

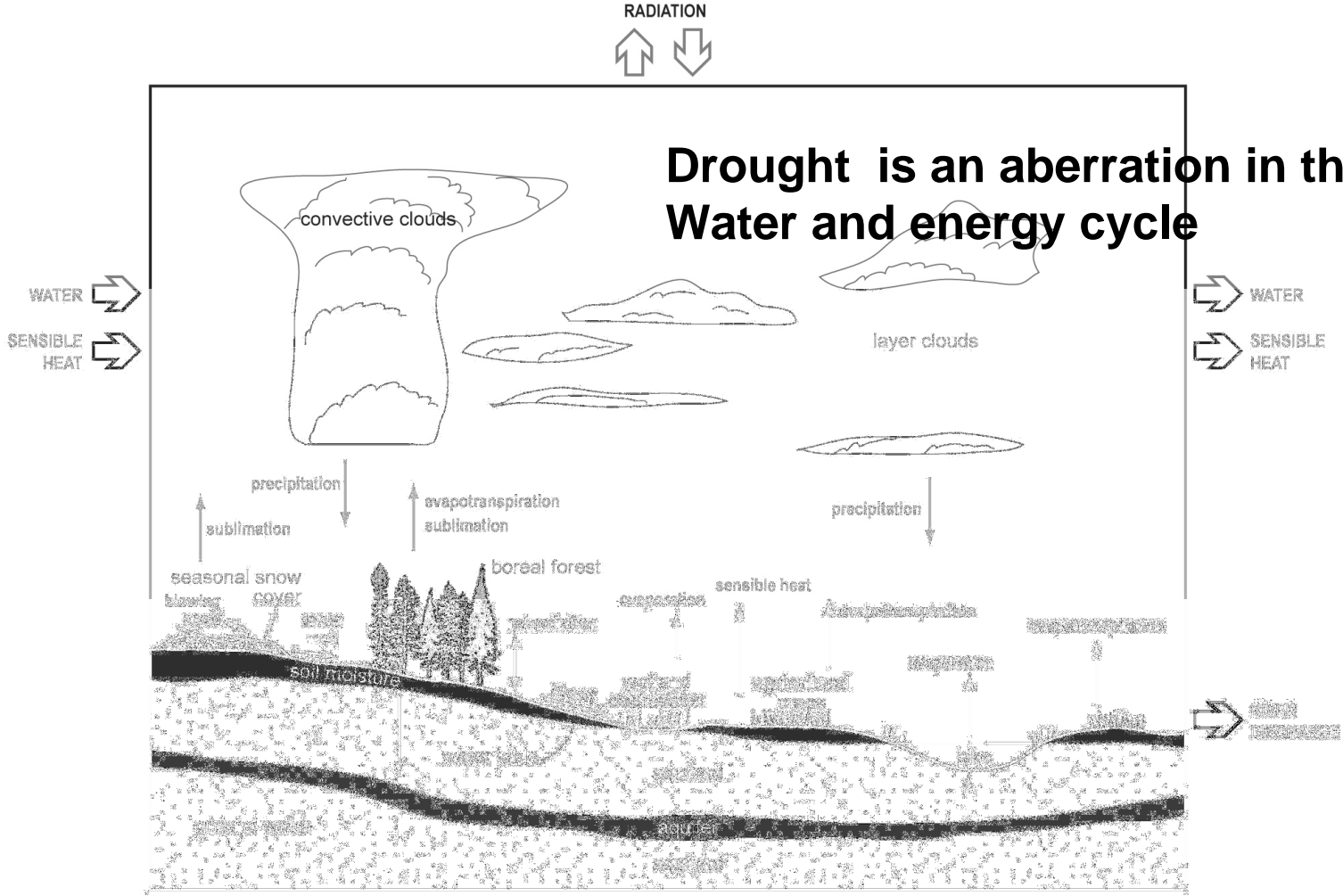
DROUGHT, STORMS AND WATER BUDGETS

Ronald Stewart
McGill University

OBJECTIVES

- ***To better understand the flow of water vapour into and through clouds and precipitating systems to the surface within and adjacent to drought regions***
- ***To apply these advances to surface and sub-surface water issues and to prediction capabilities***

