Building Resilience to a Changing Climate:

A Technical Training in Water Sector Utility Decision Support

WUCA
Water Utility Climate Alliance
10 YEARS · 2008-2018

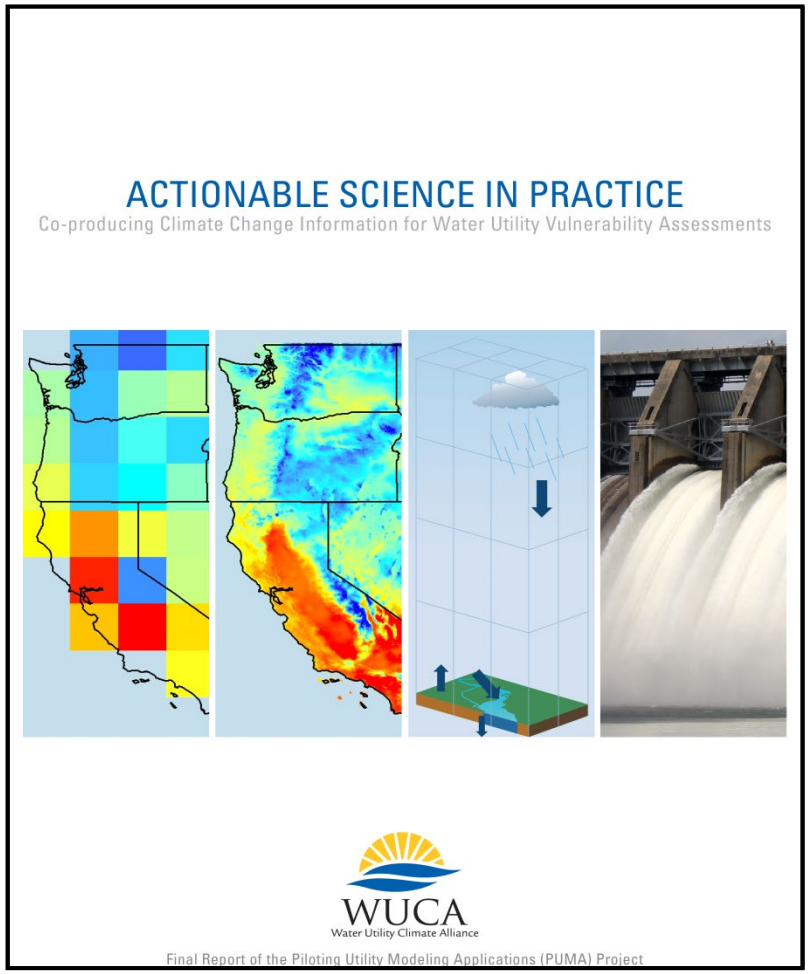
Translating Climate Science into Action

Two Case Study White Papers from the WUCA

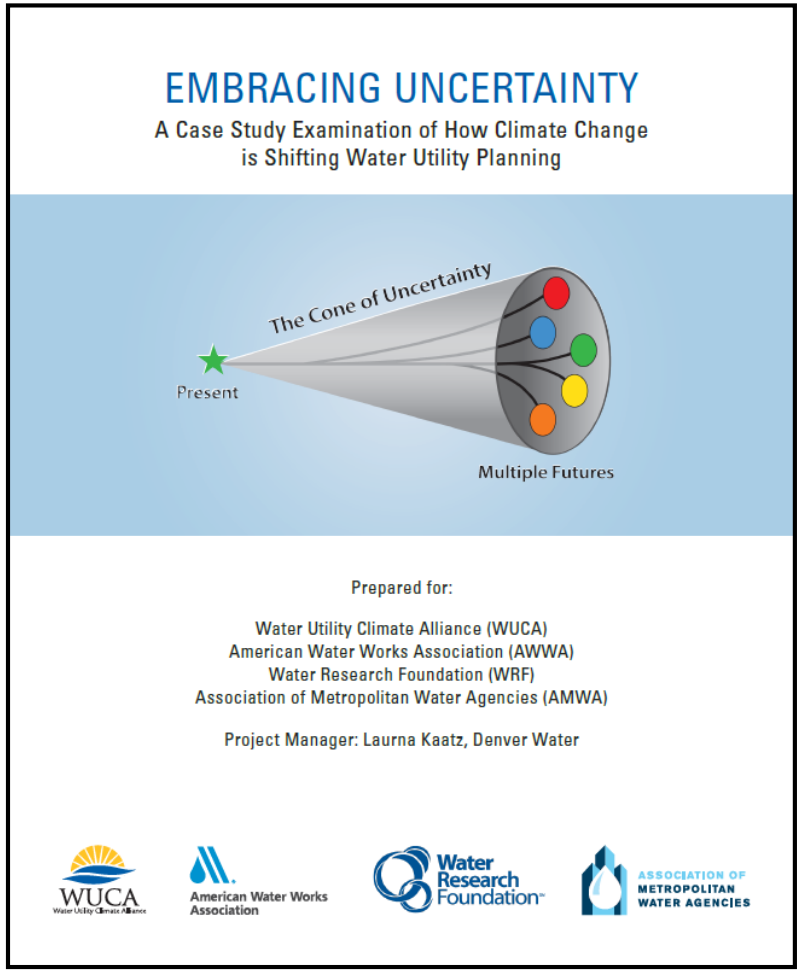
Laurna Kaatz, Denver Water/Water Utility Climate Alliance

