Water system resilience in an uncertain climate future

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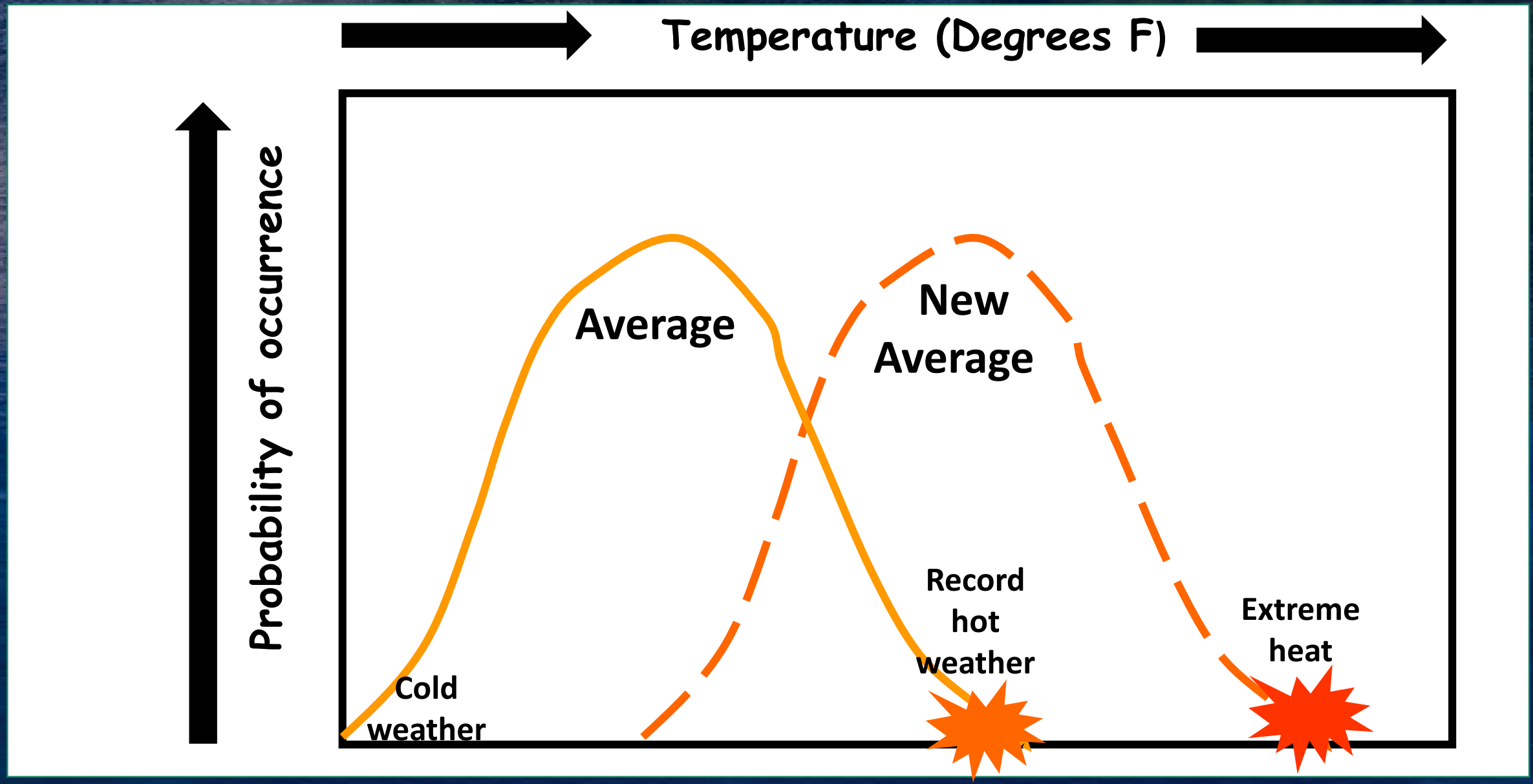
PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

