

*Challenges in Reducing Tornado  
Fatalities in the U.S.*

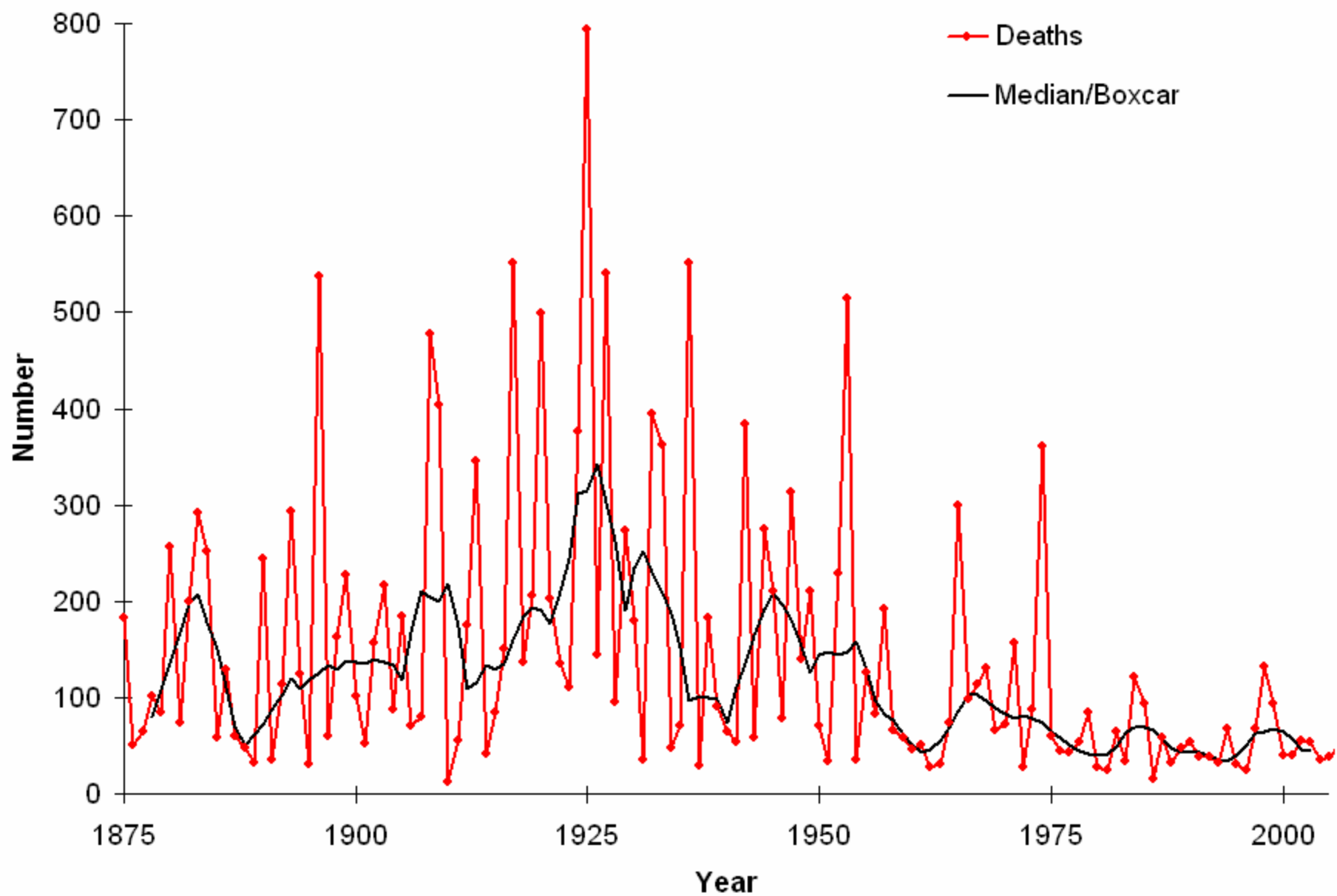


Harold Brooks

