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DRI Workshop, Winnipeg, May 11th, 2010

Everyone is Affected: Selections of Drought Characteristics, Impacts and Adaptations



Canadian Foundation for Climate
and Atmospheric Sciences (CFCAS)
Fondation canadienne pour les sciences
du climat et de l'atmosphère (FCSCA)



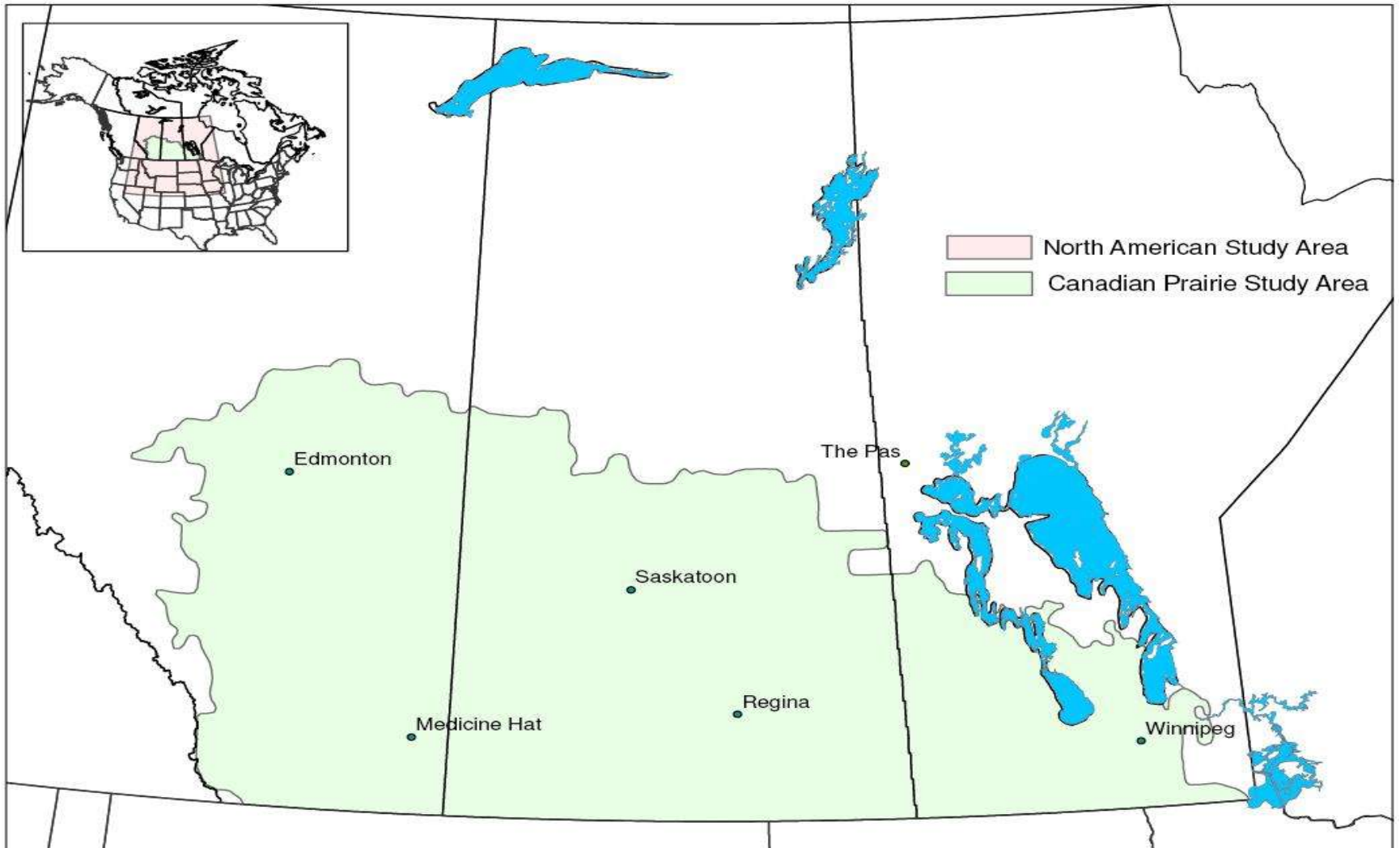
Environment
Canada

Environnement
Canada

Objectives

- *"A preliminary analysis of the 2001 and 2002 drought years in Canada suggests the Gross Domestic Product lost some \$5.8 billion in 2001 and 2002, with the largest loss - more than \$3.6 billion - occurring in 2002." -Wheaton et al. 2008*
- Comparing the 1999-2005 drought to previous extreme drought years (1919, 29, 61, 88)
- Also looking at similarities between the 1999-2005 and 2009 drought
- Assessing impacts and adaptations of the 2009 drought
- PDSI: Palmer Drought Severity Index
- SPI: Standardized Precipitation Index

