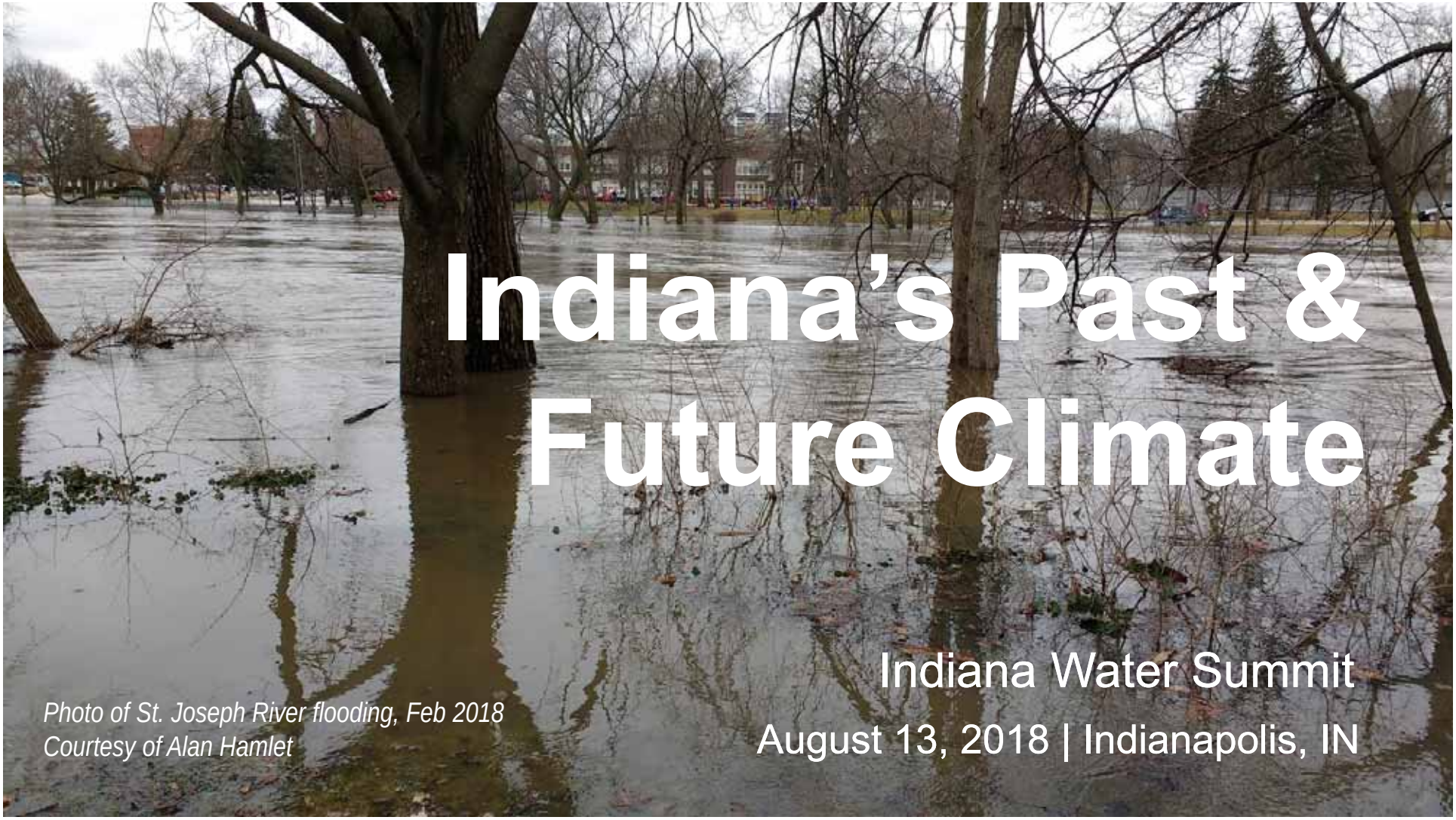


Indiana's Past & Future Climate

Indiana Water Summit

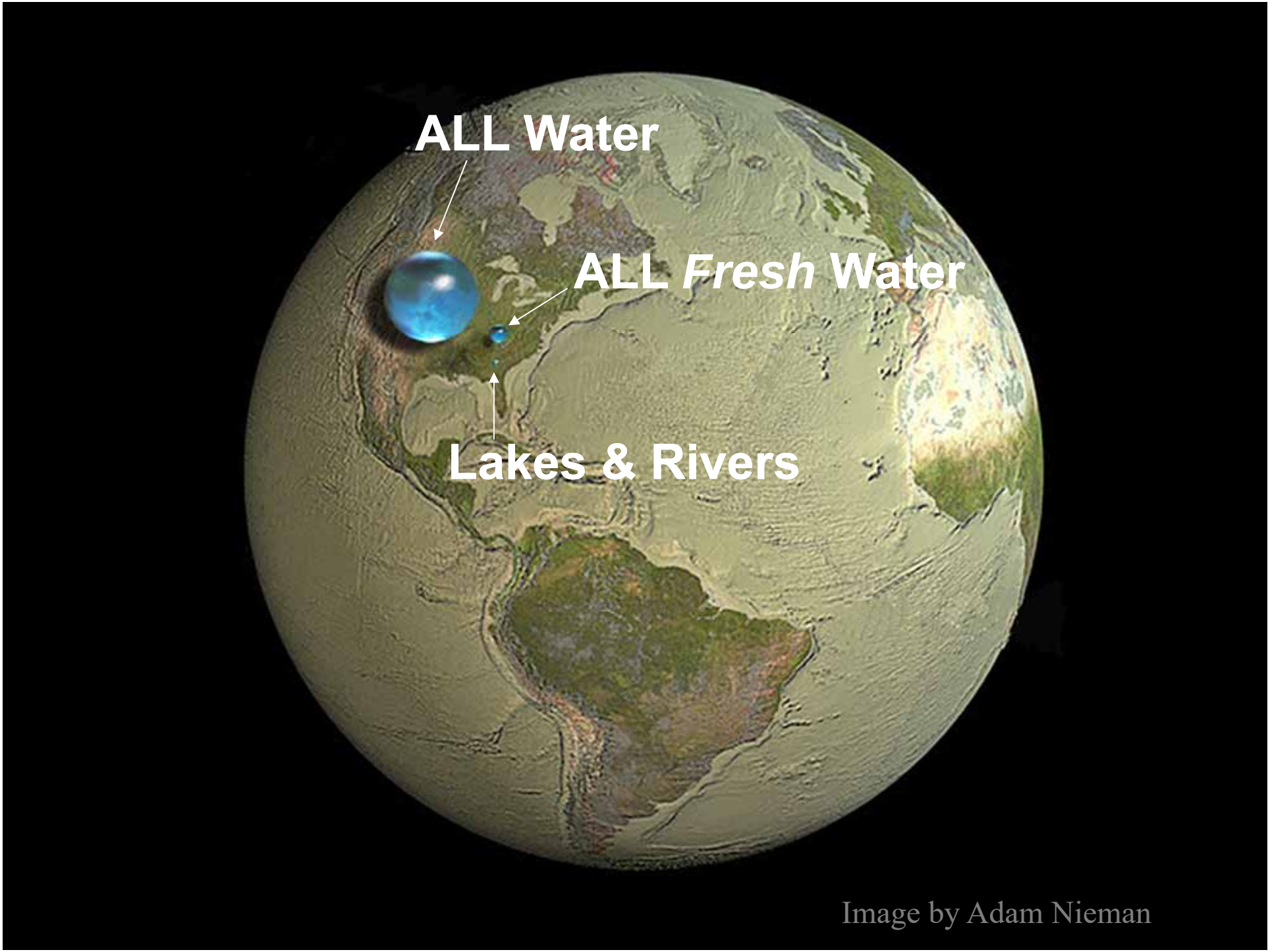
August 13, 2018 | Indianapolis, IN

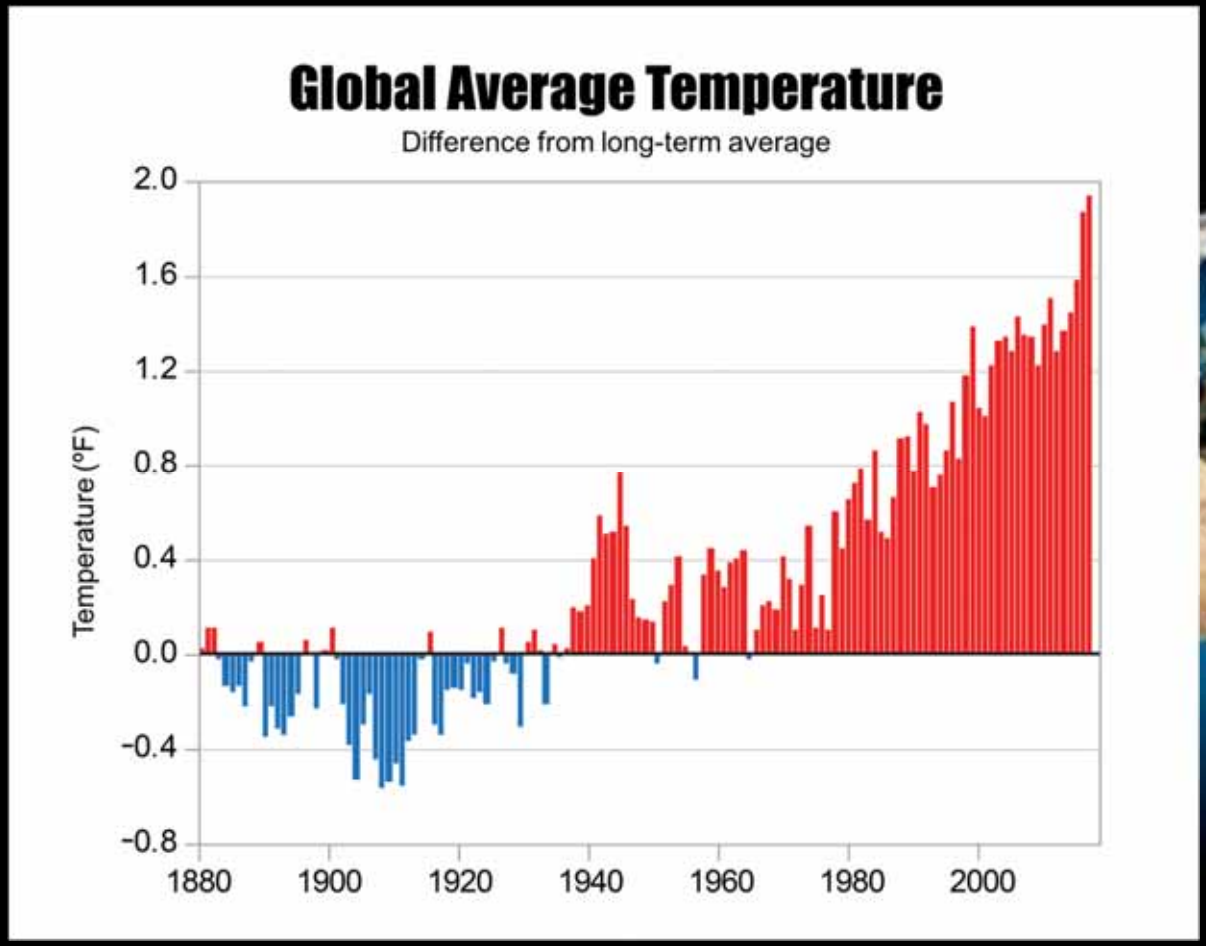
Photo of St. Joseph River flooding, Feb 2018
Courtesy of Alan Hamlet

