

Health and Culture Technical Working Group Draft Adaptation Options

HC1. CREATION OF A CLIMATE CHANGE OMBUDSMAN OFFICE

Establish a Climate Change Ombudsman Office to support rural communities in dealing with complex issues related to climate change that require coordination among multiple state and federal agencies, local governments, NGOs, and others.

Option Description

The Issue: The traditional way of life in much of rural Alaska is at risk. Alaska Native villagers are undergoing a series of challenges related both to climate change and to deteriorating economic circumstances. Rapid climate change brings a multitude of physical impacts to villages, including erosion, subsidence, floods, and storm surges that in some cases require significant emergency response efforts, massive investments in infrastructure and full-scale community relocation. Other climate changes include shifts and dislocations of subsistence species, which has the potential to negatively impact traditional practices and diet, and is leading, in several prominent cases, to increased negative social, emotional and physical health impacts.

Overview: An array of state, federal and regional entities are responsible for delivering services to rural Alaskan villages, but specific program policies and regulatory constraints produce circumstances for conflicting directives, resulting in bottlenecks in the ability to achieve a coordinated delivery of vital services and outcomes that will enable villages and traditional culture to adapt in the face of climate change. Therefore, there is a concrete need for establishing a coordinating entity with the ability to navigate these multiple bureaucratic entities and to leverage their resources to support rural villages in emergency response, relocation, subsistence concerns, and other priorities.

Objective: The objective of this policy is to create an integrated and coherent process by which state, federal, regional and local entities can provide rapid, coordinated and effective relief to communities facing (and experiencing) substantial cultural, health, economic and subsistence impacts from climate change. Objectives of this proposed agency are to navigate the complexities of rules and mandates of multiple bureaucracies that must be complied with to deal with disaster planning and emergency response, community relocation, infrastructure development, health and cultural impacts, subsistence and other issues.

The Need: Marine and terrestrial ecosystems are changing substantially with complex feedbacks that alter habitat and the mix of fish, marine mammals, terrestrial mammals and vegetation. Sea ice, the prime habitat of walrus and seals and the hunting grounds for rural villagers, is disappearing at a dramatic pace. Subsistence hunters must now travel increasing distances to hunt marine mammals, which are experiencing sharply decreasing populations (e.g., ring seal have decreased 30% in the last three years). This hunting occurs in unsafe, frigid waters in boats for which gasoline costs more than \$9/gallon, a high price to pay in communities whose per capita income is one third that of urban Anchorage. Rural villagers also confront population shifts, declines, and loss of quality in other subsistence species, including fish, moose, caribou, and wild berries and other native plants.

Many aspects of the traditional rural subsistence lifestyle are now more difficult, more dangerous and more expensive. The cost of store bought foods, heating oil, and other daily living expenses interact with climate-related challenges to create circumstances that make survival in rural villages increasingly difficult. More than one in five individuals is below the poverty threshold, three times that of their urban

counterparts. Stresses to traditional practices – including a way of life tied to being on the land, and providing for one’s community – is combining with rising cost of rural living to raise the potential of serious social impacts. Aside from these readily observable impacts from climate change other outcomes can be more subtle. For example, Alex Whiting from Northwest Alaska discusses the cultural impacts of late freeze-up on his community. He notes that the youth and elderly depend on strong ice in fall to ice fish for saffron cod and smelt. Late freeze up and a concomitant shorter ice fishing season constrains elders and youth to interact during one of their few independent subsistence pursuits and lessens the opportunity for elders to pass on traditional knowledge and ethical values.

Beyond the social and cultural impacts of climate change many villages are now facing erosion, flooding, engulfment and disappearance of their community infrastructure. Shismaref, a community of 150 households on the northern Bering Sea faces relocation under scenarios costing from \$93 million to a \$179 million dollars. A recent GAO report found 213 predominantly Native villages, historically situated along rivers and coasts, to be at risk – with potential relocation costs of \$34 billion. Several existing communities must relocate immediately.

Stanley Tom of Newtok has stated that one of the biggest obstacles his community faces in trying to relocate is the lack of a single agency or group to be in charge of planning and/or response.

- DOT can’t build an airstrip unless we have a post office, can’t have a post office without a school, but the school has to have 25 students. But you can’t build the structures to house 25 students without the airstrip. These and numerous other “catch 22’s” impede an integrated, flexible and timely response.
- Land swap with USFWS requires a lengthy and expensive EIS.
- Finding money to address the relocation is even more frustrating. FEMA regulations for emergency funding are ambiguous and are superseded by Section 117 of 2005 omnibus appropriations bill which gave \$100 million to the Corps of Engineers to address this and similar problems in the area. Unfortunately, the Corps, for whatever reasons, failed to recognize their possession of this appropriation, nor its intent; the community got no money.

Congressional hearings underscore the Alaska delegation’s frustration that no single agency has been designated to take the lead on these erosion (and climate change) issues. The Alaska Climate Impact Commission established by the Alaska Legislature likewise acknowledged in its 2008 final report that there is “a greater need for interagency action among state and federal agencies, almost exclusively where threatened communities are struggling with relocation issues” (ACIC, 2008).

Option Design

Structure: This policy is structured as a set of nine inter-linked recommendations that in whole are designed to support the climate related challenges faced by rural communities.

Recommendation 1: Create a Climate Change Ombudsman Office within the Alaska State Government.

The Ombudsman Office will be a centralized entity responsible for coordinating the response of multiple state and federal agencies, local and regional governments, regional non-profit entities and non-governmental organizations (NGOs), with the purpose of supporting rural villages in meeting challenges related to relocation, emergency response, and changes in subsistence practices. The Ombudsman Office would be comprised of a set of deputy ombudsmen or case managers who are each assigned responsibility for a regional set of rural communities. A project coordinator would also be designated within each community facing critical climate-related challenges.

