreme weather and climate change. This includes envisioning collaborative research that brings together Indigenous knowledges and science with Earth sciences in a respectful and inclusive manner to achieve culturally relevant and scientifically robust climate and weather solutions. At its core, Rising Voices aims to advance science through collaborations that bring Indigenous and Earth (atmospheric, social, biological, ecological) sciences into partnership, supports adaptive and resilient communities through sharing scientific capacity, and provides opportunities for Indigenous students and early career scientists through scientific and community mentoring. Central to Rising Voices are our [values](#) and [Ethics Guidelines](#), which provide a starting point for considerations when working in intercultural spaces.

RV is co-administered by the University Corporation for Atmospheric Research/National Center for Atmospheric Research (UCAR|NCAR) and the Livelihoods Knowledge Exchange Network (LiKEN) in partnership with Haskell Indian Nations University, the Indigenous Peoples' Climate Change Working Group, and the National Oceanic and Atmospheric Administration's (NOAA) Office for Coastal Management. RV is housed within NCAR (in turn managed by UCAR) in Boulder, Colorado, which is in the Traditional Territory of the Arapaho, Cheyenne, and Ute.

For more information about Rising Voices: [Website](#), [Introductory video](#),

Community agreements: (1) [Rising Voices Ethics Guidelines](#), (2) [UCAR/NCAR Participant Code of Conduct](#)

PURPOSE OF THE EVENT

The purpose of the event was to provide space for dialogues focused on climate and environmental justice concerns, needs, priorities, and actions, and weaving in a diversity of knowledges and experiences into the Fifth National Climate Assessment (NCA5). The NCA5 is a major U.S. Government report about how climate change affects people and places in the United States. Participants had the chance to hear from authors of the assessment and discuss

together how the report can reflect concerns around and actions towards climate and environmental justice, with the summary of the dialogues to be compiled and submitted as input into the NCA5 chapter drafts. There were 132 people that participated in the event.

AGENDA

1. Opening
2. Welcome and introduction to Rising Voices
3. Agenda, ethics guidelines, purpose of session
4. Introduction to the US Global Change Research Program and the 5th National Climate Assessment (NCA5)
5. Questions about the NCA5
6. Breakout groups
7. Share-out from breakout groups
8. Wrap-up and Closing

OPENING AND INTRODUCTION TO THE US GLOBAL CHANGE RESEARCH PROGRAM AND THE 5TH NATIONAL CLIMATE ASSESSMENT (NCA5)

Nikki Cooley (Institute for Tribal Environmental Professionals) opened the event with of the importance of acknowledging our ancestors and nonhuman relatives with which we share Mother Earth. Participants were encouraged to engage in a respectful and intentional dialogue centering justice.

Allison Crimmins (NCA5 Director) provided an introduction to the [US Global Change Research Program](#) (USGCRP) and the [5th National Climate Assessment](#) (NCA5). The five priorities of the NCA5, which is due to be released in Fall 2023, include: (1) Advance the Conversation; (2) Make it Accessible to a Broad Audience; (3) Be Creative in Communication; (4) Make it About People; and (5) Ensure it is Useful and Usable. These five priorities echo the goals of the event's dialogue, with the importance of input from a diversity of voices and perspectives to improve the relevance, usefulness, and usability of the NCA5.

Questions and discussion on the NCA5 development process and chapters included:

- There are three approaches for centering justice in the NCA5: (1) have a diverse author team; (2) content of report will interweave justice throughout the texts; and (3) audiences of the report, specifically is it reaching the communities who need this information? The NCA5 team is thinking about the words that are careful and considerate and respectful to address justice issues.
- Has there been any discussion of creating an information platform that links to databases containing information used in the assessment?
 - o For data sources used in the NCA, there are ongoing discussions in the Office of Science, Technology and Policy (OSTP) regarding putting all climate information in one place and making that publicly accessible.
- The use of conventional benefit-cost analysis with a positive (larger than zero) discount rate makes the fourth and sometimes the third generation meaningless. It is morally wrong to disregard the long term.
 - o Regarding future generations discounted by economic valuation like cost-benefit analysis, the new economics chapter will be dealing with this question. The [NCA4](#) treated economics with mitigation, this time they are separate so economics can do more on financial risk and mitigation can think about actions beyond economic costs. There is no firm answer yet on discount rates since the chapters are in their early stages.
- How do we coalesce the extractive nature of the science to industry pipeline against the community-oriented ideology of First Nation Stewards?
 - o Regarding the extractive nature of science, the human social systems chapter will be dealing with the meta question of knowledge production and grapple with this.
- Regarding whether there is an Indigenous expert on each chapter, there isn't a specific requirement but most chapters do have Indigenous authors and there has been engagement by Tribal government representatives and Indigenous peoples in the [NCA5 engagement workshops](#), which has strongly encouraged authors in each chapter to consider Indigenous issues.
- Considering implementation and action beyond the report, how is this balanced with the policy relevant but not prescriptive directive?
 - o The NCA5 is mandated to be policy relevant but not prescriptive; this is a resource to provide baseline information to policymakers. The NCA maintains being a reliable, credible resource through a stringent process of revisions and reviews, with an eye to what is most relevant to people making policy and plans.
- Regarding the chapter author teams, there is a broad range of states and tribes represented across the chapters. Authors were selected based on expertise, including, for example, lived experience as well as training, career stage, race, ethnicity, and gender.
- Will there be discussion in each chapter about what isn't known, the gaps in the research, and what is needed to make decisions and the report useful to agencies, funding agencies, communities, and researchers? It's recommended that each chapter include a section on gaps in knowledge and future research needed to answer important questions that remain, data collection, co-benefit metrics, etc.
 - o At the end of each chapter there is a section called Traceable Accounts that discusses the evidence base, research gaps, and uncertainty.

Recommendations and comments that emerged from the discussion:

- Why is there no discussion of actually trying to reverse climate change?
- The assessment seems to be skipping over the smaller communities, rural communities, tribal communities, the animals, the health of the ecosystems, and so on. Everything and everyone is connected.
- Considering how the Tribes & Indigenous Peoples Chapter fits in with justice issues, it's important to have respectful and thoughtful incorporation of Indigenous knowledge systems, perspectives, and issues as part of the NCA, including honoring data sovereignty, and with guidance from the previous NCA. A key resource is [The Status of Tribes and Climate Change Report](#) (STACC), with key messages and recommendations helpful for the NCA5 authors. The STACC report includes chapters on ecosystems and biodiversity, water, air, cultural resources, emergency management, and more.
- With agricultural activities incorporating justice issues around, for example, big agriculture and water sharing, it's important to work across the chapters on cross cutting issues.
- Develop a special report on centering justice that captures themes and ideas from the individual NCA chapters.

