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Agricultural Water Resiliency Study

Authority Board Update

August 27, 2024

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Scott Morrison – Jacobs Engineering Group

Discussion Topics

- The Need & Study Objectives
- Study Components & Results
- Next Steps

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The Need & Study Objectives

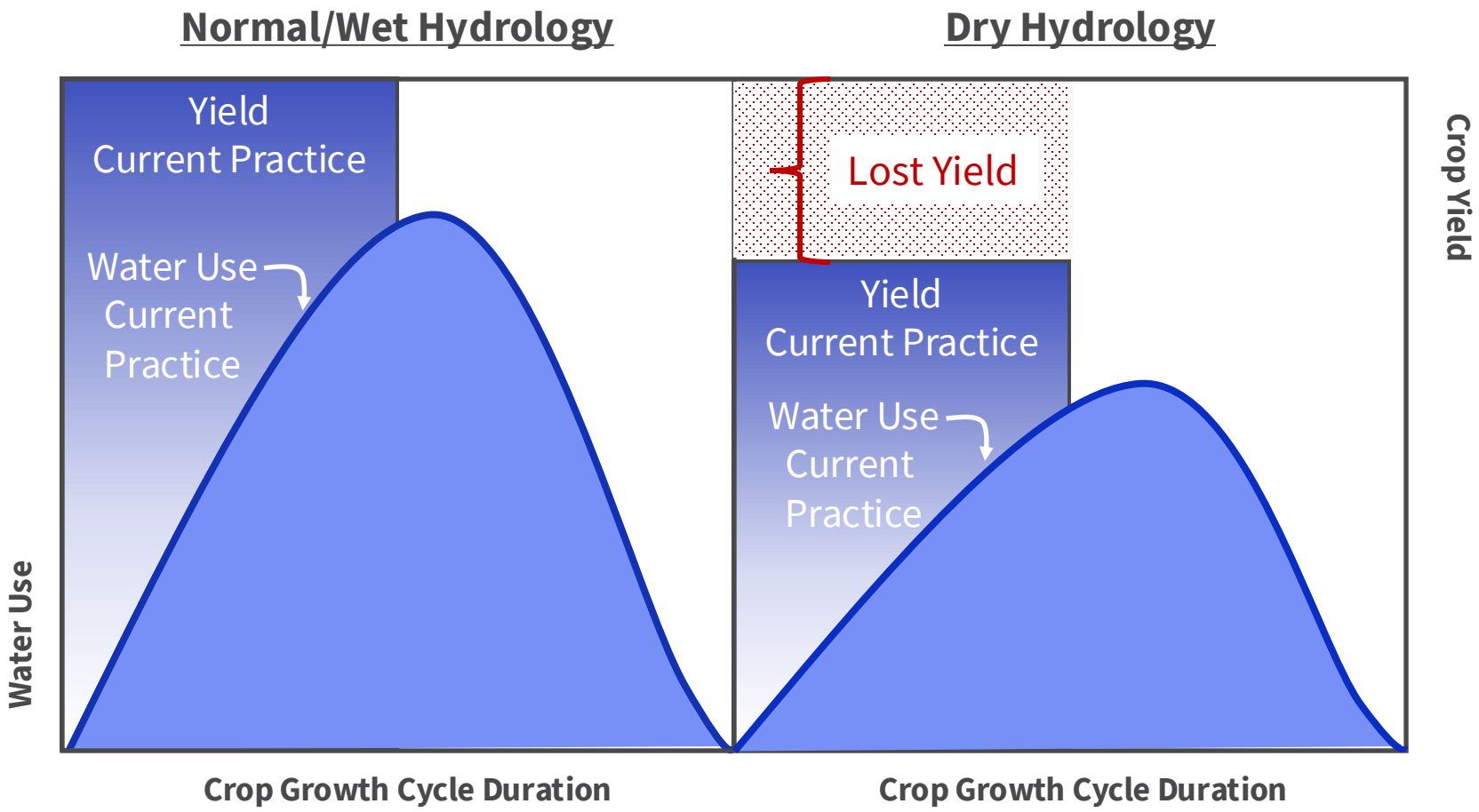
Why Did We Do This? The Need

- Anticipated Future Stressors
  - **Climate Change Impacts**
    - Potential declines in CO River supply
      - –20% by midcentury
      - –35% by end-century
    - Expected increases in crop water demand
      - +15% by 2050 (Duchesne HUC8)
      - +19% by 2080 (Duchesne HUC8)
  - **Compact Compliance**
    - Maintaining economic vitality
      - Cuts to Junior Water Rights -> pressure on Senior Water Rights (primarily Agricultural)