Objectives of the Ombudsman Office:

1. In partnership with local communities, address gaps in and constraints to adaptive capacity, and develop multi-agency strategies to address them.
2. Develop Memoranda of Agreement or Cooperation between federal and state agencies that specify how they will be responsive to a given community in order to effectively address its needs. To facilitate this endeavor the Ombudsman Office will also develop Memoranda of Agreement between agencies and village leadership. All of the federal and state bureaucracies would be required to identify a contact person or group within each entity and provide the resources for that group to coordinate with other entities. In addition, these in-house state and federal entities working with the Ombudsman Office must have the authority to initiate any processes within their agency's decision-making authority needed to change, waive or increase the flexibility of that agency's mandate. The deputy ombudsmen will then utilize these contact points to coordinate the delivery of flexible and integrated services across a broad response team. The central coordinating entity (deputy ombudsman) will be the single point of contact with the community and will serve as the conduit to process information to and from the community.
3. In partnership with appropriate local, regional, and statewide organizations, develop on-going forums or dialogues between elders, scientists, health professionals, policy-makers and others to discuss current and projected changes in the climate and the impacts of these changes on aspects of rural village life that include mental and physical health, economy, and culture. This may include exploring new subsistence opportunities and ways to reduce health risks in a warming climate.
4. Provide regularly updated information about measured and projected climate changes. In cooperation with the appropriate regional and statewide entities, the office will methodically develop communication strategies and protocols, including the use of proactive forms of communication that work for a given community such as radio, Native corporation newsletters, and websites, translated into native dialects.
5. Facilitate dialogue and information exchange between subsistence users and regulatory bodies such as the Federal Subsistence Board, the Marine Mammal Commission, and the Alaska Department of Fish and Game.

Recommendation 2: Develop a Process for Prioritizing and Addressing Climate Challenged Communities.

Following is an outline of a deliberative process for the Ombudsman Office to implement in order to systematically and fairly address the challenges of communities that are most at risk. Many of these steps are derived from recommendations of the Immediate Action Workgroup's (IAW) April 2008 report.

1. Develop "scenario analysis" whereby future climate conditions are analyzed to quantify the community impacts that might result.
2. Conduct meetings with leaders in at-risk communities to develop an understanding of the risks and challenges from climate change. Focus on personal safety, infrastructure, health threats and population decline. Allow the process to be driven by community leaders and landholders, with significant support from agencies.
3. Develop a methodology for prioritizing communities at risk, and the risks within each community. Based upon the results of the previous steps, identify and prioritize the communities at risk, the timeframe for the risk or impacts, and what is needed to address those impacts. Under this process it is likely that communities with populations too small to support a school or other basic needs (water treatment plant, airport, bulk fuel facility, city council, etc.) would receive a lower priority.

4. Make recommendations for addressing specific risks within communities. Revisit these recommendations as well as the prioritized communities annually and revise subject to new information.
5. For specific adaptation measures that may include strengthening existing community infrastructure, undertaking relocation, or making changes to community development, create strategies and measures that are specifically tailored to the needs of the community and develop alternatives for comparison.
6. Work with communities to obtain funding for these adaptation measures. In many instances, where communities lack staff or expertise to apply for and administer funding from grants, programs, or agencies, the respective Ombudsman case manager will do the groundwork to obtain and administer such funding.

For the communities that have to-date been identified by the State as those most at risk (Newtok, Kivalina, Shismaref, Shaktoolik, Koyukuk, and Unalakleet), develop and implement the following:

1. Emergency response plans and conduct training and drills
2. Community evacuation plans
3. Community wildfire management plans.
4. Geologic Mapping, Hazard Analysis and Risk Mitigation Plans
5. Relocation plans.

Recommendation 3: Create a mandate for relocation assistance within State and Federal entities.

No agency at the federal or state level has modified their charter to establish a priority for relocation efforts. Without such a mandate, relocation becomes a tertiary priority. For example, the Federal Emergency Management Agency (FEMA) has a mandate to replace what has been destroyed in situ, but does not have an obligation or directive (or resources) to rebuild infrastructure in a different location.

Lack of agency flexibility exacerbates the on-the-ground difficulties for communities facing relocation. For example, Newtok is trying to transition to Mertarvik, a new community several miles south with an elevation of 400 ft. above the existing community. However, since no central fund of money (nor several pots of money that can be combined) currently exist for a relocation effort, the movement of the community will have to be accomplished in several transitional steps, none of which has guaranteed or even approved funding. The “pioneer” community in Mertarvik is being constructed with an “evolutionary” and modular approach. A central hub at the site will initially house construction workers. As the community transitions, this hub will be converted to administrative offices with additional “spokes” radiating from this hub to house a clinic, post office, perhaps school, maintenance facilities and so forth. Housing will be added in clusters during this transition, as will a landing strip and a barge landing. Unfortunately a serious drawback to this multi-staged approach is that while agencies at various levels may have mandates to provide services and help to existing communities few, if any, incorporate mandates to aid communities in relocation efforts. The inclusion of “relocation” mandates is an integral requirement to accomplish such an approach.

Therefore, one outcome of the Ombudsman effort should be to insure that agencies at all levels of government incorporate “relocation” as a vital element of their mission and designate line item funding to accomplish the responsibilities of this task.

To serve this objective, it is proposed that the historic mission of FEMA that emphasizes planning, stockpiling of emergency resources, and a coordinated response between federal, state and local entities be resurrected at the federal level. Although not appreciably different from existing types of natural disasters, climate-related emergencies, most notably relocation, would be specifically folded into the mission of this entity. The climate-response mandate of this office would include reporting and

recommending to the President and Congress changes in policy, organization, or responses to more effectively meet the problems that climate change will bring.

With respect to Newtok or other communities faced with relocation, this kind of coordinated response effort from the federal level would support effective and organized relocation where it is most appropriate and could provide a model for addressing the unique climate challenges that undoubtedly will arise in other communities throughout the U.S.

Recommendation 4: Designate Lead Agencies at the Federal and State Levels and Develop a Rational Template that Outlines an Overall Strategy for the Relocation Process.

Currently there is no designated lead agency at the state or federal level to coordinate the development of resources (personnel, technical and funding) between agencies that have independent responsibility for community infrastructure, e.g., housing, education, health, energy and similar needs. In addition, because different components (e.g., housing, schools, health and energy) are the responsibility of different agencies with different funding cycles, priorities and fiscal resources, any single component of the process maybe be side tracked or delayed leading to significant costs overruns in other components, i.e., the communities energy infrastructure must be in place before schools can be opened. Thirdly, a lack of a coherent and secure upfront planning/funding effort requires an enormously complicated project management approach. In fact the Division of Community and Regional Affairs using Coastal Impact Assistance monies has two contract proposals through Department of Commerce, Community and Economic Development for two planning initiatives. One of these a Waterfront Management and All Hazards Plan (\$150k) that will result in a strategic management planning document that will provide criteria and guidelines for relocation and community/waterfront development at Mertarvik. The proposal recognizes the potential benefits of this planning process may be viewed as a model for future relocation of Alaskan villages affected by flooding and coastal erosion.

Based on the difficulties faced by Newtok in trying to plan for relocation, especially their experience with project management initiatives, create a rationalized, integrated and coherent strategy for relocation efforts. This process needs to be implemented and coordinated through the designated lead agency (agencies).

