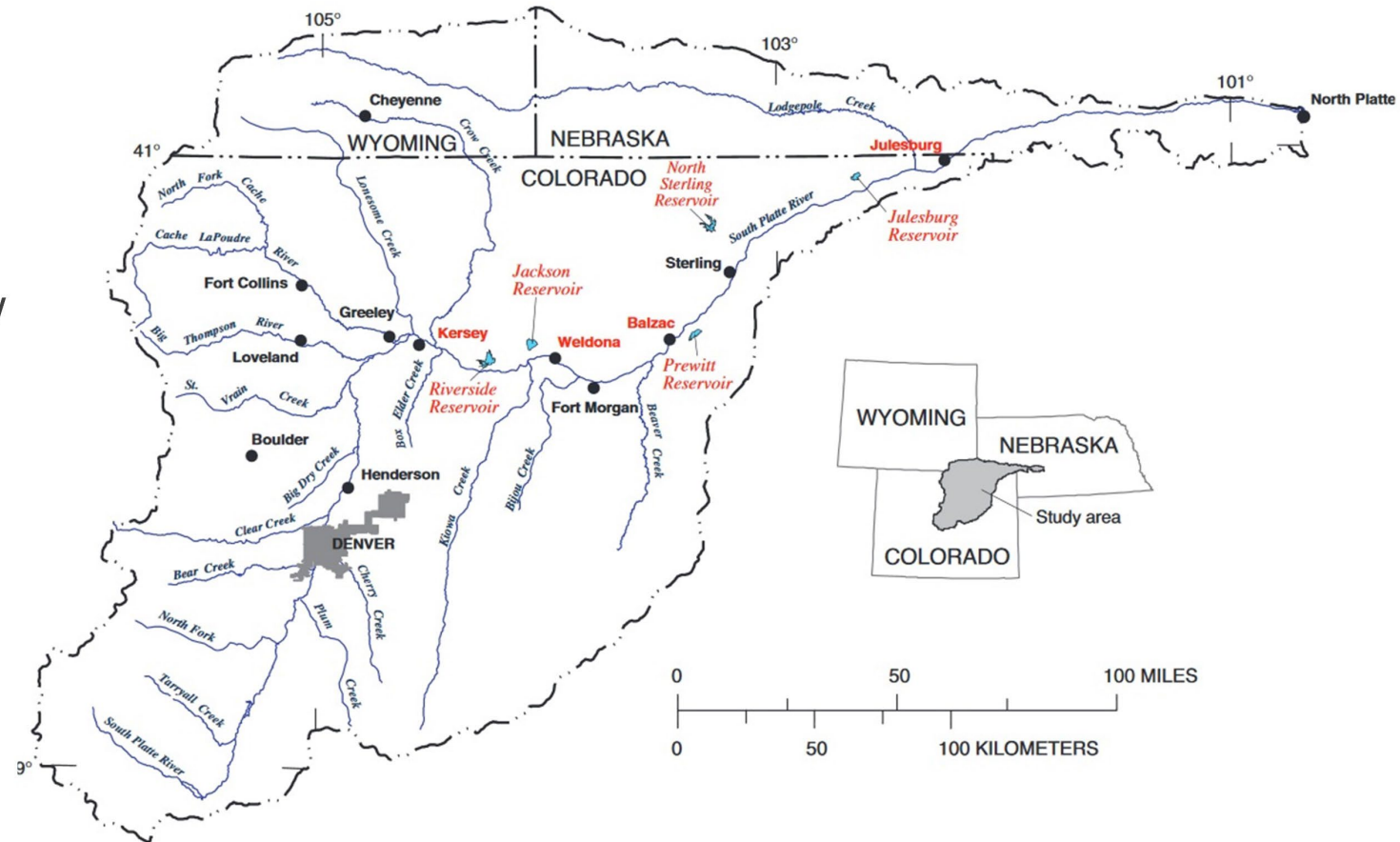


South Platte Compact

- Signed in 1923 and passed by Congress in 1926
- Establishes a 120 cfs (47 KAF) minimum flow during the irrigation season (Western Canal)
- Establishes a 500 cfs minimum flow during the non-irrigation season (Perkins County Canal, not currently developed)



Base from U.S. Geological Survey and U.S. Census Bureau digital data, 1974 to 1993

