

Extreme Precipitation Events During the Recent Drought

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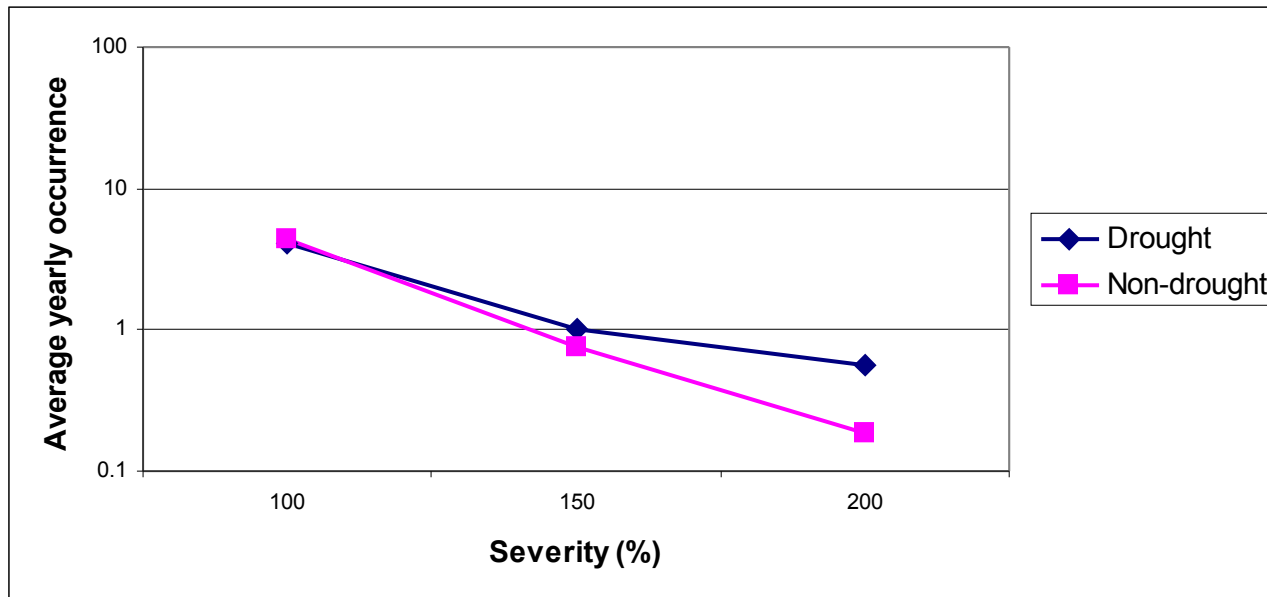
- For the drought years (1999-2005) EC daily precipitation data was analyzed at 14 Stations over the Prairies to find extreme precipitation events
- **An event was considered extreme if the daily precipitation recorded was greater than the average monthly precipitation at that station**
- 36 extreme single-day precipitation

Occurrence of Extremes

- Some stations experienced more extremes during the drought than others (Cold Lake, Estevan and Lethbridge had 5 extremes each)
- Other stations had no extremes during the drought (Edmonton and Grande Prairie)
- 6 of the 14 stations recorded more extreme events on average than in the 38 years in the background climatology (1960-1998, 2006)
- For example
 - Cold Lake had 5 extremes during the drought (0.7/year), compared to 12 in background climatology (0.3/year)

Severity of Extremes

- The incidence of a given extreme decreases as the severity of the extreme increases.
- The incidence of extremes during drought compared to the climatology is similar for moderately severe storms, but for very severe events (>200% of monthly average) their incidence is greater during the drought.