As recommended by the IAW and expanded upon, elements of a coherent relocation planning strategy should include the following:

- In addition to a preferred relocation option, provide alternatives.
- Document the advantages and disadvantages of each alternative.
- Obtain local input on community values related to alternatives.
- Evaluate the environmental effects of each relocation plan, and provide estimated costs for implementing each alternative.
- Compute the life-cycle costs of not relocating the community. As part of this analysis, calculate the costs associated with various scenarios, such as relocating in ten years vs. relocating in 20 years.
- When developing relocation plans, incorporate concepts of environmental, social and economic sustainability into community relocation design
- Determine the challenges of concurrent budgeting and meeting regulatory requirements where a collaborative effort with other agencies and organizations is proposed to implement the alternatives.
- Select the plan that provides the best overall balance to meet local needs and is cost effective, sustainable, sound from an engineering standpoint, and environmentally acceptable.

Recommendation 5: Create a Dedicated Funding Source for Relocation Efforts.

While the Ombudsman Office will provide direct assistance to communities in applying and administering grant and other funding, the office will ultimately work to investigate and integrate a dedicated funding source for relocation or adaptation efforts. In addition, the Ombudsman Office will seek to reduce capital budget expenditures as recommended by the IAW by:

- a) exploring opportunities for greater federal funding through state co-sponsorship of projects to attract federal match dollars
- b) developing local rock sources
- c) timing construction projects with others to reduce mobilization costs

Nevertheless, the existing “patchwork” funding approach needs to be rationalized on an inter-agency, multiple entity, and multi-year basis. The current funding process is time-consuming and almost impossible to coordinate. In addition, DCRA stated in an October 2007 memorandum:

Communities such as Newtok are in need of “fast-tracked” funding to address critical infrastructure needs at the current village site, as well as emergency needs ... at the new village site. There are few, if any, funding sources that provide for an expedited funding process. Communities experiencing erosion are not always eligible for imminent threat funding because erosion is not considered a single event disaster.

Recommendation 6: Create a Liquid Funding Source to Provide Immediate Assistance.

In addition to the dedicated funding source for relocation efforts there needs to be a readily accessible account that provides immediate cash flow and liquidity for private households, small businesses and other entities (e.g., local IRA). This account will pay for immediate expenses as relocation efforts unfold.

Recommendation 7: Streamline the NEPA Process.

The federal government must streamline the NEPA process as it applies to relocation and other climate adaptation projects. Communities like Newtok lack the capacity, expertise and resources to fully carry out the NEPA process, especially when they are dealing with myriad other demands, including planning for relocation, writing grants for various aspects of the relocation process, responding to inquiries from numerous agencies requiring justification for their needs and at the same time trying to sustain themselves as individuals and families. It is recommended that, through the Council on Environmental Quality, special procedures be established that tailor the NEPA process for relocation projects and to the scale of these communities.

To accomplish this, a lead agency first must be designated at the federal level to serve as the responsible entity for carrying community relocation efforts through the NEPA process. Second, that agency must be given the necessary fiscal and manpower resources. Third, the process must be streamlined and simplified, especially given the potential for hundreds of rural Alaskan communities who are facing the forces of climate change. Streamlining can include appropriation of boiler plate information from existing EIS documents or a template broadly fitting the general circumstances of these riverine and coastal communities. DCRA, in its October 2007 memorandum, highlights several additional issues.

Once a lead agency and federal action is identified, some of the challenges the lead federal agency may then encounter include:

- Identification of coordinating agencies and development of necessary Memoranda of Agreement (MOAs).
- Identification of participating agencies and development of necessary MOAs.
- Identification of funding to undertake a NEPA analysis if such funding is not in the current project budget.

- Development of a timely schedule for consultation (both Tribal and Services).
- Identification of and filling gaps in baseline data.
- Development of a timely schedule for public participation.
- Mandatory schedule for review and comment on the Notice of Intent (NOI), draft and final.

Recommendation 8: Provide Resources to Ensure Cross-Cultural Communication and Understanding within Traditional Languages.

Agencies and other entities need to pay considerable attention in their communication with communities that their technical dialogue is rendered faithfully in the Native language. Agencies and other entities must plan for increased “transaction costs” by working closely with Regional Corporations, the UAF Native Language Center and increase their sensitivity to the reception of their communication by soliciting additional feedback during discussions. The NEPA process, especially the public participation process brings out an issue highlighted during discussions with Dr. Lynn Zender a member of the Health and Culture TWG. The community of Newtok is situated in the southwest portion of Alaska among some of the most culturally conservative communities in the state. For many members of the community, but especially for middle aged and older individuals, Central Yupik is their first language. It is often the case during technical discussions about relocation, or public input during the EIS process that some technical terms, which might be rendered literally in Yupik, do not convey the conceptual intent. As Dr. Zender noted during one session the audience was actually surprised to learn that a “water shed” was not a housing structure.

Significant problems can arise when technical terms that imply widely accepted connotations in English lack a Yupik equivalent. One of the intents of the relocation process is to design new houses for the relocation community of Mertarvik that are highly energy efficient and lower the community’s carbon footprint. These new designs, which require community collaboration in their development, are running into some resistance as households prefer a more solid model of their existing housing structure rather than the “semi-subterranean” features suggested by the Alaska Cold Climate Research Center. Perhaps concepts such as “carbon footprint” will need considerable work in translation.

Recommendation 9: Develop a Flexible and Responsive Process to Regulate Subsistence Access under Changing Climatic Conditions.

Climate change is clearly a factor that impacts subsistence activities. Habitat, resource availability, and species composition are all changing. Many subsistence activities are more difficult, more dangerous and more expensive. Factors that may restrict or impede the ability of an individual to harvest or access subsistence resources will have profound implications for the cultural fabric of rural Alaskan communities. Conversely, processes that improve and rationalize access or ease of harvest will help sustain what is a thoroughly documented, traditional dependence on these resources.

Typically in rural Alaska subsistence resources provide much more than half of the local diet and in a number of places for which we have detailed information, e.g., northwest Alaska, their replacement cost (at the inflated costs of local stores) often reaches two thirds of a household’s disposable income. However, subsistence resources and the activities associated with the harvest of these resources provide more than food and nutrition. Participation in family and community subsistence activities, whether it be clamming, processing fish at a fish camp or seal hunting with a father or brother provide the most basic memories and values in an individual’s life. These activities define and establish the sense of family and community. These activities teach how a resource can be identified, methods of harvest, efficient and non-wasteful processing of the resource and preparation of the resource as a variety of food items.