Photo Credit: Bureau of Reclamation

Why Did We Do This? The Objective

- Support Producers – Identify Opportunities



Why Did We Do This? The Objective

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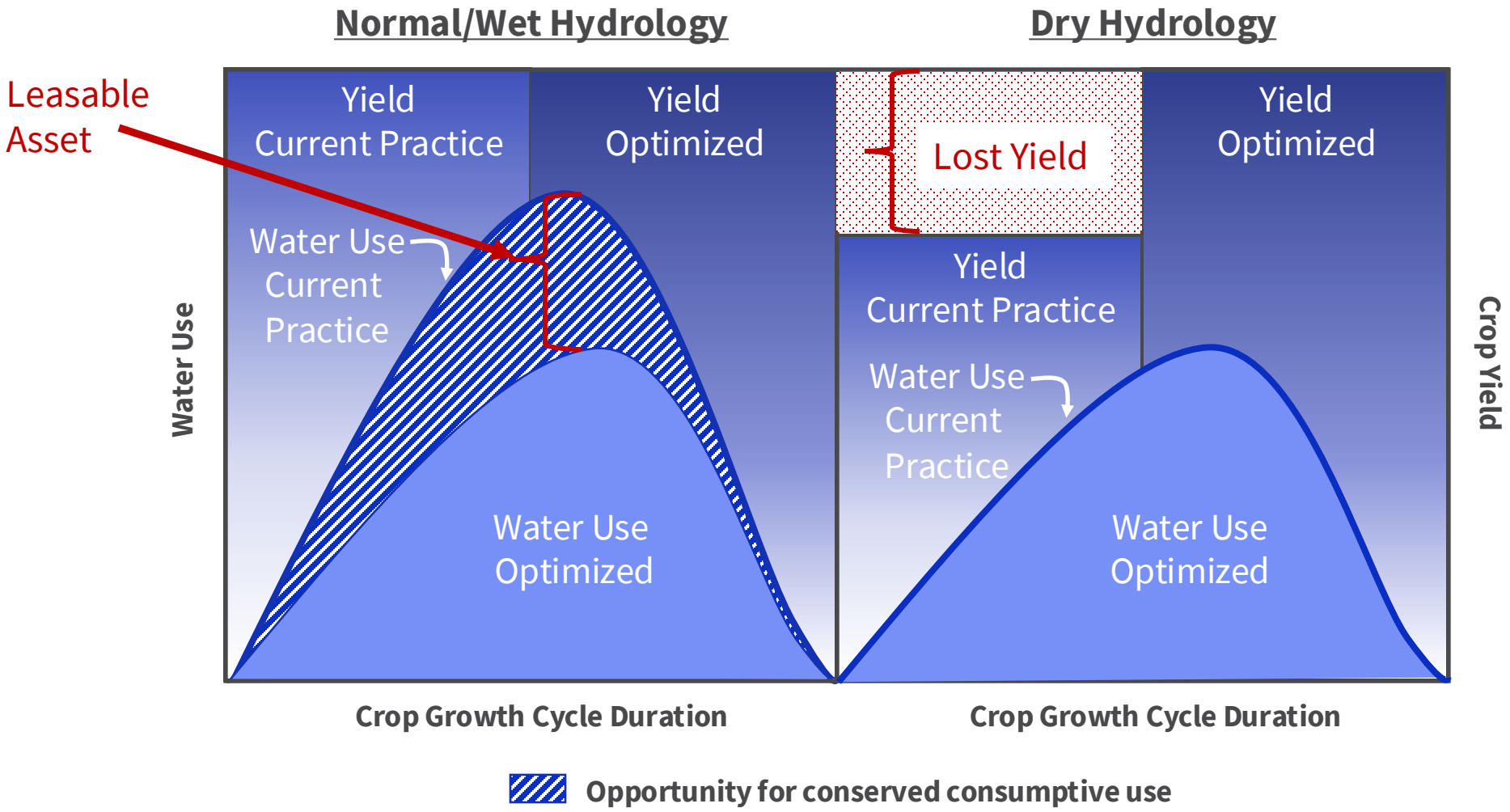

CENTRAL UTAH WATER CONSERVANCY DISTRICT

THE COLORADO RIVER AUTHORITY OF UTAH

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Study Components & Results

What Did We Do and With Who?