Conclusions

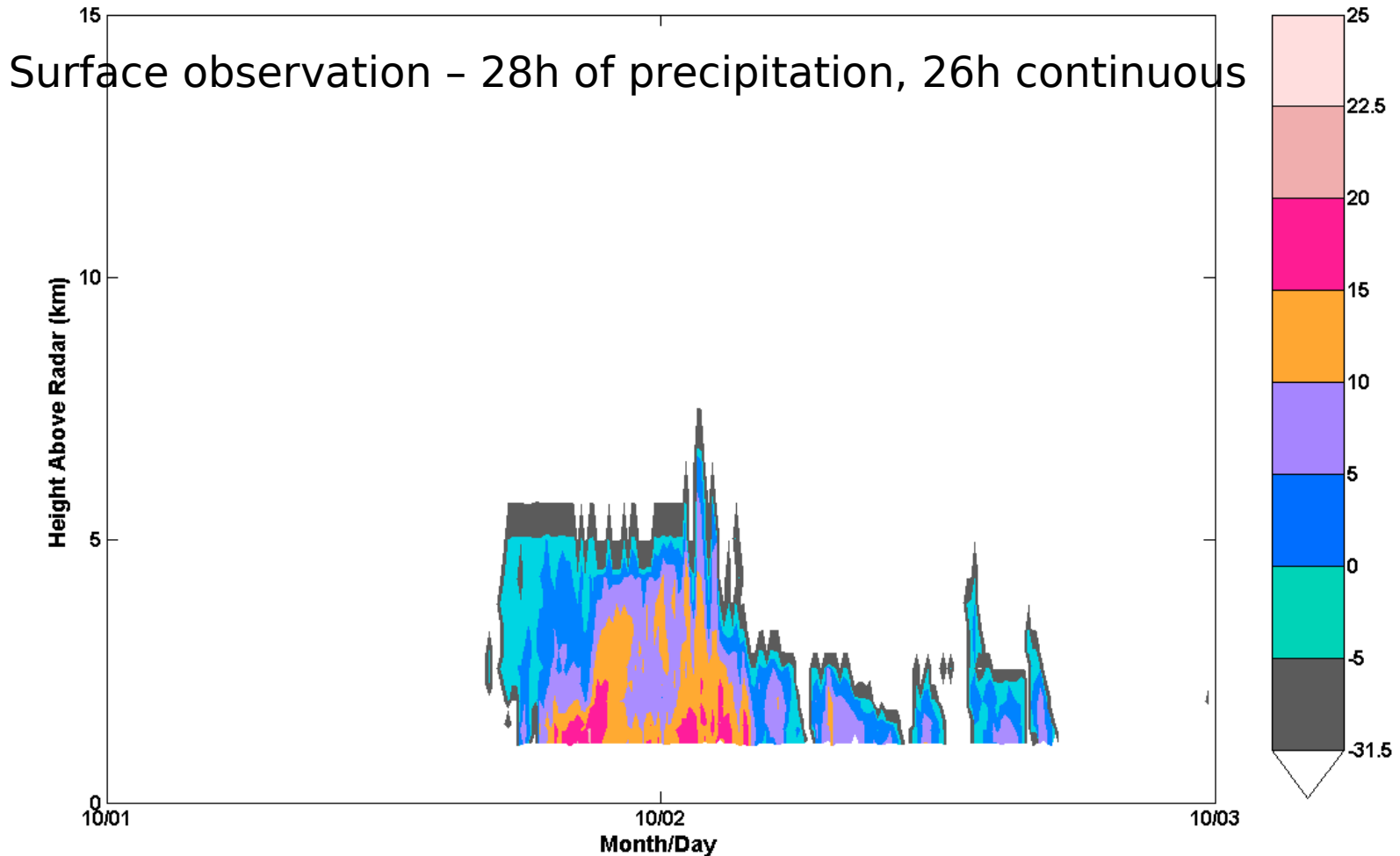
- Though drought is characterized by a general lack of precipitation, extreme precipitation events do still occur over regions of severe drought.
- Overall, the average occurrence of extremes is similar to the climatology. However, certain areas are more prone to extremes during the drought, while others are less prone.
- During the drought the occurrence of extremes ($>100\%$) was similar to the climatology, but there was, on average, a higher occurrence of very severe extremes ($>200\%$) per year.

