

2021-22 Draft LADWP Operations Plan

Inyo County Water Department

Inyo County Water Commission
April 26, 2021





2020-21 Conditions and Operations

2020-21 Pumping

W.F	Laws	Bishop	Big Pine	Taboose-Aberdeen	Thibaut-Sawmill	Ind.-Oak	Symmes-Shep.	Bairs-George	Lone Pine	Total AF/year
Planned	10,460	12,685	23,695	19,500	11,160	10,470	960	2,820	980	93,000
Actual	9,650	10,460	14,573	15,422	10,961	7,911	1,047	2,401	983	73,410

2020-21 Runoff

Approximately 303,013 acre-feet or 75% of normal. Runoff forecast was 74% of normal

The forecast is usually a good predictor of actual runoff.

2020-21 Water Levels

Indicator Wells: At 46 indicator wells the average DTW decline was 2.0 ft.

Average predicted decline was 2.7 ft.



April 2021 Groundwater Levels at Indicator Wells

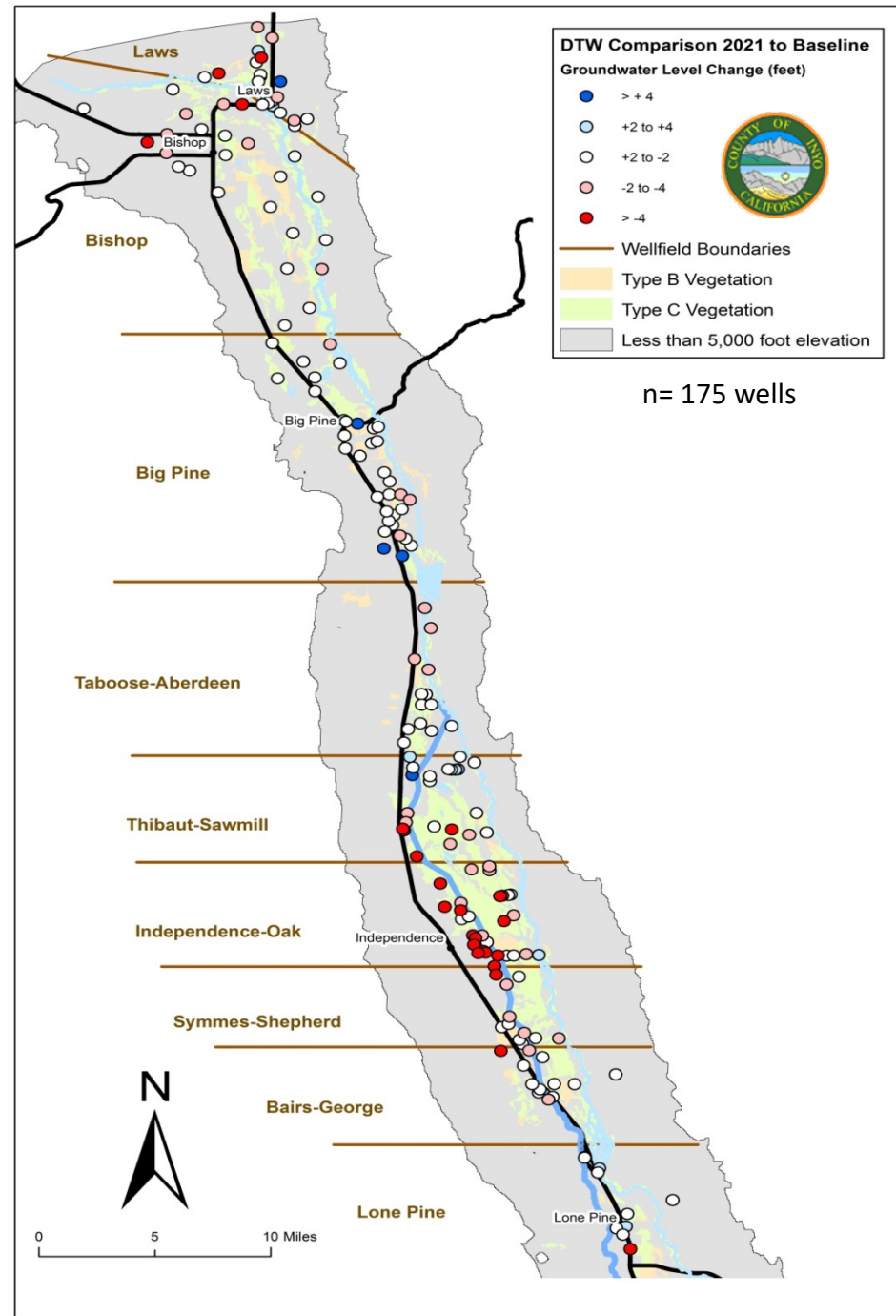
Wellfield	2020-2021 change	2021 average from baseline
	ft	ft
Laws	-4.3	-0.7
Big Pine	-0.6	0.9
Taboose-Aberdeen	-3.2	-1.5
Thibaut-Sawmill	-1.5	3.0
Independence-Oak	-1.1	-3.8
Symmies-Shepherd	-0.3	-5.4
Bairs-George	-2.1	-0.8
Average of all ind. wells	-2.0	-1.5

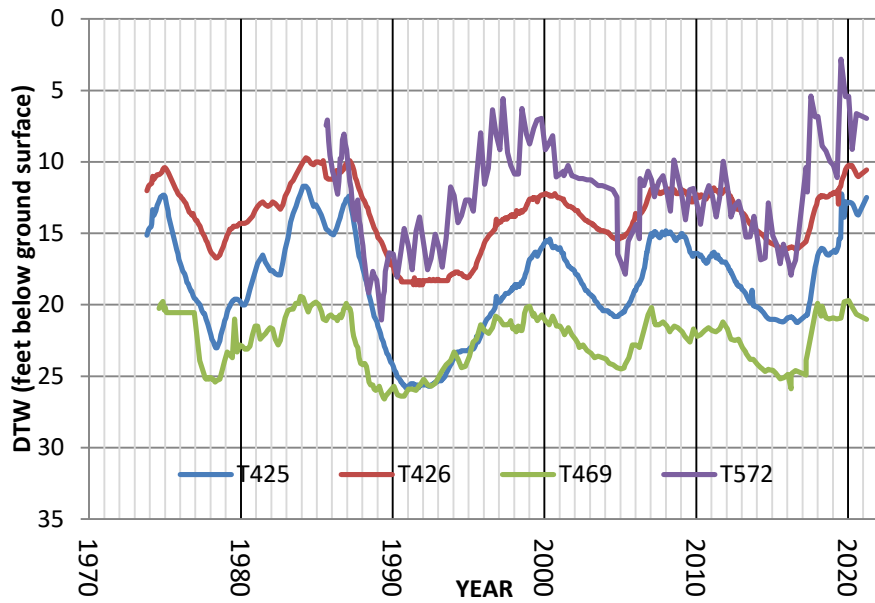
13 of 46 indicator wells are above baseline in April 2021

