

# Finding and Moving Water to the Great Salt Lake

The Future of the Great Salt Lake

The Wallace Stegner Center for Land,  
Resources and the Environment  
28<sup>th</sup> Annual Symposium

March 17, 2023



Teresa Wilhelmsen, P.E. | State Engineer/Director  
Division of Water Rights

# GSL Hydrologic Complexity

## Surface Sources & Conveyances

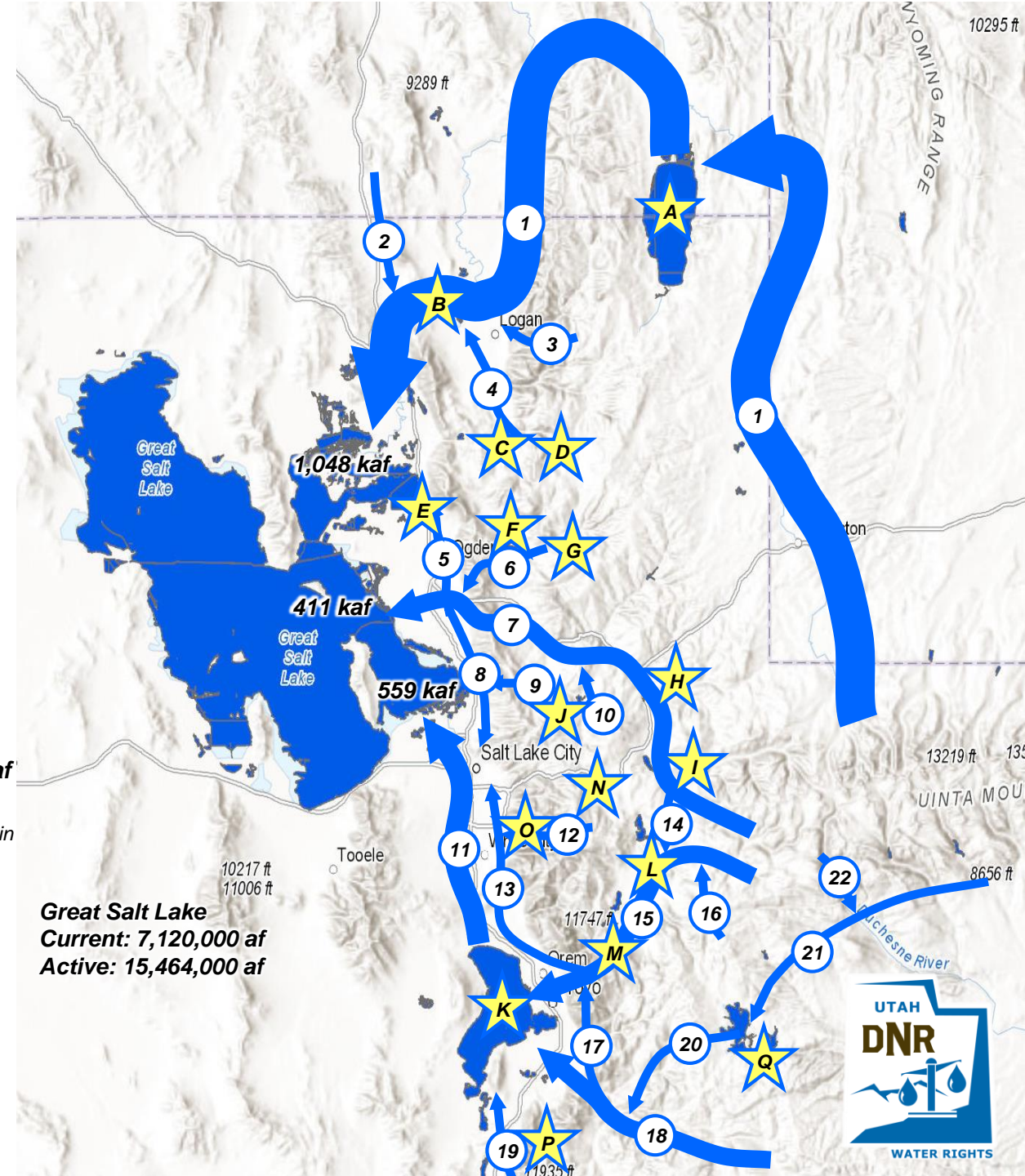
1. Bear River
2. Malad River
3. Logan River
4. Little Bear River
5. Willard Canal
6. Ogden River
7. Weber River
8. Davis Aqueduct
9. Davis County Tributaries
10. East Canyon Creek
11. Jordan River
12. Salt Lake County Tributaries
13. Salt Lake Aqueduct
14. Weber Provo Canal
15. Provo River
16. Duchesne Tunnel
17. Sp. Frk. Provo Res. Canal Pipeline
18. Spanish Fork River
19. South Utah County Tributaries
20. Syar & Strawberry Tunnels
21. Strawberry Aqueduct
22. Duchesne River Tributaries

## Significant Reservoirs (Current / Active Storage)

- A. Bear Lake (540,600 af / 676,000 af)
- B. Cutler Reservoir (7,000 af / 11,400 af)
- C. Hyrum Reservoir (9,650 af / 15,300 af)
- D. Porcupine Reservoir (7,600 af / 13,200 af)
- E. Willard Bay (99,600 af / 247,300 af)
- F. Pineview Reservoir (45,000 af / 110,200 af)
- G. Causey Reservoir (4,300 af / 6,900 af)
- H. Echo Reservoir (51,000 af / 74,000 af)
- I. Rockport Reservoir (37,500 af / 62,100 af)
- J. East Canyon Reservoir (32,100 af / 51,200 af)
- K. Utah Lake (393,800 af / 710,000 af)
- L. Jordanelle Reservoir (188,900 / 320,300 af)
- M. Deer Creek Reservoir (91,110 af / 150,000 af)
- N. Little Dell Reservoir (11,500 af / 20,500 af)
- O. Mountain Dell Reservoir (40 af / 3,200 af)
- P. Mona Reservoir (3,280 af / 18,650 af)
- Q. Strawberry Reservoir (812,800 af / 1,103,500 af)

**Reservoir Storage Totals\*: 2,335,780 af / 3,593,750 af**

*\*Not including approximately 100,000 acre-feet of storage capacity in reservoirs located in Wyoming and Idaho.*