- Objective was to investigate the similarities and differences of vertical radar profile characteristics of severe precipitation events

Severity (%)	Date	Site	Precipitation (mm)	Ave. Monthly Precip. (mm)
201*	10/9/2005	Lethbridge	79.5	39.6
207	1/10/2005	Cold Lake	36.2	17.5
208*	1/11/2000	Estevan	37	17.8
225*	9/9/2003	Cold Lake	89.8	39.9
291*	24/4/2003	Cold Lake	72.4	24.9

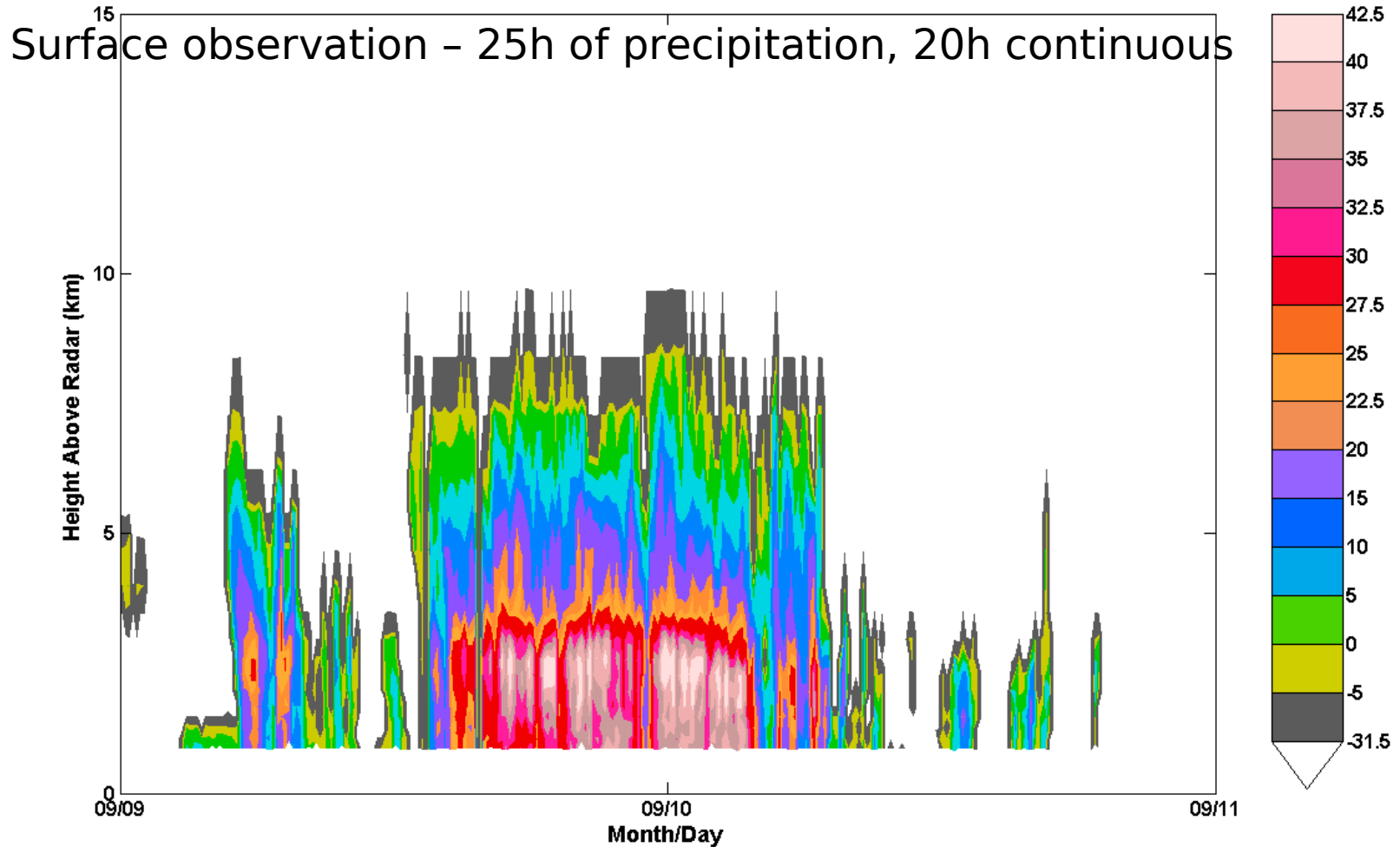
* - record 1 day accumulations for that site

October 2005 (207%)



