



Severe Weather Climatology and Long-Term Forecasting

Harold Brooks

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National Weather Center
Norman, Oklahoma





NSSL's Interest

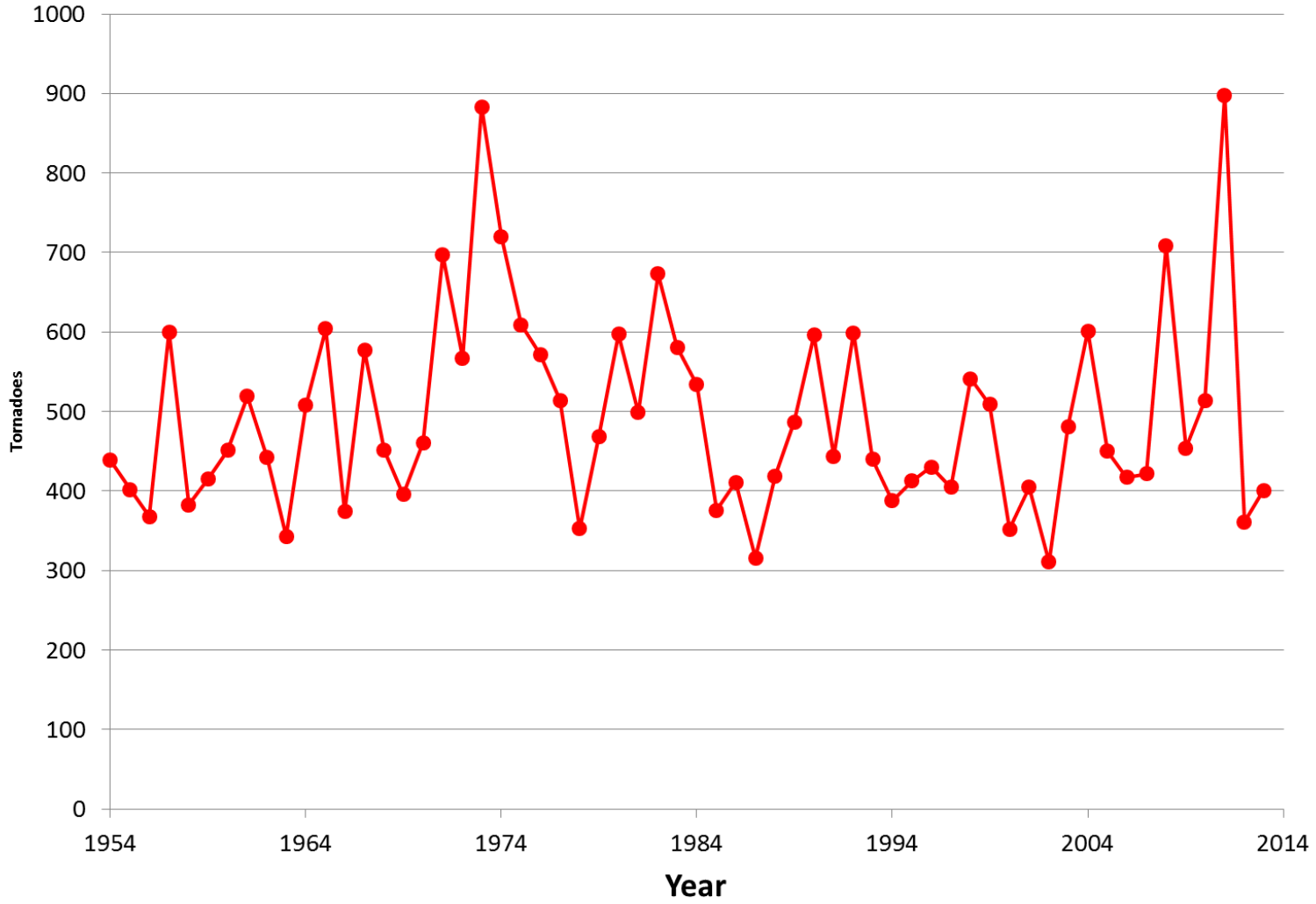
- Understanding how severe storms fit into climate
- Helping SPC put things in context
- Extending forecast horizon

