2025

Chignik Subregional Watershed Plan

FINAL, MARCH 7, 2025

SUBMITTED ON BEHALF OF THE CHIGNIK BAY TRIBAL COUNCIL

Chignik Bay Tribe, project # ACWA-23-01. This project has been funded in part by a Department of Environmental Conservation Alaska Clean Water Actions (ACWA) grant with support from the U.S. EPA.

ACKNOWLEDGEMENTS

This plan was created by the Chignik Bay Tribal Council with input from Chignik subregional residents and partners. Thank you to everyone who contributed. A special thank you to:

- Chignik Subregion
  - Chignik Bay Tribal Council: Debbie Carlson, Jeanette Carlson
  - Chignik Intertribal Coalition: George Anderson
  - Chignik Lake Traditional Council: Denise Bereskin, Zita Andrews
  - Chignik Regional Aquaculture Association: Austin Shangin, Chuck McCallum
  - Chignik River Limited: Ron Lind
  - City of Chignik: Dannica Anderson
  - Native Village of Chignik Lagoon: Michelle Anderson, Oscar Mills, Sabrina Anderson
- Partners and Supporters
  - Artesian Knowledge: Marcus Geist
  - Bristol Bay Heritage Land Trust: Tim Troll
  - Flensburg Consulting: Sue Flensburg
  - Lake and Peninsula Borough: Danica Wilson, Jordan Keeler, Nathan Hill
  - University of Alaska Fairbanks, Alaska Coastal Cooperative: Chris Maio, Matthew Balazs
- 2023 and 2024 Chignik Regional Resiliency Symposium Participants

This project has been funded in part by a Department of Environmental Conservation (ADEC) Alaska Clean Water Actions (ACWA) grant with support from the U.S. Environmental Protection Agency (EPA). A special thank you to ADEC Environmental Program Specialist Mary Inovejas and ADEC Nonpoint Source Water Pollution Prevention and Restoration Section Manager Laura Eldred for their guidance and support throughout the development of this plan.

The Chignik subregional watershed are on the ancestral lands and waters of the Alutiiq peoples. We acknowledge the past, present, and future indigenous stewards of these places. This plan is a testament to the ongoing interest and desire to honor and protect these resources for many generations to come.

This project was facilitated by Agnew::Beck Consulting with assistance from Kai Consulting.

TABLE OF CONTENTS

Acknowledgements **0**

Table of Contents **1**

Chapter 1: Introduction **2**

Project Overview 2

Project Objective & Goals 2

Planning Process 2

How to Use this Plan 5

Chapter 2: The chignik watershed **7**

Description of Area 7

Chapter 3: Community Issues & Concerns **15**

Potential Water Quality Threats 15

Resources and Data Gaps 17

Chapter 4: Action Plan **22**

Priority Strategy A: Establish mitigation programs for alder overgrowth. 23

Priority Strategy B: Improve stock assessment and monitoring of salmon populations. 24

Priority Strategy C: Complete a drainage map and stormwater management plan for Chignik Bay 26

Priority Strategy D: Clean Up contaminated sites in Chignik Lake. 27

Priority Strategy E: Initiate water quality monitoring around Chignik Lagoon 29

Other Strategies by Lead Organization 31

APPENDICES – AVAILABLE SEPARATELY

Appendix A: Acronyms

Appendix B: Public Involvement Plan

Appendix C: Chignik Regional Resiliency Symposium Summary, June 2024

Appendix D: Chignik Regional Climate Resiliency Symposium Summary, June 2023

Appendix E: Project At-A-Glance Summary

Appendix F: Project Flyer

Appendix G: Bristol Bay Leadership Forum Presentation, December 2023

Appendix H: Plan Review

CHAPTER 1: INTRODUCTION

Project Overview

Through an Alaska Clean Water Actions grant from the Alaska Department of Environmental Conservation, the Chignik Bay Tribal Council (CBTC) prepared a subregional watershed protection plan for the Chignik subregion. Watershed protection plans are used to empower local management in protecting and promoting water resources. Preserving water quality is essential to help sustain the lands, waters, and resources that residents depend on, including the salmon that are a central part of the Chignik economy and subsistence traditions. This plan was informed by residents, scientists, and other stakeholders to summarize information about the watershed, identify potential water quality threats, and document data gaps.

A key component of this plan is the **action plan**, which serves as a roadmap for addressing water quality concerns and safeguarding the long-term health of the watershed. The action plan, guided by stakeholder principles, outlines priority strategies, projects, and other actions aimed at mitigating pollution, enhancing water management practices, and strengthening community stewardship. It identifies both immediate and long-term actions, aligning them with available resources, funding opportunities, and stakeholder roles. It also provides a framework for tracking progress, adapting strategies based on new data, and fostering collaboration among regional partners. This structured approach is the first step toward securing sustainable water management practices that benefit both the environment and the communities that depend on these water resources.

Project Objective & Goals

The main objectives of the subregional watershed plan are to:

A. Summarize information about the watershed in a clear, concise, and accessible format for residents and stakeholders to easily understand and use.

B. Identify and prioritize projects that enhance watershed health, ensuring both immediate benefits and long-term sustainability.

C. Empower local and regional communities to protect, restore, and promote the sustainable management of water resources in the subregion.

Planning Process

June-August 2023

- Launched project
- Identified stakeholders
- Attended Chignik Climate Resiliency Symposium

August-November 2023

- Defined data gaps
- Inventoried ecological knowledge
- Listed sources of known, historical and suspected water quality threats

December-June 2024

- Conducted outreach
- Attended June 2024 Chignik Climate Resilience Symposium

June 2024 - February 2025

- Prepared draft and final, including funding and implementation recommendations

Public Participation Approach

To help inform this plan and its process, the project team created a public involvement plan to outline the project team's approach for engaging with residents and stakeholders. The public involvement plan identified stakeholders, outreach activities, communication tools, an outreach schedule, and key questions to consider throughout the planning process. The full public involvement plan is included in Appendix B.

Key Stakeholders

Community leaders, Elders, environmental coordinators, and residents of the following communities	Community organizations
• Chignik Bay • Chignik Lagoon • Chignik Lake • Ivanof Bay • Perryville	• City of Chignik • Chignik Bay Tribal Council • Chignik Lake Traditional Council • Native Village of Chignik Lagoon • Chignik Intertribal Coalition (CIC) • Chignik Regional Aquaculture Association (CRAA) • Chignik Lagoon Native Corporation • Far West Native Corporation • Oceanside Native Corporation • Chignik River Limited • Bayside Corporation
Regional organizations	**Research and agency partners**
• Bristol Bay Area Health Corporation • Bristol Bay Heritage Land Trust • Bristol Bay Native Association • The Conservation Fund Alaska Office	• Alaska Sea Grant • Artesian Knowledge LLC • Knik Tribe (Paralytic Seafood Poisoning testing) • Lake and Peninsula Borough • University of Alaska Fairbanks Arctic Coastal Geoscience Lab and Alaska Coastal Cooperative (ACC) • University of Washington School of Aquatic and Fishery Science

Outreach Strategies

- **Chignik Regional Climate Resiliency Symposium (June 2023 and June 2024):** The project team attended both the 2023 and 2024 Symposiums to listen, share, and learn from participants at this annual gathering (see 2023 flyer in Figure 1). At each symposium, participants shared and discussed research findings, gathered community input on environmental priorities, and catalyzed information sharing between partners working on related topics in the subregion. Summaries from the 2023 and 2024 Symposiums can be found in Appendix C and Appendix D.

FIGURE 1. SYMPOSIUM 2023 FLYER

- **Small Group Conversations**: The project team attended gatherings where community members and partners were in attendance to gather input and share emerging findings. This included a session at the Bristol Bay Leadership Forum on December 7-8, 2023, and a meeting alongside the Alaska Forum on the Environment in February 2024.

- **Existing Community and Organizational Meetings:** The project team joined existing meetings of key partner organizations to share a project update and gather input on emerging watershed plan strategies. This included:
  - Chignik Intertribal Coalition meeting, Spring 2024
  - Chignik Regional Aquaculture Association, Spring 2024

- **Project Website:** A website for the plan (chignikwatershed.com) hosts links to relevant related plans, the project schedule, and shares draft plan materials (Figure 2).

- **Brief Project Report Outs.** In spring 2024, members of the project team shared project updates and reported on project progress at various regional meetings, including the Bristol Bay Area Health Corporation (BBAHC) annual spring meeting; Bristol Bay Heritage Land Trust (BBHLT) board meeting; Bristol Bay Native Association (BBNA) annual meeting, and with Conservation Fund Alaska Office staff.

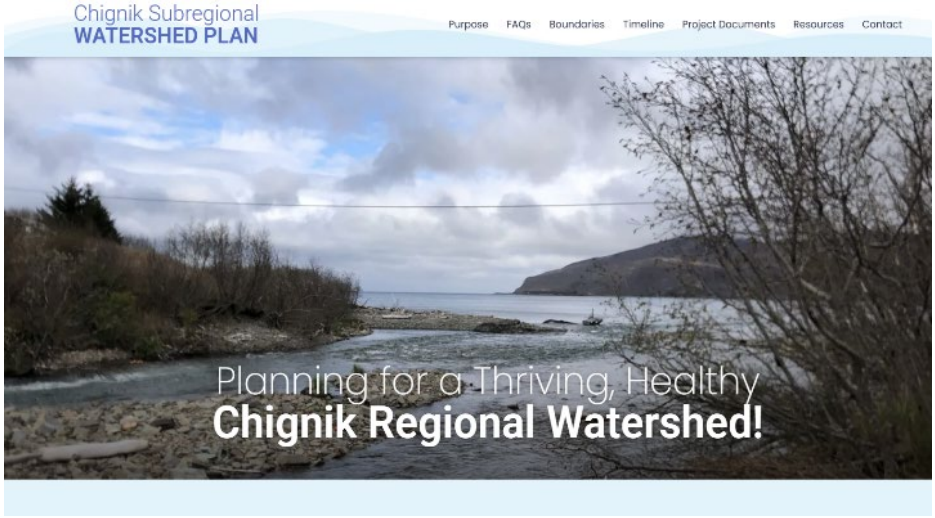


FIGURE 2. PROJECT WEBSITE

- **Interviews (Spring 2024)**: The project team conducted interviews with partner organizations and key stakeholders were conducted to identify issues, opportunities, and project ideas for inclusion in the watershed plan. These interviews helped the project team gain an understanding of how the watershed has changed over time and to identify historic pollutant sources that may not be accessible in public databases.

- **Outreach tools:** The project team also created a an "at-a-glance" project summary (Appendix E, screenshot in Figure 3), a project flyer (Appendix F), and presentations (Appendix G) to encourage resident and partner participation in the planning process.

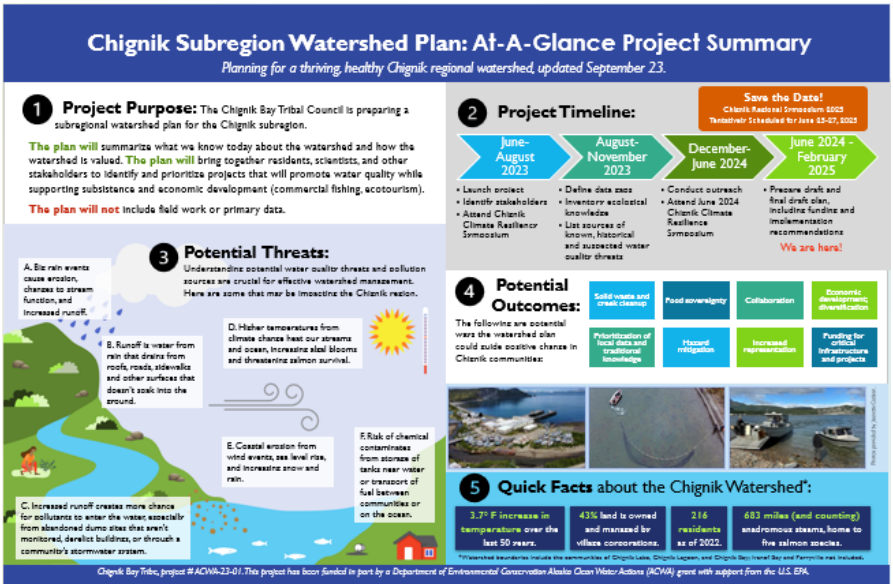


FIGURE 3. PROJECT "AT-A-GLANCE" SNAPSHOT

How to Use this Plan

The Chignik Subregional Watershed Plan is designed as a living document to guide local and regional efforts in protecting water resources while adapting to new information and evolving community needs. Local governments, tribal councils, community organizations, researchers, and other stakeholders can use this plan to:

- **Understand Watershed Conditions** – The plan provides a watershed characterization, key environmental concerns, and ongoing threats to water quality.

- **Implement Targeted Actions** – The action plan outlines priority projects, responsible entities, and timelines to ensure efficient and coordinated implementation.

- **Leverage Funding and Partnerships** – The plan strengthens eligibility for state and federal funding opportunities while fostering collaboration among agencies, non-profits, and local leaders.

- **Monitor Progress and Adapt** – The plan establishes a framework for tracking implementation, evaluating effectiveness, and refining strategies based on new data and stakeholder feedback.

Long-Term Ownership and Maintenance

The Chignik Bay Tribal Council and the Chignik Intertribal Coalition will collaborate with partners to track implementation on the Chignik Watershed Plan. This includes the following:

- The **Chignik Regional Resiliency Symposium** will be held annually to celebrate progress on actions, discuss barriers and solutions to implementation, and collaborate on outstanding actions. CBTC will ensure that subsequent Symposiums include time set aside to discuss watershed plan implementation. The following are some examples where Symposium-level collaboration can support watershed plan implementation:
    - Researchers conducting work in the area can share emerging findings, gather feedback to inform future data collection needs, and explore implications for communities in the watershed. Once more data is available, residents and partners will be able to refine and adapt the priorities to respond to findings.
    - Collaborating around contamination testing, such as lead testing on abandoned vessels.
    - Coordinating a shared backhaul to remove hazardous materials, old vehicles, and other waste from the community and watersheds.
    - Sharing lessons learned on effective alder mitigation strategies.

FIGURE 4. SYMPOSIUM 2024 PARTICIPANTS

- **Plan Website** – to be updated to ensure that plans, research, and activities underway in the region are accessible and easy to share and reference.
- Smaller teams will make progress on community-specific strategies. For example, Chignik Bay Tribal Council and the City of Chignik will work together on a stormwater management plan. Specific project leads are identified in the action plan tables.

CHAPTER 2: THE CHIGNIK WATERSHED

Description of Area

Watershed Area Boundaries

The Chignik Watershed study area is located within the Shelikof Straight Hydrologic Unit Code-8 (HUC8) watershed and encompasses three HUC10 watersheds – Black Lake, Chignik Bay, and Chignik River (Chignik Lake area). See a map of the subregion in Figure 5. The communities of Chignik Lagoon, Chignik, and Chignik Lake are within the study area. Communities within and nearby the study area, such as Ivanof Bay and Perryville, rely on these waters for subsistence and commercial fishing.

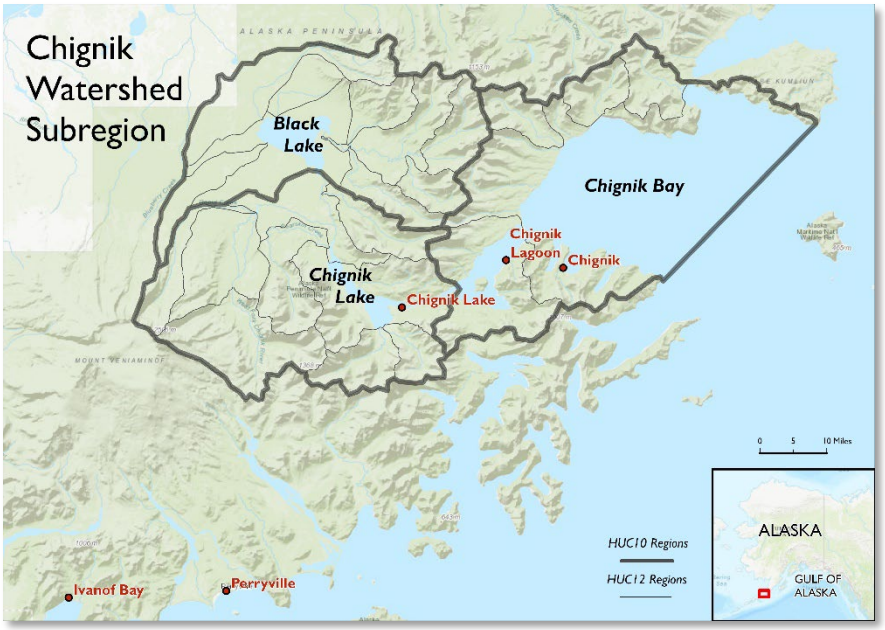


FIGURE 5. MAP OF WATERSHED BOUNDARIES

The U.S. Geological Survey (USGS) uses Hydrological Unit Codes (HUC) to classify watersheds into different levels, from the regional level down to much smaller subwatersheds.

In the Alaska region, (HUC2) there are:

- 8 subregions (identified by 4-digit codes, HUC4)
- 38 basins (6-digits, HUC6)
- 112 subbasins (8-digits, HUC8)
- 542 watersheds (10-digits, HUC10)
- Approx. 15,500 subwatersheds (12-digits, HUC12)

The number of subwatersheds in Alaska and their boundaries vary based on data updates and ongoing delineation processes.

Watershed Status

The project includes 23 HUC12 subwatersheds. None of the waters within the study area are listed under Alaska's 303(d) Category 5 Impaired Waters and therefore do not have an established Total Maximum Daily Load (TMDL).[1] Chignik Lagoon and Chignik Lake are prioritized as medium value, medium stress watersheds while Chignik Bay and Black Lake are categorized as medium value, low -stress watersheds in the Alaska Department of Environmental Conservation's Watershed Prioritization Map.[2] Two creeks in the Chignik Bay Watershed have been designated as Category 3 Assessed Waters (Not enough information).[3]

Watershed Area Population

The combined population in the Chignik subregion was 216 in 2022. The population is slowly declining, with an 11% drop in population over the past ten years (Figure 6).

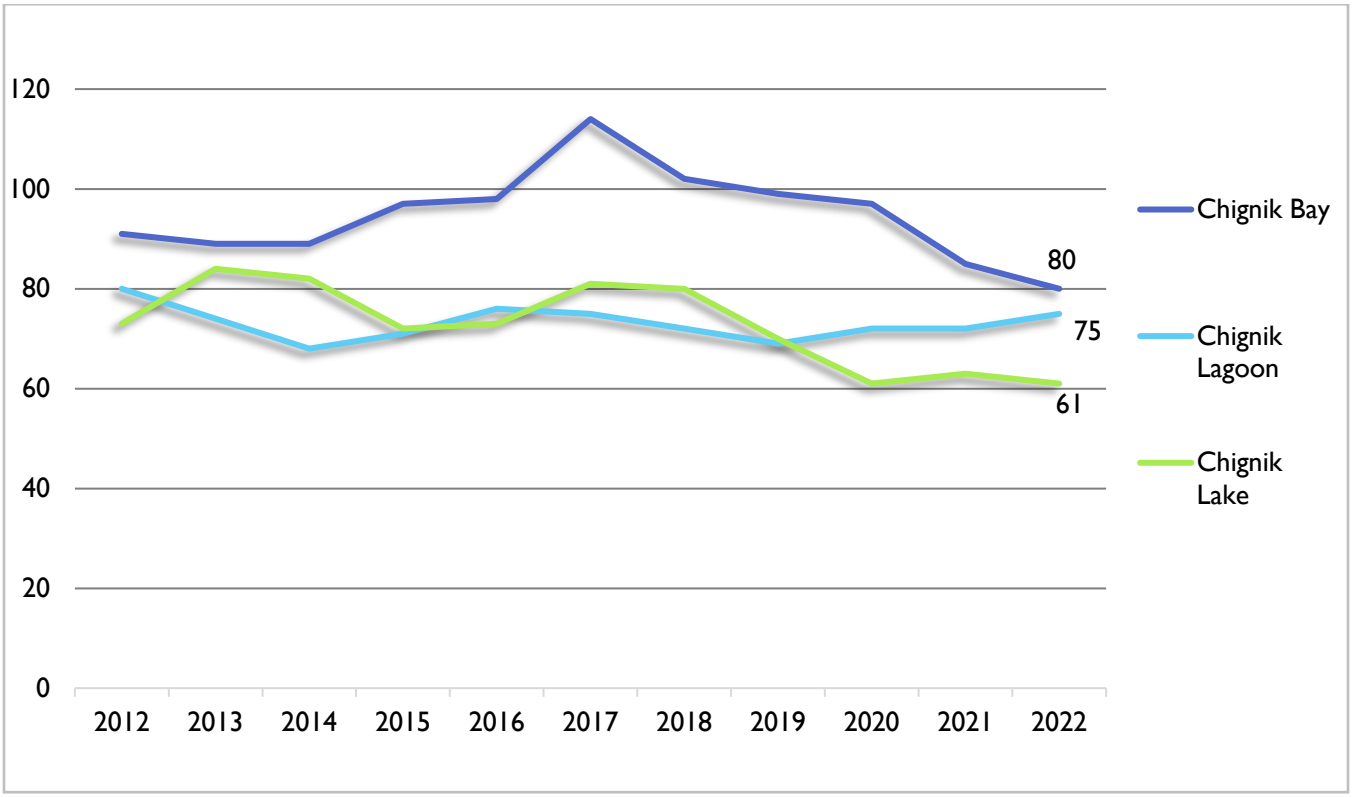


FIGURE 6. CHIGNIK SUBREGION POPULATION TRENDS, 2012-2022

Source: Alaska Department of Labor and Workforce Development, Research and Analysis

[1] Alaska DEC Integrated Water Quality Monitoring and Assessment Report Website, Updated 2024.
[2] Alaska's Watershed Prioritization Map, Chignik Region, 2023.
[3] Alaska DEC Final Integrated Report Assessed Waters Web Map, 2024.

Figure 7 depicts land management for the Chignik Watershed Subregion. Approximately 43% of area within the subregion is owned/managed by village corporations (Chignik River Ltd., Far West Inc., or Chignik Lagoon Native Corp.). Depicted in light green, the U.S. Fish and Wildlife Service (USFWS) land is part of the Alaska Peninsula National Wildlife Refuge.

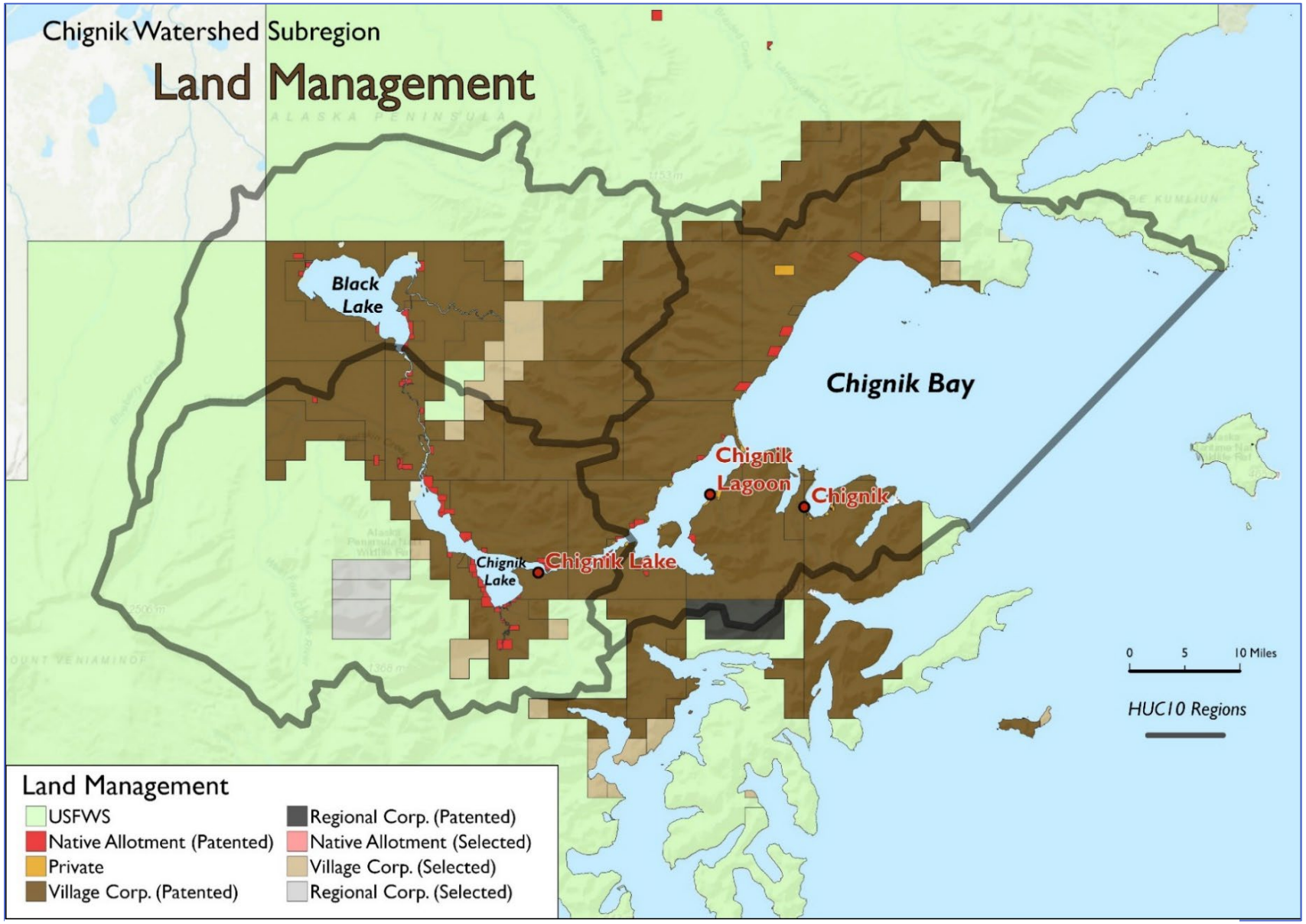


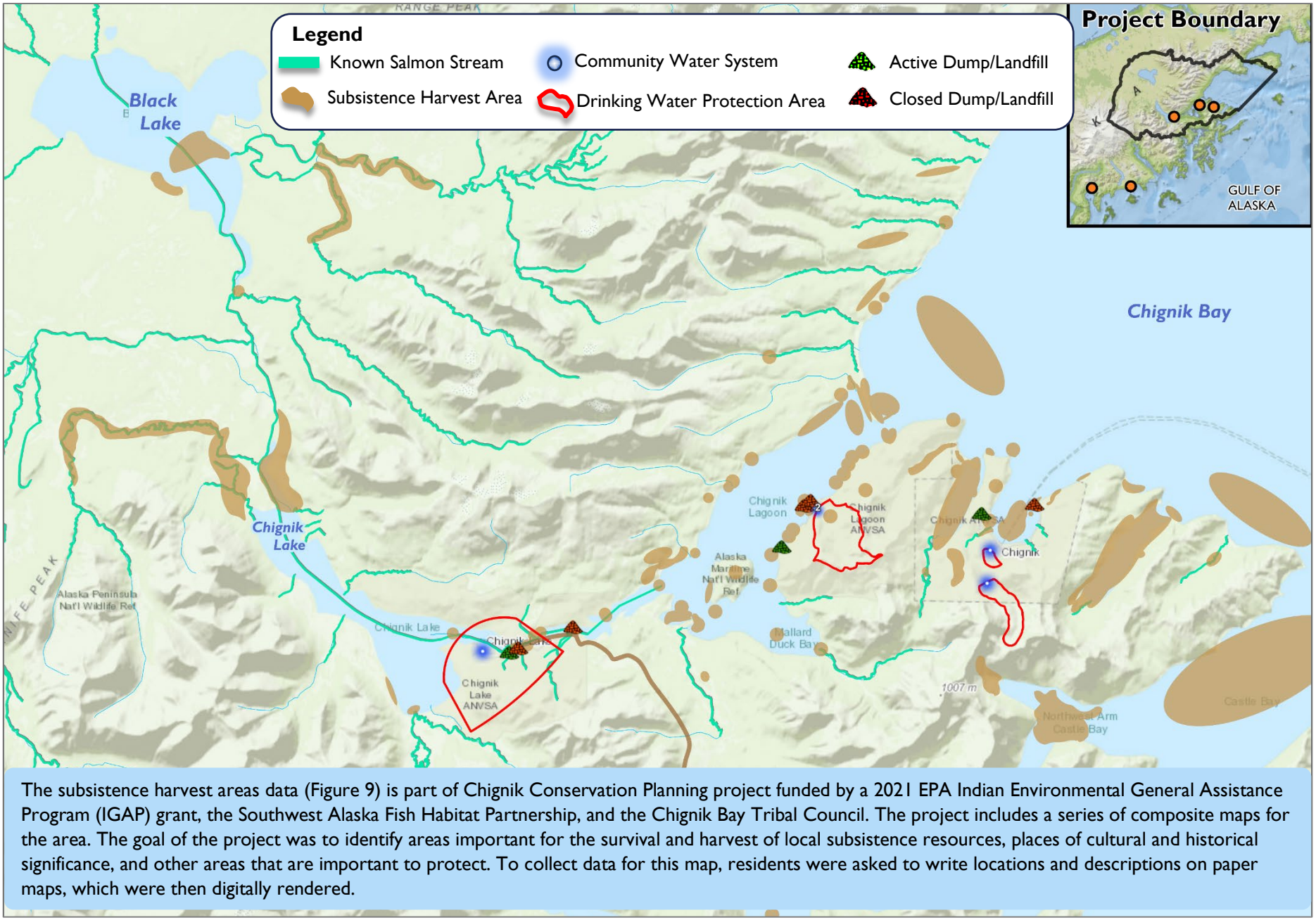
FIGURE 7. MAP OF LAND MANAGEMENT AREAS WITHIN THE CHIGNIK SUBREGION[1]

Figure 8 depicts the known anadromous streams within the subwatersheds – 683 miles and counting. The streams and riparian areas have been depicted as dynamic habitats, home to five different salmon species[4].

FIGURE 8. MAP OF ANADROMOUS STREAMS WITHIN THE CHIGNIK SUBREGION[5]

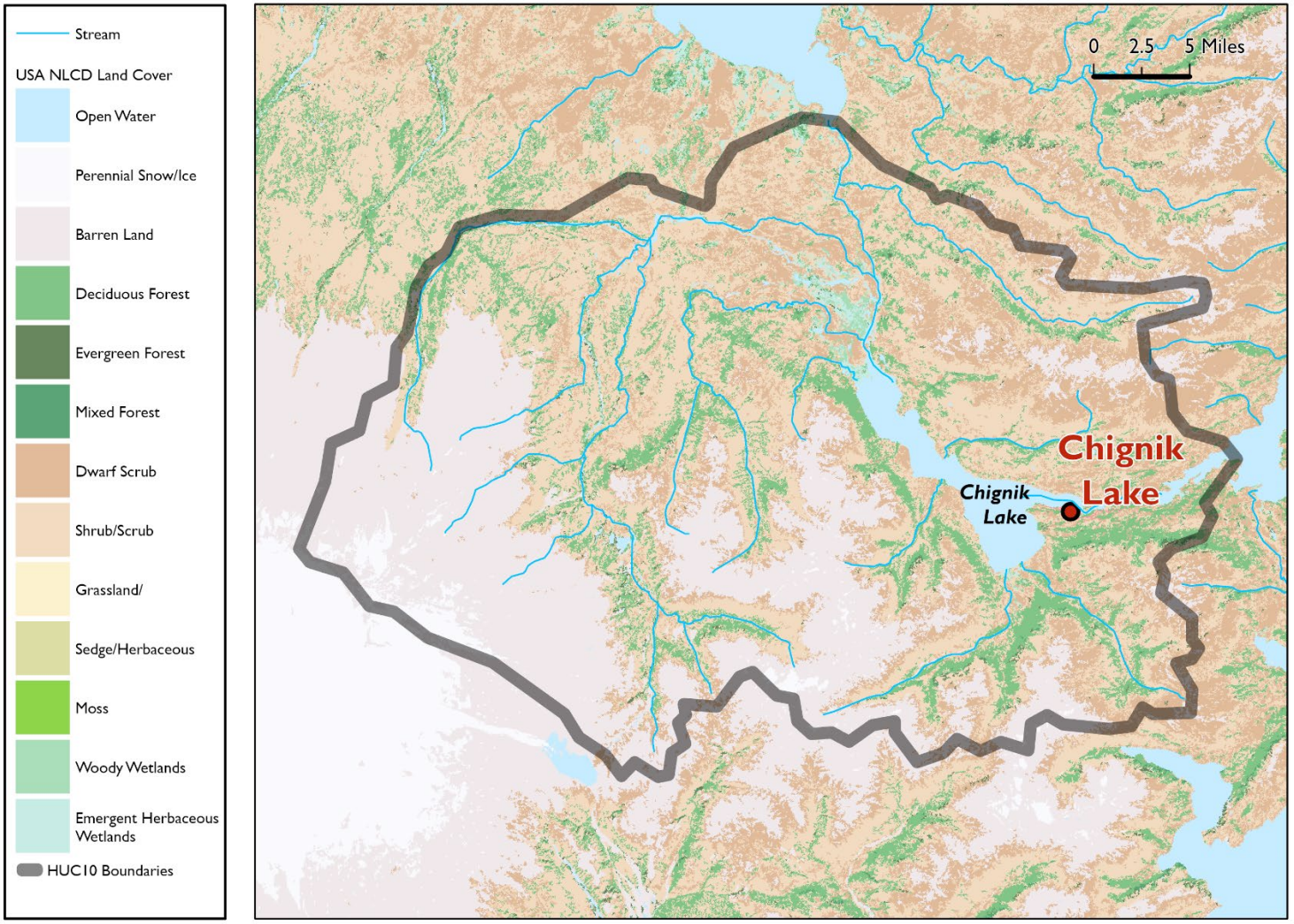
[4] Willis M., Balazs M., and Maio, C., *Very High-Resolution Mapping of Anadromous Streams and Salmon Habitat in the Chignik Watershed*, Presentation. 2023.

[5] Alaska Department of Fish & Game, Anadromous Waters Catalog, 2022



The subsistence harvest areas data (Figure 9) is part of Chignik Conservation Planning project funded by a 2021 EPA Indian Environmental General Assistance Program (IGAP) grant, the Southwest Alaska Fish Habitat Partnership, and the Chignik Bay Tribal Council. The project includes a series of composite maps for the area. The goal of the project was to identify areas important for the survival and harvest of local subsistence resources, places of cultural and historical significance, and other areas that are important to protect. To collect data for this map, residents were asked to write locations and descriptions on paper maps, which were then digitally rendered.

FIGURE 9. MAP OF SUBSISTENCE HARVEST AREAS WITHIN THE CHIGNIK SUBREGIONAL WATERSHED[6]



Figures 10, 11, and 12 show the land cover (vegetation type, land use, water, and bare soils) of each subwatershed (HUC10). Land cover plays a crucial role in determining how a watershed functions, from habitat protection to runoff, infiltration, sedimentation, and erosion control. Comparing how land cover shifts over time is also useful in monitoring and mitigating the effects of climate change.

This data was collected in 2016 as part of the National Land Cover Database. To create the dataset, high resolution imagery is used and colors assigned and modified using the 16-class Anderson Land Cover Classification System.

Since nearly all of the Chignik Subregion is undeveloped, the landcover found in this region is congruent with its biome as a taiga or boreal forest. Note how the forested areas generally follow riparian channels.

FIGURE 10. MAP OF LAND COVER WITHIN THE CHIGNIK LAKE HYDROLOGIC UNIT 10[7]

[7] Data from US Geological Survey, National Land Cover Dataset, 2016.