# Measurement and Reporting



## Utah Code 73-2-1

Measurement  
Apportionment  
Distribution

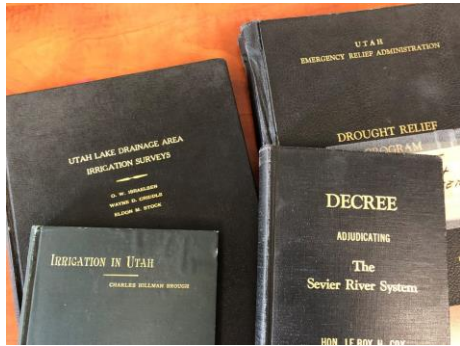


## Utah Code 73-2-1

Maintaining  
public records



# Complexities



Water Rights



Interstate and  
Intrastate



Physical  
Constraints

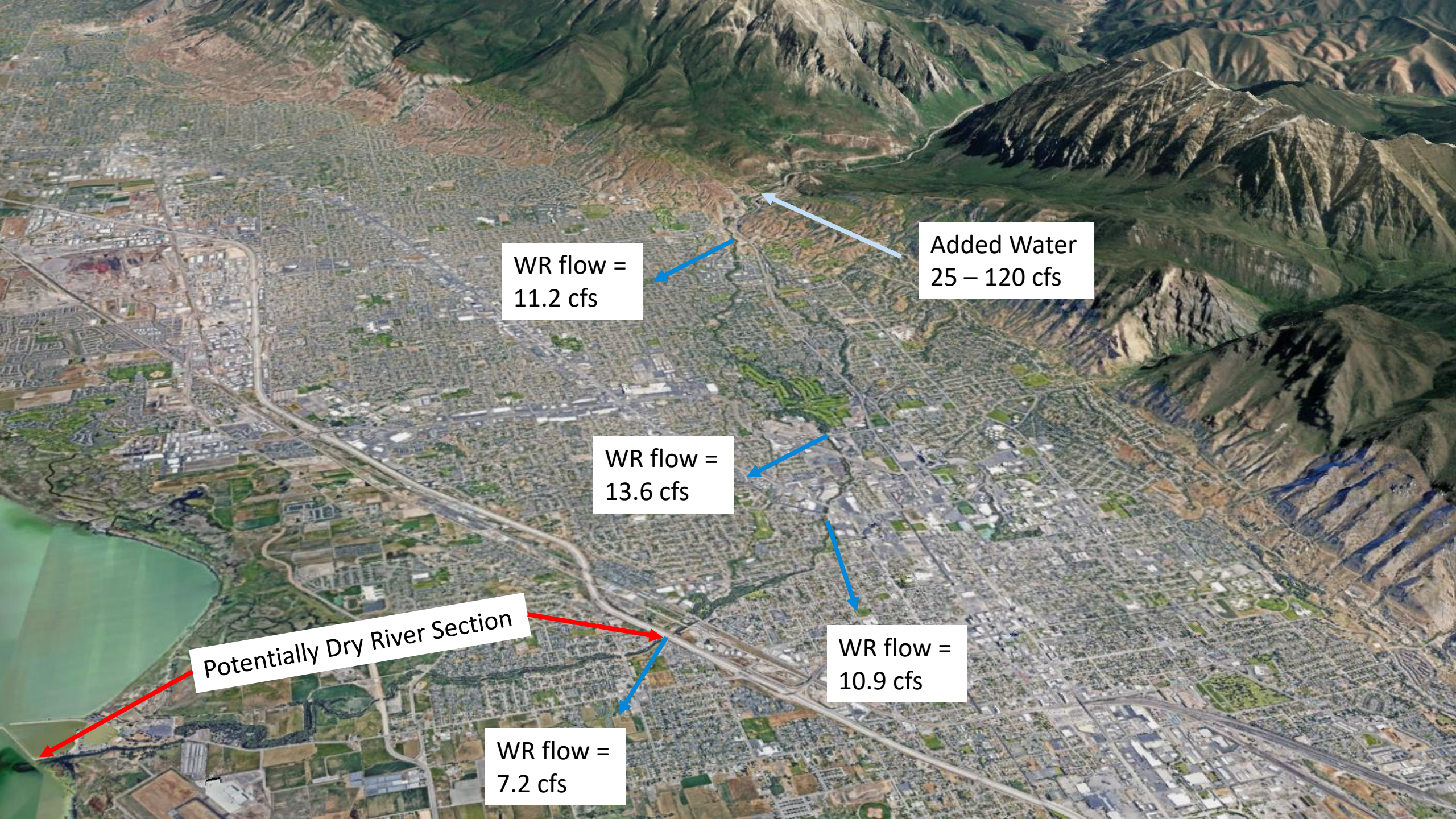


Agreements  
and Other

# Distribution is Shepherding







WR flow =  
11.2 cfs

Added Water  
25 – 120 cfs

WR flow =  
13.6 cfs

Potentially Dry River Section

WR flow =  
10.9 cfs

WR flow =  
7.2 cfs



If there is at least 42.9 cfs in the river, each diversion should be set to its legal maximum and the added water will make it down.