Some of the engagement opportunities with the NCA5 include:

- To submit technical inputs to be considered, please send an email to: nca5-technicalinputs-group@usgcrp.gov. The opportunity to submit technical input will be open until April 14, 2023. You can use that email address to submit literature and MP3 files/videos for input.
- For major NCA5 updates, including additional opportunities for public comment, you can sign up for the USGCRP newsletter, <https://www.globalchange.gov/newsletter-signup>, and follow USGCRP on Twitter (@usgcrp)

BREAKOUT GROUPS

The breakout groups were a facilitated discussion focused on climate and environmental justice concerns, needs, priorities, and actions, important for including in the NCA5. The breakout group topics included:

- **Community relocation/site expansion:** discussion on issues around communities working on community-led relocation, resettlement, or expanding into a new or ancestral site when adapting in place no longer becomes an option
- **Energy systems:** discussion on a just transition away from fossil fuels to cleaner, renewable energy
- **Food systems:** discussion on food security and food sovereignty, as connected to climate, weather, and water
- **Human health:** discussion on individual, community, and cultural health (physical, mental, social, emotional, spiritual) as these connect to climate, weather, and water

- **Phenology:** discussion on the timing of natural events, in relation to climate and plant/animal lifecycles
- **Water systems:** discussion on water quality and quantity issues, including freshwater ecosystems and marine ecosystems
- **General:** discussion on additional topics to cover priorities

The questions/prompts for the breakout groups:

1. What are your primary climate and environmental justice-related concerns, particularly related to *[topic]*?
2. What are specific examples of justice-centered adaptation or mitigation actions addressing your primary concern(s) related to *[topic]*?
3. What data can the NCA provide that would be helpful for addressing your concerns?
4. What are your top climate and environmental justice priorities to be included in the NCA5?
5. What else would you like to share that hasn't been raised yet? What do the NCA5 authors need to know?

Community Relocation/Site Expansion

Overview: There are disproportionate impacts on low-income, BIPOC, coastal, and island communities, and an unequal distribution of funds for relocation. There can be conflicts among those who have to move and there is a question of what happens to resources that are left behind and connections back to them, with the example of exclusive economic zone (EEZ) impacts when island populations are relocated. There is also a question of the role of diaspora for adaptation and governance. In the haste to relocate, central relationships can be lost, calling for the need to think about 'kinship time' (Whyte, 2021).¹ There is a need to understand what is happening through research, increasing access to adaptation funds, and for co-creation/co-governance of solutions so that there is a more equal distribution of power. The lens by which the community sees impacts is where you start.

Participants' primary climate and environmental justice-related concerns, particularly related to community relocation/site expansion, include:

Exacerbation of existing inequalities, inequities, and injustices

- Hurricane displacement and the impacts that has on low income and BIPOC frontline communities in coastal and island areas.

¹ Whyte, Kyle Powys, Time as Kinship (December 19, 2019). Forthcoming in 2021 in The Cambridge Companion to Environmental Humanities, edited by Jeffrey Cohen (Arizona State University) and Stephanie Foote (West Virginia University): Cambridge University Press, Available at SSRN: <https://ssrn.com/abstract=3830025>

- How riverine flood hazards and related adaptation strategies exacerbate current socioeconomic inequalities.
- Concern that relocation is a lose-lose proposition. Those who are asked to retreat have not been given the chance to make their community climate safe, and have also not been able to relocate as a community. Some places where retreat is being pushed are then re-purposed to new, high-end development.
- The concept of managing retreat and relocating households can exacerbate inequalities. Buy-out programs are not transparent. Thinking about risk and how that impacts communities on different levels.
- Issues of gentrification on coasts exacerbate injustice. Investments tend to be concentrated in areas formerly occupied by the underserved; i.e., gentrification that moves people into a poverty trap.
- Adaptation strategies and policies can exacerbate inequalities, such as political forces and climate issues in Puerto Rico.
- There is no prioritization of staying in situ; very little opportunities presented to engage the community to discuss/seek alternatives to relocation.
- A lot of outsiders are coming into communities but are not helping with problems the community face; people are not ready to move out of their ancestral lands.

Unequal and inequitable distribution of resources

- Unequal distribution of federal risk reduction dollars (hazard mitigation, insurance claims) to private property, which shapes who can adapt in place and who is forced to relocate.
- Neo-classical economic framework is applied in resource allocation for adaptation that ignore issues of distributive justice, institutional racism, and historical injustices.
- Who pays for equitable community relocation? What finance mechanisms exist and which have worked well? If that is unknown, what research can be invested into monitoring and evaluating these mechanisms to determine whether they are equitable and effective.
- Indigenous communities access to funds to relocate/site expansion depend on if they are federally recognized.
- Considering communities that are moving into host communities, a lot of the time communities are dealing with their own adaptation strategies and not willing to allow newcomers into their communities.
- Cost-benefit analysis fails a lot of communities. More vulnerable communities do not receive adequate benefit.
- When federal funding becomes available, application processes are often unclear or not really intent on meeting the needs of the community at risk, and seemingly written more for the government than the applicant, creating a huge obstacle to receiving funds.

- If federal funds become available, the government has little to offer in terms of support and guidance on the process for expending the funds. The language of the grants are convoluted and difficult to understand. As a result, the resettlement process is complex, time consuming and, in the end, may not ultimately meet the needs of the community.
- There is unequal distribution of flood burdens and mitigation benefits. A lot of the time, very little of mitigation benefits go to rural communities while urban communities get more of the benefits. For example, there is unequal distribution of [Louisiana's Strategic Adaptations for Future Environments](#) (LA SAFE) funds between city and rural communities. LA SAFE participatory planning charrette/design workshops – lack of transparency on its real impacts, where the funds were being spent.
- Isle de Jean Charles resettlement plan: lots of lessons on what not to do and what needs to be done to address community visions, concerns and desires – tensions in this process reflects the obstacles faced by tribal-driven resettlement efforts when they're taken over by a state body and incorporated into their state-wide “coastal retreat” planning through the use of federal funding sources that were intended for the tribe's resettlement and not used for the original intent of the effort and accompanying funds. Poor communication, slow to take action to address immediate issues, such as repeated flooding, and restrictions by the state that went counter to the tribe-led plan, kept the plan from being realized in its original form and intent.