New White Papers

www.wucaonline.org

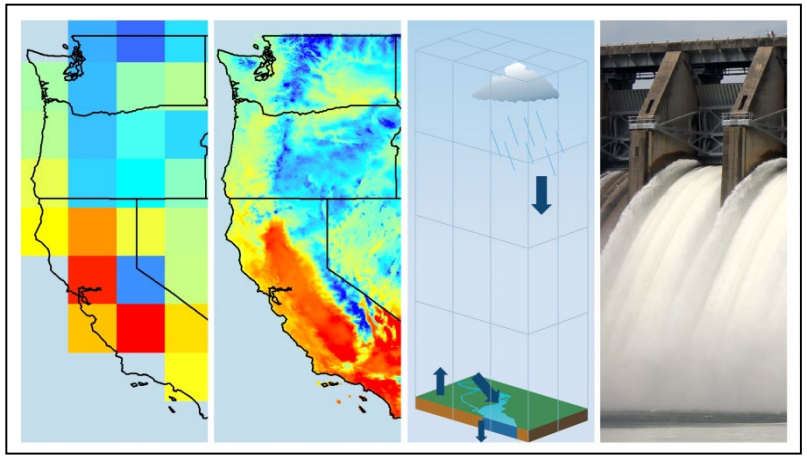


Actionable Science in Practice



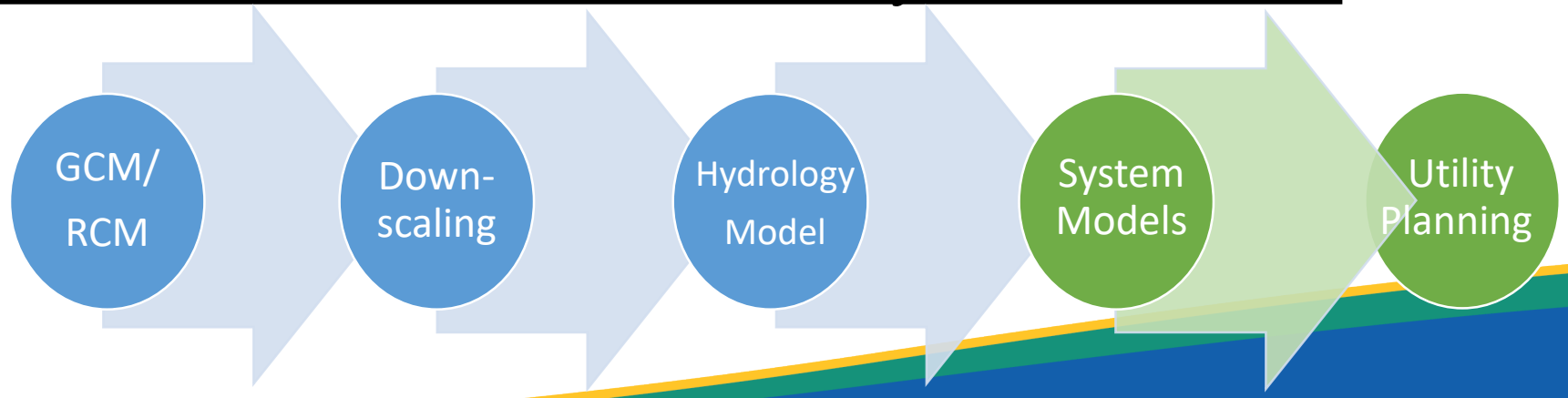
Embracing Uncertainty

1. Actionable Science in Practice



- Tampa Bay: explored downscaling techniques
- NYCDEP: selection of GCM
- Seattle: transient look beyond supply impacts
- Portland: evaluated hydrology models

