



People on the Move in a Changing Climate

THE GREATER PACIFIC, A WORKSHOP SUMMARY

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EXECUTIVE SUMMARY

Despite increased references to the link between climate change and human mobility, little research has been done on how shifts in population patterns intersect with underlying socioeconomic, cultural, political, and environmental processes. In response, the National Science Foundation Coastlines and People Research Coordination Network funded the People on the Move in a Changing Climate project, led by the University of Georgia Sea Grant College Program and other Sea Grant and institutional partners across the US, including Alaska Sea Grant. Workshops were held around the United States to create a dialogue around climate-induced human mobility and the research, policy, and planning needs that resulted. This report describes a workshop for the greater Pacific region held in Anchorage, Alaska. The Anchorage workshop was led by Alaska Sea Grant and focused on the current state of knowledge on climate-induced human mobility. This included general areas of climate resilience, where people are migrating from and where they might be moving, and the underlying climate and social issues related to human mobility. The goal was to bring together participants from across the Pacific region to create a conversation and dialogue around climate resilience and explore shared climate-induced stress, as well as resilience and adaptation solutions to enhance community well-being. A special emphasis was placed on underserved and underrepresented coastal communities, specifically in Alaska, Hawai‘i, and the Mariana Islands.

Hawai‘i and other islands in the Pacific and Alaska are home to large Indigenous popula-

tions, including Native Hawaiians, Chomorro, and Alaska Natives. These communities often sit at the periphery of wealthy urban centers and federal infrastructure, such as military bases and lands controlled by federal agencies. Workshop participants heard from researchers, practitioners, and residents of the region who live in or work with mainly rural Indigenous communities. Discussions of equity became a central focus of this workshop. During small group discussions, a theme was that these rural communities need to have a more significant say in the decisions that affect their lives, and specifically, elders and youth should have a say in decisions. Residents of predominantly Indigenous communities of the greater Pacific region have a close, often spiritual connection to the land and the resources on which they depend for their livelihoods. Communities are often multi-generational, encompassing close kin networks, so family ties are essential within the community. Elders have deep knowledge of the lands and waters on which they depend, and youth are inspired by the ability to innovate in service of their communities by drawing on their elders’ knowledge. It is for these reasons that people continue to live where they have generational connections to place, and in light of the changing climate and structural inequities, they will continue to innovate, thrive, and live successful lives. ■

INTRODUCTION

Despite increased references to the link between climate change and human mobility—which includes displacement, migration, and planned relocation—we have done little research on how shifts in population patterns intersect with underlying socioeconomic, cultural, political, and environmental processes. We also know little about the resources or lack thereof that either enable or constrain the ability of people to cope in place or move due to climate influences.

In response, the National Science Foundation (NSF) Coastlines and People (CoPe) Research Coordination Network funded the project “People on the Move in a Changing Climate” (PEMOCC), led by the University of Georgia Sea Grant College Program and other Sea Grant and institutional partners. Sea Grant programs are boundary organizations that are

well-equipped to address and lead dialogue around climate-induced human mobility and the research, policy, and planning needs that result. Workshops were held around the United States. Workshops were held for the Northeast and Mid-Atlantic, hosted by the New Jersey and New York Sea Grant programs, held online due to COVID-19 in September 2021; the Great Lakes region hosted by New York Sea Grant held in Buffalo, New York, in June 2022; the Southwest, hosted by California Sea Grant online in September 2022; and the Southeast, Caribbean and Gulf of Mexico region hosted by the University of Georgia Sea Grant in Atlanta in early December 2022. In April 2023, the final workshop was held in Anchorage, Alaska, covering Alaska, the greater Pacific Region, the Pacific Northwest, and international perspectives.



PHOTO BY SEAN KELLY/ALASKA SEA GRANT

The Anchorage workshop was led by Alaska Sea Grant from the University of Alaska Fairbanks and focused on the current state of knowledge on climate-induced human mobility. This included general areas of climate resilience, where people are migrating from and the underlying climate and social issues related to human mobility, and where people might move to. The goal was to bring together participants from across this broad region to create a conversation and dialogue around climate resilience and explore shared climate-induced stress, but also resilience and adaptation solutions to enhance community well-being. A special emphasis was placed on underserved and underrepresented coastal communities, specifically in Alaska, Hawai'i, and the Mariana Islands.

A takeaway from the Alaska workshop was that it is important to understand not just where people are moving *from* but also where they might move to. In addition, the Pacific Northwest region was underrepresented at the workshop, so an additional workshop was held in Corvallis, Oregon, in September 2024, to cover receiving communities and the Pacific Northwest. This workshop brought together experts, practitioners, policy-makers, and coastal residents to delve into critical research, policy, and equity issues that arise when communities receive an influx of people who may be displaced or are relocating in response to coastal hazards or climate impacts.

After a general introduction, honoring the place where the workshop was being held, and an ice-breaker activity, the Anchorage workshop began with narratives from the coast of

migration in Alaska. This included speakers helping to ground the participants in the place where the workshop was being held and the topic of discussion through memory and experience. Following this was a session focused on island communities, recognizing the uniqueness of the Pacific Islands. The third session on building and maintaining communities shifted participants to thinking about the current state of communities in this broader region. Finally, the last session helped participants think about the future of resilience in coastal communities, where people might be moving, and the challenges associated with new arrivals.

There were 17 speakers, and small group discussions followed each panel of speakers. Approximately 60 attendees participated in the engagement discussions following the presentations. More details on speakers, topics covered, and the outcomes of the engagement discussions are included below. ■



METHODS AND OBJECTIVES

Dr. Davin Holen, an anthropologist and coastal community resilience specialist at Alaska Sea Grant, led the workshop. Assisting Davin and leading the engagement sessions was Sean Kelly, who was at the time an Alaska Sea Grant State Fellow (Sean is now the coastal adaptation specialist for Alaska Sea Grant). Biweekly organizing calls included a steering committee of Sea Grant and other practitioners. The planning team is listed below. Alaska Sea Grant staff were instrumental in organizing the venue and assisting participants with their travel to Anchorage.

The workshop followed the objectives of this project. This includes the following objectives and goals.

OBJECTIVES

1. Foster analysis and synthesize research on climate-induced human mobility using existing datasets and legal and policy frameworks.
2. Stimulate collaborative problem-solving across disciplines of natural and social sciences.
3. Broaden participation in research and education by engaging diverse individuals and stakeholders from US coastal communities.
4. Identify and tailor existing tools and generate new tools and knowledge for building community resilience and climate adaptation.

