

Community Resilience Planning Workshops



City of Minnetonka

January 17, 2018

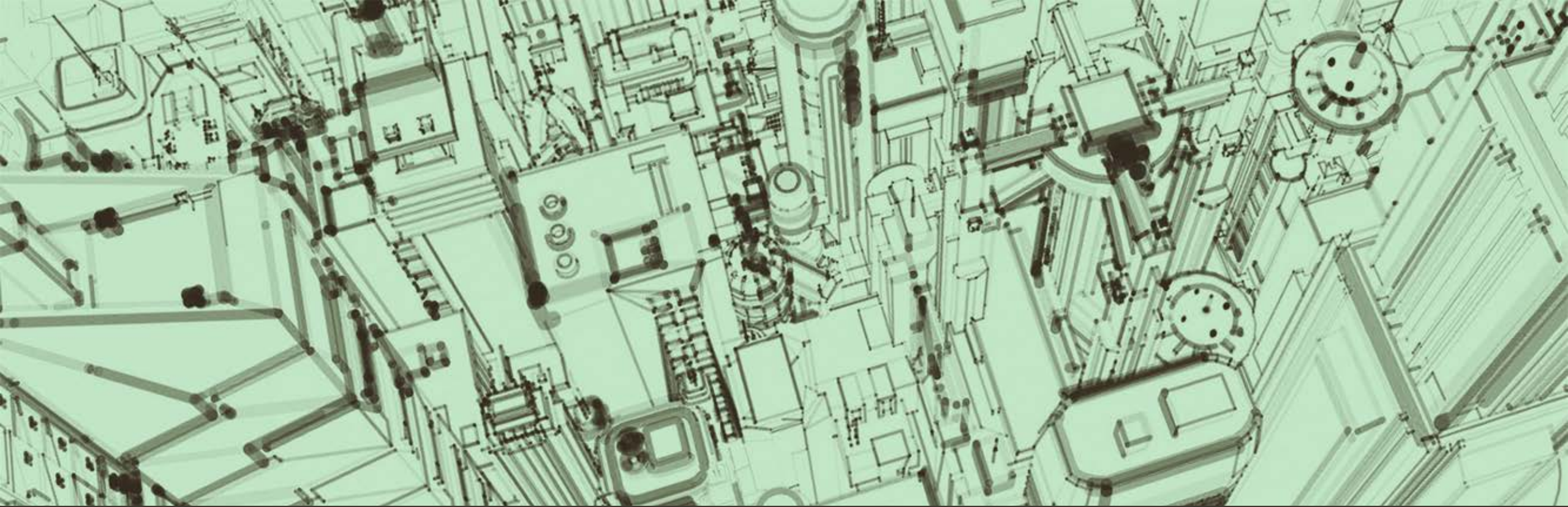
Purpose

Develop climate-related strategies and priorities to inform draft Comprehensive Plan

- Identify top climate hazards
- Determine vulnerabilities and strengths
- Prioritize community strategies

Infrastructure – Society – Natural Resources





Climate Change, Minnesota & Environment

Jen Kader – Freshwater Society



“Minnesota is becoming warmer and wetter.”

- Kenny Blumenfeld, MDNR



Intense Rain



Extreme
Heat



Severe
Storms/Wind



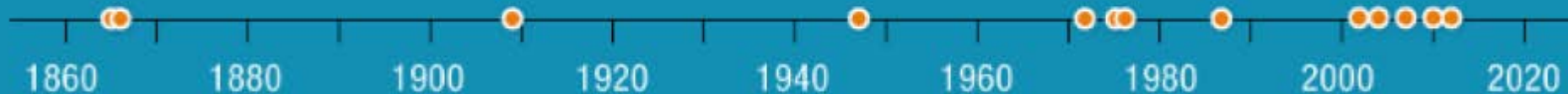
Warming
Lows

Intense Rain

- Overall amount of rain may not change. Just **when** and **how**.
- Mega Rain events
 - 6 inches of rain over 1000+ square miles, and core of event > 8 inches
 - **NINE** (9) in the last 45 years, only four (4) in the 110 years before that
 - First time more than one recorded in a single year: 2016