The distribution of these resources establishes and promotes the most basic ethical values in Native and rural culture - generosity, respect for the knowledge and guidance of elders, self-esteem for the successful

harvest of a resource and family and public appreciation in the distribution of the harvest. No other set of activities provide a similar moral foundation for continuity between generations.

One of the impacts of climate change is that animal species that migrate into the region have been arriving up to three weeks earlier and in some cases also leaving three weeks later. These changes extend and expand the breeding season of migratory species. These seasonal changes when coupled with other environmental factors, such as lack of snow cover, impact traditional and seasonal harvest patterns. Unfortunately, even with emergency openings, the subsistence regulatory regime at the state and federal level seem to lack the flexibility to extend seasons or modify bag limits. Anecdotally, all of the seven or so proposals to the Federal Subsistence Board, that base requests for changes in harvest seasons on climate change have been refused. Biologists often cite uncertain impacts on species productivity as the rationale for this refusal. However, everything, including habitat is changing and methods must be found, even under conditions of profound uncertainty to sustain traditional subsistence practices.

One problem already alluded to is the time it takes just to participate in this process. We recommend the Ombudsman position have the personnel and budget to provide substantial technical assistance in helping the community organize its response to relocation and climate change issues. Even now the Newtok planning group has meetings that limit agenda's to specific topics and specific agencies. The Ombudsman Office should seek ways to streamline communication, interaction and burden on the community, perhaps using the Newtok experience to increase efficiency on various issues and additional communities start to undergo the increasing impacts of climate change. At the least, meetings and communication can be scheduled to minimize the involvement community members during high subsistence harvest seasons.

To improve flexibility and dialogue, the Ombudsman Office will work to facilitate interactions between subsistence users and regulatory bodies (such as the Federal Subsistence Board, the Marine Mammal Commission, and the Alaska Department of Fish and Game, particularly where local observations may provide important data to managers on the health and quality of subsistence species. The aim of this policy is to support the ability of these bodies to adaptively and sustainably manage species from year to year in a changing climate/environment so that healthy populations are maintained in companionship with subsistence use.

In this regard and based on input from rural communities, the Ombudsman Office will seek to create a citizen-based reporting system to document, potentially on-line, changes observed in rivers/lakes/aquifers, fish, bird, and animal numbers, locations, and conditions as well as berry and other gathered food conditions. Likewise, in partnership with appropriate regional and local entities, the Agency may seek to have surveillance programs developed to identify changing range, densities and health of subsistence food species and to increase existing monitoring of fish and animal health for emerging pathogens and introduction of new species to ensure food safety and sustainability.

Targets:

Possible Targets by 2012:

- Two villages successfully relocated
- Measurable improvements in rural community emergency response services
- Community-based reporting mechanism to document on-the-ground changes in subsistence foods (with an online database element and links to all fish, game, and marine mammal management agencies/biologists)
- A mental health support network that engages native elders

Timing: Under Development

Participants/Parties Involved: The partial list below represents parties that do or will play some role in relocation efforts, emergency response, and traditional foods and traditional knowledge networks.

Relocation

Native Organizations:

- Native Village Traditional Councils
- Native Corporations
- Other formal and informal village or Native networks

State of Alaska:

- Alaska Department of Commerce, Community, and Economic Development (DCCED), Division of Community & Regional Affairs (DCRA) – *group coordinator*
- Alaska Department of Environmental Conservation (DEC)/Village Safe Water Program (VSW)
- Alaska Department of Transportation and Public Facilities (DOT/PF)
- Alaska Department of Military and Veterans Affairs (DMV)/Division of Homeland Security and Emergency Management (DHS&EM)
- Alaska Department of Natural resources (DNR), Division of Coastal and Ocean Resources (DCOM)
- Alaska Department of Education and Early Development (DEED)
- Alaska Department of Health and Social Services (DHSS)
- Alaska Industrial Development and Export Authority (AIDEA)/Alaska Energy Authority (AEA)
- Alaska State Emergency Response Commission
- Alaska Municipal League
- Alaska Governor’s Office

Federal:

- U.S. Army Corps of Engineers (USACE), Alaska District
- U.S. Department of Commerce, Economic Development Administration (EDA)
- U.S. Department of Agriculture, Rural Development (USDA-RD)
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)
- U.S. Department of Housing and Urban Development (HUD)
- U.S. Department of the Interior, Bureau of Indian Affairs (BIA) Indian Reservations Road Program
- U.S. Department of Transportation, Federal Aviation Administration (FAA).
- U.S. Environmental Protection Agency (EPA)
- Denali Commission
- Offices of Senators Lisa Murkowski and Mark Begich

Regional Organizations:

- Association of Village Council Presidents Regional Housing Authority (AVCP)
- Coastal Villages Region Fund (CVRF)
- Lower Kuskokwim School District (LKSD)
- Rural Alaska Community Action Program (RurAL CAP)
- Yukon-Kuskokwim Health Corporation (YKHC)

Emergency response

- Department of Military and Veterans Affairs, Division of Emergency Services
- DHS-FEMA
- DHS- U.S. Coast Guard Search and Rescue
- Local Emergency Planning Committees

Traditional foods and traditional knowledge networks

- U.S. Fish and Wildlife Federal Subsistence Management Program
- Federal Subsistence Board and Regional Advisory Councils
- Marine Mammal Commission
- International Whaling Commission?
- ADF&G Boards of Fish, Game, and the Division of Subsistence

Evaluation: Under Development

Research and Data Needs:

- Standardized ADF&G Harvest Surveys (which include considerable social, demographic and economic information in addition to household harvest per species) need to be accomplished in each of the designated with emergency status.
- Standardized Social Network research needs to be accomplished in select communities to understand potential impacts of relocation on social, sharing, economic and subsistence networks.
- Regional economic models to quantify climate change impacts on communities and provide input to the NEPA process.
- Regional Assessments of existing social service infrastructure, staffing, budgets and delivery need to be accomplished at regional level as baseline to plan for increased demand.
- Social Impact Assessments need to be conducted at regional and community level to provide information for Section III of the NEPA process, description of the affected environment.
- Detailed interviews and oral histories need to be conducted to provide narrative information needed to assess the impacts of climate change and the potential impacts of different forms of relocation.

Implementation Mechanisms

Under Development

Related Policies/Programs and Resources

Related Policies and Programs: Under Development

Available Resources: Under Development

Feasibility

Feasibility: Under Development

Constraints: Under Development

Adaptation Benefits and Costs

Under Development

TWG Approval and Deliberations

The concept of an Ombudsman Office grew out of discussions among TWG members that emphasized the clear need for a centralized agency to support rural communities in navigating bureaucratic requirements of multiple state and federal agencies in addressing community-wide crises linked to climate change. The need was borne out of recent and ongoing experiences of several villages that are currently in peril. As the TWG discussed and voted for priority options, nearly unanimous support was voiced for a central agency to serve as an advocate for communities and to spearhead infrastructure reinforcement, emergency response, and relocation efforts.