GOALS

1. Foster synthesis and analysis of existing data to increase the relevance and applicability of research.
2. Support use-inspired research that generates novel solutions to priorities identified by diverse coastal communities in various US regions.
3. Leverage Sea Grant to engage end users in the co-production and utilization of knowledge and tools.
4. Advance the vitality and diversity of the scientific workforce by engaging scholars and students in research, education, and engagement.
5. Broaden participation in research and education by proactively facilitating communication, cooperation, and partnerships with underserved and under-represented populations nationwide.
6. Use systematic and rigorous evaluation mechanisms to measure performance, evaluate the impact, and improve the management of the PEMOCC RCN.

The planning team considered what had already been learned at previous workshops while paying close attention to the objectives and goals of the overall RCN. However, the planning team also recognized the uniqueness of island places in the US, including Alaska, as a majority of communities in Alaska are not on roads and have unique challenges. Current projections show that Alaska and other Arctic regions have warmed at four times the global

average since 1979, creating unique challenges for remote and underserved communities in Alaska (Rantanen et al. 2022). In addition, the Pacific region is dealing with rising sea levels

and increased intensity of storms. Both areas are distant from the rest of the continental US and do not have the same level of data and resources to assist with resilience planning.



CITY OF ANCHORAGE, ALASKA

ANCHORAGE AS MIGRATION HUB

Anchorage was a traditional location of harvest for the Dena'ina Athabaskan peoples of the region. Anchorage is located on the shores of Tikahtnu (ocean river), Cook Inlet. There were several traditional Dena'ina fish camp locations along the coast, and the streams, such as Chanshtnu (Grass Creek) or Chester Creek, that run through Anchorage provided spawning habitat to the salmon the Dena'ina relied on for their subsistence way of life here

in Dena'ina Elnena, Dena'ina country (Kari and Fall 2003). Anchorage is a destination for migrants and refugees from around the world. Anchorage as a whole may not be the most diverse of US cities, but parts of the city are in the country's top 10 most diverse census districts (US Census 2024). The top three most diverse high schools in the United States are in Anchorage, including Bettye Davis East Anchorage High School, Bartlett High School,

and West Anchorage High School. Over 90 languages are spoken in Anchorage schools. At both East and West, there are many migrants from Samoa, Hawai‘i, and other Pacific regions, with recent refugee populations from the Sudan, Afghanistan, and the Ukraine.

Besides migration from around the world and the US, there is a high migration in-state that has enriched Anchorage’s cultural diversity. Twelve percent of Anchorage is Alaska Native.

In the early 1970s, Anchorage had a population of 50,000. The Trans-Alaska Pipeline led to considerable growth in Anchorage, the

economic hub of the State of Alaska. In 1975, during the boom years of pipeline construction, the Municipality of Anchorage was established, incorporating the surrounding smaller towns. Between the pipeline boom and the municipality’s incorporation, by 1980, there were 175,000 people in Anchorage (US Census 2024). Today, there are at 290,000. Rural areas started to grow, too. In 1980, the neighboring Matanuska Susitna Borough, which sits north of Anchorage and has an area the size of West Virginia, had a population of 18,000 (US Census 2024). Today, there are 114,000 people in the Matanuska Susitna Borough, and

Some areas consistently gain in-state movers and some usually lose them

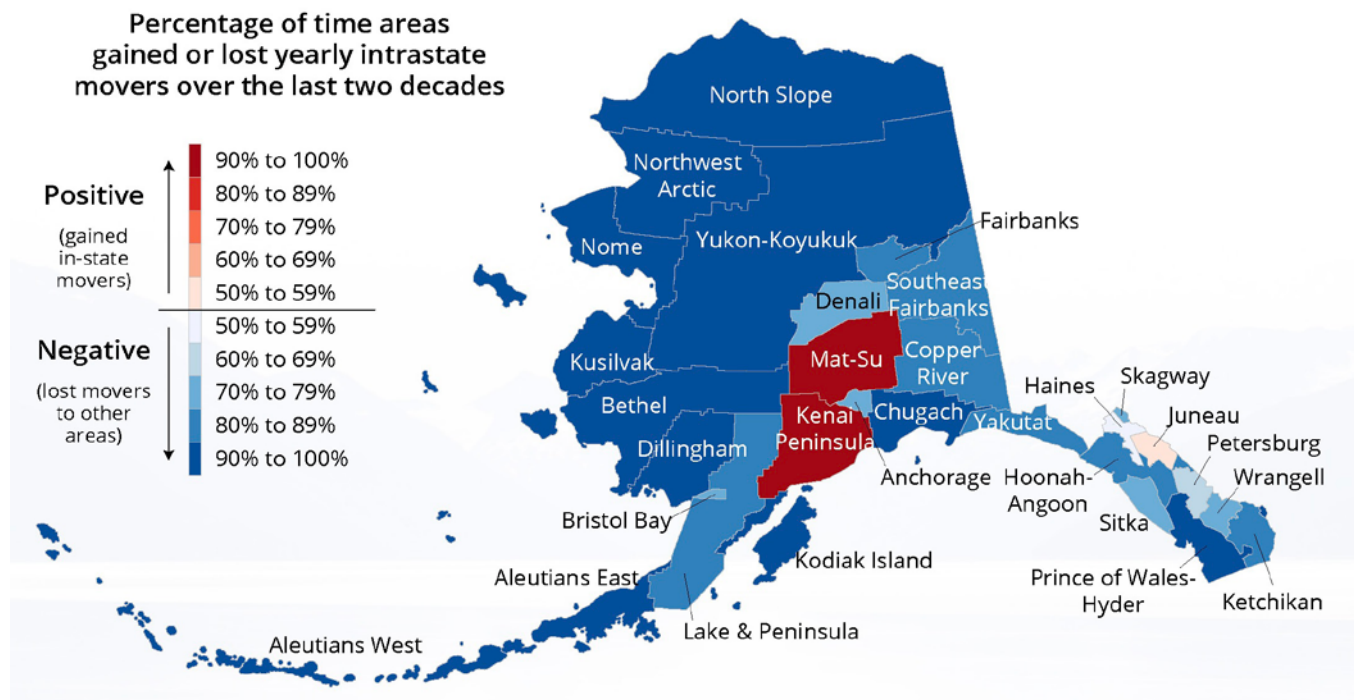


FIGURE 1. ALASKA DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT, RESEARCH AND ANALYSIS SECTION.

it's no longer considered a rural area (ADLWD 2024). As shown in Figure 1, the Mat-Su Borough, and the Kenai Peninsula Borough south of Anchorage, are major destinations for Alaskans to move to (Sandberg 2018; 2022). At the same time, we see a growing population in other areas of Alaska, especially rural areas (Figure 2). However, as the population grew in rural communities, there was also migration into the hub communities and ultimately into larger urban centers such as Anchorage, the Matanuska Susitna and Kenai Peninsula

Boroughs, and Fairbanks. Here, we see the major hubs for migration and how much of the migration is between smaller communities and larger urban centers (Sandberg 2022). These figures show some return from the urban area to the rural area, but overall, the net migration is rural to urban. However, a recent review of studies has not identified whether climate is a key driver in human migration (Chi et al. 2024).