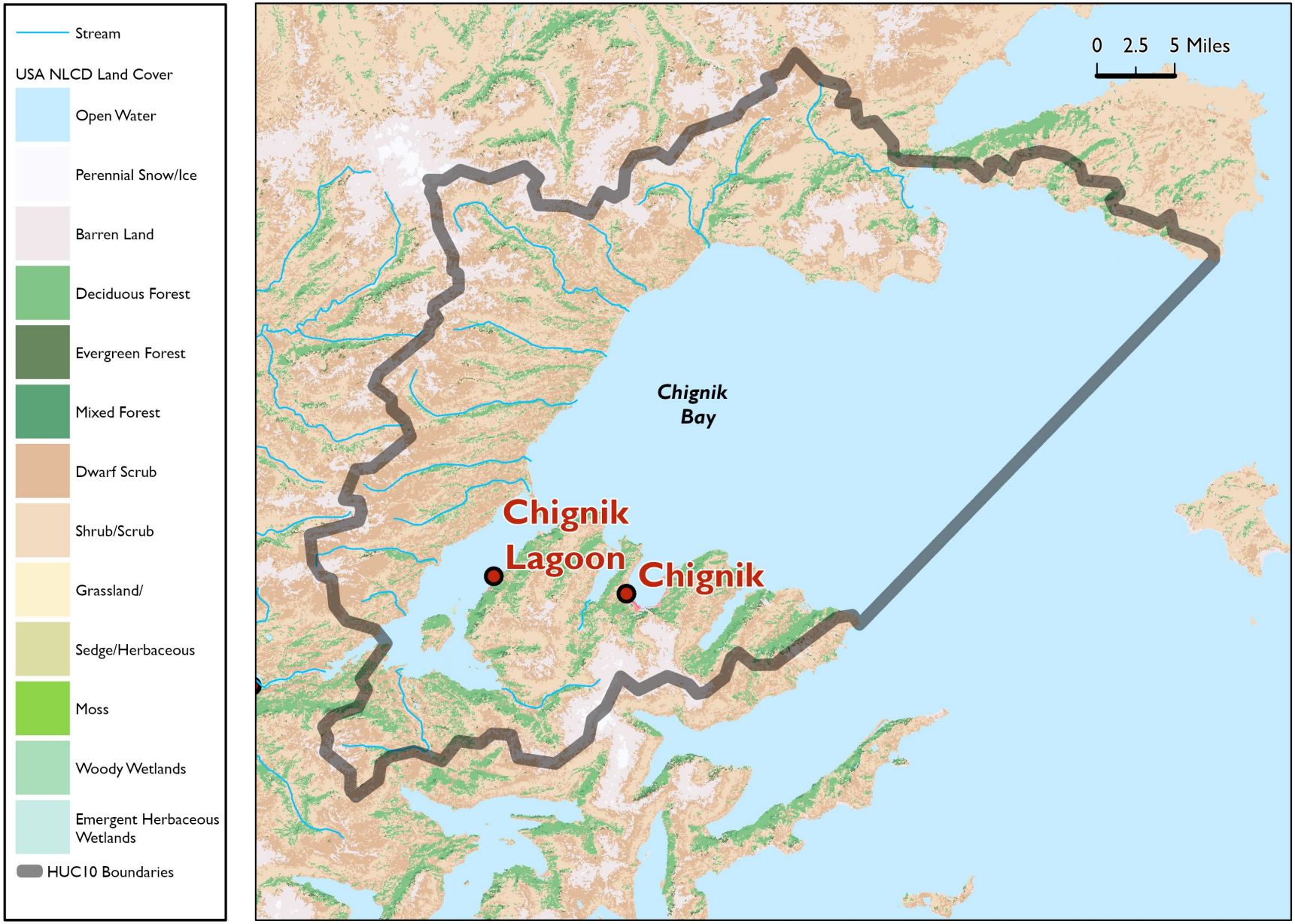


FIGURE 11. MAP OF LAND COVER WITHIN THE CHIGNIK LAGOON AND CHIGNIK BAY HYDROLOGIC UNIT 10[8]

[8] Data from US Geological Survey, National Land Cover Dataset, 2016.

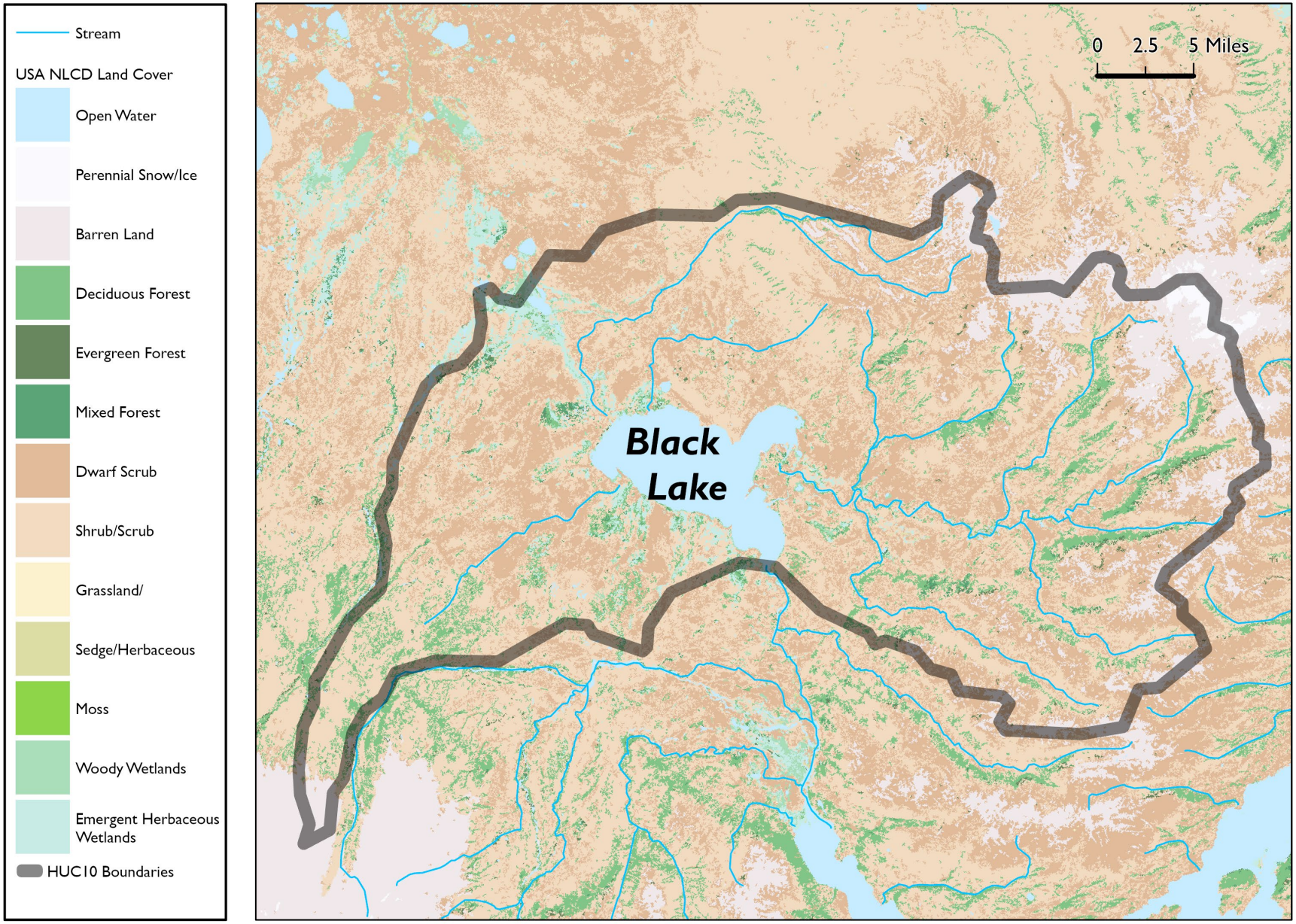


FIGURE 12. MAP OF LAND COVER WITHIN THE BLACK LAKE HYDROLOGIC UNIT 12[9]

[9] Data from US Geological Survey, National Land Cover Dataset, 2016.

CHAPTER 3: COMMUNITY ISSUES & CONCERNS

Potential Water Quality Threats

Understanding potential water quality threats and pollution sources are crucial for effective watershed management in the Chignik subregion. Identifying these factors is a critical first step towards developing a protection-based watershed plan that focuses on improving water quality and preventing future degradation of water sources and aquatic habitats.

The list of water quality threats in this document is incomplete and is based on data from narratives from local community groups and other plans related to the study area. Resources for the list include watershed characterizations and challenges presented during the 2023 Chignik Regional Climate Resiliency Symposium, historic reports documenting watershed impairment in the region, and federal and state resources, including the Alaska Department of Environmental Conservation Contaminated Sites Database.

Definitions of Point and Nonpoint Pollution Sources

Point source: *A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution, such as a pipe, ditch, ship, ore pit, or factory smokestack.*

Nonpoint source: *Diffuse pollution source; a source without a single point of origin or not introduced into a receiving stream from a specific outlet. The pollutants are generally carried off the land by stormwater. Common nonpoint sources are agriculture, forestry, urban areas, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.*

Definitions from the U.S. Environmental Protection Agency, Handbook for Developing Watershed Plans to Restore and Protect Our Waters

1. **Climate Change Impacts**. Like most watersheds in the Alaska, the Chignik subregion watershed is susceptible to climate change-related impacts, including accelerated coastal and stream bank erosion and flooding from altered precipitation patterns, increasing water temperatures, changes in vegetation rise in sea levels, and intense storm events. These changes can lead to alterations in discharge/flow patterns, water chemistry, sedimentation, and increased risk of water contamination nonpoint source pollution, all of which can impair the long-term health and resilience of the watershed.
2. **Stormwater Runoff.** Stormwater is the flow of water from precipitation events over impervious surfaces, such as roads, parking lots, rooftops, instead of infiltrating into the ground. The runoff collects pollutants from various sources and carries them into nearby waterbodies or directly into the watershed as nonpoint source pollution.
3. **Bacterial Contamination & Nutrient Discharges.** Failing or improperly maintained septic systems, unmonitored dump sites, and unregulated sewage discharges from communities can introduce harmful bacteria and excessive nutrients into the watershed via runoff. Contamination of bacteria poses significant risks to the health of humans, aquatic life, wildlife, and the overall integrity of the ecosystem. Nutrients, such as nitrogen or phosphorus, can propagate algal blooms and deplete oxygen levels in water systems, jeopardizing the heath of residents and aquatic species.
4. **Chemical Contamination**. Improper disposal of hazardous substances can introduce chemicals, heavy metals, and petroleum products into the watershed as nonpoint source pollution. In the Chignik region, there are several abandoned buildings that may need to be condemned, which could be sources of chemical

contamination. Additionally, the landfill at Rocky Point and other old dumpsites have not been monitored for potential runoff or contamination. These contaminants, if not adequately managed, can have severe impacts on water quality, aquatic organisms, and the ecological balance of the Chignik subregion.

5. **Oil and Fuel Spills.** Due to maritime activities in the region, the potential for oil and fuel spills exists within the watershed. Some spills have been reported on or near Chignik Lake as approximately 40,000 gallons of bulk fuel is hauled from Chignik Bay to the landing pad of the Chignik River then transported from by a fuel truck to a tank farm in the village.[10,11] Other spills have been reported from vessel and facility fires, bilge accidents, and groundings.[12] These include the following contaminated sites, identified in the Alaska Department of Environmental Conservation Contaminated Sites Search (see Figure 13):

    i. **Chignik Bay (4):** Chignik Bay City Tank Farm, Chignik Bay School, Chignik Norquest Plant, Trident Seafoods

    ii. **Chignik Lagoon (3):** Chignik Lagoon PTI Communications Central Office, Columbia Ward Fisheries Facility, Wards Cove Packing Former Cannery

    iii. **Chignik Lake (4)**: Chignik Lake PTI Communications Switch Gear Station; Chignik Lake Tribal Council Old Tank Farm, Chignik Lake Fuel Transfer Tank Farm, Chignik Lake Alaska Native Tribal Health Consortium (ANTHC) Water Line Upgrade

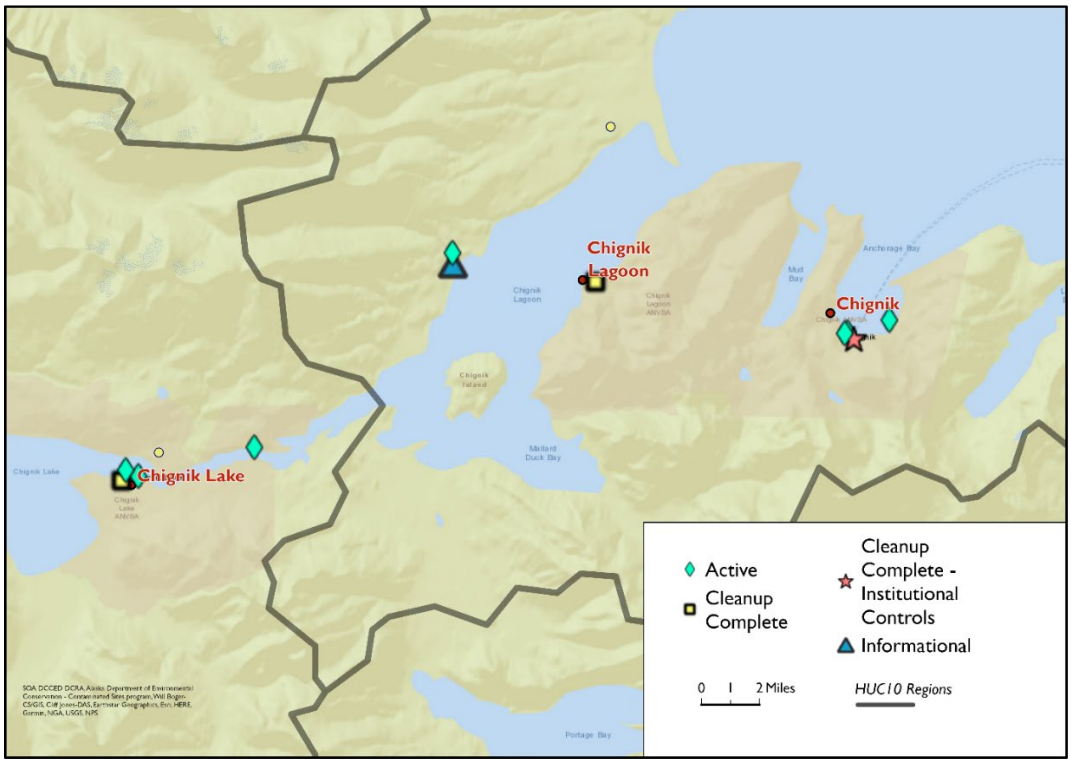


FIGURE 13. MAP OF CHIGNIK SUBREGION CONTAMINATED OR WASTE DISPOSAL SITES[13]

[10] Alaska DEC SPAR Online Services, PPR Spills Database (Chignik Lake CDP)

[11] Chignik Lake IGAP Proposal, 2011.

[12] Alaska DEC SPAR Online Services, PPR Spills Database

[13] Map provided by Marcus Geist using data from the Alaska Department of Environmental Conservation Contaminated Sites Program, 2023

Spills like this, as well as smaller incidental spills, can have detrimental effects on marine ecosystems, shoreline habitats, and numerous species that rely on the region's waters for survival.

6. **Erosion & Sedimentation.** Land disturbances from erosion and flooding lead to increased sediment runoff in the watershed, which exacerbates nonpoint source pollution from the above listed water quality threats. The community experiences flooding yearly, with the worst flooding often occurring during spring thaw. Additionally, the increase of sediment deposits can alter river flows, change water levels (reducing water depth important for spawning streams), disrupts the natural food chain by destroying habitat leading to declines in fish population, and can impact fish egg and larvae development.

7. **Mining Impacts.** The subregion is home to various mineral resources, with small mining exploration sites spread throughout the area, mostly on Bristol Bay Native Corporation lands. Mining exploration and mineral extraction/production activities could potentially impact the watershed via nonpoint source pollutants from mining operations, disturbances of water bodies, and other concerns.

Resources and Data Gaps

The project team reviewed and analyzed existing and previous plans related to the Chignik subregion to build a more comprehensive understanding of stakeholder perspectives on the needs and future direction of the community. Through our review, we identified an emerging list of data gaps. Our list of resources will grow and data gaps will shrink as more resources become available.

LIST OF BACKGROUND RESOURCES REVIEWED

The full plan review is available in Appendix H.

Document Name	Source	Project Area	Year
ADEC Contaminated Sites (Database)	ADEC	Chignik Bay, Chignik Lagoon, Chignik Lake	2023
ADEC Solid Waste Information Management Systems (SWIMS) (Database)	ADEC	Chignik Bay, Chignik Lagoon, Chignik Lake	2023
ADEC Spill Prevention and Response (SPAR) (Database)	ADEC	Chignik Bay, Chignik Lagoon, Chignik Lake	2023
ADEC Waste Erosion Assessment and Review WEAR Reports	ADEC	Chignik Bay, Chignik Lagoon, Chignik Lake	2014
ADEC Watershed Prioritization Map	ADEC	Statewide	2023
Alaska Baseline Erosion Assessment	US Army Corps of Engineers (USACE)	Chignik Bay, Chignik Lagoon, Chignik Lake	2009
Alaska Region Terrestrial Invasive Plant Management Strategy	USFWS	Chignik Lake	2022
Assessing the Vulnerability of Western Alaska Ecosystems and Subsistence Resources to Non-native Plant Invasion	Western Alaska Landscape Conservation Cooperative Project; Jennifer Robinette	Chignik Lake, Chignik Lagoon, Chignik Bay	2015
Bristol Bay Area Plan	State of Alaska	Regional	2005. 2013
Bristol Bay National Wetlands Inventory Fact Sheet	USFWS & Bristol Bay Native Corporation (BBNC)	Regional	

Document Name	Source	Project Area	Year
BBNA Brownfields Program Website	BBNA	Chignik Bay, Chignik Lake	2023
Chignik Bay As-Built for Waterline Distribution Improvements	ANTHC	Chignik Bay	2021
Chignik Bay Coastal Hazard Assessment	University of Alaska Fairbanks (UAF) Arctic Coastal Geoscience Lab	Chignik Bay	2023
Chignik Bay Inundation Maps	Alaska Department of Natural Resources (ADNR)	Chignik Lagoon & Bay	2016
Chignik Conservation Planning (Presentation)	Chignik Climate Resilience Symposium	Chignik Bay, Chignik Lagoon, Chignik Lake	2023
Chignik Intertribal Coalition Chignik Area Projects Summary	Chignik Intertribal Coalition	Regional	2024
Chignik Lagoon Community Plan	Chignik Lagoon Village Council	Chignik Lagoon	2016
Chignik Management Area Salmon Annual Management Report	Alaska Department of Fish & Game (ADF&G)	Chignik	2022
Chignik Regional Comprehensive Salmon Plan	ADF&G	Chignik	1992
Chignik Subregion Watershed Maps (Presentation)	Marcus Geist, Artesian Knowledge; Tim Troll, Bristol Bay Heritage Land Trust; Sue Flensburg; Community Members	Chignik Bay, Chignik Lake, Chignik Lagoon, Black Lake	2023
Climate Change and Health Effects in the Bristol Bay Region of Alaska (Presentation)	ANTHC, BBNA, & BBAHC	Regional	2014
Climate Resiliency Action Plan	Chignik Bay Tribal Council	Chignik Bay	2023
Community-Based Monitoring: Shoreline Change in Southwest Alaska	Christian J. E. (UAF Thesis)	Chignik	2023
Emergency Response Plan - Chignik Bay Tribal Council	BBNA	Chignik Bay	2023
Emergency Response Plan - Native Village of Chignik Lagoon	BBNA	Chignik Lagoon	2023
Envirofacts System (Database)	EPA	Chignik Bay Chignik Lagoon Chignik Lake	2023
Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps	FEMA	Chigniks	2023
Greenstar Community Assessments	Alaska Forum on the Environment	Chignik Bay Chignik Lagoon Chignik Bay	2020-2023
IGAP Proposal - Chignik Lake	Native Village of Chignik Lake	Chignik Lake	2011
Integrated Solid Waste Plan for the Community of Chignik Lagoon	Chignik Lagoon Village Council	Chignik Lagoon	2017
Lake and Peninsula Borough Comprehensive Plan Update	Lake & Peninsula Borough	Regional	2020
Lake and Peninsula Borough Renewable Energy & Infrastructure Initiatives	Lake & Peninsula Borough	Regional	2023
LiDAR Mapping	Lake & Peninsula Borough	Chignik Lake, Chignik Lagoon, Chignik Bay	2024
Multi-jurisdictional Hazard Mitigation Plan Update - Lake and Peninsula Borough	Lake & Peninsula Borough	Chignik Lake, Chignik Lagoon, Chignik Bay	2015

Document Name	Source	Project Area	Year
National Wetland Inventory – Chignik Subregional Area	U.S. Fish & Wildlife Service	Chignik Lake, Chignik Lagoon, Chignik Bay	2024
Paralytic Shellfish Toxin Results for Chignik Lagoon	Knik Tribe	Chignik Lagoon	2023
Perryville Community Plan	Native Village of Perryville	Perryville	2015
Preliminary Climate Risk Assessment	Chignik Intertribal Coalition	Chignik	2022
Sanitation Facilities Community Plan	ANTHC & City of Chignik Bay	Chignik Bay	2019
Small Community Emergency Response Plan (SCERP) - Chignik Bay	BBNA	Chignik Bay	2023
Small Community Emergency Response Plan (SCERP) - Chignik Lagoon	BBNA	Chignik Lagoon	2023
Superfund Sites (Database)	EPA	Chignik	2023
Tsunami Inundation Maps – Chignik and Chignik Lagoon	ADNR	Chignik Lagoon, Chignik Bay	2016
Tribal Hazard Mitigation Plan - Chignik Bay	BBNA	Chignik Lake	2019
Tribal Hazard Mitigation Plan - Chignik Lagoon	BBNA	Chignik Lagoon	2019
Tribal Hazard Mitigation Plan - Chignik Lake Village	BBNA	Chignik Lake	2019

Data Gaps

This data gaps list comes from recommended areas of further study from other studies in the area, and initial thoughts on data gaps based on conservations with stakeholders at the 2023 Chignik Regional Climate Resiliency Symposium.

1. **Water quality monitoring.** Lack of consistent water quality monitoring within the subwatersheds hinders accurate assessment of pollutant levels and potential impacts on aquatic systems. There is no data for the Chignik area on the Ambient Water Quality Monitoring System (AWQMS) or in the National Water Quality Monitoring Council's Water Quality Portal (NWQMC WQP). Of the approximately 45 streams in the study area, only two are listed in the ADEC's Water Quality Assessment Report and they are designated as Category 3 – Not enough information.
2. **Stream flow measurements.** Existing stream flow data is absent, making it challenging to evaluate water availability and the potential impact of varying flow rates on aquatic habitats and water supplies.
3. **Soil erosion rates.** Precise data on soil erosion is limited to coastal areas, as identified in the Chignik Bay Coastal Hazard Assessment. A comprehensive understanding of erosion-prone areas is lacking, which could lead to difficulties in implementing erosion control measures. Only one stream – Indian Creek in Chignik Bay – is currently being monitored for erosion and only within the last few years, via summer field work by UAF's Alaska Coastal Cooperative.

4. **Coastal erosion rates in Chignik Bay.** The Arctic Coastal Geoscience Laboratory at UAF recently completed a coastal hazard assessment that notes specific gaps in data for monitoring coastal erosion in this region and have field-based data from 2019 to the present day, but no historic baseline data. The following resources or tools are unavailable:
    - Tidal datum
    - Bathymetry
    - Lidar Digital Terrain Model
    - Wave buoys to help develop a storm events index
    - Stream gages to record stream elevation for flood modeling
    - Infrastructure height measurements to assist with flood and tsunami event planning
    - Frequency and severity of flooding to create hazard/exposure maps and recommend building elevation
    - Orthorectified historical aerial imagery
5. **Historic climate data.** Historical climate data provides critical insights into long-term weather patterns, trends, and variations in precipitation and wind. Past plans and reports frequently cite the lack of historic climate data as a common data gap within the area (Chignik Bay Coastal Hazard Assessment, 2023; Climate Resiliency Action Plan, 2023; Tribal Hazard Mitigation Plans, 2019). Without this data, it is challenging to accurately assess how the local climate has changed over time and anticipate future shifts, hindering effective mitigation of the impacts of climate change, such as altered hydrological patterns, increased storm intensity, or shifts in seasons.
6. **FEMA flood maps**. Flood plains are areas adjacent to rivers or streams that are prone to periodic flooding. Flood plains are determined by the Federal Emergency Management Agency through its Flood Insurance Rates Map program. FEMA has not completed any studies in the area to determine the flood hazards, which limits the ability to implement targeted flood mitigation measures, such as levees, riverbank restoration, or flood retention areas. The lack of flood plain mapping also prevents identification of suitable locations for building critical infrastructure development (e.g., wastewater treatment plants, road networks).
7. **Stormwater management**. None of the three communities appear to have stormwater management plans. Chignik Bay has a Sanitation Facilities Community Plan authored by the Alaska Native Tribal Health Consortium in 2019, but it does not include stormwater maintenance or management efforts. The absence of stormwater information creates data gaps in rainfall patterns, runoff volumes, and flow velocities. It also underscores the lack of water quality assessments in the study area, which is the main way to identify nonpoint source pollutants in the water system. Stormwater information would also include infrastructure inventories, such as retention ponds, culverts, or storm drains, which help manage and control runoff. Knowledge of the existing infrastructure is crucial for assessing changes in land use patterns, system capacity

and conditions, and potential sources of pollutants.

8. **Invasive and Non-invasive plant inventory & monitoring.** There is a lack of comprehensive data on the presence and spread of invasive and non-invasive species of plants, making it challenging to assess impacts on water quality and water flow rates (IGAP Proposal, 2011). One inventory was conducted in 2013 by the Western Alaska Landscape Conservation Cooperative, which noted invasive species risks near all three communities. The US Fish and Wildlife Service, which manages the Alaska Peninsula Wildlife Refuge, has not completed any invasive plant surveys in the study area (Alaska Region Terrestrial Invasive Plant Management Strategy, 2022).

Photo provided by Zita Andrews, taken by Stephen Price.

FIGURE 14. ALDER OVERGROWTH AT CHIGNIK LAKE

9. **Landfill, dump site, and tank farm assessments.** All three communities within the study area have active and inactive private or municipal landfills, dumpsites, and tank farms (SWIMS, 2023). The landfills each have Waste Erosion and Assessment Review (WEAR) reports and in 2024, Landfill Inspection reports were provided with inspection scores and related recommendations. However, there have been no detailed assessments completed of current landfills or the abandoned dumpsite at Chignik Lake (IGAP Proposal, 2011; Chignik Climate Resilience Symposium, 2023). Without more thorough assessments, there is a lack of information regarding the presence of contaminants that may be leaching from the sites into the watershed. It is also unknown where contaminants may be leaching from and the rate at which it may be occurring.

CHAPTER 4: ACTION PLAN

The **Action Plan** serves as the implementation roadmap for the Chignik Subregional Watershed Plan, outlining priority strategies and actions designed to safeguard water resources while addressing key environmental challenges. Each strategy is broken down into actionable steps, including responsible parties, timelines, estimated costs, and potential funding sources to ensure effective implementation.

The action plan is designed to be a **living document**, adaptable as new data, funding opportunities, and community priorities emerge. By following this structured approach, stakeholders can take measurable steps toward protecting the Chignik watershed for future generations.

Prioritization of Strategies

While all strategies identified in this plan support watershed health, **priority strategies** were selected based on their **alignment with existing community plans**, their **strong stakeholder support**, and their **ability to meet watershed plan criteria**. These priority strategies focus on immediate, high-impact interventions that address pressing water quality concerns and ecosystem restoration efforts. Beyond these top-tier priorities, the plan also includes **additional strategies** that support long-term watershed resilience.

Examples of the Guiding Principles in Action

- *The Chignik Intertribal Coalition maintains a Data Management Plan that establishes standards for accessing, sharing, distributing, and preserving data.*
- *The Bristol Bay Native Corporation will be hosting a culture camp in Chignik Bay in summer 2025, inviting young people to discover and learn about the traditions and natural resources.*

Guiding Principles

Guiding principles are the foundational values that shape our approach to protecting the Chignik watershed. These principles were developed based on input at the 2024 Chignik Regional Resiliency Symposium. They provide a framework for decision-making, ensuring that strategies and actions align with community values for watershed sustainability and resilience. These principles should be considered during implementation of all the strategies that follow.

A

Tell Our Story

Honor our history, evolution, and cultural values by prioritizing community voices, preserving traditional knowledge, and strengthening advocacy for watershed health.

B

Prioritize Youth Voices

Actively engage and empower young people in the watershed protection process to ensure their perspectives, ideas, and leadership shape the future.

C

Integrate Local Economies

Align watershed protection with sustainable economic opportunities by supporting workforce development and value-added industries.

D

Protect Data Sovereignty

Data collected within the watershed remains under local control, and may require agreements ensuring secure management, transparency, and cultural respect.

E

Foster Collaborative Governance

Adapt successful governance models to foster shared responsibility, broaden partnerships, and strengthen community connections to find regional solutions.

Priority Strategy A: Establish mitigation programs for alder overgrowth.

Benefits to the watershed:

Removing overgrown alders helps restore native plant species that play a critical role in stabilizing soil, reducing erosion, and filtering runoff before it reaches waterways, thus improving water quality. Native vegetation also supports diverse ecosystems that depend on healthy watersheds, including areas for traditional uses like berry picking and subsistence hunting. By reestablishing other native species, the strategy enhances both ecological balance and the watershed's natural ability to maintain clean, healthy water systems.

What are the actions to make progress on this priority?	Who?	Target timeframe	Estimated cost	Potential funding sources
1. Use new LiDAR, historic imagery, and remote sensing data to assess alder overgrowth areas and quantify change. Document changes in berry patches through local observations and remote sensing.	Lead: All Chignik Communities Potential Partners: ACC, Lake & Peninsula Borough	2025-2026	$0 LiDAR (already complete) Est. $10K-20K for Analysis	LiDAR provided by Lake & Peninsula Borough and Alaska Coastal Cooperative; Analysis through the ACC ACTION Project
2. Incorporate alder clearing along landfill access routes into IGAP funding requests to the EPA.	Lead: All Chignik Communities	2026-2027	TBD, costs based on acreage	Alaska Native Tribal Health Consortium Solid Waste and Resilience Program (Up to $75K)
3. Clear alders along roadways and trails where there is a public safety concern. Ensure the desired roads/trails to be cleared are recorded in the Tribe's inventory prior to removal to incorporate Bureau of Indian Affairs Tribal Transportation Program (BIA TTP) funds. ACC is mapping the trail network in Chignik Bay.	Lead: All Chignik Communities Potential Partners: BBNA Forestry, Far West	2026-2027	TBD	Bristol Bay Native Association (BBNA) Forestry Program, BIA TTP, ADEC Thriving Communities grant
4. Identify areas along streambanks in need of restoration and include plans to replace some alder with a variety of native plants that will capture and filter runoff pollution before it enters waterways and shade the stream to help moderate water temperature for aquatic life.	Lead: All Chignik Communities Potential Partners: BBNA Forestry	2026-2027	TBD	BBNA Forestry Program, Alaska Venture Fund
5. Develop longer-term work plan to address alder growth and regrowth throughout the subregion. Consider the riparian benefits of alders; ways to mitigate erosion caused by removal; identify long-term interventions such as controlled burning; and alder disposal (e.g., woody debris, incinerator, value-added products).	Lead: All Chignik communities Potential Partners: BBNA Forestry, Far West	2027-2029, ongoing	TBD	BBNA Forestry Program, Alaska Venture Fund, Others[14]
HUC10 Locations: Chignik Bay-Frontal Pacific Ocean – 1902070215; Chignik River – 1902070214; Alec River-Black Lake – 1902070213				

[14] See Alaska Department of Fish and Game Resources at: https://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.funding

Priority Strategy B: Improve stock assessment and monitoring of salmon populations.

Benefits to the watershed:

Healthy salmon populations depend on clean, well-oxygenated water, free of excess sediment and pollutants, aligning with EPA watershed planning goals to protect aquatic habitats. Salmon are essential to the Chigniks for subsistence, cultural, and economic reasons, but their numbers have been declining. By focusing on salmon monitoring, this strategy supports adaptive management efforts that safeguard water quality while preserving key species integral to both ecological balance and cultural heritage. This strategy is intended to build on historical research for Black Lake. Emerging technologies such as drones could be used to help implement some of the actions below.

What are the actions to make progress on this priority?	Who?	Target timeframe	Estimated cost	Potential funding sources
1. Continue to implement the multi-year salmon escapement enumeration and quality project using Artificial Intelligence for enumeration and species identification at the Chignik Weir.	Lead: Chignik Intertribal Coalition Potential Partners: Chignik Regional Aquaculture Association, ADF&G, USFWS	Ongoing annually through 2028	$65K-$175K per year per weir[15]	Tribal Wildlife Grants | U.S. Fish & Wildlife Service National Fish and Wildlife Foundation (NFWF) grant National Oceanic & Atmospheric Administration (NOAA) Pacific Coastal Salmon Recovery Fund
2. Use environmental DNA to test for presence and absence of salmon and presence of invasive species, like crayfish.	Lead: Chignik Intertribal Coalition Potential Partners: Alaska Coastal Cooperative (ACC)	2026-2027	$500 per freshwater site per day[16]	Partners for Fisheries Monitoring Program through the Department of the Interior (Requires Tribal Partner) NOAA Citizen Science for Improved Stock Assessments and Climate-Ready Fisheries Management

[15] Per KAI Consulting: Traditional weir projects with a field crew everyday cost about $135-175K in Southeast Alaska. Video weir monitoring can cost less, at $95K start-up (includes equipment) and $65-75K operating. Both styles projects depend on remoteness.

[16] Assumes high estimate of sampling, site setup, and lab testing. Does not include travel. Source: *Assessing the cost-efficiency of environmental DNA sampling,* Adam S. Smart, Andrew R. Weeks, Anthony R. van Rooyen, Alana Moore, Michael A. McCarthy, Reid Tingley, 2016.

3. Establish a Chinook (King Salmon) Avoidance Program.	Lead: Chignik Intertribal Coalition Potential Partners: Chignik Regional Aquaculture Association, Alaska Coastal Cooperative	2026-2027	TBD, Depends on program design	Tribal Wildlife Grants | U.S. Fish & Wildlife Service Bycatch Reduction Engineering Program (BREP)
4. Install research and data sensing buoys around the area. University of Washington is monitoring water temperatures in Black Lake and Chignik Lake; no monitoring has occurred yet in Chignik Lagoon or the Bay. Need to identify buoy locations.	Lead: Alaska Coastal Cooperative Potential Partners: University of Washington	2025-2029	TBD	Tribal Wildlife Grants | U.S. Fish & Wildlife Service Transformational Habitat Restoration and Coastal Resilience Grants (NOAA)
5. Add anadromous streams to Alaska Department of Fish & Game (ADF&G) Anadromous Waters Catalog (AWC); update fish distribution for identified streams and known species. (with BBHLT). LiDAR can hopefully help support this effort.	Lead: Chignik Intertribal Coalition, Chignik Regional Aquaculture Association), Alaska Coastal Cooperative Potential Partners: Alaska Coastal Cooperative	2025-2029	Approx. $60,000[17]	State of Alaska Southeast Sustainable Salmon Fund (SSSF) Pacific Coastal Salmon Recovery Fund (NOAA)
6. Compile and share data collection efforts to date (including traditional ecological knowledge); ensure data sovereignty objectives are considered in current and future data collection efforts.	Lead: Chignik Intertribal Coalition Potential Partners: Alaska Coastal Cooperative (ACC)	2025, Ongoing	TBD	Coastal Habitat Restoration and Resilience Grants for Tribes and Underserved Communities (NOAA)
HUC10 Locations: Chignik Bay-Frontal Pacific Ocean – 1902070215; Chignik River – 1902070214; Alec River-Black Lake – 1902070213				

[17] Based on costs for a similar project in Southeast Alaska, a partnership between a Tribe and the Nature Conservancy via a grant was through State of Alaska Southeast Sustainable Salmon Fund (SSSF). Expenses included contracted project management for crew training and a crew leader, as well as 2 local field technicians for 8 weeks of field work. Project management included AWC submission paperwork.