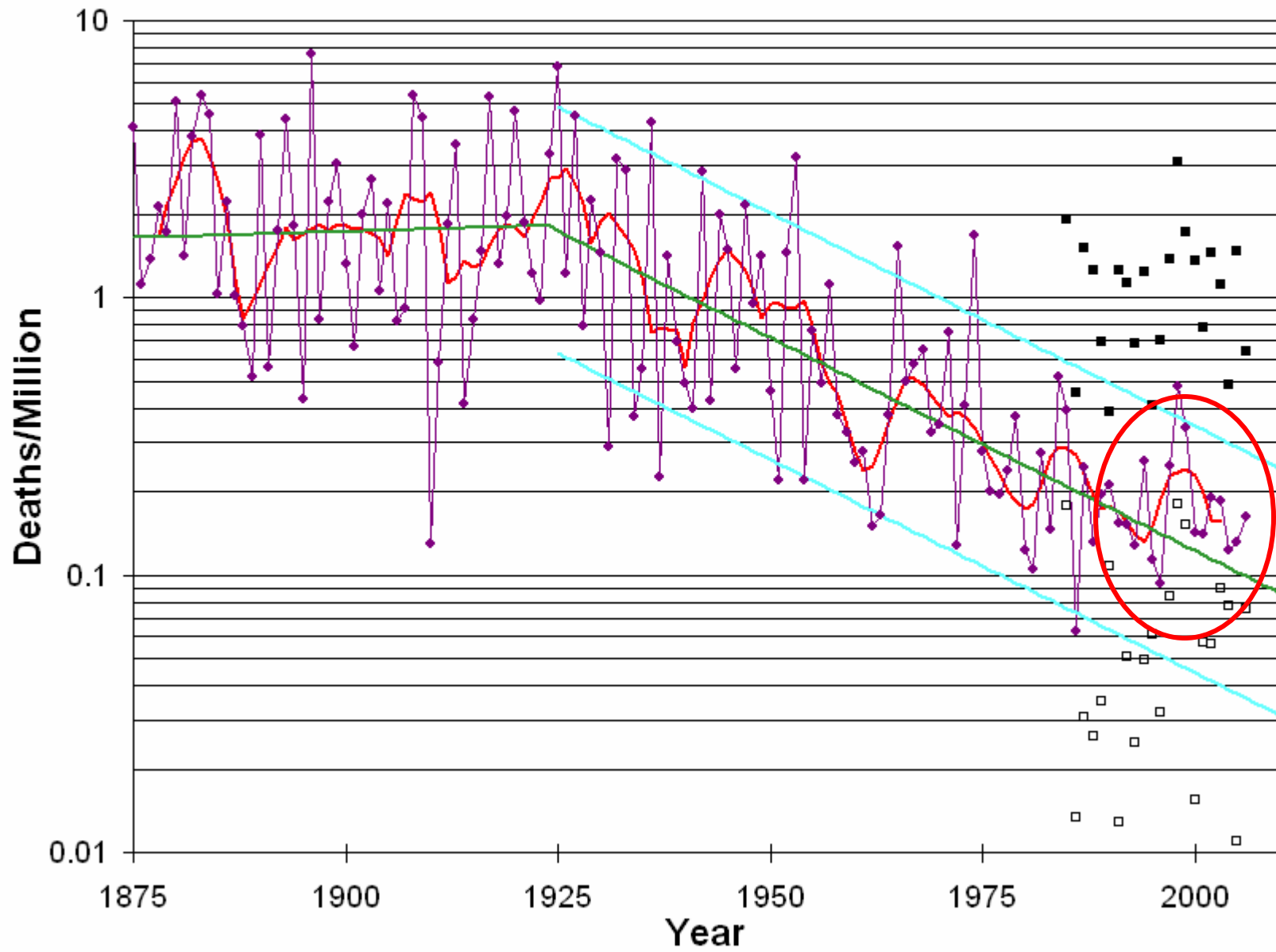
NOAA/National Severe Storms Laboratory

Norman, Oklahoma, USA

