Recommendations Report to the Governor's Subcabinet on Climate Change

Objective of the Immediate Action Workgroup :

To deal with the early assessment and development of an action plan addressing climate change impacts on coastal and other vulnerable communities in Alaska.

These communities face imminent threats of loss of life, loss of infrastructure, loss of public and private property, or health epidemics caused by coastal erosion, thawing permafrost and flooding.

POLICY 1: RELOCATION ASSISTANCE TO COMMUNITIES IN PERIL MUST UTILIZE COMPREHENSIVE INTEGRATED PLANNING AND VIABLE, FUTURE-ORIENTED SOLUTIONS WITH FUNDING THAT ALLOWS FOR SUSTAINABLE RELOCATION.

The Immediate Action Work Group believes that

- Comprehensive integrated planning must be used to implement solutions for communities in peril.
- Flexible funding streams should be sought to accommodate the needs associated with the ambitious task of moving communities to safe locations.
- A Sustainable Community Relocation Policy should be formulated which integrates the concepts of sustainability into the design, location and attributes of the resulting settlement.
- The development of statutes, in conjunction with dedicated funding assurances, is necessary for statewide programs to mitigate hazards to enhance community viability and sustainability.
- Current federal and State statutes should be examined to identify limitations in mitigation measures. The Stafford Act, for example, limits the ability of the State to deal effectively with communities in peril.

POLICY 2: EFFECTIVE RESPONSE AND ADAPTATION STRATEGIES MUST BE SUPPORTED BY A COMPREHENSIVE STATEWIDE DATA COLLECTION AND EVALUATION SYSTEM.

- A statewide data collection and evaluation system must be developed and implemented. The phenomena of climate related impacts is not well understood and the impacts uncertain.
- A State lead coordinating agency should be identified and provided necessary resources to develop an effective data collection and evaluation system.
- Flexible funding must be provided to the State lead agency and appropriate collaborating State agencies that actively engage in identification, collection, analysis and dissemination of data.
- Response strategies should be developed through current adaptation impact modeling to identify near-term climate change impacts for both protecting in-place and relocation scenarios:

The Six Communities

Kivalina

Shishmaref

Newtok

Unalakleet

Koyukuk

Shaktoolik

Kivalina

Ongoing erosion and flooding concerns have caused problems for a number of years:

Recently installed seawall was ineffective at arresting erosion and was severely damaged with sections completely destroyed during the minor storm events of 2006.

Erosion is threatening the waste storage containment area located at the dump site. This is a potential environmental catastrophe for the surrounding water bodies. It will contaminate the area where subsistence activities are still practiced i.e. fishing and storage of fish on the lagoon side of the island.

Overarching Problem:

No definite timeline or authorities for erosion control and/or relocation makes it difficult to plan for needed erosion control projects and relocation. ***There has been no mandate to coordinate and focus resources.***

A coastal storm threatens critical infrastructure in Kivalina

Photo: Colleen Swan

Work crew at eroded shoreline in Kivalina

Photo: Colleen Swan

Koyukuk

There are three types of serious threats/impacts facing Koyukuk: erosion, flooding and fires.

Entire village of Koyukuk lies within the floodplain of the Yukon River. Erosion occurs during anytime the river is open and specifically during high flow events on the Yukon River. Events happen throughout the year, including floods during spring breakup ice jam events; spring/ summer/fall significant rainfall events; wind and permafrost melt at Koyukuk and upstream. These floods are often severe, inundating a majority of the Village and sometimes requiring evacuation of citizens to other villages.

Community has begun planning efforts to relocate themselves to higher ground above the floodplain of the Yukon River upon nearby Koyukuk Mountain.