WR flow =  
11.2 cfs

Added Water  
25 – 120 cfs

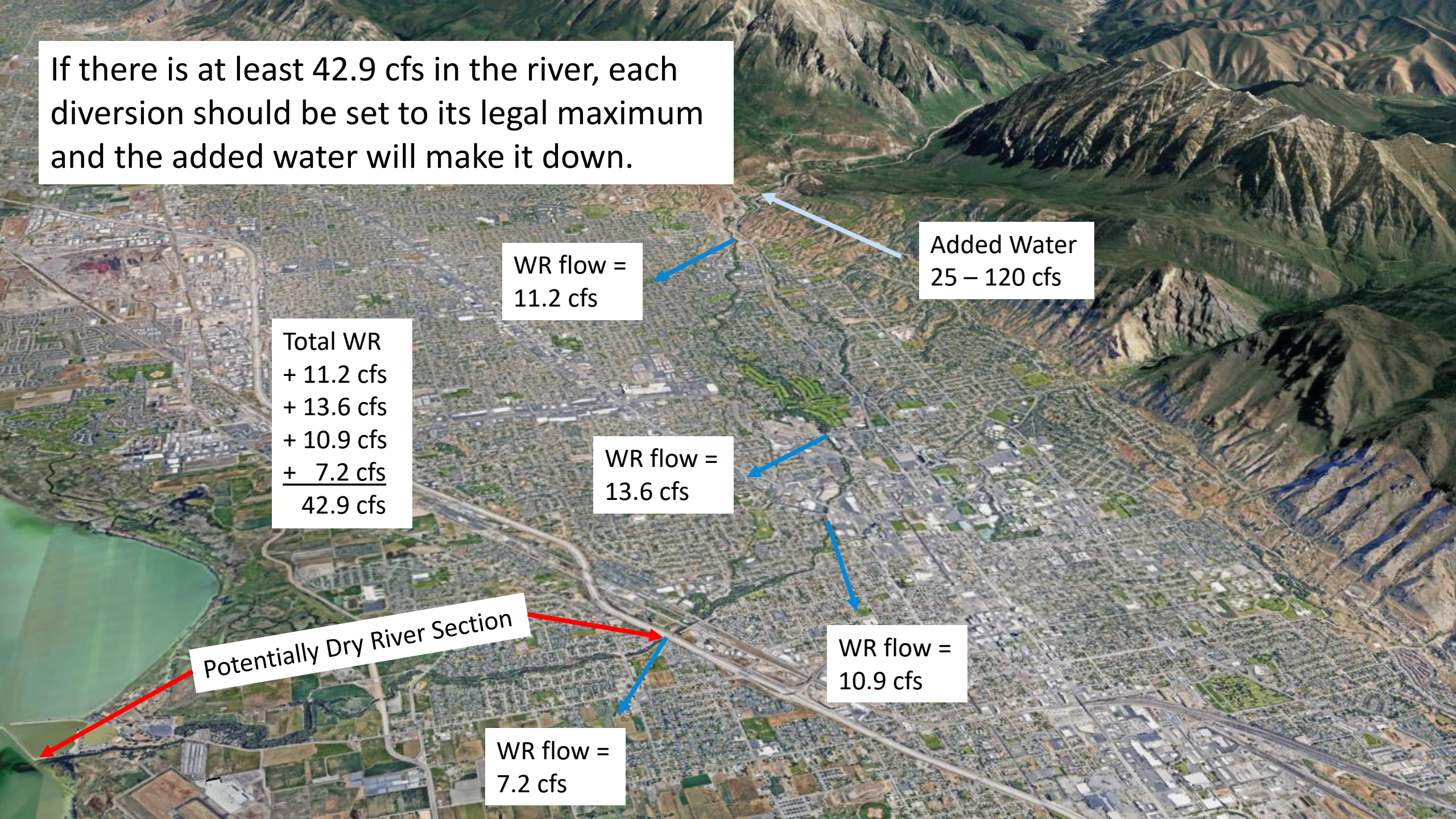
Total WR  
+ 11.2 cfs  
+ 13.6 cfs  
+ 10.9 cfs  
+ 7.2 cfs  
42.9 cfs

WR flow =  
13.6 cfs

WR flow =  
10.9 cfs

WR flow =  
7.2 cfs

Potentially Dry River Section





What if there is only 20 cfs in the river?  
Each diversion should be set to 47 % of  
its legal maximum.

Set flow =  
5.2 cfs

Added Water  
25 – 120 cfs

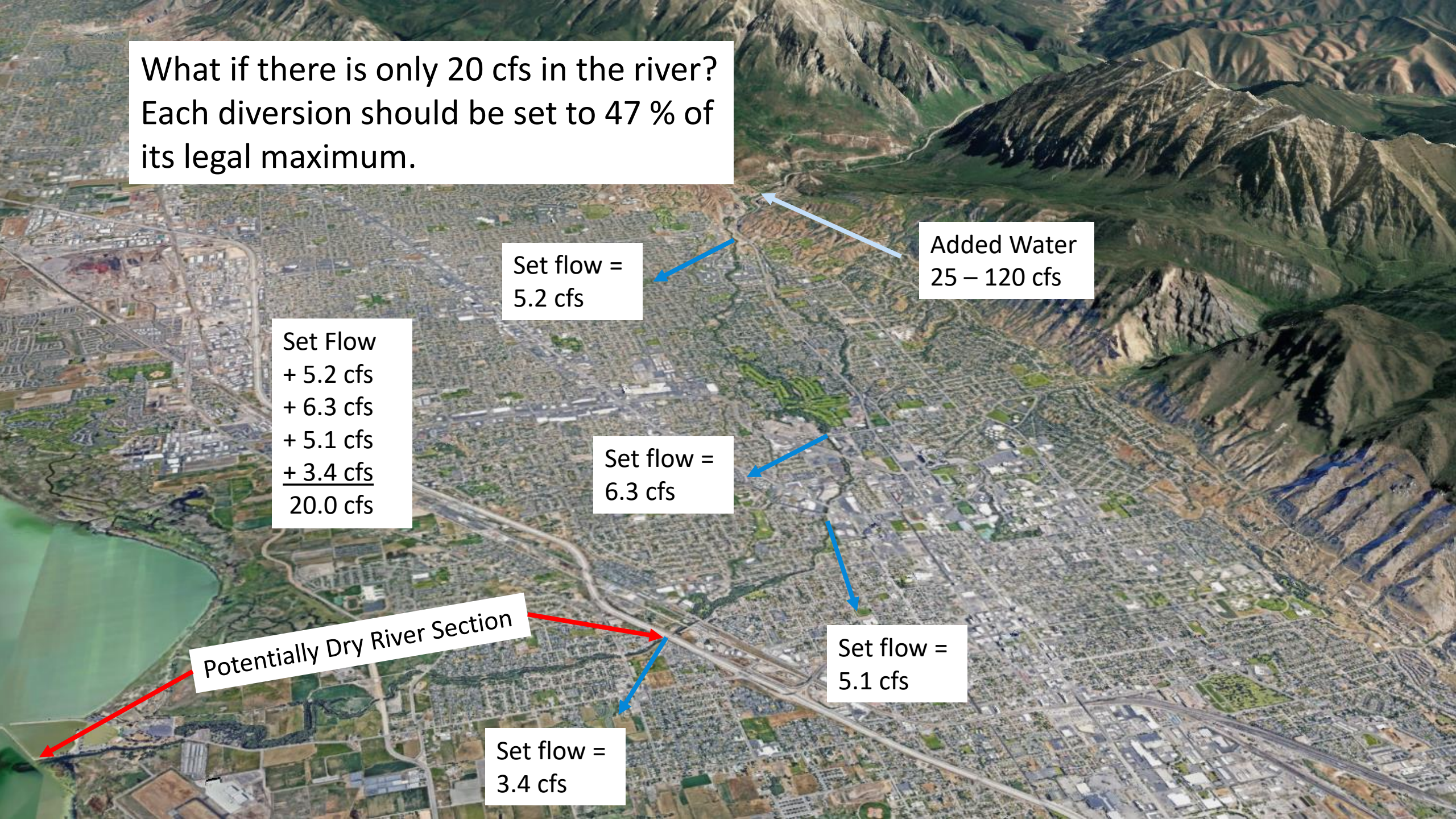
Set Flow  
+ 5.2 cfs  
+ 6.3 cfs  
+ 5.1 cfs  
+ 3.4 cfs  
20.0 cfs

