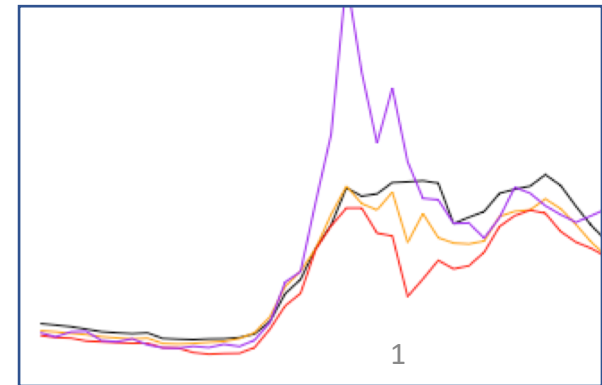
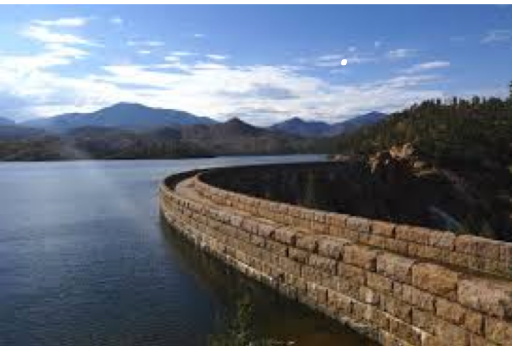
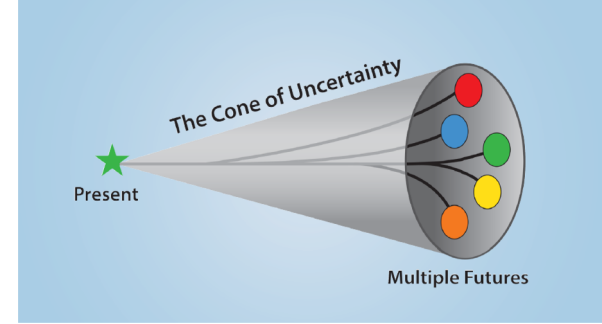


# Incorporating decadal predictions into water management

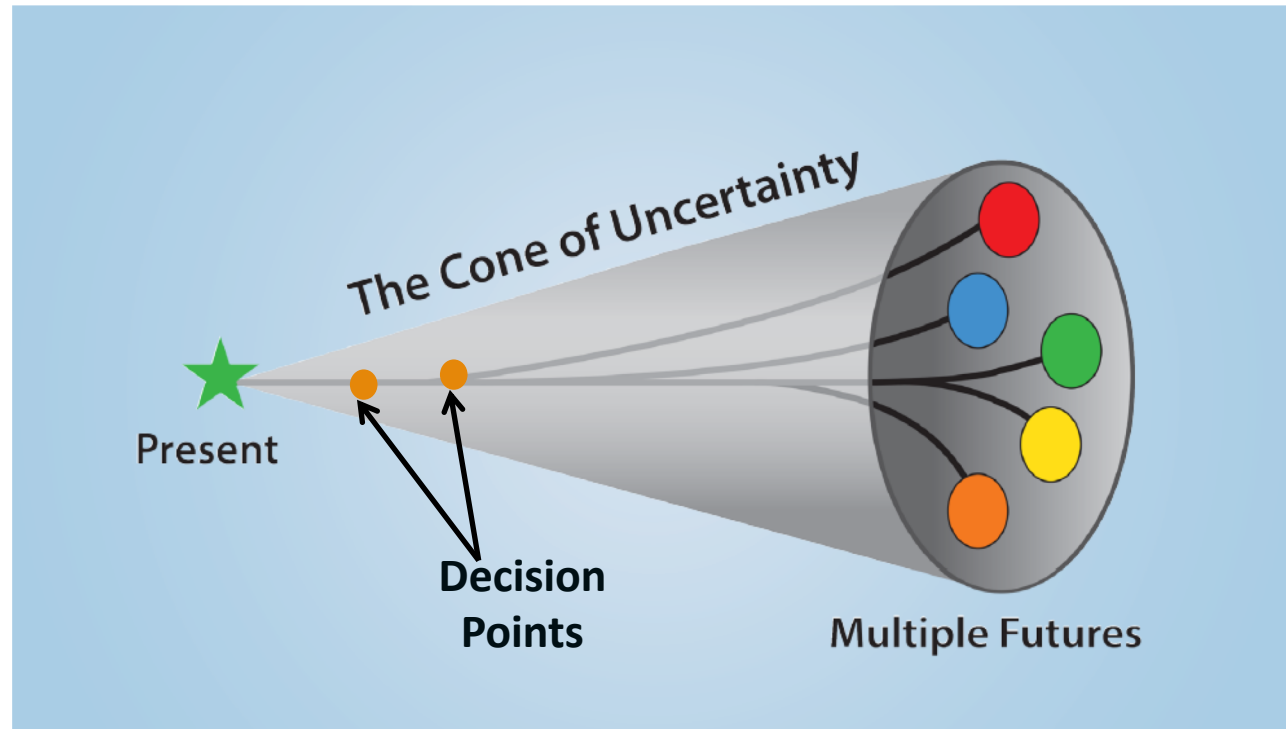
Erin Towler (NCAR)

