

Far North Community-based Climate Change Adaptation Planning Matrix – for an invented ABC First Nation

Community:

Draft for Discussion in Community

(D. Pearson Sept 2012)

p.1

Vulnerability Indicators – ecosystem services and infrastructure			Climate Projections to 2050		Risks and Priorities			Impact / Benefit Adaptation Options	Evaluation of Options	Implementation	
TEK and Community Observations	Community Weather Incidents	Technical Information	Temperature & Precipitation climate scenarios	Weather Event modeling	Hazard Risk = Consequence x Likelihood  High - Med – Low	Technical Assessment = Risk / Capacity to Adapt High - Med - Low	Community Priority  High - Med - Low			Costs	Timing
Trees dying in some locations – poplar, birch, tamarack, white spruce, black spruce		Cause = water stress?  Insects also possible	Gula & Peltier summer warmer by 2.5 -3°C in 2050. Rain little less; more summer storms and winter rain ievaporation	N.B. imminent MNR high and low water flow / drought modeling	Ecosystem impacts currently low but may rise  Community risk –Low	Growing risk of fuel for wildfires = medium		Benefit of dry fuel for woodstoves in community.  Monitor in identified areas to assess cause and extent			
Wildfires in traditional territory maybe 6 – 10 [more?] in 60 yrs. Trap lines lost. Re-growth good.	Community evacuated in 1980s. Partial evacuation in Aug 2011 Pioneer Road fire v. close		Summer warmer; more evap = drier forest. More intense storms poss = more lightning causing fires	MNR drought modeling under way	Med Community protected by lake to south and west but not from dense smoke and not from the north. Fringe near trees more vulnerable	Med – but only if evacuation is timely and if community not in path of fire  Fringes more vulnerable		Maintain inventory of smoke sensitive community members in readiness for smoke evacuation. Plan for protection of community buildings.			
Low water level in drinking water source lake said to lead to quality issues with drinking water taken from lake to DW Treatment Plant.	Need to establish the rationale for this ... seasonal profiling		Precipitation decrease in summer + longer dry spells + increased evaporation = lower lake levels		Health risk uncertain – not clear what effect lower water level might have.			Monitor and evaluate. . May be useful to move location of water intake to deeper water. E.g. ensure intake height is in year round oxygenated water			
Many wetlands drying.			Same reasons as lower water levels (plus glacial rebound)		May change locations of some plants  Low impact			Identify wetlands that provide key services – e.g. berries; examine options for retaining water e.g. berms			

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Severe flooding in the 1960s from rise in lake level	Flooding not in recent memory but Elders speak of severe event in the 1960s. Implies water level 6 feet higher	Time of year uncertain						Future construction to be located on high land. Consider berm options for existing low areas.			
Spring flooding from rapid local snow melt and rain in March	See locations on aerial photo of community. Affects surface road and property drainage.		Winter average +3 to +4°C in 2050; shorter winter = late winter rain on frozen surface = drains fast		Med - High  Risk likely rising from late winter rain on frozen ground			Improve roadside ditching and culverts; maintain and clear debris from culverts; consider small scale retention ponds			
Late freeze up (Nov) and thin ice at time when good winter travel conditions expected. Early break up or thin ice = most dangerous	Dangerous ice breakthrough incidents				High	Med  High capacity to adapt		Accentuate communication about unsafe travel conditions – use social media word of mouth and radio			
Winter roads - every year is different; wet areas don't freeze as deep; water crossings freeze later; road season shorter than in past	Delays in transporting heavy loads – construction material, diesel		Winter is warming by more than a degree per decade		Med – High  Some say not yet a major issue but pressure to deliver = risk taking	Has been capacity to adapt to shorter season but involves rising risk		Investigate new ice- road building techniques			
Run-off from snow melt and heavy rain carries contamination to lake from community	Plume of clay visible over intake for drinking water				Could be high	Treatment plant able to filter clay; chlorine kills bacteria		Develop water retention basins to interrupt direct flow to lake from culverts			
March rain on frozen ground in community = roads flooded if culverts are frozen and / or blocked with debris	Swinging temps can freeze standing water into dangerous road and paths		Much variability of temperature in winter spring transition		High  Vulnerable area in front of school. Sewage pump station vulnerable?	Med  High capacity to adapt with culverts and ditching					