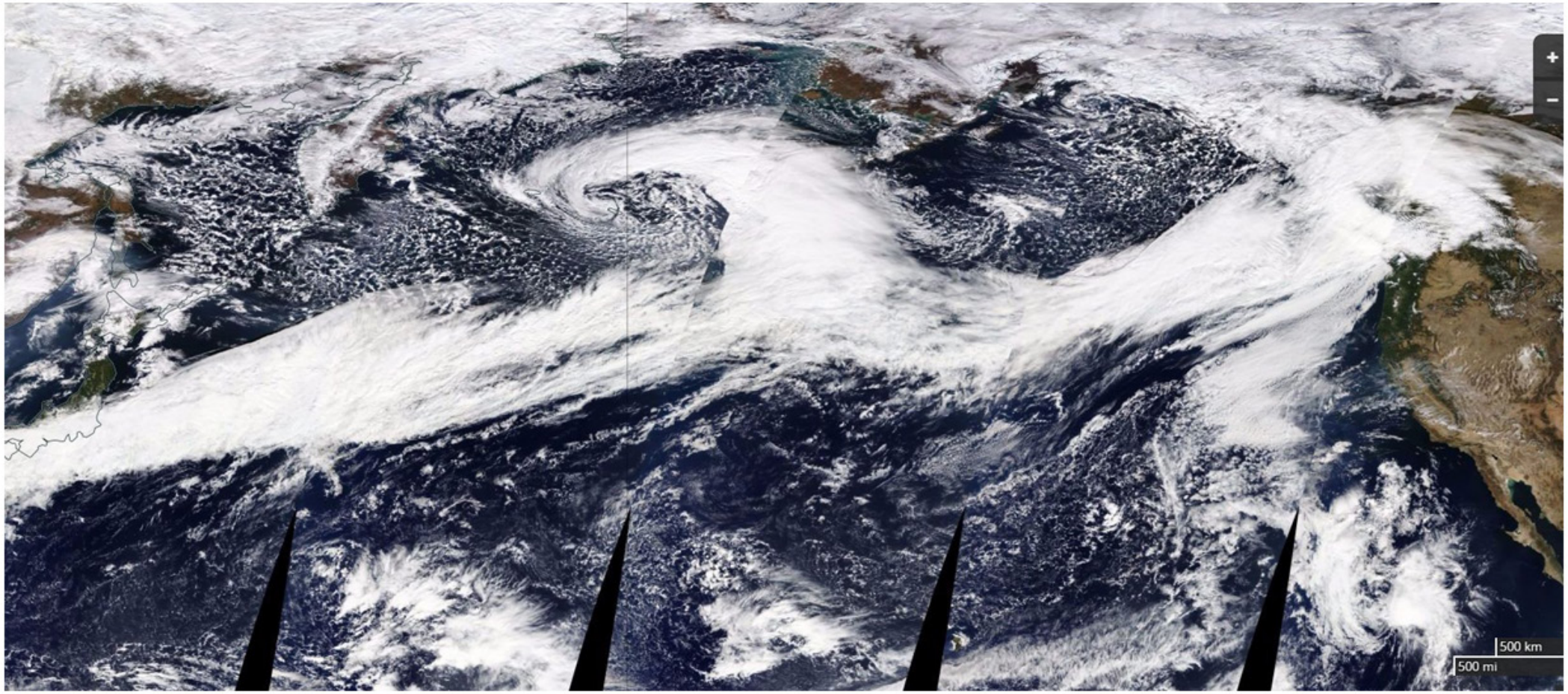
Resilience challenge 1: Increased risk of failure



