# Climate Change and Mental Health: Uncertainty and Vulnerability for Alaska Natives

## Center for Climate and Health

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*Climate change is currently affecting the health of Alaska Natives, through impacts of: extreme weather, changes to the local environment, and alterations in plants and animal resources. The mental health effect of such impacts remains incompletely researched and understood. This bulletin provides an academic review of Alaska Native climate change mental health impact pathways, and potential responses to mental health effects. This bulletin sets a foundation for future analysis in participation with community members, researchers, and behavioral health practitioners. Alaska Native mental health is vulnerable to climate change impacts, such as: extreme weather, increased erosion, changes in subsistence resources, sea-level, and seasonality, and thawing permafrost. To best protect and promote mental health in response to climate change, the tribal health system can conduct appropriate vulnerability assessment, undertake response planning through existing and novel systems, increase population wide and individual awareness on mental health effects, and support ongoing research and monitoring activities that address these issues.*

**Background: Alaska Native Mental Health**

Similar to other northern indigenous communities experiencing rapid socio-cultural change over the last century, many Alaska Native mental health issues have origins in cross-cultural adjustment, or acculturation. Acculturation's impact on mental health is largely negative (e.g. stressing the human-environment system), but may also have some positive impact (e.g. enhancing community resilience) (McCarthy & Martello, 2005). Acculturation is associated with stress/anxiety, psychosomatic symptoms (pain with no biological cause), and depression (Berner & Furgal, 2005). In contrast, Enculturation, the process of learning about and identifying with ethnic and cultural identity, is associated with psychological well being, more effective coping strategies, and less frequent drug/alcohol use (Wolsko, Lardon, Mohatt, & Orr, 2007). It is known that climate change will provide additional stress to acculturation, and instigate re-traumatization, as a changing climate will force people to behave in new ways and with new adaptive cultural mechanisms (Berner & Furgal, 2005; Warren, Berner, & Curtis, 2005).

Alaska Native communities support cultural activities and strong family structures, both of which positively influence mental health through continued maintenance to ethnic identity. Communities continue to navigate complex acculturation and enculturation experiences and are achieving community resiliency in the face of these challenges (Hensel, 1996). Yet stress, depression, suicide, drug and alcohol abuse, and family violence do occur in communities (Curtis, Kvernmo, & Bjerregaard, 2005; Shephard &

Rode, 1996; Alaska Native Epidemiology Center, 2009). Alaska Native men experience mental health challenges as they transition from a primarily subsistence to market based economy, with associated changes to cultural identity and gender roles (Hensel, 1996). Men are also observed to experience mental health issues in greater numbers than women, with common male mental health outcomes (suicide, violence) also more visible than women's common outcomes (suicidal thoughts, depression) (Berner & Furgal, 2005; Wolsko et al., 2007). Alcohol and substance abuse in particular appear to instigate many mental health issues in the form of self-harm and general decreased quality of life (Injury Prevention Program & Alaska Native Epidemiology Center, 2008).

Historically, Native communities were not confined to a single location and therefore followed the requirements of seasonal movement to improve chances of survival, and take advantage of available subsistence resources. Most Alaska Natives now live in permanent, immovable communities, and this may influence a sense of loss and grief if the surrounding environment is impacted in a negative manner. Hunting and fishing camps are used seasonally, but have also been oriented to year-round permanent settlements. Both permanent and semi-seasonal settlements are often located in coastal or river areas vulnerable to erosion, storm surge, and flooding. Infrastructure from socio-economic acculturation has delivered beneficial community services, but has also constrained residents to the environmental risks of a given location (Warren et al., 2005).

**Health Impact Pathways: Climate and Mental Health**

Indigenous populations in Arctic and sub-Arctic regions are known to be particularly health vulnerable to climate change (Confalonieri et al., 2007; Huntington & Fox, 2005). Alaska Natives experience vulnerabilities through their reliance on subsistence resources, reduced economic opportunity as evidenced by high unemployment and impoverishment, and a well described set of health disparities, some directly influenced by the natural environment (Alaska Native Epidemiology Center, 2009). To understand mental health effects specifically, descriptive modeling of climate change impact to the existing Alaska Native mental health context must be undertaken (Costello, 2009).

In general, climate change impacts mental health by (Fritze, Blashki, Burke, & Wiseman, 2008):

1. Creating new stress that exacerbates existing mental illnesses or develops new illnesses,
2. Disrupting the social, economic, and environmental determinants of mental health,
3. Introducing generalized stress of an uncertain future, and
4. Inhibiting enculturation as traditional systems (e.g. subsistence species) are further disrupted.

Table 1 below includes some of the potential climate change impacts to mental health in Alaska Native communities.