WAP Projects and Other Brief Water updates

PRRIP Water Advisory Committee

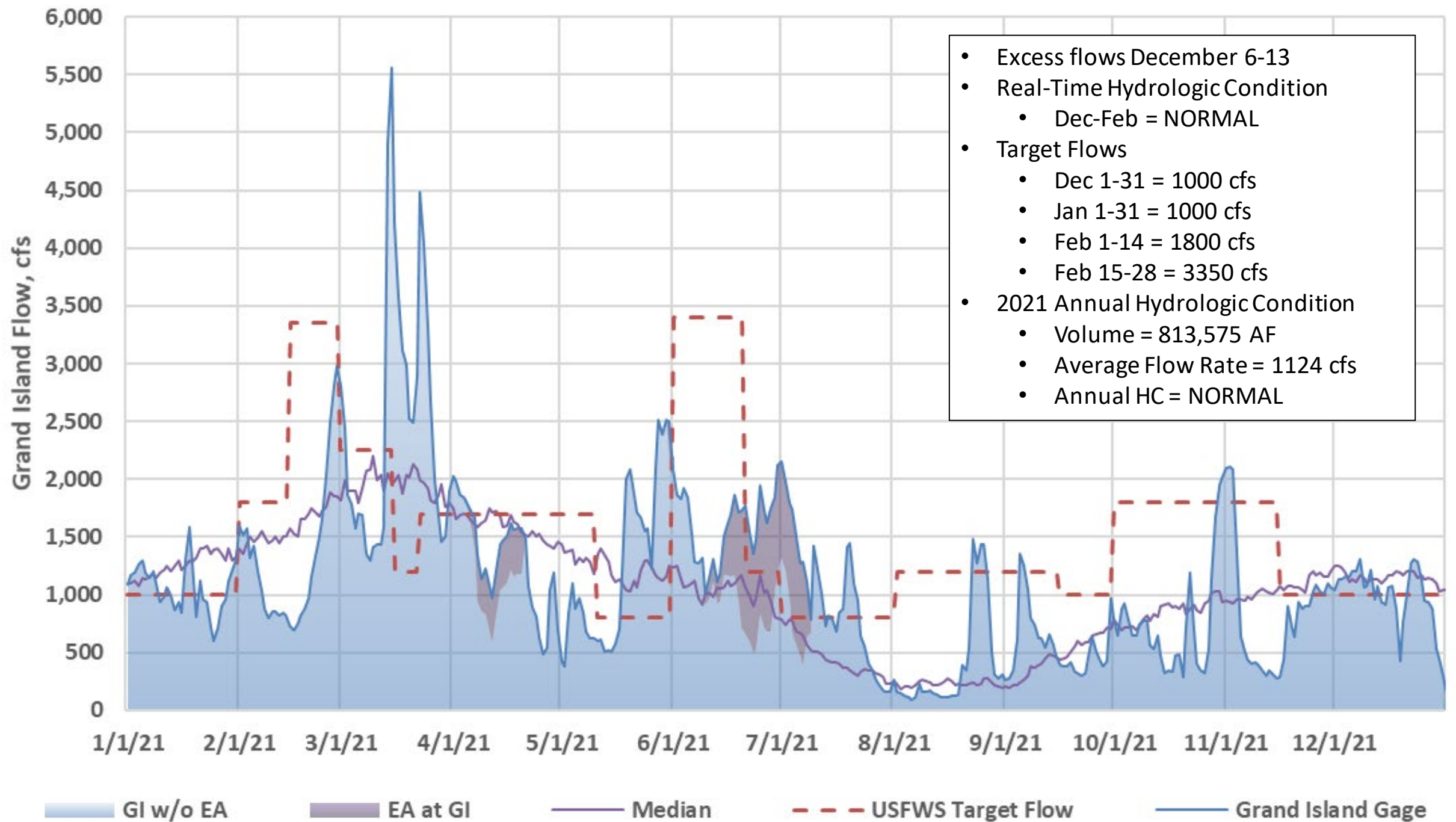
February 1, 2022

Seth M Turner, PE

Leasing and Recharge Projects

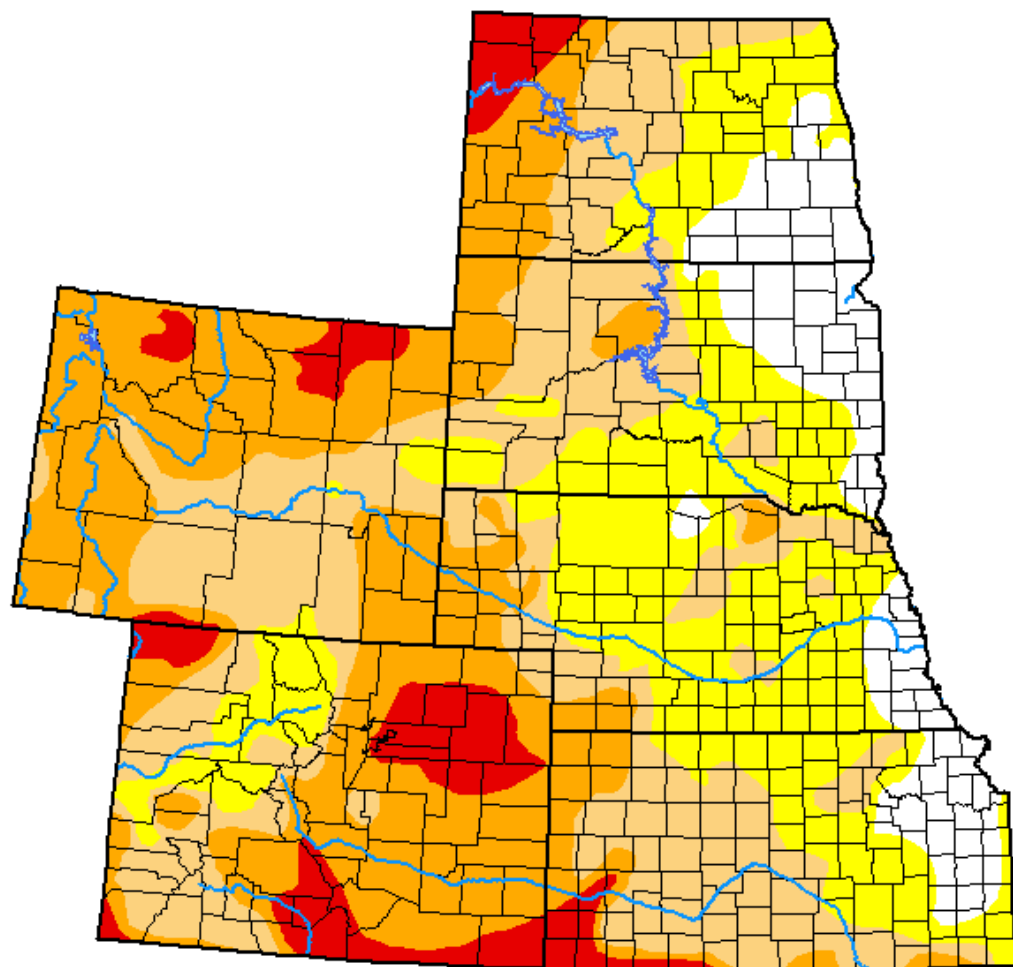
- Phelps Recharge: 688 AF excess flow diversions December 6-13
- Cook Well
 - Pumped 323.9 AF from August 25-December 17
 - Total pumping for 2021 was 541.12 AF
- CNPPID Irrigator Lease
 - 1,157 acres enrolled for 2022

Platte Basin Hydrology



U.S. Drought Monitor High Plains

January 25, 2022
(Released Thursday, Jan. 27, 2022)
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	9.71	90.29	65.88	36.28	7.37	0.00
Last Week <i>01-18-2022</i>	11.74	88.26	65.34	35.58	6.79	0.00
3 Months Ago <i>10-26-2021</i>	16.96	83.04	63.10	33.07	7.19	0.40
Start of Calendar Year <i>01-04-2022</i>	12.84	87.16	64.81	34.56	8.63	0.00
Start of Water Year <i>09-28-2021</i>	14.24	85.76	63.58	43.69	18.57	0.86
One Year Ago <i>01-26-2021</i>	6.65	93.35	85.76	51.74	25.51	5.09

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

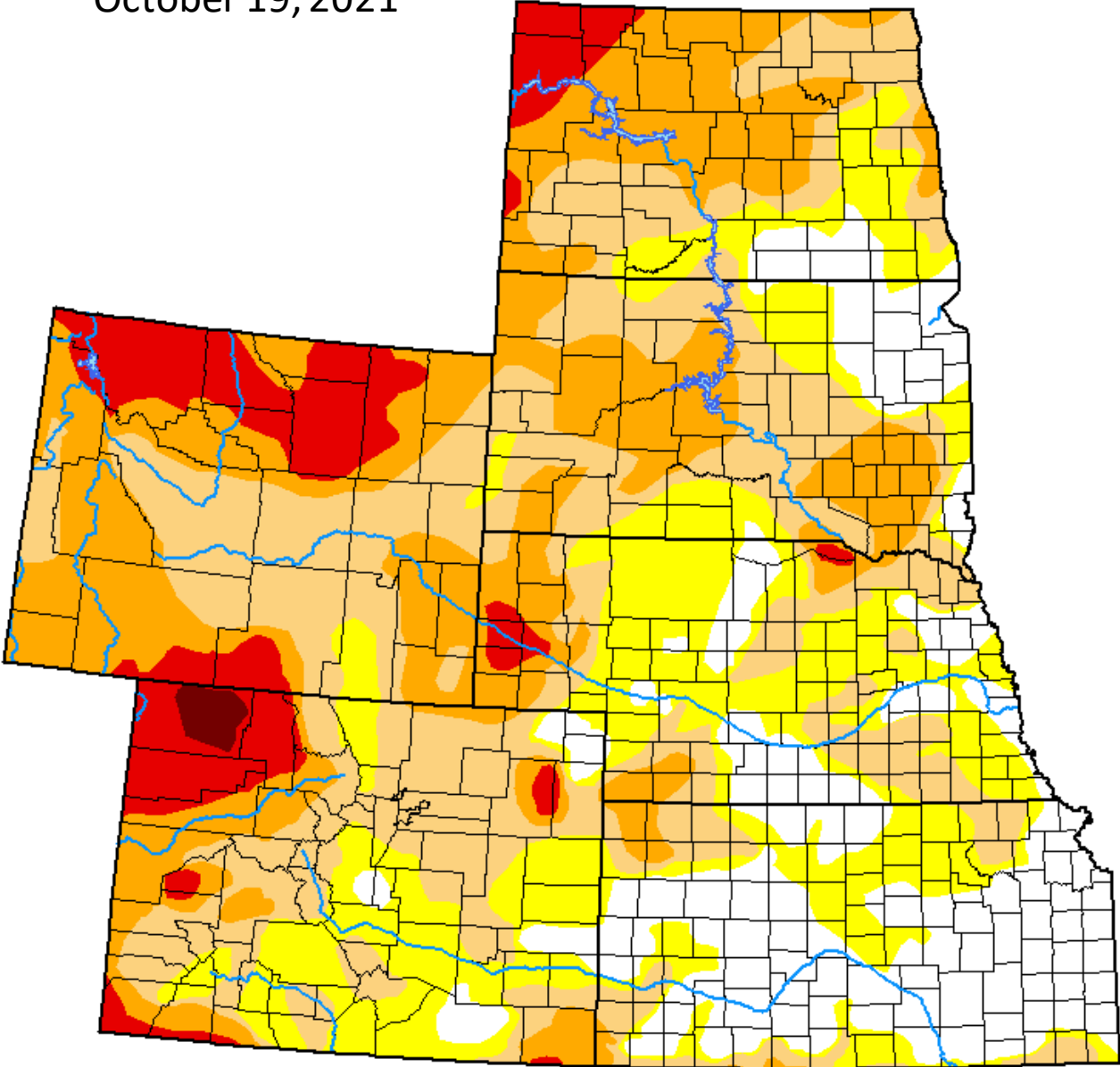
Author:

Brad Rippey
U.S. Department of Agriculture

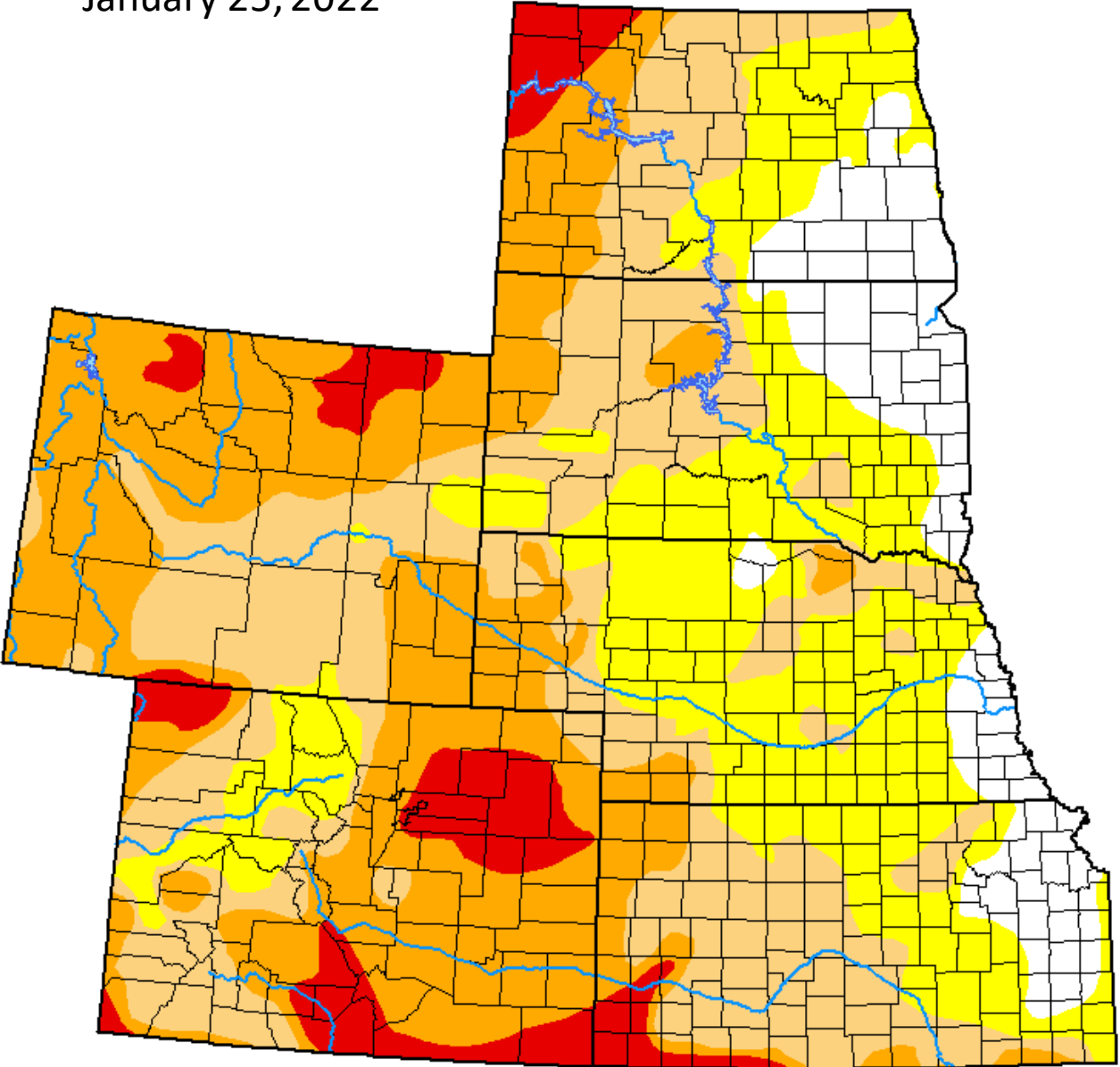


droughtmonitor.unl.edu

October 19, 2021



January 25, 2022



Lake McConaughy EA

- Lake McConaughy at 64.6% of capacity (1,125,200 AF) as of 1/31/2022
- EA Volume ~122kaf at end of October
- 10% of Storable Natural Inflows (SNI) credited during non-irrigation season (volume TBD)
- USFWS finalized WY2022 AOP in late December