April 2021 DTW Conditions

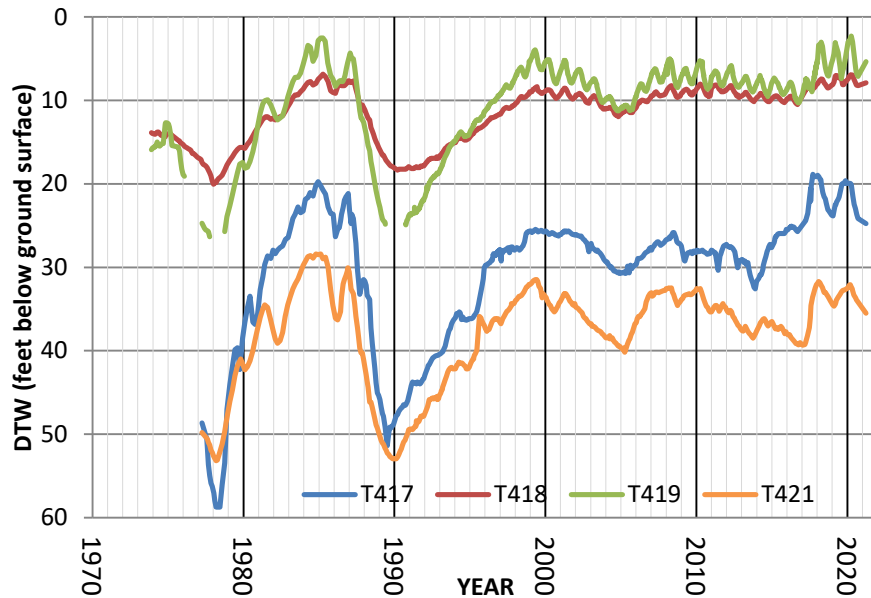
Some wellfields near or below baseline
but DTW below baseline in:

- Parts of Laws and Bishop
- Northern TA
- Southern TS to Symmes-Shepherd



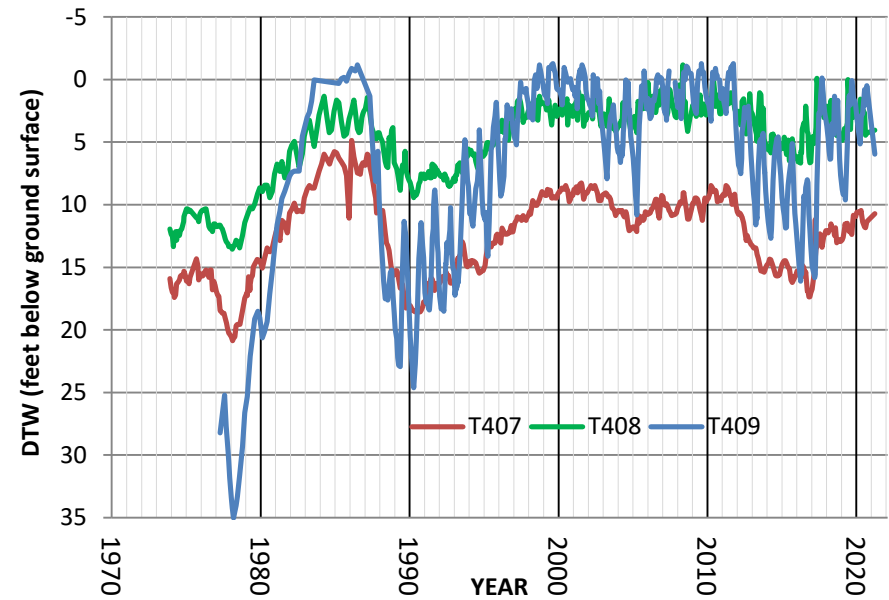


Big Pine

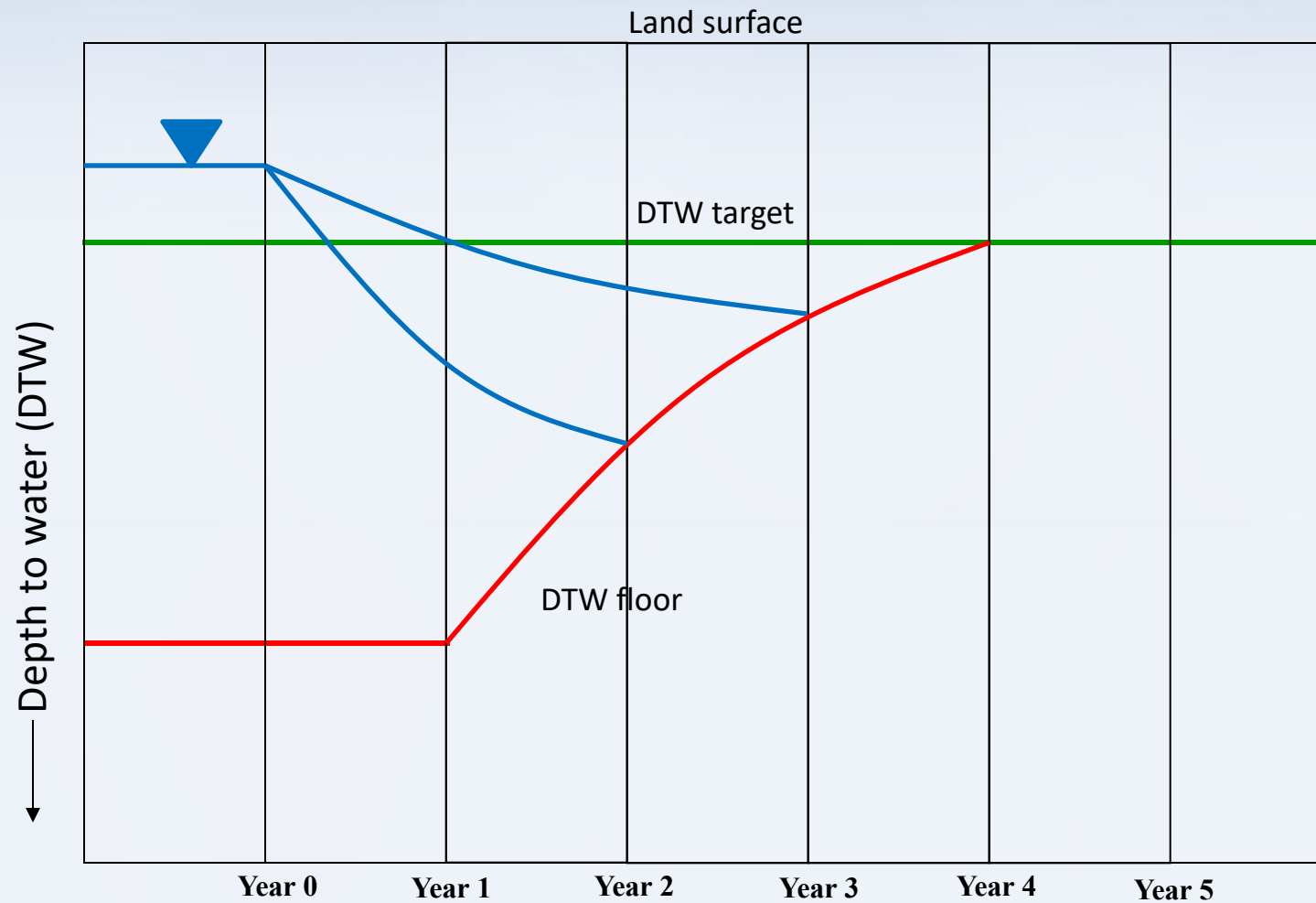


Taboose-Aberdeen

Independence



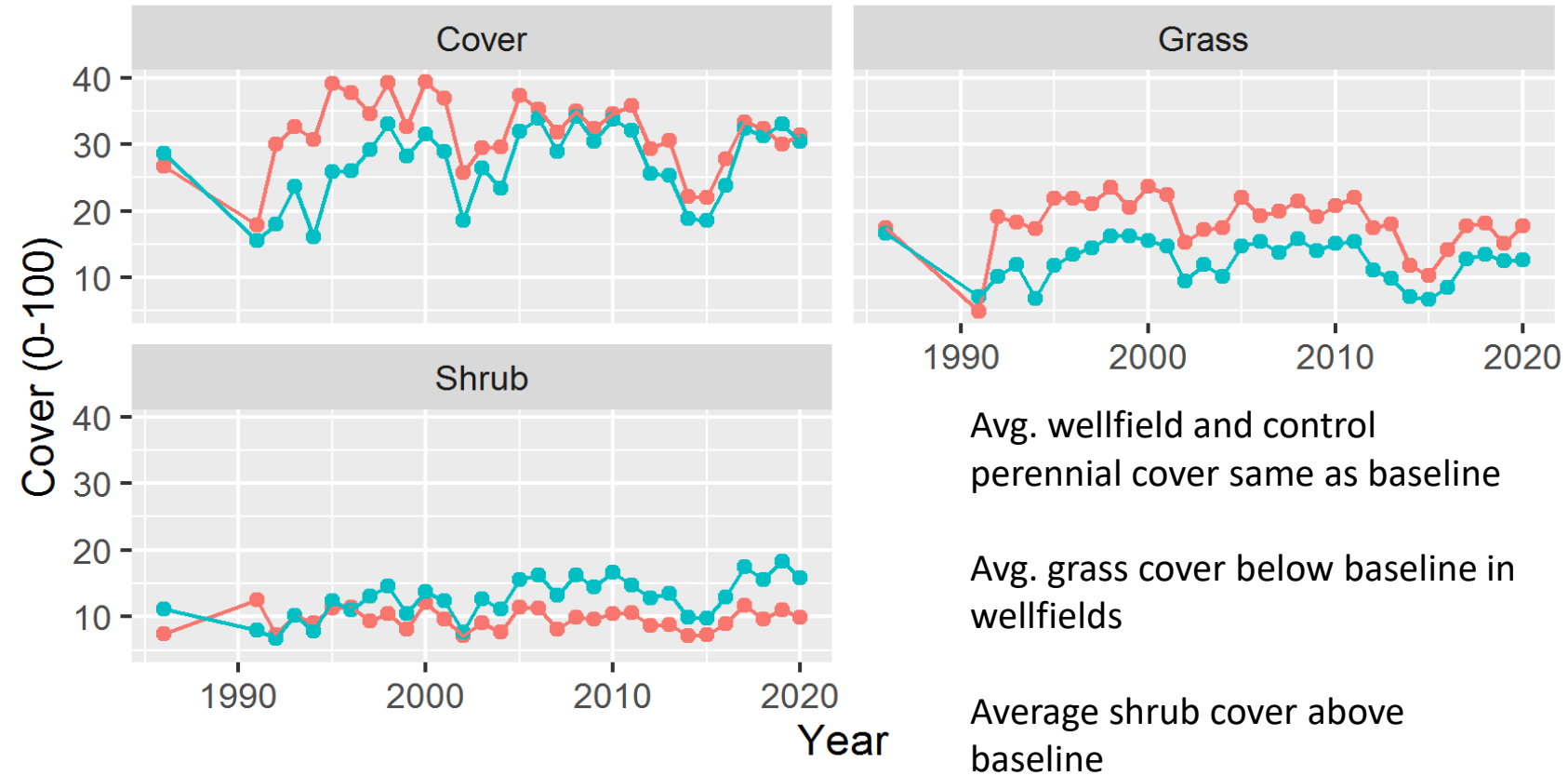
Water Table Management Model





2020 Conditions and Operations

Type Control Wellfield



TIN030 (W/C): W | Type: C | Alkali Meadow
 Entisols Hesperia | ESD: Loamy 5-8" P.Z.
 Geomorphic: alluvial fans

