THE STATE of ALASKA

GOVERNOR BILL WALKER

DEPARTMENT OF COMMERCE, COMMUNITY AND ECONOMIC DEVELOPMENT

Division of Community and Regional Affairs

Community Resilience and Climate Adaptation in Alaska

Sally Russell Cox • Climate Impacts to Infrastructure Workshop • February 26, 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

Newtok

Photo: Joseph Antosh, 2015

Thawing Permafrost + Erosion

Ice-rich permafrost layer thaws when exposed to warmer river water, leaving a “shelf” with no support

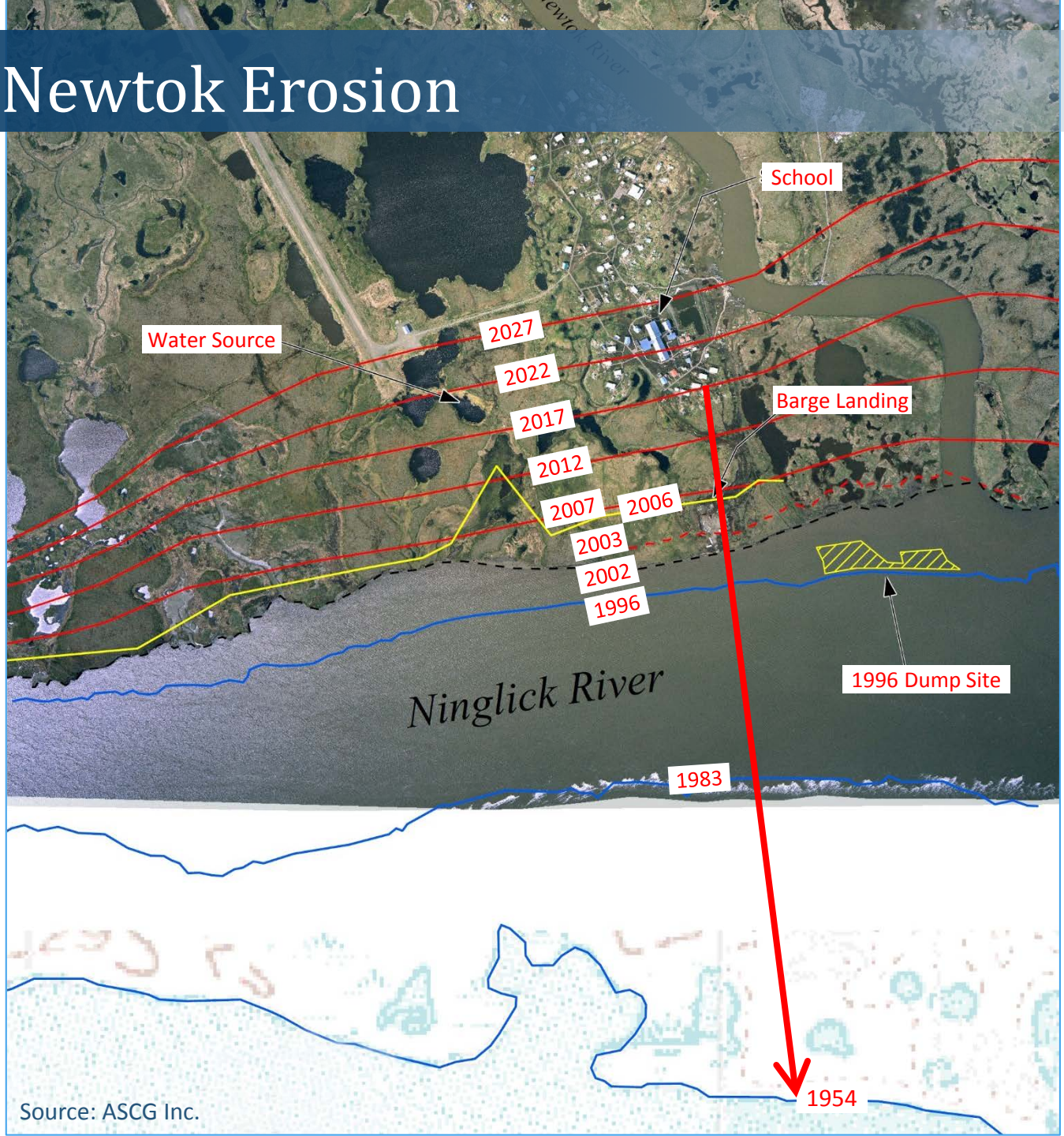
Bank of the Ninglick River at Newtok

Photo: Lisa Charles


Photo: Lisa Charles

Photo: Lisa Charles

Newtok Erosion



Source: ASCG Inc.

