CALIFORNIA

WATER SERVICE GROUP

INVESTING FOR LIFE

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

2019 NARUC Summer Policy Summit

"Extreme Weather Events and Climate Variation"

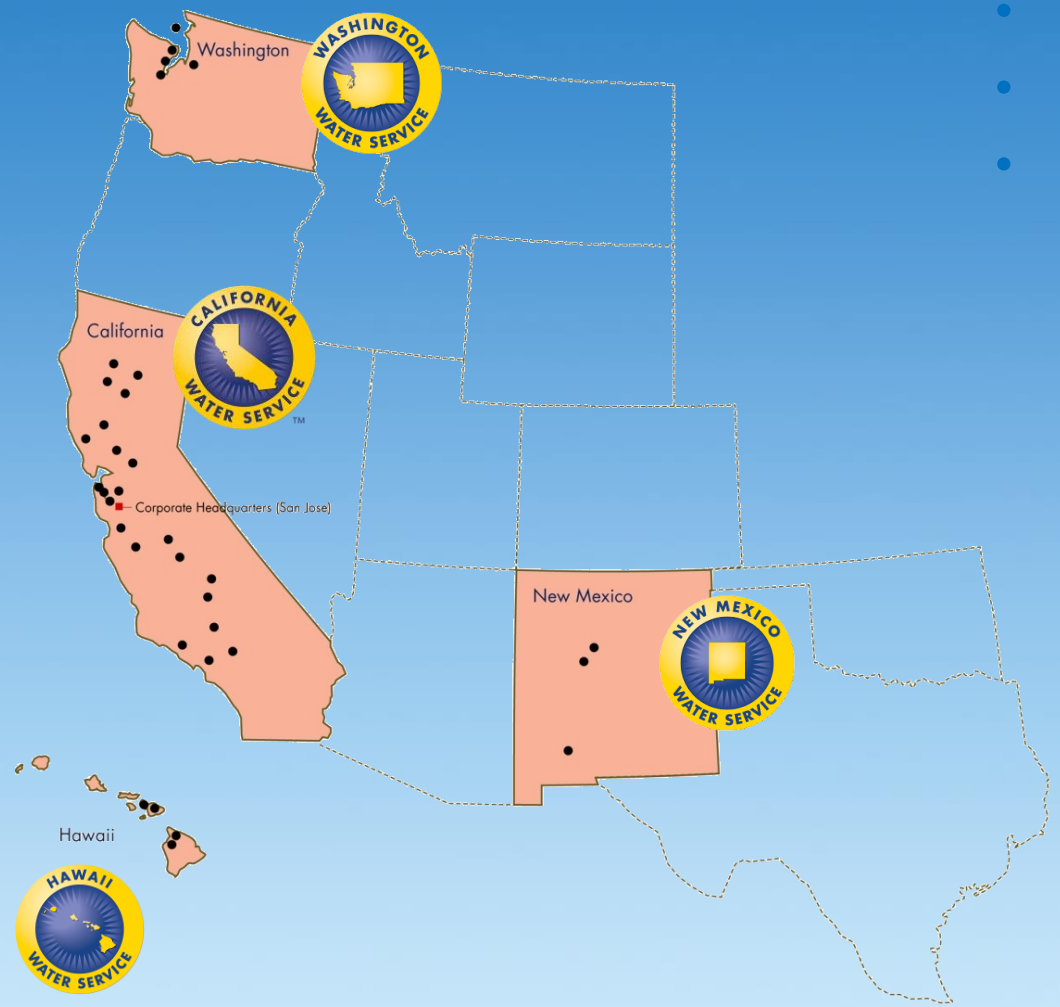
Presented by:
Mike Mares
Vice President of California Operations

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

AGENDA

- Company Overview
- Changing Climate – “Is this the new norm?”
- Managing Risk
- Wildfire Task Force

California Water Service Group



- Largest in the West
- 3rd largest in U.S.
- Serves 2 million+ people via…
  - 6,000+ miles of main
  - 1,130 wells
  - 662 storage tanks
  - 155,000+ valves
  - 50,000+ hydrants
  - 2,010+ sampling stations
  - 6 surface water treatment plants
  - 10 wastewater treatment plants

Quality. Service. Value.

CALIFORNIA WATER SERVICE GROUP
INVESTING FOR LIFE

“Is this the new norm?”

California Drought:

- 2014 - Sustainable Groundwater Management Act (SGMA) Emphasizes local management and formed groundwater sustainability agencies (GSAs) from local and regional authorities
- Ensure sustainable groundwater management by 2040
- 2015 - Executive order to reduce urban water use by 25%
- Customer first approach – provided numerous options

CALIFORNIA WATER SERVICE GROUP
INVESTING FOR LIFE

"Is this the new norm?"

Wildfires:

- 2016 Erskine Fire – Lake Isabella, Kern County
  - 47,800 acres burnt, 2nd largest fire of 2016
  - 300+ buildings destroyed
  - 2 fatalities
- 2018 Complex Fire – Lucerne (Clear Lake)
  - 459,123 acres burnt, largest recorded fire in state history
  - 500+ structures destroyed
  - 1 fatality

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

“The new norm?”

Wildfires:

- 2018 Woolsey Fire – Westlake Village, CA
  - 96,949 acres burnt
  - 1500+ structures destroyed
  - 3 fatalities
- 2018 Camp Fire – Paradise/Chico, CA
  - 153,336 acres burnt, most destructive fire in the history of the state of California
  - 13,973 homes and over 4,500 structures destroyed
  - 86 fatalities
  - 11 employee's homes destroyed – 18 employees displaced – 1/3 of the workforce

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

Managing Risk

- Robust risk management model
- Enterprise Risk Management assessment
  - ✓Water Supply
  - ✓Climate change - natural or human caused disasters and “Inverse Condemnation”

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

Managing Risk - Water supply

- Water conservation is the new norm
- Working with agencies and creating partnerships to ensure a reliable future water supply for the communities we serve

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

Managing Risk – Natural Disasters

- People first approach, #1 priority in any emergency
- Robust emergency response planning and training
- Created “Wildfire Taskforce” to identify, reduce, and manage risk created from wildfires

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

CALIFORNIA WATER SERVICE GROUP
INVESTING FOR LIFE

Managing Risk – Wildfire Task Force

- Conducted risk assessments for all districts
  - ✓Identified and ranked systems vulnerable to the threat of wildfire
  - ✓Developed and prioritized a list of critical capital projects to reduce risks and add reliability against the threat of wildfires (back up power generators and equipment)

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

Managing Risk – Wildfire Task Force

- Ensure that equipment and assets, are in proper working order or are repaired/replaced – “all hands on deck” approach
- Conducted mandatory training for all district employees on: Red Flag Warning, Weather Watch/Warning/Advisory, Hydrant Maintenance SOPs, Hot-work and Vegetation Management BMP’s
- Develop regionalized emergency response for: strike teams, EOCs, trainings, emergency supply, and equipment storage/“Emergency Response Trailer Units”

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

Managing Risk – Wildfire Task Force

Manage “Public Safety Power Shutdowns” (PSPS)

- Employee and customer safety
- Firefighting
- Hospitals, critical care units
- Fuel for generators & vehicles
- Assure continuous water quality support during critical incidents