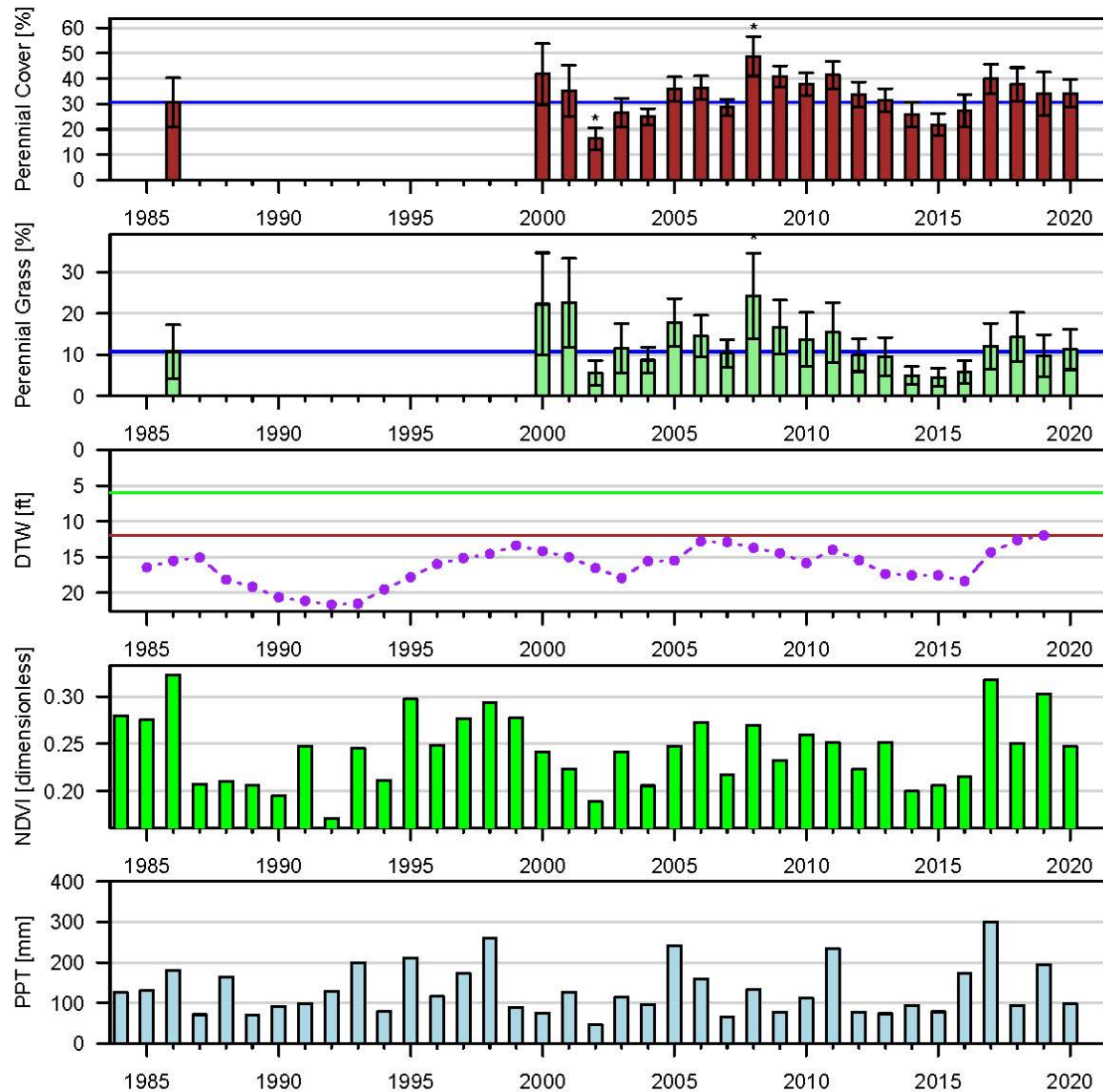
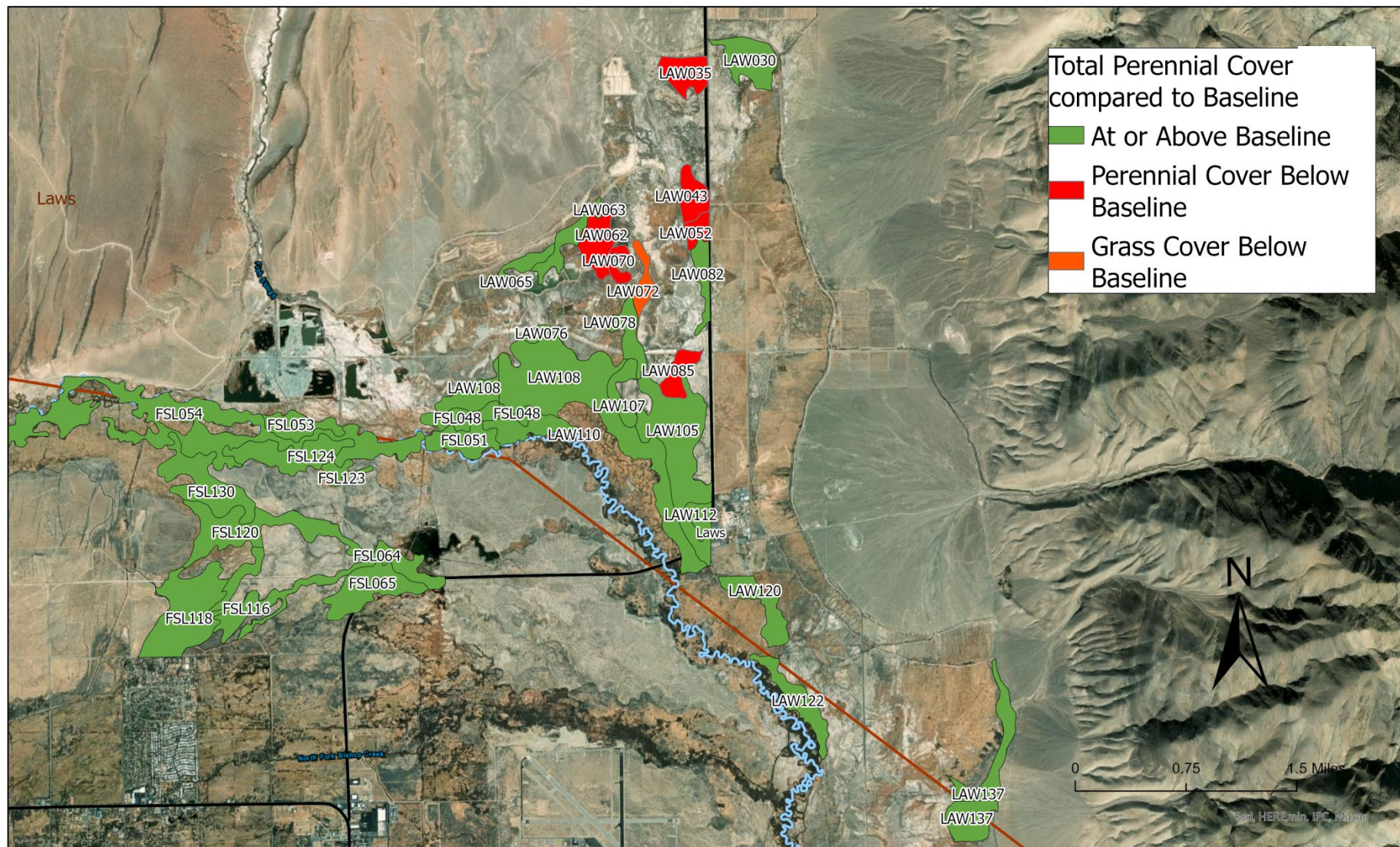