Set flow =  
6.3 cfs

Set flow =  
5.1 cfs

Potentially Dry River Section

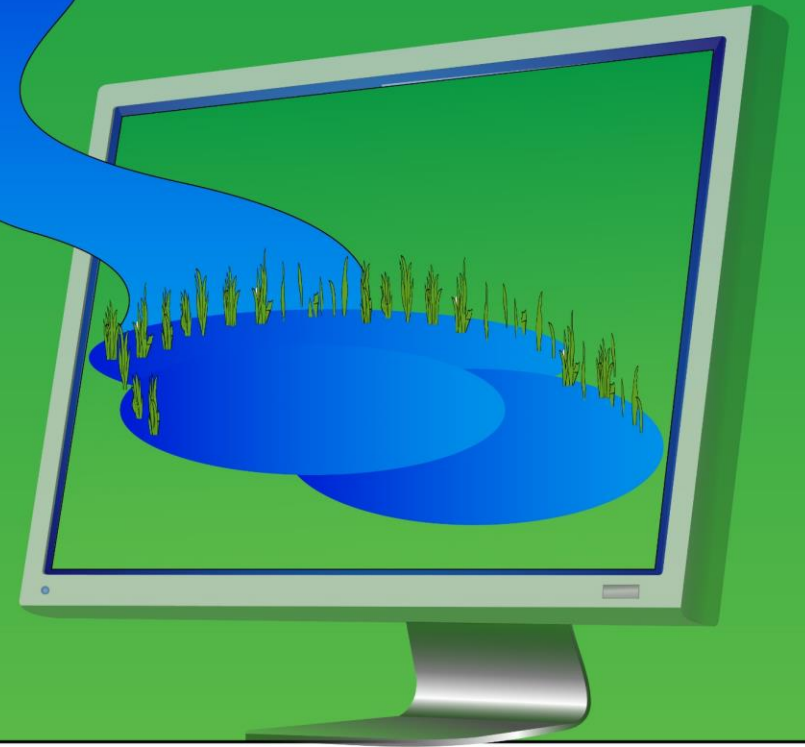
Set flow =  
3.4 cfs



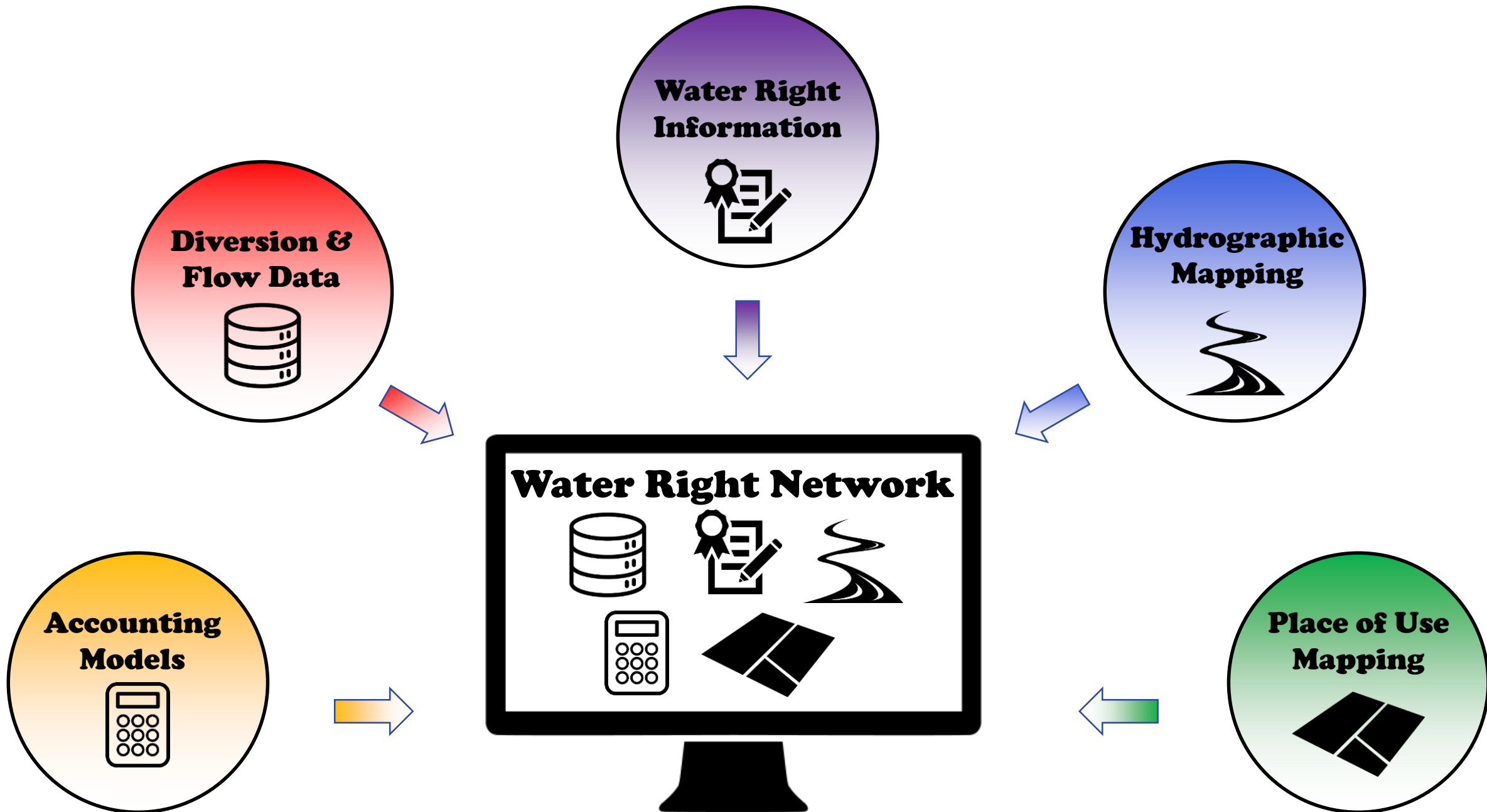


# Stream to Screen

- Diversion and flow data
- Water Rights
- Priority
- Timing
- Nature of Use
- Place of Use
- Reporting
- Transparency









# Utah Division of Water Rights



Layers Basemap Search Tools

- ☒ + Roads, Counties and Labels
- ☐ + My Location
- ☒ + Points of Diversion
- ☐ + Adjudication Books
- ☐ + Irrigation Duty Values
- ☐ + Land Ownership
- ☐ + Parcels (Not shown at this scale!)