Study Area

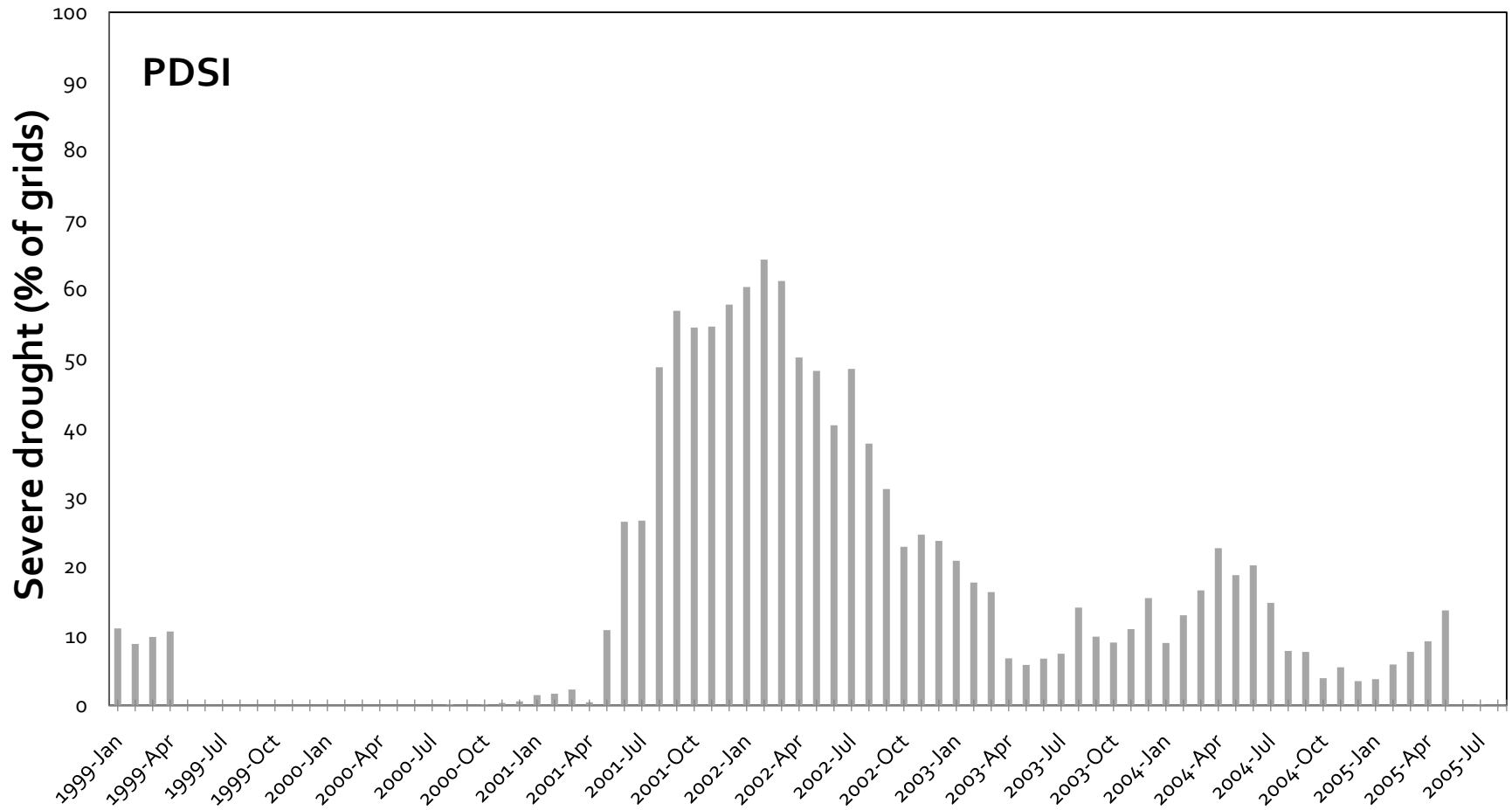


Six stage system

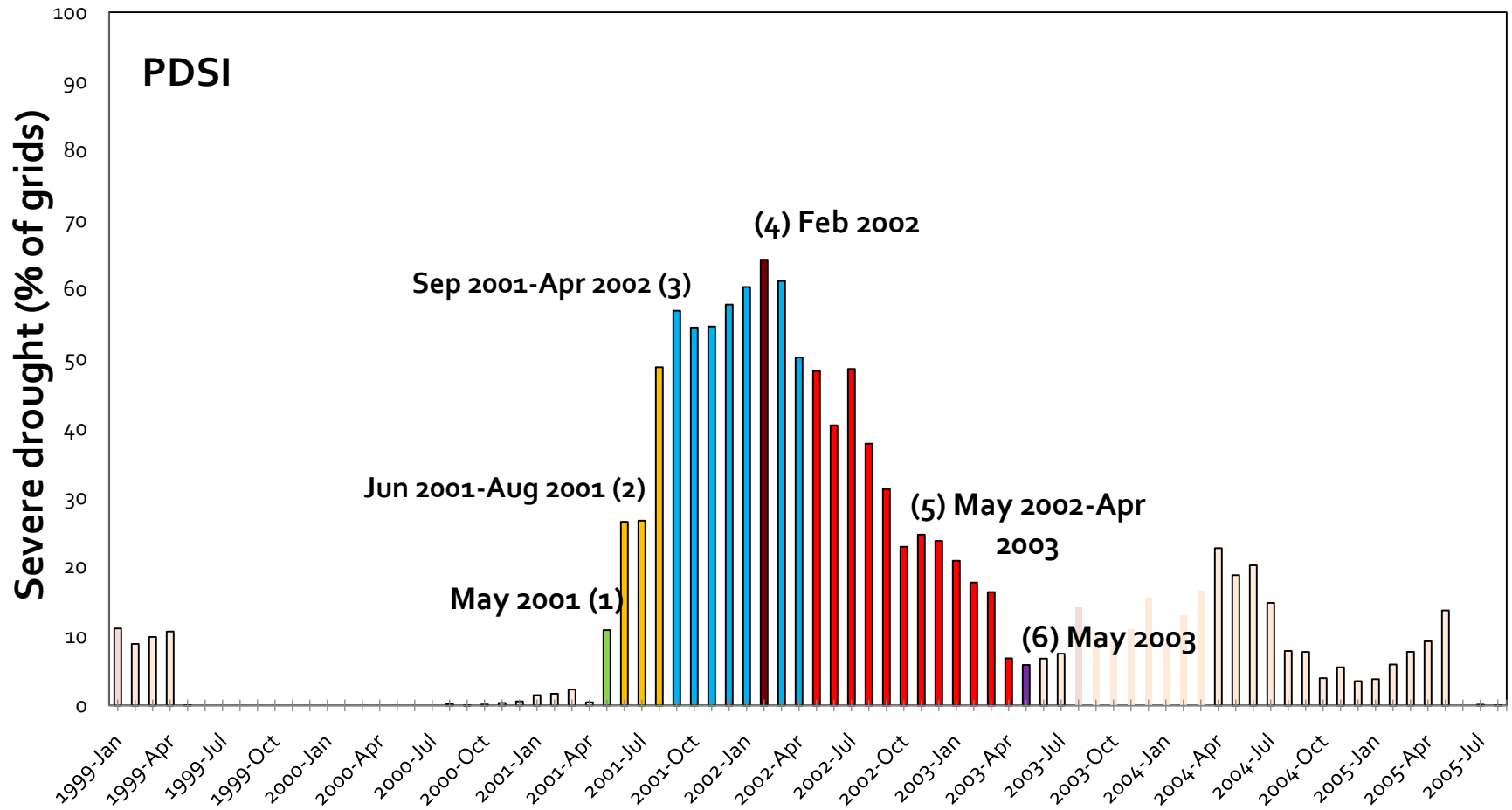
- (1) Onset of drought (above 10%)
- (2) Growth or extension (between 10% to 50% leading to peak)
- (3) Persistence (remaining above 50%)
- (4) Peak (greatest area coverage)
- (5) Decline or decrease in area (50% to 10% following peak)
- (6) Termination of drought (<10%)