Newtok Erosion

Newtok

- **1958:** BIA built a school at the current Newtok location. *This site was selected because it was the farthest point upriver the BIA barge could navigate to off-load the school building materials.* A permanent village developed around the school.

- 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

- Between **1987** and **1989**, the State provided $1,337,447 to Newtok for erosion control measures. Corps of Engineers and others continued to study the problem but concluded that ***the village must relocate, as there is no permanent and cost effective alternative available for remaining at the current site***
- **1994:** Decision to relocate; relocation site selection
- **1996:** Newtok Native Corporation began negotiating land exchange with USFWS for Mertarvik.
- **2003:** Land Exchange completed with enactment of U. S. Public Law 108-129.

Photo: Landye Bennett Blumstein LLP

2006 Newtok Planning Group

Newtok
- Newtok Village Council
- Newtok Native Corporation

State of Alaska
- Commerce, Community, and Economic Development/Community and Regional Affairs– ***group coordinator***
- Environmental Conservation/Village Safe Water Program
- Transportation and Public Facilities
- Military and Veterans Affairs/Homeland Security and Emergency Management
- Education and Early Development
- Health and Social Services
- Alaska Energy Authority
- Alaska Governor's Office
- Alaska Legislative Representatives

Regional + Non-Profit Organizations
- Association of Village Council Presidents, Regional Housing Authority
- Alaska Native Tribal Health Consortium
- Coastal Villages Region Fund
- Lower Kuskokwim School District
- Rural Alaska Community Action Program
- Yukon-Kuskokwim Health Corporation

Federal
- U.S. Army Corps of Engineers, Alaska District
- Economic Development Administration
- National Oceanic and Atmospheric Administration
- DoD Innovative Readiness Training Program
- USDA, Rural Development
- USDA, Natural Resources Conservation Services
- Housing and Urban Development
- Bureau of Indian Affairs
- Federal Aviation Administration
- Environmental Protection Agency
- Denali Commission
- Alaska Congressional Delegation Representatives

Source: Vice News

Newtok Planning Group

- ***Fosters good relationships:*** brings together community and agencies on a regular basis
- ***Ensures a local "seat at the table":*** community leadership always part of discussions and final decision-maker
- ***Enhances creative thinking:*** often times, a creative synergy will occur with "outside the box" brainstorming of solutions to issues
- ***Relieves some of the bureaucratic process:*** brings agencies to community instead of forcing community to navigate the bureaucratic web alone
- ***Enhances agency collaboration and coordination:*** many examples of how agencies worked together on relocation projects, leveraging funding, expertise and other resources

** None of this precludes individual engagement with community leadership*

Newtok Planning Group

- 2006 EDA Award to DCCED, DCRA for *Mertarvik Barge Landing and Staging Area*
- 2008 Discussions with Dept. of Defense's *Innovative Readiness Training Program (IRT)* to assist with pioneer infrastructure construction for 5 years
- *Caveat:* Barge landing needed to be completed before IRT arrived at Mertarvik with landing craft on *July 15, 2009*

