

Slide 18**Table 1. Example of a System to Rank the Timing and Magnitude of Health Impact Dimension Criteria**

	Timing and Magnitude		
Health Impact Dimension	Lower	Intermediate	Higher
Time to Impact	≥50 years	20–50 years	<20 years
Geographic Extent	Local	Regional	Statewide
Number of People Directly Impacted	Few	Intermediate	Many
Number of People Impacted who Might Experience Serious Health Problems	Few	Intermediate	Many
Resources Needed to Adapt/Respond	Few	Intermediate	Many

Slide 19**Table 2. Notional Example of Potential Adverse Health Impacts of Climate Change Statewide, by Health Effect Category***

Health Effect Category	Selected Adverse Health Impacts	Time to Impact	Geographic Extent	# of People Directly Impacted	# People Experiencing Serious Health Problems	Resources Needed to Adapt/ Respond
Mental Health and Wellbeing	Increase in solastalgia, anxiety, and depression due to the changing environment					
Accidents and Injuries	Increased heat stress and associated disorders					
	Increased accidents/injuries due to infrastructure damage					
	Increased accidents/injuries due to wildfires					
	Increased accidents/injuries due to extreme weather events (e.g., flooding)					
	Increased accidents/injuries due to unsafe ice conditions					
Exposure to Potentially Hazardous Materials	Increased cardiovascular disease morbidity/mortality due to air pollution (e.g., caused by wildfires)					
	Increased respiratory disease morbidity/mortality due to air pollution (e.g., caused by wildfires)					
	Increased exposure to hazardous materials (e.g., due to infrastructure damage, storm events)					
Food, Nutrition, and Subsistence Activity	Decrease in subsistence food consumption and food security (e.g., due to migration changes, increased costs of importing foods)					
Infectious Diseases and Toxins from Microorganisms	Increased morbidity/mortality related to vectorborne diseases					
	Increased morbidity/mortality related to zoonotic diseases					
	Increased morbidity/mortality related to food- and waterborne diseases (e.g., botulism, PSP, <i>Vibrio parahaemolyticus</i>) [†]					
Non-communicable and Chronic Diseases	Increased rates of chronic diseases such as obesity, diabetes, and hyperlipidemia due to changing lifestyles [‡]					
	Increased rates of chronic respiratory diseases due to aeroallergens					
Water and Sanitation	Increased morbidity/mortality due to compromised access to water and sanitation facilities (e.g., infrastructure damage)					
Health Services Infrastructure and Capacity	Increased morbidity/mortality due to compromised access to health care (e.g., infrastructure damage)					

*Note: This table was constructed as a notional example for Alaska communities to consider replicating when developing the community health component of their own climate change adaptation plans. As such, it should be viewed primarily as an instructional tool rather than a precise representation of the likelihood of specific health impacts due to climate change in Alaska. Creating a reliable table for the entire state would require more input from a wide range of subject matter experts and stakeholders.

[†]This health impact focuses on illnesses that are not a direct result of compromised access to water and sanitation facilities, which are addressed in a subsequent category (Water and Sanitation).

[‡]This health impact focuses on illnesses that are not a direct result of air pollution, which is addressed in a previous category (Exposure to Potentially Hazardous Materials).

Slide 21**Table 3. Proposed Health and Environmental Indicators and Monitoring Resources***

Potential Impact	Health and Environmental Indicators	Examples of Existing Monitoring Resources
Mental Health and Wellbeing		
Increase in psychosocial distress (e.g., anxiety or depression) due to the changing environment	<p>Health indicators</p> <ul style="list-style-type: none"> Hospital/clinic visits due to distress following a climate-associated event (e.g., flooding, storm surge, wildfire) <p>Environmental indicators</p> <ul style="list-style-type: none"> Tidal gauges (to monitor sea-level rise) 	<p>Health resources</p> <ul style="list-style-type: none"> Alaska Trauma Registry (ATR) for injury trends: http://dhss.alaska.gov/dph/Emergency/Pages/trauma/registry.aspx Alaska Health Facilities Data Reporting Program (HFDR) for hospital diagnoses trends: http://dhss.alaska.gov/dph/HealthPlanning/Pages/DischargeData.aspx <p>Environmental resources</p> <ul style="list-style-type: none"> NOAA Sea Level Trends: http://tidesandcurrents.noaa.gov/sltrends/sltrends.html
Accidents and Injuries		
Increased heat stress and associated disorders	<p>Health indicators</p> <ul style="list-style-type: none"> Deaths due to heat (number, rate)* Hospitalizations due to heat (number, rate)* ER visits due to heat (number, rate)* <p>Environmental indicators</p> <ul style="list-style-type: none"> Daily maximum and minimum temperatures 	<p>Health resources</p> <ul style="list-style-type: none"> ATR for injury trends Alaska HFDR for hospital diagnoses trends <p>Environmental resources</p> <ul style="list-style-type: none"> Scenarios Network for Alaska + Arctic Planning (SNAP) for community profiles on observed and projected temperatures: https://www.snap.uaf.edu/tools-and-data/all-analysis-tools
Increased accidents/injuries due to infrastructure damage (e.g., motor vehicle accidents)	<p>Health indicators</p> <ul style="list-style-type: none"> Injuries and deaths from transportation (number, rate) <p>Environmental indicators</p> <ul style="list-style-type: none"> Daily maximum and minimum temperatures Soil temperatures 	<p>Health resources</p> <ul style="list-style-type: none"> ATR for injury trends Alaska HFDR for hospital diagnoses trends Alaska Department of Transportation (DOT) reports on fatal and nonfatal motor vehicle accidents

