

Climate change: Risks and Opportunities for the Prairie Provinces

Dave Sauchyn
Prairie Adaptation Research
Collaborative,
University of Regina

Canadian Club, Regina, 06 February 2007





INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



4th Assessment Report

800+ contributing authors

450+ lead authors from 130+ countries

2500+ scientific expert reviewers

6 years of work

4 volumes

**Climate Change 2007: The Physical Science Basis -
Summary for Policymakers, February 2, 2007**

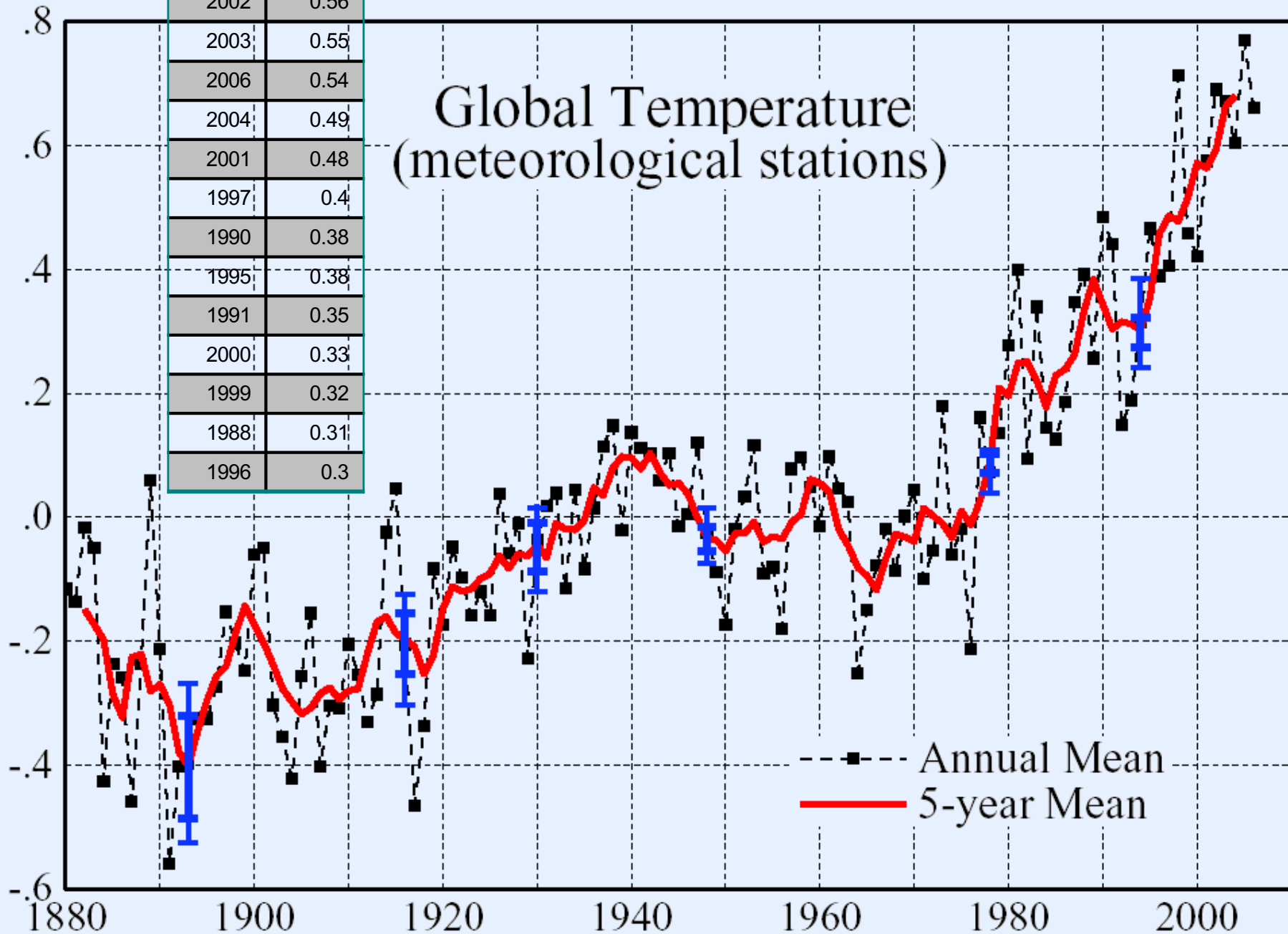
IPCC 4th Assessment Report

- Warming of the climate system is unequivocal
- The warmth of the last half century is unusual in at least the previous 1300 years
- Most of the observed increase in globally averaged temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations
- Anthropogenic warming would continue for centuries, even if greenhouse gas concentrations were to be stabilized

