



# Iowa Actuary Club / Drake University

## *Avoiding Knee Jerk Reactions to Short Term Natural Catastrophes*

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EMC Insurance Companies



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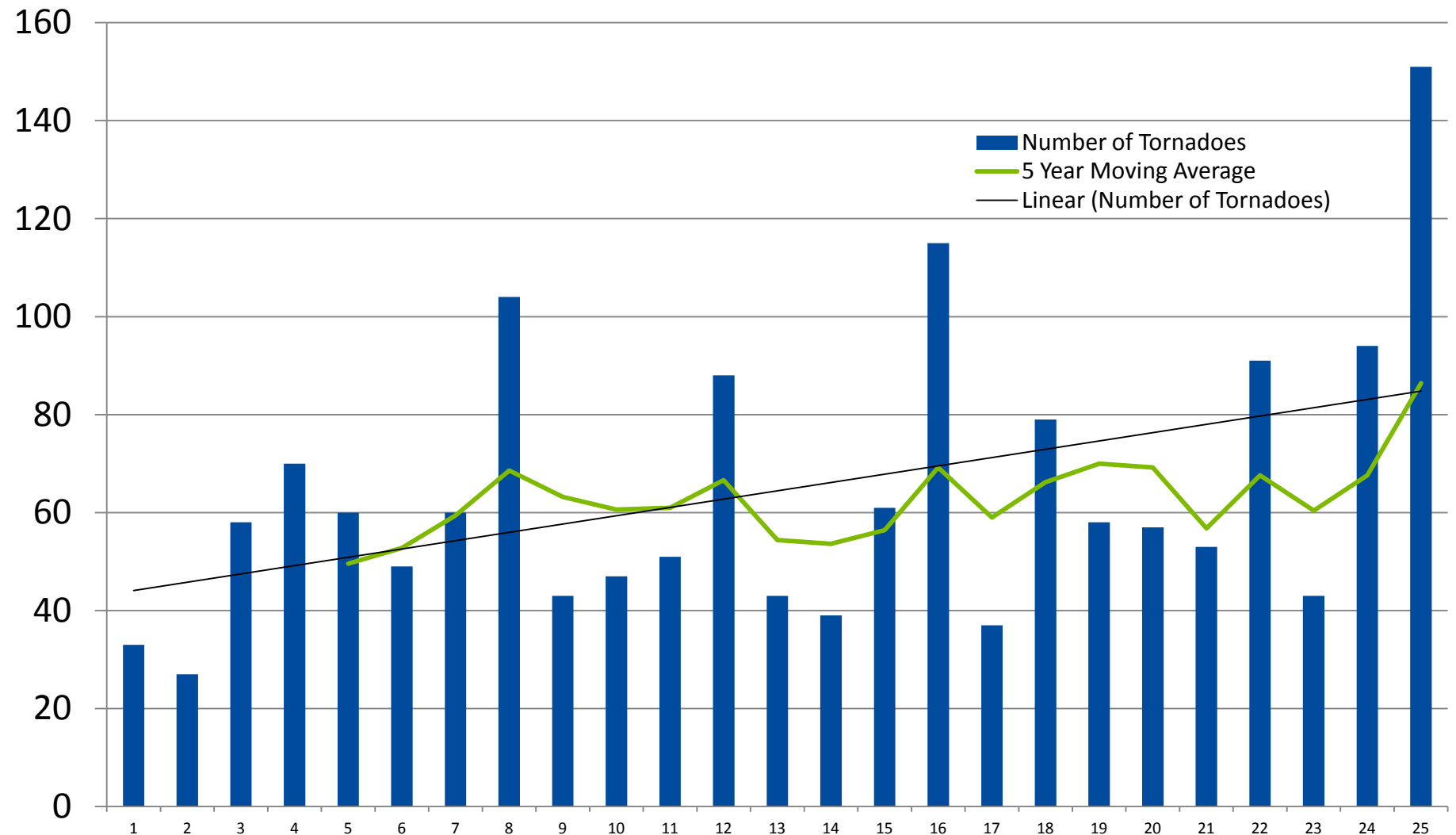
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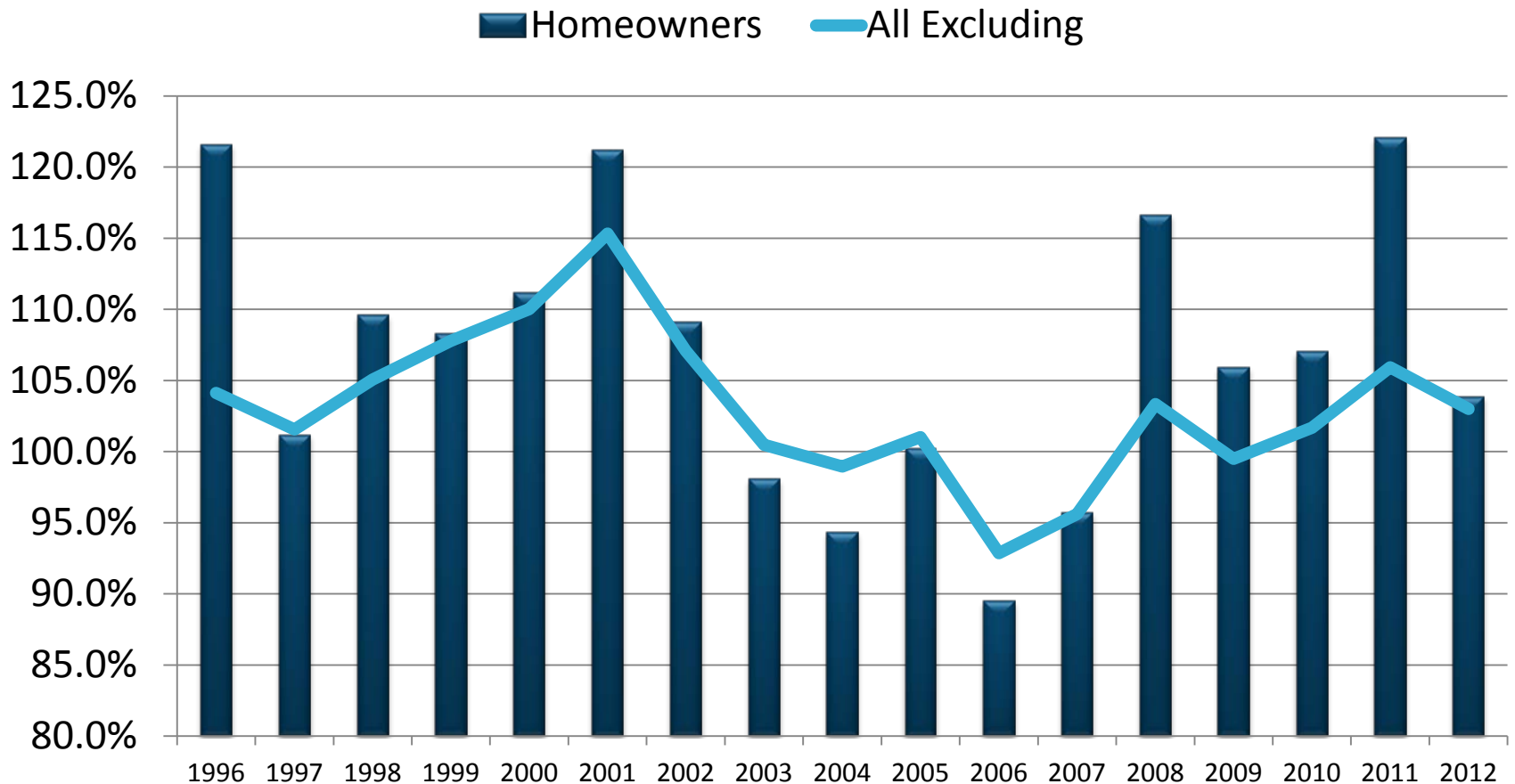
# Session Objectives

- Objectively review weather data for insurance relevancy
- Evaluate limitations in using short term data to achieve long term predictions
- Consider alternative data sources to assist in interpreting relevant insurance experience

