

BARROW (UTQIAGVIK) ALASKA COASTAL EROSION STUDY

PCOP WEBINAR

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US Army Corps
of Engineers®



TODAY'S WEBINAR: BARROW, ALASKA



BLUFF: Barrow is an Alaska Coastal Erosion study that has utilized Risk Informed Decision Making (RIDM) and is on track to be completed in 27 months.

Agenda:

- Barrow & the erosion and flooding problems they are facing
- Original scope and successful RIDM and re-scoping
- Community involvement
- Use of other social effects for justification
 - Cost Effectiveness/Incremental Cost Analysis
 - 2 model reviews
- Cultural Resource MOA
- Lessons learned

COMMUNITY AND THE EROSION/FLOODING PROBLEMS

Video link of erosion problems in Barrow, AK
https://www.youtube.com/watch?v=VxrkUAj_N1A





STUDY OVERVIEW



Authority:

Section 116 of the Energy and Water Development and Related Agencies Appropriations Act, 2010, Public Law 111-85.

Section 116 Implementation Guidance:

“If there is no NED Plan and/or the selection of a plan other than the NED Plan is based in part or whole on non-monetary units (Environmental Quality and/or Other Social Effects), then the selection will be supported by a cost effectiveness/incremental cost analysis...” (Memorandum for Commander, Pacific Ocean Division, 10 May 2012).

** “Projects authorized without a report” = Director’s report

** Authorized to move immediately into PED & Construction

Non Federal Sponsor: North Slope Borough (NSB)

** Due to 2 Presidential Disaster Declarations 2 years apart
= Eligible for 2018 Supplemental Funding



LOCATION OF BARROW



Northern most community in the United States

Located on the Chukchi Sea ~750 miles north of Anchorage



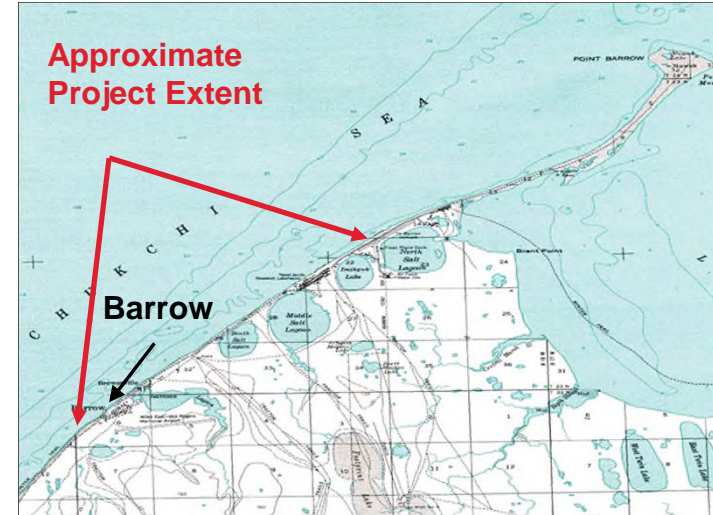
BARROW

Population: ~5,000 (NSB Census 2016)
– 50% of the North Slope residents live in Barrow

Barrow is the political, economic, social, and cultural center for the NSB

Damages from erosion and flooding include, but are not limited to, loss of:

- Cultural resources
- Infrastructure and property
- Subsistence area access
- Frequent and high cost of emergency response and repairs (~\$8M per year)
- Limited local material causing housing shortage





PROJECT AREA DETAIL



Study Area
— — —





PHOTOS OF THE PROBLEM



Super sacs used to protect eroding bluff



Sacrificial berm during a storm



Super sac berm protecting a road



Super sacs used to protect eroding bluff



Erosion along a road during a storm



Flooding at a Utilador pump station



CULTURAL RESOURCE SITES IN STUDY AREA





ORIGINAL AND ITERATIVE SCOPINGS, RIDM

Subtitle here



CHECK-IN



Do you hold a charette at the beginning of your study?