<http://data.giss.nasa.gov/gistemp/>

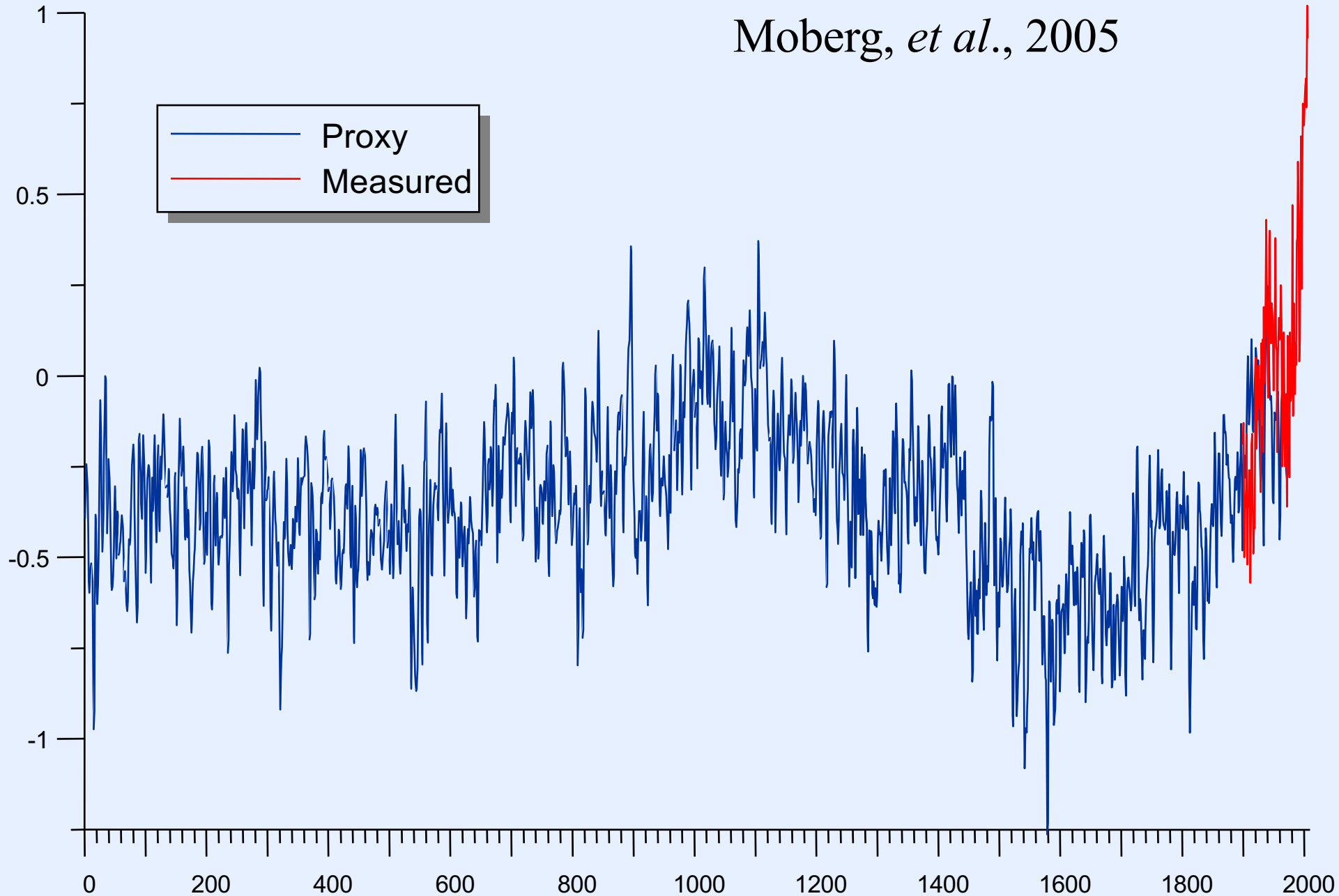
Temperature Anomaly (°C)

Global Temperature (meteorological stations)