Beyond these immediate challenges, the TWG saw an opportunity for the Ombudsman Office to embrace a broader range of objectives to support rural communities. Thus the TWG voted to move several additional priorities under the umbrella of the Ombudsman Office. These include: assessing the adaptive capacity of communities; increasing the level of communication between communities and state and federal agencies by holding community forums with elders; utilizing traditional knowledge to provide feedback to regulatory agencies and scientists (via a citizen-based reporting system) on changes to subsistence resources and on-the-ground climate observations, and increasing the communication of information in native languages and in formats (radio, television, newsletter, web, and others) that are specific and useful to the needs of rural communities. The objective of the policy to support communities in conveying their concerns about changes in subsistence resources to regulatory bodies was viewed as a high priority and, along with communicating in traditional formats, languages, and utilizing traditional knowledge, received among the highest number of votes during the balloting of any of the policies considered by the TWG. These particular issues are viewed as central to the TWG's mission of developing adaptation measures that address the cultural impacts of climate change on Alaska's indigenous people.

HC2. AUGMENT SURVEILLANCE AND CONTROL PROGRAMS FOR INFECTIOUS DISEASES

Augment surveillance and control programs for vector-, water-, and foodborne diseases likely to become greater threats because of climate change. Develop educational programs for the public, health care providers, environmental staff, and others on approaches to reduce emerging disease threats.

Option Description

The Issue: Increases in global temperatures have led to increased incidence of certain infectious and non-infectious diseases, new problems in sanitation and solid waste management, and contaminant exposures.

Overview: This option concerns the observed and projected increase in diseases in Alaska due to global climate change. Current programs are insufficient to identify and control these changes. Existing infrastructure needs to be augmented to address these emerging concerns.

Objective: The objective of this option is to protect the health of humans and animals, both domestic and wildlife, from the effect of climate changes in Alaska by improving surveillance information. This will allow more robust tracking and identification of trends in order to respond to and control emerging threats in an expeditious manner.

The Need: There is a growing scientific consensus that climate change has affected the distribution, including incidence and geographic range, of infectious and non-infectious diseases globally. Surveillance and control are necessary because they are the mechanisms by which public health practitioners prevent, prepare for, and respond to disease threats. Examples of emerging diseases that have been linked to climate change in Alaska include *Vibrio parahaemolyticus* in oysters, toxoplasmosis in sea otters, and increases in venomous insect events.

Option Design

Structure: The agencies currently tasked with the responsibility for surveillance and control for human and animal diseases are the Alaska Department of Health and Social Services, the Alaska Department of Environmental Conservation, the Alaska Department of Fish and Game, and the Municipality of Anchorage. The recommendations presented in this option will require augmentation of existing surveillance and control efforts performed by programs within these agencies. Implementation of the option recommendations will require increased human and material resources, including methods and tools, within existing programs, as well as new and augmented partnerships with the public and private sectors, including memoranda of understanding to collect the necessary data.

Targets:

1. Create a statewide emergency room discharge database to improve detection of climate change-related diseases
 - a. Purchase software/hardware
 - b. Fund personnel for data entry/management
2. Expand and improve the state's hospital discharge database to improve detection of climate change-related diseases
 - a. Purchase software/hardware
 - b. Fund personnel for data entry/management
3. Improve surveillance for vectorborne diseases in vectors
 - a. Expand insect sampling (e.g., mosquitoes, ticks)
 - b. Expand wild/domestic animal sampling (e.g., equine, rodent, ruminants, beavers, hares)

4. Improve health care provider education around infectious disease reporting laws
 - a. Health aide conference lectures
 - b. Public health nursing conference lecture
 - c. Grand rounds in hospitals
5. Create a reporting system for sanitation/wastewater integrity disruptions
 - a. Create a reporting system database
 - b. Educate around reporting requirements
 - c. Expand current monitoring capabilities to include rural and subsistence communities
6. Improve interagency notification of wastewater violations between MOA, DHSS, DEC
 - a. Establish a notification MOU between agencies
7. Increase monitoring in humans, animals and the environment for specific contaminants and irritants
 - a. Mercury
 - b. Arsenic
 - c. Halocarbons (e.g., pesticides, PCBs, PBDEs)
 - d. Pollens/allergens
 - e. Establish an MOU whereby federal agencies would agree to collaborate with state and local government officials in the collection and analysis of contaminant/irritant samples

Timing: For each of the above targets, we recommend that they be implemented as soon as possible to establish baseline data and discontinued only if it is determined that the solution is no longer necessary during the evaluation process.

Participants/Parties Involved: ADHSS, ADEC, ADFG, ADNRR, MOA, ANTHC, AML, Alaska Hospitals and Emergency Departments, USDA, CDC, DOI, NOAA, EPA

Evaluation: For each of the above solutions, we recommend ongoing monitoring and evaluation, with annual assessments regarding the need to continue the effort.

Research and Data Needs: Sufficient evidence exists that implementation of this policy option will provide the intended benefits—namely, surveillance data for detection of disease and sanitation/wastewater violations. This information is critical for determining targeted public health control needs.

Implementation Mechanisms

Under Development

Related Policies/Programs and Resources

Related Policies and Programs: *Under Development*

Available Resources: *Under Development*

Feasibility

Feasibility: Each of the proposed solutions is highly feasible as no new legislative authority is needed and the basic governmental structure already exists for implementation with minimal cost in terms of capital infrastructure and personnel services support.

Constraints: *Under Development*

Adaptation Benefits and Costs

Under Development

TWG Approval and Deliberations

All TWG members agree that implementing this adaptation option is critical to increase Alaska's capacity to avoid, prepare for, and effectively respond to the health and culture risks of climate change.

HC3. COMMUNITY HEALTH IMPACT EVALUATION INITIATIVE

Actions taken to mitigate greenhouse gas emissions or to adapt to the current and projected impacts of climate change also may benefit or harm human health. This option proposes a Community Health Impact Evaluation (CHIE) initiative to rapidly and efficiently screen proposed mitigation and adaptation activities to determine whether there may be associated health benefits or harms and to identify additional actions to maximize the benefits and reduce potential adverse impacts.