Table 1: Priority EA target flow releases for WY2022

<i>Dates</i>	<i>Target Flow (cubic feet/sec)</i>		<i>Purpose</i>	<i>Priority</i>	<i>Median Normal/Dry Shortage (kaf)</i>
	<i>Wet/Normal</i>	<i>Dry</i>			
Mar 23-May 10	2,400/2,400	1,700	Whooping crane	Medium	83.9/82.8
May 20 -Jun 20	3,400/3,400	800	Channel maintenance	Medium	153/23.5
Jun 1 - Jul 15	2,000/2,000	2,000	Germination suppression	High	72.9/98.9
Jun 21 – Sep 15	1,200/1,200	800	Terns & plovers, and aquatic community	Low	127/126

SIWY
704 cfs

MBWY
67 cfs

SEMINOE RESERVOIR (SEMR)
Top 1017273 af, 6357.0 ft
Current 287926 af, 6301.4 ft
To fill 729347 af, 55.6 ft
Computed Inflow 442 cfs

SWWY
38 cfs

KORTES RESERVOIR (KORR)
Top 4739 af, 6142.0 ft
Current 4712 af, 6141.7 ft
To fill 27 af, 0.3 ft
Computed Inflow 553 cfs
Total Outflow 549 cfs

PATHFINDER RESERVOIR (PATR)
Top 1070000 af, 5852.5 ft
Current 648297 af, 5830.6 ft
To fill 421703 af, 21.9 ft
Computed Inflow 587 cfs

CAWY
0 cfs

PAWY
70 cfs

ALCOVA RESERVOIR (ALCR)
Top 184405 af, 5500.0 ft
Current 157487 af, 5488.6 ft
To fill 26918 af, 11.4 ft
Computed Inflow 418 cfs

GRAY REEF RESERVOIR (GRAR)
Top 1800 af, 5332.0 ft
Current 1523 af, 5330.4 ft
To fill 277 af, 1.6 ft
Computed Inflow 450 cfs
Total Outflow 450 cfs

ORWY
546 cfs

GLENDO RESERVOIR (GLER)
Top 492022 af, 4635.0 ft
Current 284704 af, 4614.1 ft
To fill 207318 af, 20.9 ft
Computed Inflow 546 cfs
Total Outflow 1 cfs

GUERNSEY RESERVOIR (GUER)
Top 45612 af, 4420.0 ft
Current 0 af, 4370.0 ft
To fill 45612 af, 50.0 ft
Computed Inflow 29 cfs
Total Outflow 29 cfs

ICWY
0 cfs

WHWY
27 cfs

FCWY
0 cfs

NORTH PLATTE RIVER BASIN
Data as of 01/29/2022

- Pathfinder Ownership as of 1/29/2022
- 34 Account (Pathfinder EA) = 3,465 AF
- 20 Account (Municipal Account) = 13,018 AF

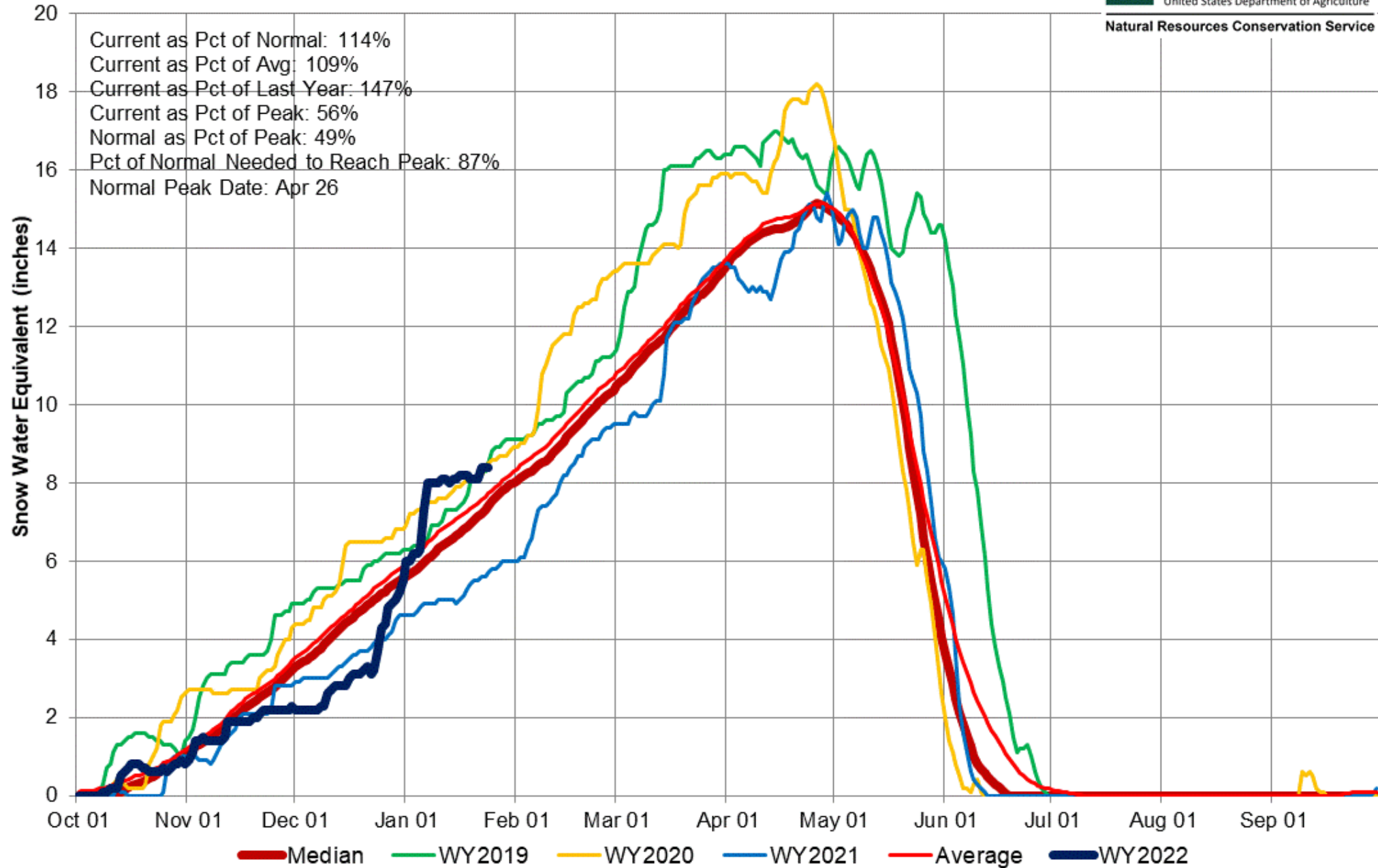
South Platte River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Jan 24, 2022

