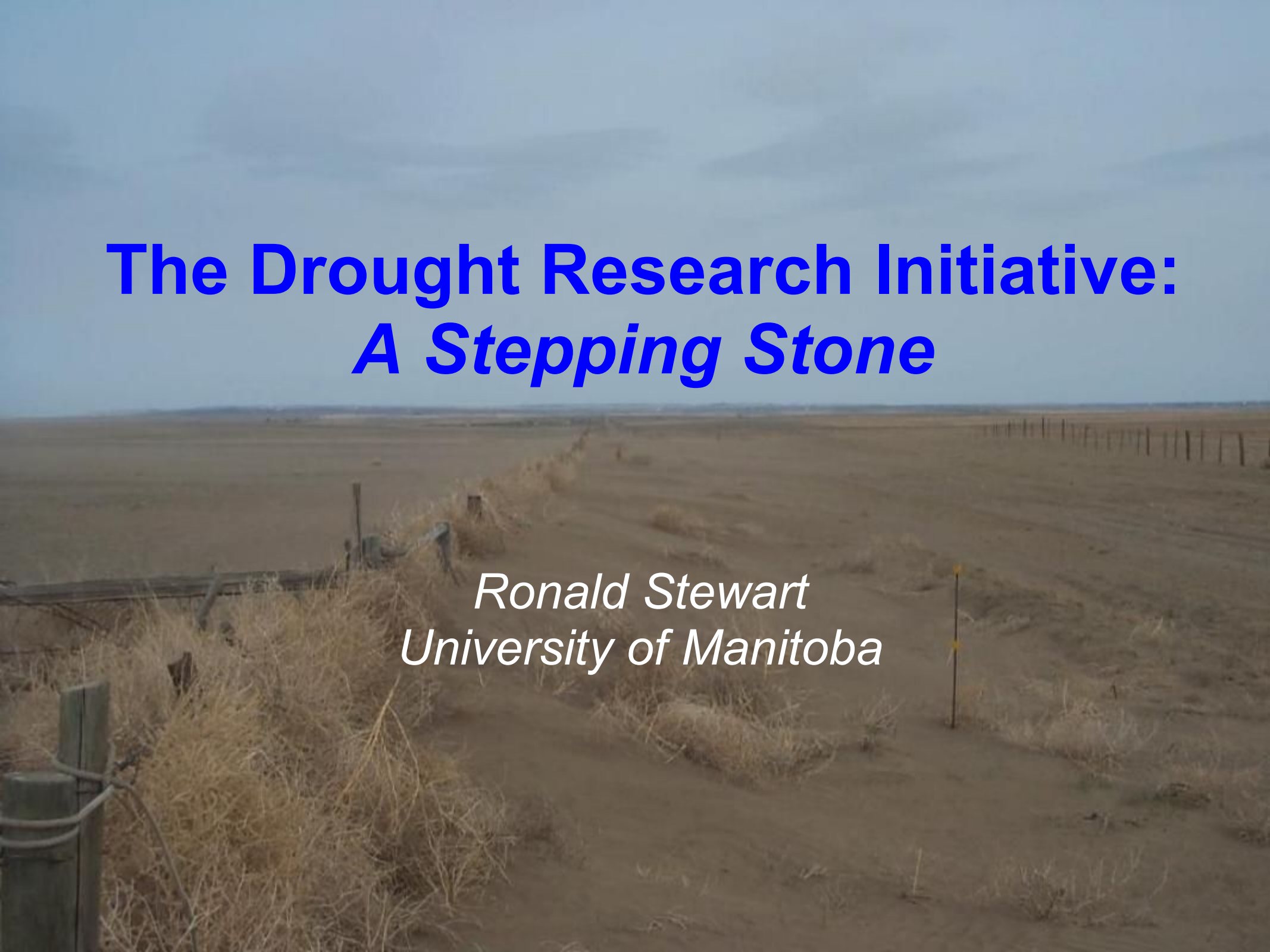
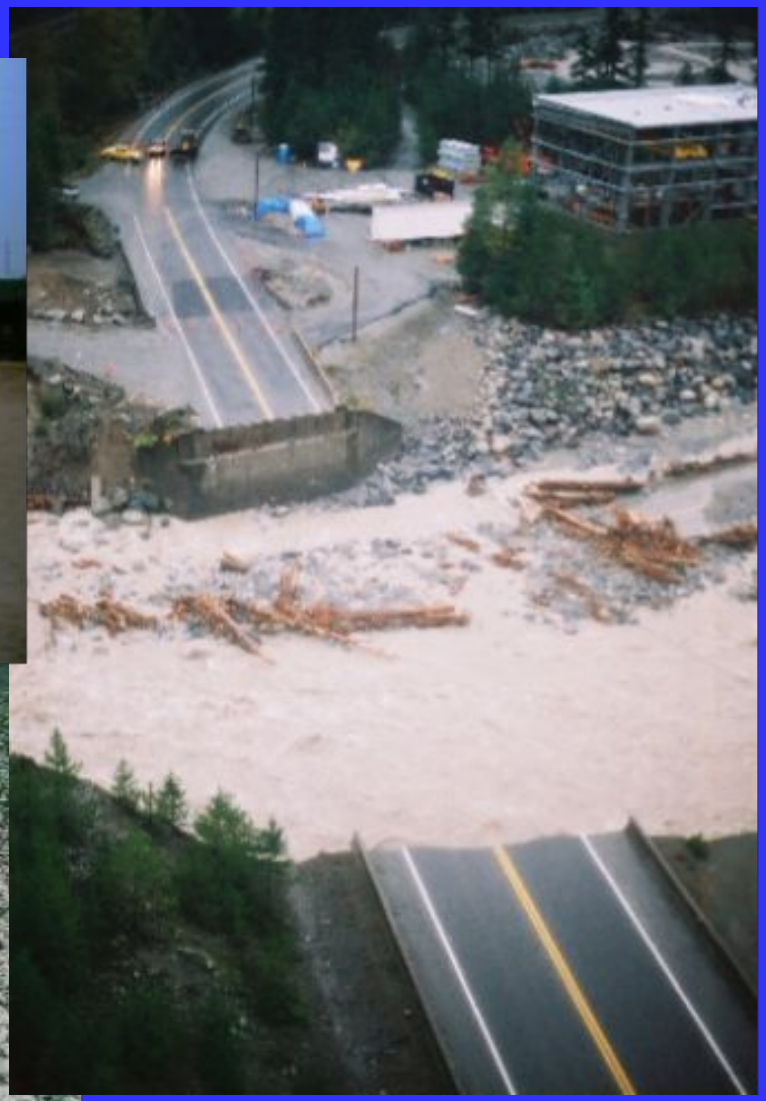