Where communities send their largest number of in-state migrants, 2000 to 2021

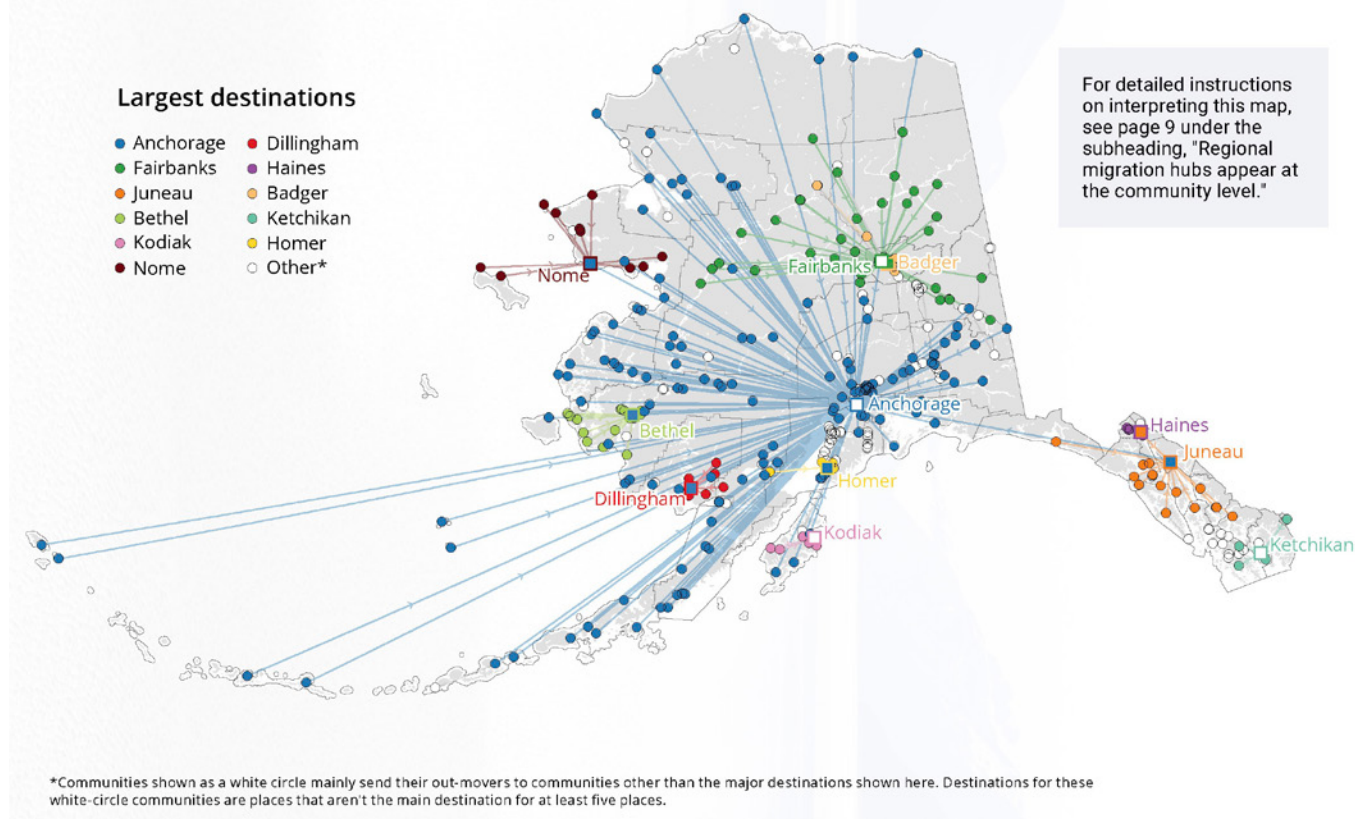


FIGURE 2. ALASKA DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT, RESEARCH AND ANALYSIS SECTION.

WORKSHOP PLANNING TEAM

The workshop planning team met every two weeks over several months, and included Sea Grant professionals and others involved in climate resilience and adaptation.

- ▶ Davin Holen, Alaska Sea Grant
- ▶ Ashley Dunker, Alaska Sea Grant
- ▶ Mona Behl, Georgia Sea Grant
- ▶ Katherine Bunting-Howarth, New York Sea Grant
- ▶ Danielle Meeker, Alaska Center for Climate Assessment and Policy
- ▶ Katy Hintzen, Hawai‘i Sea Grant
- ▶ Sydney Fishman, Washington Sea Grant
- ▶ Sean Kelly, Alaska Sea Grant

WORKSHOP PARTICIPANTS

The Anchorage workshop had 66 total participants. Most participants came from Alaska, including Anchorage (19) and the nearby Matanuska Susitna Borough (10). There was a large contingent from Hooper Bay (11) and nearby Chevak (2) in the Yukon-Kuskokwim Delta region of Western Alaska. This area was particularly hard hit by Typhoon Merbok in the fall of 2021, which caused extensive flooding and erosion. Other Alaska locations included Utqiagvik, Homer, and Unalakleet. Five participants came from Hawai‘i, three of which represented the organization Sust‘āinable Molokai. Six participants came from the Southeastern United States, including the Jean Charles Choctaw Tribe, which has dealt with relocation. Finally, it should be noted that six of the participants from the Matanuska Susitna Borough communities of Wasilla, Palmer, and Big Lake were high school and college students who were taking an Alaska Native Cultures class with Dr. Holen. In the evaluation and through comments by workshop participants, it was found that having young voices in the engagement sessions was beneficial. This diversity of agency, academic, community, elders, and youth enriched the discussions described below.

Through the NSF CoPe grant from NSF and core funding, Alaska Sea Grant provided funding for approximately 25 participants from communities across Alaska, Hawai‘i, the Northwest Coast, and other regions. ■

WORKSHOP STRUCTURE

Following opening remarks by Davin Holen on migration in Alaska and a presentation by project principal investigator Mona Behl on the PEMOCC workshop series, Sean Kelly led icebreaker sessions for participants to get to know each other. This was followed by two storytelling sessions, *Narratives from the Coast* and *Stories from Islanded Communities*. The second day was dedicated to two sessions, *Building and Maintaining Communities* and *Future Coastal Communities* (see Appendix A: Agenda). As noted above, speakers helped to set the stage for the engagement sessions. Engagement sessions provided a forum for workshop participants to discuss issues related to climate-induced human mobility, identify priorities, and ideate potential solutions.

The workshop was divided into four sections, each followed by an engagement session. Workshop attendees were randomly assigned to one of six engagement groups of around eight participants each to provide a more intimate space for discussion and processing. A facilitator and notetaker were assigned to each

group to support discussions and activities and document findings. Groups remained the same throughout the workshop to build cohesion and continuity. Engagement session discussion prompts and activities were designed after the themes of the workshop segment and topically aligned with the presentations from each workshop segment.