Recommendations and examples of justice-centered adaptation or mitigation actions related to community relocation/site expansion include:

- Transformational adaptation
- Information sharing via interactive platforms (e.g., [NJFloodmapper](#)), mandated disclosures of flood risk to homebuyers.
- Developing a voucher program scaled to income to help low-income homeowners afford flood mitigations to their home and flood insurance, allowing for adaptation in situ.
- Siting / locating public/affordable housing outside of the floodplain in desirable areas close to jobs.
- We need to incorporate ideas of justice in decision making to address inequality.
- Issues about grief: Strategies to help communities think through uncertainties of climate change impacts on their communities and the areas where people are going to be relocated.

The top climate and environmental justice priorities to be included in the NCA5:

- Co-creation of knowledge and community leadership in planning. Not just “consultation” but respect, deference and support – co governance of the entire process.
- Need to recognize special rights for climate migrants. Ways of preserving cultures and histories of displaced communities and nations; redefining 'nation' in an era of climate change.

- Exclusive Economic Zones (EEZs): what happens to EEZs when island states, territories and nations lose their land? What are the impacts to the native diaspora that were driven to leave because of land loss/lack of economic opportunity due to climate change? Use cultural history/heritage as a tool to examine past records of climate change and the history of adaptations that took place to allow the survival of the culture.
- Will “[climate mobility](#)” allow for ensuring the use of traditional coastal/oceanic assets of their former EEZ after islands are “drowned?” This represents a tie back to their ancestral homeland as well as continued opportunities for economic development that would have to be forgone if their EEZ shrinks because of island loss.
- Climate migration and the resettlement conflicts that accompanies it need to be acknowledged and addressed (see Carteret Islands for example).
- Rethinking property rights in an era of climate change, and the intergenerational implications.
- Relocation impacts sovereignty. Need to ensure that sovereignty of the community and their responsibilities to their places – new and former – are developed and retained.
- In most cases, communities cannot relocate because relocation adds another layer of risk. They are not able to relocate, for example, buildings, and considering the grief associated with leaving everything behind.
- There’s a large focus on relocating people and/or communities, on moving people away from hazards, and relatively little research or focus on the communities/spaces the people are moving to. Social and economic systems are tied to land; when people lose land, how does that impact tie into that and intergenerational impacts?
- What is the best co-decision approach to determine who, when, and where communities relocate in the most equitable manner?
- The US government often mentions that climate impacts, including climate relocation/site expansion, is a whole of government problem. Why not advocate for statutory authority to form a whole of government approach – all departments working together, each bringing their expertise (science, management, health, ecosystems, tribal nations, housing, response and recovery, national security, etc. – with a lead agency that is charged with a coordinating function specified along the lines of FEMA, the ESFs/RSFs that require all agencies to be a member of those areas that take advantage of their particular expertise and require them to have affected communities represented at all levels – to co-govern process development, decision making and project execution – not quite sure what this would look like but worth advancing the concept/discussion.

Additional resources shared:

- Whyte, Kyle Powys, Time as Kinship (December 19, 2019). Forthcoming in 2021 in The Cambridge Companion to Environmental Humanities, edited by Jeffrey Cohen (Arizona State University) and Stephanie Foote (West Virginia University): Cambridge University Press , Available at SSRN: <https://ssrn.com/abstract=3830025>
- <https://isledejeancharles.la.gov/>

- Siders, A. R. (2019). Social justice implications of US managed retreat buyout programs. *Climatic Change*, 152(2), 239–257. <https://doi.org/10.1007/S10584-018-2272-5/TABLES/3>
- Dundon, L. A., & Abkowitz, M. (2021). Climate-induced managed retreat in the U.S.: A review of current research. *Climate Risk Management*, 33, 100337. <https://doi.org/10.1016/J.CRM.2021.100337>
- Dundon, L. A., & Camp, J. S. (2021). Climate justice and home-buyout programs: renters as a forgotten population in managed retreat actions. *Journal of Environmental Studies and Sciences*, 11(3), 420–433. <https://doi.org/10.1007/S13412-021-00691-4/FIGURES/4>
- Hino, M., Field, C. B., & Mach, K. J. (2017). Managed retreat as a response to natural hazard risk. *Nature Climate Change*, 7(5), 364–370. <https://doi.org/10.1038/nclimate3252>

Energy systems

Overview: Key points raised included the accessibility of energy systems including renewables, research on other non-burning uses of coal or fossil fuels, representation in local government, democratic community ownership of utilities, what can we do in our own households and communities, and state and tribal policies in addressing economic justice issues. A key consideration is where the raw materials come from when trying to mitigate greenhouse gases and the transfer of risk to other communities and parts of the world and the cascading effects; this calls for considering how we use justice as a way of extraterritorial decision-making around, for example, energy and transportation. It's important to consider jobs and what is happening in rural communities and states that are heavily depending on fossil fuel production and revenues as they transition to cleaner energy systems, and for places with limited land capacity and how to preserve cultural and agricultural lands in the process to transition to renewable energy.

Participants' primary climate and environmental justice-related concerns, particularly related to energy systems, include:

Cascading effects of energy transition to renewables

- How do we use justice as a way of extraterritorial decision-making around energy and transportation? The transfer of risk to other communities and parts of the world when talking about the creation of batteries, for example, for electric vehicles and transportation infrastructure.
- When focusing on the effects of trying to mitigate greenhouse gases from transportation, what does that mean if we move to electronic vehicles? Where do those raw materials come from, considering the second and third order effects.
- The "devil is in the details". For example, just transition issues around major employment, workforce readiness, training.
- How can we replace jobs? Many do not have other options
- Utilities transition to marketing of and profiting from renewable energy. It's like extraction even from renewable sources.

- Concerns about the mining of lithium, and how we will move from fossil fuels to renewables where there are also environmental impacts
- What discussions are happening regarding rural communities and states heavily dependent on fossil fuel productions/revenues/etc. as they transition, or persevere through transition, to cleaner energy systems?
- In places such as Oahu, a significant concern on the implementation of Solar Farms and (already implemented) Wind Turbine farms. With limited land already due to dense population, the lands next pursued could be cultural and agriculture lands, and the conservation of the native lands could be lost. Should a place like Hawaii place more focus on energy production that can be done in small amounts of areas of land?
- Hawaii going to solar actually encouraged more consumption of energy; in terms of justice, who gets to put a raise on their houses?
- Who has access to renewables (e.g. solar)? Renters and houseless you do not have access.
- Is there an ability to evacuate from hurricanes with electric vehicles?
- How building decarbonization can be made more affordable on city levels so that low-income housing can be prioritized in some of these efforts.
- State and Tribal policies' impact in creating environmental justice and economic issues
- We are not talking about the bigger picture, feedback loop in the US.

