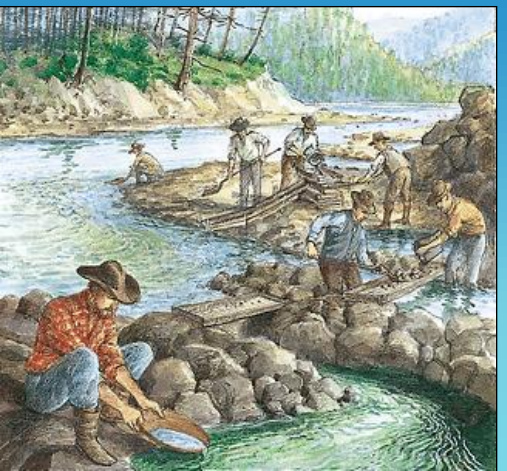
Lower South Platte Water Symposium

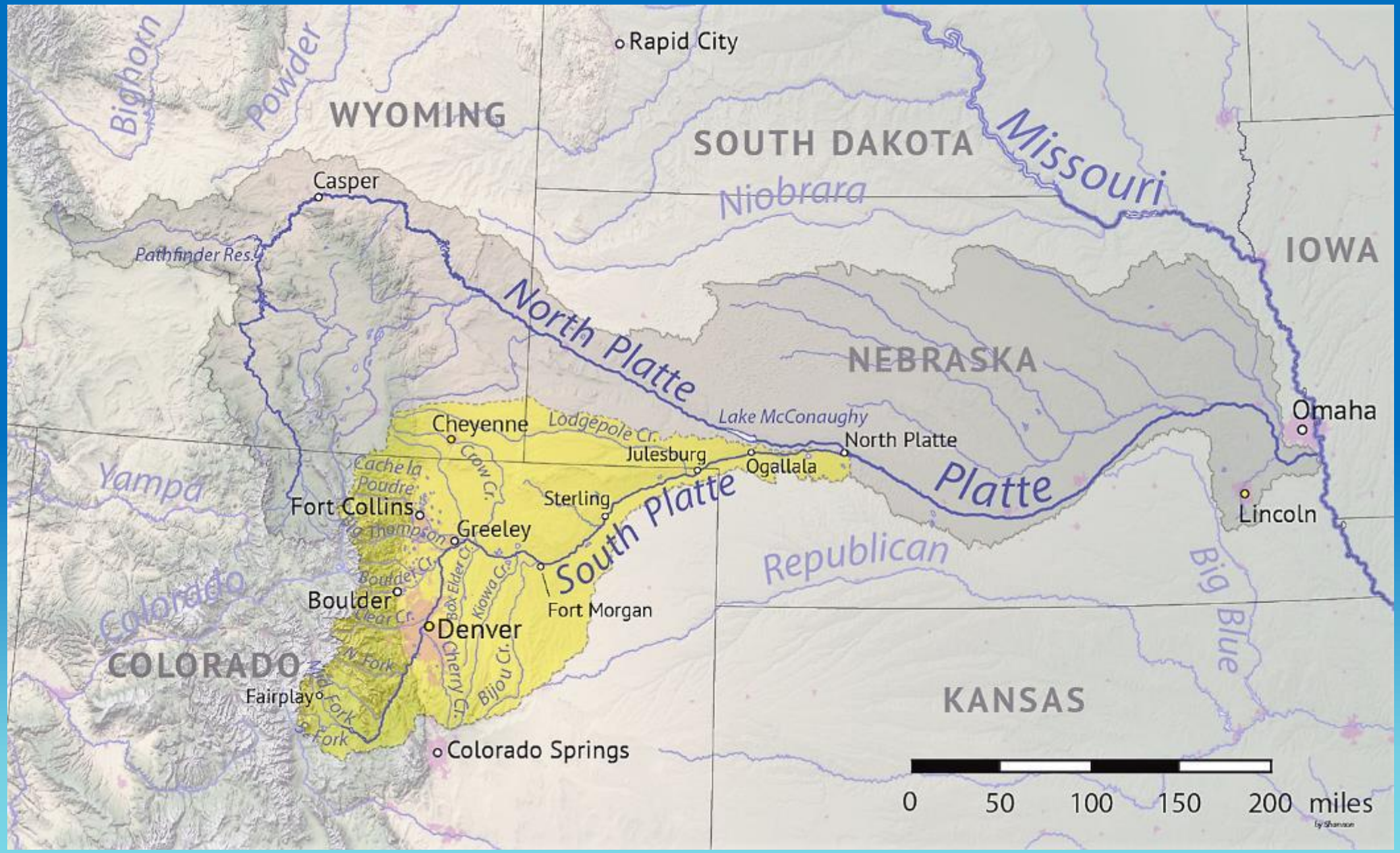


Lower South Platte River Update

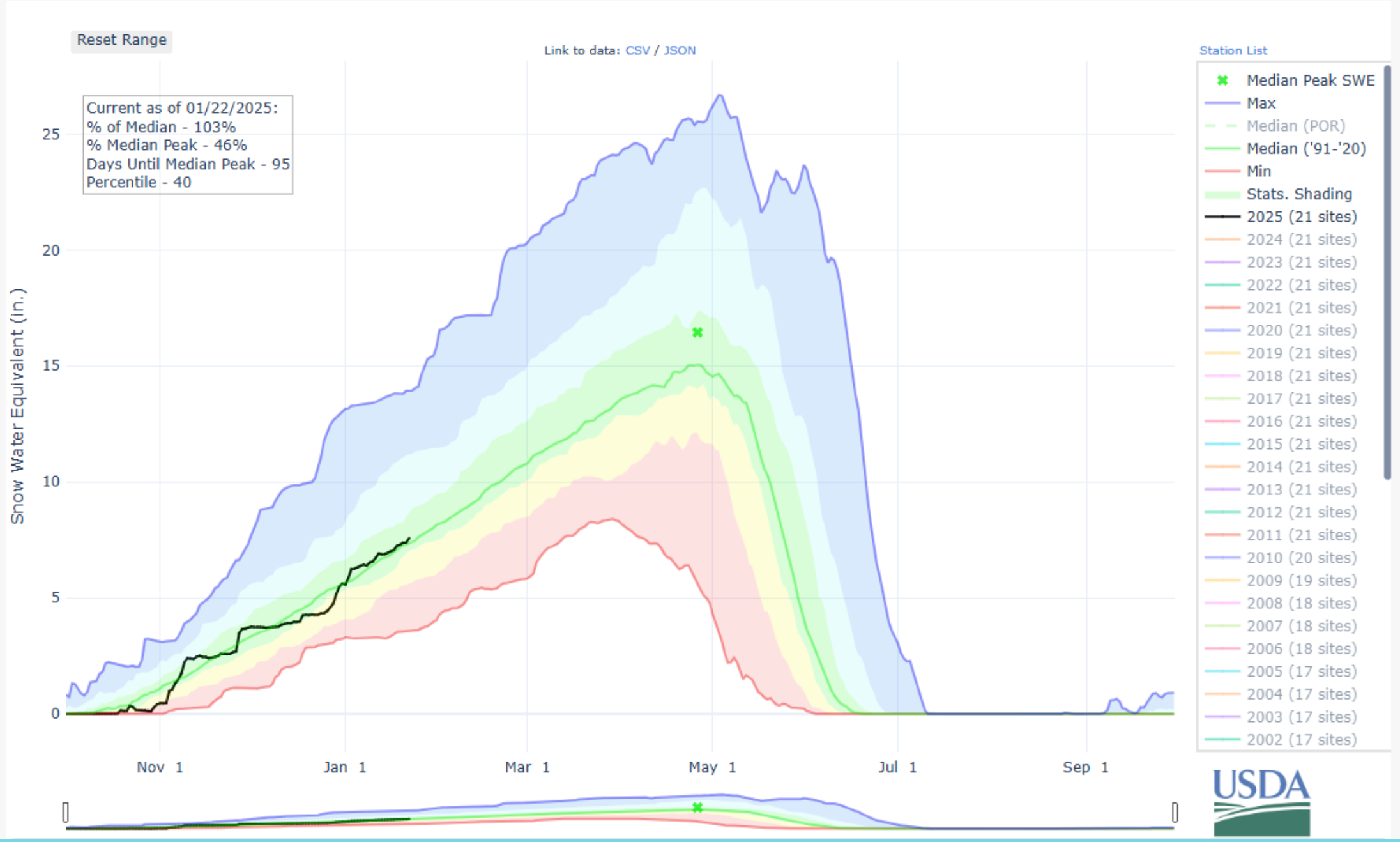
January 23rd, 2025

Joe Frank, PE
General Manager

SOUTH PLATTE RIVER



SNOW WATER EQUIVALENT IN SOUTH PLATTE



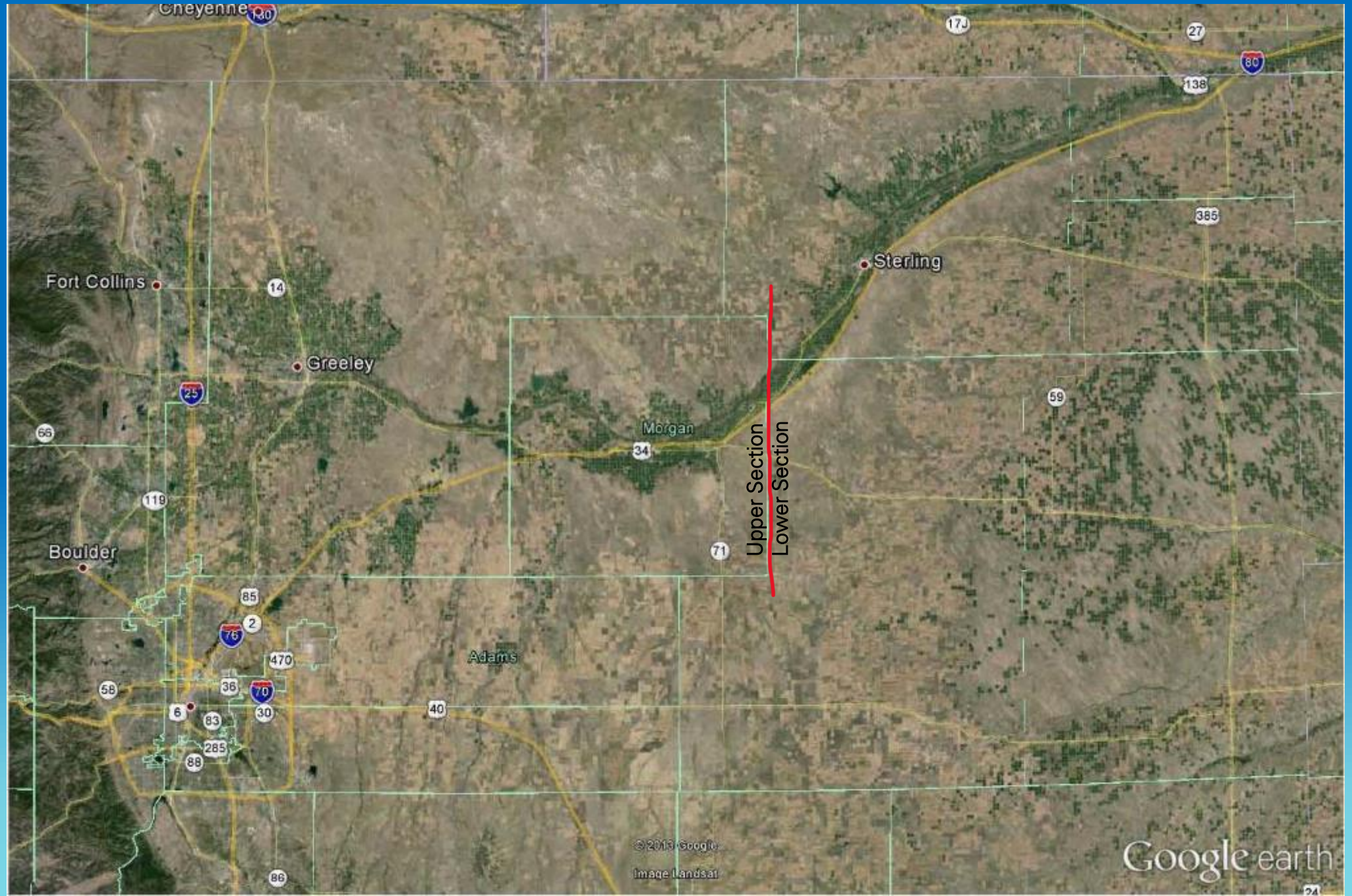
Water Districts 1, 2 and 64
Reservoir Levels

Month = December			
Reservoir	Acre Feet in Reservoir	Full AF	% Full
Standley	35224	42734	82%
Barr	12291.55	30057.2	41%