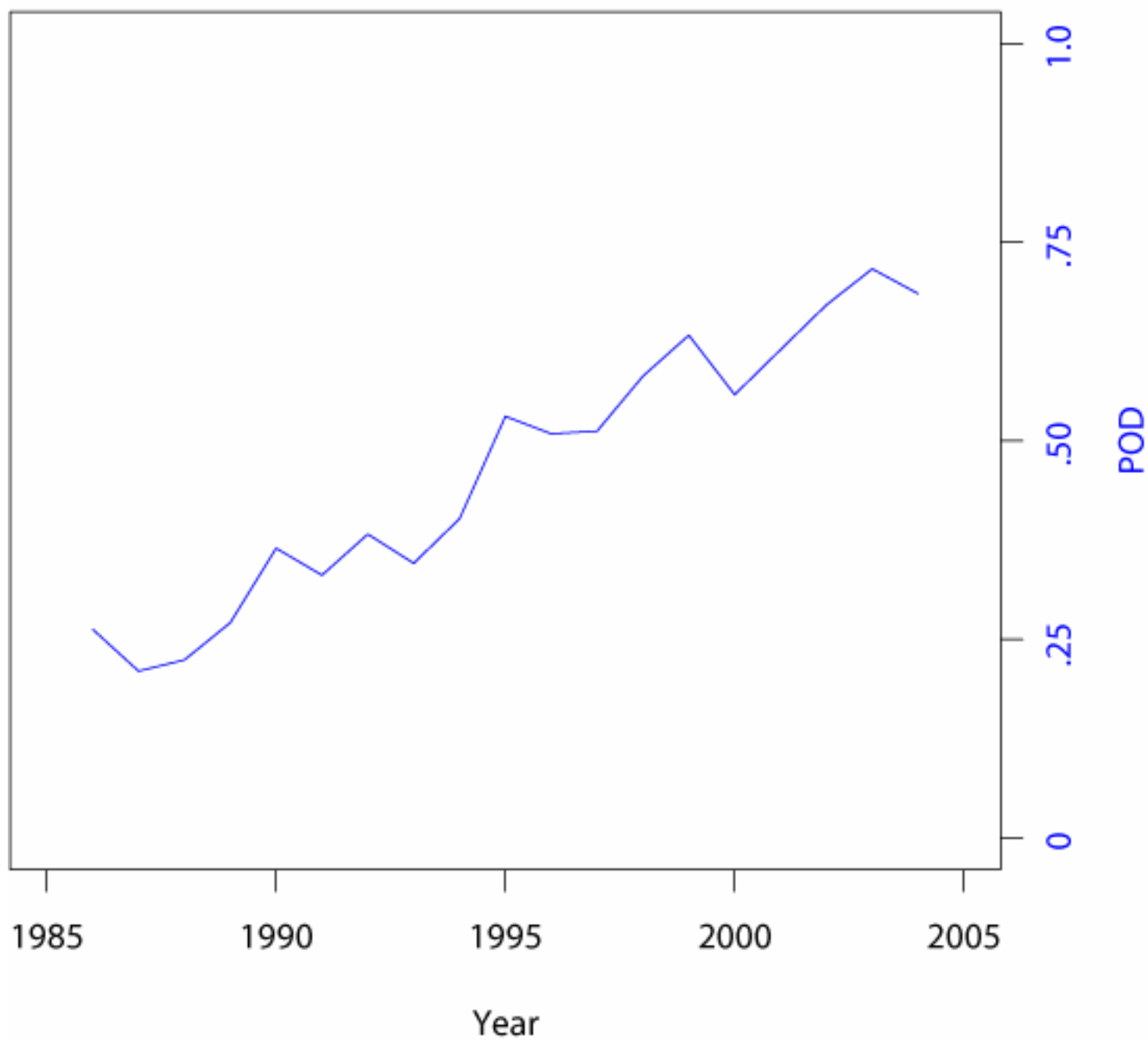
# US Annual Tornado Deaths



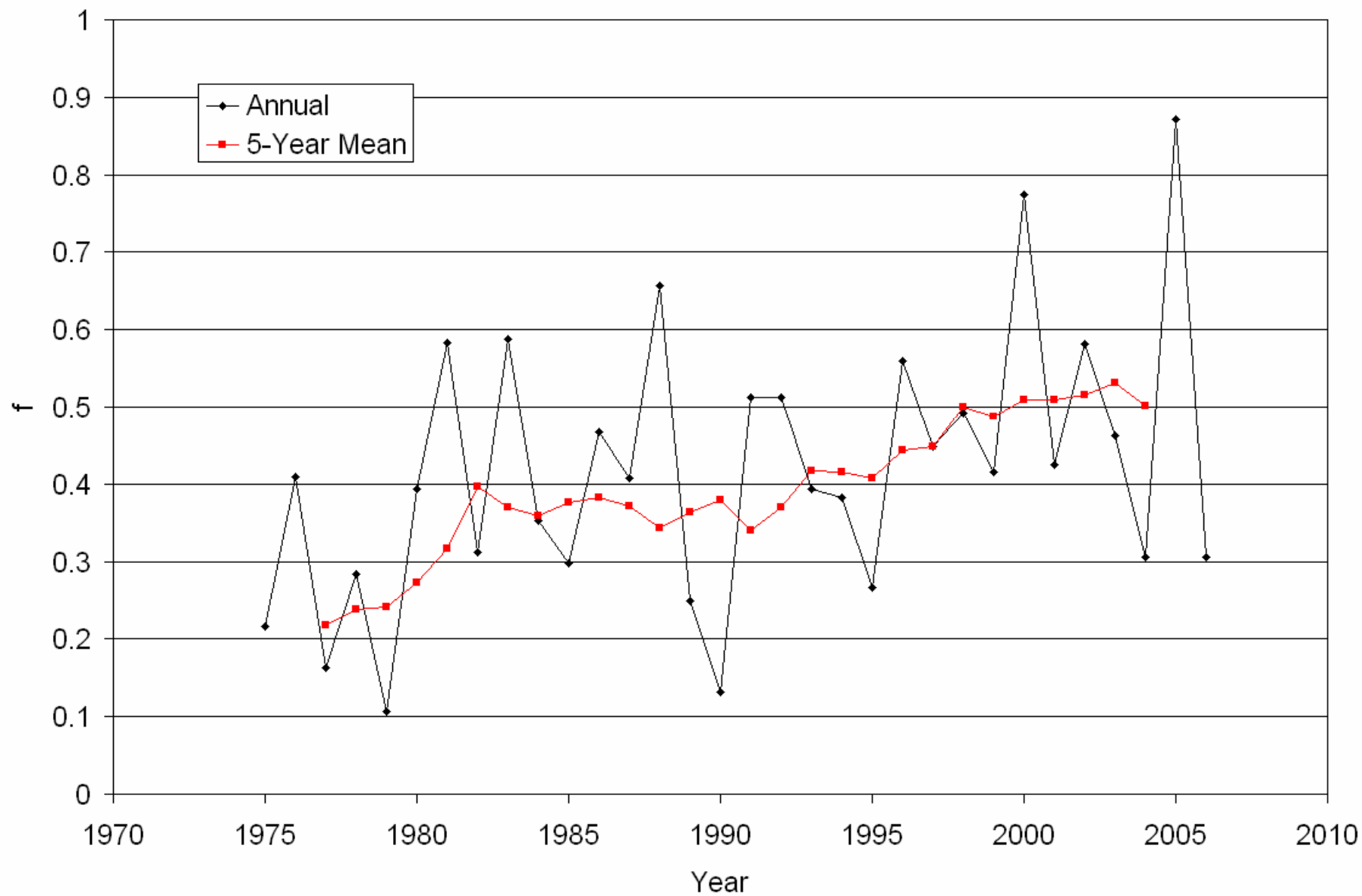
