BUILDING NETWORKS TO BRIDGE INFORMATION AND ACTION ON ALASKA’S COASTS

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INTRODUCTION: COLLABORATIVE PROJECTS

• Promoting Coastal Resilience and Adaptation in Coastal Arctic Alaska
  • Karen Pletnikoff, Aleutian Pribilof Islands Association
  • Aaron Poe, Aleutian Bering Sea Islands LCC

• Tribal Led Monitoring, Mitigation and Adaptation Activities in Southeast Alaska
  • Davin Holen, Alaska Sea Grant
  • Raymond Paddock, Central Council Tlingit Haida

• Tribal Climate Adaptation Planning in Nome
  • Jacob Martin, Nome Eskimo Community
  • Nathan Kettle, University of Alaska Fairbanks
PRESENTING RESEARCH TO TAKING ACTION

Collaborative Learning ➔ Collaborative planning ➔ Collaborative action
PROMOTING COASTAL RESILIENCE AND ADAPTATION IN COASTAL ARCTIC ALASKA

A collaborative project sponsored by three Alaska Landscape Conservation Cooperatives and APIA.
Project Partners

- Aleutian Bering Sea Islands LCC
- Western Alaska LCC
- Aleutian Pribilof Islands Association
- Arctic LCC
- Kawerak, Inc.
- Qawalangin Tribe of Unalaska
- Bristol Bay Native Association
- Northwest Arctic Borough
- National Oceanic and Atmospheric Administration
- Sea Grant, University of Alaska Fairbanks
- Alaska Climate Science Center
- Alaska Ocean Observing System
Landscape Conservation Cooperatives

Public-private partnerships focused on conservation.

Tackling BIG issues like climate change that are too large for any entity to handle alone.

Largely funded by the U.S. Fish and Wildlife Service.

Over 130 member organizations including agencies, Tribes, NGOs, and universities participating in Alaska LCCs.
OVERALL PROJECT GOAL

Provide regional residents and resource managers
• Information and tools they need to better respond to coastal climate change challenges
• Support healthy habitats and resilient communities.
WORKSHOP APPROACH

• Presentations and discussions on climate-change topics and informational tools of interest to participants in each region.

• Dialogue about local and regional responses to known and forecasted climate changes.

• Networking with community decision-makers, resource managers, other environmental and agency professionals.
WORKSHOPS: WHEN + WHERE

- **Bering Strait Region, Nome:** May 10-11, 2016
- **Aleutian Life Forum, Unalaska:** August 13-19, 2016
- **Bristol Bay Region, King Salmon:** September 21-22, 2016
- **Northwest Arctic Region, Kotzebue:** December 7-8, 2016
PROJECT METHODS: HOW TO GET THERE

• Two-way information exchange - share tools and information within the region

• Collaborate/build a network
GETTING CLIMATE CHANGE INFORMATION INTO THE HANDS OF DECISION-MAKERS

Summary of the nature and severity of coastal climate change, including what to expect in the future...
POSTERS DESCRIBING COASTAL IMPACTS
The Ocean is Our Grocery Store & it's Changing in Ways We've Never Seen

The Bering Sea/Bering Strait and Chukchi Sea form one of the richest, most pristine and biologically productive ocean systems on the planet. The same unique characteristics that support this area's productivity - particularly its annual Variations In sea ice - make this region especially vulnerable to the impacts of climate change.

Changing sea ice / Changing ecosystems: Humpbacks, sea lions, other species are moving north (Katie Severson)

How is Climate Changing Impacting Marine Ecosystems? And How Might We Respond? Three Examples:

NEW PATHS FOR WHALES & MARINE SHIPPING?

CHANGE DRIVERS: Reduced sea ice opens the Arctic to new ship traffic, posing risks of oil spills and disturbance of species and subsistence hunting.

CHALLENGES & EMERGING STRATEGIES: Climate change is altering whale migration timing and pushing migration routes further from shores, disrupting vital subsistence traditions and forcing hunters to travel further into hazardous seas. Growing vessel traffic requires establishing rules for shipping routes and vessel noise, and creating capacity for local oil spill response.

WALRUS, EIDERS & MELTING SEA ICE

CHANGE DRIVER: Algae grow on the underside of sea ice. When the ice melts, the algae falls and feeds marine food chains. Less sea ice means fewer ocean nutrients, and a cascading decline in Arctic (ocean bottom) creatures, including things we like to eat, ice seals, humpbacks and walruses, and the creatures they eat.

CHALLENGES & EMERGING STRATEGIES: Arctic wildlife and people have evolved sophisticated ways of living based on sea ice. Lose the ice, and lose the platform these walrus, seals, eiders and people use to hunt, feed, rest and raise young, and sustain cultural traditions. Emerging reponses include moving newly established shore-based walrus haulouts and tools as humans have real time information on shifting sea ice.