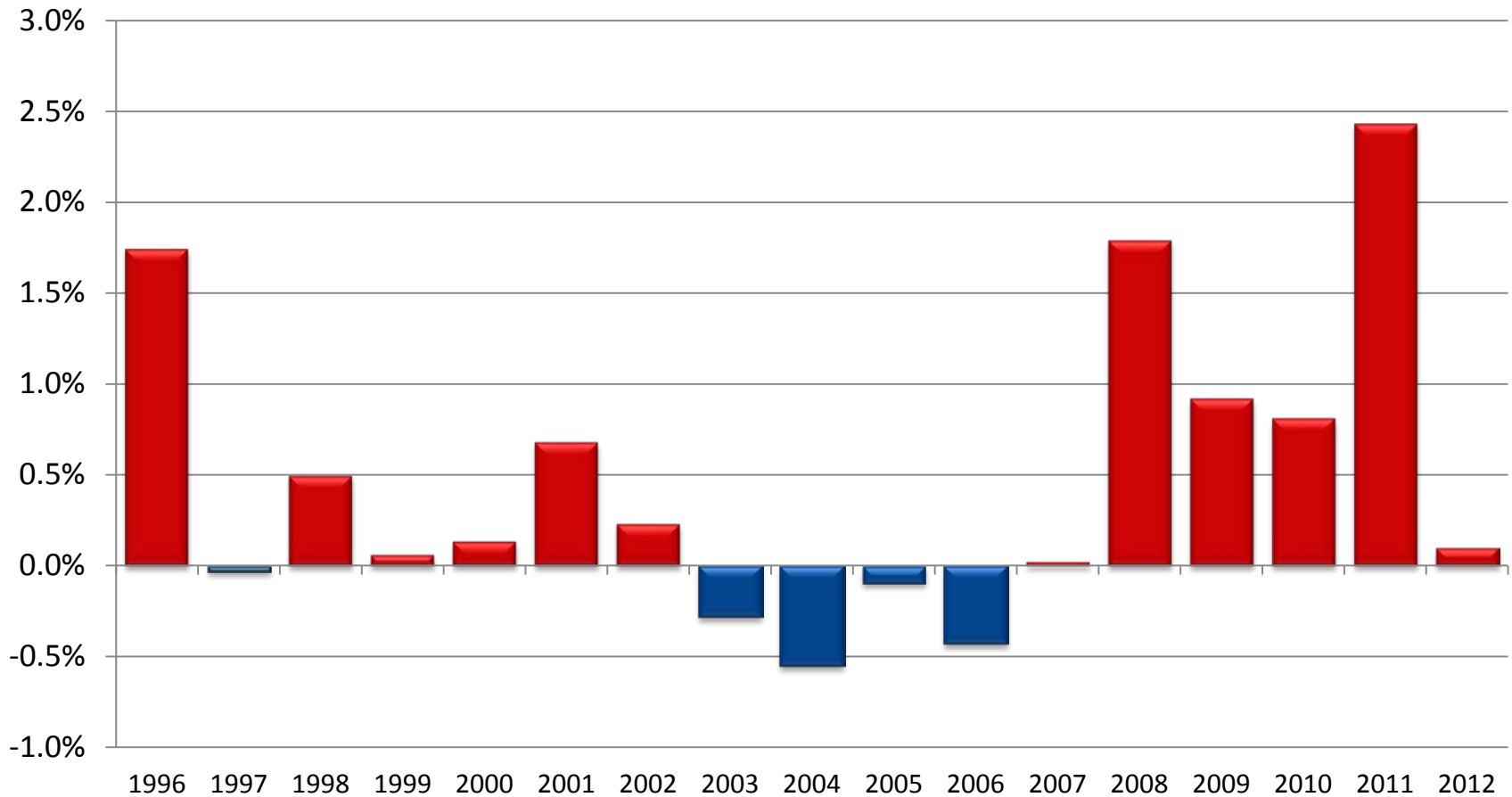
# Significant Tornadoes by Year



# Industry Combined Ratios



# Industry Homeowners Differentials





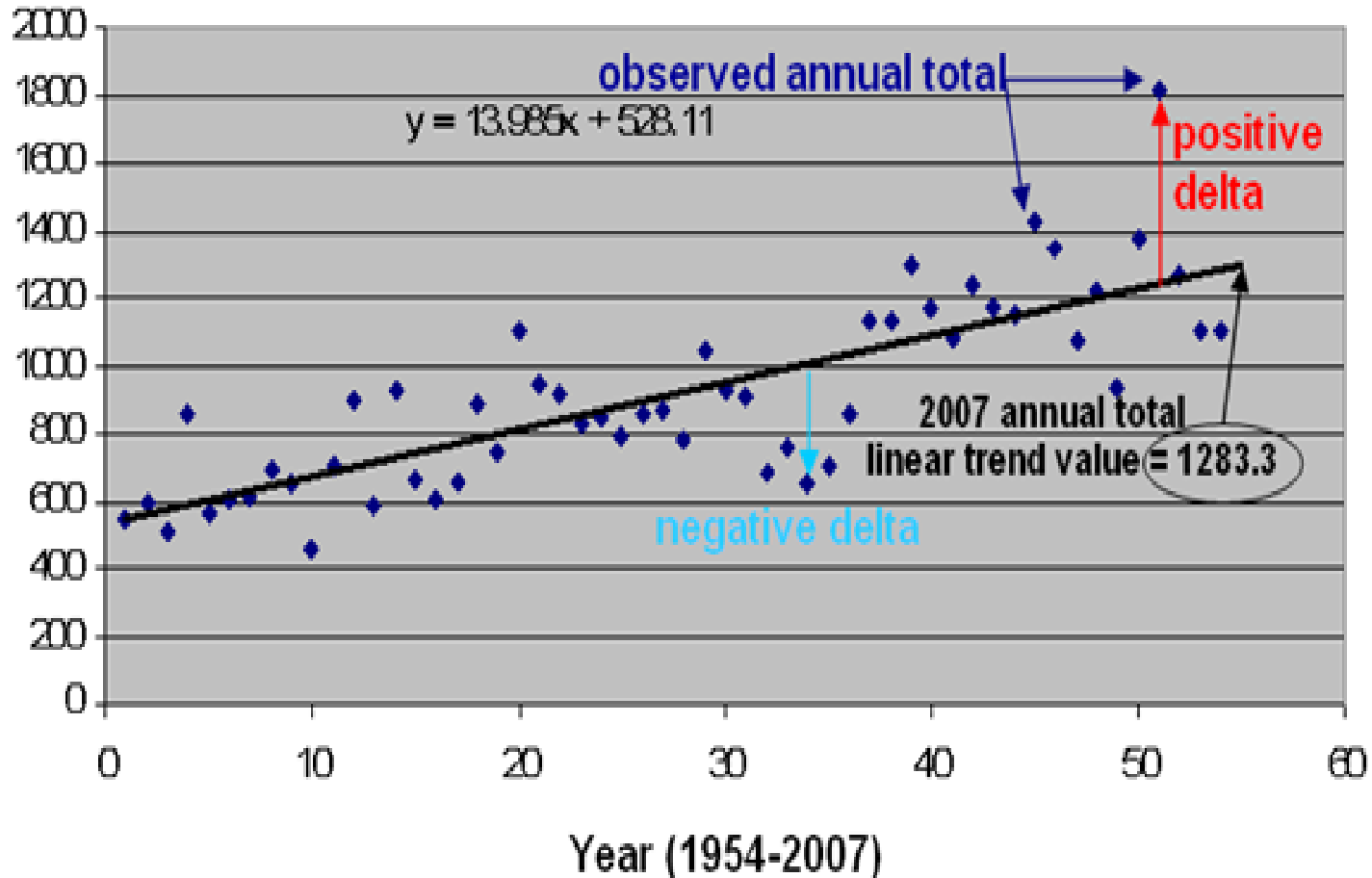
# Convective Storms



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# Number of Tornadoes Reported