WATER AND ENERGY CYCLING



FOCUS

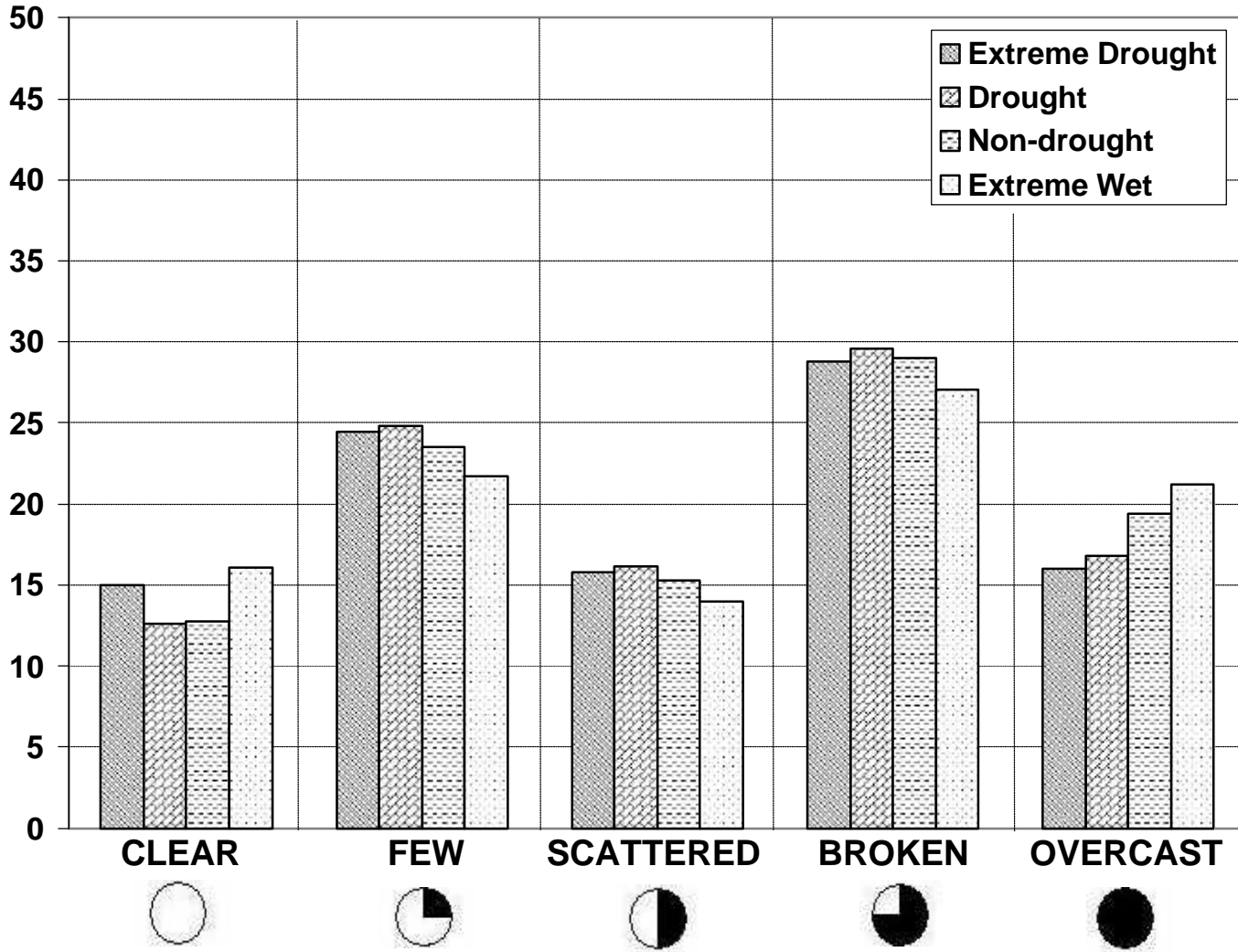
Sub-Issues

- **episodic events producing heavy, widespread precipitation**
- **threshold conditions for precipitation to reach the surface**