SAWMON, COD, POLLOCK IN A CHANGING OCEAN

CHANGE DRIVER: The health of the Bering Sea salmon, cod and pollock stocks rests on a complex web of many marine ice creatures, from algae to zooplankton. The building blocks of this rich system are being fundamentally altered by warming waters and ocean acidification. Impacts include shifting fish locations, growing risks of harmful algal blooms, and less nutritious zooplankton - a key food source for the whole ecosystem.

CHALLENGES & EMERGING STRATEGIES: Warming waters coupled with ocean acidification will modify and likely decrease key fish species populations. These changes will ripple through local life, affecting everything from subsistence to jobs & government tax revenues. Needed responses include better environmental monitoring and a new generation of regulations dynamic enough to keep up with a changing climate.

Complex Ecosystem Building Blocks are Vulnerable to Climate Change

The abundant life in the Bering Sea region emerges from a complex web of physical, chemical and biological building blocks. Climate change is altering the structure of this system. This in turn could dramatically change what the ecosystem produces, including subsistence food on the table and the basis for this region's robust commercial fishing industry.

Ecosystem Foundation: currents, chemistry, heat, temperature, and the upwelling & downwelling of nutrients

"I can't hunt for whales. I lose the heart of what I teach my grandkids." - Nome

"Ice is now too thin for travel on lake, too thick to walk on." - Nome
Changes in Alaska’s Coastlines
“Our Homes, Our Way of Life”

**OUR RIVERS ARE CHANGING**
“Rivers are our roads, our highways, and every passing year they’re less reliable.” King Salmon

• What’s Changing? Warmer temps are thawing permafrost, leading to bank erosion and reducing the amount of stable, snow-bound river ice that scours out channels each year. Nanook F8 and campus is now a redneck. At the same time, summer water levels are falling due to lower snowpack and changing rainfall.

• Impacts: Low water levels threaten river communities dependent on recently from summer to fall surge travel, while at the same time challenging the salmon as they don’t freeze as they have in the past and making water travel between communities or to reach subsistence food sources dangerous or impossible.

**COASTAL LAGOONS AND ESTUARIES**
“Coastal lagoons are incredibly rich and productive ecosystems, and western Coastal Alaska has some of the most pristine lagoons remaining anywhere on the planet.” Quote from Kotze presentation

• What’s Changing? The complex physical and ecological structure of the lagoons is being re-shaped by a combination of changing sea waters, increasing storm surge, melting permafrost, new vegetation, and new patterns of freshwater flows.

• Impacts: Changes are threatening nesting and nesting habitats for the rich array of bird and wildlife that use these unique natural settings, often as critical areas for hatching and raising young. Changes then impact subsistence and commercial use of species like salmon and waterfowl.

**ROCKY BLUFF LANDS, ISLANDS**
“Watch Armin & Anna”

• Quote – changes on St. Paul

• What’s Changing? - Dunes of St. Paul Island - Barren watch!

**MELTING SEA ICE:**
“if I can’t hunt for walrus I lose the heart of what I teach my grandchildren” Nome

• What’s Changing? Warmer air and water keeps sea ice from forming. Sea ice in the Arctic is at its lowest levels ever measured – the North Pole is projected to be ice free in summers in the next several decades. Exposed Arctic water then absorbs more energy, a feedback loop that accelerates warming.

• Impacts? Sea ice is critical to life in the Arctic. It’s the platform where creatures from white sharks to seals to whales and polar bears rest, feed, and raise their young. Sea ice provides access to subsistence hunting and fishing that is the heart and soul of traditional culture.

**RISING WATERS, STORM SURGE, FLOODING COASTLINES**
“There are more tidal data stations in Chesapeake Bay than all of Alaska – we need better data.” King Salmon

• What’s Changing? As glaciers melt and warmer marine water expands, ocean levels are rising, with a projected average global rise of 2 to 4 feet by 2100. Small rise in sea level rise generally means 1 foot of additional surge during storms. But the ocean doesn’t rise uniformly like a bathtub, and Alaska lacks basic information needed to predict sea level rise. To begin to tackle challenges like this, you need information, including data on storm and wave patterns, bathymetry, current sea levels, coastal rebound, and short-term topography.

**LIFE AT THE MELTING EDGE OF CLIMATE CHANGE**
“Shishmaref is our home, it’s where our heart is” (NYT article)

• What’s Changing? Shishmaref is home to over 1,500 residents, who are facing a climate change quadruple threat: thawing permafrost, less sea ice, rising sea levels, and storms. The cold sea ice is a buffer for the community from storms.

• Impacts: These changes are combining to a significant hard, butting against, and failing to protect the community from the water.