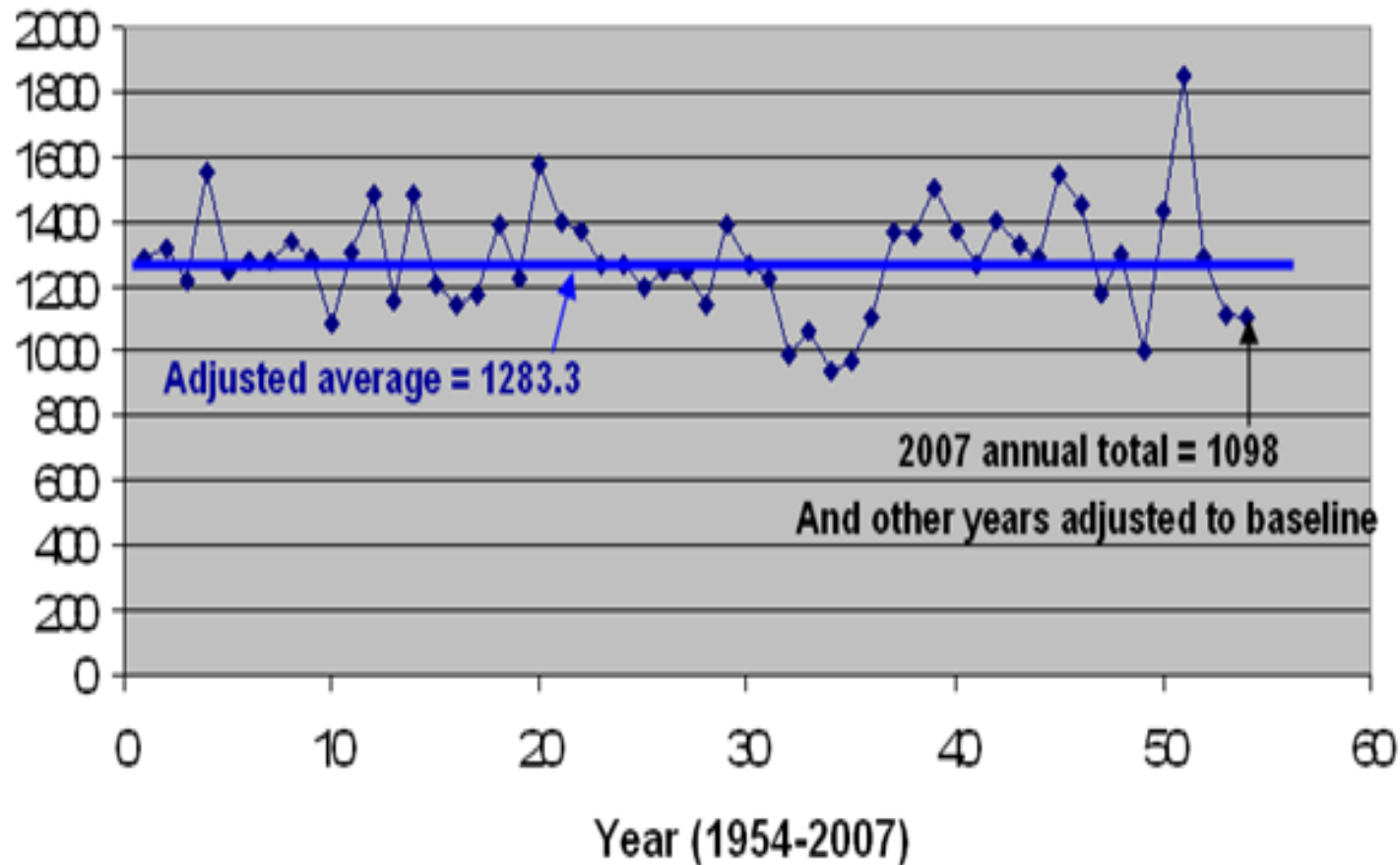
## Tornadoes per year and linear trend



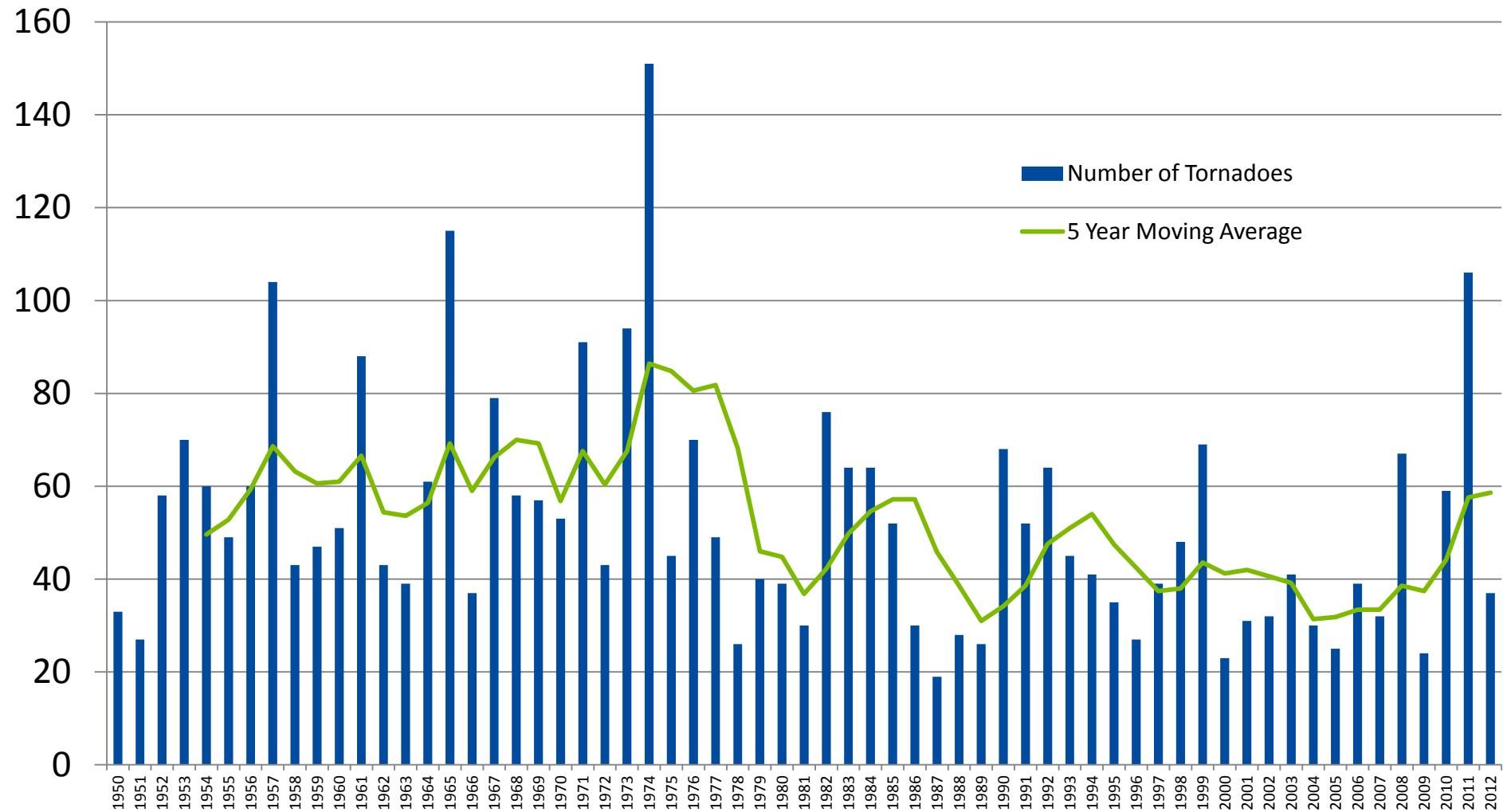


# Adjusted Tornadoes Reported

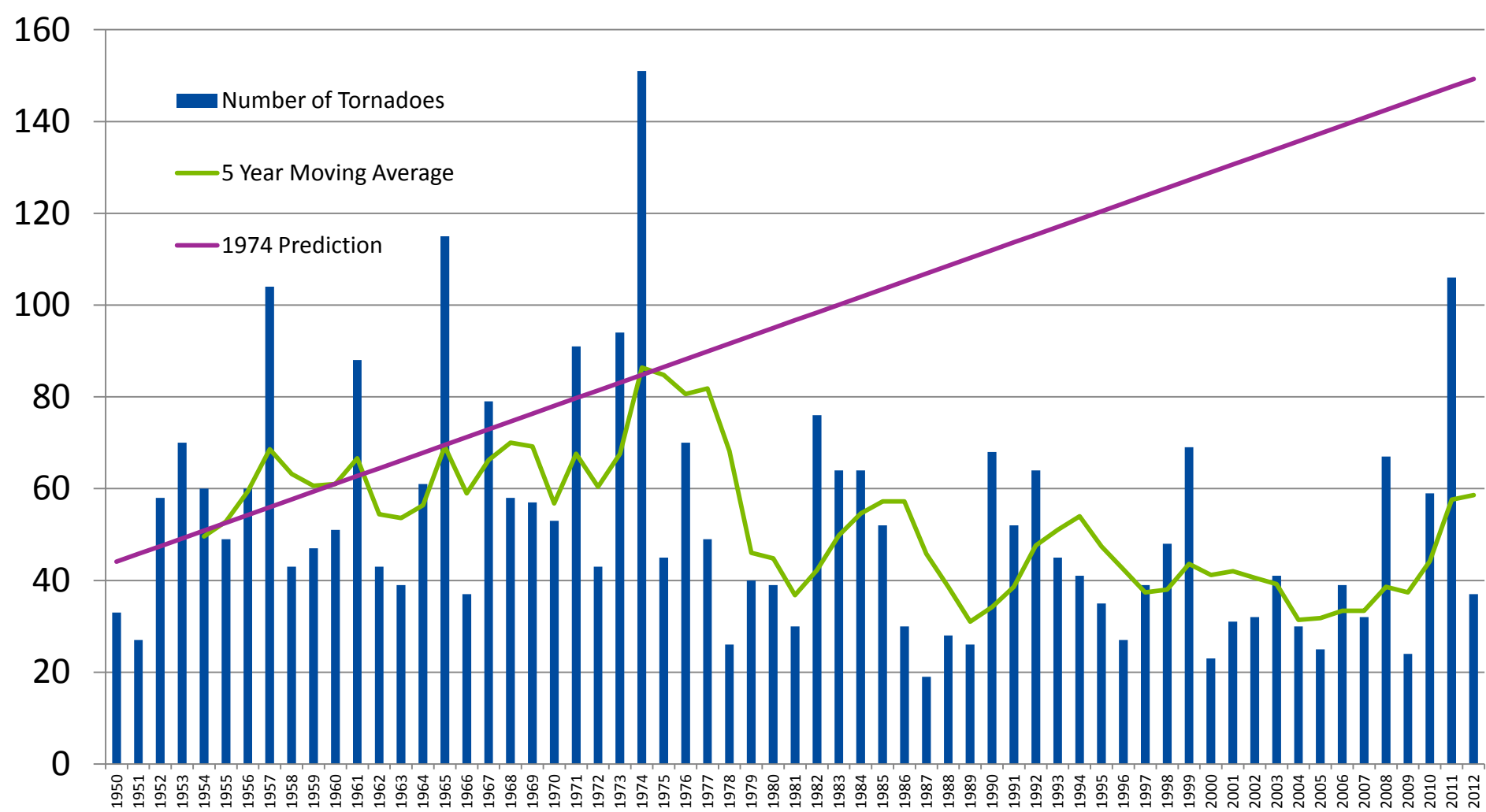
Tornadoes per year adjusted to baseline (2007)