Indigenous Peoples' rights and energy systems

- Concerned about hydropower; as dams go down, what are we going to do to replace those? There's a lot of wind and solar to replace the Columbia River dams, Colorado River dams; how does that impact the rights of Indigenous peoples?
- What is the priority: electrical generation, agriculture, or in-stream flow? There's a tension between tribes that rely on fish, or what is happening with the Colorado River Compact. How will these allocations to energy and agriculture, for example, affect tribal interests? How much water is actually going to be there to provide water resources?
- Continual transgressions of tribal lands that continue to fuel this transition is concerning.

Emerging questions

- What are recommendations for best outreach practices and avenues for reaching as many environmental justice stakeholders as possible regarding development and energy projects near them?
- How can government-employed environmental justice professionals build, or be better at building, trust and rapport with the environmental justice communities they work with?
- What projects are going on in academia and how are they working within communities?
- Who is measuring and addressing adverse impacts on rural communities, impacting ecosystems, water, and air systems?
- As we deal with energy and justice, Indigenous Peoples are called upon at the last moment, when the decisions have been made in different places and at different times. How do we get Indigenous voices at those forums? At the peer reviews are they going to have Indigenous voices as they go through discussions?

Recommendations of justice-centered adaptation or mitigation actions related to energy systems:

- Research on other (non-burning) uses of coal other fossil fuel resources such as carbon fiber
- Representation in local governments (i.e., community organizers, reflective of diverse community)
- Energy, solar system businesses owned by people of color, Indigenous people, giving back to their own communities
- Democratic community ownership of utility, ensuring representation on community boards
- Solar companies owned by Indigenous people, training their own people to learn how to install solar systems, going back to their communities to try to make that affordable; having representation at that level is important
- While we look at all the big things, consider the power of one; what can we do in our own households and communities? What is everyone doing to the best of their abilities?

Additional resources shared:

- [Indigenous Council on Mining and Metals \(ICCM\) Good Practice Guide: Indigenous Peoples and Mining](#)

Food systems

Overview: Concerns were raised about not having access to local food. Local economies and groceries are positioned so they need international systems of food trade, such that local economies are impacted. It is not only Indigenous peoples affected in the US but also food policies abroad which are impacting other countries' food issues. Local systems have harvesters and local knowledges persisting but there are a lot of barriers, such as literacy of legal systems and technology. An 'interagency facilitator' would be helpful for bridging these gaps and improving access and empowering local food systems. Climate change impacts different groups unequally, but these economic links might require strategizing attention towards shared burdens. Local communities and economies need to be empowered. Respect diverse sciences and knowledges, and do not use one science to validate another science. Non-traditional and non-text data is helpful for accessibility of materials, and to enable local economies to be part of food systems at larger scales.

Participants' primary climate and environmental justice-related concerns, particularly related to food systems include:

Link between local and global food systems

- The relationship of local food systems and global food systems, considering transportation (e.g. "fossil fuel") and the climate change effects, subsequent impacts, and who feels those impacts.

- For regional organizations for sources of food and the role of funding regional sources, but in a global economy, local is not supported. Local economies are linked to the global economy, but not being supported for their own. Political economics is really important because it comes back around to local sources, back to the islands. It may not make sense for Pacific Islands, for example, to have rice from distant locations, when the rice makes up 70% of the diet, and if a drought occurs at the source of this rice, food security on receiving islands drops, which makes this food system policy relevant.
- Equality is an issue. Market system based conditions are still geared toward quantity and efficiency, which leads to “supplements” to help things grow, and then “people forget”. Place-based food is not being supported equally; it is being forgotten. We need to enhance what we have.
- Invasives demonstrate importance of global scale.

Industrial-scale animal production and agriculture

- As all greenhouse emissions have a local source, these are important drivers of climate change. Large-scale animal production, agriculture and food systems are significant driver of greenhouse emissions and other negative environmental implications. This is a significantly under evaluated area and gap in our knowledge for health. These exposures also have important environmental justice and equity implications. Will specific implications of the current food system and industrial-scale animal agriculture be covered in the NCA?
- Considering the effect of greenhouse gases and dairy waste, there are dumping grounds for animal waste that increase greenhouse gases.
- Considering large-scale animal production and sustainable processes, there are multiple ways to increase habitat, so wildlife does not need to be thinned like in non-Indigenous management systems that thin animal populations. Increasing processing centers on Indigenous land would help equalize access, but there is currently unequal access, with more access to processing centers than Indigenous groups. Cattle and sheep are relatively new for Indigenous populations in food systems. These more novel livestock are not managed properly because there is no incentive. There is no processing center for Indigenous people to be incentivized because now everything goes to bigger food system productions.

Accessibility

- There are concerns over accessibility, such as knowing logistics and forms of information literacy for empowering local food systems and access to adequate funding.
- There are changes and differences in how people acquire food and long lines of people to get food.
- Some regions have a small percentage of funding for small farmers but this is difficult to acquiring and managing due to low computer literacy and low procedural literacy.
- We have a disconnection from food sources, and need to facilitate a just economy. [Tocabe's Indigenous Marketplace](#) in Denver, for example, is a source of Native American food that has a national reach.
- The NCA needs to ‘come home’ with its aims and goals and not make food abstract.