2009 Mertarvik Barge Landing

EDA Grant to State + State Legislative Funding

Photo: Sally Russell Cox

2009 Mertarvik Barge Landing

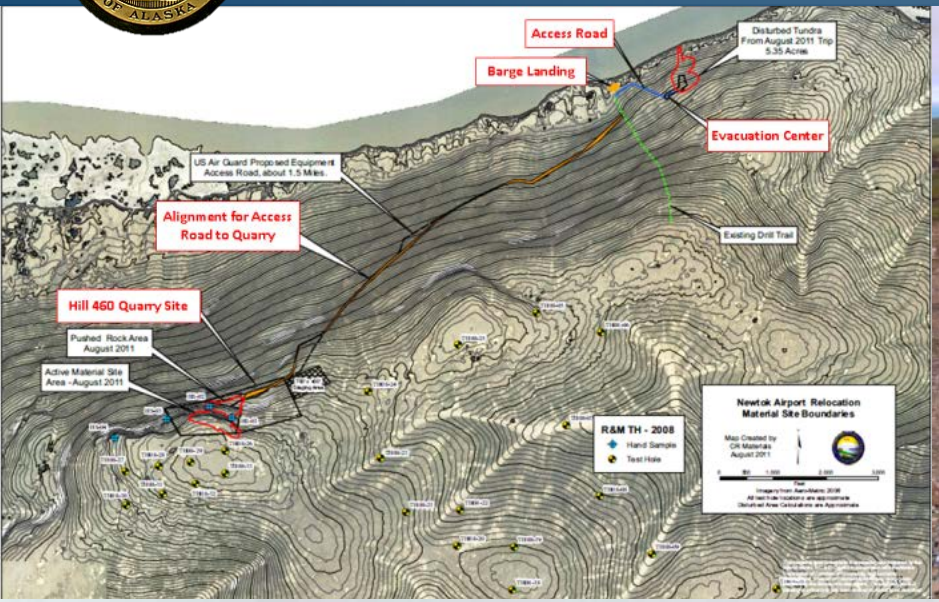
EDA Grant to State + State Legislative Funding

Photo: Robert Lundell

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 Mertarvik Strategic Management Plan

MERTARVIK

**Nunaullemteggun ikayuqulluta tamamta,
assirluta aknirtenritellerkamtenun,
nuggtarllemtenun ciunerkamteni**

*a community that builds together
for the safe and healthy future of Newtok*

Preliminary Relocation Report :: Newtok to Mertarvik

ISSUED FOR REVIEW by the Community of Newtok and the Newtok Planning Group, June 2011
Developed by Agnew::Beck Consulting with PDC Engineers and USKH Inc. in collaboration with NPG members Sally Russell Cox and Greg Magee.

Strategic Management Plan

Newtok to Mertarvik

March 2012

MERTARVIK

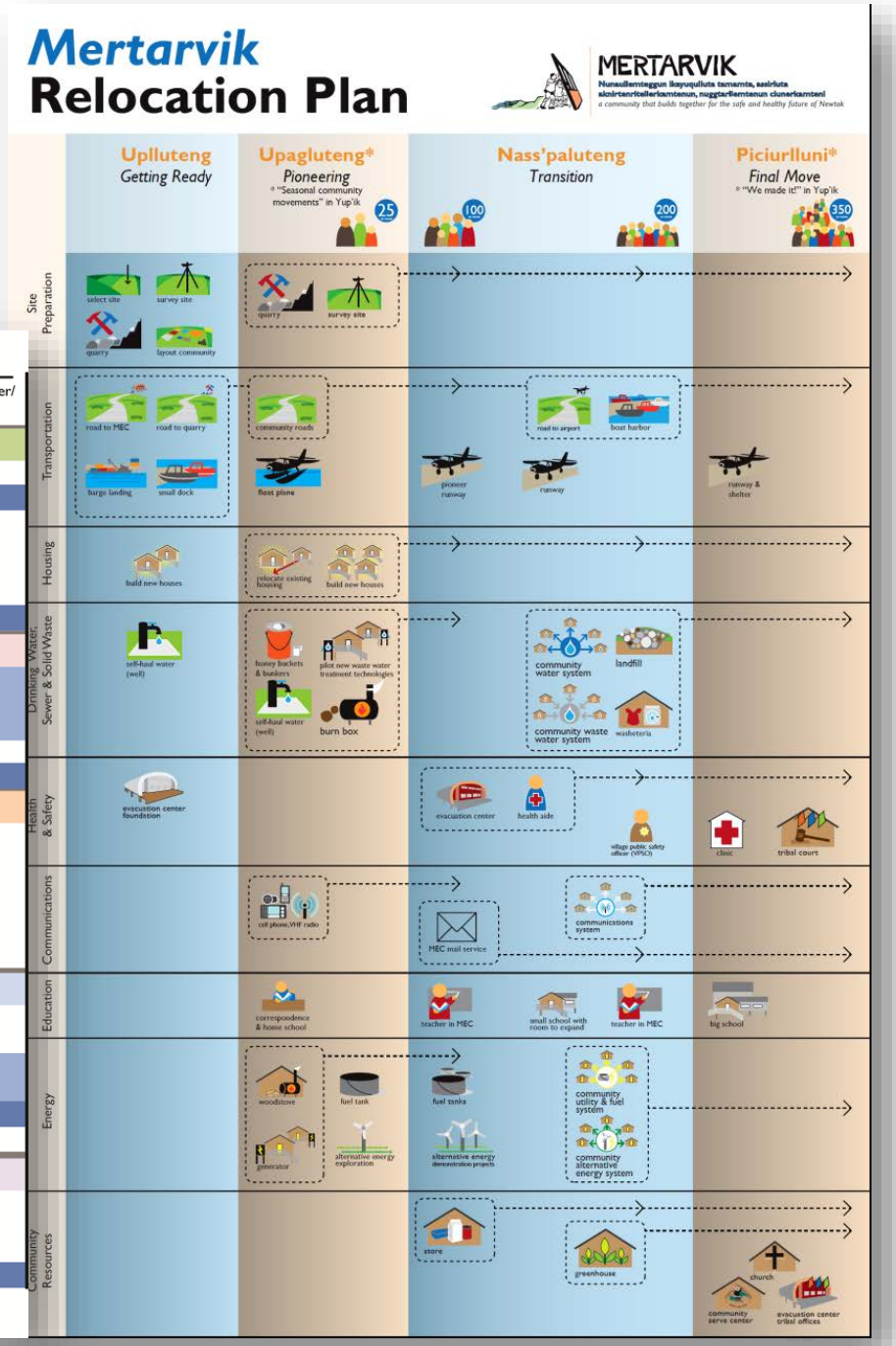
**Nunaullemteggun ikayuqulluta tamamta,
assirluta aknirtenritellerkamtenun,
nuggtarllemtenun ciunerkamteni**