Resilience challenge 1: Increased risk of failure

CW3E Atmospheric River Update – Outlook

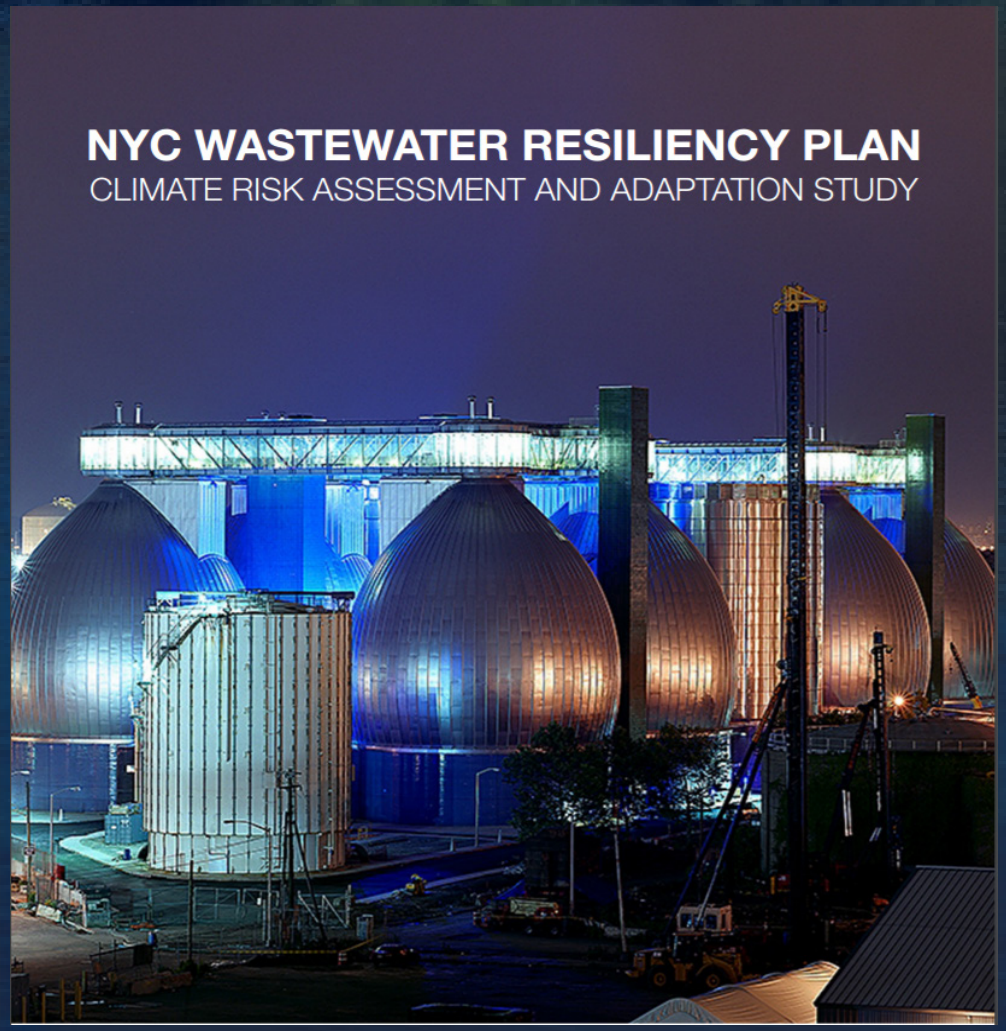
Source: Center for Western Weather & Water Extremes, Scripps, UCSD



The synoptic scale configuration that is leading to these consecutive ARs over the Pacific Ocean is providing impressive satellite imagery that exhibits a cloud band that spans the entire northern Pacific Ocean (~5,000-miles). Photo credit NWS Seattle.

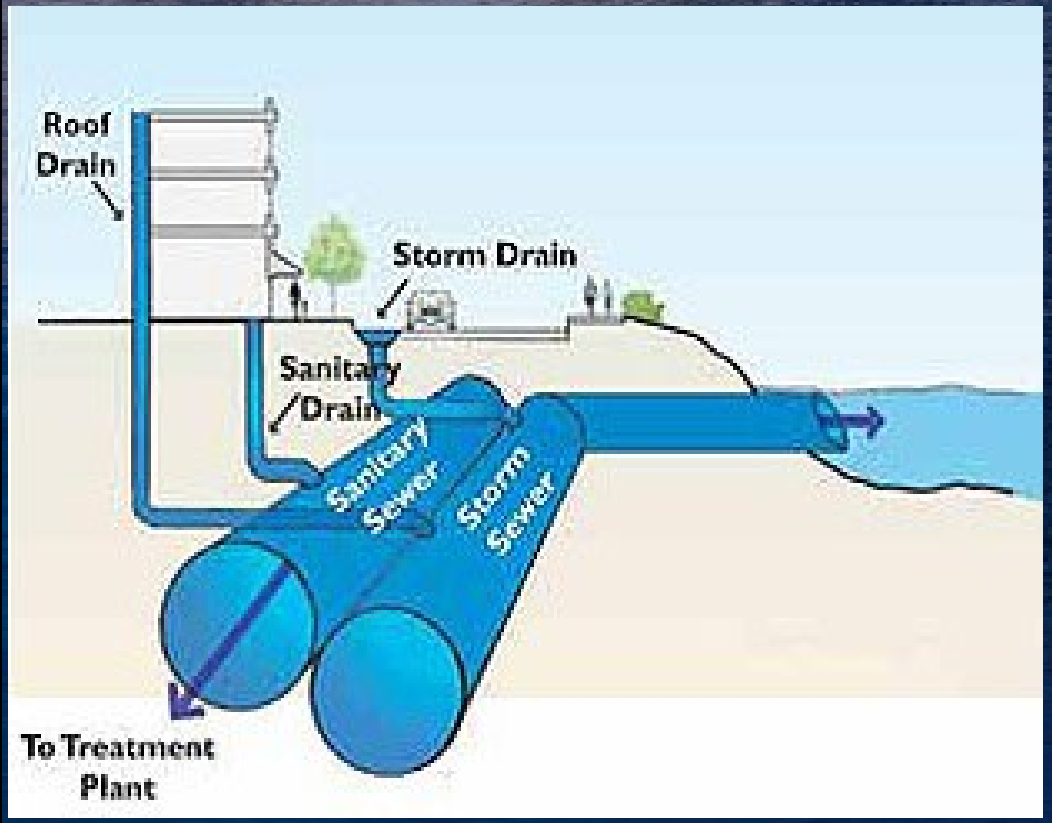
Resilience strategy 1: Design for a range of extremes