# US Tornado Deaths/Million People



# Annual Tornado Warning Performance

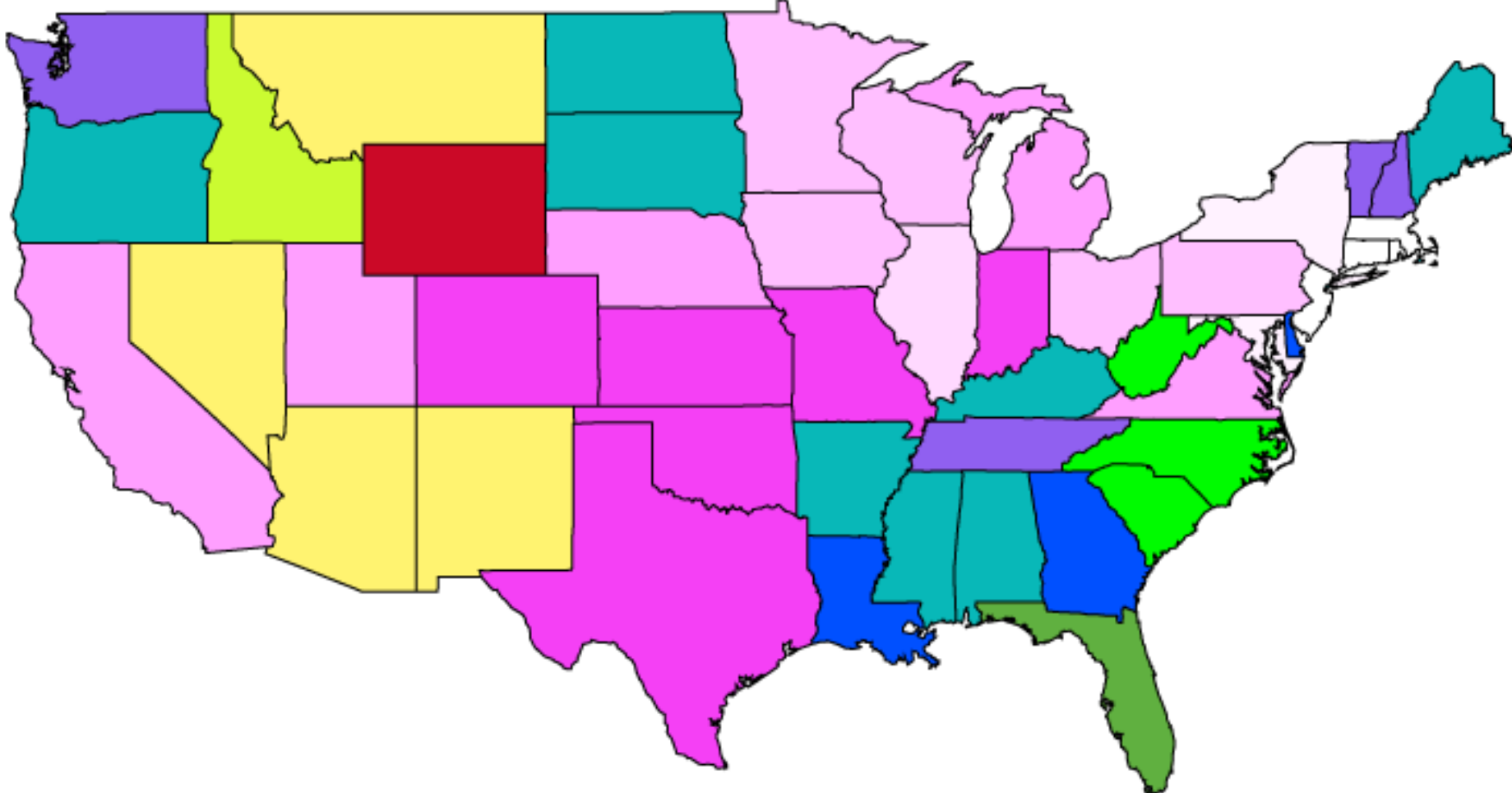