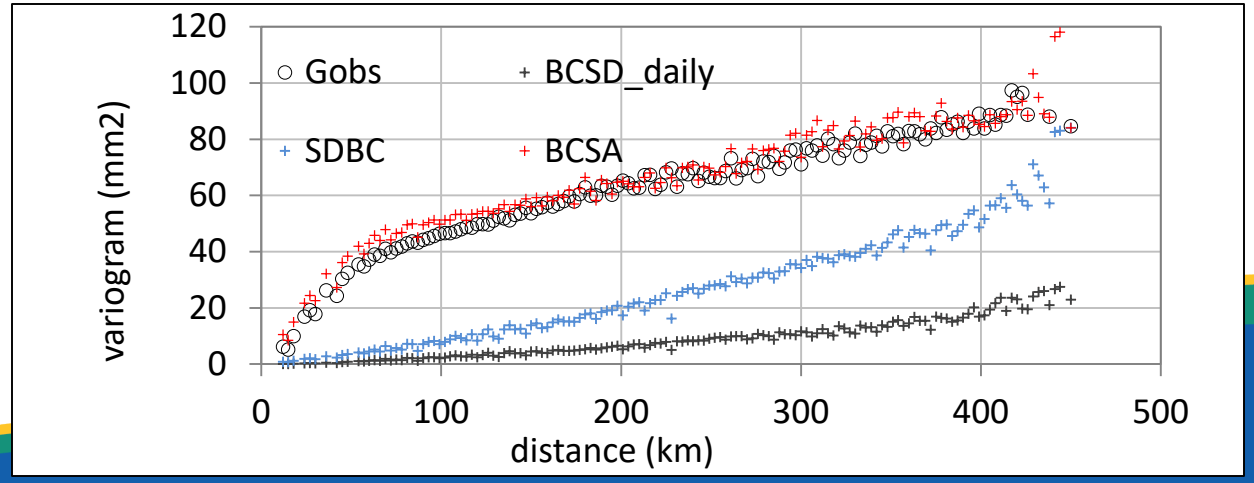
Chain of Models for Water Utility Assessments



Tampa Bay: Significant Finding

- What we did
  - Developed a new statistical downscaling method
- Why we did it
  - Existing statistical downscaling methods did not reproduce rainfall characteristics in Florida very well
- What we found
  - Choice of statistical downscaling method matters in Florida

UF Downscaling Method (BCSA) Works Best!



Which scenarios to select?