PCCRC
Purdue Climate Change Research Center

Melissa Widhalm
Purdue Climate Change Research Center

Image by Adam Nieman


ALL Water
ALL *Fresh* Water
Lakes & Rivers
Image by Adam Nieman



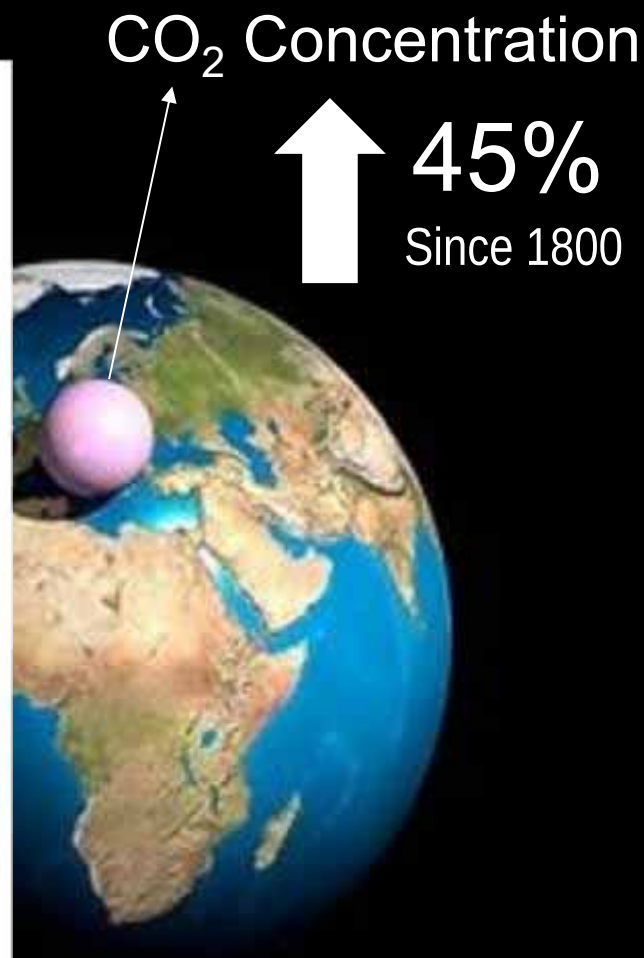
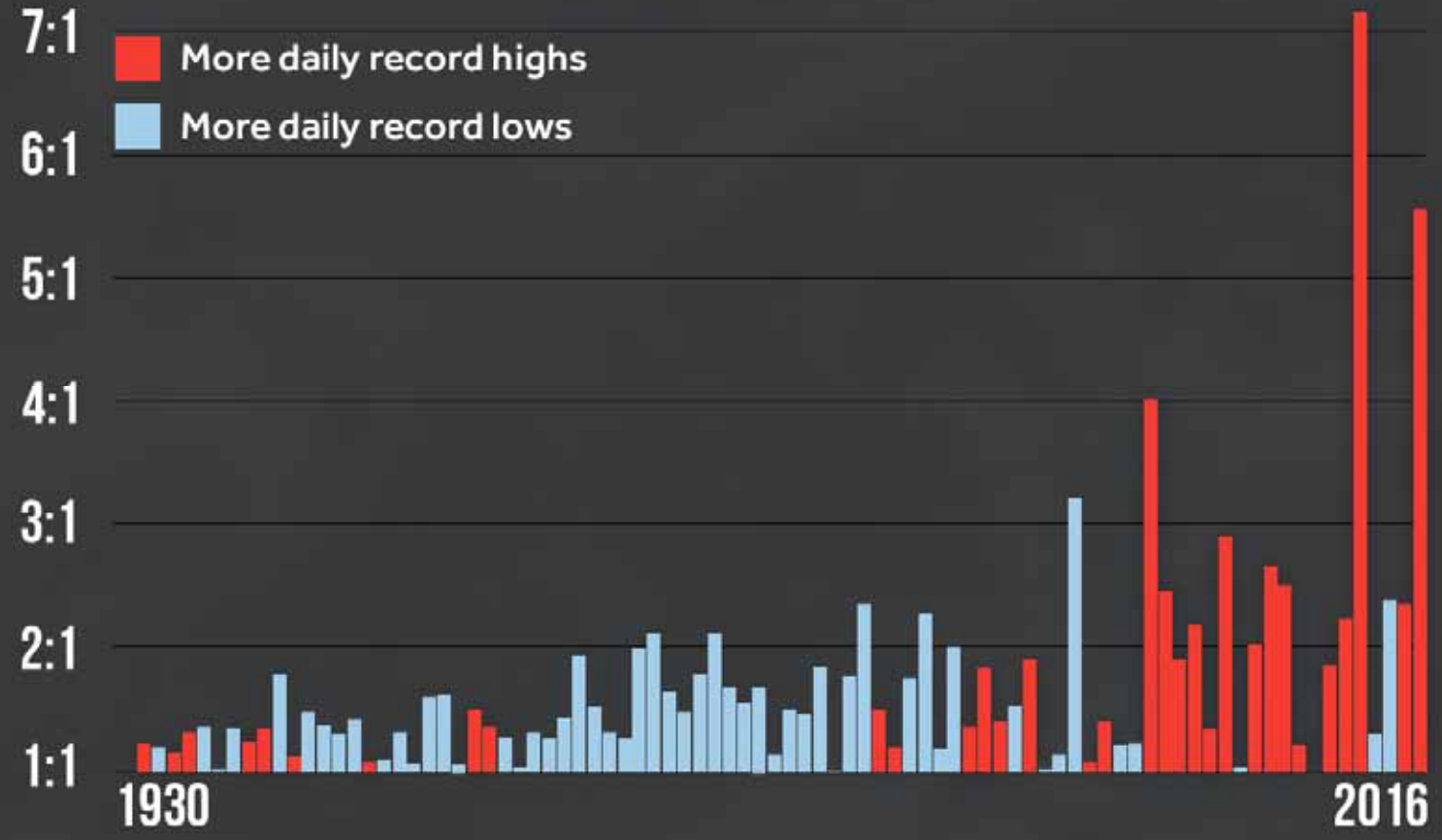