Key issues

- **external and local moisture sources**
- **cloud systems efficiency to convert vapour into surface precipitation**
- **drought environment possibly enhancing the strength and/or efficiency of some precipitating systems**
- **scattered, partially drought-alleviating precipitation**
- **surface and sub-surface moisture conditions**
- **current models capabilities**

FRACTIONAL OCCURRENCE OF CLOUD FOR EACH OF THE FOUR CONDITIONS 00-23 LST (%)

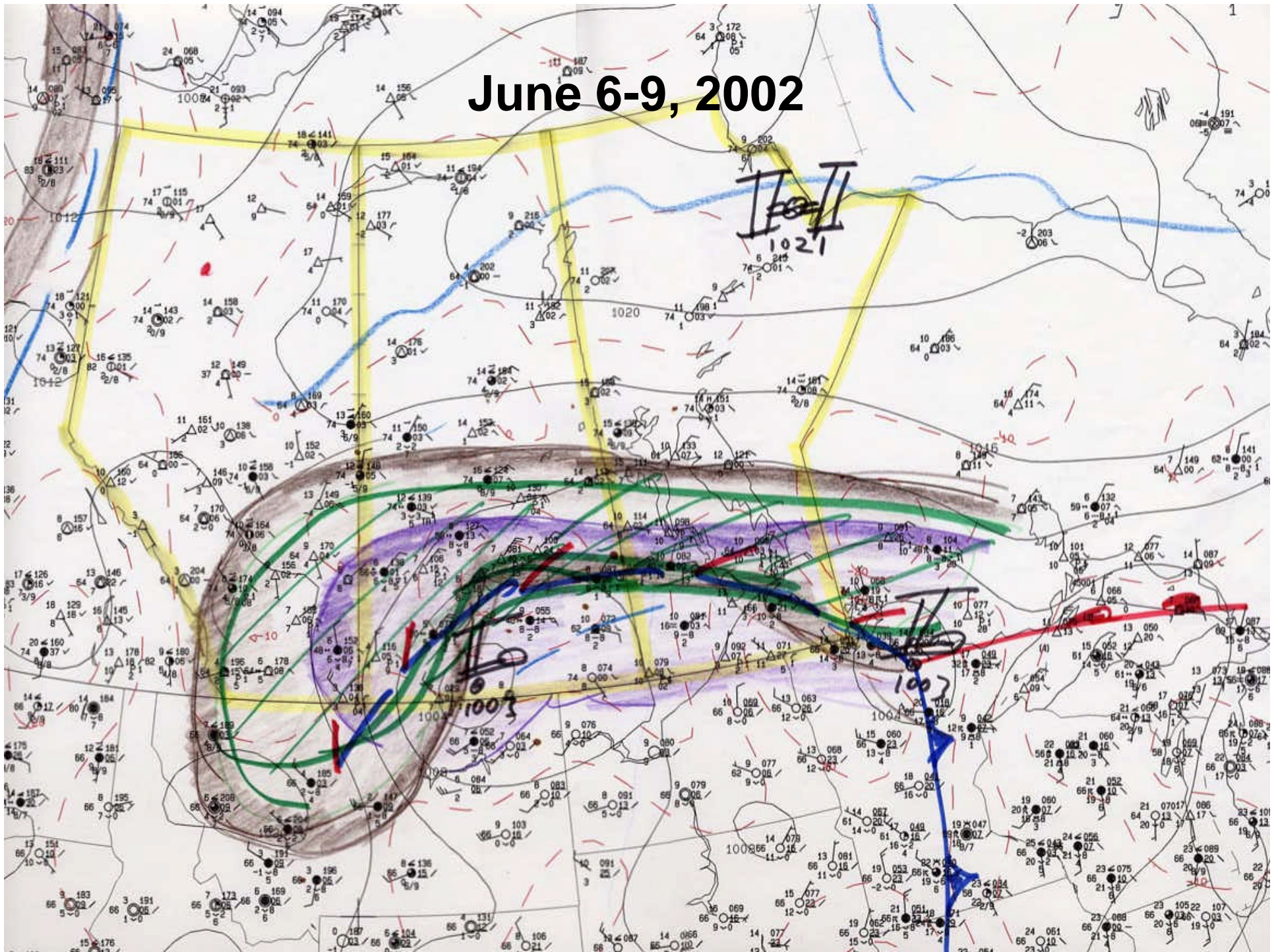


SOUTHERN SASKATCHEWAN

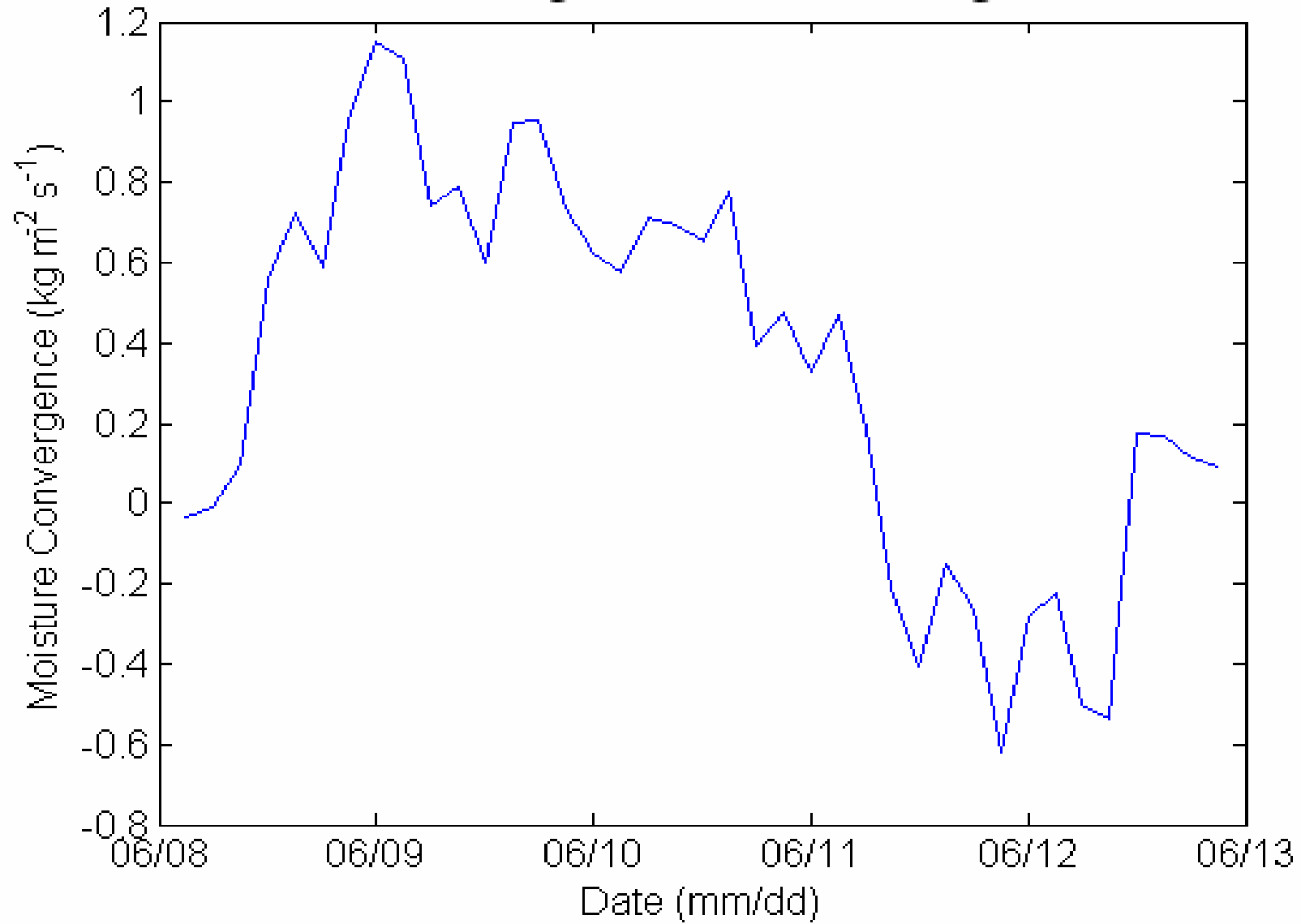