- Study Components
  - Quantify Agricultural Depletion (Demand)
  - Quantify Opportunities to Reduce Depletion (Demand)
  - Evaluate Future Available Supply to Agriculture vs. Future Demands
  - Assess Economic Impacts & Incentives

- Collaborators

Primary	Supporting
CUWCD	DNR (Water Resources & Water Rights)
CRAU	USU
Jacobs	OpenET
M.Cubed	DRI
	WestWater Research LLC

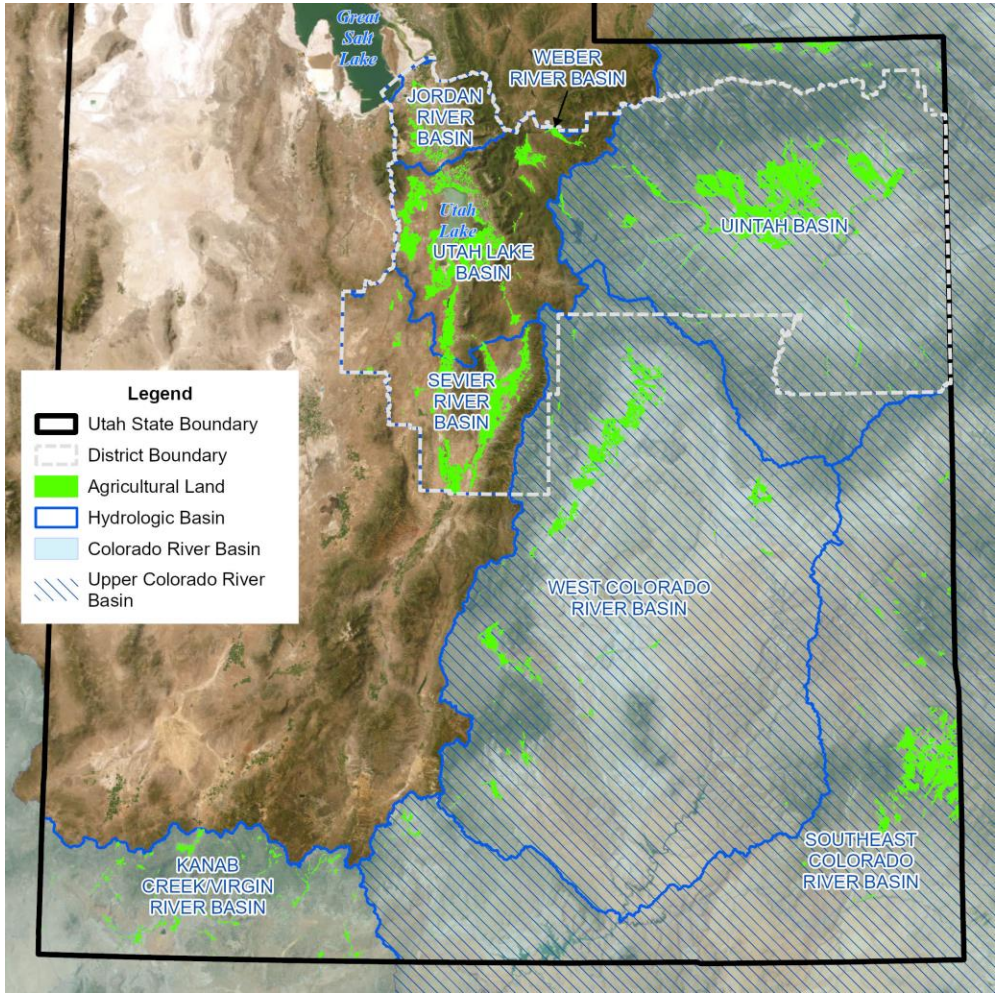

Figure: Study Area

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What Did We Learn?

