

# Major Program Highlight: Climate Resiliency

**Presentation to the Customer Review Panel  
11/30/2016**

Seattle  
 Public  
Utilities

# Presentation Outline

- **Presentation Objectives**
  - Familiarize CRP with the why and what of SPU's climate program
- **Background**
  - Why is a municipal water utility working on climate change?
- **Current State**
  - What have we done to date
- **Looking Forward**
  - Major initiatives

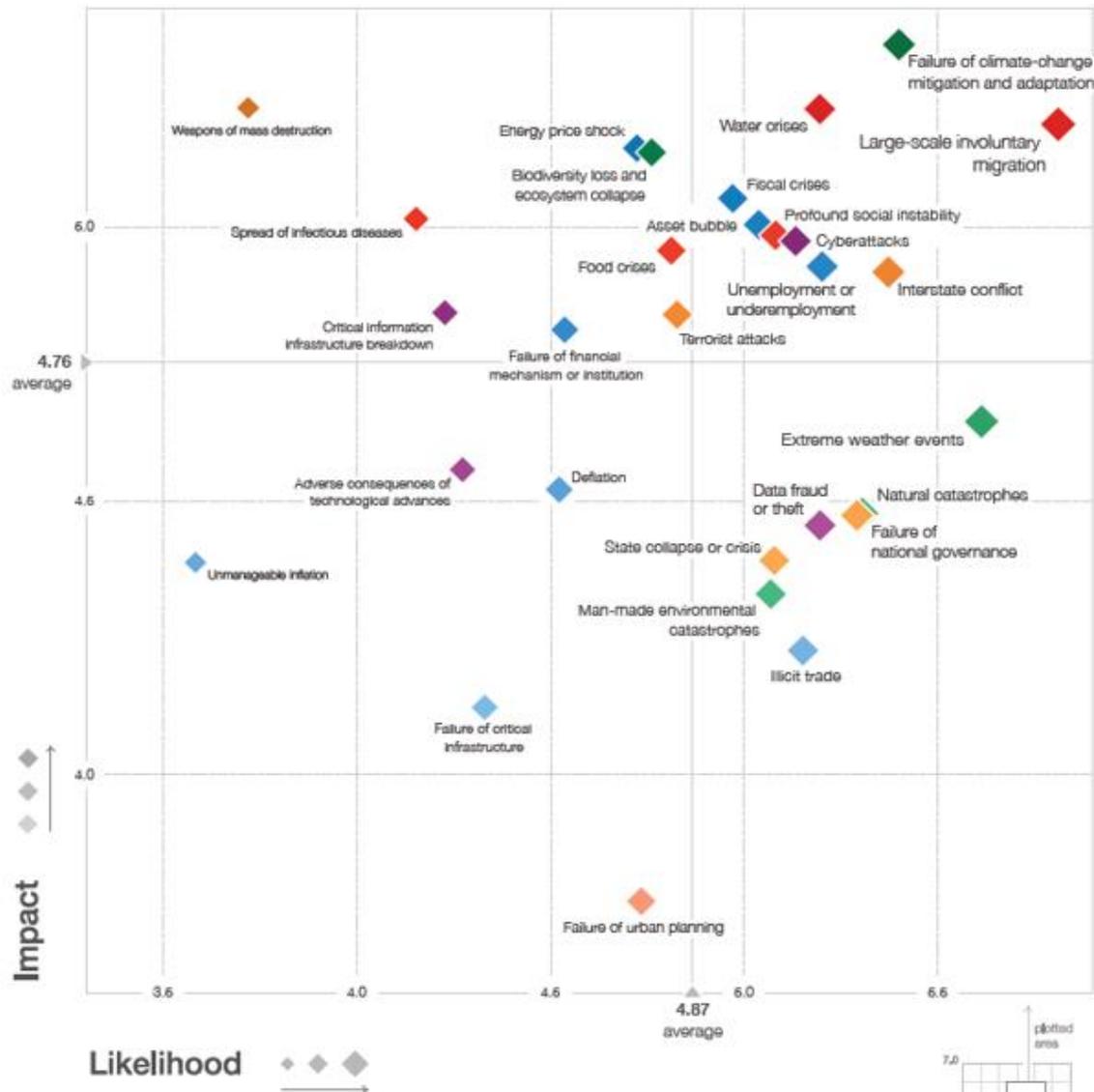
When you think of climate change, what comes to mind?

# Managing Climate Change

- Greenhouse gas (GHG) mitigation can avoid, reduce or delay the impacts of climate change
- Some impacts are unavoidable due to past emissions, hence the need for adaptation
- Avoid the unmanageable, manage the unavoidable
- Will focus today on our adaptation work – but we're ramping up on mitigation and carbon neutrality

# Climate Change Magnifies Stressors

Figure 1: The Global Risks Landscape 2016



# The Future is Now

W I R E D

The Texas Floods Are So Big They Ended the State's Drought



## ▲ Charleston, S.C.

At high tide, water can back up in the old sewers and bubble into the streets. The city is spending more than \$200 million on improvements.