The Drought Research Initiative: *A Stepping Stone*

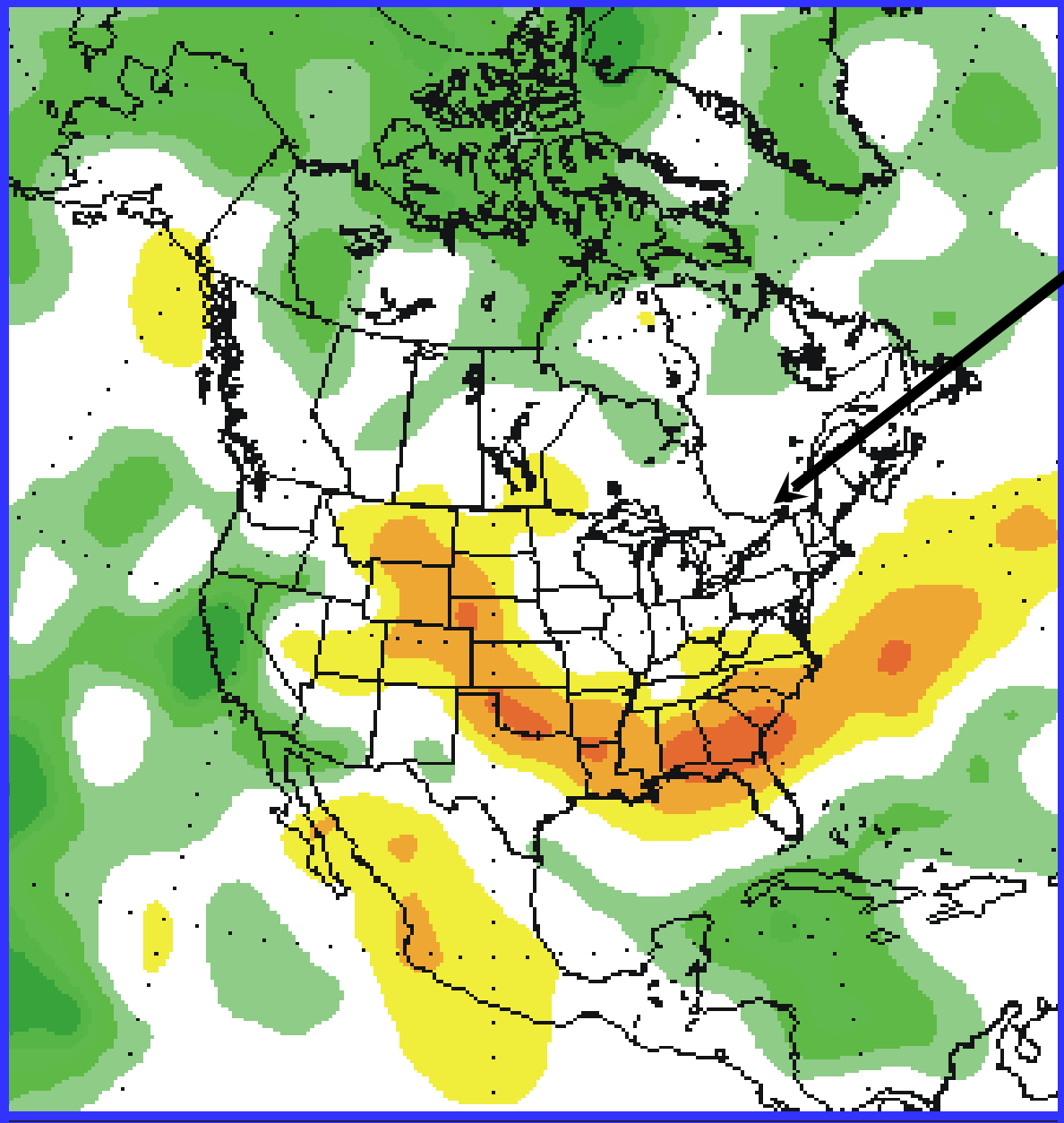
Ronald Stewart
University of Manitoba

IMPACTS OF EXTREMES



And many others

FUTURE PRECIPITATION?