Milton	10561.56	23515.2	45%
Mose Davis 1	334.8	464.2	72%
Mose Davis 2	116.6	119.9	97%
Sand Hill aka Coal Ridge	495.95	349.05	86%
Lower Latham	5645.6	6023.2	94%
Prospect	517.34	5296.5	10%
Lord		3448.9	
Horsecreek	1860.97	15537.6	12%
EMPIRE	24618.98	33817.49	73%
RIVERSIDE	53265.76	63302.5	84%
JACKSON	24577.81	27256.72	90%
VANCIL	2676.48	6409	42%
NORTH STERLING	51196.5	74587	69%
PREWITT	13849	32164	43%
JUMBO aka JULESBURG	16069.5	20206.1	80%

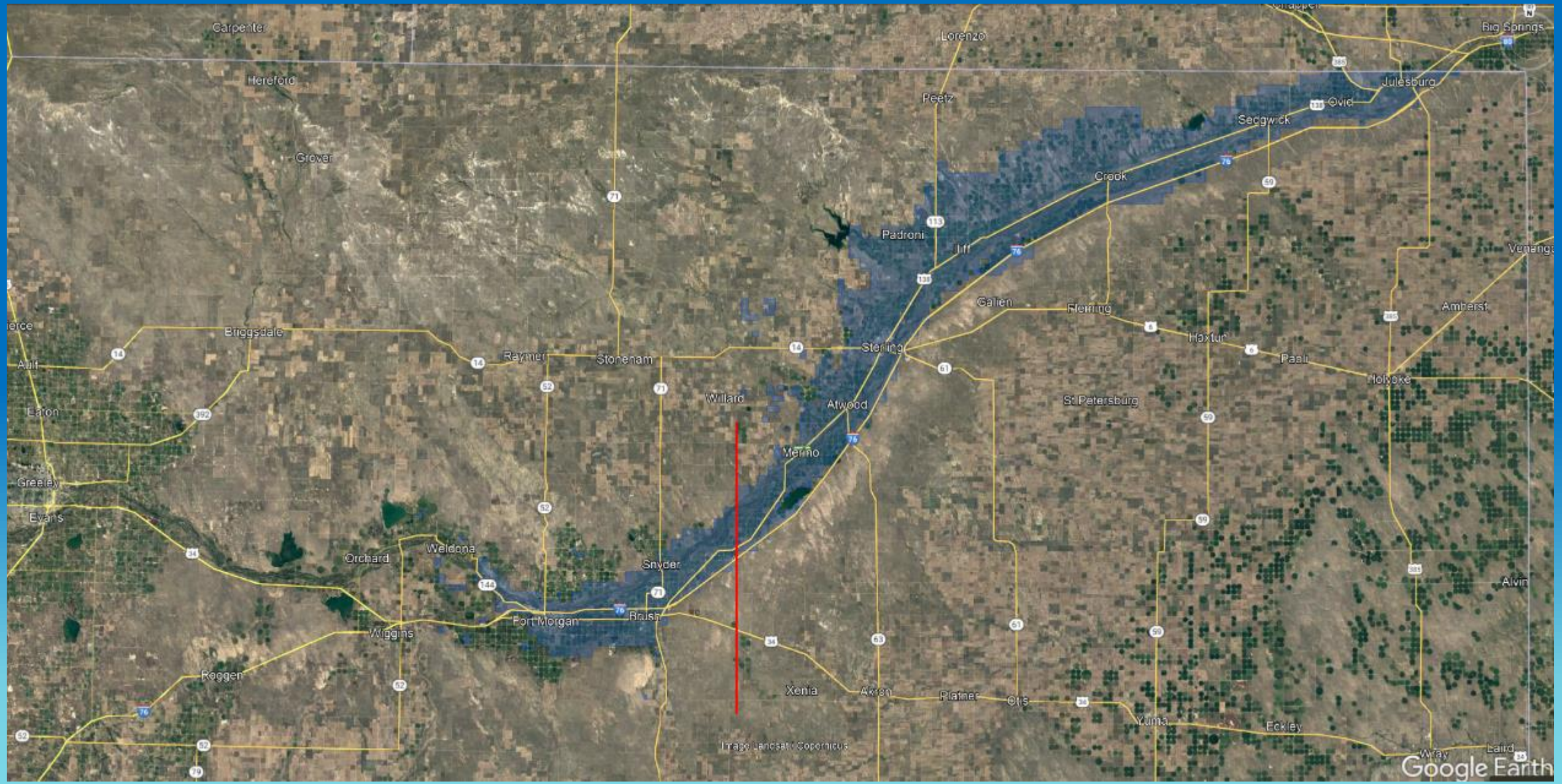
January 22nd, 2025 Update:

North Sterling = 80%
Prewitt = 73%

SOUTH PLATTE BASIN

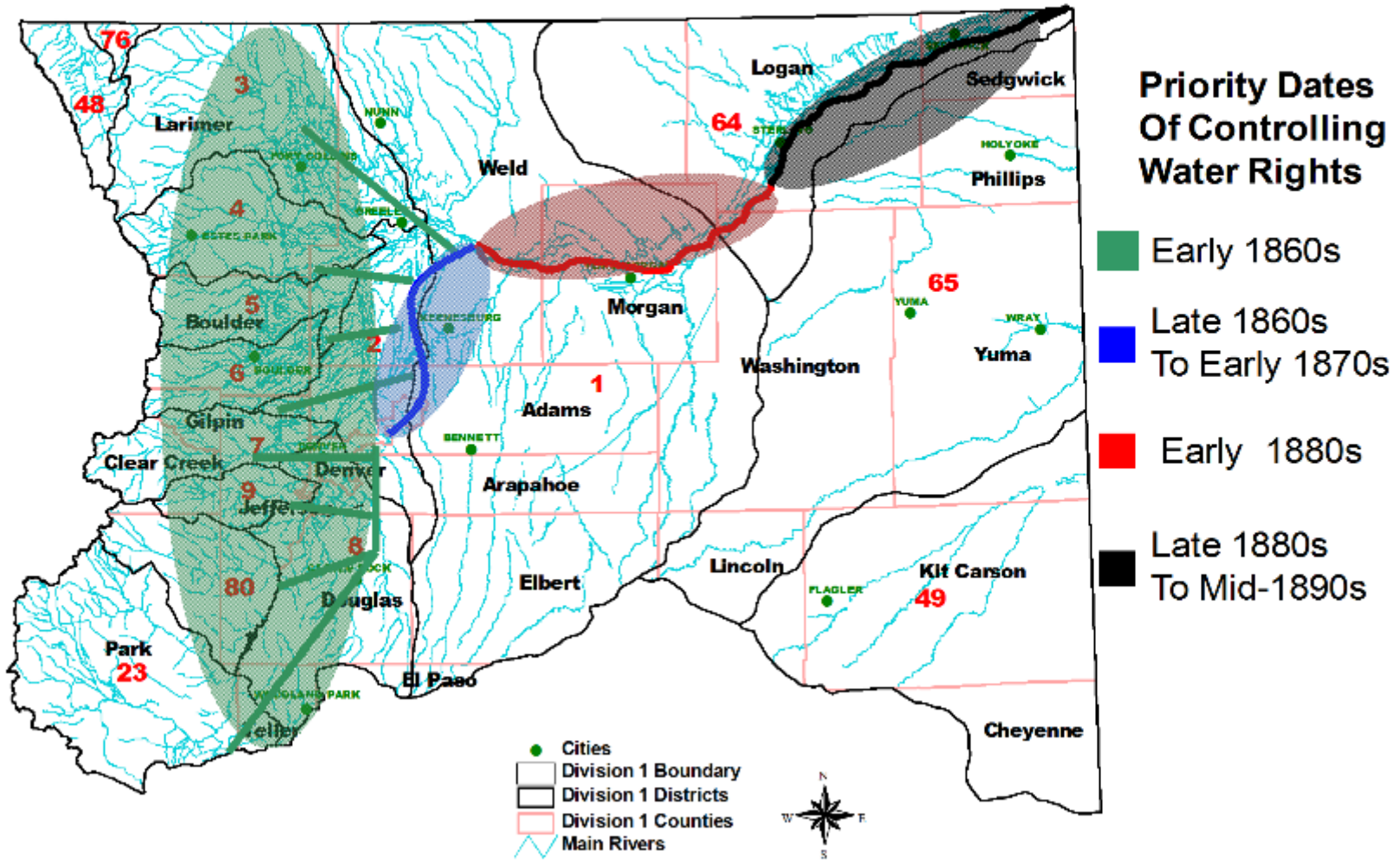


LOWER SOUTH PLATTE WATER CONSERVANCY DISTRICT



Water Rights Development in South Platte Basin was Influenced by Return Flows

State of Colorado, Division of Water Resources, Division 1, South Platte River Drainage.

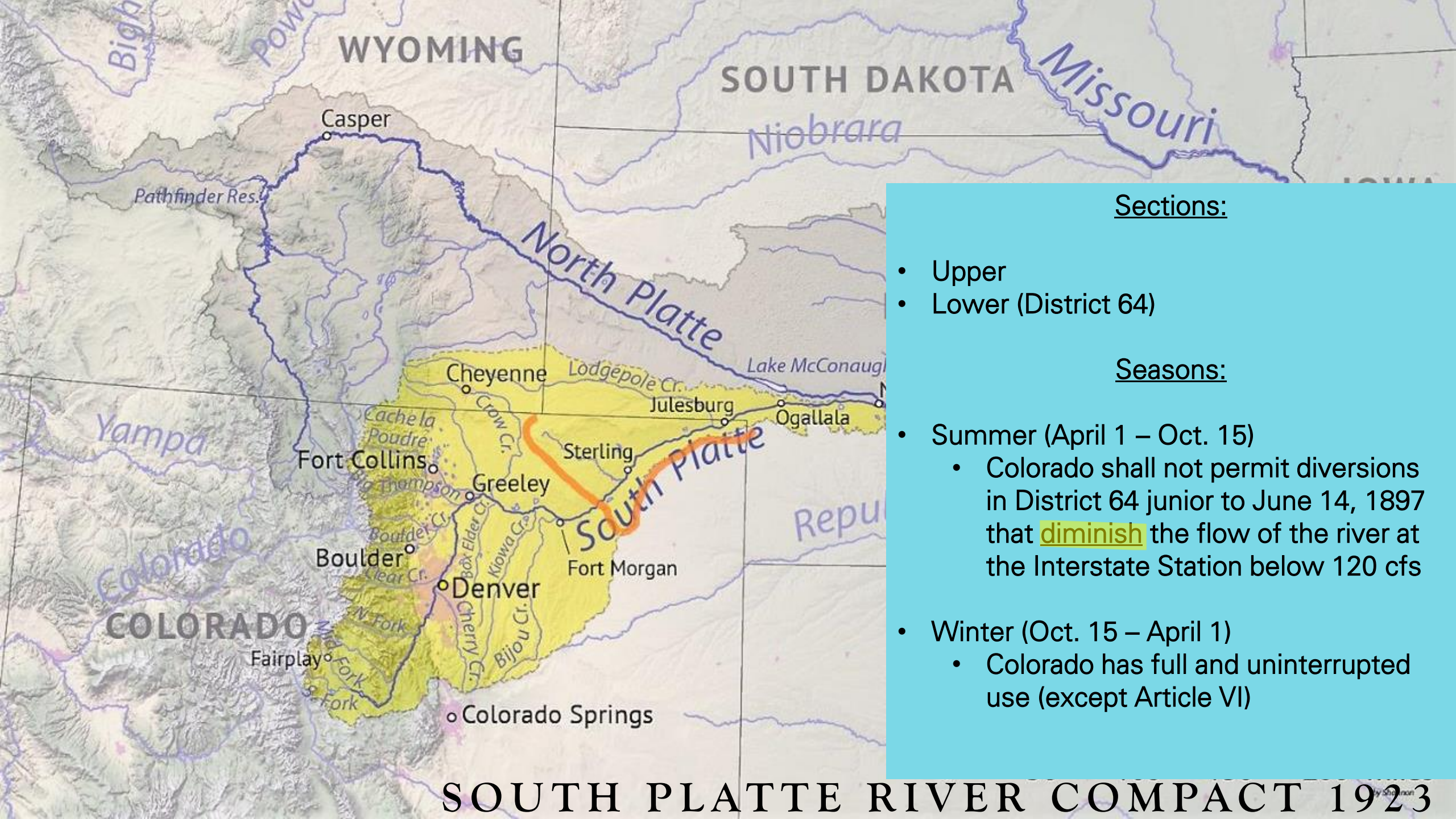


Source: SWSI 2010 South Platte Basin Report Basinwide Consumptive and Nonconsumptive Water Supply Needs Assessments, Figure 6.12

South Platte River Compact

Signed by CO and NE in 1923

Signed by CO Governor Clarence J. Morley in 1925



Sections:

- Upper
- Lower (District 64)

Seasons:

- Summer (April 1 – Oct. 15)
  - Colorado shall not permit diversions in District 64 junior to June 14, 1897 that diminish the flow of the river at the Interstate Station below 120 cfs
- Winter (Oct. 15 – April 1)
  - Colorado has full and uninterrupted use (except Article VI)

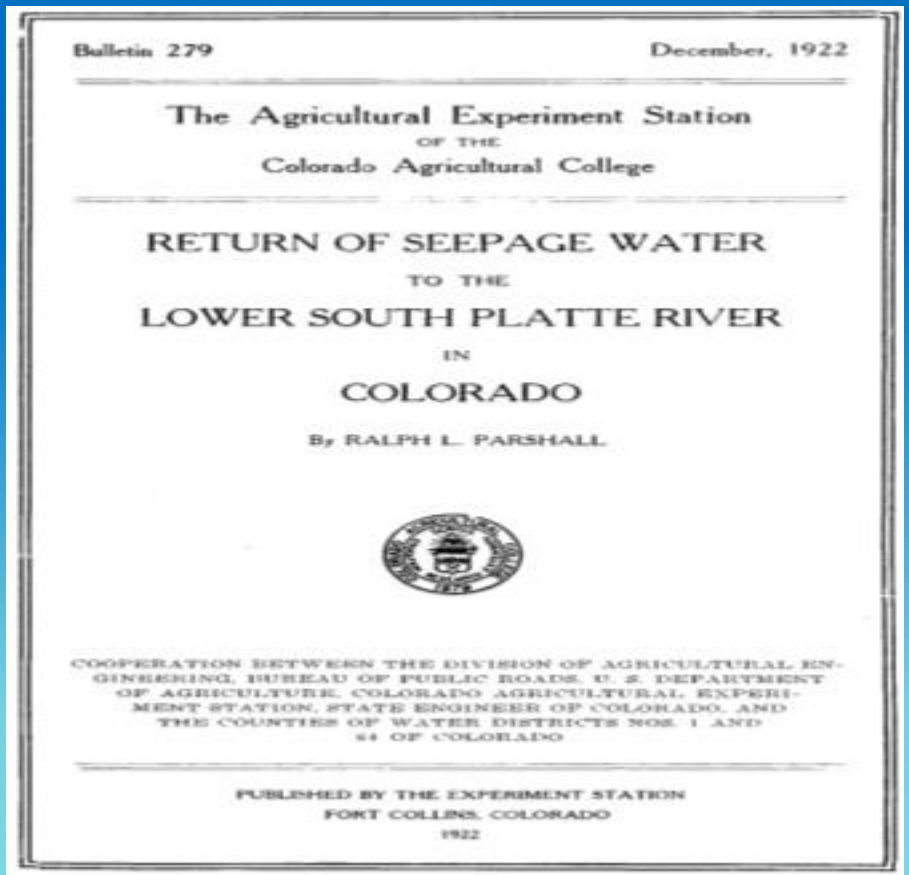
SOUTH PLATTE RIVER COMPACT 1923

Ralph Parshall in 1922

Return of Seepage Water to the Lower South Platte River in Colorado

Ralph Parshall (Colorado Ag. College now Colorado State University) December, 1922.

Fig. 23.—River station at Beetland showing a discharge of 300 second-feet which is all seepage or return flow to the river.