David Yates (NCAR), James Done (NCAR), Deb PaiMazumder (AIG)

**Second International Conference on Seasonal to Decadal  
Prediction (S2D)  
NCAR, Boulder CO  
Sept 19, 2018**

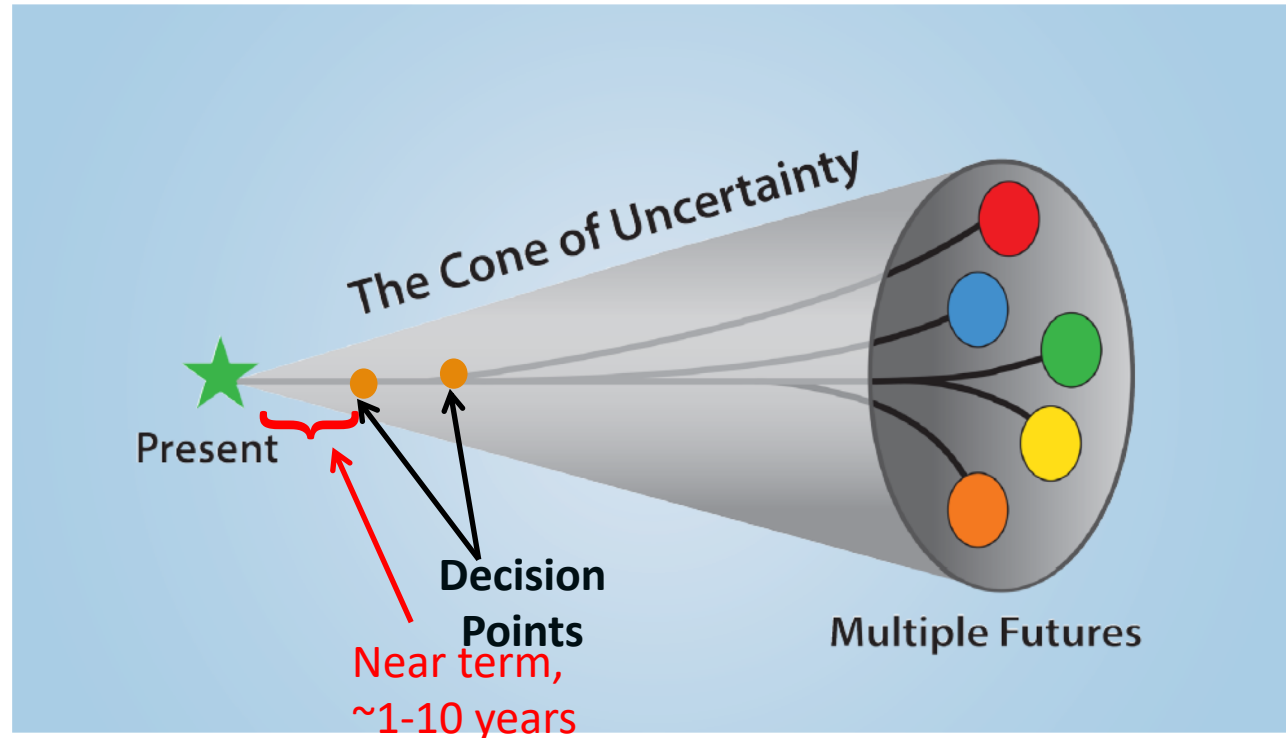


Many water managers are already considering climate information in their planning



(Stratus and DW 2015)

Water managers have identified improved climate projections on decadal time scales as a desired need to better fit with their planning horizons



Interview results corroborate the three criteria needed for climate information to be used by decision makers identified by Cash et al. (2002):

**\**Saliency*** - How relevant the information is to decision makers

**\**Credibility*** - How authoritative, believable, and trustworthy the data and its source are considered to be by decision makers

**\**Legitimacy*** - How “fair” an information producing process is and whether it considers appropriate values, concerns, and perspectives of different actors