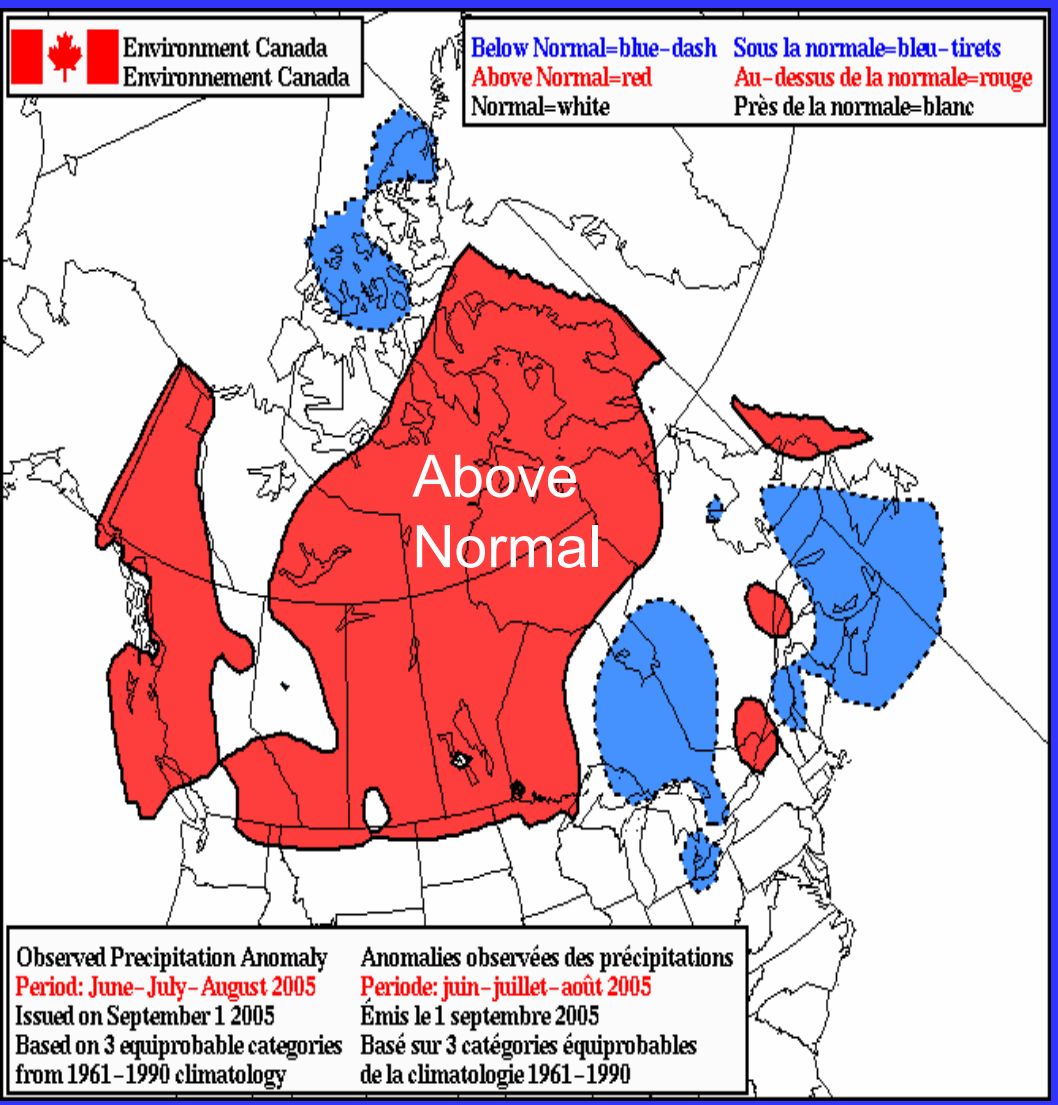


Precip. % Change

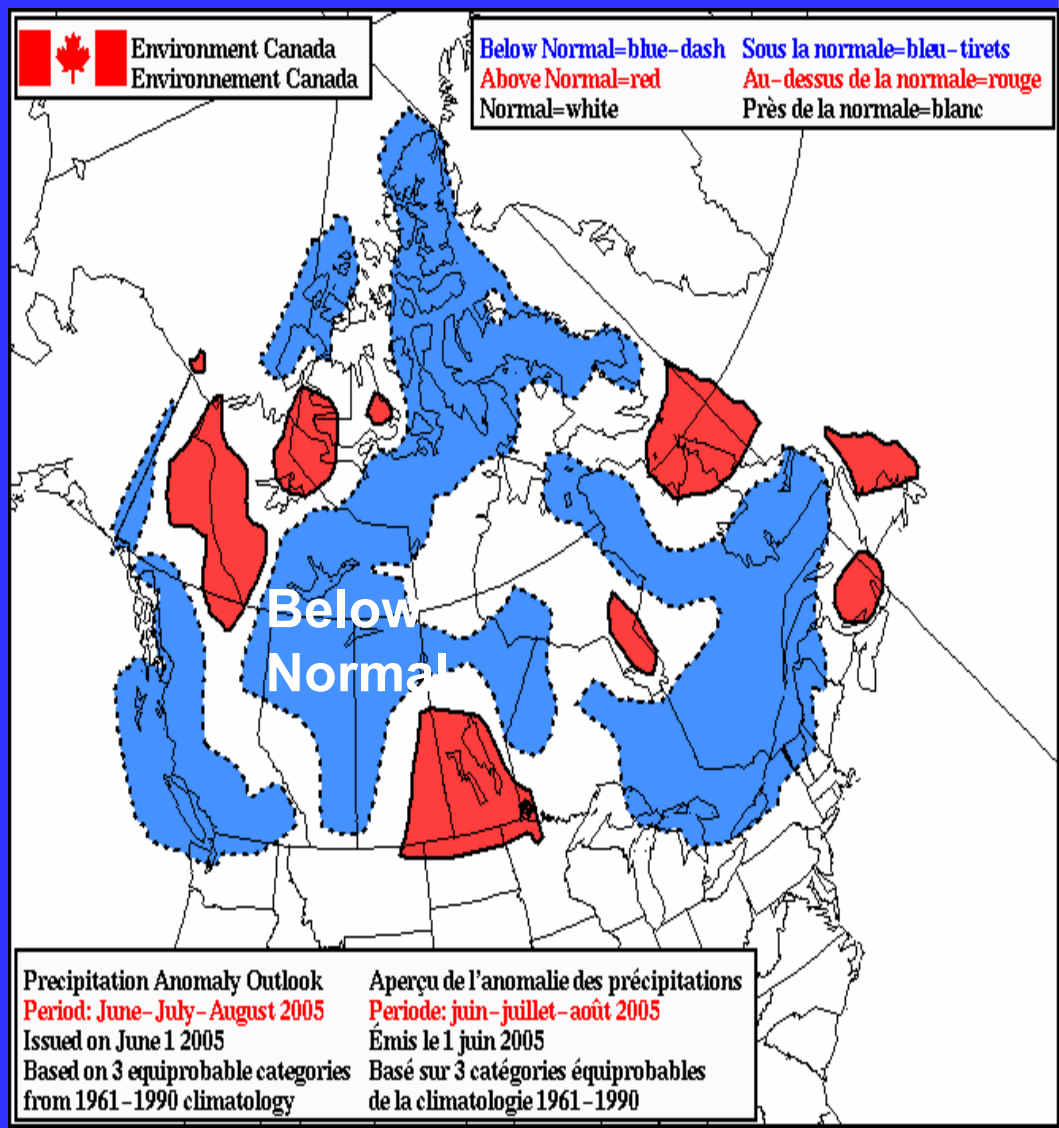
-75 - -30
-30 - -20
-20 - -10
-10 - 0
0 - 10
10 - 20
20 - 30
30 - 40
40 - 50
50 - 75
75 - 100
100 +