The objective of the engagement sessions was for participants to use the presentations as a launching point for discussion. In addition, the goal of the workshop and the engagement sessions was to create connections between participants.

Below is a summary of the four engagement sessions. Each session summary is organized by the speakers, a description of the session, and a summary of the conversation. The first session was designed for participants to share their own stories. We did not take notes at this session because we wanted community members to feel free to share their experiences, perspectives, and personal stories. ■

WORKSHOP SEGMENT 1: NARRATIVES FROM THE COAST

Narratives from the Coast was an opportunity to hear stories of migration and life in Alaska from different perspectives. Anchorage is home to a large community of migrants from Mexico who have made Anchorage their home for several generations. In fact, several generations of residents from a single community in Mexico split their time between their community of NN and Anchorage (Komarnisky 2018).

These migrants engage in place and community building in Anchorage by buying homes close together and sharing food and traditions as a community. The audience heard one story of migration from Mexico to Alaska and the place and community building by the Mexican community in Anchorage by a newspaper editor and scholar, Gabriela Olmos Rosas. This was followed by two presentations on migra-



PARTICIPANTS ENGAGE IN A COLLABORATIVE PRESENTATION) SESSION. PHOTO BY SEAN KELLY/ALASKA SEA GRANT.

tion by Alaska Native speakers. Sonya Gray is an anthropologist from Hoonah in Southeast Alaska, where she spent most of her life. She is a lifetime member of the Alaska Native Sisterhood, a tribal member of the Hoonah Indian Association, and a shareholder of Huna Totem Corporation. Sonya was employed as Program Manager from 2002–2014 for the Huna Totem-owned port of call, Icy Strait Point, and has also worked in Glacier Bay National Park and Preserve as an interpretive ranger. Sonya told the story of the Tlingit of Icy Strait, who has had a fraught relationship with the US Government over migration in the region with the establishment of Glacier Bay, and how the two, the National Park Service and the Tlingit of Hoonah, have come together to heal this relationship through reestablishing a Clan house in the park and through cultural activ-

ities. The final speaker came from Chevak in the Yukon-Kuskokwim Delta region of Alaska. This region is one of Alaska's most densely populated, with 56 communities not connected by road. It is also one of the most underserved regions of Alaska and the United States, with several communities that still do not have household water and sanitation systems. Casey Ferguson is the Indigenous Engagement Coordinator for the Alaska Coastal Cooperatives at the University of Alaska Fairbanks. Casey is a lifelong hunter who travels back to his home community several times a year to practice the subsistence way of life. Casey shared Chevak's story of migration and the challenges they still face with coastal erosion and coastal flooding. These stories helped the participants think about their own stories, which they then shared during the first engagement session.

ENGAGEMENT SESSION 1: SMALL GROUP STORYTELLING

DESCRIPTION

The purpose of the first breakout discussion and activity was to provide a forum for participants to become acquainted with each other and get to know the experiences and perspectives of other participants. The workshop included speakers and participants, both nationally and internationally, representing a diversity of climate resilience professionals, practitioners, and other interested parties. It was thus a priority for the workshop steering committee to take advantage of this unique opportunity by ensuring that attendees

were afforded ample opportunity to learn from and network with other attendees.

This forty-minute engagement session followed the morning's round of speakers and a brief coffee break. Facilitators led breakout groups through a sharing exercise where each participant shared where they are from and shared a story about the place they call home. The idea is to understand how we create connections. No notes were taken during this session to make it a more comfortable place to share. The following sections will include summaries from the engagement sessions. ■



ARTISTIC DEPICTION OF PANEL DISCUSSION BY ELIZABETH OLIVER.

WORKSHOP SEGMENT 2: STORIES FROM ISLANDED COMMUNITIES

The Islanded Communities session brought together perspectives from the greater Pacific Region. The presentations were held in the afternoon to enable the first two presenters to give their presentations via Zoom. This included a presentation by Sheila Babauta, a former legislator and current owner of Community Solutions, which advocates for people in the Northern Mariana Islands. This helped the participants think through the process of decision-making in remote places. This presentation was followed by a presenter, Kyana Tuncap, from the Guam Water Project, that advocates for clean water for area communities. These two remote presentations helped the audience glimpse issues facing island communities in the greater Pacific region.

The workshop was lucky enough to have three in-person attendees from Sust'ainable Molokai. Harmonee Williams, Katy Mokuau, and Heather Place gave a presentation on the Climate Change & Sea-Level Rise Plan for Moloka'i's future. This ambitious plan has 1) an indigenous place-based perspective driven by Moloka'i kama'āina and long-time community leaders, 2) incorporates appropriate technical land-use planning and coastal engineering expertise, 3) utilizes a process to engage and develop the next generation of local leaders, and 4) results in an action-oriented document that identifies the key climate change issues, upcoming Moloka'i projects that may need to be adapted, as well as new plans that should be adopted to build greater community adaptability, resilience, and capacity in the years ahead.

ENGAGEMENT SESSION 2: WORLD CAFÉ DESCRIPTION

This engagement session focused on understanding the factors influencing climate-induced human mobility and how decisions about human mobility are made. The session emphasized the importance of context in these decisions, noting that specific strategies, such as relocation, might not always be viable and should involve decision-makers from the local to the national level. To explore decision-making processes and identify potential gaps, a “World Café” activity was employed, where participants rotated between stations to discuss

prompts related to decision-making around climate resilience, mitigation of environmental threats, and the inclusivity of diverse voices in decision-making.

The World Café activity aimed to foster dynamic discussions, with participants moving between rooms to respond to specific prompts. These prompts covered who is involved in decision-making on climate resilience, factors influencing decisions to stay or move, resources available for relocation, and the representation of voices in climate-induced mobility



ARTISTIC DEPICTION OF PANEL DISCUSSION BY ELIZABETH OLIVER.

discussions. One of the main prompts asked, “How can we ensure that decision-makers are listening to and incorporating the perspectives of underrepresented communities in climate mobility and vulnerability planning and policy-making?” The exercise sought to encourage participants to reflect on existing decision-making practices and explore ways to enhance inclusivity and effectiveness in addressing climate vulnerability.