CALIFORNIA
WATER SERVICE GROUP
INVESTING FOR LIFE

Extreme Weather

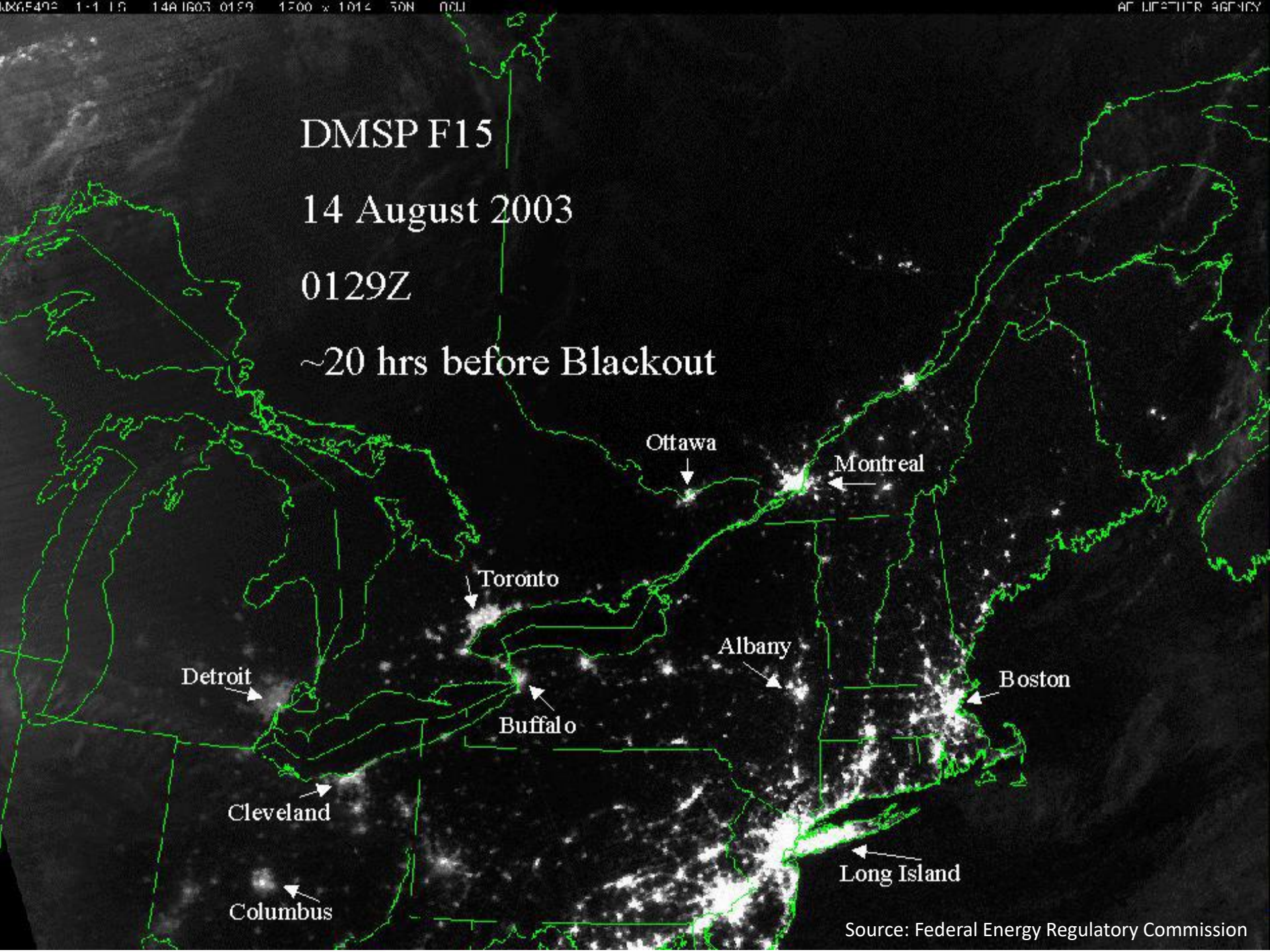
NARUC Summer Policy Summit

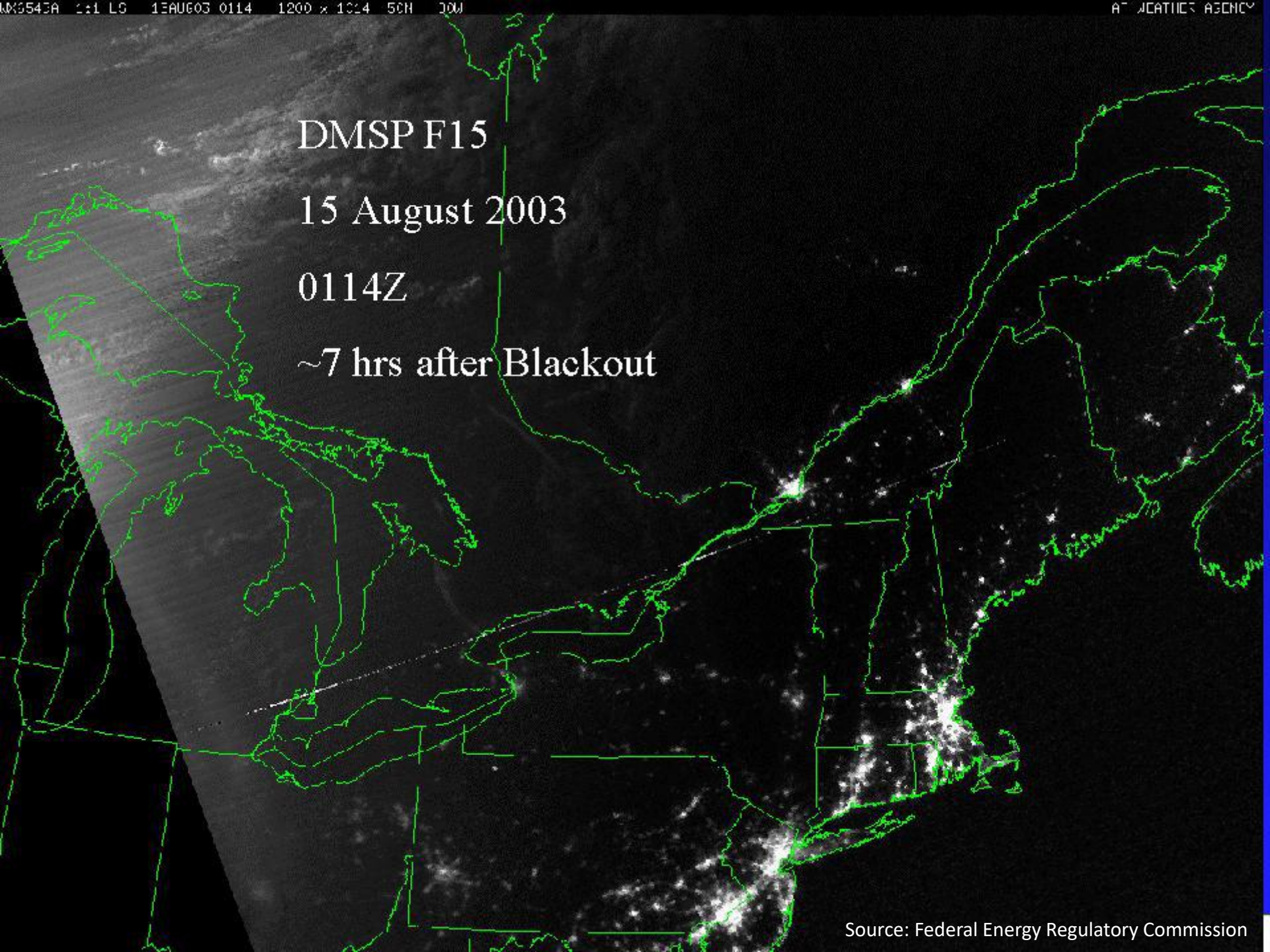
7/23/2019

Megan Levy
Local Energy Programs Manager &
Energy Assurance Coordinator
Office of Energy Innovation
Public Service Commission of WI

