



THE STATE
of ALASKA

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**DEPARTMENT OF COMMERCE, COMMUNITY AND
ECONOMIC DEVELOPMENT
Division of Community and Regional Affairs**

**Community Responses to
Natural Hazard Threats**

Sally Russell Cox

Bureau of Indian Affairs Providers Conference

December 5, 2019



Climate Change Adaptation vs Hazard Mitigation

Climate Change Adaptation

Hazard Mitigation

Focus:

Environmental threats associated with a changing climate

Focus:

All natural hazards

"Actions taken to help communities ... cope with changing climate conditions."

UNFCC (*United Nations Framework Convention on Climate Change*)

Increased Resilience

"...[A]ctions taken to reduce or eliminate long term risk to people and property from natural disasters."

FEMA



Responding to Natural Hazard Threats



Protection-in-Place

- Shoreline protection measures and other controls to prevent/minimize the effects of coastal or riverine threats
- Allows 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 Understanding of Risk

- Hazard Identification
 - Community-Based Monitoring
 - Science + Engineering Studies
 - Risk Assessments
- Informed Community Ready to Make Decisions to Reduce Risk/Adapt



Planning: Local Decisions to take Action to Adapt/Reduce Risk

- Strategic Adaptation Planning
 - Hazard Mitigation Planning
 - Inter-Agency Planning Groups
- Identification + Prioritization of Strategic Actions
- Identification of Resources
- Development of Timeline



Implementation: Carrying Out Strategic Actions to Achieve Resilience

- Inter-Agency Partnerships to support Implementation (Funding, Technical Assistance)
- Implementation of Strategic Actions (Protect-in-Place, Migrate Infrastructure, Relocation, Adaptive Technology)

The Path to Resilience



Community Understanding of Risk

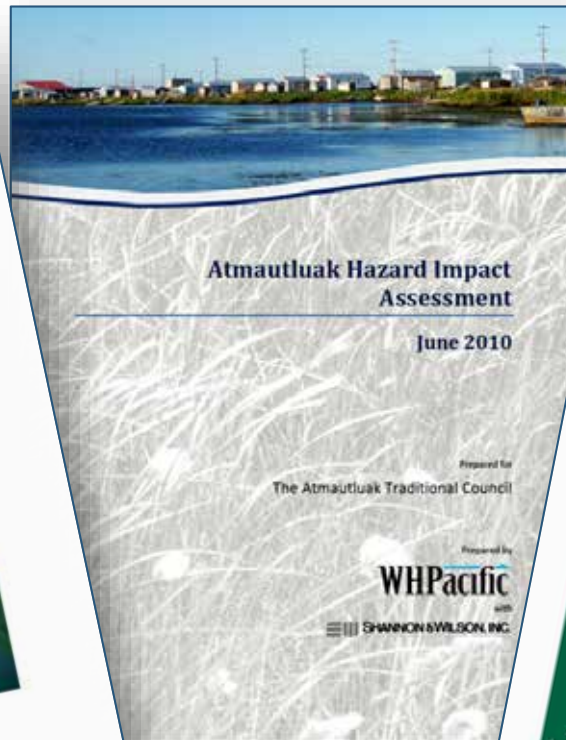


Community-Based Monitoring



Community Understanding of Risk

Integration of local knowledge with Science/Engineering Studies





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The Path to Resilience



Identifying Issues, Values, Goals and Objectives

Shishmaref residents prioritized their top hazard issues and values at a Community Gathering, based on community surveys, interviews and classroom exercises.



Voting with dots...



Planning: Local Decisions + Identification of Actions to Reduce Risk

Vision

Our community is a safe and resilient community. We will increase resilience while respecting our traditional values and be a community where existing and future generations want to live.

Issues

Progressive erosion threatens buildings, homes and infrastructure in our community

Goals

Prevent damage or loss of property to riverine erosion resulting from high water events and thawing permafrost

Objectives

By 2023 at least 80 percent of buildings, homes and infrastructure in our community be moved away from the eroding riverbank

Strategic Actions

(Adaptation Measures)

- 1) Identify suitable land in community to move buildings, homes and infrastructure
- 2) Conduct survey of buildings, homes and infrastructure to determine what can be safely moved
- 3) Secure funding to relocate structures or buyout properties and rebuild in new location



Identifying and Prioritizing Strategic Actions

Inter-Agency Planning Groups provide assistance to community members as they identify and prioritize strategic actions. Agencies can provide technical expertise and advise the community on funding opportunities to implement strategic actions.