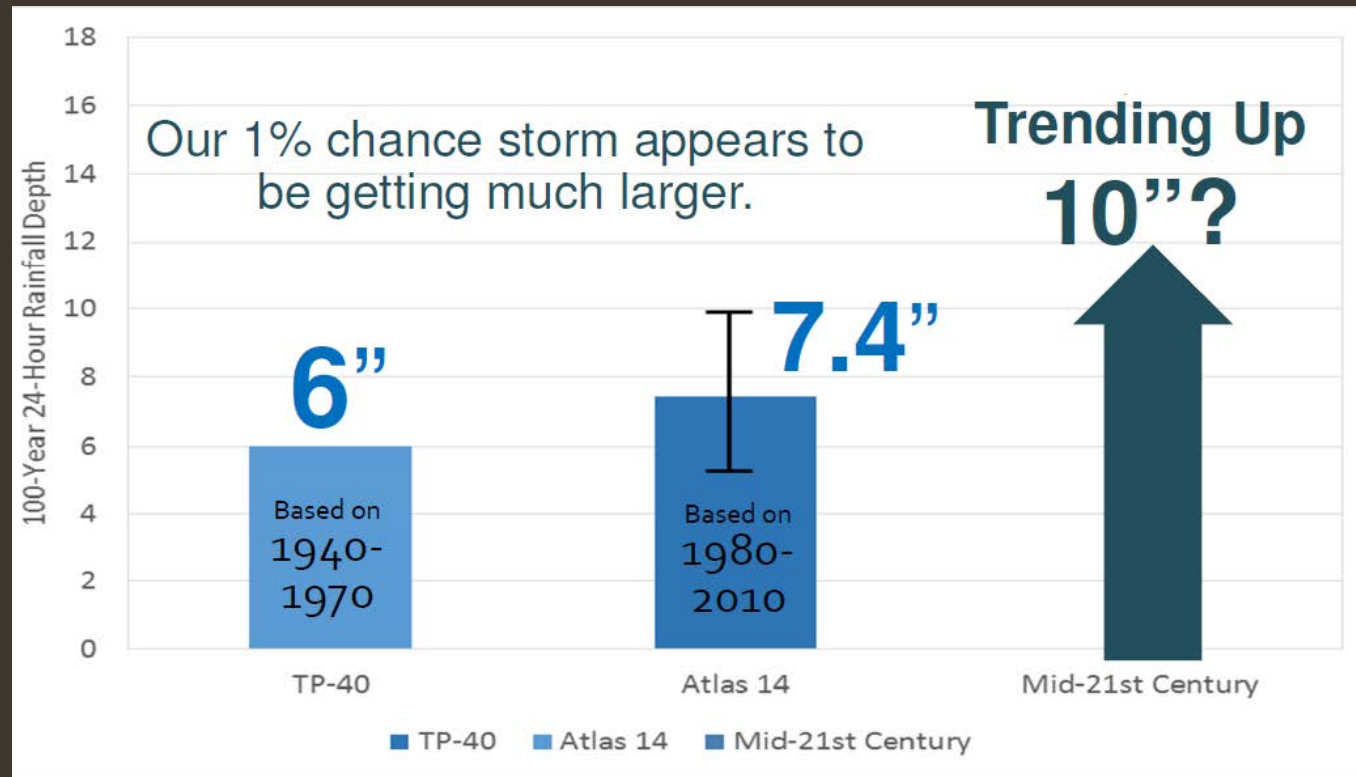


Timeline of Minnesota's historic mega-rain events 1866-2014



Intense Rain

- Overall amount of rain may not change. Just when and how.