*Table shows only first two health categories. Additional information is presented for all HECs in the full document: Assessment of the Potential Health Impacts of Climate Change in Alaska

Slide 23**Table 4. Overarching Adaptation Strategy Examples for Communities**

Adaptation Strategies
Create local climate change advisory groups, assessments, and adaptation plans
Offer community members ample opportunity to relay their concerns about climate change and propose solutions
Develop and implement local community resilience plans (https://www.communityresiliencebuilding.com)
Include human health in community vulnerability assessments for climate change (for an example, see: http://www.georgetowntc.com/pdf/GeorgetownVulnerabilityAssessmentFinal.pdf)
Develop or update Small Community Emergency Response Plans (SCERP) and include potential climate-related disasters in the plans (https://ready.alaska.gov/Plans/SCERP).
Develop local and statewide health surveillance systems for selected climate change indicators
Provide informational resources to community members about the potential health impacts of climate change
Promote climate change research at local, regional, and statewide levels
Develop an ongoing catalogue of climate change studies and data gaps in Arctic and sub-Arctic populations
Assure sufficient public health workforce capable of performing climate change research, surveillance, and adaptation
Conduct risk communication, health education, and community outreach as needed

Slide 25**Table 5. Health Effect Category-Specific Adaptation Strategy Examples for Alaska Communities**

Health Effect Category	Potential Adaptation Strategies
Mental Health and Wellbeing	<ul style="list-style-type: none"> • Raise awareness about solastalgia (the distressing sense of loss that people experience as a result of unwanted environmental changes that occur close to one's home) and promote strategies that mediate public risk perceptions, psychological and social impacts, coping responses, and behavioral adaptation (Resser et al. 2011) • Implement community-based strategies to promote mental health and wellbeing • Implement and strengthen existing community-based behavioral health programs that aim to prevent mental/behavioral health problems (e.g., anxiety/depression, substance abuse, suicide, and violence prevention programs)
Accidents and Injuries	<ul style="list-style-type: none"> • Review architecture and engineering designs to ensure that infrastructure can withstand changes to the underlying permafrost and extreme weather events, and if not, consider ways to address the problem • Support surveillance and communication networks to warn community members of dangerous travelling conditions (e.g., thin ice, frost heaves in roads, storm surges) • Develop risk-appropriate storm shelters for Alaska communities • Develop a plan to create access to cooling centers during extreme heat events (e.g., in interior Alaska; often cooling centers are located in buildings with the capacity to provide cooler environments, such as an air-conditioned school or library)
Exposure to Potentially Hazardous Materials	<ul style="list-style-type: none"> • Review architecture and engineering designs to ensure that infrastructure can withstand changes to the underlying permafrost, and if not, consider ways to address the problem • Assess location-based vulnerabilities to wildfires, mitigate high-risk areas, and develop community response plans, such as the Firewise Community Program • Develop a plan to create access to clean air centers during wildfires
Food, Nutrition, and Subsistence Activity	<ul style="list-style-type: none"> • Establish community-based monitoring programs for subsistence resources, such as the Local Environmental Observer (LEO) Network and the Alaska Native Tribal Health Consortium (ANTHC) Rural Alaska Monitoring Program (RAMP); • Provide support for community freezers and other food safety programs to ensure access to safe and healthy traditional foods in Arctic communities • Conduct risk communication, health education, and community outreach regarding the presence of potential contaminants in subsistence foods
Infectious Diseases and Toxins from Microorganisms	<ul style="list-style-type: none"> • Support programs such as LEO Network, the One Health Group, and RAMP • Conduct ongoing, active monitoring for harmful algal blooms (HABs) • Expand surveillance efforts for cases of vectorborne diseases and presence of associated vectors
Chronic and Non-communicable Diseases	<ul style="list-style-type: none"> • Support monitoring efforts for seasonal patterns of respiratory and cardiovascular disease exacerbations that might be associated with wildfire smoke or aeroallergens
Water and Sanitation	<ul style="list-style-type: none"> • Review architecture and engineering designs to ensure piping infrastructure can withstand changes to the underlying permafrost, and if not, consider ways to address the problem • Collaborate with water utilities and water resource managers to assess expected performance of infrastructure and natural systems under changing climate conditions
Health Services Infrastructure and Capacity	<ul style="list-style-type: none"> • Review architecture and engineering designs to ensure health care infrastructure can withstand changes to the underlying permafrost, and if not, consider ways to address the problem