Tarrant Regional Water District



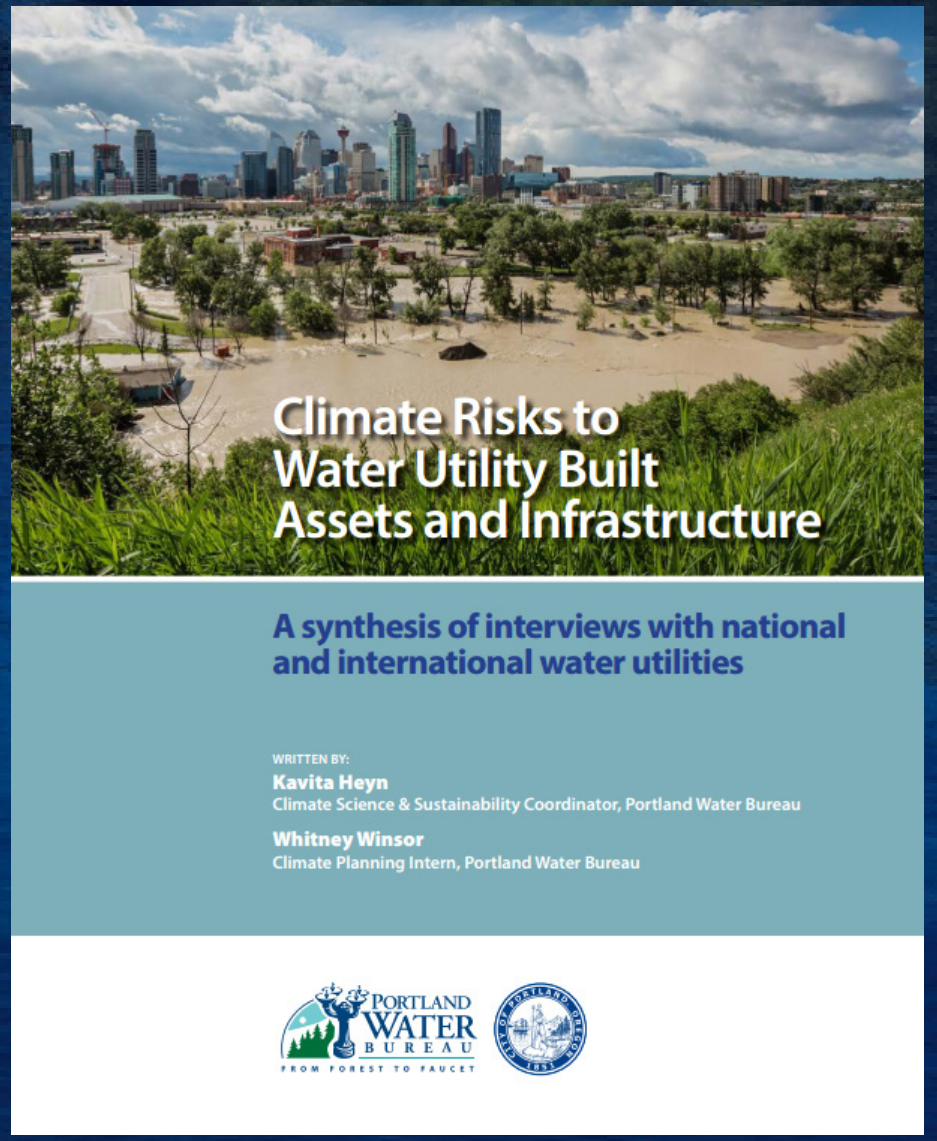
Resilience strategy 1: Design for a range of extremes

Modify the System to Adapt to Climate Change	
	New infrastructure must accommodate expected sea level rise within the service life of the asset. (i.e., 16 inches by 2050, 25 inches by 2070, 55 inches by 2100).
	Existing infrastructure will be modified based on actual sea level rise.