# Mobile Home Fraction of Tornado Deaths

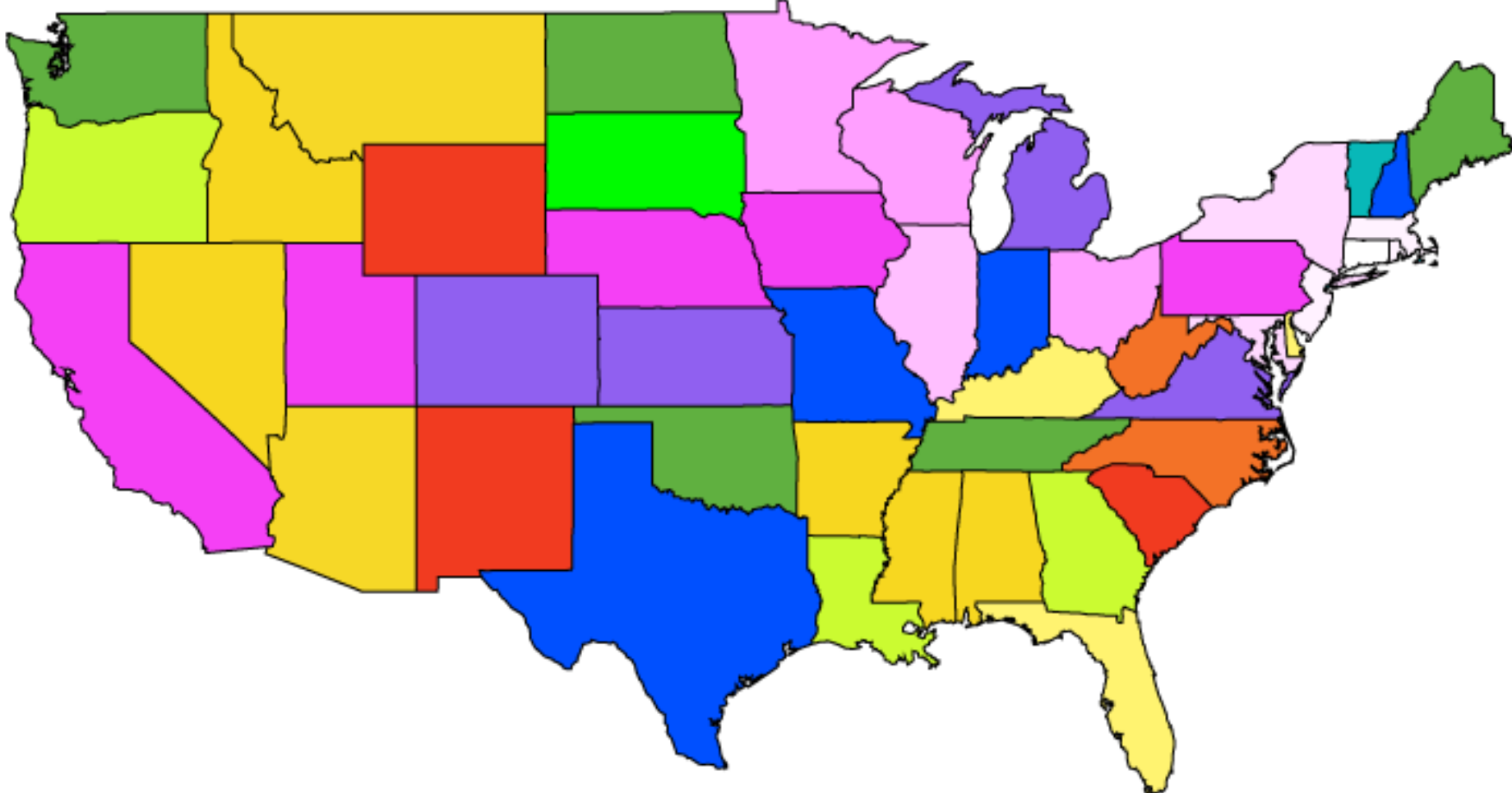




# Mobile Home Percentage of Total Housing