- Reports to look at past tornado changes
- Using environmental conditions to forecast longer



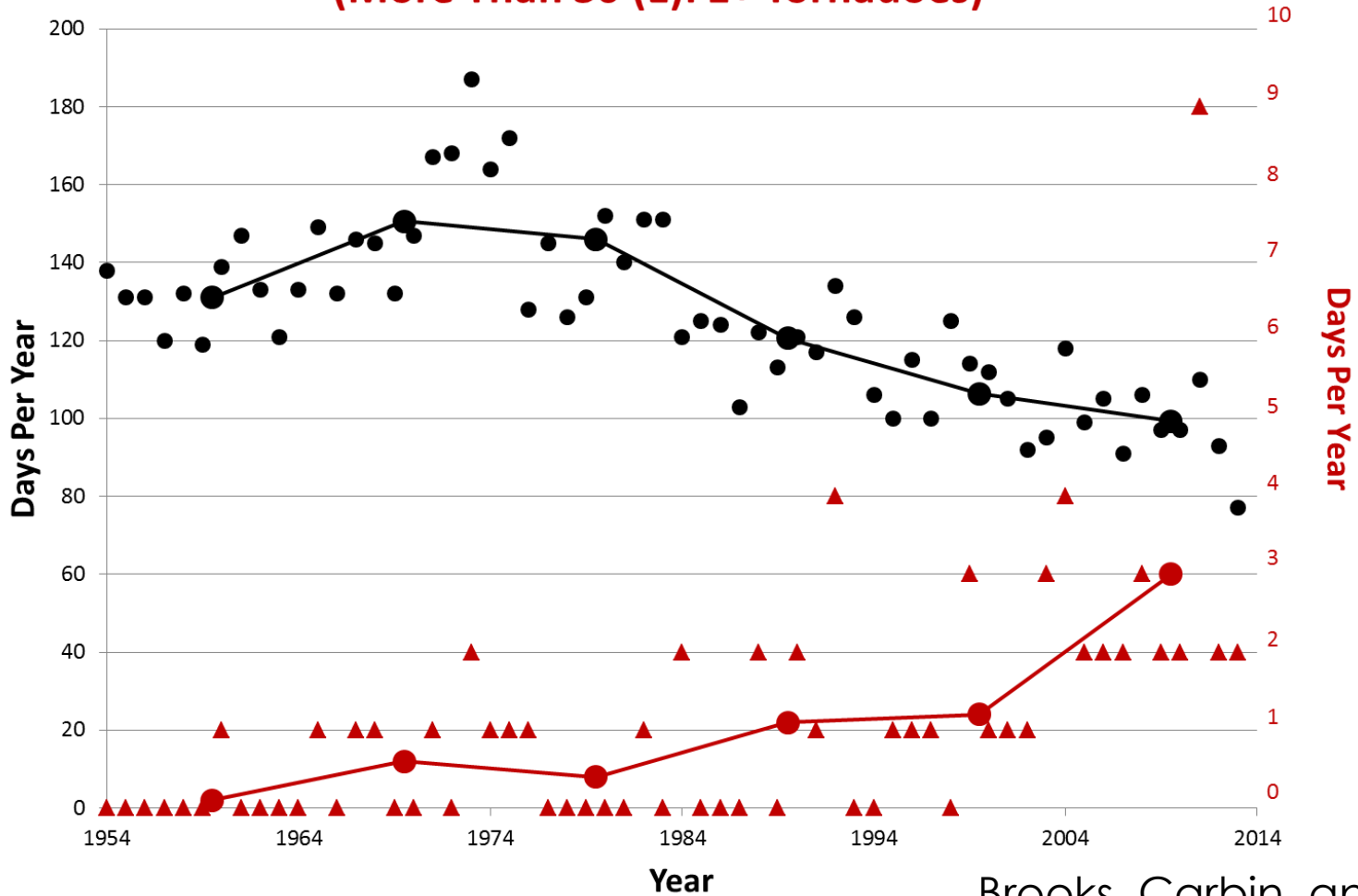


Annual (E)F1+ Tornadoes in US





Days Per Year With At Least 1 (E)F1+ Tornado in US (More Than 30 (E)F1+ Tornadoes)