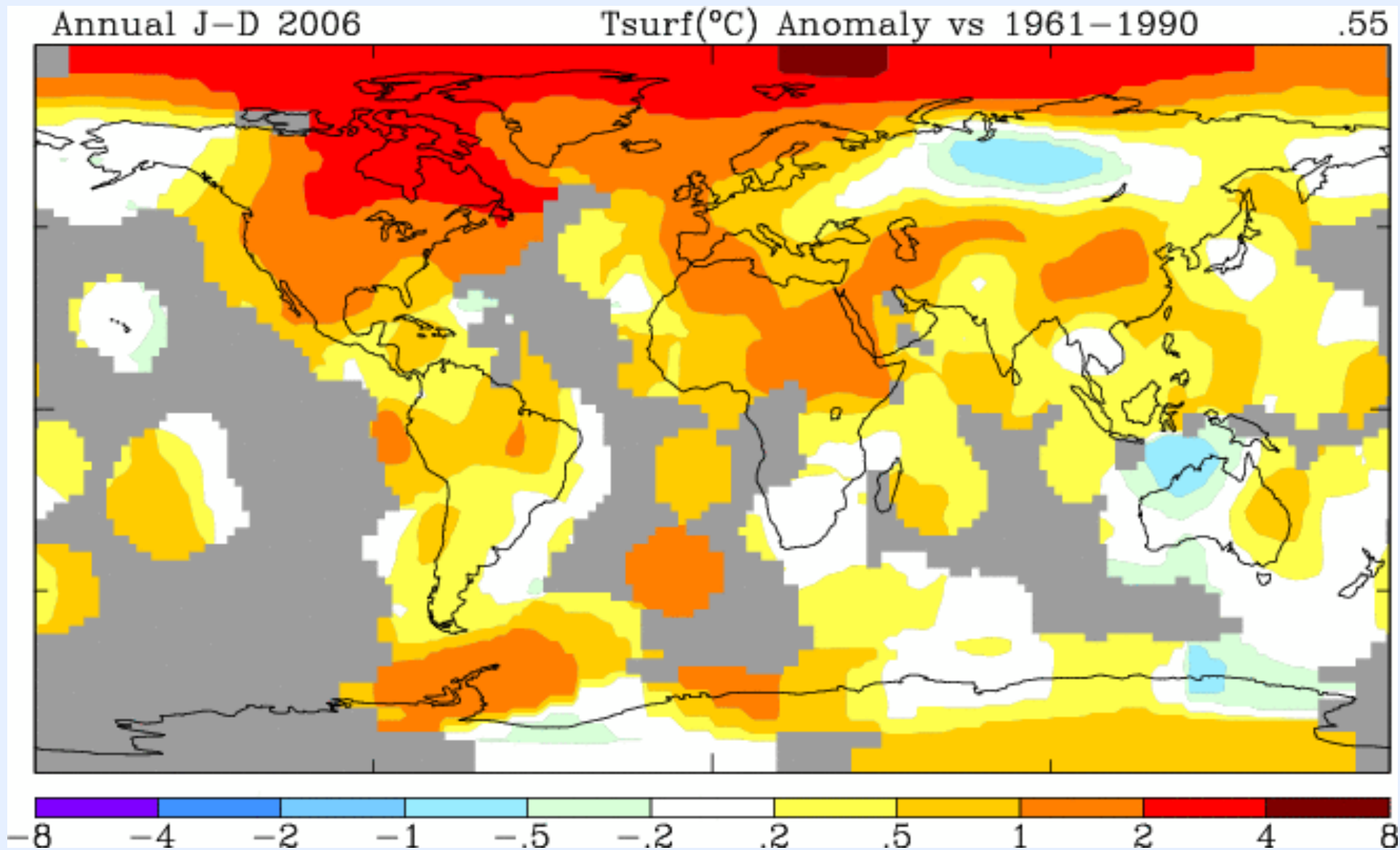


Northern Hemisphere temperature, past 1000 years

Moberg, *et al.*, 2005

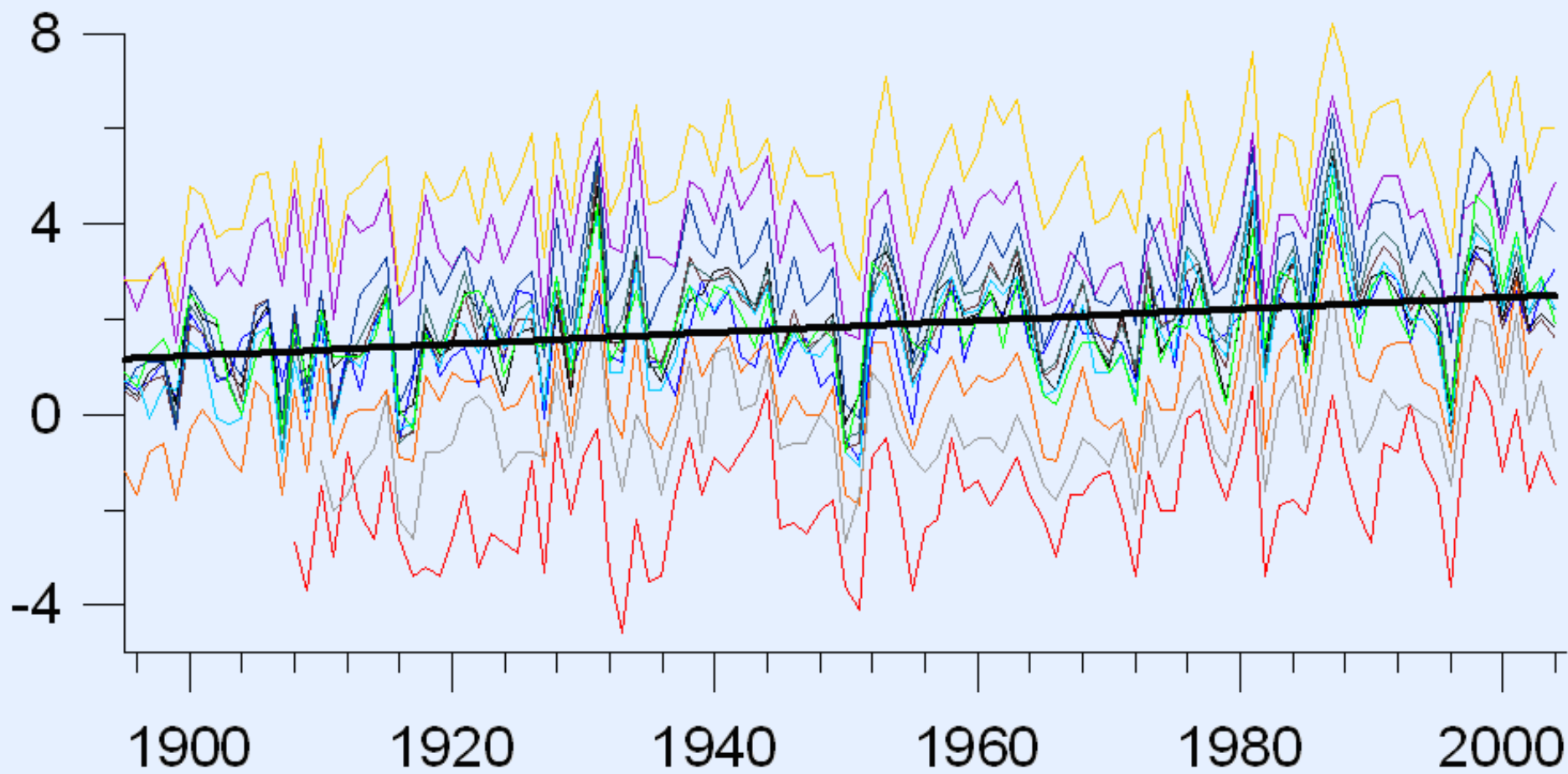