Option Description

The Issue: Mitigation and adaptation activities implemented in a wide variety of sectors can affect human health, from building new physical infrastructure, such as protective seawalls, to a review of historical burial site records. These auxiliary health effects are generally unintended, and can range from none to highly significant. At present, there is no established mechanism for a brief, structured, and rapid professional evaluation of a proposed mitigation or adaptation measure to identify potential adverse or positive influences on health. This option would create such a mechanism to identify where health effects were unlikely, minor, few, or more significant. Such an evaluation would facilitate the design and implementation of necessary additional measures, including monitoring, to maximize benefits and to reduce potential likely and significant adverse effects.

Objective: The objective of this policy is to create a Community Health Impact Evaluation initiative to rapidly and efficiently screen proposed mitigation and adaptation measures to identify health benefits and harms, and to identify activities to maximize the benefits and reduce potential harms.

Option Design

Structure/design: The CHIE would require a designated Project Review Committee (PRC) with primary responsibility for examination and evaluation of each mitigation and adaptation measure recommended for implementation. To optimize efficiency and ensure rapid response, the PRC would have a core team that includes the State Department of Public Health, representatives from relevant State agencies, and public health professionals from other organizations. Implementing this option would not require the hiring of new professional staff, but would need part-time staff support.

The PRC would follow these steps:

1. The State agency responsible for the mitigation or adaptation measure would forward a request to the PRC chair for an evaluation, along with a full description of the measure.
2. The PRC Chair would convene the core PRC members, with at least one representative from the responsible State agency. The proposed measure would be reviewed by the PRC to determine the possible need for an in-depth review. A detailed evaluation would be recommended if (1) multiple likely mechanisms for adverse health effects were identified, (2) one mechanism was identified with a high likelihood of adverse effect, or (3) the initial evaluation suggested that there was likely to be a public perception of possible adverse effects.
3. If the PRC evaluation concluded that there was a negligible likelihood for any adverse health effect, a report from the PRC would be issued to the responsible State agency. TARGET—one working week.
4. If the PRC decided an in-depth evaluation was advisable, an appropriate group of additional consultants, agency personnel, and citizen members would be convened, and the following steps taken:

- a. The PRC Chair would send an interim report to the responsible State agency recommending an in-depth evaluation and listing the reasons that justify the recommendation. TARGET - 2 working weeks.
- b. The PRC Chair would convene the expanded committee and:
 - i. Ascertain the possible pathways or mechanisms of potential adverse effects or benefits.
 - ii. Assure all needed additional State, federal, municipal and other citizen groups possibly affected by the identified mechanisms were represented. This group would identify all aspects of effect mechanisms, positive and adverse, and suggests measures to mitigate adverse effects and maximize benefits.
 - iii. Align measures designed to minimize adverse impacts, and measures designed to maximize benefits, with outcome monitoring indicators to create the most efficient monitoring strategy.
 - iv. Submit a final report to the requesting State agency. TARGET--4-6 working weeks.

Timing: Implementation of the CHIE option would require authorizing legislation or regulations before the first mitigation and adaptation option is implemented.

Participants/Parties involved: The PRC needs to be the responsibility of the State Department of Public Health, with participation from community and environmental health professionals from other agencies and organizations. The expanded PRC required for an in-depth review would reflect the needs of the specific mitigation and adaptation option.

Evaluation: A variety of mechanisms for PRC evaluation could be used. The simplest could consist of regular feed back forms used by the PRC Chair to elicit evaluation comments from the participants and agencies involved in each review. In addition, regular feedback and critique could be solicited from involved agencies over the life of a mitigation or adaptation project, as well as residents at whom the option was directed. Monitoring reports should be maintained over the life of the project, to fine-tune the option as needed, and to provide information to affected communities that might be useful for planning additional adaptation/mitigation strategies. Periodically, the PRC should undergo evaluation by an outside consultant to enable continuous improvement. Ideally, the reports, and monitoring reports, as well as all evaluation reports should be available to the public on a user-friendly website.

Research and Data Needs: The CHIE Option is based on existing models of assessing the impacts of policies and measures on community health, including those used by the Centers for Disease Control and Prevention, and does not require further research. It is a well-established, widely used public health protection mechanism.

Implementation Mechanisms

The CHIE Option would require at least authorizing regulations. Existing personnel in the Department of Public Health could probably meet the professional needs, but part-time support staff would be needed. It is anticipated that the number of mitigation and adaptation options selected by the State will not be large enough at any one time to make additional full-time professional staff a requirement.

Related Policies/Programs and Resources

Related Policies and Programs: No programs currently address this issue.

Available Resources:

Feasibility

Adaptation Benefits and Costs

TWG Approval and Deliberations

All TWG members agree that implementing this adaptation option is critical to increase Alaska's capacity to avoid, prepare for, and effectively respond to the health and culture risks of climate change.

This option is in the early stages of development.

HC4. ADDRESS RISKS TO RURAL SANITATION AND SOLID WASTE MANAGEMENT

Assess sanitation infrastructure and practices at risk from flooding, thawing permafrost, and other risks, or that is otherwise subject to changed conditions that significantly reduce performance in environmental health protection. Consider the modification, rebuilding, or relocation of sanitation infrastructure to protect human and environmental health

Option Description

The Issue: Increases in global temperatures have led to new and exacerbated problems in rural sanitation and solid waste management that are anticipated to negatively impact community health.

The Need: There is a growing scientific consensus that climate change has affected the incidence and geographic range of infectious and non-infectious diseases. Effective sanitation systems are intended to minimize outbreaks of infectious diseases. Additionally, changes in water quality, such as acidification and increasing temperature, can affect human and wildlife health through exposures to toxic compounds. Further, changes in drinking water supply and location may occur with the changing hydrology regime. Permafrost (intended to serve as a waste liner) and riverbanks (support treatment cells and infrastructure) are eroding. These phenomena are a concern as rural sanitation differs from urban and semi-rural facilities in that:

- 1) Solid waste and wastewater treatment and retention largely relies on earthen structures, unlined natural land cells, simpler water supply and treatment systems, inadequate logistical opportunity for waste compaction, cover, and consolidation that make toxin and pathogen removal/barrier performance susceptible to physical environmental changes.
- 2) A high proximity of facilities to housing, drinking water sources, and local diet aquatic life is present creating conditions amenable to the spread of water, vector, and hygienic disease.
- 3) Economies-of-scale present extreme O & M costs so that impacts from climate change threaten to exceed the tipping point of community ability to pay.

Objective: The objective of this option is to protect the health of humans and wildlife from the effects of climate changes by improving the capacity of the rural sanitation and solid waste management systems to control anticipated new and exacerbated disease and toxic exposures. This will prevent acute and chronic health problems in the population.

