Dawson Land Use Planning:

Managing Lands for a Changing Climate

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The mission of the Northern Climate ExChange is to provide a credible independent source of information, develop shared understanding, promote action and coordinate research on climate change in Northern Canada.

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NCE has provided a range of climate change services to Yukon since 2000, related to:

- **Adaptation** (community climate change adaptation plans, vulnerability assessments, hazard mapping, and mainstreaming…)
- **Mitigation** (Whitehorse Green Guide, Advisor for YG Climate Change Action Plan and emission targets…)
- **Education and outreach** (Decision Making for Climate Change, online newsletter distributed across Canada, lecture series…)
- **Climate Change Information and Mainstreaming Program** (provide information and recommendations to decision makers)

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NCE is developing research capacity through:

- **Partnerships** (First Nations, communities, industry, Yukon government, Canadian universities)
- **Project-based funding** (partners, AANDC, NRCan, NSERC)
- **Reputation** (project successes and collaborations)
- **Capacity building** (staffing, student training opportunities)

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CLIMATE CHANGE

Policy Responses

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ADAPTATION and MITIGATION



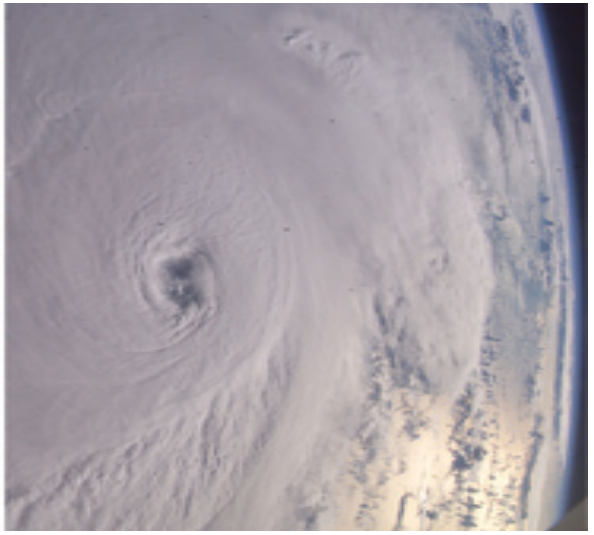


Photo credit: NASA

LAND USE PLANNING

Challenges, Barriers and Opportunities

- Changes in ecosystem stability: avoid fragmentation; reduce non-climatic stresses; consider protected areas and special management areas; protect a wide variety of species and key ecosystem features
- Flooding/erosion: consider flood management options; plan on a watershed basis
- Develop effective monitoring systems: coordinated, effective research programs; opportunities for collaboration between agencies/organizations/governments
- Uncertainty is inherent: build in flexible management strategies
- Loss of ability to attenuate existing or future impacts: incorporate buffer zones; incorporate flexibility in planning