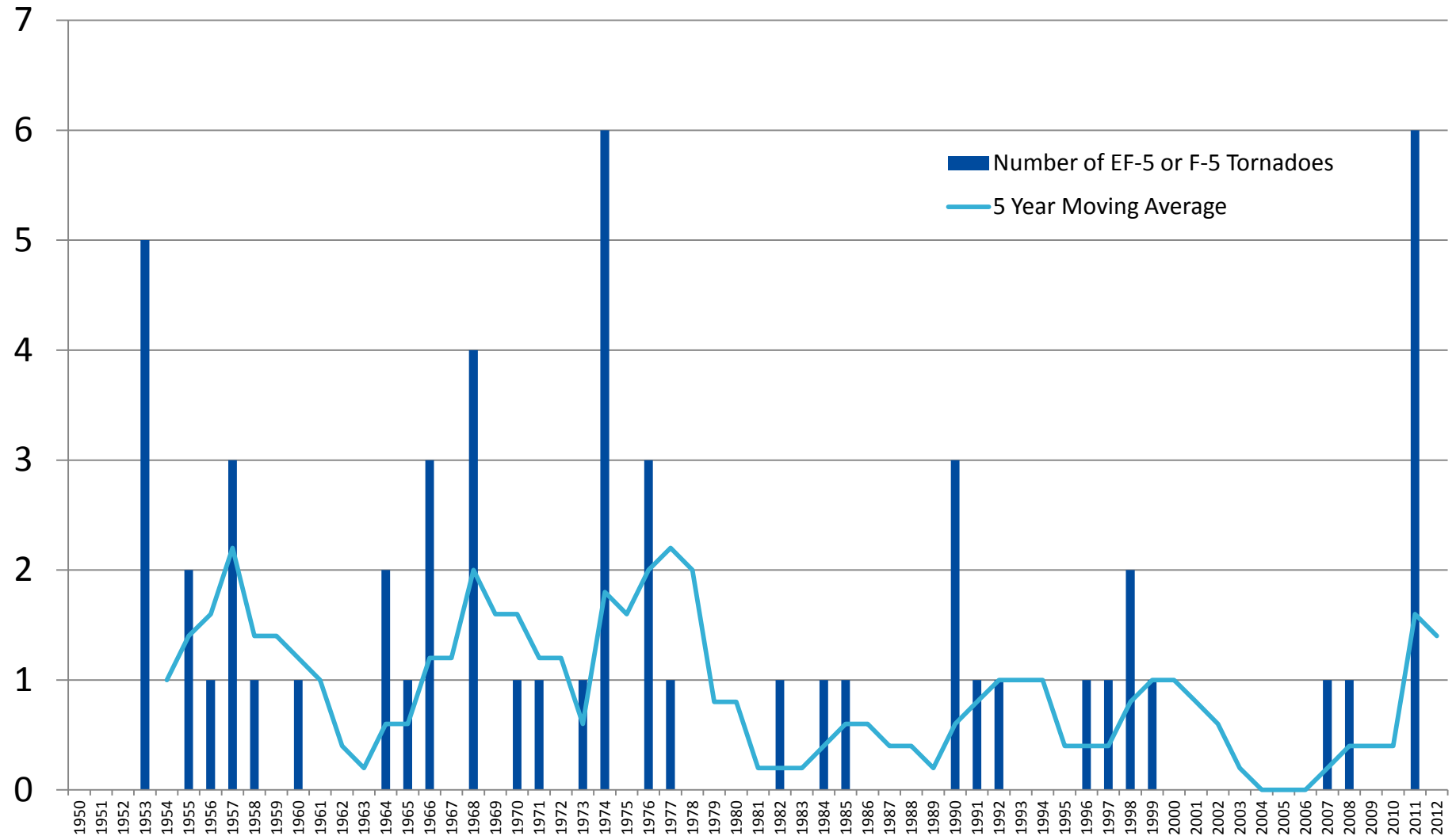
# Significant Tornadoes by Year



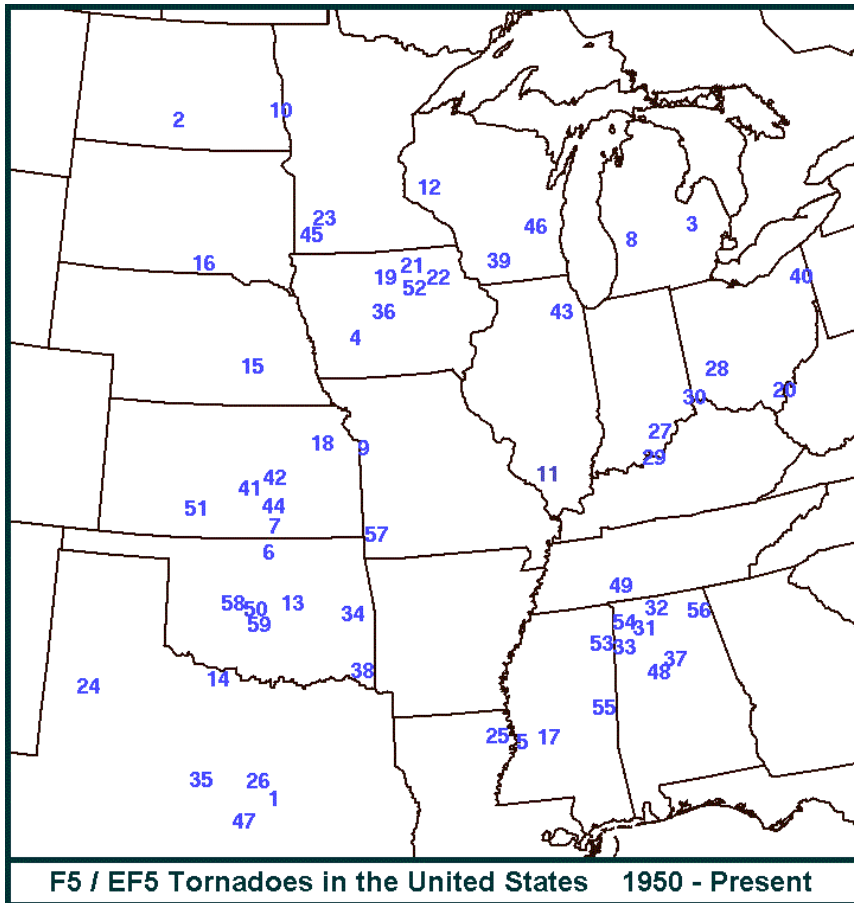
# Significant Tornadoes by Year



# EF5 or F5 Tornadoes Reported by Year



# EF5 or F5 Tornadoes since 1950

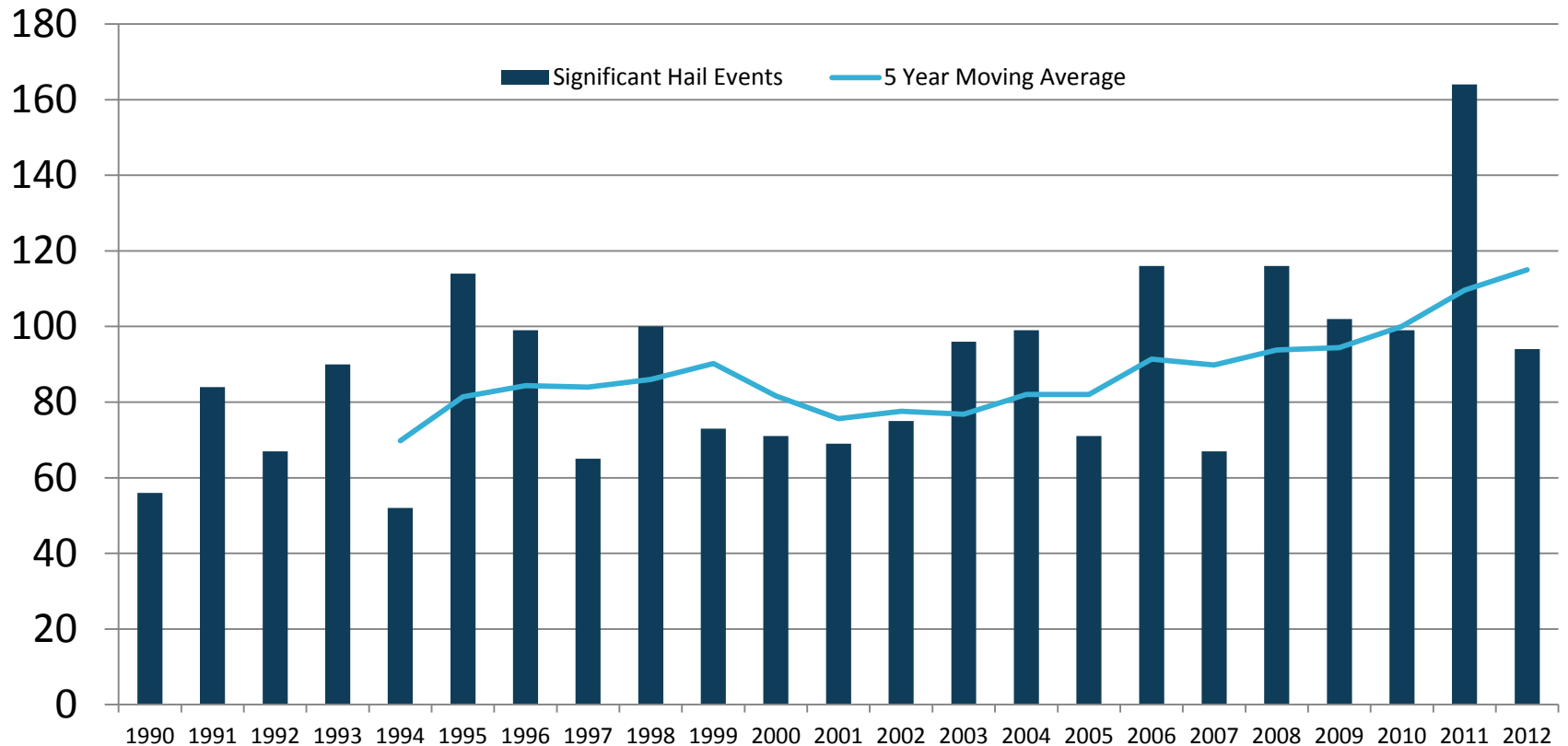


59 May 20, 2013 Moore OK 58 May 24, 2011 El Reno/Piedmont OK 57 May 22, 2011 Joplin MO 56 April 27, 2011 Rainsville/Sylvania AL 55 April 27, 2011 Preston MS 54 April 27, 2011 Hackleburg/Phil Campbell AL 53 April 27, 2011 Smithville MS 52 May 25, 2008 Parkersburg IA 51 May 4, 2007 Greensburg KS 50 May 3, 1999 Bridge Creek/Moore OK 49 April 16, 1998 Waynesboro TN 48 April 8, 1998 Pleasant Grove AL 47 May 27, 1997 Jarrell TX 46 July 18, 1996 Oakfield WI 45 June 16, 1992 Chandler MN 44 April 26, 1991 Andover KS 43 August 28, 1990 Plainfield IL 42 March 13, 1990 Goessel KS 41 March 13, 1990 Hesston KS 40 May 31, 1985 Niles OH 39 June 7, 1984 Barneveld WI 38 April 2, 1982 Broken Bow OK 37 April 4, 1977 Birmingham AL 36 June 13, 1976 Jordan IA 35 April 19, 1976 Brownwood TX 34 March 26, 1976 Spiro OK 33 April 3, 1974 Guin AL 32 April 3, 1974 Tanner AL 31 April 3, 1974 Mt. Hope AL 30 April 3, 1974 Sayler Park OH 29 April 3, 1974 Brandenburg KY 28 April 3, 1974 Xenia OH 27 April 3, 1974 Daisy Hill IN 26 May 6, 1973 Valley Mills TX 25 February 21, 1971 Delhi LA 24 May 11, 1970 Lubbock TX 23 June 13, 1968 Tracy MN 22 May 15, 1968 Maynard IA 21 May 15, 1968 Charles City IA 20 April 23, 1968 Gallipolis OH 19 October 14, 1966 Belmont IA 18 June 8, 1966 Topeka KS 17 March 3, 1966 Jackson MS 16 May 8, 1965 Gregory SD 15 May 5, 1964 Bradshaw NE 14 April 3, 1964 Wichita Falls TX 13 May 5, 1960 Prague OK 12 June 4, 1958 Menomonie WI 11 December 18, 1957 Murphysboro IL 10 June 20, 1957 Fargo ND 9 May 20, 1957 Ruskin Heights MO 8 April 3, 1956 Grand Rapids MI 7 May 25, 1955 Udall KS 6 May 25, 1955 Blackwell OK 5 December 5, 1953 Vicksburg MS 4 June 27, 1953 Adair IA 3 June 8, 1953 Flint MI 2 May 29, 1953 Ft. Rice ND 1 May 11, 1953 Waco TX