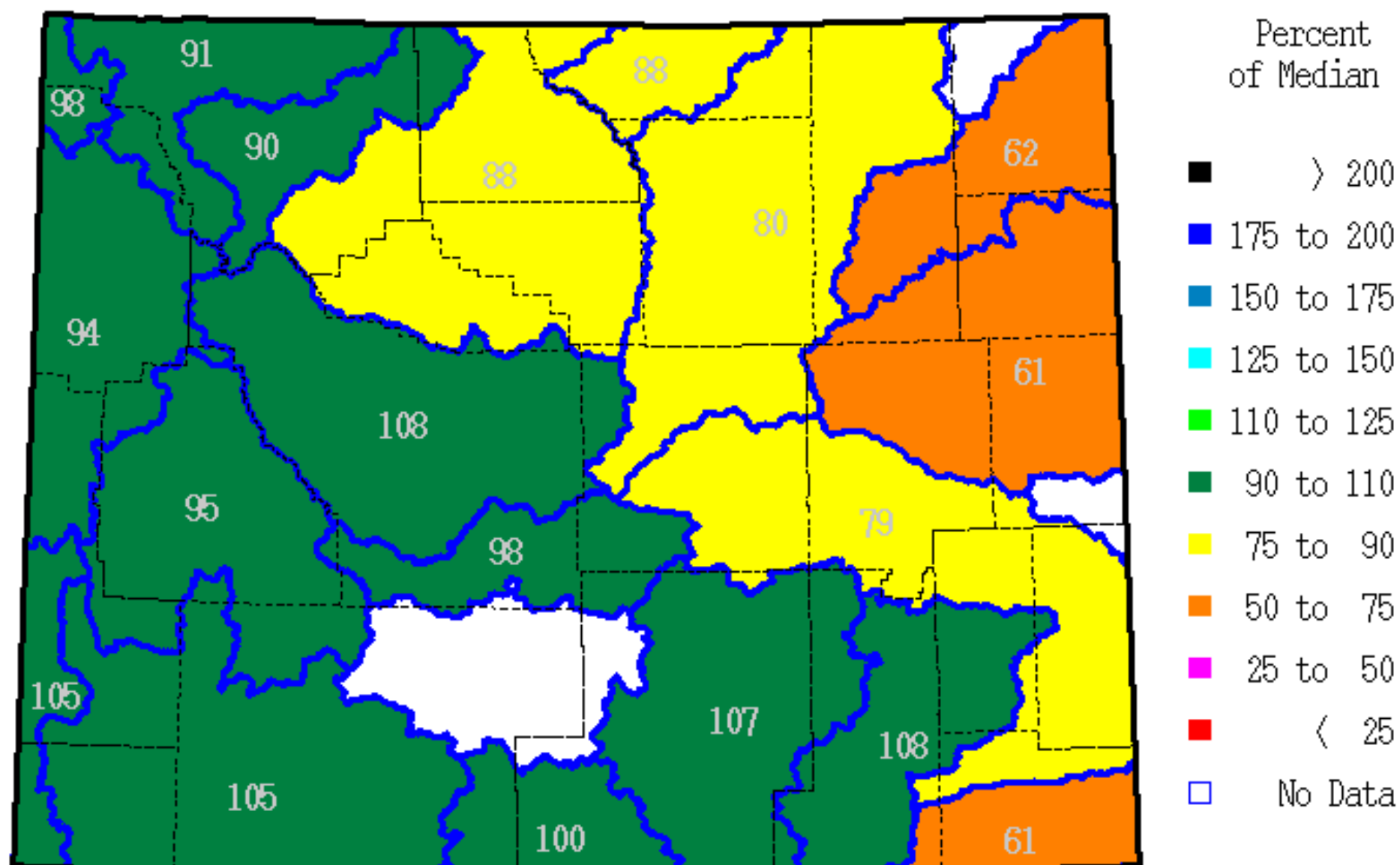


United States Department of Agriculture

Natural Resources Conservation Service



SWE % of Median as of Monday, 31 January 2022



Produced by the Wyoming Water Resources Data System: <http://www.wrds.uwyo.edu>

* = Data may not provide a valid measure of conditions

North Platte Chokepoint

- Disking same areas sprayed in Fall 2021
 - ~43 acres along banks, islands, side channels
 - Landowner permissions
 - RFQ
 - Need to complete before irrigation season
- Bypass Canal
 - Modified flow routing tool (input to channel width modeling)
 - Science Reporting Session (February 15-17)
 - GC Meeting (March 8-9)

2022-2025 Permitting Services RFP

- Proposals
 - RFP released January 5
 - Pre-proposal meeting held January 19
 - Proposals due February 2 @ Noon Central
- Contractor selection
 - GC appointed selection panel in December
 - Selection to be based on proposal only, no interviews
 - Expect to have recommendation at March GC meeting

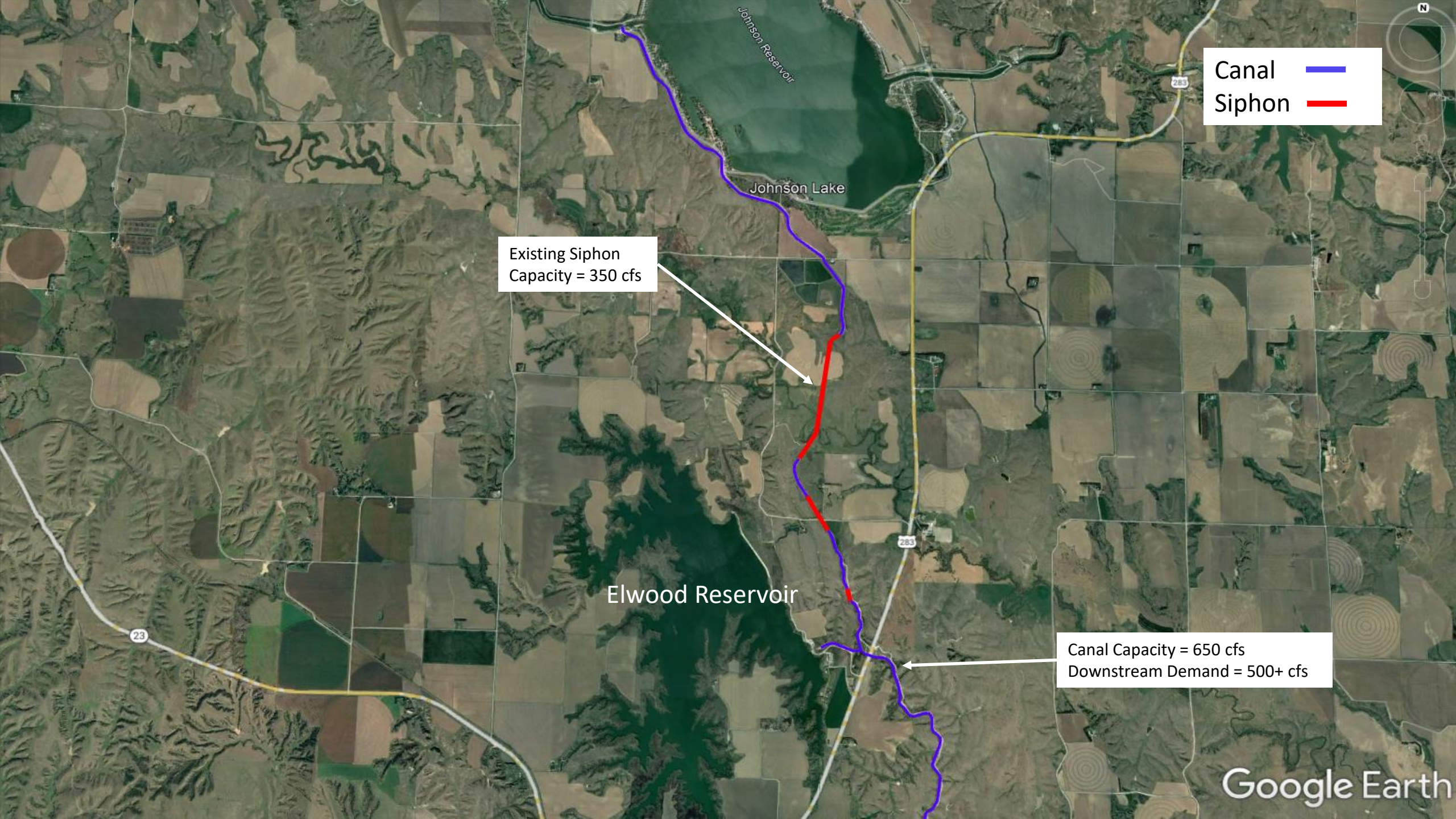
Colorado Depletions Update – North Platte

- DWR reduced 2020 irrigated acres from 97,689 to 96,964.
- Reduced irrigation CU from 81,082 AF to 80,480 AF
- Increased CU underrun from -30,487 AF to -31,088 AF



Elwood Reservoir Projects

2/1/22



Canal ———

Siphon ———

Existing Siphon
Capacity = 350 cfs

Elwood Reservoir

Canal Capacity = 650 cfs
Downstream Demand = 500+ cfs

Elwood Reservoir Background

- Elwood Reservoir was constructed in mid to late 1970s
- Purpose is to supplement canal flows when irrigation demand (up to 500+ cfs) exceeds upstream siphon capacity (350 cfs)
- Water is pumped into Elwood in the spring and released for irrigation
- Maximum water elevation of 2607
- Maximum live storage of 25,700 AF
- Maximum total storage of 37,800 AF

Elwood Reservoir Seepage

- In recent years the average water surface elevation has been higher due to recharge
- In summer of 2019 we noticed significant seepage at the Pump Station Dam
- Hired RJH consultants to investigate
- RJH determined that there was potentially unsafe seepage at the Pump Station Dam and the Main Dam when the WSE is above 2597
- Temporary max WSE 2597 until repairs are made







Elwood Seepage Repair Status

- Maximum WSE temporarily limited to 2597
- 95% Design completed
- Design submitted to the state for review
- State to provide comments by early February
- RJH construction estimate is \$4.2 million
- Seek additional funding
- Construction in 2022 and 2023

New E65 Canal and Siphon

Canal	
Siphon	
New Canal	
New Siphon	

New Canal and Siphon
Capacity = ~ 450 cfs

Existing Siphon
Capacity = 350 cfs

Canal Capacity = 650 cfs
Downstream Demand = 500+ cfs

Existing E65 siphons

- Siphons have been in service for over 80 years
- 78" – 84" steel pipes
- Approximately 7,300 ft in total length
- Capacity is only 350 cfs
- Pipes are near the end of useful life

