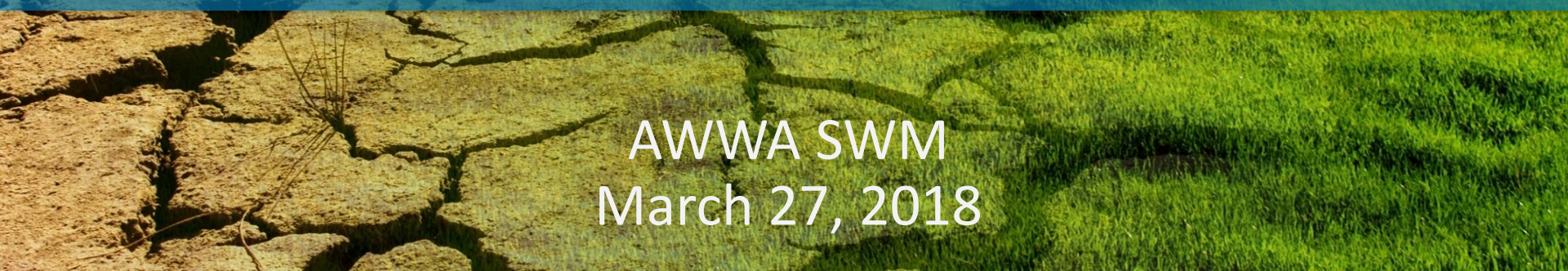


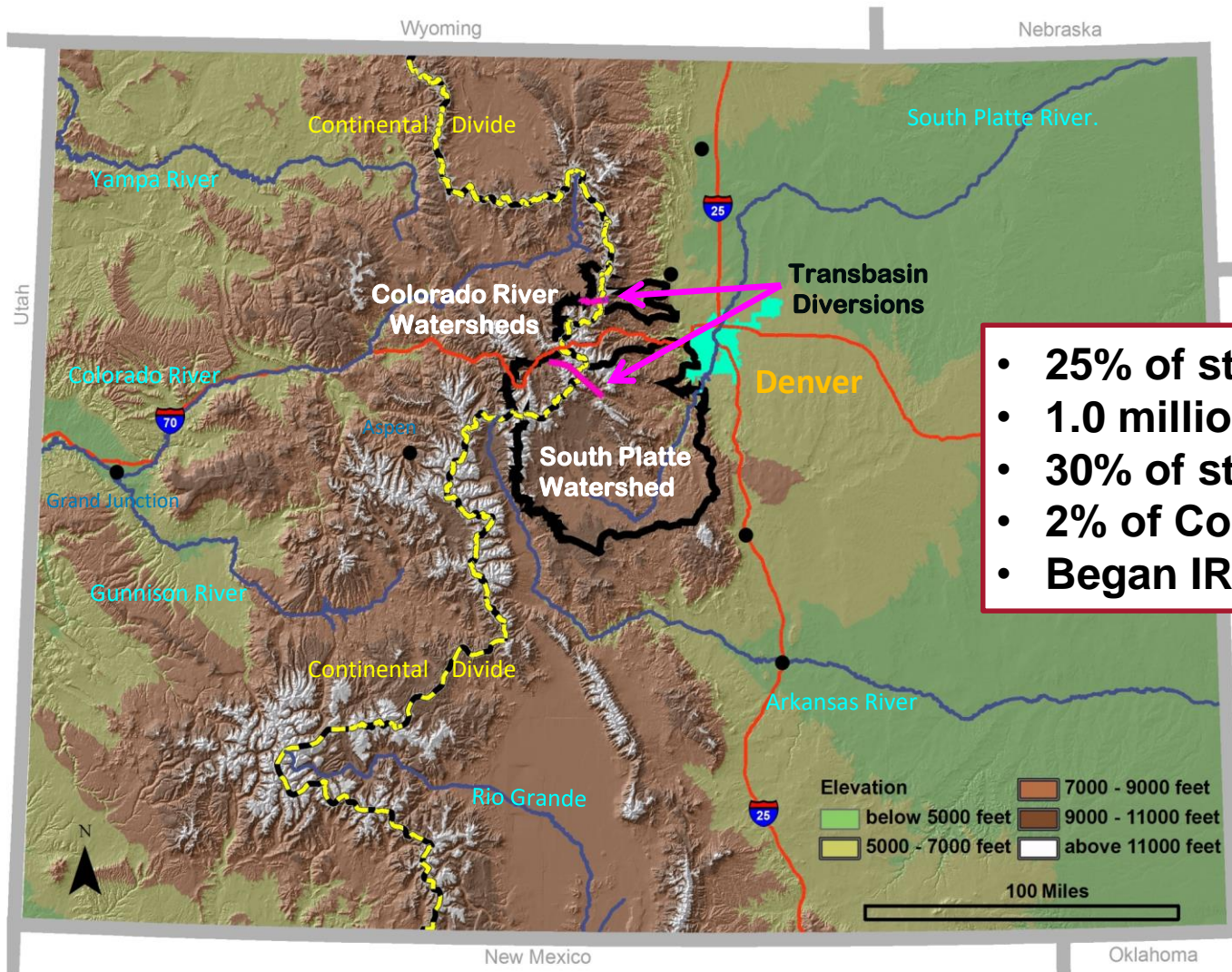


Successful Coproduction and Collaboration

Laurina Kaatz, Climate Program Director, Denver Water



AWWA SWM
March 27, 2018



- 25% of state population
- 1.0 million jobs
- 30% of state GDP
- 2% of Colorado's water
- Began IRPs in 1996

This story begins 16 years ago...