April 2002



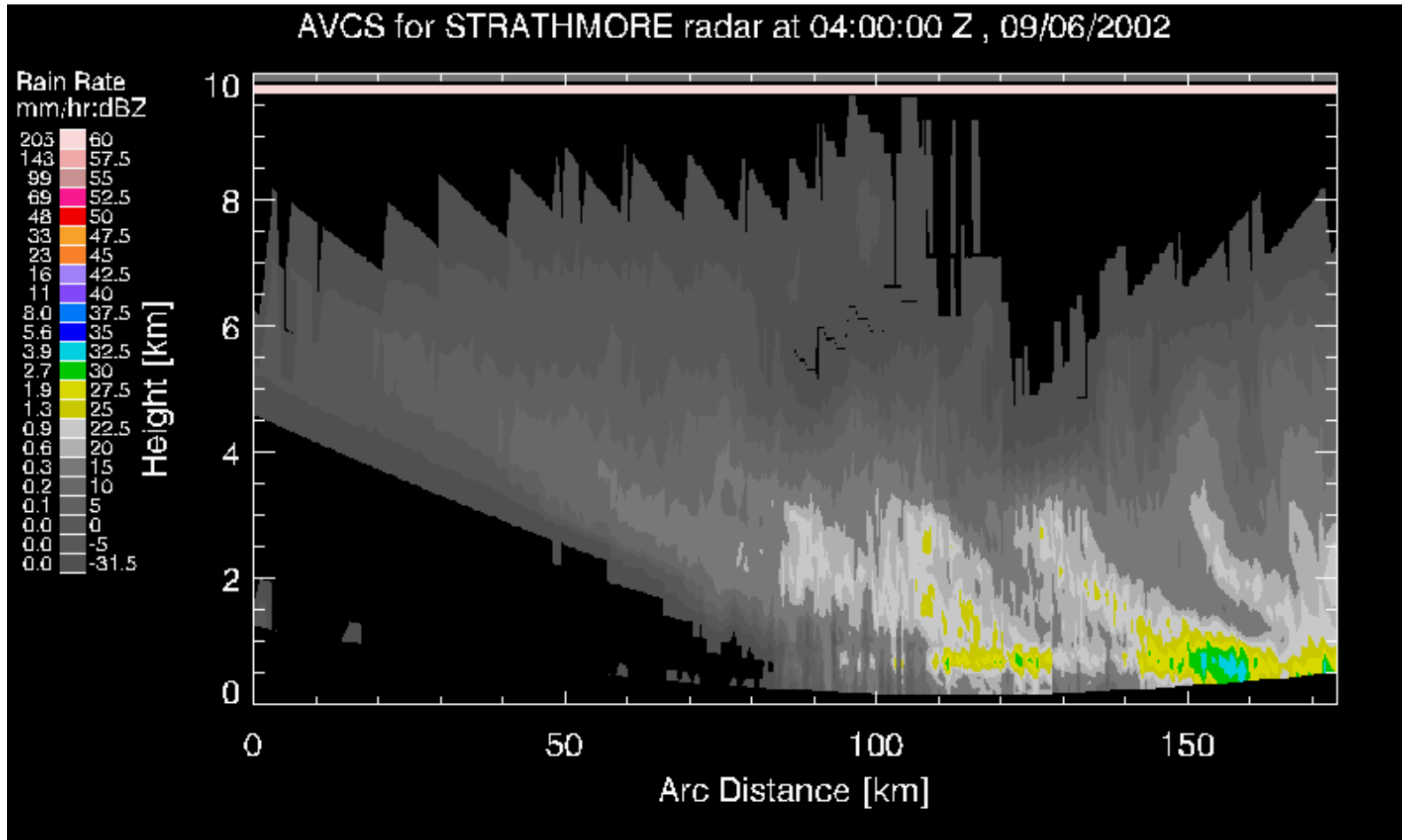
June 6-9, 2002



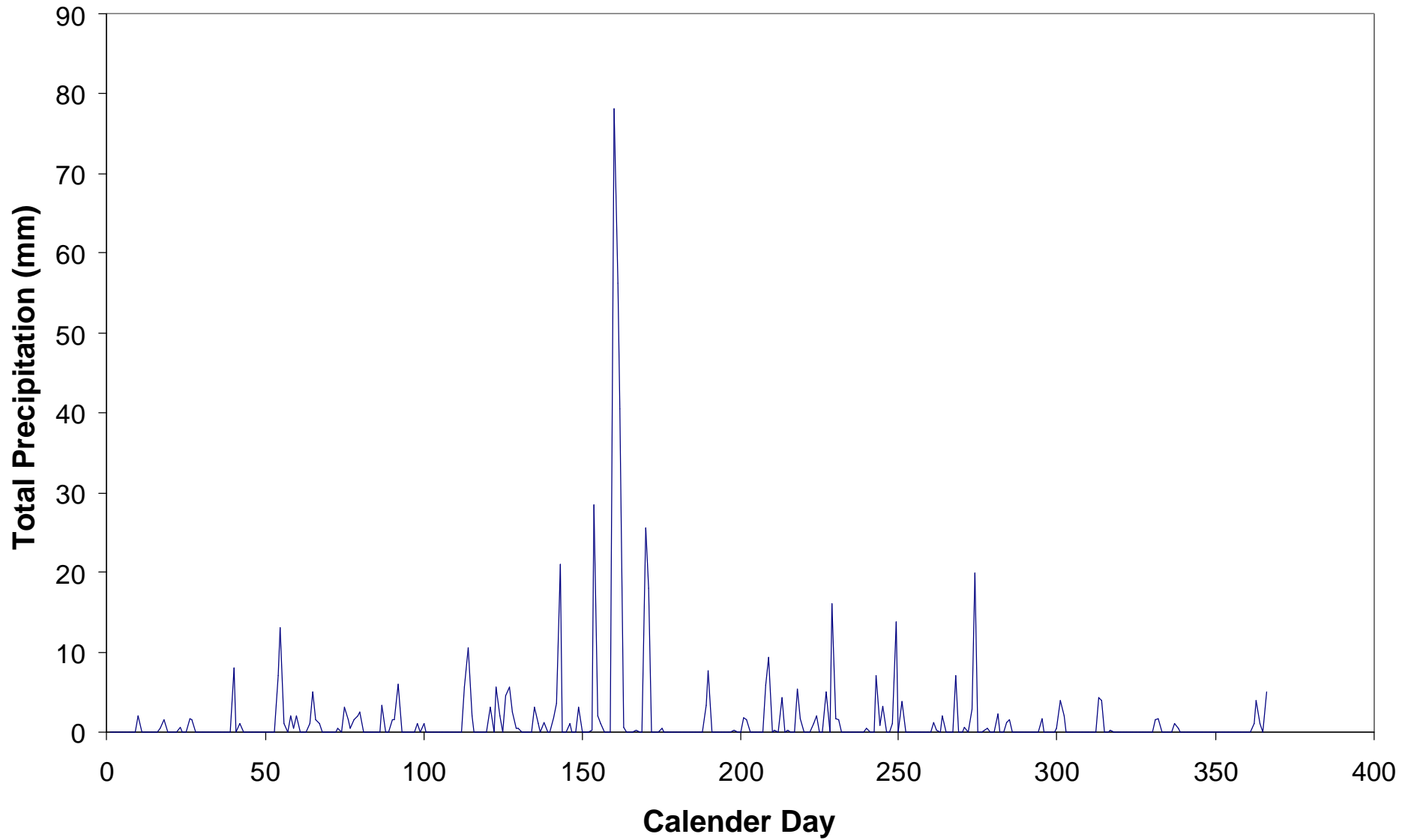
Moisture Convergence over Lethbridge, Alberta