Option Design

Structure/design: The agencies currently tasked with the responsibility for rural sanitation and solid waste management include the Alaska Department of Environmental Conservation, the Alaska Native Tribal Health Consortium, Regional Native Non-profit Health Consortia, and local Environmental Programs, *****, and U.S. Environmental Protection Agency. The Alaska Department of Health and Human Services, Department of Fish and Game, and U.S. Fish and Wildlife are indirectly involved in identification and control for human and aquatic life negative outcomes that may emanate from inadequate system performance.

The option recommendations will require augmentation of existing sanitation and waste management programs for human and aquatic life health. Implementation of the option recommendations will require increased human and material resources, including methods and tools, within existing programs, as well as new and augmented partnerships with the public and private sectors, including memoranda of understanding to collect the necessary data.

Targets:

8. Create a statewide emergency room discharge database to improve detection of climate change-related diseases
 - a. Purchase software/hardware
 - b. Fund personnel for data entry/management
9. Expand and improve the state's hospital discharge database to improve detection of climate change-related diseases
 - a. Purchase software/hardware
 - b. Fund personnel for data entry/management
10. Improve surveillance for vectorborne diseases in vectors
 - a. Expand insect sampling (e.g., mosquitoes, ticks)
 - b. Expand wild/domestic animal sampling (e.g., equine, rodent, ruminants, beavers, hares)
11. Improve health care provider education around infectious disease reporting laws
 - a. Health aide conference lectures
 - b. Public health nursing conference lecture
 - c. Grand rounds in hospitals
12. Create a reporting system for sanitation/wastewater integrity disruptions
 - a. Create a reporting system database
 - b. Educate around reporting requirements
 - c. Expand current monitoring capabilities to include rural and subsistence communities
13. Improve interagency notification of wastewater violations between MOA, DHSS, DEC
 - a. Establish a notification MOU between agencies
14. Review existing Class III solid waste management guidelines (for rural and remote, non-hub communities) to adapt the regulations, recommendations, and community outreach to anticipate continued climate change impacts. For example:
 - a. Design allowances such as permafrost loss and inability to rely on permafrost as liner,
 - b. Alternative or supplemental systems such as composting, hazardous waste storage facilities
 - c. System design or operations for erosion, or flooding – such as leachate retention ponds,
 - d. Design amenable to anticipated relocation (move back from eroding river or move community) such as sack-fill/road mat system that may be used to move entire landfill using local resources
 - e. Minimum distance to housing and drinking water sources to allow for increased rodent, insect disease vector populations at disposal site
 - f. Open burning in covered containers to keep out increased precipitation, decreasing smoke toxicity
8. Review CIP solid waste projects and priority classifications
9. Make available financial resources or incentives for development of more efficient adaptive system
 - a. Increase monitoring in humans, animals and the environment for specific contaminants and irritants
 - b. Mercury
 - c. Arsenic
 - d. Halocarbons (e.g., pesticides, PCBs, PBDEs)
 - e. Pollens/allergens
 - f. Establish an MOU whereby federal agencies would agree to collaborate with state and local government officials in the collection and analysis of contaminant/irritant samples

Timing: For each of the above targets, we recommend that they be implemented as soon as possible to establish protection-adaptive systems in the communities where resources are being allocated in the near-term. Without timely implementation, wastage of capital resources is risked as system lifespan horizons

are designed for 20 - 40 years. Human and aquatic life health may suffer both acute and chronic effects as well as reduced quality of life.

Participants/Parties Involved: ADHSS, ADEC, ADFG, ADNR, MOA, ANTHC, AML, Alaska Hospitals and Emergency Departments, USDA, CDC, DOI, NOAA, EPA

Evaluation: For each of the above solutions, we recommend ongoing monitoring and evaluation, with annual assessments regarding the need to continue the effort.

Research and Data Needs: Sufficient evidence exists that implementation of this policy option will provide the intended benefits—namely, modification of rural sanitation and waste management to meet health and quality-of-life performance goals in the face of anticipated environmental impacts will meet the intent of public health infrastructure in rural communities.

Implementation Mechanisms

Related Policies/Programs and Resources

Related Policies and Programs:

Available Resources:

Feasibility

Each of the solutions is highly feasible as no new legislative authority is needed and the basic governmental structure already exists for implementation. If systems are adapted to climate change impacts in design versus post-construction, capital costs are not likely to increase dramatically. Some increase may be anticipated in communities where systems must be located further from town than previously, for systems with no alternative than supporting a higher protective level (e.g. a treatment cell liner), or for alternative systems (e.g. Reverse Osmosis, road mats in place of gravel roads). However, initial increase in costs in switching to targeted adaptive policies will decrease over time as these methods become conventional and design and production costs lower.

Adaptation Benefits and Costs

TWG Approval and Deliberations

All TWG members agree that implementing this adaptation option is critical to increase Alaska's capacity to avoid, prepare for, and effectively respond to the health and culture risks of climate change.

This option is in the early stages of development.

HC5. EFFECTS ON ARCHAEOLOGICAL, HISTORICAL, AND CEMETERY SITES

The State, in partnership with tribes and other stakeholders and through augmentation of existing infrastructure, should coordinate the inventory, assessment and prioritization of cemetery, archaeological, and historic sites to develop mitigation strategies for threats due to climate change.

Option Description

The Issue: Alaska’s gravesites, archaeological sites, and historic sites are becoming increasingly exposed and impacted through anthropogenic and natural processes, including global climate change. Coastal sites are particularly vulnerable. The sea level rise predicted to occur over the next few decades will alter the shape of coastline and speed erosion, submerging or destroying many graves and cultural sites. Inland, warming temperatures have led to the melting of ice fields thousands of years old, exposing organic artifacts such as arrows to the elements. Warming temperatures are also causing lake and stream levels to become higher or lower than normal, exposing or inundating sites. In some areas, the onslaught of the bark beetle has had an effect on sites and structures.

Overview: This option addresses the observed and projected increase in the destruction of grave sites, archaeological sites, and historic sites due to the effects of global climate change. Programs within the state framework have the authorities, infrastructure, and expertise to coordinate identification, assessment and mitigation of adverse effects to these resources, but do not have adequate staff or funding to perform the duties. Appropriate responses to these challenges require the augmentation to existing infrastructure.

Objective: The objective of this option is to identify, assess, prioritize, and mitigate adverse effects of climate change on grave sites, archaeological sites, and historic sites through the development of dedicated program areas within the existing state framework. This will provide for the coordination of efforts to identify, assess, prioritize, and develop mitigate plans to address the effects of climate change, and will enable the State to rapidly respond to threats as necessary.