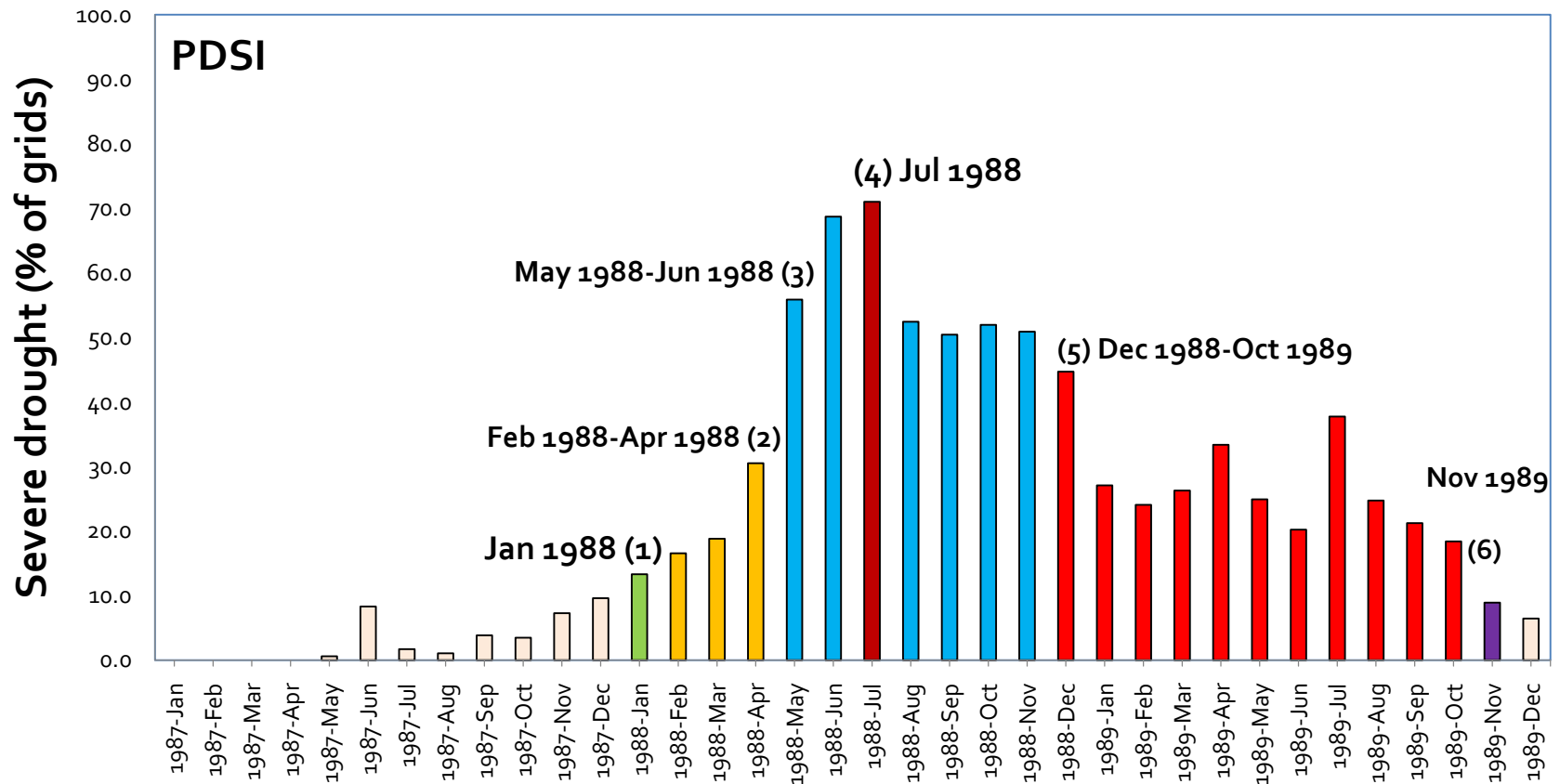
Six stage system for characterizing drought evolution (e.g. 1999-2005)



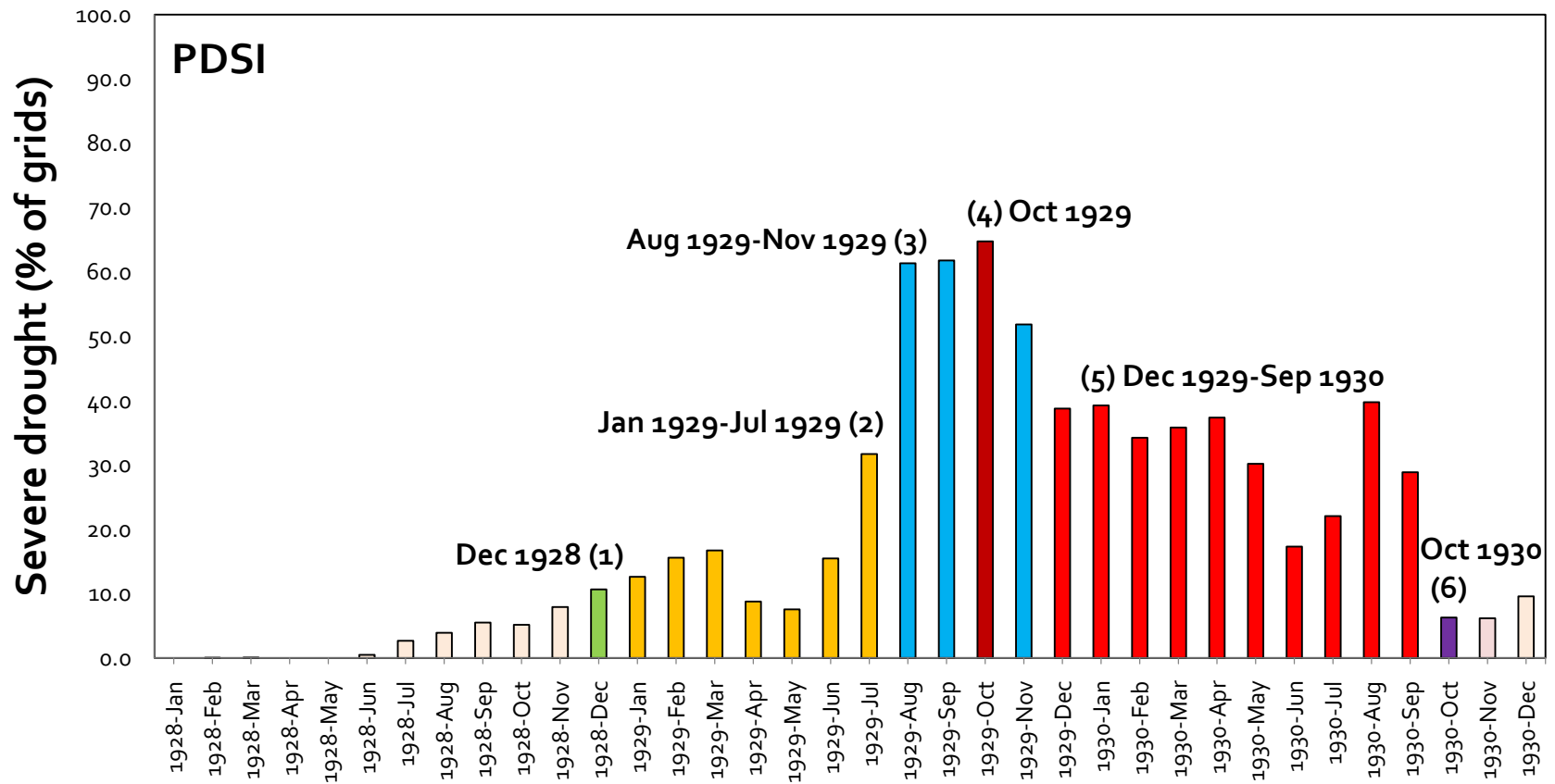
Six stage system for characterizing drought evolution (e.g. 1999-2005)