LARGE OVERHANGS



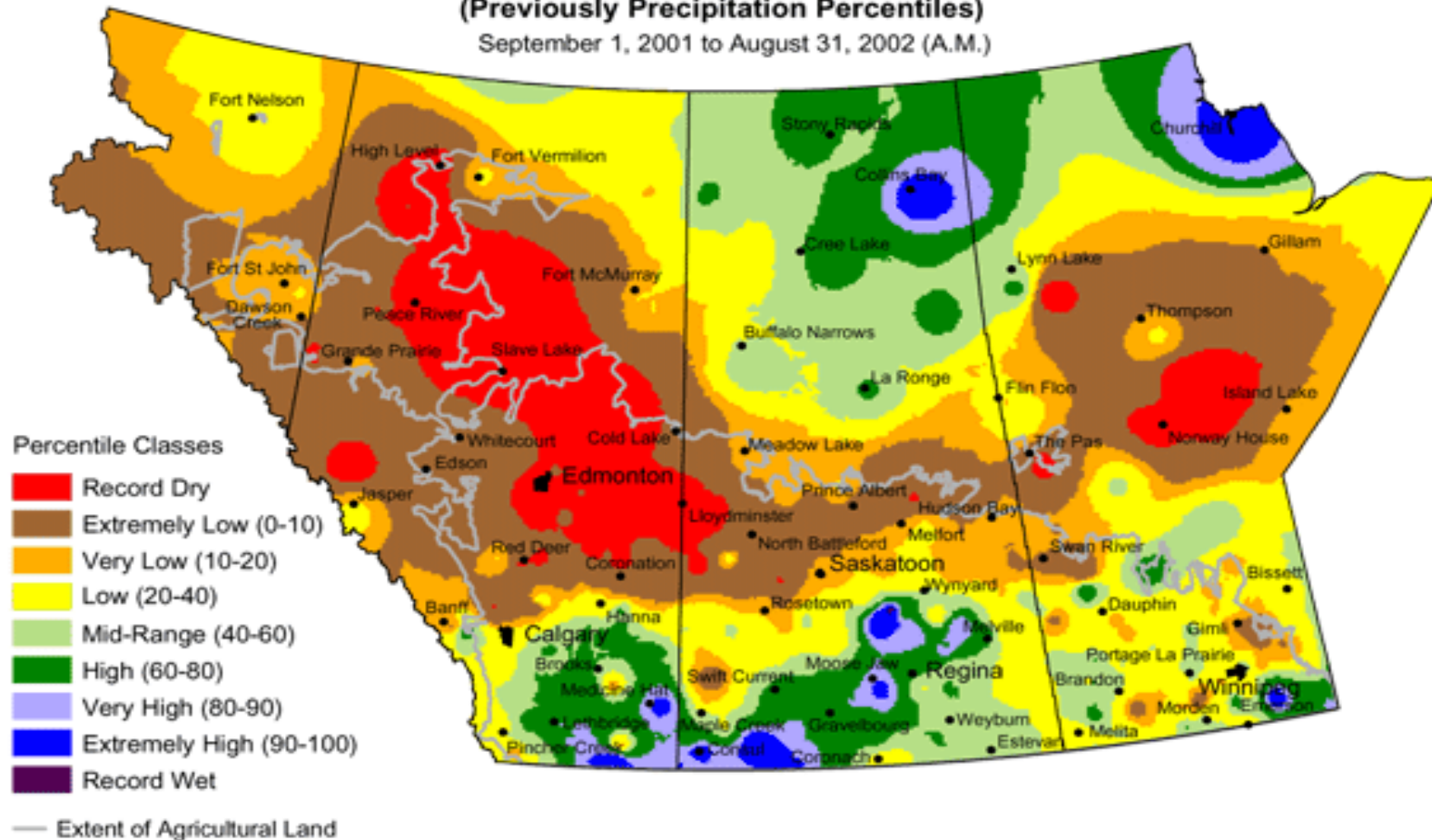
Lethbridge 2002



CANADIAN PRAIRIES

2002

Current Precipitation Compared to Historical Distribution
 (Previously Precipitation Percentiles)
 September 1, 2001 to August 31, 2002 (A.M.)



Prepared by PFRA (Prairie Farm Rehabilitation Administration) using data from the Timely Climate Monitoring Network and the many federal and provincial agencies and volunteers that support it.

SOUTHERN SASKATCHEWAN

April 2002

What were the consequences of this precipitation on surface and sub-surface moisture conditions?