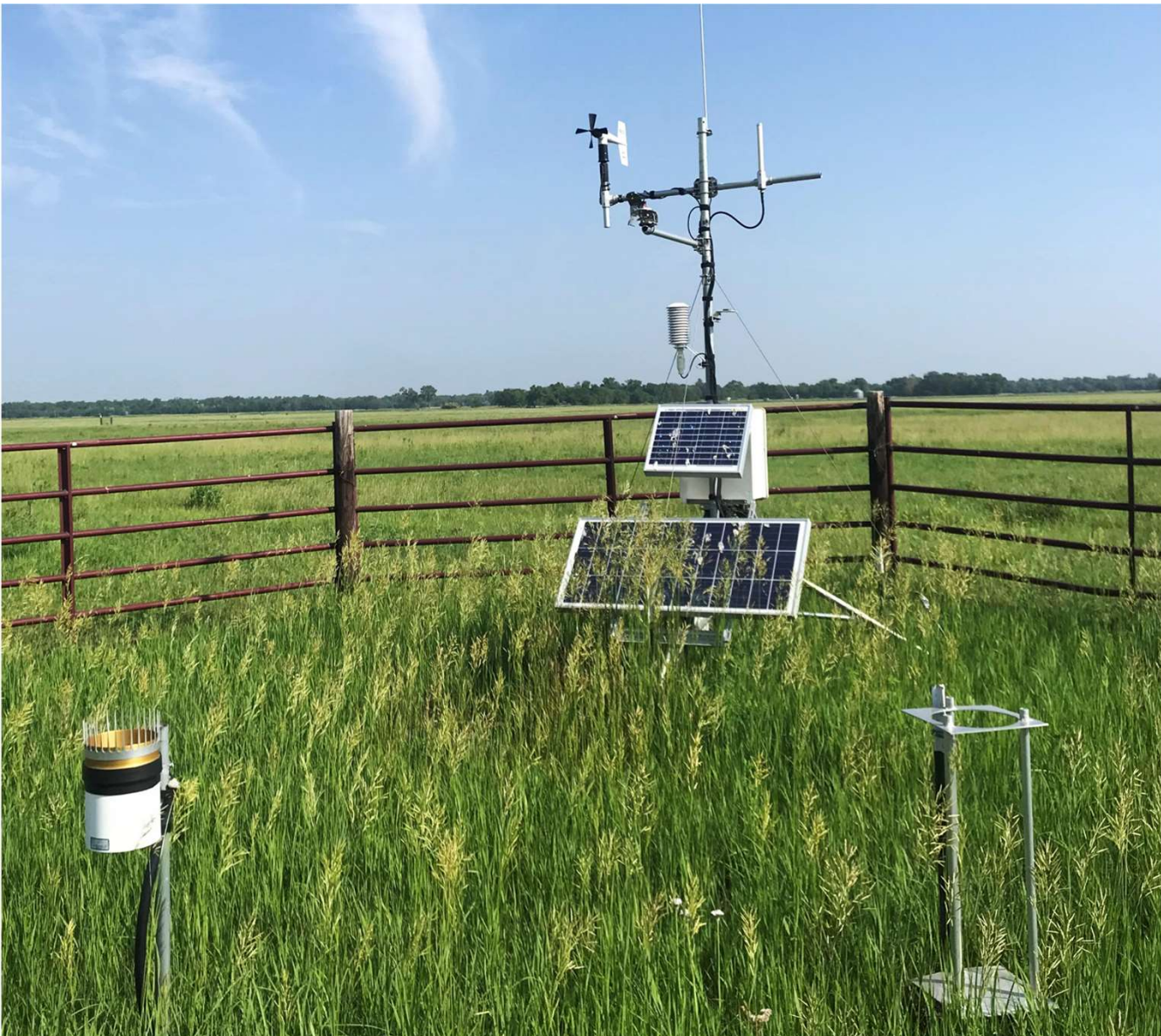
New E65 Canal and Siphon

- Approximately 5,500 ft of new canal and 5,800 ft of new siphon
 - New alignment is approximately 2 miles shorter than existing
- Gravity flow water into Elwood instead of pumping
- Capacity is estimated at approximately 450 cfs
 - Increase conveyance to better meet irrigation demand
 - Increase amount of storage availability in Elwood (ie. Recharge)
- ~102" outside diameter fusion welded HDPE pipe for the siphon
- Save water by allowing us to capture rejected irrigation water in Elwood after rains

New E65 Canal and Siphon Status

- Feasibility Study completed by JEO
- Estimated Construction cost of \$15 million
- Applied for and received a Water Sustainability Fund Grant for \$8.9 million
- Design RFP coming soon
- Construction in 2023 and 2024

Questions?

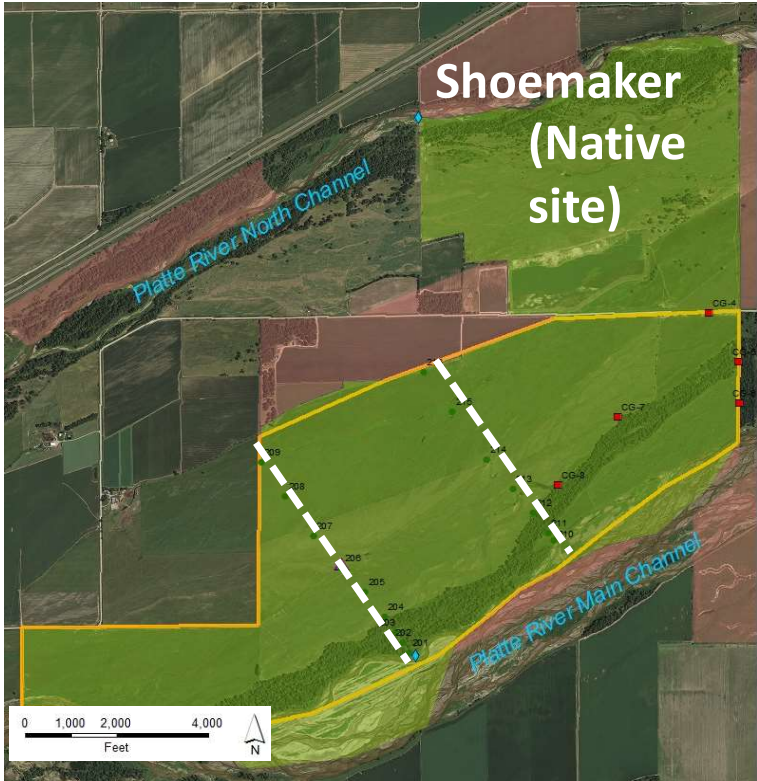
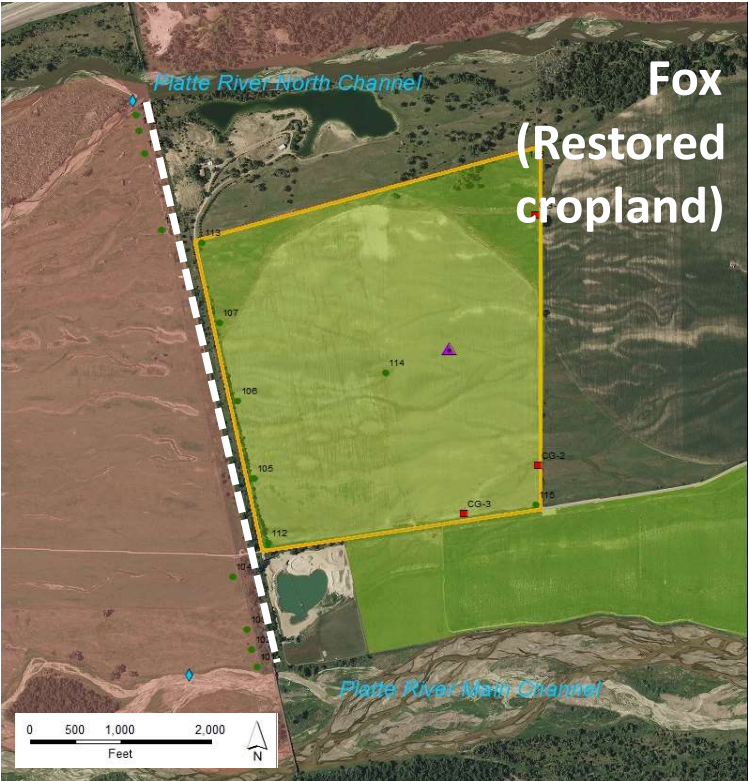


Wet Meadow Hydrology Update

WAC - February 2022
By: Kristen Cognac

Background

Since 2013 - hydrological and climatological monitoring at the Fox and Shoemaker wet meadow sites.



- Conducted comprehensive data QC
- Developed hydrologic study objectives and methodology and presented to the GC
- Tested / calibrated analytical models
- Performed data analysis

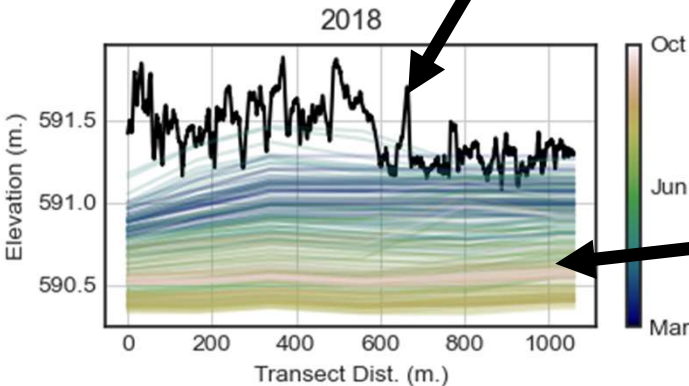
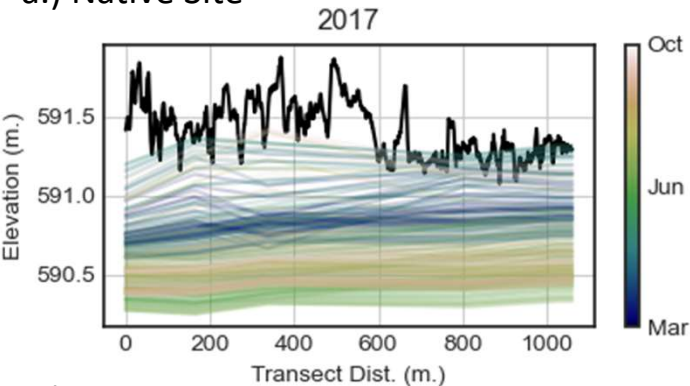
Objectives

1. Quantify relationships between hydrological and meteorological variables and groundwater levels
2. Develop hydrological management targets
3. Develop a tool to inform management decisions.