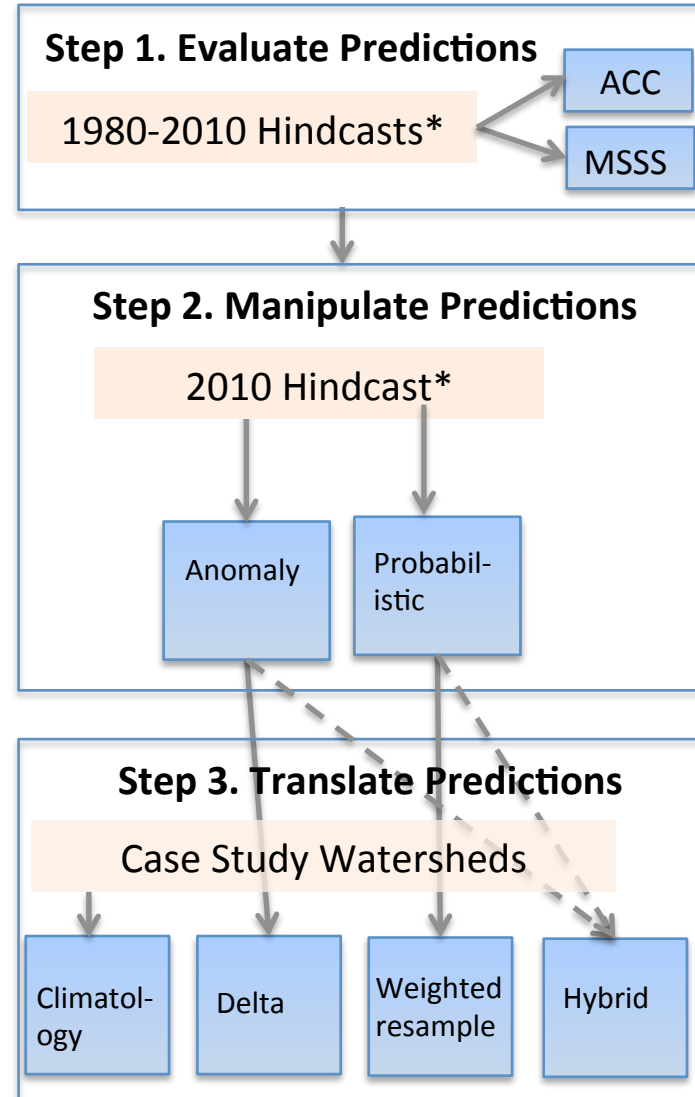


Results also indicated two additional criteria:  
Compatibility and Contextual Acceptability.

***\*Compatibility*** - How well the new data fits with existing processes, mathematical models, decision-making processes, and required activities

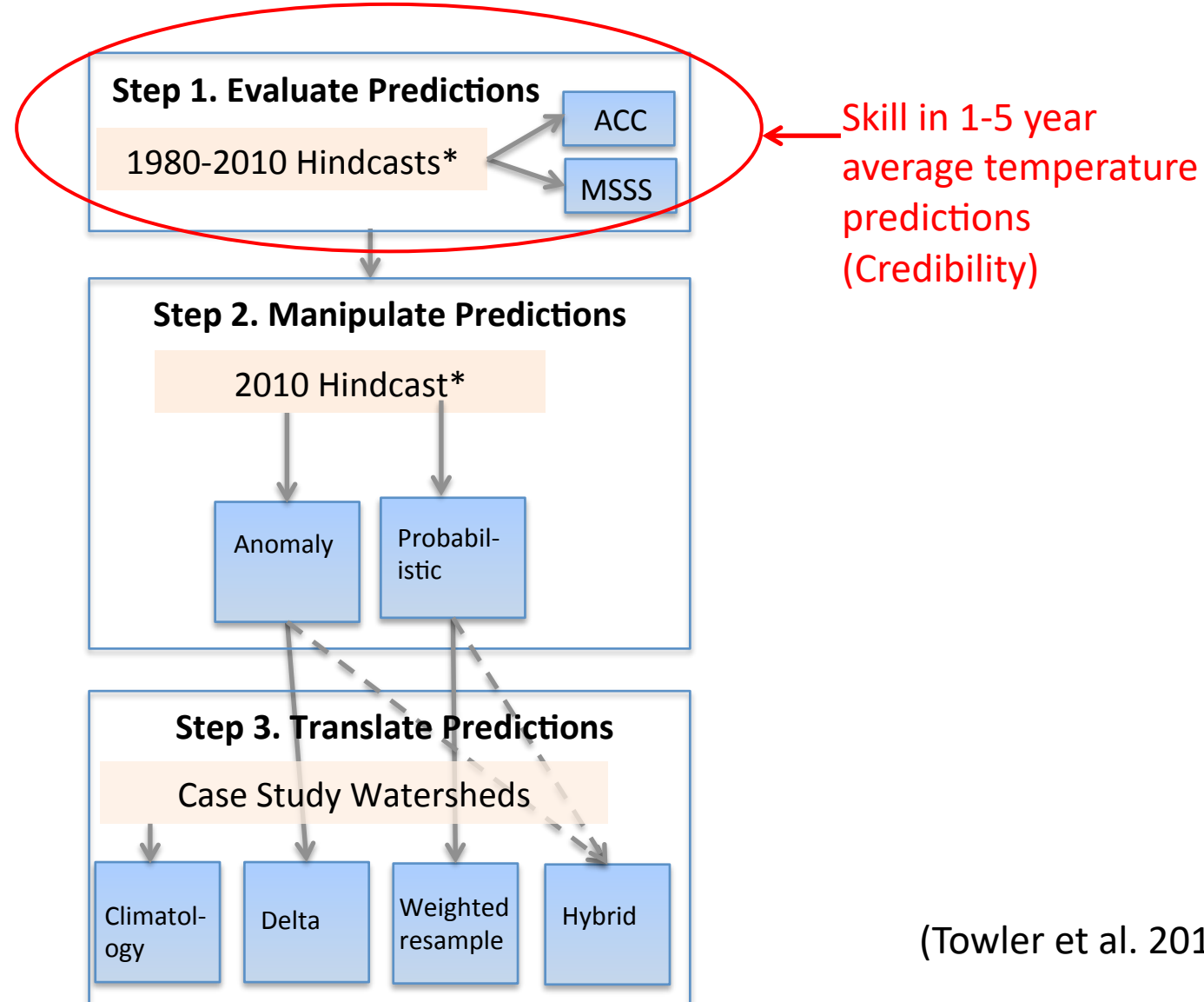
***Contextual Acceptability*** - How well the new data fits with existing political, financial, and social forces

