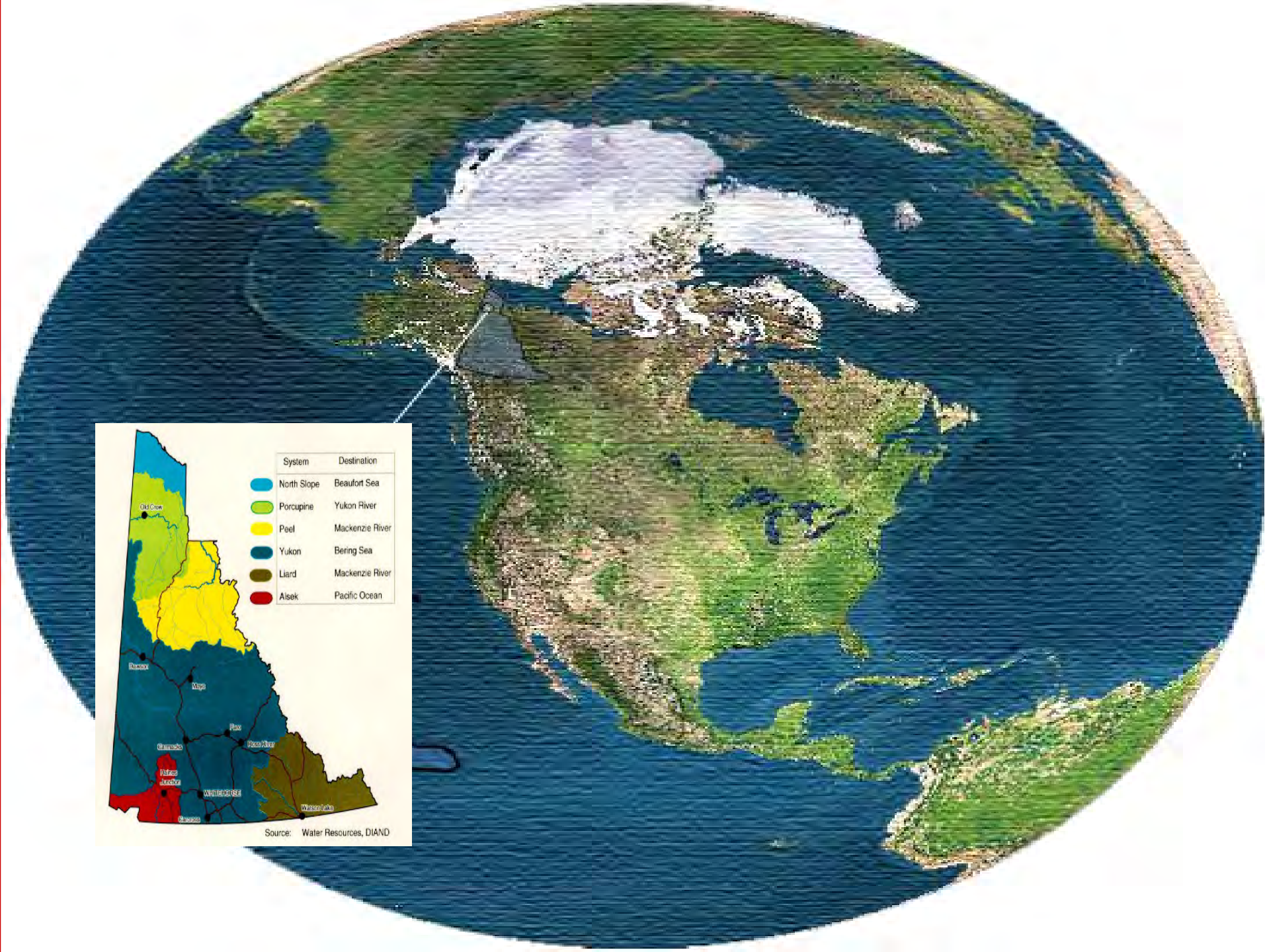


YUKON FLOODING AND FLOOD FORECASTING

J Richard Janowicz
Water Resources Branch
Yukon Department of Environment
Whitehorse, Yukon