CLIMATE PROJECTIONS

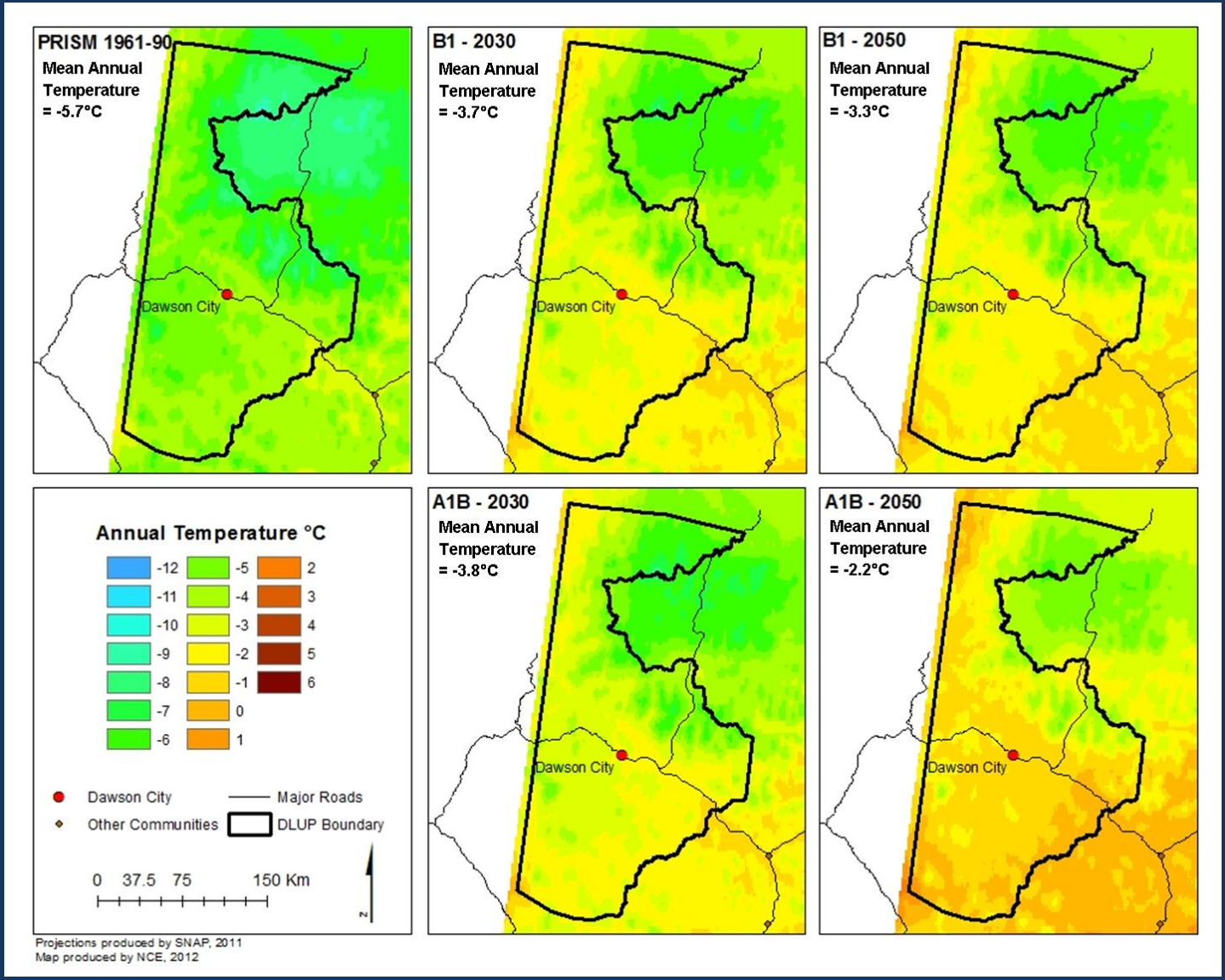
Air Temperature

Baseline and Projections of Temperature for the DLUP (˚C)					
Season	Baseline (1961-1990)	Modest climate change (B1)		Medium-High climate change (A1B)	
		2030	2050	2030	2050
Annual	-5.7	-3.7	-3.3	-3.8	-2.2
Spring	-4.5	-2.7	-2.3	-2.7	-1.0
Summer	11.3	12.5	12.9	12.2	13.3
Autumn	-6.8	-5.0	-4.4	-5.0	-3.4
Winter	-22.8	-19.9	-19.6	-19.7	-17.7

Average annual temperature is predicted to warm by 2 to 3 degrees by 2050 with winter temps warming by 3 to 5 degrees.