Six stage system for characterizing drought evolution (e.g. 1988)



Six stage system for characterizing drought evolution (e.g. 1929)



Summary of six stage system

- Six stage system was evident in every major drought we have looked at
- Some droughts have longer stages than others, specifically in stage 2 (growth) and 5 (decline)
- PDSI tends to have a longer stage 5 than SPI, possibly due to the lag effect created by this index
- Secondary peaks and droughts are defining aspects of stage 5 for both SPI and PDSI
- First attempt at applying a class system for comparison and understanding of droughts

Impacts Assessment of the 2009 Drought

- Media survey which focuses on key words
 - Crop
 - Yield, Quality, Pest, Disease
 - Livestock
 - Economic
 - Government Programs
 - Water
 - Municipalities, Communities



Methods

- 218 Articles from Jan. 2009 to Feb. 2010 newspapers and online sources
- Based on categories and identified through keywords
- Number of articles for each category and month were tabulated to create various tables and graphs for the study

MARKETS
Higher prices may offset drop in honey production
By Robert Anderson
Alberta's honey production was up 10 per cent in 2009, but the price of honey has fallen 10 per cent. The net result is a 10 per cent increase in honey production value.

Sask. harvests great crop despite all the problems
COMMENTARY
Spring wheat set a new record at 38.6 bushels per acre. So did oats at an average of 80.5. Flax was also a record at 71.1 bushels per acre.

Erratic year for seed quality
Crop Production Week / Farmers report that seed quality was generally good.

Farmers protect water quality
The Saskatchewan Conservation Council has announced a new program to help farmers protect water quality. The program will provide technical assistance and financial incentives to farmers who want to improve their water quality.

Weather extremes kept prairie farmers hopping
Farmers in Saskatchewan closed out 2009 with an above average crop report. The weather was a mix of challenges and opportunities. Farmers had to contend with drought in the spring and late season frosts, but they also benefited from a wet start to the season and a relatively mild fall.

Above average crop yield for Sask. farmers
Last Updated: Wednesday, December 23, 2009 | 3:13 PM CT [Comments](#)/[Recommend](#)
CBC News
Farmers in Saskatchewan closed out 2009 with an above average crop report. The weather was a mix of challenges and opportunities. Farmers had to contend with drought in the spring and late season frosts, but they also benefited from a wet start to the season and a relatively mild fall.

Record cold, early snow grip Prairies on Thanksgiving
Last Updated: Monday, October 12, 2009 | 3:10 PM CT [Comments](#)/[Recommend](#)
CBC News
An arctic air mass brought record cold temperatures across parts of Alberta early Monday, topping off a

BUSINESS DS
Hail claims hit low
Payouts for hail claims in Saskatchewan totalled a record low of \$23.4 million this season, the Canadian Crop Hail Association reported Friday. A total of 4,075 claims in the province were paid out for a total of \$21,000 in 2008, crop hail amounts of work in Saskatchewan said in its final hail report. In 2008, the total amount of work reached a record high of \$100 million.

Affordable feed tough to find
By Bob Mackenzie
Farmers are finding it difficult to find affordable feed for their livestock. The cost of feed has increased significantly in recent months, and farmers are looking for ways to reduce their feed costs.

Extra feed key to winter grazing
By Brian Dochow
Alberta, Alta. — Cows need to be fed extra feed during the winter months to keep them healthy and productive. The extra feed is usually in the form of hay or silage, and it is essential for the cows to have access to it during the winter months.

Late season flea beetles call for preventive steps
By Michael Basso
A large population of flea beetles is causing concern in Saskatchewan. The beetles are feeding on the leaves of crops, and they can cause significant damage if they are not controlled. Farmers are advised to take preventive steps to control the beetles, such as using insecticides or planting resistant varieties.

Federal tax decision brings relief to disaster-stricken cattle producers
July 23, 2009
Calgary, AB — The Canadian Cattlemen's Association (CCA) welcomed news that the Government of Canada will provide tax relief to disaster-stricken cattle producers in 2008 and 2009. This comes after the government has provided relief to disaster-stricken producers to make decisions.

A tale of two seasons By Shirley Byers
Freelance writer
FOR MANY PRODUCERS, 2009 DELIVERED THE BEST OF YIELDS AND THE WORST OF WEATHER

Drought tolerance breakthrough
By Michael Raine
Saskatoon newsroom
Drought tolerance in grain and oilseeds is a tough genetic cell to crack, but Chang-Jui Liu thinks his lab has one of the answers. Brookhaven National Laboratory in Upton, New York, is working with the ability to control the amount of water and nutrients they let in, while keeping most pathogens out. Liu's lab has found a way to genetically control the expression of the enzyme, which will allow researchers to control the amount of water and nutrients they let in, while keeping most pathogens out.

Incentives offered for water management
The Western Producer November 12, 2009
Producers who want to take advantage of the program should contact an Alberta Conservation Officer. The program provides incentives for producers who want to improve their water management practices. The incentives are in the form of grants or rebates, and they are available to producers who have a water conservation plan in place.