- ☐ + PLSS
- ☐ + Water Right Areas
- ☐ + Contours
- ☐ + Consumptive Use
- ☐ + Water Related Land Use (2021)
- ☐ + WR Network Fields
- ☐ + WR Network Flowlines & Nodes
- ☐ + Distribution Stations (Not Realtime)
- ☐ + Distribution Stations (Realtime)
- ☐ + Place Of Use

Show More Layers

0 0.2 0.4mi



# Utah Division of Water Rights



Layers Basemap Search Tools

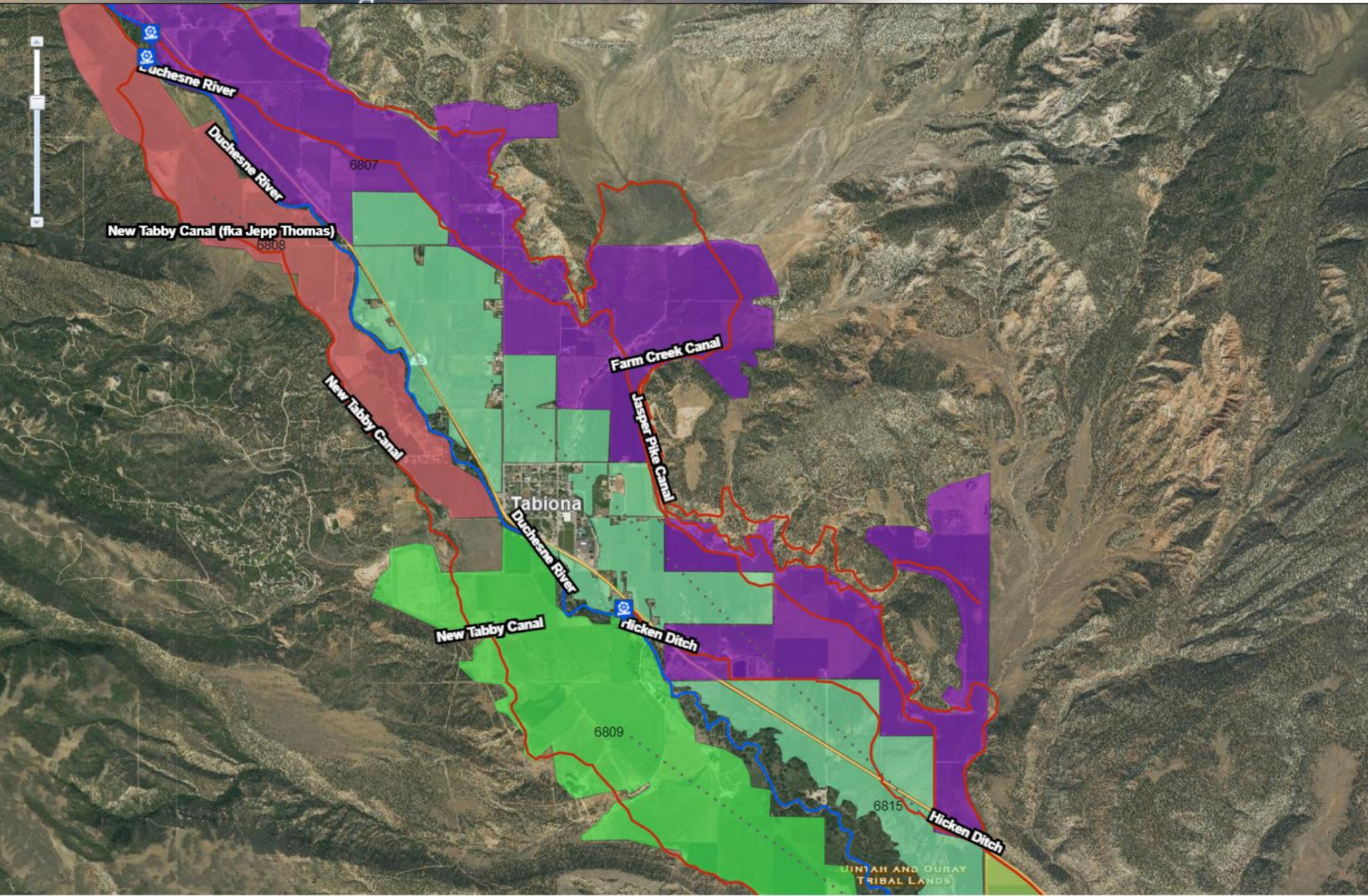
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- ☐ Distribution Stations (Realtime)
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Show More Layers