- Current Agricultural Demands

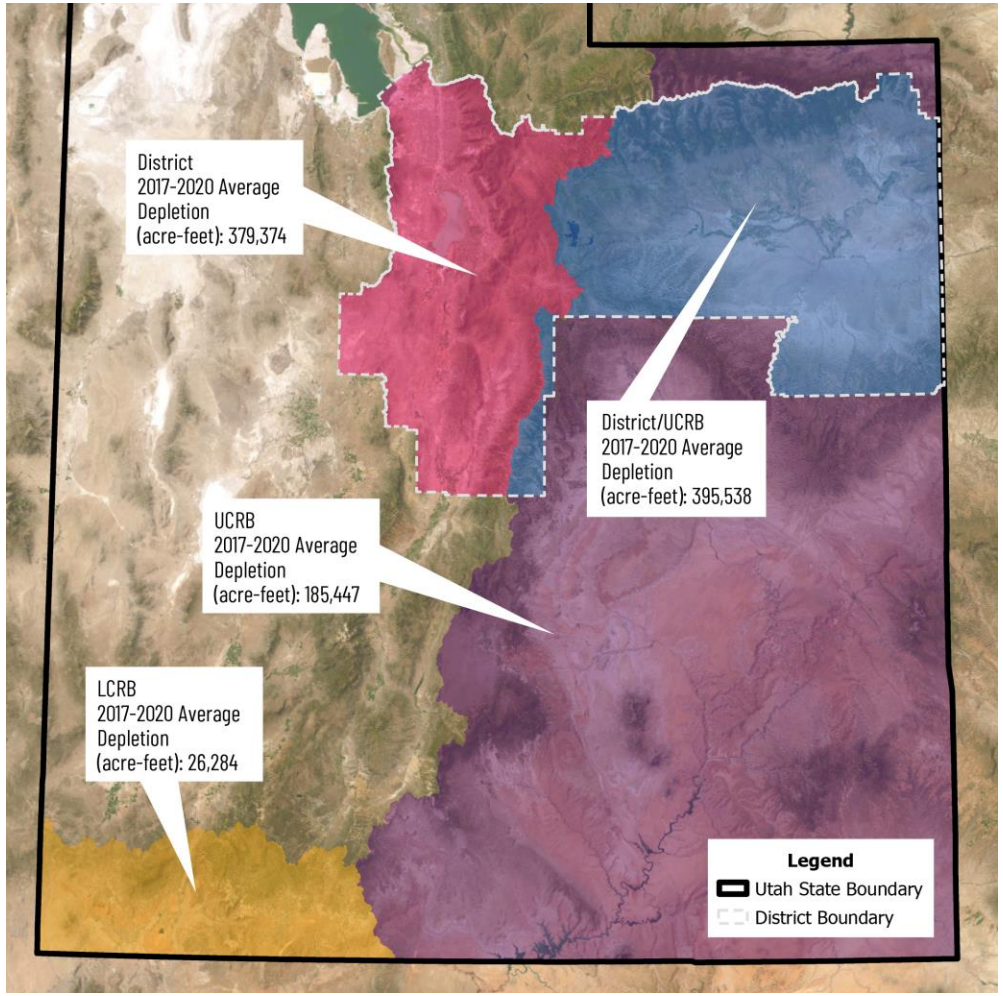


Figure: Study Area Average Agricultural Depletion (2017-2020)

- Opportunities for Demand Reduction Irrigation System Conversions: ~220kaf

From	To	Depletion Change (percent)
Surface: Basin/border	Pivot/lateral MESA[a]	0
	Pivot/lateral LEPA[a]	-2
	Pivot/lateral LESA[a]	-5
	SDI[b]	-18
Sprinkler: Pivot/ lateral MESA	Pivot/lateral LEPA[b]	-1
	Pivot/lateral LESA[b]	-4
	SDI[b]	-29

Note: These results are theoretical in nature and based on assumptions relevant to this study detailed in the *Quantify the Possible Technical Memorandum*;[9] actual results may vary.

