

# UNDERSTANDING WEATHER AND CLIMATE- RELATED RISKS

Pew Project on National Security, Energy, and Climate  
January 25, 2016

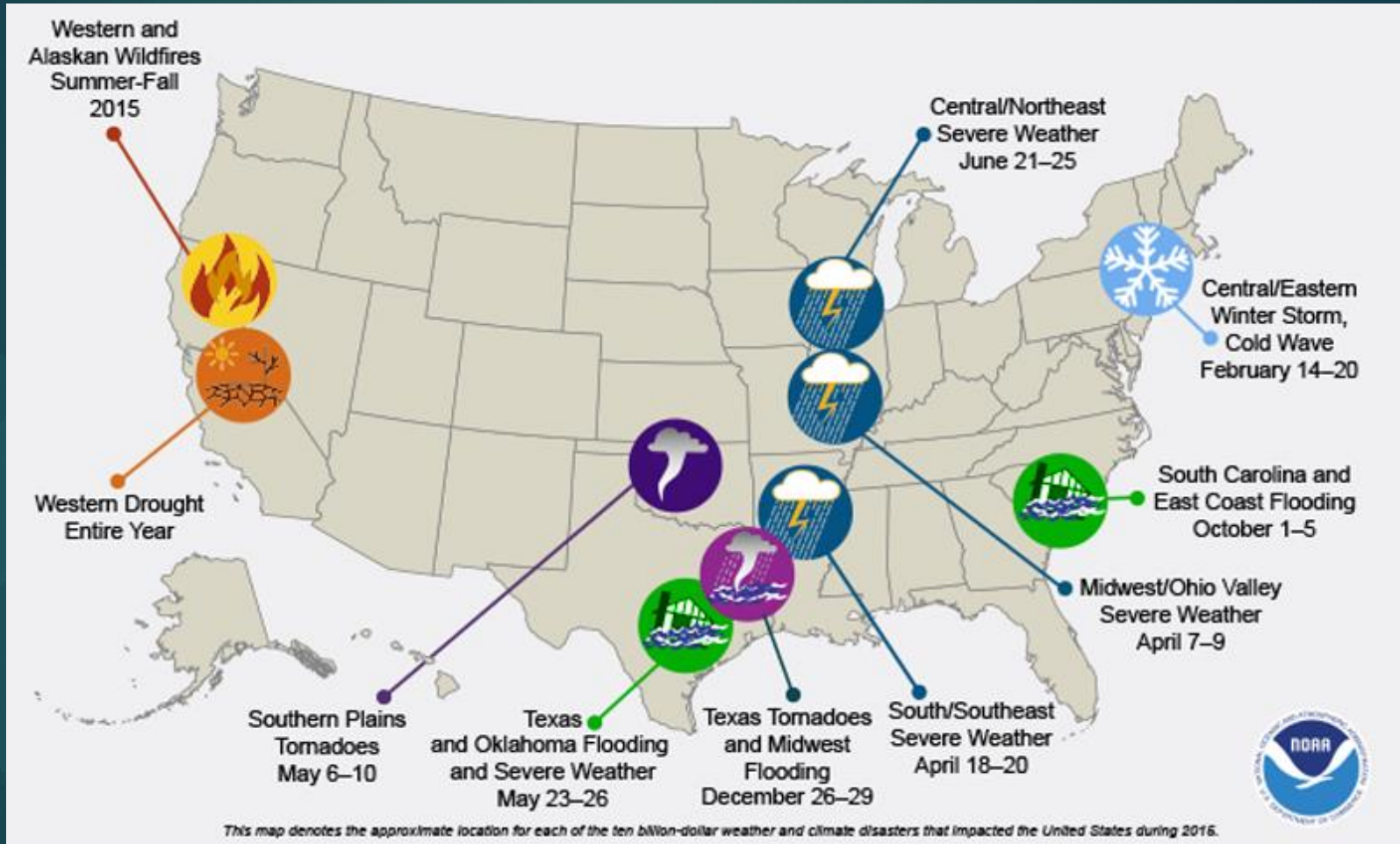
RICK SPINRAD, PH.D., CMARSCI

NOAA CHIEF SCIENTIST