We develop a three-step framework to explore how decadal temperature predictions could be applied by potential users.

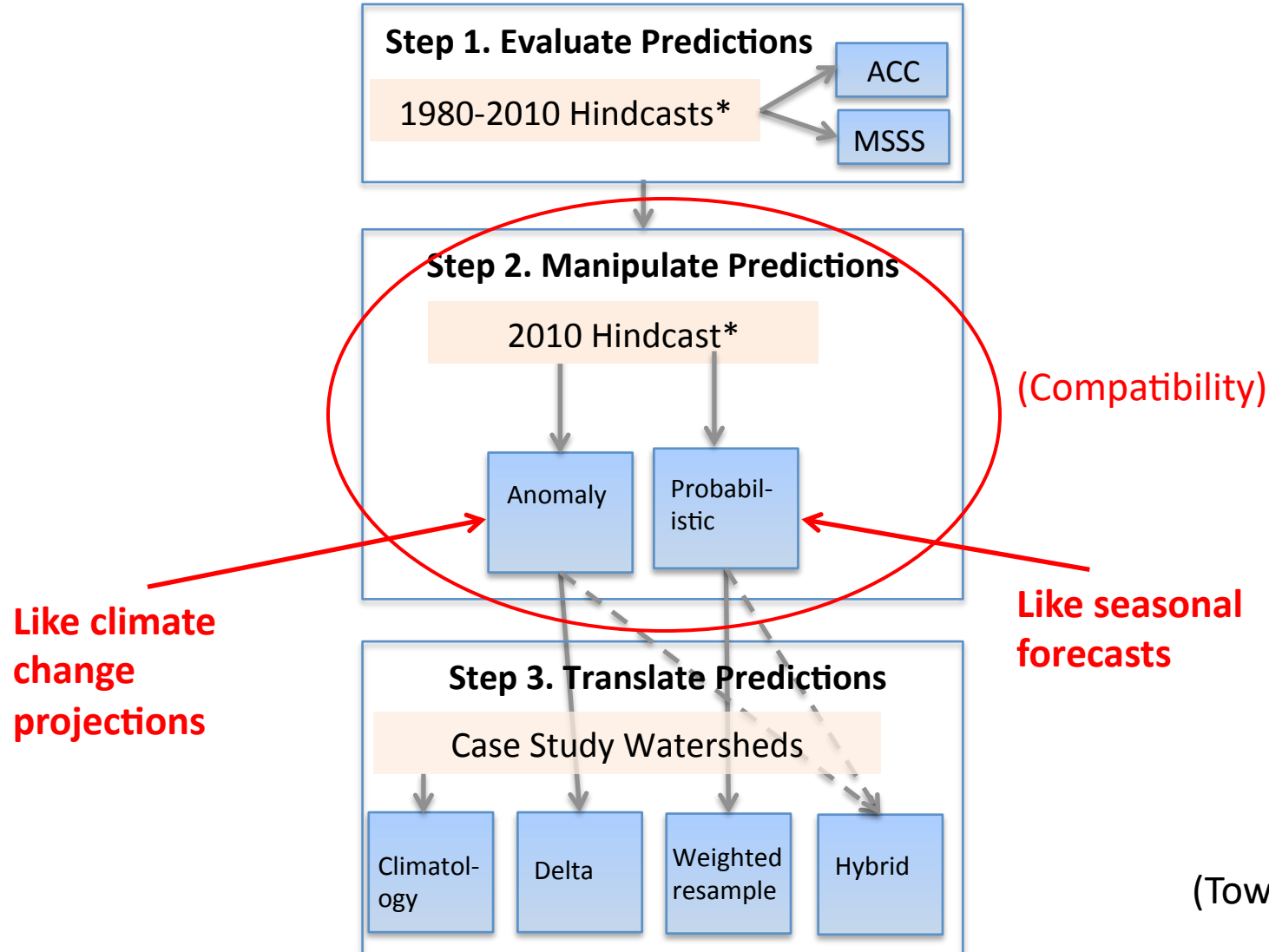


(Towler et al. 2018 JAMC)

We develop a three-step framework to explore how decadal temperature predictions could be applied by potential users.