**SHRINKING LAKES, DRYING WETLANDS**
“The tundra is so dry now it crusts when you walk” Yakutat

• What’s changing? Many coastal lakes and adjoining wetlands are drying, due to higher temperatures, smaller winter snowpacks, and thawing permafrost.

• Impacts? Shrinking lakes impact fish, birds, wildlife and people. In Kozlowski, the city’s water comes from a shallowing lake, which normally is replenished by melting snow. But as precipitation switches from snow to rain, the lake dries up early in summer, and the city now must find and fund an alternative water source.
Sustaining Subsistence, Life & Culture as the Climate Changes

Climate change is here today and accelerating, transforming the land, waters, plants and animals of western arctic Alaska. Communities, tribal organizations, land managers, researchers and agencies will all need to work together to respond to these serious changes and where possible seize on new opportunities.

More Than Just Food: Family, Fitness, Identity, Community, Memory, Spirit

Subsistence in the House of Wife in western arctic Alaska. The image below, based on a UAF Native Knowledge Network graphic, gives a generalized picture of foods used through the seasons, and how these seasons are changing.

"For us, it’s like someone moved the calendar by a month and nobody told us. We wonder what it must be like for the animals, plants and fish."

What’s a Walrus Worth?

- About 500 sources of usability from meat quality.
- Provided equivalent of about 600 steak meals.
- Estimated replacement cost $50,000 to $57,500.

"Lately we notice they’re expanding north and west..."

"Taxes, water, ice, migrations – they’re all unpredictable. Sometimes we can’t get to where we always harvested. We have to plan hunting attention in advance."

"Towards the road: creatures are shifting and sifting up."

"We’re going to have more rains, floods, storms, and maybe our clinic."

"Looking out, images are becoming: on days, rivers, images where there is less access to subsistence foods. These places are getting warmer for climate change."

"Lagoons on Alaska’s western coast are pristine and incredibly biologically productive – not many of these left on our planet."

"Seeing changing insect hatch: afraid this will impact timing of food for breeding birds."

LIVING WITH RISING WATERS

- Some of us are going to have to live things the new ways, using those old technologies.
- New, mobile infrastructure: new styles of building, weather resistant structures.
- Well-nurtured community buildings for short-term survival.
- Seasonal subsistence camps and shelters.
- New energy sources, micro hydro.

PROVIDING FOOD

- Grow food locally, re-establish tradition of household gardens, native greens.
- "We’re growing potatoes. We’re growing veggies."
- "Should we crossbreed bees?" help establish nectar bees in the area."
- "Greenhouses and gardens may be one adaptation strategy but they don’t work everywhere."
- "The land is our garden. That land is our commons."
- "Traditional foods are increasingly critical for people’s health."
- "We’re more in tune with the seasons."
- "New subsistence practices, equipment, and more: new regulations."
- "The last couple of winters in Bristol Bay were the worst we can remember. People have been through a lot, and they’re trying to make important changes."
- "We need to provide subsistence resources and adapt, but regulations are very different."

WORKING TOGETHER TO TRACK CHANGE

- "New, standardized protocols for local monitoring will enable}
- "Better quality change."
- "New regional partnerships to expand traditional knowledge and homestead scientific research."
- "Need to do a better job of bringing science back to communities."
- "Before science is happening, so we can see what to do change ahead of time."
- "Need to improve salmon monitoring to understand changing run times."

Response to Change:

"We have always been adaptive, resilient people. For thousands of years, Alaska’s traditional cultures have shown remarkable resilience, adapting to new skills to adapt, survive and thrive. Sections with stars below highlight emerging strategies to sustain cultures in the face of climate change."
JUST IMAGINE THE POSSIBILITIES...

Wow Senator Murkowski… that poster explains it all! Clearly we need more focus on Alaska ASAP!
SHARING ACTIONS + STRATEGIES

Case studies of Alaskan coastal communities and resource managers that are responding to climate change
Karen Pletnikoff, Aaron Poe, Karen Murphy, Amy Holman, Leanna Heffner, Davin Holen, Heather Stewart, Chris Beck. [in prep.]

Promoting Coastal Resilience and Adaptation: a synthesis from four regional workshops in the Alaskan Arctic. Aleutian Pribilof Islands Association, Anchorage Alaska.
The Changing Climate of Southeast Alaska: Tribal led Monitoring, Mitigation and Adaptation Activities
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Southeast Alaska Environmental Conference
PROCESS

Collaboratively led with the Central Council of Tlingit and Haida Indian Tribes and Sitka Tribe of Alaska.