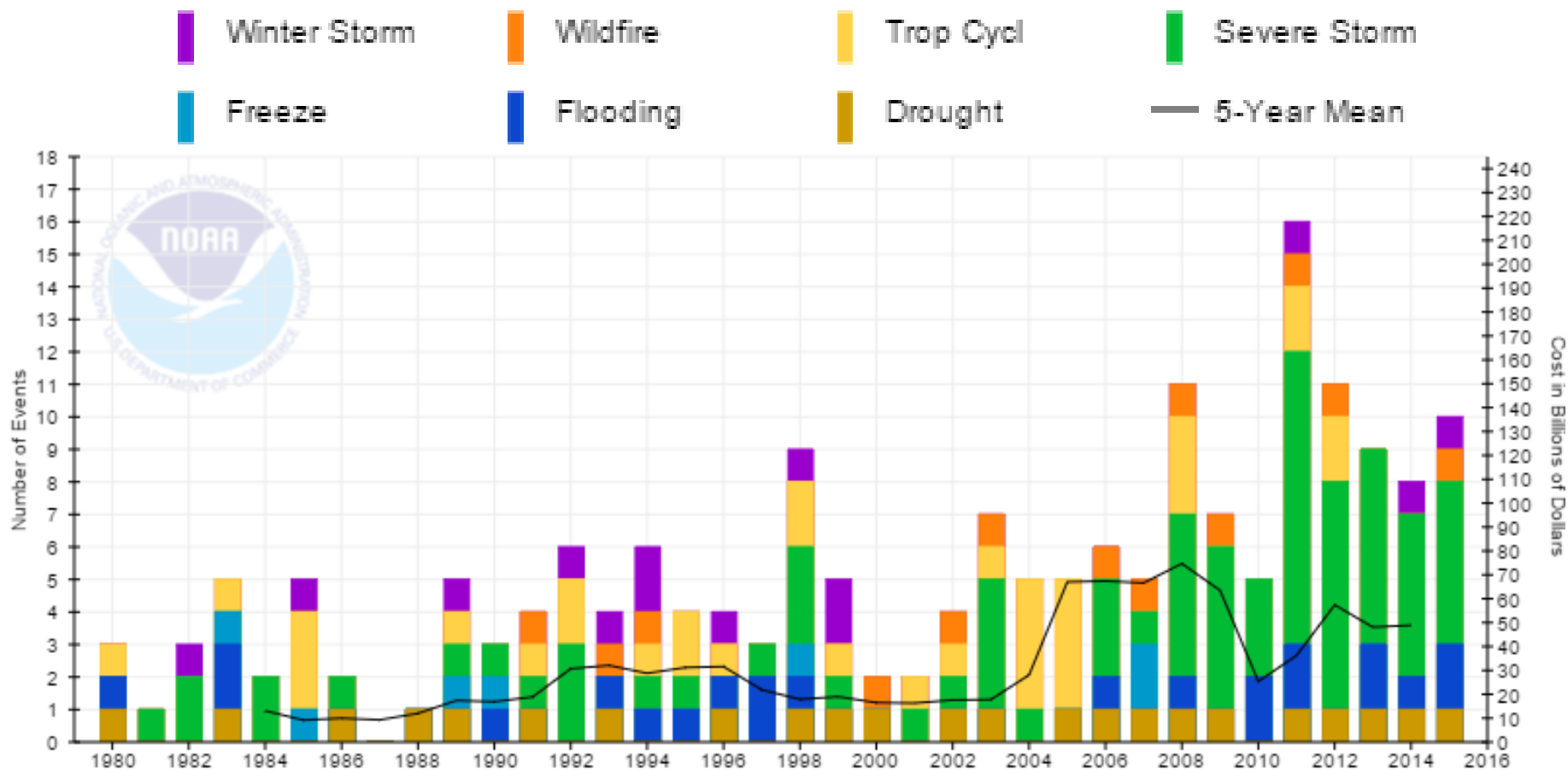
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | NOAA

# U.S. 2015 BILLION-DOLLAR WEATHER & CLIMATE DISASTERS



[www.ncdc.noaa.gov/billions/](http://www.ncdc.noaa.gov/billions/)

