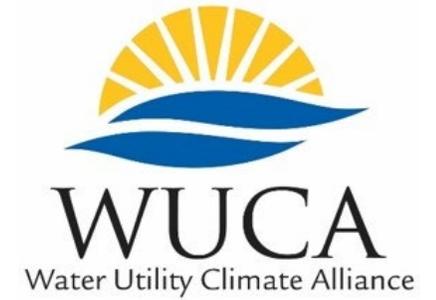


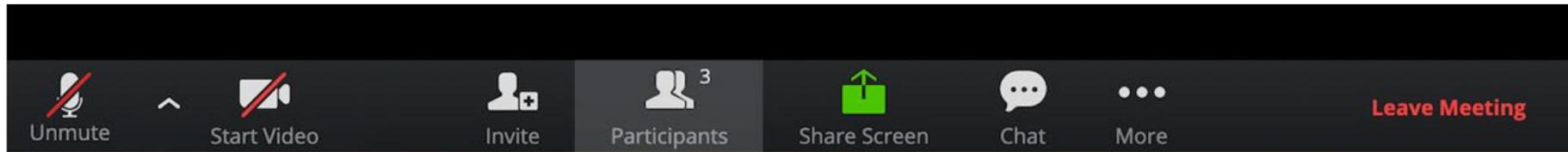
**Building Resilience to a Changing Climate:  
A Technical Training in Water Sector  
Utility Decision Support**



# **Workshop logistics**

Alyssa Hall, Cadmus

# Logistics and housekeeping before we get started



↑  
Mute/  
Unmute

↑  
Turn video  
on or off

↑  
Open  
chat

↑  
Raise  
hand

# Workshop Logistics

## **Audio**

- Please mute yourself during presentations except when called on to ask a question

## **Video**

- Please keep your video off during presentations.
- Please turn your video on during interactive portions.

## **Recordings**

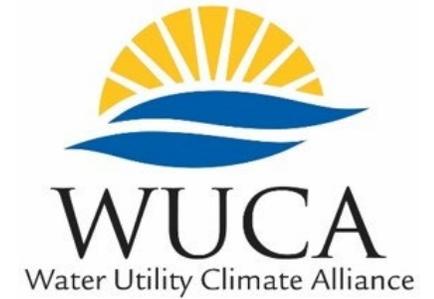
- All presentations will be recorded but breakout group discussions will not be recorded.

## **Renaming**

- Please make sure to rename yourself by what you'd like to be called.

This workshop is a collaborative environment. Please be respectful of others and their thoughts/ideas.

**Building Resilience to a Changing Climate:  
A Technical Training in Water Sector  
Utility Decision Support**



# **Welcome & Agenda Review**

Kavita Heyn, WUCA Staff Chair, Portland Water Bureau

Keely Brooks, WUCA, Southern Nevada Water Authority

Alyssa Hall, Cadmus

# Water Utility Climate Alliance

Over 50 million Americans get their drinking water from WUCA utilities

## Mission

Collaboratively advancing water utility climate change adaptation

## Vision

Climate-resilient water utilities supporting thriving communities



# Acknowledgements

## **WUCA Staff**

Keely Brooks, Southern Nevada Water Authority

Seth Shanahan, Southern Nevada Water Authority

Nolie Templeton, Central Arizona Project

Laurna Kaatz, Denver Water

Brandon Goshi, Metropolitan Water District of Southern California

## **Partners and Trainers**

Alyssa Hall, Cadmus

Julia Nassar, Cadmus

Robert Lempert, RAND

Julie Vano, Aspen Global Change Institute

Jim Prairie, U.S. Bureau of Reclamation

Joel B. Smith, Independent Consultant

Heidi Roop, University of Minnesota Climate Adaptation Partnership

Zane Marshall, Southern Nevada Water Authority

Michelle Garrison, Colorado Water Conservation Board

Steve Fries, U.S. EPA Creating Resilient Water Utilities

Ned Gardiner, NOAA Climate Program Office



Climate change is here and now ...  
BUT how it manifests is deeply uncertain

The water sector needs guidance and practical approaches to prepare and plan

# Training Vision

## WUCA's Broad Training Vision:

- Foster smart translation and use of climate information
- Encourage action on adaptation and resilience planning under conditions of deep uncertainty
- Effectively communicate to decision makers
- Transfer knowledge from WUCA's community of practice
- WUCA Strategic Plan goals to Innovate & Lead, Mainstream & Operationalize and Transfer Knowledge

