Local Government Adaptation to Climate Change Impacts

Sally Russell Cox ● Alaska Municipal League Conference ● November 14, 2018
Climate Adaptation Responses

**Protection-in-Place**
- Shoreline protection measures and other controls to prevent/minimize the effects of coastal or riverine threats
- Allow the community to remain in its current location

**Migration**
- Gradually moving property and development away from hazard-prone areas
- Community must have suitable, developable land nearby

**Relocation**
- Moving entire community to entirely different location not vulnerable to natural hazards
- Usually considered only after determination that other methods of dealing with hazard threats would not be feasible
Community Decision-Making Continuum

Community Understanding of Risk
- Hazard Identification
- Science/Engineering Studies + Local Observation
- Risk Assessments
- Recommendations

Planning: Local Decisions + Actions to Reduce Risk
- Strategic Community Planning
- Inter-Agency Planning Groups
- Identification + Prioritization of Strategic Actions
- Identification of Resources

Implementation: Working toward Resilience
- Implementation of Strategic Actions (*Protect-in-Place, Migrate Infrastructure, Relocation*)
- Continuation of Inter-Agency Planning Groups to support implementation
Community became aware of erosion issues in the 1970s and they began monitoring erosion using stakes.

1983: State provided $100,000 for *Ninglick River Erosion Assessment* by local engineering firm, Woodward-Clyde. Recommendation:

“Relocating Newtok would likely be less expensive than trying to hold back the Ninglick River.”
Newtok

Community Planning: Local Decisions + Actions to Reduce Risk

• **1994**: Decision to relocate; relocation site selection
• **2003**: Land exchange completed with Department of Interior
• **2006**: Newtok Planning Group formed. Discussions on how to develop Mertarvik begin.
• **2006 - 2015**: Community plans developed:
  • Mertarvik Community Layout Plan
  • Mertarvik Strategic Management Plan
  • Waterfront Development Plan
Newtok

Implementation: Working toward Resilience
2009 Mertarvik Barge Landing

EDA Grant to State + State Legislative Funding

Photo: Sally Russell Cox
2009 IRT Arrives at Mertarvik

Photo: Robert Lundell
2011 Opening of Mertarvik Quarry

State Legislative Funding + IRT
2011 Mertarvik Evacuation Center Foundation

State Legislative Grant to Newtok

Photo: Sally Russell Cox
2011 Water Well + Septic System
2012 Mertarvik Access Road

State Legislative + BIA Funding

Photo: Robert Lundell
2012 Waterfront Development Concept

Prepared by State DOT/PF with BIA
Funding to Newtok

Source: Alaska DOT/PF
2 Military Buildings: State Legislative Grant to Newtok
3 Homes: AVCP RHA through HUD

Photo: Sally Russell Cox
2016 Mertarvik Pioneer Infrastructure

Photo: LeMay Engineering
Community Understanding of Risk

Established in 2008 to help threatened communities develop planned approach to shoreline protection, building relocation and/or eventual relocation of the village.

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<thead>
<tr>
<th>Hazard Impact Assessment (HIA)</th>
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<td>Identify and document climate change-related hazards; establishes baseline</td>
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<td>Analyze hazard trends and future impacts to community to understand risk</td>
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<tr>
<td>Recommend actions to adapt to hazard impacts, taking into account financial considerations</td>
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Hazard Impact Assessment studies conducted in the communities of Atmautluak, Elim, Kipnuk, Nelson Lagoon and Quinhagak.

Helped these communities understand their hazard risk and identify adaptation and mitigation actions.
# Alaska Climate Change Impact Mitigation Program

## Planning: Local Decisions + Identification of Actions to Reduce Risk

<table>
<thead>
<tr>
<th><strong>Community Adaptation Planning Grant</strong></th>
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<tr>
<td>Funding to implement one or more adaptation actions from Hazard Impact Assessment</td>
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<td>Provides additional information on hazard risk</td>
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<td>Brings community to next stage in adaptation decision-making process</td>
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Informed Shishmaref’s decision to relocate and select a relocation site.
Unalakleet Foothills Master Plan and Subdivision Design Project

• Directs new development to higher ground, away from impacts of erosion, flooding, and storm surge.
• Concept-level design for an elevated structure which will provide shelter for the community during emergencies, principally during storm surges, *but* also in other extreme weather events and serve other non-emergency functions.
Koyukuk Community Emergency Shelter

- Proposed to provide shelter for community during flood events
- Will serve as command post and “safe house” accessible to community
- Facilitates evacuations, provides temporary housing, and enables return of residents to their homes in safe manner
Planning: Local Decisions + Actions to Reduce Risk

• Based on Newtok model:
  o Local Coordinator funded full-time for 2 years
  o Organization of Inter-Agency Planning Groups to provide technical expertise on actions in Strategic Management Plan
  o Development of comprehensive Strategic Management Plan to guide community-agency activities to increase local resilience.