Priority Strategy C: Complete a drainage map and stormwater management plan for the community of Chignik Bay.

Benefits to the watershed:

Proper stormwater management reduces runoff carrying sediment, nutrients, and contaminants into streams, aligning with EPA watershed planning objectives to protect aquatic habitats. This strategy not only improves water quality but also helps safeguard the community's fisheries and subsistence resources, ensuring long-term ecological and cultural sustainability.

What are the actions to make progress on this priority?	Who?	Target timeframe	Estimated cost	Potential funding sources
1. Procure funding and develop partnerships with lead agencies and community stakeholders.	Lead: Chignik Bay Tribal Council Potential Partners: City of Chignik	2024-2025	$222,435 (applies to actions 1-4)	Alaska Department of Environmental Conservation (DEC) Alaska Clean Water Action (ACWA) grant (Applies to actions 1-4) U.S. Fish & Wildlife Service Tribal Wildlife Grants: here
2. Create a request for proposals (RFP), solicit bids, and select a qualified engineering firm.	Lead: Chignik Bay Tribal Council Potential Partners: City of Chignik	2025		Potential technical assistance through EPA's Technical Assistance to Brownfields program, administered in Alaska via the Center for Creative Land Recycling
3. Develop a drainage map for the community. Include site assessment mapping for old or current landfills in Chignik Bay that may not be captured by ADEC (e.g. the Alaska Packers Cannery area from 1976; the site where ANTHC stayed while doing a water project). The community has many old dumpsites and industrial areas that are not adequately documented. The need to understand areas with contamination and runoff concerns has become especially pressing now that the former Trident properties in Chignik Bay have recently been transferred to the City. Many of these areas are covered with water during high tides and storm events. ANTHC has also uncovered debris while digging for utilities.	Lead: Chignik Bay Tribal Council Potential Partners: City of Chignik	2025-2026		

4. Develop a draft stormwater management plan for the community, integrating community goals and the drainage map and site assessments.	Lead: Chignik Bay Tribal Council Potential Partners: City of Chignik	2027		
5. Use the stormwater management plan's best management practices (BMPs) to develop policies that will mitigate or protect watershed resources during development projects. BMPs may include green stormwater infrastructure to capture and treat runoff, reduce erosion, and mitigate flooding. Further actions may be added to include installation of green infrastructure.	Lead: Chignik Bay Tribal Council Potential Partners: City of Chignik	2027, ongoing	TBD based on stormwater management plan recommendations	U.S.D.A. Rural Development Solid Waste Management grants: here
HUC12 Location: Chignik Bay-Frontal Pacific Ocean - 190207021505				

Priority Strategy D: Clean Up contaminated sites in Chignik Lake.

Benefits to the watershed:

Cleaning up contaminated sites prevents pollutants from leaching into groundwater and surface waters. This strategy not only protects the community's drinking water and fisheries but also supports the long-term ecological integrity and cultural practices tied to the watershed.

What are the actions to make progress on this priority?	Who?	Target timeframe	Estimated cost	Potential funding sources
1. Develop partnerships with lead agencies and community stakeholders for site assessments. Create and implement a community outreach plan to communicate about the project, and mitigation efforts.	Lead: Chignik Lake Community Potential Partners: Alaska Community Action on Toxics	2025	$6,000[18]	Alaska Native Claims Settlement Act (ANCSA) Contaminated Lands Assistance Program (EPA) U.S. Fish & Wildlife Service Tribal Wildlife Grant Program
2. Complete site assessments of known contaminated sites and undocumented sites. Include (a) the abandoned dumpsite adjacent to critical fish habitat (lake/river), which is near the current landfill; (b) hazardous waste, alder overgrowth at the current dumpsite; (c) the old sewage site near the new school; and (d) other areas prone to flooding. The site assessments will identify potential cleanup options and cost estimations. Action includes creating a request for proposals (RFP), soliciting bids, and selecting a qualified engineering firm to complete site assessments. Engaging with landowners will take place before any activity such as alder clearing.	Lead: Chignik Lake Community Potential Partners: Alaska Community Action on Toxics	2026-2027	$200K[19]	U.S.D.A. Rural Development Solid Waste Management Grant Program Potential technical assistance through EPA's Technical Assistance to Brownfields program, administered in Alaska via the Center for Creative Land Recycling State of Alaska Revolving Loan Fund Program

[18] Assumes 40 hours of work to be performed at a rate of $40/hr plus fringe benefits.

[19] Assumes contractual site sampling a mapping work.

3. Procure other funding and perform cleanup and mitigation efforts, as determined by the site assessments.	Lead: Chignik Lake Community Potential Partners:	2027-2030, ongoing	TBD based on site assessment findings	Contaminated Alaska Native Claims Settlement Act (ANCSA) Lands Assistance Program (EPA) BBNA has done some preliminary assessments) Alaska Native Tribal Health Consortium Solid Waste and Resilience Program (Up to $75K)
4. Implement recommendations identified in the October 2024 Chignik Lake Landfill Inspection Report, including a) purchase a new burn unit, b) brush cutting around the landfill, c) acquire dedicated heavy equipment for managing the landfill; d) establish policies around disposal of animal carcasses and subsistence waste; e) establishing a collection area for future backhaul items; f) participate in regular solid waste trainings; and g) review and update the landfill operations plan and site map at least yearly.	Lead: Chignik Lake Community Partners: Alaska ADEC, Solid Waste Program	Ongoing	Varies	View ADEC's solid waste funders list for potential solid waste project funding opportunities: click here
HUC12 Location: Chignik Lake-Chignik River - 190207021409				

Priority Strategy E: Initiate water quality monitoring in locations around Chignik Lagoon to identify areas of concern and prioritize next steps.

Benefits to the watershed:

The infrastructure in Chignik Lagoon – fuel storage, power systems, water, sewer – is aging and showing signs of disrepair. In particular, the community has concerns about leaking sewage and contamination around the landfill. Much of Chignik Lagoon's infrastructure is located right next to the lagoon beach. The community would like to conduct water quality testing at sites around the community, including creeks and in the lagoon itself. This baseline data will help the Tribe and community partners understand which areas have water quality concerns that need to be addressed immediately, and to track changes over time to ensure pollutants are not leaching into waterways in the future.

What are the actions to make progress on this priority?	Who?	Target timeframe	Estimated cost	Potential funding sources
1. Identify priority sites, conduct baseline water quality testing, and train IGAP coordinators on taking samples, potentially via the free technical assistance provided by Zender Environmental Group. Identify the measurable water quality goals, including the appropriate water quality standards and designated uses. Include development of a Quality Assurance Project Plan (QAPP) to define methods, parameters, equipment, goals, and data requirements.[20]	Lead: Chignik Lagoon Village Council Potential Partners: Zender Environmental Group; ADEC Water Quality Program	2025	Technical assistance is free to Tribes	U.S. Department of Agriculture Rural Development funds the technical assistance; ADEC ACWA grants
2. Incorporate water quality sampling into the work plan for future IGAP funding requests to the Environmental Protection Agency (EPA) so Tribal staff can collect and process water quality samples on a regular basis.	Lead: Chignik Lagoon Village Council Potential Partners: Zender Environmental Group, Bristol Bay Native Association; ADEC Water Quality Program	2025	TBD	EPA IGAP funds
3. Use water quality data to identify areas of concern and help prioritize capital improvements. Identify the causes and sources or groups of similar sources that need to be controlled to achieve the water quality standards. If possible, estimate pollutant loads entering the waterways and determine the pollutant load reductions needed to meet the water quality goals.	Lead: Chignik Lagoon Village Council Potential Partners: Zender Environmental Group, Alaska Native Tribal Health Consortium	ongoing	Varies	DEC ACWA grants

[20] ADEC resources on quality assurance and QAPP templates can be found at: https://dec.alaska.gov/water/water-quality/quality-assurance/

4. If sample results show exceeding pollutant loads, develop measurable milestones to determine if progress is being made towards attaining state water quality standards.	Lead: Chignik Lagoon Village Council Potential Partners: Zender Environmental Group, Alaska Native Tribal Health Consortium	ongoing	Varies
HUC12 Location: Chignik Bay-Frontal Pacific Ocean - 190207021504			

Other Strategies by Lead Organization

The following is a list of other strategies identified by stakeholders through the course of the project. Strategies may be re-prioritized, revised, removed, or added as necessary during annual reviews of the plan.

Alaska Coastal Cooperative

Emerging Priority Strategies	Assessment	Prevention	Mitigation	Evaluation	Time to Complete?	URGENT?	Black Lake	Chignik Lake	Lagoon + Bay	Partners ?
A. In Chignik Bay, monitor the erosion occurring at the bank of Indian Creek Bridge using the water level gauge installed in 2022.	X			X					X	
B. Establish baseline data for water temperature of priority anadromous streams and rearing grounds.	X			X			X	X	X	
C. To improve predictions regarding erosion flood events in Chignik Bay streams and shorelines, install water level gauges, collect nearshore single or multibeam bathymetry, and collect ground control and check points.	X								X	
D. Use bathymetric data to determine shellfish areas.	X								X	

Other Potential Strategies

E. Document dynamic movement of fish.	X						X	X	X	
F. Identify traditional uses within the watershed to help prioritize areas and/or prevent or mitigate harm from threats to the watershed.	X	X	X				X	X	X	

Lake and Peninsula Borough

Emerging Priority Strategies	Assessment	Prevention	Mitigation	Evaluation	Time to Complete?	URGENT?	Black Lake	Chignik Lake	Lagoon + Bay	Partners ?
G. Upgrade water distribution system in Chignik Bay.		X							X	
H. Upgrade water intake infrastructure in Chignik Lagoon and repair water service lines.			X						X	Chignik Lagoon Village Council

Chignik Intertribal Coalition

Emerging Priority Strategies	Assessment	Prevention	Mitigation	Evaluation	Time to Complete?	URGENT?	Black Lake	Chignik Lake	Lagoon + Bay	Partners ?
I. Develop and implement tissue sampling program to monitor heavy metals in salmonids and other key subsistence or commercial species.	X			X			X	X	X	
J. Identify spawning and nursing grounds for Kings.	X						X	X		

Chignik Bay

Chignik Bay Tribal Council

Emerging Priority Strategies	Assessment	Prevention	Mitigation	Evaluation	Time to Complete?	URGENT?	Black Lake	Chignik Lake	Lagoon + Bay	Partners ?
K. Address coastal bank erosion threatening the clinic in Chignik Bay.		X	X			X			X	City of Chignik; Borough
L. In Chignik Bay, transport and install the new incinerator at the landfill for fire mitigation, landfill life extension, and to reduce leachate.		X							X	City of Chignik; Borough

City of Chignik

Emerging Priority Strategies	Assessment	Prevention	Mitigation	Evaluation	Time to Complete?	URGENT?	Black Lake	Chignik Lake	Lagoon + Bay	Partners ?
M. Reduce contaminates from road dust by resurfacing roads, enforcing slower speed limits, and/or purchasing a water truck.		X	X			X			X	City of Chignik; Borough
N. Complete community sanitation infrastructure projects in Chignik Bay to repair station #5 controls, complete the access trail to the reservoir, and other related improvements.		X	X						X	City of Chignik; Borough
O. In Chignik Bay, address landfill leachate.	X	X	X						X	

Other Potential Strategies

P. Designate holding area for heavy equipment.		X						X	X	

Q. Conduct water quality monitoring, including cruise ship effluent in the bay and monitoring at the boat harbor.				X					X	

Chignik Lagoon / Chignik Lagoon Village Council

Emerging Priority Strategies	Assessment	Prevention	Mitigation	Evaluation	Time to Complete?	URGENT?	Black Lake	Chignik Lake	Lagoon + Bay	Partners ?
R. Repair septic systems in Chignik Lagoon.	X	X	X						X	Borough

Other Potential Strategies

S. Improve road access to the active landfill site.		X							X	Borough
T. In Chignik Lagoon, repair road and pathways on fuel distribution routes.		X							X	Borough
U. Address/remove abandoned barge in Chignik Lagoon. Could do lead testing? ADEC has plans to visit Ugashik to do lead testing of their abandoned vessel.										

Chignik Lake / Chignik Lake Village Council

Emerging Priority Strategies	Assessment	Prevention	Mitigation	Evaluation	Time to Complete?	URGENT?	Black Lake	Chignik Lake	Lagoon + Bay	Partners ?
V. Upgrade the water tower and build a new pump house to supply more pressure to fire hydrants.		X						X		Borough
W. In Chignik Lake, maintain & improve oil collection program.		X						X		

Other Potential Strategies

X. Replace water plant.		X	X					X		Borough
Y. Update and improve drainage features as needed in the community.		X	X					X		
Z. Continue to work with Alaska Rural Utility Collaborative (ARUC) to develop a sustainable and safe water system.		X						X		

All Communities (No Lead Assigned)

Emerging Priority Strategies	Assessment	Prevention	Mitigation	Evaluation	Time to Complete?	URGENT?	Black Lake	Chignik Lake	Lagoon + Bay	Partners ?
AA. Implement a program to prevent bears from getting into dumpsters and trash bins.		X						X	X	
BB. Inventory location and ownership of derelict buildings and vessels, old equipment storage, fuel storage, and old cannery sites where contamination may be more likely to occur or is occurring. Demo abandoned buildings and investigate brownfield repurposing.	X	X	X					X	X	
CC. Establish baseline water quality data collection system.	X			X				X	X	
DD. Work with landowners to demolish and clean up abandoned homes in the flood zone.		X	X					X	X	
EE. Plant new vegetation and invest in reinforcement projects that prevent and mitigate stream and shore erosion.		X	X					X	X	
FF. Implement various improvements to solid waste management: Separate burnable and non-burnable wastes, eliminate open burning whenever possible, ensure all dumpsters have lids and that dump areas are fenced; using spill guards to prevent oil leak contamination, maintain landfill signs, encourage backhauling, and continue to implement the IGAP recycling program.		X	X					X	X	*(Tribal Entity Needed)*
GG. Establish, monitor, improve existing commercial fishing waste disposal system (e.g., for byproducts like fish carcasses).		X	X					X	X	
HH. Create a residential fuel tank inspection and repair program.		X						X	X	
II. Mitigate flooding, especially at contaminated sites.			X					X	X	
JJ. Establish shellfish testing program for bivalves at risk for saxitoxin contamination, which can lead to paralytical shellfish poisoning.	X			X					X	*(Tribal Entity Needed)*
KK. Participate in BBNA's Brownfield's Program for contaminated sites with potential for redevelopment. Sites that may be eligible are (Chignik Bay) #1 School Road, Southern Chignik's Tank Farm, Trident Seafoods, (Chignik Lake) Tank Farm, Fuel Transfer Area, and the Water Line Upgrade Area; (Chignik Lagoon) Old cannery across from village and CLNC lands site and old landing craft area near main village site.			X					X	X	*(Tribal Entity Needed)*

Other Potential Strategies

LL. Development, outreach, education, and implementation of spill response program.		X						X	X	
MM. Establish development setbacks from riparian areas.		X						X	X	
NN. Develop water quality monitoring plan to determine if there are impacts from current landfill operations.	X			X				X	X	
OO. Acquire conservation easements to protect uplands and riparian areas from development.		X					X	X	X	
PP. Set up system to divert water to priority salmon streams in times of drought.			X				X	X	X	
QQ. Establish stormwater protection standards for new developments or maintenance of existing infrastructure.		X						X	X	
RR. Map trails in the area and distinguish between motorized (ATV) and non-motorized use; improve enforcement of motorized use in areas designated non-motorized.	X	X	X					X	X	

Suggested Strategies Not Included

Below are suggested strategies that were not included because they either do not directly address a watershed-specific threat or they were identified by a source outside of the subregion.

- Create a parks and recreation department and build boardwalks and viewing decks.
- Create an Inupiaq Language Commission.
- Collect data on instream habitat and functions to determine if any instream restoration efforts are warranted.
- Acquire firefighting equipment and create a volunteer fire fighting program in Chignik Bay.

Chignik Subregional Watershed Plan

List of Appendices

Appendix A: Acronyms	***Page 2***
Appendix B: Public Involvement Plan	***Page 4***
Appendix C: Chignik Regional Resiliency Symposium Summary, June 2024	***Page 6***
Appendix D: Chignik Regional Climate Resiliency Symposium Summary, June 2023	***Page 41***
Appendix E: Project At-A-Glance Summary	***Page 75***
Appendix F: Project Flyer	***Page 77***
Appendix G: Bristol Bay Leadership Forum Presentation, December 2023	***Page 79***
Appendix H: Plan Review	***Page 101***

Appendix A: Acronyms

Chignik Subregional Watershed Plan

ACC	Alaska Coastal Cooperative
ACTION	The ACTION Project (also referred to as 'AC^{3}TION'), funded by NSF and led by the ACC
ACGL	Arctic Coastal Geoscience Lab
ACWA	Alaska Clean Water Actions
ADEC	Alaska Department of Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AFE	Alaska Forum on the Environment
ANC	Alaska Native Corporation
ANCSA	Alaska Native Claims Settlement Act
ANTHC	Alaska Native Tribal Health Consortium
ARUC	Alaska Rural Utility Collaborative
AWC	Anadramous Waters Catalog
AWQMS	Ambient Water Quality Monitoring System
BIA	Bureau of Indian Affairs
BBAHC	Bristol Bay Area Health Corporation
BBHLT	Bristol Bay Heritage Land Trust
BBNA	Bristol Bay Native Association
BBNC	Bristol Bay Native Corporation
BESC	Bristol Engineering Services Company
BLM	Bureau of Land Management
BMPs	Best Management Practices
BOF	Alaska Board of Fisheries
BREP	Bycatch Reduction Engineering Program
CBTC	Chignik Bay Tribal Council
CCLR	Center for Creative Land Recycling
CIC	Chignik Intertribal Coalition
CRAA	Chignik Regional Aquiculture Association
DCRA	Alaska Division of Community and Regional Affairs
DEC	Alaska Department of Environmental Conservation
DOI	U.S. Department of the Interior
DNR	Alaska Department of Natural Resources
DOT&PF	Alaska Department of Transportation and Public Facilities
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GGS	Geological & Geophysical Surveys Division; Alaska Department of Natural Resources
HUC	Hydrological Unit Codes
IGAP	Indian Environmental General Assistance Program
LiDAR	Light Detection and Ranging
LPB	Lake and Peninsula Borough
MSY	Maximum Sustained Yield (greatest annual average yield from a fish stock)
NFWF	National Fish and Wildlife Foundation
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service (USDA division)
NSF	National Science Foundation
NWALT	Northwest Arctic Leadership Team

NWI	National Wetlands Inventory
NWQMC	National Water Quality Monitoring Council
PER	Preliminary Engineering Report
RFP	Request for proposals
QAPP	Quality Assurance Project Plan
SCERP	Small Community Emergency Response Plan
SPAR	Spill Prevention and Response
SSSF	Southeast Sustainable Salmon Fund
STEAM	Science, Technology, Engineering, Art, Math
STEM	Science, Technology, Engineering, Math
SWIMS	Solid Waste Information Management System
SWMP	Stormwater Management Plan
TCR	Tribal Climate Resilience (EPA program)
TCTAC	Thriving Communities Technical Assistance Centers (EPA program)
TEK	traditional ecological knowledge
TMDL	Total Maximum Daily Load
WEAR	Waste Erosion Assessment and Review
WQP	Water Quality Portal
UAA	University of Alaska Anchorage
UAF	University of Alaska Fairbanks
USACE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UW	University of Washington

Appendix B: Public Involvement Plan

updated March 2024

What is the project purpose?

Through an Alaska Clean Water Action grant from the Alaska Department of Environmental Conservation, the Chignik Bay Tribal Council is preparing a subregional watershed plan for the Chignik subregion. The plan will summarize information about the watershed, identify and prioritize projects to support watershed health, and empower local management in protecting and promoting water resources in the subregion.

What is the purpose of the public involvement plan?

This public involvement plan (PIP) outlines the project team's approach for engaging with residents and stakeholders to develop a watershed plan that meets the needs of Chignik subregion community members and partners. The PIP identifies stakeholders, outreach activities, communication tools, an outreach schedule, and key questions to consider throughout the planning process.

Who are the key stakeholders?

Community leaders, Elders, environmental coordinators, and residents of the following communities	**Community organizations**

• Chignik Bay
• Chignik Lagoon
• Chignik Lake
• Ivanof Bay
• Perryville
	• Spring '24: Chignik Intertribal Coalition (CIC)
	• Spring '24: Chignik Regional Aquaculture Association (CRAA)
	• To convene if needed after meeting with CIC and CRAA above (they all have representatives who participate):
	  o Chignik Lagoon Native Corporation
	  o Far West Native Corporation
	  o Oceanside Native Corporation
	  o Chignik River Limited
	  o Bayside Corporation

Regional organizations *(15-minute presentations)*	**Research and agency partners** *(email list, potentially interview key contacts)*
• March 2024: Bristol Bay Area Health Corporation (Sharing update as part of report out during BBAHC annual meeting on 3/7/24) • Spring 2024: Bristol Bay Heritage Land Trust • Spring 2024: Bristol Bay Native Association (board meets in March and September; next meeting March 19th – 22nd in Anchorage) • Spring 2024: The Conservation Fund Alaska Office	**Done** • Artesian Knowledge LLC - interviewed **Priority** • Lake and Peninsula Borough (interview with staff, also share a Borough update, see also Deerstone update) **Others to keep informed** • Alaska Sea Grant • Knik Tribe (Paralytic Seafood Poisoning testing) • University of Alaska Fairbanks Arctic Coastal Geoscience Lab and Alaska Coastal Cooperative • University of Washington School of Aquatic and Fishery Science

What outreach strategies will be used?

- **Chignik Regional Climate Resiliency Symposium (June 2023):** listen, share, and learn from participants at this annual gathering. At the 2023 symposium, participants shared and discussed research findings, gathered community input on environmental priorities, and catalyzed information sharing between partners working on related topics in the subregion.
- **Small group conversations (varying dates – see below)**: much like the existing organizational meetings above, we will take advantage of gatherings where community members and partners will already be in attendance and schedule adjacent project conversations to gather input and share emerging findings. A preliminary list of meetings that could guide the scheduling of small group conversations includes:
    - Bristol Bay Leadership Forum: December 7-8, 2023 – **completed (full forum presentation, plus interactive breakout)**
    - Alaska Forum on the Environment: Feb. 5-9, 2024 – **held a meeting alongside AFE with Chignik subregional participants; presented a short project update as part of an existing EPA session**
- **Existing Community and Organizational Meetings (ongoing):** When appropriate, we will connect with, ask to join a meeting agenda, and accept invitations from existing organizational meetings either in person or remotely to get input on and emerging strategies and priorities for the watershed plan. A preliminary list of meetings we will consider include:
    - Chignik Intertribal Coalition meeting (CIC)
    - Chignik Regional Aquaculture Association (CRAA)
- **Interviews (Spring 2024)**: conduct up to 12 interviews with partner organizations and key stakeholders to identify issues, opportunities, and project ideas for inclusion in the watershed plan. These interviews will help the project team gain an understanding of whether and how the watershed has changed over time and to identify historic pollutant sources that may not be accessible in public databases.
- **Community visit (June 2024):** We will travel to the community to meet with community residents in person. Many residents only live in the region seasonally; therefore this visit will coincide with the June 6-8, 2024 Chignik Resiliency Symposium. This visit will likely include day trips to adjacent communities and/or a shared meeting with representatives from each community attending. A key element of this visit will be to identify and apply criteria to determine how to evaluate and prioritize the relative importance of different recommendations and project ideas.
- **E-newsletter (ongoing):** We will develop and send up to five e-newsletters for consistent and efficient project communications with community members and stakeholders.
- **Website (ongoing):** We will create and host a simple project website for sharing links to relevant related plans, posting updates, and sharing draft plan materials.
- **Outreach tools (ongoing):** such as a project flyer, presentation slides, social media outreach, and more to encourage resident and partner participation in the planning process.

Appendix C: Chignik Regional Resiliency Symposium Summary, June 2024

2024 CHIGNIK REGIONAL Resiliency Symposium

Symposium Summary

June 6 – 8th, 2024, Chignik Bay, Alaska

Coordinated and hosted by Chignik Bay Tribal Council, Agnew::Beck Consulting, and Flensburg Consulting

Thank you to the following organizations for supporting the Symposium:

Alaska Department of Environmental Conservation (ADEC) Alaska Clean Water Actions (ACWA)
Alaska Native Tribal Health Consortium
Chignik Bay Tribal Council
Paul G. Allen Foundation/VULCAN
National Science Foundation
University of Alaska Fairbanks
Environmental Protection Agency (EPA) Indian Environmental General Assistance Program (IGAP)

THANK YOU

to everyone who participated and *Chignik subregion residents*

to the Chignik Bay Tribal Council

to the City of Chignik Bay

to Partners & Presenters

and to our Chignik Bay hosts

Save the Date for the 4th Annual

2025 Chignik Regional Resiliency Symposium!

Tentatively scheduled for the third week of June, 2025

Table of Contents

Overview 4
Symposium Purpose 4
Key Takeaways 4
Outcomes 4
Acronyms 5
June 6 (Thursday) Presentation Highlights 6
Welcome & Agenda Overview 6
Advancing Resilience in Indigenous Communities through Community Driven Science, Technologies, and Capacity Building 6
Chignik Intertribal Coalition (CIC), Chignik Regional Aquaculture Association (CRAA) 9
UW Alaska Salmon Program 10
UAF Department of Fisheries and Ocean Science: Update on 2018 Disaster Research 10
Center for Creative Land Recycling: Brownfield Basics 11
GreenStar Community Assessments: Chignik Lake, Chignik Lagoon, and Chignik Bay 12
Lake and Peninsula Borough: Capital Projects Update 12
June 7 (Friday) Presentation Highlights 13
Socioeconomic Impacts of Fishery Disasters on Chignik Region Subsistence Users 13
Chignik Subregional Watershed Plan 15
June 8 (Saturday) Presentation Highlights 21
Chignik Bay Tribe and the City of Chignik Bay with Bristol Engineering: Overview of Projects 21
National Science Foundation: ACTION Project – Alaska Coastal Cooperative for Co-producing Transformative Ideas and Opportunities in the North 22
Closing Comments 24
Appendices 25
Symposium Evaluations 26
Symposium Flyer 28
Symposium Agenda 29
Attendee List 33
List of Presentations/Attachments (hyperlinked) 35

Overview

Symposium Purpose

- Share progress and findings from regional research and planning projects.
- Convene researchers and community members to identify missing information and discuss emerging solutions to increase the region's ability to respond to change.
- • Work together to identify what next steps are most important.

Key Takeaways

- Creating more opportunities for youth involvement, transfer of knowledge and culture, youth participation, and youth leadership was a top theme that resonated in all sessions.
- The Symposium highlighted the continuing need to collaborate with partners and neighbors. There was a hope that next year's Symposium can include more residents for the Chignik Subregion, not just Chignik Bay.
- Research and data collection is key to fine tuning fisheries regulations, best practices, and resilience during fisheries disasters.

Outcomes

Immediately following the symposium, participants took the following actions:

- Hosting a Family Culture Camp in Chignik Bay (Alaska Coastal Cooperative).
- Completing LiDAR imagery for Chignik communities (Lake and Peninsula Borough).
- Launching the "Chignik Forever" mini feature film (Alaska Coastal Cooperative).
- Finalizing a Community Plan for Chignik Bay that will be adopted in 2025 (City of Chignik Bay, Chignik Bay Tribal Council, and Far West).
- Submitting a resolution for Alaska Tribal Spectrum's BIA application to install solar panels for 26 tribally owned homes (Chignik Bay Tribal Council).
- Completing a preliminary engineering report for the bridge and road to the dump site in Chignik Bay (Bristol Bay Engineering, Chignik Bay Tribal Council).

From the group exercise, "What does 'resilience' mean to you?"

Experience • Perseverance • Diversity

Success during difficult/challenging times

Meeting challenges • Strength

Ability to bounce back after disruptions

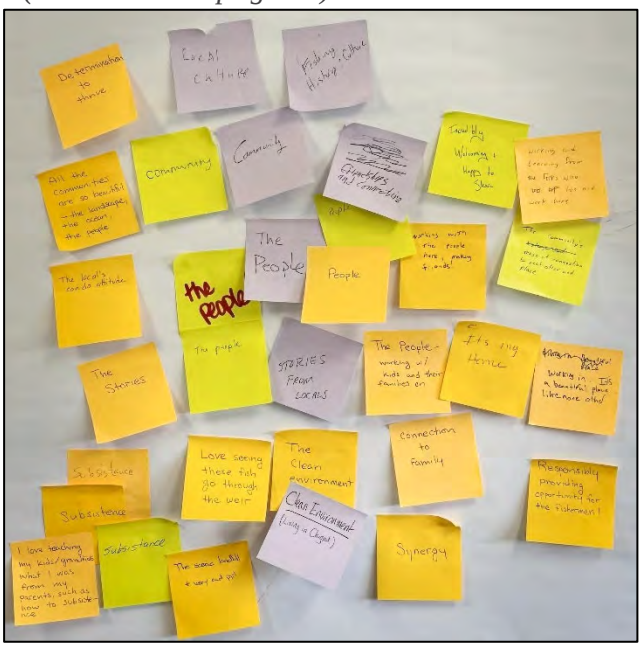
Ability to adapt to change • Subsistence

Planning for future needs • Awareness

Structured recovery • Passing on knowledge • Faith, listening, and doing what God says • Language • A buzz word used for grant applications • Language • Culture • Children

Preservation of people

Notes from the breakout question, "What do you value most about the Chigniks?"
(see details on page 23)

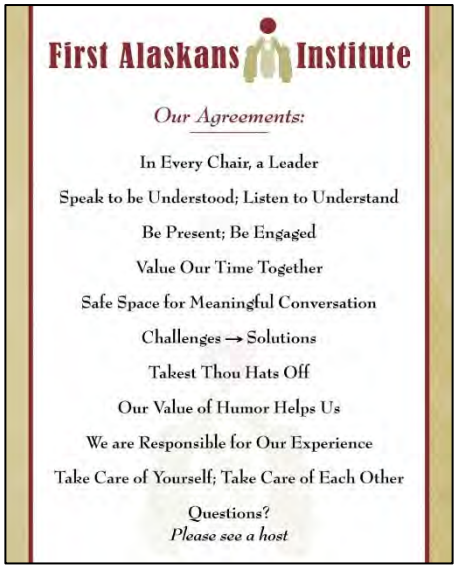


Acronyms

ACC	Alaska Coastal Cooperative
ACTION	The ACTION Project (also referred to as 'AC³TION'), funded by NSF and led by the ACC
ACGL	Arctic Coastal Geoscience Lab
ACWA	Alaska Clean Water Actions
ADF&G	Alaska Department of Fish and Game
AFE	Alaska Forum on the Environment
ANC	Alaska Native Corporation
ANTHC	Alaska Native Tribal Health Consortium
BIA	Bureau of Indian Affairs
BBAHC	Bristol Bay Area Health Corporation
BBNA	Bristol Bay Native Association
BBNC	Bristol Bay Native Corporation
BESC	Bristol Engineering Services Company
BLM	Bureau of Land Management
BOF	Alaska Board of Fisheries
CCLR	Center for Creative Land Recycling
CIC	Chignik Intertribal Coalition
CRAA	Chignik Regional Aquiculture Association
DCRA	Alaska Division of Community and Regional Affairs
DEC	Alaska Department of Environmental Conservation
DOI	U.S. Department of the Interior
DNR	Alaska Department of Natural Resources
DOT&PF	Alaska Department of Transportation and Public Facilities
EPA	U.S. Environmental Protection Agency
IGAP	Indian Environmental General Assistance Program
LiDAR	Light Detection and Ranging
LPB	Lake and Peninsula Borough
MSY	Maximum Sustained Yield (greatest annual average yield from a fish stock)
NRCS	Natural Resources Conservation Service (USDA division)
NSF	National Science Foundation
NWALT	Northwest Arctic Leadership Team
PER	Preliminary Engineering Report
STEAM	Science, Technology, Engineering, Art, Math
STEM	Science, Technology, Engineering, Math
TCR	Tribal Climate Resilience (EPA program)
TCTAC	Thriving Communities Technical Assistance Centers (EPA program)
TEK	traditional ecological knowledge
UAA	University of Alaska Anchorage
UAF	University of Alaska Fairbanks
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UW	University of Washington

June 6 (Thursday) Presentation Highlights

See presentation slides for details



Welcome & Agenda Overview

Jeanette Carlson, Chignik Bay Tribal Environmental Coordinator; Shelly Wade, Agnew::Beck Consulting Principal, Owner

- Opening Prayer
- Land Acknowledgement
- Group introductions
- Symposium Objectives & Meeting Agreements

Advancing Resilience in Indigenous Communities through Community Driven Science, Technologies, and Capacity Building

Chris Maio, Matthew Balazs, George Anderson, Mike Willis, Ryan Petersen

Overview

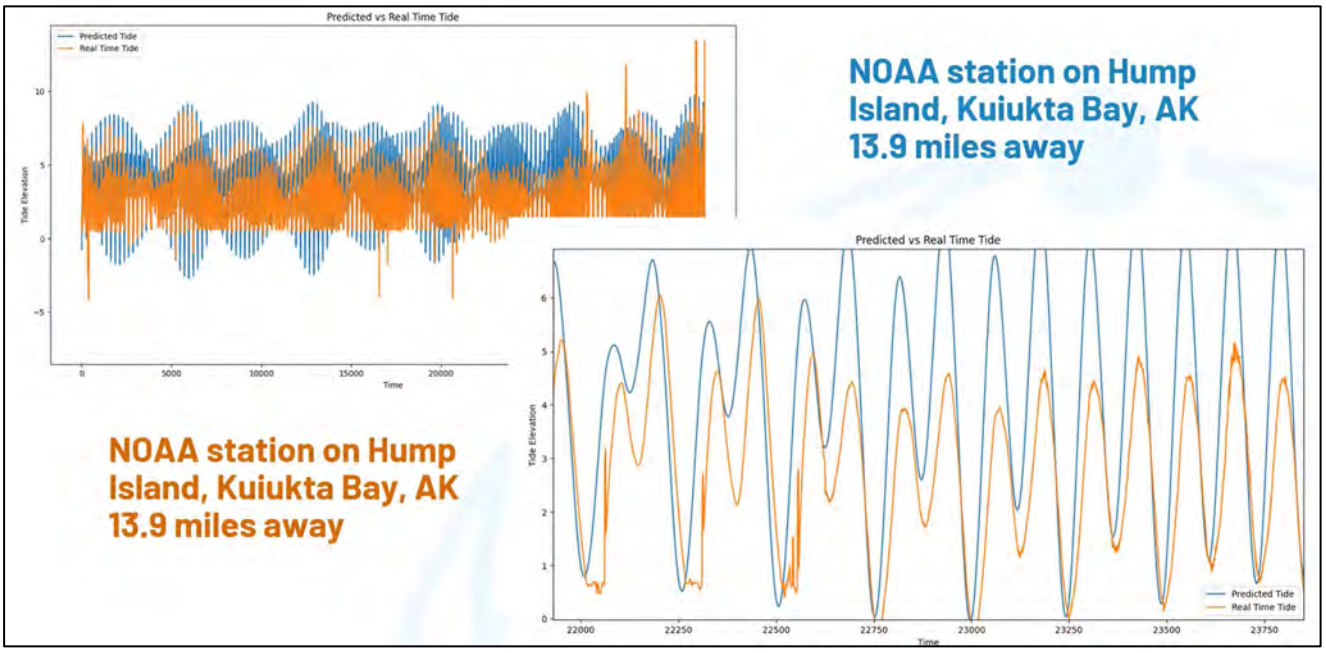
- The Alaska Coastal Cooperative's (ACC) mission is to enhance communication to identify and act on shared goals, advance applied science that addresses local priorities and delivers actionable products, and to contribute towards building technical capacity through education and training. The NSF-funded ACTION Project is an example of what the ACC does; other projects were discussed

Questions, Comments, Responses

- Q. This seems like a very broad topic. Can you narrow it down? How is this different than a community plan?
    - R: We want to integrate some things that are already known about a community and build from those existing ideas with capacity and technology. The approach is different in that this is about relationship building.
    - R: As people, we are more than subsisters and fishers. So, when we're talking about community resilience, it's about making sure our cultures are preserved, and that our elders' knowledge is preserved.
- Q. There are more empty homes than there are people living in Chignik Bay? How do we resolve this? Start a program for buying up vacant properties?
- Q. The visioning process sounds great, but I'm curious: What happens after the meetings and the data is collected? What are the goals? What does the result look like?