FINDINGS

Communities facing relocation due to climate-related events encounter several limitations despite the support offered by state and federal governments. Sustained support for adapting in place (managed retreat) or relocation often proves challenging. Effective support requires engagement with communities at a local level, with examples from rural Alaskan

communities and rural Hawaiian areas demonstrating the importance of direct, in-person outreach. For instance, in Moloka‘i, involving representatives from all ages and backgrounds, including Native Hawaiians in discussions about land and relocation was crucial. Ensuring that conversations include experts and government officials while also integrating the perspectives of immigrants and community members fosters a more inclusive process. In Alaska, there are significant challenges for adapting in place or relocation. Efforts require thorough research and planning, including permafrost and GIS mapping and forecasting models for water levels. Recent efforts have emphasized community engagement in the modeling process to better address local needs. Engineering support has been positively noted in Gulf Coast communities and Western Alaska. However, the slow pace of research and the lengthy grant-writing process poses challenges. Efficient resource allocation must balance complexity with practicality to avoid undermining community involvement and needs.

Local and Indigenous leaders play a vital role in the planning process for adapting in place or a relocation process. These leaders, especially elders with long-term knowledge of the community, landscape, and marinescape, are essential for bridging gaps between communities and government agencies. Elders, who have witnessed long-term changes and possess valuable cultural knowledge, should be included in discussions despite potential challenges such as ageism or focusing on financial rather than cultural considerations. For example, in the case of Moloka‘i, the importance of local

connections and the willingness of county officials to cede some control led to more effective engagement with the community. Tribal governments and local officials must be actively involved, respecting sovereignty rights and ensuring that local voices are heard.

Besides elders, youth involvement is crucial in the relocation process as they are among the most impacted by climate change. Schools and youth clubs should be actively engaged to provide input and advocate for their needs, with youth sometimes even challenging and influencing their parents. Incorporating their perspectives can strengthen the overall response.

The presence of health professionals is important for addressing community needs, especially in isolated island communities. This includes mental health—members of communities under change can benefit from mental health professionals as well as peer-listening exercises.

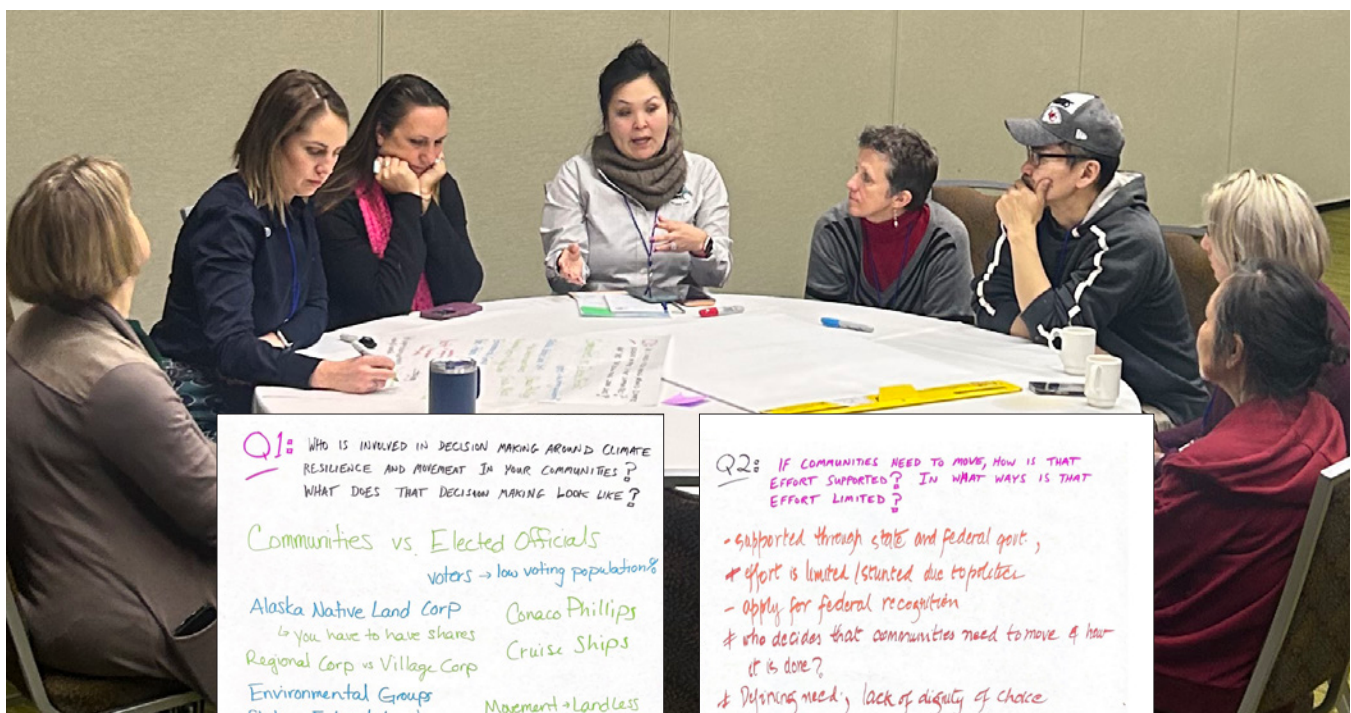
Various factors influence decisions about whether to stay or relocate. Discussing relocation can risk losing current resources and lead to tensions between pro- and anti-relocation groups. Economic considerations, such as job availability, cost of living, and housing, play significant roles. Additionally, concerns about brain drain, personal trauma from past relocations, healthcare access, and legal land rights impact decisions. Changing demographics and proximity to family also influence the decision-making process.

Communities often face slow disaster response and inadequate disaster assistance, especially in rural areas. The traditional grant-writing process is time-consuming, prompting questions

about whether alternative methods, such as direct support from land-owning corporations or parametric insurance, might be more efficient. Ensuring that resource allocation does not cut corners but rather supports community needs is crucial, acknowledging that climate relocation is inherently complex and requires thoughtful, community-centered solutions.

Communities facing relocation due to climate-related events receive various forms of support, including land for relocation, funding, and emergency resources. For relocation, feasibility depends on factors such as natural

resource availability and infrastructure like ports. For instance, a Louisiana community that relocated inland lost essential port access, which impacted their fishing income. Funding following major disasters is also a consideration. In Hooper Bay, Alaska, funding sources such as FEMA for insulation after Typhoon Merbok and other funding for typhoon recovery have been utilized, though the efficiency and adequacy of these resources vary. Emergency supplies, like those provided after Hurricane Ida in the Gulf, address immediate needs, but longer-term requirements such as building materials often remain unmet. ■



Q1: WHO IS INVOLVED IN DECISION MAKING AROUND CLIMATE RESILIENCE AND MOVEMENT IN YOUR COMMUNITIES? WHAT DOES THAT DECISION MAKING LOOK LIKE?

Communities vs. Elected Officials
 voters → low voting populations%

Alaska Native Land Corp
 ↳ you have to have shares

Conaco Phillips
 Cruise Ships

Regional Corp vs Village Corp

Environmental Groups
 State + Federal levels

Movement + Landless
 ANSCA
 claim parcels of land

Youth → involved in monitoring programs
 ↳ outspoken
 ↳ social justice

Lobbying
 Usually a community expert / advocate / person keeping track of processes and final experts.
 Local Champion →

Fed budgeting during rapid timelines making full inaccessible.