*a community that builds together
for the safe and healthy future of Newtok*

- Phasing + sequencing of tasks of overall relocation
- Identification of funding
- Short-term strategic focus areas

Strategic Focus Areas	2012 winter/ spring	2012 summer/ fall	2013 winter/ spring	2013 summer/ fall	2014 winter/ spring	2014 summer/ fall
Site Preparation						
1. Fund, develop townsite plan	■	■				
2. Fund, carry out survey		■		■		■
3. Resolve land ownership questions	■					
4. Determine lot allocation strategy	■					
5. Construct pioneer roads	■	■	■		■	
6. Establish basic housing development rules	■					
7. Develop quarry resource		■		■		■
Building Capacity						
1 Identify partnership team	■	■	■	■	■	■
2. Define MCDC role, strengthen functions	■	■	■	■	■	■
3. Assess needed skills, create training plan	■		■	■	■	■
4. Assess regional demand for rock/gravel	■					
5. Build relationships with foundations	■	■	■	■	■	■
Emergency Response + Public Health						
1. Redesign MEC if necessary	■	■				
2. Hire MEC construction manager and crew	■					
3. Develop, implement MEC funding strategy	■	■				
4. Identify health professional pioneer	■					
5. Complete MEC vertical construction		■	■	■	■	
6. Develop long-term plan for clinic			■	■	■	■
Housing						
1. Complete site preparation tasks	■	■				
2. Conduct housing survey	■					
3. Develop a housing strategy	■	■	■	■	■	■
4. Relocate houses	■	■	■	■	■	■
5. Implement housing programs			■	■	■	■
6. Research housing energy technologies		■	■	■		
Drinking Water+ Sanitation						
1. Identify practical system alternatives	■					
2. Evaluate + select alternatives		■	■			
3. Develop business plan				■		
4. Pursue funding for design + construction	■	■	■	■	■	■