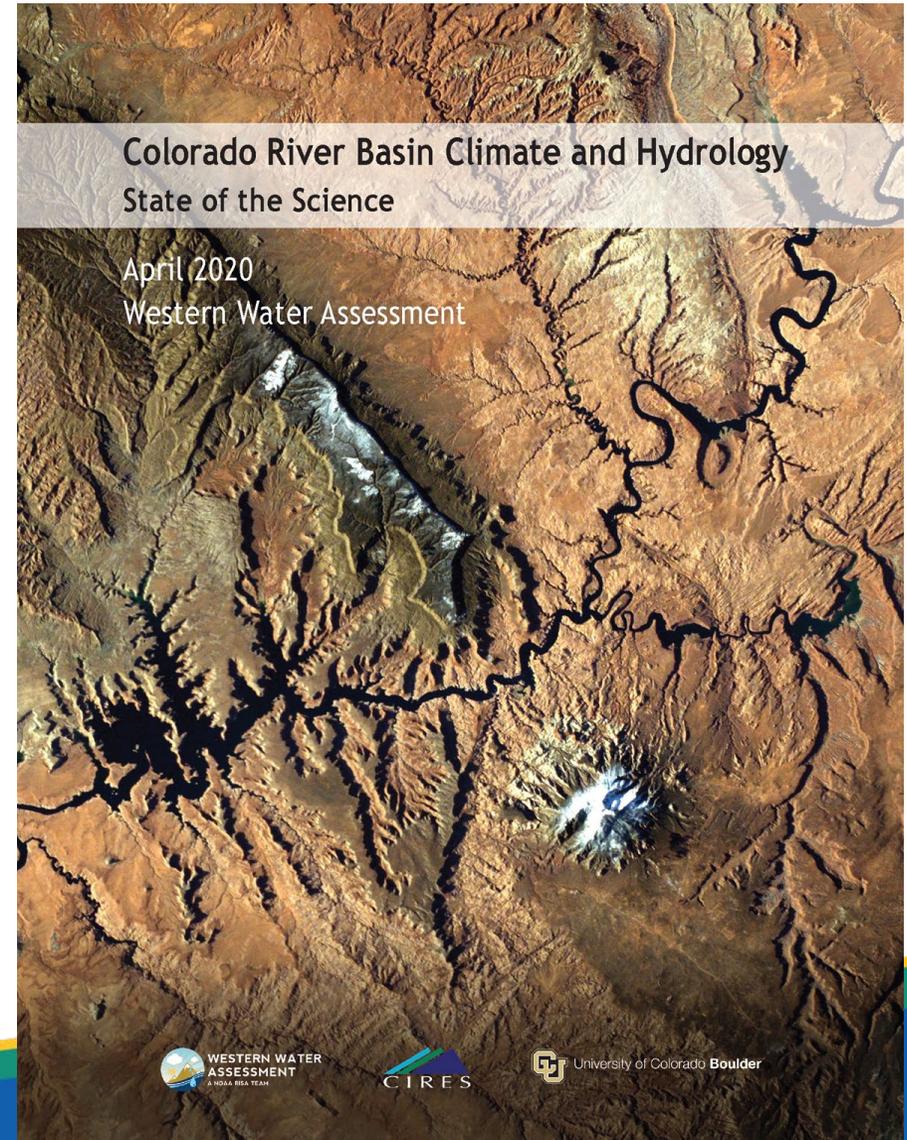
## Today's training objectives:

- Enhance understanding of capabilities and limitations of climate science
- Learn best practices for using climate science in long-term water agency planning
- Understand different climate change planning frameworks for deep uncertainty
- Provide communication tools/strategies to explain the value and limitations of different climate change planning frameworks

# WUCA training meeting the needs of stakeholders

This workshop intends to address the challenge identified in the Colorado River State of the Science report which reads, *“Any given ensemble of climate change-informed hydrology (e.g., CMIP5 BCSD) is a complex dataset that is challenging to obtain, analyze, and interpret; the increasing proliferation of similar datasets and their respective underlying methodological approaches can be bewildering to even sophisticated users.”*

- The number and range of possible future hydrologies is so wide it's not feasible to use in decision making.
- Can't be prepared for everything but must be prepared.
- How do we navigate this sea of datasets?



# July 19 – 21 Agenda Brief Preview

## Day 1 (July 19)

- Group exercise: Decision for the decades.
- Focus will be on understanding the capabilities and limitation of climate science.

## Day 2 (July 20)

- Expand on capabilities and limitation of climate models, downscaling, and hydrology models.
- Hear from a panel of experts about confronting challenges (especially communication challenges) from decision makers in the water sector.

## Day 3 (July 21)

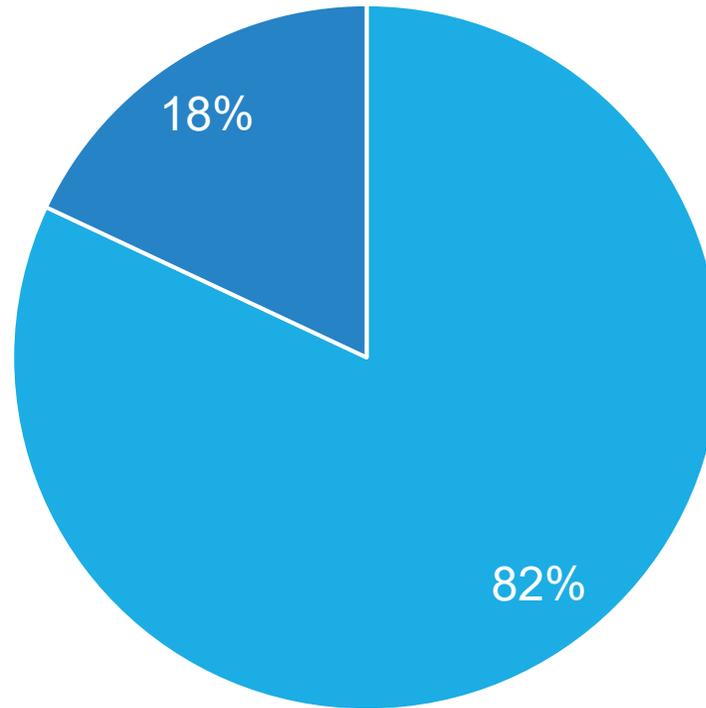
- Understand the different planning frameworks that address deep uncertainty associated with climate change; and
- Learn different communication tools to be able to explain the value and limitations of different planning frameworks to various audiences.