SEASONAL PREDICTIONS
Summer of 2005

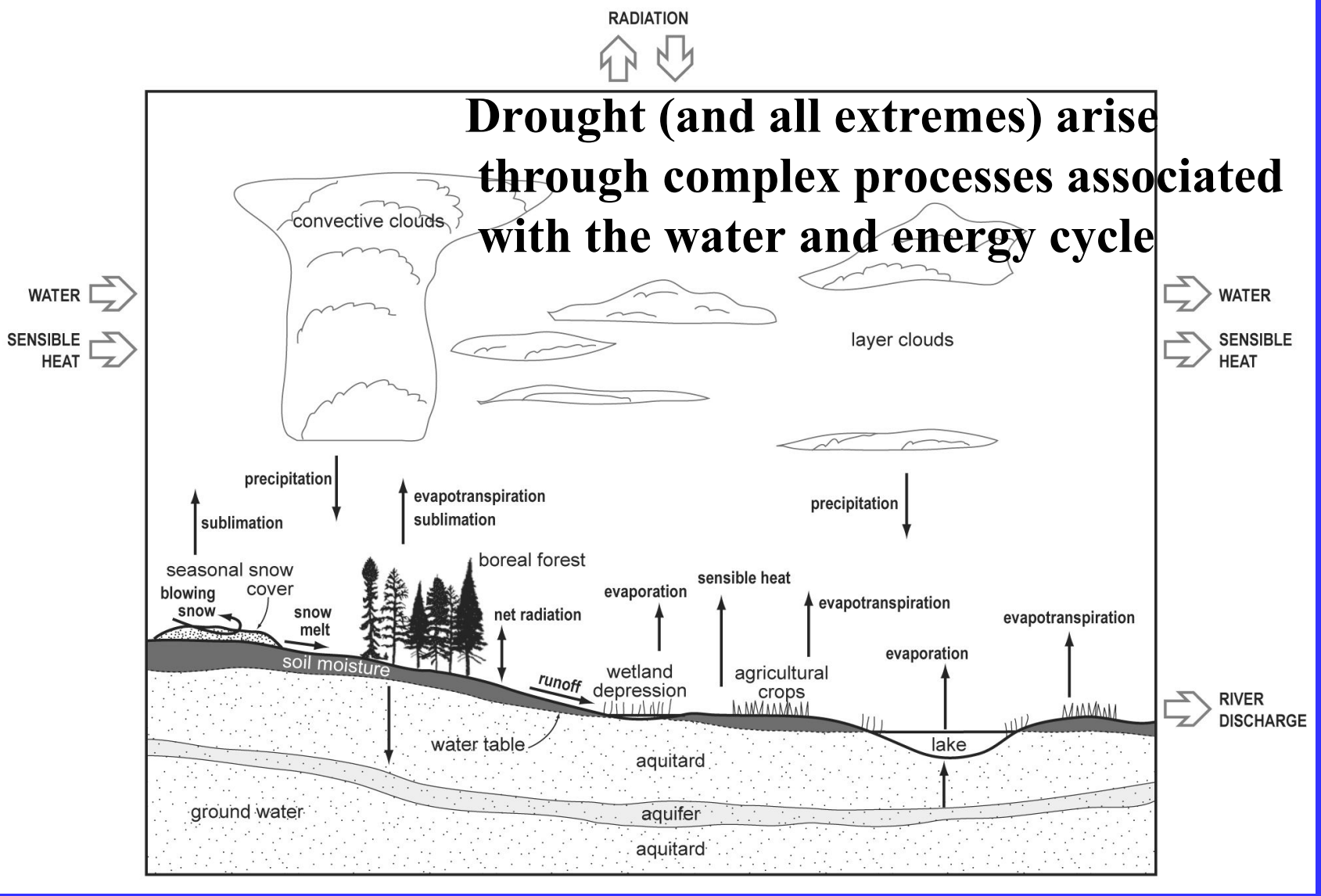
OBSERVATION

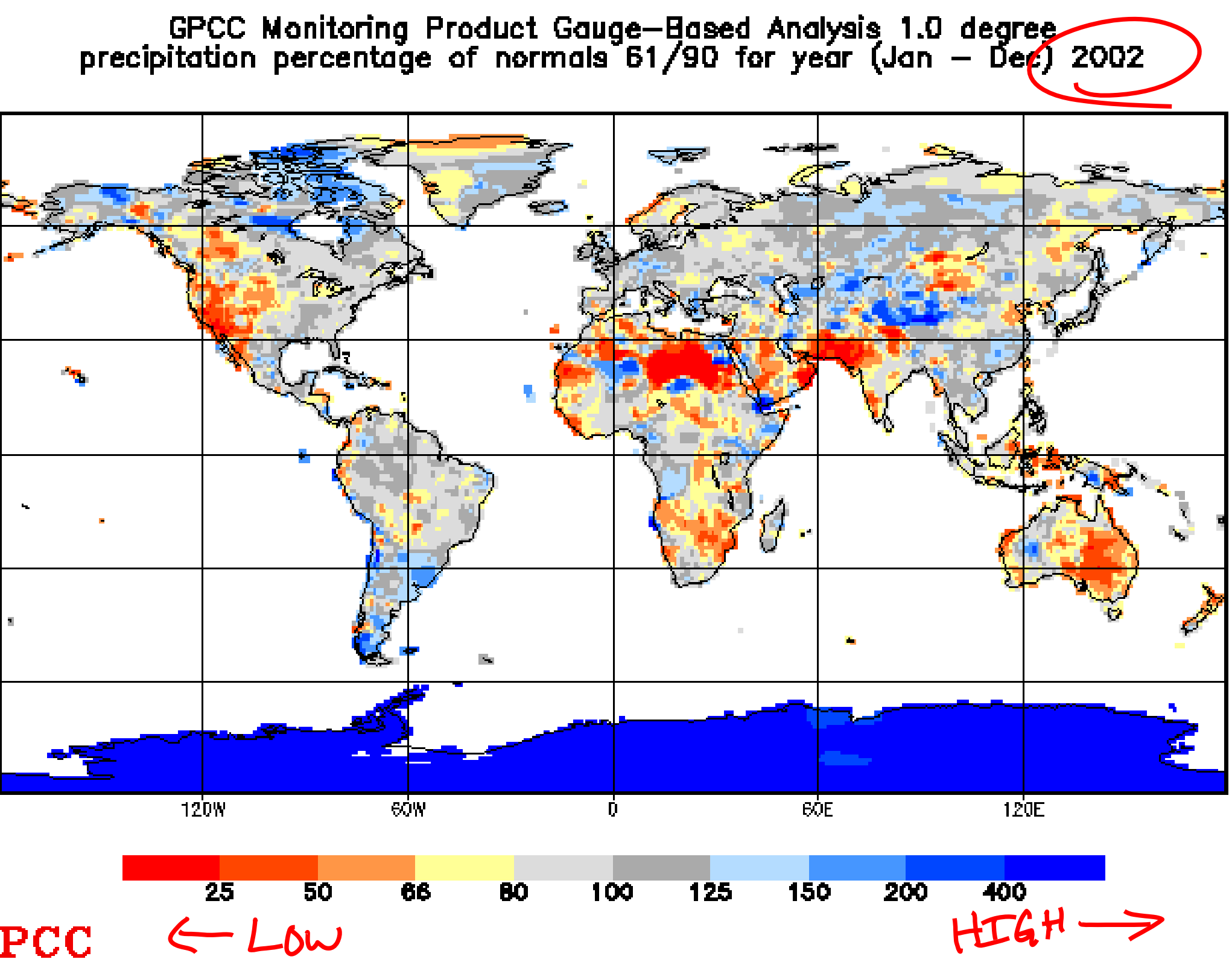


PREDICTION



WATER AND ENERGY CYCLING




GPCC Monitoring Product Gauge-Based Analysis 1.0 degree
precipitation percentage of normals 61/90 for year (Jan - Dec) 2002
120W
60W
0
60E
120E
25
50
66
80
100
125
150
200
400
PCC
← Low
HIGH →


The Canadian
Prairies

OBJECTIVES AND STRATEGY

The objectives of DRI are:

- ***To better understand the physical characteristics of and processes influencing Canadian Prairie droughts, and***
- ***To contribute to their better prediction***

Strategy:

- ***Focus on the recent severe drought that began in 1999 and largely ended in 2005***

BIG ISSUES

Given the 1999-2005 drought, some key issues include:

1. What maintained it over multiple years?

2. What governed its actual structure?

3. Why did it end?

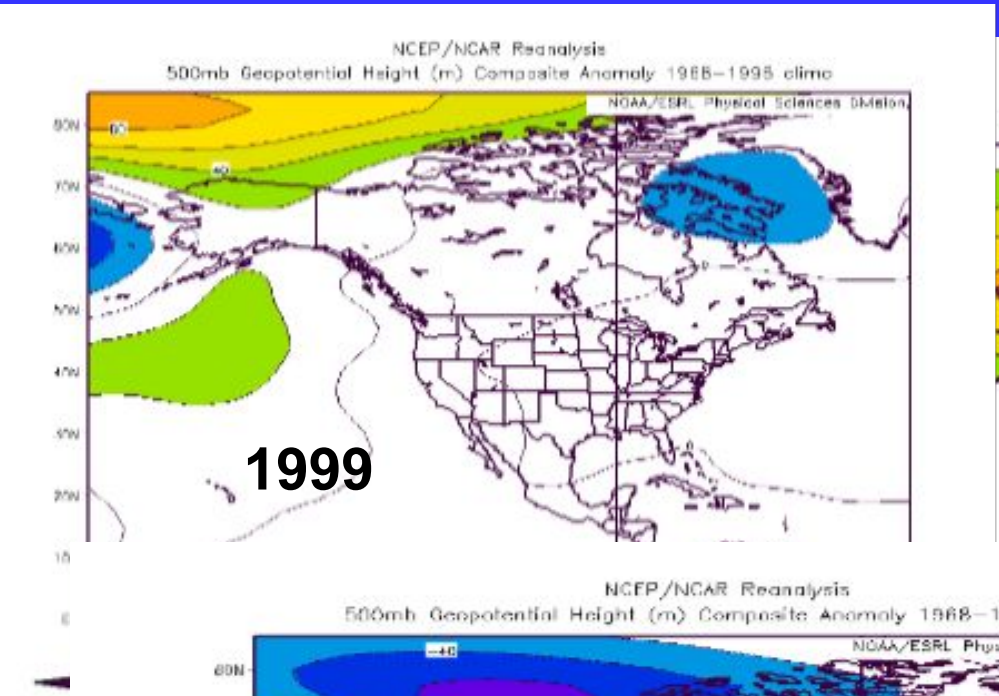
4. What did prediction systems 'miss‘ and why?