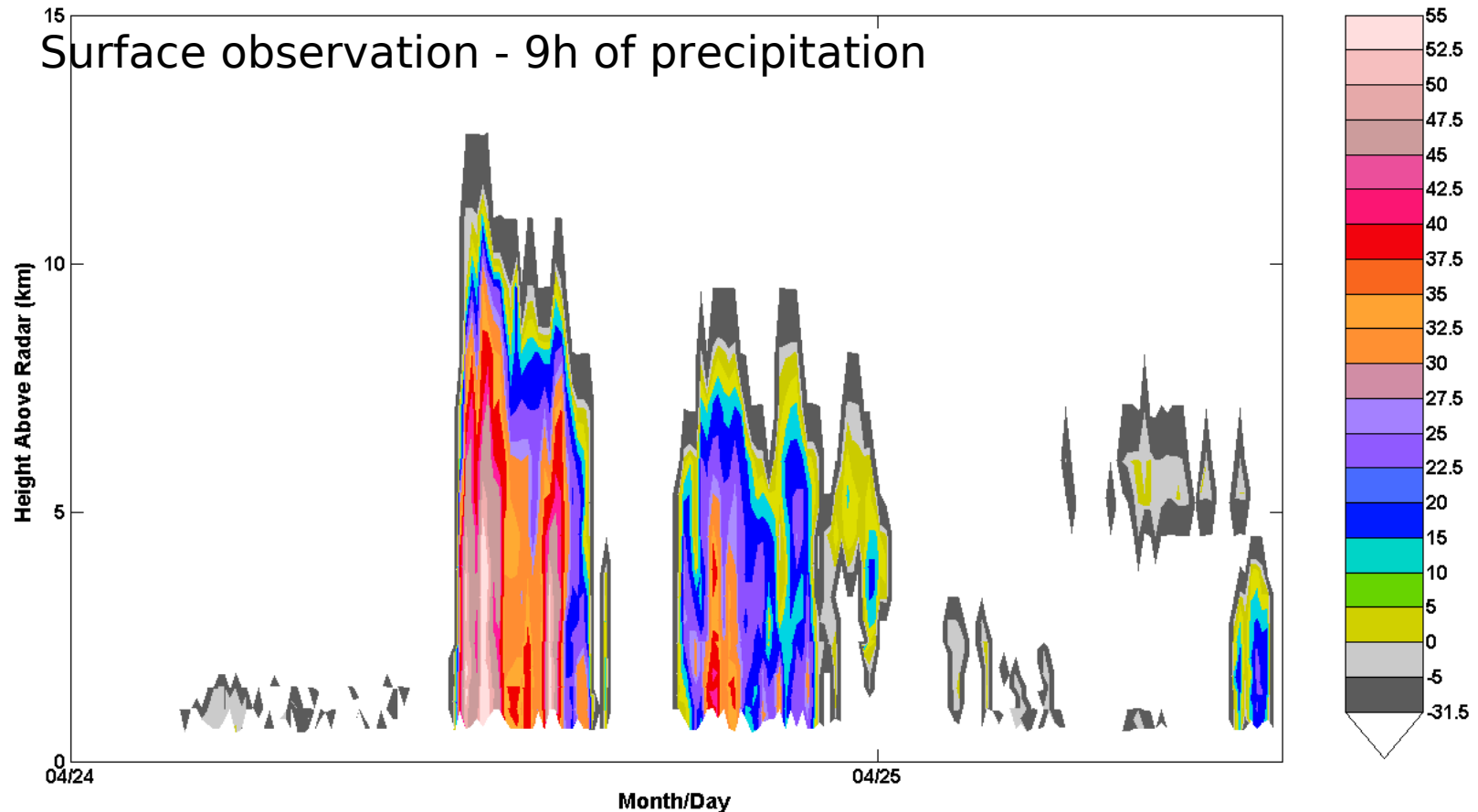
- Very low heights and low reflectivity values
- Surface observations recorded rain and snow (rain to snow to a mixture then back to snow)

September 2003 (225%)



- Bright band/melting layer is present - stratiform precipitation
- Long period of consistent precipitation rain (at times

April 2003 (291%)



- Very short, intense periods of precipitation, thunderstorms, rain and hail reported
- Some reflectivity aloft not reaching the ground - could this event

Summary

- No apparent similarities
- Differences
 - April 2003 was convective, Sept. 2003 is stratiform with a melting layer, Oct. 2005 low reflectivities and cloud heights
 - Different durations, stratiform tended to be long (>20 h)
 - Different radar reflectivity ranges (different phases of precipitation)
 - Indicates each event was different