Scenario-based planning /climate risk narratives

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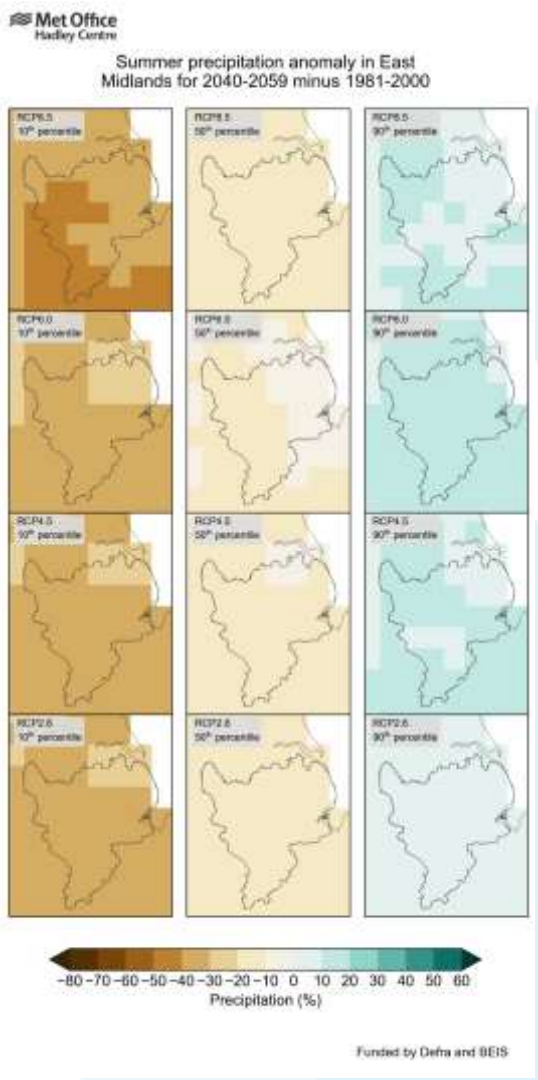
Tip 1: Evaluate climate **and** context



Sustainable and Community-Engaged Education: Campuses prioritize environmental sustainability and serve as hubs for sustainable research and innovation.

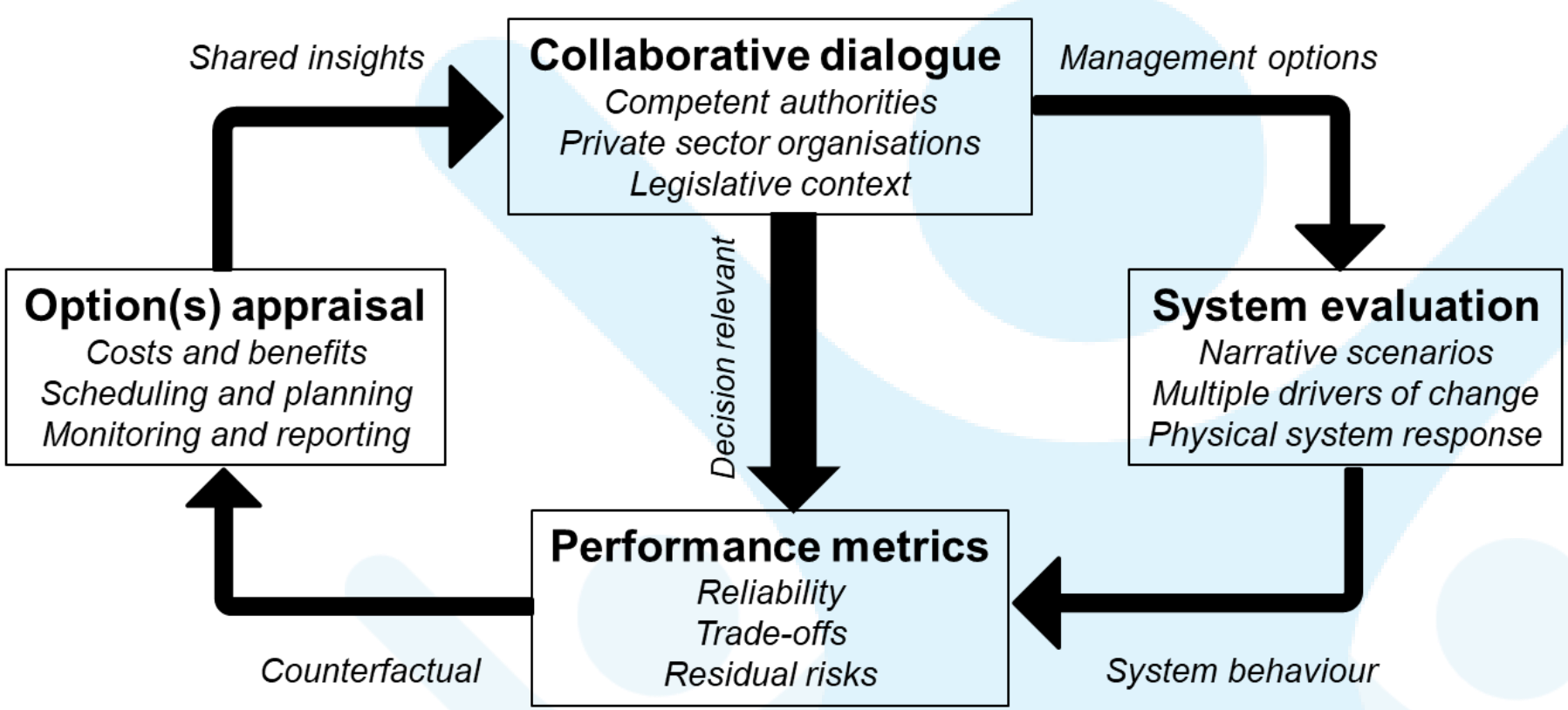
Skills-Based and Lifelong Learning: Universities shift from degree-based education to micro-credentials, digital badges, and continuous education programs are prominent.