High yields, good quality surprise end to crop year
WISCONSIN (SPN) — While a woman's secret recipe (say, Prairie farmers) has made last year the 2009 crop was better than expected, with yields and quality.

New El Ninos may worsen global droughts
Global warming may be the cause of the droughts in Australia, say researchers in South Africa. The researchers found that the El Niño is a warm body of water in the central Pacific Ocean that causes droughts in Australia. The researchers also found that the El Niño is becoming more frequent and intense, which could worsen global droughts.

Sask. extends insurance deadline to Dec. 1
By Karen Eide
Regina bureau
Saskatchewan farmers struggling to bring in the late harvest have an extra two weeks to make crop insurance claims. The Saskatchewan Crop Insurance Corp. has extended the deadline for crop insurance claims to December 1.

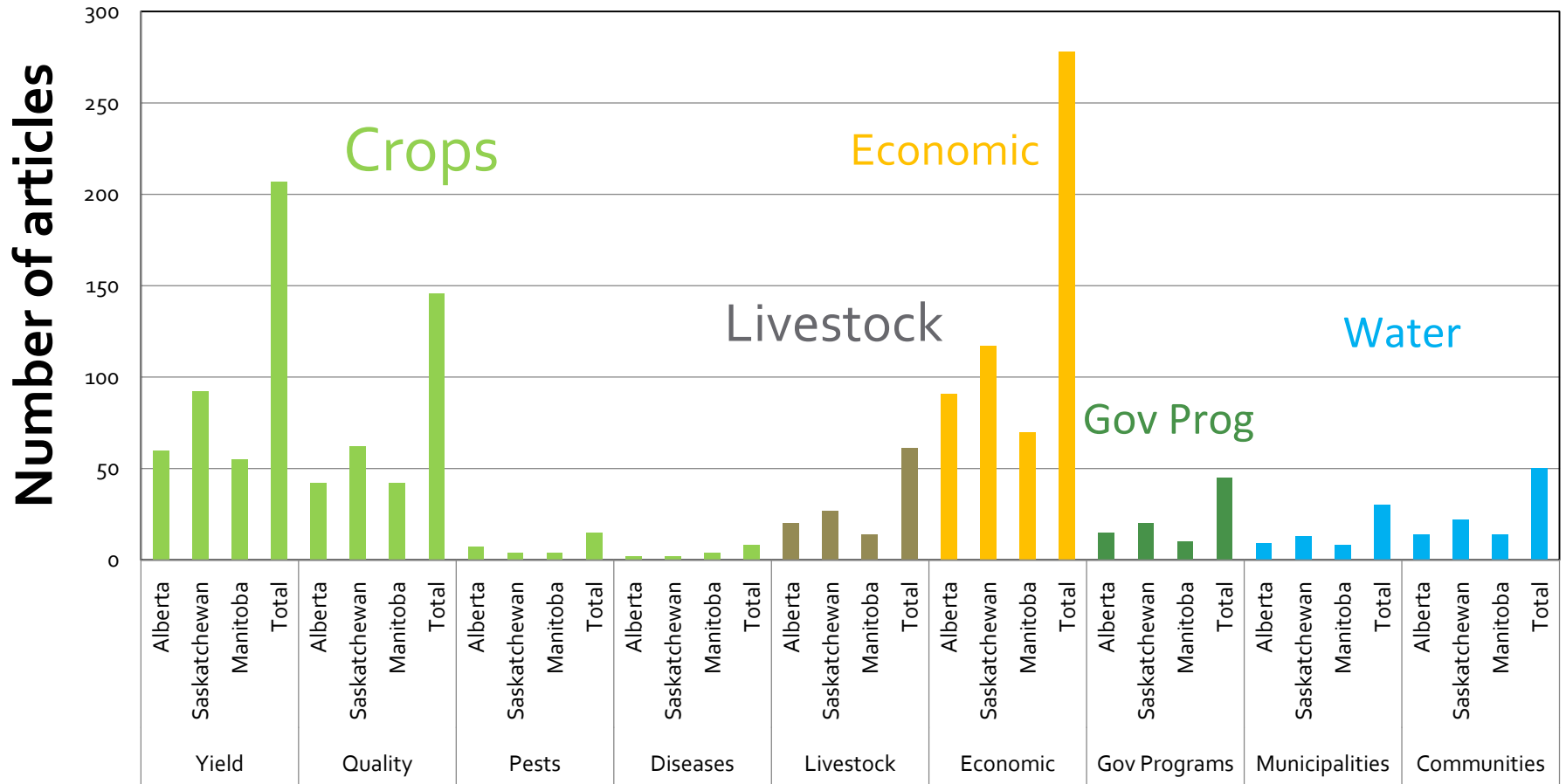
Sugar beets in trouble
By Bob Mackenzie
The sugar beet crop in Saskatchewan is in trouble. The crop has been hit by a combination of factors, including drought and late season frosts. Farmers are concerned about the quality and quantity of the crop, and they are looking for ways to improve their sugar beet production.

Sask. feels record heat during Sept.
By Janet French and Jeannette Stewart
The StarPhoenix
Rosetown just might be Canada's new hot spot. A good dose of "Obama air" last week made Saskatchewan the hottest place in Canada in September — ever.

Water diversion plan creates potential irrigation option
Regina, Moose Jaw population, is a water supply.

3. Priority for drought loss payments
by D. Lorraine Andrews
Changes to Alberta's crop insurance program should expedite drought loss payments to farmers hit by severe drought conditions.

Specific Impact Types by Province

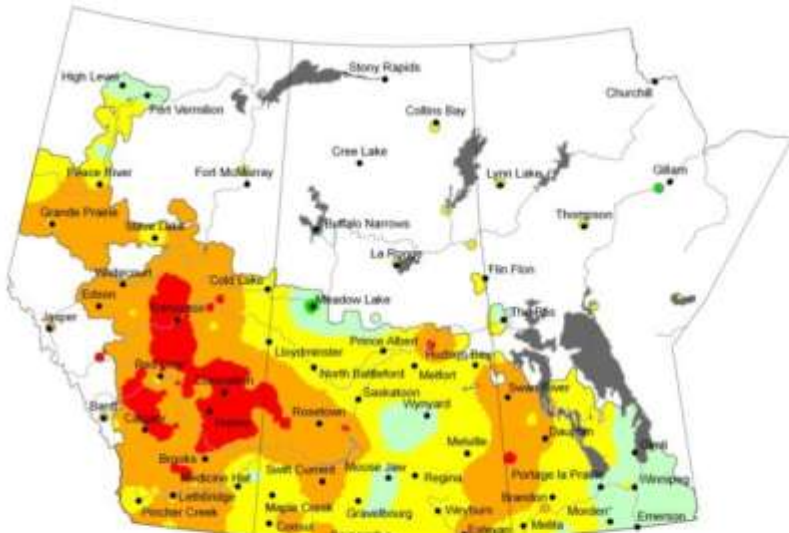


Spring 2009 Cold and Dry

Precipitation

Percent of Average Precipitation (Prairie Region)