Bulletin 279 December, 1922

The Agricultural Experiment Station
OF THE
Colorado Agricultural College

RETURN OF SEEPAGE WATER
TO THE
LOWER SOUTH PLATTE RIVER
IN
COLORADO

By RALPH L. PARSHALL

COOPERATION BETWEEN THE DIVISION OF AGRICULTURAL ENGINEERING, BUREAU OF PUBLIC ROADS, U. S. DEPARTMENT OF AGRICULTURE, COLORADO AGRICULTURAL EXPERIMENT STATION, STATE ENGINEER OF COLORADO, AND THE COUNTIES OF WATER DISTRICTS NOS. 1 AND 64 OF COLORADO

PUBLISHED BY THE EXPERIMENT STATION
FORT COLLINS, COLORADO
1922

Ralph Parshall in 1922

The Phenomenon of Return Waters

- **Return flows were increasing over time and continued to increase, mostly due to the general rise of the water-table over greater areas.**

- **The water table has risen each year (since the early stages of irrigation development) as much as 100 feet in some areas.**

- **Return flows varied from 2 to 8 ½ second-foot per mile and averaged 5 ¼ second-foot per mile.**

- **The diversions from the river after the spring floods have subsided are practically all from seepage or return water, and only during summer floods or freshets is the river flow increased.**

Nature of return flows in the South Platte

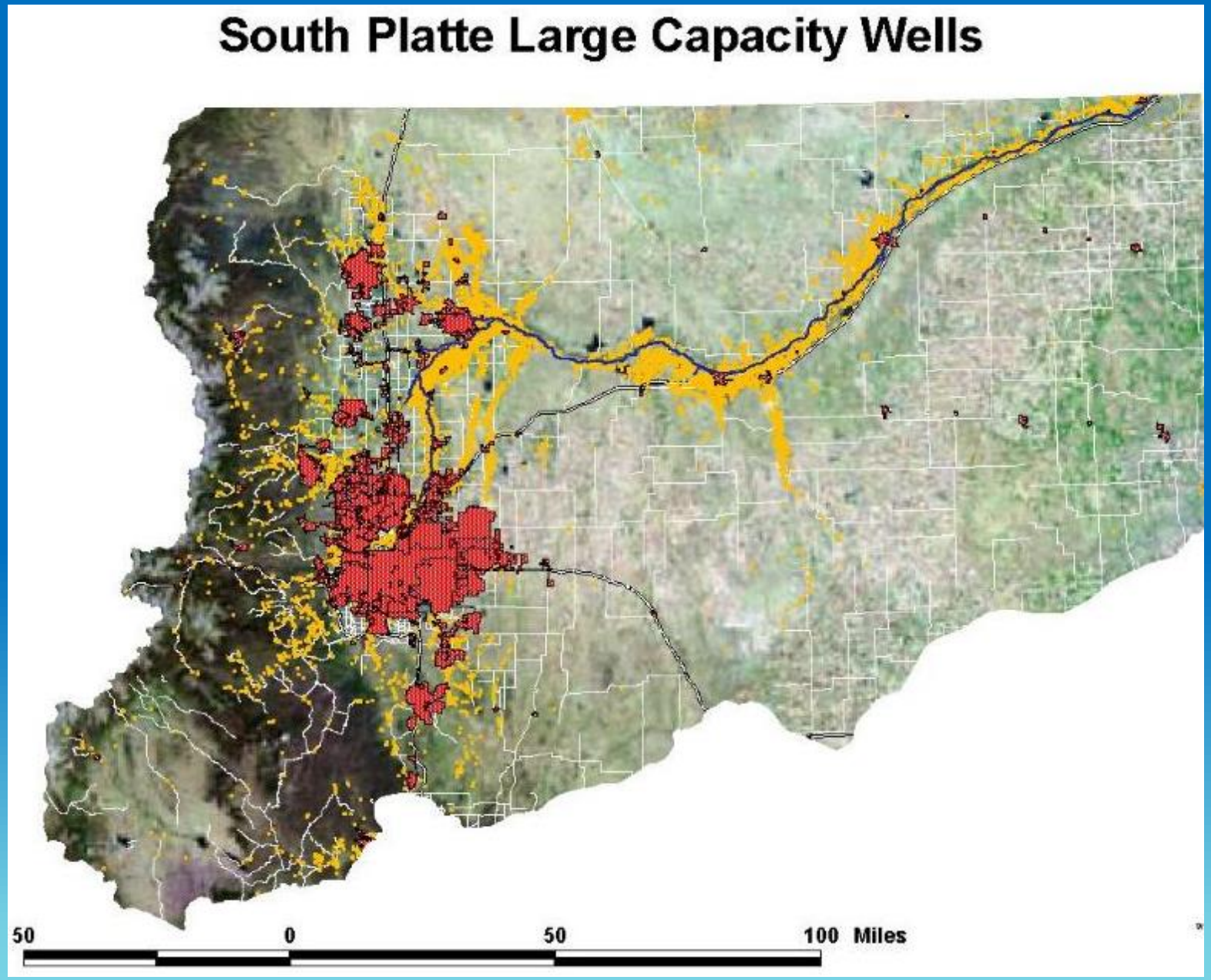
"The flow was excessive in May and June and disappeared entirely during the summer. The river frequently became dry for months of each year to points as far west as the present city of Fort Morgan." – Prior to surface irrigation.

"The flow of return and seepage waters coming back to the river from irrigation of Colorado lands, has resulted in a constant supply at the interstate line."
– After surface irrigation development.

"This flow is increasing and will soon be sufficient to care for the full demands of Nebraska as determined by the compact, while great quantities of water annually flow to waste across the interstate line, during the flood season and winter months……."

" The once "disappearing" flood stream has been converted into one of constant flow making possible the development in both states."

Delph Carpenter, 1925 letter to CO Governor



Alluvial Wells of the 1930's to 1970's

The Water Problem

Ralph Parshall's address to Ft. Collins Rotary Club
August 29th, 1956

- **Several issues impacting the dwindling river and hydrologic conditions.**

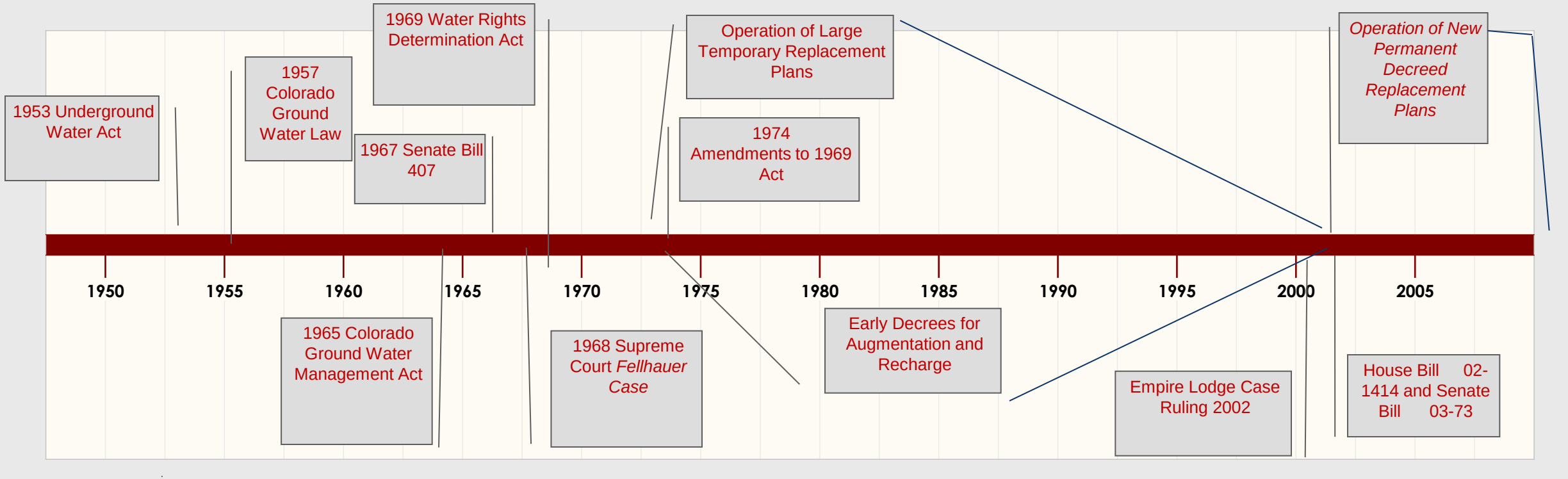
- **Return flows have been investigated since the early 1880s and these past records strongly indicated a steady increase in the return flow to the river.**

