

Future Extreme Rainfall in Iowa

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Analysis of Extremes

Societal importance, esp. for climate change

Key Question: Do climate models behave like observations?

Diagnosis of physical mechanisms

- **Necessary for model vs. observations comparison**
- **Basis for developing confidence in projections**



Focus:

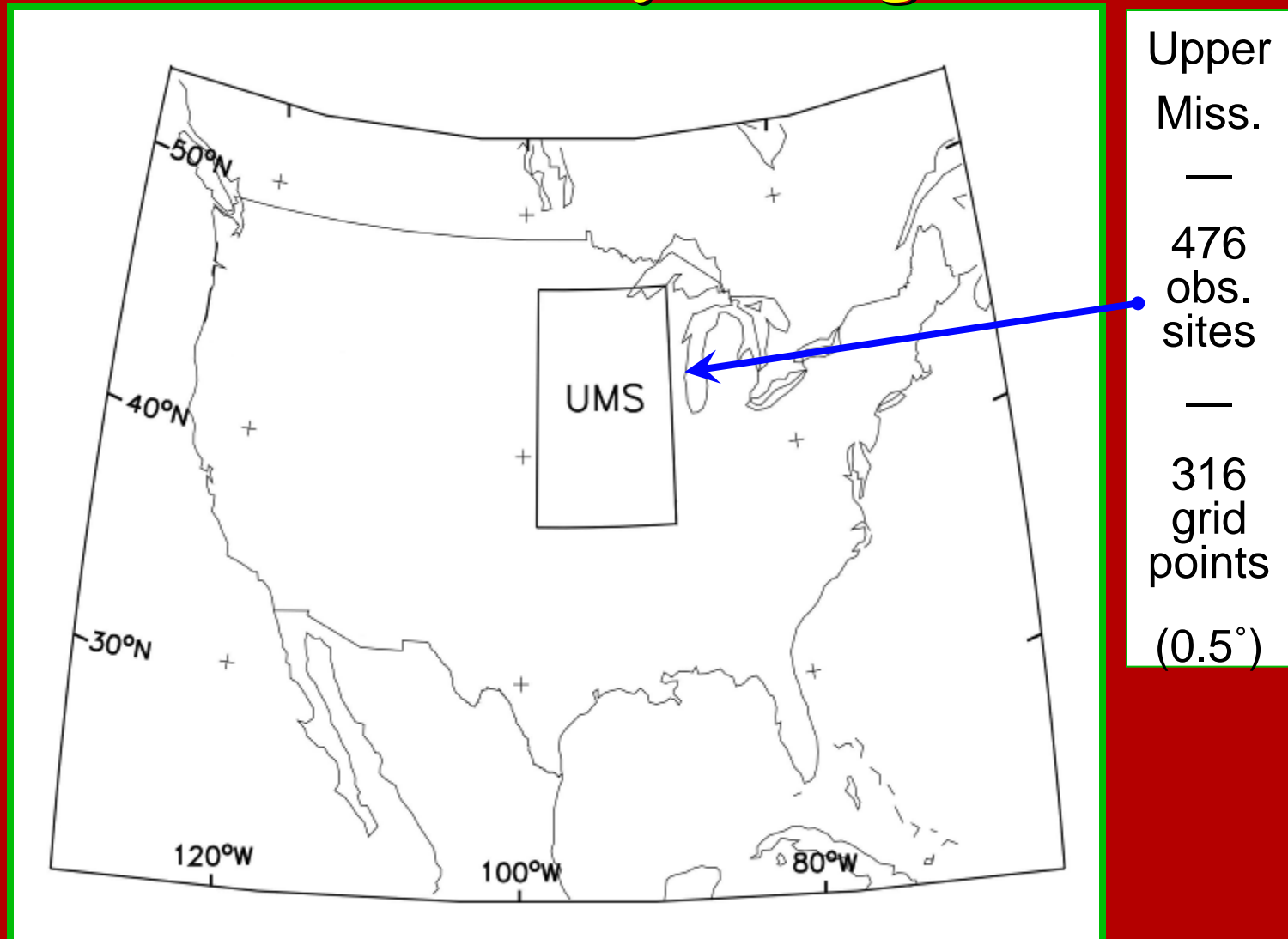
Extreme Precipitation by Daily Weather

Specifically, for 8-year observed and simulated (present and future) periods:

- **The strongest 0.05% of daily precipitation events among several hundred locations**
- **Regional events - occurring every 1-2 years**

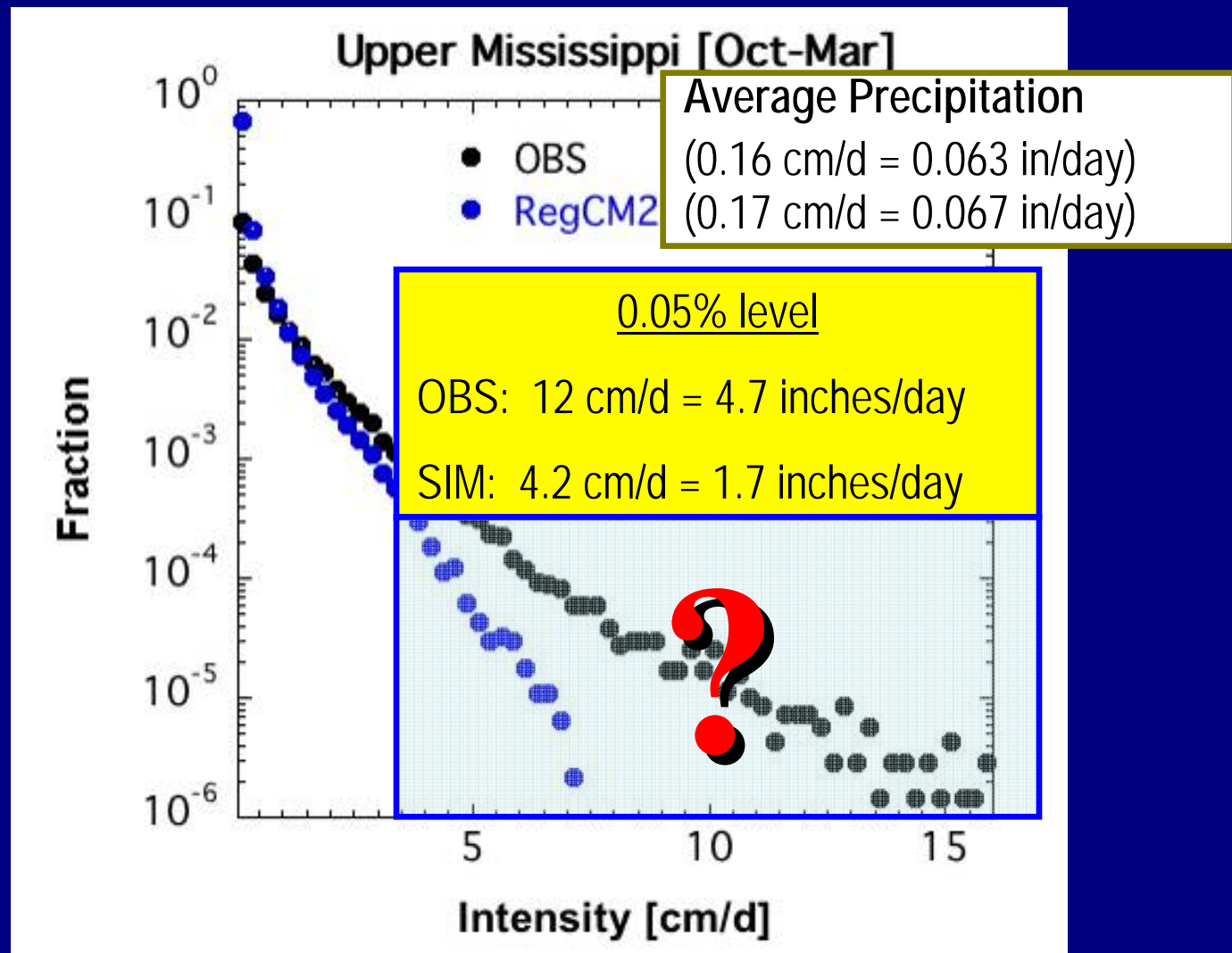


Domain & Analysis Region

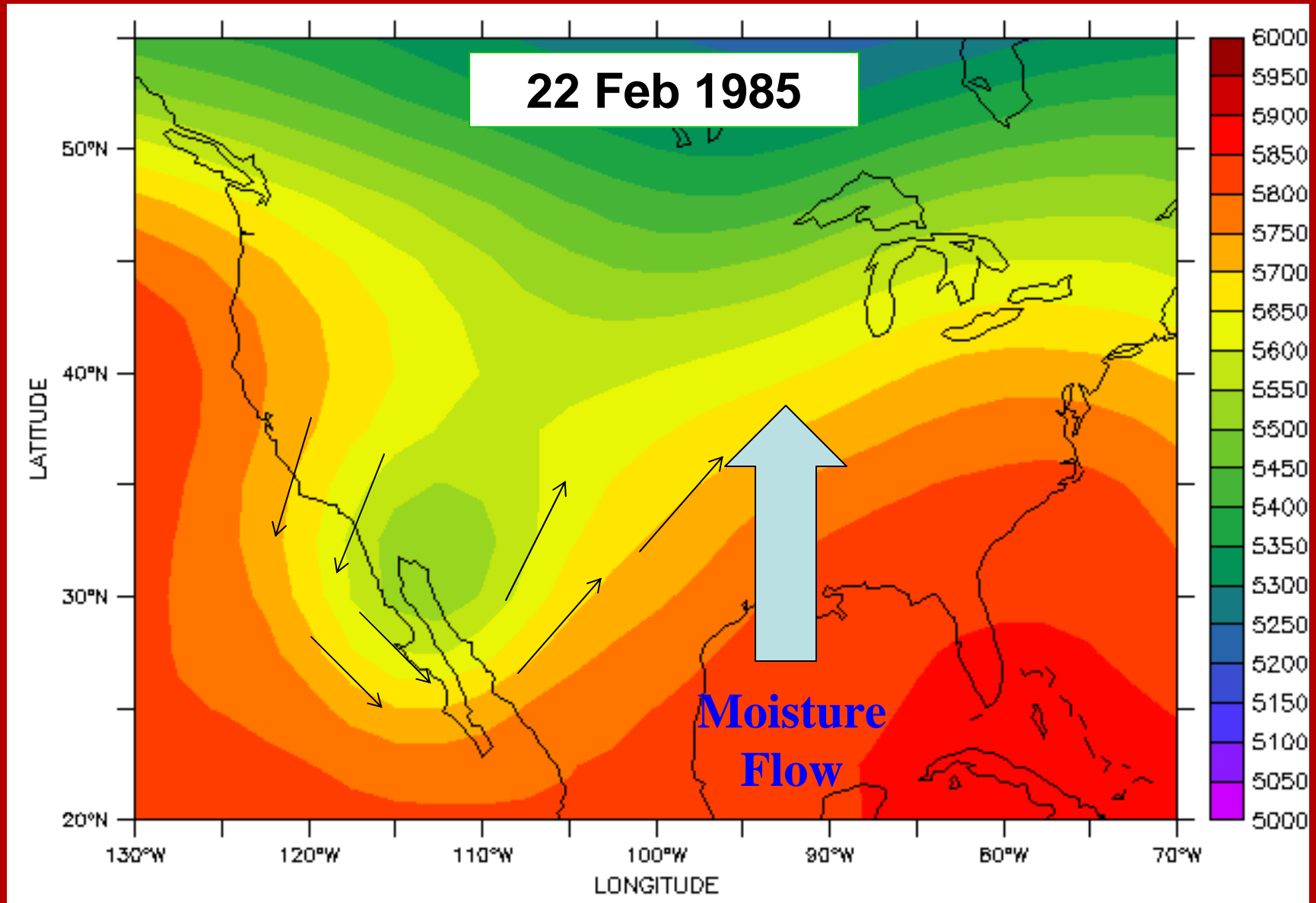


Cold season (October - March)