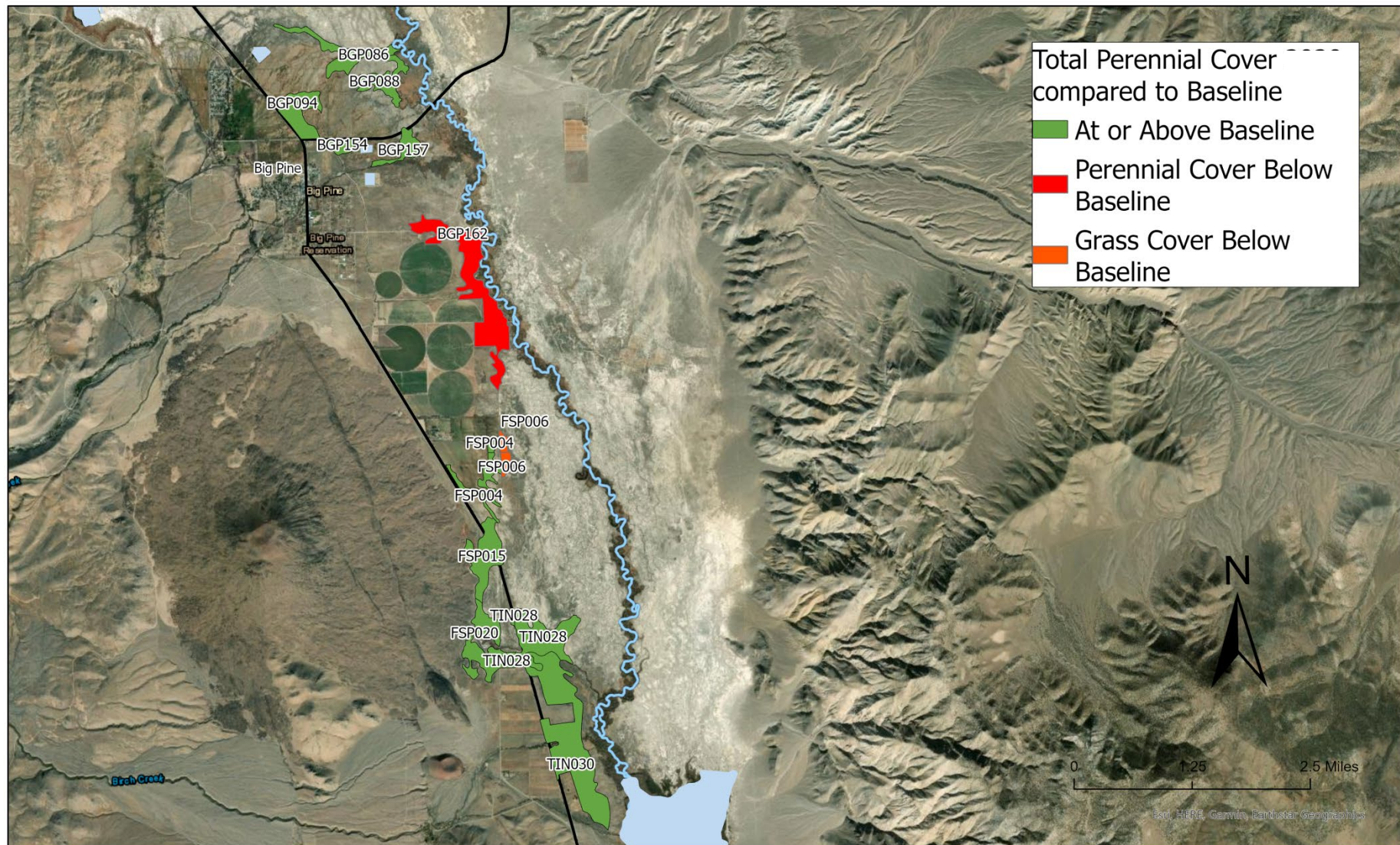
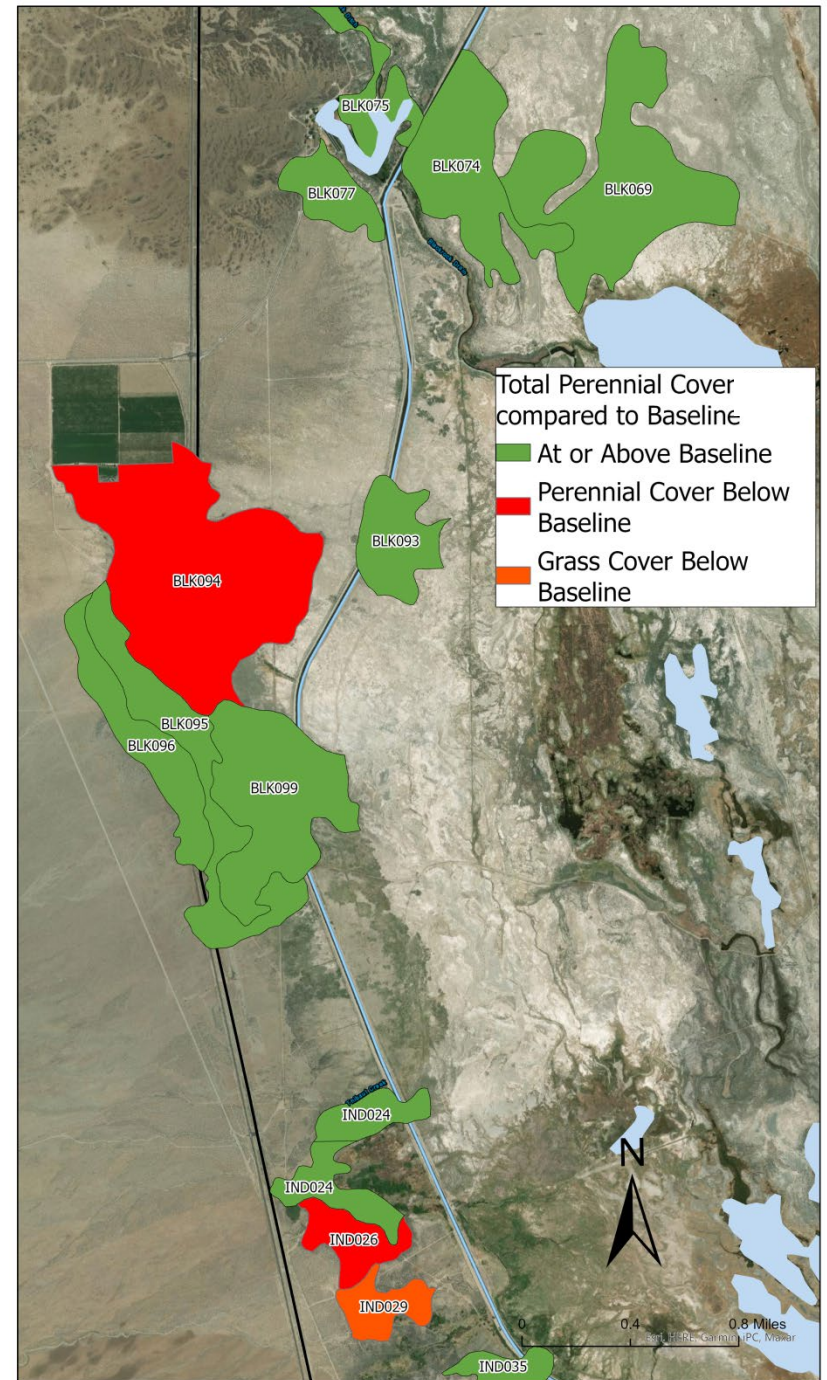
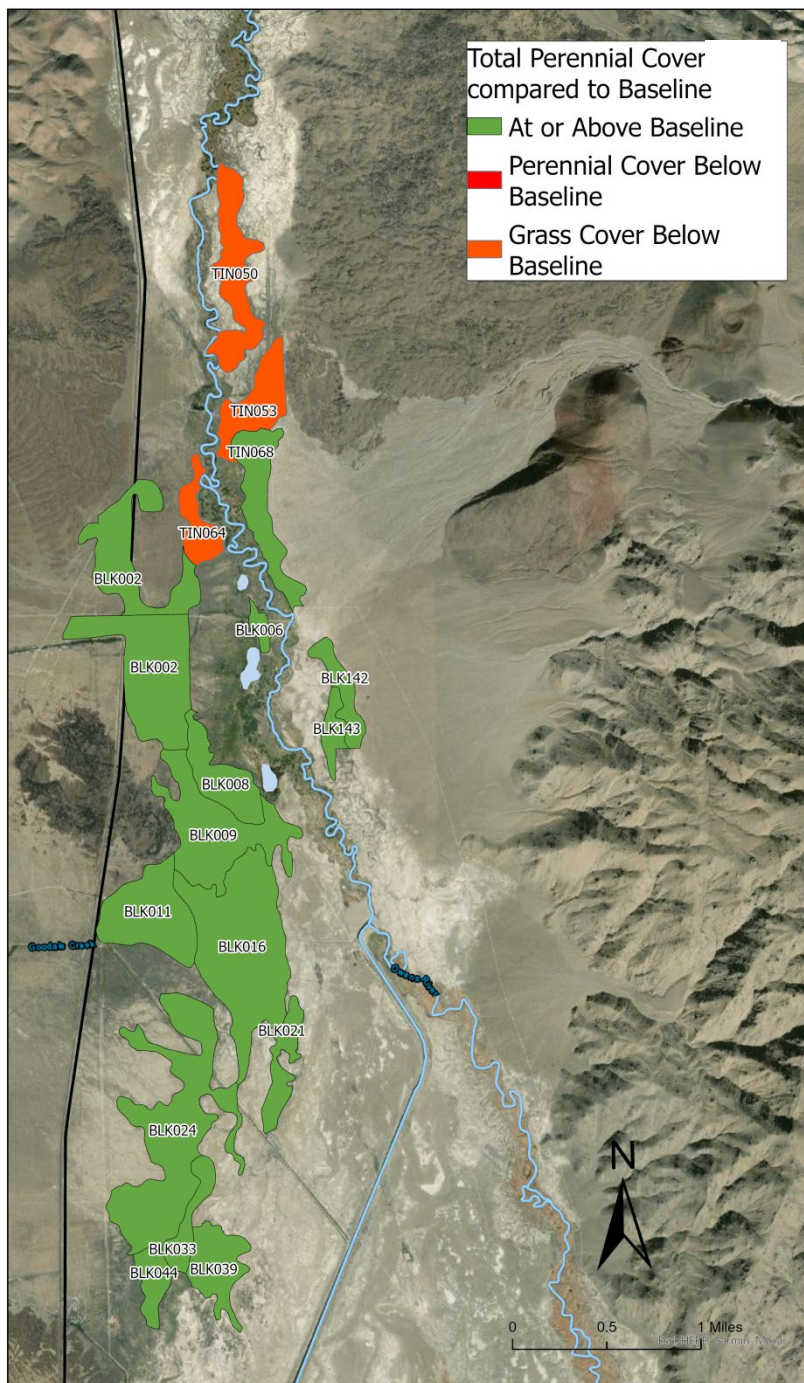