Dec. making looks like a dance between different community entities.

Tribal Council
 ↳ Elders

Nonprofit Organizations
 University involvement

Social Media

Q2: IF COMMUNITIES NEED TO MOVE, HOW IS THAT EFFORT SUPPORTED? IN WHAT WAYS IS THAT EFFORT LIMITED?

- supported through state and federal govt.,
- effort is limited / stunted due to politics
- apply for federal recognition
- & who decides that communities need to move & how it is done?
- Defining need; lack of dignity of choice
- sovereignty rights
- engagement with policy makers
- community is actively engaged in planning process
- emphasize co-benefits
- keep in mind environmental conditions
- university efforts / grants to do research + provide assistance
- community makes decision to move and purchase property
- locating higher ground for future generations
- support from Sea Lin Corp / Rimmet /
- support in distribution of space
- tribal social issues may be challenging

WORKSHOP SEGMENT 3: BUILDING AND MAINTAINING COMMUNITIES

Session three of the workshop focused on the current state of planning and mitigating the impacts of climate for coastal communities. Sydney Fishman, one of the workshop organizers, formerly of the Washington Department of Ecology and now with Washington Sea Grant, described efforts on the Washington coast to mitigate the impacts of coastal erosion in the built environment. This helped the audience understand the current state of mitigations while also thinking through more effective and cheaper practices. Jackie Qataliña Schaefer of the Division of Environmental Health and Engineering at the Alaska Native Tribal Health Corporation, who now leads the new Climate Programs Initiative, talked about health impacts on individuals and overall stress on communities from climate. In one poignant episode, she described the impacts of the relocation of Newtok to Mertarvik, the only ongoing relocation in Alaska. Newtok is a small Yup'ik community made up of a multitude of extended families. At the time of the workshop, the relocation was in its tenth year. Jackie helped the audience understand the stress, especially for children growing up apart from their extended family during this relocation, with families split apart between the old and new villages. This relocation occurred through a land swap between a corporation, Tribe, and the federal government. Federal agencies, including the Army Corp of Engineers, invested heavily to make this relocation possible, and it still has taken half a generation to complete

(Korkut et al. 2022; GAO 2022). With numerous communities still needing relocation in Alaska, will future communities have the same experience as Newtok?

Shifting to a Pacific perspective, Paula Dobbyn, a reporter with the Civil Beat in Hawai'i, described how Hawai'i addresses climate change. Hawai'i is a leader in addressing climate change and is the first state to commit to addressing the Paris Agreement. This was followed by legislation on achieving 100% renewable energy and addressing sea level rise and coastal erosion. Sea level rise is projected to cost Hawai'i \$20 billion over the rest of the century, displace 20,000 people, along with significant land loss. However, there are many structural barriers to managed retreat from the coast in Hawai'i. This was followed by a focus on Hawai'i's largest community by Emily Makini from the City of Honolulu. Honolulu established one of the country's first resilience officers at a city level and has been progressive in considering the impacts of rising sea levels on its infrastructure as a hub of American activity and tourism in the Pacific. One of the critical factors in moving people away from the coast is equity. Dobbyn first discussed this in her presentation on who is getting buyouts for expensive properties built in hazard zones. Around the world, local, regional, and national responses to climate impacts on the built environment and communities are not always equitable. Idowu Jola Ajibade from Portland

State University presented via Zoom on a project mapping successfully managed retreat programs worldwide and identified whether they were equitable or just (Ajibade et al. 2022). This study assessed whether managed retreat programs “are reducing exposure to climatic hazards, enhancing adaptive capacity, and im-

proving the living conditions of communities in a just and equitable manner or are [instead] exacerbating existing risks and vulnerabilities.” With this, the participants broke into groups to consider the current status of climate mitigation, adaptation, and managed retreat through an equity lens.



ARTISTIC DEPICTION OF PANEL DISCUSSION BY ELIZABETH OLIVER.

ENGAGEMENT SESSION DESCRIPTION

During the engagement session, participants were first asked to reflect on what makes their communities healthy and successful, writing their responses on sticky notes. This was followed by a consensus exercise where groups categorized these notes, discussing and clarifying the reasons behind their chosen health and success metrics. The discussion then shifted to

identifying climate or environmental concerns that could threaten these factors. Participants used sticky notes to highlight their concerns, leading to a deeper exploration of potential risks.

The conversation evolved to consider the specific challenges faced by communities undergo-

ing relocation or managed retreat and challenges faced by receiving communities. Participants discussed the types of obstacles both groups might encounter, such as social integration, resource allocation, and infrastructure strain. They also explored ways to prepare receiving communities to accommodate newcomers, ensuring that both relocating and host communities could navigate these transitions effectively.

FINDINGS

Cultural values and practices are integral to community cohesion and identity. Elders are regarded as leaders and are actively involved in decision-making processes. Many communities maintain a subsistence way of life, reinforcing strong cultural ties and social cohesion. Participation in cultural activities and family engagement contribute to a safe and supportive environment. Ensuring that decisions are made with community support and respect for cultural practices is vital, with a focus on culture-based decision-making and maintaining control over housing and food security. Community members are often open to growth and want their communities to be places where their families are safe and where they can have a future. They want communities to be centered around opportunities for interaction, such as cultural events and community gatherings, access to healthy local food, affordable housing, and places where people connect to each other and the land.

When it comes to decision-making, effective governance requires a collaborative approach involving community input and maintaining trust in government agencies. Essential elements in-

clude having a functional regulatory system, an evacuation plan, and a willingness to meaningfully address environmental and climate-driven changes. Community decisions should reflect local needs and cultural values, with no outside decision-making imposed without community backing. Ensuring that decision-making processes are inclusive and responsive to community concerns helps in managing environmental and social challenges effectively.

Communities face numerous risks from climate and environmental changes, such as wildfires and flooding, which threaten homes and infrastructure, and dry weather, which affects agriculture. Permafrost thawing and loss of sea ice further destabilize infrastructure and complicate relocation. Government regulations and policies can also negatively impact communities, either by reducing access to natural resources or by imposing conditions that force cultural compromises as a condition of receiving funding. Preparedness and timely decision-making are essential but often hindered by slow studies and inadequate response mechanisms.