Deterministic thinking

- Observed hydrology and extrapolation of past trends



- Integrated Resources Plan (IRP):
 - Conservation-Supply-Reuse
 - Excess resources?
 - Regional role?

Unprecedented Simultaneous Natural Disasters



The Joint Front Range Climate Change Vulnerability Study

Benefits of a Regional Approach

- ***Scale:*** Projections are coarse and cover watersheds
- ***Communication:*** Cohesively communicate with customers and the media
- ***Safety:*** Provide political coverage
- ***Coordination:*** Coordinate with and inform other investigations
- ***Resources:*** Pool finances, staff, and expert resources
- ***Attention:*** Everyone wanted to work with us
- ***Learning:*** Monthly meetings and education



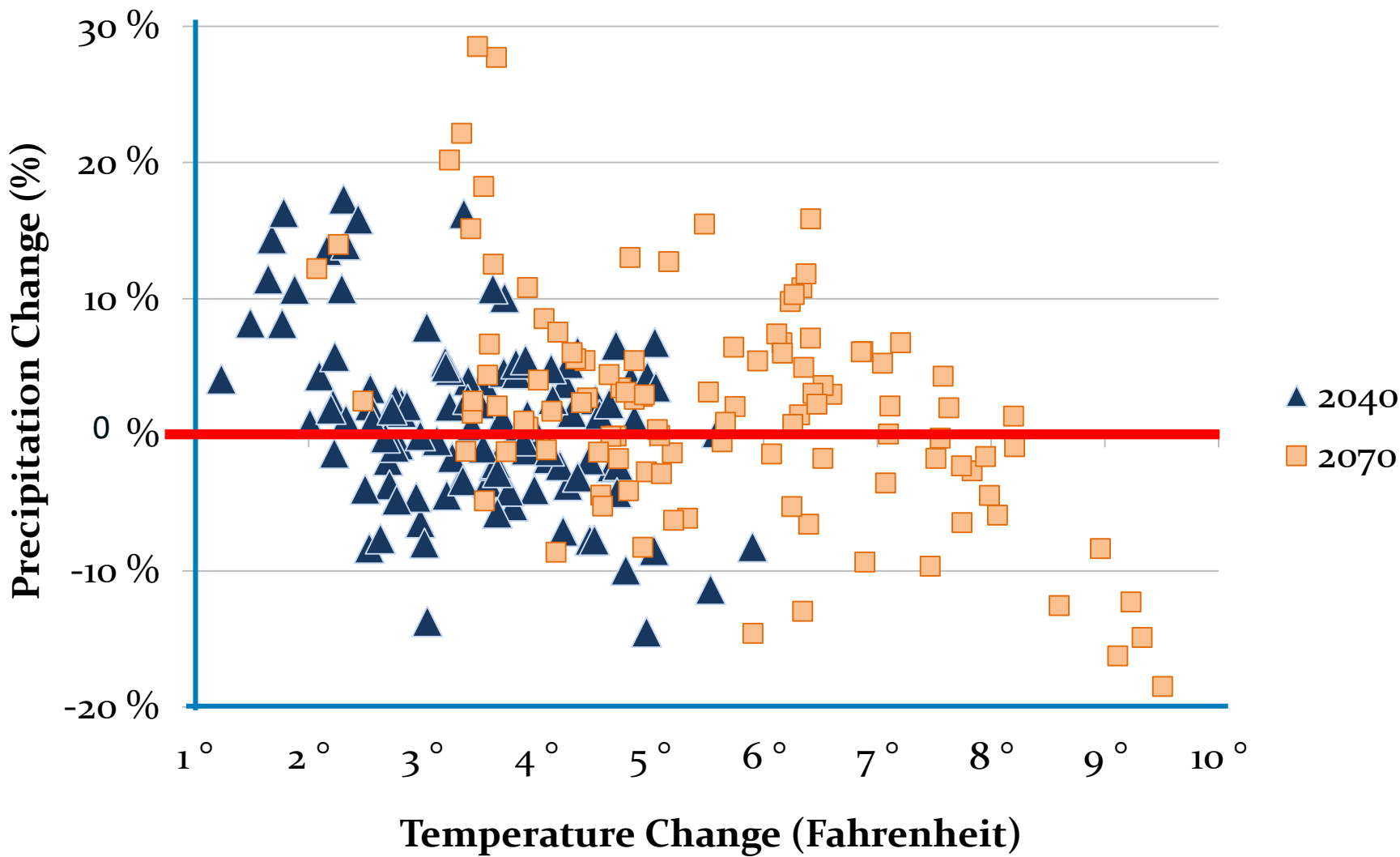
What is Coproduction?