April 1, 2009 to June 30, 2009

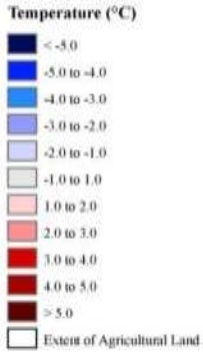
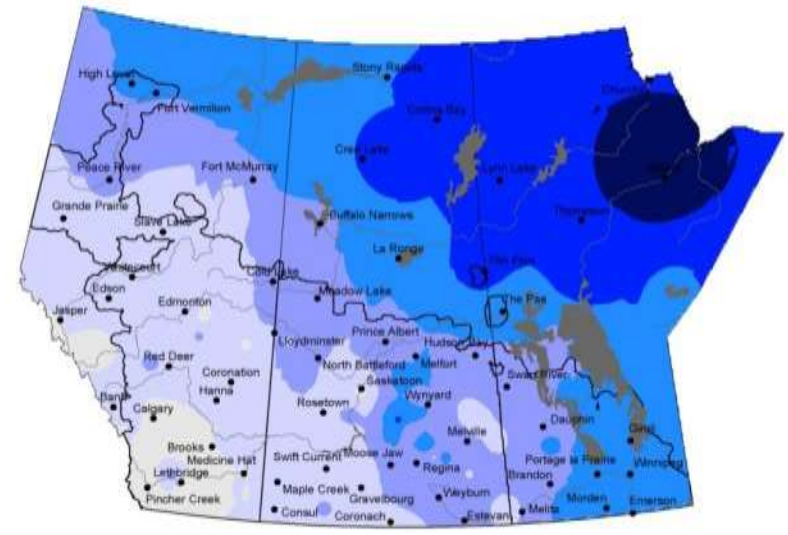


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Monthly Mean Temperature Difference from Normal (Prairie Region)

May 2009

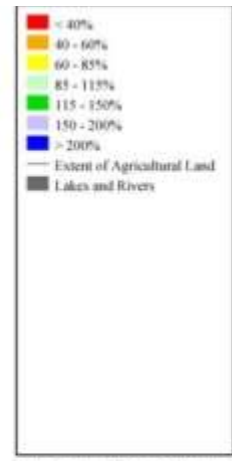


The map may not be accurate for all regions due to data availability and data errors.

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Prepared by Agriculture and Agri-Food Canada's National Agroclimate Information Service (NAIS). Normal temperature based on 1971-2000.

Temperature



Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.

Created: 07/15/09
www.agr.gc.ca/pfca/nais

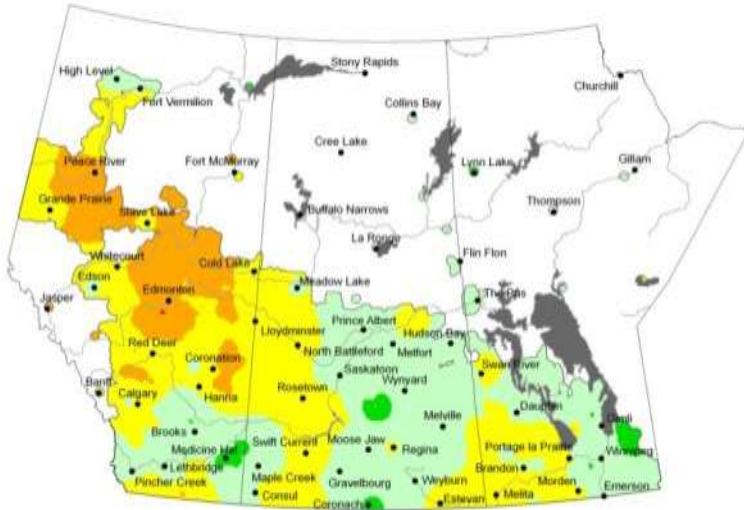
Summer 2009 Cold and Wet

Precipitation



Percent of Average Precipitation (Prairie Region)

April 1, 2009 to August 31, 2009



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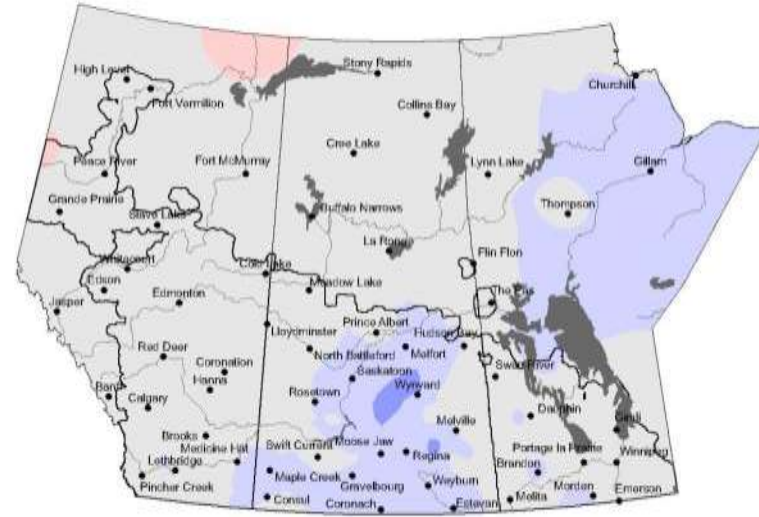


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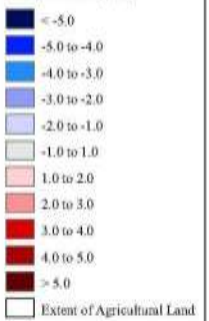
Canada

Monthly Mean Temperature Difference from Normal (Prairie Region)

August 2009



Temperature (°C)

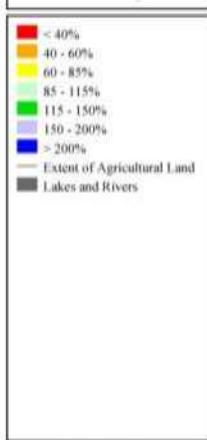


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Prepared by Agriculture and Agri-Food Canada's National Agroclimate Information Service (NAIS). (Normal temperature based on 1971-2000)