CLIMATE PROJECTIONS

Air Temperature



CLIMATE PROJECTIONS

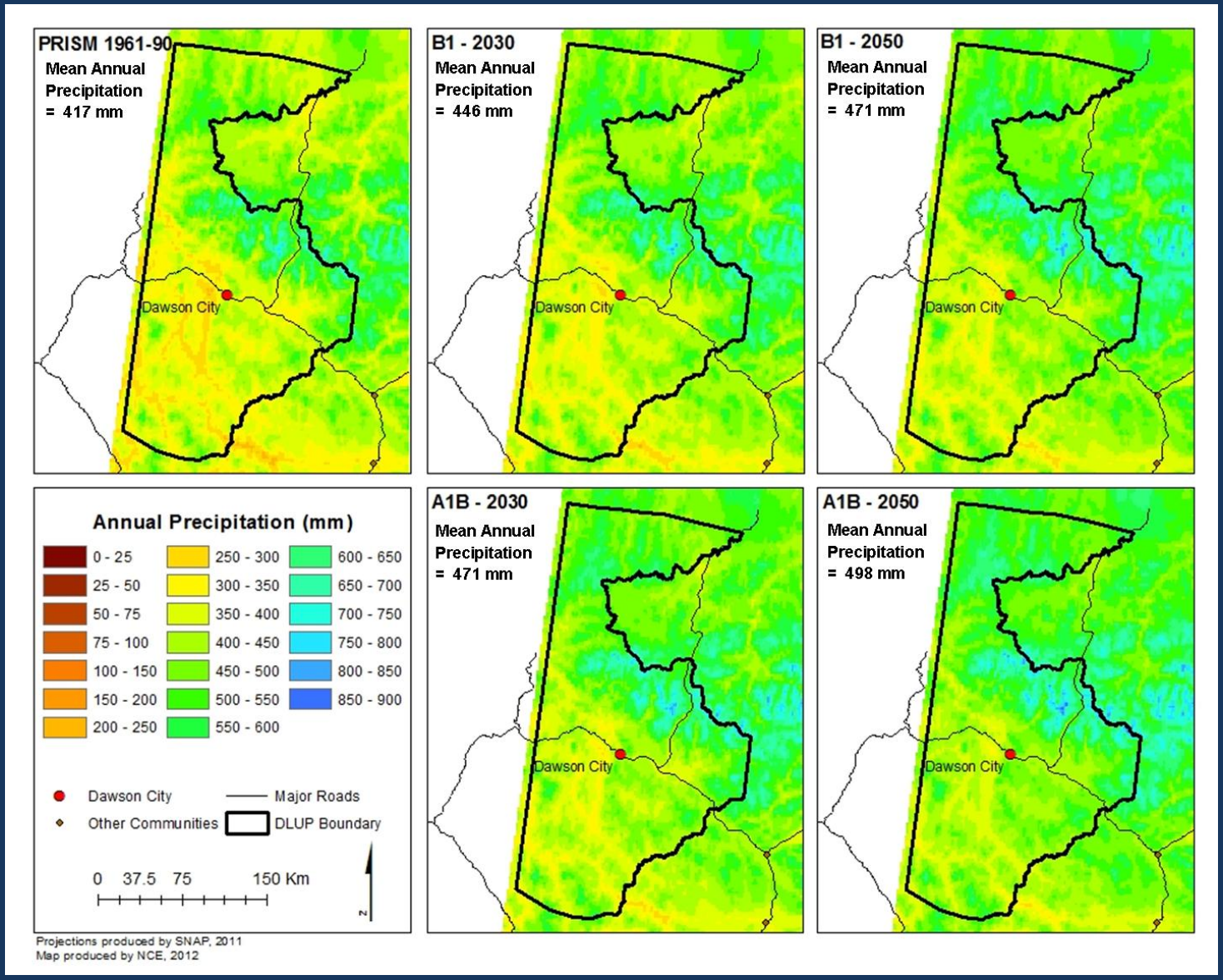
Precipitation

Baseline and Projections of Precipitation for the DLUP (mm)					
Season	Baseline (1961-1990)	Modest climate change (B1)		Medium-High climate change (A1B)	
		2030	2050	2030	2050
Annual	417	446	471	471	498
Spring	62	68	73	71	73
Summer	176	193	198	197	204
Autumn	108	108	121	122	131
Winter	71	77	81	81	90

Average annual precipitation is predicted to increase by 54 to 81 mm per year by 2050.