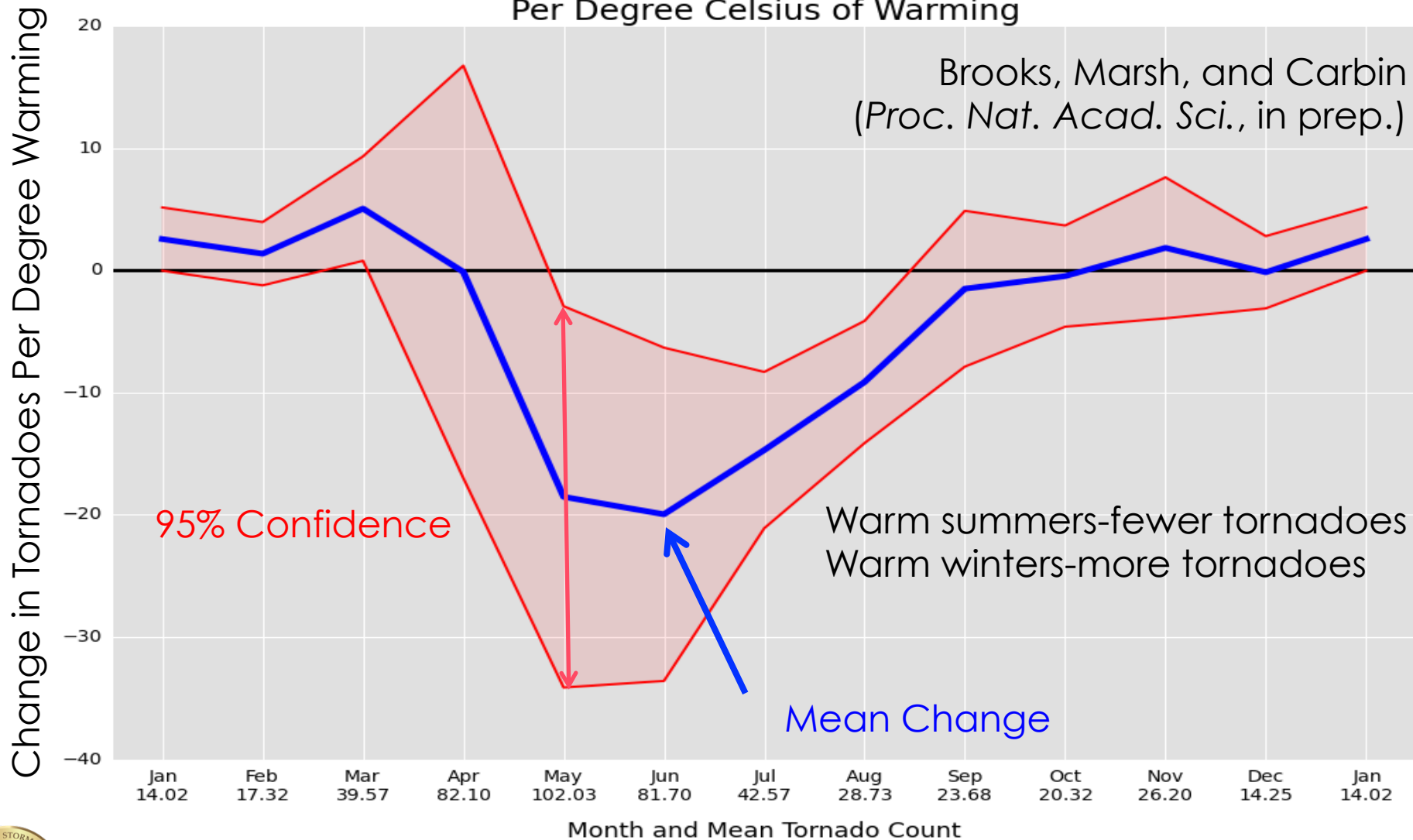
Brooks, Carbin, and Marsh
(*Science*, 2014)