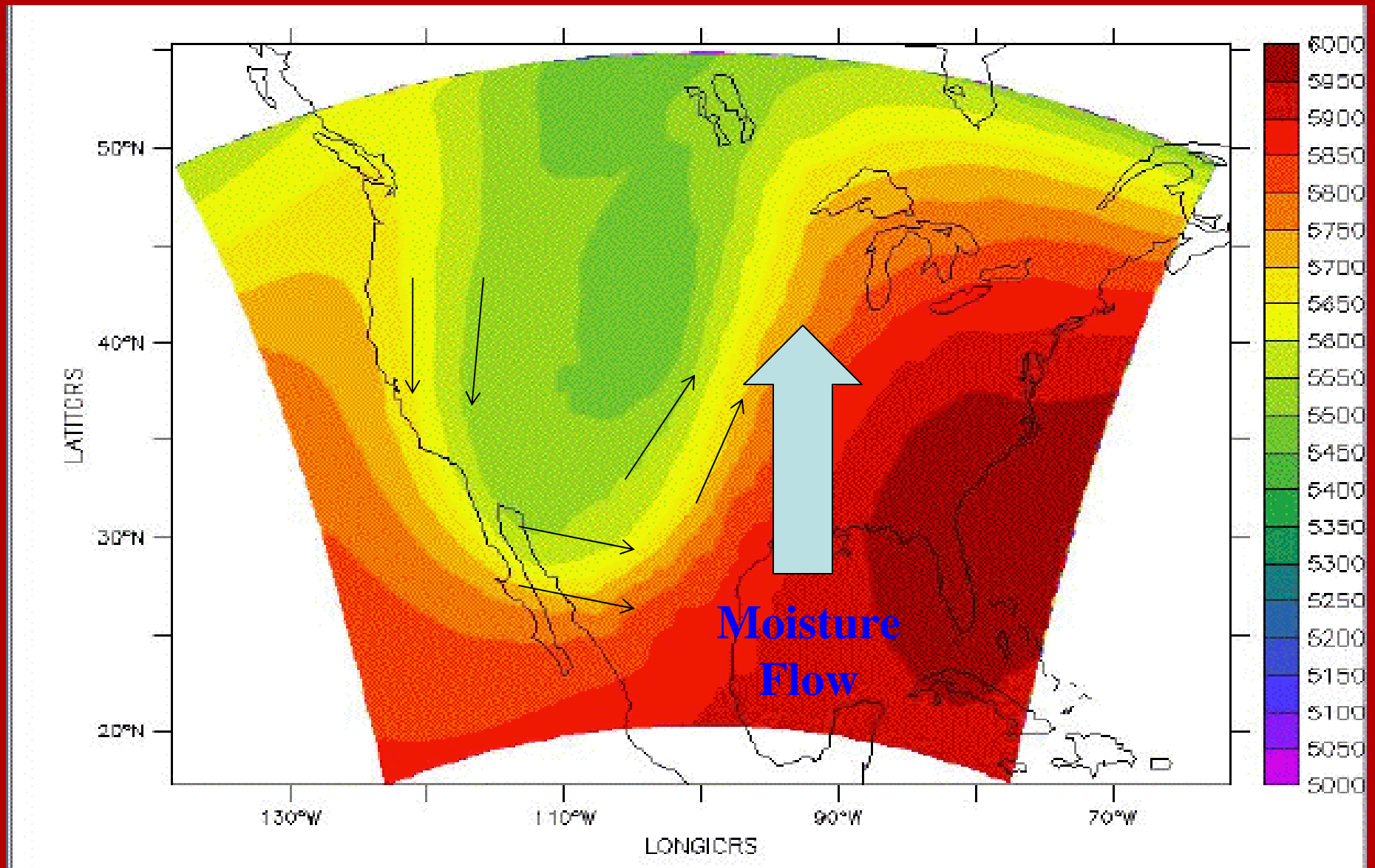
Precipitation Frequency vs. Intensity



Circulation - Day of Observed Event



Circulation- Day of Future Event



Precipitation Changes?

Current

Future –

0.05% Threshold

+ 17%

Extreme Precip.