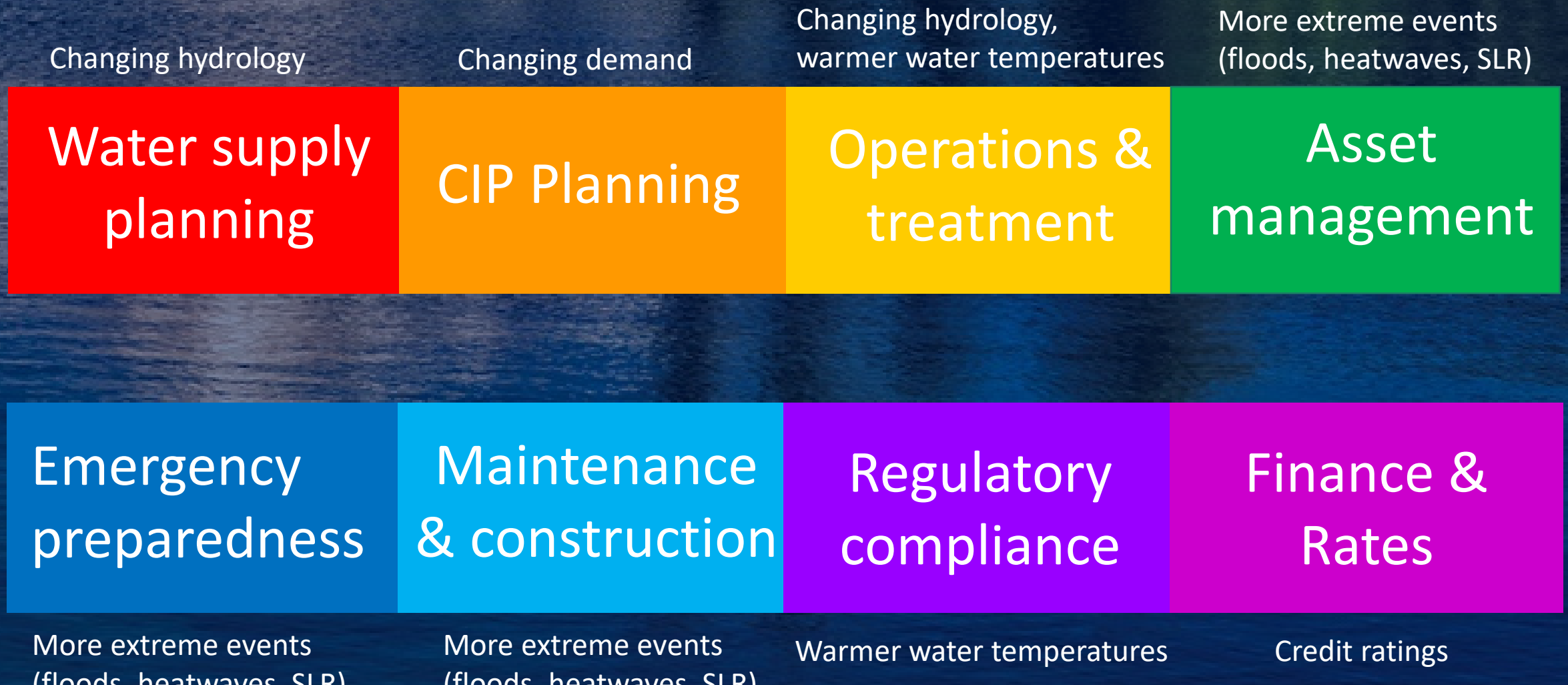
San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission



https://www.wucaonline.org/

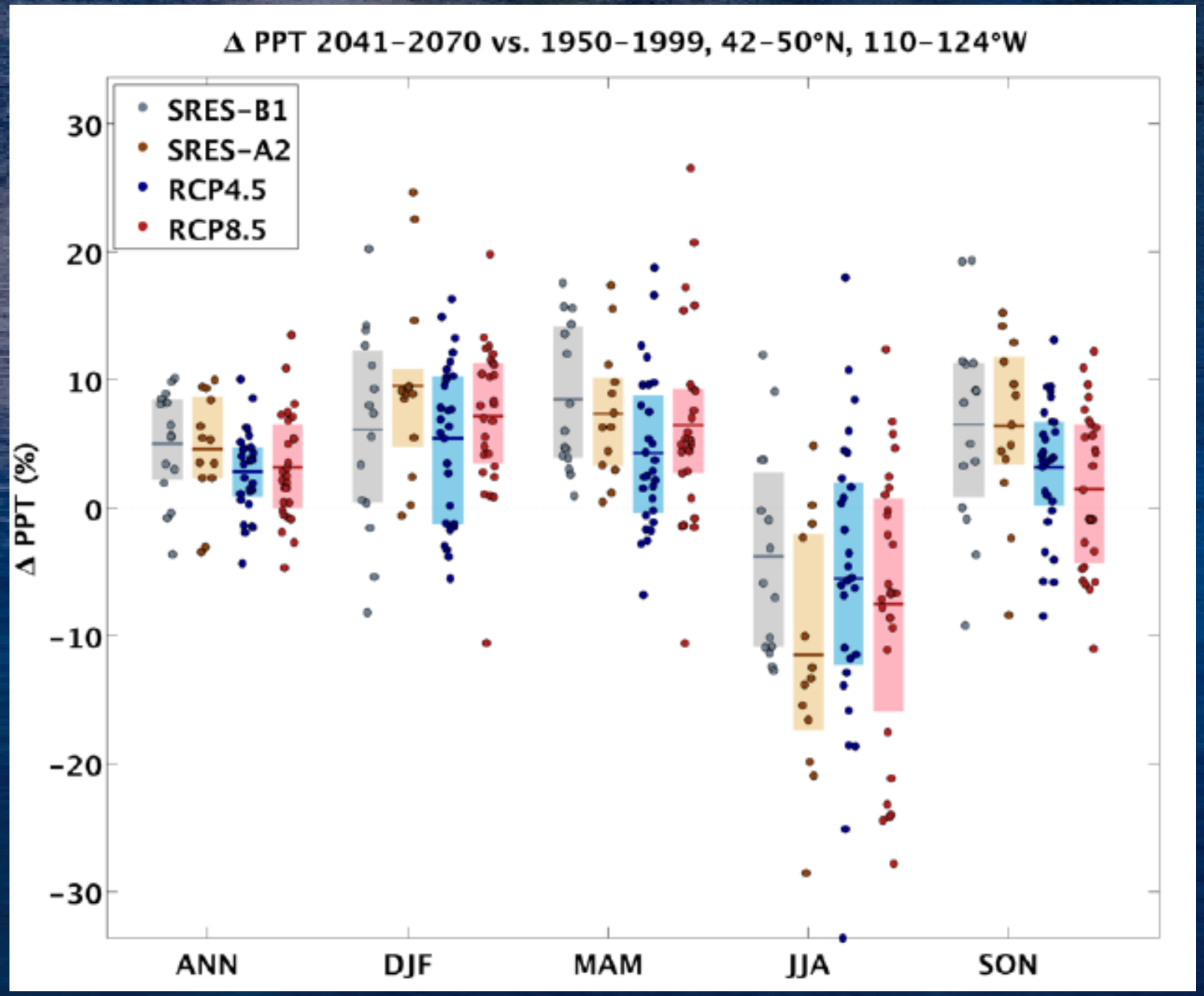
Resilience challenge 2: A spectrum of impacts



Resilience strategy 2: Build adaptive capacity

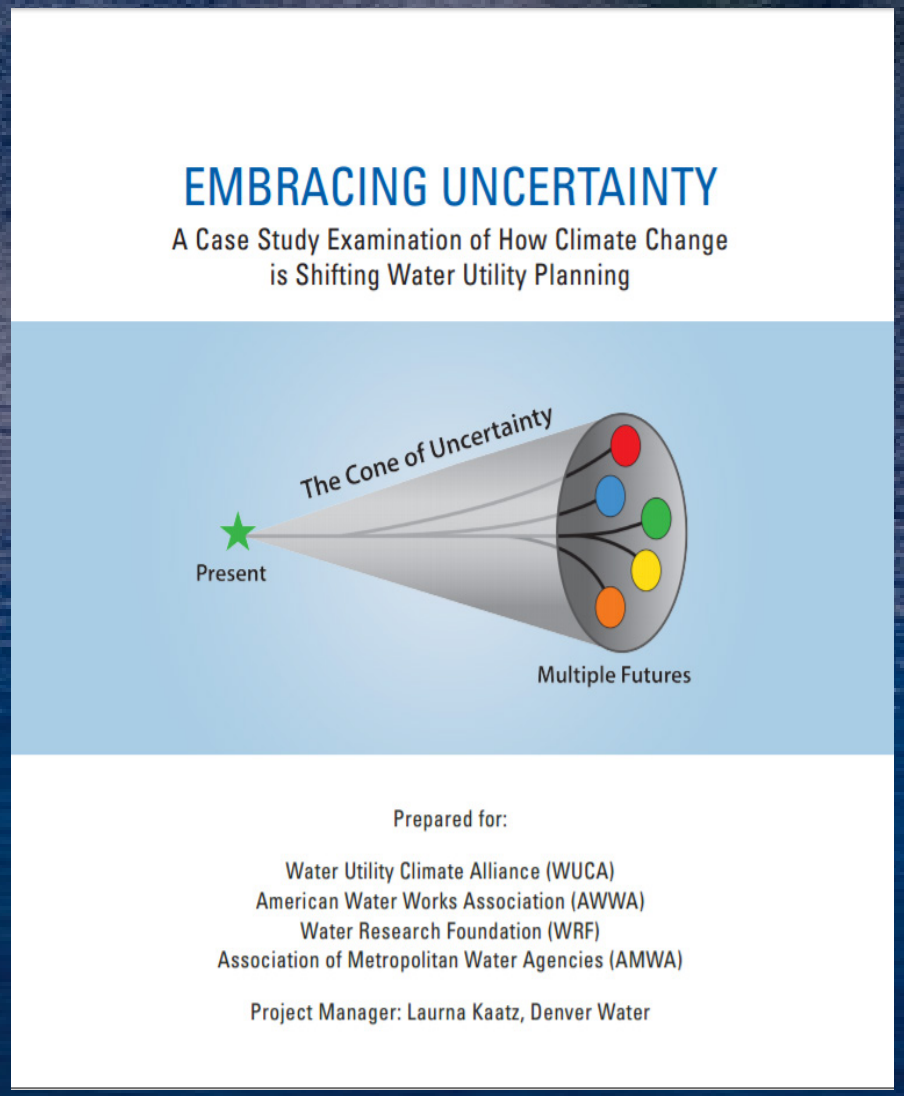
WUCA
Water Utility Climate Alliance
10 YEARS · 2008-2018