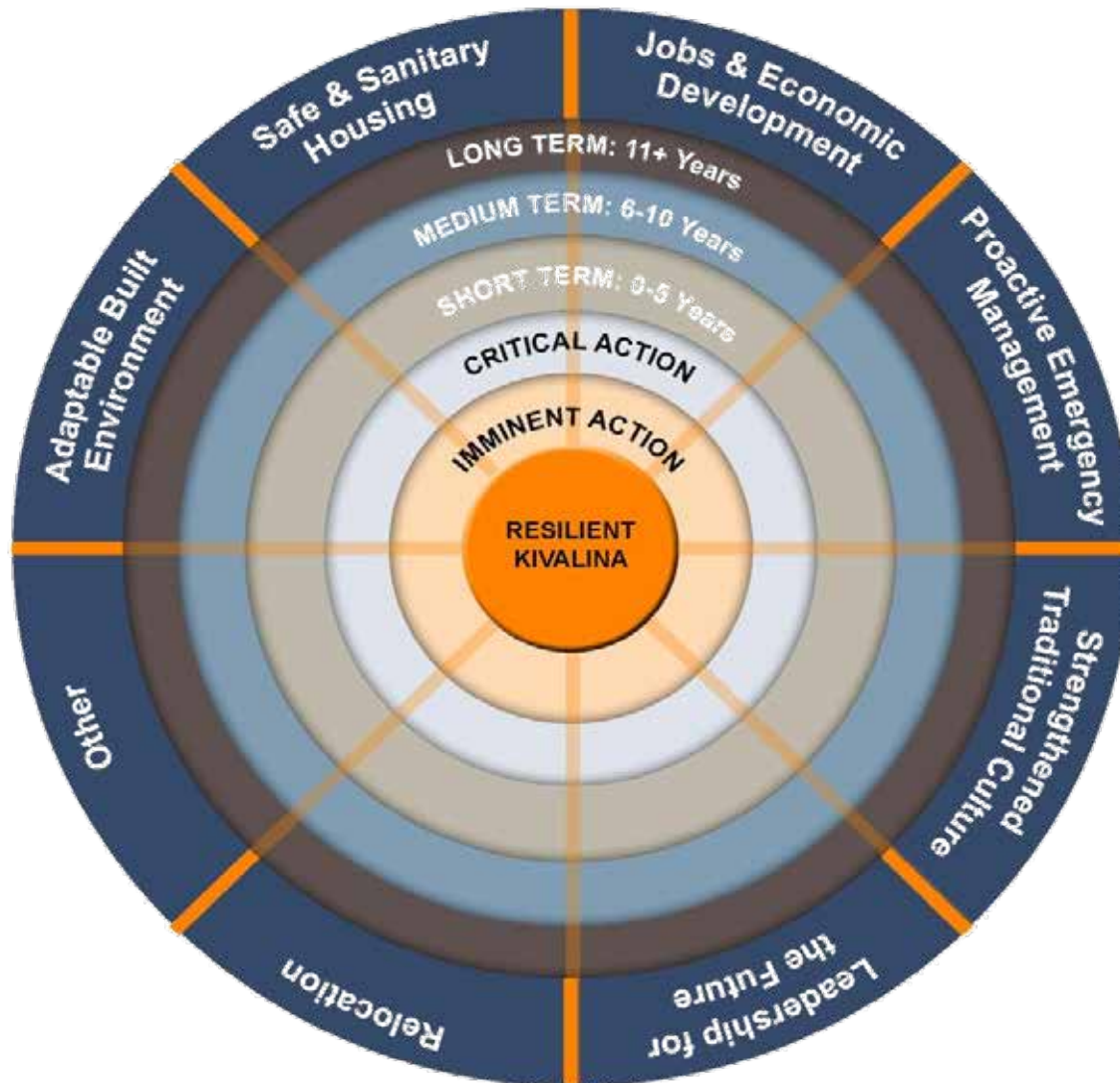


Identifying and Prioritizing Strategic Actions





Strategic Focus Areas and Actions





Strategic Management Plan



Image courtesy of ShariZane



Kivalina Strategic Management Plan

Kivalina, Alaska

August 2016



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The Path to Resilience



IMPLEMENTATION: Working toward Resilience



Photo: Jeffery Charles, Newtok



PROTECTION-IN-PLACE



- Shoreline protection measures and other controls to prevent or minimize the effects of coastal or riverine threats

- Allows the community to remain in its current location





Shaktoolik Evacuation Shelter Design Analysis Report

Shaktoolik hired a contractor to develop a 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