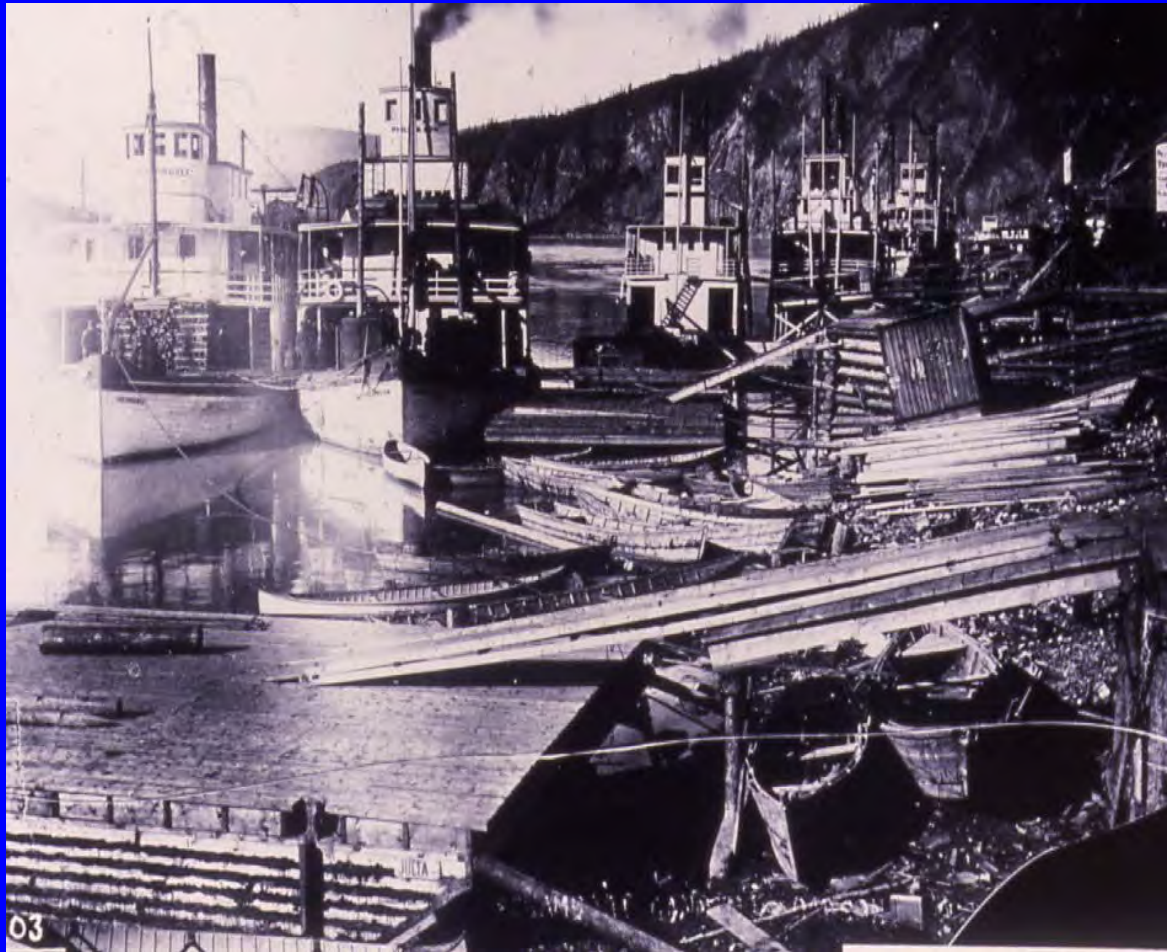




System	Destination
North Slope	Beaufort Sea
Porcupine	Yukon River
Peel	Mackenzie River
Yukon	Bering Sea
Liard	Mackenzie River
Aleak	Pacific Ocean