    - R: Some examples would be the elevation data that has been collected, water depth data collected, water level monitoring stations have been set up, a field school in Chignik Bay has been set up, and we created a documentary film to help others understand the changes in the environment. The products are foundations in data and setting up data sovereignty. It is data that is desired, collected, and owned by the community.
    - R: In terms of usefulness of data, wanting to see tangible or actionable items from data. For example, one of the successful actions from the last symposium was a community cleanup.

- Q. What is LiDAR for and why is it important?
    - R: It's a type of geospatial imagery that is used to measure elevation, changes in land use patterns, depths, and is important in community planning.
- Q. Is there a way to get LiDAR every year to show how things change over time?
    - R: We can compare Google Earth imagery with this data to show how landscapes have changed over the last five and ten years.
- Q: Does anyone know the original name of Indian Creek?
    - [No response.]
- Q: Do we have cameras to show the bay's erosion or how alder growth has changed over time? It would be good to see time lapses of growth and erosion. The biggest erosion concern that I've seen is in front of the clinic. There's a massive cut on the shore and we need more riprap there.
    - R: There's no shortage of applications to the technology we're using, whether it's shoreline changes or alder growth over time.



Slide from presentation showing that the measurements collected from tide cycles in Kuiukta Bay by Mike Willis' team (orange) are several feet different than what NOAA predicts (blue).

- Q: What is the datum projection on NOAA's bathymetry maps?
  - R: Bathymetric surveys are put on a "chart datum," which is very localized.
- Q: What is the goal for data collection; is it to develop a tide book?
  - R: It's simply to get a better idea of the tide changes.
- Q: I'm amazed at the difference in feet. Is that common?
  - R: NOAA data is based on a tide station over 13 miles away, so it may not accurately capture localized differences in water levels. Direct monitoring in the area can provide more useful data; This collection helps bridge the gap.
- Q: I'm interested in how wind might impact still water levels. Have you looked at that?
  - R: We have not; it would be an interesting correlation.

Chignik Bay Teacher Training Field Course and Family Camp Questions, Comments, Responses

- Q: Who wants to be involved in this program?
  - R: Kids are busy fishing in the summer. We have seniors that can help teach how to clean salmon and how to dry and can.
  - R: Angela can take a group out to the beach
- Q: How should we transport kids?
  - R: We'll put bells on them! [Laughter]. No, we'll use vans for transport There will be 8 students mostly locals
- Q: What is the age cutoff?
  - R: Middle high school kids. Kids that are under 12 should come with an adult.
  - R: This is a good opportunity for people who are learning to be teachers in rural Alaska.

Chignik Bay Video Premier and Discussion, Ryan Petersen with ACC
https://www.youtube.com/watch?v=GG7T6m1CNFw

- Q: What comments or feedback do you have about this first draft?
  - R: It's important to label the geographic locations.
  - R: This video could be used on Alaska Airlines flights as part of their passenger programming.
  - R: The video should have subtitles.
  - R: I would love to see a feature length director's cut.

Chignik Intertribal Coalition (CIC), Chignik Regional Aquaculture Association (CRAA)

George Anderson, CIC; Chuck McCallum, CRAA; Jon Gerkin, USFWS

Overview:

- George Anderson provided an update on CIC projects, including the Chignik River Subsistence Harvest Surveys wish USFWS and ADF&G, and the ACTION Project with ACC.
- Chuck McCallum provided an update on CRAA projects, including ADF&G's 2023 genetic sample analysis of sockeye, and UW Fisheries Research Institute's studies on smolt lagoon use (genetic analysis), king migration patterns (lazer ablation analysis), and annual monitoring of the hydrological and geomorphological characteristics/changes of Black Lake.

Questions, Comments, Responses

- Q. Do we have the results of the ADF&G sampling?
  - R: Not yet. They are still in the process of analyzing the samples.
- Q: What is the importance of collecting harvest data for subsistence?
  - R: We suspect that the numbers used for subsistence are lower than what they really are. In times of low abundance when there are not many fish and closure decisions are made, the impact on subsistence harvests is not well understood. Having a better idea on how regulatory decisions will impact subsistence harvesters is important.
  - R: From a BOF perspective, subsistence data is collected very infrequently – about every 10 years or so. It's important that the subsistence surveys sent out are returned. When the State makes a closure determination for an area, it considers whether an area has declining usage or low usage.
- Q: How are surveys conducted / collected?
  - R: They are generally mailed, or a notice is mailed providing a link to an online survey. If paper, there are usually designated places that you can drop them off - Miranda Lind in Chignik Lake is an example of a drop off place.
- Q: It seems like there would be a sampling error. What if I harvested fish and gave 100 away to my cousin. We would both report that we received 100 fish. How does the survey account for this doubling error potential?
  - R: There is a section of the survey where you can indicate whether it was direct harvest or whether it was given by someone.

UW Alaska Salmon Program

Cirque Gammelin & Jonathon Singleton, UW Alaska Salmon Program

Overview:

- Cirque Gammelin provided an update on the Juvenile Sockeye Competition Study within Chignik Lake, hypothesizing that earlier Black Lake emigration is increasing intraspecific competition within Chignik Lake due to earlier emigration.
- Jonathon Singleton discussed how studying sockeye otoliths may help to determine where juvenile sockeyes are rearing and their rate of growth in varying thermal regimes.

Questions, Comments, Responses

- Q: Are there any indications of competition in migration of smolt from Black Lake populations and Chignik Lake populations?
  - R: Yes, there appears to be potential competition between these two populations. The hypothesis is that Black Lake sockeye will outcompete Chignik Lake sockeye because their rearing period is longer.
- Q: Does it seem like there is enough food in Black Lack?
  - R: There appears to be. There is no need to supplement food currently.
- Q: Why was there an extreme jump in 2009?
  - R: Unsure; we assume that food availability was the main impact.

What is an otolith?

The University of Washington's College of the Environment describes otoliths as part of a fish's ear bones. Fish use these stone-like particles to sense vibrations and maintain balance in the water. Like counting the rings on a tree, each ring on an otolith indicates one year of life.

UAF Department of Fisheries and Ocean Science: Update on 2018 Disaster Research

Peter Westley & Scott Chandler, UAF

Overview:

- Peter Westley and Scott Chandler discussed their study, which investigates stressors that influence the abundance and ecology of Chignik's sockeye salmon that could lead to fishery failures. The goal is to complete a life-history statistical modeling of survival and potential stressors using simi lar designs from a Yukon study. Samples from 1994-2016 outmigrating smolt help determine size, run time, and differences between runs. Results so far show:
  - Small increases in smolt length (longer) and small decreases in body condition (thinner) over time.
  - Run times were particularly early in 2015 and 2016.
  - Age composition varies over time.

Questions, Comments, Responses

- Q: How do you tell the age of the fish you're sampling?
    - R: ADF&G determines the age by looking at their scales. Scales are layered and grow a bit more rapidly in the summer (bunched together) and slower in the winter (spread out).
- Q: How will your study link to the difference between hatchery salmon and wild salmon? I understand that hatchery fish are fed well and are a lot stronger than wild fish, and they are competing for the same food.
    - Response: It's an interesting conundrum. There are many studies that link hatcheries and the sheer number of fish in the ocean to shrinking salmon and potential fishery failures. We're hoping to integrate this into our target model.
- Q: What made you choose this location? And do you have plans to look at samples after 2016?
    - Response: There are very few samples after 2016 and it's really the 2015-2016 samples that best inform indicative stressors.
- Comment: Note that the escapement goals changed significantly after 1994. The harvest periods are much shorter, we are taking fish later into the season.
- Comment: There's a difference between a smolt run time and an adult run time.
- Comment: As we learn more about this, I am wondering if there is an opportunity refine to the relationship to the state management score (MSY).
- Q: Thinking about Kate Myers' work, how do you decide on the variables to use for Chignik.
    - Response: We can use very similar variables. For example, if we assume that these fish are going out to the Gulf of Alaska, we might look at surface water temperature in that area. Modification of the variables is somewhat determined by the amount of data we have for these samples; I believe the Yukon study had more data to work with.

Center for Creative Land Recycling: Brownfield Basics

Joy Britt, Center for Creative Land Recycling

Overview:

- Joy Britt presented on how to identify a brownfield site, how contaminated sites can affect communities that are more susceptible to impacts from climate change, and opportunities for redevelopment and/or management of sites. Brownfield properties can often provide housing or sites for tourist learning centers or shops.

Questions, Comments, Responses

- Can the Center for Creative Land Recycling help prepare solid waste proposals?
    - Yes, but we can only help as far as our scope (brownfields). The EPA offers technical assistance (https://www.epa.gov/environmentaljustice/environmental-justice-thriving-communities-technical-assistance-centers) through its TCTAC programs. Check out examples from https://nwejc.org/ and https://deohs.washington.edu/cehe/.

GreenStar Community Assessments: Chignik Lake, Chignik Lagoon, and Chignik Bay

Tanner Johnson, Alaska Forum on the Environment

Overview:

- Tanner Johnson highlighted the benefits of GreenStar Assessments for Chignik communities to reduce risks of contamination and improve solid waste management. Placards of Gratitude were presented to Chignik Lagoon representative George Anderson and Chignik Bay Tribe representative Roderick Carlson.

Questions, Comments, Responses:

- Q: How long does the GreenStar certification last?
  - Response: Five years. Technical assistance is available during that time.

Lake and Peninsula Borough: Capital Projects Update

Jodan Keeler & Danica Wilson, Lake and Peninsula Borough

Overview:

- Danica Wilson and Jordan Keeler presented on Chignik-specific capital improvement projects, proposed and funded. Projects discussed include LiDAR for the subregional communities to advance an addressing system and lot line delineation, Chignik dock uplands improvements, and design and construction of the hydroelectric dam.

Questions, Comments, Responses

- Q: Will the LiDAR capture our fishing and hunting grounds?
  - R: LiDAR is focused on the lived/built environment within community regions, but the Borough is open to capturing other areas.
- Q: Does the ARPA project include sewer and water utilities as well?
  - R: Just electricity.
- Q: Will the school be included in the energy audit even if it's closed?
  - R: Yes. All facilities, including teacher housing and the school, will be part of the audit.

June 7 (Friday) Presentation Highlights

See presentation slides for details

Socioeconomic Impacts of Fishery Disasters on Chignik Region Subsistence Users

Melissa Errand and Tom Sandborn, Northern Economics, Inc.

Overview:

- Economists Melissa Errand and Tom Sanborn discussed findings from approximately 33 individual interviews that explored the impacts of the 2018 Sockeye fishery disaster on Alaska's subsistence users. Interviews were conducted within five communities in the Chignik Subregion. The final report will be published in July and will include ideas and actions that may help prepare for or recover from future disasters.

Questions, Comments, Responses

- Q: What are the long-term impacts of the fishery disaster is the disrepair of homes and buildings and how this will be addressed. When the disaster occurred, people had to leave their homes and vacate facilities and emigrate to other communities. If in the future people decide to come back, how will we address the damage and repair of the abandoned homes and buildings? What can we do in the interim to prepare for the return?
    - R: This wasn't something that we heard about during interviews, so let's continue this conversation after the presentation.
- C: A follow-up question could be whether Native Corporations or other might be willing to subdivide and donate land. If people want to come back, they don't have a place to build a home, so securing land would also be important.
    - R: We are also talking about two different groups of people. One group who has lived her before and another that may recognize this place as their ancestral home who many never have lived here.
- Q: The context of "subsistence" seemed very narrow in the presentation, as if it was reduced to the act of catching fish for one's belly. Did you hear a broader interpretation during your interviews?
    - R: This is a great question about interview protocol. It was challenging to capture the true sentiments of "subsistence". Somethings can't be quantified or coded

> *"There is a kind of peril about the system of words we use. My parents never uttered the word "subsistence". It's a word my generation said and learned how to compartmentalize thoughts and identify what we do. Our measures, and how many buckets and jars we stack over a year, does not explain it. We're still learning."*

within this type of analysis. However, there are more high-level descriptions in the report.

- Q: Why was the tenure period singled out?
    - R: We wanted to focus on what was happening just prior to the disaster. The report will show longer, broader timelines.
    - C: For me, the last 10 years were the most volatile in this community's history. Looking at a longer time period (40 years) will capture a different story.
- C: Reaching out to families that used to live here but are longer here would add significant value to this report.
- C: There wasn't a slide breakdown of the methodology. It seems like a very small sample size.
    - R: It was a small sample size, but the interviews were extensive, open-ended discussions.
- Q: There is a slide that indicates people will never leave this place despite the hardship. Can you explain this reasoning?
    - R: Again, this is a very complex notion that is difficult to capture. The report does not explore the reasoning.
- Q: Does the report explain precisely how the population and employment declined in each community?
    - R: We have one area in the report that shows population decline, but one of the biggest barriers for rural Alaska communities is the ability to report accurate information about population. We compare data with fisheries and data based on PDF applications with other demographic indicators. We may be able to incorporate more employment data from the Department of Labor and Workforce Development.

"When I visited Saint Paul during a fishery downturn, I heard a scientist ask: 'Why do you stay there when things are so bad?' Local responded that 'families, elders and friends are buried here. This ground is sacred to us.' Villages all over Alaska are the same: village residents do not want to leave the land that is so special, even when food is in short supply."

- C: It's important to explain what happens when people can't return to the community or have a meaningful role. Our youth learn who they are by who they're related to, and they learn about the history of the community, and they get a sense of their own identities when they are in their home community. There are social, emotional, and psychological effects, and relationship-building knowledge with relatives and friends. We do not yet have appropriate terminology to explain this, but we should.

> *"Thinking about improving resiliency, one way would be to create a culture camp. Bring kids in that could have grown up here and just process fish and share with elders that live here."*

- Q: Referring to how we are balancing systems of culture and life, was there any discussion about how to build resilience during closures?
    - R: One theme was to improve communications. We spoke to individuals who didn't understand the reasons for closures and were confused about certain permitting processes and management regulations.
- C: A few months ago the Upper Cook Inlet had an abundance of Sockeye but low abundance of Kings. The Board of Fisheries closed the entire east side of the fishery. All setnetters and the fleet of gillnetters were to have experienced a fishery disaster simular to what we experienced here. However, ADF&G then created a permit specific to the setnetters so they could continue to fish. The reasoning for the decision is that gillnetters are more non-discriminatory with their catches. These decisions are extremely difficult beccause of the significant generational impact on local fishermen and their families. There is an opportunity for more data collection and research to better understand salmon behavior and improve fishing methods, and to selectively target sockeye while conserving Chinook salmon. There's also a need for proactive management and potential future solutions to avoid similar conflicts.
- C: More suggestions for improving resiliency are to diversify our economy, support small businesses through loans, and increase workforce development training for our youth.
- Q: Is it possible to use disaster relief funds to support the kind of research that the report is referencing, especially in terms of research and supporting a future fishery adaptation/resiliency?

Chignik Subregional Watershed Plan

Shelly Wade (Owner) and Holly Smith (Associate), Agnew::Beck Consulting

Overview:

- Shelly Wade and Holly Smith introduced the purpose, project timeline, and initial findings. Participants were asked to break out into small groups to discuss the below components, which were then shared with the full group. Ideas and topics that were noted more than once are marked with a checkmark (✓) for each instance.

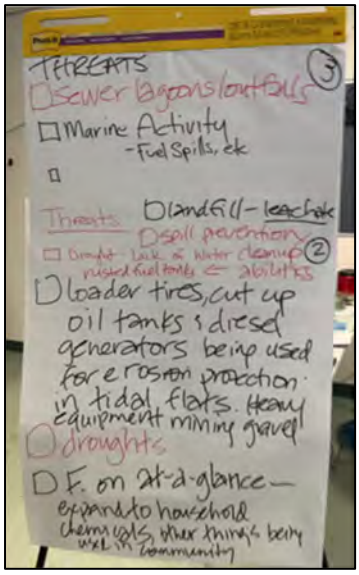
Discussion #1: What do you value most about the Chigniks?

1. The People ✓✓✓✓✓✓✓✓✓✓
    - "The local's can-do attitude."
    - "Working with kids and families on boats."
    - "Working with the people here, making friends."
    - "Learning from the folks who live and work here."
    - "Incredibly welcoming and happy to share."
    - "Determination to thrive."
2. Fishing Culture & History ✓✓✓✓
    - "I love seeing fish go through the weir."
    - "Responsibly providing opportunity for the fisherman!"
3. Community ✓✓✓
    - "It's my home."
    - "The community's sense of connection to each other and place."
4. Subsistence ✓✓✓
    - "I love teaching my kids and grandkids what I learned from my parents, such as how to subsist."
5. Stories from Locals ✓✓
6. Clean Environment ✓✓
7. Connection to Family and Friends ✓✓
8. Beauty ✓✓✓
    - "All the communities are so beautiful – the landscape, the ocean, the people."
    - "Working here: It's a beautiful place like no other."
    - "The scenic landfill."
9. Workplace ✓✓
10. Synergy

Discussion #2: What uses or areas should be protected?

1. Wildlife ✓✓✓
    - Castle Bay crab
    - Octopus
2. Recreational areas ✓✓✓
    - Community picnicking
    - Fresh water for kids to swim in
3. Mariculture
4. Water storage
5. Habitat complexity
6. W/M of Lake and Peninsula Borough boundaries
7. Subsistence berry picking in Chignik Bay
8. Wetlands in middle of Chignik Bay

Discussion #3: What are some potential threats to the watershed?

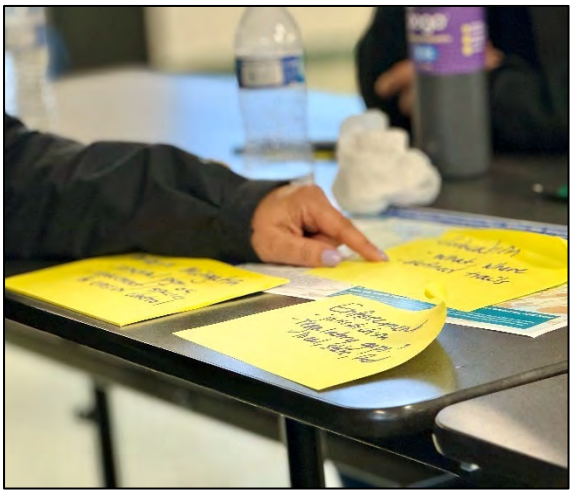


1. Contamination ✓✓✓✓
    - Spills ✓✓
    - Rusted fuel tanks ✓✓
    - Landfill leachate
    - Lack of cleanup
    - Household chemicals
    - Vacant or abandoned infrastructure
    - Sewer lagoon outfalls
    - Marine activity
2. Drought ✓✓
3. Native invader plants / Proliferating native plants ✓✓
4. Avalanches / Landslides
5. Volcanic ash

Discussion #4: How should threats be addressed?

Note: Some ideas shared on Saturday, June 8, during the Alaska Coastal Cooperative ACTION vision session are included below as they relate to potential watershed strategies.

1. **Assessment – Evaluating and Understanding Current Conditions**
    a. More backhaul (inventory with LiDAR or field work) ✓✓
    b. Identify property owners and institute site IDs in order to establish liability for abandoned properties and/or monitor all properties ✓✓
    c. Prioritize streams and establish baseline datasets of priority streams ✓✓✓✓
        - Water quality
        - Water temperature



    b. Define & map trails and distinguish between motorized (ATV) and non-motorized ✓✓
    c. Identify regulatory gaps in enforcement (categorize by local, tribal, state, federal)
    d. Identify liability for vessels and boat owners
    e. Use E-DNA to identify aquatic invasive species
    f. Add missing anadromous streams to ADF&G Alaska Waters Catalog
    g. Document dynamic movement of fish
    h. Continue to assess traditional areas / how Chignik has evolved over the last 40-50 years
    i. Use bathymetric data to identify areas where mariculture might thrive

2. Prevention – Protecting Uses and Mitigating Harm

a. Education ✓✓✓✓✓
   - Awareness campaigns:
     - Safer chemical usage in households and landfills✓✓
     - Native invader plant species
     - Burnable vs. non-burnable
     - Drinking water safety
     - Spill prevention
     - Landfill + spring cleanup
     - Habitat restoration
   - Signage – English, Alutiiq, and Sugpiaq
   - Post flyers in public places
   - Develop youth leadership programs
   - Show up to local meetings

b. Establish City Ordinances ✓✓✓
   - Mitigate pollution from increased volume of passenger boat traffic ✓✓
   - Create speed limit
   - Adoption of hazardous materials standards

c. Reduce road dust contamination ✓✓
   - Resurface roads and runway
   - Enforce speed limit

d. Establish Spring Clean-Up & Removal of native invader plans similar to trash clean up efforts. ✓✓

e. Designate holding area for heavy equipment to prevent contamination

f. Flood mitigation

g. Drought mitigation
   - Salmon habitat project to divert water to priority salmon streams

h. Slide mitigation

i. Improve Commercial Fishing Waste Disposal Program

j. Erosion Control
   - Planting new vegetation
   - Reinforcement projects
   - Tools/Resources for shore protection

k. Invest in new incinerator for fire mitigation and to reduce hazardous chemicals

l. Have tools and resources for spill prevention

m. Implement program of fuel tank inspection and repairs

n. Trail maintenance

o. Establish native species proliferation and invasive species removal programs

p. Abandoned building reclamation
   - Demolish and cleanup abandoned buildings
   - Can the city create a program to clear some lots at no cost to owner through brownfield grants?
   - Minimize pollution hazard of Trident facility through negotiations

q. Create diamond grids for trails

r. Focus on emergency response:

- Preparation
- Identify, create shelters
- Identify fire lines
- Identify key infrastructure
- Gather supplies and necessary equipment
- Have tools and resources for spill cleanup

3. **Monitoring – Tracking and Analyzing Data Trends Over Time**
    a. Establish monitoring programs for pollutants (drinking water systems, fresh water systems
    b. Update datasets
    c. Video surveillance
    d. Establish shellfish testing program
    e. Establish trail maintenance program
    f. Cruise ship discharge (bilge water, sewage, graywater, solid waste) monitoring framework and program
    g. Create data management plans for each community

4. **Guiding Principles – What is Integrated with All Strategies**
    a. Prioritize the Youth Voice ✓✓✓✓✓✓✓✓
        - Culture camp ✓✓✓✓
            - Look at Gather Grant for Ivanof Bay
            - Note that BBNC is in the process of enrolling descendants
            - BBNC has reached out to Chignik Bay Tribe to host a culture camp next year

        - Develop youth leadership programs ✓✓✓✓
            - Set up an organizational model like the Northwest Arctic Leadership Team (NWALT), a collaborative initiative with the school district, Tribes, Alaska Native corporation, and industry partners ✓✓✓
        - Provide workforce development opportunities for our youth so they can be part of upcoming projects ✓✓✓
            - Create a counselor position to help with training

b. Tell Our Story ✓✓✓✓
Provide an historical aspect to show how Chignik has evolved over the last 40-50 years
- Community voices are the priority ✓✓
- Identify community/cultural values ✓✓
- Identify what to retain as traditional knowledge (not to be shared publicly)

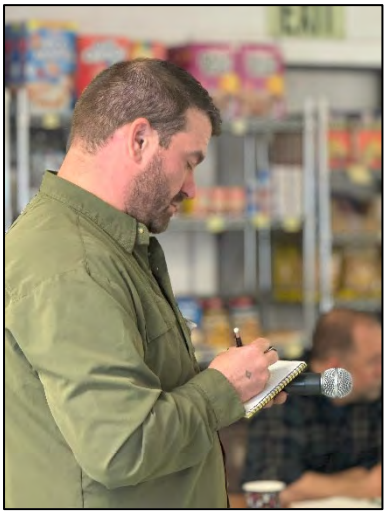
c. Establish a Model of Governance, Communication, Connection ✓✓✓✓
- Use/adapt governance models that have worked well in other communities ✓✓✓
  - Refer to the Regional Elders Council Model, which includes elected representatives from each community
    - Develop an Inupiaq Language Commission
  - Ownership of action cannot depend on one entity – all must share in solutions and outcomes
- Widen the circle of partners that work within our community and communicate expansively ✓
- Continue to build relationships within Chignik Intertribal Coalition
- Create a Community Advisory Board that meets locally provides communications and connections to ongoing threats and initiatives

d. Integrate Economic Development ✓✓✓
- Incorporate Workforce Development in Solutions ✓✓✓
  - Create year-round employment
  - Leverage existing infrastructure and projects
  - Youth-focus
- Develop Value Added Markets in Fisheries and Aquaculture
  - Assess mariculture opportunities
- Focus on Processor Issue
  - Recognize the Trident acquisition as a significant opportunity to effect processing in Chignik Bay
- Increase timber production for alders to reduce native invaders

June 8 (Saturday) Presentation Highlights

See presentation slides for details

Chignik Bay Tribe and the City of Chignik Bay with Bristol Engineering: Overview of Projects



Isaac Pearson, Bristol Engineering Services Company; Dannica Anderson, Chignik Bay City Clerk; and Jeanette Carlson, Chignik Bay Tribe

Overview:

- Participants learned of ongoing and completed projects conducted by Bristol Engineering Services Company on behalf of the Chignik Bay Tribal Council and the City of Chignik Bay. Projects included the completion of the Draft Community Plan, Tribal Hazard Mitigation Plan, Community Resiliency Action Plan, and Data Gap Analysis.

Questions, Comments, Responses

- C: Note that the East Side Electrical Distribution Project now includes the whole site – east and west side.
- C: Note that the community generator house is in an avalanche slide zone and a tsunami inundation area.
- C: Over the next year, the BIA will be offering grants for homes to install solar panels. Alaska Tribal Spectrum (ATS) is applying to BIA on behalf of Tribes. Chignik Bay Tribe submitted the required resolution for 26 tribally owned homes and is waiting to hear from ATS if Chignik Bay is selected for the project.
- C: Note that many community projects began with the completion of the Tribal Hazard Mitigation Plan, which needs to be updated every five years. FEMA funds are great, but you must be current on the plan.
- C: Land use planning is needed/missing in the community plan.
- C: The community plan doesn't seem to recognize that our fishermen are our first priority. I'm concerned that there isn't more information about the processor and about getting fuel.
    - R: This is a good reminder that we need more input from everyone for this plan.

National Science Foundation: ACTION Project – Alaska Coastal Cooperative for Co-producing Transformative Ideas and Opportunities in the North

George Anderson, CIC; Chris Maio, Matthew Balazs, and Casey Ferguson, UAF
Facilitated by Shelly Wade, Agnew::Beck Consulting

Overview:

- Enhancing communication and collaboration is a primary goal of the ACTION Project. Presenters led the group in a Visioning Discussion to brainstorm what is needed in Chignik Bay now and in the future.

Group Discussion: What are our community and regional priorities?

- Map our trails and create a parks and recreation department; build boardwalks and viewing decks
- Help organize, interview, and continue the work on the history of Chignik and how that's evolved in 40-50 years
- Stand up an NWALT-model from the Northwest Arctic Borough with the school district, ANCs, Tribes, industry partners (e.g., Red Dog)
- Identify community/cultural values – "Alutiiq/Sugpiaq Values"
- Establish a Regional Elders Council Model with elected representatives from each community
- Create an Inupiaq Language Commission
- Adapt governance models that have been successful
- Widen circle of partners that work with the community and communicate out in a more expansive way
- Think outside the box of onshore canneries: What are other ways (value-add or marketing) of using fish?
- Let's make this a year-round fishery like it used to be
- Focus on the processor issue; this is an historic opportunity to effect processing in Chignik
- Provide workforce development and training of our young people so they can be part of upcoming/future projects
- Host more culture camps with our youth

- Send a letter to BBNC requesting collaboration with Tribe to do culture camps here next year. BBNC is in process of enrolling descendants, which are now a huge population of Shareholders. We need to work harder at preparing future generations to take over.
- Hire a counselor to help with training
- Build a community store. The Community Hall is great as a placeholder, but we need something more like what Trident provided.
- Continue to build relationships within CIC
- Make Chignik a hub for workforce development. We've got the infrastructure.

- Bring youth together – culture camps, training, regular schedule, using upcoming projects, getting head – where can we fit youth in – let's create program for them; give them life skills
- Gather more data (Bathymetric!)
- Assess mariculture opportunities
- Create a Community Advisory Board that holds local meetings on a regular basis; be connected to what's going on to keep communication going
- Community voices are the priority, especially youth!

Closing Comments

"We've heard about these priorities year after year. We are fully aware of them, but it's great to have them articulated by different people, different voices. We also hope this conversation can expand to the other Chigniks so we can align our resources."

"It blows me away how many people are out there that care about Chigniks. So, thank you."

"Let's start training our young people so that they can be part of this and so that they'll take ownership of it. They're our next leaders."

"The youth are the bridge to our future and their brains are just as good as ours."

"When this meeting is over, it's not over. This is the beginning of the conversation. I am always listening, whether the issue is old or new."

"Who will actually lead and do the projects? Research is great, but who will act?"

"I really appreciate every single one of you who have come here, come together for this."

"We're understanding the mission now that our priorities are coming together and ensuring all voices are heard and part of discussion and ownership of action."

"We can't depend on one entity – we have to share in all of this."

"We're resurrecting our community in a different way and we're learning to adapt to the changes."

"I really appreciate all the good words that the local people here have put into this. What you have to say is the heart of this meeting. It is your words and your presence."

"You all ask the best questions. Real results won't happen without those questions. I have faith that this community will drive their futures. Keep having these conversations outside of this room."

"Already, I see some things we can do right away – like incorporating ideas for youth leadership in this summer's culture camp.?"

Appendices

Symposium Evaluations

Symposium Flyer

Symposium Agenda

Attendees List

List of Presentations/Attachments (hyperlinked)

Symposium Evaluations

12 participants submitted evaluations about the Symposium – their feedback is below.

Questions 1-4: Rate these statements.

Category	Prompt	Average Score 1 = Strongly Disagree 5 = Strongly Agree
Symposium Purpose	I understood the purpose of the Symposium.	**4.8**
	There was value in what we worked on, and my days were well spent.	**4.8**
Openness	I felt comfortable asking questions and expressing my views.	**4.8**
	Discussion was facilitated in an appropriate manner.	**4.8**
	Adequate time was given for questions, answers and discussion.	**4.5**
Productivity	The Symposium ran efficiently with minimum interruptions/ disruptions.	**4.1**
	I was satisfied with the overall outcome of the Symposium.	**4.6**
Logistics	The Symposium location and space was satisfactory for the group's needs.	**4.6**
	The time and length of the Symposium was appropriate.	**3.8**

Question 5: What did you enjoy most about the symposium?

- Reconnecting with everyone
- Fisheries science updates. Appreciated zoom/online participants' ability to engage. Great in-person presence - awesome to have experts, consultants, etx. here in person! Community meals/events
- smolt samples, electric studies and Isaac presentation
- Sharing all the information and finding ways to work together
- The people.
- THE PEOPLE!
- Listening to the locals
- Getting folks together for a meaningful discussion
- The multiple organizations that attended
- How people from multiple areas (community, academia, public works, etc) came together to be active in Chignik's present and future. The community events were particularly wonderful.

- Project updates and opportunity to engage in interactive discussion about how these projects affect the Chignik region.

Question 6: What was your least favorite part of the Symposium?

- Early AM start on first day
- Weather :) - Maybe needed a little more time, but not much more. Good balance to maintain engagement. Overall, really well done.
- Couldn't get as in depth on some topics because of time
- Hmmm... not enough food ;) j/k
- POWERPOINT PRESENTATION FORMAT
- The high winds when we were flying
- None
- First day was very long with too much information. It also would have been good to have more in person representation from the other regional villages.
- The lack of ADFG's involvement.
- We had to rush a few sections of the agenda due to weather affecting those that needed to depart Chignik Bay on outbound flights.

Question 7: Do you have any specific suggestions for improving future Symposiums?

- Days were too long. Movement/activity would be helpful. Movement breaks. Tour of cannery? Trash pick up?
- Maybe having an outdoor community project activity with all participants, ie. alder clean-up, litter pick-up, trail restoration, or hike. More participation from Perryville and Ivanoff and Lagoon and Lake, but I know housing people is challenging.
- Job creation and employment. Community services for elders. Training opportunities and employers.
- Thank you very much so grateful for being able to interact w/ everyone
- PUT EVERYONE IN A CIRCLE FOR PRESENTING + DISCUSSION
- The best improvement is getting more locals to attend and engage in the discussions. This is no reflection on how well the symposium went, the team did an excellent job with their work.
- Getting more folks involved
- Ask for "outsiders" for a donation or registration fee to help cover costs. I imagine most would be able to help cover costs.
- None at this time.

Symposium Flyer

2024 CHIGNIK REGIONAL Resiliency Symposium

JUNE 6TH - 8TH AT THE COMMUNITY HALL

ALL ATTENDEES ARE ELIGIABLE FOR THE DOOR PRIZE DRAWINGS!

JUNE 6TH, 9:30 AM-5:30 PM

10:30 AM - UAF researchers unveil a year's worth of progress on a community-driven science project that strengthens Indigenous resilience through technology and capacity building. Expect data updates, a field school discussion, and a video premiere.

11:30 AM - Chignik Intertribal Coalition and Chignik Regional Aquaculture Association present updates on tribal fish initiatives and funded projects.

1:30 PM - Alaska Salmon Program & ADF&G Kodiak Lab examine Chignik Lake vs Black Lake sockeye competition & growth patterns, with an update on 2018 disaster research projects.

2:30 PM - Chignik communities explore Green Star assessments for improved resource management & brownfield redevelopment in a changing climate.

3:45 PM - LPB managers present on funded and proposed projects for Chignik communities with timelines.

COMMUNITY POTLUCK JUNE 6TH AT 6:00 PM

JUNE 7TH, 9:30 AM-5:30 PM

10:00 AM - Economists delve into the economic impacts of fishery disasters on subsistence users' way of life. Join the session for a project overview, timeline, and interactive feedback.