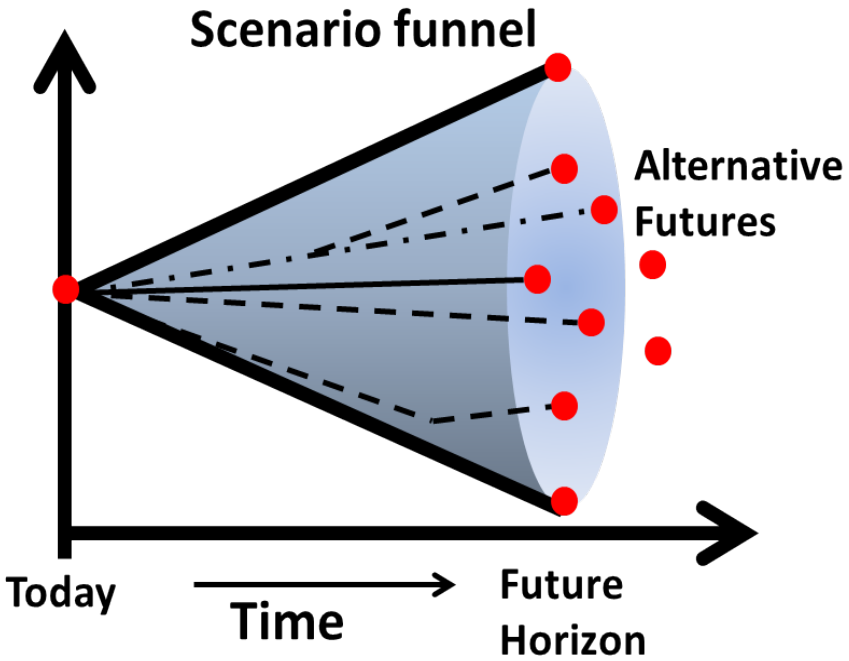


Fig. 1. Conceptual diagram of a scenario funnel. Adapted from Liu *etal.*, 2008

Part 1

GCM evaluation
Performance & Convergence

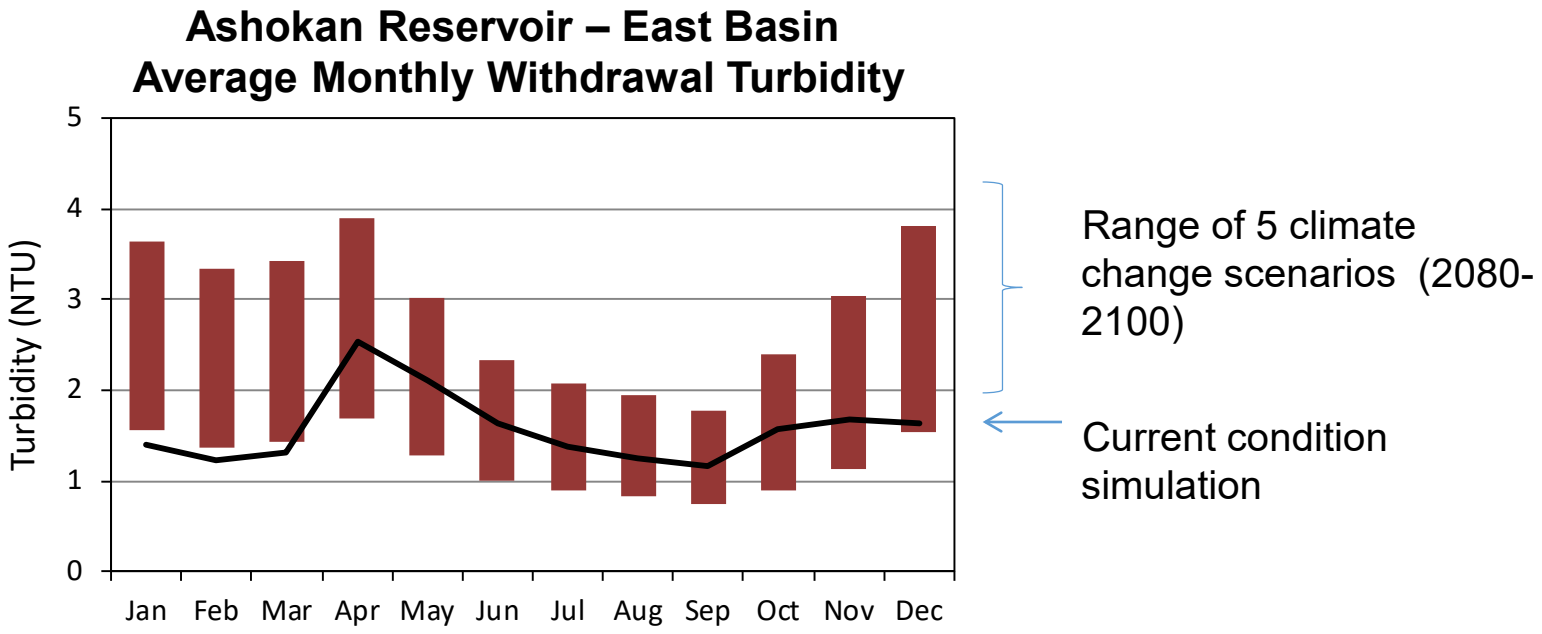
Probability distribution

Part 2

Downscaling

Delta change factor method

NYC DEP



Higher temperatures

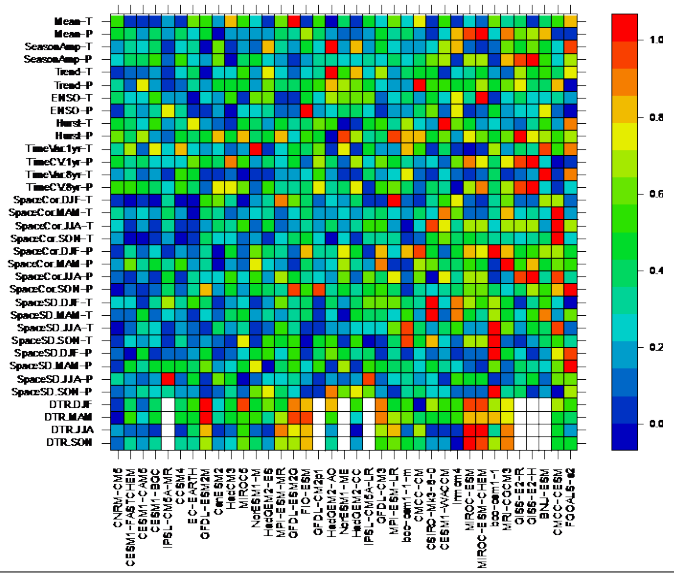
→ More rain instead of snow

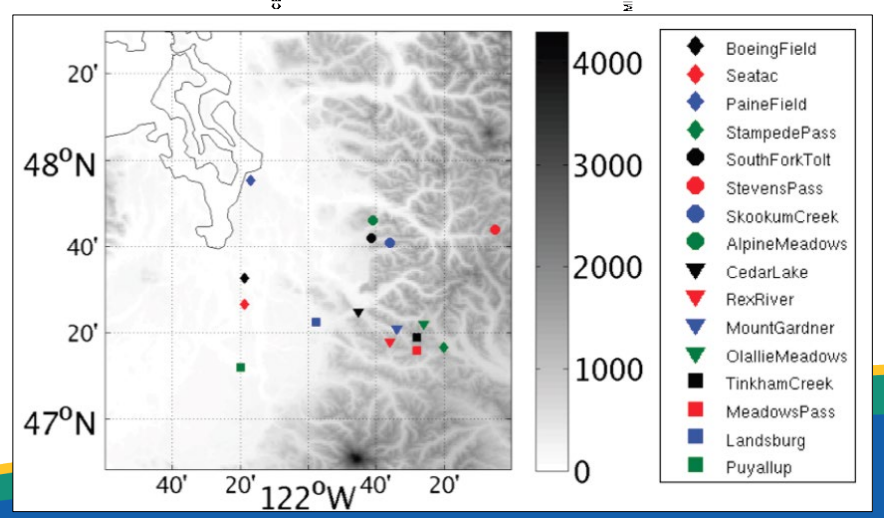
→ Greater streamflow in late fall and early winter

→ Higher turbidity