Koyukuk Community Emergency Shelter

Design Analysis Report

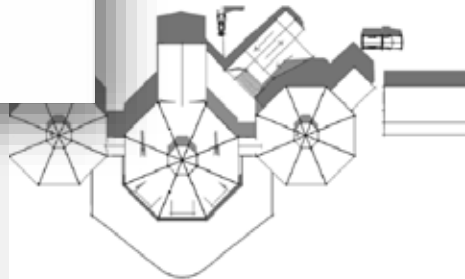


October 2010

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Gabion Sea Wall at Tununak





Toksook Bay Seawall





Kivalina Rock Revetment





Shishmaref Rock Revetment



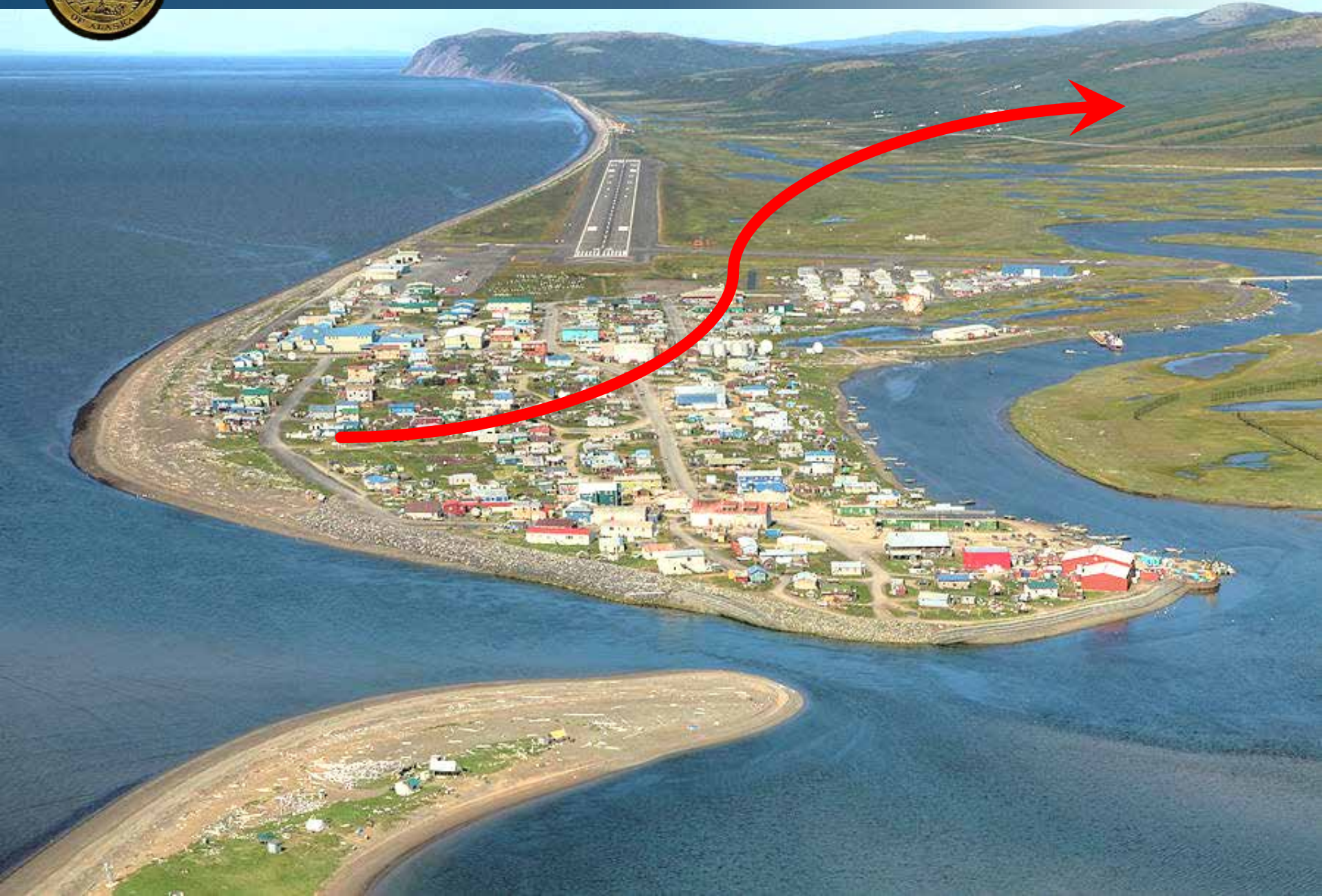


Earthen Berm built by Shaktoolik Community





MIGRATION



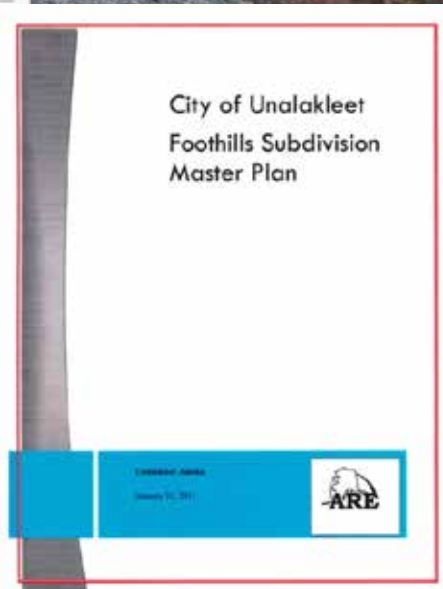


Foothills Master Plan and Subdivision Design Project

Directs new development to higher ground, away from impacts of erosion, flooding, and storm surge.



Photo: Emily Kussen/Box





Napakiak Moving Armory





Napakiak Moving Armory





RELOCATION



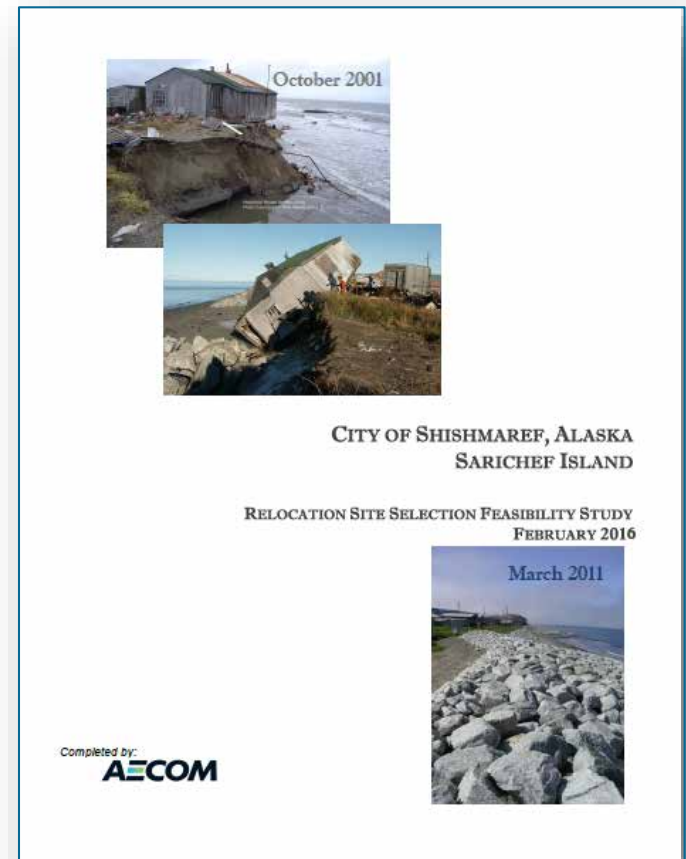
Ben Chugoluk moves a house to Taksook Bay.

1990 Don Dull, 87



Shishmaref Relocation Site Selection Feasibility Study

- Developed community criteria for a relocation site
- Evaluated candidate relocation sites
- Identified at least one relocation site with broad community support and reasonable constructability