Units (1980)



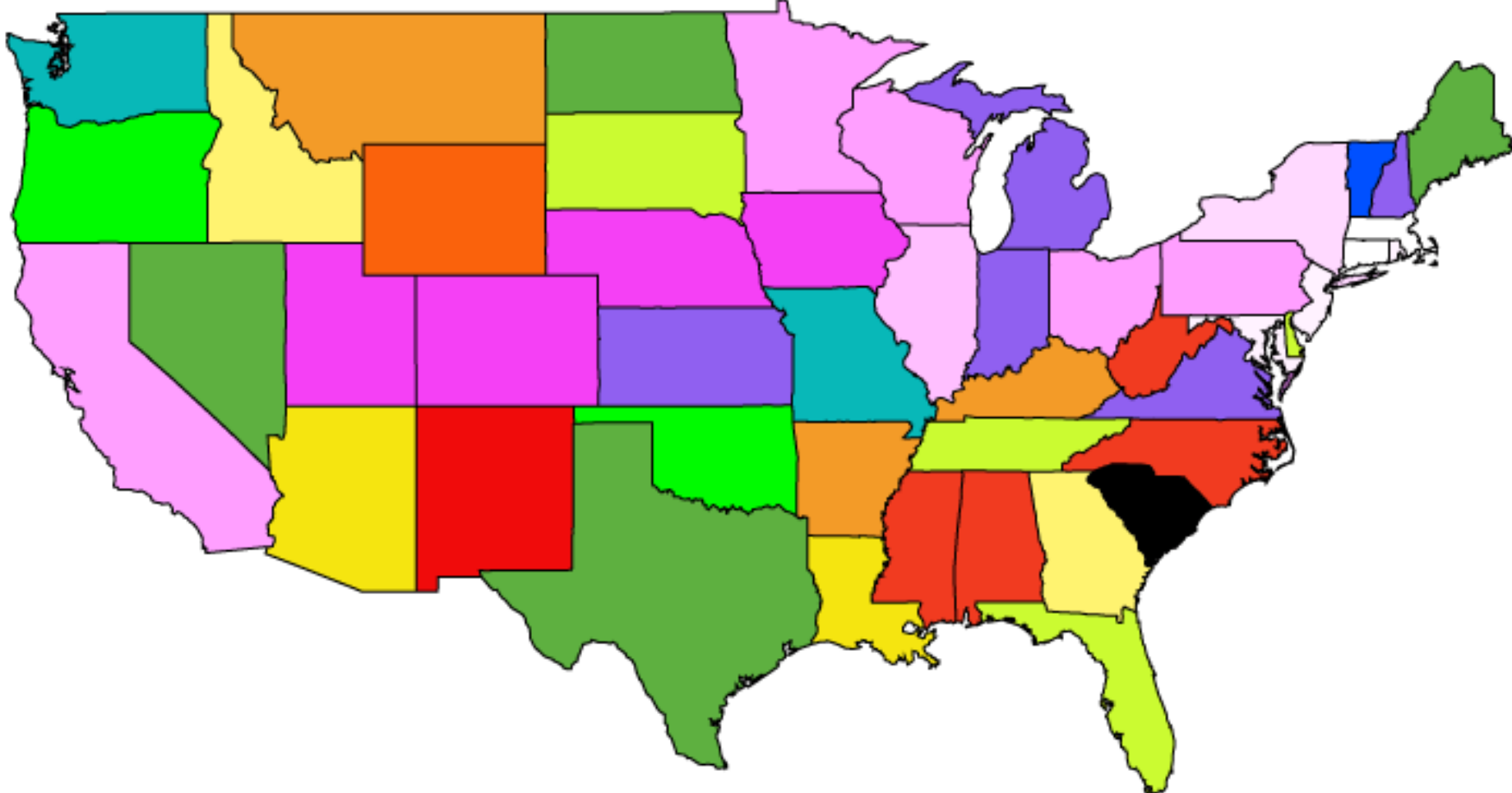
# Mobile Home Percentage of Total Housing Units (1990)