CLIMATE PROJECTIONS

Precipitation



CLIMATE PROJECTIONS

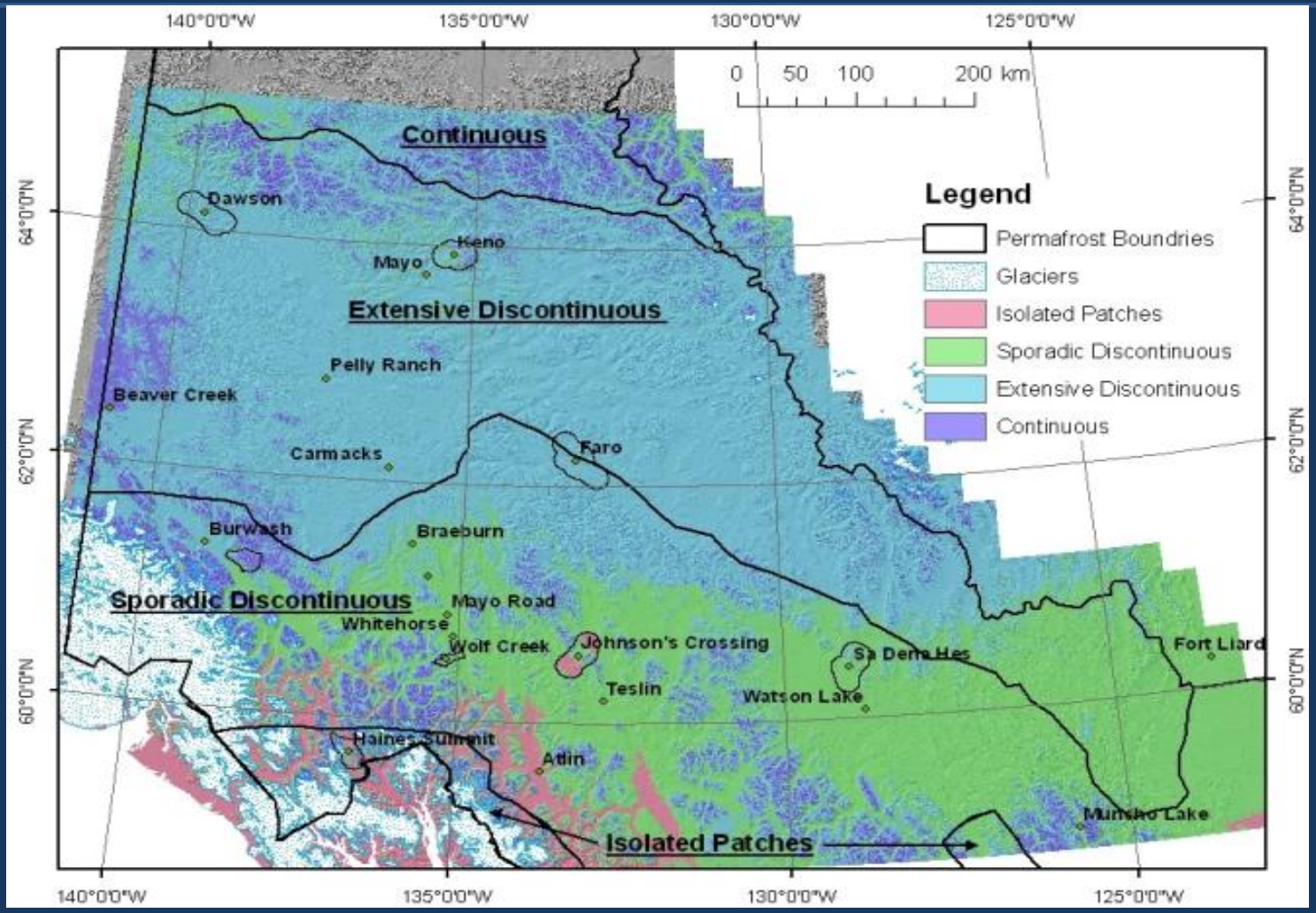
Growing Season

Baseline and Projections of Other Climate Parameters for the DLUP					
Measure	Baseline (1961-1990)	Modest climate change (B1)		Medium-High climate change (A1B)	
		2030	2050	2030	2050
Growing Season Length (days)	152	163	165	161	172
Date of First Thaw (JD)	118	112	112	113	109
Date of First Freeze (JD)	271	275	277	275	280

The growing season is predicted to grow by 13 to 20 days by 2050.

PERMAFROST DISTRIBUTION

Yukon



Source: Bonnaventure et al., 2012

The Dawson Land Use Planning Area is an area of mostly extensive discontinuous permafrost.