Seattle's Research Topics

- Evaluation and Generation
  - GCM
  - Point locations
  - Fire
- Review of key drivers
  - Fall rains
  - Atmospheric Rivers
  - ENSO
- Creation of operational metrics
- Impacts assessment





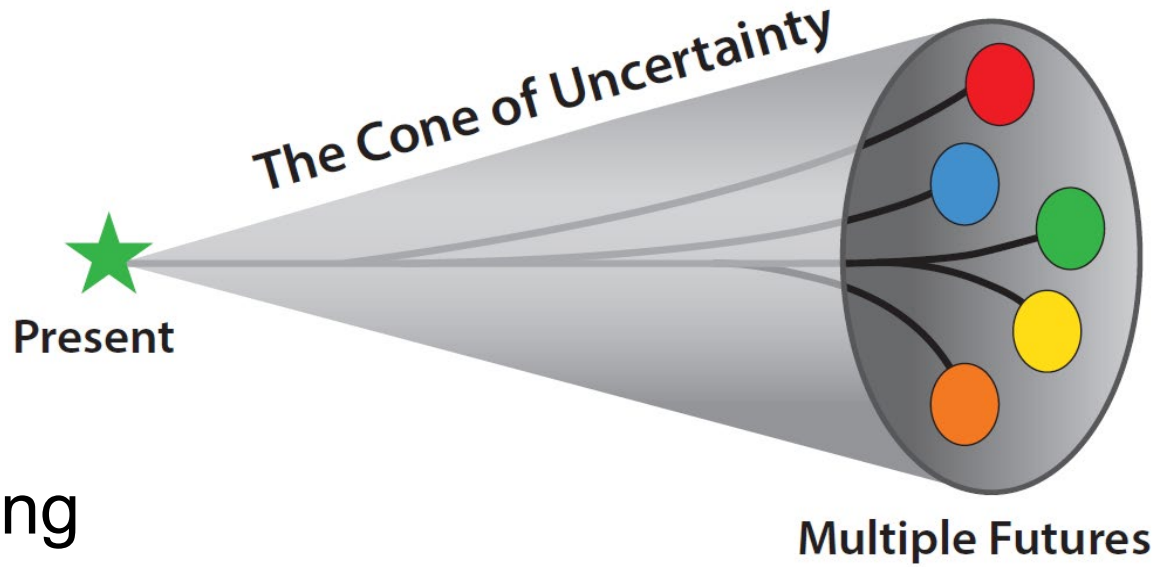
Portland Water Bureau PUMA

Hydrologic model selection criteria:
Non- proprietary software
Able to process multiple runs
Spatial and temporal scale
Easy to setup and use
Cost
Model reputation in other climate change studies
Relevant output parameters