OEI
Wisconsin Office of Energy Innovation

Wisconsin Office of Energy Innovation


DMSP F15
14 August 2003
0129Z
~20 hrs before Blackout
Ottawa
Montreal
Toronto
Albany
Boston
Detroit
Buffalo
Cleveland
Long Island
Columbus
Source: Federal Energy Regulatory Commission



Source: Federal Energy Regulatory Commission

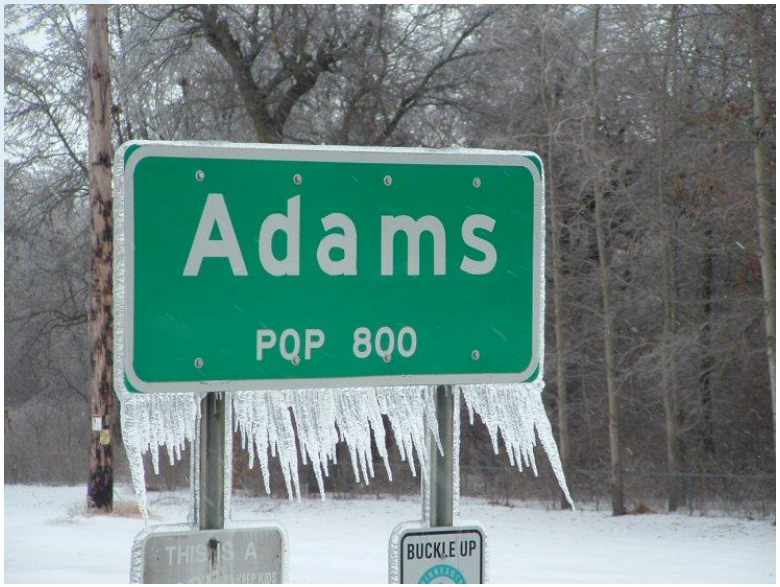
Source: Federal Energy Regulatory Commission