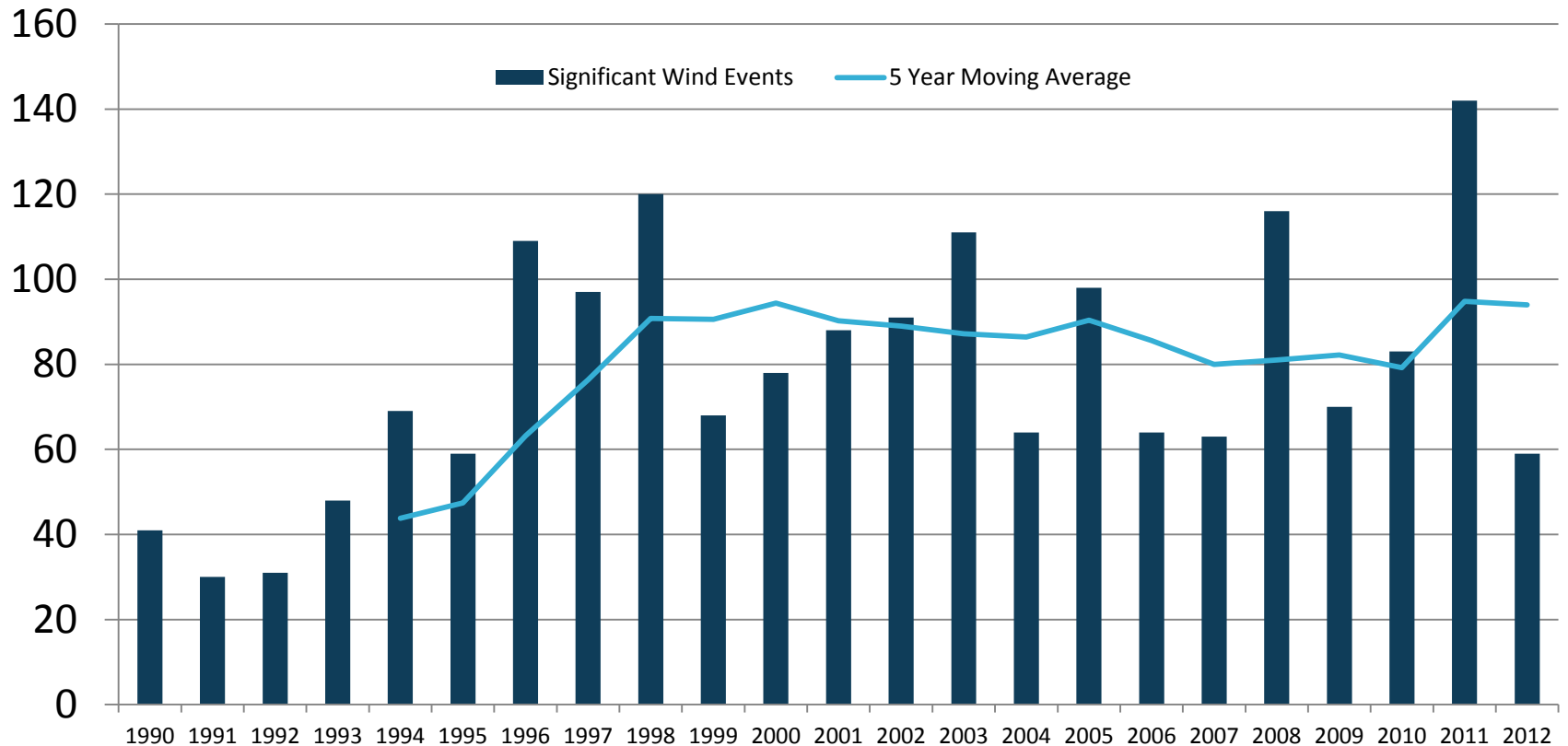
# Top 5 April Tornado Outbreaks

Year	Tornadoes
2011	758
1974	291
2006	258
2009	226
1957	219

# Significant Hail Events by Year



# Significant Wind Events by Year





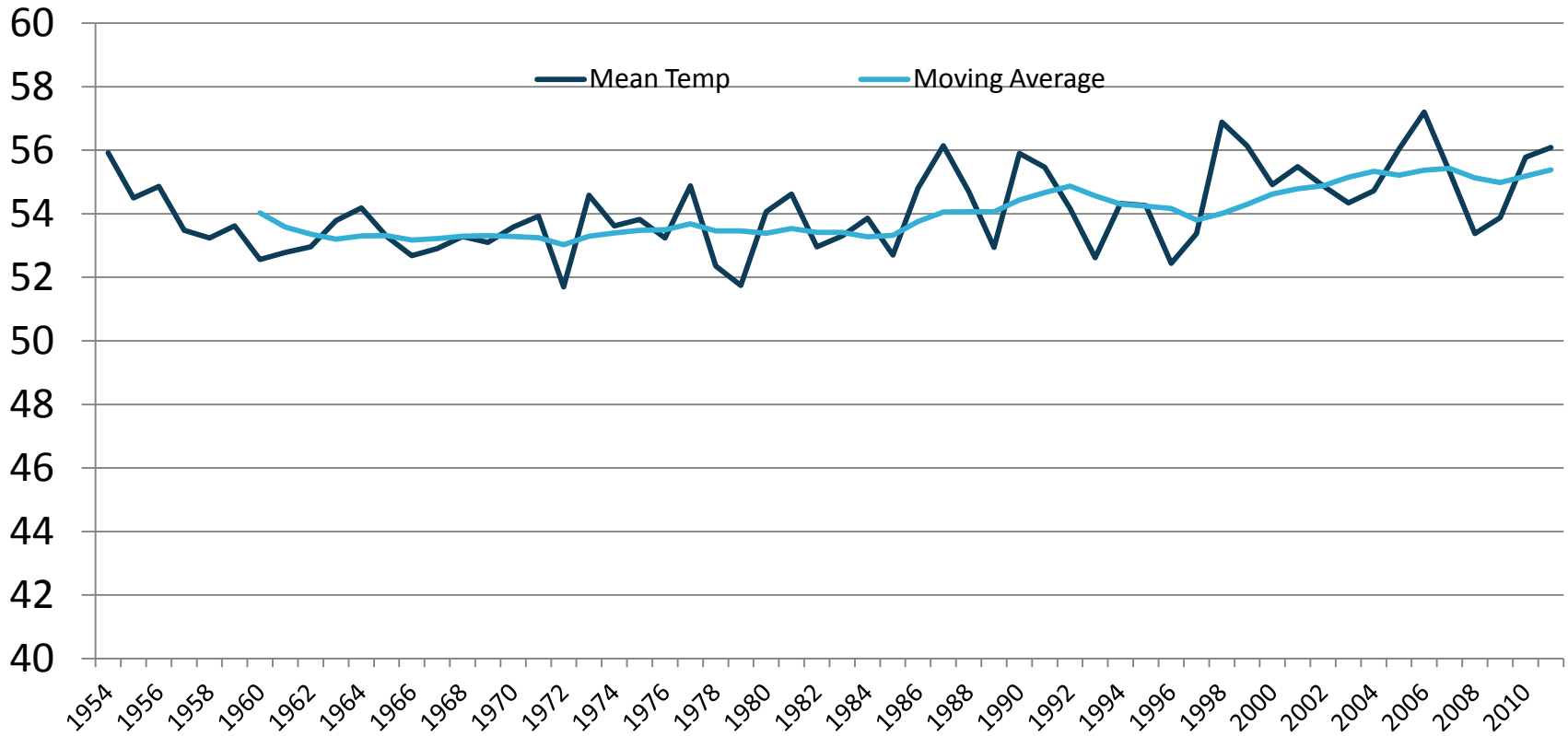


# Historical Weather Data



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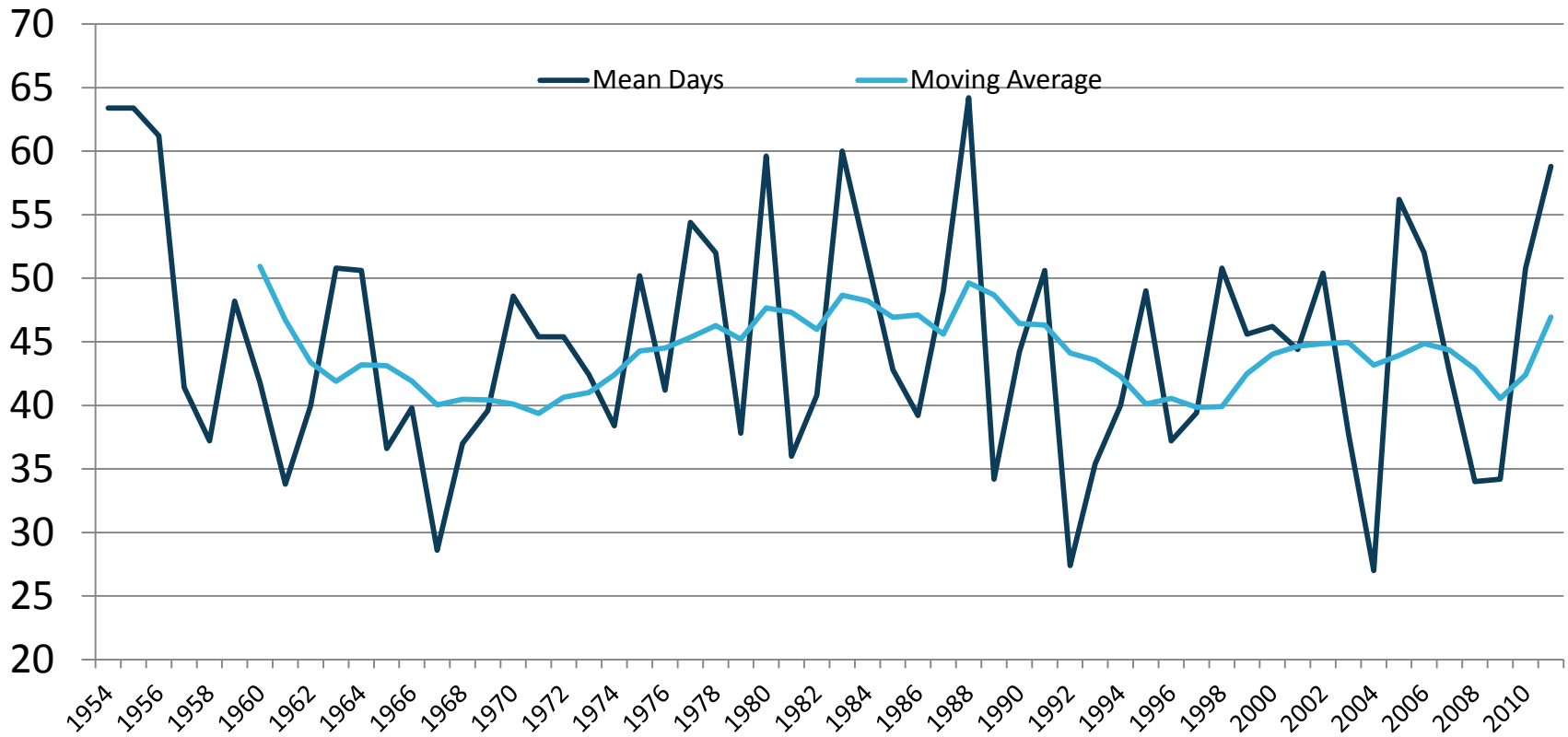