• Focus communities were Kivalina, Shaktoolik and Shishmaref.

• Funding came from Coastal Impact Assistance Program
The Planning Process

Identifying Issues, Values, Goals and Objectives

Year One
1. Literature Review
2. Community Survey
3. Value Survey
4. Elder Interviews
5. Community Gathering

Background Planning Report
July 2015

Identifying and Prioritizing Strategic Actions

Year Two
6. Inter-Agency Planning
7. Group Meetings
8. Community Input
9. Community Gathering

Strategic Management Plan
August 2016
Inter-Agency Planning Groups

Kivalina Inter-Agency Planning Work Group

▶ Meeting Agendas and Summaries
▶ Reports and Studies

Background

Kivalina is a traditional Inupiat community located in the Northwest Arctic Borough of Alaska. The community is located on a barrier island off the Chukchi Sea, 83 miles north of the Arctic Circle. Historically, the marine waters around Kivalina have been ice-free from early July through late October, but later freeze-up and earlier melting have resulted in longer ice-free periods during recent years. This has left Kivalina facing significant risks from storms, such as flooding and erosion.

This barrier island has long been subject to the processes of accretion and erosion. Residents of the community have expressed concerns about storm surges and erosion for decades. The longer ice-free period that has resulted from the changing climate makes the village vulnerable to dangerous fall storms. Storm events in 2004 and 2005 eroded the Chukchi Sea shoreline, threatening critical infrastructure and facilities, including the community fuel tank farm, school, and airstrip. Chronic erosion on the lagoon side of the island has threatened homes, while on the sea side of the island, fall storm surges create annual coastal flooding and beach erosion. It has long been apparent that the island will eventually succumb to natural forces and that the village will have to be moved. Extensive studies have been undertaken, alternative village sites have been identified, and cost estimates have been prepared.

Strategic Management Planning

From 2014 to 2016, Kivalina was engaged in a community planning process with the Division of Community and Regional Affairs (DCRA) to develop the Kivalina Strategic Management Plan which provides a holistic approach for adapting to environmental threats and increasing community resilience to climate impacts and natural hazards. As part of the

Strategic Actions

Kivalina prioritized Strategic Actions based on community need:

- **Imminent Actions** are those actions the community needs in place today to protect people from harm during a hazard event.
- **Critical Actions** are those action items that, if not completed in 5 years, will result in a negative impact on community safety. Implementation of critical actions should be undertaken immediately with a goal of completing or substantially completing the action within 5 years. The identified critical actions are actions that are especially important for increasing community resiliency now.
- **Short Term Actions** are those action items that can be realistically completed in 0-5 years
- **Medium Term Actions** are those action items that can be realistically completed in 6-10 years
- **Long Term Actions** action items that will take 11 years or more to complete

The current focus of the Kivalina Inter-Agency Planning Work Group is to help Kivalina implement the Imminent and Critical Actions from the Strategic Management Plan.

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<th>IMMINENT ACTIONS</th>
<th>STATUS</th>
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<td>Emergency Drills and Exercises: Emergency drills and exercises provide an opportunity to practice aspects of an emergency plan, allowing people to become familiar with what is expected of them during an emergency, and help identify whether the plan meets community needs or if changes need to be made. Kivalina has an emergency plan and an evacuation plan, but there has not been a community drill for either one in recent years.</td>
<td>The Alaska Division of Homeland Security and Emergency Management provided Kivalina with technical assistance to prepare a Small community Emergency Response Plan (SCERP). The community plans to organize a mock disaster to drill on the roles and responsibilities assigned to community residents in the SCERP.</td>
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<td>Personal Emergency Kits: During a storm, Kivalina will likely be cut off from the rest of the state and will need to be self-sufficient until outside assistance can arrive. Residents need personal emergency kits that will last 7 to 10 days until additional resources can be brought to the village. Kivalina can either work with partners to find sufficient funding to purchase kits, find organizations willing to donate supplies, or encourage residents to assemble their own kits.</td>
<td>Kivalina plans to hold a community event where individual households will assemble a personal emergency kit.</td>
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Risk MAP: Assisting Alaska Native Villages

Discovery
- Identification of community threats + needs
- Collection of new/available data
- Summarize in Discovery Report

Risk Assessment + Analysis
- Conduct risk and vulnerability assessments
- Analyze results and document in Risk Report for community

Risk Reduction
- Share results of risk assessments + draft Risk Report with community
- Identify strategies for risk reduction

Resilience
- Integrate Risk MAP information into local plans
- Seek funding + implement mitigation/adaptation projects
Communities Prioritized for Risk MAP based on Statewide Threat Assessment