

# Drought Research Initiative 1<sup>st</sup> Annual Workshop

Saskatoon, Saskatchewan - 11-12 January 2006

## Breakout Sessions

### Theme-2 - Understand processes and feedbacks of the recent drought

#### Important issues

1. How do we define droughts?
  - Do we use soil moisture? Precipitation?
  - The drought with respect to soil moisture is dependent on what happens on the prairie, whereas the drought with respect to river flow (e.g. South Saskatchewan) depends on what happens in the mountains. What is our scope?
2. Evapotranspiration is the critical feedback affecting land-surface and atmospheric processes at all scale. How can we improve our understanding of ET?
  - We need to study ET in relatively small watersheds, where we can close the water balance with reasonable confidence.
  - These small watersheds will be used for algorithm development and accuracy assessment.
  - Without some confidence in ET model at small scale, we cannot trust ET modeling at large scale.
3. Small-scale, or even point study will be effective for examining runoff generation.
4. Many of the on-going process studies and monitoring started after 1999. How can we examine the processes that initiated the drought in 1999?
  - We will calibrate process models using the current data, and use the models to hind-cast the conditions in 1999.
5. In order to examine the processes causing onset and cessation of droughts, we need to look beyond the most recent drought. It is important to carry out Theme 4.
6. What is the role of groundwater?
  - Is lateral flow of groundwater important for watershed water balance?
  - Can groundwater flow be considered mostly vertical?
  - Where are recharge areas and how does the recharge take place?
  - How do groundwater processes affect water levels in wetlands?
7. What is the relative importance of synoptic scale forcing vs. atmospheric instability?
8. How does convection develop over wet-dry boundaries of the land surface (10-100 km scale)?

**Priority List for Year 1**

1. Water balance of small watersheds to evaluate the change in moisture storage, with special emphasis on ET. Potential sites are St. Denis National Wildlife Area, Assinniboin Delta Aquifer, West Nose Creek watershed, BERMS sites, and Bratt's Lake. There may be more sites suitable for water-balance study.
2. Evolution of droughts at synoptic scale, with emphasis on synoptic forcing and atmospheric instability.
3. Convection associated with wet/dry boundaries of the land surface.

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