- Considering diverse knowledges and languages, words might vary in, for example, bee pollination with multiple words or different distinctions across pollination processes and across languages. If the NCA5 uses a glossary of terms, what words would such a glossary reflect? How to make the information more understandable?
- In the US we waste (dispose of) about one-third of all food stuffs produced, unconsumed

Water quality

- A topic often underappreciated for food is the continuing and worsening degradation of water quality, including water used for irrigation. Increasing acidity and intensity of precipitation are likely to hasten mobilization of pollution. An example is abandoned mined lands, exposed for much longer times with changing seasonality. The huge slow-moving storms recently experienced will very likely increase mobility of wastes.
- Tribal and national capacity to enforce water quality standards on flows into and/or across Native-held lands; for example, see [Dr. Karletta Chief's work on the Gold King Mine Spill](#)

Indigenous food systems

- Due to changes in and loss of rainfall, there have been loss of seeds, for example in Hopi land. Agriculture is faith-based farming as Indigenous Hopi people.
- It's important for a holistic approach from Indigenous people; it's time to turn a corner and for the NCA to share Indigenous peoples' story. It's important to not use one science to validate another but rather to respect each other's own science.
- One concern is how to improve inter-group trading and coordination for continuing adaptation to continuing climate change? "Rolling adaptation" will be needed for all foreseeable futures, and that calls for work such as faster and cheaper field trials to cope with changing environments on lands that are held by Indigenous peoples.
- There needs to be more conversations in island states. In light of the pandemic, there has been long lines at supermarkets, empty food shelves, and with the supply chain of food affected, prices have been driven up. Consider the link between fossil fuels (due to transportation of foods) to prices for food going up due to this transportation. We need more focus on local and Indigenous agriculture. There is historical agriculture existing for thousands of years in small islands. There are, for example, Caribbean Indigenous people but they have no or very little representation; there are many issues in common and there are scaled solutions to local needs that could be met by local economies and sources rather than reliance on international global markets.
- How can traditional agricultural practices be intensified on lands where there is historic claim to access, without ownership? Where Native people have been involved, as in wild rice, there have been important benefits.

Hawai'i Perspectives on Food Systems

- For centuries prior to western contact, Native Hawaiians managed a self-sufficient agricultural system with thriving loko i'a (fishponds), lo'i kalo (taro ponds) and a number of medicinal and food plants such as awa (kava), ki (ti leaves), mai'a (banana), pua'a (pig), ko (sugar cane), niu (coconut), ulu (breadfruit), 'olena (turmeric), 'uala (sweet potato), uhi (yam) and awapuhi kuahiwi (eating ginger). But these traditional agricultural systems were transformed by western business interests beginning in the 19th century

into expansive mono-cropped plantations of pineapple and sugar cane that exploited cheap land and labor to produce goods that were shipped mainly out of the islands. By the 1960s, less than half of the state's fresh fruits and vegetables were grown locally, marking a 30-year increase in imported foods goods and a long decline of Hawaii's food sovereignty ([see 4/23/2021 article in Civil Beat](#)).

- Along with the establishments of plantations, invasive weeds, rodents and other pests were also introduced as a by-product of these western-driven agricultural practices. Combined with the impacts of the coronavirus pandemic, which raised the risk shipping disruptions and created widespread fear of food shortages, exacerbating the State's vulnerability, it's clear that Hawai'i is far from secure in its food sources. The [Hawaii State Departments of Business, Economic Development and Tourism \(DBEDT\) and Agriculture \(DoA\)](#) and the State Office of Planning estimates that islands need to be growing at least 50% of its staple crops; like rice, breadfruit, potatoes, and wheat; in order to be self-sufficient if disaster strikes.
- Climate change, especially in the form of the change of seasonal patterns and hotter temperatures, has led to increased wildfires and loss of topsoil from intense flooding, create challenges to pollination and the flowering of edible and medicinal plants and trees. Combined, the increased frequency and duration of droughts, more unpredictable weather patterns and an overall loss of precipitation, especially on the leeward sides of the islands, pose a strong challenge for [Hawai'i's goal of doubling its food production by 2050](#).
- In efforts to re-vitalize local farming within the framework of Native Hawaiian agricultural systems, there's a realization that the conditions today are vastly different than those faced by ancestral Hawaiians. And as the State seeks to strengthen its food security, it cannot revert back to the pre-contact systems. Nonetheless, as the [University of Hawai'i's Dr. Noa Lincoln reminds us](#), "self-sufficiency in the 21st century will require a new system rooted in the sustainable values that guided Hawaii's pre-Western food system."

Recommendations of justice-centered adaptation or mitigation actions related to food systems:

- It would be helpful to have a template of information needs that will be relevant to working with agencies and grant applications for public and for private funding.
- An 'interagency facilitator' is needed to help access funding, procedures. It's about access and the right to these things. Islands are small, but have the right to access local food systems.
- Some effective tools to make materials more accessible include graphics, the use of bullet-points, social media to share stories, and blogging.
- Some ideas shared for getting students involved in food-justice and making systems more just as active change-makers include [Rising Voices](#) and the [Native American Agriculture Fund](#) and specifically looking for equity to food access, food hubs to stop standing in line, as example goals.
- Research needed on political and economic impacts of worsening inequality in food access and food quality.

- Need for regenerative and sustainable agriculture practices, including on micro0scale in urban and suburban agriculture and support of biodiversity.
- Access to pre-colonial food stuffs and practices.
- Avoiding monocultures of what is cultivated and in governance.
- In talking about environmental justice, the agricultural activities need to be properly categorized into appropriate classifications because there can be no equitable water sharing if the truth about the disparities in agricultural practices are not outlined. Big Agriculture, flood irrigation, laboratory modified food farms, exporters, small organic farms, public land ranchers, small family ranches, wineries, and etc. These finer classifications could be categorized if we can transfer the way we present information from a report to a platform of linked databases and tools to synthesize information. The regions will be better able to address the classifications.

Additional resources shared:

- [Reimagining Native Food Economies](#)
- [INHABITANTS](#) documentary film
- Colorado State University's [Center for Environmental Justice](#)
- Stiles, Kaelyn, Özlem Altıok, and Michael M. Bell. "The ghosts of taste: food and the cultural politics of authenticity." *Agriculture and Human Values* 28.2 (2011): 225-236.

Human Health

Overview: Key concerns raised include toxins as a linked health issue, such as pollution and extreme events impacting people like fishers in coastal areas and toxins getting in through the food chain; waste management issues; the impact of heat on the elderly; relocation due to climate impacts; and mental health and climate grief and how these are affecting different communities unequally. We need to be better at engaging public health when discussion climate impacts; and include the cultural context in approaches to address these issues.

Participant's primary climate and environmental justice-related concerns, particularly related to human health, include:

Mental health and climate grief

- The mental health impacts of nuisance or sunny day flooding.
- The toll on people's mental health on the west coast that need to relocate due to sea level rise, poor air quality due to wildfires, and on the unhoused population.
- The impacts of tourism on human health, including mental health, and communities such as in San Diego and Pacific coast spaces.
- Climate grief that's happening for place-based people such as Indigenous people who are losing their homelands and everything that goes along with it.