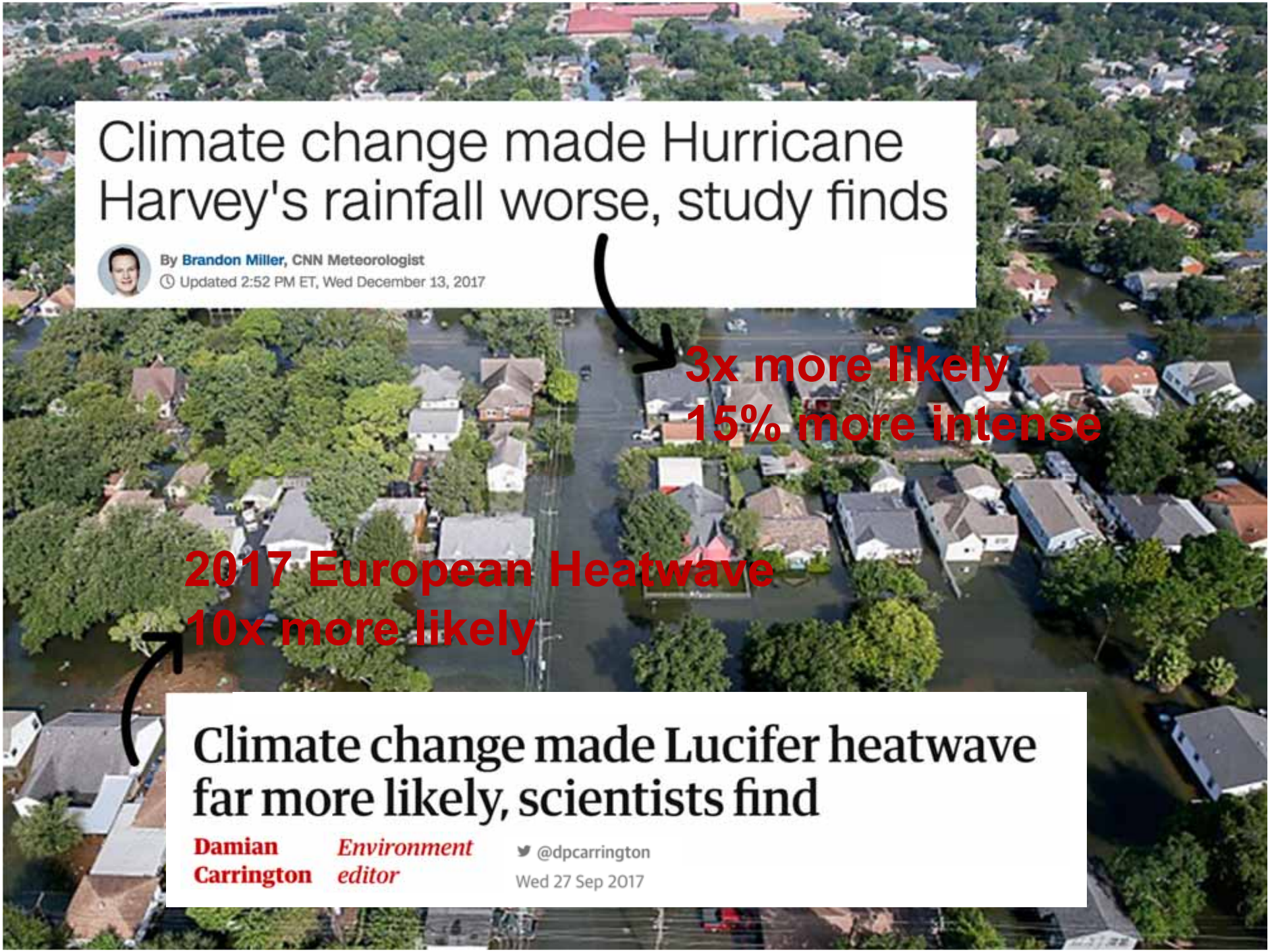
Image by Adam Nieman

RECORD HIGHS BEATING LOWS



Source: USGCRP Climate Science Special Report 2017

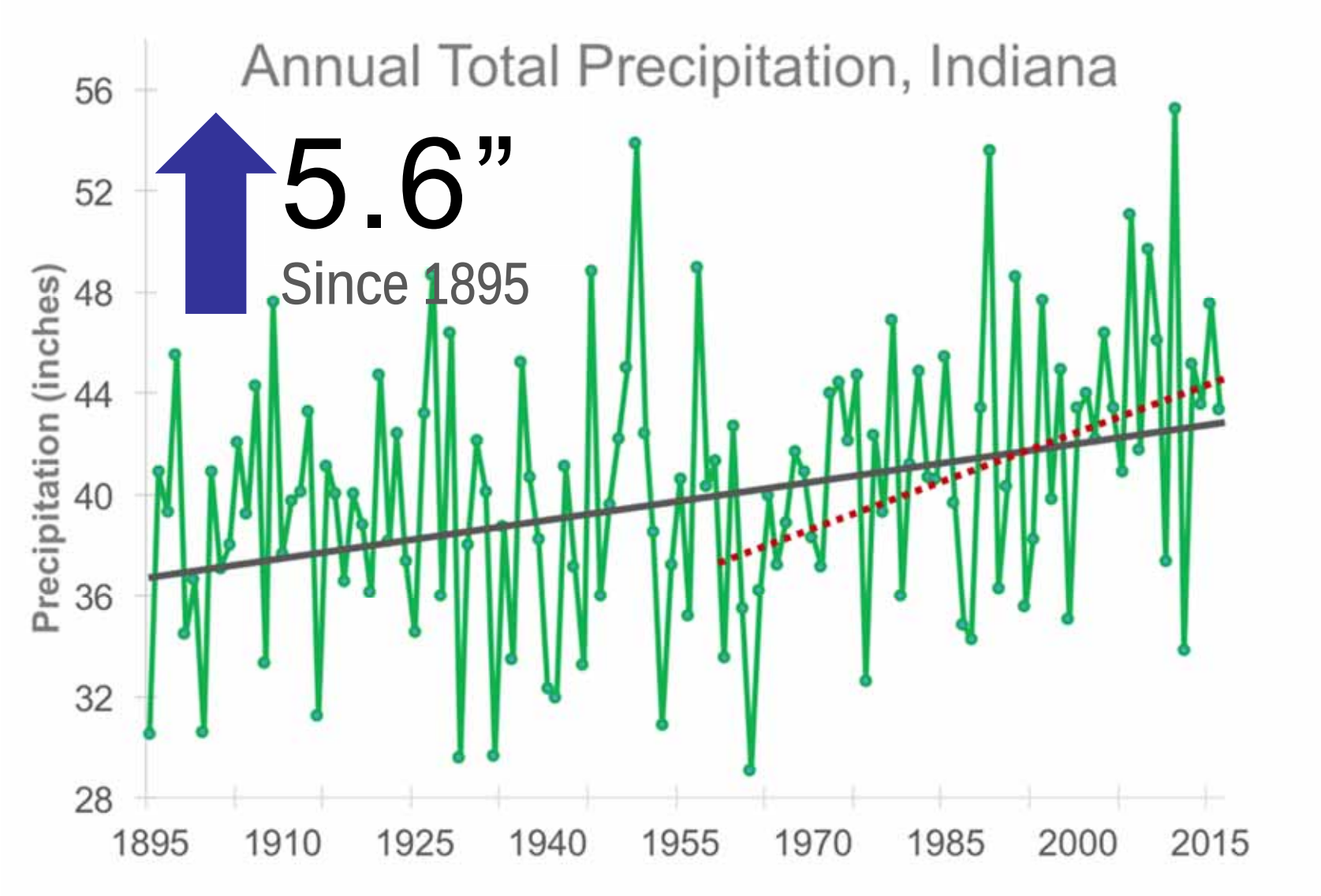
CLIMATE CENTRAL


Climate change made Hurricane Harvey's rainfall worse, study finds
By Brandon Miller, CNN Meteorologist
Updated 2:52 PM ET, Wed December 13, 2017
3x more likely
15% more intense
2017 European Heatwave
10x more likely
Climate change made Lucifer heatwave far more likely, scientists find
Damian Carrington
Environment editor
@dpcarrington
Wed 27 Sep 2017