**Table 1.** Expected Climate Change Mental Health Effects in Alaska Native Communities

| **Event*** | **Health Impact*** | **Health Outcome** (Negative & Positive) |
|---|---|---|
| *Increased frequency/ severity of extreme weather events* | Damage to infrastructure will occur during severe events (Warren et al., 2005). If events occur with "disaster" (deaths & injury) level impact, significant mental health outcomes occur in the aftermath. | Negative: Stress disorders, depression, anxiety, grief responses, psychosomatic illnesses (Van der Berg, Grievink, Yzerman, & Lebret, 2005), "maladaptive" coping (unhealthy behaviors such as drug use and violence).<br>Positive: Unknown. |
| *Sea-level change* | Sea-level Rise (SLR) combined with storm events may force relocation and changed lifestyles, migration to urban centers could occur. | Negative: Stress, "maladaptive" coping, feelings of loss.<br>Positive: Transition to a safer and more sustainable environment. |
| *Long-term increasing temperatures* | Alterations to subsistence and water resources. Threat of possible emerging infectious diseases, especially in subsistence species. Possibly fewer cold-related illnesses and deaths, more opportunities for outdoor recreation. | Negative: Depression, stress, "maladaptive" coping (including unhealthy dietary changes), feelings of loss.<br>Positive: New subsistence/recreation opportunities, decreased stress. |
| *"Phenology" (seasonality) alterations* | Changing seasonal timing and type of local environment may be detrimental. New valued activities could be facilitated. | Negative: Stress and worry, including transportation hazards (e.g. unsafe sea ice).<br>Positive: Possible longer period for warm-weather activities. |
| *Thawing permafrost* | Damage to residential and public health infrastructure. | Negative: Stress and uncertainty about the future, including safe water supply.<br>Positive: Unknown. |
| *Increasing wild fire events* | General degradation to local environment, events could occur with "disaster" level impact. | Negative: Stress, possible anxiety and depression, "maladaptive" coping.<br>Positive: Unknown. |
| *Resource development related to climate change* | Concerns over development impact could cause stress and worry, general change to local economies and worker influx. | Negative: Stress, "maladaptive" coping.<br>Positive: New economic opportunities can support wellness and reduce stress. |

*Adapted from (Climate Change Science Program, 2008; Page & Howard, 2009).

As can be seen in Table 1, uncertain climate change impacts and community response makes prediction of mental health outcomes difficult. However, these public health concerns have been verified through community testimony and preliminary research describing feelings of sadness, fear, stress and worry in response to climate change events (Flint & Isert, 2010). These feelings echo other documented instances of mental distress following rapid loss of a valued local environment (Albrecht et al., 2007). Alaska Native populations experience climate change mental health risk factors (Van der Berg et al., 2005), including: *predisposing* factors (mental health issues in existence before climate change), *precipitating* events (severe and rapid climate change impacts in Alaska), and *perpetuating* health care system deficiencies (currently insufficient response strategies). The following section references these described mental health vulnerabilities and outcomes by considering an observed climate change-influenced impact.

***Alaska Natives face an uncertain climate future.*** *Photo by Mike Brubaker*

**Case-study: Community Relocation**

The climate change events threatening Alaska Native mental health presented in Table 1 occur differentially across the distinct regions of Alaska. ANTHC has received many descriptive accounts of stress and worry surrounding particular climate change impacts in Alaska, these generally include: sea-ice and marine mammal alterations along the Northern Arctic coast; storm-surge and permafrost changes in the Northwest Arctic; wildfire and drought in the Interior; water source vulnerability and subsistence changes in the Western delta; fisheries health and extreme weather in the Aleutians; rapid landscape change such as spruce-beetle infestation in South-central; and fisheries and forest resources

threatened by invasive species in Southeast. Researchers have begun to quantify sadness, fear, stress and worry related to these changes (Flint & Isert, 2010), but adequate mental health assessment, education, and response remains incomplete.

One pressing example of a climate change influenced mental health risk, and the limited assessment and response to this risk, is community relocation. It has been recently reported that 31 Alaska Native villages face imminent threats from flooding and erosion, although the full extent of the threat is admittedly unknown (GAO, 2009). Both flooding and erosion are expected to worsen due to the cumulative impacts of climate change (Climate Change Science Program, 2008). At least 12 of the imminently threatened villages have decided to make plans to relocate, either in part or entirely. Unfortunately the resources needed for preparation, protection, disaster recovery, and relocation of these villages, are not sufficiently available (GAO, 2009).

Following the four impact pathways in the previous section and integrated with data outlined in Table 1, the following community mental health experience may occur as a result of flooding, erosion, and associated community relocation:

1. Interaction with existing mental health: *Residents may have experienced rapid relative acculturation over their lifetimes. This is known to be a stressful experience and therefore may have influenced associated mental health outcomes.*
2. Disrupting other determinants of mental health: *The physical built environment and familiar environmental residence are determinants of community mental health (Warren et al., 2005). The act of relocation may add significant changes to the built environment, and contribute to ongoing alteration to the broader environmental residence, thereby influencing feelings of loss and grief (Albrecht et al., 2007).*
3. Introduce generalized stress of an uncertain future: *Relocation is a massive undertaking, and the governmental capabilities to support such action is unclear (GAO, 2009). Even with a well devised plan, the movement to an entirely new location presents considerable uncertainty. Some aspects of relocation, such as improved safety, would be a welcomed community health intervention; yet the entire process still presents an uncertain future.*
4. Inhibiting enculturation through system disruption: *Residents may have to adapt to new subsistence resources and possibly neighbor cultures (particularly if relocation involves integration into an existing community). Movement away from a valued settlement location is a disruption that demands re-*