0 0.2 0.4mi



# Utah Division of Water Rights



Layers Basemap Search Tools

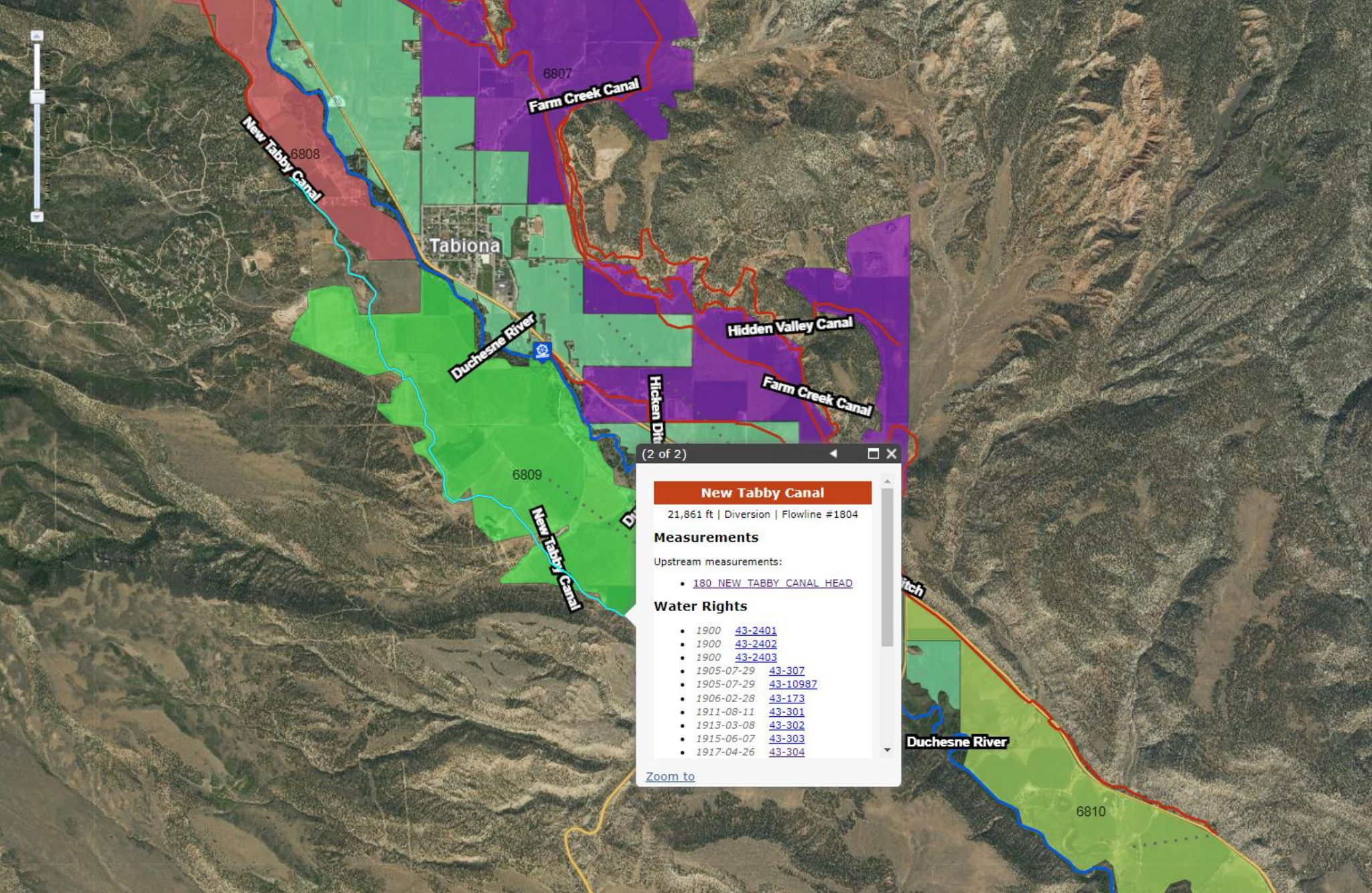
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Show More Layers

(2 of 2)

**New Tabby Canal**

21,861 ft | Diversion | Flowline #1804

**Measurements**

Upstream measurements:

- [180 NEW TABBY CANAL HEAD](#)

