**Constructive Feedback on the 2021 Draft Utah State Water Plan**

These comments are also posted publicly at: [xxx](https://utahandwesternwater.wordpress.com/2019/12/31/constructive-feedback-on-the-2019-draft-cache-water-master-plan/)

This Fall, the Utah Division of Water Resources (hereafter, UDWR) released a draft 2021 Utah State Water Plan (<https://water.utah.gov/2021waterplan/>) and solicited public feedback. Below, I describe my involvement with the UDWR, strengths of the 2021 draft plan, and suggestions to improve.

**Prior Engagement**

I have worked formally and informally with UDWR since 2008. The UDWR provided a copy of their Fortran model for the Bear River basin which I and colleagues used to develop a model that identified new reservoir operations to enhance aquatic, flood plain, and impounded wetland habitat while sustain water deliveries for agriculture and municipalities (Alafifi and Rosenberg, 2020). I also worked with the UDWR on the Drought Contingency Plan for the Weber Basin (JUB Engineers, 2018). As part of a follow-on drought vulnerability study, Jacob Everitt and I used and extended the UDWR’s RiverWare model for the Weber Basin to identify system vulnerabilities to stream flow, future demand, reservoir sedimentation and evaporation rates (Everitt, 2020). I have also made presentations to UDWR staff on research to target households with the most potential to save water, money, and energy by conserving water (Abdallah and Rosenberg, 2014; James, 2019). From December 2020 to March 2021, the UDWR approached Utah State University and the University of Utah to conduct a study that compared Utah per capita water use methods and results to nearby states and districts.

**Strengths of the 2021 Draft Plan**

The major strength of the 2021 draft plan is to present state water supply and state water demand together and to support the analysis with open data. Additional strengths include:

1. **Educated readers.** The plan presents multiple infographics and text that define key concepts like diversion, depletion, and return flow that are central to water planning and management. The plan also includes an infographic that explains how cloud seeding works. Education is an important goal for a water plan. Education helps readers, stakeholders, and the public get on board and share a common language.
2. **Data available.** Data are available through an open water data website. These data include municipal and industrial water use, water related land use, and basin level annual water budget. The portal is easy to use and data are in common formats. Available data improves transparency and legitimacy of planning efforts.
3. **Increased temporal frequency of data reporting.** M&I data are reported every year instead of every five years. Water-related land use data are reported every year instead of every six years. This increased temporal frequency helps resolve trends and helps planners sooner catch and react to anomalies or divergent trends.
4. **Included uncertainty in demand forecasts**. For the first time, the plan acknowledges uncertainty in two factors that have a large impact on demand forecasts (Figure 6-2). The uncertain factors are:
   * **Per-capita water use**. This uncertainty is represented by three scenarios that differ in:
     + **No change**: baseline (2015) rates of use, no climate change
     + **Baseline**: current 2019 conservation practices continued, partial conversion to more efficient household appliances and landscapes, climate change,
     + **Regional water conservation goals**: meet state’s regional conservation goals and climate change.
   * Agricultural to urban conversions (low and high rates).

Acknowledging this uncertainty is important because it communicates that Utah can expect a range of future water use over the next 30 to 50 years. Many demand scenarios stay within the available supply and do not require additional Bear River or other development.

1. **I was excited to see the plan state that Bear River development is not needed for the next 3 decades or longer**. This statement can allow state water planning efforts to focus on efforts that can deliver water sooner, at lower cost, with fewer environmental impacts, and are less controversial such as water conservation, water banking, aquifer storage and recovery, and agricultural water use efficiency.
2. **Many water conservation efforts**. The plan describes state wide conservation efforts such as flip your strip, integrated land use and water planning, water efficient standards for new development, secondary water meters, agricultural optimization, and a weekly lawn watering guide. These conservation efforts help reduce per capita water use and further delay the need for new projects such as Bear River development or Lake Powell Pipeline.
3. **Recommended conservation actions.** The plan listed different conservation actions individuals, state government, UDWR, and other entities. These action items are great because they tell parties what to do now to conserve water and grow conservation efforts over time.
4. **Engaging report.** The report has large font size, concise text, many photos, figures, and infographics. All these make the plan easy to read and to share with diverse stakeholders.

**Suggestions to Improve**

1. **Make regional conservation goals more aggressive**. For example, the regional conservation goals for Kanab/Virgin River in Figure 6-4 are not large enough. We are the state with the largest per capita municipal and industrial water use in the nation. . We can do much better. Lower Colorado River South regional conservation target (14%) is second smallest in the state. In the discussion of the Lake Powell pipeline (pp. 87-88), there is no discussion of water conservation.
2. **Remove the “No change” demand scenario from all plots**. The no change scenario references 2015. The “baseline” scenario references 2019. There were changes in water use from 2015 to 2019. In 2021, we can not go back to a 2015 water use. The no change scenario can no longer occur and showing this scenario in plots incorrectly inflates the upper bound on future water demand.
3. **Explain the complexity of the demand model.** Chapter 5 starts off with “Projecting Utah’s future water needs is complex.” Yet Figure 6-1 shows a linear growth in water use. And the Garner center forecast for Utah’s population is linear with respect to time.
4. **Better emphasize the good water situation we have**. Most demand/supply plots for the baseline and regional conservation scenarios in chapter 5 and Appendix G show demand within supply through 2045 and beyond. This is an important finding that the plan should emphasize. The situation can be further improved be conserving more water (see suggestions #1-3 to improve).
   * A noticeable difficult situation is the Jordan River basin in 2070 (Figure 4-2). Here the plan can discuss the basin-specific water management strategies that can help Jordan River water users.
5. **Support with actual data** the hypothesis that Utah’s per capita water use is higher than neighboring states and cities because Utah counts more components of water use. Absent support, remove the statements and hire an independent entity to study and test the hypothesis.
6. **Compare current water use to Utah in prior years and to neighboring states and cities.** Comparing to use in prior years as the plan suggests tells us if Utah water per capita use is declining and headed in the right direction. Comparing to neighboring states and cities tells Utah whether Utahns can conserve more and use even less.
7. Change the infographic on p. 35 to correctly represent water use in Washington County. This infographic says a person only uses 15 gallons per day. On average, Utahns use something like 245 gallons per person per day and there are municipalities in the UDWR’s data set that use as high as 4,000 gallons per person per day.
8. Explain better where the agricultural to municipal water use values come from. The values in Table 6-1 seem low. What percent of the new municipal and industrial water use will occur *inside* existing municipal boundaries? What percent of new municipal and industrial water use will occur *outside* of municipal boundaries?
9. **Give the Great Salt Lake more prominence** **in the plan and explain how Utahns will protect and restore this unique resource**. The Great Salt Lake is Utah’s largest surface water body. The Lake is the namesake for our state’s capital city. The Lake also benefits Utah’s economy, makes Utah’s snow the greatest on earth, serves as permanent or temporary home for millions of birds, and wetlands (Box 1) (Great Salt Lake Advisory Council). Enhancing these services through drought will require integration across hydrologic, ecology, limnology, hydraulics, water management, and policy domains plus engagement by diverse stakeholders.

**References**

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