- **In 1956 it was found that seepage return was practically nil.**

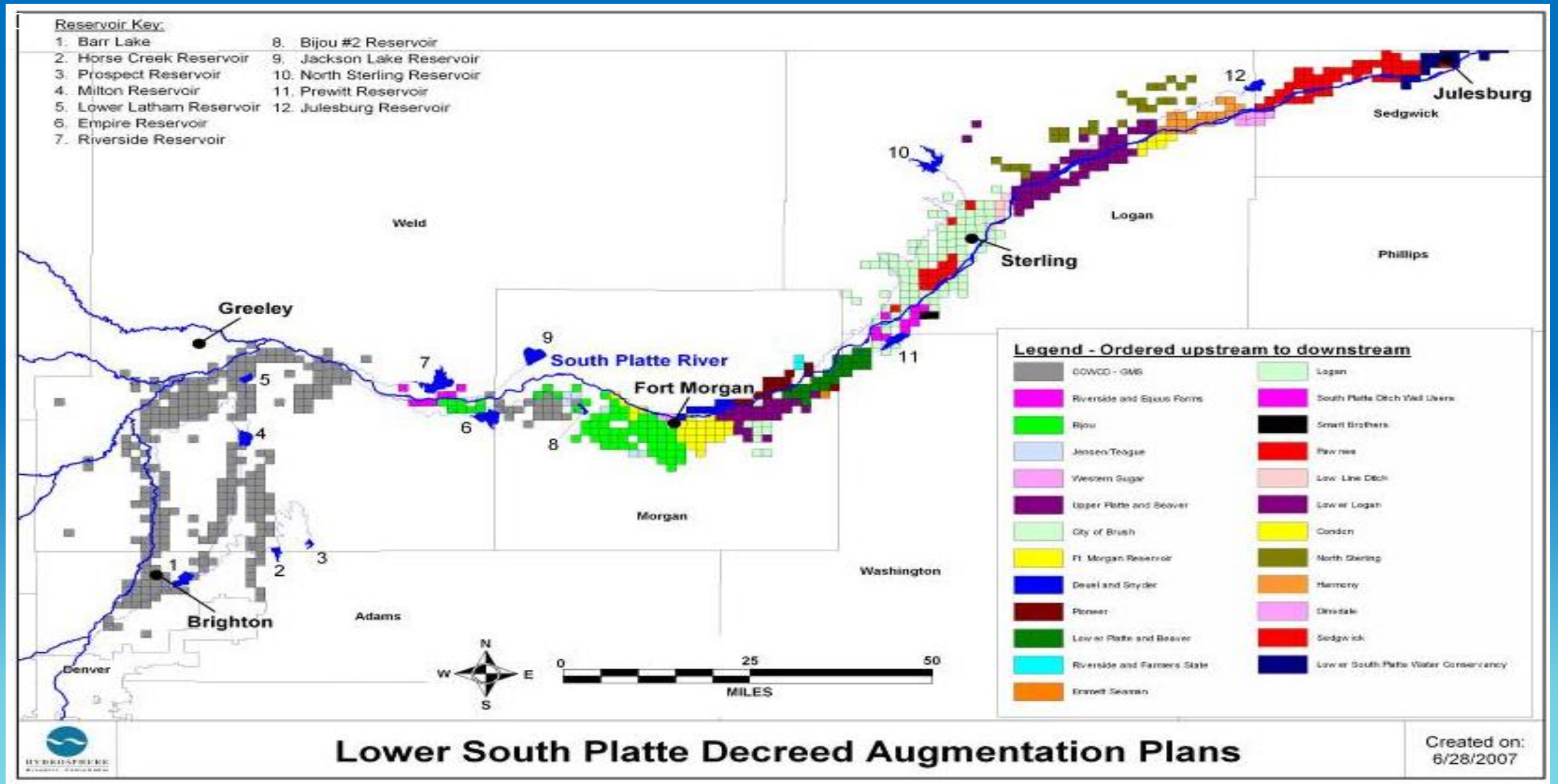
- **Partly due in the fact, that between Kersey and Julesburg, more than 4000 irrigation wells pumped to deliver enough water to fill Horsetooth Reservoir four times during the season of 1955 (584,000 ac-ft).**

- **Appeared obvious that we cannot continue depleting the underground reservoir at that rate.**

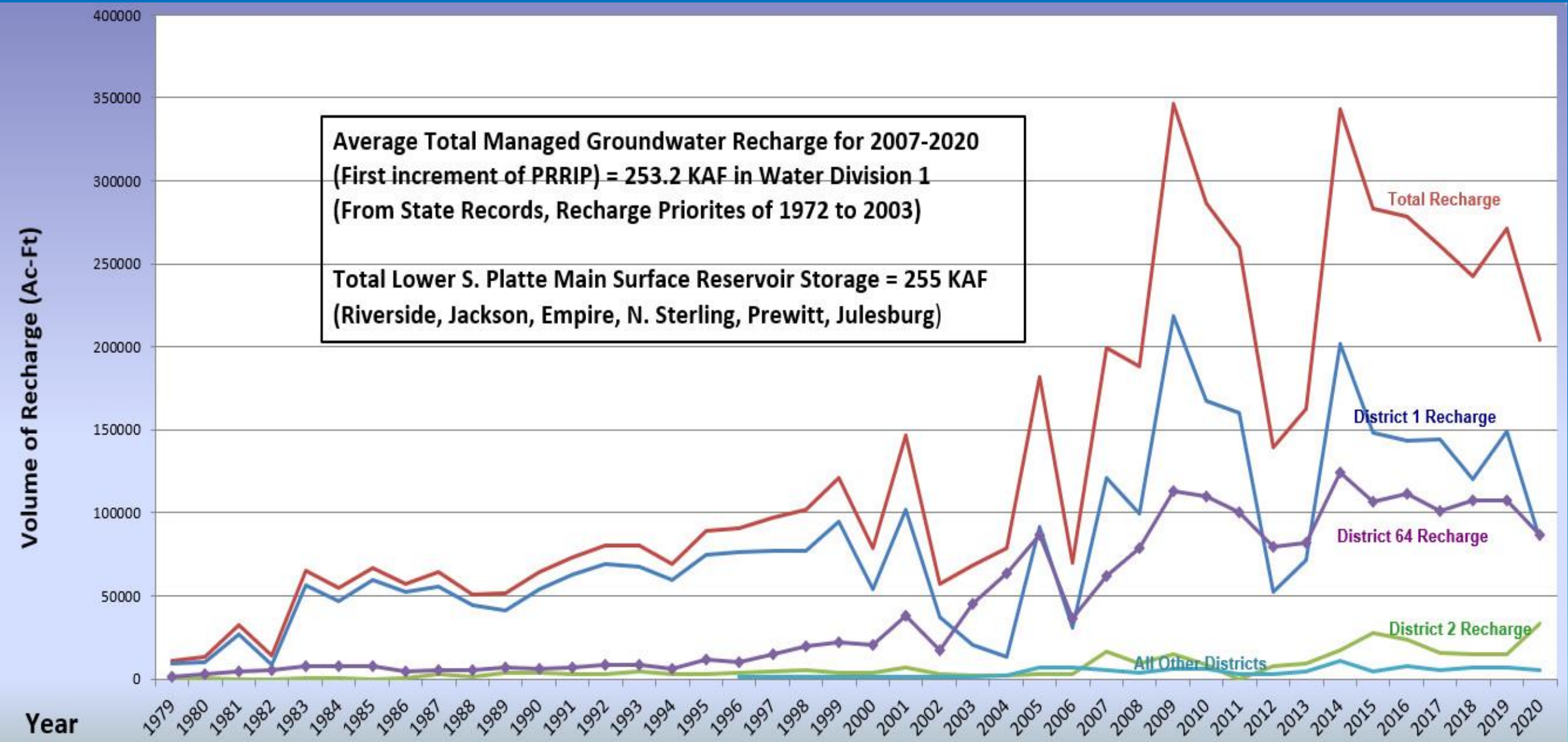
South Platte Conjunctive Use Administration