The Need: There is strong scientific support for a relationship between global climate change and the environmental changes that are causing the destruction of gravesites, archaeological sites, and historic sites. The collection of baseline data and monitoring efforts are required to identify, assess and prioritize threatened sites, and develop plans for mitigating these threats. Examples of cemeteries and cultural sites that have been wholly or partially destroyed by changing weather patterns are widespread throughout Alaska.

Option Design

Structure/design: The state agency tasked with preservation and protection of archaeological and historical sites on state lands, including tidelands and submerged lands, is the Office of History and Archaeology (OHA). Housed within the Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation, OHA carries out the policy of the state to “preserve and protect the historic, prehistoric, and archeological resources of Alaska from loss, desecration, and destruction so that the scientific, historic, and cultural heritage embodied in these resources may pass undiminished to future generations...” (AS 41.35.10). OHA also fulfills the responsibilities of the State Historic Preservation Office, a federally funded program that carries out the mandates of the National Historic Preservation Act of 1966 (*16 U.S.C. 470*) for a wide range of historic preservation activities, including maintenance of the official restricted-access statewide inventory of archaeological and historic sites. With regard to gravesites and human remains, OHA has provided forensic anthropology consultation to the State Medical Examiner under reimbursable services agreements since 1988. In 2004, OHA initiated a Memorandum of Understanding with the State Medical Examiner and Alaska State Troopers that provides interagency guidance on the discovery and treatment of human remains.

With the ability to work across agency lines, staff expertise in the related fields, and a history of collaborations with tribes and other organizations, OHA is the best candidate for coordinating and facilitating the activities described under this option. While OHA has the authorities and infrastructure to begin assessing the effects of climate on the state’s archaeological and historic sites, including grave sites, it does not currently have the staff or funding to carry out these duties. Implementation of this option will require increased human and material resources within this existing program, as well as new and augmented partnerships with other agencies, local governments, tribes, and organizations such as historical societies.

Targets:

1. Establish a new program area within OHA, with a dedicated archaeologist / anthropologist position and funding for travel and equipment to coordinate and facilitate cemetery issues. Duties would include coordination of studies to assess the effects of climate change and providing technical advice. Modeled somewhat after a successful program in Wisconsin, the proposed “Alaska Burial Sites Preservation Program” would coordinate closely with the Alaska State Troopers, the Alaska State Medical Examiners Office, tribes, and other stakeholders. The position should be supplemented as necessary to carry out specific program activities through the use of paid college interns or non-permanent state positions. The position would serve as OHA liaison with law enforcement agencies, the State Medical Examiner’s Office, and the Bureau of Vital Statistics (for burial transit permits and disinterment / re-interment permits). The position would also facilitate communication with tribal representatives on matters involving human remains. As a part of program development, the position would:
 - a. Help to establish the “Alaska Burial Sites Preservation Board” comprised of the State Archaeologist (nonvoting facilitator), program archaeologist, tribal members, scientists, university faculty, and other stakeholders. The Board will provide guidance and oversight to the “Alaska Burial Sites Preservation Program.”
 - b. Coordinate and facilitate field surveys, interviews, and records searches to identify, inventory, and determine the condition of cemetery and gravesites. Assess threats by erosion and quantify changes by measuring rates of erosion through time.
 - c. Develop a dedicated restricted-access database for reported cemetery / gravesites and discovered human remains. This can best be accomplished by designing a supplemental GIS-compatible module to the AHRS database, which is under ongoing development by the state’s DNR LRIS/GIS Section. The cemetery database would be the primary tool for identifying, managing and monitoring changes to gravesites. By implementing a map interface, it would also serve as an important tool for law enforcement agencies and the State Medical Examiner’s Office by allowing a visual comparison between human remains discovery sites and known grave locations.
 - d. In consultation with the “Alaska Burial Sites Preservation Board” and landowners, prioritize cemetery / grave sites based on level of threat, feasibility to relocate or mitigate, and importance to stakeholders such as tribes and local organizations.
 - e. Help develop mitigation plans (such as relocation); seek supplemental funding opportunities and partnerships with tribes, other agencies, universities, non-profits, and other stakeholders for survey or to carry out mitigation projects;
 - f. Coordinate with other OHA program areas to develop a public education program with site stewardship and monitoring components. This should be done in collaboration with other organizations when possible. This will give local community members an active role in monitoring sites for changes due to climate or disturbance, and will provide baseline information to the state.

2. Establish a new program area within OHA, with a dedicated archaeologist position and funding for travel and equipment, to coordinate and facilitate studies for addressing the effects of climate change on Alaska’s archaeological and historic sites.
 - a. In collaboration with tribes, other agencies, and local organizations, this position will help to coordinate and facilitate field surveys, interviews, and records searches to identify and inventory threatened cultural resource sites. The position should be supplemented as necessary to carry out program activities through the use of paid college interns or non-permanent state positions.
 - b. Enter or update site records in the Alaska Heritage Resources Survey (AHRS) database, the state’s official statewide inventory of archaeological and historic sites. The AHRS is the primary management tool for preservation planning under state and federal laws. Data fields in the AHRS record observations on current condition and provide baseline information for assessing changes to sites through time.
 - c. Prioritize sites based on level of threat, feasibility to mitigate, and importance to stakeholders such as tribes and local organizations.
 - d. Help develop mitigation plans (such as data recovery) for threatened sites; seek supplemental funding opportunities and partnerships with tribes, other agencies, universities, non-profits, and other stakeholders for survey and mitigation efforts.
 - e. Carry out a public education program with site stewardship and monitoring components. This should be done in collaboration with other organizations when possible. This will give local community members an active role in monitoring sites for changes due to climate or disturbance, and will help provide baseline information on changes for inclusion in the AHRS inventory.
3. Enact legislation to create a property tax benefit for private landowners who actively protect listed cemeteries / gravesites and archaeological or historical sites on their land.

Timing:

Participants/Parties involved:

Evaluation:

Research and Data Needs:

Implementation Mechanisms

Related Policies/Programs and Resources

Related Policies and Programs:

Available Resources:

Feasibility

Adaptation Benefits and Costs

TWG Approval and Deliberations

The majority of the TWG members agree that implementing this adaptation option is critical to increase Alaska's capacity to avoid, prepare for, and effectively respond to the health and culture risks of climate change. Archaeology and history are nonrenewable resources. This statement made by a TWG member states, "The loss of culture is mourned always in hindsight and recognized as irreplaceable. Here we have a chance to not repeat mistakes of the past by proactively recognizing those tangible aspects that make us Alaskan, make us Native, make us human."

This option is in the early stages of development.