

Predicting Unmet Municipal & Industrial Water Demand Due to Population and Drought in Cache County, Utah



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Introduction

- Cache County Utah is expected to nearly double its population by 2050 (Governors office).
- Ground water and the Bear River system supply Municipal & Industrial (M&I) water to Cache County (Figure 1).

Research Question

Which combinations of severe drought duration and population growth in cache county will cause the existing Bear River system to not meet M&I demands within Cache County? If demands are not met, at which percent are they unmet?

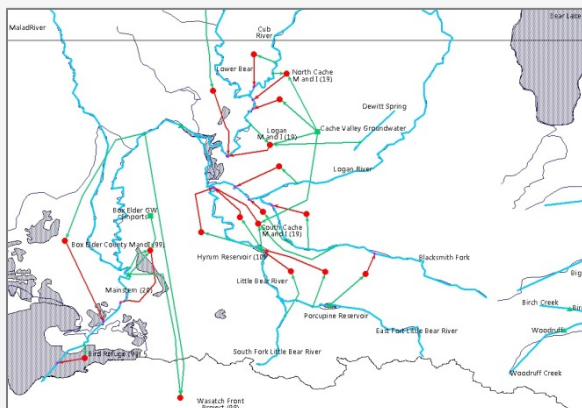


Figure 1 Model Schematic for Bear River

Methods

- A Water Evaluation And Planning (WEAP) model was used.
- WEAP allocates demand water by priority date using available supply (Figure 1).
- 4 Population (demand) scenarios (Figure 2) and 3 drought scenarios (Table 1) were used.

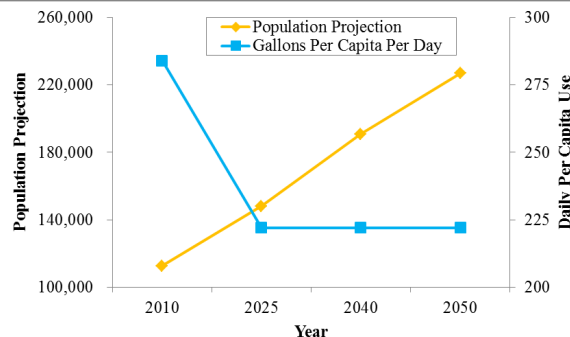


Figure 2 Population Scenarios and GPCD

Year	Scenario	Severity (Min % Flow)
1983	Control	75%
1977-78	2 Year	8%
1987-90	4 Year	10%

Table 1 Drought Scenarios

Results

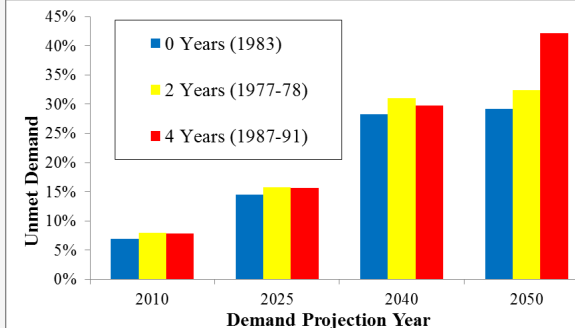


Figure 3 % of Unmet Water Delivery by Scenario

- System is more sensitive to population growth.
- Indoor water use is generally met. Summer demand is largest factor in unmet demand.

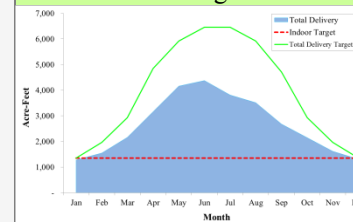


Figure 4 2050 4 Year Drought Delivery

- Large unmet amount in 2050 4 year drought is because north Cache County will not be able to pull enough water from the Cub River.
- Sites downstream also suffer unmet demand
 - Box Elder County M & I
 - The Migratory Bird Refuge
 - The Wasatch Front.
- Recommendations:
 - More accurate population projection
 - Develop Cache County Drought Management Plan.