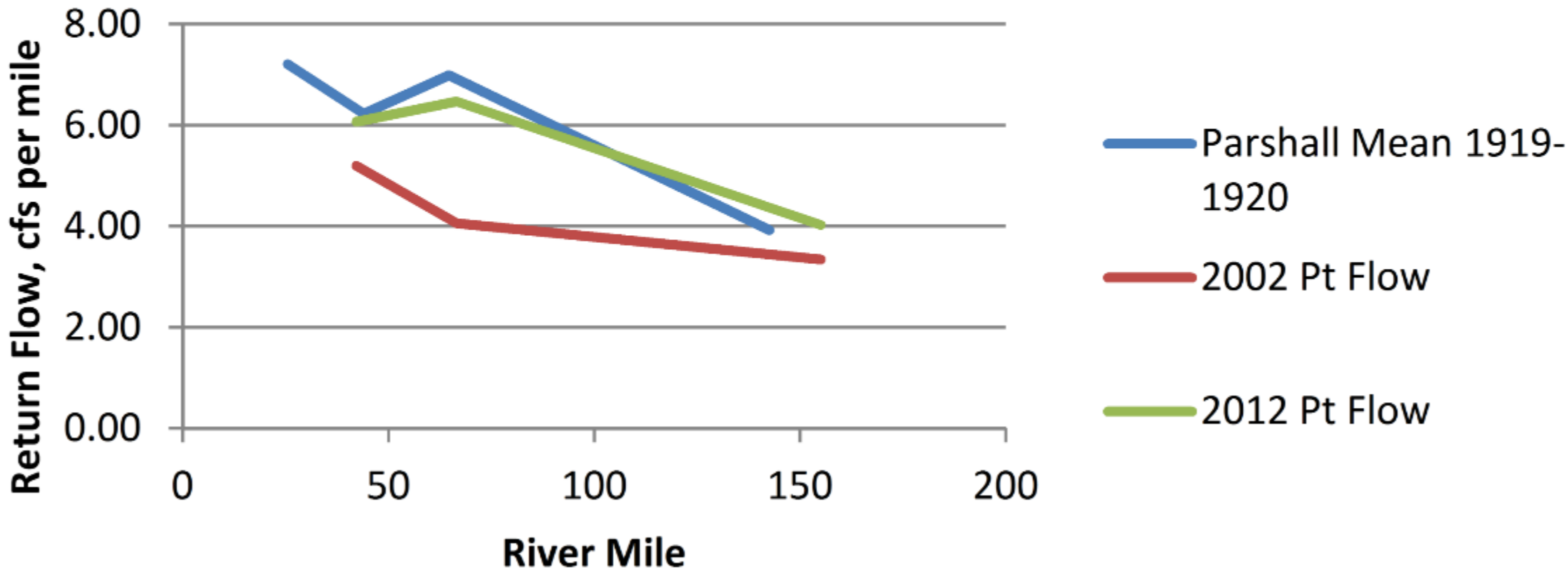
Augmentation Plan Service Areas

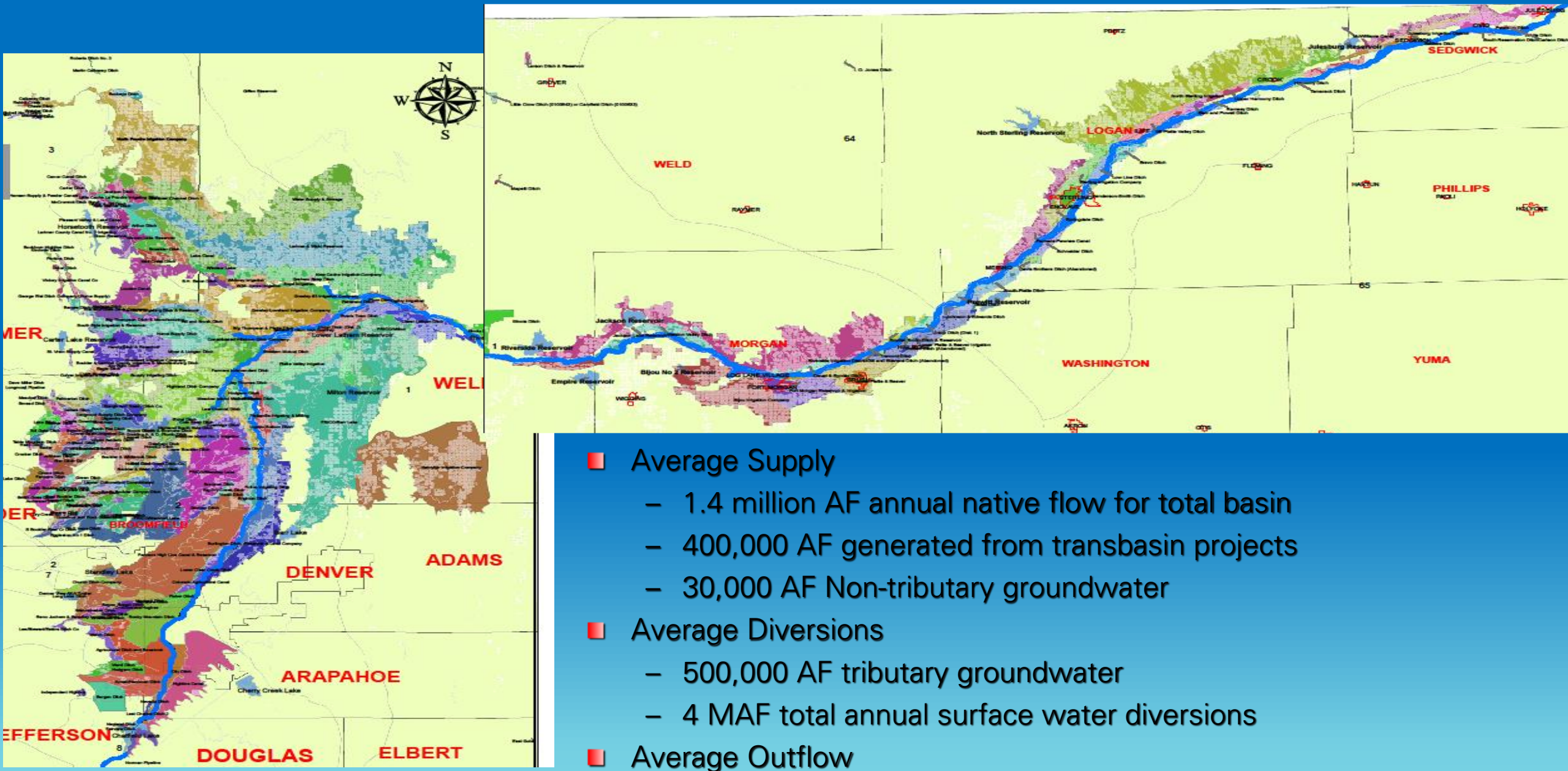


South Platte Managed Groundwater Recharge



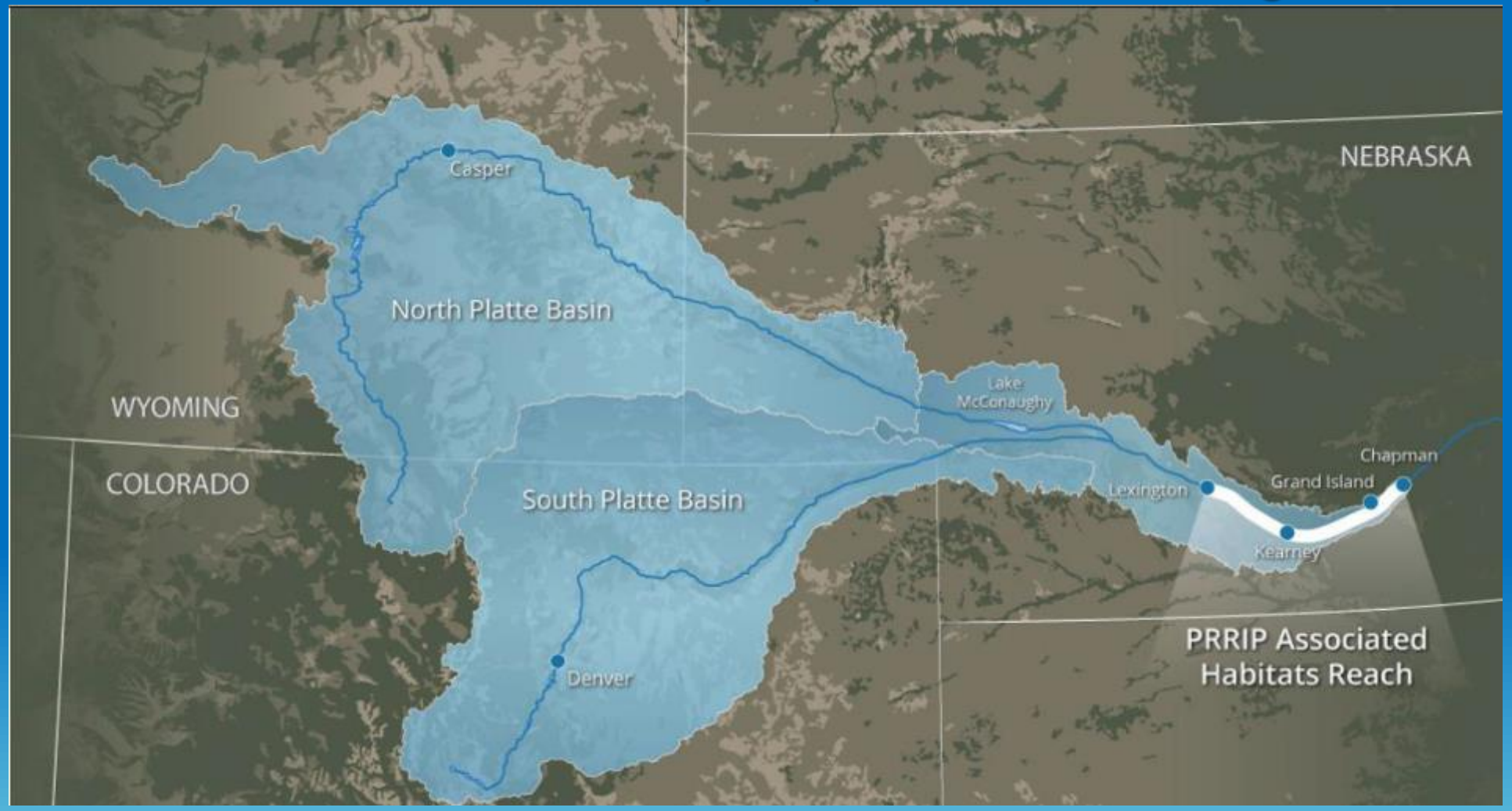
South Platte River Kersey to Julesburg Comparison of Parshall 1920 Return Flow with Point Flow Model 2002 and 2012





- Average Supply
  - 1.4 million AF annual native flow for total basin
  - 400,000 AF generated from transbasin projects
  - 30,000 AF Non-tributary groundwater
- Average Diversions
  - 500,000 AF tributary groundwater
  - 4 MAF total annual surface water diversions
- Average Outflow
  - 300,000 AF to Nebraska

