Table 5-1: Examples of how observed environmental changes may affect arctic ecosystems. Note that some changes can reverse direction depending on the local context.

CHANGING PHYSICAL ENVIRONMENT	ECOSYSTEM IMPACTS					
	Vegetation	**Wildlife**	**Biogeochemical Fluxes**	**Trace gas**	**Fire**	**Lakes and Streams**
Permafrost thaw	Slumping soils disrupt vegetation	Decrease in trafficability	Increased export of C, N, P and sediments	Increasing flux to atmosphere	Drainage promotes fire	Increased productivity/ sediment load
Soil moisture changes	Shifts in species distribution	Mixed response depending upon species	Increased export if runoff increases	CO_2 flux increases in drier soils, methane flux increases in wetter soils	Fire frequency and severity increases in drier soils	If runoff increases, productivity will increase
Summer temperature increase	Higher gross primary production and respiration	Increase in insects	Increased decomposition liberates nutrients	Decomposition leads to increases in fluxes	Fire frequency and severity increase	Lake trout and grayling growth decline
Snow cover decline	Shifts in vegetation stature and species	Less insulation for rodents. Predator species become more advantaged	Greater winter export	Fluxes may decrease if soils are colder due to lack of insulation	Increased fire	Less spring input of organic matter and nutrients lowers productivity
Winter temperature increase	Northward migration of species, increase in shrubs	Winter mortality decreases. Ice layers reduce fresh air to rodents	Decomposition rates increase during winter increasing soluble nutrients in spring	Fluxes increase	Longer fire season	Increases in baseflow throughout winter

Table 5-2: Points of contact, and areas of needed research, where changing physical environment parameters are likely to affect human activities in the Arctic.

CHANGING PHYSICAL ENVIRONMENT	HUMAN DIMENSION IMPACTS				
	Infrastructure	**Transportation**	**Other Economic Activities**	**Subsistence, Traditional Activities**	**Health**
Permafrost	Buildings, water & power systems	Roads, runways	Pipelines	Overland travel, subsistence resources	Water supplies, waste disposal
Precipitation, runoff	Riverbank erosion, flooding, water supplies	Roads, navigable waters	Mining & industrial wastes	Overland travel, subsistence resources	Water-borne illness
Storms, fog	Coastal wave erosion	Sea, air	Fire prevention	Subsistence hunting & fishing	Accidents
Snow cover	Snow removal	Winter travel avalanches	Water supply	Overland travel, subsistence resources	Water supply
River & sea ice	Coastal/riverside erosion	Shipping routes & season	Hydropower	Subsistence hunting, travel	Accidents
Summer temperature	Foundation instability	Permafrost and ice-road degradation	Tourism	Changes in species and migration routes	Insects, vector-borne illness
Sea level	Coastal flooding, erosion	Shipping facilities	Village relocation	Coastal cemeteries or artifacts	Freshwater salinization
Ocean circulation	Harbor siting	Shipping	Commercial fisheries	Subsistence hunting & fishing	Contaminant transport
Contaminants	Water supply/ treatment	Spill prevention remediation	Commercial fisheries	Subsistence hunting & fishing	Human exposure