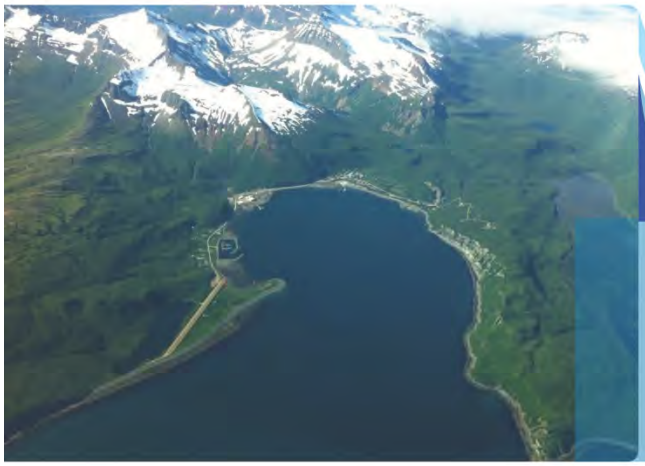
1:00 PM - Agnew::Beck Consulting leads a comprehensive Chignik Subregional Watershed Plan workshop. Join discussions on project goals, threats to water quality, valuable resources, and action strategies to prioritize.

COMMUNITY BBQ JUNE 7TH AT 6:00 PM

JUNE 8TH, 9 AM-3:30 PM

10:00 AM—Bristol Engineering will dive deep into Chignik Bay Tribe and City accomplishments, including completed Community and Hazard Mitigation Plans, project reports, and future plans.

11:00 AM - NSF's ACTION project partners with Chignik Intertribal Coalition for a "Visioning Discussion." Share your thoughts on coastal issues and shape the project's direction for Chignik Bay.



Join us on Zoom!

https://agnewbeck.zoom.us/j/81897860633

Dial: 1-888-475-4499 (Toll-free)

Meeting ID: 818 9786 0633#

Passcode: 604470#

Need More Information?

Debbie Carlson, CBTC Admin: 907-749-4018
Chickie Carlson, CBTEC : 907-749-4019

https://chignikwatershed.com/

Detailed agendas are available at the Tribal & City offices

Symposium Agenda

Chignik Regional Climate Resiliency Symposium

June 6-8, 2024

Location:	Chignik Bay Community Hall
June 6 (Thursday)	9:30 am –12:15 pm refreshments, presenters/sessions below 12:15 – 1:30 pm lunch 1:30 – 5:30 pm presenters/sessions below 6:00 – 7:30 pm community potluck; all are invited!
June 7 (Friday)	9:30 – 11:45 am refreshments, presenters/sessions below 11:45am – 1:00 pm lunch 1:00 – 5:30 pm presenters/sessions below 6:00 – 7:30 pm barbeque; all are invited!
June 8 (Saturday)	9:00 am – 12:15 pm refreshments, presenters/sessions below 12:15 – 1:30 pm lunch 1:30 – 3:30 pm open discussion, next steps, and closing circle 6:00 pm dinner on your own (food available for Symposium guests)

June 6 (Thursday)

9:30-10:30 am ***Coffee & Refreshments, Welcome & Agenda Overview***

(Jeanette Carlson, Chignik Bay Tribal Environmental Coordinator; Shelly Wade, Agnew::Beck Principal::Owner)

- *Opening Prayer & Land Acknowledgement*
- *Introductions*
- *Symposium Objectives & Meeting Agreements*

10:30-11:30 am *Paul G. Allen Family Foundation:* ***Advancing Resilience in Indigenous communities through Community-driven Science, Technology, and Capacity Building.***

- Updates on the project after 1 year, including topographic and bathymetric mapping, water level gauges, and erosion monitoring data,
- Chignik Field School informational discussion,
- World premiere of project video.

(Presenters: Chris Maio/UAF, Matthew Balazs/UAF, George Anderson/CIC, Mike Willis/UAF)

11:30 am-12:15 pm ***Chignik Intertribal Coalition (CIC), Chignik Regional Aquaculture Association (CRAA)***

- CIC update, including BBNA Fish Task Force
- CRAA summary of fish projects funded in 2024
(Presenters: George Anderson/CIC, Chuck McCallum/CRAA)

12:15 – 1:30 pm ***Lunch***

1:30 -2:30 pm ***UW Alaska Salmon Program, UAF Department of Fisheries and Ocean Science, ADF&G Kodiak Island Limnology Laboratory Projects***

- *Competition between Chignik Lake & Black Lake sockeye fry*
- *Using otoliths to assess where Black Lake sockeye grow up*

(Presenters: Cirque Gammelin & Jonathon Singleton/UW AK Salmon Program)

- *Update on 2018 Disaster Research funded projects*

(Presenters: Peter Westley & Scott Chandler/University of Alaska Fairbanks Department of Fisheries and Ocean Sciences, Heather Finkle/ADF&G Kodiak Island Limnology Lab Director-Research Biologist tentative)

2:30 – 3:30 pm ***Green Star Community Assessments - Chignik Lake, Chignik Lagoon, Chignik & Brownfields Basics***

- *How to identify a brownfield site, what to do with them, and how these potentially contaminated sites can affect communities in the face of climate change*

(Presenters: Joy Britt, Senior Brownfields Redevelopment Consultant/Center for Creative Land Recycling)

- *Highlights of the Green Star Community Assessments for Chignik subregion communities to improve and prioritize water, wastewater, energy and waste disposal operations and practices.*

(Presenters: Tanner Johnson, Environmental Programs Coordinator, Alaska Forum)

3:30 – 3:45 pm ***Break***

3:45 -4:30 pm ***Lake & Peninsula Borough (LPB) funded projects in the Chignik Region***

- *This session will summarize funded and proposed projects for communities, including timeframes.*

(Presenters: Nathan Hill/LPB Manager, Jordan Keeler/LPB Projects Manager, Danica Wilson/LPB Community Development Coordinator)

4:30 – 5:30 pm ***Questions/Answers or Breakout Sessions***

6:00 -7:30 pm ***Dinner at Community Hall (Potluck)***

June 7 (Friday)

9:30-10:00 am ***Coffee & Refreshments, Agenda Overview***

10:00-11:45 am ***Socioeconomic impacts of fishery disasters on Chignik Region subsistence Users***

- *This session will provide an overview of the overall project and timeline and interactive feedback from participants.*

  (Presenters: Melissa Errand, Economist and Tom Sanborn, Research Assistant with Northern Economics, Inc.)

11:45–1:00 pm ***Lunch***

1:00—5:30 pm ***Chignik Subregional Watershed Plan***

- *Introduce the Project – What is the project purpose and timeline? What is the project area? What work has happened so far?*
- *Discuss Threats & Strengths* – What are the water quality threats in the watershed? What areas/resources are most important and should be protected?
- *Review and Discuss Strategies* – What projects can help us address threats, protect resources, and ensure a healthy and thriving watershed into the future?
- *Prioritize Strategies* – What is most important for us to focus on?
- *Action Planning* - How can we make progress together? Who will lead this work?
- *Confirm Next Steps* – What comes next? How can I stay involved?

(Presenters: Shelly Wade and Holly Smith, Agnew::Beck Consulting)

6:00 -7:30 pm ***Dinner at Community Hall (Barbeque)***

June 8 (Saturday)

9:00-10:00 am ***Coffee & Refreshments, Agenda Overview***

10:00-11:00 am ***Overview of Bristol Engineering Services Company (BESC) Projects with Chignik Bay Tribe and City of Chignik in Chignik Bay***

- *This session will highlight recently adopted plans - The Chignik Bay Community Comprehensive Plan & Tribal Hazard Mitigation Plan, Preliminary Engineering Reports or priority projects, and future proposals, such as the construction of a tsunami shelter.*

  (Presenters: Isaac Pearson/BESC, Dannica Anderson/Chignik City Clerk, Jeanette Carlson/Chignik Bay Environmental Coordinator)

11:00-noon ***National Science Foundation: ACTION Project – Alaska Coastal Cooperative for Co-producing Transformative Ideas and Opportunities in the North***

- Introduction to the ACTION project and partnership with Chignik Intertribal Coalition

- Chignik Bay "Visioning Discussion" – gaining feedback on current and future activities and how to best align ACTION to address priorities specific to Chignik Bay
  (Presenters: Chris Maio/UAF, George Anderson (CIC), Matthew Balazs/UAF, Casey Ferguson/(UAF)

12:00-3:30 pm **Lunch, *Open Discussion, Next Steps & Closing Comments Circle***

Attendee List

In person

Name	Organization	Email
Holly Smith	Agnew::Beck Consulting	holly@agnewbeck.com
Shelly Wade	Agnew::Beck Consulting	shelly@agnewbeck.com
Tanner Johnson	Alaska Forum on the Environment	
Chris Capo	Bristol Bay Native Corporation	
Isaac Pearson	Bristol Engineering Services	jpearson@bristol-companies.com
Chickie Carlson	Chignik Bay Tribal Council	jeanettecarlson749@gmail.com
Debbie Carlson	Chignik Bay Tribal Council	cbaytc@aol.com
Roderick Carlson	Chignik Bay Tribal Council	
Sue Flensburg	Chignik Bay Tribal Council advisor	sflensburg@gmail.com
Robert Carpenter	Chignik City Council	chignikcityclerk@gmail.com
George Anderson	Chignik Intertribal Coalition	
Ronald Lind	Chignik Lake River Limited	
Charles McCallum	Chignik Regional Aquaculture Association	chuckmccallum@gmail.com
Axel Kopun	Chignik resident	
Billy Anderson	Chignik resident	
Brandon Daugherty	Chignik resident	
David Hill	Chignik Resident	
Ernie Carlson	Chignik resident	Janisc585@aol.com
Eugene Carlson	Chignik resident	
Kaeloni Scanlan	Chignik resident	
Peter Anderson	Chignik resident	ptanderson780@yahoo.com
Arlene Kopun	City of Chignik	
James Anderson	City of Chignik	
Dannica Anderson	City of Chignik	chignikcityclerk@gmail.com
Mary Inovejas	DEC	mary.inovejas@alaska.gov
George Pappas	DOI Office of Subsistence Management	george_pappas@ios.doi.gov
Hazel Nelson	Land & Sea Resources	northsider579@gmail.com
Melissa Errand	Northern Economics, Inc.	melissa.errend@norecon.com
Tom Sandborn	Northern Economics, Inc.	tom.sandborn@norecon.com
Märit Carlson-Van Dort	Part-time Chignik resident	marit@farwestak.com
Casey Ferguson	University of Alaska Fairbanks	
Chris Maio	University of Alaska Fairbanks	cvmaio@alaska.edu
Matthew Balazs	University of Alaska Fairbanks	mbalazs@alaska.edu
Mike Willis	University of Alaska Fairbanks	mdwillis@alaska.edu
Peter Westley	University of Alaska Fairbanks	
Scott Chandler	University of Alaska Fairbanks	
Jon Gerken	USFWS	jonathon.gerken@fws.gov

Over Zoom

Name	Organization	Email
Oxcenia O'Domin	Alaska Native Tribal Health Consortium, Chignik River Limited Board Member	
Ryan Peterson	Alaskanist Stories Films	firstcast@gmail.com
Joy Britt	Center for Creative Land Recycling	joy.britt@cclr.org
Alvin Pedersen	Chignik Lagoon resident	
Sabrina Anderson	Chignik Lagoon Village Council Deputy Administrator	
Michelle Anderson	Chignik Lagoon, Village Administrator	manderson@chigniklagoon.net
Clinton	Chignik Lake resident	
Benjamin Allen	CRAA, Chignik Council Member	
Stephen Price	DEC	stephen.price@alaska.gov
Earl Krygier	KEE Biological Consultants	
Angela Krauss	Part-time Chignik resident	kimccarlson@gmail.com
Kimberly Basler	Part-time Chignik resident	angeladaugherty_327@hotmail.com
Melodee Carlson-Forbes	Part-time Chignik resident	mdcarl74@aol.com
Ian Purnell	Swiss Filmmaker	
Phyllis Carlson		

List of Presentations/Attachments (hyperlinked)

1. UAF's Alaska Coastal Cooperative: Introductory Presentation at the 3rd Chignik Regional Climate Resiliency Symposium (Chris Maio, George Anderson, Matthew Balazs, Mike Willis): **Presentation Slides**

2. Chignik Forever Video (Alaska Coastal Cooperative, Final Version, Posted July 9th, 2024): **YouTube Link**

3. UW Salmon Program: Juvenile Sockeye Competition Within Chignik Lake (Cirque Gammelin): **Presentation Slides**

4. UW Salmon Program: Using Otoliths to Determine Where Juvenile Sockeye Rear in the Chignik Watershed (Jonathon Singleton): **Presentation Slides**

5. UAF Department of Fisheries and Ocean Science: Update on 2018 Disaster Research (Peter Westley, Scott Chandler): **Presentation Slides**

6. Center for Creative Land Recycling: Reclaiming the Past, Building the Future: Brownfield Basics (Joy Britt): **Presentation Slides**

7. GreenStar Community Assessments – Chignik Lake, Chignik Lagoon, and Chignik (Tanner Johnson): **Presentation Slides**

8. Lake and Peninsula Borough: Capital Projects Update (Jordan Keeler): **Presentation Slides**

9. Northern Economics, Inc: Socioeconomic Impacts of Fishery Disasters on Chignik Region Subsistence Users & Pathways to Resilience (Melissa Errand, Tom Sandborn): **Presentation Slides**

10. Chignik Subregion Watershed Plan Update: (Shelly Wade, Holly Smith): **Project At-A-Glance Poster**

11. Chignik Bay Tribe and City of Chignik: Overview of Projects (Dannica Anderson, Jeanette Carlson, Isaac Pearson): **Presentation Slides**

12. National Science Foundation: ACTION Project – Alaska Coastal Cooperative (Chris Maio, George Anderson, Matthew Balazs, Mike Willis, Casey Ferguson): **Presentation Slides**

13. Chignik Community Research Database List prepared by Chignik Bay Tribe as part of the National Science Foundation ACTION Project **Research Database List**

Appendix D: Chignik Regional Climate Resiliency Symposium Summary
June 2023

2023 Chignik Regional Climate Resiliency Symposium

Symposium Summary *finalized 8-22-23*

June 4 – 5th, 2023, Chignik Bay, Alaska

Coordinated and hosted by Chignik Bay Tribal Council

Thank you to the following organizations for supporting the Symposium:

Paul G. Allen Foundation/VULCAN
Alaska Department of Environmental Conservation (ADEC) Alaska Clean Water Actions (ACWA)
Alaska Forum on the Environment (AFE)'s Greenstar Program
Bureau of Indian Affairs (BIA) Tribal Climate Resilience (TCR) Program
Chignik Bay Tribal Council
Chignik Intertribal Coalition
Environmental Protection Agency (EPA) Indian Environmental General Assistance Program (IGAP)

THANK YOU

to everyone who participated:

Chignik subregion residents

Chignik Bay Tribal Council

Partners & Presenters

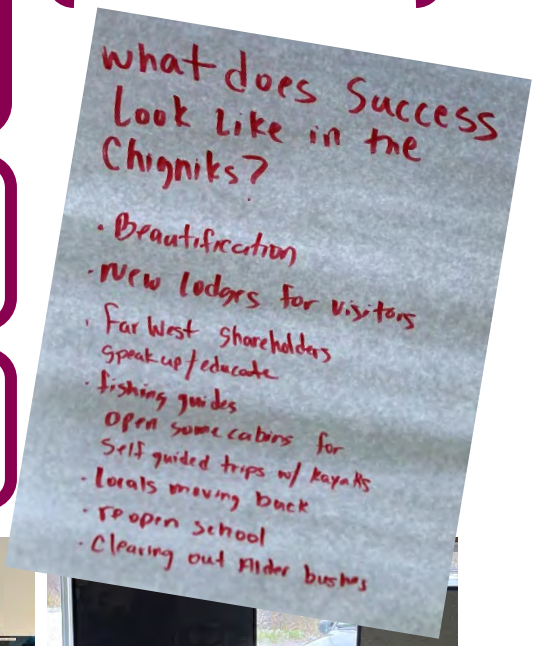
Our Chignik Bay hosts

"Last year's symposium we lay the foundation and this year we're building on that foundation. This is much bigger than fighting at Board of Game meetings. We are building a path forward around what's been occurring. For the Chignik region to have a future, we need to collect science that we own ourselves."

"We're all here toward the same objective: long term resiliency, having a healthy economy and food security."

"Everyone is a stakeholder of the watershed and needs to be proud of it, own it, and care for it."

"We got the ball moving, now let's not let it stop. We want to keep our communities alive."



Save the Date for the 2024 Chignik Regional Resiliency Symposium!

Tentatively scheduled for the first week of June, 2024

Table of Contents

Overview 4
Symposium Purpose 4
Key Takeaways 4
Outcomes 4
Symposium Flyer 5
Symposium Agenda 6
Attendee List 8
Acronyms 10
June 4 (Sunday) Presentation Highlights 11
Welcome & Agenda Overview 11
UAF's Arctic Coastal Geoscience Lab & Alaska Coastal Cooperative: Updates on Coastal Monitoring 11
Chignik Intertribal Coalition & Chignik Regional Aquaculture Association projects 14
Chignik Subregion Map Project 18
Chignik Subregion Watershed Plan 19
Refuge Visitor Use Monitoring Plan 20
Breakout Questions 20
June 5 (Monday) Presentation Highlights 25
Field School: What topics would be most important to cover in a Chignik-based field school? 25
Backhaul Update 27
Green Star Program Assessment of Chignik Bay 27
Chignik Bay Climate Resiliency Action Plan Final Draft 28
Discussion 30
Closing Comments 32
List of Presentations/Attachments (hyperlinked) 34

Overview

Symposium Purpose

- Share progress and findings from regional research and planning projects.
- Convene researchers and community members to identify missing information and discuss emerging solutions to increase the region's ability to respond to change.
- Work together to identify what next steps are most important.

Key Takeaways

- Now is a critical time to plan for the future of the region given the uncertainty of the fisheries and population loss.
- The Chignik region has energized leadership who are taking charge of the future, even as state and federal partners are slow to respond to the fisheries disaster.
- Research and data collection must be informed by traditional knowledge. Researchers working in the region should collaborate with one another and with the community, through forums like the Symposium.
- Tourism is a growing opportunity; many cruise ships are visiting Chignik Bay in summer 2023. The community must be ready to host visitors.

Outcomes

Immediately following the symposium, participants took the following actions:

- Conducted multiple major clean up events, including demolishing several old houses.
- Did trail brushing to clear local hiking trails.
- Helped coordinate regional backhaul scheduled for August 2023.
- Worked with research partners to refine data collection efforts to accommodate recommendations identified during the Summit.
- Hosted multiple cruise ships (see photo below).
- Met with Trident to discuss transfer of ownership of facilities in Chignik Bay.

Word cloud based on closing comments (larger words were repeated more frequently)

Themes from the breakout question, "What topics are most important for us to take action on, related to the watershed and climate change??" *(see details on pages 20-24)*

Solid waste and creek cleanup	**Food sovereignty**
Communications	**Economic development; diversification**
Prioritization of local data and traditional knowledge	**Hazard mitigation**
Stopping population outmigration	**Representation**

Symposium Flyer

CHIGNIK REGIONAL CLIMATE RESILIENCY SYMPOSIUM

Please join us for presentations and discussions on important topics that affect our region! We'll be serving coffee and refreshments throughout the days, along with sandwiches for lunch, with potlucks to follow in the evenings.

WHERE:

Chignik Bay Community Hall
Sign up for door prizes!

WHEN:

June 4th: 8:30 - 5:30
Ham and Turkey Potluck at 6:00pm
June 5th: 8:30 - 4:00
BBQ Potluck at 6:00 pm
Bring a dish for the potlucks if you wish!

For more info or to request a zoom link, please contact jeanettecarlson749@gmail.com

A special thank you to the Paul G. Allen Family Foundation!

June 4th

Welcome and overview with **Jeanette "Chickie" Carlson** - Chignik Bay Tribal Council Environmental Coordinator

New Chignik Subregion research projects with **Chris Maio and team** - UAF Arctic Coastal Geo Science Lab

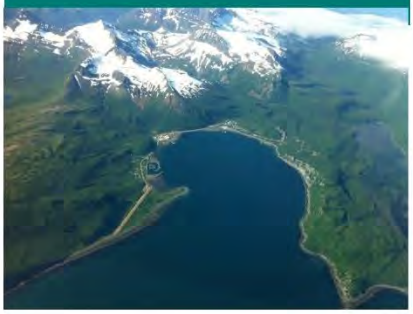
Projects update from **George Anderson** - Chignik Intertribal Coalition and **Chuck McCallum** - Chignik Regional Aquaculture Association

Chignik Subregion Map Project Planning with **Marcus Geist** - Artesian Knowledge LLC

June 5th

Green Star Program Environmental Assessment with **Joy Britt** – Alaska Forum on Environmental Programs Director

Final Draft of Chignik Bay Climate Resiliency Action Plan with **Isaac Pearson** – Bristol Engineering Services



Symposium Agenda

Chignik Regional Climate Resiliency Symposium
June 4-5, 2023

Location:	Chignik Bay Community Hall
June 4 (Sunday)	8:30 am – 1:00 pm coffee & refreshments, presenters/sessions below 1:15-2:15 pm lunch 2:30-5:30 pm breakout discussions on Day 1 presentations 6:00 pm barbecue potluck
June 5 (Monday)	8:30am-12:45 pm coffee & refreshments, presenters/sessions below 12:30-1:30 pm lunch 1:30-4:00 pm breakout discussions continued 4:00 pm closing remarks

June 4 (Sunday)

8:30-9 am	Coffee & Refreshments, Welcome & Agenda Overview (Jeanette Carlson, Chignik Bay Tribal Environmental Coordinator)
9:00-10:30 am	UAF's Arctic Coastal Geoscience Lab and the Alaska Coastal Cooperative will provide updates on the coastal monitoring work and highlight the new mapping and education project funded by the Paul G. Allen Family Foundation (Chris Maio, Matthew Balazs and others/UAF ACGL and ACC)
10:30-11:30 am	Chignik Intertribal Coalition and Chignik Regional Aquaculture Association projects (George Anderson/CIC President, Chuck McCallum/CRAA Executive Director)
11:45-12:45 pm	Chignik Subregion Map Project – conservation planning for subsistence, culturally important areas, etc. (Marcus Geist/Artesian Knowledge LCC)
12:45-1:00 pm	Chignik Subregion Watershed Plan recently awarded grant (Agnew: Beck contractor and/or Jeanette Carlson/Chignik Bay Tribal Environmental Coordinator)

1:15-2:15 pm	Lunch (sandwiches provided)
2:30-5:30 pm	Breakout discussions on presentations
6:00 pm	BBQ at the Community Hall-bring a dish to share if you wish

June 5 (Monday)

8:30-10:00 am	Coffee & Refreshments, Breakout discussions on Day 1 topics continued
10:00-11:00 am	Green Star Program Assessment of Chignik Bay (Joy Britt/Alaska Forum on Environment, Environmental Programs Director)
11:15-12:15 pm	Chignik Bay Climate Resiliency Action Plan Final Draft (Isaac Pearson/Bristol Engineering Services Corporation, LLC Senior Civil Engineer)
12:30-1:30 pm	Lunch
1:30-4:00 pm	Breakout discussions continued
4:00 pm	Closing Remarks

Attendee List

In person

Name	Organization	Email	Phone
Carl Burnside	Alaska Dept. of Fish and Game	Carlton.burnside@alaska.gov	
Cayman Christ	Alaska Dept. of Fish and Game	cpchrist@eckerd.edu	
Myra Scholze	Alaska Dept. of Fish and Game	Myra.scholze@alaska.gov	
Isaac Pearson	Bristol Engineering Services	jpearson@bristol-companies.com	
Russell Nelson	Bristol Bay Native Corporation	rnelson@bbnc.net	907-843-1075
Chickie Carlson	Chignik Bay Tribal Council	jeanettecarlson749@gmail.com	907-749-4019
Debbie Carlson	Chignik Bay Tribal Council	cbaytc@aol.com	
Roderick Carlson	Chignik Bay Tribal Council		907-749-4020
Robert Carpenter	Chignik City Council	chignikcityclerk@gmail.com	907-749-4003
George Anderson	Chignik Intertribal Coalition		907-830-2623
Charles McCallum	Chignik Regional Aquaculture Association	chuckmccallum@gmail.com	
Dannica Anderson	City of Chignik	chignikcityclerk@gmail.com	907-749-2280
James Anderson	City of Chignik		
Jim Brewer	City of Chignik		907-749-4012
Arlene Kopun	City of Chignik		907-229-9022
Angela Daugherty	Chignik resident		907-749-4064
Axel Kopun	Chignik resident		907-952-7240
Billy Anderson	Chignik resident		907-529-4542
Dakota Anderson	Chignik resident		907-395-7696
Ernie Carlson	Chignik resident	Janisc585@aol.com	907-749-4042
Eugene Carlson	Chignik resident		907-749-4008
Guy Ashley	Chignik resident	Guyashley7@yahoo.com	
Kavik Skonberg	Chignik resident		907-654-9238
Magda Kopun	Chignik resident		907-952-7692
Polly Aleck	Chignik resident		907-749-4012
Andrey Khalkachan	Alaskanist Stories Films	akhalkachan@icloud.com	907-717-9854
Ryan Peterson	Alaskanist Stories Films	firstcast@gmail.com	907-570-6841
Gabe Miller	Paul G. Allen Foundation	gabem@vulcan.com	
Casey Ferguson	University of Fairbanks		
Chris Maio	University of Fairbanks	cvmaio@alaska.edu	
Matthew Balazs	University of Fairbanks	mbalazs@alaska.edu	
Mike Willis	University of Fairbanks	mdwillis@alaska.edu	
Bo Jensen	USFWS - Refuges	Barbara_jensen@fws.gov	907-469-0433
Carl Russell			
Sue Flensburg	Chignik Bay Tribal Council advisor	sflensburg@gmail.com	907-250-0391
Shelly Wade	Agnew::Beck Consulting	shelly@agnewbeck.com	907-242-5326
Molly Mylius	Agnew::Beck Consulting	mmylius@agnewbeck.com	907-782-8787

Over Zoom

Name	Organization	Email	Phone
Joy Britt	Alaska Forum on the Environment	Jbritt@akforum.org	907-360-6505
Oxcenia O'Domin	Alaska Native Tribal Health Consortium		
Marcus Geist	Artesian Knowledge	marcus.geist@gmail.com	907-602-0834
Colleen 'Cindy' Roque	Bristol Bay Native Association	colleen.roque@alaska.gov	
Nana Kalmakoff	Chignik Lake resident		
Michelle Anderson	Chignik Lagoon, Village Administrator and 16-year resident	manderson@chigniklagoon.net	907-840-4049
Alvin Pedersen	Chignik Lagoon resident		
Clinton	Chignik Lake resident		
Hazel Nelson	CIC Climate Resilience Action Plan Author	northsider579@gmail.com	907-301-8023
Peter Westley	University of Fairbanks		206-235-7603
Kimberly Basler	Part-time Chignik resident		206-235-7603
Melodee Carlson-Forbes	Part-time Chignik resident	mdcarl74@aol.com	907-351-8270
Ruel Carlson	Part-time Chignik resident	rscak79@gmail.com	907-980-7835
Frank Harris	USFWS	frank_harris@fws.gov	907-260-0122
Jon Gerken	USFWS	jonathon.gerken@fws.gov	

Acronyms

ACC	Alaska Coastal Cooperative
ACGL	Arctic Coastal Geoscience Lab
ACWA	Alaska Clean Water Actions
ADF&G	Alaska Department of Fish and Game
AFE	Alaska Forum on the Environment
ANTHC	Alaska Native Tribal Health Consortium
BIA	Bureau of Indian Affairs
BBAHC	Bristol Bay Area Health Corporation
BBNA	Bristol Bay Native Association
BBNC	Bristol Bay Native Corporation
BLM	Bureau of Land Management
CRAA	Chignik Regional Aquiculture Association
CIC	Chignik Intertribal Coalition
DCRA	Alaska Division of Community and Regional Affairs
DEC	Alaska Department of Environmental Conservation
DoD	U.S. Department of Defense
DOI	U.S. Department of the Interior
DNR	Alaska Department of Natural Resources
DOT&PF	Alaska Department of Transportation and Public Facilities
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information Services
IGAP	Indian Environmental General Assistance Program (EPA program)
NRCS	Natural Resources Conservation Service (USDA division)
PER	Preliminary Engineering Report
STEAM	Science, Technology, Engineering, Art, Math
STEM	Science, Technology, Engineering, Math
TCR	Tribal Climate Resilience (EPA program)
TEK	traditional ecological knowledge
UAA	University of Alaska Anchorage
UAF	University of Alaska Fairbanks
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

June 4 (Sunday) Presentation Highlights

See presentation slides for details

Welcome & Agenda Overview

(Jeanette Carlson, Chignik Bay Tribal Environmental Coordinator)

- Opening remarks
- Group introductions

UAF's Arctic Coastal Geoscience Lab & the Alaska Coastal Cooperative: Updates on Coastal Monitoring

(Chris Maio, Matthew Balazs and others/UAF ACGL and ACC)

- UAF Arctic Coastal Geoscience Lab (ACGL): documenting coastal baseline conditions data; to be successful, requires close local partnership. Started in Bristol Bay, expanding out into the Aleutians.
- Alaska Coastal Cooperative: objective is to enhance collaboration between lab work, field work, and state and federal agencies to address shared goals. Formed in 2022. Specifically:
    - Enhance communication.
    - Apply science to address community priorities.
    - Develop/enhance workforce development and education.
- New project: Advancing Resiliency in Indigenous Communities through community driven science, technology, and capacity building. Piloted in Chignik region.
    - Goal: map and monitor the landscape and habitat of Chignik area.
    - Example of applied science: drone photography of the reservoir to understand how raising the dam height would impact flooding.
    - Also contributing data to the Borough's Lidar mapping project.
    - Developing baseline data on water levels for waterways throughout the area.
- Developing a field class that will take place locally; 6-8 teachers or teachers in training, run through UAF Bristol Bay campus; Goal is to learn about the area, indigenous knowledge, etc. (launching summer 2024 – see day 2 discussion below for topics).
- Questions, Discussion?
    - Q. What will they learn?
        - A. We have some ideas, such as teaching about community-based monitoring, or how to use a weather station or water gauge. Want to get them on a boat. Ultimately – want to make a strong impression.
    - Q. We would like to better understand the changing flow of West Fork coming off the volcano. That's the source of a lot of change at Black Lake. Is that an opportunity for additional research?

        - A. We have some priority areas already but recognize we don't know all the important areas yet. Right now the West Fork is well researched toward the confluences. Hopefully some upcoming work will explore this a bit more.
    - Q. Would field school include kids that live in the Chigniks? With the school closure, many have had to transition to online learning.
        - A. That's a great idea. We could build that in and do some work with local kids.

Gabe Miller, Paul G. Allen Family Foundation

- The Paul G. Allen Family Foundation supports many efforts, including ocean health, climate resilience, and wildlife. A theme that spans all projects: community. Seeks to bridge data and community.
- Have done some dam removals in Oregon and Washington, helped with Pebble Mine resistance.
- It is exciting to be here, getting to see the community and the process.

Casey Ferguson, Alaska Coastal Cooperative

- Casey is the indigenous coordinator for the ACC; he was the first full time staff member.
- Casey is from Chevak, he shared a Cup'ik song with the group about resiliency.
- Coastal hazards are so prevalent in western Alaska; this ACC project is really important in helping understand impacts and plan for the future.

Mike Willis: UAF Graduate Researcher

See slides for details on research methods and research questions.

- Project: High resolution mapping of anadromous streams and salmon habitat in the Chignik watershed.
- Research question: What is the spatial distribution and extent of viable salmon habitat within the Chignik watershed?
- Background:
    - Rural Alaska is behind the rest of the lower 48 when it comes to baseline data.
    - Climate change is having an outsized effect here, e.g., with erosion.
    - Watershed summary: 1,100 km "known" salmon streams; small area but highly productive. Very dynamic system with extensive habitat variability; 5 salmon species.
    - Challenging to document all salmon streams without geospatial data. ADF&G has an incomplete catalog documenting salmon habitat, so this project seeks to expand knowledge of salmon habitat.
- The Lake and Peninsula Borough is conducting a LiDAR survey around its communities; with foundation funding, this study is collecting additional LiDAR in the Chignik region to supplement Borough data.
- Questions? Comments?
    - Q. Looking at the mapping and erosion – has anyone looked at creek erosion? The mouth of Indian Creek seems like it's changing constantly.
        - A. We have done a lot of historical monitoring. There is a time lapse camera collecting information now. Documenting historical change.
    - Q. How can people see results now? Live feed would be challenging, but for people who want to see data – how can they access it?
        - A. Reach out to Chris and other ACC team members. They may be able to explore releasing videos or other highlights on Facebook.

- Comment. Thinking about linkages between this data, and the fish. Have you considered applying intrinsic modeling? This is applying collected data to the full watershed, enhanced with indigenous knowledge.
    - A. Researchers will consider this.
- Comment: another research question to consider would be, what makes certain habitats so important and productive? What characteristics contribute to productivity?
- Comment (From Isaac, Bristol Engineering): We're working with the Tribe to help understand the Indian Creek bridge, since it was identified as one of the priority projects in the Climate Resiliency Action Plan. It would be helpful to understand high water collection and water flows of the creek itself – that data could inform the action plan recommendations.

- Ryan Peterson, Filmmaker
    - Ryan's background: from Eagle (on the Yukon River), grew up in Anchorage. Spent time as a fly fishing guide in Bristol Bay; slowly got into video.
    - In Chignik, documenting what efforts are underway to increase resilience in the region. Exploring the human side of these challenges. Teach viewers to learn about the challenges, which are shared across many other coastal Alaska communities, and some of the research and solutions that are being explored.
    - Shared video example documenting erosion in Dillingham.
    - Working with Andrey; they met while working in St. George.

Matthew Balazs, Alaska Coastal Cooperative

- Ongoing work includes erosion monitoring, GIS shoreline data collection, water level sensors; surveying via drones and other tools. Research is informed by feedback received at least year's symposium.
- Data is live, public, and shareable – contact the team if you'd like to access it.
- Highlighted two reports summarizing recent findings:
    - Chignik Bay Coastal Hazard Analysis
    - Community-Based Monitoring Shoreline Change in Southwest Alaska
- What's Planned
    - Expanded LiDAR collection to supplement Borough data; covering more of the watershed. USGS, Tribes, Chignik Intertribal Coalition, UAF, Borough – exciting connections.
- What's next?
    - Indian Creek

- Landslides
- Historical flood documentation – see day 2 discussion.

Chignik Intertribal Coalition & Chignik Regional Aquaculture Association projects

(George Anderson/CIC President and Steering Committee for Alaska Coastal Cooperative, Chuck McCallum/CRAA Executive Director)

- Chignik Intertribal Coalition (CIC) Overview
  - Originally advocating for commercial and subsistence fisheries; now advocating for resilience
  - Organization was born out of disaster
  - Over the years CIC has partnered with UAF, Fish & Game, CRAA, Borough, BBNA, BBNC, and others
  - Member communities: Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville, Ivanoff Bay.
  - Continues to advocate at Board of Fish for subsistence users.
  - Expressed appreciation for being invited to attend and listen, "We're here today rafting through the storm."
- Summary of recent projects
  - Subsistence harvest survey and escapement: funding to keep the Fish and Game weir open later into the season and collect more comprehensive data. All species counts are 10 min counts every hour at the top of the hour. Have done multiple looks at sockeye. Now trying to count every single king salmon, have recordings of every passage; finishing analyzing last summer's data now.
  - Bathymetric monitoring. Employing the technology on eight vessels from Black Lake through the Lagoon, including some seiners out of Perryville and Ivanoff Bay. Will be used to document their subsistence habits, and record Tribally-owned imagery.
  - Tribal Resiliency Program. Funded through Bureau of Indian Affairs (BIA). Interviewed all five Tribes over two years. Initial scoping summarized in Preliminary Climate Risk Assessment. Includes topics such as infrastructure, subsistence, and commercial fishing. Seeking funding for Phase 2 from BIA. "We're all here toward the same objective: long term resiliency, having a healthy economy and food security."
    - With Northern Economics – conducting a study, "Impacts of Fishery Disasters on Chignik Fishery Users." Includes interviews on socioeconomic impacts of disasters, using funding from 2018 disaster.
    - Subsistence harvest surveys, conducted with USFWS. In season harvest estimates. CIC will hire someone to work part time to make phone calls to figure out who in the Chigniks are interested in participating in surveys, then once a week, CIC will be calling to learn about their catch. From that, developing weekly estimates. To mitigate survey fatigue, try to spread out phone calls between households.
  - Working with University of Washington Fisheries Institute to look at juvenile salmon across the watershed.