“Coproduction of knowledge is the process of producing usable, or actionable, science through collaboration between scientists and those who use science to make policy and management decisions.” (*Meadow et al. 2015*)

“We define *coproduction* as collaboration among managers, scientists, and other stakeholders who, after identifying specific decisions to be informed by science, jointly define the scope and context of the problem, research questions, methods, and outputs, make scientific inferences, and develop strategies for the appropriate use of science.” (*Beier et al. 2016*)

“Actionable science provides data, analyses, projections, or tools that can support management of the risks and impacts of climate change. It is ideally **coproduced** by scientists and decision makers and creates rigorous and accessible products to meet the needs of stakeholders.” (*WUCA*)

Projections for North Central Colorado



Important outcomes

- Denver Water:
 - climate adaptation and planning philosophy
 - work with WUCA and others
 - value of coproduction and collaboration
- State of Colorado:
 - climate modeling of Colorado River
 - adoption of climate science and scenario planning in CO Water Plan
- Climate Change in Colorado report

AND the FRCCG still meets quarterly!

AND DW has ongoing collaborations with NCAR, WWA, RTI!

A Decade of Coproduction



- Shoshone relaxation agreement
- Using IRI forecasts to inform seasonal and annual operations
- Decadal predictions
- Climate diagnostics for water management decisions
- “Simple” planning model

General Lessons:

For research and consulting to be relevant for decision-making:

- 1. TRUST**
- 2. UNDERSTANDING**
- 3. PROOF**
- 4. CAPACITY**

Lessons with coproduction

1. TRUST and Respect and Credibility
2. Mutual UNDERSTANDING
3. PROOF imbedded in the process
4. CAPACITY – non factor

Reflections

- It's slow.
- It's educational.
- It may cause philosophical change.
- It leads to more questions. And more work.
- It will change the world.

Collaboration: Water Utility Climate Alliance



Vision: Climate-resilient water utilities, thriving communities

Mission: Collaboratively advance water utility climate change adaptation



Water Utility Climate Alliance 2017–2021 STRATEGIC PLAN

October 30, 2016

2017 WATER UTILITY CLIMATE ALLIANCE ANNUAL REPORT



October Summary of activities

This report documents the Water Utility Climate Alliance's 2017 Work Plan progress and provides a list of next steps.

HOW ARE WUCA UTILITIES COMMUNICATING ABOUT CLIMATE CHANGE?



May 2017

Summary of findings from a Water Utility Climate Alliance communications survey

K. Hays, Portland Water Bureau
K. Brooks, Southern Nevada Water Authority

Climate Risks to Water Utility Built Assets and Infrastructure

A synthesis of interviews with national and international water utilities

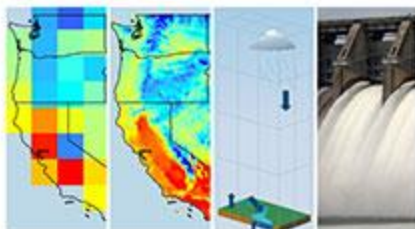
with editors

Kerstin Hays
Climate Science & Sustainability Coordinator, Portland Water Bureau
Whitney Wisner
Climate Planning Director, Portland Water Bureau



ACTIONABLE SCIENCE IN PRACTICE

Extrapolating Climate Change Information for Water Utility Vulnerability Assessments



Final Report of the Planning Utility Modeling Applications (PUMA) Project

EMBRACING UNCERTAINTY

A Case Study Examination of How Climate Change
is Shifting Water Utility Planning



Prepared for:

Water Utility Climate Alliance (WUCA)
American Water Works Association (AWWA)
Water Research Foundation (WRF)
Association of Metropolitan Water Agencies (AMWA)
Project Manager: Laura Kautz, Denver Water



DECISION SUPPORT PLANNING METHODS: INCORPORATING CLIMATE CHANGE UNCERTAINTIES INTO WATER PLANNING



JANUARY 2010

OPTIONS FOR IMPROVING CLIMATE MODELING TO ASSIST WATER UTILITY PLANNING FOR CLIMATE CHANGE



December 2009

2018 WUCA Highlights

- Best Practices in Climate Adaptation
 - Defining climate adaptation
 - State of the science for climate adaptation
- Business Function Mapping
 - Funding from WRF
 - Link to BPs
- Climate Resilience Training
 - Smart users and consumers of climate information
 - Plan for multiple futures
 - Effectively communicate about climate

Denver Water's Climate Adaptation Program

Knowledge

- Informed and engaged staff
- Climate *smart* organization

Science

- **Coproduce** science to better meet our needs and bring good science home

Planning and Preparation

- Develop and apply better water utility planning techniques
- Mainstream climate adaptation across organizational practices

Partnerships

- Seek regional and national **collaborations**

Communication

- Continuously message internally and externally