Models: VIC, PRMS, DHSVM

2. Embracing Uncertainty

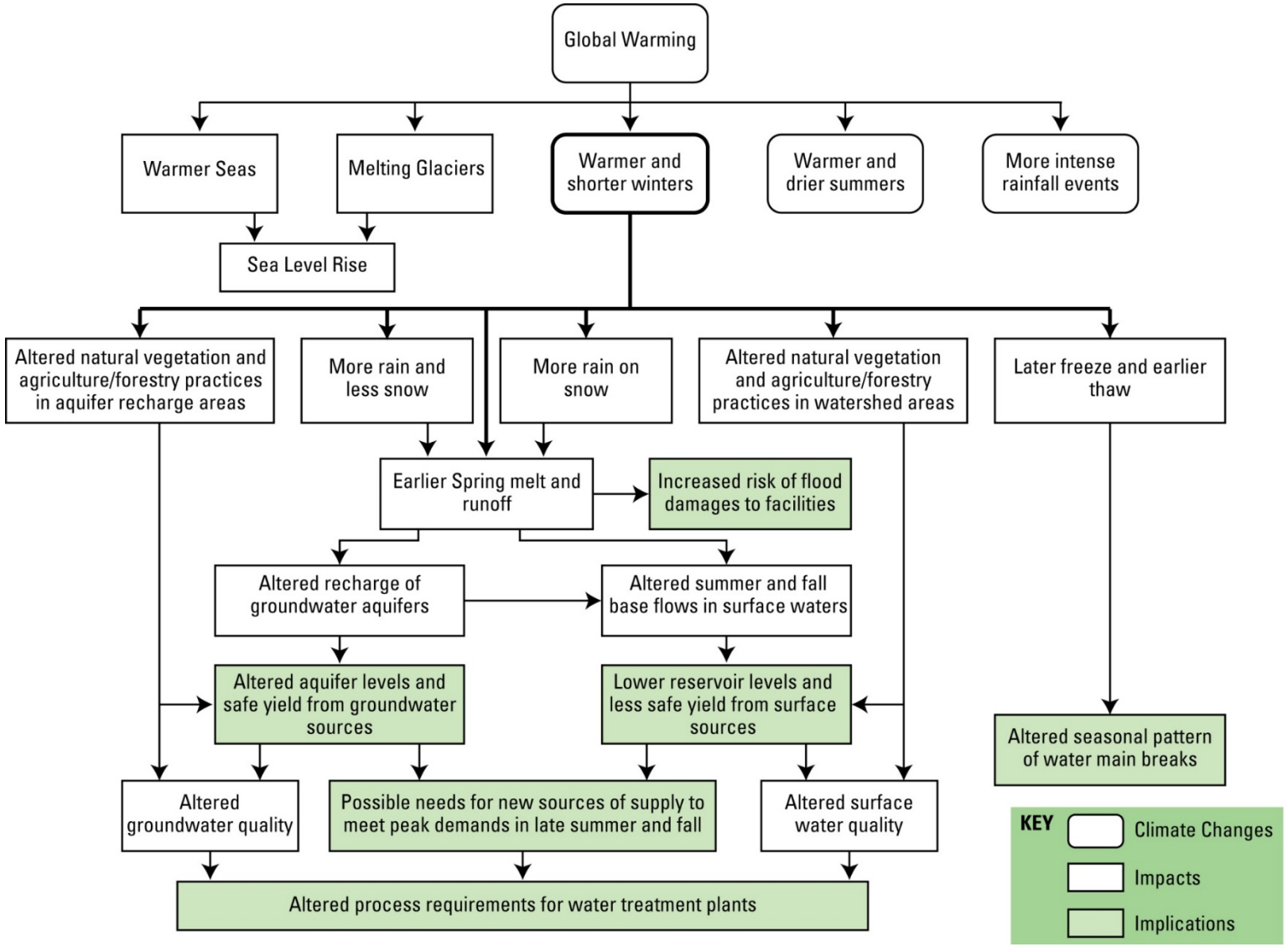
13 case studies illustrating how utilities are incorporating complex, highly uncertain climate change information into planning, from immediate-term operational decisions to capital planning and asset management to long-term supply planning