- Question and Answer, Comments
  - Q. Listening about fish resource monitoring program: has that been looking at rainbow trout and dolly varden, too? Seeing if there is correlating information on how those species are changing and interacting with salmon?
    - A. There are a lot of species in our watershed; we have to prioritize which ones to study first when seeking funding. We have one of the most documented sockeye populations on the Peninsula. Despite all the info collected over the years, there's a lot we don't know. It's great to have Chris and his guys asking us new questions that have never been asked before. Hopefully we can start filling the gaps. Answers to questions such as - Where are the sockeye rearing? If they're rearing in the Lagoon, where? What intershore predation is happening? What's happening once they enter the blue water? There is a lot of money coming for research, but with four disasters out of the past five years, it's been challenging. We're doing the groundwork right now.

  - Q. Are past year's weir videos fully archived, or only the 10 minute recordings?
    - A. Full archive is available from last summer, but previously, only 10 minute counts with short stints of full recordings.
  - Q. I read an article about hatchery fish and how they impact wild species of salmon. Has there been research on how hatchery fish are impacting our wild species?
    - A. Not equipped to answer this right now. It is a bigger question.
    - Comment from Peter Westley: Peter was taught that the ocean did not have capacity limits when he was in school. "A black box and limitless pasture." In the past 25-30 years, that view has changed due to evidence – study after study – that has shown association between growth of certain species (e.g., Asian chum salmon) and changes to other species. It's not just a hatchery issue. Chum and pink and sockeye are struggling in some places like Chignik but overall those species are thriving, doing very well. Correlation is not causation, but when we have a strong understanding of causation – salmon in the ocean tend to eat the same things –these associations are probably linked. Disappointing that it's taken so long for 2018 disaster funding to come through; Peter got final funding two weeks ago to initiate his project. Focus is trying to understand some of the causes of the most recent ups and downs, especially the downward trends. One of the things to test is competition with other species of salmon in the North Pacific. In years when it's really warm, "blob years," competition might be extra high – fish eat more food in warm years. Hatcheries are likely part of the issue but not the whole issue. Competition with both hatchery and wild species.
    - Alaska releases around 2 billion salmon each year – mostly pinks and chums. 2nd in the world behind Asia.

- Related Q: Is any research going toward this now? Correlations between our salmon and other species?
    - A. There is so much that needs to be researched. We need to prioritize; the funding is there. To keep the infrastructure going, we need to focus on what keeps the lights on. Exciting to drive through town and see new water lines going in. There is also a new water line going to the port (5 cruise ships landing this year, plus Alaska Marine Highway visits).
- Q. CRAA funded a project to broadcast the video. Would that be possible – to livestream the recordings at the weir?
    - A. Can discuss this possibility but could likely be done now that there is Star Link on site.
- The voices from the Tribes are powerful. We are building on the foundation from last year's symposium. We want to connect the dots between what has begun to occur in response to the reoccurring disasters. The fisheries disasters are frustrating, but also the lack of response from the State of Alaska in how they could be more effectively responding to the disasters. The communities in Chignik need to move the needle because of how the state is reacting (or not reacting). You're already doing it by engaging with Universities, USFWS, researchers, holding this symposium. Bringing your ability to make change in not only how research occurs, but also management. It's much bigger than fighting at the Board of Game meetings. For the Chignik region to have a future, that needs to be continuously built on, including collecting science we own ourselves.
- It's more than food security – it's food sovereignty.

- Chignik Regional Aquiculture Association (CRAA)
    - Overview
        - The CRAA board is made up of local stakeholders: commercial, subsistence, processors, government, village corporations. Funded by 2 percent tax on salmon.
        - Primary mission is to increase salmon production. Mostly interested in rehabilitation, not hatcheries.
        - Formed 1991. Not looking at hatcheries, but at changes at Black Lake. Locals noticed the West Fork had shifted where it was entering Black River, closer to Chignik Lake. Concerning – a high interest in investigating whether there needed to be a rehabilitation project.
    - Black Lake Summary of Activities
        - Did different projects over the years to determine if rehabilitation was appropriate, learned a lot about the system. Facilitated a 2012 Defenders study, building on CCRA's previous studies. Determined that Black Lake has already lost between 1/3 and ½ of its volume, but declines had stabilized. Did not recommend rehabilitation but did suggest the community continue to monitor. Highlighted measurements that should be done regularly, to ensure recommendations were correct and there were no more dangerous habitat changes occurring.
        - Most recent monitoring: looked at cross sections of Black River near Black Lake. Stream had been downcutting the area; primary reason the water levels were reducing. That had stabilized, too. River is migrating left to right, it's no longer downcutting.

- Alec River outlet into Black Lake. There is a North channel (above the spit) and South channel (closer to outlet basin). Concern about more water shifting into South channel, concern about problems with rearing habitat.
- Most recent monitoring has shown interesting changes. At low volume flow, most of the water flow goes to South channel. This last year, that changed – it was more equal. South channel also moved its outlet by a couple hundred yards south; still learning if that's a problem or not.

- Salmon
  - CRAA is developing a comprehensive salmon plan. CRAA has done many projects over the years. Cooperative agreements with ADF&G to do genetic stock analysis, in season management, etc. ADF&G has lost interest in those projects, we were disappointed in both those outcomes. Department has indicated we need to stay focused on rehab, "not act like a fisheries organization." Still determining what that means for the scope of our projects and underscores the importance of the collaborations being done here. Great to hear about all the work being done.
- Question and Answer, Comments
  - Q: You have a website? Are the projects summarized on your website?
    - A. Yes, a website for CRAA. Not sure how comprehensive or up to date, though. No website for CIC.
  - Q: How is CRAA adapting to these recent disasters?
    - A. Can recall when CRAA was basically a science symposium for anything salmon related. Now we're being told that's not what CRAA should be doing. Should be narrowly focused on salmon hatcheries or rehabilitation. Still grappling with what that means.
  - Q. With changes in Black Lake over the years and changes in the West Fork - what does the monitoring setup look like up there? What exists for implementation monitoring?
    - A. They monitor lake levels and cross sections at specific locations.
  - Comment (Peter): Last time I was in CRAA was as a grad student in around 2003-04. All research was about Black Lake, hyper focused. We've arrived at a time where our understanding of that system has advanced so much. We have a good sense of what happens and why now. CRAA is less focused on just Black Lake, and there have been some good discussions about identifying other areas of enhancement projects, spawning channel for new spawning in other areas, etc. – to identify what is happening with the runs and what should be the focus going forward. How to respond to changes and build resilience. Maybe even revisit CRAA's mission statement. It's an exciting time for the organization that has historically been so focused. Confident CRAA will play a sustained, important role in the Chigniks.
- Q. What would a rehabilitation project look like? Dredging? Moving a channel? Examples:
  - Building a structure near the outlet of Black Lake.
  - Work on Alec River so more water would go into North Channel and help move more salmon into main body of lake.
  - Rerouting the river. That river is hugely dynamic, part of the productivity of Chignik is the diversity and changing nature of the landscape, and that has benefited and created diversity of fish.

        - Other ideas: are there sites with good rearing habitat that have current barriers to accessing them, and you can build fish passage? Increase wild production by giving it a nudge; done successfully in Kodiak. Would simply require stakeholder engagement and local input on what feels right.
    - Q. Indian Creek is so full, don't know if salmon can travel that far... is there opportunity there? Would CRAA look at more local streams? Would they have to change their mission to do so?
        - A. Wouldn't need to change the mission statement to consider/explore something like Indian Creek. We could look at what have we done in the past that was successful and we could apply it elsewhere. Coho restoration in Perryville was successful.
    - Comment: Everyone participating is going to join in the rebuilding and rehabilitation of sockeye and Chinook. This symposium is an important part of that.

Chignik Subregion Map Project

(Marcus Geist/Artesian Knowledge LCC)

- Project Overview
    - Marcus is a geographer; primarily works at UAA but continues with selective mapping projects.
    - Reviewed benefits and limitations of village mapping – gaps between Alaska Division of Community and Regional Affairs (DCRA) community profiles and US Geologic Survey (USGS) /Alaska Department of Natural Resources (DNR) maps.
    - To achieve The Nature Conservancy's conservation goals, needed to invest in projects that were practical, locally accepted, and data driven. Built a simple conservation scoring formula to guide prioritization.
    - Chignik mapping process: visited Chigniks last year and also participated in some Anchorage meetings; had folks mark up paper maps, then digitized that feedback – could document attributes such as where, what, and even when (e.g. seasonal movements of animals or harvesting). Merging traditional knowledge with traditional western tools.
    - See slides for results of the data collection effort, with various visualizations such as distribution of cultural resources, physical resources (e.g., hydrography, elevation, slope, biological resources, land management)
    - Divided the region into sections and for each section, looking at an inventory of all the different inputs. For new infrastructure (e.g., road corridor or new runway) – could look at the proposed sections with development potential, and can view the various features to inform placement and where conservation values are important.
    - Some of the data collection methods work better in more stable systems; the Chigniks include very dynamic waterways.
    - We are learning lessons about the demise of salmon in Europe and the Pacific Northwest; we want to manage fish for not only where they are today, but where they were 100 years ago, and where they will be 100 years from now.
- Conservation Planning Atlas
    - Context: While we are making big leaps in bandwidth now, we were driven from interest in having an atlas/gazetteer as reference for research and those working on landscapes who don't have reliable internet. Context: While we are making big leaps in bandwidth

now, we were driven from interest in having an atlas/gazetteer as reference for research and those working on landscapes who don't have reliable internet.

    - We are producing detailed maps for planning sections around the area. One page each, to include imagery background, data summary (including which fish are present), and locator inset. Can see conservation values for the section.
    - Map access options:
        - GIS data, Google Earth files, or PDF. Can toggle layers on and off in PDF – "budget GIS." Making GIS layers accessible even if folks do not have GIS. Can also measure areas or merge coordinates from the field onto the maps.
        - Accessible via USB drive, with index links to files.
    - Bristol Bay Heritage Land Trust now has the ability to pursue conservation options for the areas with highest resources (cultural, biological, etc.)
- Questions and Comments
    - Comment (Sue): For Bristol Bay Heritage Land Trust – originally just Nushagak and Mulchatna drainage but now expanded to all of Bristol Bay. Sue is happy to share more about the Bristol Bay Heritage Land Trust. Tries to align their gathering with when BBNC is hosting their annual meeting since folks are already together. Reach out to Tim or Sue if you want to learn more, get involved, attend meetings.
    - Comment (Dannica): excited to be able to use these maps for economic development. Would be so helpful to have a map showing private, public, and undeveloped land. Is there an opportunity in the future to develop a visitor's map? As we build capacity to host cruise ships, wish we had a map to guide visitors. Dannica has a rough version but would love a more sophisticated interactive one (could toggle on/off natural sites, historical and cultural sites, etc.)

Chignik Subregion Watershed Plan

(Shelly Wade, Agnew::Beck and Jeanette Carlson/Chignik Bay Tribal Environmental Coordinator)

- Context
    - Chickie introduced the idea of watershed planning. Sue applied for a Clean Water Grant from Alaska Department of Conservation – that made this possible.
    - Agnew::Beck helped with IGAP environmental training in the Bristol Bay region, working with Sue, Chickie, and Oxcenia.
    - Project will be about connecting the dots with all the findings and recommendations from various efforts, do some prioritization and incorporate community input. Owning the science, building the stage for resiliency, helping weather turnover of administrations, leadership, etc.
- Questions and Comments
    - Comment: You have until February 2025 to complete the plan. Want a draft by June 2024, but want some generous time to get feedback.
    - Comment: Where can we set up a page for a data dump for this climate resiliency summit? A Facebook page? Could the City manage a page?

Refuge Visitor Use Monitoring Plan

Bo Jenson, USFWS

- Visitor Use Monitoring Plan Overview
  - Conducting visitor survey projects as a contractor.
  - Plan is in early stages; want community input.
  - Developing a plan focused on the region's refuges – 4 millions acres of federal lands, adjacent to state lands and community and Tribal lands. Want to find out – who are the users? And how are those uses going? Not seeking quantity, but quality. Learning about subsistence uses as part of her role.
  - Guiding research questions: When you hunt, gather, fish, are you finding what you are looking for? In terms of outcomes, what are the quality of harvests and quality of experience you are having?

Breakout Questions

Question 1: What topics are most important, related to the watershed and climate change?

Themes from responses across groups:

Detailed input by group:

- Group 1
  - Food security.
    - Especially relevant to disaster in 2018. Taking that a step further – food sovereignty. The food that was brought in helped tackle insecurity but didn't empower people to choose how they received food, where it came from. Food sovereignty is empowering, participating in conversations around regulations that impact hunting.
    - Traditional foods – salmon, berries, moose, Bidarki traditions.

        - Understanding and participating in regulatory conversations around harvesting of traditional foods.
    - Research.
        - Making research available, accessible – in communities, in Anchorage, in Seattle. Considering how connectivity changes access.
    - Fish.
        - Helping protect our fish in the area. That is our way of life and main food source. I'm in Anchorage now but live in the region seasonally, make smoked and canned fish. Aunt used to joke, "You eat so much fish, you're going to finish the fish." Not sure why the fish are diminishing.
    - Erosion
    - Living in Chignik Lagoon – more erosion in this one year than seen in my entire life. We lost 100-150 ft of shoreline. Chignik Lagoon is prime rearing habitat for all species of fish and game. See a lot of placement of rocks, tanks cut up in the watershed, rubber tires to stop further erosion. How are those mitigation efforts impacting species? Need to start cleaning up our own backyard.
- Group 2
    - Clean up and environmental hazards.
        - Cleaning up contamination; contamination management; e.g., cleaning up Trident properties in Chignik Bay.
        - Safety and environmental hazards. Old oil filters, transmission fluid is seeping into the Bay, could be impacting the fish population and fish is an essential resource.
        - Cleaning up creek. Fence to stop outflow of debris? Beautify surrounding areas, address old buildings, restart school. A community without a school shouldn't happen here – how can we bring population back, year-round?
    - Collaboration.
        - How can everyone come together instead of City, Corporation, Tribe separately navigating these contamination problems?
    - Tree management.
        - Trimming back the alders – they are overgrown, some over 20 feet. Causing harm in multiple ways, need to manage.
        - Some of the abandoned boats have alders growing through them. Impacts cleanup.
        - Makes it harder to see and safely exist with bears.
        - Alders also overgrowing salmonberry bushes. Impacts food security.
        - Seeing growth in other coastal areas, too – like Chevak.
    - Population loss.
        - Population turnover; locals moving out, so having to hire out for roles, which is more expensive.
- Group 3
    - Communication and collaboration.
        - How to communicate effectively with all community members – those in other villages, those who are here seasonally.
        - Networking communities.
    - Economics.

        - How to capture and present economic impacts of what is helping? People get it if you make it into numbers and dollars.
        - Criticality of the disaster.
        - Diversify income streams, e.g., with ecotourism and cruise ships visitors; what else is there?
    - Population
        - How to slow outmigration.
    - Subsistence.
        - Building knowledge across generations. Lacking mid generation to provide for Elders, young people who do not know how to practice subsistence. Need to address knowledge gap and culture loss.
- Group 4
    - Fish.
        - All of this seems to stem from the fishery not being here, not being viable. No one is talking about the interception of the fish coming here. Even in '98, when serving on Board of Fisheries, area L is tiny, between K and M; was a concern even then. Those areas have all the political pull. Political problem, too. Also an issue in the Yukon Kuskokwim region; villages that are poor and don't have fish any more. We have newer genetic technologies that could help us identify where fish are coming from but there is obstruction because powerful influences don't want that information. Lessons learned from the Pacific Northwest, "industries can take care of themselves," that was not successful.
        - Local representation – requires government appointment.
        - Tracking conditions to identify trends.
    - Clean up.
        - We need to clean up the towns and have them look better if we want to attract people and become a destination. Most places we've turned into concrete jungles; our communities are in beautiful places but we need to clean them up.
        - Processer purchased the competition, didn't take care of the facilities.
        - Norway as a comparison – scenic, cute, an international destination.
        - Cruise ships as opportunity.
    - Population loss and families.
        - We need to bring young people back. We need people who are having kids, who enroll kids in school. Grandparents want to be near their grandchildren.
    - Diversification.
        - Diversity of job opportunities. Bringing salmon back would help, but either way, need more besides salmon.

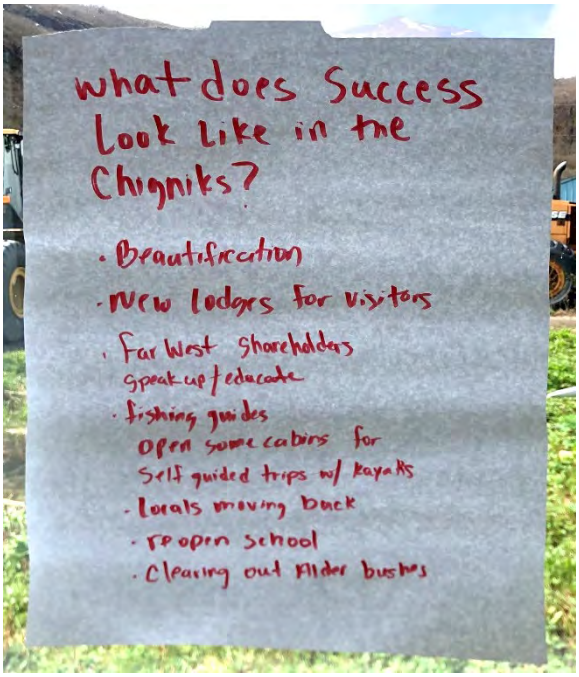
Question 2: What does success look like?

- Group 1
    - Food sovereignty.
        - All local Tribes are involved in advocating for any regulatory impacts and involved in the studies themselves.
        - Growing up, all winter long, we always had caribou; always harvesting and processing. My son didn't get his first caribou until he was 17; we were encouraged to give meat back to Elders but we needed it for our freezers.

Couldn't harvest locally; had to go to Port Heiden. Getting involved and having local decision-makers involved from start to finish on any regulatory decisions – both fish and game. Need to build that capacity to participate.

- Fish.
  - Watching counts and runs – seeing the numbers go back up. It's frustrating to see how they are counting. Researchers say they see the fish, but when you live at the lake and don't see the fish – hard to know what is correct. Frustrating when perceptions of fish don't match the results from the counts.
- Erosion.
  - Erosion in Chignik Lagoon – not sure what can be done. Shorelines are gone, hillsides are falling in. Talking with surveying staff – it's a statewide issue.
- Clean up and backhaul.
  - Start by cleaning up our own communities.
  - Backhauls; lots of talk but not a lot of implementation.
  - Oxcenia offered to follow up on this to find out status. Not sure one will be enough; supposedly one this summer.
  - First step will require staging, collection.
  - Drone imagery could help document a baseline of debris/waste around communities; is it growing? Shrinking? Can we estimate volume? Identify areas for cleanup?
    - Some visible on Google maps.
  - Work with agencies to identify areas on their land where there is contamination, and identify the sources and who is responsible for cleanup (e.g., landfill at Rocky Point; all old dumpsites).
    - Reference BLM inventory – not sure whether all were previously documented.
    - Contaminated Lands Partnership Group (led by ANTHC) – includes DoD, DOI, USFWS, Village and Regional Corps, Tribes). Objective is to find existing contaminated sites and making sure they're reflected in inventory.
    - We often know who the responsible parties are, the challenge is getting them to engage in clean up.
    - DEC's inventory – they are point-based sites, may have information available.
    - Oxcenia's office at ANTHC is adjacent to the Contaminated Lands Partnership Group and she can help us get connected.
    - In Chignik Lagoon, there are very little cleanup efforts, aside from annual cleanups through the school; doesn't address soil cleanup needs.
  - Cleaning up wetlands and watershed.
  - Getting stuff back into landfills
- Accessibility and availability of research.
  - Making it easier to find.
  - Hearing about intertie road, hearing about benefits, but never saw the feasibility study.

        - Within communities, is there a central spot for getting information? Library, Tribal Council Hall, City Hall?
        - Establishing something like this in each community – would be great. Oxcenia was previously a Tribal Administrator and finding reports, studies, plans was impossible when she first started.
        - Chignik Lagoon – many spaces under renovation. School, village office both getting a lot of work done.
        - This process is a first step!
- Group 2
    - Local data and planning.
        - Seen as more accurate, and more representative. E.g., federal agencies relying more on local data.
        - Communication plan – including timing, purpose of communication when planning efforts are underway.
        - Importance of community planning – having schools and clinics open, villages working together.
    - Education.
        - About subsistence, language, culture.
- Group 3
    - Local data.
        - Need for locally-owned data
        - Data is collected, analyzed, and served locally. But should be done jointly; using standardized data collection so it can be used by multiple parties.
        - Reliability. Data is used over and over in reports; accuracy is important. Local data collection can help ensure accuracy.
        - Need more and better demographic data. Important for planning, grants, etc. Not accurate data available for this region.
    - Need for economic diversity.
        - Problematic working with Trident
        - Blue economy; aquaculture; smaller fisheries; selling water? What unique opportunities could exist here?
    - Need to update rules; many developed in the 70s, need to reflect current times.
- Group 4
    - School reopens.
    - Boat harbor full of boats.
    - More year-round residents, who can support themselves and families.
    - Presence of local processor. Opportunity for fish co-op? Was one at one point in the area, was ruled unconstitutional and was closed.



June 5 (Monday) Presentation Highlights

See presentation slides for details

Group Discussion: Field School: What topics would be most important to cover in a Chignik-based field school?

Context: want to leverage the resources and knowledge here in the Chigniks to bring teachers in training to the community. Funding for 6-10 teachers (from Paul G Allen Foundation and National Science Foundation). Could include teachers already in the region, and undergraduate students studying to be teaching. Objective is to teach teachers on how to teach about relevant topics, such as climate change, natural resources research, culture, fish, food security, etc. Could start in Dillingham at the UAF Bristol Bay Campus, or could initiate in Homer and arrive via ferry.

- When should the field school take place?
    - Alongside the symposium; it's a busy time of year, nice to have everyone here at once; easier for the community to host the visitors in one go.
    - If students come in early, could meet other local youth, and could do some volunteer activities together such as clean ups.
- Who should participate?
    - Would like to also see young residents invited to participate; even youth up to age 24.
    - More buy in when residents and locals are participating in research. Collaborate with local scientists and researchers.
    - Would like to invite participation from neighboring Chignik communities.
    - Could pilot new lessons at the end of the program with local students – such as a camp on the last day for emerging teachers.
    - Participants could be eligible for an occupational endorsement.
- Resources
    - IGAP grant could support this work, too; each community in the area has IGAP funds.
- What topics would be most important to cover in a Chignik-based field school?
    - History and Culture– learning about culture (e.g., art), community history, guided hike with local teachers, Aleut people. History is not well documented but important to share.
    - Collaborating with school teachers to fill in gaps via summer programming.
    - Learn about the unique histories, heritages of different parts of Alaska, and especially the areas the teachers will ultimately be working.
    - Artists – paint or build something together. Work with ADF&G or FRI. Counter the comment: "we're not scientists." Integrating art and science as a powerful learning method. Could do a project together on an older building – a mural.
        - STEAM, not just STEM: Science, Technology, Engineering, Art, Math.
        - Everyone who is aware of the Chignik region knows that there are a lot of great artists from those communities. I like the suggestion of enhancing the attraction based on art, that's what Homer has done, and Halibut Cove, I think there's a lot of art grant funds available to help with growing this. Could collaborate with Homer as a ferry-connected neighbor. Invite a local artist to lead a mural installation with the visiting teachers.

        - Cruise ship visitors want to spend money on local art. An opportunity for local artists to sell and showcase their work.
    - Collaborating with scientists who have done research locally – e.g., Peter Westley to learn about their process and what they learned.
    - Tourism opportunities.
        - Leavenworth, WA was a depressed logging community, and has revitalized itself as a Bavarian village. Identify a motif; could collaborate with artists to build out a theme.
        - Birding – another learning opportunity; birding is a major segment of the tourism industry. Could use the book Birds of Southwest Alaska as a learning reference. Birders are low impact visitors; "they take only pictures."
        - Developing local guides.
        - Cruise ships: 350-400 people coming to shore for a 6-10 hour visit. They pay a lot of money to come out here. We should be equipped to greet them, share history, etc. We can plan for it but we also need to be ready for them NOW – they are arriving this summer. How can we keep them safe and ensure they have a positive experience?
        - Don't want to be overdependent on tourism at the expense of culture. Using Homer as an example – Homer is not a fishing town anymore, it's a tourist trap. Seward, too – they shut down for the winter, costs have tripled. Need something that will create year-round opportunities for employment. My three kids love coming back; one is a certified diesel mechanic, working on heavy equipment operator certification, then refrigeration; he wants to be able to work here on boats. But we keep shrinking as the fisheries are going away. We don't have infrastructure for cruise ships; worried about the appearance of the community and impressions of visitors. Worried about the future – keeping the generators on. We need to respond fast. 25 boats fishing last summer, used to have 106, only a few this summer. If you lose the connection with the primary driver of the economy, everyone leaves. "Reality of the situation...we're a long way down the road toward being extinct."
    - Recruit local host families – visiting teachers could stay with residents who are willing to mentor and share about their lives and experiences.
    - Could have alternate options for teachers – e.g., could choose to do an art program or visit the fish weir.
    - Flora and fauna – field guides, learning about what is living and growing here.
- General Community Education Needs
    - Continuing education for utility operators to keep their licenses; challenging to access continuing education here.
    - Community is in crisis mode; young people are leaving. We need to keep them here, ensure they have things to do, have them transition into positions of leadership. Need to engage young people in dialogues like the symposium. Starts with conversations at home about the importance of community involvement.
    - BBNC's new education and workforce development program could help meet some of these needs. Currently planned for Naknek and Dillingham but could expand to additional communities. Establish in one of the Chigniks? Still in evolution; could meet some local needs such as the continuing education for utility operators.

- BBNC does fund various education projects; requests are vetted through Shareholder Relations Committee. BBNC works in partnership to help deliver programs instead of delivering directly. Can also advocate for state programs that can benefit the region. Priority is paying dividends, but other programs are important, too.
    - BBNC Education Foundation is now BBNC Foundation – their mission has expanded to more than just scholarships.

Backhaul Update

Chickie is hoping a backhaul can happen this fall. They have documented what could go out already. Still working on the details. Could be a great win.

Green Star Program Assessment of Chignik Bay

Joy Britt/Alaska Forum on Environment, Environmental Programs Director

- Alaska Forum on the Environment (AFE) has four staff; Joy is focused on Green Star.
- AFE is mostly known for hosting its annual conference, but also hosts this program. Covers waste reduction, landfill operations, etc.
- Green Star was launched in Dillingham in 2017.
- Communities that meet criteria are awarded the Green Star recognition status. Awarded annually at the Alaska Forum on the Environment conference.
- The U.S. Department of Agriculture (USDA) supports this program.
- Chignik Lake become one of the awardees in 2019, one of the first communities. Chignik Bay was just enrolled.
- Lots of challenges and hoops to jump through in our rural communities compared with communities in the lower 48.
- Green Star is non-regulatory; we do not investigate your implementation.
- Green Star members receive five years of technical assistance and support to help communities implement their green star community standards. E.g., identifying or seeking funding for local waste reduction projects, improving drinking water, proposal review, etc.
- How to join? What happens when you join?
    - Show interest, e.g., by being nominated (Chignik Lake and Chignik Lagoon have been nominated).
    - Need confirmation by the community to proceed.
    - Green Star conducts a community visit to talk about standards and do initial documentation of challenges and priorities, including drone photography. Photos, reports are owned by you, can be used in community planning, grant applications, etc.
    - Work with the community to develop a work plan (can be only 2 pages), including short and long term realistic goals. Only used by the community – does not to be submitted or formally approved. Priorities written by community.
    - Green Star can help with implementation of your goals and actions. For example:
        - If you want to do a backhaul, Green Star can help organize a backhaul with Zender.
        - Can help coordinate trainings, e.g., training with Environmental Management. See training list here: https://emi-alaska.com/training/
- Pollution Prevention focuses on reducing waste; federal funds are available for these programs.

- Chignik Lake as a case study.
    - 2019 Awardee.
    - Implemented various projects including emission reduction efforts at the power plant; landfill cleanup, reusing waste heat, etc.
- Sue presented on the Chignik Bay IGAP work plan actions related to Greenstar Program.
- Questions, Comments
    - Question: We've talked about debris and clean up. What does the role Green Star play in helping with debris removal?
        - Answer: Can be a long-term goal to remove all derelict vehicles and debris from a community. Once identified in a work plan, AFE can help work on identifying funding and backhaul organizations to do that work. Can also provide trainings on how to do safe dismantling of smaller and environmentally sensitive items such as car batteries.
    - Question: Will this include waste coolant from the power plant? How can we dispose of waste coolant?
        - Answer: Joy can answer this separately via an email.

Chignik Bay Climate Resiliency Action Plan Final Draft

(Isaac Pearson/Bristol Engineering Services Corporation, LLC Senior Civil Engineer)

See slides for details on project objectives, report process and status, summary of past presentations, risk mitigation and community goals, priority projects, and data gap analysis.

- Funded through BIA Tribal Resiliency grant award to the Chignik Bay Tribal Council.
- Bristol is at the tail end of this project, which launched at the symposium last year. Exciting that the watershed plan is now initiating at the symposium.
- Through the planning process, selected three priority projects for additional scoping and cost estimation. Developed proposed scope of work.
    - Project #1: Indian Creek Bridge and Road Rehabilitation
        - Question: What data did you use? Will you use the new LiDAR to inform planning?
            - Answer: We were not aware of the LiDAR data when scoping this. The LiDAR data, if available to the future consultant, will result in significant cost savings for the engineering since they could use that to inform their surveying. Engineers could also benefit from the hydrology reports.
        - Question: You mentioned the community profile maps are outdated. Can you give us some more information on what elements are outdated, and what is most important to update? How do you use the maps?
            - Answer: Two elements that would be most helpful would be recent imagery, and land ownership. While ownership changes and it is just a point in time, it is helpful context. Topographic information can also help with planning and even engineering when budgets do not allow for full surveys.
        - Question: According to your slides, $281.6 k would be the budget before a bridge is even built. What might bridge alternatives look like?

        - Answer: An example could be relocating the bridge to a different spot in the watershed that is easier/safer to build, access, and maintain.
    - Question: Does DOT&PF come out and do assessments of the bridge periodically? How were these assessments used?
        - Answer: Reached out to DOT&PF and reviewed their past inspection reports. The reports help document conditions and will ultimately help the engineers have technical information when they proceed with design.
    - Question: How could this be funded? Would DOT&PF fund the project?
        - Answer: Cannot speak for DOT&PF. One potential contributing funding source would be the Tribal Transportation Program – if the bridge project is identified on the Tribe's inventory, could use some of that funding for the project. Tribal shares are considered a non-federal match so can be useful leverage for other funding.
    - Question: What is the rough estimate for implementation cost of these projects, recognizing the details are still in development?
        - Answer: there was a 100 ft road and bridge built for $7 million, 10 years ago in Ekwok. Tribal shares funded planning and design. USDA Rural Development was a major funder because the landfill was accessed by the road and bridge.
        - (added by Sue): NRCS soil survey helped inform design and sighting in Ekwok.
- Project #2: Two Tsunami Shelters Preliminary Engineering Report (PER) – one on each side of the bay.
    - Question: What is the rough estimate for implementation cost of these projects, recognizing the details are still in development?
        - Answer: In this building climate, building costs are $500-$900 per square foot. A lot of unknowns because building design is unknown.
    - Question: What happens after the preliminary building report is completed? Is it ready to build?
        - Answer: Would need to seek funding. Funders really like to see these PERs to advance funding.
    - Question: How long is the PER good for?
        - Answer: Can be good for a long time. The elements that would time out: if the channel itself made a major diversion, or moved significantly, then information that was gathered would need to be reevaluated. Project costs also time out the fastest. By the time it goes out the door it's almost obsolete. Even if it changes you should have a good grasp on what it should cost. After 5 or so years you would need to do a major reevaluation to make sure design assumptions are in the same place.
    - Question: Could local building materials be salvageable and used for the facility?
        - Answer: Estimates it would take more money to take buildings apart and reuse, and a lot of it is in poor shape. The engineers would assess local resources to determine how they could be used; e.g., availability of local gravel can dramatically shift the cost of building a road.
    - Comment: thank you for considering all our input at the last symposium and for sharing these details. Other Chignik communities have similar needs; would

Chickie and Sue consider helping mentor other communities to go through a similar process?
    - Answer (Sue): Can't request money from the delegation until you know costs. Talked to BIA to see if they could help, a few other agency representatives assisted with answering questions and developing a competitive funding request. Sue can share details if other communities want to go through.
    - Answer: Bristol Engineering is happy to talk through scope and estimated cost to do something similar for other Chignik communities.
  - Project #3: East Side Electric Distribution Upgrades PER
    - Untapped opportunity: waste heat at Power Plant.
    - Power Plant in avalanche prone area.
    - Relevance with Green Star – reusing and disposing of power plant waste.
    - Question: With the potential for a larger dam on the upper lake and resulting hydroelectric potential – has that been considered in this project?
      - Answer: Should be considered in the PER.
- Data Gap Analysis
  - Many of the gaps identified on the list are currently being filled by the work of the UAF ACC team.
  - Isaac highlighted inner transit system feasibility study; recognizing the benefits of connectivity for efficiency, sharing resources, etc.
    - Comment (Chickie): there has been discussion between the Chigniks about establishing a small ferry between the Chigniks. When airport is closed (e.g., runway is too soft, or a community is socked in), could fly into a neighboring community. Chignik Lake has a new landing craft barge; could that be repurposed?
    - Comment: Like the idea of a mini highway. Could we reach out to the Alaska Marine Highway System to better support travel between rural coastal communities? Discounted travel, partnering with local operators, etc.?
    - Comment: Looking at Lake and Peninsula Borough Comprehensive Plan. Issue of road connecting communities was a high priority at the time. The Borough will likely be updating the plan in the next year or so.
    - Comment: This is a call to action. Some of these have been identified already in plans; how do we make progress?

Discussion

1. What is the single most important action we can take as a community this summer to make progress on our priorities? Grouped responses by theme

- Solid waste (6 responses)
  - Creek Clean up.
  - Solid waste – plan for and conduct clean up.
  - Start clean up. Pieces of metal, old tv dishes, etc. – easily visible now since alders have not yet branched out. Elements that can be disposed of without heavy equipment.
  - Solid waste beautification.
  - Creek and community cleanup.

