

**Theme 2: Atmospheric Processes**  
**Associated with the 1999-2005 Drought**  
**over the Canadian Prairies**

**DRI Cross-Cutting Issue on**  
**Drought Processes**



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# Background

- | Processes and feedbacks during drought act on a variety of spatial and temporal scales
- | A key task of DRI is to better understand the atmospheric and hydrologic processes and feedbacks responsible for the initiation, persistence, and termination of this recent drought
- | This cross-cutting theme focuses on linkages among the various atmospheric processes associated with the 1999-2005 Prairie drought



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# Methods

## 1. Documentation of atmospheric conditions associated with the drought (from Theme 1)

This will be a series of individual studies at specific spatial and temporal scales and will include:



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# Methods

## A) Teleconnections to synoptic scale (Bonsal, Shabbar, Gyakum)

- | Global SSTs
- | Geopotential Heights – Blocking, storm tracks, jet stream
- | ENSO, PDO, PNA, AMO, AO, NAO, QBO
- | Large-scale soil moisture



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# Methods

B) Mesoscale to synoptic scale (Szeto, Stewart, Strong, Leighton)

- | Water and energy budgets, storms/thunderstorms, clouds, precipitation

C) Mesoscale atmosphere to surface (Hanesiak, Raddatz, Lin)

D) Surface features associated with the drought: Temperature and precipitation, drought indices, soil moisture, evaporation (Wheaton and others)



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# Methods

2. Linkage of aforementioned studies to determine how atmospheric processes at various scales interacted to initiate, perpetuate, and terminate the drought
3. Integrate findings with Theme 2 hydrologic studies of processes and feedbacks associated with the recent drought



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# Key Questions for Discussion

- | How do we tie the different components together?
- | What components are missing? How do we handle this?
- | Can these processes explain the spatial and temporal aspects of the drought? (e.g. Core drought regions, drought migration patterns – related to shifts in the jet stream?)
- | Can shifts in large/synoptic scale atmospheric patterns account for individual extreme events during the drought? (e.g. major precipitation event in southern Alberta in June 2002)
- | Others?



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