PERMAFROST TEMPERATURE

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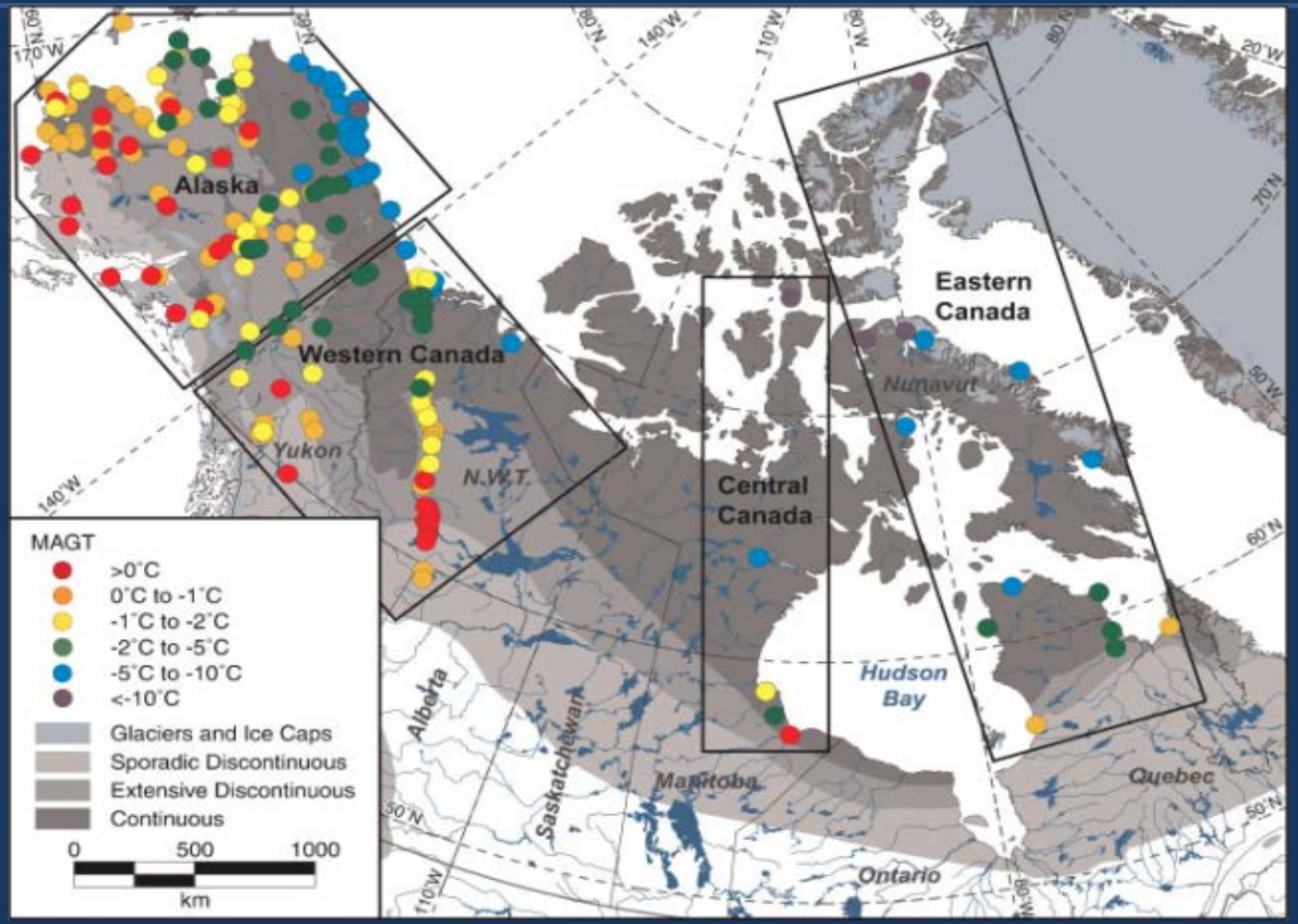


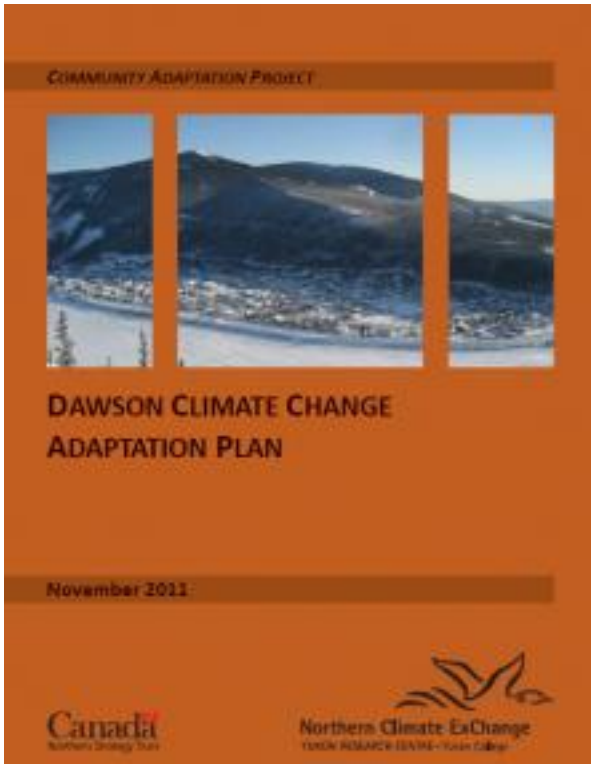
Source: Smith et al., 2010

The temperature of the permafrost in north-western Yukon ranges from 0°C to -5°C. It is generally considered warm and is often ice-rich.

IMPACTS and OPPORTUNITIES

Projected for the Dawson Area

- Permafrost thaw (land slumps, ponding, methane release, impacts to water quality, etc.)
- Increased forest fires
- Increased intensity of spring freshets (river flooding, erosion, water quality)
- Species distribution (habitat shifts, increased competition, changes to predator/prey relationships, invasive species, etc.)
- Economic opportunities (agriculture, tourism, etc.)



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