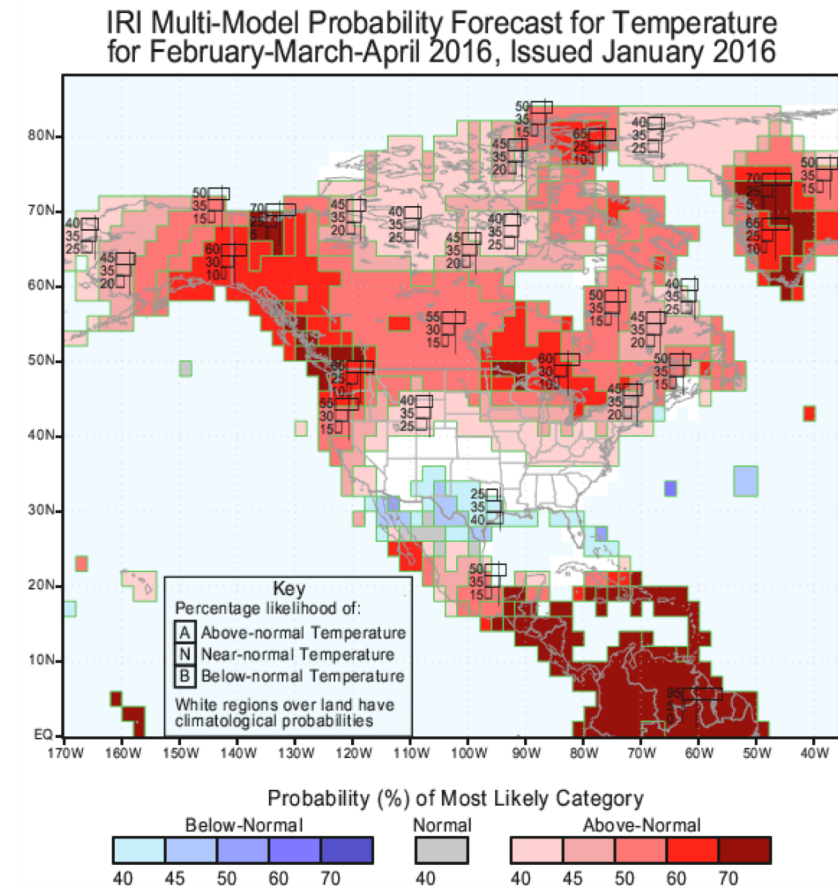
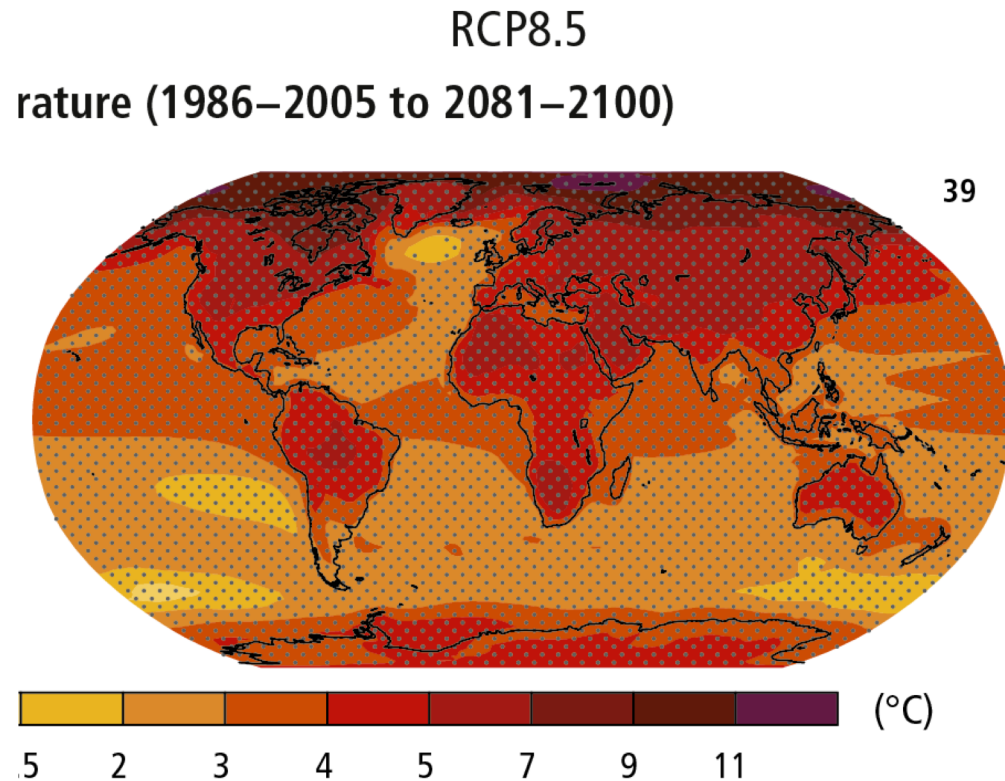


We develop a three-step framework to explore how decadal temperature predictions could be applied by potential users.