Overarching Problem:

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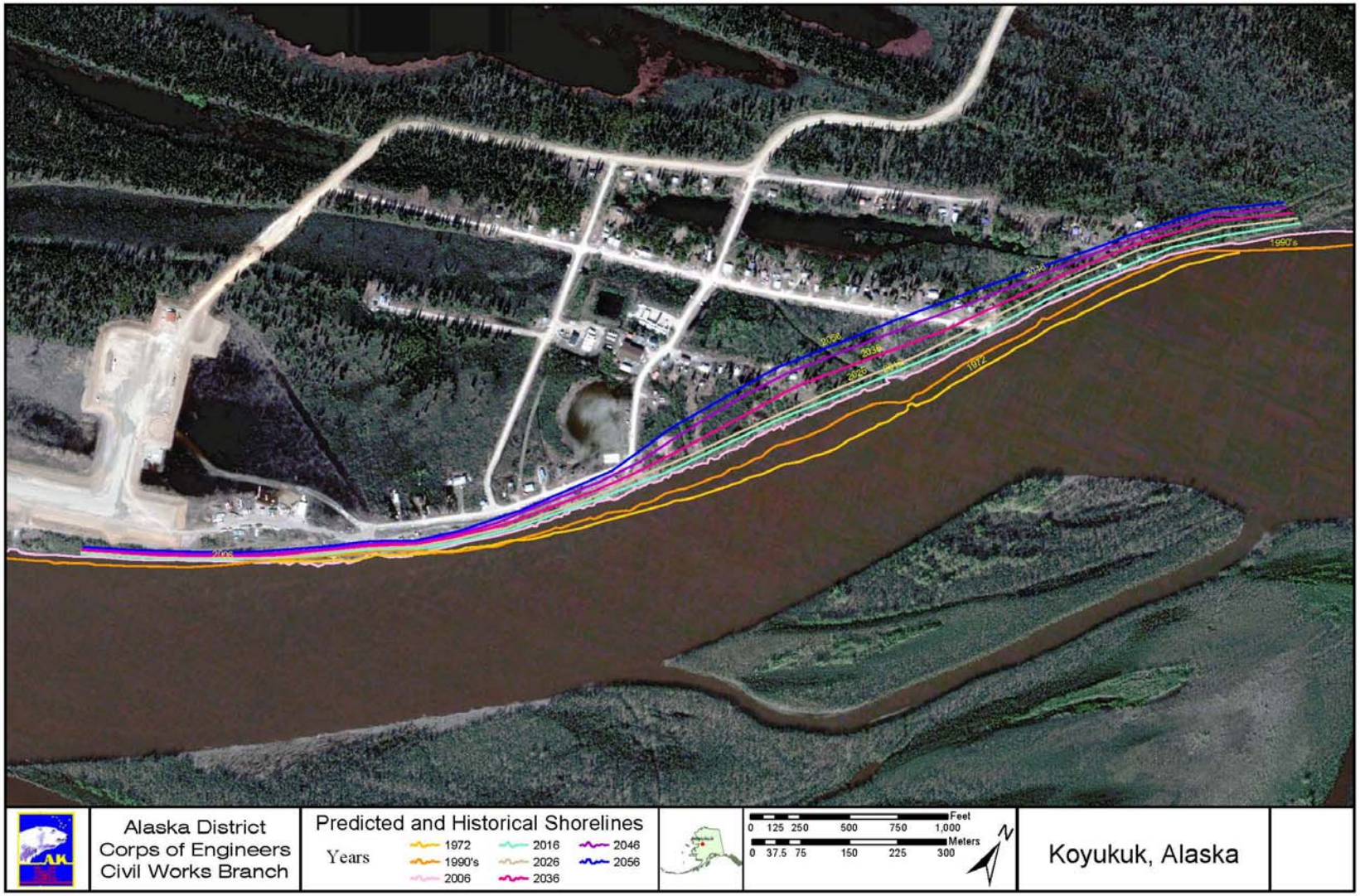

Predicted and historical shorelines in Koyukuk

Runway located in the floodplain in Koyukuk

Photo: Cynthia Pilot

Newtok

Newtok facilities – both public and private – have already been severely damaged by erosion and storm surge flooding due to lack of sea ice, and it's anticipated that continued erosion and destruction of public and private facilities are imminent. Problems endemic to many rural Alaska communities, such as a lack of adequate drinking water and sanitary sewage disposal, have been worsened by the erosion and flooding.