2006 Temperatures: Departures from Normal (1961-90)



<http://data.giss.nasa.gov/gistemp/>

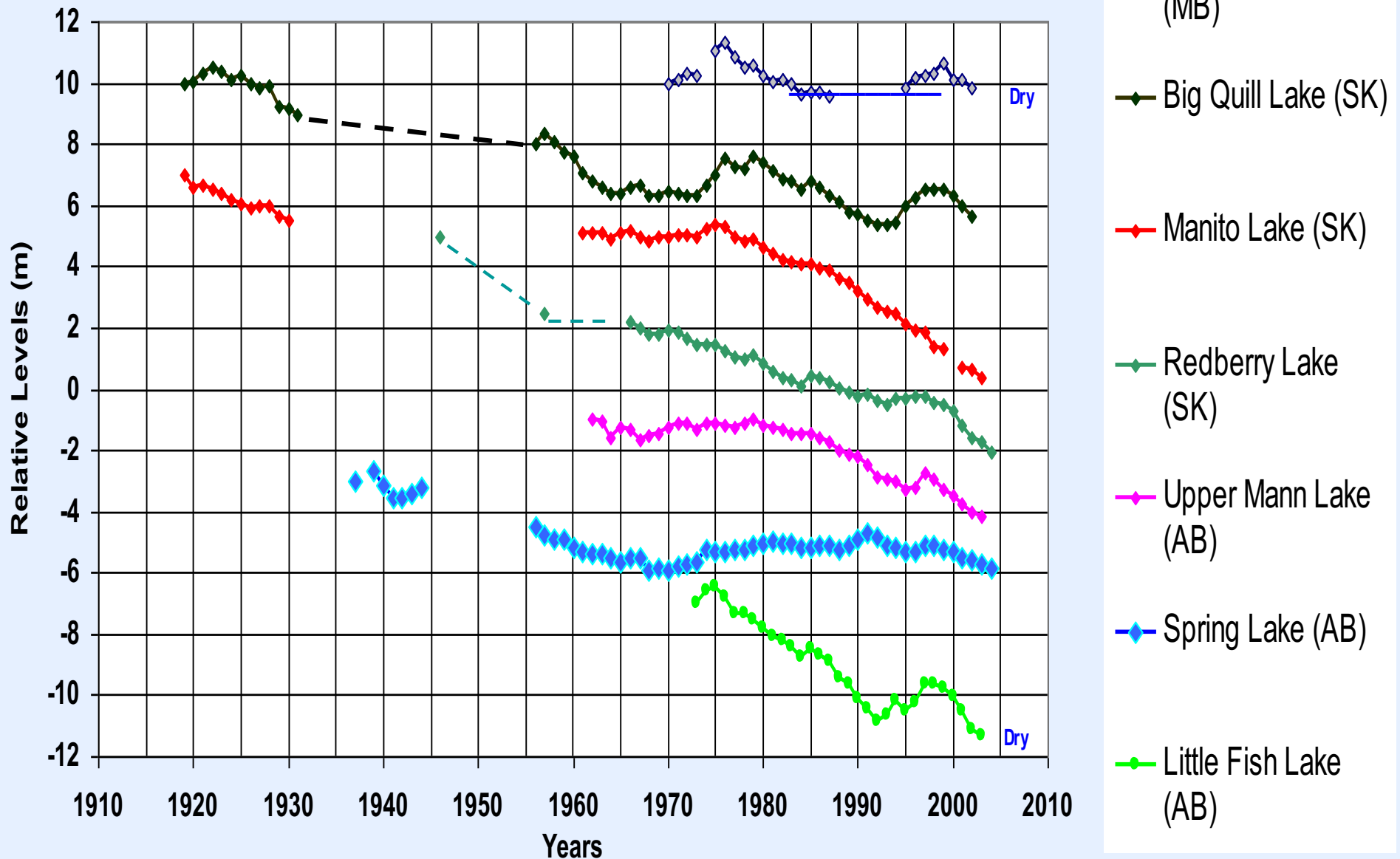
Mean Annual Temperature (°C)