# Billion-dollar U.S. Disaster Event Types by Year (CPI-adjusted)



# EXTREME WEATHER (U.S.)

National Climate Assessment

## HEATWAVES



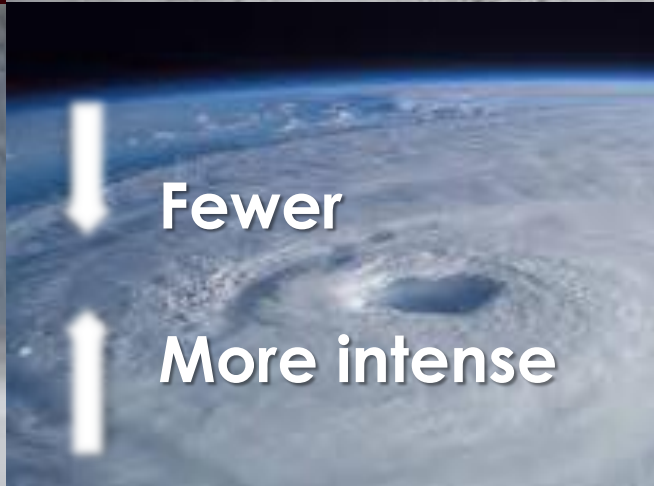
## WINTER STORMS



## DROUGHT



## HEAVY DOWNPOURS

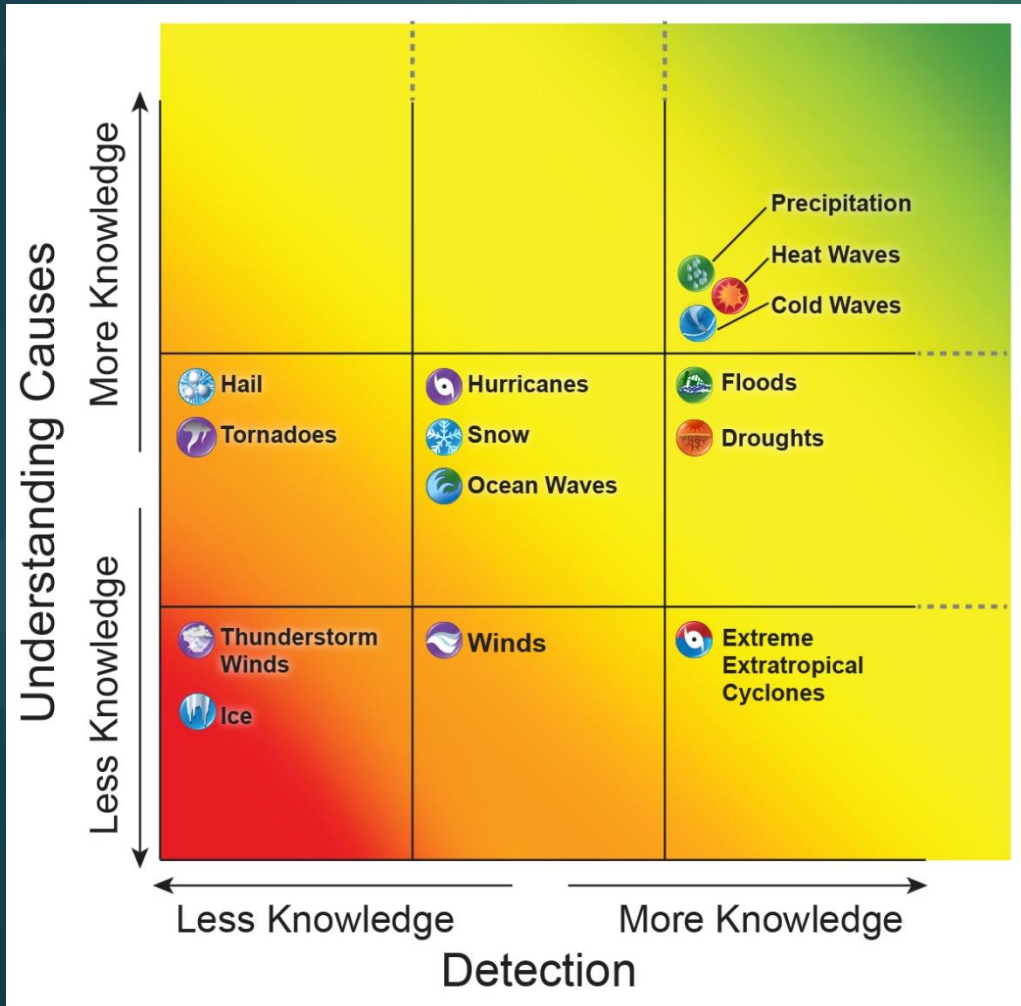


## HURRICANES



## FLOODING

# Adequacy for Detection and Understanding Causes for Classes of Extremes



Monitoring and Understanding Changes in **Extreme Storm** Statistics: State of Knowledge. Kunkel, K.E. et al., 2012, BAMS

Monitoring and Understanding Changes in **Heat Waves, Cold Waves, Floods and Droughts** in the United States: State of Knowledge. Peterson, T.C. et al., 2013, BAMS

Monitoring and Understanding Changes in **Extreme Winds, Waves, and Extratropical Storms** along the Coasts: State of Knowledge. Vose, R.S. et al., 2014, BAMS

**CMIP5** Climate Model Analyses: Climate Extremes in the United States. Wuebbles, D., et al., 2014, BAMS

# KEY RESOURCES



## U.S. National Climate Assessment

[nca2014.globalchange.gov](http://nca2014.globalchange.gov)



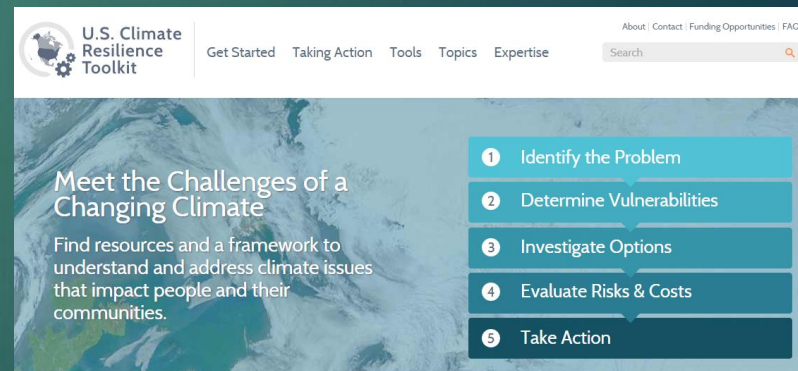
## State of the Climate in 2014

[www.amset.org](http://www.amset.org)



## Explaining Extreme Events from a Climate Perspective

[www.amset.org](http://www.amset.org)



## NOAA National Centers for Environmental Information

[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

## U.S. Climate Resilience Toolkit

[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

# Thank you

► [www.noaa.gov](http://www.noaa.gov)