However, addressing environmental and climate-induced risks often involves difficult trade-offs, including the potential compromise of cultural practices to secure funding or meet regulatory requirements. Communities may struggle with limited political responsiveness and inadequate support during emergencies. The challenge lies in balancing the need for effective disaster preparedness and infrastructure development while respecting cultural heritage and ensuring that funding processes do not undermine community values. Ensuring that all

these factors are considered in decision-making is crucial for sustainable and respectful outcomes. Some limitations and factors that often involve trade-offs in addressing environmental and climate-induced change include obtaining funding that might require communities to alter or forfeit cultural traditions to meet eligibility criteria, resulting in a tension between

securing necessary resources and preserving cultural identity. For example, cultural sites, such as burial grounds, may be affected by environmental hazards, and sometimes government agencies are unaware of their significance. These factors highlight the need to carefully consider cultural and environmental impacts in decision-making processes. ■



WORKSHOP SEGMENT 4: FUTURE COASTAL COMMUNITIES

The speakers and engagement sessions for this final part of the workshop focused on how to build resilience in coastal communities in the face of climate change. This included considerations such as personal and community connections to place, locally driven economies, resilient infrastructure, a climate-ready workforce to meet future challenges, and other factors necessary for building the communities of tomorrow. Self-determination will be a critical consideration in decision-making around future coastal communities.

Mathew Berman, an economist with the University of Alaska Anchorage, focused on Alaska while following up on the discussion by Idowu Jola Ajibade on international studies by describing climate adaptation efforts from seven communities worldwide. Berman was part of an international team sponsored by the Belmont Forum that sought to identify the shared factors of successful climate adaptation. The study found that coastal communities that adapted successfully had several shared factors, including the prominence of rural livelihoods such as fisheries and grazing, successfully adapting community assets such as water and sanitation system and other public infrastructure, strong local institutions, and a focus on local adaptations that utilize traditional and local knowledge. Berman and colleagues, including E. Lance Howe and Lee Huskey, also University of Alaska Anchorage economists, have reviewed the factors involved in decision-making around migration in Alaska (Berman 2009; Howe et al. 2014). People in

rural Alaska are tied to the landscape and the subsistence way of life as fundamental to their connection to the land and resources of their region. However, a lack of jobs and employment can lead some to migrate to urban areas.

This led to two presentations, one by Ryan Foster, a city planner from Homer, Alaska, and another by Kelsey Anderson, a planner from the Matanuska Susitna Borough. Over the past 40 years, the Matanuska Susitna Borough has grown from 20,000 residents to 117,000 residents. The Borough did not plan well for this rapid growth and is now reassessing how to plan a series of smaller community centers to provide better services and a sense of community.

Homer is at the end of the highway on the Kenai Peninsula in Kachemak Bay. A destination community for recreation, sport fishing, and a home port commercial fishery, Homer has also become a popular destination for Alaskans to retire. The population is growing rapidly, and they are dealing with housing and infrastructure challenges.

Southeast Alaska communities live with the shared history and memory of Tlingit Aani', Tlingit territory, and today share ownership and stewardship with agencies and government entities. Sonya Gray from Hoonah gave a second presentation on the predominantly Tlingit community of Hoonah at the mouth of Glacier Bay as they consider how to couple their history and traditions in Glacier Bay and consider

the future in enhancing community well-being through traditions.

Momi Afelin and Katy Mouau from Sust'ainable Molokai discussed initiatives on Moloka'i, a fairly rural island in Hawai'i. With the rise of sea levels and more intense storms, the community is planning for enhanced resilience to meet the current challenges and plan and prepare for the future. In doing so, they

follow a traditional management system called Ahupua'a, which considers people a part of watersheds.

These case studies helped to ground the participants in place, in urban and rural Alaska and Hawai'i, as they considered the communities of tomorrow that are resilient to the impacts of the changing climate.



ARTISTIC DEPICTION OF PANEL DISCUSSION BY ELIZABETH OLIVER.

ENGAGEMENT SESSION DESCRIPTION

This engagement session employed an exercise framed after a traditional vulnerability assessment approach, in which challenge statements guide participants through problem-solving. In the first round, facilitators presented a problem or challenge statement and encouraged partici-

pants to brainstorm ideas creatively, capturing as many as possible on Post-it notes within five minutes. These ideas were then categorized into groups on poster paper to identify common themes.

In the subsequent rounds, participants evaluated the categorized ideas using a priorities matrix, considering both feasibility and potential impact. Facilitators encouraged participants to think beyond traditional maximization strategies and consider alternative approaches. In the final round, participants developed action plans for each prioritized idea, outlining necessary steps, identifying responsible parties, creating a timeline, and considering potential challenges and solutions. This structured approach aimed to translate brainstorming into actionable strategies.

FINDINGS

Building resilient local economies involves fostering diverse industries, skills, and ownership structures. Education and workforce development must align with local job opportunities to ensure effective job placement. Emphasizing natural resources such as fishing—commercial, recreational, and subsistence—and tourism can drive economic growth. Local ownership helps keep financial benefits within the community and promotes business investment in community resilience. Infrastructure needs include public facilities, those tailored to specific industries, and adequate housing to support a growing workforce and economic development.

Maintaining cultural heritage is essential for community health and cohesion. This includes preserving and practicing cultural traditions, teaching them to younger generations, and ensuring natural spaces remain intact and healthy. A holistic approach to health—encompassing mind, body, and spirit—is vital. You

need affordable, culturally appropriate health-care, including access to culturally appropriate mental health resources, in order to prevent migration due to inadequate services. Building comfortable gathering spaces for cultural activities, supported by sustainable and renewable energy sources, further enhances community well-being.

Developing sustainable infrastructure is critical to supporting future community needs. However, there are several barriers to accessing funding, from proposal development and grant management to fulfilling cost-match requirements. Alternative funding structures designed to ameliorate inequities in access to funding should be considered. Investing in updated energy infrastructure, including renewable energy and energy efficiency, and sustainable water and sewer infrastructure should be prioritized. These resources should be built with future conditions considered as the climate is rapidly changing, and they should take into consideration traditional and local knowledge. Finally, more roads may not be the answer to future transportation needs. Exploring and expanding transportation options beyond roads can improve connectivity and resilience.