<u>Findings</u>

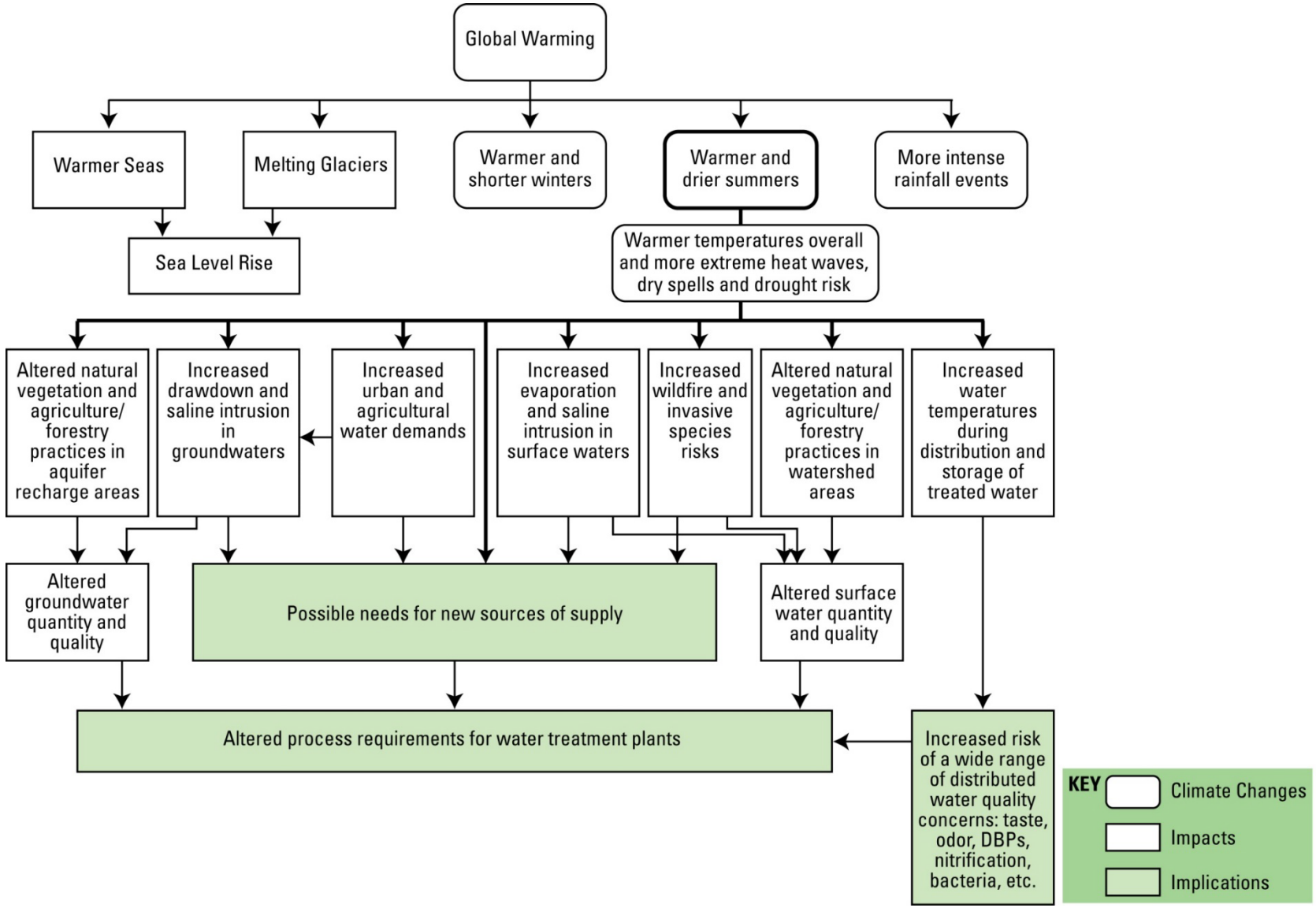
1. Climate change is being included across all scales of utility decisions
2. Utilities are using scenarios and looking at a range of plausible futures
3. Planning for multiple futures is crucial for long-range term planning
4. Stakeholders are being included from the beginning