No



For some studies



Always,
every study



MULTIPLE ITERATIONS & DECISION POINTS



Milestone/Event	Notes
FCSA	12 Jul 2017
Charette	12-13 Sep 2017
AMM	16 Nov 2017 – preliminary study estimate 3 yrs; \$4.9M
Work with Charlie Yoe and Karen Miller on RIDM	Fall 2017 – Jan 2018 – scopes worked with VT on reasonable and necessary data to reduce risk; however, continued discussions to reduce data gathering efforts Feb 2018 – RIDM champion and mentor training, Barrow as example to utilize RIDM to potentially reduce scope and budget; goal of moving TSP from Feb 2019 into summer 2018
Sheet pile decision	April 2018 – removed sheet pile option, reduced cost by \$700k (\$4.2M)
TSP Re-scoping	25 Jun 2018 – Proposed 30-month schedule and reduced budget to \$3M; Post TSP re-scoped to 24-month schedule. Took each risk item that generated data gathering (time/\$\$) and presented path forward to PDT
ADM	Model Reviews and sensitivity analyses; Refined Emergency Response costs; Working through reviews in light of risk-informed decisions; MOA



REVISITING RISK – COST & SCHEDULE DRIVERS

Risk Items

HIGH

- Lack of data to tie land elevation to sea level
- Unknown storm duration and frequency
- No known local gravel sources
- Adverse effects to cultural resources
- Extending the study area, but basing the TSP decision on current data

MEDIUM

- New information may affect BCR value
- Not updating fish survey information before release of EA
- Ability to obtain ROE before summer field efforts

LOW

- Risk of encountering HTRW at old Navy landfill
- Not designing for an ivu event
- Escalation to an EIS
- Property owners/stakeholders not accepting relocation/buyout



CONSIDERATIONS TO CHANGING SCHEDULE/BUDGET

Original Budget	Updated Cost	Moved to PED
\$4.9M	\$3M	\$1.9M

Accepting risk and moving select Geotechnical, H&H and other analysis to PED.

Leaving large contingencies on select cost items.

Agency coordination status by final report submittal uncertain.

Increase PED duration and costs.

Accelerating timeline and decreasing budget could position Barrow to obtain supplemental funding.



SCHEDULE BREAKDOWN



Milestone #	Title	Date			Actual = 27 Months
		36 Month	30 Month	24 Month	
FEA1000	Execute FCSEA	12 Jul 2017	→	→	12 Jul 2017
FEA1020	Alternatives Milestone	16 Nov 2017	→	→	16 Nov 2017
FEA1030	Tentatively Selected Plan Milestone	4 Feb 2019	Jun 2018	Apr 2018	28 Jun 2018
FEA1040	Agency Decision Milestone	6 Aug 2019	Dec 2018	Oct 2018	04 Feb 2019
FEA1050	MSC Transmittal of Final Report	20 Mar 2020	Aug 2019	Mar 2019	13 June 2019
FEA1070	Signed Director of Civil Works Report	06 Jul 2020	Jan 2020	July 2019	13 Oct 2019

27-month schedule has included:

- NED analysis
- Justification of project on OSE (Community Resiliency Units)
- Development of CE/ICA (including 2 model reviews & approval for 1x use)
- Cultural resource MOA



COMMUNITY INVOLVEMENT



CHECK-IN



What does your community involvement entail?



Sponsor meetings,
no other if no
particular issues or
EIS



Meetings with
sponsors, charrette,
public involvement
meeting



Frequent and
customized to
community/study



COMMUNITY INVOLVEMENT



22 Trips to project site since Feb 2018:

- 1 Charrette – NFS and stakeholders
- 9 Public Comment meetings – Whaling Captains, 2 Tribal Corporations, City of Utqiagvik, North Slope Borough, 2 public town halls, 2 Tribal Councils
- 3 Site visits with HQ, RIT, and USACE Generals
- 2 MOA meetings
- 6 meeting with NFS
- 1 site visit to see erosion after a storm

Public comment period – Sponsor hired a contractor (Regional Native Corporation) to develop a presentation, strategically set up meetings, and help message and present the study in terms the community would identify with.

- 362 public comments
- Positive feedback and community buy-in
- 5 letters of support





OTHER SOCIAL EFFECTS & 2 MODEL REVIEWS



CHECK-IN

Do you have experience working with other social effects to justify projects?