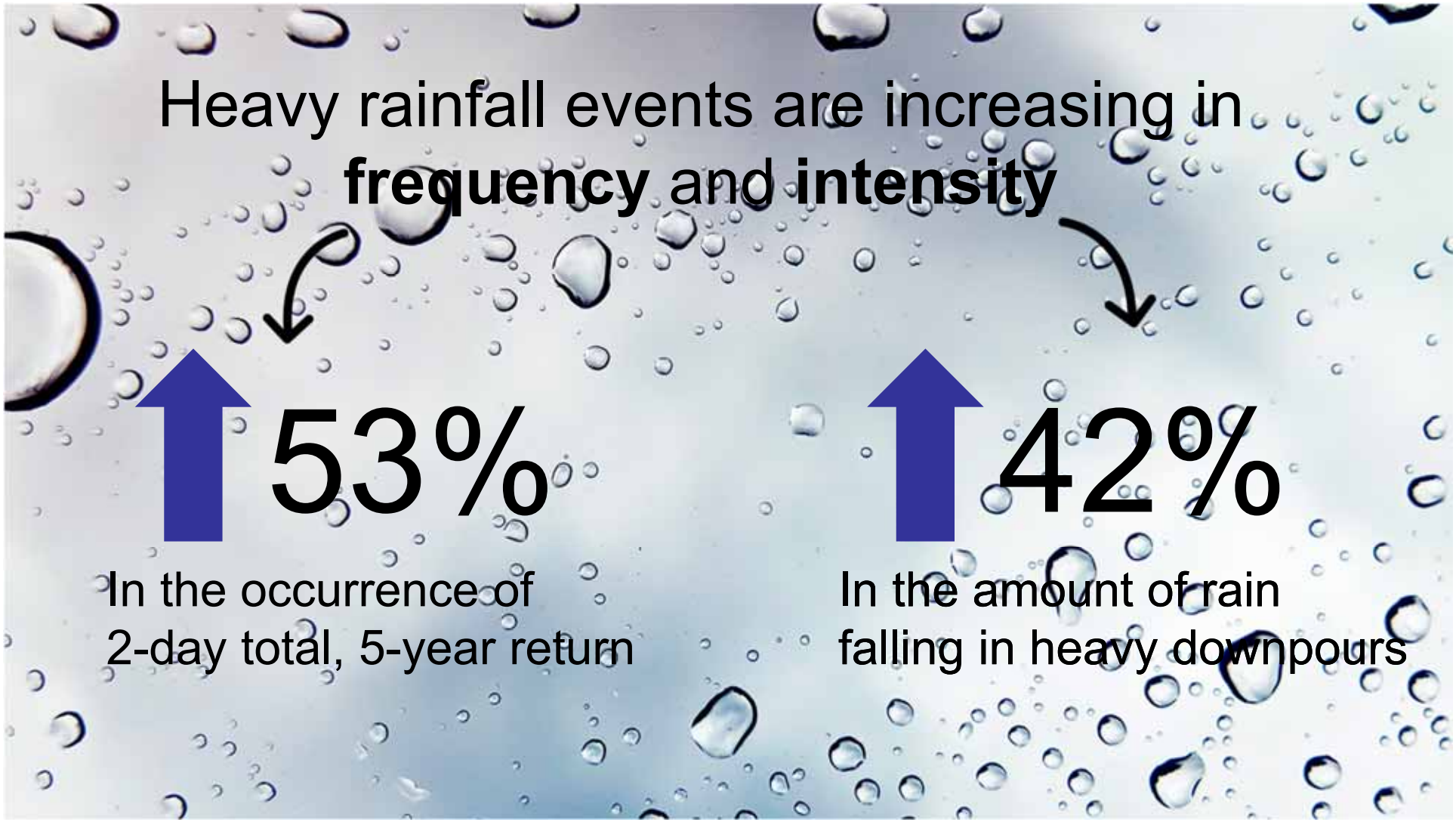

It’s happening now...
...it’s hurting Hoosiers
Photo Credit: Santiago Flores, South Bend Tribune

Indiana is getting warmer

Indiana is getting wetter



Indiana is getting wetter



Data for Midwest U.S., 1958 – 2016. Source: NOAA

INDIANA WATER SUMMIT 2018

What is Indiana's Water Future?