1. Quantify hydrological, meteorological, GW, wet meadow relationships

Shoemaker Island –
Native, functioning
wet meadow site

a.) Native Site

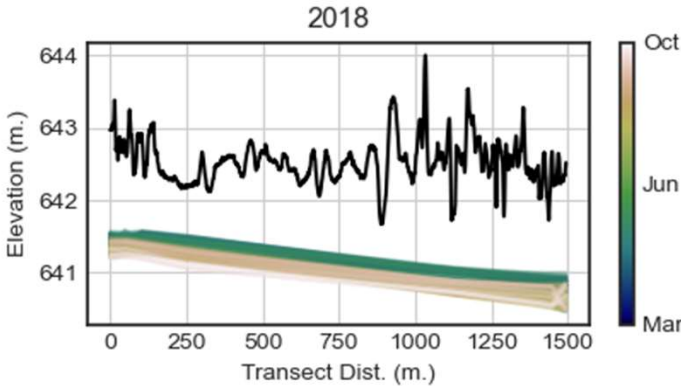
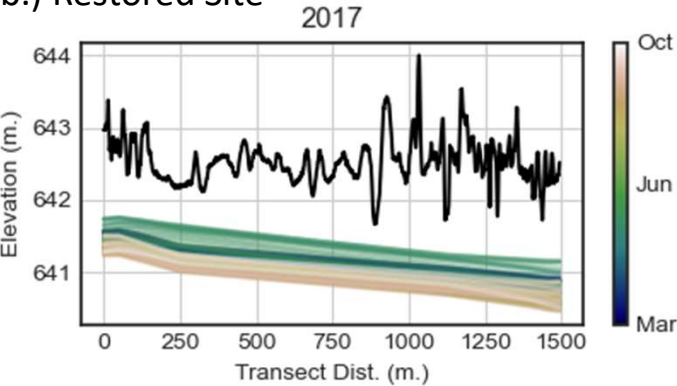


Monitoring transect
ground surface

Daily
groundwater
table

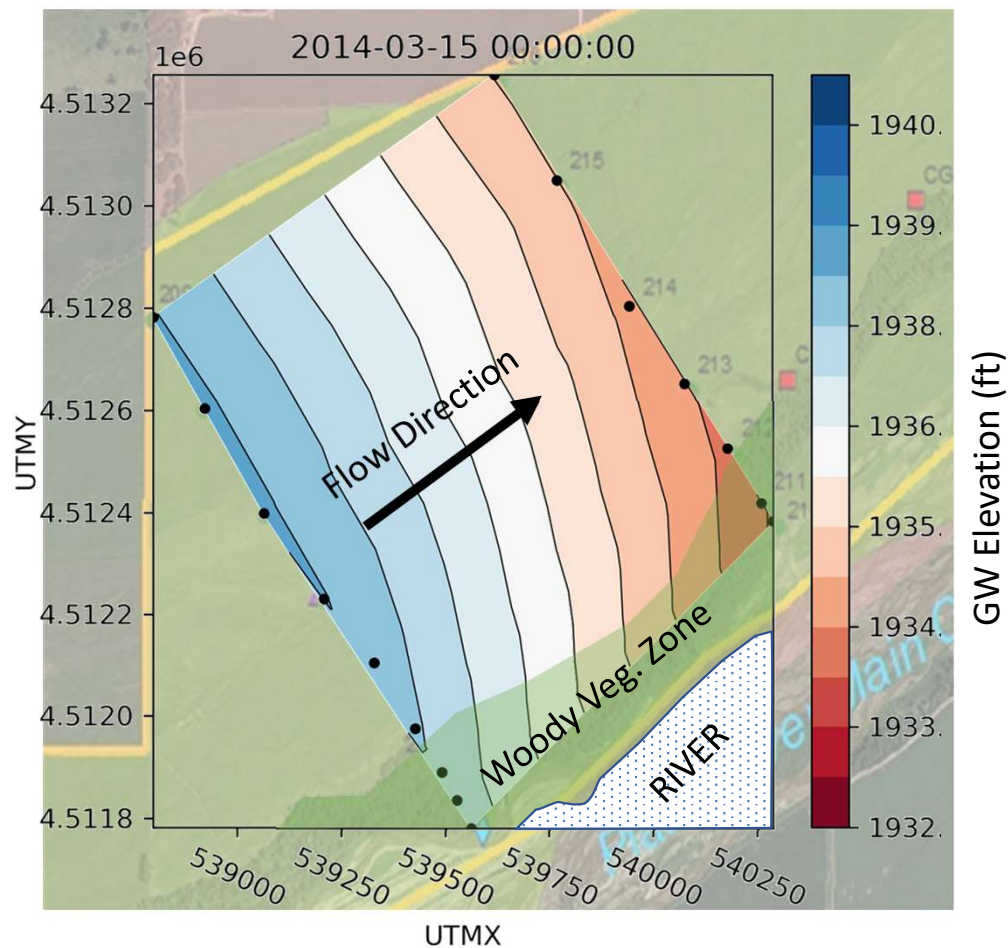
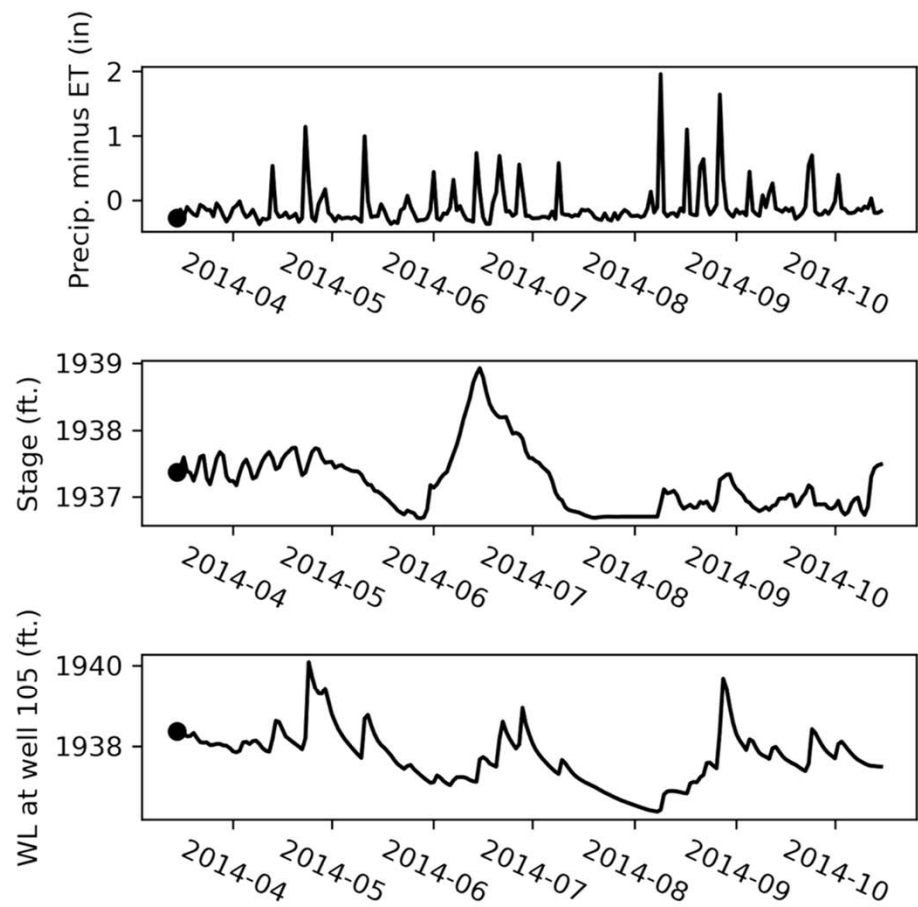
Fox – Restored wet
meadow site

b.) Restored Site



(different y-scale)

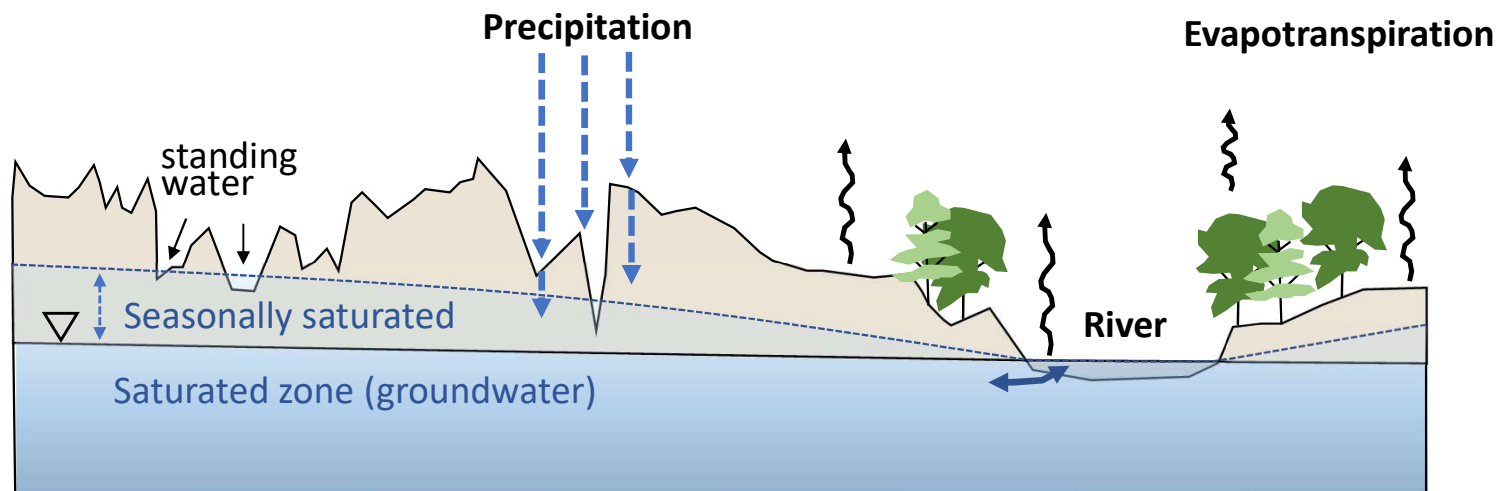
1. Quantify hydrological, meteorological, GW, wet meadow relationships



1. Quantify hydrological, meteorological, GW, wet meadow relationships

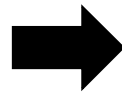
What controls groundwater levels?