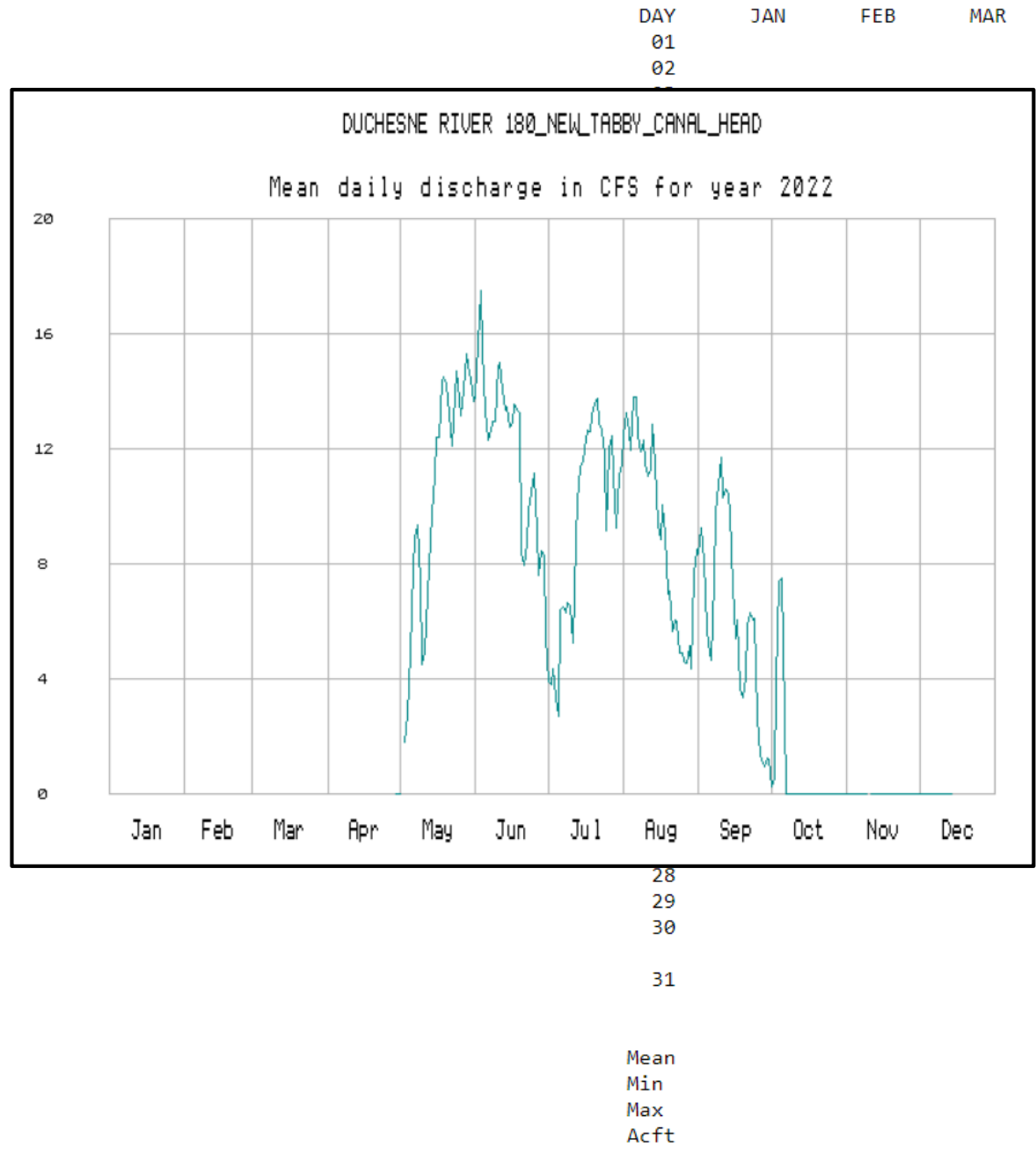
**Water Rights**

- 1900 [43-2401](#)
- 1900 [43-2402](#)
- 1900 [43-2403](#)
- 1905-07-29 [43-307](#)
- 1905-07-29 [43-10987](#)
- 1906-02-28 [43-173](#)
- 1911-08-11 [43-301](#)
- 1913-03-08 [43-302](#)
- 1915-06-07 [43-303](#)
- 1917-04-26 [43-304](#)

[Zoom to](#)



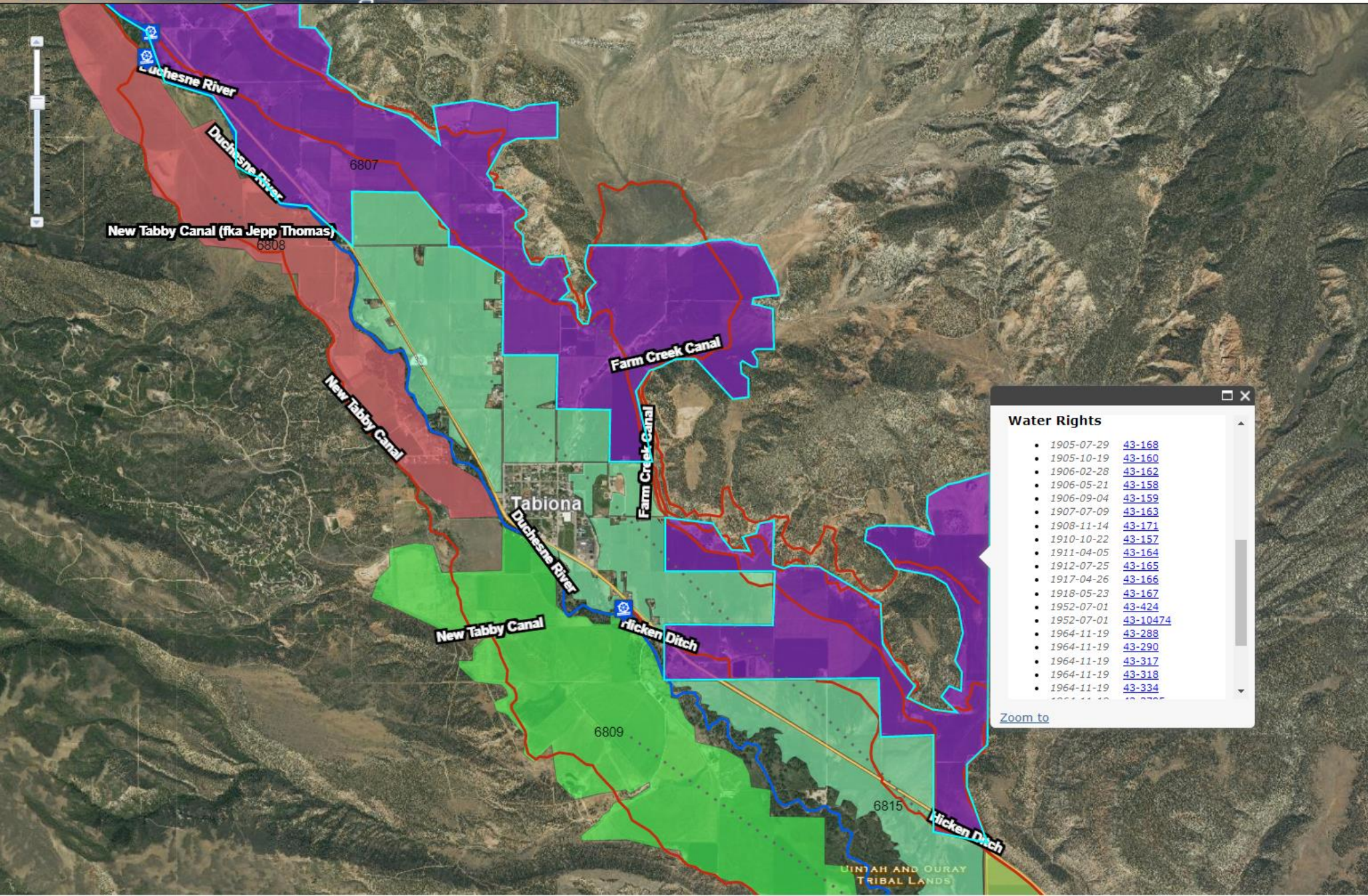
CALENDAR YEAR 2022 Mean daily discharge in CFS