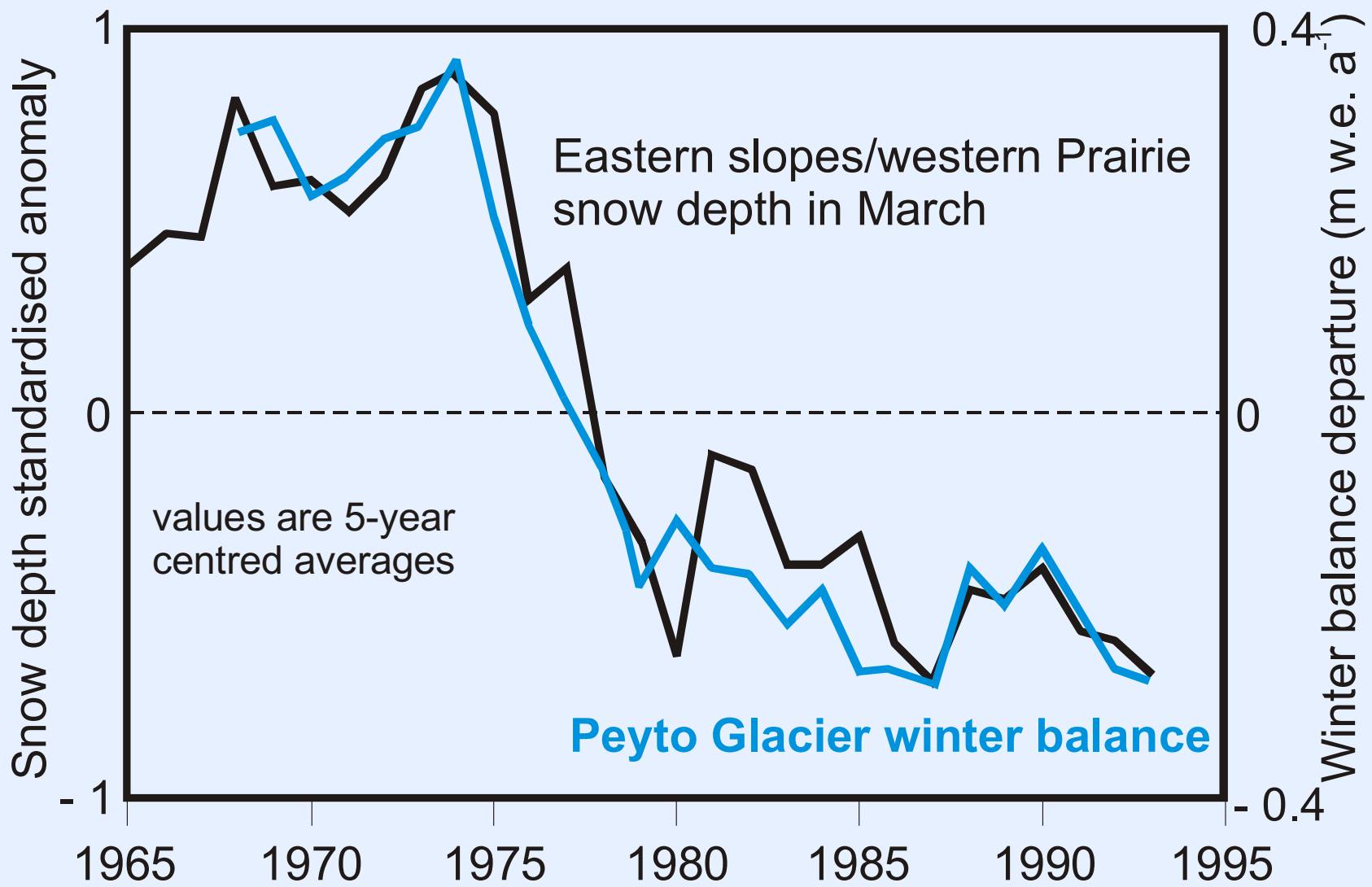


- Banff
- Brandon
- Calgary
- High Level
- Indian Head
- Medicine Hat
- Prince Albert
- Regina
- Saskatoon
- Swift Current
- The Pas
- Winnipeg
- Average

Closed-basin prairie lakes

Water level changes, 1918-2004 (van der Kamp *et al.*)

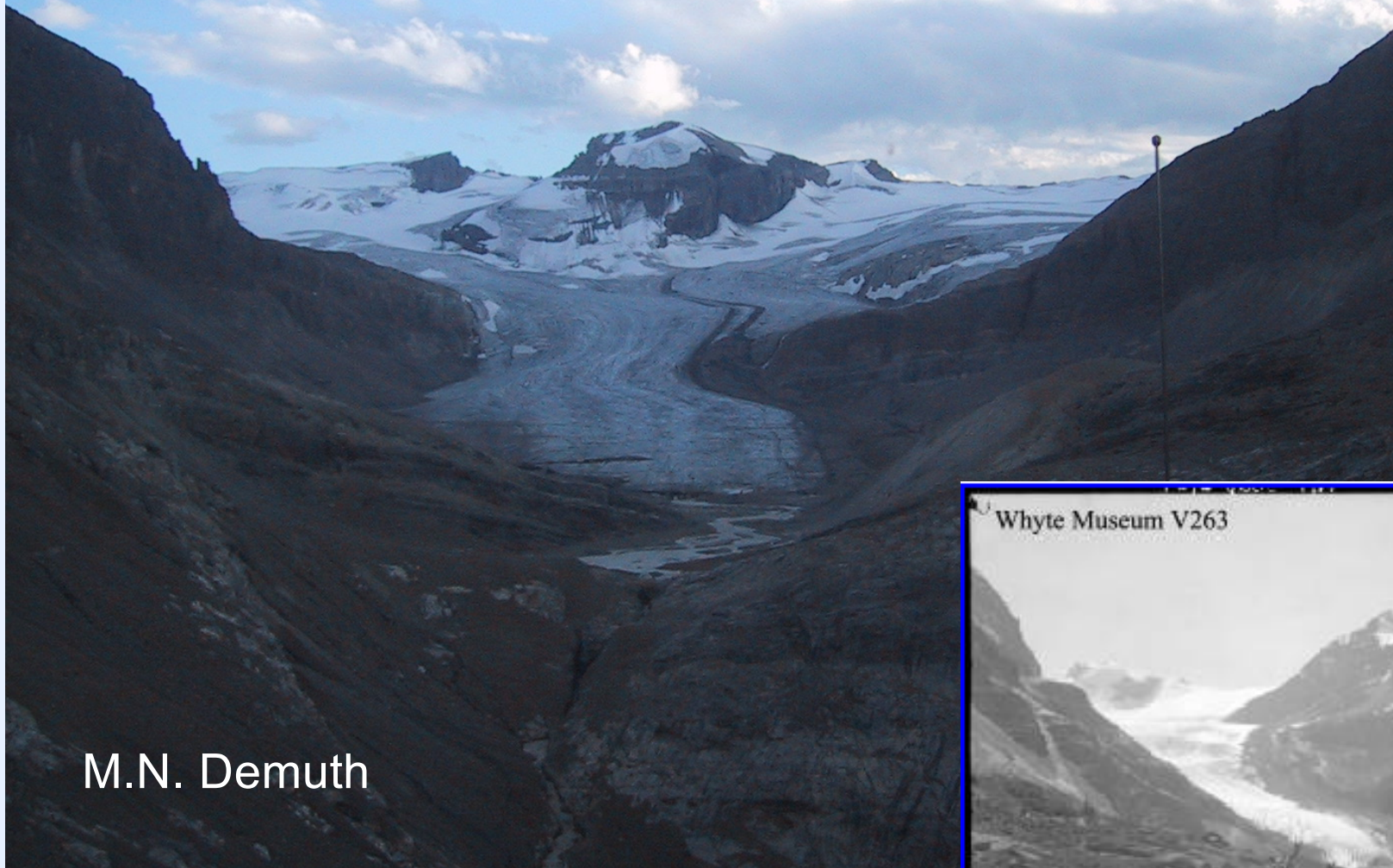




Demuth and Pietroniro, 2001

Peyto Glacier

2006



M.N. Demuth



Whyte Museum V263

1917

Canadian National Assessment – early fall, 2007

Canadian Climate Change Impacts and Adaptation Assessment The Assessment Outline

The key sections of the Assessment are described below:

Synthesis Report

A concise overview of what climate change means for Canada. The report will highlight key findings, and discuss commonalities and differences among the regions. It will serve as both an executive summary and a value-added synthesis of the entire Assessment.

Section 1: Introduction/Overview

An introduction to the Assessment, emphasizing its goals and purposes, as well as the importance of understanding vulnerability.

Section 2: Climate and Climate Change in Canada

An overview of the importance of climate and climate change to Canada, with discussion of climatic, social and economic trends that affect exposure to climate. Will also outline future projections for Canada.

Section 3: Regional Chapters

The main content of the Assessment, these chapters will focus on current regional sensitivities and future vulnerabilities to climate and climate change. Case studies will be an important component of these chapters.

The regional chapters are:

- Atlantic Canada
- Quebec
- Ontario
- Prairies ←
- British Columbia
- The North

Section 4: Canada in an International Context

A broader perspective on climate change impacts and adaptation, which discusses climate change impacts and adaptation with respect to continental effects, oceans, global issues, and Canada's international obligations.

Section 5: Impacts and Adaptation Research- Capacity, Tools and Moving Forward

An examination of the present state of impacts and adaptation research in Canada, future directions and needs, and moving research to action.

http://www.adaptation.nrcan.gc.ca/assess_e.php

National Assessment - Prairies Chapter



Dave Sauchyn, PARC, Lead
Suren Kulshreshtha, U of S, Co-Lead
Danny Blair, U of W
Jim Byrne, U of L
Debra Davidson, U of A
Polo Diaz, U of R
Norm Henderson, PARC
Dan Johnson, U of L
Mark Johnston, SRC
Justine Klaver, U of A
Stephan Keinzle, U of L
Elaine Wheaton, SRC

Climate is moving outside the range of recent experience with natural variability

Projected median annual increases of 2 to 5 degrees in temperature and 2-12% in precipitation





Major ecosystem shifts are expected

They will be most visible in the mountains and at the margins of the northern and western forests.

There will be greater variation from season to season and year to year

Both drought and unusually wet years could occur with greater frequency and severity