Pollution and contaminants

- Mobilization of legacy contaminants and fugitive chemicals during floods.

- Local pollution in marine coastal communities and particularly fishers. Among people for example are fishing in polluted waters. There needs to be learning about how to work with communities to assess risk. Specifically concerning is the seafood-to-people pipeline and how it affects people for generations to come.
- Air pollution for islands such as St. Croix, USVI.
- How people are being impacted by waste management, especially in the islands.

Extreme heat

- Low-income areas have fewer trees and more concrete, raising costs for cooling systems, and exacerbating health impacts.
- There is increasing extreme heat impacts on ecosystems and marginalized communities; for example, increasing heat is affecting elderly people in New York City and for under-resourced communities in the Central Valley of California, many lack insulation and air-conditioning in their homes.
- In many Caribbean islands, there is not a culture of air conditions; most people keep their homes cool with windows, fans, and the general construction of the house. If most of the people in the Caribbean do not use an air conditioner, and for one-third to one-half of the year the houses are locked down, what will that do for the low-income elderly population? This poses a cultural and environmental issue being that there are many nights where the temperature is over 80 degrees.

Access to life-sustaining resources

- There are Tribes and Tribal communities in the Northwest already relocating due to sea level rise and riverine flooding. Some Tribes have also been severely impacted by flooding and have only been able to get food and medicines by helicopter because all roads were washed out to and from their reservations.

Economic costs

- We're not doing enough on climate change and the economic costs of the health impacts, including how we frame questions and how impacts are manifesting themselves.

Examples of justice-centered adaptation or mitigation actions related to human health include:

- During the summer of 2020, New York City implemented the [Get Cool program](#), purchasing 75,000 air conditioners for low-income seniors, many of whom are in environmental justice areas.
- Washington State's Department of Health, as well as local health jurisdictions in the state, are doing multiple studies and implementing several programs focused on getting portable air cleaners to low-income households, schools, and shelters for unhoused people.
- [Washington State's Healthy Environment for All Act](#).
- The Oregon and Washington Departments of Health have teams collaborating with urban planners and others to find interdisciplinary linkages.

Participants' top climate and environmental justice priorities to be included in the NCA5:

- Mental health
- Depression, anxiety
- LGBTQ+ health impacts due to climate change
- How realistic and sustainable are the solutions that are being brought up? For example, telling people to “just buy an air conditioner” to those that complain that it's too hot (even though they may be low-income or there may not be a culture surrounding air conditioning) or telling someone to “just move” if the sea-levels are rising even though their people have ties to the land that they may be told to move from.
- Relocation and migration from climate-driven disasters (e.g., wildfire, typhoon, cyclone)
- Connections with place, lands, and waters and the toll on livelihood and mental health due to a disruption of these.
- Migration and forced relocation in Hawaii and the Pacific Islands, including Indigenous Peoples losing their connections to their waters and lands that are important to their cultures.
- Environment being degraded in part influenced by climate change.
- How trash management can affect human health and how climate change and other environmental issues affect it. For example, people used to use specific places for trash, but if on an island there are only so many places to put garbage. People dispose of their trash near rivers and other bodies of water and when the water rises, it can potentially interfere with coastal spaces.

Additional resources shared:

- [New York City Heat Vulnerability Index](#)
- [New York City's Environmental Justice Advisory Board](#), series of town halls, open survey, and data on health concerns related to environmental justice.
- [Growing Evidence for the Impact of Air Pollution on Depression](#)
- [Ecological Grief as a Response to Environmental Change: A Mental Health Risk or Functional Response?](#)
- [Ecological grief as a mental health response to climate change-related loss](#)
- [Climate Change Is The Greatest Threat To Public Health, Top Medical Journals Warn](#)
- [Affects of pollution and toxin accumulation in human and non-human communities](#)
- [Toxic Tourism: Rhetorics of Pollution, Travel, and Environmental Justice](#)
- [The health impact of tourism on local and indigenous populations in resource-poor countries](#)
- [Health outcomes of tourism development: A longitudinal study of the impact of tourism arrivals on residents' health](#)
- [Human Health and Ocean Pollution](#)
- [Can you eat fish caught in San Diego Bay?](#)
- [Long-Lasting Health Impacts of DDT Highlighted in New Study](#)
- [Global Water Pollution and Human Health, annual review](#)
- [Trash Crisis Leaves Puerto Rico Near 'the Brink'](#)
- [Trouble in paradise: Recycling a tough proposition for US territories](#)

Phenology

Overview: Elevated level of CO₂ is affecting vegetation in multiple places. There is a dramatic drop in insect availability. Monitoring is needed over time and the role of insect farming. There is a need to get insects back because, for example, of the impacts on birds and more. A key importance is thinking of food chains and cycles. There is no time to lose on the changes in phenology.

Participants' primary climate and environmental justice-related concerns, particularly related to phenology, include:

Food resources

- Negative impacts to food production from loss of pollinating insects
- Access to traditional foods

Insects

- Insects are being lost at an alarming rate; we need to farm insects so that they can be saved; species like birds and fish rely on them for food.
- [Where have all the insects gone?](#), the May 2020 issue of National Geographic, the article claims, "We've lost 70% of our insects from 1990 – 2016." That was 6-years ago; they continue to disappear.
- Mild winters resulting in increased generations of harmful insects (e.g., mountain pine beetle in western mountains)

Trees

- Trees don't look dead, but they are not healthy.
- Observations in both coniferous and deciduous trees in northwest Washington include:
 - o In July 2019: no dandelions observed; they are typically present 2 weeks before May through 2 weeks before June
 - o Pine needles: can put in a bunch and pull them apart and crumble them; shouldn't be able to do that as they should be flexible and tough, use them for weaving to make mats and bowls
 - o Pine needles should be forest green but they are now a dull green, getting yellow because the cuticle (waxy coating) is missing.
 - o Pine needles now emerge in circumference around end of the branch; this morphology differs from what it used to be
 - o Pine trees are only supposed to hold their needles for 2-3 years but they are still holding onto their needles, which contributes to wildfire smoke when the trees burn
 - o The [pine tree tops are breaking](#); also see here for [breaking trees](#).
 - o [The roots look rotten](#); every tree is experiencing this right now; the trees are lacking lateral roots
- Those changes are happening because of increased CO₂; we are at 420ppm (50% greater than pre-industrial concentrations). Under increased CO₂, trees grow more rapidly, though without the other necessary nutrients, they grow very poorly. Elevated

levels force vegetation to grow at an accelerated rate; nothing can grow bigger and faster forever.