Platte River Recovery Implementation Program



Interior Least Tern

Whooping Crane

Piping Plover

Pallid Sturgeon

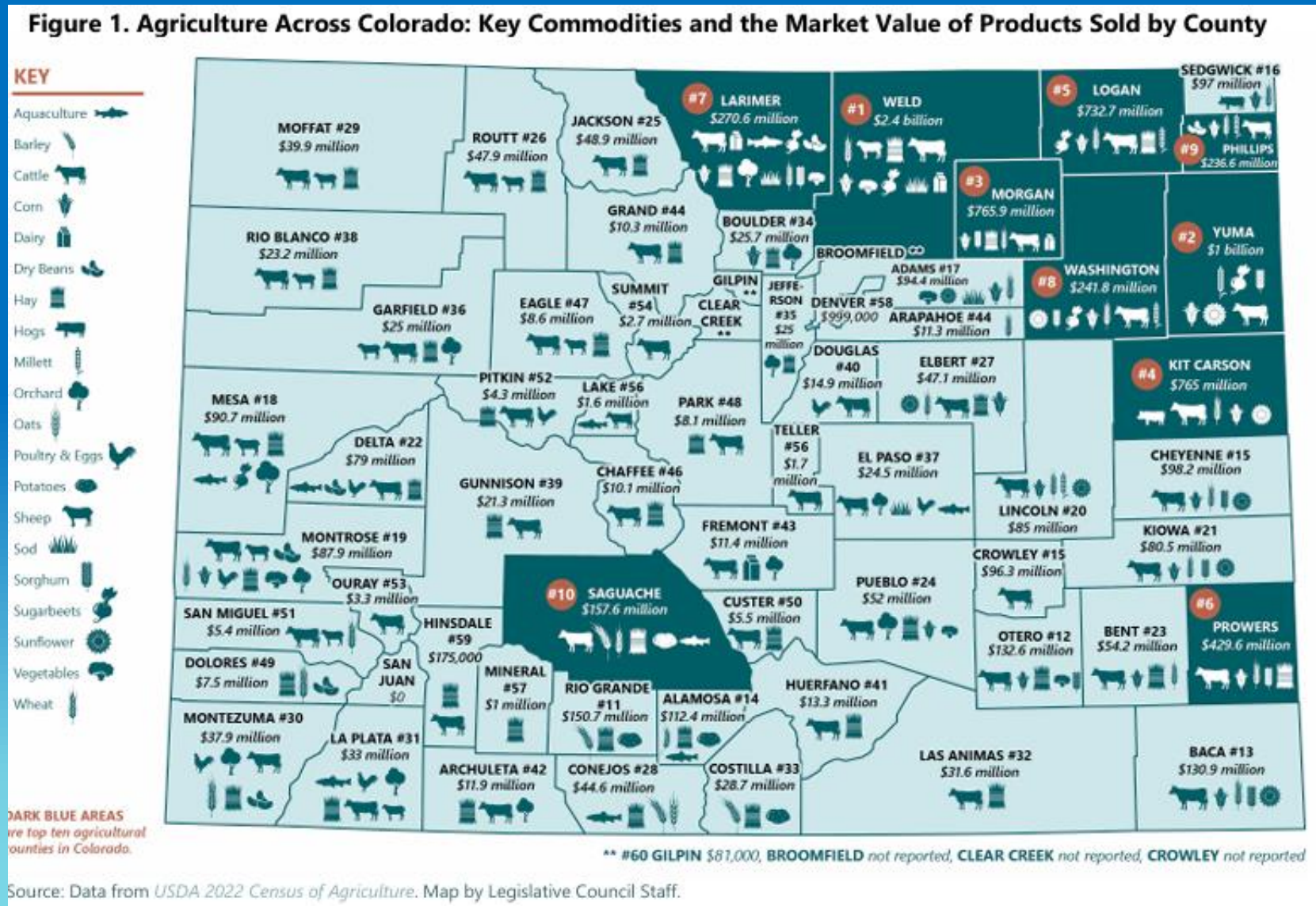
IRRIGATED AGRICULTURE

- South Platte Basin: Approx. 831,000 irrigated acres (SWSI 2010)
- Republican Basin: Approx. 550,000 irrigated acres (SWSI 2010)

- 40% of Colorado's Irrigated Land

- South Platte 379,000 AF Avg. Annual Ag. Gap (SWSI 2010)
- Republican 200,000 AF Avg. Annual Ag. Gap (SWSI 2010)

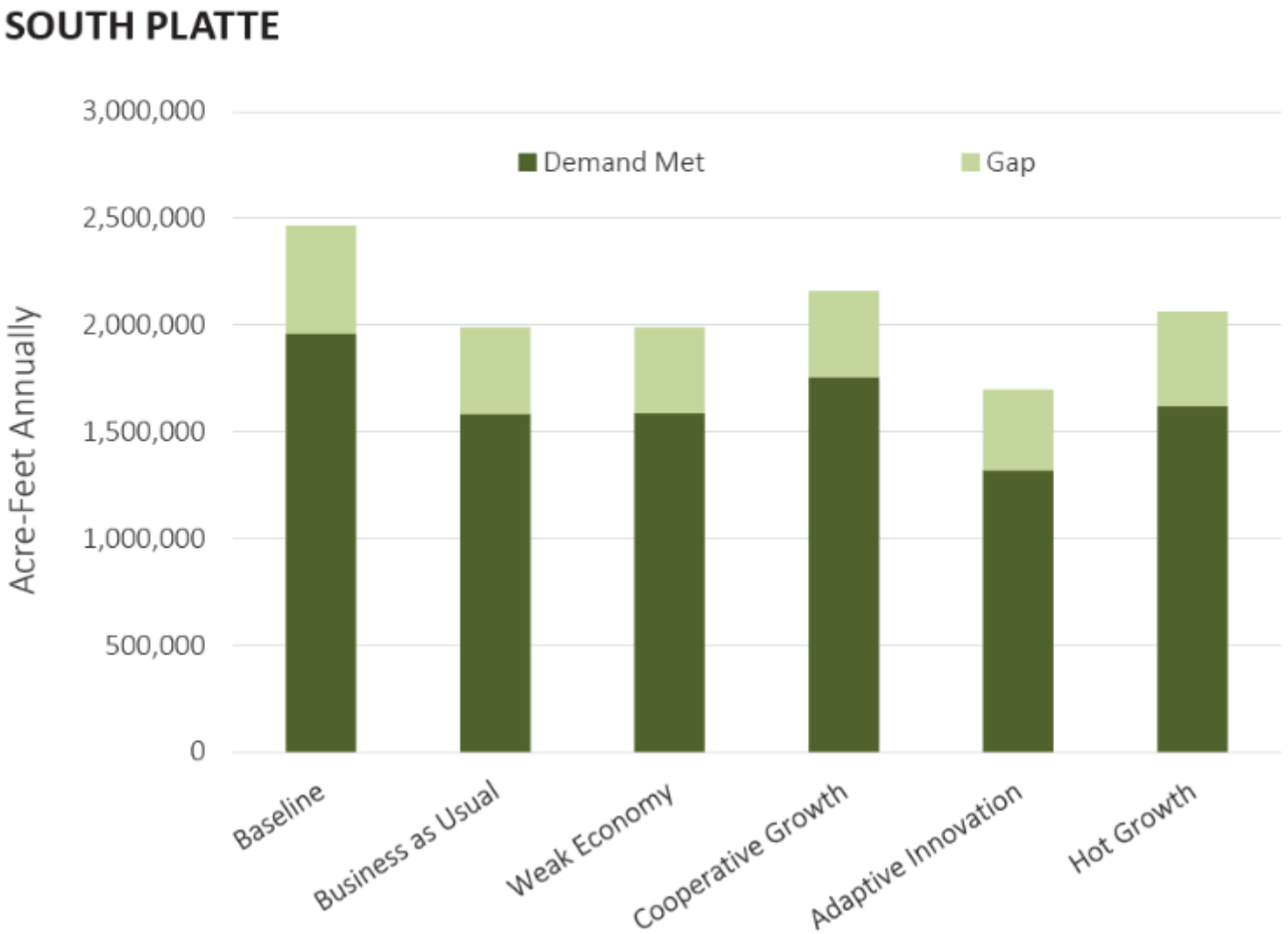
Figure 1. Agriculture Across Colorado: Key Commodities and the Market Value of Products Sold by County

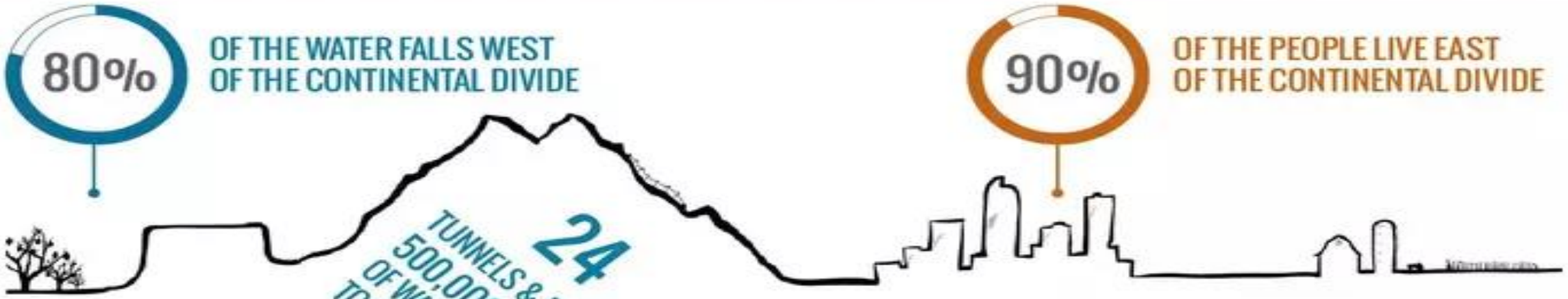


Source: Data from *USDA 2022 Census of Agriculture*. Map by Legislative Council Staff.