- Identified initial next steps for pioneer development
- Informed community's decision to relocate





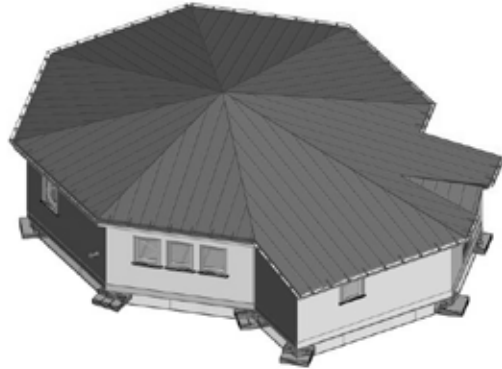
Mertarvik, Newtok's New Village Site





Adaptive Technology

Infrastructure and Facilities that work best in the place we call home



Bringing together the old and the new



Looking Back to Look Forward





Mertarvik Demonstration Home by Cold Climate Housing Research Center





Mertarvik Prototype Home by Cold Climate Housing Research Center





Homes to Withstand an Environment that Floods





Greenland Mobile Shelter on Skis



<https://inhabitat.com/rob-sweeres-sledge-project-is-a-tiny-space-age-mobile-shelter-on-skis/>



A Houseboat for the Arctic in Greenland



<https://inhabitat.com/prefab-friday-a-house-boat-for-the-arctic/>



Houseboats, "Floating Homes" in Yellowknife, Canada





Houseboats, "Floating Homes" in Yellowknife, Canada





Imagine ...

What Ideas Do You Have?



Contact Information

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