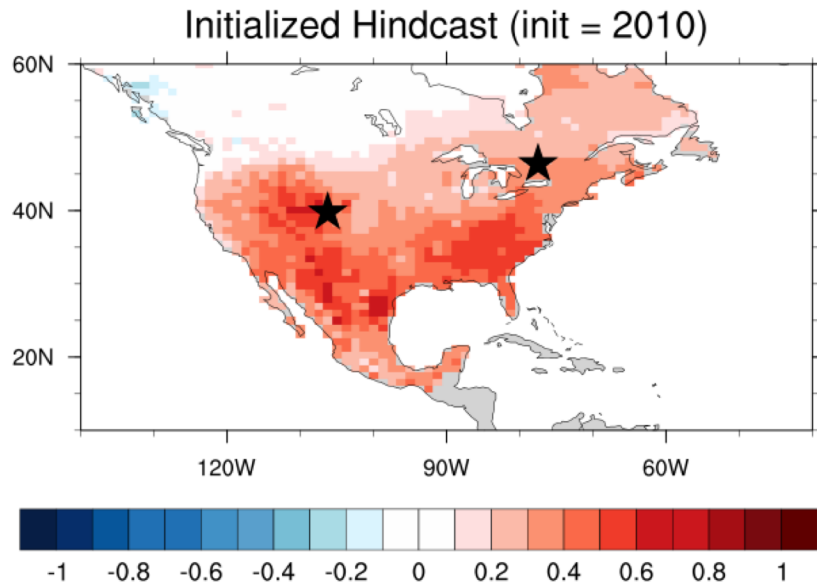
(Towler et al. 2018 JAMC)

Decadal temperature predictions can be manipulated like climate change projections or seasonal forecasts.

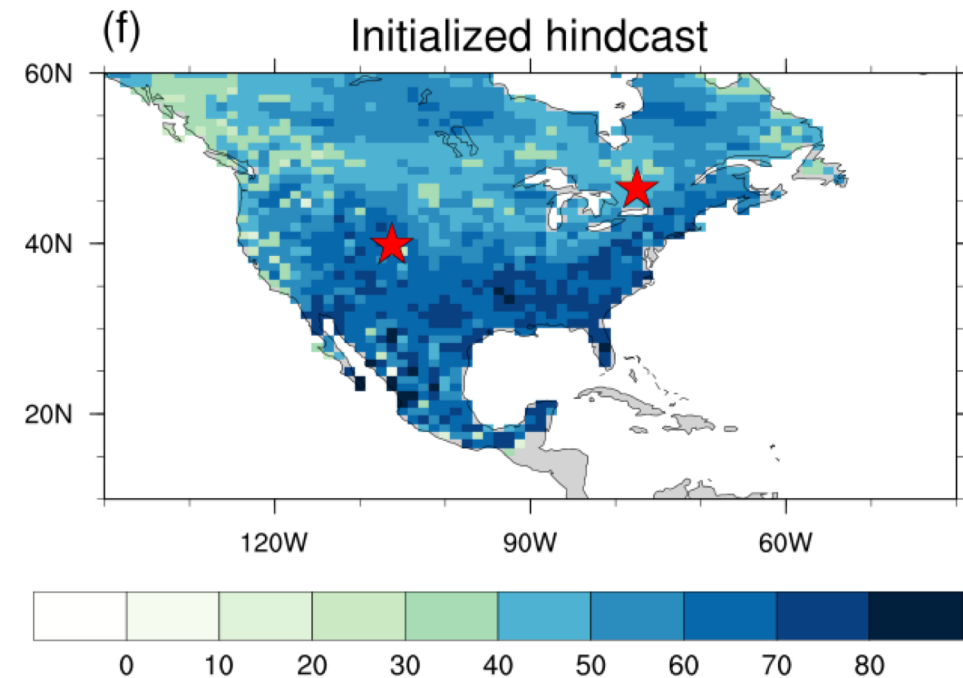


To demonstrate, we create prototypes from a 2011-2015 temperature prediction (initialized in 2010) from CCSM4 to compare **climate change projections** and **seasonal forecast** approaches.