The community is actively engaged in efforts to relocate to a new village site on Nelson Island. Agency coordination is occurring through the Newtok Planning Group, however the scarce funding resources and no mandate for a State lead coordinating agency for relocation presents a challenge to this endeavor.

Overarching Problem:

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Flooding during coastal storm in Newtok

Photo: Stanley Tom

Flooding during a coastal storm in Newtok

Photo: Stanley Tom

Severe undercutting of the river bank in Newtok

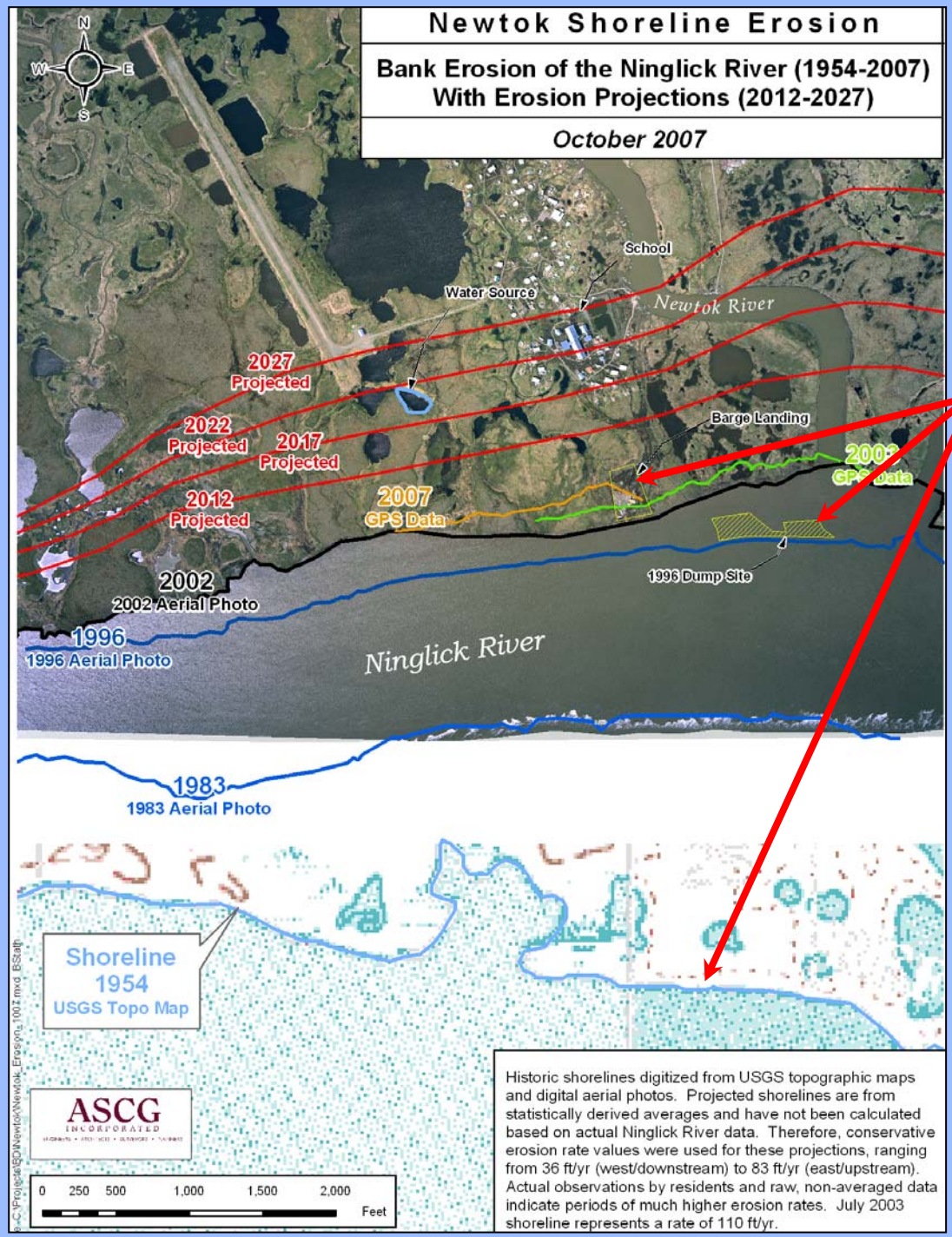
Photo: Stanley Tom

Mass wasting of the river bank in Newtok

Photo: Stanley Tom

Remains of eroded barge landing in Newtok

Photo: Stanley Tom



Newtok Shoreline Erosion:

The shoreline in 1954

The dump site and the barge landing have already eroded away.

First houses impacted by erosion between 2012 and 2017

New homes being constructed at Mertarvik

Photo: Stanley Tom

Shaktoolik

The community is vulnerable to erosion when fall storms hit the sand and gravel spit upon which the community resides. There is no breakwater to protect the community from destructive waves from Norton Sound when storms come from the southwest. In severe storms, the community becomes an island. The beaches have historically been susceptible to damage and erosion from storm conditions, tidal surges, and from the sea ice conditions. Logs that float down the Yukon change from being protective to becoming destructive during storms surges. Several areas along the coastline used by the people in Shaktoolik are vulnerable to erosion and flooding during the storm season. Over the past three floods natural barriers have eroded substantially.

Overarching Problem:

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Log inundation at Shaktoolik

Photo: Steve Ivanoff

Log inundation at Shaktoolik

Photo: Steve Ivanoff

Shishmaref

Shishmaref has been threatened by erosion for many years with recent increases due to the lack of sea ice during the fall storm season. A partially completed USACE project is providing protection for portions of the shoreline.

Overarching Problem:

No definite timeline or authorities for erosion control and/or relocation makes it difficult to plan for needed erosion control projects and relocation. ***There has been no mandate to coordinate and focus resources.***

Shoreline erosion at Shishmaref

Photo: Tony Weyiouanna

Home falling over eroded bank in Shishmaref

Photo: Tony Weyiouanna

Unalakleet