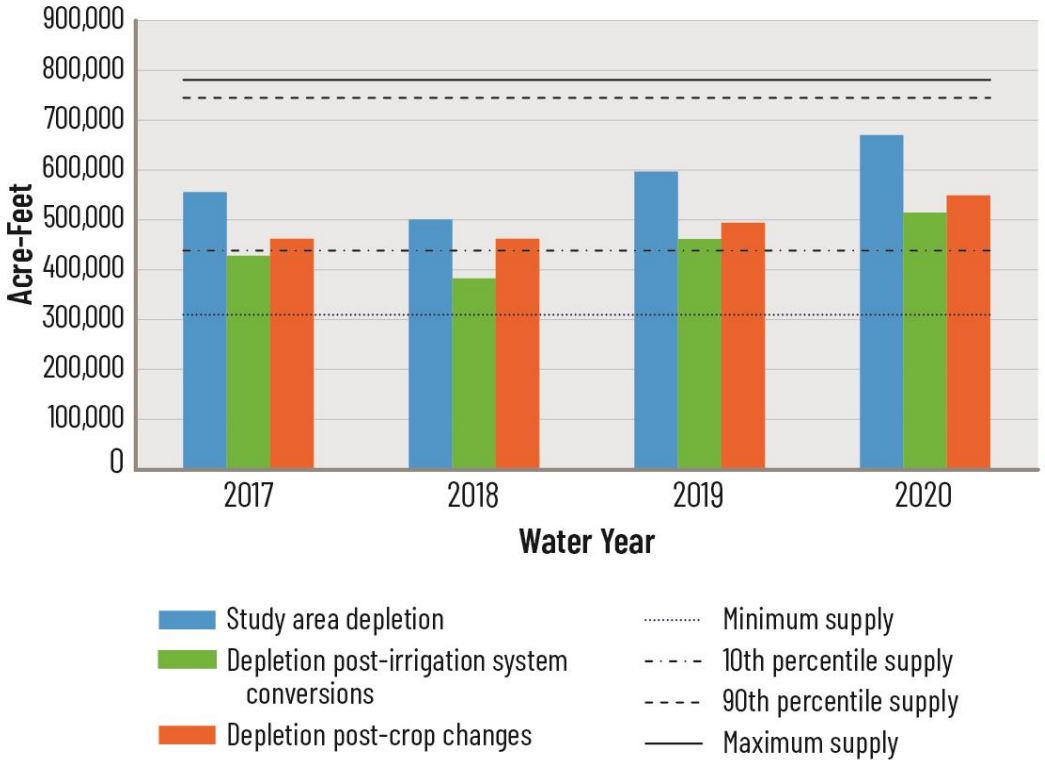
[a] Field production assumed to decrease as a result of not irrigating field corners following conversion.

[b] Field production assumed to be held constant.

  - Crop Changes: ~185kaf
    - Alfalfa and Grass Hay to Spring Grain
  - Temporary Fallowing of Marginal Lands: ~80kaf

What Did We Learn?

- Future Available Supply vs. Future Demand



- Economic Analysis:
  - Positive & Negative Regional Impacts
    - Irrigation system conversions increase economic activity
    - Temporary land fallowing could decrease economic activity
  - Conservation Strategy Incentive Levels

From	To	Depletion Reduction	Cost per Acre-Foot Saved
Forage	Fallow	100%	$218
Pivot	SDI[b]	29%	$270
Forage	Grain	31%	$363
Flood (Surface)	SDI[b]	18%	$440
Forage	Corn	32%	$530

[a] The conservation program is assumed to target alfalfa and other hay acreage for conversions. Pivot depletion reduction and cost are based on conversion of MESA pivot systems. Costs and savings for irrigation system conversions are based on acreages reported in Table 16 of *Water Savings, Costs, and Regional Impacts of Potential On-Farm Water Use Optimization and Conservation Strategies in Utah's Upper Colorado River Basin* (prepared by M.Cubed in association with Jacobs Engineering Group Inc. for the Central Utah Water Conservancy District, June 2024).

[b] Field production assumed to be held constant.

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Recommended Next Steps

What Needs To Be Done Next?

- Share the Work, Avoid Duplication
- Continue Partnership with Producers
  - Understand practicality, identify alternative options
- Evaluate Performance
  - Evaluate performance of agricultural optimization projects – inform next steps
  - Conduct pilot studies – supplement study results
- Build Consensus (Over Time) - Depletion Reduction Opportunities

Figure: Subsurface Drip Irrigation Installation

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