10"...



## ▲ Norfolk, Va.

Rulers at low-lying intersections help drivers figure out if floodwaters are safe to plow through. Some cars go too fast, creating wakes that damage nearby property.

10"...

Did any of the headlines on the previous slide remind you of your answer to the first question?

Do you have a sense of why it is SPU works on climate change?





# Why Does SPU Work on Climate Change?

- Potential to disrupt provision of essential services
- Consistent with and threat to our mission
- Increasingly part of what a forward looking utility considers
- Opportunity to improve
- This is who we are

# Sustained and Committed Focus

## Climate Resiliency Group Objectives:

- Build sustained capacity to prepare for climate change by:
  - Enhancing knowledge
  - Participating in collaborative partnerships
  - Fostering an enabling environment
- Leverage sustained capacity to embed what we learn in what we do



# SPU's Evolving Capacity

## **2002 Study:**

### **Consumer**

SPU “manages” one link in chain of models – utility planning

## **2007 Study:**

### **Partner**

SPU “manages” 2 links in chain of models – operations/system model and utility planning

## **2015 PUMA:**

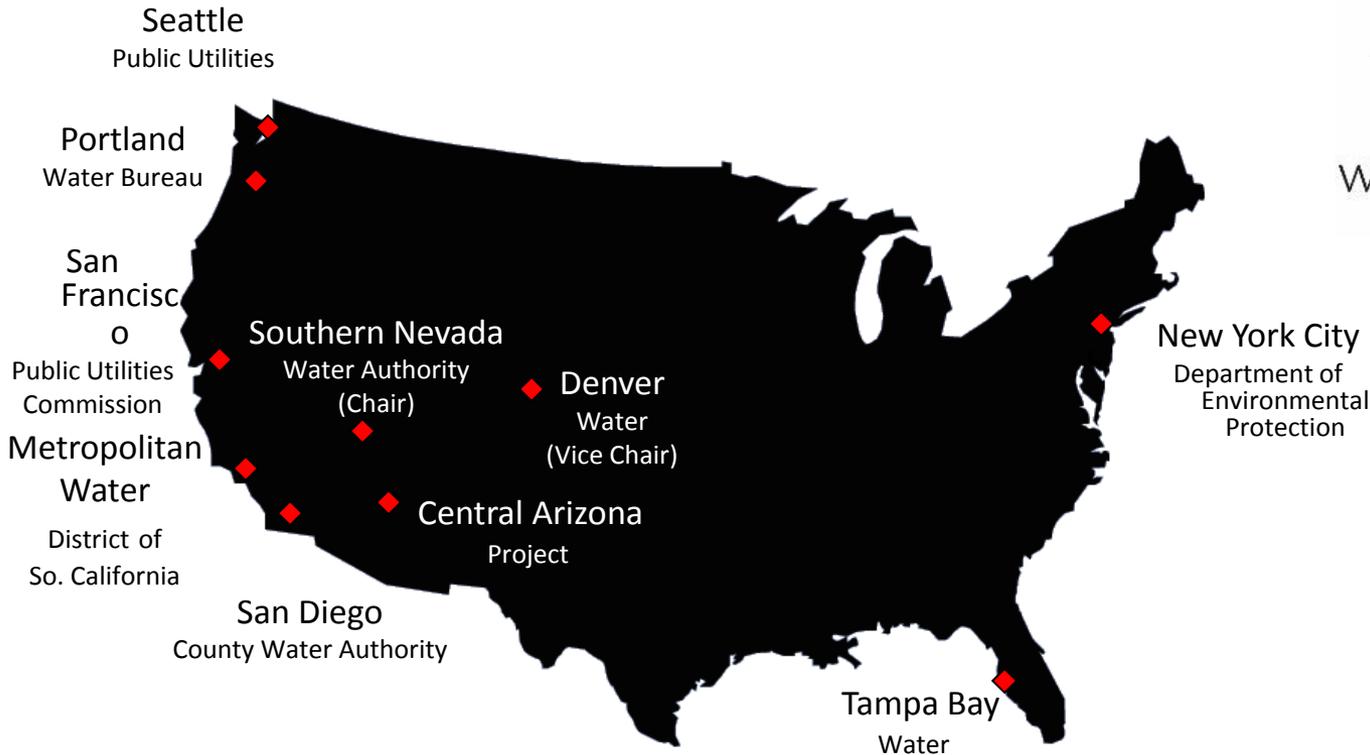
### **Co-Producer**

SPU “manages” 3 links in chain of models – hydrologic model, operations/system model and utility planning