OEI

Wisconsin Office of Energy Innovation

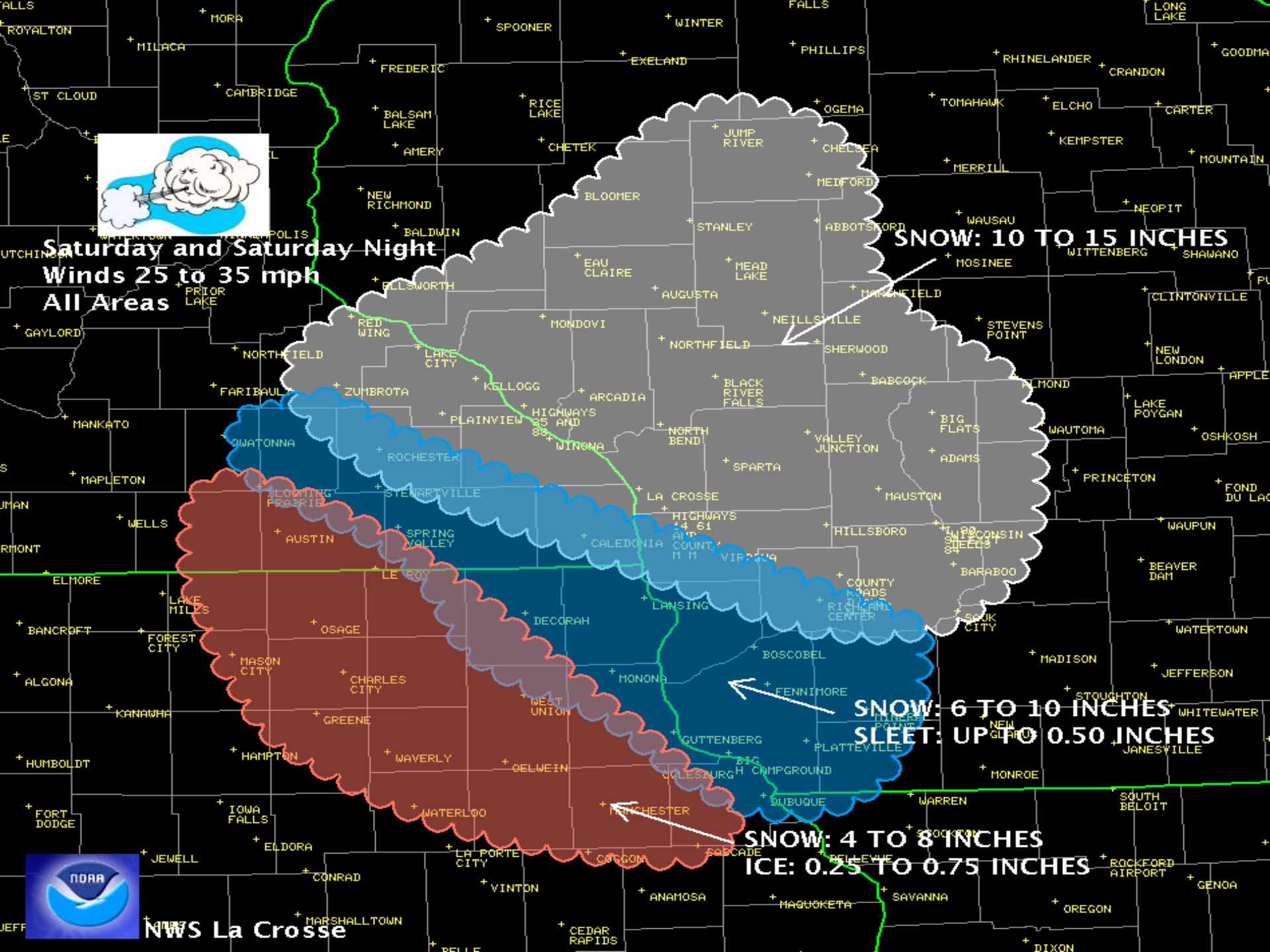
OEI

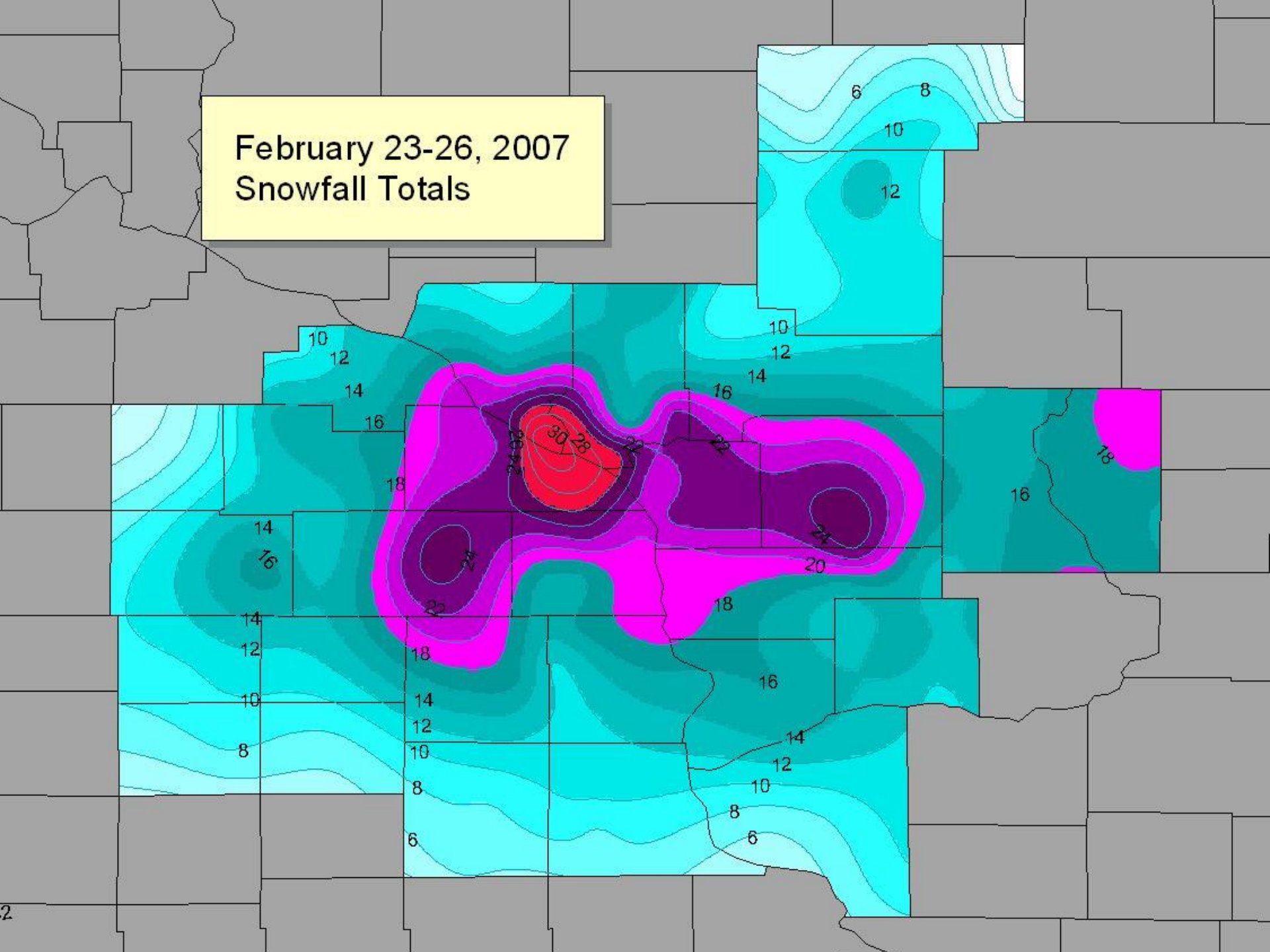
Wisconsin Office of Energy Innovation



OEI

Wisconsin Office of Energy Innovation


Saturday and Saturday Night
Winds 25 to 35 mph
All Areas
SNOW: 10 TO 15 INCHES
SNOW: 6 TO 10 INCHES
SLEET: UP TO 0.50 INCHES
SNOW: 4 TO 8 INCHES
ICE: 0.25 TO 0.75 INCHES
NWS La Crosse


February 23-26, 2007
Snowfall Totals
6
8
10
12
14
16
18
20
22
24
26
28
30

OEI

Wisconsin Office of Energy Innovation

OEI

Wisconsin Office of Energy Innovation

OEI

Wisconsin Office of Energy Innovation

OEI

Wisconsin Office of Energy Innovation

Extreme Weather and Climate Variability

NARUC Summer Policy Conference 2019

AMERICAN WATER

More Frequent News Stories on Extreme Weather Impacts?

The Telegraph, Alton, Illinois - May 20, 2019

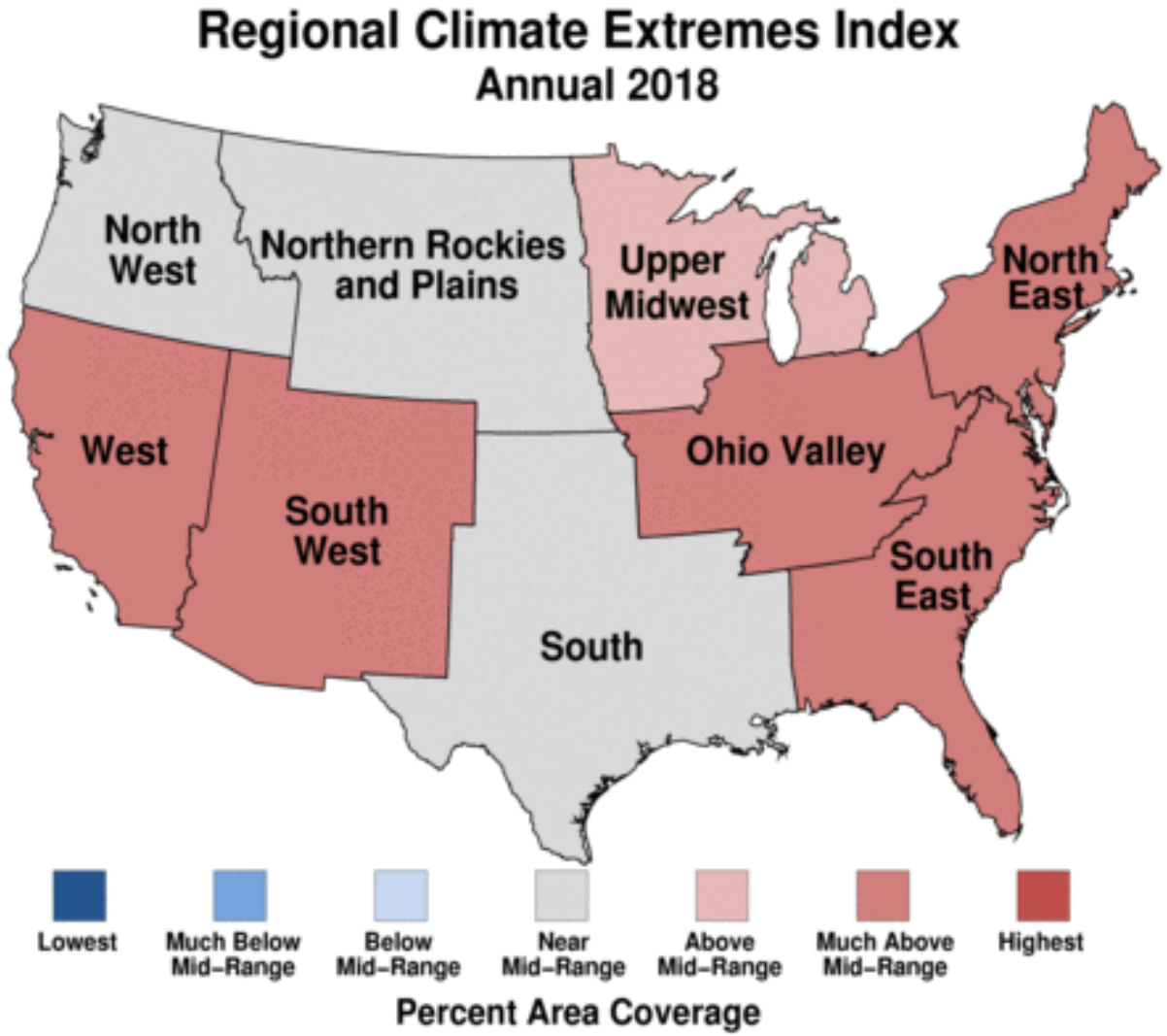
KSDK.com June 3,2019

Relocated and Modernized Water Plant
- Improved Resiliency, Treatment, Efficiency and Security