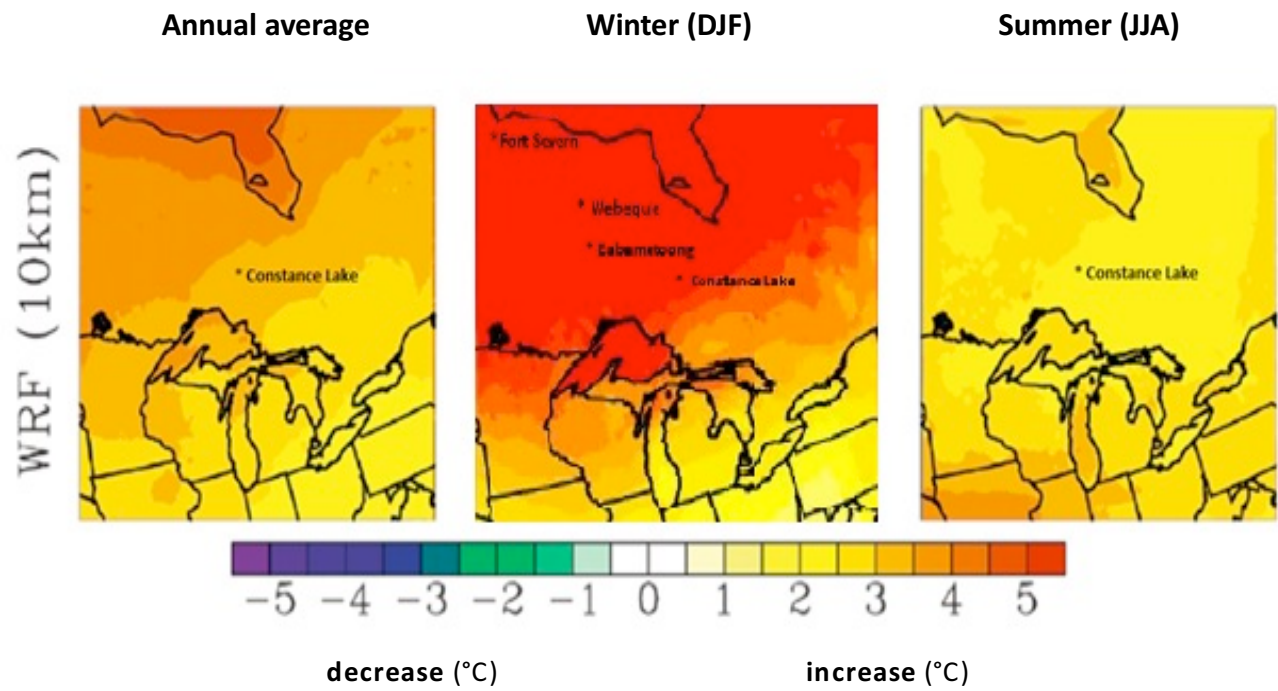
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Birds fewer, e.g. partridge New birds – pelicans, cormorants, song birds					Low Ecosystem issue						
Geese are not landing during migration in areas where traditionally hunted					Outcome = medium for families relying on wild food			Alter timing and location of hunting			
Caribou movements are not following known traditional pattern		Influenced by depth of snow Legs cut by ice on snow	Much variation in snow depth from year to year		Outcome = high for families relying on wild food			Alter location and timing of hunt but hard to predict where and when; opinions needed			
Deer seen in traditional territory may indicate growth of local numbers. One Lyme Disease case known from ticks					Potential risk of Lyme Disease from black legged ticks on deer			Increase awareness of appearance of tick bite; prepare to treat			
West Nile virus tests negative since 2006 but reports positive from close to south of community					High	Nursing Station active Med		Maintain awareness Possible late season control of WNV mosquitoes if identified			
Heat stress in vulnerable young and Elders not a current issue but known in past	Traditionally hot conditions led to cooling visits in muskeg		Average summer not projected to become much hotter, but heat waves possible		Med for those vulnerable	Nursing station active		Prepare plans for cooling locations			
Potential exists for growing vegetables as in past			Longer growing season but variable		Possible important health benefits from fresh vegetables			Group already active in planning garden			

Summary of Big Trout Lake temperature trends and projections 1938 – 2050s (°C)

	1938 - 1980	1980 - 2010	Trend 2010 to 2050s	G&P 2010 to 2050s
<b>Winter</b>				
Day (max)	- 1.6	+ 1.5	+ 2.0	
Night (min)	- 1.3	+ 0.8	+ 1.1	
Mean	- 1.1	+ 0.9	+ 1.4	+ 3.2
<b>Spring</b>				
Day (max)	+ 1.0	+ 0.7	+ 0.8	
Night (min)	+ 1.4	+ 0.8	+ 1.2	
Mean	+ 1.9	+ 1.3	+ 1.7	
<b>Summer</b>				
Day (max)	No change	+1.7	+2.3	
Night (min)	No change	- 1.7	- 2.4	
Mean	No change	- 0.4	- 0.5	+ 2.3
<b>Fall</b>				
Day (max)	- 0.6	+ 2.2	+ 2.9	
Night (min)	- 1.3	+ 1.5	+ 2.0	
Mean	- 1.2	+ 2.2	+ 2.9	

Summary of Neskantaga (Lansdowne House) temperature trends and projections 1941 - 2050s (°C)

	1941 - 1980	1980 - 2011	Trend 2011 to 2050s*	G&P 2010 to 2050s
<b>Winter</b>				
Day (max)	- 1.4	+ 1.0 (miss data)	-	
Night (min)	- 1.5	- 0.1 ( " " )	-	
Mean	- 1.1	+ 0.5 ( " " )	-	+ 3.2
<b>Spring</b>				
Day (max)	- 1.1	+ 2.6 (miss data)	-	
Night (min)	+ 0.6	- 0.1 ( " " )	-	
Mean	+ 1.0	+ 0.4 ( " " )	-	
<b>Summer</b>				
Day (max)	+ 1.4	+0.8 (miss data)	-	
Night (min)	- 0.3	- 1.7 ( " " )	-	
Mean	- 0.4	- 0.7 ( " " )	-	+ 2.3
<b>Fall</b>				
Day (max)	- 0.3	+ 0.1 (miss data)	-	
Night (min)	- 0.8	+ 0.7 ( " " )	-	
Mean	- 1.0	+ 1.6 ( " " )	-	



Projected changes in average Annual, Winter and Summer temperatures in 2050 compared with 1979-2001

(Gula and Peltier 2011).