# Mean Average Temperature\*



\*Selected Cities: Des Moines, Minneapolis, Wichita, Chicago, Dallas

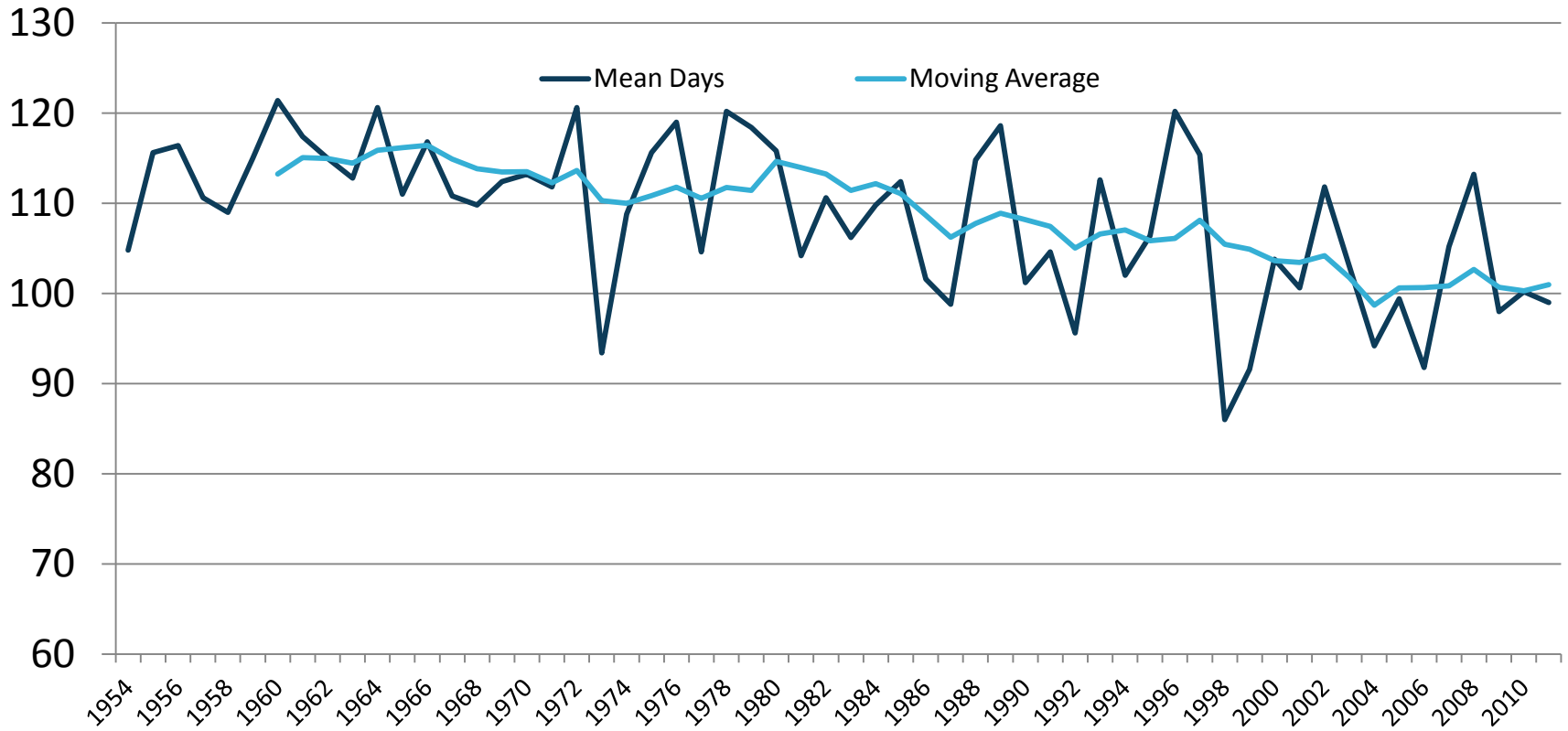


# Days Above 90 Degrees\*



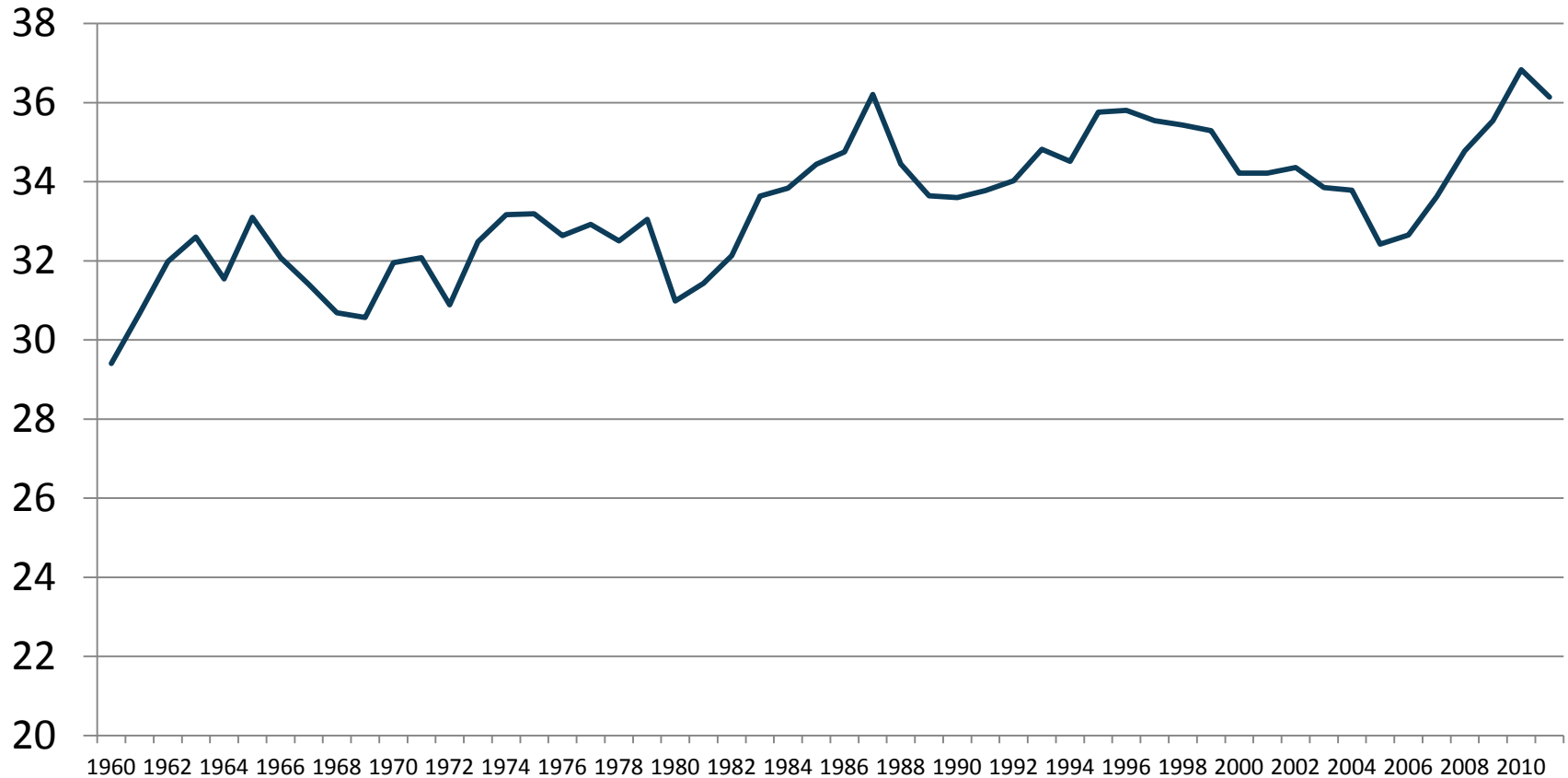
\*Selected Cities Average: Des Moines, Minneapolis, Wichita, Chicago, Dallas