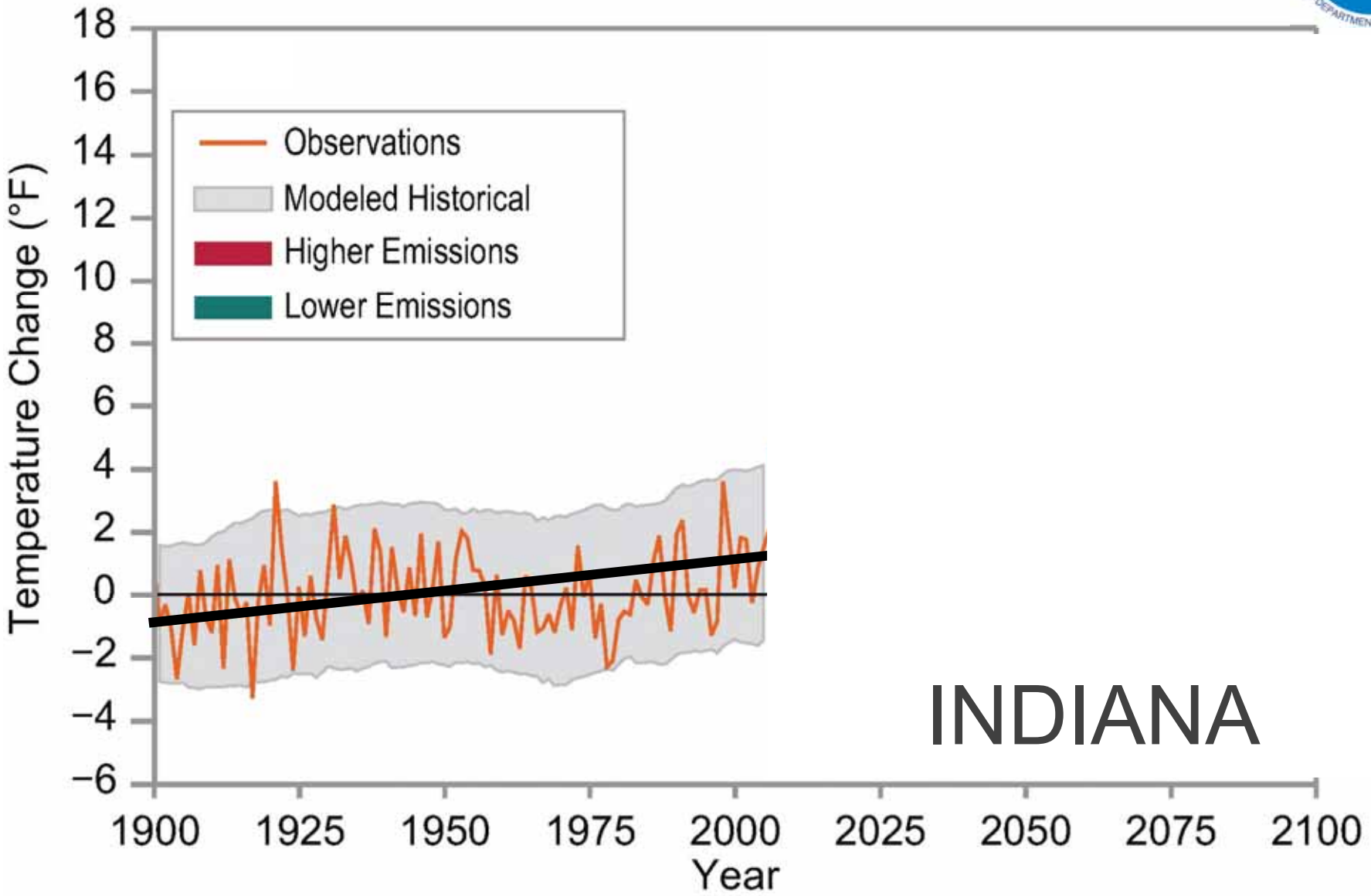
PURDUE UNIVERSITY

#INCCIA

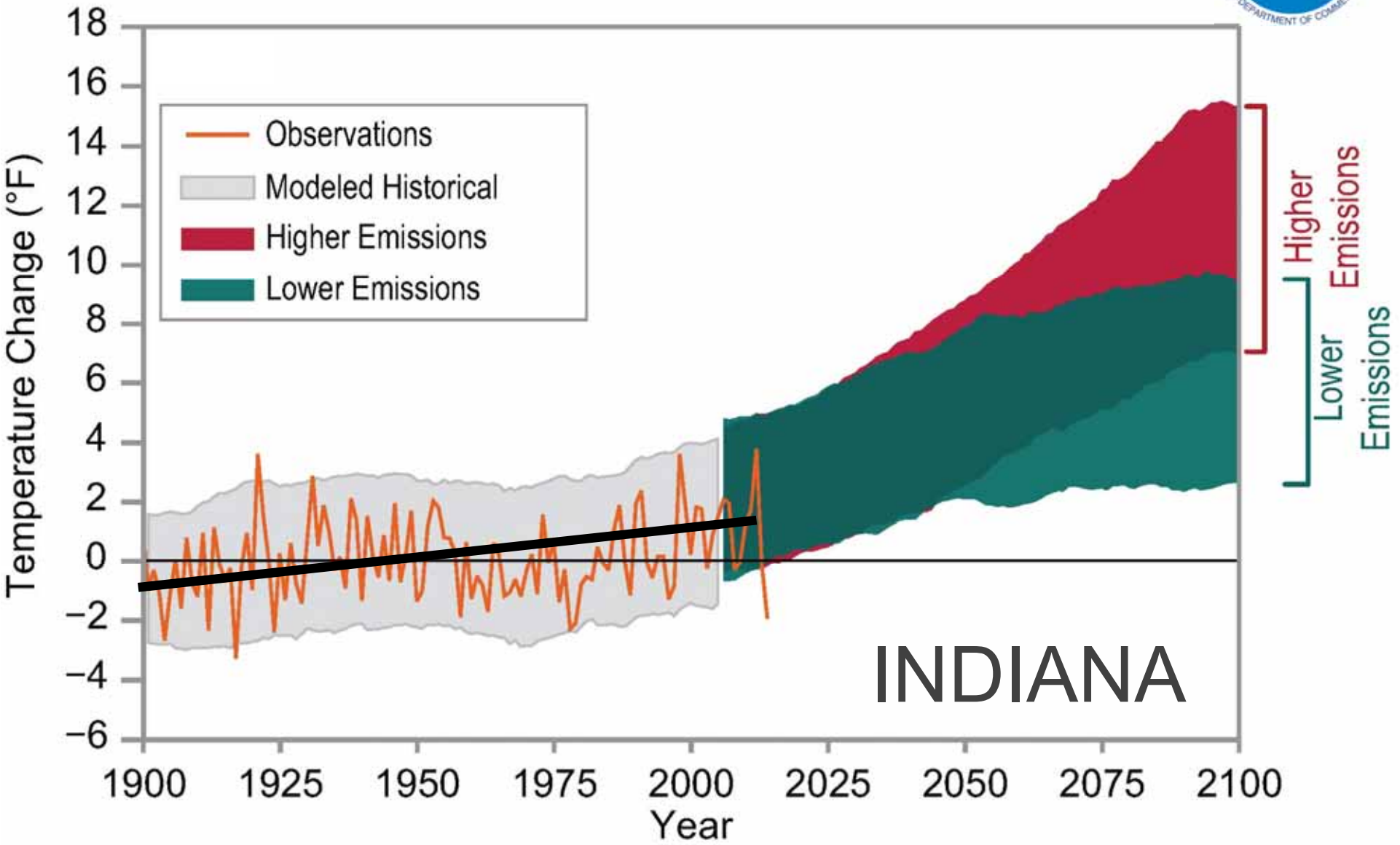
Technical contributions from:

Purdue Climate Change Research Center
University of Notre Dame
IUPUI
Indiana University
Indiana University Northwest
Ball State University
Indiana State University
Purdue University Northwest
Midwest Regional Climate Center
U.S. Forest Service
Northern Institute of Applied Climate Science
Indiana Department of Natural Resources
Marion County Public Health Department
Mesh Coalition
U.S. Geological Survey