# Participant Make-Up (Survey Results)

## **Drinking Water Utilities/Government**

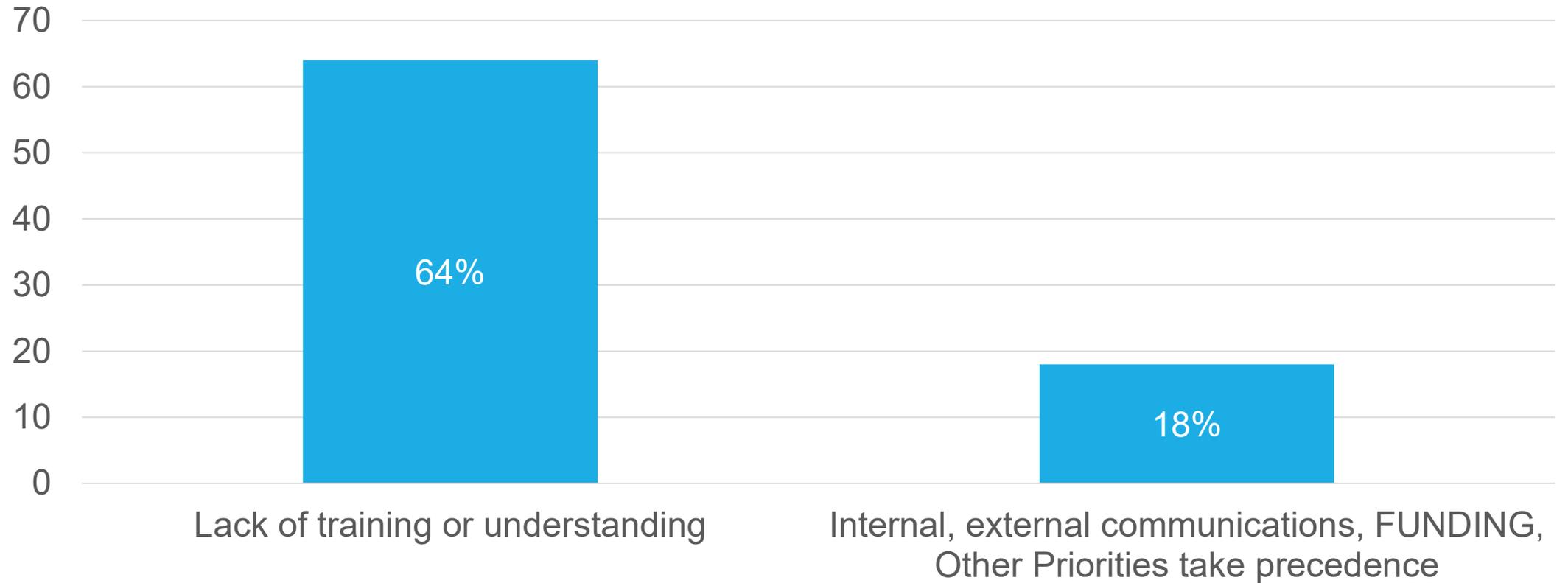
- 82% Water resources/long-term planning
- 55% Demand/conservation
- 36% Water resource operations

# Who uses climate information (Survey Results)



- We currently use information from climate models and/or climate assessments
- Don't currently but might in the future.

# What challenges have you encountered in integrating climate information into your work? (Survey Results)



# You'd like to learn more about (Survey Results)

## **Climate Modeling (Importance rank):**

(4.27) How to identify the best information for use in utility planning

(4.09) How to communicate about the complex uncertainty inherent in climate adaptation

(4.09) A better understanding about uncertainty

(4.00) A basic understanding

(3.64) Where to gather info

(3.45) How downscaling works

# You'd like to learn more about (Survey Results)

## **Uncertainty Planning Methods (Importance rank):**

(4.36) A better understanding of robust decision-making approaches

(4.27) A basic understanding of approaches to planning and decision making within a highly uncertain context.

(4.09) A better understanding of scenario approaches

(4.09) A better understanding of risk approaches

(3.91) How to identify the best planning method for use at my utility

(3.73) Understanding of the aspects of adaptive planning

# You'd like to learn more about (Survey Results)

## **Communication Best Practices (Importance rank):**

- (4.00) Integrating climate science into utility planning operations
- (3.82) Addressing climate science communication barriers
- (3.73) A basic understanding of climate science best practices.

# You'd like to learn more about (Survey Results)

## Open Ended Questions:

1) How many models has the federal government developed? How well do they agree?

2) We run into communication barriers when presenting analysis considering a high number of GCM scenarios and are often asked to 'narrow the envelope' or present 'one example'. However, I hesitate to do this because of the innate nature of uncertainty with each GCM on its own. Is there a defensible way to evaluate only certain GCMs? How would one determine which are most applicable for that region?

# Polling Question #1:

What climate impacts are you worried about?