Intense Rain

- Larger nutrient “flushes” to water bodies
 - Higher water levels
 - Increase in flash floods
 - Increase in landslides & erosion
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- At the same time...
 - Longer time between rain events
 - Increased likelihood to drought-like conditions within a year



Extreme Heat

- Typically, 12 days with temps $> 90^{\circ}$, maybe 1 $> 100^{\circ}$
- Near the end of the century...
 - 60-70 days over 90°
 - 25-30 of those days exceeding 100°
- Air is more humid from higher dew points, increasing heat index



Extreme Heat

- Increased plant stress
 - Less healthy
 - Increased susceptibility to disease
- Loss of iconic plant species
- Introduction of new plant species



Severe Storms and Wind

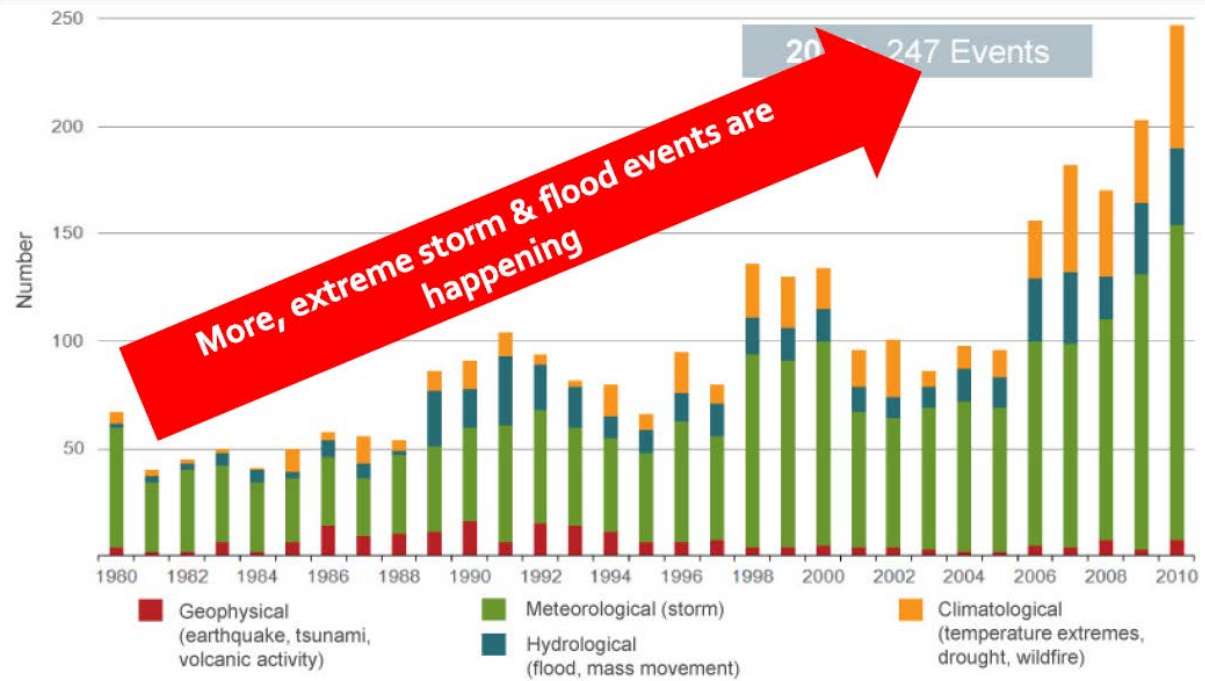


U.S. Natural Catastrophe Update

Natural Disasters in the United States, 1980 – 2010 Number of Events, Annual Totals



The number of events in the United States in 2010 set a new record.