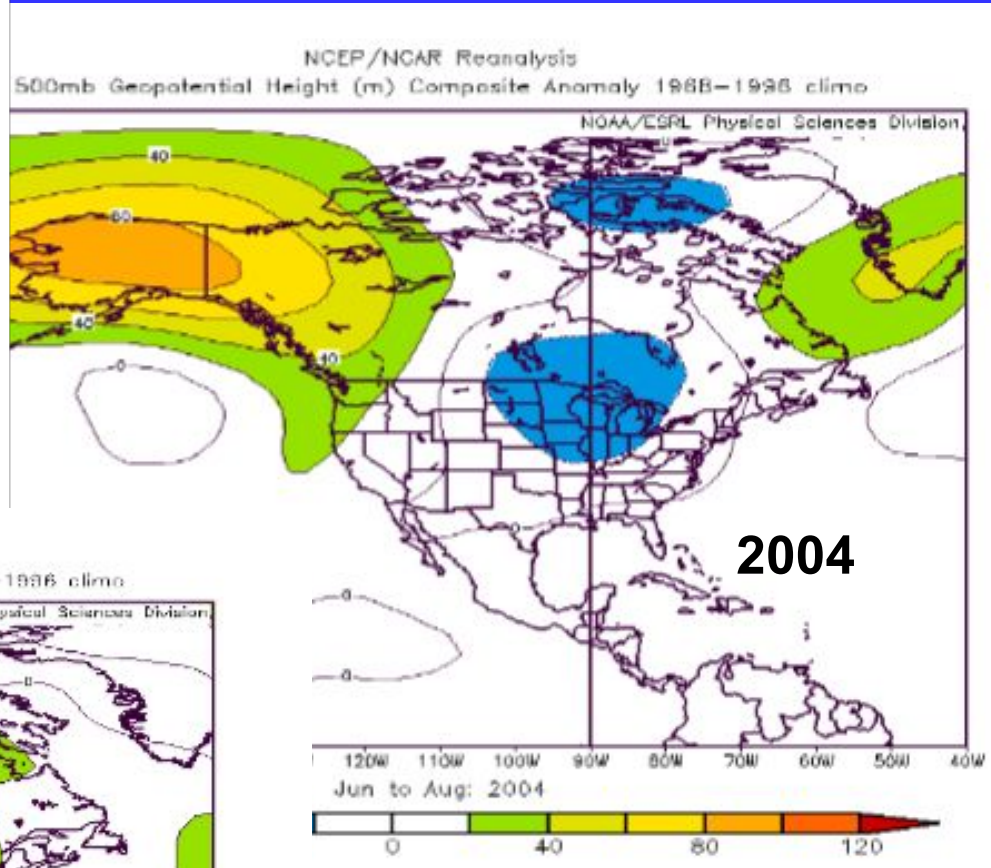
5. Given this progress, how can we better cope with drought?