Source: Water Resources, DIAND

RIVER TRANSPORTATION HISTORY



Most
Communities
On the
Floodplain

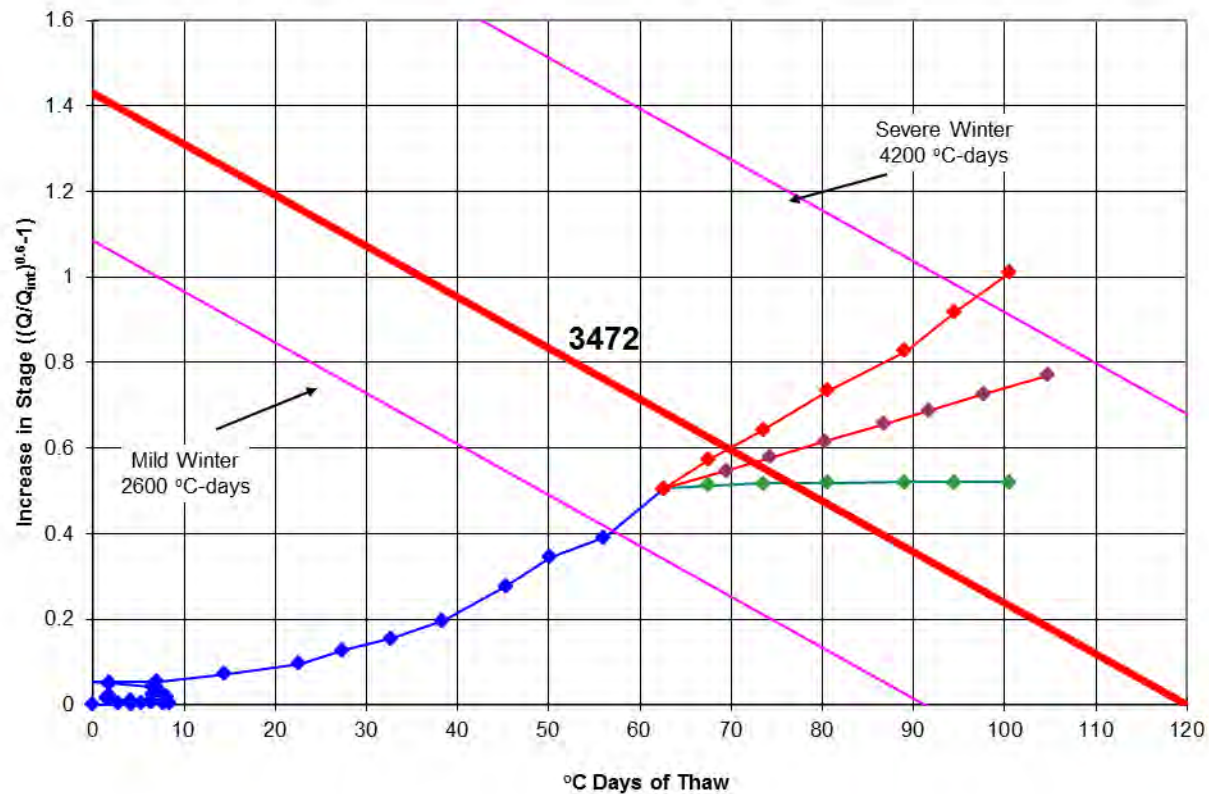
YUKON FLOODING MECHANISMS

- Spring Ice Jams
- Snowmelt Freshet
- Rain on Snow
- Summer Rainfall
- Glacier / High Elevation Snowmelt
- Freeze – up Ice Jamming
- Mid – Winter Break-up / Ice Jams (Recent – Climate Change)

DAWSON - 1979



DAWSON BREAK-UP TIMING FORECAST - 2017



BREAK - UP MONITORING



- River Ice Jams
Potentially Responsible
for Earliest Flood Events

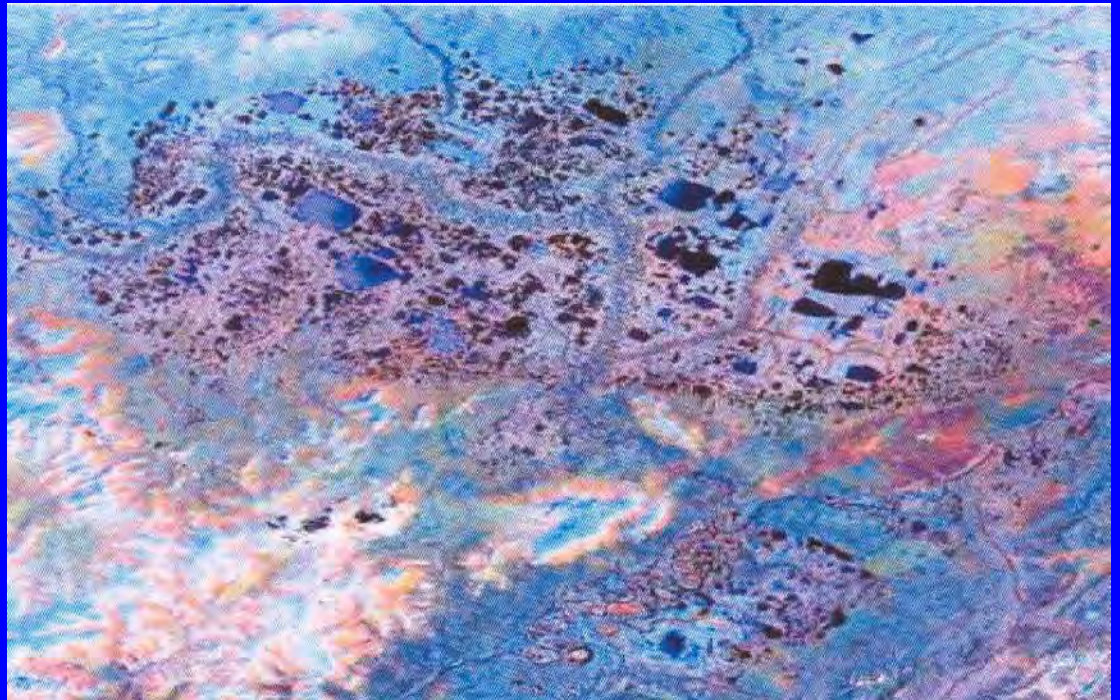
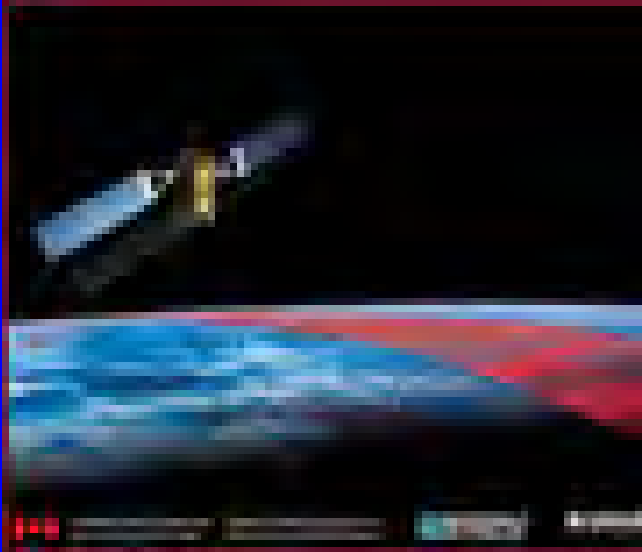
- Rock Creek / Dawson /
Old Crow Most
Susceptible Communities