No



Some



Expert

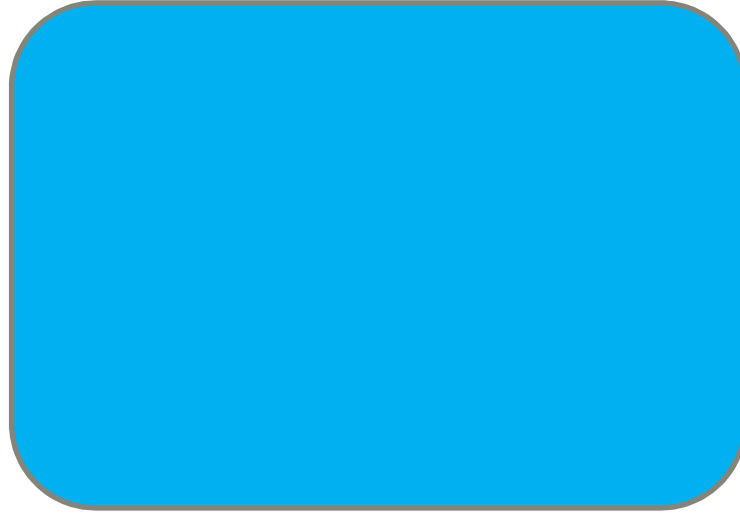


CHECK-IN

Do you have experience working with Cost Effectiveness/Incremental Cost Analysis?



No



Some



Expert



SECTION 116 – CE/ICA EVALUATION FRAMEWORK



Identify the types of risk that exist in Barrow within the three resilience areas.





MODEL REVIEWS



Post TSP - conducted two model reviews simultaneously

- 1x use model review for CE/ICA
 - Using multiple metrics to determine risk reduction
- 1x use model review for NED Emergency Response cost model
 - NSB spends ~\$8.3M each year to maintain their sacrificial berm
- Delayed ADM by 4 months

Model review, ATR, and PGM Comments resulted in developing various sensitivity analysis:

- CE/ICA metric weighting
- Project height
- Reach by reach analysis
- Ice free days (Emergency Response Cost)

No changes to selected plan or justification from draft report release. However, the study has a more robust description and justification as a result of all of the effort.