There are advantages and disadvantages to a shorter winter

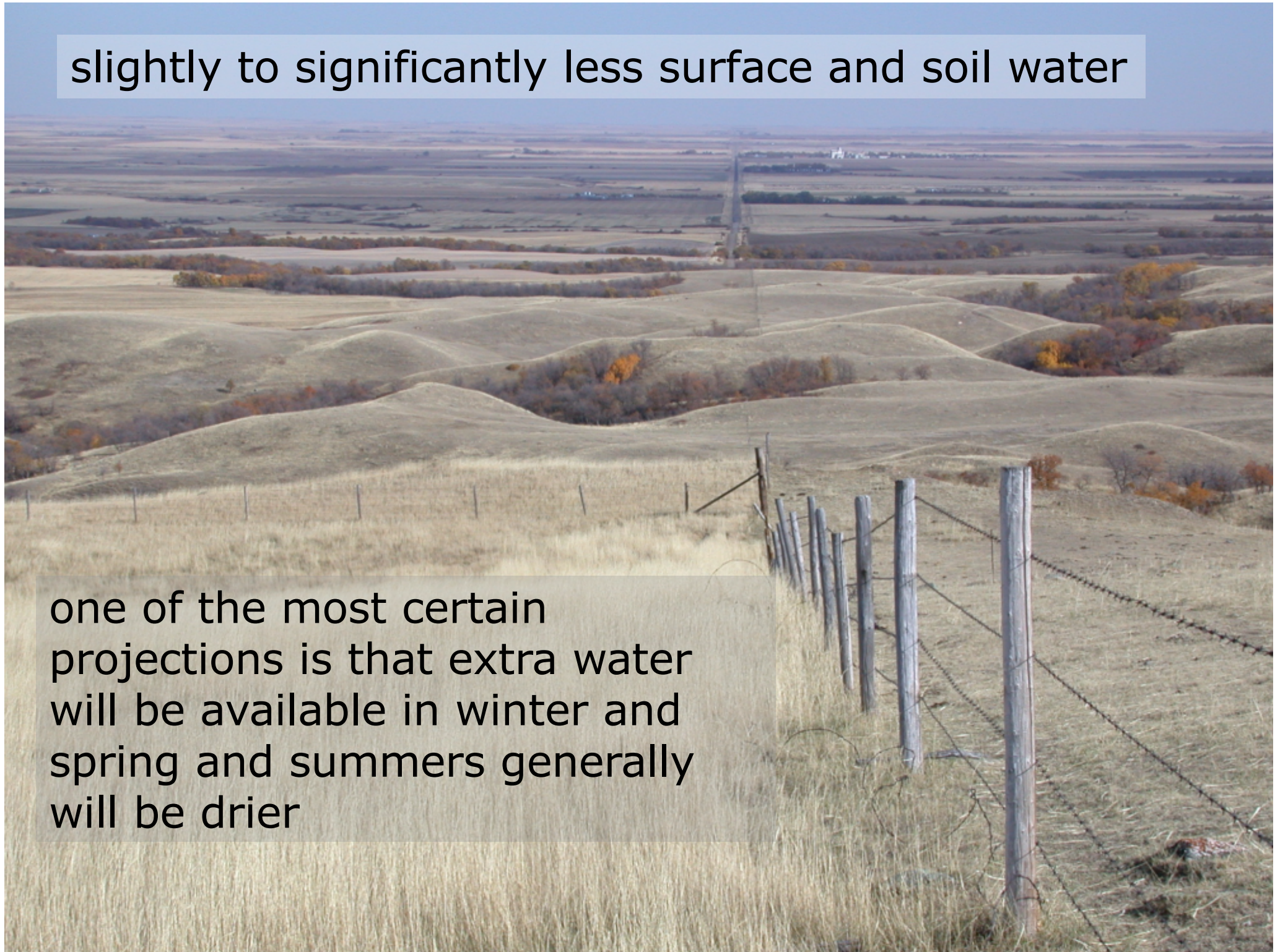


Most impacts are adverse because economies and activities are not adapted to change



slightly to significantly less surface and soil water

one of the most certain projections is that extra water will be available in winter and spring and summers generally will be drier



The impacts of climate change will depend on how well we adapt and how much adaptation is required



Adaptation



The degree to which adjustments are possible in practices, processes, or structures of systems to projected or actual changes of climate (IPCC, 2001).



Adaptive Capacity

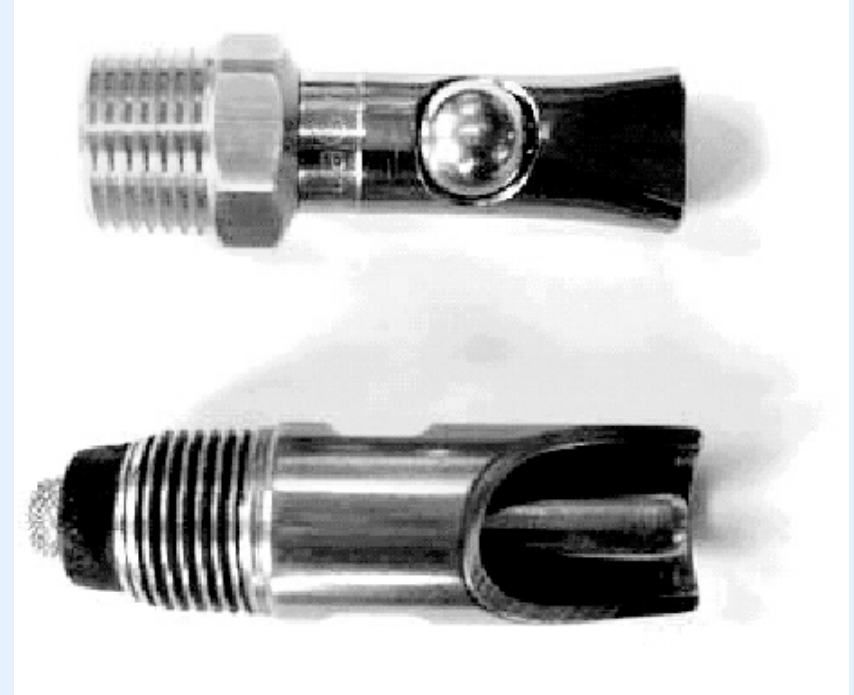
Determinant	Explanation
Economic resources	Greater economic resources increase adaptive capacity Lack of financial resources limits adaptation options
Technology	Lack of technology limits range of potential adaptation options Less technologically advanced regions are less likely to develop and/or implement technological adaptations
Information and skills	Lack of informed, skilled and trained personnel reduces adaptive capacity Greater access to information increases likelihood of timely and appropriate adaptation
Infrastructure	Greater variety of infrastructure can enhance adaptive capacity, since it provides more options Characteristics and location of infrastructure also affect adaptive capacity
Institutions	Well-developed social institutions help to reduce impacts of climate-related risks, and therefore increase adaptive capacity
Equity	Equitable distribution of resources increases adaptive capacity Both availability of, and access to, resources is important