OLD CROW RADARSAT PROJECT

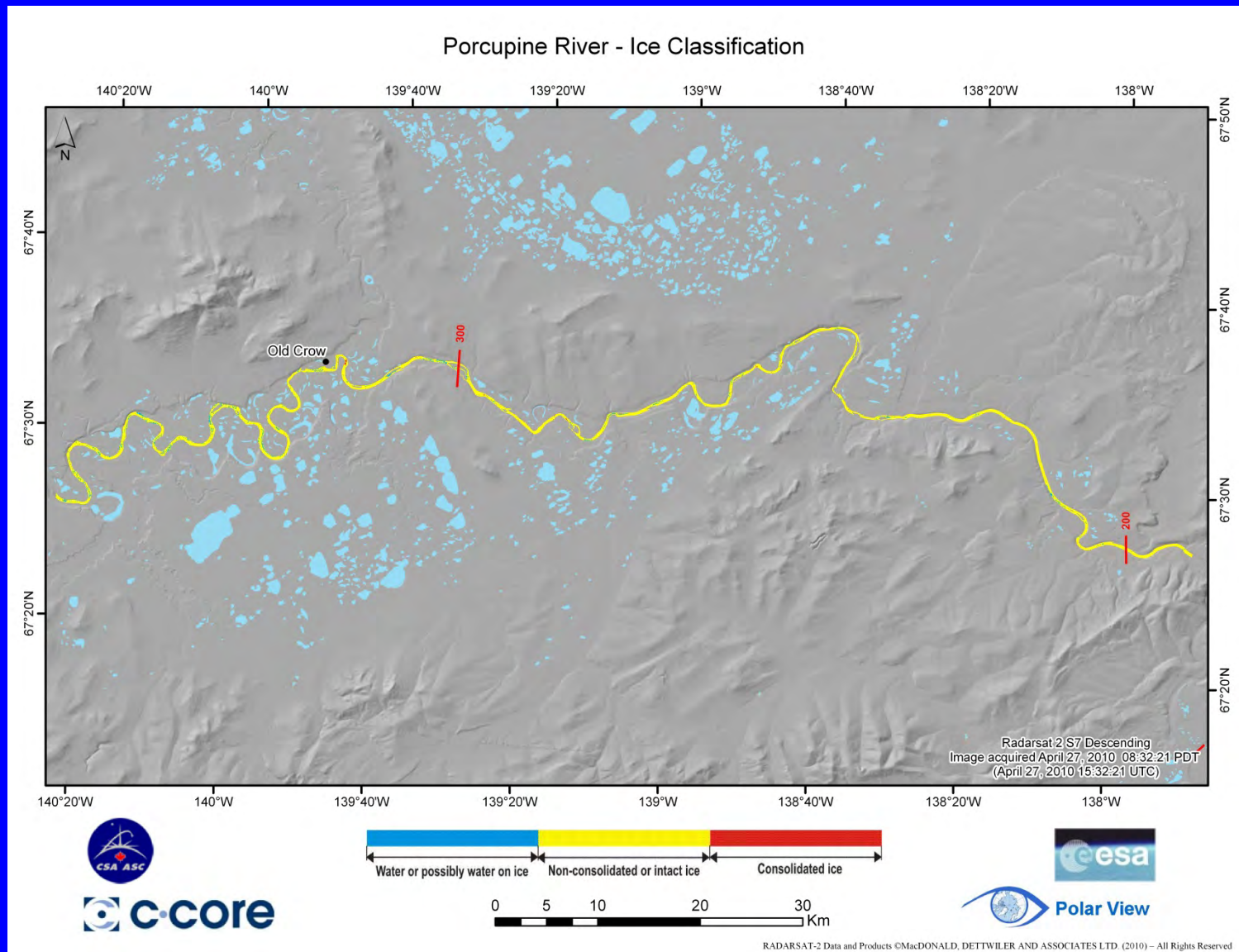
Old Crow and Porcupine River



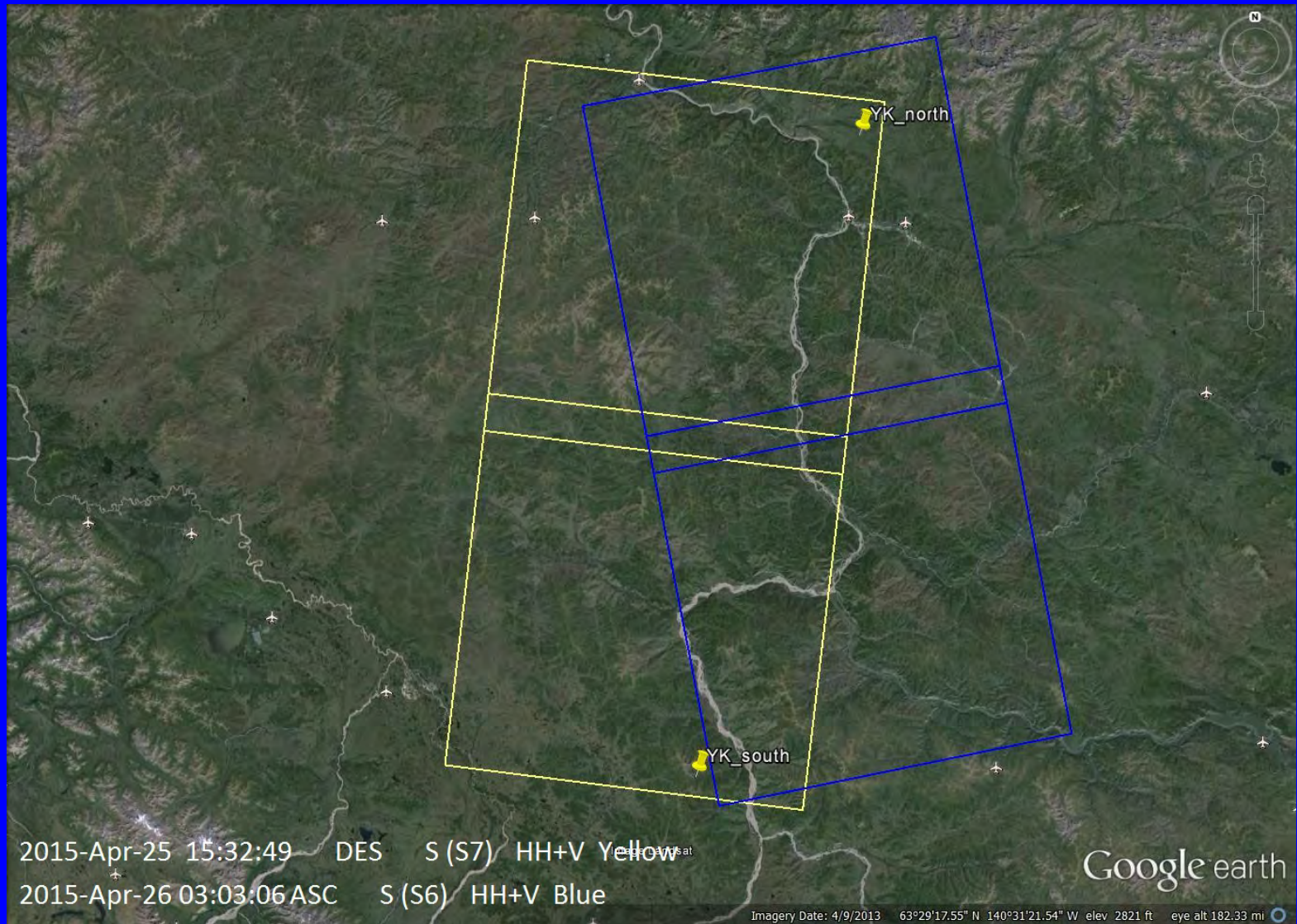
RADARSAT IMAGE COVERAGE



RADARSAT 2: May 1, 2014, 15:32 UTC

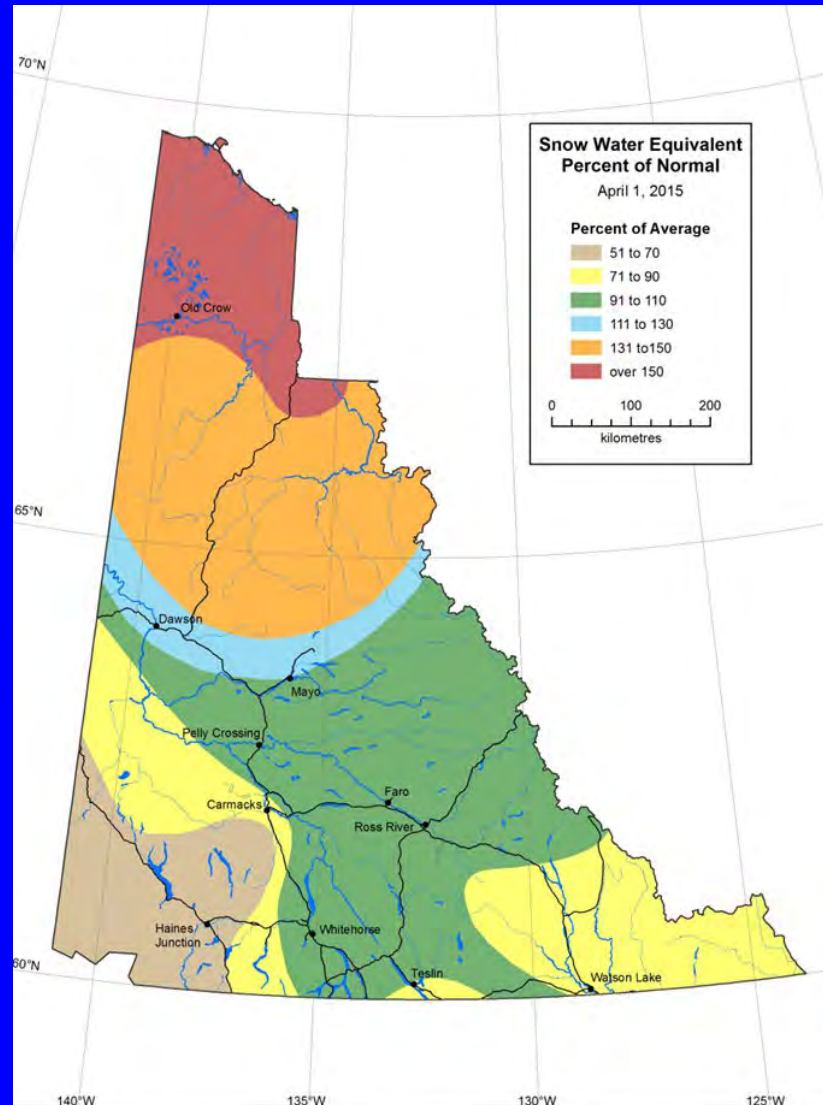


YUKON RIVER RADARSAT 2 MONITORING PROGRAM