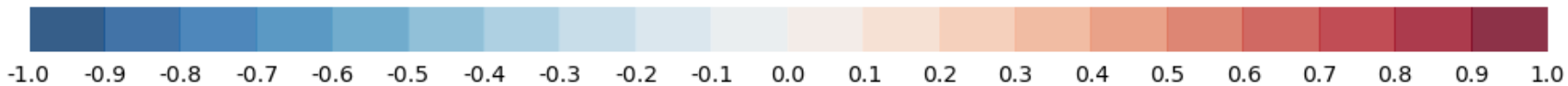
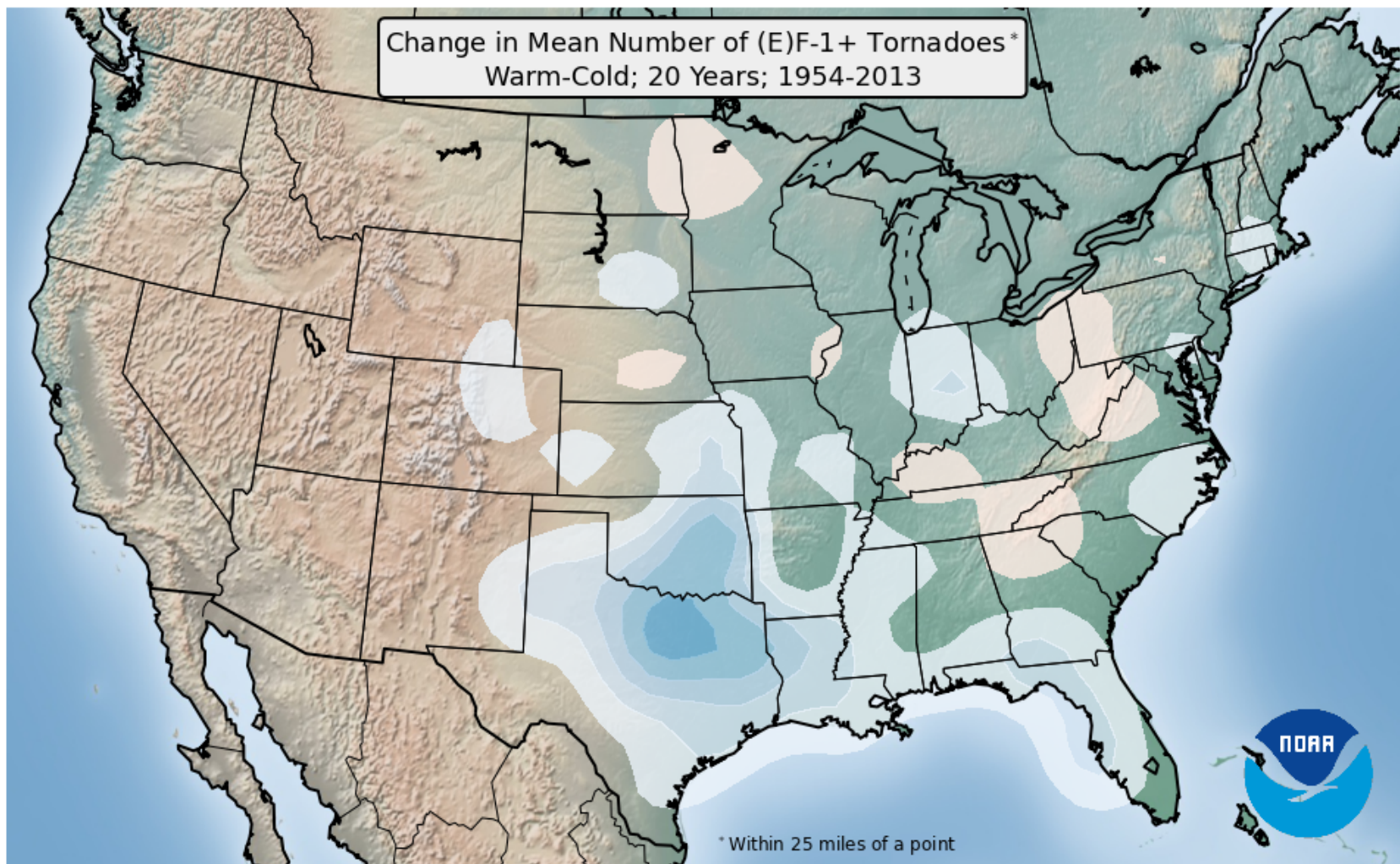




Monthly Change in Number of (E)F-1+ Tornadoes Per Degree Celsius of Warming

Brooks, Marsh, and Carbin
(*Proc. Nat. Acad. Sci.*, in prep.)