Technologically Integrated Education: Students engage in immersive virtual environments, collaborate with peers globally, and receive personalized instruction from avatar professors.

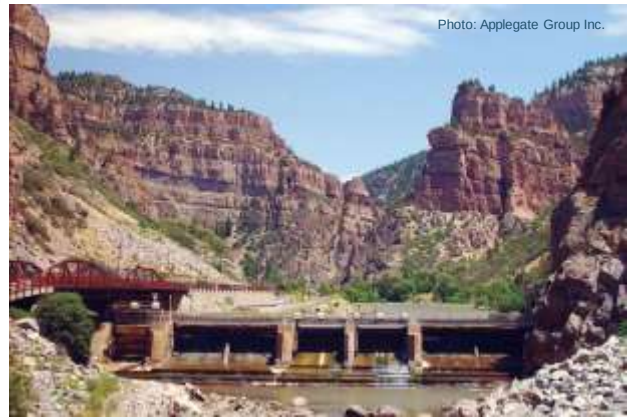
Decentralized and Globalized Education: Students access diverse courses taught by AI lecturers and study at multiple institutions simultaneously.

See: Wilby and Smith (2023)

Tip 2: Start with people not scenarios



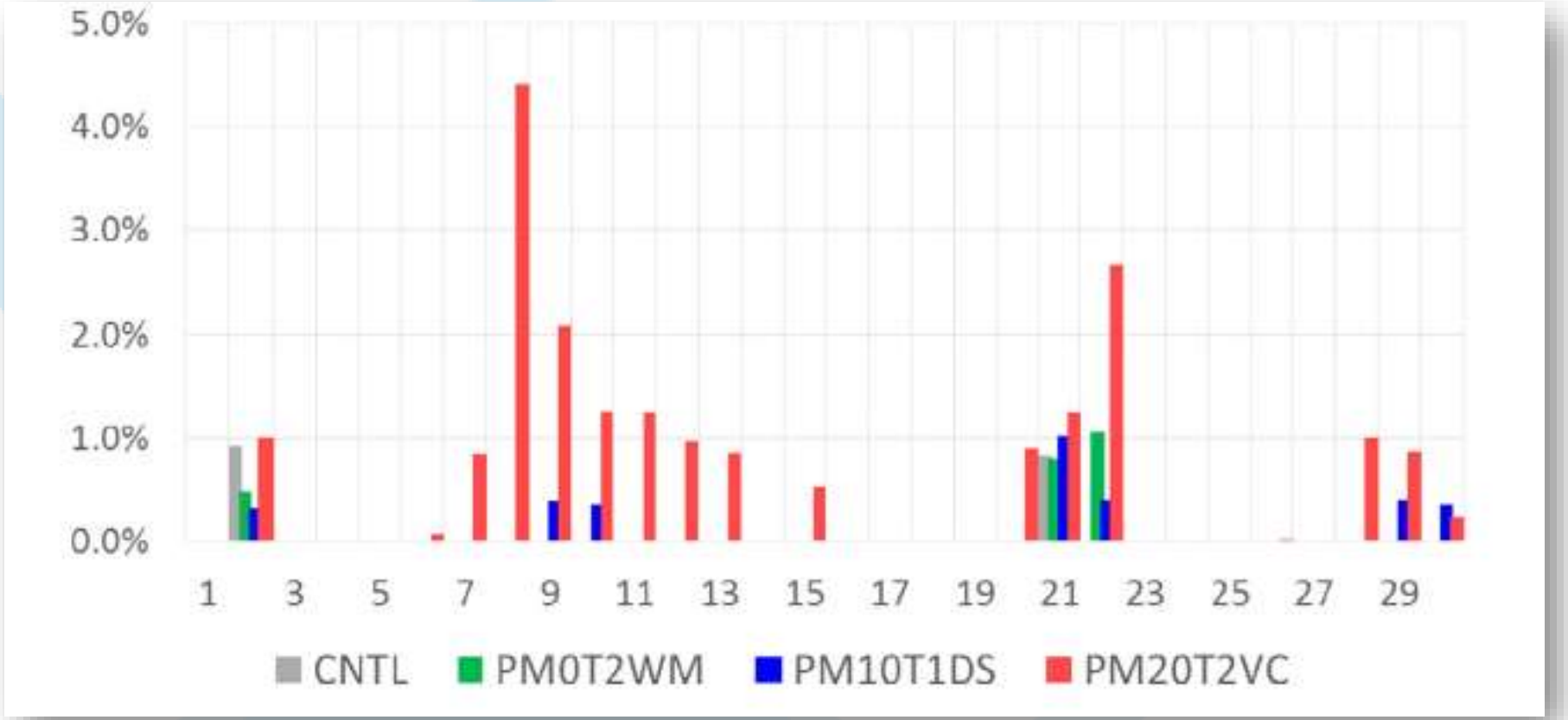
An adaptation option appraisal framework that begins with dialogue about the adaptation options and goals ***before*** developing narrative scenarios. Source: Wilby (2022)