Severe Storms and Wind



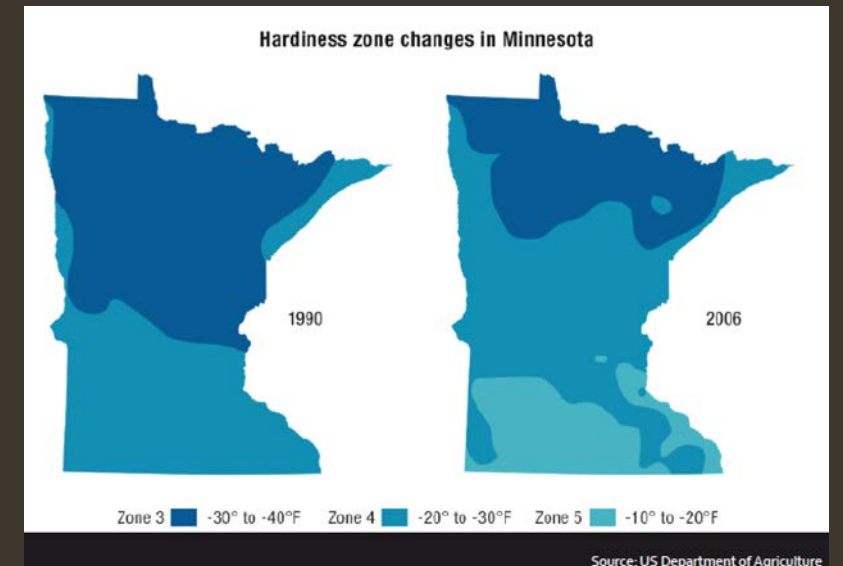
Warming Lows

- Two pieces
 - Warming overnight lows (see extreme heat)
 - Warming winters
 - We're number 1!
 - Minnesota winters warming 11 degrees per century since 1960
 - Fastest rate of winter warming in the nation
 - More winter rain
 - Winter rain frequency has increased roughly 4 x since 1970



Warming Lows

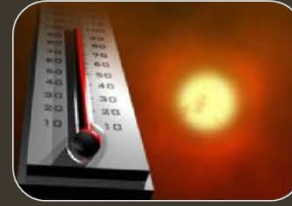
- New species of plants introduced
- Higher survival rate of pests such as EAB
- Increased use of salt due to more freeze-thaw cycles, increasing salinity of surface and groundwater



Coming together...



Intense Rain



Extreme
Heat

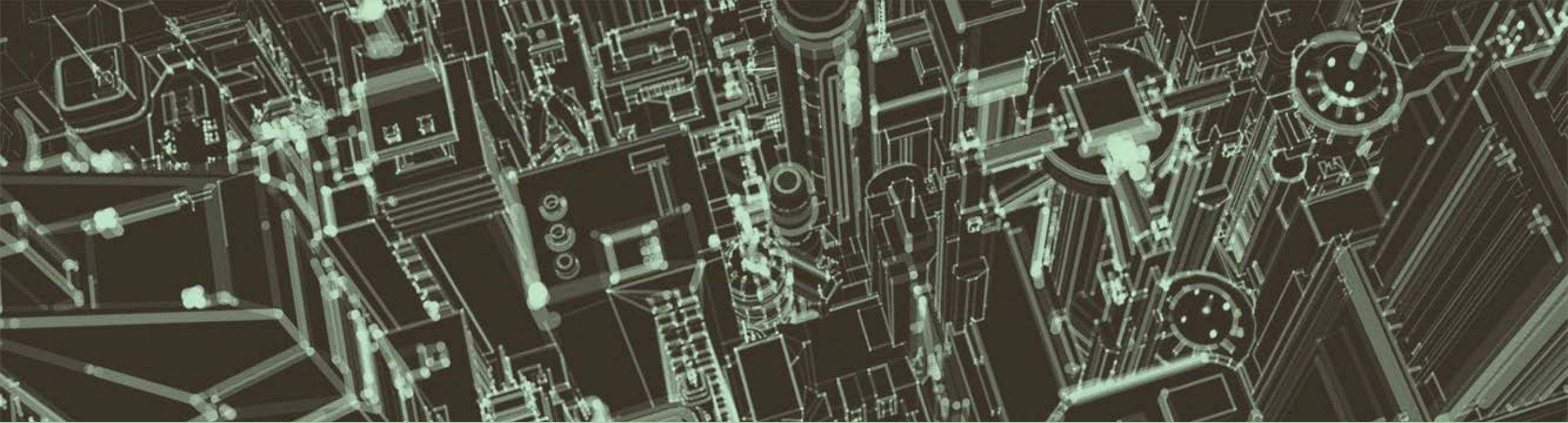


Severe
Storms/Wind



Warming
Lows

- MN's natural systems vulnerable to change
 - Increased stress on ecosystems
 - “Good-bye Walleye, Hello Small Mouth Bass”
 - Some native plants replaced by invasives
 - Some native animals leave (or die), others arrive
 - Changing seasons impact migratory patterns



Questions?