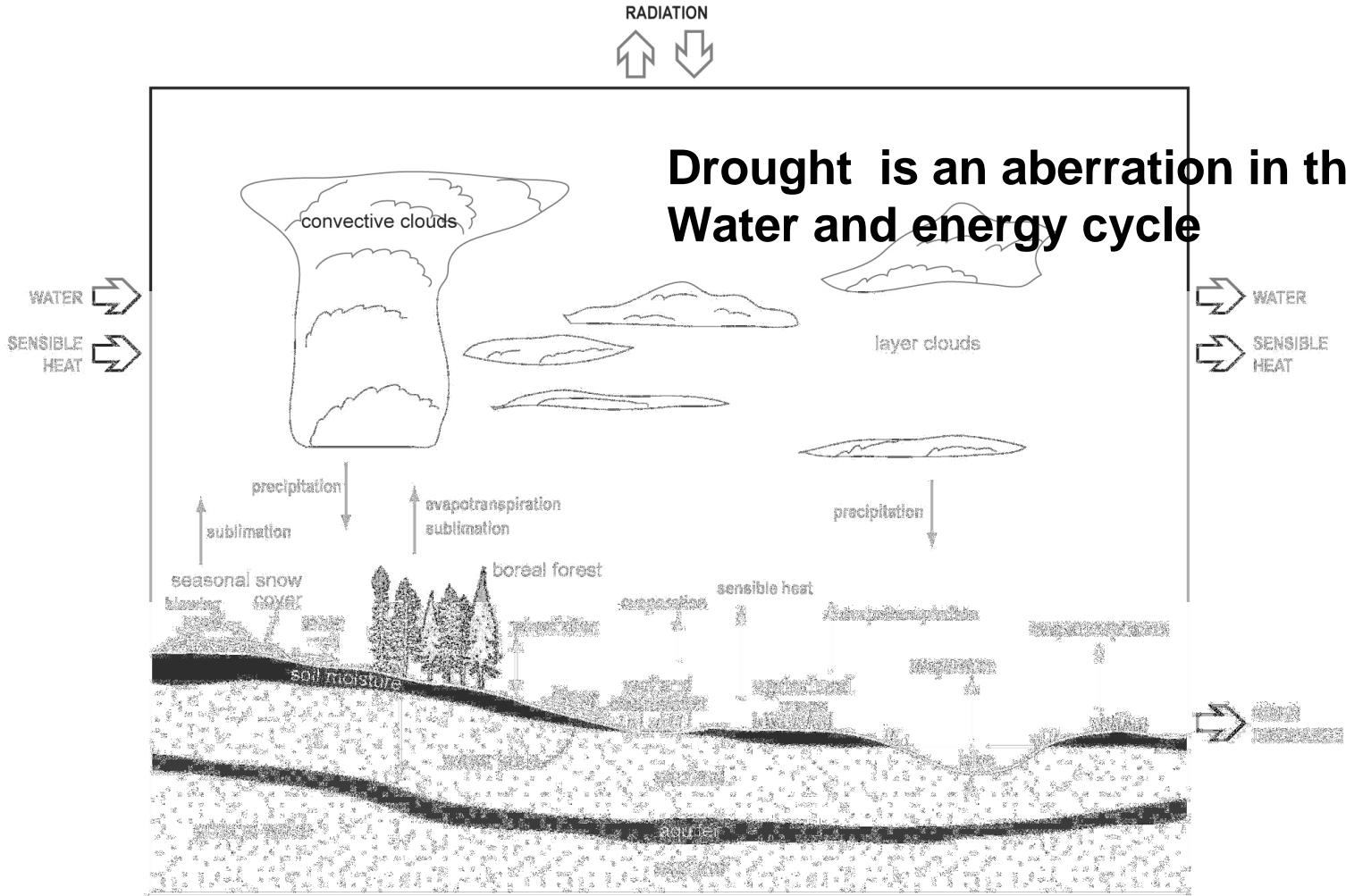


OUTCOMES

This research will result in several outcomes including:

- Quantitative assessment of several branches of the water cycle in relation to drought
- Assessment of simulation and predictive models and (probably) recommendations for their improvement

RELEVANCE TO DRI ...



SUMMARY

Two points:

- This research represents one contribution to the entire DRI effort
- It, along with all other contributions, will be the basis for our collective synthesis of the 1999-2004/05 drought