FRESHET FLOODING

2015 Maximum Winter Snowpack



FLOODING



- Mayo
- Ross River

FRESHET FLOODING – UPPER LIARD (2012)



SNOWMELT FRESHET FORECASTING

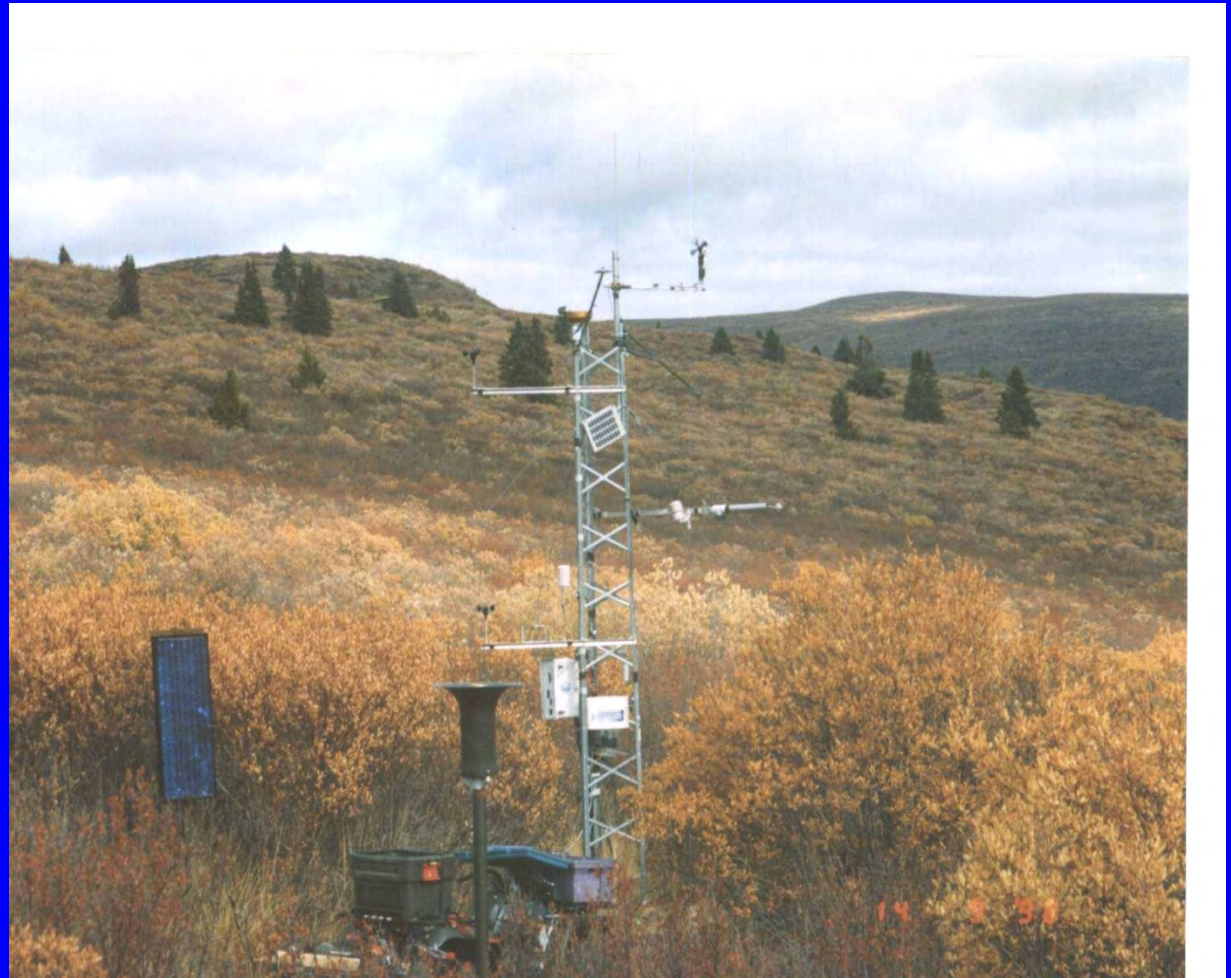
- Simple Temperature Index Model
- SSARR
- NWSRFS
- MESH

NATIONAL DISASTER MITIGATION PROGRAM

- Public Safety Canada Program
- \$630 K Funding (2016 – 2017)
 - Upgrade Meteorological Stations (including Wolf Creek)
 - Enhance Yukon's Flood Forecasting Program
 - Collaborating with EC / U of S Modelling Initiative
 - Floodplain Mapping