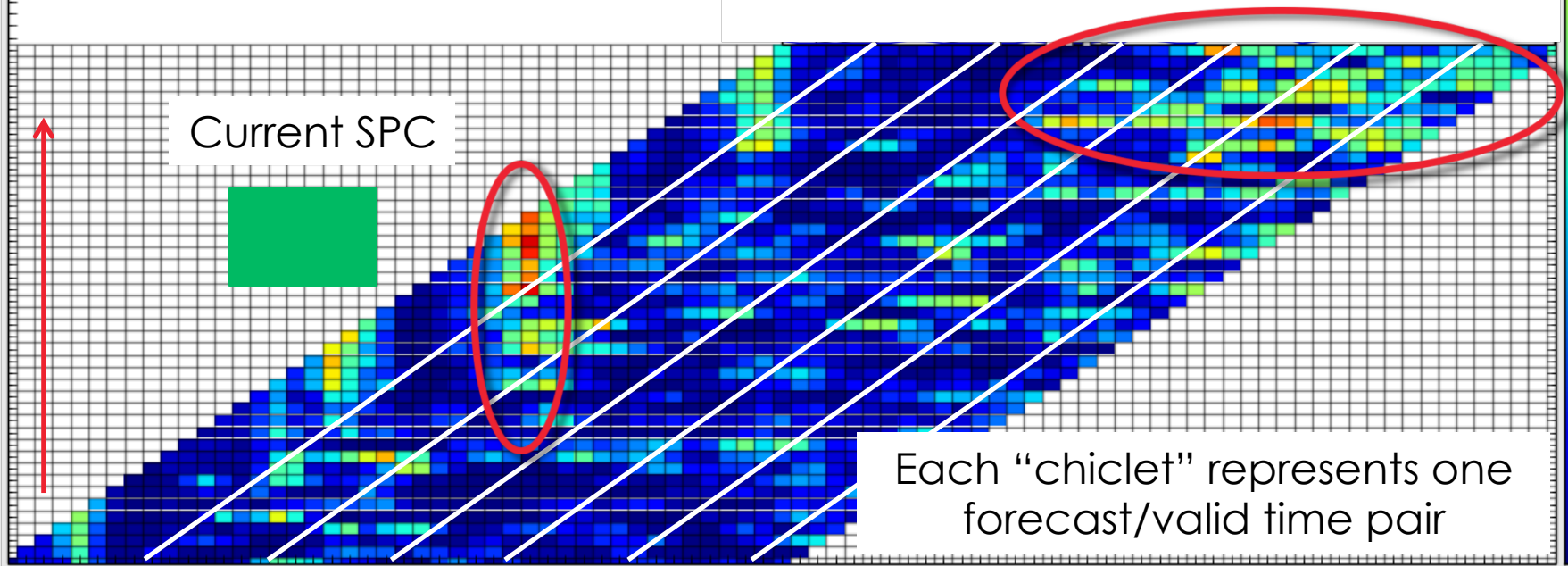




Long-range forecasting with
Climate Forecast System
(SPC, Climate Prediction
Center, Columbia)

“Why don't I get seasonal
tornado forecasts like I get
seasonal hurricane forecasts?”
-B. Obama, 5 March 2012

Forecasts valid same day



Current SPC

Each “chiclet” represents one
forecast/valid time pair

Forecasts made same day



Summary and Next

- Variability of tornado occurrence has increased
- Warm winter (summer)-more (fewer) tornadoes
- Have environments changed like tornadoes?
- Continue tool, evaluation work for extended range