+ 26%

Extreme precipitation ↑ as max humidity ↑

Max atmospheric humidity ↑ ~ 7% per degree

Projected temperature increase: ~ 2.5°C



Conclusions

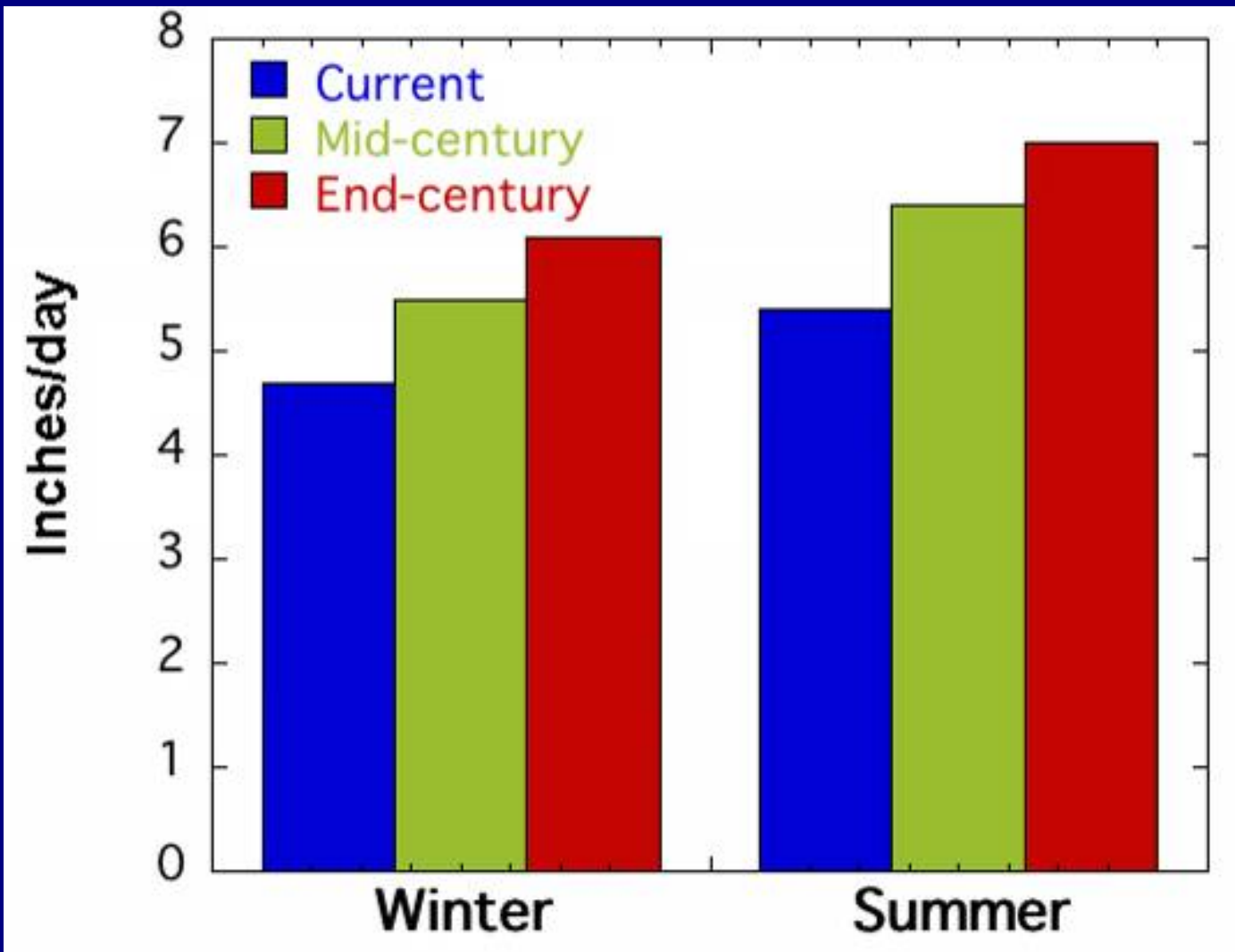


- ❖ **Simulated precipitation extremes**
 - **Low vs. observations (resolution-limited)**
- ❖ **For cold-season extreme events**
 - **Simulated circulation ~ observed**
 - **Future circulation ~ contemporary climate**
- ❖ **Temperature change, mid-21st century of 2.5 °C**
- ➔ **extreme 1-2 year events ↑ 0.8 in/day to 5.5 in/day**

Photos:
www2.mvr.usace.army.mil
/
namakkalcity.com/
September 2008



Conclusions



Weather Last October