■ = project initiation ■ = project maintenance



2012 Waterfront Development Concept

Prepared by State DOT/PF with BIA Funding to Newtok

Source: Alaska DOT/PF

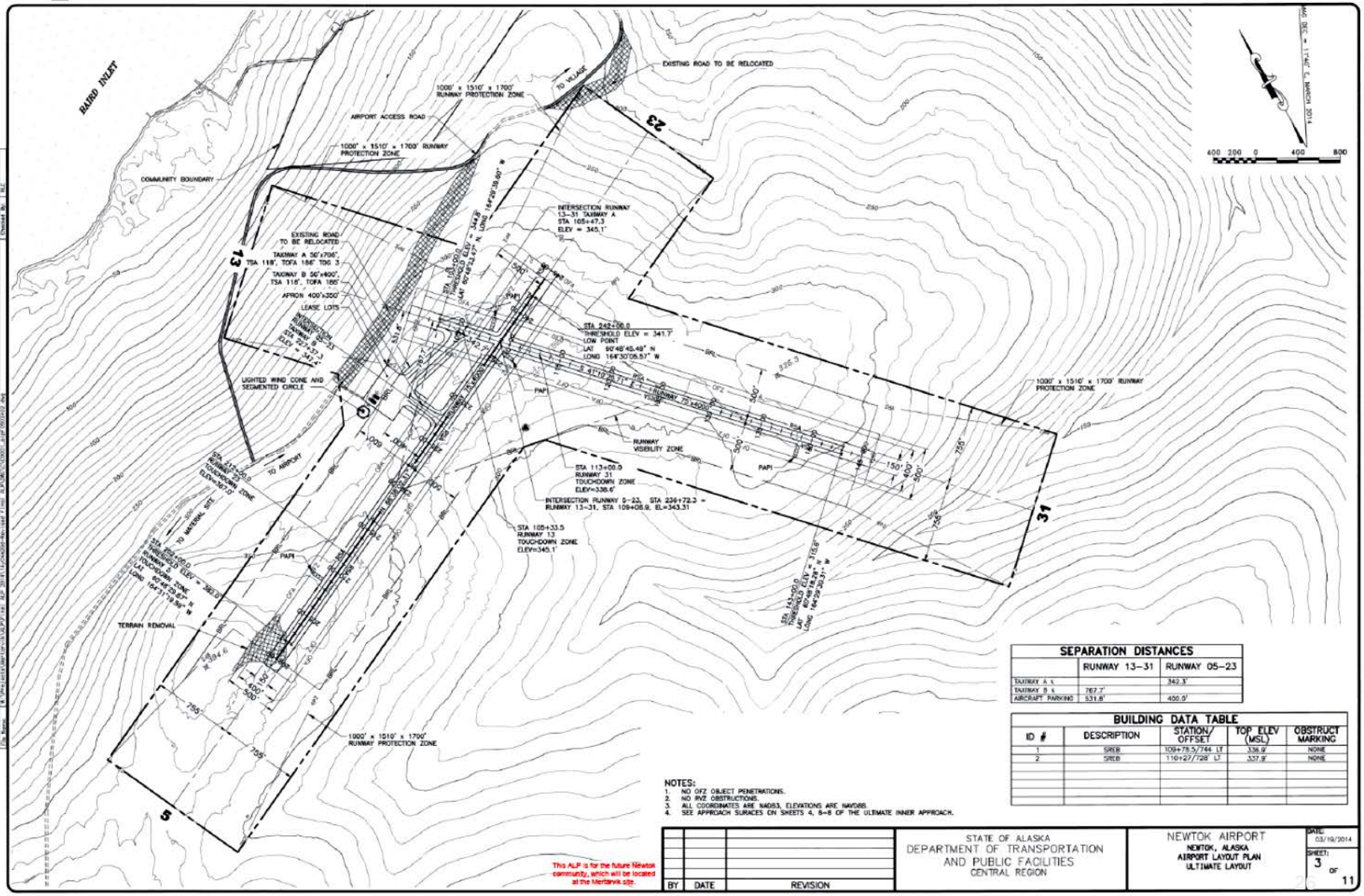
2012-13 Military Buildings + Homes

2 Military Buildings: State Legislative Grant to Newtok

3 Homes: AVCP RHA through HUD

Photo: Sally Russell Cox

2014 Airport Layout Plan



SEPARATION DISTANCES		
	RUNWAY 13–31	RUNWAY 05–23
TAXIWAY A ℄		342.3'
TAXIWAY B ℄	767.7'	
AIRCRAFT PARKING	531.8'	400.0'

BUILDING DATA TABLE				
ID #	DESCRIPTION	STATION/ OFFSET	TOP ELEV (MSL)	OBSTRUCT MARKING
1	SREB	109+78.5/744 LT	336.9'	NONE
2	SREB	110+27/728 LT	337.9'	NONE

NOTES:
1. NO OFZ OBJECT PENETRATIONS.
2. NO RVZ OBSTRUCTIONS.
3. ALL COORDINATES ARE NAD83, ELEVATIONS ARE NAVD88.
4. SEE APPROACH SURFACES ON SHEETS 4, 8–9 OF THE ULTIMATE INNER APPROACH.

This ALP is for the future Newtok community, which will be located at the Mertarvik site.