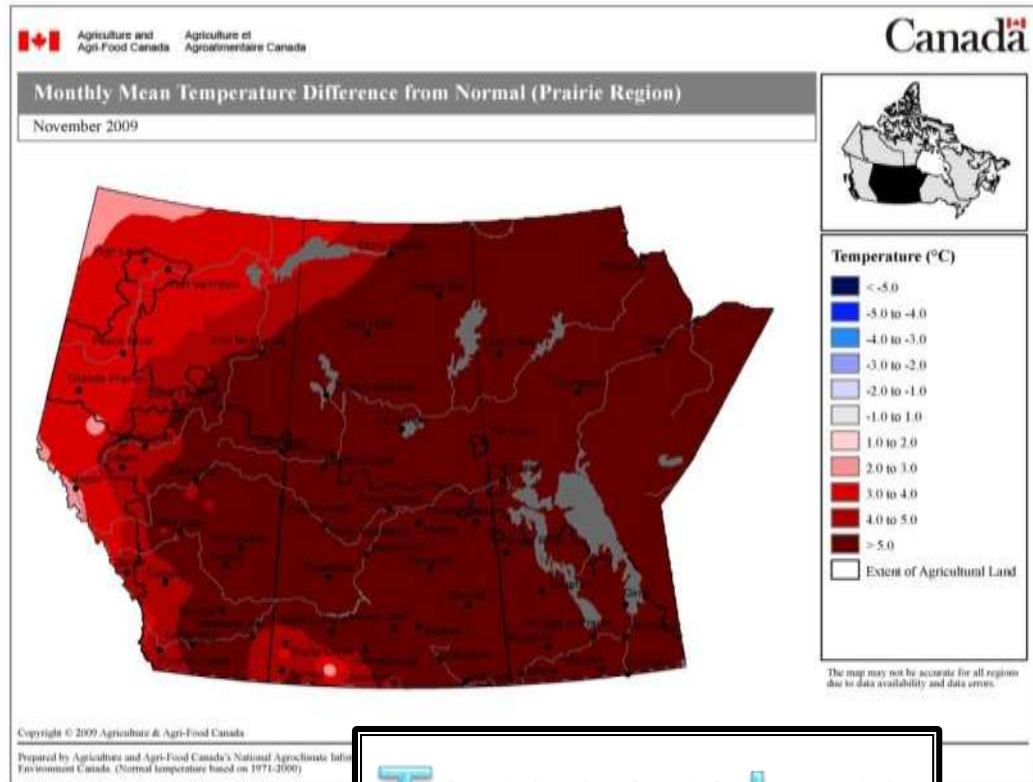
Temperature



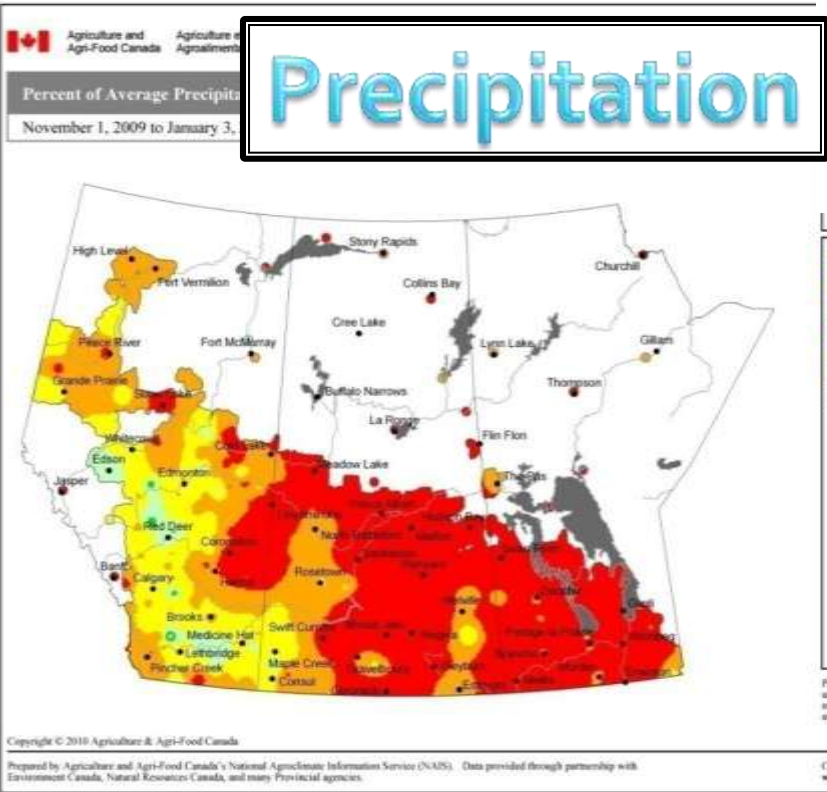
Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.