Impacts and Implications of Warmer and Shorter Winters for Water Supply



Developed by Stratus Consulting Inc, published in AMWA (2008)

Impacts and Implications of Warmer and Drier Summers for Water Supply



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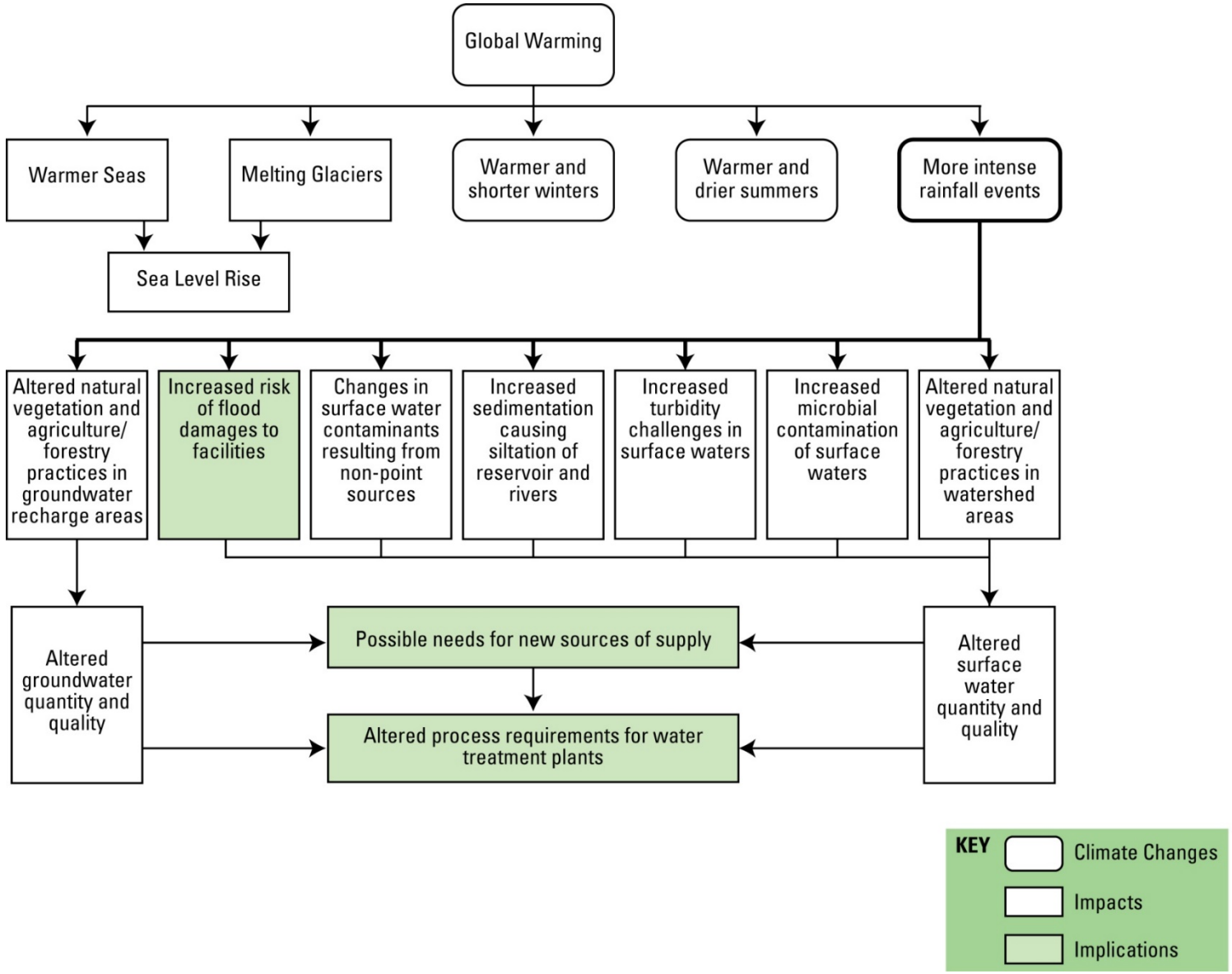
Impacts and Implications of More Intense Rainfall Events for Water Supply



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Thank you!

www.WUCAonline.org

Laurna Kaatz DENVER WATER
Climate Program Manager
Laurna.Kaatz@denverwater.org
303-628-6424