Ensuring food security involves providing access to diverse food types—proteins, fruits, vegetables, and carbohydrates—and fostering traditional subsistence practices. Protecting biodiversity and resources through community-based management is crucial for maintaining a secure food supply. The management of subsistence resources needs to be responsive to changes in species' spatial and temporal distribution, which is vital for the subsistence way

of life. Land tenure issues that act as barriers to traditional subsistence practices must be addressed and ameliorated. Secure and culturally appropriate food storage and preservation are necessary to ensure food security. Finally, publicly funded programs that favor the inclu-

sion of nutritionally rich subsistence foods and policies that support educational experiences in food production and preparation for community members will help to sustain community well-being. ■



Local Economies	Culture & Community Health	Infrastructure	Food Security/ Subsistence Way of Life	Other
*local ownership *diversity of economy *planning (w/ hazards) *circular economy -locally -supply chain	*storing sufficient food *water supplies (winter esp) *capacity building & training *demedicalization *empowering cultural practitioners *local + traditional medicine *traditional medical insurance *revitalizing languages *J&S health presentation	*funding! (→) ↳ prereqs can be limiting *implementing basic infrastructure *grant - writing capacity ↳ expertise *support precolonial infrastructure *geographically community-spec needs *long-term planning	*Elders teaching younger generation (training) *sustainability (longterm) + best practices ↳ TLK informed *co-stewardship *local stewardship *invasive species mgmt *species (local) migration mgmt *allowing/sup. subsistence rights to move geographically	*funding mech. flexible for communitiespec. needs (& culturally responsive) *public education engagement

CONCLUSION AND RECOMMENDATIONS

The Pacific is a dynamic region. Storms, heavy precipitation, and coastal inundation have long been a way of life for those in the region. But the world is changing. In September 2022, a perfect storm emerged from an abnormally warm region of the Pacific, northwest of Hawai‘i, that traveled north to Western Alaska. Driven by unusually warm water, Typhoon Merbok reached over 50 feet when it entered the Bering Sea. The storm, with hurricane-force winds, washed away storm berms, destroyed roads, moved and destroyed public buildings and homes, inundated the coastal community of Hooper Bay, and surrounded the community of Chevak six miles inland, scattering boats and fishing infrastructure across the tundra (Thoman 2022; Mucioki et al. 2024). The Arctic region is warming rapidly with highly variable seasonal variations causing glacial flooding and massive forest and land loss as permafrost thaws and storms wash away large areas of coastlines (Druckenmiller et al. 2023).

Hawai‘i, other US islands in the Pacific, and Alaska are home to large Indigenous populations, including Native Hawaiians, Chomorro, and Alaska Natives. These communities often sit at the periphery of wealthy urban centers and federal infrastructure, such as military bases and lands

controlled by federal agencies. This workshop heard from researchers, practitioners, and residents of the region, who live in or work with mainly rural Indigenous communities. Discussions of equity became a central focus of this workshop. There are deep historical structural inequities that still need to be overcome. In small group discussions, one of the central themes was that these rural communities need to have a greater say in the decisions that affect their lives, and specifically, elders and youth should have a say in decisions.

Residents of predominantly Indigenous communities of the Pacific region have a close, often spiritual connection to the land and the resources on which they depend for their livelihoods. Communities are often multi-generational, encompassing close kin networks, so family ties are essential within the community. Elders have deep knowledge of the lands and waters on which they depend, and youth are inspired by the ability to innovate in service of their communities by drawing on their elders’ knowledge. It is for these reasons that people continue to live where they have generational connections to place, and in light of the changing climate and structural inequities, they will continue to innovate, thrive, and live successful lives. ■

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APPENDIX A: WORKSHOP AGENDA

PEOPLE ON THE MOVE IN A CHANGING CLIMATE

Alaska, Pacific Northwest, Pacific Islands, and International Workshop

April 11 - 12, 2023

Dena'ina Civic and Convention Center, Anchorage



Tuesday, April 11

8:30 Check In, Coffee, and Light Breakfast

9:00 Welcome and Acknowledgments

Davin Holen, Alaska Sea Grant

9:20 PEMOCC

Mona Behl, Georgia Sea Grant

9:40 Icebreaker Activity

Sean Kelly, Alaska Sea Grant

Narratives from the Coast

Moderator: Davin Holen, Alaska Sea Grant

10:00 Anchorage as a Migration Destination

*Gabriela Olmos Rosas, University of Alaska Fairbanks
Anchorage, Alaska*

10:30 Called into Being: The Glacier Bay Story

*Sonya Gray
Hoonah, Alaska*

10:50 Monitoring Coastal Change in Chevak

*Casey Ferguson
Chevak and Anchorage, Alaska*

11:10 Break

11:30 Small Group Discussion: Share Your Stories

12:10 Catered lunch

Stories from Islanded Communities

Moderator: Katy Hinzen, Hawai'i Sea Grant

1:30 Connecting Communities in the Mariana Islands

*Sheila Babauta, Community Solutions
Northern Mariana Islands*

2:00 Protect Guam Water Project

*Kyana Tuncap, Protect Guam Water Project
Guam*

2:20 Moloka'i Climate Change and Sea Level Rise Adaption & Resiliency Master Plan

*Harmonee Williams, Katy Mokuau & Heather Place, Sustainable Moloka'i
Moloka'i, Hawai'i*

2:40 Facilitated Discussion

3:00 Coffee Break

3:20 Small Group Discussion

4:00 End of Day 1

6:00 Catered Reception

49th State Brewing, 717 W. 3rd Avenue, lower level



**PEOPLE
ON THE
MOVE IN A
CHANGING
CLIMATE**

April 12, 2023

8:30 Check In, Coffee, and Light Breakfast

9:00 Welcome and Goals for Day 2

Building and Maintaining Communities

Moderator: Danielle Meeker, Alaska Center
for Climate Assessment and Policy

**9:10 Sea Level Rise and Management Options for
Washington's Shorelines**

*Sydney Fishman, Washington Sea Grant
Olympia, Washington*

**9:30 The Realities of our Rural Communities Facing
Climate Change**

*Jackie Qatalina Schaeffer, Alaska Native Tribal Health Consortium
Anchorage, Alaska*

9:50 Barriers to Managed Retreat in Hawai'i

*Paula Dobbyn, Honolulu Civil Beat
Big Island, Hawai'i*

**10:10 City and County of Honolulu: Successes,
Constraints and Future Goals**

*Emily Makini, City of Honolulu
Honolulu, Hawai'i*

**10:30 Reflections on justice, decision making, and
factors shaping global relocation programs**

*Idowu Jola Ajibade, University of Portland
Portland, Oregon*

10:50 Coffee Break

11:10 Small Group Discussion

12:00 Catered Lunch

Future Coastal Communities

Moderator: Sydney Fishman, Washington Sea Grant

**1:00 Resilient adaptation to climate change:
findings from seven coastal communities**

*Matthew Berman, University of Alaska Anchorage
Girdwood, Alaska*

**1:20 Answering the Call: Interpreting Collaborative
Futures in Glacier Bay**

*Sonya Gray
Hoonah, Alaska*

**1:50 Climate Action and the Future of a Coastal
Community**

*Ryan Foster, City of Homer
Homer, Alaska*

**2:10 Growing Pains: Reacting to, and Planning for,
Growth in the Mat-Su Borough**

*Kelsey Anderson, Matanuska-Susitna Borough
Palmer, Alaska*

**2:30 Moloka'i Ranch and the 'Umeke' Ai Resiliency
and Sustainability Center**

*Momi Afelin & Katy Mokuau, Sustainable Moloka'i
Moloka'i, Hawai'i*

2:50 Coffee Break

3:10 Small Group Discussion

3:50 Closing Comments

Davin Holen, Alaska Sea Grant