Annual Statewide Average Temperature

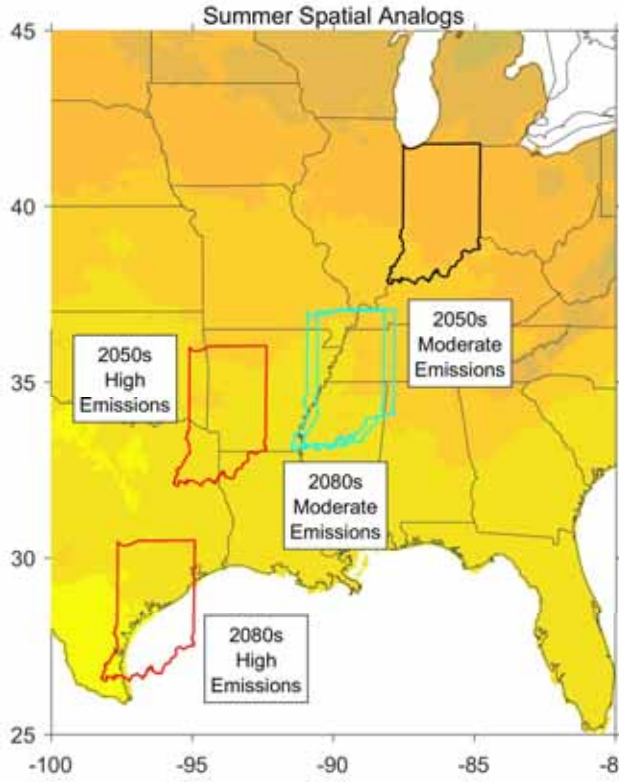


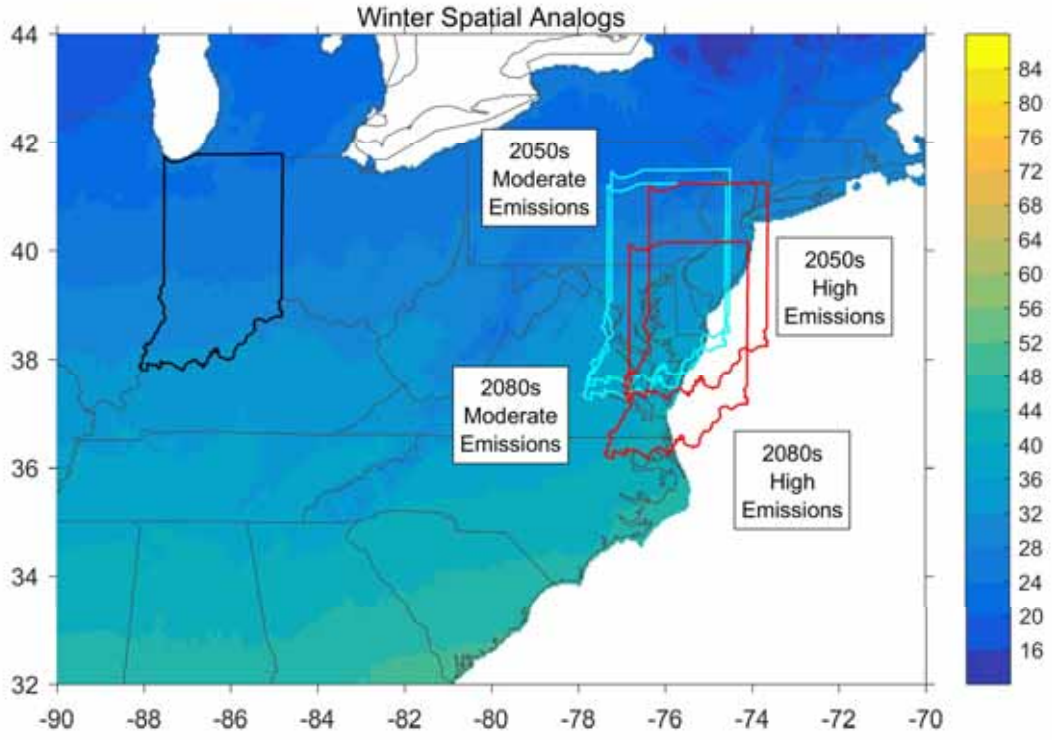
Annual Statewide Average Temperature



Seasonal Analogs

Based on seasonal average temperature and precipitation





Statewide Average

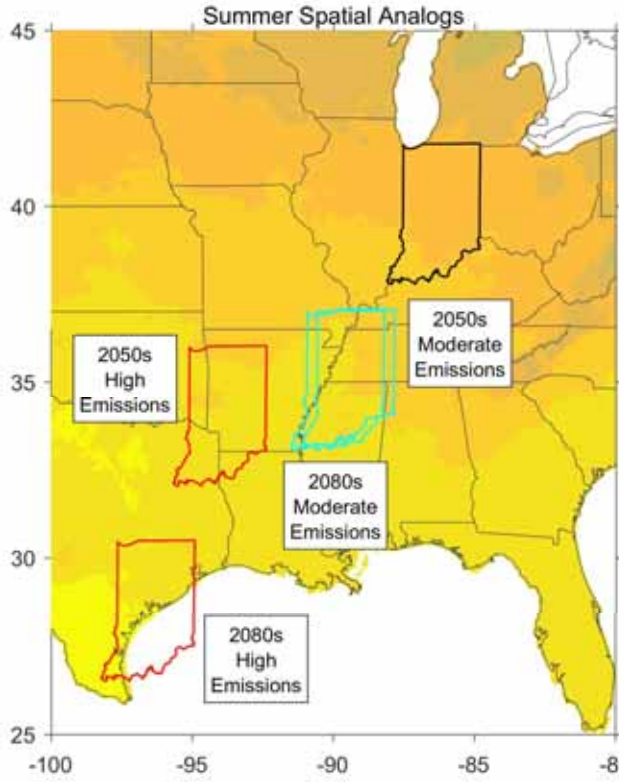
2050s represents average from 2041 to 2070

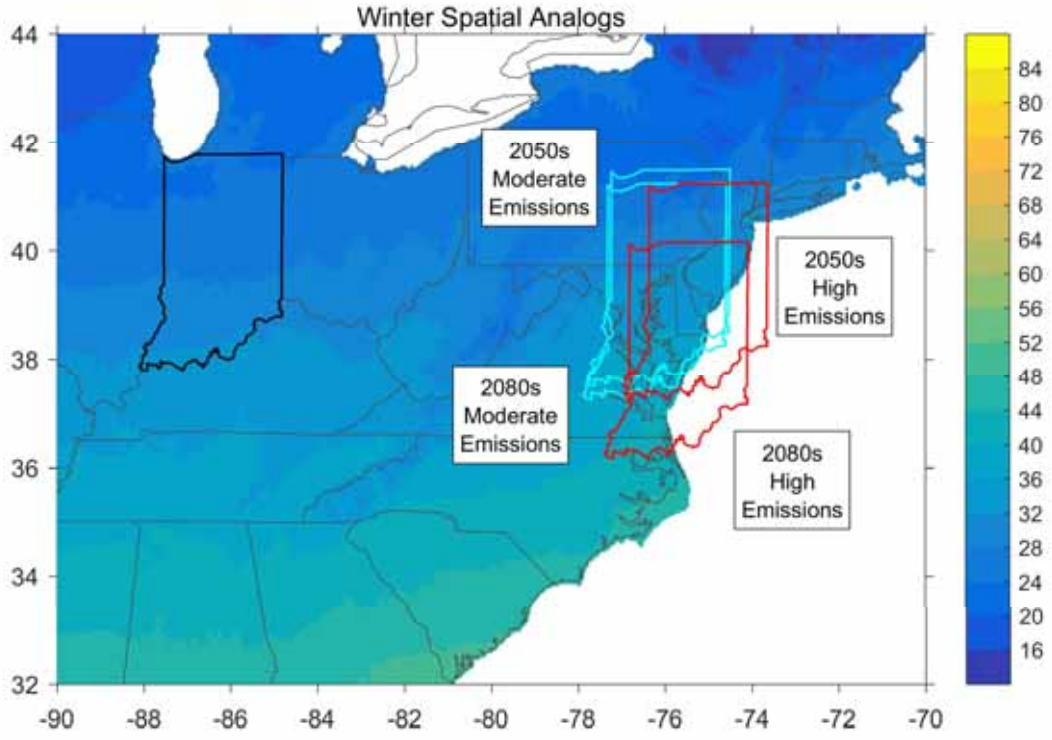
2080s represents average from 2071 to 2100

Base map shows 1981 to 2010 average seasonal temperature from PRISM archive

Seasonal Analogs

Based on seasonal average temperature and precipitation





Statewide Average

2050s represents average from 2041 to 2070

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Base map shows 1981 to 2010 average seasonal temperature from PRISM archive

Days Above 90 ºF

Annual Count

20

PAST
1915-2013

57-70

FUTURE
2050s

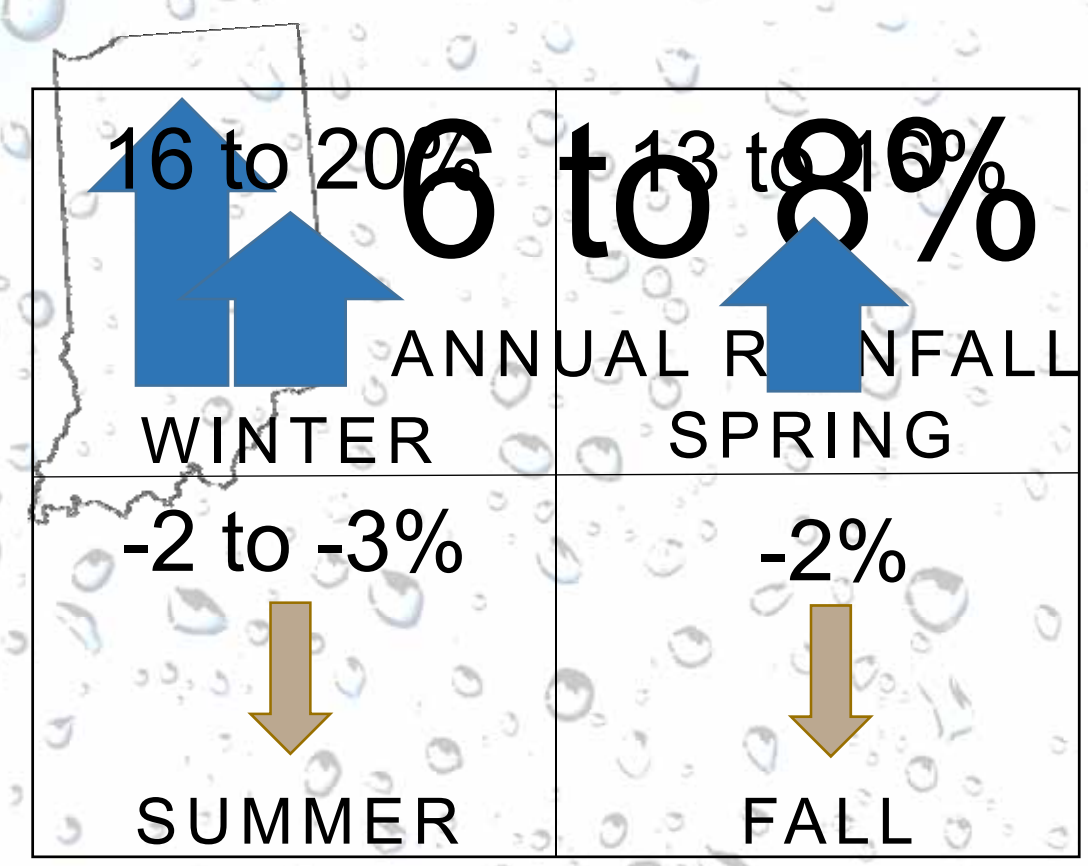
Tippecanoe County, Indiana

Future data for medium and high emissions scenario

2050s represents 30-year period 2041 to 2070

2050s

Relative to
1971-2000 average



Statewide Average
2050s represents average from 2041 to 2070

Future data based on medium and high emissions scenario

Declining crop yields

Change in dryland crop yield at mid-century

IN CCIA

Corn	Soybean	Wheat
-25 to -31 bushels per acre	-5 to -6 bushels per acre	-3 to -5 bushels per acre