1993
100+ Year Old Plant Flooded

2001
New Plant Commissioned

NOAA Monitors Extremes in 5 Variables

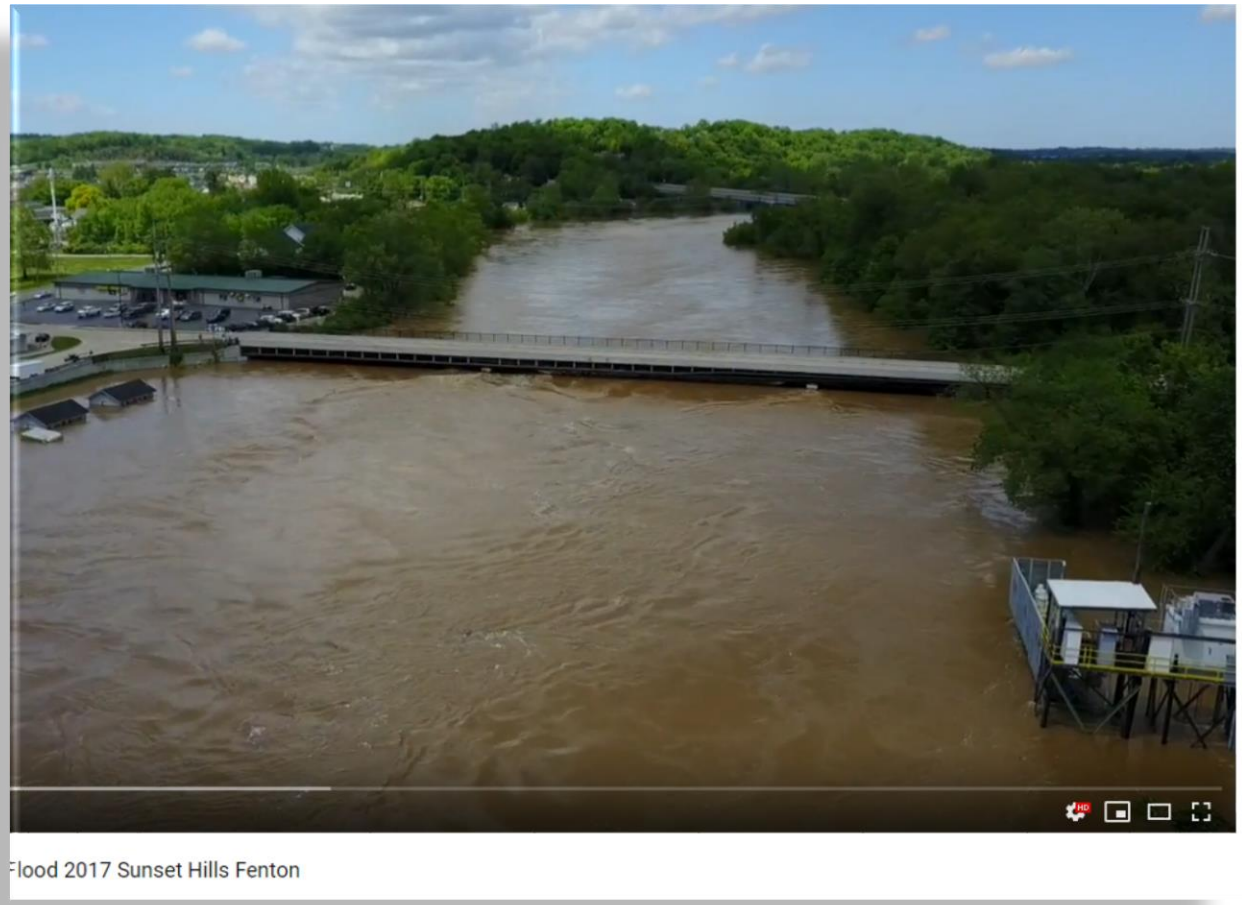


How does 2018 compare to history?

- Highest in days with precipitation
- 66% above average in extremes (more extremes than average year)
- Ranked 8th highest in 109-yr record
- 5th highest year in extremes in warm minimum temperatures