NATIONAL DISASTER MITIGATION PROGRAM

Upgrade 6
Meteorological
Stations (flood
forecasting)
(including
Wolf Creek)

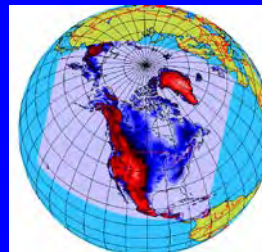


Environment Canada's Hydrological Forecasting Infrastructure (MESH)

- Based on the coupling of existing numerical models

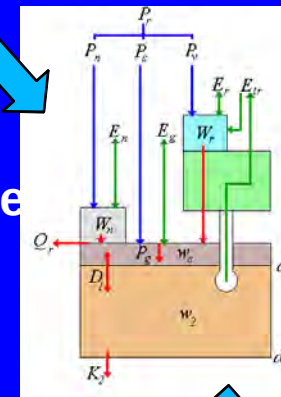
- Components:

- Atmospheric model
- Land-surface Model (CLASS)
- River and routing model (WATROUTE)



Any atmospheric model
or observations

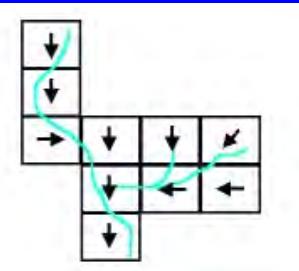
Land Surface
Scheme



Coupling with
GEM can be
one-way (offline)