Annual ACFT Total: 2866.93



# Utah Division of Water Rights



Layers Basemap Search Tools

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- ☐ Place Of Use

Show More Layers

## Water Rights

- 1905-07-29 [43-168](#)
- 1905-10-19 [43-160](#)
- 1906-02-28 [43-162](#)
- 1906-05-21 [43-158](#)
- 1906-09-04 [43-159](#)
- 1907-07-09 [43-163](#)
- 1908-11-14 [43-171](#)
- 1910-10-22 [43-157](#)
- 1911-04-05 [43-164](#)
- 1912-07-25 [43-165](#)
- 1917-04-26 [43-166](#)
- 1918-05-23 [43-167](#)
- 1952-07-01 [43-424](#)
- 1952-07-01 [43-10474](#)
- 1964-11-19 [43-288](#)
- 1964-11-19 [43-290](#)
- 1964-11-19 [43-317](#)
- 1964-11-19 [43-318](#)
- 1964-11-19 [43-334](#)

[Zoom to](#)



# Distribution Accounting Models

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# Utah Division of Water Rights

Distribution » Water Commissioner Accounting Tool » Provo River Complete Model Draft #7



Ending Year: 2022

- > Accounting Input (Commissioner)
- > Accounting Calculations
- > Accounting Reports

[Above Midway Schematic/NF](#)

[HORS Calculations](#)

[HORS Water Rights](#)

[ODT Apportionment](#)

[WCWEP/Wetland Apportionment](#)

[Upper Apportionment Table](#)

[Below Midway Schematic/NF](#)

[A9580 Worksheet](#)

[Lower Apportionment Table](#)

[Below Murdock Schematic/NF](#)

[Storage Accounting](#)

[Storage Totals](#)

[Upper Provo Decreed Water Rights](#)

[PRWUC Shares](#)

[Lower Diversions](#)

[CUWCD Water Only](#)

[Class A Water Rights](#)

[Teacups](#)

[Station Descriptions](#)

[Summary](#)

[A16642 Estimate](#)

Units: Default

Date: 2021-12-13

## Above Midway Schematic/NF



		DAILY	YTD
Washington Lake Contents	●	1.0 cfs	134 af
Trial Lake Contents	●	-13.3 cfs	16 af
Lost Lake Contents	●	0.7 cfs	136 af
Duchesne Tunnel (Net)	→	(-) 19.9 cfs	(-) 2,286 af
Shingle Creek (Net)	→	(-) 0.0 cfs	(-) 0 af
Sunrise Diversion	←	0.0 cfs	0 af
Washington/South Kamas Diversion	←	0.0 cfs	0 af
Cutler-Larsen Diversion	←	0.0 cfs	0 af
WPC at Francis - Inflows (Net)	→	(-) 24.5 cfs	(-) 2,473 af
Ontario Drain Tunnel (Net)	→	(-)	(-)
Jordanelle Reservoir Contents	●	-19.7 cfs	-119 af
Evaporation	←	1.6 cfs	222 af
4% Conveyance Loss	←	0.7 cfs	48 af
Wetlands Diversion	←	0.0 cfs	0 af
Timpanogos (Wasatch) Diversion	←	0.0 cfs	0 af
Wasatch/Extension Diversion	←	0.0 cfs	0 af
North Field Diversion	←	14.8 cfs	1,193 af
Midway Diversion	←	0.0 cfs	0 af
Miscellaneous Diversion	←	0.0 cfs	0 af
Flow Past Midway	↓	129.1 cfs	11,335 af





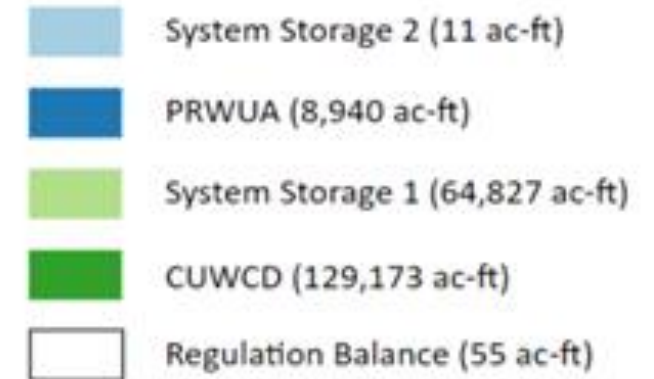
## Teacups

Units:

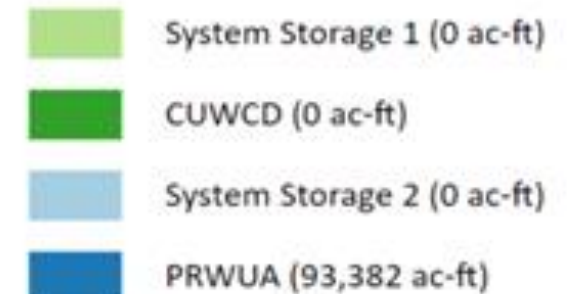
Date:



Jordanelle Contents (203,005 ac-ft)



Deer Creek Contents (93,382 ac-ft)







Account Details							Measured Uses				
Water Rights											
Beneficial Uses							Water Rights				
	#	Account Na...	Fie...	Group/Cha...		Use Total		Water Right	Use	Priority	Source
<input type="checkbox"/>	100191	BRACKEN,	B	600088	IRR	56.829 ac	<input type="checkbox"/>	71-1154	56.829 ac	1946-03-27	GW
<input type="checkbox"/>	100191	BRACKEN,	B	601251	IRR	4.056 ac	<input type="checkbox"/>	71-4592	1.431 ac	1946-03-27	GW
		MARVIN					<input type="checkbox"/>	71-4919	1.25 ac	1942-03-30	GW
							<input type="checkbox"/>	71-4920	1 ac	1942-03-30	GW
							<input type="checkbox"/>	71-4921	0.375 ac	1944-01-12	GW
<input type="checkbox"/>	100191	BRACKEN,	A	603197	IRR	78.49 ac	<input type="checkbox"/>	71-3161	50 ac	1950-12-21	GW



# Water Rights – Staffing, Measuring and Reporting





# Thank You

**Teresa Wilhelmsen, P.E.**

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Division of Water Rights

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