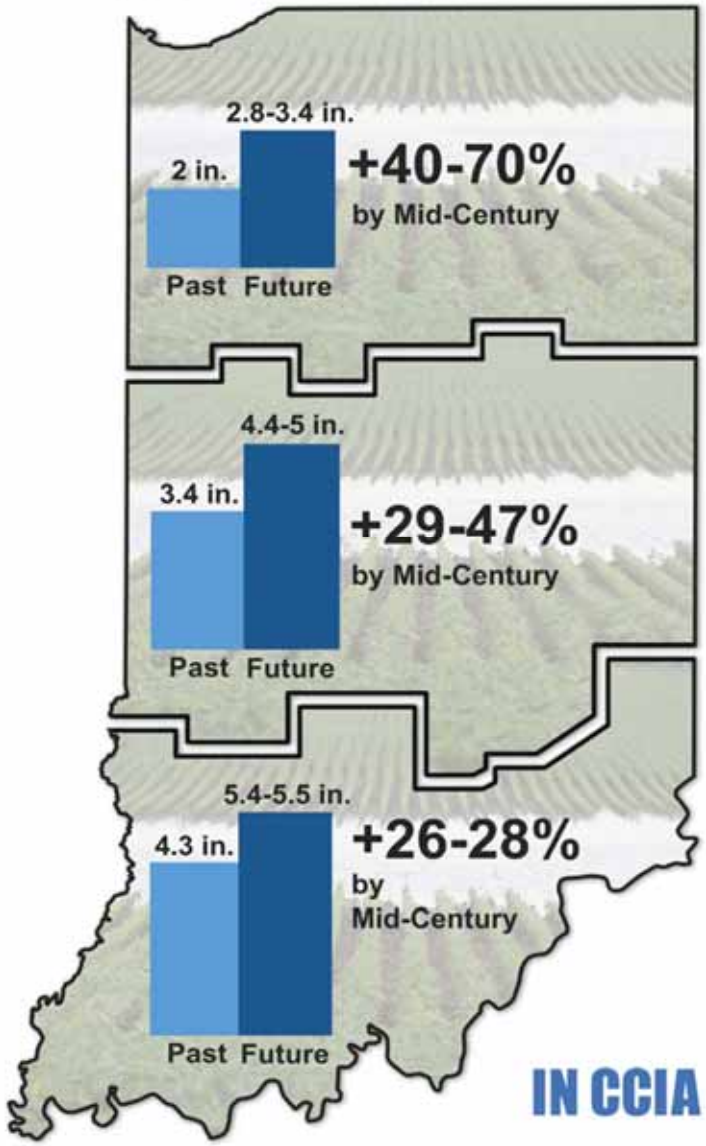
Projections based on currently available varieties with no management changes

Future data based on medium and high emissions scenario;
Mid-century represents average from 2041 to 2070;
Percent change is relative to 1984-2013 average

Central Indiana Average

Increasing Spring Drainage

Amount of water flowing from subsurface tile drains from March to May



Historical period is from 1981 to 2010. Mid-century represents the period from 2041 to 2070. Range of results based on medium and high emissions scenarios.

Future data based on medium and high emissions scenario;
Percent change is relative to 1981 to 2010 average
PRELIMINARY DATA

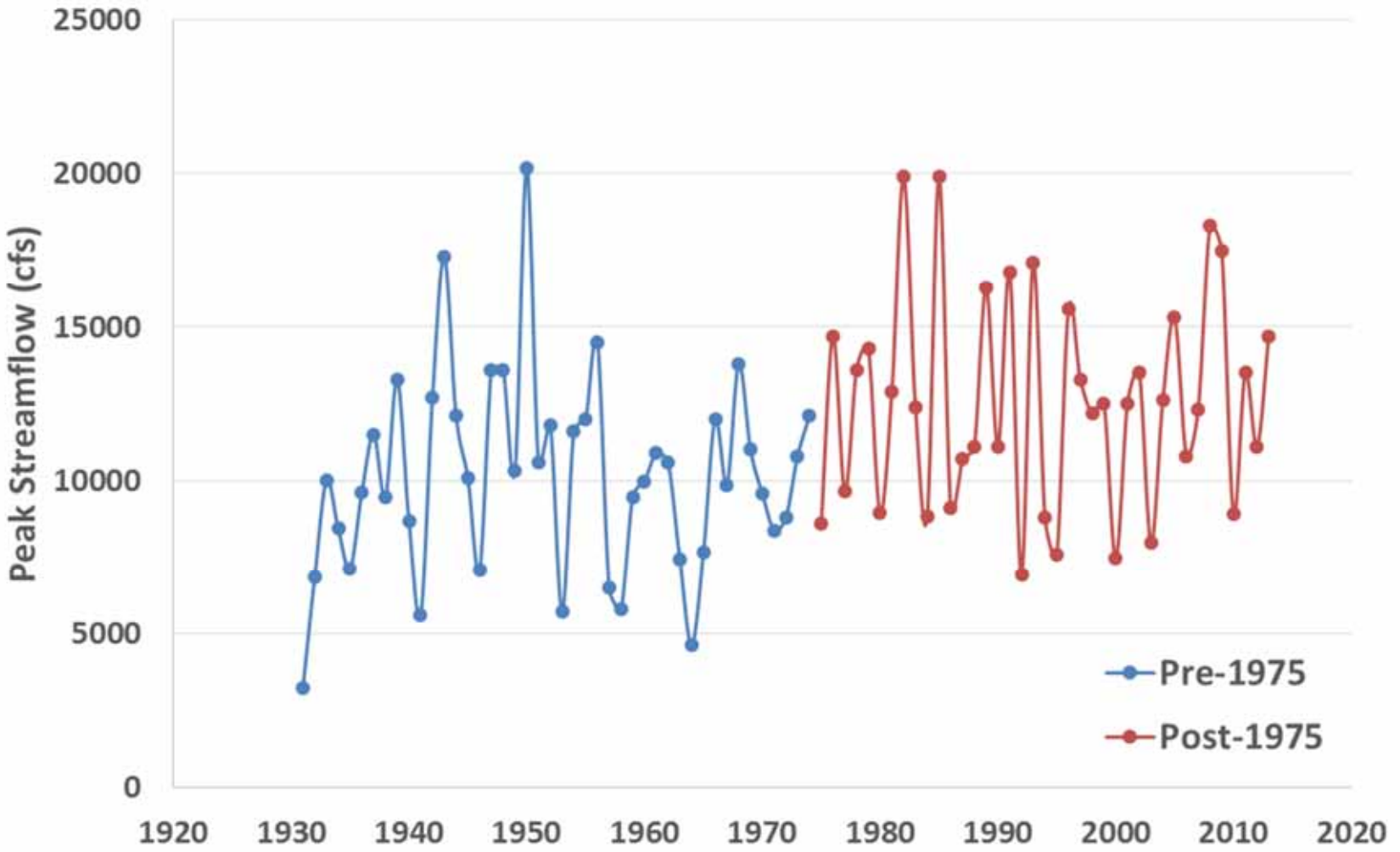
West Central Indiana Average

Future data based on medium and high emissions scenario;
Percent change is relative to 1981 to 2010 average
PRELIMINARY DATA