# Days Below 32Degrees\*



\*Selected Cities Average: Des Moines, Minneapolis, Wichita, Chicago, Dallas

# 7 Year Moving Avg Days of Precipitation\*



\*Selected Cities Average: Des Moines, Minneapolis, Wichita, Chicago, Dallas



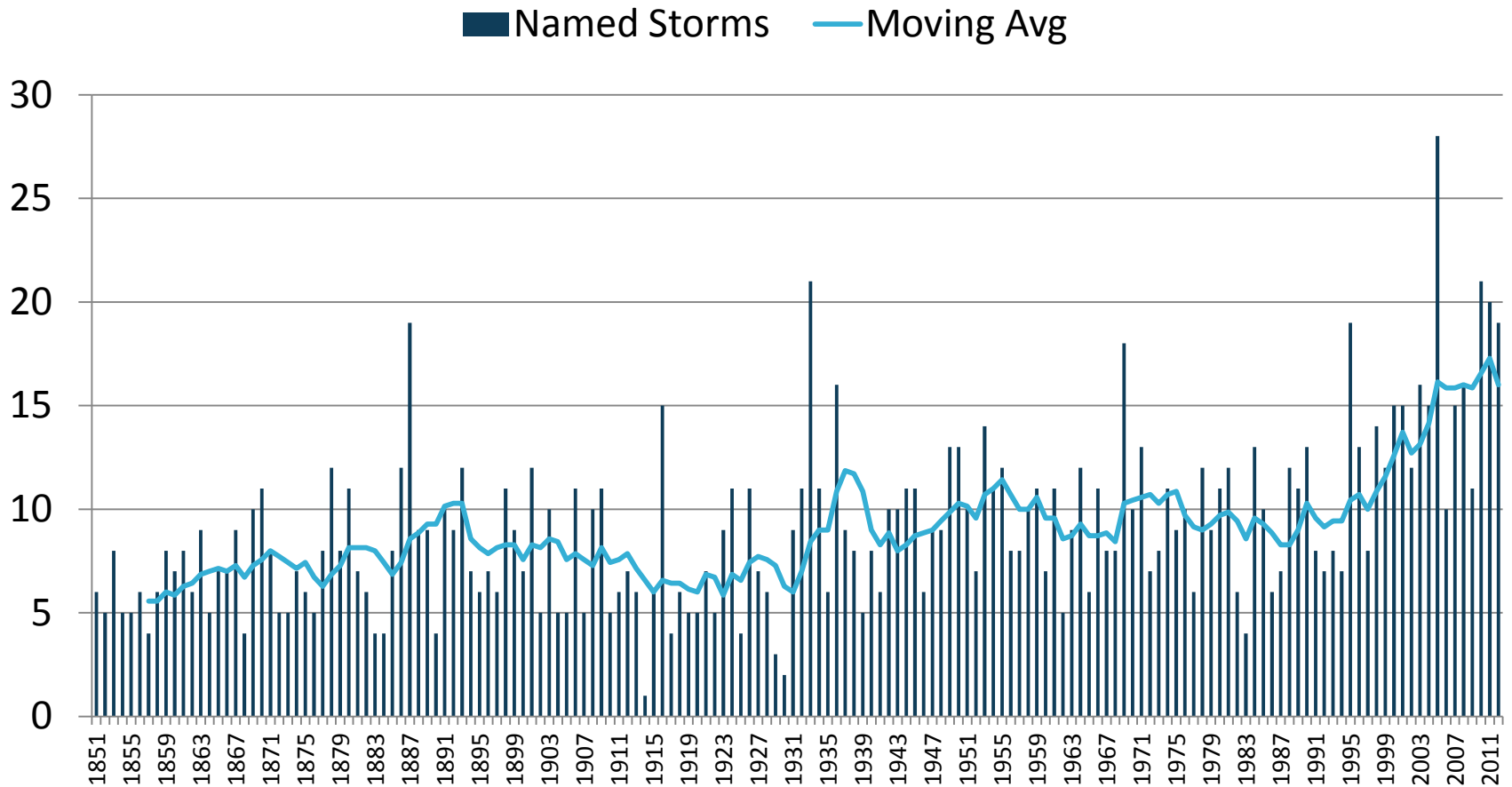


# Hurricanes

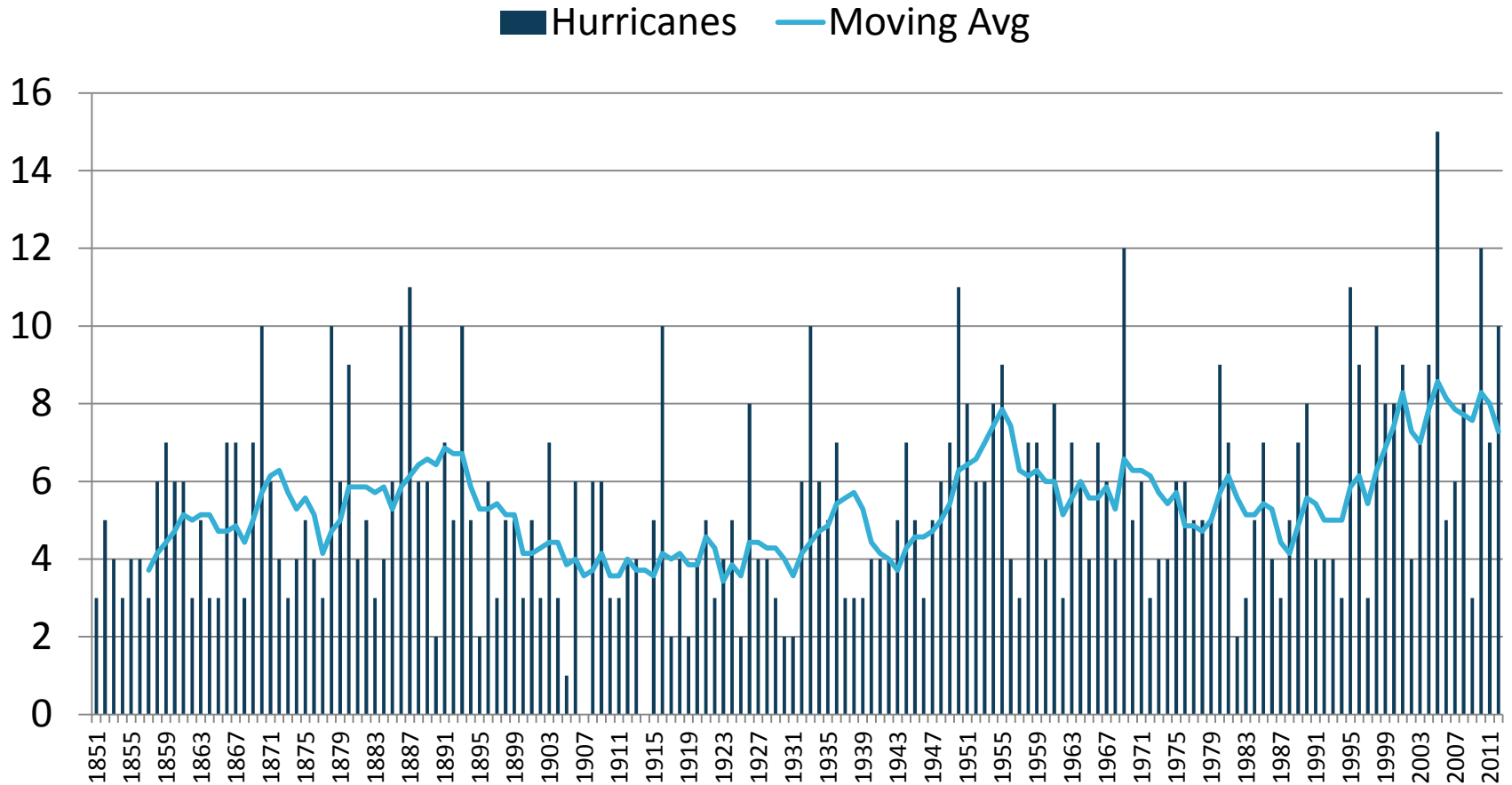


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# Historical Named Storms

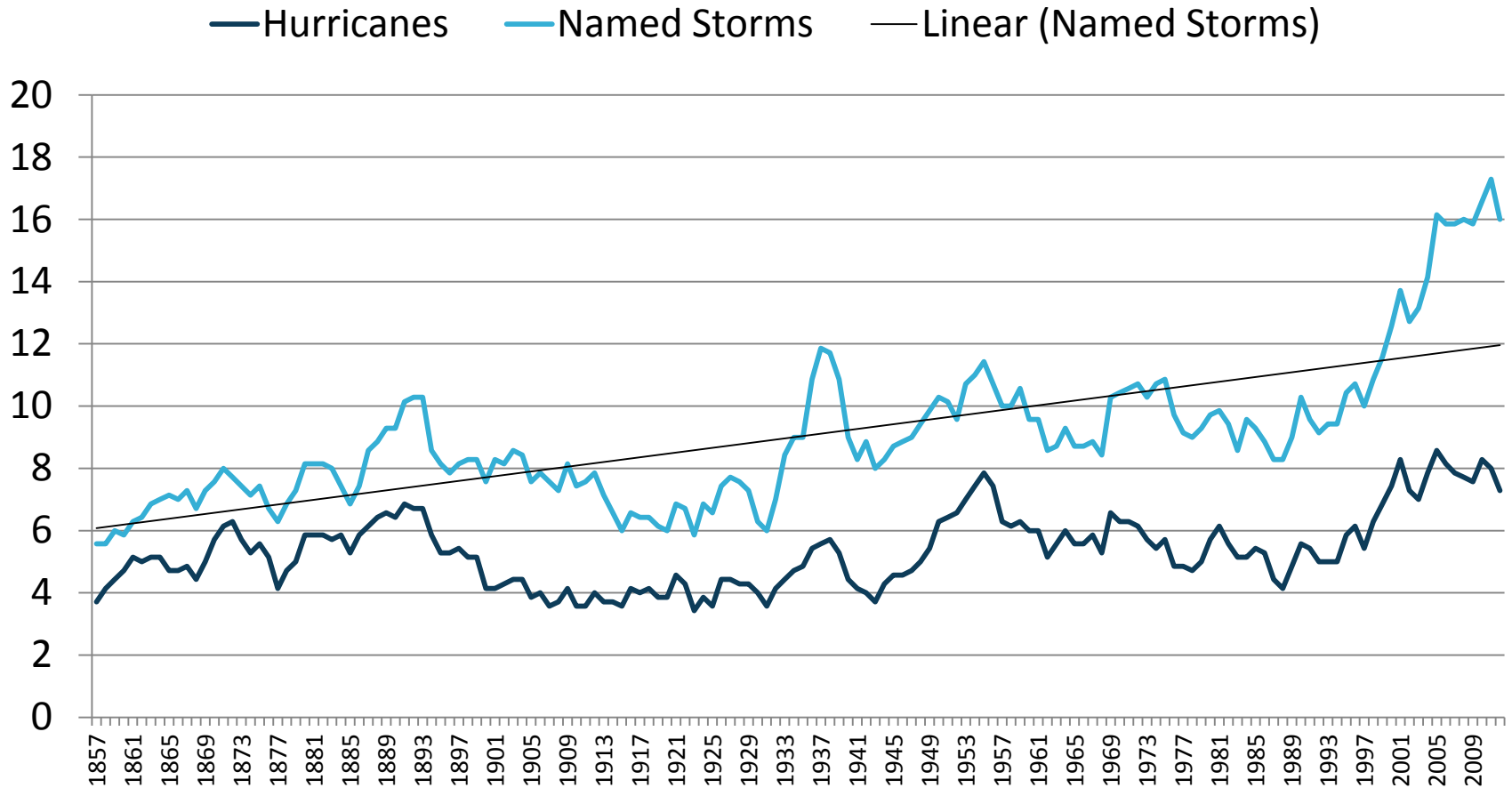


# Historical Hurricanes



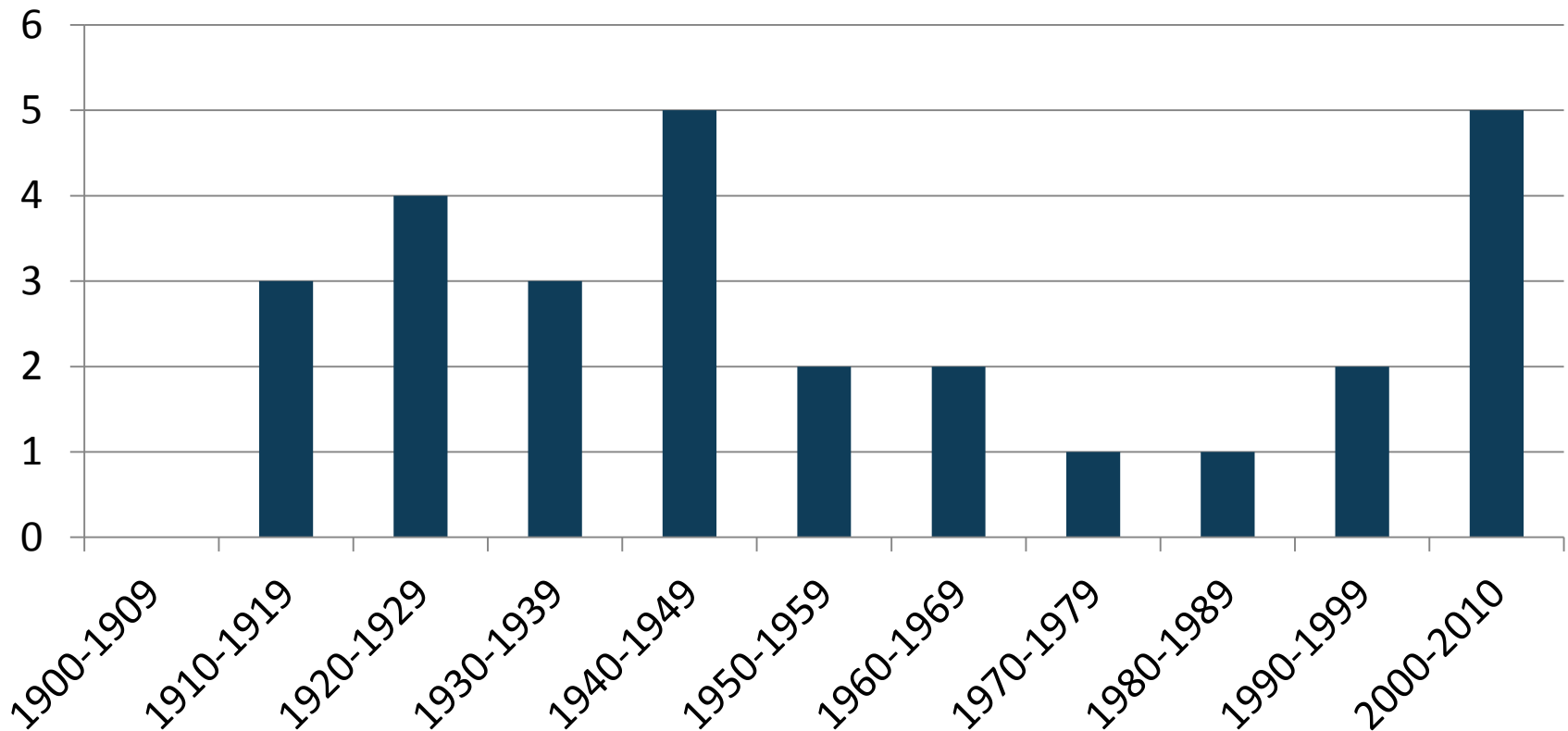


# 7 Year Moving Averages

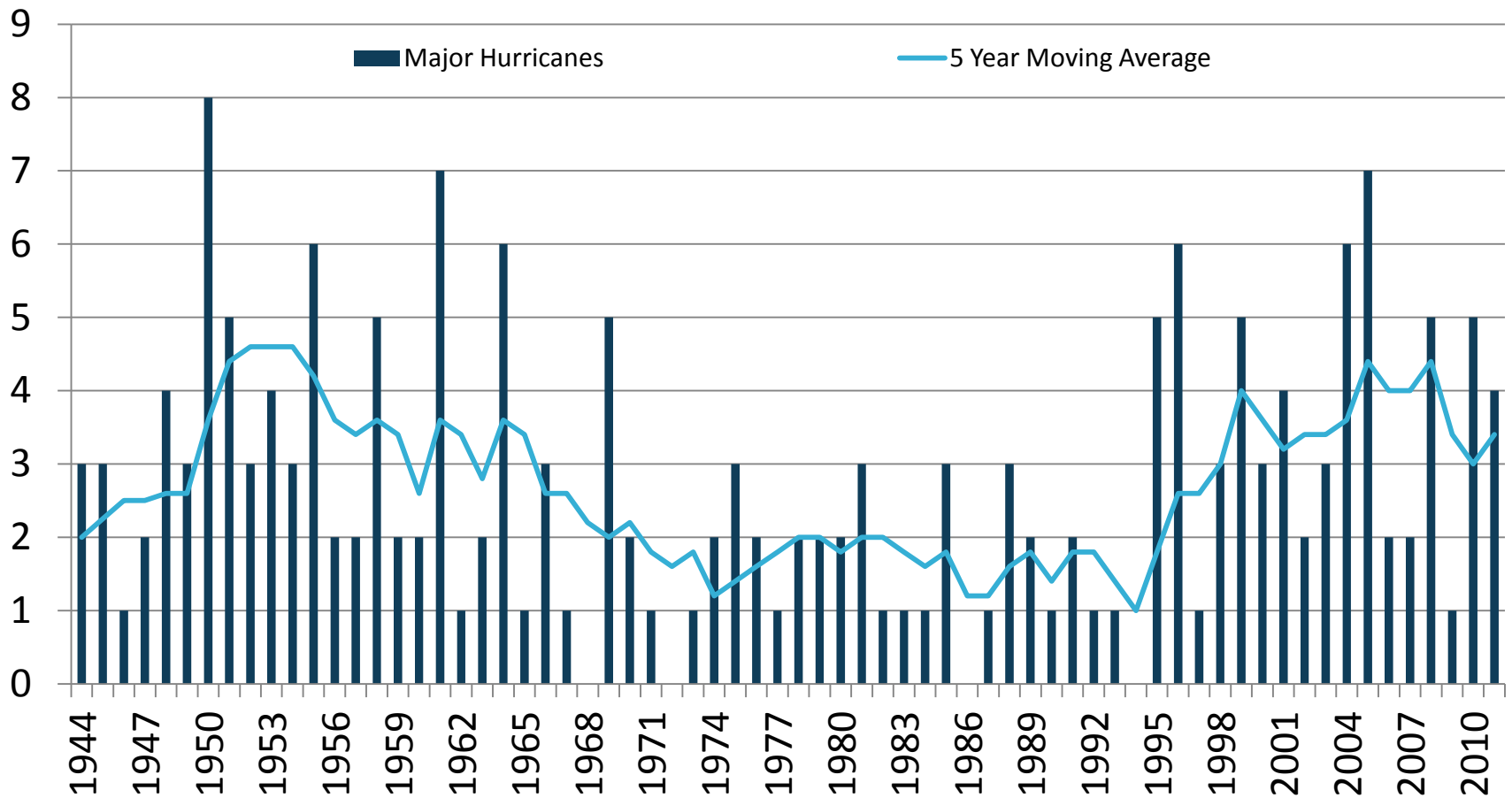


# Florida Hurricane Strikes

Category 3, 4, or 5 Hurricane Strikes in Florida by Decade



# Major Atlantic Hurricanes



# Hurricanes and Global Warming

- Chris Landsea (NOAA) presented at the AON Benfield Analytics Insights Conference and addressed this question. His analysis:
  - Due to warmed waters his theory and modeling suggest approximately a 1% increase in hurricane winds today
  - By the late 21<sup>st</sup> century, his model suggests an approximate increase in wind speed of 3%
  - The same research also suggests a decrease in the frequency of hurricanes

# Why Increases in Insured Losses?

- Recent active weather period
- Population changes
- Economy
- Stormchasers
- The new norm?

# Significant Tornadoes by Year