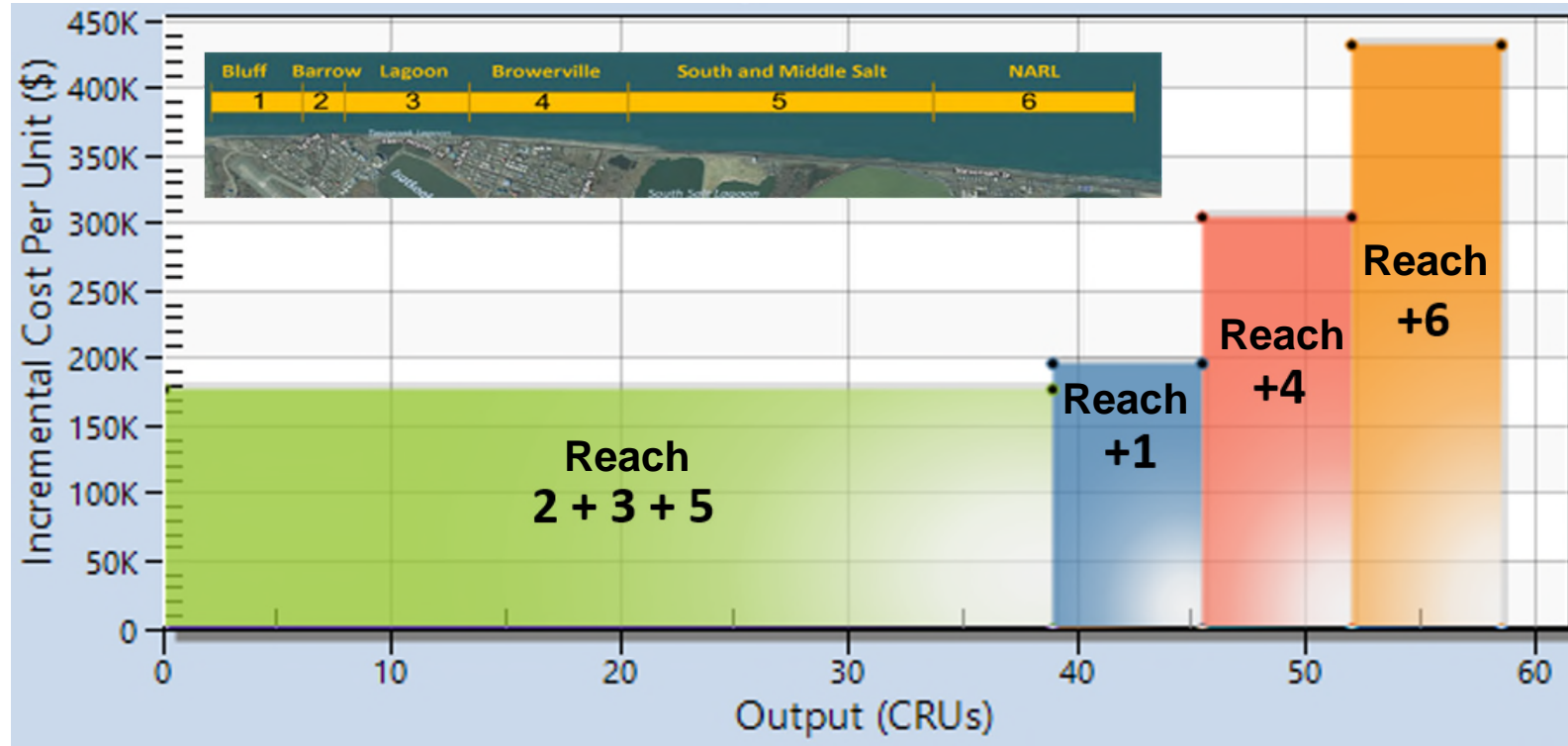


FINAL ARRAY ALTERNATIVE PLANS





BEST BUY OPTIMIZATION SCENARIOS



Scenario	Total Constr. (PV \$1000)	Annualized Cost	CRU	Inc. Cost per Unit
No Action		\$0	0	\$0
R2+R3+R5	\$158,787	\$6,954,662	38.94	\$178,599
R2+R3+R5+R1	\$188,436	\$8,243,785	45.49	\$196,813
R2+R3+R5+R1+R4	\$234,135	\$10,238,975	52.03	\$305,075
TSP → R2+R3+R5+R1+R4+R6	\$299,090	\$13,078,893	58.58	\$433,575



MOA FOR CULTURAL RESOURCES



SIGNED MOA – REQUIRED IN FINAL SUBMITTAL

Bluff revetment would permanently cap a culturally significant site

- Protection in place is considered an adverse impact in AK
- Cap could weigh on site as permafrost melts
- Erosion at the bluff has exposed human remains

We thought we could develop the MOA in PED

- Coordination with our diligent OWPR and Cultural Resource CoP helped us identify a path forward in the study

Quickly develop and MOA and have it signed within the study

- 3 months to develop and get an MOA signed
 - We had some outrageous thoughts of what truly needed to go into this document
 - Worked with HQ, VT, SHPO, Sponsor, and local community to develop an agreement document that would work for all parties
 - Held 2 MOA meetings, 2 rounds of revisions
 - Received all signatures with 2 weeks to spare
- Community leaders were away whale hunting (subsistence harvesting)
 - No one was available to review/sign
 - Sponsor helped get these folks to respond to us



SUMMARY/ LESSONS LEARNED



WHAT WE LEARNED



Scoping and budget is a full PDT effort

- Use your experts to take the hard look at what you need, uncertainty and risks, and consequences/trade-offs

Vertical team alignment throughout RIDM

Keeping reviewers informed throughout RIDM

Recognize need for model reviews early!!!

Culture of flexibility and coping skills for change are needed

Face to face public involvement is key to have community behind you

Accelerating this study schedule was only achievable because there was a previous study and data (for most AK studies there is often a lack of critical data)

- You can use what data you have and frame assumptions