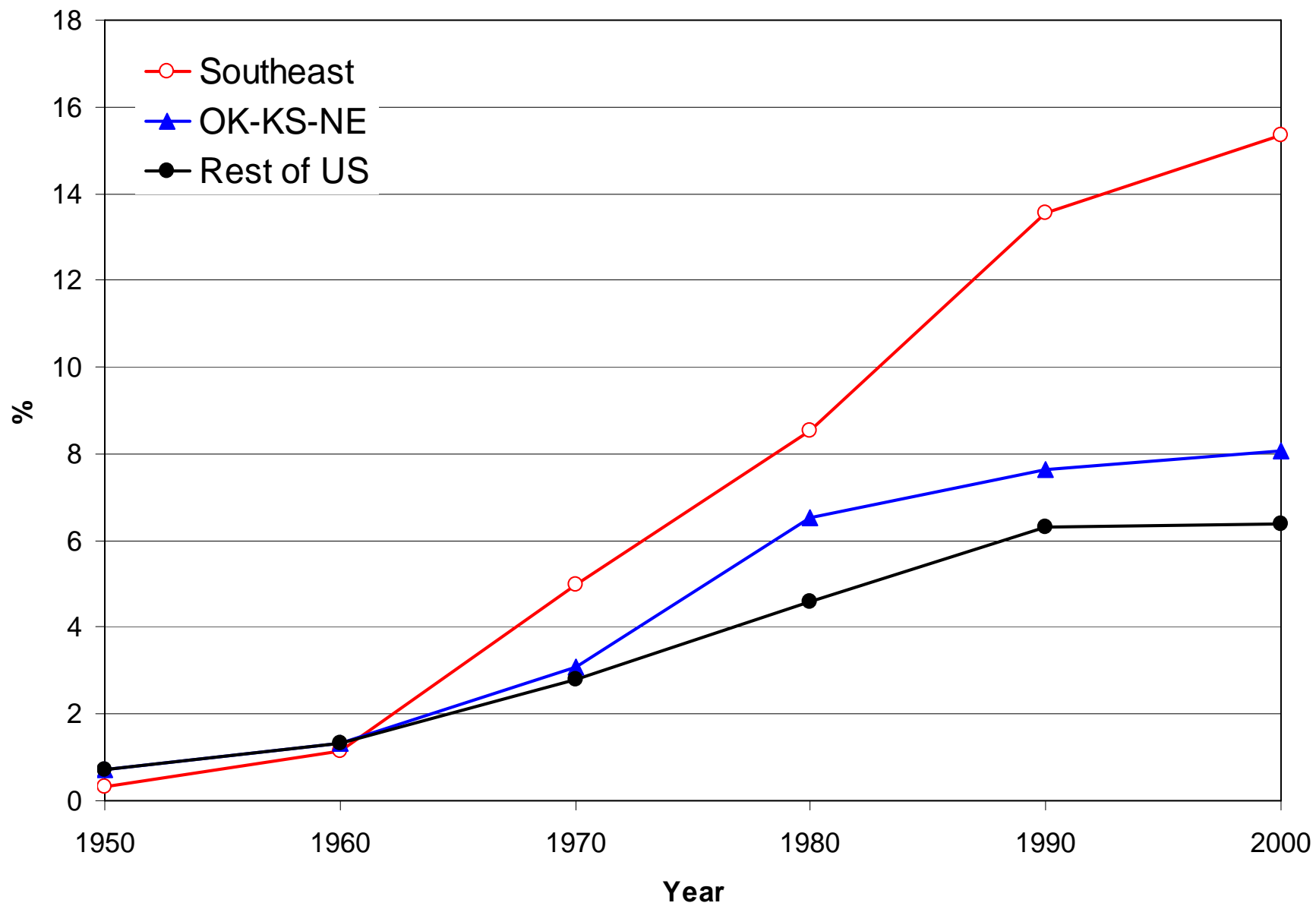
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20



# Mobile Home Percentage of Total Housing Units (2000)



## Mobile Home Fraction of Total Housing



# *Dilemma*

- Tornado warnings are more accurate
- Death toll decrease has slowed or stopped
- What can be done?