*adaptation of cultural activities. This disruption is applied to other ongoing experienced cultural alterations.*

Residents could thus experience mental health effects through a number of pathways from community relocation. The resultant outcomes could include: depression, anxiety, and perhaps in response to these outcomes, maladaptive coping behaviors. However, residents may also experience new subsistence activities of high value that improve mental wellbeing, and decreased anxiety surrounding flooding and erosion threats to the village. Ultimate mental health outcomes would be subject to: individual approaches to these complex impact pathways; the community's response; and the health system by which associated services are received. Final mental health outcomes of relocation can therefore not be conclusively stated, but relocation is identified as a climate change health-risk challenge with many implications for mental health.

**Responding with Effective Action**

The described climate change mental health effects should be met with appropriate action. First, assessments can be performed with qualitative and quantitative methodology to describe population vulnerability, and then informed responsive actions can be developed and implemented. Through a process of Climate Change Health Assessment (CCHA), ANTHC's Center for Climate and Health is identifying community vulnerability to climate change health effects including mental health, so that response efforts can be developed through many diverse "adaptation" actions.

Community vulnerability assessment occurs through a screening process:

1. Identify occurrence or expected occurrence of certain climate events,
2. Indentify pathways linking these events to mental health effects, and
3. Qualify and quantify the likelihood of these impacts.

Adaptive community-wide responses to climate change mental health effects:

1. Integrate vulnerability/impact assessment into community planning and preparedness,
2. Promote healthy cultural activities and effective community recovery (if disasters occur),
4. Raise awareness in mental health system about climate impacts, monitoring, and response,
5. Explore novel community mental health services, such as response teams for disaster events, and
6. Establish sustainable health monitoring mechanisms to best understand and respond to impacts.

The existing mental health system is a good starting point for community-wide response activities (McMichael, Nyong, & Corvalan, 2008). Education and coordination would be required to best inform mental health professionals of climate change risks, and this work would require constant attention to culturally appropriate communication among all age groups (elders and youth). In many rural Alaska Native communities the mental health system includes the Community Health Aide (CHA), Behavioral Health Aide, Village Public Safety Officer (VPSO), women's services staff, and related professional staff. In a vulnerable community, these professionals would benefit from increased knowledge about climate change impacts, the potential mental health effects, relevant monitoring, and coordinated response.

During instances of environmental stress, mental health provider collaboration at the state and local level could initiate effective response to climate change threats. One proven response method to such stress is the support of community cultural activities, which increase avoidance of depression outcomes following the stress (McMichael et al., 2008), and have been utilized in other Alaskan communities (Brennan, Flint, & Luloff, 2009). In Alaska Native communities these community cultural activities will only succeed with active participation from all age groups, from youth to elders. It may also be beneficial to promote entirely new forms of community mental health assistance. For example, Community Emergency Response Teams (CERTs) have been utilized as environmental risk mitigators, long-term planners, emergency first responders, and disaster aid managers (Brennan & Flint, 2007). Related social policies that promote healthy adaptive coping behaviors (without the maladaptive use of drugs or alcohol), can also have significant preventative impact on community mental health (Wood & Gruenewald, 2004).

As large scale climate change impacts occur, such as extreme storm events or relocation experiences, mental health providers and the community should join together to create an effective recovery environment. This recovery could incorporate factors of: security and safety, reuniting families, creating foundations for work and livelihoods, and restoring important institutions. Individual recovery particular to climate change mental health effects can also be promoted (Fritze et al., 2008).

Due to the uncertainty of climate change impacts, monitoring of associated mental health outcomes is extremely important (Warren et al., 2005; Berner & Furgal, 2005). Time-analysis of monitoring results also promotes improved understanding of the potential seasonality of mental health outcomes in Alaska Native populations. Climate change mental health monitoring could include: diagnoses such as depression and anxiety, maladaptive coping outcomes of alcohol and substance use, violence, and

suicide, as well as scheduled focus groups for qualitative input. These indicators should be considered for scaled-up monitoring by the tribal health system, to effectively direct appropriate mental health response to the climate change risk.

**Conclusion**

The environmental changes and acculturation Alaska Natives have experienced in recent history have forced an identification of the adaptive aspects of traditional culture. The rapid pace of climate change and the related mental health vulnerabilities described in this paper are emerging sources of re-traumatization and forced adaption. By focusing enculturation on the most adaptive aspects of traditional culture, Alaska Natives can minimize climate change stress and enable successful responses. Additionally, the continued healthy management of acculturation, and promotion of its beneficial aspects, will facilitate positive mental health in the face of complex future stressors (Berner & Furgal, 2005). Alaska Native populations have proven mental health resiliency. Working with the tribal health system, Alaska Natives can undertake climate change assessments, develop response plans, and implement adaptation strategies that protect and promote mental health.

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