Building Resilience to a Changing Climate:

A Technical Training in Water Sector Utility Decision Support

WUCA
Water Utility Climate Alliance
10 YEARS · 2008-2018
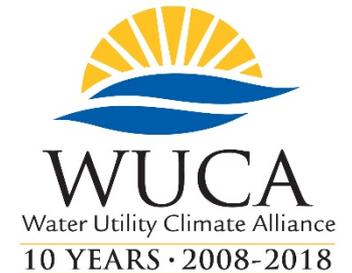
Key Takeaways from Day 1

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Reflections on the Day?

Day 1 Key Takeaways: Climate Science

- Temperatures are rising – the climate is changing
- We expect more warming in the future
  - Timing and magnitude are uncertain
- We can **project** potential changes in climate, but can't **predict** them
- There are many sources of uncertainty including uncertainty about future emissions and exactly how the climate will change
- We expect some sources of uncertainty to not go away

Day 1 Key Takeaways: Climate Science

- Climate models are the best source of information on future climate
  - They have important limitations
  - Their outputs are projections, not predictions

Day 1 Key Takeaways: Downscaling

- Downscaling provides **local-scale insight** into the range and possibilities projected by GCMs.

- Impacts models need **fine-scale and high-temporal resolution climate inputs** (e.g., precipitation, temperature, winds, radiation, moisture).

- Often, downscaling provides **bias correction** of global climate models (though this can lead to misleading outcomes if the GCM is biased in both its mean climate and its anomalies, e.g., jet stream position).

Day 1 Key Takeaways: Downscaling

- In some cases, downscaling may provide **precision that can be mistaken for accuracy.**

- For the historical period, **"truth" is not perfectly known**, making it difficult to evaluate the quality of downscaled products.

- For these reasons, downscaling products can rarely be used "off the shelf." Expertise is required to evaluate them for the application at hand.

Day 1 Key Takeaways: Hydrologic Models

- Hydrologic modeling can help understand local water resources.

- Some change signals are more certain than others.

- Some uncertainty is unavoidable.
  – Representation of uncertainties is hard but necessary.
  – Uncertainties have always been there; just understanding them now.
  – Previous climate impact studies possibly over-confident.

- Approaches being developed to select representative set of scenarios useful for water resources planning.

- It is critical to understand important processes and uncertainties involved in **your** system.

Day 1 Key Takeaways: Climate Information Dos & Don'ts

- It is important to evaluate climate risk.

- Models can be helpful tools, if used appropriately.

- Uncertainty is everyone's responsibility.

- Tools and guidelines for navigating climate information are available and will continue to evolve.

- Coming soon from NCAR: **https://github.com/NCAR/dos_and_donts**

Day 1 Key Takeaways: Planning

- The challenge of anticipating climate change is making decisions in light of uncertainty.
  - Note: that is the challenge of anticipating any future change.

- Uncertainty approaches are better suited to identify and assess options for anticipation of climate change.
  - Adaptive management, risk management
  - No regrets, low regrets, incremental
  - Traditional approaches can still be useful

- Decision support can help in analyzing options.

- Other factors besides climate are also changing and can be relevant.

Day 1 Wrap-Up

- Please complete your Day 1 feedback form
- Coffee available tomorrow starting at 8:00 am
- Please be seated and ready to go by 8:30 am