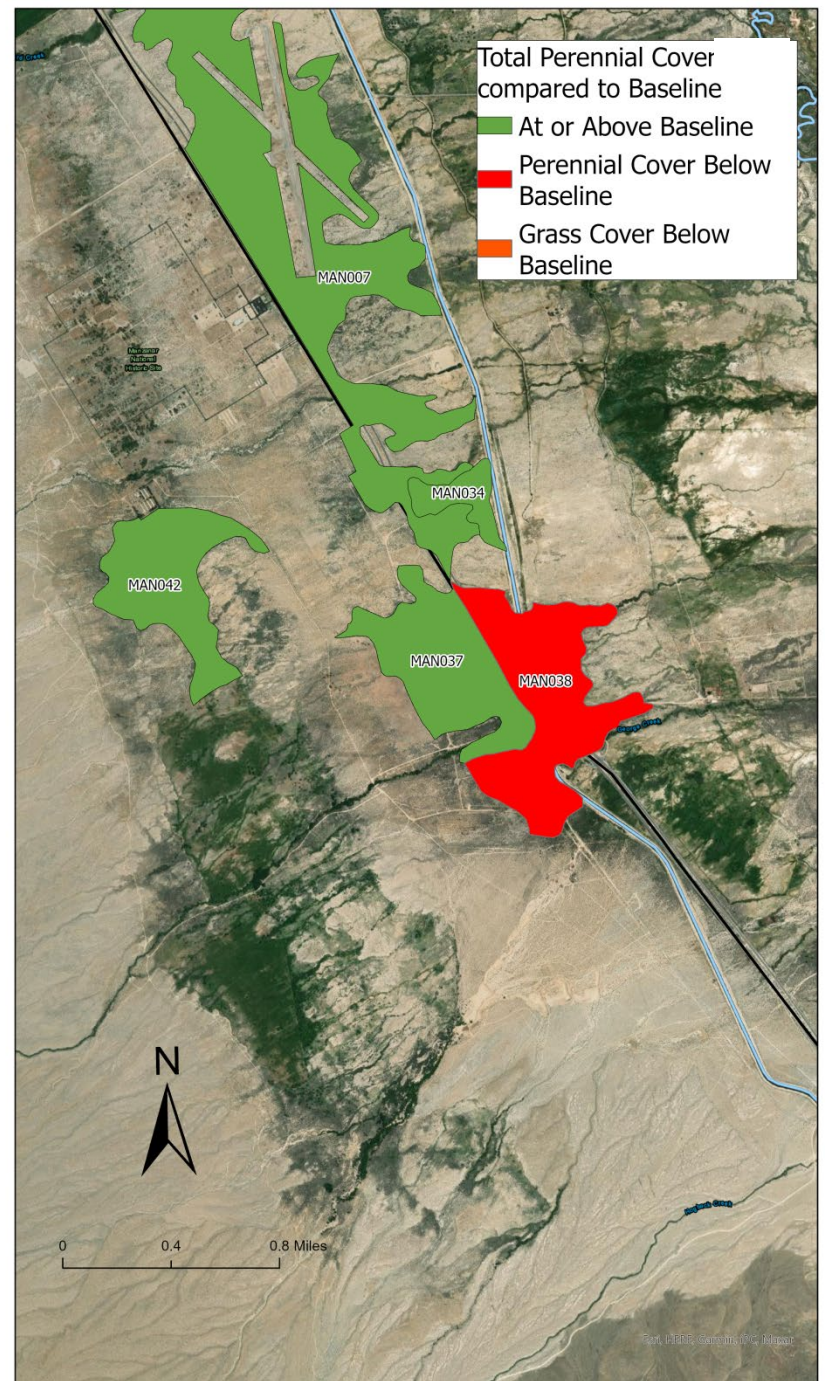
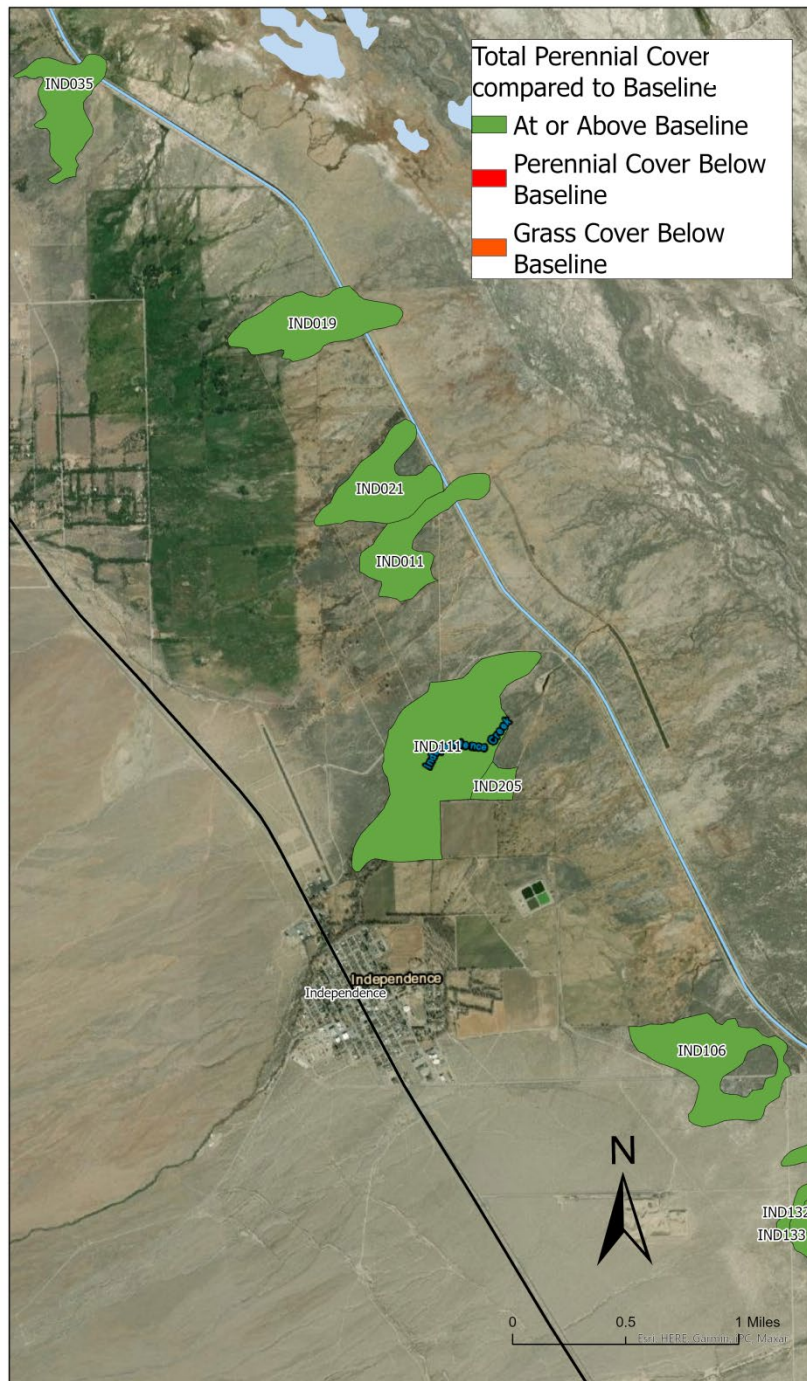