SE 6-33-11-W4, May 1914



ball-bite drinker

standard drinker



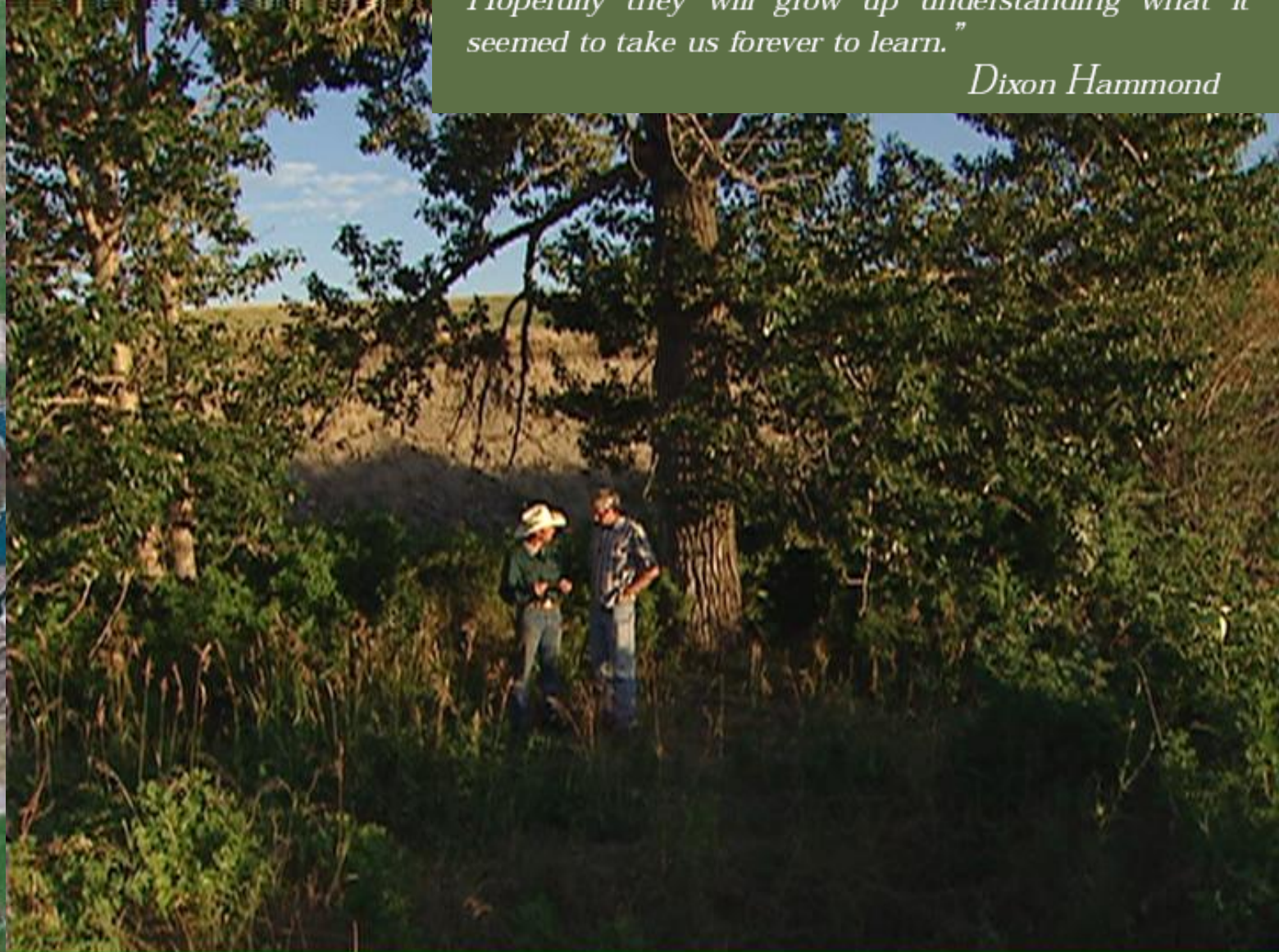
- one-year trial, from August 2004 to July 2005, the ball-bite drinker sections of the barn used 35 per cent less water than the standard drinker sections
- no detrimental effects on the animals or facility management. the
- significant decrease in water usage led to many secondary benefits

Dennis McKerracher
JV Farms, High River, AB

Beaver Creek Watershed Group

"We are really the ones who manage the land every day and the positive actions we take today will ensure that our children have healthy riparian areas and clean water. Hopefully they will grow up understanding what it seemed to take us forever to learn."

Dixon Hammond

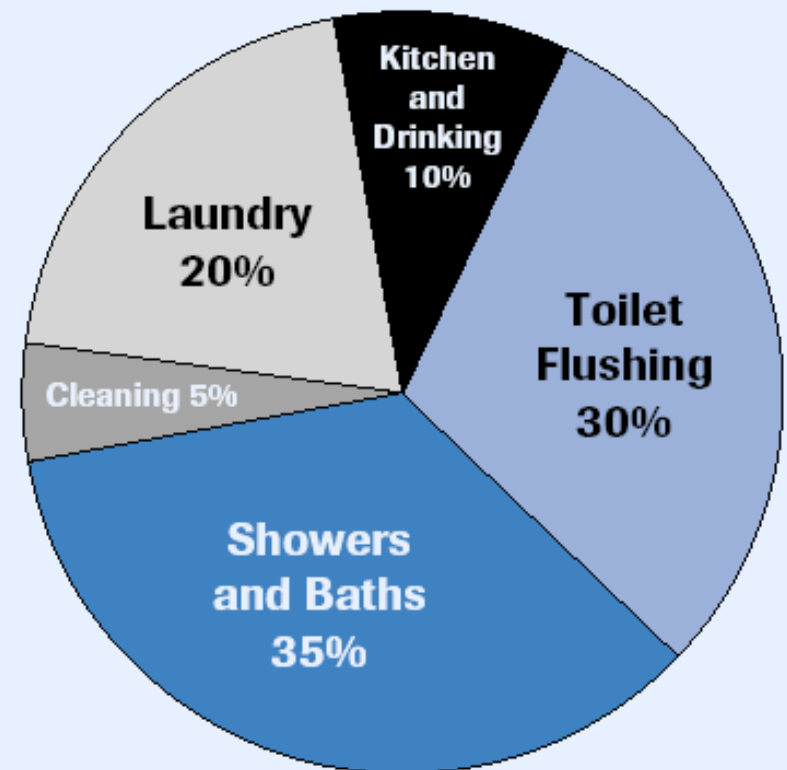


► Programs & Services[Welcome to Regina](#)[Doing Business](#)[Parks & Recreation](#)[City Hall](#)

Water Conservation

The Water Conservation Program was established in 1988 to reduce water consumption in the city and delay the need for a \$40 million expansion of the water treatment plant. Each summer, when demand for water is highest, the program sponsors a public awareness campaign. During other times in the year, the City offers an informative display at the Home and Garden Show, **free xeriscape workshops** and water conservation tips on water bills.

The program has been successful. Since the late 1980's average day water consumption has been reduced by 20%, and peak day water use is down by 25%.





Thanks