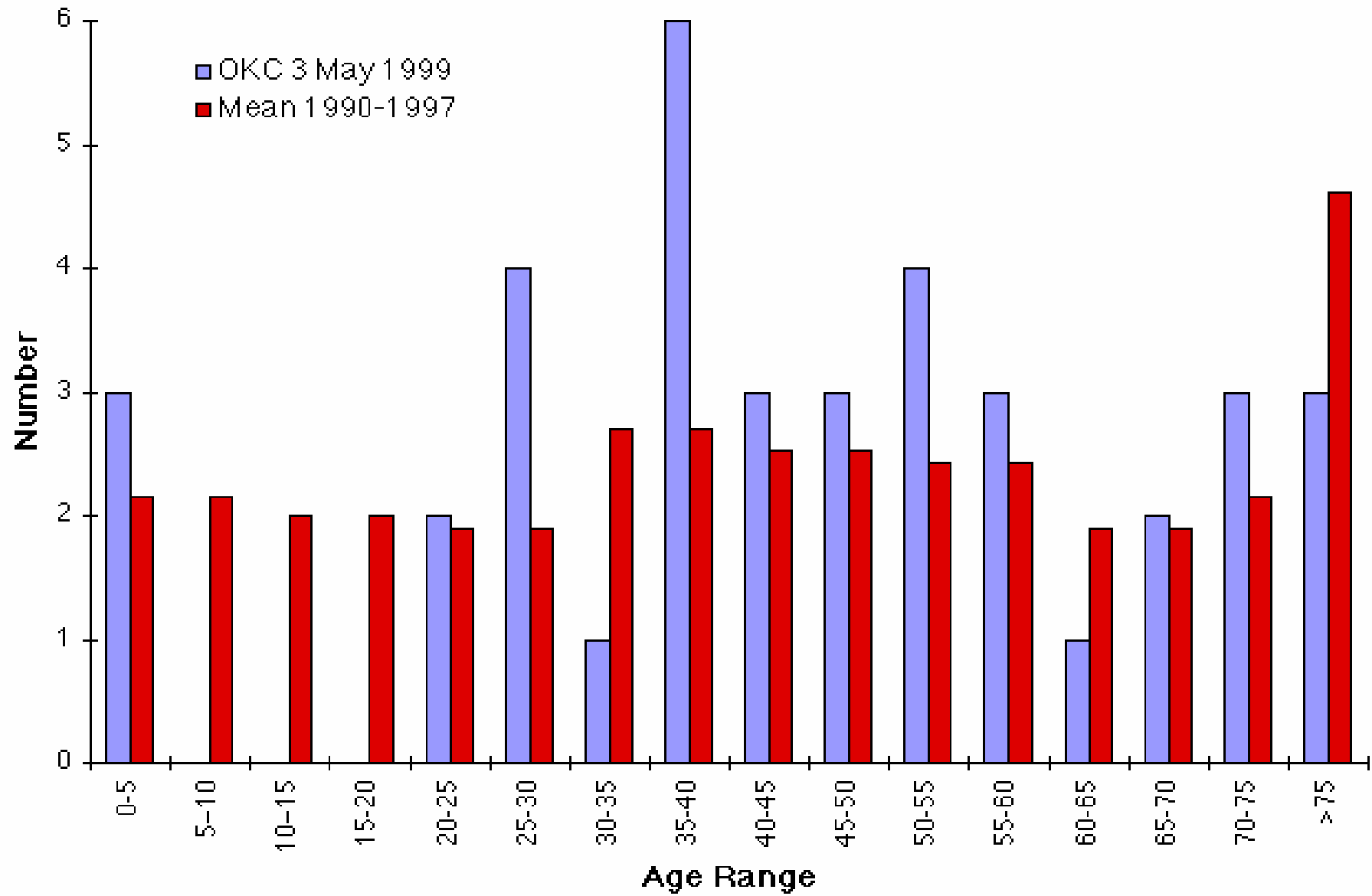


# *Goodness of forecasts*

- Allan Murphy, 1993: What is a “good” forecast? *Wea. Forecasting*
- Consistency
  - Forecast matches forecaster’s “true” beliefs
- Quality
  - Forecast matches observations
- Value
  - Users get benefits from forecasts



## Tornado Fatalities by Age



# *Value of forecasts*

- Response is critical
- Individual
  - Have options as what to do
  - Know what to do
  - Get information they understand
- Community
  - Help provide information/options
  - Long-term planning



# *What can we do?*

- What do people do currently in warnings?
- Communicating information
  - Planning
  - During event
- Hazard assessment