Figure 133: Two-Sample t-Test: Baseline (lpt) vs. reinventory (* $p < 0.05$).
 Baseline sample size ($n = 12$). Current year sample size ($n = 24$). Error bars = 95% CI.











Water Agreement Process

Inyo/LA Water Agreement Section IV.D "Annual Operations Plan"

- Draft plan provided by April 20th each year
- County has 10 days to review and provide comments
- Technical Group meeting within 10 days to review County's comments
- LADWP has 10 days to finalize the Operations Plan



2021-2022 LADWP Operations Plan

Table 1.1. Eastern Sierra Runoff Forecast for 2021-22 Runoff Year

**2021 EASTERN SIERRA
RUNOFF FORECAST
April 1, 2021**

APRIL THROUGH SEPTEMBER RUNOFF

	MOST PROBABLE VALUE		REASONABLE MAXIMUM	REASONABLE MINIMUM	LONG-TERM MEAN
	(Acre-feet)	(% of Avg.)	(% of Avg.)	(% of Avg.)	(1966 - 2015) (Acre-feet)
MONO BASIN:	53,900	53%	66%	41%	100,782
OWENS RIVER BASIN:	144,900	48%	62%	35%	299,885

APRIL THROUGH MARCH RUNOFF

	MOST PROBABLE VALUE		REASONABLE MAXIMUM	REASONABLE MINIMUM	LONG-TERM MEAN
	(Acre-feet)	(% of Avg.)	(% of Avg.)	(% of Avg.)	(1966 - 2015) (Acre-feet)
MONO BASIN:	68,800	58%	71%	44%	119,103
OWENS RIVER BASIN:	226,800	55%	68%	43%	409,199

MOST PROBABLE - That runoff which is expected if median precipitation occurs after the forecast date.

REASONABLE MAXIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average once in 10 years.

REASONABLE MINIMUM - That runoff which is expected to occur if precipitation subsequent to the forecast is equal to the amount which is exceeded on the average 9 out of 10 years.