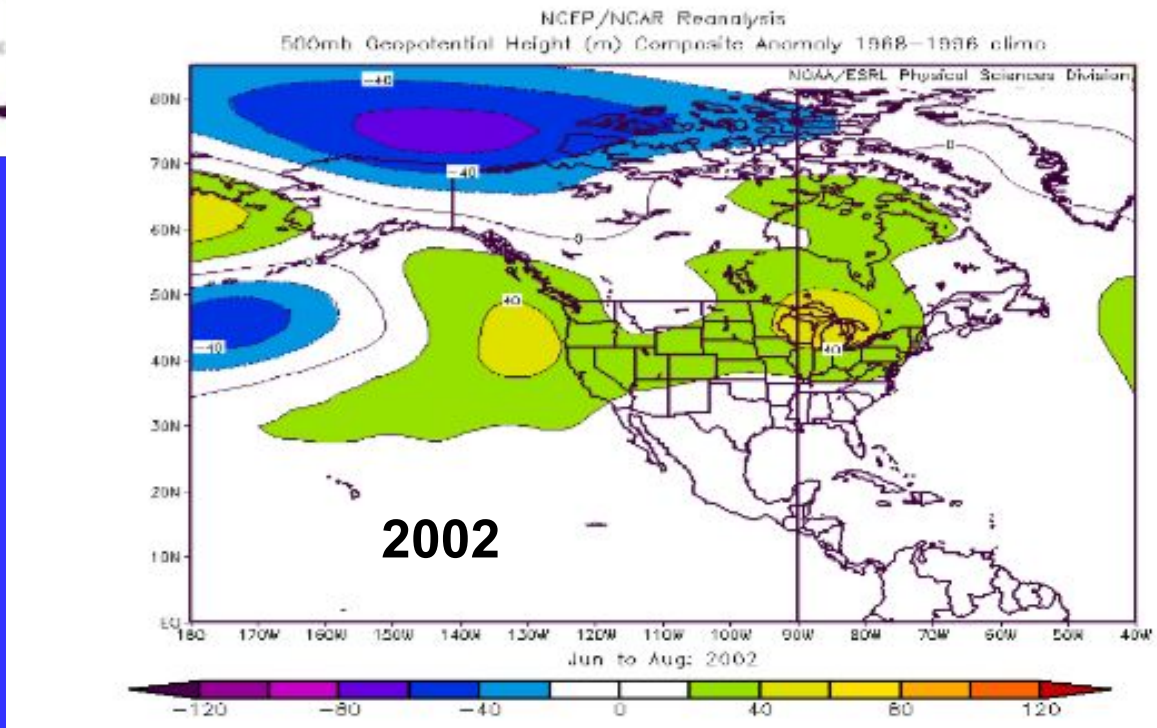
DRI THEMES

- Quantify the physical features,
  - flows of water and energy into and out of the region, and
  - storage and redistribution within the region
- Improve the understanding of processes and feedbacks governing the
  - formation,
  - evolution,
  - cessation and
  - structure of the drought
- Assess and contribute to reducing uncertainties in the prediction of drought
- Compare the similarities and differences of current drought to previous droughts and those in other regions
- Apply our progress to address critical issues of importance to society

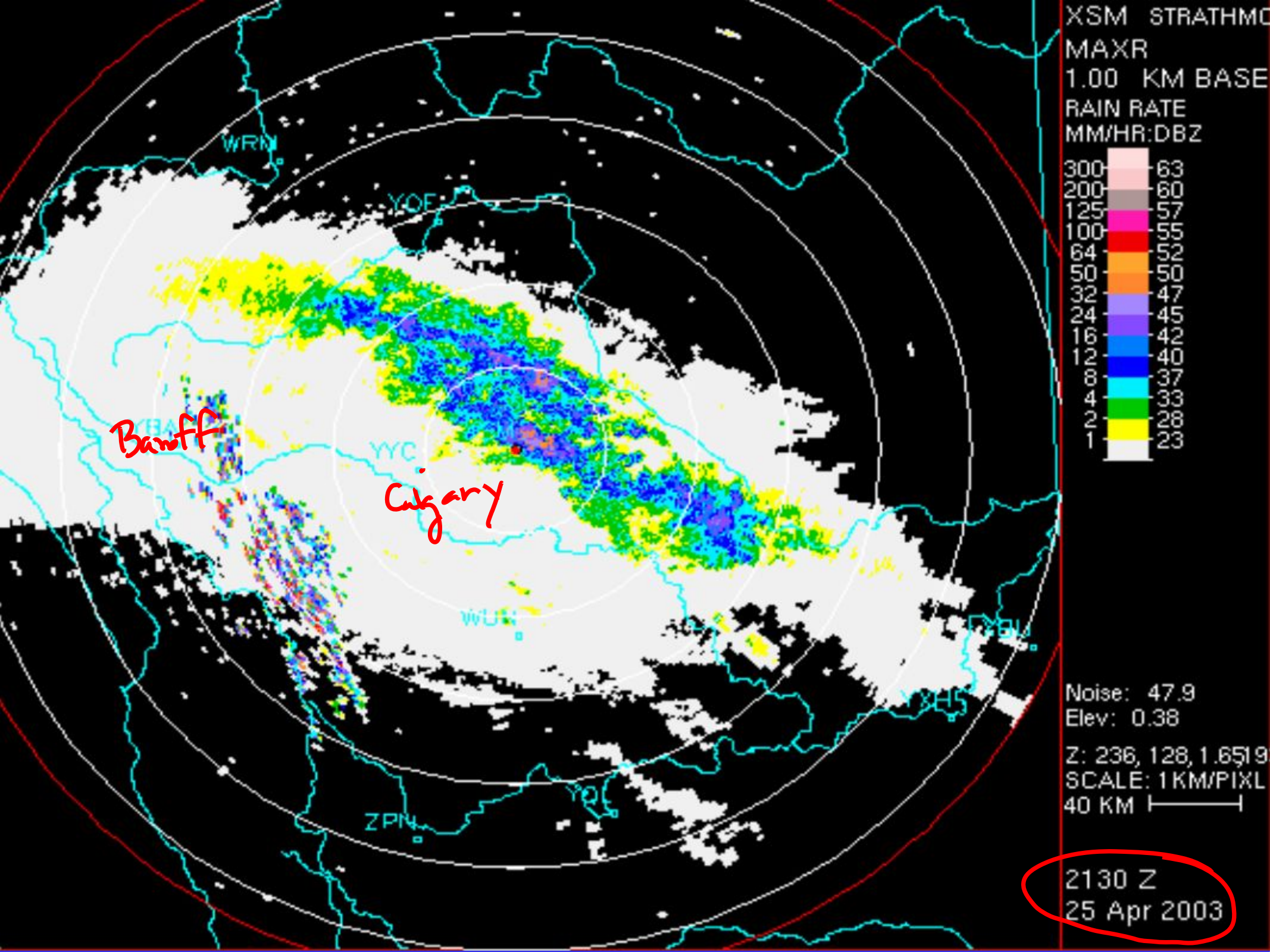
LARGE SCALE ACTUAL PATTERNS







Summer 500 mb


XSM STRATHMO
MAXR
1.00 KM BASE
RAIN RATE
MM/HR:DBZ
300 63
200 60
125 57
100 55
64 52
50 50
32 47
24 45
16 42
12 40
8 37
4 33
2 28
1 23
WRN
YQF
Banff
YYC
Calgary
YXH
ZPN
Noise: 47.9
Elev: 0.38
Z: 236, 128, 1.65
SCALE: 1KM/PIXL
40 KM
2130 Z
25 Apr 2003

DRI STATEMENT
January 2008

We have continued to add datasets to characterize drought and to investigate the many factors leading to, sustaining and ending drought. We have developed interactions with other groups examining drought and other extremes in the United States and elsewhere. Our partners have organized an advisory group to ensure that there are strong two-way interactions with researchers. We are organizing our synthesis article on drought characterization and we have developed a strategy to assess and to contribute to improved predictive capabilities.