- Precipitation,
- River stage, and
- ET



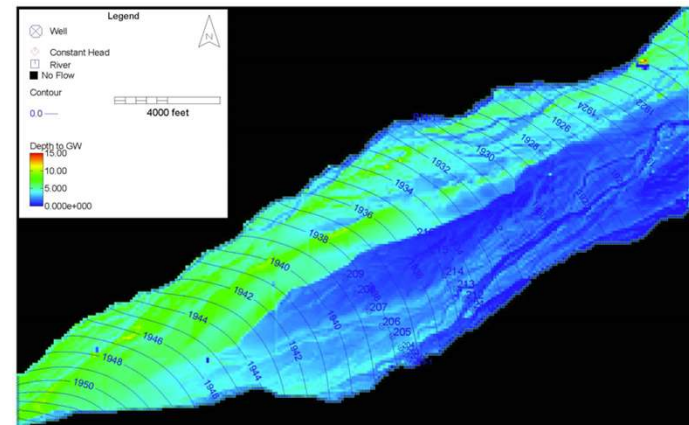
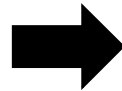
1. Quantify hydrological, meteorological, GW, wet meadow relationships

Analytical Models
(Superposition)



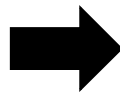
$$s(x,t) = \underbrace{s_0 * \operatorname{erfc}\left(\frac{x}{\sqrt{4\alpha t}}\right)}_{\text{Stage}} + \underbrace{\frac{P}{S}}_{\text{Precip.}} - \underbrace{\frac{ET_{scaled}}{S}}_{\text{ET}}$$

Numerical Models

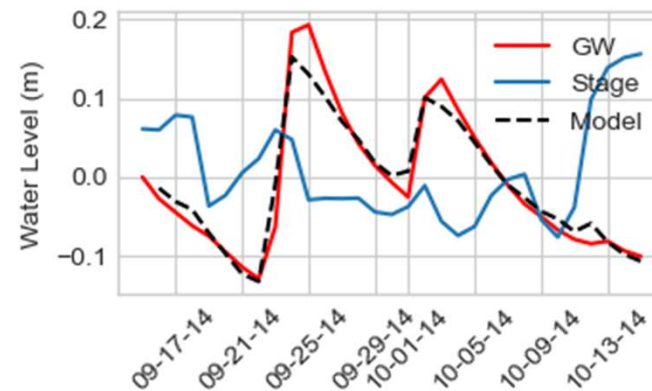
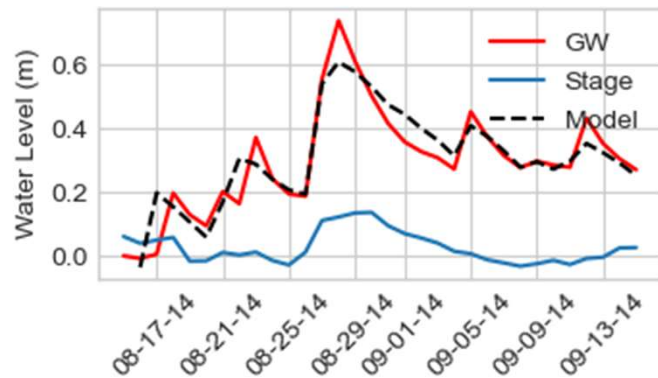


1. Quantify hydrological, meteorological, GW, wet meadow relationships

Analytical Models
(Superposition)



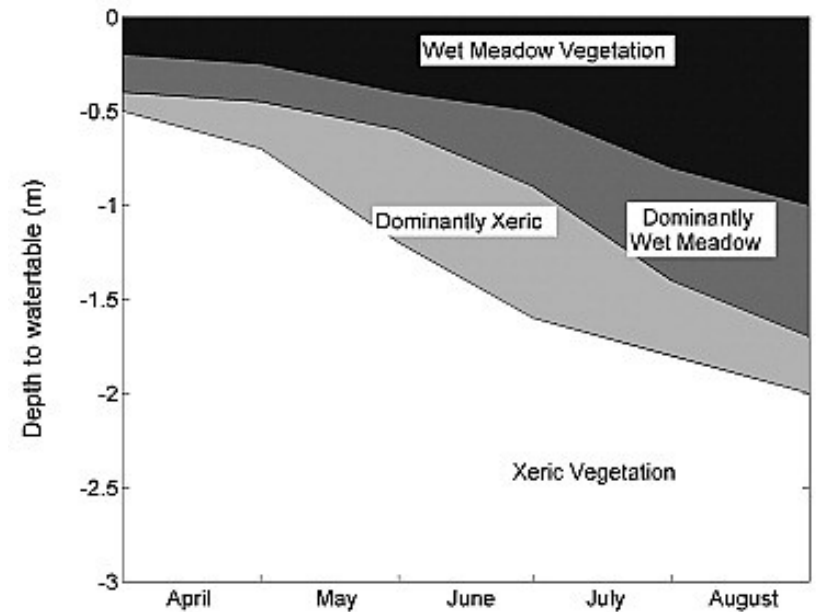
$$s(x,t) = \underbrace{s_0 * \operatorname{erfc}\left(\frac{x}{\sqrt{4\alpha t}}\right)}_{\text{Stage}} + \underbrace{\frac{P}{S}}_{\text{Precip.}} - \underbrace{\frac{ET_{scaled}}{S}}_{\text{ET}}$$



Calibrated models can then be used to predict how management actions (e.g. stage increase, surface recharge) would affect groundwater levels.

2. Develop hydrological management targets

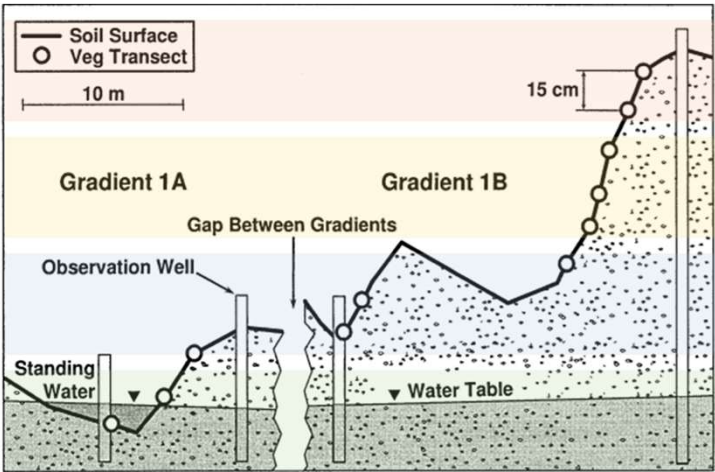
- Determine target groundwater levels
 - Using existing studies
 - Compare GW levels between two sites.
- Complicated by spatio-temporal variations



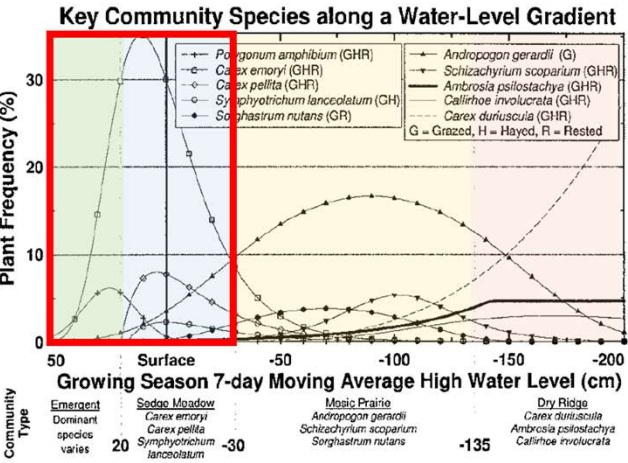
[Loheide and Gorelick, 2007]

2. Develop hydrological management targets

- Henszey et al. 2004 linked variable topography & GW levels -> variable vegetation (e.g.)
- Can determine DTW necessary for supporting wetland and sedge meadow
- Incorporate LIDAR to get integrated WL statistics along transects



- Dry Ridge
- Mesic Prairie
- Sedge Meadow
- Emergent



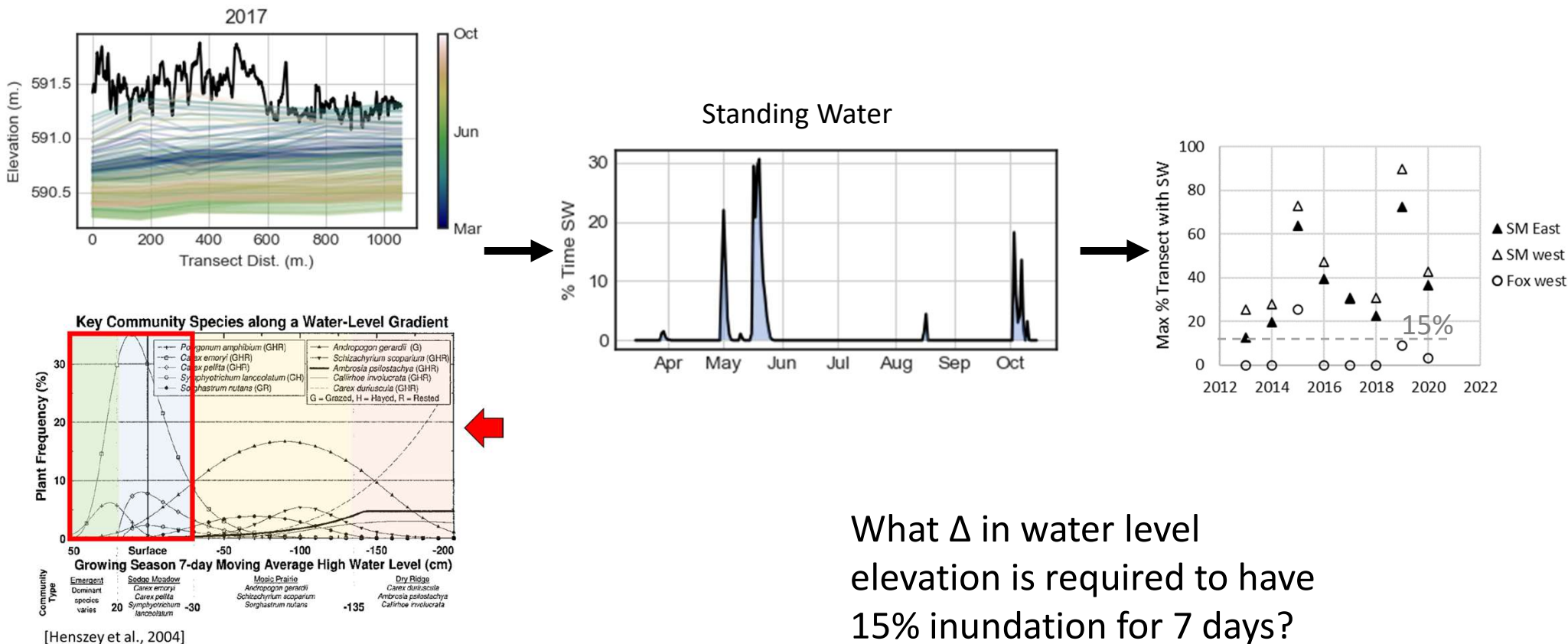
L7th = yearly maximum 7-day-moving average GW depth