# Collaborative Partnerships



**WUCA**  
Water Utility Climate Alliance





DEAD  
END





# Forecasting & Mapping

## Enhanced weather forecasting:

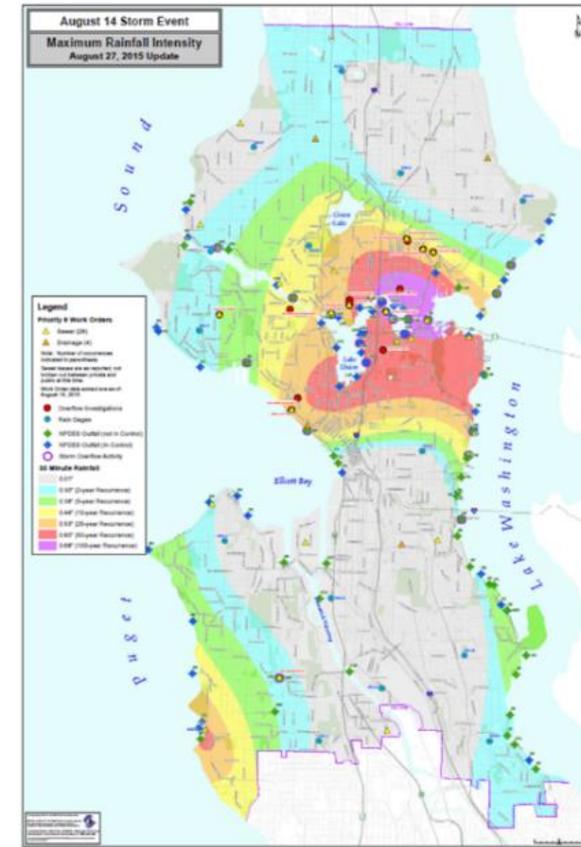
- Applying knowledge of systems & impacts to rainfall predictions

## Post-storm analytics:

- Mapping events & their impacts to find patterns, better define sensitivity

## Sea-level rise mapping:

- Understanding exposure, managing assets



# Mainstreaming



# PUMA and the Water System Plan

- PUMA = Piloting Utility Modeling Applications
- Created 40 climate scenarios
- Assessing how system would perform
- Development of adaptation strategies
- Feed into 2019 Water System Plan

# Characterizing Observed and Projected Rainfall Change

24-hour rainfall	Study Period	2yr	5yr	10yr	25yr	50yr	100yr
	1978-2003	2.16"	2.40"	2.88"	3.36"	3.60"	4.08"
	1978-2015	2.29"	3.04"	3.59"	4.34"	4.95"	5.60"
	▲	6%	27%	25%	29%	38%	37%

6-hour rainfall	Study Period	2yr	5yr	10yr	25yr	50yr	100yr
	1978-2003	1.08"	1.26"	1.38"	1.56"	1.74"	1.86"
	1978-2015	1.06"	1.36"	1.57"	1.84"	2.05"	2.27"
	▲	-2%	8%	14%	18%	18%	22%

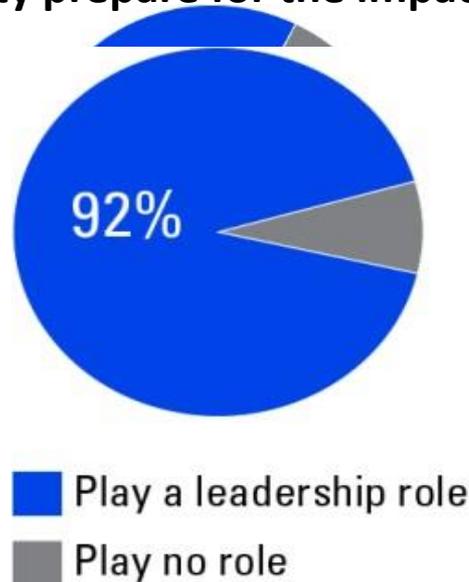
Source: SPU Combined Sewer Overflow Reduction Program: Precipitation Intensity, Duration, and Frequency Update (DRAFT)

# Drainage & Wastewater Adaptation Strategy

- Characterize system threats
- Identify opportunities to use non-SPU assets to provide enhanced stormwater management under extreme events
- Develop resiliency metrics/performance measures
- Linked to broader DWW system planning

# Opportunity for Public Engagement

**Climate change will have a significant impact on the water utility play in helping your community prepare for the impacts of climate change?**



Source: "What Do Americans Think about Community Water and Climate Change", Survey of 1,021 adults, April 10-28, 2013

# Conclusions

- Climate change is a threat to SPU's mission
- Requires sustained capacity to prepare for continuous change
- SPU has established a knowledge center
- Opportunities to improve water management
- Opportunities to engage the public

What are your impressions of our climate program?

Based on the survey results, should we be having more discussions with the community about our climate work?