CHALLENGES

- Different perspectives
- Data
- Simulations
- ‘Integration’
- Expectations
- …

DRI LEGACY

- The approach, we did it!
- Datasets, models, processes, team, users, outreach
- Synthesis
- Connections (scientific, society, national, international)
- ...

NEXT STEP …

Although still under discussion and of course subject to many things …

Always considered DRI to be just be step 1

Hydrometeorological extremes (dry-wet) and their variability
- short and long term
- reducing impacts, better coping

Up to continental-scale
- including mountainous regions

In partnership
- Canadian efforts
- US and international efforts

In Summary …

Extremes are a fundamental aspect of the climate system

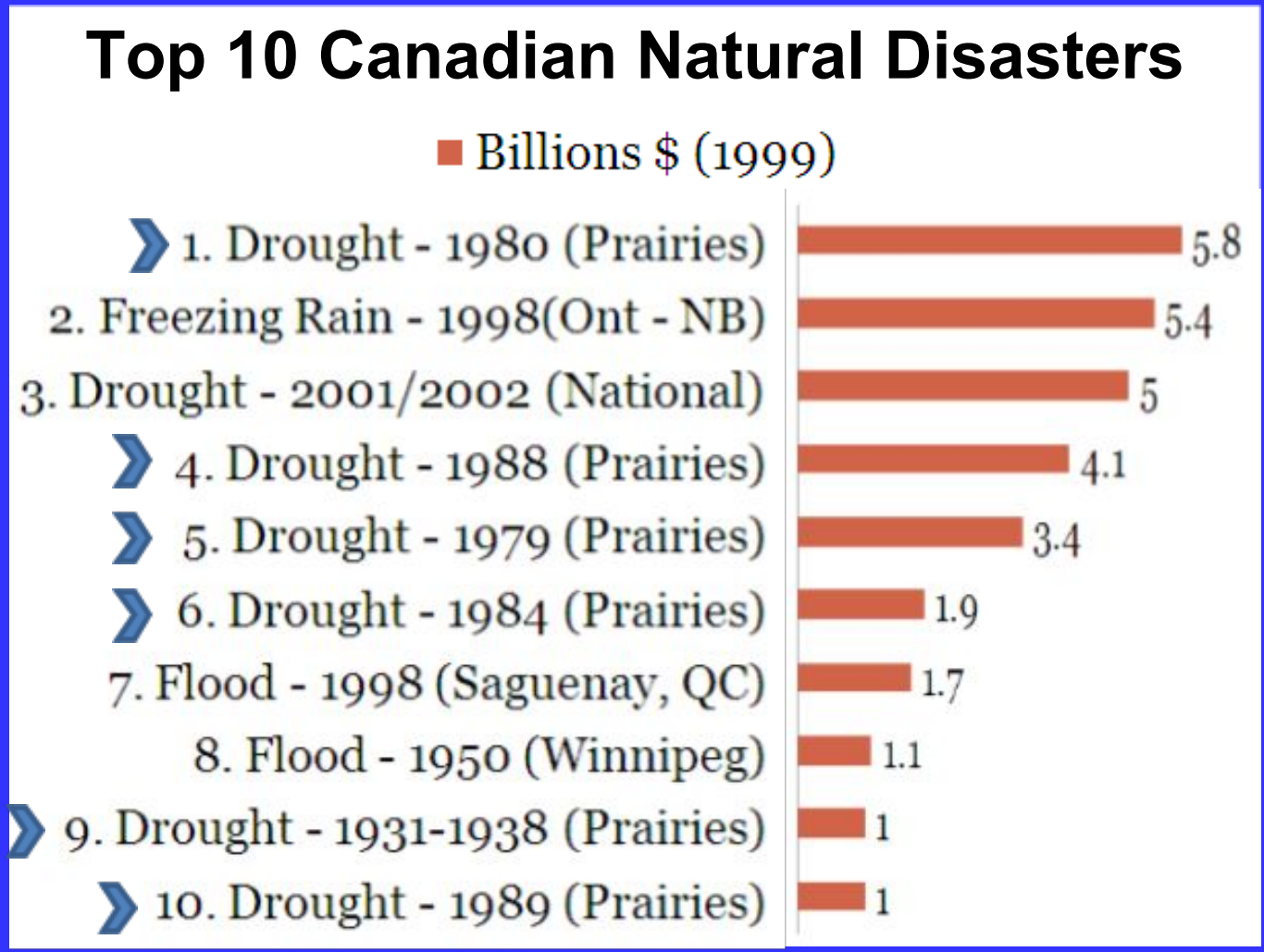
DRI is addressing one type of extreme, drought, over the Prairies with a focus on a particular event

The next step will (probably and hopefully) involve a greater focus on extremes and their variability (dry-wet) and over a wider spatial domain.


Thank you for your attention

Motivation

- Drought is Canada's most consistent and costly natural disaster, yet until recently there has been no coordinated effort to study and understand drought in Canada.
- Canadian Prairies are particularly vulnerable, and they recently experienced a multi-year drought (1999-2005).



(Etkin, 2004)