Unalakleet is susceptible to erosion damages along various locations in the community, particularly along an NRCS gabion revetment that has been damaged by storms. The recommended project is a 1,500 foot long rock revetment which would be constructed along the alignment of the existing NRCS gabion basket revetment. The NRCS project would be removed or covered by the USACE project. $12.8 million is the most current estimate available. Another threat is the logs that float down the Yukon, in that they change from being protective to becoming destructive during storms surges.

Overarching Problem:

No definite timeline or authorities for erosion control and/or relocation makes it difficult to plan for needed erosion control projects. ***There has been no mandate to coordinate and focus resources.***

Remains of infrastructure at eroded shoreline at Unalakleet

Photo: Steve Ivanoff

Inundation of Yukon logs at Unalakleet

Photo: Steve Ivanoff

Immediate Action Funding Recommendations

Community	Immediate Action	Budget Estimates	Action Taken
All Six Communities	**Develop Suite of Emergency Plans and Training/Drills** (Alaska DHS&EM is lead) Emergency Operations, Community Evacuation, Hazard Mitigation Fire Management (Koyukuk only-DNR is lead) Purpose: Best chance to reduce loss of life and property when natural disasters occur. Coordinate with community planning projects to ensure dollars go as far as possible.	$400,000 total to DHS&EM. DHS&EM will RSA $25,000 to DNR for Koyukuk Fire Management Plan. DHS&EM will also provide $100,000 federal funds match. Funds were included in FY09 Capital Budgets; Investment: DHS&EM estimates for every $1 spent on preparation, $4 saved.	Funds were included in FY09 Capital Budget.
All Six Communities	**Community Relocation Plan** Funding for future relocation planning efforts for each community require coordination and resources both at the community and agency levels. Communities need funding and technical assistance to support/augment local capacities. Rational and collaborative planning needs to examine alternatives (e.g. shoreline stabilization/protection vs. relocation) and identify the opportunities for implementation. Training/Workshop to orient communities, agency personnel and contractors to the recommended collaborative community planning process. Cost Effective: When coordinated, Emergency Preparedness, Community Relocation and other community project planning and project developments have cost-effective results.	Partially covered in current budgets.	Funds were included in FY08 Supplemental Budget for initial relocation planning resources