### A la climate change delta:



### A la seasonal forecast:



% in above-average tercile for 2011-2015

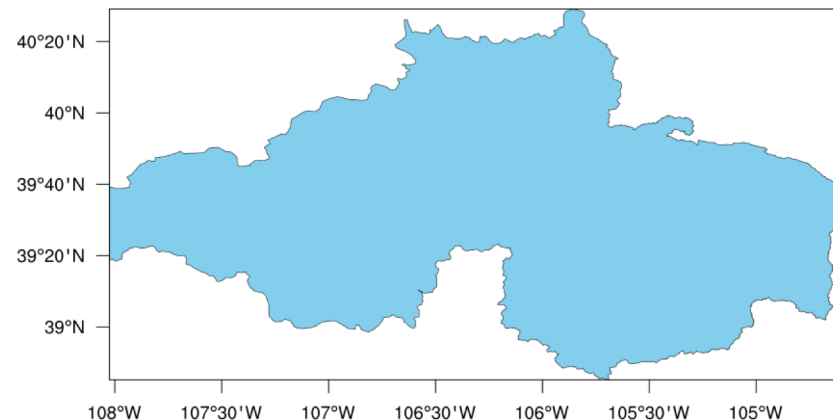
**A la climate change delta:**  
**E.g., add a delta to**  
**historic years (1980-2010)**

	Colorado
Delta (C )	0.9

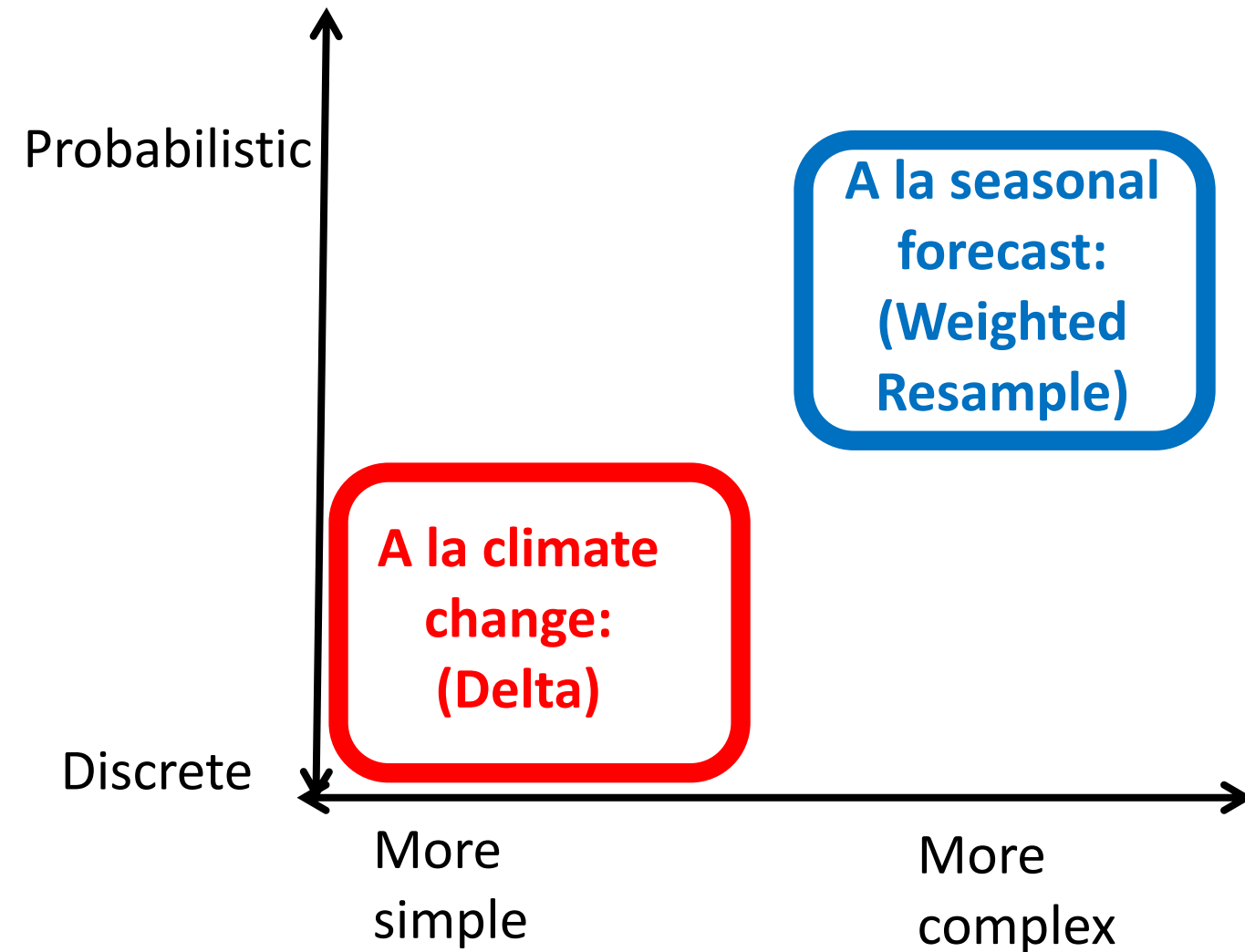
**A la seasonal forecast:**  
**E.g., Use probabilities for weighted**  
**resample of historic years**

		Colorado
	Below-normal	0
Probability (%)	Normal	27
	Above-Normal	73

## Colorado watershed results



Manipulating temperature predictions like **climate change projections** vs **seasonal forecasts** have pros and cons & depend on user needs.