1. Review latest ongoing research on key cultural species in Southeast Alaska.
2. Collaboratively discuss potential mitigation and monitoring activities.
3. Review current ongoing and proposed mitigation and monitoring activities.
4. Initiate or join current mitigation and monitoring activities as partnerships involving nonprofits, Tribes, land managers, and agencies.
Goals:
1. Review current status of 5 Resources identified as cultural important as well as human health

2. Initiate monitoring and adaptation strategies

- Salmon
- Shellfish
- Berries
- Yellow cedar
- Cultural sites
- Human health

Forest Environment
Approach: 2-3 generations
Approach: Narrative

Climate Change in Western Arctic Alaska: Poster 4
Peop-le, Culture, Food Security
Possible Impacts and Adaptation Responses

Change is here today and accelerating
Climate change is altering the landscapes and water of western arctic Alaska. Some changes are clearly negative, others, such as new game entering the region, may be positive. It is likely that these changes will continue and intensify, and drive new challenges and opportunities for the region.

Possible Impacts and Adaptation Responses
Change is here today and accelerating
Food – But Much More Than That:
Family, Fitness, Identity, Community, Memory, Spirit

The diverse plants and animals, and the associated subsistence traditions, are at heart of the life of western arctic Alaska. The graphic to the right, derived from a UAF Alaska Native Knowledge Network program graphic, gives a sense of the rich array of foods provided through the seasons by land and sea in western Arctic, Alaska.

Response to Changes? What Will the Future Be?
Over the millennia, Alaska’s traditional cultures have shown incredible abilities to adapt, survive and thrive. How can you, your community and other partners apply that creativity, resilience and mix of ancient and modern skills to sustain life and in the face of these new challenges and opportunities?


Food security
• Re-establish tradition of household gardens?
• Greenhouse? (e.g. Tonnell is growing an increased percent of local food)
• New more flexible subsistence regulations - in Bristol Bay, the state extends caribou season to catch late snow or river breakup)

Tracking change
• New protocols for measuring, monitoring and quantifying change? New systems for observation and traditional knowledge, and partnerships with other communities and resource managers?

Sustaining the link to the place, the land
• “Living with rising waters:” new, mobile infrastructure; new subsistence practices
• Ongoing/accelerated transfer of cultural traditions, subsistence skills from elders to youth?

New and changing subsistence challenges
• New subsistence practices and equipment?
• New opportunities? (e.g. moose)
Tribal Climate Adaptation Planning in Nome
Climate Adaptation Planning in Nome, Alaska

Nathan Kettle and Jacob Martin
Project Goals

- Improve understanding of climate change
- Identify visions of success, key risks, and strategies
- Develop climate adaptation plan
- Share experiences with other communities
Project Team

University of Alaska Fairbanks

Nathan Kettle
John Walsh
Sarah Trainor

Nome Eskimo Community

Mike Sloan
Jacob Martin

Project Steering Committee

Davin Holen
(Alaska Sea Grant)
Approach

Phase 1: Scoping
- Interviews
- Literature Review

Phase 2: Planning
- Workshops
- Write Plan

Phase 3: Outreach and Evaluation
Workshop #1

Observations and concerns

- Local and western science observations of climate change in Nome
- Climate impacts of concern
  - Food security
  - Erosion and infrastructure
  - Increased shipping
Adapt food preservation techniques

• **Strategy #1:** Provide opportunities to learn about how tribal members across the Bering Strait region are adapting food preservation techniques.

**Action Steps:**
(1) Use existing conferences and venues. Consider live demonstrations. Start with local venues, then statewide.
(2) Use social media to start conversations on what works and what doesn’t
Protect tribal cemeteries from erosion

- **Strategy #1**: Develop a long term solution to protect culturally significant grounds and public health

**Action Steps:**

1. Work with City to designate NEC Track A as a cemetery
2. Develop MOU for management (NEC & Sitnasuak)
3. Learn from other communities
4. Protect the shoreline (identify an engineer and funding)
PROCESS

Goal

• Build a network of collaborators
• Decide on desired final product

Process

• Pull together latest research
• Discussion of biggest issues for the region
• Synthesis

Product

• Provide options for moving forward
• Create partnerships
• Move to action
EXAMPLE OF OUTCOME

Recent NOAA Coastal Resilience Grant – 3 collaborative proposals from Alaska as an outcome of these efforts

1. Leveling up: Building Coastal Flood Guidance for Alaska Communities
2. Establishing a Coalition of Communities and Agencies in Defense of Alaska’s Coasts
3. Building Community-Based Coastal Resilience in Southeast Alaska
COMING SOON

Adapt Alaska Website

In a word, what does adaptation mean to you?

Respond at PollEv.com/alaskaseagrant

Text ALASKASEAGRANT to 22333 once to join, then text your message

change, survive, different, flexible, cooperation, endurance, giving, new, resilience, effective, intentional, future, new, strategies, youth, heritage, traditions, perservere, mean, continue, endurance, coming, existing, adjust, learning, change, adapt, place, exist, coming, new, youth, preparing, survival, may, creative, respond, evolve, together, prepared, heritage.