    - Get beaches and public areas clean; get rid of old metal and plastic waste from cannery.
    - Tear down old and abandoned houses. Requires permission from owners
    - **Next Step**: Set a date and do it! Plan and prioritize one area at a time. The longer we wait the more overgrown it will be. Will need to trim alders in some areas. Prioritize areas most visible to visitors. Scheduled a planning meeting to organize Chignik Bay clean up efforts: TODAY, Monday, June 5th at 4 pm, community hall.
- Visitor and quality of life improvements (5 responses)
    - Cut and maintain walking trails – James to initiate.
    - Newsletter with historical information, unique features, how to contribute to community success; for sharing with visitors.
    - Fix up the Barabara to show visitors.
    - Set messaging and plan activities for cruise ship visitors.
    - Invite Bristol Bay artists to charter into communities when ships arrive to share their wares to cruise visitors.
    - Invite someone from BBAHC (Robert Clark) to give the story of how the clinics in the region were just a dream 30 years ago and now the community of Chignik has a subregional clinic that is a model for the health aid programs in the state. I think people from the ship would be intrigued to hear the history.
- Data (3 responses)
    - Help fill data gaps and set up equipment for local data collection
    - Finish field surveys and kick off bathy project with George!
    - Identify mapping priorities from community members
- Population retention/growth; new resident planning (3 responses)
    - List and contacts for available properties for sale/rent (outreach to property owners), plus a list of available jobs.
    - Population – try to open the school.
    - Educate Chignik Lake.
- Communication (1 response)
    - Continue having workshops like this so agencies, partners, researchers understand community needs.
- Economic Development diversification (1 response).
- Infrastructure: maintain what we already have. (1 response).

Reminders for tomorrow: (June 6th)

- Discuss bathymetry project for Chignik Bay.
- Historic floods and storms – want longtime residents to help understand recent and historic flood impacts and interpret photos.
- Ryan: will continue with additional documentation and recording of stories from Elders and longtime residents. Participants shared suggestions on who Ryan should talk with: Gene, Roderick, Ernie, Axel, Jim, James' dad and mom.

Closing Comments

- Looking ahead to next year's symposium.
    - Suggestion: solidify the symposium to be this weekend after Memorial Day weekend so we don't have to figure out a day in the future. When they leave, you can put it on your calendars. June 2, 3, or 4? Consider and try to plan for before or after the minus tides.
    - Suggestion - a new name? Chignik Resiliency Symposium, or Chignik Science Symposium; Chignik Science & TEK Symposium. Could have a specialized focus each year.
- Hazel: enjoyed being with everyone. Appreciated all the comments, took notes. Appreciate the information – it will be good for thinking about the future. The exercises today really helped. Liked the prompt: what can we do next. First step is most important. I will be down for next year's symposium.
- Cindy Roque, DCRA Community Governance Specialist: So great to see today's work. Sorry to miss yesterday, was traveling. Started job in January, Chignik was one of the first trips. Met Dannica, and in discussion, learned about cruise ship visitation this summer. First Cindy had heard. From that conversation, it's been intriguing how this has taken off. Sat around and talked, and today, you already have a plan. That doesn't happen everywhere. Thank you for inviting me, looking forward to visiting later this week. I This group is taking action. Commend everyone. Looking forward to seeing some of you next week.
- Clinton – no comments.
- Melodee Carlson-Forbes: Thank you for inviting me, sorry unable to join yesterday. I love my home village and to see it spruced up is amazing. And thank you to everyone who made this possible.
- Nana: Thank Chickie for inviting us to the symposium. Next year, would like to be there in person. First time we heard about it, was really informative. Enjoy the BBQ later!
- Bo: thanks for letting me be here.
- Magda: statement of gratitude to Chickie and Debbie and everyone taking initiative. Much needed. Thank you is inadequate but thank you.
- Chris: thank you to everyone, it's been another wonderful experience in the bay and looking forward to visiting other areas. Looking forward to serving you with helpful data products.
- Debbie: first step in getting our village back together. We need more meetings like this, we need this kind of help. Thank you.
- Chickie: thank everyone for your participation. Without you all, this wouldn't be a success, and this feels like a success. Sue is my champion. Sandy cleaned up the hall, her son was helpful. Everyone who made this a success and made this happen. Had to borrow an amplifier, Chris for the data, took everyone to make this possible. Thankful for Starlink. We got the ball moving, let's not let it stop. It's so positive and gives us hope in the future. We want to keep our communities alive. We don't have the salmon as a resource and hopefully that will build back up but we have many other resources. Our region is so beautiful, we have opportunities to burst with spurts like tourism. Need to lay foundation, which is starting to get it cleaned up. We are all stakeholders of this watershed, we should all own it and be proud of it. If you see a cigarette butt, pick it up!

- Isaac: thank you for inviting me. there's an excavator working over here at the ANTHC site, if you're' able to use it, along with a dump truck, could make short work of the clean up.
- George: please show up! Want other communities to join in greater numbers.
- Chuck: thank you for inviting us to be here. Already thinking about what to include in next year's report.
- Matthew: the leadership here is incredible. Truly inspiring, makes me think about how I can do better in my own community.
- Sue: thought it was a great symposium. The word that comes to mind for me is synergy. Makes me feel motivated, more likely to move forward with things. Also – let's get out a short newsletter! Update on what we're doing.
- Dannica: echo on gratitude. In winter, when it feels like we're wading through the mud and we're on our own and it's dark, it's tough being out here. But then you all come, we see we have a team working for our community who want to see and help us thrive. It is so great and there are so many of you helping us.
- Gabe: very inspirational to see the coordination and the work. I hope to be able to bring some of these stories and resilience back to where I work.
- Molly and Shelly: excited to take all of this, stay connected, not make more plans. Ability to laugh and eat food and spend time together. Thank you to the community leaders who have participated to this success.
- A group thank you to Angela and Lisa on clean up and food.

List of Presentations/Attachments (hyperlinked)

1. UAF's Arctic Coastal Geoscience Lab and the Alaska Coastal Cooperative: Introductory Presentation at the 2nd Chignik Regional Climate Resiliency Symposium (Chris Maio): **Presentation Slides**

2. UAF's Arctic Coastal Geoscience Lab and the Alaska Coastal Cooperative: Ongoing and Future Work (Matthew Balazs): **Presentation Slides**

3. UAF's Arctic Coastal Geoscience Lab and the Alaska Coastal Cooperative: Very High-Resolution Mapping of Anadromous Streams and Salmon Habitat in the Chignik Watershed (Mike Willis, Matthew Balazs, Chris Maio): **Presentation Slides**

4. UAF's Arctic Coastal Geoscience Lab and the Alaska Coastal Cooperative: Chignik Bay Coastal Hazard Assessment (Jessica Christian, Reyce Bogardus, Harper Baldwin, Richard Buzard, Roberta Glenn, Ed Krauss, Jeanette Carlson, Deb Carlson, Chris Maio): **Report**

5. Chignik Intertribal Coalition (George Anderson/CIC President: **Chignik Intertribal Coalition Preliminary Climate Risk Assessment Summary**

6. Chignik Subregion Map Project (Marcus Geist/Artesian Knowledge LCC): **Presentation Slides**

7. Chignik Subregion Watershed Plan: (Shelly Wade and Molly Mylius, Agnew: Beck): **Project Flyer**

8. Green Star Program Assessment of Chignik Bay (Joy Britt/Alaska Forum on Environment, Environmental Programs Director): **Presentation Slides**

9. Native Village of Chignik Indian Environmental General Assistance Program (IGAP): **Chignik Solid and Hazardous Waste and Marine Debris Collection Work Plan**

10. Chignik Bay Climate Resiliency Action Plan Final Draft (Isaac Pearson/Bristol Engineering Services Corporation, LLC Senior Civil Engineer): **Presentation Slides**, **Action Plan**

11. Community-Based Monitoring: Shoreline Change in Southwest Alaska (Jessie Ellen Christian): **UAF Master Thesis**

Appendix E: Chignik Subregion Watershed Plan: At-A-Glance Project Summary

Planning for a thriving, healthy Chignik regional watershed, updated September 2024.

1 Project Purpose: The Chignik Bay Tribal Council is preparing a subregional watershed plan for the Chignik subregion.

The plan will summarize what we know today about the watershed and how the watershed is valued. **The plan will** bring together residents, scientists, and other stakeholders to identify and prioritize projects that will promote water quality while supporting subsistence and economic development (commercial fishing, ecotourism).

The plan will not include field work or primary data.

2 Project Timeline:

Save the Date!
Chignik Regional Symposium 2025
Tentatively Scheduled for June 25-27, 2025

June-August 2023
- Launch project
- Identify stakeholders
- Attend Chignik Climate Resiliency Symposium

August-November 2023
- Define data gaps
- Inventory ecological knowledge
- List sources of known, historical and suspected water quality threats

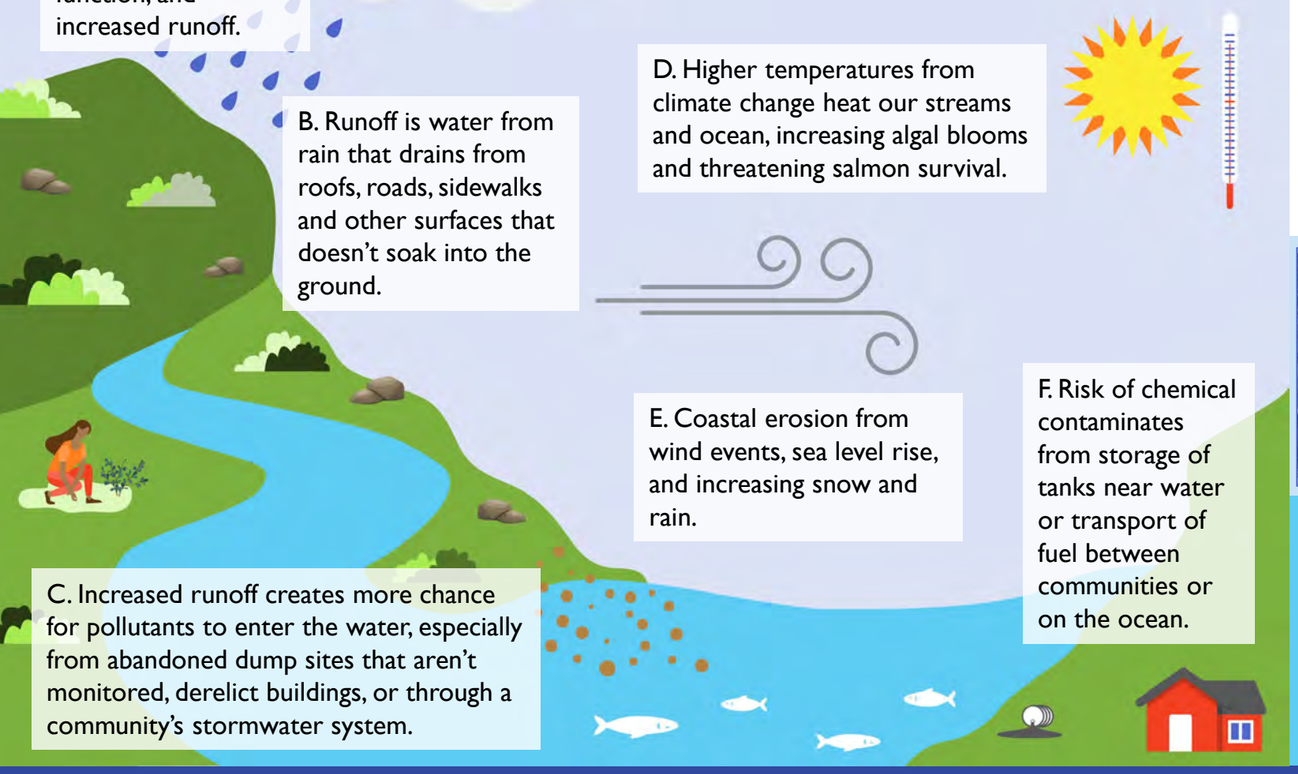
December-June 2024
- Conduct outreach
- Attend June 2024 Chignik Climate Resilience Symposium

June 2024 - February 2025
- Prepare draft and final draft plan, including funding and implementation recommendations

We are here!

3 Potential Threats:

Understanding potential water quality threats and pollution sources are crucial for effective watershed management. Here are some that may be impacting the Chignik region.



A. Big rain events cause erosion, changes to stream function, and increased runoff.

B. Runoff is water from rain that drains from roofs, roads, sidewalks and other surfaces that doesn't soak into the ground.

C. Increased runoff creates more chance for pollutants to enter the water, especially from abandoned dump sites that aren't monitored, derelict buildings, or through a community's stormwater system.

D. Higher temperatures from climate change heat our streams and ocean, increasing algal blooms and threatening salmon survival.

E. Coastal erosion from wind events, sea level rise, and increasing snow and rain.

F. Risk of chemical contaminates from storage of tanks near water or transport of fuel between communities or on the ocean.

4 Potential Outcomes:

The following are potential ways the watershed plan could guide positive change in Chignik communities:

- Solid waste and creek cleanup
- Food sovereignty
- Collaboration
- Economic development; diversification
- Prioritization of local data and traditional knowledge
- Hazard mitigation
- Increased representation
- Funding for critical infrastructure and projects

Photos provided by Jeanette Carlson.

5 Quick Facts about the Chignik Watershed*:

3.7° F increase in temperature over the last 50 years.

43% land is owned and managed by village corporations.

216 residents as of 2022.

683 miles (and counting) anadromous steams, home to five salmon species.

*Watershed boundaries include the communities of Chignik Lake, Chignik Lagoon, and Chignik Bay; Ivanof Bay and Perryville not included.

Chignik Bay Tribe, project # ACWA-23-01. This project has been funded in part by a Department of Environmental Conservation Alaska Clean Water Actions (ACWA) grant with support from the U.S. EPA.

Chignik Subregion Watershed Plan: What We Know So Far & Questions that Guide Us

Planning for a thriving, healthy Chignik regional watershed, updated September 2024.

Guiding Questions

Areas We Cherish

- Community Water System
- Drinking Water Protection Area
- Known Salmon Stream
- Subsistence Harvest Area

Areas of Concern

- Active Dump or Landfill
- Closed Dump or Landfill
- Contaminated Site

Project Website

Visit the project website for more information and to sign up for updates:
ChignikWatershed.com

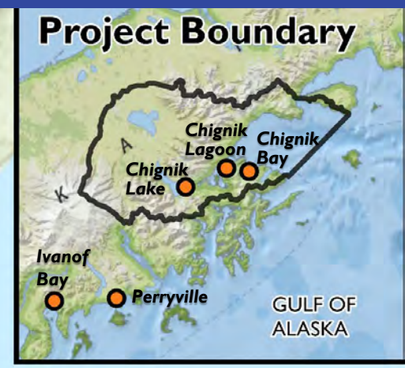
Project Contacts

Jeanette Carlson
Chignik Bay Environmental Coordinator
jeanettecarlson749@gmail.com
907-749-4019

Molly Mylius
Consultant Project Manager
molly@agnewbeck.com
907-782-8787

1. What areas of the watershed are most important and should be protected?

Examples: Streams and riparian areas, traditional berry picking spots, traditional hunting grounds, salmon nursery and spawning areas, halibut grounds, bidarki and razor clam habitat, drinking water sources, etc.



2. What are your top concerns for the watershed?

Examples: Data gaps, salmon declines, increased stream and ocean temperatures, invasive plants, paralytic shellfish poisoning, fuel spill risk, erosion, contamination from dumpsites or old canneries, etc.

Sources: The Subsistence Harvest Areas are derived from interviews with residents as part of the Chignik Conservation Planning project from the Bristol Bay Heritage Land Trust and Artesian Knowledge, LLC, 2023. The Community Water System, Drinking Water Protection Area, Landfill, and Contaminate Site areas are from the Alaska Department of Environmental Conservation, 2023. Known Anadromous Stream sites are from the Alaska Fish & Game Alaska Waters Catalog, 2023.

3. What are some strategies that address concerns, and how can we work together to address them?

Examples: Incorporate existing research and protection programs, provide funding strategies, improve Commercial Fishing Waste Disposal program, add missing anadromous streams, remove invasive plants (like alders), establish baseline data for water temperature and quality of priority streams, develop youth leadership programs around watershed protection and monitoring, establish shellfish testing program, etc.

Appendix F: Project Flyer

Chignik Subregional Watershed Plan

Planning for a thriving, healthy Chignik regional watershed!

What is the project purpose?

Through an Alaska Clean Water Action grant from the Alaska Department of Environmental Conservation, the Chignik Bay Tribal Council is preparing a subregional watershed plan for the Chignik subregion. The plan will summarize information about the watershed, identify and prioritize projects to support watershed health, and empower local management in protecting and promoting water resources in the subregion.

What are we trying to learn?

Summarize what we know about the watershed:

- Issues and opportunities.
- What residents most value about the watershed.

Based on the initial findings, we will identify and prioritize options for reducing pollution and promoting water quality, while supporting economic development opportunities such as commercial fishing, subsistence, and ecotourism.

What is a watershed?

A watershed is a land area that drains to a common waterway, such as a stream, lake, estuary, wetland, or ultimately the ocean.

What is watershed planning?

Watershed planning provides a framework for assessing and managing water quality within a watershed.

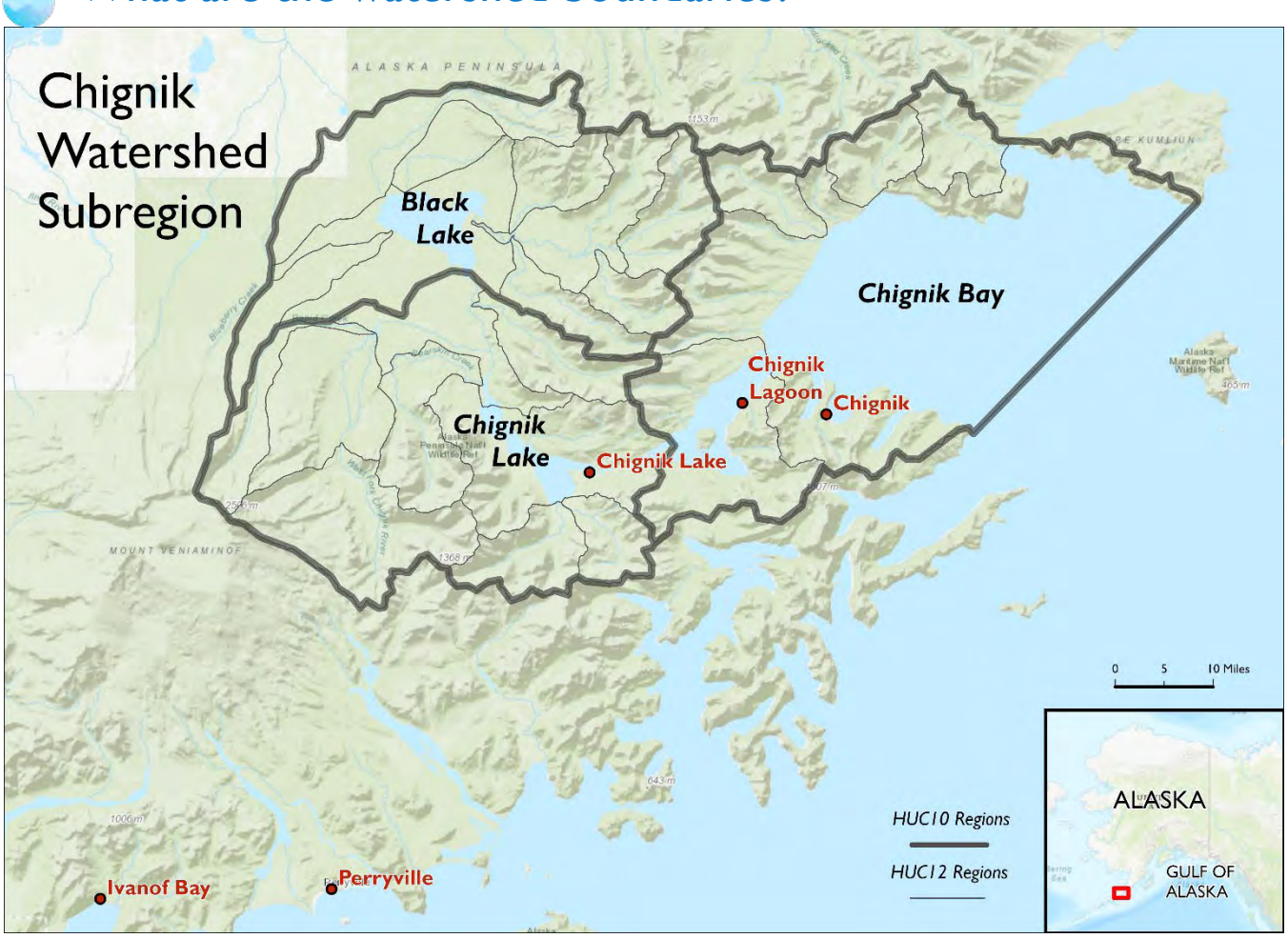
Adapted from the Environmental Protection Agency's Handbook for Developing Watershed Plans

Questions? Comments? Want to Get Involved?

- Jeanette Carlson, Chignik Bay Environmental Coordinator, jeanettecarlson749@gmail.com, 907-749-4019
- Molly Mylius, Consultant Project Manager, molly@agnewbeck.com, 907-782-8787

Project website:
http://chignikwatershed.org

What are the watershed boundaries?



What is the timeline?

June-August 2023	August-November 2023	December-June 2024	June-September 2024
• Launch project • Identify stakeholders • Attend Chignik Climate Resiliency Symposium	• Define data gaps • Inventory ecological knowledge • List sources of known, historical and suspected water quality threats	• Conduct outreach • Attend June 2024 Chignik Climate Resilience Symposium June 6-8, 2024	• Prepare draft and final draft plan, including funding and implementation recommendations

Contact the Project Team

- Jeanette Carlson, Chignik Bay Environmental Coordinator, jeanettecarlson749@gmail.com, 907-749-4019
- Molly Mylius, Consultant Project Manager, molly@agnewbeck.com, 907-782-8787
- Visit the project website: http://chignikwatershed.org

Collaboration in the Chigniks:

Creating Shared Resiliency through the Chignik Subregional Watershed Plan

Presentation at the Bristol Bay Leadership Forum

December 7, 2023

Introductions and Purpose

The Project Team

Jeanette Carlson

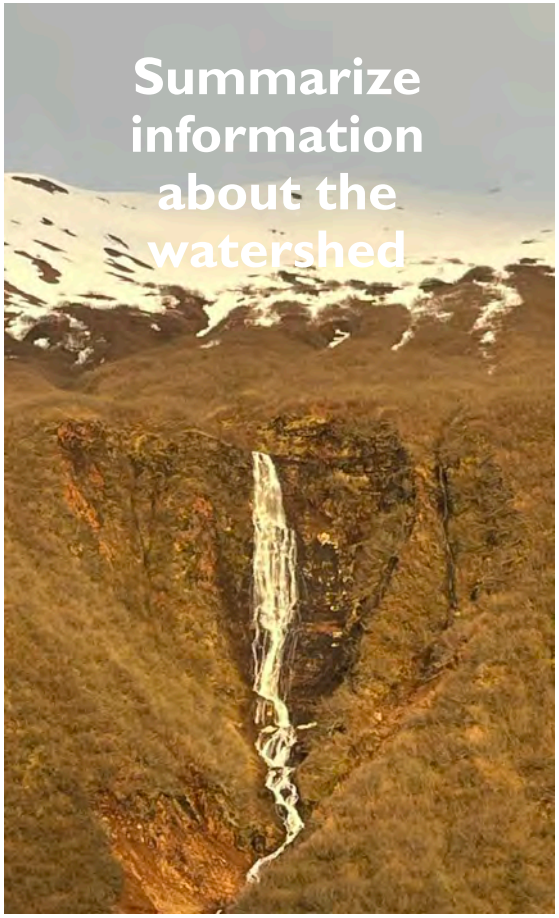
Environmental Coordinator
Chignik Bay Tribal Council

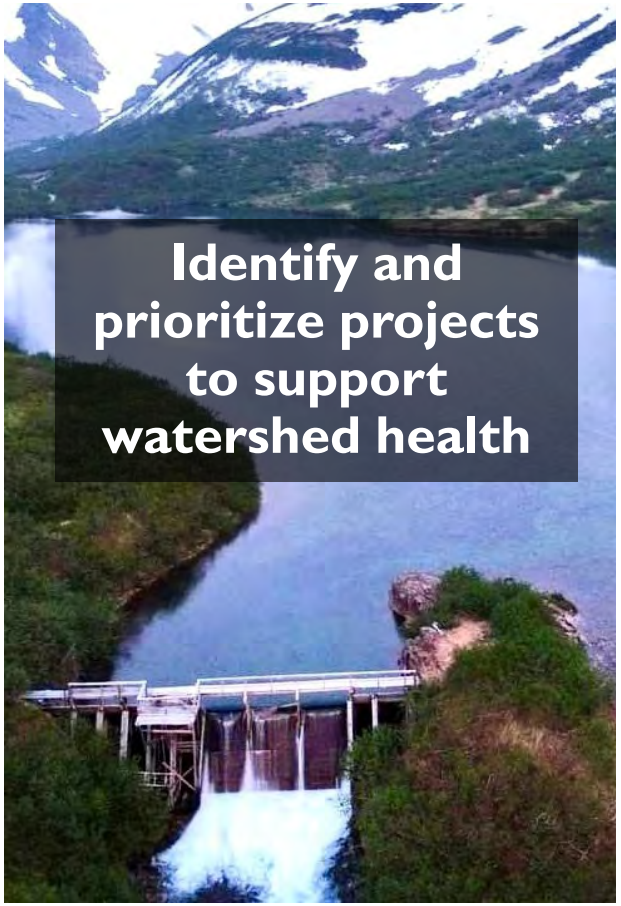
Sue Flensburg

Chignik Bay Tribal Council Advisor
Flensburg Consulting

This project has been funded in part by a Department of Environmental Conservation Alaska Clean Water Actions (ACWA) grant with support from the U.S. EPA.

Project Purpose; the plan will…





Chignik Subregional Watershed Plan Appendices, Page 82

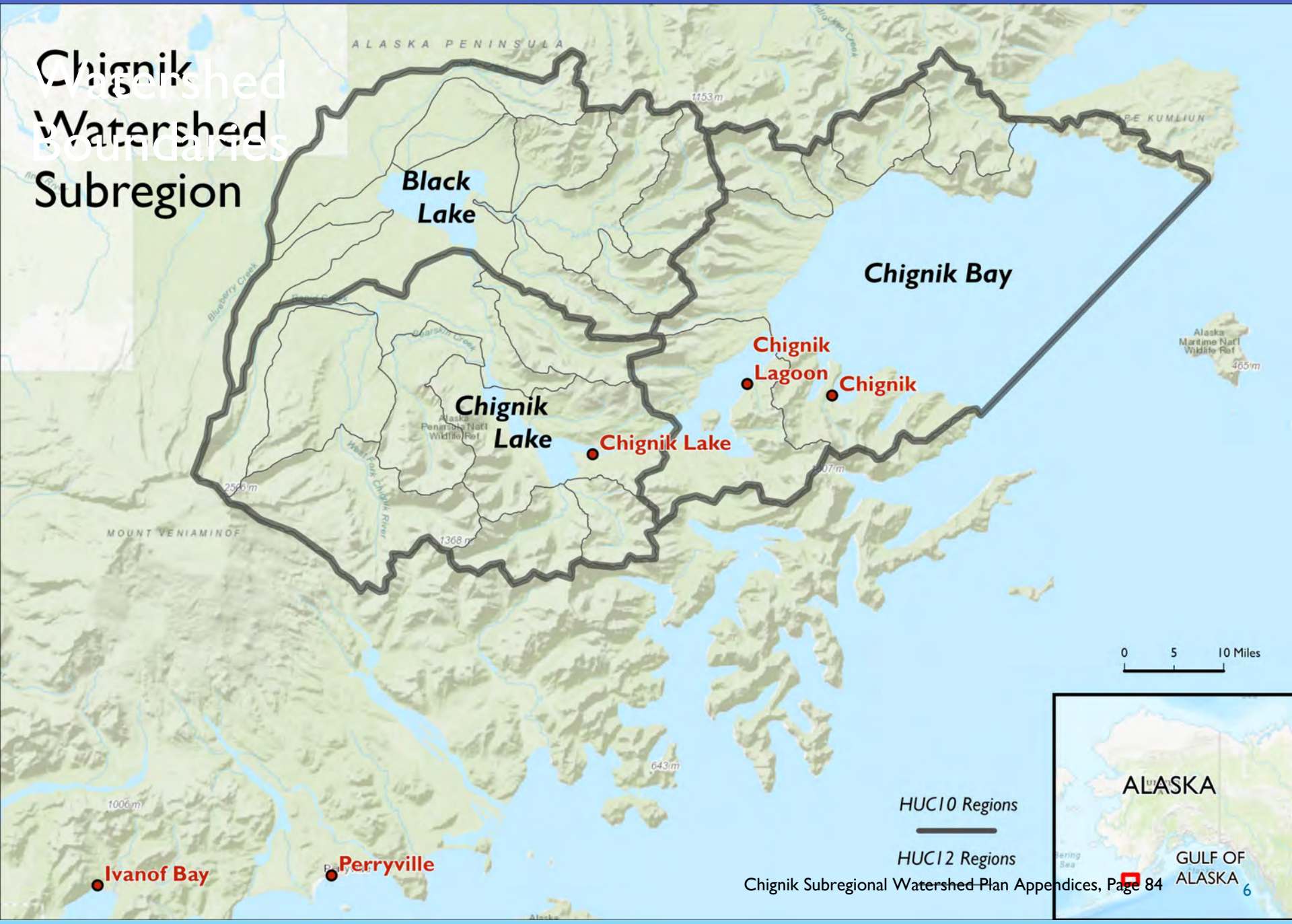
What a Watershed Plan Does/Does Not Do

Does:

- ✓ Brings together information and people
- ✓ Identify options for reducing pollution and promoting water quality, while supporting economic development (commercial fishing, subsistence, ecotourism)

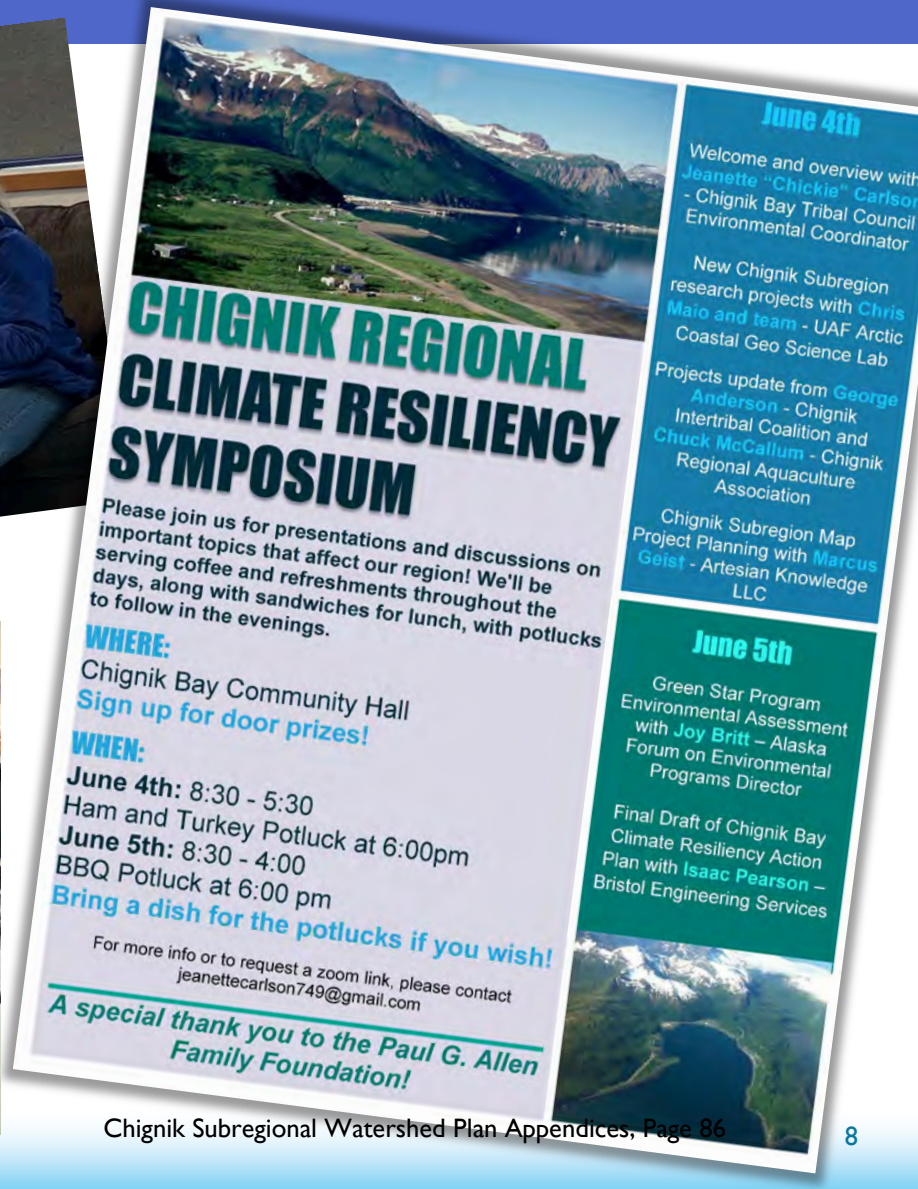
Does Not:

- o Include field work or other primary data collection
- o Involve extensive technical details or engineering


Chignik Watershed Boundaries
Chignik Watershed Subregion
ALASKA PENINSULA
Black Lake
Chignik Bay
Chignik Lagoon
Chignik
Chignik Lake
Chignik Lake
MOUNT VENIAMINOF
Ivanof Bay
Perryville
0 5 10 Miles
HUC10 Regions
HUC12 Regions
ALASKA
GULF OF ALASKA

Our Kickoff: Chignik Regional Climate Resiliency Symposium

2022 and 2023 Symposiums



Symposium

"Everyone is a stakeholder of the watershed and needs to be proud of it, own it, and care for it."

Thank you to the following organizations for supporting the Symposium:

- *Paul G. Allen Foundation/VULCAN*
- *Alaska Department of Environmental Conservation Alaska Clean Water Actions*
- *Alaska Forum on the Environment's Greenstar Program*
- *Bureau of Indian Affairs Tribal Climate Resilience Program*
- *Chignik Bay Tribal Council*
- *Chignik Intertribal Coalition*
- *Environmental Protection Agency Indian Environmental General Assistance Program*

"We got the ball moving, now let's not let it stop. We want to keep our communities alive."

Key Takeaways from 2023 Symposium

- Now is a **critical time to plan for the region's future** given the uncertainty of fisheries and population loss.
- The Chignik region has **energized leadership** who are taking charge, even as state and federal partners are slow to respond to the fisheries disaster.
- Research must **be informed by traditional knowledge.** Researchers working in the region should collaborate with one another and the community, through forums like the Symposium.
- **Tourism is a growing opportunity;** many cruise ships are visiting Chignik Bay in summer 2023.