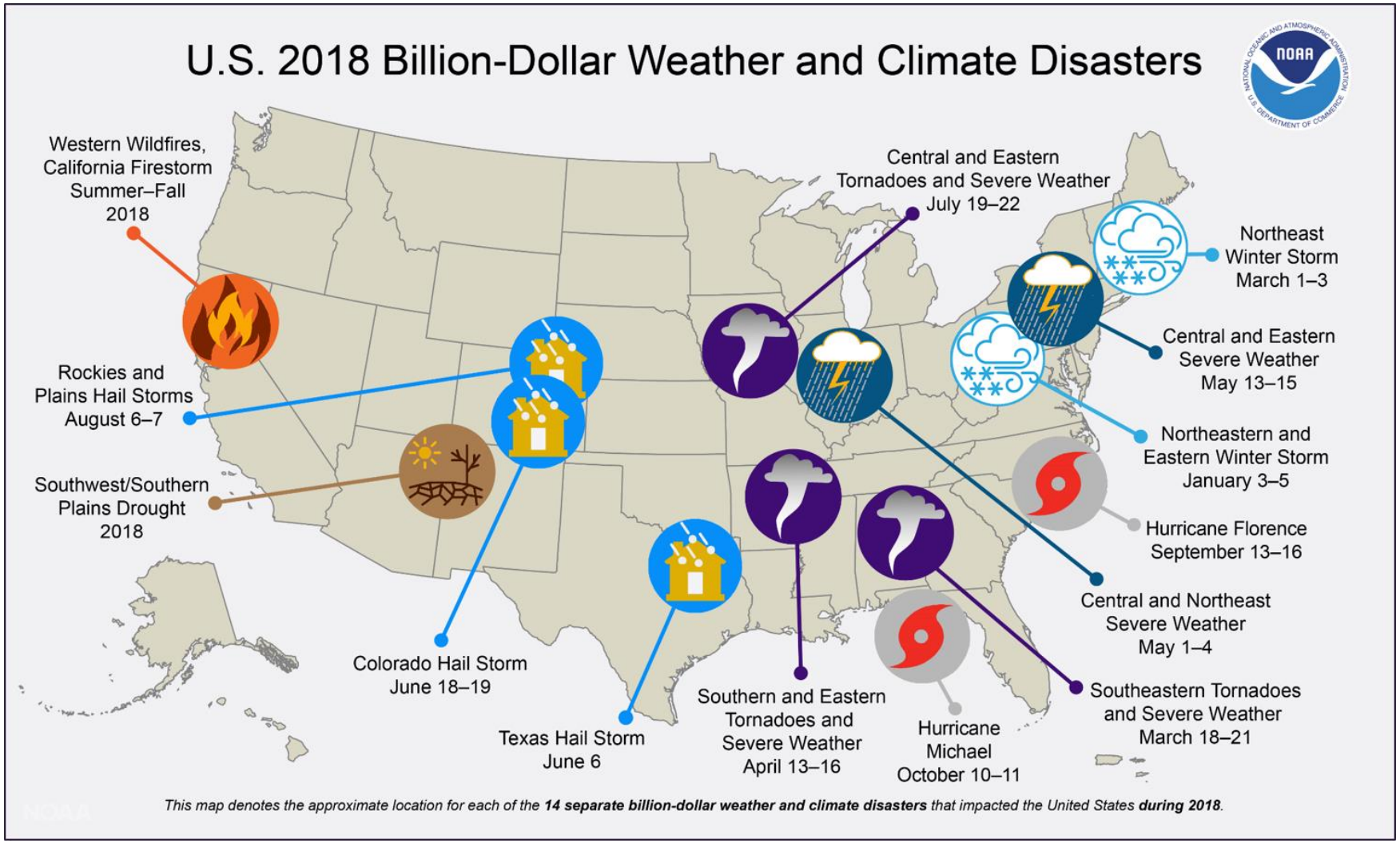
Source: NOAA

Variability in Same Year – Meramec River, Missouri



https://www.youtube.com/watch?v=_cMs4ZNCmH8

Impacts - Large Natural Disasters Across U.S.

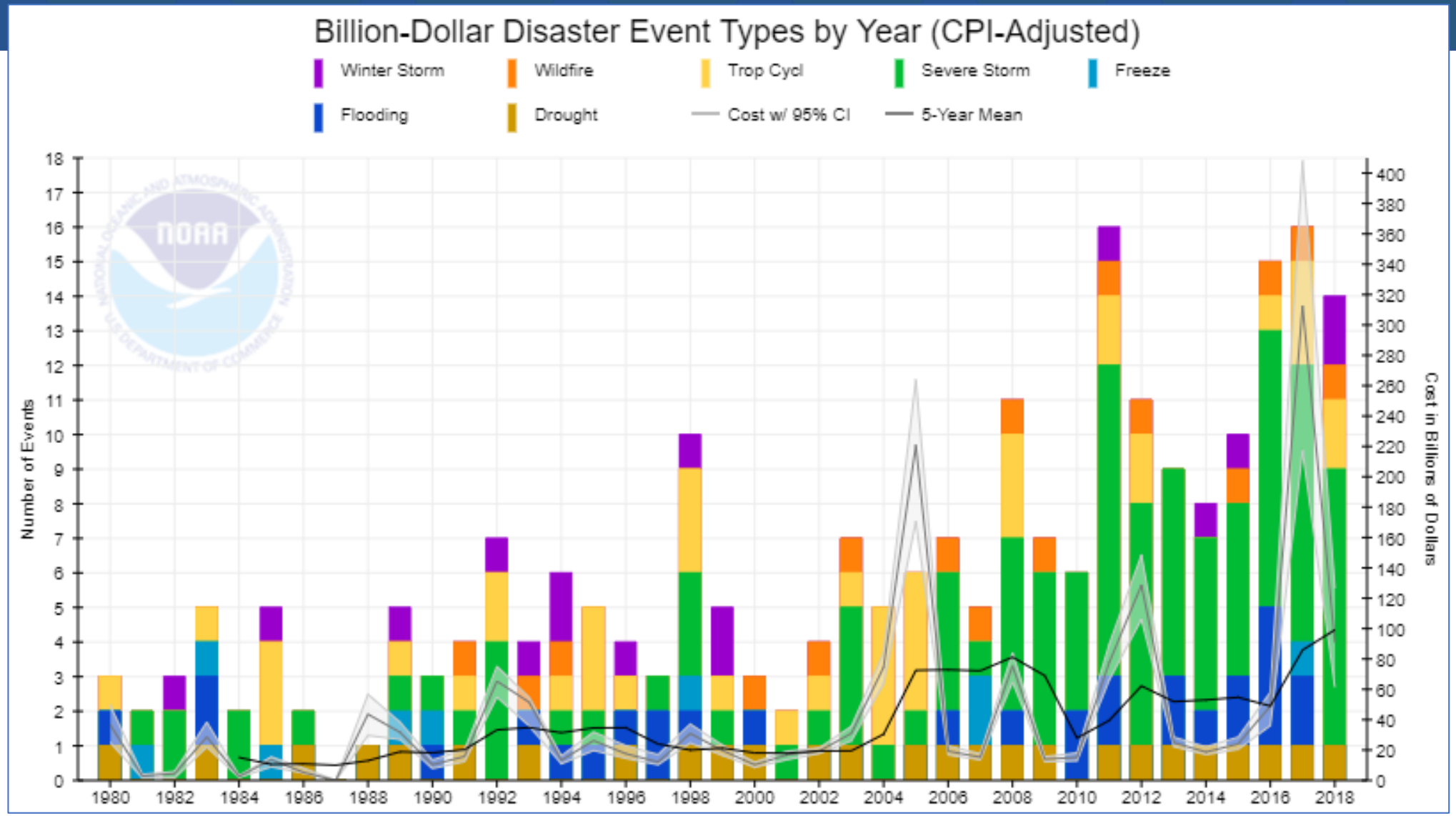


8th consecutive year with 8 or more Billion-Dollar disasters

- Above average precipitation (4.69 inches)
- 3rd wettest year on record (124-year record)
- 1st wettest year in past 35 yrs
- 14th warmest year on record
- 22nd consecutive warmer-than-average year for the U.S.

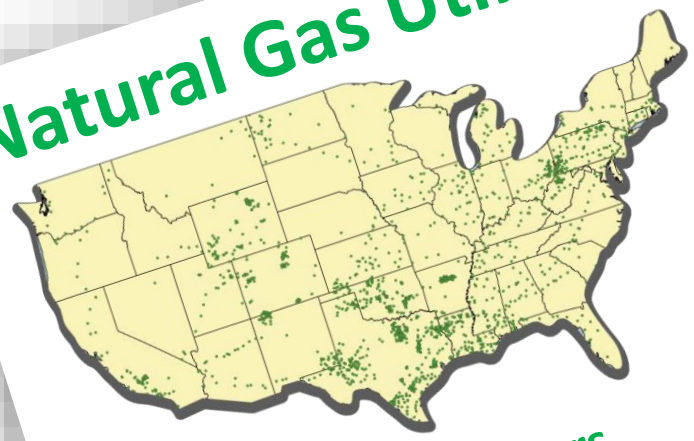
CONFIDENTIAL AND PROPRIETARY – FOR INTERNAL USE ONLY