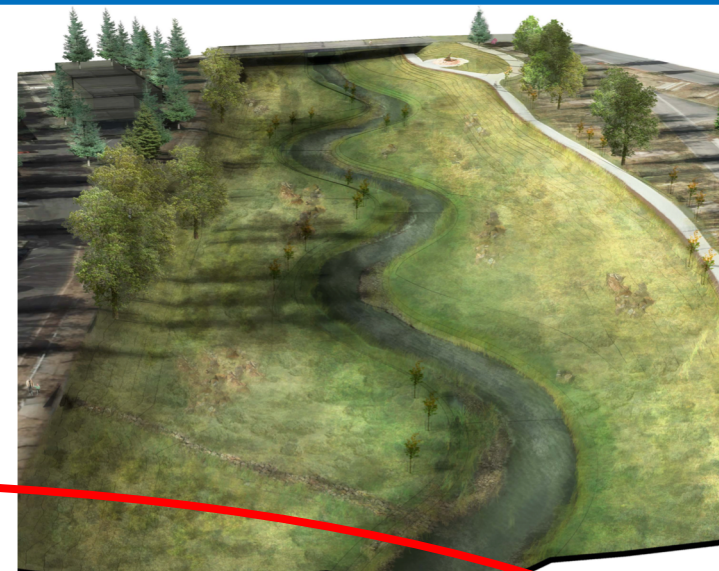




# What is Needed?

**Urban storm water drainage planners:**

Built versus natural channel construction?

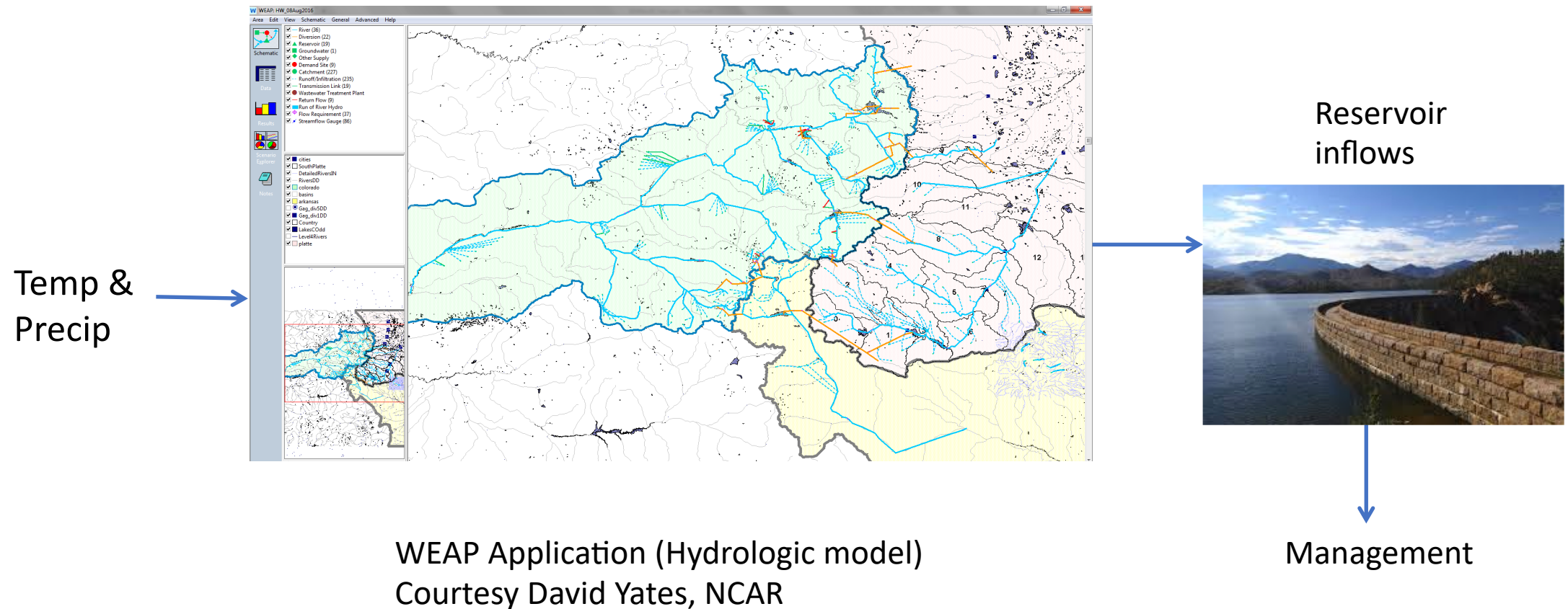


**A drinking water utility:**

If we're in a drought,  
when will we come out of it?



# Hydrologic model makes predictions salient to water managers



# Hydrologic model inputs reflect decadal temperature predictions from (i) delta and (ii) weighted resample