Extreme weather events

- Disproportional impacts to poor and BIPOC communities from drought and extreme weather
- Lengthening fire season; there are fire warnings, for example, in South Dakota in February when should be under snow; never had those warnings this time of year before; it's the drought and heat.

Species on the move

- Non-native species thriving in new areas
- Range shifts
 - o Observations in the Sierra Nevada Mountain range in California of a movement in plants; seeing tall grasses at 13,000-feet, wetland and marshy plants in places that used to only host Alpine tundra [alpine?]. Species are occupying different habitats; species range change is a well-established consequence of changing climate conditions. Seeing birds that in the past occupied lower latitudes (e.g., blue-footed booby in Carmel, CA)

Recommendations and examples of justice-centered adaptation or mitigation actions related to phenology include:

- Seed sharing
- Start farming insects
- [Sacred Circle Garden](#), Sanford Underground Research Facility in South Dakota
- The [medicine wheel garden](#) at Black Hills State University
- Indigenous knowledge is being more shared and more respected
- Efforts to get legislation passed to help communities with needs to get support, but these efforts don't always play out as they should and benefit those that need the support most
- Work with tribal partners in Oklahoma to collect native seeds, germinate them, and support restoration efforts; encourage funding and support for efforts such as this
- Efforts to support adaptation efforts that mesh well with Native stewardship aims
- There is nothing more important than farming insects; plants will not survive without the insects. Without insects, we have no food; they are almost gone. We can learn from those that grow insects; for example, beneficial insects like ladybugs as a model for how to carry this out.
- Encourage neighbors, others to allow leaf litter to remain on the ground
- Set aside money for grassroots efforts (e.g., local air boards) for mitigating climate change impacts; groups that will stand up projects that will make an impact
- We need more place-based studies; many phenology studies have taken place in temperate and boreal ecoregions. If the NCA could highlight the need for more

information on how climate change is impacting phenology and ecosystems that are less represented in the literature

- Sense of urgency; it's too late for moderate action.
- How to do we get this information into the hands of educators? What about a NCA Justice Curriculum?

Additional resources shared:

- [Tribal Climate Resilience Program: Climate resilience strengthens Tribal sovereignty](#)
- [Observed Evidence of Changing Forests: Testimonial for the Status of Tribes and Climate Change Report.](#)
 - o In [The Status of Tribes and Climate Change Report](#) (page 60).
- [McCrea featured in Western Forester Magazine](#)
- [Potential Capstone – Culturally Significant Species Network Project](#)
- [‘The bottom has just dropped out’: As insect populations plummet, scientists wonder why](#)
- [Hardwood examples](#)

Water systems

Overview: Some of the critical understandings are water rights in the broadest sense (quantity, quality, availability, etc.); the Human Right to Water (HR2W) has been largely unrecognized by the United States. Codifying the HR2W at the federal and state levels would significantly enable tribes and Indigenous communities to create and sustain more climate-resilient water systems; and if Nature's Right to Water were equally considered this would also support cultural and ecological sustainability. There are injustices of water shortages and the potential for violence amongst already disadvantaged people as a result. A lack of transparency and low accountability for water polluters is both damaging and disproportionately unjust to Indigenous communities. Communities most affected by climate change are also potentially the ones bearing the burden of big water projects (like desalination plants in Hawai'i). For the NCA5, include literature on the quantification of the plausibility, feasibility, and outcomes of projects that *do not engage* the impacted communities beforehand versus the success of projects that do involve the communities beforehand. Use the literature and data to demonstrate the benefits versus costs for more inclusive climate change adaptation projects.

Participants' primary climate and environmental justice-related concerns, particularly related to water systems, include:

Rights to Water

- Human Right to Water. Recognition of the HR2W at both the federal and the state levels. [UN resolution in 2010 recognized this right.](#) [California codified the human right to water](#) in 2012, although many in the US still don't have access to safe, clean water, tribes and Indigenous communities are disproportionately impacted by lack of access to clean, reliable water. While there have been some enabling legislations enacted and legal actions taken in California, it's been very inadequate and millions of Indigenous and communities of color still lack clean, reliable, and affordable water. Identify the fact that

the HR2Wis defined by about how much clean and affordable water people have access to. Access issues fall along racial lines with Indigenous and communities of color having much higher likelihood of water stress and insecurity.

- Nature's right to water, including water itself; recognizing "those who swim, those who fly, those on four legs" - the religious/ontological position of those who don't speak in the same way humans do but are an equal part of the community.
- Impacts on salmon, on the Columbia River for example, including treaty rights, and how they relate to water rights and climate resilience for tribes and Indigenous communities.
- Relates to Indigenous ways of ""Indigenous view that water is not property, therefore, the US Eurocentric concept of water rights is contrary to Indigenous views because water belongs to everyone (including ecosystems, etc.), and this understanding supports cultural and ecological resilience and well-being.

Exacerbation of existing inequalities, inequities, and injustices

- There are conversations about building desalination plants in under-resourced communities but not wealthy communities in Hawai'i. The impacts of large, top-down water projects fall on the under-resourced people and places exacerbating inequalities and making community-driven climate adaptation even more challenging.
- Increased flooding disproportionately impacting underserved communities (both flooding impacts in communities and resulting runoff impacting marine ecosystems and subsistence fishing).

Water security and availability

- Water availability issues as they intersect with use, supply, demand, accessibility, etc. For example, by the time the Colorado River reaches the Mexican border, it's too saline to be usable; it doesn't reach the Gulf of California anymore and contains toxins from agriculture, climate change is making this worse.
- Conflict driven by water scarcity issues. For example, almost violent conflict in Oregon in summer 2021 between farm workers, weed farmers, and Indigenous and other local communities. "Water security" is a common framing for this. More is written about this outside the US than within, thus, there is a need for research on the potential for climate change to increase water scarcity-driven conflict for marginalized communities in the US.

Extreme events

- Droughts and intersection with agriculture and subsistence for food security in Indigenous communities exacerbated by climate change.
- Climate change is resulting in increasing fire severity impacts on tribes and Indigenous communities and impeding the ability to implement preparedness measures.

Water resources and linkages

- Understanding Indigenous water systems and resources in general (e.g., in places such as Hawai'i) is lacking; studies on development and climate change are needed for building more climate-resilient water systems and communities for Indigenous communities.
- Water and energy; need for better understanding about the connections between human consumption of large amounts of water indirectly through energy consumption.