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All Six Communities	**Reduce Capital Budget Expenditures** - Through inter-agency and local coordination identify capital cost savings by aligning timing of projects requiring heavy equipment. - State should establish co-sponsorship funding to ensure Alaska attracts federal funds for its priority projects. - Find/develop Western Alaska rock source to reduce costs. 35% Funding Co-Sponsorship: Based on recommendations from Senator Stevens at recent roundtables and other meetings.	**Immediate and Near Term Capital Budget Estimates:** State should be prepared to augment federal funds with a target of 35% of erosion control and mitigation capital costs US Army Corps of Engineers (USACE) recommends the State of Alaska create co-sponsorship funding for erosion control/mitigation projects to ensure the highest likelihood that federal funds will be allocated to Alaska, given the competitive nature of these funds.	
All Six Communities	**Preliminary Engineering and Early Coordination** Funding will allow for preliminary engineering investigations to begin so that project development can move ahead in an orderly, timely, and efficient manner. Site surveys, material source investigations, hazard mapping, geotechnical and hydrologic studies, and environmental documentation and permitting studies will all need to be conducted prior to developing erosion protection or relocation design plans. Because all likely project scenarios will involve extensive environmental documentation and permitting, it is critical that the project development process start as early as possible. Will also allow for early coordination between agencies and affected communities and a review of existing data, reports, and plans.		$600,000 to ADOT/PF was included in the FY09 Capital Budget
All Six Communities	**Identify and Develop a Data Strategy** to support Subcabinet decisions that need to be made for erosion control and relocation projects.	**Identify and Develop a Data Strategy** to support Subcabinet decisions that need to be made for erosion control and relocation projects.	

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Kivalina USACE Description of Need: 2000 LF is needed to provide interim protection for critical structures and residences on the ocean-side of the island while Kivalina plans to relocate. Anticipated contract cost is $16M. USACE received $4.9 million in Federal fiscal year 2008, which will fund 400 LF of the 2000 LF total.	**Revetment/Erosion Control Project** Near-term (next 18-24 months): construction of 2000 LF linear feet of rip rap revetment with a current estimated cost of $16 M .to protect critical structures and residences on the ocean-side of the island where catastrophic erosion is taking place. **Intermediate-term:** construction of 1300 LF of rip rap revetment to provide interim protection to critical structures and residences at the lagoon side of the island. Estimated cost is $10 M. Total anticipated revetment project is $26 M. (protection for both ocean-side and lagoon-side of island).	**Immediate Action – Capital Budget Estimate for erosion protection on ocean-side of island:** $3.3 million (35% of $9.3 million in Federal funding) funds a portion of 2000 LF shoreline protection for ocean side of island. **Intermediate -Term Estimated Capital Budget –** $9.1 million (35% of $26 million)	Funds were included in the FY 09 Capital Budget
	State of Alaska serve as 3rd Party Reviewer for geologic aspects of USACE (Relocation) Assessment Reports Alaska DGGS as lead.	Budget Estimate: $12,000	Covered in current budgets or FY08 Supplemental
	Relocation Feasibility Study Geologic Mapping (Alaska DGGS as lead)	Budget Estimate: $180,000	Eligible for funding through CIAP funds or FY 10 Capital Budget.
Koyukuk	**Review Feasibility Report:** Koyukuk, DGGS ADOT/PF and DCCED should review the USACE Recommendations Report to provide feedback/reality check to the USACE Report was recently provided to Koyukuk community. USACE representatives travel to Koyukuk to meet with community. **Coordination Among:** Koyukuk, USACE, ADOT/PF, DCCED, DHS&EM for preliminary engineering, planning and funding strategy **Upgrade Existing Road:** Ensure road is passable during flooding. **Build Evacuation Center:** Ensure community has an emergency shelter.	**FY10 Capital Budget Estimate:** $800,000 **FY10 Capital Budget Estimate:** $4.5 million.	Covered in Current FY09 Capital Budgets For FY08 & FY09: Covered in current and/or FY08 Supplemental (Community Planning grants and DHS&EM Emergency Planning Training)