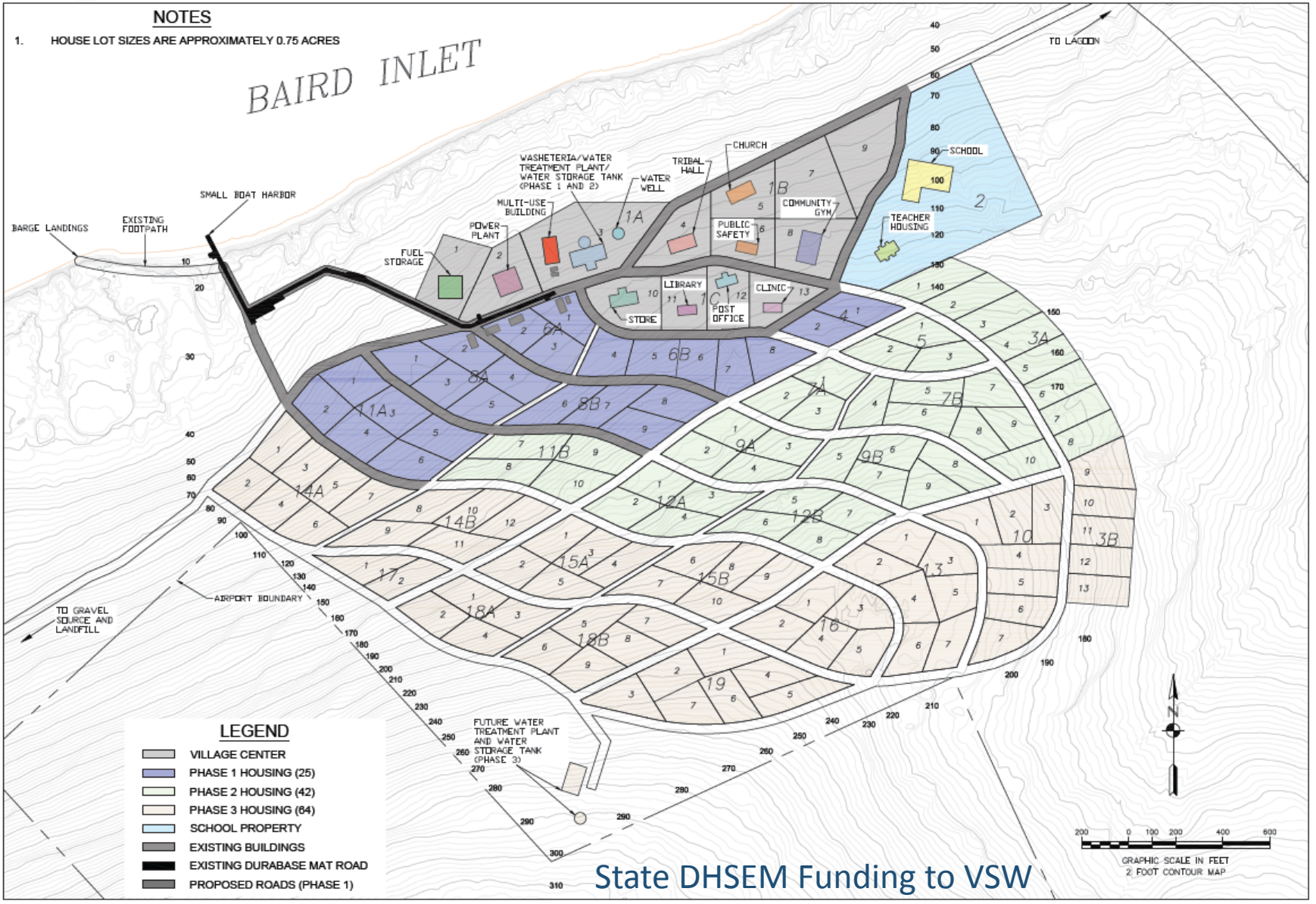
BY	DATE	REVISION

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
CENTRAL REGION

NEWTOK AIRPORT
NEWTOK, ALASKA
AIRPORT LAYOUT PLAN
ULTIMATE LAYOUT

DATE: 03/19/2014
SHEET: 3 OF 11

2015 Concept Paper Plat and Layout



State DHSEM Funding to VSW

2016 Mertarvik Pioneer Infrastructure

Photo: LeMay Engineering

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 Understanding of Risk

Alaska Climate Change Impact Mitigation Program

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

Hazard Impact Assessment (HIA)	Community Adaptation Planning Grant
Identify and document climate change-related hazards; establishes baseline	Funding to implement one or more adaptation actions from HIA
Analyze hazard trends and future impacts to community to understand risk	Provides additional information on hazard risk
Recommend actions to adapt to hazard impacts, taking into account financial considerations	Brings community to next stage in adaptation decision-making process