Runoff Forecast

Owens Valley runoff: 55% of normal (226,800 ac-ft)



2021-2022 LADWP Operations Plan

Planned Uses in the Owens Valley

Table 1.8. Water Uses on City of Los Angeles Owned Lands in Owens Valley – Actual Use in 1981-82 and Planned Use in 2021-22 Runoff Year (acre-feet)

Use	April		May		1981	TOTAL Apr-Sep	
	1981	2021	1981	2021		1981	2021
Irrigation	3,980	5,100	7,958	7,060	10,370	46,403	40,420
Stockwater	1,141	880	1,319	960	1,270	7,487	5,430
E / M	0	1,090	0	1,210		0	6,940
LORP	0	830	0	1,300		0	13,980
Rec. & Wildlife	379	490	804	680	1,160	6,585	4,190
1600 ACFT Proj.	0	80	0	90		0	510
Total	5,500	8,470	10,081	11,300	12,770	60,475	71,470

Use	October		November		December	TOTAL Oct-Mar		TOTAL Apr-Mar	
	1981	2021	1981	2021	1981	81-82	21-22	81-82	21-22
Irrigation	263	160	0	30		277	340	46,680	40,760
Stockwater	1,065	940	1,045	960	1,070	6,275	5,060	13,762	10,490
E / M	0	370	0	210		0	980	0	7,920
LORP	0	1,250	0	1,020		0	3,520	0	17,500
Rec. & Wildlife	781	970	713	570	570	3,326	2,920	9,911	7,110
1600 ACFT Proj.	0	70	0	140		0	1,090	0	1,600
Total	2,109	3,760	1,758	2,930	1,640	9,878	13,910	70,353	85,380

2021-2021
Irrigation: 40,760
Stockwater: 10,490

1981-1982
Irrigation: 46,680
Stockwater: 13,762



2021-2022 LADWP Operations Plan

LADWP Proposed Groundwater Pumping

Table 1.6. Planned Owens Valley Pumping for the 2021-22 Runoff Year (acre-feet)

Month	Laws	Bishop	Big Pine	Taboose-Aberdeen	Thibaut-Sawmill	Indep.-Oak	Symmes-Shepherd	Bairs-Georges	Lone Pine	TOTAL
April	1,150-1,200	1,620	1,750-1,960	425-450	667-880	980-1,100	200	80-100	120	6,992-7,630
May	1,150-1,200	1,620	1,750-1,960	425-450	667-880	980-1,100	200	80-100	120	6,992-7,630
June	1,200-1,345	1,620	1,750-1,960	425-450	667-880	980-1,100	200	0-150	120	6,962-7,825
July	1,200-1,345	1,620	1,750-1,960	455-450	667-880	980-1,100	200	0-150	120	6,992-7,825
August	1,150-1,200	1,620	1,750-1,960	510-450	667-880	980-1,100	200	80-150	140	7,097-7,700
September	1,150-1,200	1,620	1,750-1,960	510-450	667-880	960-1,100	200	80-230	140	7,077-7,780
October	500	380	1,700-1,960	425-1,100	666-960	190-370	0-285	80-230	30	3,971-5,815
November	490-500	380	1,660-1,960	425-1,100	667-960	190-370	0-285	80-230	30	3,922-5,815
December	430	380	1,660-1,960	425-1,100	666-960	190-370	0-285	80-230	20	3,851-5,735
January	430	380	1,660-1,800	425-1,100	666-960	190-370	0-285	80-230	20	3,851-5,575
February	25	380	1,660-1,800	425-1,100	666-960	190-360	0-280	80-150	20	3,446-5,075
March	25	380	1,660-1,760	425-680	667-920	190-360	0-280	80-150	20	3,447-4,575
TOTAL	8,900-9,400	12,000	20,500-23,000	5,300-8,880	8,000-11,000	7,000-8,800	1,200-2,900	800-2,100	900	64,600-78,980

Between 64,600 and 78,980 AF pumping planned for 2021-2022



2021-2022 LADWP Operations Plan

Indicator Well Predictions (n =46)

Pumping: 64,600 AF

Indicator wells predict an average 1 foot decline in DTW
DTW declines in 34 indicator wells (exceptions in TS, IO, SS, BG)
DTW above baseline in 6 wells in central BP, TS and BG

Pumping: 78,980 AF

Indicator wells predict an average 1.6 foot decline in DTW
DTW declines in 41 indicator wells
DTW only above baseline in 3 wells in TS



April 2022 Groundwater Levels at Indicator Wells

Wellfield	2022 average change LADWP, 78,980	2022 average from baseline, 78,980	2022 avg. change Minimum, 54,445
	ft	ft	ft
Laws	-3.2	-3.8	-2.3
Big Pine	-1.9	-1.0	-1.3
Taboose-Aberdeen	-1.1	-2.5	0.8
Thibaut-Sawmill	-0.9	+2.1	0.3
Ind.-Oak	-1.3	-5.0	-0.5
Symmes-Shepherd	-0.3	-5.7	0.2
Bairs-George	-1.4	-2.2	0.2



April 2022 Groundwater Levels at Indicator Wells

Predicted water levels relative to baseline

Wellfield	2022 average change LADWP, 78,980	2022 average from baseline, 78,980	2022 avg. change ICWD, 59,377
	ft	ft	ft
Laws	-3.2	-3.8	-2.3
Big Pine	-1.9	-1.0	-1.3
Taboose-Aberdeen	-1.1	-2.5	0.0
Thibaut-Sawmill	-0.9	+2.1	0.1
Ind.-Oak	-1.3	-5.0	-0.5
Symmes-Shepherd	-0.3	-5.7	0.0
Bairs-George	-1.4	-2.2	0.0



LADWP and ICWD Proposed Groundwater Pumping

Wellfield	LADWP Low (64,600 AF)	LADWP High (78,980AF)	In-Valley Min (54,445 AF)	ICWD recommended (59,377AF)
Laws	8,900	9,400	6,000	6000
Bishop	12,000	12,000	12,000	12,000
Big Pine	20,500	23,000	19,225	19,225
Taboose-Aberdeen	5,300	8,880	300	4,000
Thibaut-Sawmill	8,000	11,000	8,000	8,432
Independence-Oak	7,000	8,800	6,420	6,420
Symmes-Shepherd	1,200	2,900	1200	1,800
Bairs-George	800	2,100	400	600
Lone Pine	900	900	900	900



2021-2022 LADWP Operations Plan

Summary

- Reduced irrigation deliveries compared with 1981-82 anticipating reduced creek flows due to low runoff
- LADWP pumping between 64,600 and 78,980 AF
 - Water levels in most indicator wells will be below baseline in 2021-22
- ICWD recommended pumping 59,377 AF
 - Reduces water level declines near degraded vegetation parcels or where DTW is below baseline.
 - Pumping above minimum if water levels will be stable