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Newtok USACE Status: Designs are underway for the road from the barge landing to the evacuation center at the new town site for Newtok. USACE does not currently have funding to construct the road which is estimated at $5 million.	**Build Staging Area for Barge Landing** – Ensure ability to receive supplies. **Coordination Among**: Newtok, USACE, ADOT/PF, DCCED and the Newtok Planning Group to determine what road standards are needed (purpose – construction costs may be less than FY10 estimate). Coordination expanded to Navy to determine if building Evacuation Shelter can be used as a training exercise (Navy has indicated they may be able to provide labor). **Build Road to Evacuation Site** – Ensure community has access to shelter (2. 5 miles). **Build Evacuation Shelter** – Ensure community has an emergency shelter (approx 4,000 sq ft + 2,000 sq ft equipment shelter).	**FY09 Capital Budget Estimate:** $279,000. **Capital Budget Estimate:** $3.75 million. **FY10 Capital Budget Estimate:** $4.5 million	Funds were included in the FY 09 Capital Budget for construction. Planning funds were included in the FY08 Supplemental Capital Budget Partial funding was included in the FY 09 Capital Budget
Shaktoolik	**Preliminary Relocation Site Assessment** for relocating village. **Evacuation Road** **Coordination Among Shaktoolik, Kawerak, Federal and State Agencies:** Funding, design, etc.	**Budget Estimate:** $150,000 **Budget Estimate:** Likely have an estimate by Fall 2008 after reconnaissance work completed.	Eligible for funding through FY08 Supplemental for Community Planning Grants
	Relocation Feasibility Study **Geologic Mapping** (Alaska DGGS as lead)	**Budget Estimate:** $180,000	Eligible for funding through CIAP funds or FY 10 capital budget.

Community	Immediate Action	Budget Estimates	Action Taken
Shishmaref USACE Description of Need: The washeteria and lagoon are not protected by the 700 LF USACE has under contract to install. the length was determined by funds availability. USACE anticipates the contractor will demob. Fall 2008 or early Spring 2009. The next 750 ft increment of rock revetment has been designed and is estimated at $9 million for construction cost. This increment would protect homes and a church. An additional 550 feet of rock revetment is needed to protect the washeteria and the sewage lagoon. There is also a need to extend the protection on the southern end of the village where the existing reveted area ends.	**Funding Strategy Coordination:** Shishmaref, USACE, ADOT/PF and DCCED **Revetment/Erosion Control Project** 700 ft section that will provide protection to the North shore including the washeteria and sewage lagoon. USACE estimate – $8.7 million for 700 ft.; $25 million for remaining project.	**FY10 Capital Budget Estimate:** $8.5 million (35% of $25 million). Recommendation for funding needed in Capital budget FY10-FY11.	**For FY08 & FY09:** Covered in current and/or FY08 Supplemental

Community	Immediate Action	Budget Estimates	Action Taken
Unalakleet USACE Status: Design for 1500 ft is complete. No funds are available to initiate construction. Real Estate actions are advanced and if federal supplemental funds become available in Summer 2008, USACE	**Revetment/Erosion Control Project** Coordination with ADOT/PF's 2008 Airport Erosion control project	**Immediate Action Capital Budget Estimate:** $5 million (35% of $13.5 million project).	Included in the FY 09 Capital Budget