- More broadly consider ecological impacts and connections related to water that impact other areas of concern.

Water and Access in Hawai'i

- In Hawai'i, water has historically been, and continues to be, a public trust resource. This trust status requires the State to both protect and ensure the “maximum reasonable and beneficial” use of water. However, the State continues to violate its trust responsibilities “by authorizing corporations’ diversions of public water for private profit.” This continues to be a flashpoint between corporate interests and the increased demand for water use by mostly small agricultural enterprises to help to increase food production in the State. The article, [OLA I KA WAI: THE BATTLE OVER EAST MAUI WATERS](#), published by the Ka Huli Ao Center for Excellence in Native Hawaiian Law at the William S. Richardson School of Law, includes a description and analysis of the continual struggle over water in Hawai'i and its link to food systems and beyond. It's really all about the 'aina – “that which feeds us” – and the wai – Ola I ka wai. And conflict driven by corporate vs. public interests and the public trust.

Participants top climate and environmental justice priorities to be included in the NCA5, include:

- Communication; not just talking, but also listening
- Transparency from all levels of government
- Ensuring that climate adaptation strategies prioritize underserved communities and involve them in decisions.

Recommendations and examples of justice-centered adaptation or mitigation actions related to water systems include:

- Honor the rights of future generations, of all peoples when considering adaptation and mitigations actions
- Recognize tribal sovereignty and honor treaties
- Data that could help bolster the argument for water/treaty rights to native entities.
- Implementing natural infrastructure equitably to reduce flooding impacts and maintain water quality.
- Need more transparency in communication with military and federal entities that are impacting access to clean and fresh water and actually involve communities substantively beforehand; especially for people with little access to information and technology who might be confused about what's happening and why.
- A need for studies for large-project siting that take into consideration climate impacts on already stressed water systems and impacted communities. For example, when talking about building extension of military base in Guam, the “only” place they could think to build it was on an aquifer that could put at additional risk an already climate change-vulnerable resource. Similarly, there have been severe impacts on the availability and quality of water of Oahu aquifers from contamination by the Red Hill Bulk Fuel Storage Facility.

- Benefits of procedural and distributive justice, where there are benefits gained through the participatory processes; there is literature on this the NCA5 can use.
- Community involvement and input for better impacts on climate change adaptation strategies.

General

Overview: The group focused on youth and education and considerations of how K-12 will educate youth on climate change and variability and how to care for place. Adaptation and mitigation injustice such as green gentrification and uneven distribution of adaptive capacity was highlighted. Linkages across systems emerged, such as the intersection of climate change impacts with ongoing disasters, like COVID-19 and toxic contamination. Communication and access to information are important to consider, such as access to digital infrastructure and climate information. Ideas were shared around indicators and data reflecting justice issues that might be able to be used in the NCA5. A number of recommendations emerged such as highlighting racism and injustice (e.g., red-lining), rural communities, and considerations for the different justice issues that people face, and the important of preserving the information and knowledge of place.

Participants' primary climate and environmental justice-related concerns include:

Youth and education

- Youth capacity building to access funding, resources, green job pathways. What is a possible income-earning pathway to make a livelihood in working in this field?
- The current K-12 education systems is designed to separate youth from the environment; the system itself needs to change. How will K-12 educate youth on climate change and variability, and teach next generations how to care for place and connect to place on a deeper level?
- Lack of career engagement opportunities for youth to enter into climate, natural resource, and environmental jobs
- Access to outdoor education and equipment.
- Getting more youth voices in decision-making spaces.
- Connecting youth to ancestral heritage; youth don't know what will be lost

Adaptation and mitigation injustice

- Adaptation injustice, such as green gentrification
- Adaptive capacity is not evenly distributed
- Many policies to address potential impacts from climate change or to mitigate greenhouse gas emissions create new injustices.
- The need to be neutral (not policy prescriptive) obfuscates power, such as who is responsible for climate change vs. who suffers the impacts.
- Those with the greatest proximity to the problem are not always part of the solution making.
- There is too much talk about "adaptation" and not trying to reverse climate change.

Linkages across systems

- When forests dry out, that allows for the invasive bugs to kill our trees. Not connecting forest health to groundwater health is what enables invasive bugs to kill the trees.
- Invasive species impact infrastructure and urban population
- Intersection of climate change impacts with ongoing disasters, such as COVID-19 and toxic contamination
- The groundwater is not being considered to be protected from continued fracking and oil drilling and mining activities, which directly affects forest health, adding heat to atmosphere
- Generalizations result in the smaller communities continuing to be ignored, and eventually being wiped out.
- Climate change impacts hazardous materials and sites
- Disaster response and preparedness, and weather extremes and hazards

Communication and access to information

- Digital infrastructure (e.g., broadband) and how it relates to climate resiliency
- Those most vulnerable to climate change are not aware of how and where to find information on climate impacts, or how to join the discussion and contribute to solutions on climate resilience or adaptation.
- Language is important. How do we describe non-native species that affect or change ecosystems and biodiversity?
- How shifts in technology are influencing decision-making at local levels

Data that the NCA can provide that would be helpful for addressing concerns include:

- The metrics and appendix that indicate climate change and the impacts. What are the right indicators to help evaluate? Where is the data coming from?
- Need more equity data for climate disaster recovery disparities.
- Green indicator, such as access to green space
- Data about smaller communities seems to be missing from the assessment.
- Data on adaptation and mitigation actions and impacts for BIPOC people
- How do we capture the boundary of the political side, state and cities that do not allow climate and justice education?

Recommendations and examples of justice-centered adaptation or mitigation actions related to water systems include:

- Highlighting racism and injustice (e.g., red-lining), rural communities, and how people face different justice issues.
- Recommendations on education and curriculum that supports climate change and impacts knowledge for youth
- [Introducing Youth to American Infrastructure, Inc.](#) ("Iyai"); there are 16 critical infrastructure sectors defined nationally. Our focus is to help significantly increase diversity across all aspects of these sectors, which profoundly impact our daily lives, the health and wealth of our communities and overall society.
- Low-income housing should be prioritized.

- Gentrification of older communities kicks out the original residents of the communities. The disparities about gentrification needs to be a topic of discussion.
- Acknowledge the gaps and sources of data
- Preserving the knowledge and information of place from elders, farmers, fishermen, hunters, and others who hold information about local places.