Created: 09/01/09
www.agr.gc.ca/brought

“Late Fall” 2009 “hot” and dry



Precipitation

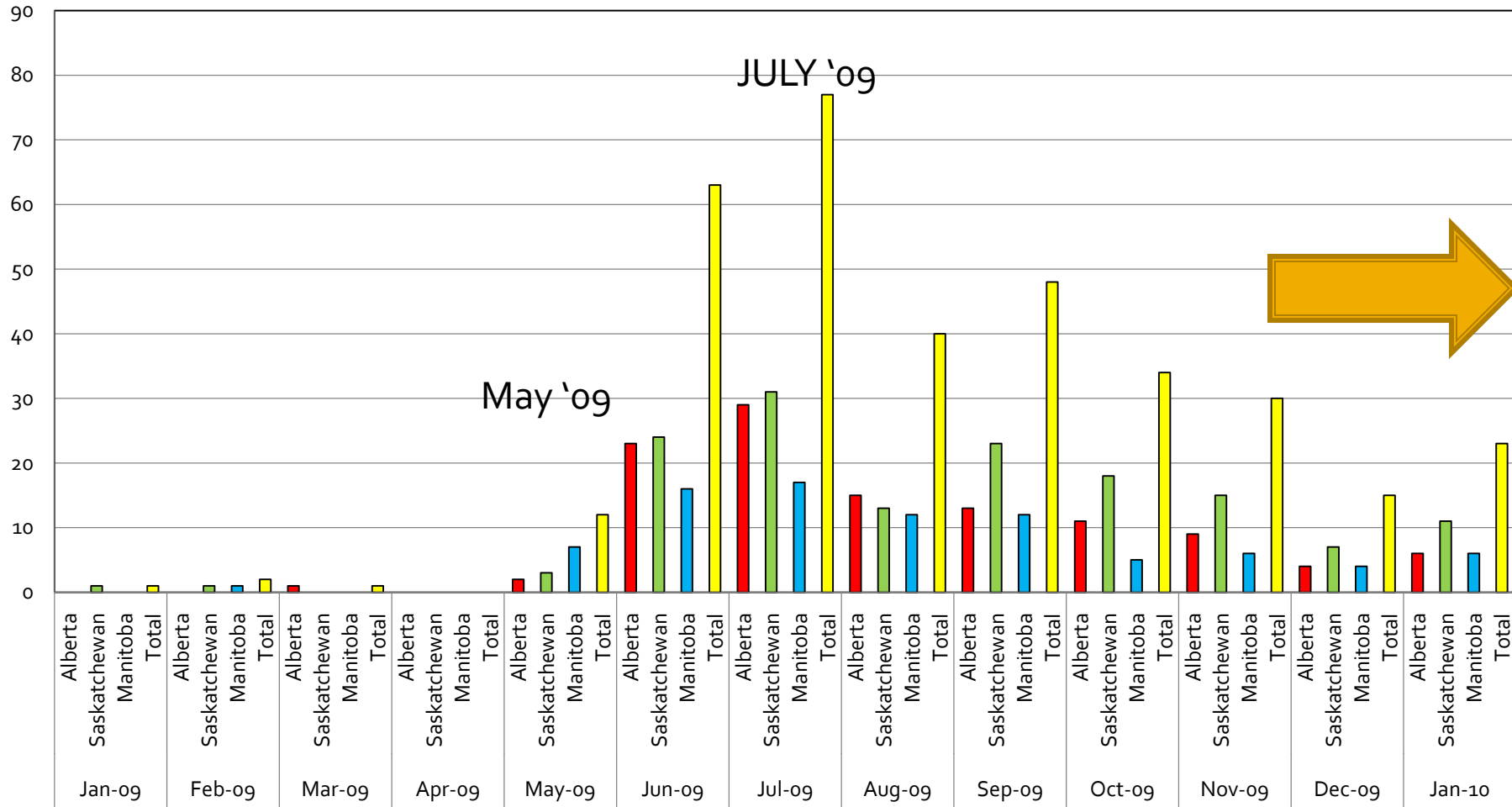


Temperature

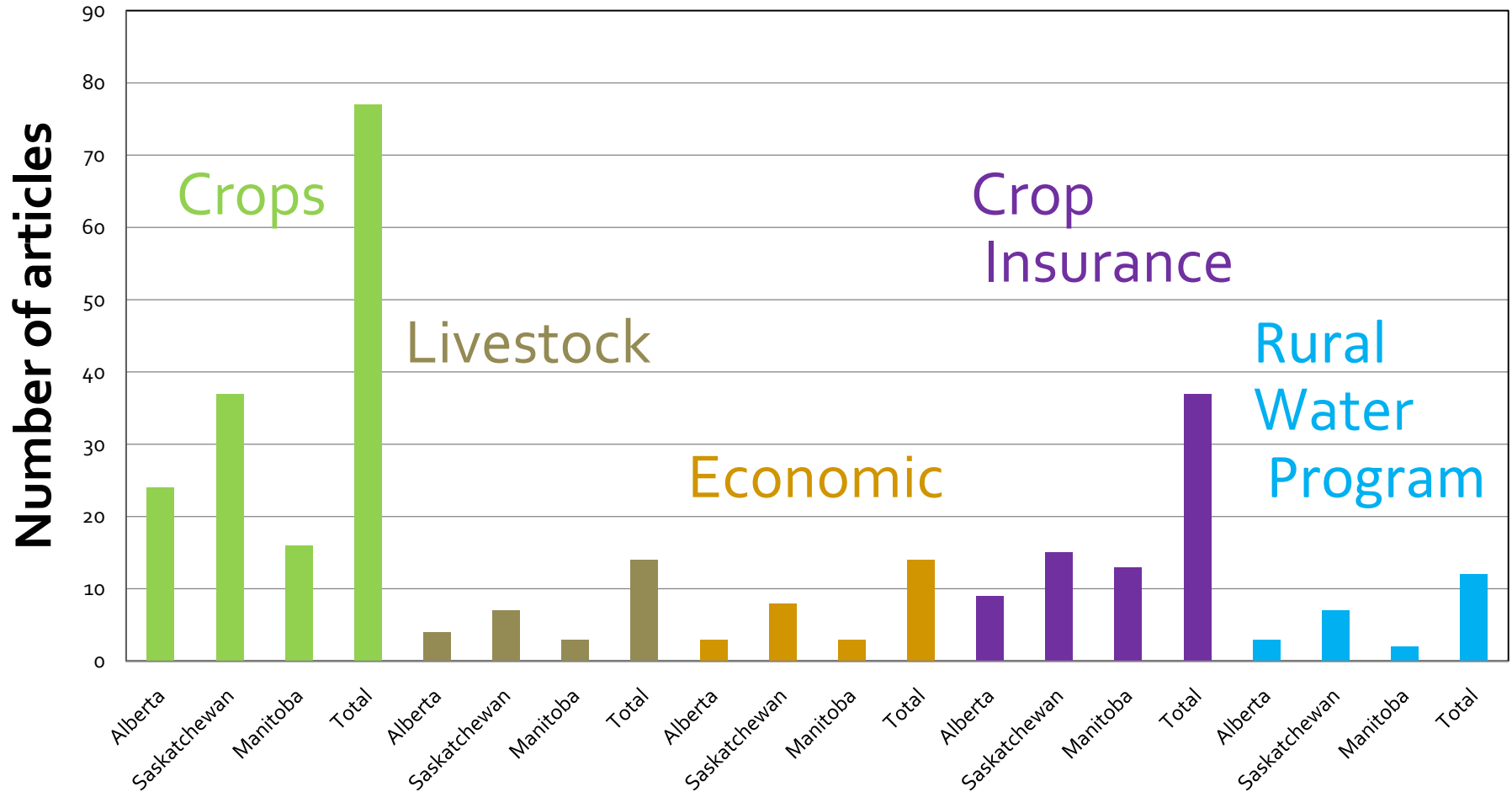
Makes 2010 look like it could be “interesting”

Timeline of Impacts Per Province by Month

Number of articles



Adaptation Types Emphasized By Province



The End



1996-2010?

Questions?

Questions?



References

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