Resilience challenge 3: Uncertainty



Abatzoglou & Hegewisch - University of Idaho

Resilience strategy 3: Plan for multiple futures



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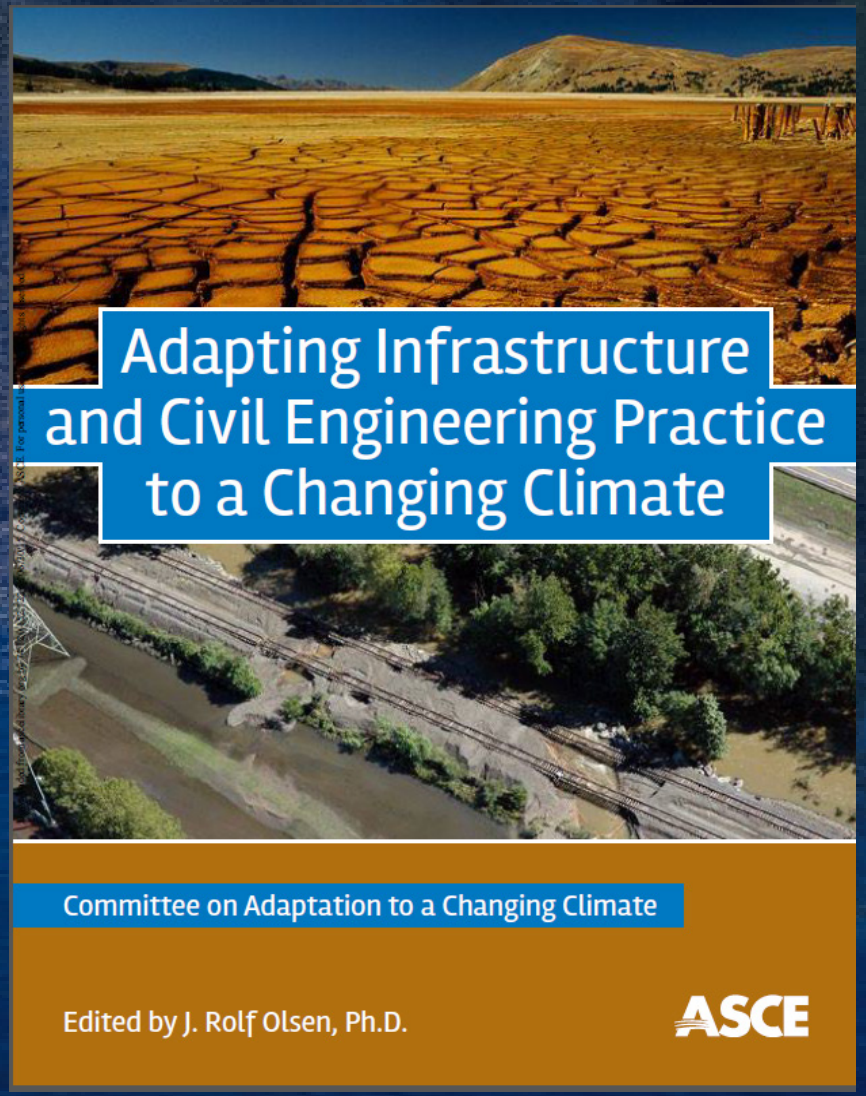
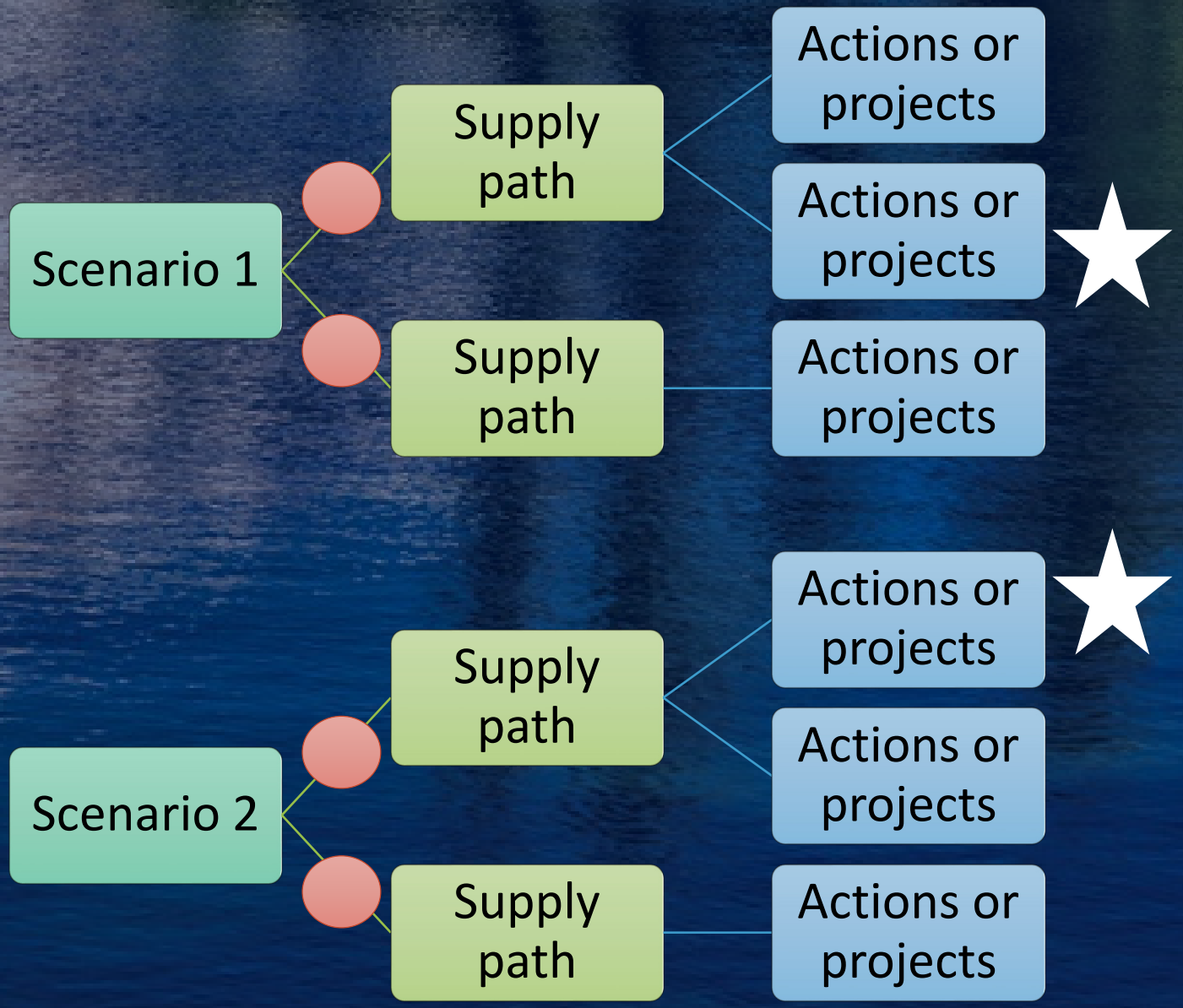


"Engineers should seek alternatives that do well across a range of possible future conditions."

Adapting Infrastructure and Civil Engineering Practice to a Changing Climate, Ed. Olsen, American Society of Civil Engineers, 2014

Resilience strategy 3: Plan for multiple futures



Climate resilience strategies:

1. Design for a range of extremes
2. Build adaptive capacity and expertise
3. Plan for multiple futures, and monitor conditions as they unfold