West Central Indiana Average

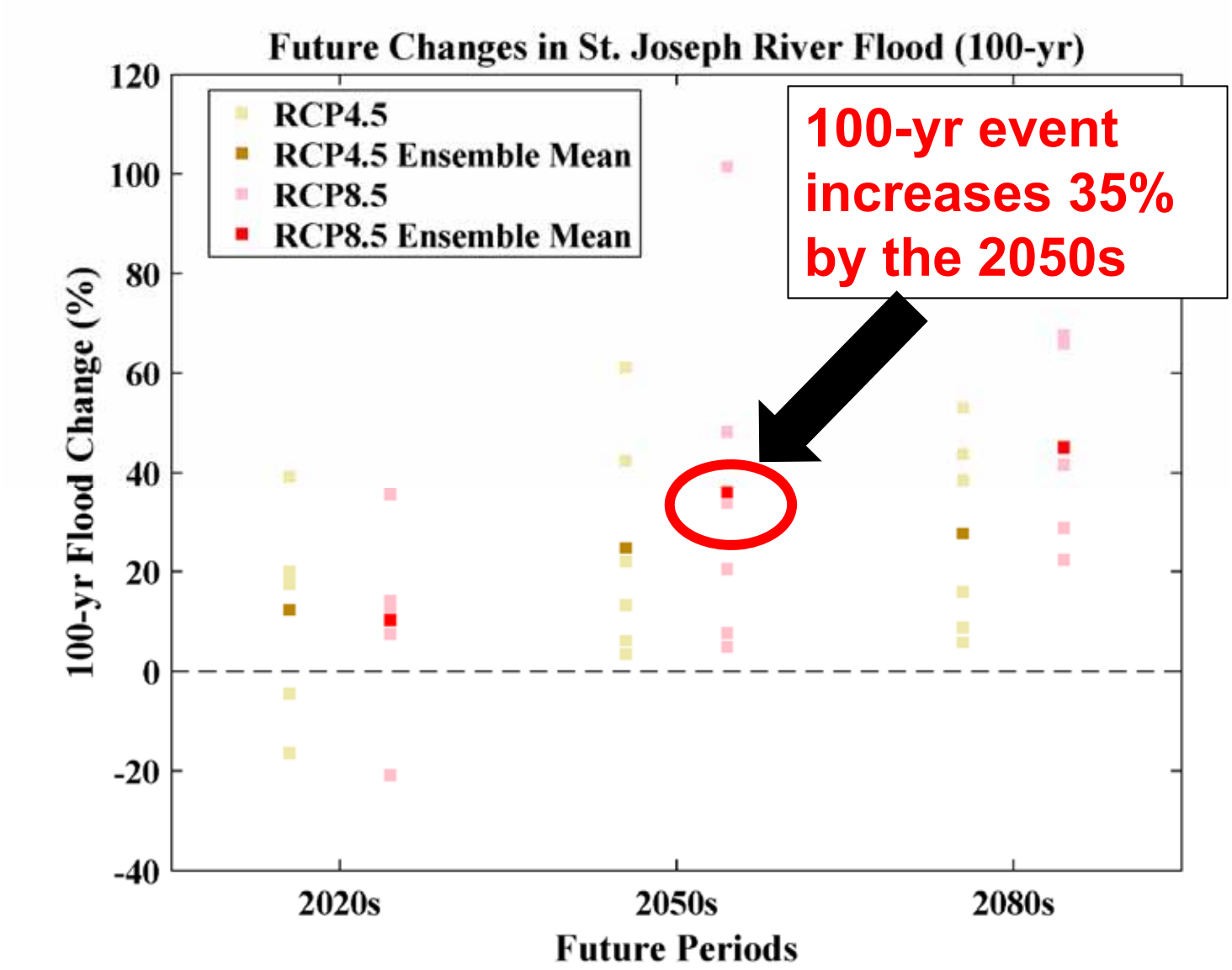
Peak Annual Streamflow

Observations for St. Joseph River at Niles, MI



Data courtesy of Alan Hamlet, Notre Dame

Projected Changes in the Magnitude of the 100-yr Flood

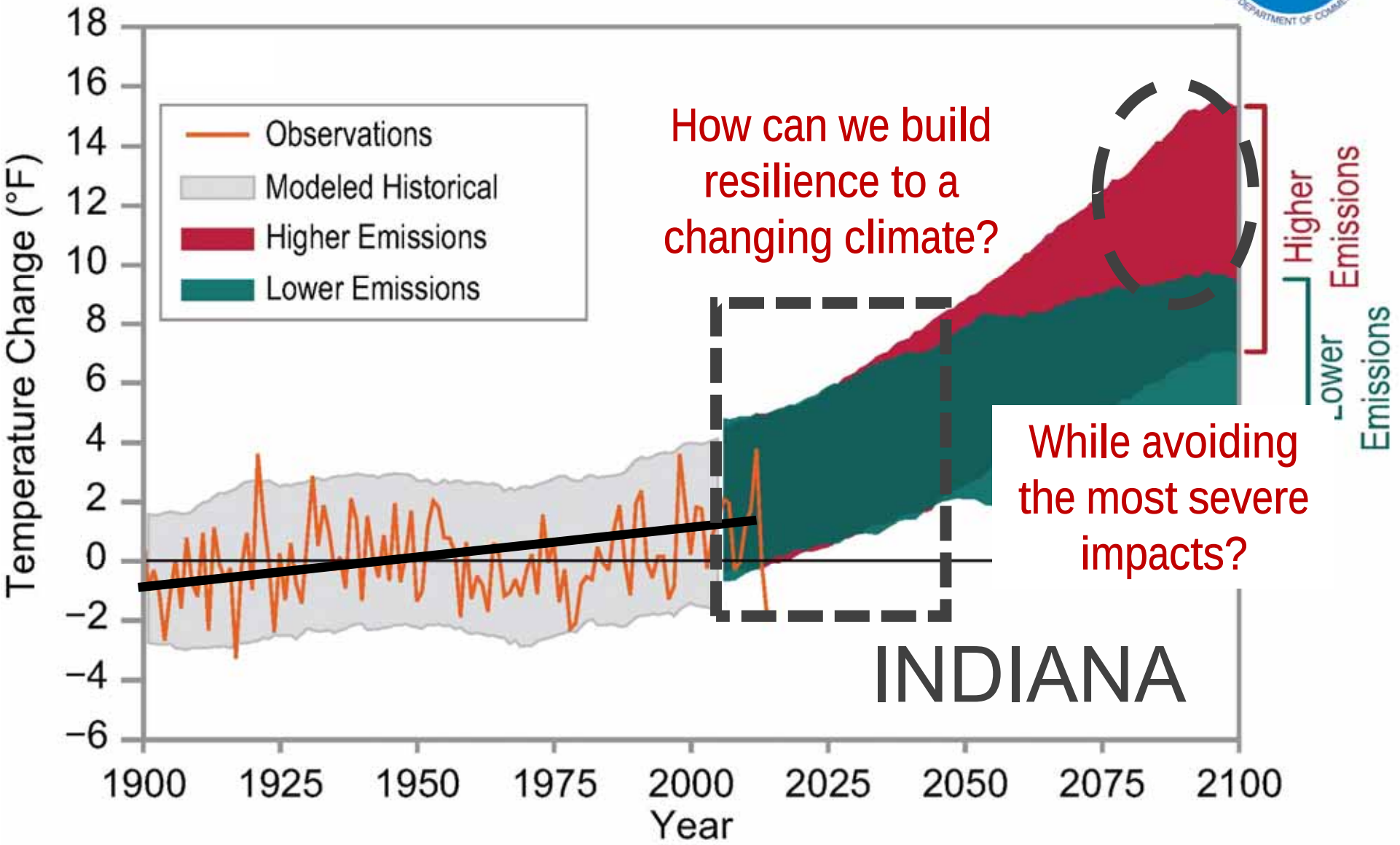


Water resource management is critical

- Indiana is getting warmer and wetter
- Extreme heat & heavy rainfall will challenge us
- Seasonal changes are critical to managing risks

Where we end up depends on the choices we make!

Annual Statewide Average Temperature



Stay informed, stay connected

http://IndianaClimate.org

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