Emergent = 20cm above GS L7th

Sedge meadow = <30cm L7th

[Henszey et al., 2004]

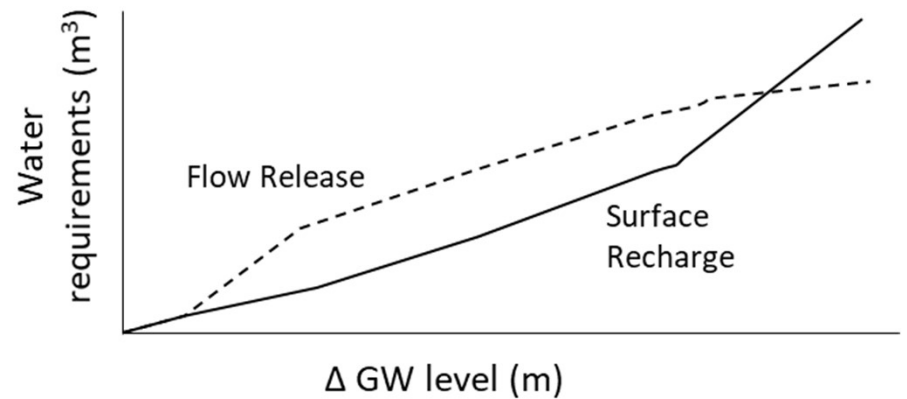
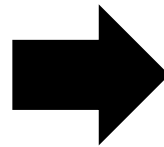
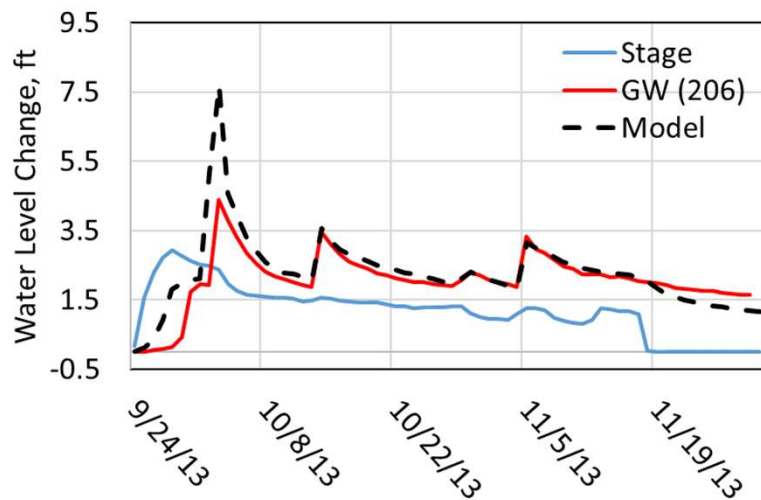
2. Develop hydrological management targets



What Δ in water level elevation is required to have 15% inundation for 7 days?

3. Next steps - Develop a tool to support management at wet meadow sites

- Use calibrated models to test management scenarios





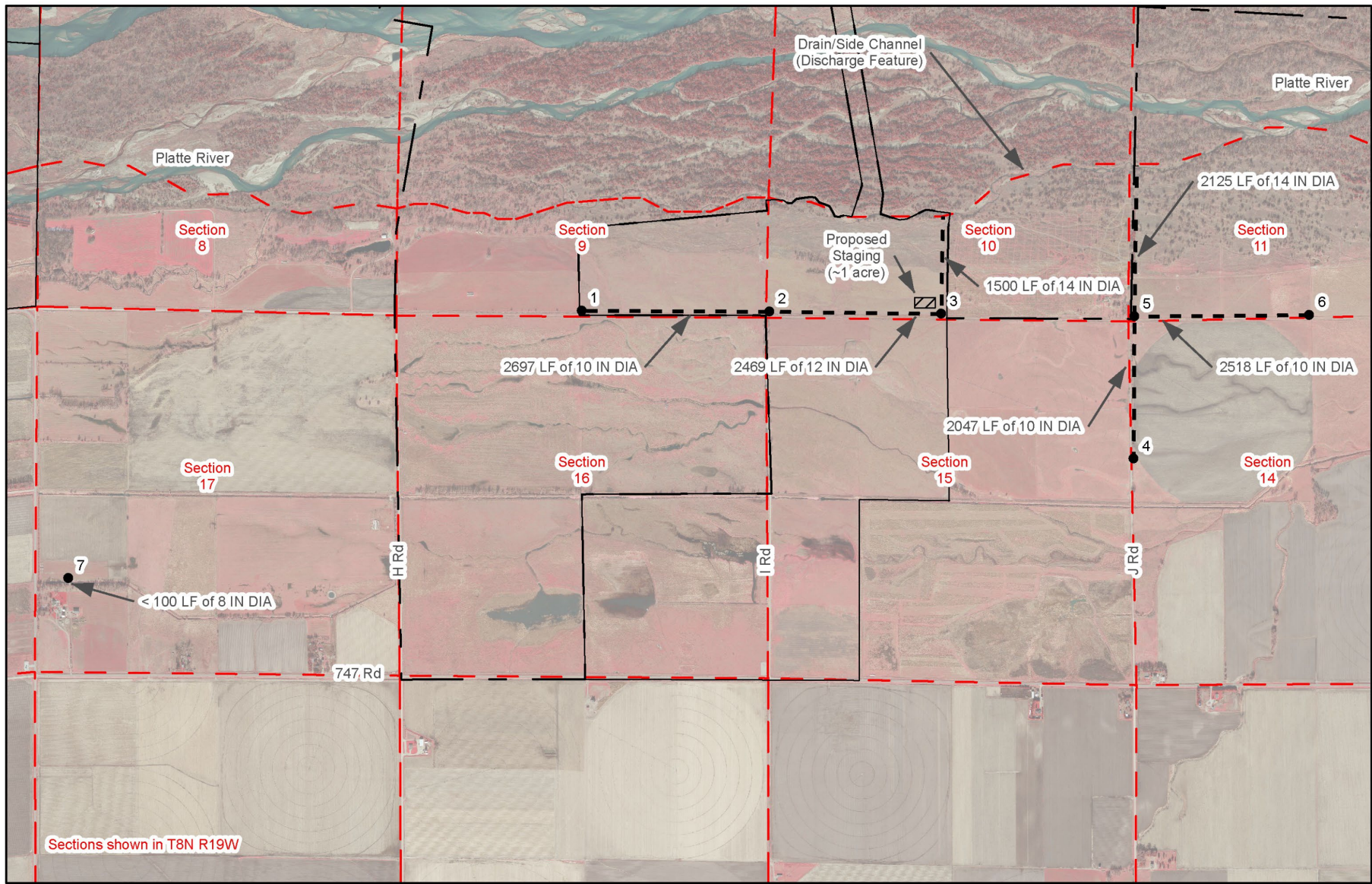
Questions?

Pilot Recapture Network Construction

PRRIP Water Advisory Committee

February 1, 2022

Seth M Turner, PE



General Augmentation Plan

Legend

- Augmentation Wells
- - - Pipeline Alignments
- ▨ Proposed Staging
- ▭ Program Leased
- ▭ Program Owned
- - - Sections



0 0.25 0.5 Miles

**Figure
1a**

Date:
8/30/2021

Contractor Selection

- Bid in September, pipeline re-bid in October
- Well Construction
 - Downey Drilling
 - \$178,000 + \$22,000 change order for stainless steel mesh screen
- Pipeline Construction
 - J&G Dirtworks
 - \$803,800

Construction Progress

- Well Construction
 - Drilling and testing completed week of December 13
 - Finalizing pump sizing this week
- Pipeline Construction
 - Installation between mid-November and mid-December
- Completion by March 31
 - Discharge structures
 - Pump-outs
 - Pumps and motors
 - Fittings from wells to pipelines

Well	Estimated Yield (gpm)
1	510
2	715
3	580
4	390
5	330
6	790
7	915

Well 5



Well 6



Well 7



Well 7



Trench from Well 6



Pipeline to River



East Discharge



East Discharge

Well 6

Well 4

Well 5

To River



Cook Well

- Problem
 - Persistent surging and/or valve cavitation issues
 - Consistent long-term pumping 630-640 gpm
- Solution
 - Downey completed pump test January 14
 - New, smaller pump to be installed
 - Existing pump to be used at Cottonwood Ranch
- Integration with Recapture Network
 - SCADA to be installed
 - Tri-Basin NRD to operate with the 7 new wells (verbal agreement)
 - Likely need to amend Water Augmentation Agreement (March or June GC)