Some Accomplishments 2008-2016

- ***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.
- ***Mertarvik Community Layout:*** helped Newtok begin planning and design of new townsite at Mertarvik
- ***Shishmaref Relocation Site Feasibility Study:*** informed Shishmaref's decision to relocate and select a relocation site
- ***Conceptual Designs of Emergency Shelters*** for Koyukuk, Newtok and Shaktoolik to protect-in-place while making longer term plans
- ***Foothills Master Plan and Subdivision Design:*** helped Unalakleet plan to migrate development away from hazard-prone coast
- Helped the ***Immediate Action Working Group*** identify funding needs in most threatened communities

Alaska Community Coastal Protection Project

- Based on Newtok model:
  - Local Coordinator funded full-time for 2 years
  - Organization of Inter-Agency Planning Groups to provide technical expertise on actions in Strategic Management Plan
  - 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

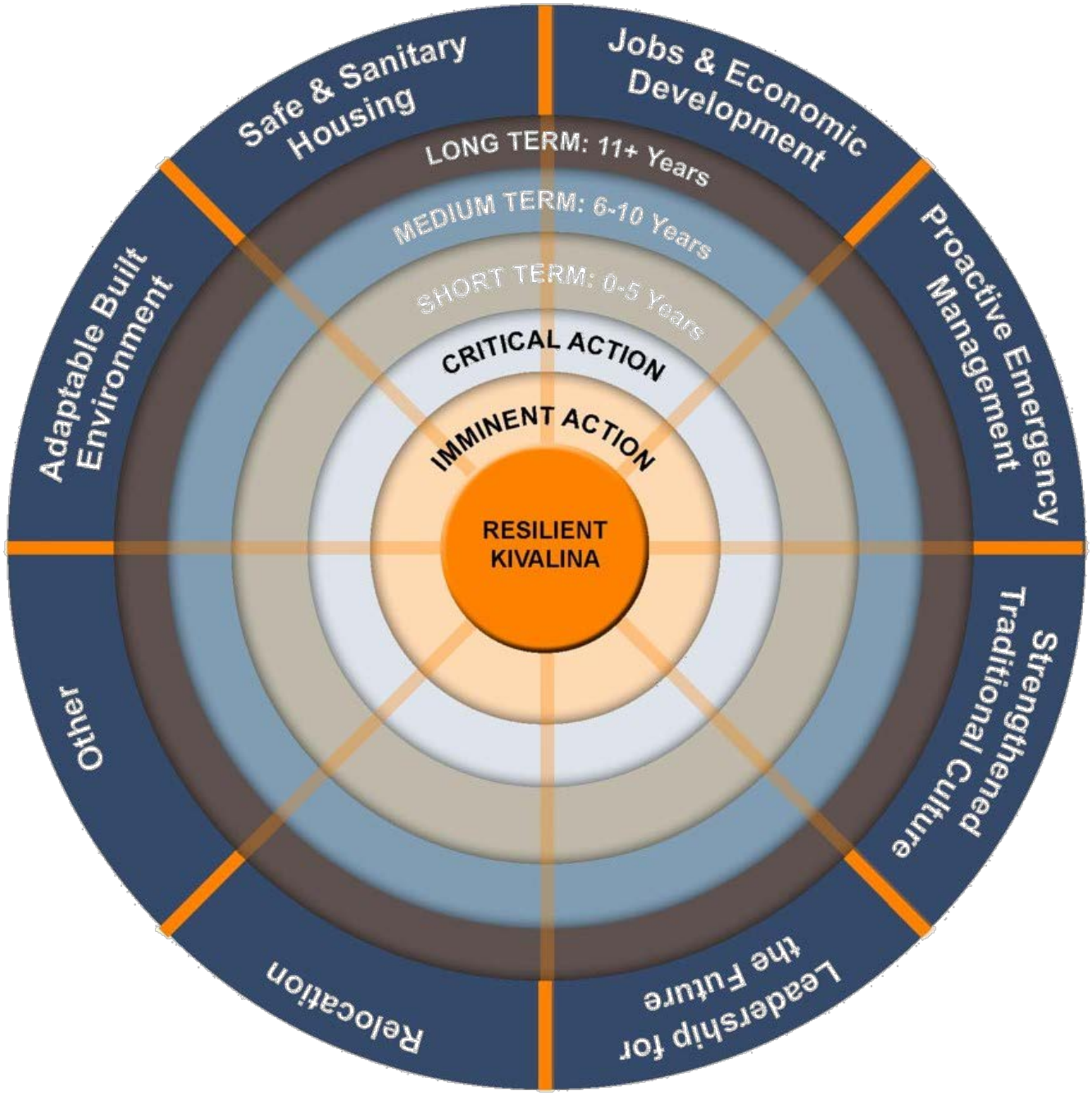
Identifying and Prioritizing Strategic Actions