Increasing Frequency and Magnitude of Events



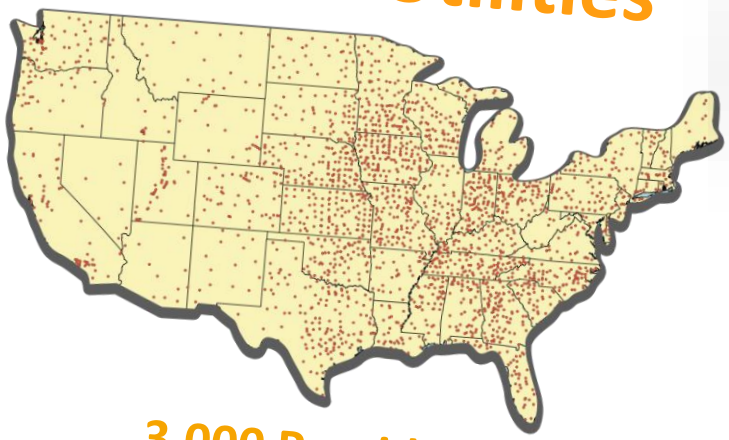
Compound extremes also increase the risk of cascading infrastructure failure

Natural Gas Utilities



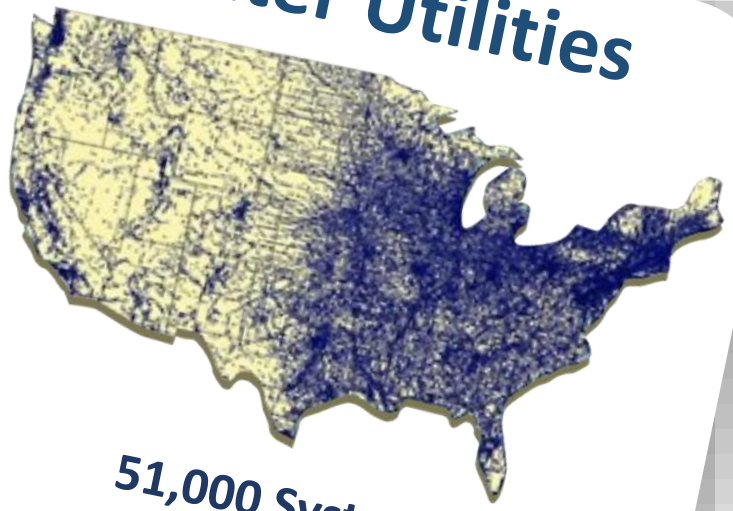
3,000 Providers

Electric Utilities



3,000 Providers

Water Utilities



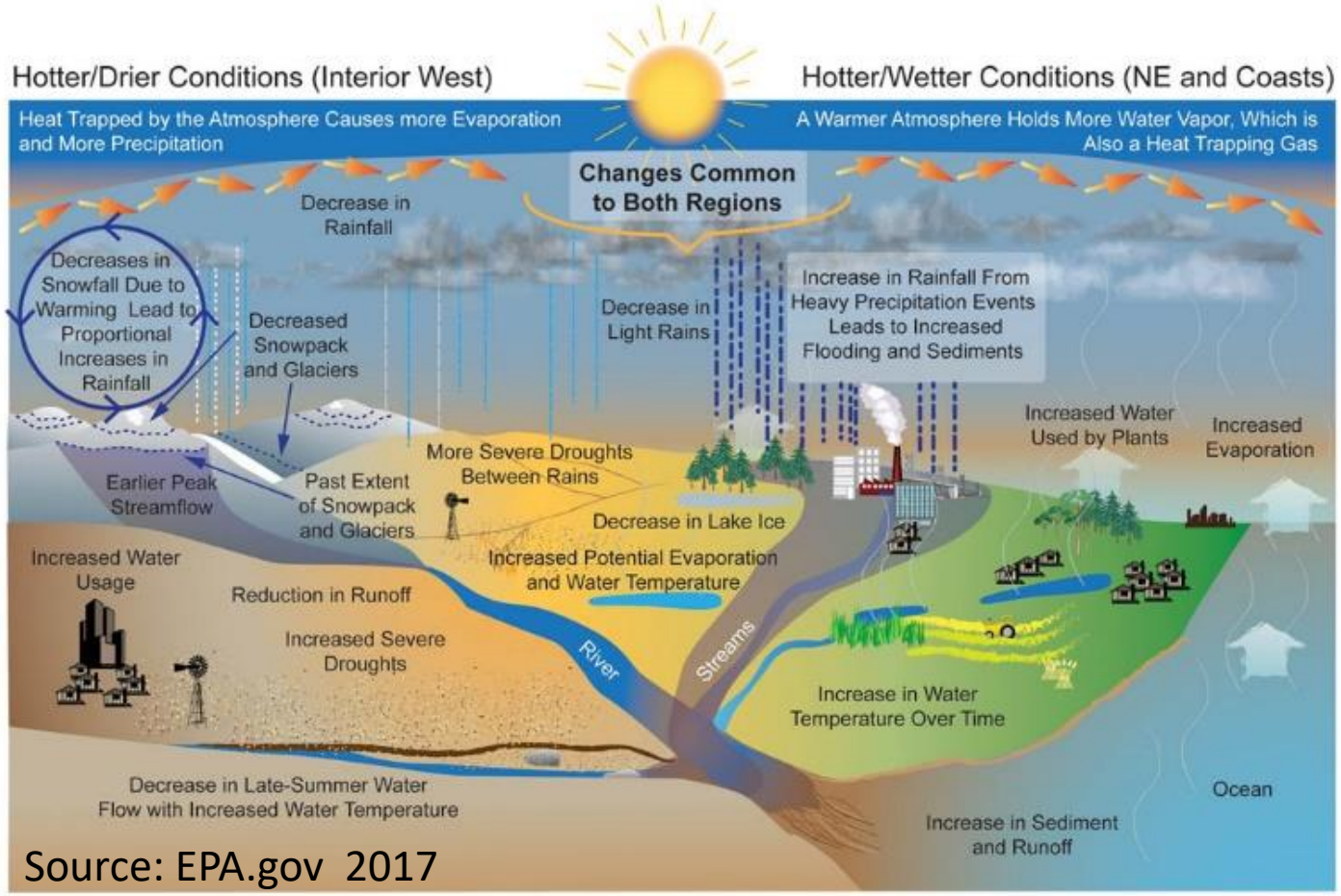
51,000 Systems

Gas Utilities Source: EPA F.L.I.G.H.T. Greenhouse Gas Emissions from Large Facilities Ghgdata.epa.gov/ghgp/main.do#

Electric Utilities Source: Form EIA-861 detailed data files www.eia.gov/electricity/data/eia8

Water Utilities Source: EPA SDWIS Federal Reports Search www3.epa.gov/enviro/facts/sdwis