Actions Following 2023 Symposium

- ← Multiple cruise ships
- Collaboration with research partners
- Trail brushing to clear local hiking trails

Chignik Subregional Watershed Plan Appendices, Page 89

Actions Following 2023 Symposium

- ← Regional backhaul
- Clean up events, including demolishing old houses
- Met with Trident to discuss transfer of ownership of facilities

Chignik Subregional Watershed Plan Appendices, Page 90

Save the Date:
2024 Chignik Symposium!
June 6-8th, 2024

Chignik Subregional Watershed Plan Appendices, Page 91

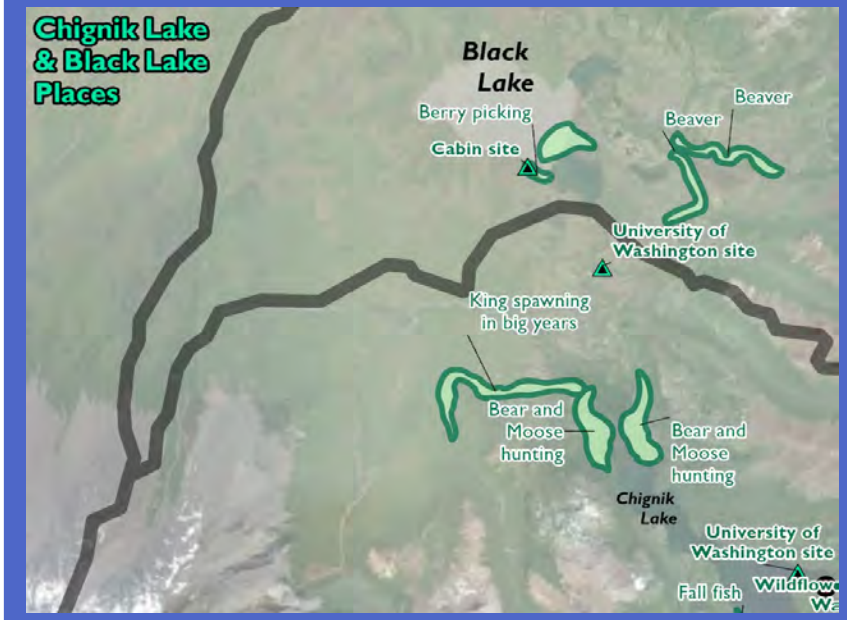
What is Included and We're Learning

What topics are most important for us to take action on, related to the watershed and climate change? *(from 2023 Symposium)*

- Solid waste and creek cleanup
- Food sovereignty
- Communications
- Economic development; diversification
- Prioritization of local data and traditional knowledge
- Hazard mitigation
- Stopping population outmigration
- Representation

Chignik Subregional Watershed Plan Appendices, Page 93

Sampling of Projects Underway in the Chigniks



View from Old East Side Water Storage Tank

Chignik Conservation Planning

Funded by a 2021 EPA Indian Environmental General Assistance Program (IGAP) grant, the Southwest Alaska Fish Habitat Partnership, and the Chignik Bay Tribal Council

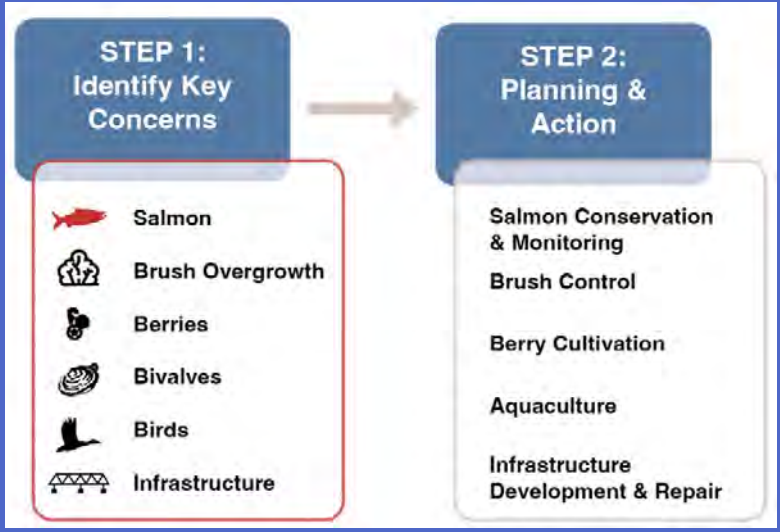
Climate Resiliency Action Plan

(priority projects: Indian Creek Bridge Rehab, Tsunami Shelters, Electric Distribution Upgrades)

Chignik Bay Tribal Council

Chignik Subregional Watershed Plan Appendices, Page 94

Sampling of Projects Underway in the Chigniks



Preliminary Climate Risk Assessment

Chignik Intertribal Council

Chignik Bay Coastal Hazard Assessment

UAF Arctic Coastal Geoscience Lab

Chignik Subregional Watershed Plan Appendices, Page 95

Potential Water Quality Threats in the Subregion

Next Steps and Ways to Get Involved

Ways to Get Involved

- Attend our breakout session tomorrow!
  (2:15 – 2:45 pm)

- Visit our website for other opportunities to get involved, learn more, and share your comments:

  https://chignikwatershed.com/

- Attend the 2024 Symposium

Questions?

Thank you!

Jeanette Carlson

Chignik Bay Environmental Coordinator

jeanettecarlson749@gmail.com

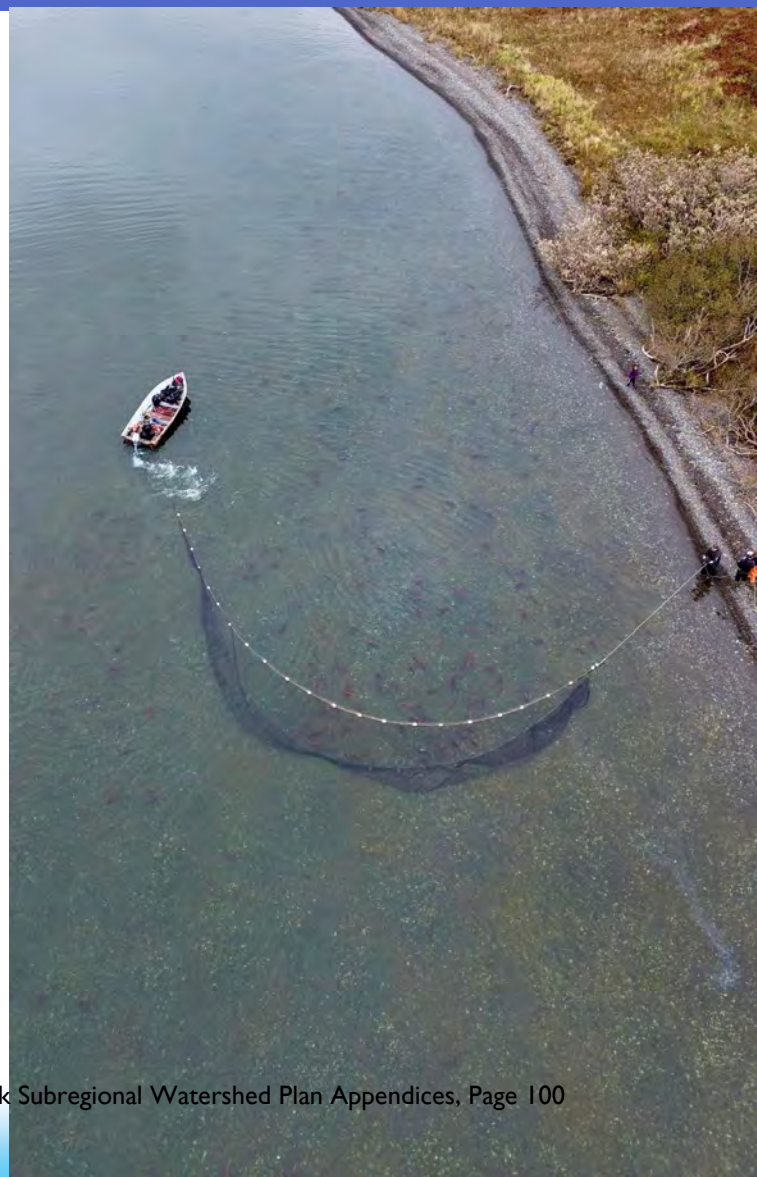
907-749-4019

Molly Mylius

Consultant Project Manager

molly@agnewbeck.com

907-782-8787



Appendix H: Plan Review

• *Source water assessments* • *TMDL implementation plans* • *Stormwater management plans* • *Resource management plans* • *Master plans* • *Facility plans* • *Wetland assessments* • *Wildlife action plans* • *Aquatic GAP analyses* **Document Name**	**Source**	**Community, Regional, or State Plan**	**Year**	**Project Area**	**Maps**	**Description & Primary Data Collection**	***Water Quality Threats / Pollutant Sources*** *Pollutants (contaminant in a concentration or amount that adversely alters the physical, chemical, or biological properties of the natural environment) sources are nonpoint (sources without a single point of origin, like runoff from agriculture lands) or point (a fixed location from which pollutants are discharged, such as a pipe or ship). (See also AS 46.03.900)*	**Includes Goals / Objectives?**	**Potential Solutions Identified**	**Data Gaps Source**	**Data Gaps Identified**	**Issues identified?**	**Notes**	**Reviewed for Strategies**	**Funding Sources**
1. Chignik Bay Coastal Hazard Assessment	Arctic Coastal Geoscience Lab (UAF)	Community	2023	Chignik Bay	Yes	Remote sensing and spatial analysis project, intended to aid with data needed for FEMA Hazmit Plans.	Coastal bank erosion & flooding from storm events	No	No	Page 50	Lack of understanding of (1) local oceanographic setting (2) potential storm and flooding impacts. Not enough information on past storm total water levels and building first floor heights.	Yes	Includes interview from Chignik Intertribal Coalition. Includes a table list of all data gaps.	Yes	
10. Watershed Prioritization Map	ADEC	State	2023	All	Yes	Chignik Bay & Lagoon are included in this assessment. Provides a statewide data-driven, objective methodology for evaluating and prioritizing watersheds for the ACWA program. Chignik Lagoon is categorized as a "medium stress" watershed.		No	No			No	More time needed to read through the Watershed Stress Criteria for Lagoon & Bay.	N/A	
11. Integrated Solid Waste Plan for the Community of Chignik Lagoon	Chignik Lagoon Village Council	Community	2017	Chignik Lagoon	No	Solid waste plan for Chignik Lagoon	Water contamination. Notes an old dumpsite that could be contaiminating water, new dumpsite close to shore, and new dumpsite and access road impacted by increased flood events and erosion due to climate change	Yes, p 91	Yes		None Identified	No	Created in 2010, updated in 2017. Includes community goals/actions that are prioritized based on perceived traditional values, health risk, subsistence risk reduction, cost, reduction of waste volume, and "Ease of doing well"	Yes	Yes
12. Chignik Management Area Salmon Annual Management Report	ADF&G	Region	2022	All	Yes	Salmon management report for southern Lake & Pen area focuses on esapement goals.		No	No			No		N/A	
13. Chignik Regional Comprehensive Salmon Plan	ADF&G	Region	1992	All	Yes	Intent of plan was to improve management strategies, habitat modification, and restoration with focus on Chignik Lake sockeye protection.	N/A	Yes, p 57			None Identified	No	The plan is outdated by 20 years, but referenced in other recent Chignik documents. The Chignik Reqional Aquaculture Association attempted to repeat the questionaire in 2015.	N/A	
14. Chignik Subregion Watershed Maps	Marcus Geist, Artesian Knowledge; Tim Troll, Bristol Bay Heritage Land Trust; Sue Flensburg; Community Members	Region	2023	Chignik Bay, Chignik Lake, Chignik Lagoon, Black Lake	Yes	Mapping project in progress. Includes pdf maps from Geist via 9/11 email and maps presented at Summit. Among other datasets, composite maps show local places collected from resident interviews, contaminated sites, and invasive plans.	Contaminated sites; invasive plant species	No	No			Yes	The maps are incomplete. Project ongoing thru 2024.	N/A	
15. Sanitation Facilities Community Plan	ANTHC & City of Chignik Bay	Chignik Bay	2019	Chignik Bay	Yes	Record existing condition of water, wastewater, and solid waste infrastructure in Chignik Bay to define the community's sanitation infrastructure priorities. Engineering reports show useful details on issues around past water projects	storm water discharge, soil erosion, sewage, flood, leaks in piping; threats to air quality mentioned also	Yes		p70	USFWS digital wetalands data for Chignik Lake area	Yes	Document copy poor quaility, might be the best resource to date. Collection of documents and reports. Risks and mitigations for each site: burn pit, water treatment plant, waste disposal infrastructure, etc.	Yes	
16. Climate Change and Health Effects in the Bristol Bay Region of Alaska (Presentation)	ANTHC, BBNA, & BBAHC	Region	2014		No	Evaluates connections between climate change impacts and health. Includes a Climate Change Vulnerability Index; Chignik Lagoon scores a 1 (highest level), Chignik Lake 2, and Chignik Bay 3.		No	No		None Identified	Yes	Shows linkages between climate change, water quality, and health.	N/A	

• *Source water assessments* • *TMDL implementation plans* • *Stormwater management plans* • *Resource management plans* • *Master plans* • *Facility plans* • *Wetland assessments* • *Wildlife action plans* • *Aquatic GAP analyses* **Document Name**	**Source**	**Community, Regional, or State Plan**	**Year**	**Project Area**	**Maps**	**Description & Primary Data Collection**	***Water Quality Threats / Pollutant Sources*** *Pollutants (contaminant in a concentration or amount that adversely alters the physical, chemical, or biological properties of the natural environment) sources are nonpoint (sources without a single point of origin, like runoff from agriculture lands) or point (a fixed location from which pollutants are discharged, such as a pipe or ship). (See also AS 46.03.900)*	**Includes Goals / Objectives?**	**Potential Solutions Identified**	**Data Gaps Source**	**Data Gaps Identified**	**Issues identified?**	**Notes**	**Reviewed for Strategies**	**Funding Sources**
17. IGAP Proposal - Chignik Lake	Native Village of Chignik Lake	Community	2011	Chignik Lake	No	The IGAP proposal lists areas of environmental concern, accomplishments, a proposed work plan, and performance evaluation.	The IGAP proposal lists areas of environmental concern, including landfill deficiencies, hazardous waste storage, an abandoned dumpsite, potential fuel spills from hauls between the lake and neighboring communities, air quality issues related to woodstoves, and impacts from climate change.	No	No	Page 2-3	Lack of assessment from abandoned dumpsite; lack of oil discharge prevention and contigency plan for fuel transport; possible lack of continual monitoring of invasive plant species from climate change	Yes	Referenced by Sue. Appears to be a draft IGAP proposal. Unclear if proposal was accepted or if any work plan objectives were complete.	Yes	
18. Emergency Response Plan - Chignik Bay Tribal Council	BBNA	Community	2023	Chignik Bay	Yes	Provides community description, resouces, disaster preparedness status, and hazard analysis for standard AK DHS & EM events.	Pollutants from flooding (p 38). Notes that many roads, properties, and airport in community have poor drainage, referencing the Tribal Hazard Mitigation Plan, 2019. Also notes that fuel and hazardous material spills are most likely to occur in Chignik Bay during fuel transfers over water.	No	No		None Identified	Flooding		N/A	
19. Alaska Baseline Erosion Assessment	USACE	State	2009	Chignik Bay, Chignik Lagoon, Chignik Lake	Yes	An investigation conducted by USACE to determine severity of erosion issues in Alaskan communities. Data methods included invidual reports, "extensive correspondence," qualitative surveys, and review of relevant literature.	Notes that community conditions related to erosion in Chignik Lagoon should be monitored. Also notes that all three communities had reported changes to community from erosion.	No	No		None explicitly identified	Erosion	Includes programs for erosion control assistance, which may be relevant for funding sources for plan implementation.	Yes	
2. Preliminary Climate Risk Assessment	Chignik Intertribal Coalition	Region	2022	All	No	Cat. 6 BIA Tribal Climate Reilience Program grant, food security from return declines. Narrative research.	Climate change	Yes		N/A		Yes		Yes	
20. Emergency Response Plan - Native Village of Chignik Lagoon	BBNA	Community	2023	Chignik Lagoon	Yes	Provides community description, resouces, disaster preparedness status, and hazard analysis for standard AK DHS & EM events.	conaminated drinking water from hazardous spills or emergency events like floods or droughts	Yes			No	Yes	Identifies community roles to designate mitigations actions. Focus on access to drinking water, boil notices, and risks to water access in case of emergencies	Yes	
21. Tribal Hazard Mitigation Plan - Chignik Lake Village	BBNA	Community	2019	Chignik Lake	Yes	Risk assessment of natural hazards and mitigation strategies for Chignik Lake.	earthquakes loosen sheetrock and walls making water not safe to drink; erosion is risk to water supply; floods carry contaminants to watershed, "Everything from leaked motor oil on parking areas, plastic grocery bags, pesticides, fertilizers, detergents, and sediments; known as non-point source pollutants. Point source discharges are; discharge points, bulk fuel storage and sewage treatment plants, and other regulated known sources or points of pollutant discharges."	Yes		PDF p.29 PDF p.37 PDF p.42	weather data - wind and temperature Precipitation data FEMA flood maps	Yes	Good tables of prioritized mitigation actions (table 6-4) for different events, listed by infrastructure site; past community meeting minutes and summaries of project funding opportunities	Yes	
22. Tribal Hazard Mitigation Plan - Chignik Lagoon	BBNA	Community	2019	Chignik Lagoon	Yes	Risk assessment of natural hazards and mitigation strategies for Chignik Lagoon.	"Everything from leaked motor oil on parking areas, plastic grocery bags, pesticides, fertilizers, detergents, and sediments; known as non-point source pollutants. Point source discharges are; discharge points, bulk fuel storage and sewage treatment plants, and other regulated known sources or points of pollutant discharges. If untreated, these pollutants wash directly into waterways carried by runoff from rain and snowmelt. These contaminants can infiltrate groundwater and concentrate in streams and rivers and can be carried down the watershed and into the ocean. Non-point source pollution is linked to the creation of large dead-zones (areas with minimal oxygen) in the ocean and threatens the health of the ecosystem."	Yes		PDF p 41, PDF p 182 PDF p 47	FEMA flood maps, lack of info about resources available to community precipitation and wind data gaps	Yes	same document structure as 21 and 23; includes past communications meeting minutes and summaries of project funding opportunities	No	

• *Source water assessments* • *TMDL implementation plans* • *Stormwater management plans* • *Resource management plans* • *Master plans* • *Facility plans* • *Wetland assessments* • *Wildlife action plans* • *Aquatic GAP analyses* **Document Name**	**Source**	**Community, Regional, or State Plan**	**Year**	**Project Area**	**Maps**	**Description & Primary Data Collection**	***Water Quality Threats / Pollutant Sources*** *Pollutants (contaminant in a concentration or amount that adversely alters the physical, chemical, or biological properties of the natural environment) sources are nonpoint (sources without a single point of origin, like runoff from agriculture lands) or point (a fixed location from which pollutants are discharged, such as a pipe or ship). (See also AS 46.03.900)*	**Includes Goals / Objectives?**	**Potential Solutions Identified**	**Data Gaps Source**	**Data Gaps Identified**	**Issues identified?**	**Notes**	**Reviewed for Strategies**	**Funding Sources**
23. Tribal Hazard Mitigation Plan - Chignik Bay	BBNA	Community	2019	Chignik Lake	Yes	Risk assessment of natural hazards and mitigation strategies for Chignik Bay.	"Point source discharges are; discharge points, bulk fuel storage and sewage treatment plants, and other regulated known sources or points of pollutant discharges. If untreated, these pollutants wash directly into waterways carried by runoff from rain and snowmelt. These contaminants can infiltrate groundwater and concentrate in streams and rivers and can be carried down the watershed and into the ocean. Non-point source pollution is linked to the creation of large dead-zones (areas with minimal oxygen) in the ocean and threatens the health of the ecosystem."	Yes		PDF p 31, 34, 36	FEMA flood maps, precipitation, wind data gaps	Yes	same document structure as 21 and 22; includes past communications, meeting minutes, and summaries of project funding opportunities	No	
24. Multi-jurisdictional Hazard Mitigation Plan Update - Lake and Peninsula Borough	Lake & Peninsula Borough	Region	2015	Chignik Lake, Chignik Lagoon, Chignik Bay	Yes	Borough wide, multiple jurisdictions including Chignik area, update to hazard mitigation plan; historical disaster events, risks and mitigations	erosion or stripping vegetation can increase flood potential and degrade water quality	Yes		PDF p42; p53	long-term earthquake event data; historical flood event data; "more detailed or comprehensive assessment of risk (including annualized losses, people injured or killed, shelter requirements, loss of facility/system function, and economic losses)."	Yes	There is a 2021update, but not posted (that I can find) on Lake and Pen nor State websites. Aligns past studies and projects with grant funding	No	
25. Small Community Emergency Response Plan (SCERP) - Chignik Bay	BBNA	Community	2023	Chignik Bay	Yes	An instruction manual to be used in case of emergency or disaster, created from the larger emergency response plan for the community.	N/A	N/A	N/A		None Identified		From Sue. The fuller emergency response plan seems more relevant to watershed plan research.	No	
26. Small Community Emergency Response Plan (SCERP) - Chignik Lagoon	BBNA	Community	2023	Chignik Lagoon	Yes	An instruction manual to be used in case of emergency or disaster, created from the larger emergency response plan for the community.	N/A	N/A	N/A		None Identified		From Sue. The fuller emergency response plan seems more relevant to watershed plan research.	No	
27. Assessing the Vulnerability of Western Alaska Exosystems and Subsistence Resources to Non-native Plant Invasion	Western Alaska Landscape Conservation Cooperative Project; Jennifer Robinette	Region	2015	Chignik Lake, Chignik Lagoon, Chignik Bay	Yes	A survey of invasive plants in the region. Data gathered by local volunteers, city employees, and school children in 2012-2013.	Invasive plants have potential to degrade water quality by decreasing water flows and reducing the transportation of nutrients or by increasing runoff and erosion, leading to hyper-eutrophication (reducing oxygen in water leading to plant and animal deaths). This report notes that pervasive alders have taken over berry areas and have caused safety concerns in all three communities.						The map is accessed online via the AKEPIC Database. Note that the survey data has not been updated since 2013.	Yes	
28. Alaska Region Terrestrial Invasive Plant Management Strategy	USFWS	State	2022	Chignik Lake	No	A NEPA document for invasive plant management in Alaska on USFWS managed lands.		N/A	N/A	Yes p 18	"Formal terrestrial invasive species surveys on the Alaska Peninsula/Becharof NWR Complex have not occurred. Baseline knowledge of occurrence for invasive species throughout the Complex and on neighboring National Park Service land is limited."			Yes	
29. USGS Chignik Quad Mineral Resources	USGS	Region												N/A	
3. Chignik Conservation Planning (Presentation)	Symposium	Region	2023	All	Yes	Composite maps from USGS, ADNR, DCRA, Interviews, LandSat, ISAR, ADF&G, BLM, BBNC, USF&W	N/A	No	No			No	Super impressive cartography	N/A	
30. Alaska Resource Data File, New and Revised Records Version 1.7	USGS	State	2008											No	

• *Source water assessments* • *TMDL implementation plans* • *Stormwater management plans* • *Resource management plans* • *Master plans* • *Facility plans* • *Wetland assessments* • *Wildlife action plans* • *Aquatic GAP analyses* **Document Name**	**Source**	**Community, Regional, or State Plan**	**Year**	**Project Area**	**Maps**	**Description & Primary Data Collection**	***Water Quality Threats / Pollutant Sources*** *Pollutants (contaminant in a concentration or amount that adversely alters the physical, chemical, or biological properties of the natural environment) sources are nonpoint (sources without a single point of origin, like runoff from agriculture lands) or point (a fixed location from which pollutants are discharged, such as a pipe or ship). (See also AS 46.03.900)*	**Includes Goals / Objectives?**	**Potential Solutions Identified**	**Data Gaps Source**	**Data Gaps Identified**	**Issues identified?**	**Notes**	**Reviewed for Strategies**	**Funding Sources**
31. BBNA Brownfields Program (Website)	BBNA	Region	2023	Chignik Bay, Chignik Lake	Yes	A description of the Brownfields Program offered through BBNA. Includes map of active Brownfield sites, some located in the Chignik area. Also includes a link to documented cleanup efforts in the area ("Brownfields Public Record - April 2023).	1. Chignik Lake: Presence of petroleum contamination identified during the March, 2016 water distribution system renovation work . 2. Chignik Lake: Presence of diesel fuel at old Tribal Office TF (?). 3. Chignik Lake: Fuel Transfer TF; diesel and gasoline contamination. 4. Chignik Bay: Trident Seafoods petroleum contamination. 5. Chignik Bay: City Tank Farm petroleum contaminates. 6. Chignik Bay: School heating oil contamination.	No	No		None explicitly identified, but records show multiple attempts from DEC to contact Tribes for cleanup plans, which points to lack of data that would identify extent or severirty of contamination.	Yes	Follow up with Chignik Lake Tribe, Chignik Bay Tribe, and Trident Seafood about any cleanup actions since 2020.	Yes	
32. DEC Contaminated Sites - Chignik Bay (Chignik), Chignik Lagoon, and Chignik Lake	State of Alaska	Community	2023	Chignik Bay	Yes	Database. In **Chignik Bay**, three active hazards have been indicated at the school, tank farm, and at Trident Seafoods. One hazard at the Norquest Plant was cleaned and has been monitored (Institutional Controls Compliance) since 2017. In **Chignik Lagoon**, there is one active hazard indicated at the former Wards Cove Packing cannery. The hazard report notes that there is one creek north of the site and another that bisects the facility. A Site Characterization Work Plan is underway. In **Chignik Lake**, three active hazards have been indicated at the old tank farm, the fuel transfer tank farm, and at Third Street as part of a water line upgrade. One hazard at the PTO Switch Gear station was cleaned in 1996, but it is unclear from site notes if cleanup meets current DEC standards.		Yes					Link to map: https://www.arcgis.com/apps/mapviewer/index.html?webmap=315240bfbaf84aa0b8272ad1cef3cad3	Yes	
33. ADEC Solid Waste Information Management Systems (SWIMS)	ADEC: https://dec.alaska.gov/Applications/EH/SWIMS/Default.aspx	Community	2023	Chignik Bay, Chignik Lagoon, Chignik Lake	No	Database. **Chignik Bay** has one active class III landfill (municipal) and one retired class three landfill (Chignik Pride Fisheries), closed in 1993. The municipal landfill has been active since 1996. **Chignik Lagoon** has three retired class III landfills (old cannery and two municipal) and one active class III landfill (municipal). **Chignik Lake** has one active class III landfill and two inactive landfills - all municipal. The SWIMS database also notes that **Chignik Lake** uses groundwater as its primary drinking water source and is approximately 3800 feet away from the active landfill.								N/A	
35. ADEC Waste Erosion Assessment and Review (WEAR) Report - Chignik Lagoon	ADEC	Community	2014	Chignik Lagoon	No	Includes photos. A site assessment and inspection report of active and inactive landfills and tank farms in Chignik Lagoon.	The report notes that the old tank farm has staining and dead vegetation and is approximately eight feet from the actively eroding beach. At the closed Packer's Creek landfill (also site of new sewer tanks), batteries were observed in the creek. Other waste was reported from the West Landfill, also near the actively eroding beach. The active landfill has been in operation since 2005, designed by ANTHC, however, as of 2014, the community believed that the landfill was nearing capacity and is only 85 feet from the lagoon waterbody. Some erosion control measures are in place - mainly to reduce loss of land - but the items placed to halt erosion are crude riprap (fishing nets, tires, metals).							Yes	
36. ADEC Waste Erosion Assessment and Review (WEAR) Report - Chignik Lake	ADEC	Community	2014	Chignik Lake	No	Includes photos. A site assessment and inspection report of active and inactive landfills and tank farms in Chignik Lake. Report notes that the active landfill is well managed and that there are no erosion threats. An old landfill (retired in 1996) located approx. 4,000 ft. from the community is 1/2 acres and protrudes to the Chignik riverbank, though there have been no reports of bank erosion as of 2014.							Yes	

• *Source water assessments* • *TMDL implementation plans* • *Stormwater management plans* • *Resource management plans* • *Master plans* • *Facility plans* • *Wetland assessments* • *Wildlife action plans* • *Aquatic GAP analyses* **Document Name**	**Source**	**Community, Regional, or State Plan**	**Year**	**Project Area**	**Maps**	**Description & Primary Data Collection**	***Water Quality Threats / Pollutant Sources*** *Pollutants (contaminant in a concentration or amount that adversely alters the physical, chemical, or biological properties of the natural environment) sources are nonpoint (sources without a single point of origin, like runoff from agriculture lands) or point (a fixed location from which pollutants are discharged, such as a pipe or ship). (See also AS 46.03.900)*	**Includes Goals / Objectives?**	**Potential Solutions Identified**	**Data Gaps Source**	**Data Gaps Identified**	**Issues identified?**	**Notes**	**Reviewed for Strategies**	**Funding Sources**
38. EPA Envirofacts System	https://enviro.epa.gov/	Community	2023	All	No	No relevant information found.		No	No				Reviewed by both Mark and Holly	N/A	
39. Bristol Bay National Wetlands Inventory Fact Sheet	USFWS & BBNC	Region	2023	All	Yes	Project flyer about the National Fish and Wildlife Foundation America the Beautiful grant to map wetlands across the Bristol Bay region. The Chignik Subregional Watershed Protection Plan project area is **EXCLUDED** from this grant.		No	No	Page 1	It identifies the possibility that there may be no immediate efforts underway to map wetlands in the area.	No	Reviewed by Holly. Emailed project contact about more info re: NWI Projects Mapper	N/A	
4. Community-Based Monitoring: Shoreline Change in SW AK	Christian J. E. (UAF Thesis)	Region	2023	All	No	Thesis about the completion of the Chignik Bay Coastal Hazard Assessment.		No	No	Pages 29, 39	References data gaps listed in Chignik Bay Coastal Hazard Assessment. Also list community capacity, data overload and processing time as challenges to reporting.	Yes	Great resource for plan; Requires more thorough review	No	
40. Chignik Bay As-Builts for Waterline Distribution Improvements	Alaska Native Tribal Health Consortium	Chignik Bay	2021	Chignik Bay	Yes	As-builts for most recent waterline upgrates / expansion. Includes info about estimated average day demand for water, climate data, water sources, and stormwater infrastructure.		No	No				Reviewed by Holly.	N/A	
41. Lake & Peninsula Deerstone Consulting Progress Report - Renewable Energy & Infranstructure Initiatives	Lake & Peninsula Borough; DeerStone Consulting	Region	2023	All	No	List of project updates for the following watershed-related topics: Regional Energy Service Provider Project, Climate Pollution Reduction Planning Project, Chignik Bay Dock Upgrades Design Project, Chignik Bay 2016 and 2018 Fisheries Disaster Funding (waterline to dock), Chignik Bay Hydroelectric Project (dam replacement, transmission line, road, replacement of water related infrastructure), and Borough LiDAR Mapping (est. complete in 2024 for Chignik area).		No	Yes		Yes - Mapping		No goals explicitly identified, but note of funding sources that may be available for "projects requiring a "non-federal" match.	No	
42. Bristol Bay Area Plan for State Lands	Alaska Dept of Natural Resources, Division of Mining, Land & Water, Resource Assessment & Development Section	Region	2005, 2013	All	Yes	Document page 335 provides summary of resources and uses in "Chignik, Perryville" and references map 3-17 (document page 421). Very little state land exists within project boundaries, though the land designations appear to apply to the whole region - A "general use" designations has been placed on Black Lake and Chignik Lake Vicinity.	**Threats from potential mining**: "Region 17 contains a large number of base and precious metal occurrences and prospects. It also includes the Chignik coal basin. The identified resources for the Chignik and Herendeen Bay coalfields range up to 200 million short tons; hypothetical and speculative resources range to three billion short tons." **Threats from hydrocarbons:** "The oil and gas potential of the Region is not known; part of an oil and gas basin lies in a small portion of the southwestern part of the Region and near Black Lake indicating potential in these areas. State and Native landowners are currently pursuing a new hydrocarbon exploration licensing and leasing program.	No		Yes p 337	oil and gas potential is largely unknown; many mining sources are yet unidentified		Map of historic/archeological sites	No	
43. Paralytic Shellfish Toxin Results Update October 4, 2023	Knik Tribe	State	2023	Chignik Lagoon	No	The first report of a four-year "Harmful Algal Blooms" project, conducted by Knik Tribe in partnership with ADEC's Environmental Health Laboratory. Samples sent from Chignik Lagoon showed very high toxin (PST) levels for razor clams in Chignik Lagoon.	Harmful algal blooms leading to food toxicity	No	No	No		Yes	Unclear if CL is only community participating in program	Yes	
44. Chignik Area Projects	Chignik Intertribal Coalition	Region	2024	All	No	Summary report presented at the March 2024 Chignik Regional Aquaculture Association by CIC. Report lists projects and descriptions of watershed-related research with focus on salmon.		No	No	Yes (See Report)	topo and environmental mapping products, human or management interactions with Chignik sockeye fishery (Management Strategy Evaluation), eDNA monitoring,	Yes		Yes	
45. GreenStar Community Assessment - Chignik Lake	The Alaska Forum - GreenStar®	Chignik Lake	2019	Chignik Lake	No	A report summarizing the on-site assessment of Chignik Lake to evaluate GreenStar community award metrics. Documents solid waste, drinking water, sewer, and energy policies and management practices.						Yes			
46. GreenStar Community Action Plan - Chignik Lake	The Alaska Forum - GreenStar®	Chignik Lake	2019	Chignik Lake	No			Yes							

• *Source water assessments* • *TMDL implementation plans* • *Stormwater management plans* • *Resource management plans* • *Master plans* • *Facility plans* • *Wetland assessments* • *Wildlife action plans* • *Aquatic GAP analyses* **Document Name**	**Source**	**Community, Regional, or State Plan**	**Year**	**Project Area**	**Maps**	**Description & Primary Data Collection**	***Water Quality Threats / Pollutant Sources*** *Pollutants (contaminant in a concentration or amount that adversely alters the physical, chemical, or biological properties of the natural environment) sources are nonpoint (sources without a single point of origin, like runoff from agriculture lands) or point (a fixed location from which pollutants are discharged, such as a pipe or ship). (See also AS 46.03.900)*	**Includes Goals / Objectives?**	**Potential Solutions Identified**	**Data Gaps Source**	**Data Gaps Identified**	**Issues identified?**	**Notes**	**Reviewed for Strategies**	**Funding Sources**
5. Climate Resliliency Action Plan	Chignik Bay Tribal Council	Community	2023	Chignik Bay	No	Aims to better understand effects of climate change on community; combines traditional ecological knowledge sessions, site investigation of at-risk infrastructure, and a review of past studies around climate, erosion, and flooding	Non-point: motor oil on parking areas, plastic grocery bags, pesticides, fertilizers, detergents, and sediments. Point source: discharge points, bulk fuel storage, sewage treatment plants; large earthquake could alter the mineralogy or quality of groundwater; Erosion affects water table depletion	Yes		doc p.61	Data gap analysis section: root cause of low salmon returns, more accurate weather data specific to Chignik Bay, Bathymetry of waterways, water level monitoring, centralized historical flood database, sediment transport model, land ownership maps, aerial imagery, inner transit system feasibility study	Yes	Useful for recent summary of past reports	Yes	
6. Lake and Peninsula Borough Comprehensive Plan Update	Lake & Peninsula Borough	Region	2020	All	Yes	Comprehensive plan for entire region with focus on economy, education, housing, transportation, quality of life, energy, governance, etc. Minimal focus on land use and environmental goals.	N/A	Yes		N/A		No	Provides overview and goals for communities with Pacific Sub-Region in Chapter 4. Mentions erosion as concern in meeting notes (p 181)	No	
7. TSUNAMI INUNDATION MAPS FOR THE COMMUNITIES OF CHIGNIK AND CHIGNIK LAGOON, ALASKA	DNR GGS	Community	2016	Chignik Lagoon & Bay	Yes	Tsunami inundation maps created by spatial modeling.	N/A	No	No	No NOAA Tidal Benchmark		No	Due to shallow bathymetry in Lagoon, tsunami impact on village would like be a bore	No	
8. Chignik Lagoon Community Plan	Chignik Lagoon Village Council	Community	2016	Chignik Lagoon	Yes	Community Plan	NA	Yes		NA	NA	NA	This document has little to do with the watershed or threats to water quality	Yes	
9. Perryville Community Plan	Native Village of Perryville	Community	2015	Perryville	Yes	Community Plan								No	
Lake and Peninsula Borough Lidar Mapping Project	Lake & Peninsula Borough	Region	2024	All	No	Mentioned in Climate Resilliency Symposium as an ongoing project. Lidar will be used as a tool to measure coastal erosion changes over time; its data will be used as part of UAF Coastal Hazard Analysis and Erosion Monitoring.							This resource does not yet exist. UAF researchers will know the status of this project. See also: DeerStone report (Item 41)	N/A	