Adaptation option: Shoshone Call Relaxation Agreement Priority water right of Xcel Energy relaxes from 40 m^3/s to 20 m^3/s under specified drought conditions to allow out-of-priority filling of upstream public water supply reservoirs.

Tip 3: Stress test adaptation options

Narratives	
Moderate warming (WM) Seasonal precipitation totals are unchanged. Higher temperatures/ more heatwaves change the volume and timing of spring/summer runoff.	P-0% T+2°C
Dust on snow (DS) Modest warming and drying increases the annual likelihood of dust on snow events by D%. No other effects.	P-10% T+1°C
Vegetative change (VC) Fewer cold winters reduce mortality amongst infecting beetle populations. Warmer, longer dry conditions stress forests increasing their susceptibility to insect attack. T% of forest dies above reservoirs A, B and C and is permanently replaced by low scrub.	P-20% T+2°C



System-wide increase in stored water in reservoirs in the Upper Colorado River Basin. The increase in total storage (%) between weeks 11 to 20 is shown for each narrative, with the Shoshone Call Relaxation Agreement. Under the CNTL scenario, relaxation occurs only 2 of 30 years. Note 4% more water equates to the annual domestic water use of ~300,000 citizens of Denver. Source: Yates et al. (2015)

Thank you!

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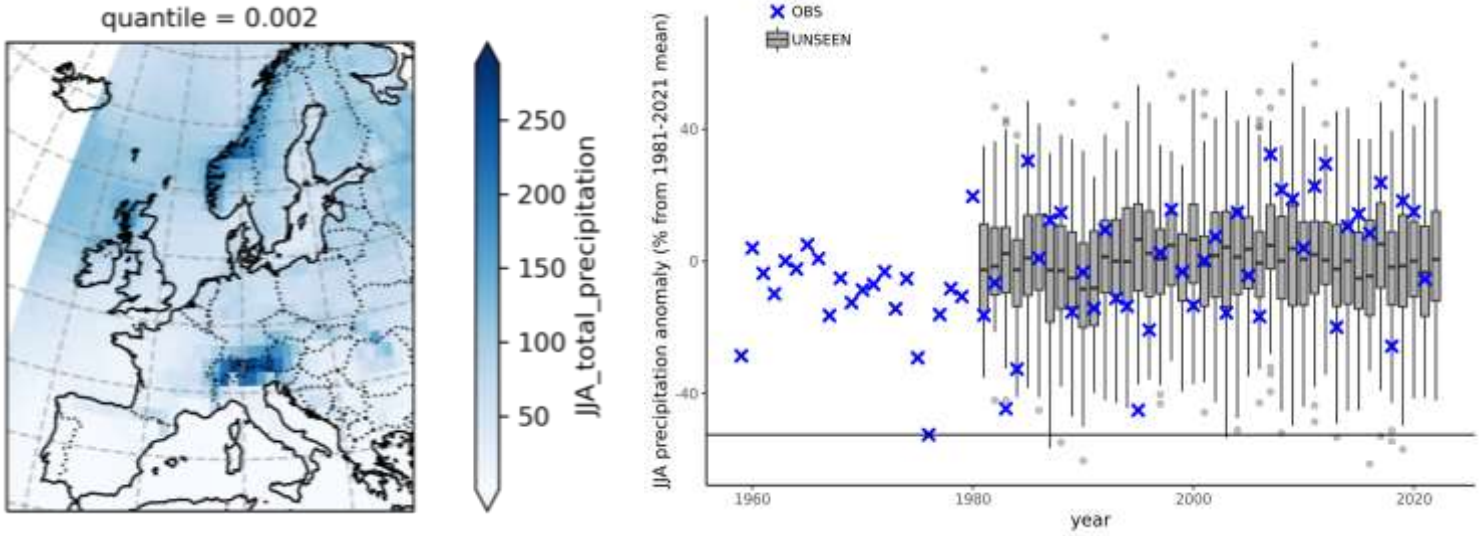

Empirical estimates of the 500-year drought from an UNSEEN archive of 3618 SEAS5 summers could be used to stress-test resilience of water supply systems. See: Kelder et al. (2022)