MESH

Routing model



RAIN ON SNOW



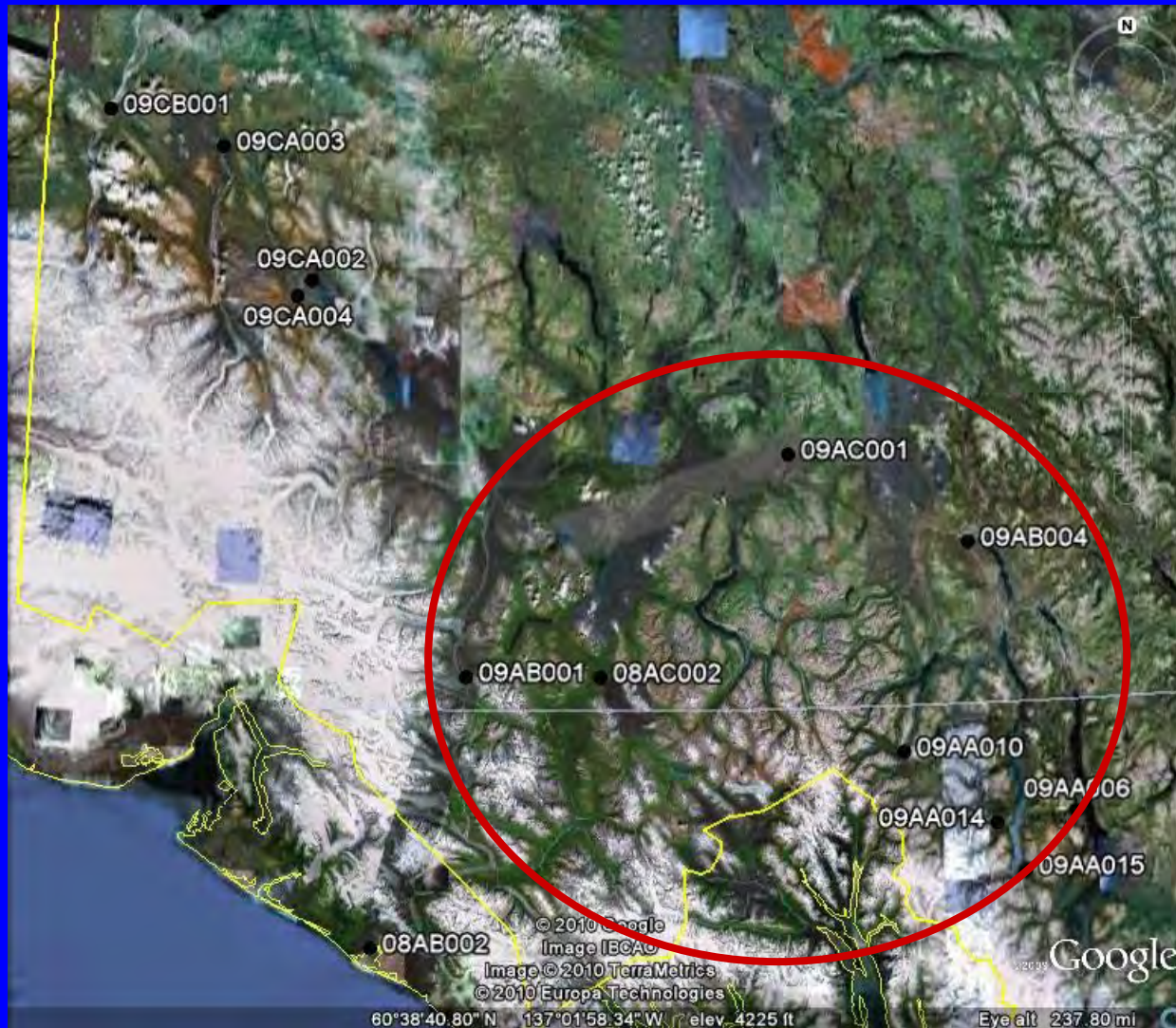
SUMMER RAINFALL



GLACIER / HIGH ELEVATION SNOWMELT



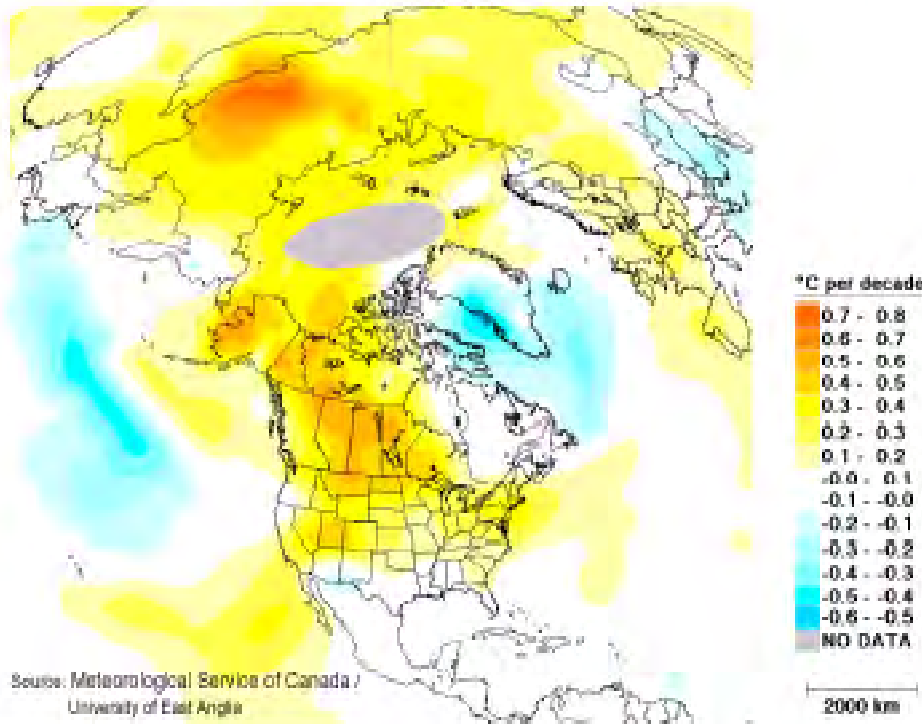
GLACIER / HIGH ELEVATION SNOWMELT



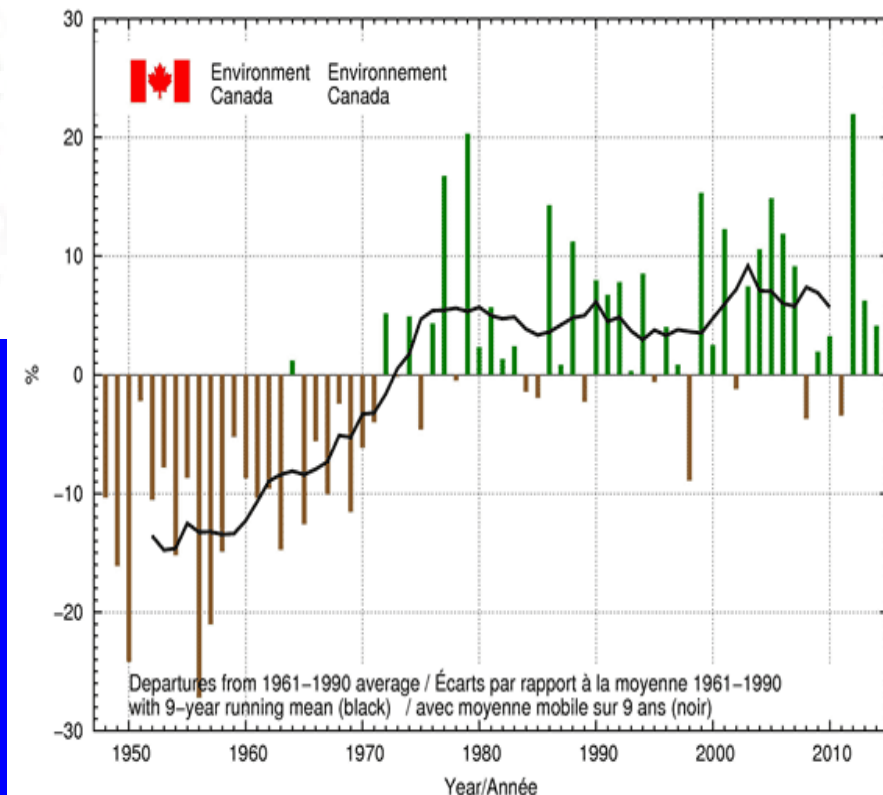
GLACIER / HIGH ELEVATION SNOWMELT



Annual Surface Air Temperature Trends 1961-1990



HISTORICAL TEMPERATURE AND PRECIPITATION



- Summer Temp + 2 - 6 ° C
- Winter Temp + 4 - 6 ° C
- Summer Precip + 5 - 10 %
- Winter Precip -10 - + 20 %

THANK YOU