Year Two

Inter-Agency Planning Group Meetings + Community Input

Community Gathering

Strategic Management Plan
August 2016


Safe & Sanitary Housing
Jobs & Economic Development
Proactive Emergency Management
Strengthened Traditional Culture
Leadership for the Future
Relocation
Other
Adaptable Built Environment
LONG TERM: 11+ Years
MEDIUM TERM: 6-10 Years
SHORT TERM: 0-5 Years
CRITICAL ACTION
IMMINENT ACTION
RESILIENT KIVALINA

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.

IMMINENT ACTIONS	STATUS
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.	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.
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.	Kivalina plans to hold a community event where individual households will assemble a personal emergency kit.

Some Guiding Principles

- Assistance to imperiled communities should be based on fair and defensible methodology which prioritizes communities by level of threat and need
- Community must be key player in decision-making process
- Imperiled communities (and agencies assisting them) need quantifiable data from which to make informed decisions
- A coordinated, interdisciplinary approach to address community threats is essential to increasing community resilience

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

RECOMMENDATION 3D

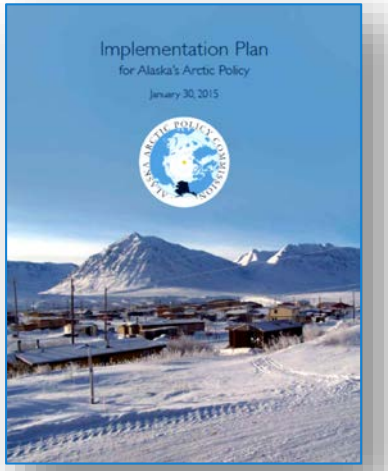
Anticipate, evaluate and respond to risks from climate change related to land erosion and deterioration of community infrastructure and services and support community efforts to

Execution

"DCCED's Risk MAP program is a good start to identifying and prioritizing risk, though as a FEMA-funded project it is very specific in the communities it can include."

Legislative Actions

"1. Expand DCCED Risk MAP program and partner with communities who are ready to take action."



Issues and Barriers

In 2007, the Newtok Planning Group submitted a memo to the Immediate Action Work Group outlining the key issues challenging efforts to assist Newtok with its relocation. Many of these were mentioned in the 2009 GAO Report:

- No mandate for relocation assistance
- No designated lead agency at State or Federal level
- No strategy for relocation process
- No dedicated funding source for relocation
- Uncertainty in fulfilling NEPA requirements
- Barriers to making infrastructure investments in threatened and unpopulated new communities
- Strained local capacity and resources

Issues and Barriers

The following are additional issues identified:

- Problems *(reduced quality of life and increased public health issues)* resulting from funding agency disinvestment when a community decides to relocate
- The challenge of having to establish population to trigger infrastructure development. This creates a backward planning process which is difficult to implement.
- The problem with having competitive processes for funding opportunities. Funding for threatened communities should be based on level of threat and not on grant-writing capabilities.
- Lack of scientific data to inform community decisions on protection-in-place or relocation, as well as relocation site selection

Recommendations

- Fully fund efforts to increase local understanding of risk in threatened communities
- Fund emergency shelters and evacuation planning in at-risk communities
- Establish clear guidelines for when relocation is the right response
- Ensure that infrastructure + facilities in relocating communities is maintained as long as residents have not yet moved
- Formalize a State-Federal process to address relocation and other adaptation responses in threatened communities
- Provide adequate funding so community plans can actually be implemented