How Do Changes in the Water Cycle Impact Utilities



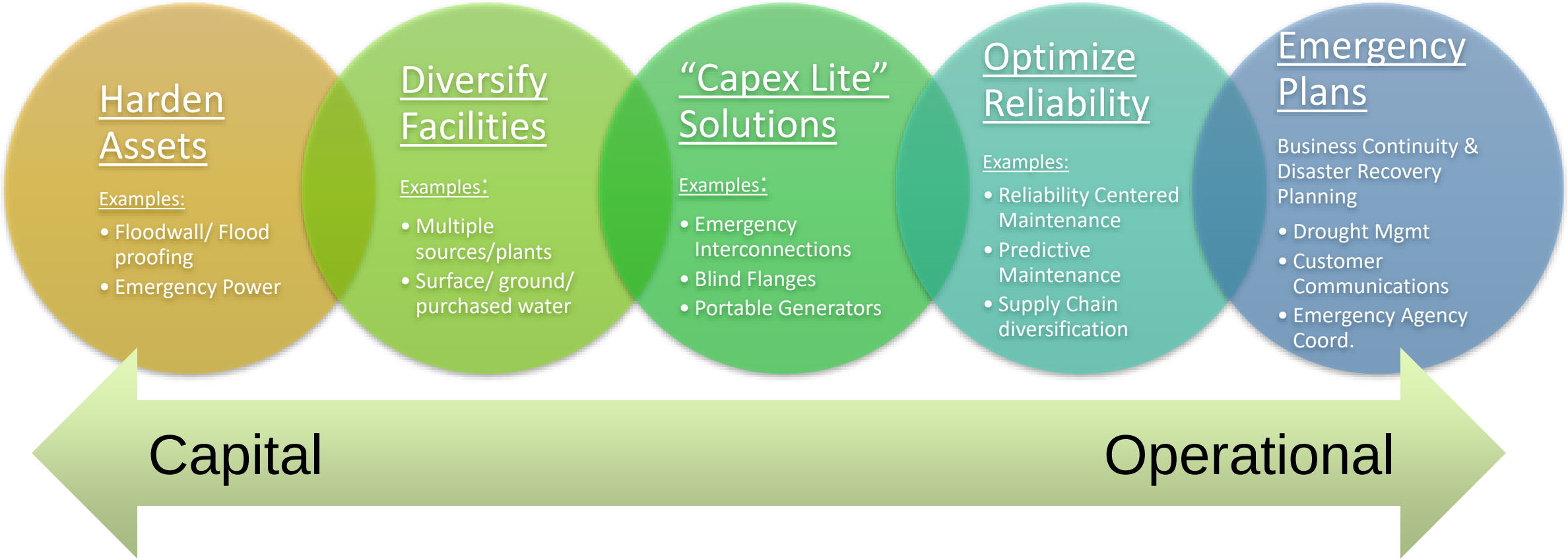
Source: EPA.gov 2017

Fourth National Climate Assessment

1. Changes in Water Quality and Quantity
2. Deteriorating Water Infrastructure at Risk
3. Water Management in a Changing Future

Resiliency Toolbox

Hardening of Assets to Emergency Response Plans



Work in Flood Hazard Area

Building Codes Cite ASCE-24 Flood Design Standard

Essential facilities (Flood Design Class 4)
Elevation of lowest floor:

Base Flood Elevation (100yr flood) + 2 ft,
Design Flood Elevation,
or 500-year flood elevation,

whichever is higher.

“Harden Assets” Example: Davenport Iowa

- The river crested at a record 22.7’ in 2019
- The previous record flood for this area was 22.63’ in 1993

Davenport Iowa Water Plant Floodwall

message to local media:

"We are operating normally and continually monitoring the water quality. The plant is operating under normal conditions and well protected by the flood wall."

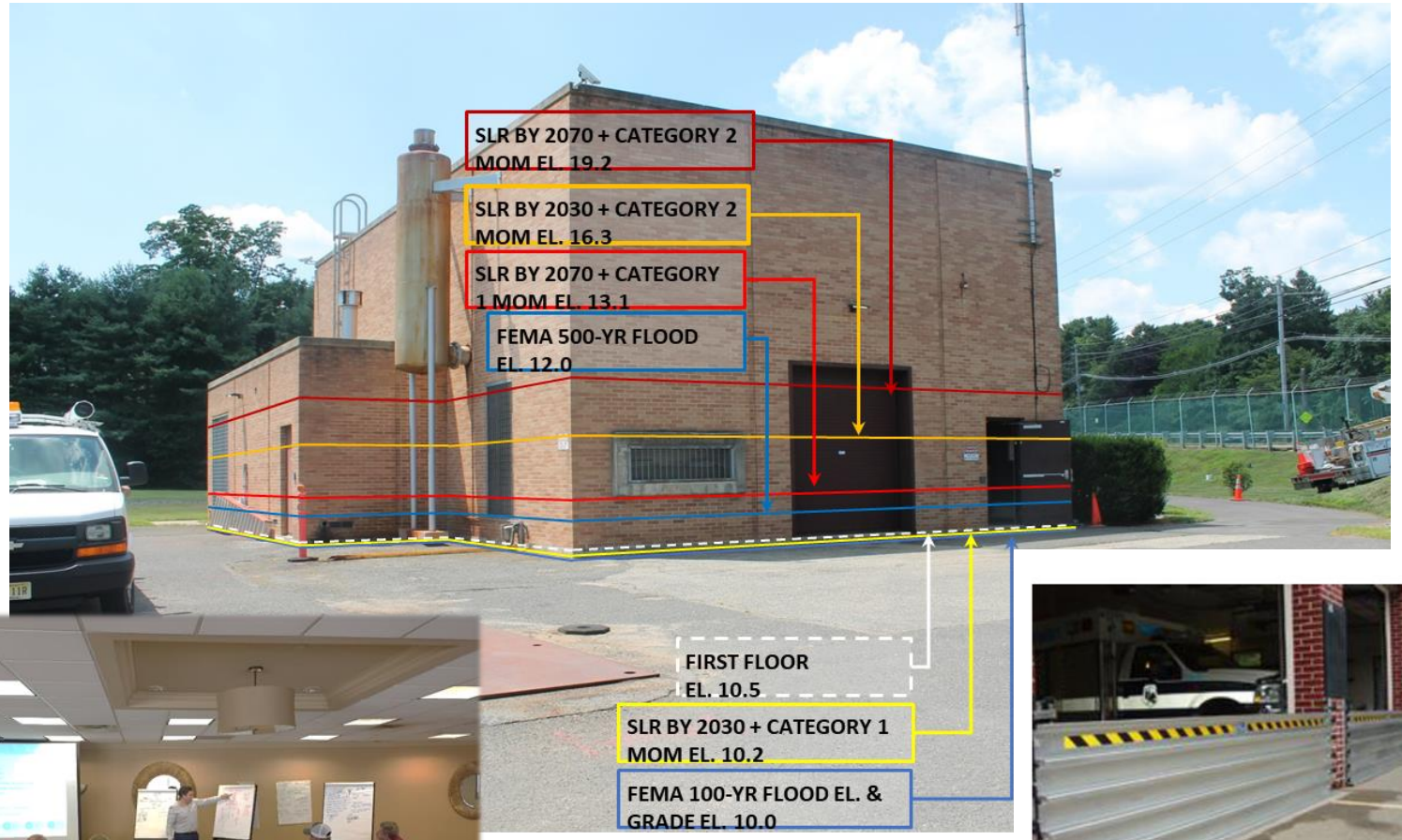
Water Service Available Before, During and After Event

QCTimes.com May 2019

4th National Climate Assessment: Compound extremes can also increase the risk of cascading infrastructure failure since some infrastructure systems rely on others, and the failure of one system can lead to the failure of interconnected systems, such as water–energy infrastructure *(Ch. 4: Energy; Ch. 17: Complex System*

What's Next?
AWIA- America's Infrastructure Act of 2018

- Conduct risk and resiliency assessments
- Revise emergency response plans
- Review and, if necessary, revise these documents at least every 5 years
- Consider physical risks posed by malicious acts and natural disasters, as well as risks from cyber threats



Type C1
(< 4 ft. Water)

THANK YOU