SIGNIFICANT AGRICULTURAL SHORTAGES EXIST

Figure 6. Baseline and 2050 Projected Average Annual Agricultural Diversion Demand, Demand Met, and Gaps





8 BASINS
where major rivers flow

9 COMPACTS LEGALLY REQUIRE WATER TO BE DELIVERED BEYOND COLORADO'S BORDERS

9 ROUNDTABLES
collaborate on local needs

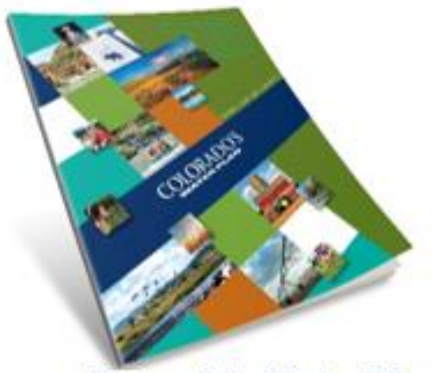
88% AG/FOOD PRODUCTION
8% MUNICIPALITIES
4% LARGE INDUSTRIES

15 MAJOR INDUSTRIES
depend on water for growth and success

5.6 MILLION PEOPLE
use water to live, work and play in Colorado

UP TO 33% OF IRRIGATED LAND COULD BE DRIED UP BY 2050 TO MEET NEW MUNICIPAL DEMANDS

REALIZING IDEAS…

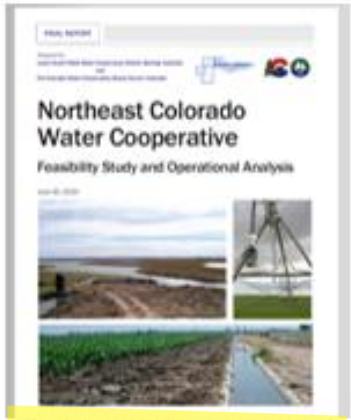


Colorado's Water Plan

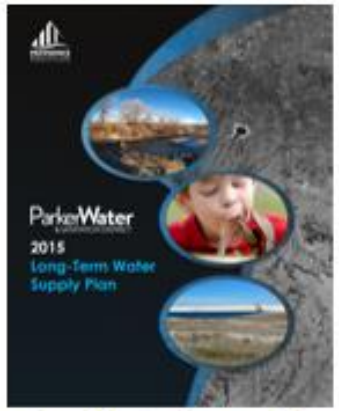
South Platte Basin Implementation Plan

South Platte Storage Study

SPROWG Feasibility Study



Northeast Colorado Water Cooperative



Parker Water Long Term Water Supply Plan

PIONEERING A COLLABORATIVE AND SUSTAINABLE WATER FUTURE

Platte Valley WATER PARTNERSHIP

WATER IS CONNECTED

COLLABORATIVE WATER SHARING AGREEMENTS

CWSAs, formerly known as ATMs, are innovative and flexible water use agreements between two or more users, typically involving agricultural, municipal, or environmental users. CWSAs provide a temporary, voluntary, and compensated alternative approach to the "buy and dry" method that occurs when a water provider purchases senior agricultural water rights, formally changes the water's designated use through water court, and permanently removes the water from farmland.

WATER STORAGE

Water storage helps meet the year-round needs of agriculture, municipalities, recreation, and the environment. While snowpack is Colorado's greatest storage "facility," reservoirs hold water to be released during heightened demand or periods of drought. Nearly half of Colorado's storage capacity is located on the western slope in the Colorado River Basin and its tributaries.

Storage is comprised of both surface and underground storage. Surface water storage includes reservoirs and gravel pits and relies on water infrastructure, such as pumps, tunnels, and ditches, to convey water across the landscape. Underground storage includes alluvial and bedrock aquifers that offer potentially significant groundwater storage capability.

To support the water needs in Colorado, it is important to recognize that storage is an important tool to manage and share conserved water and address the challenges of a changing future climate. Most storage projects, however, were developed in the middle of the last century, and the construction of both new infrastructure and storage has remained relatively static over the last 30 years.

CONVEYANCE INFRASTRUCTURE

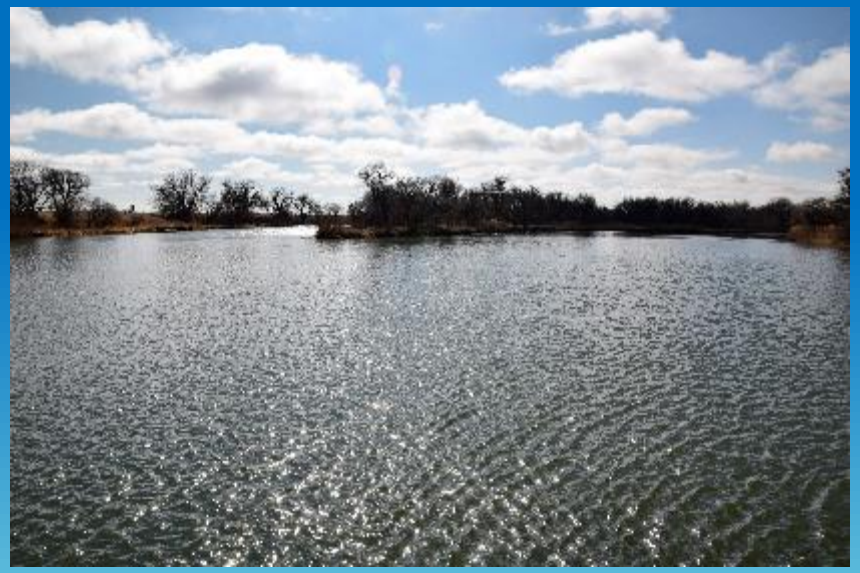
Conveyance infrastructure is critically important for meeting Colorado's water needs. While storage projects are important for capturing available supply, conveyance infrastructure moves the water from reservoirs, streams, and aquifers to where the water is needed using pipes, pumps, diversion structures, headgates, and ditches. Conveyance is critical for agricultural purposes in moving water from streams and irrigation wells to farm fields. In a municipal setting, conveyance infrastructure moves water from storage reservoirs to water treatment plants, from treatment plants to homes, and from homes to wastewater treatment facilities.

Often, the most expensive components of a water development project are the conveyance facilities. Water may need to be transported over many miles from its source to end use, which results in high material costs, extensive land or easement purchases, and potentially lengthy and expensive permitting processes. While conveyance infrastructure is often buried and out of sight, it represents a significant investment and an important component of how we get water.

Platte Valley Water Partnership

PIONEERING A COLLABORATIVE AND SUSTAINABLE WATER FUTURE

Parker Water & Sanitation District



Lower South Platte Water Conservancy District
EST. 1964

Castle Rock Water
Securing our future *drop by drop*

Platte Valley Water Partnership

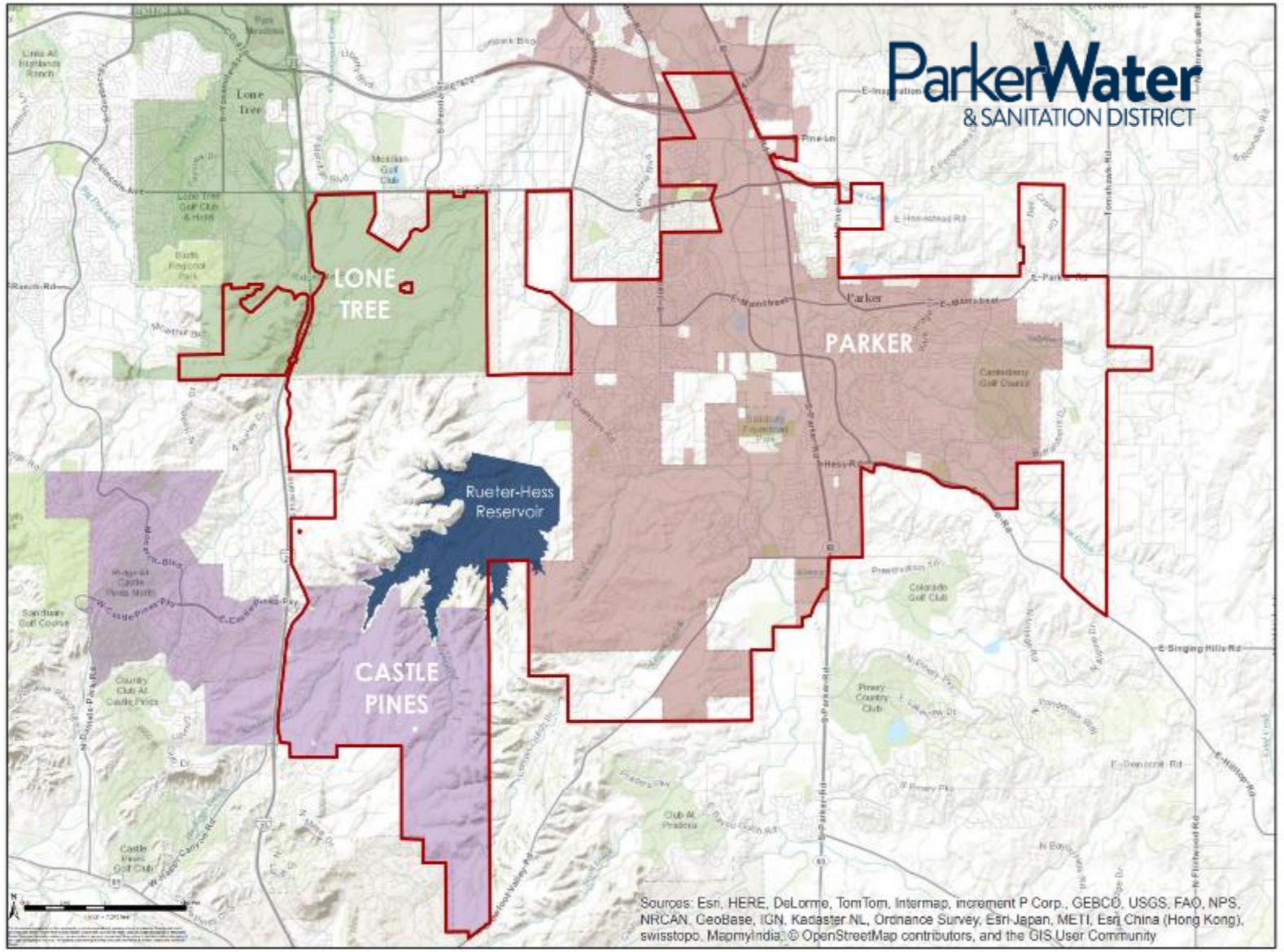
PIONEERING A COLLABORATIVE AND SUSTAINABLE WATER FUTURE

Current:

- 75,000 Residents
- 44+ square miles

Build-out (2050):

- New Developments to the South and West
- 120,000-140,000 Residents



Parker Water and Sanitation District Service Area

Parker Water & Sanitation District

Vision: Sustaining Life for Our Community

Mission: To effectively manage our vital water resources to ensure quality and value to those we serve.

Platte Valley Water Partnership

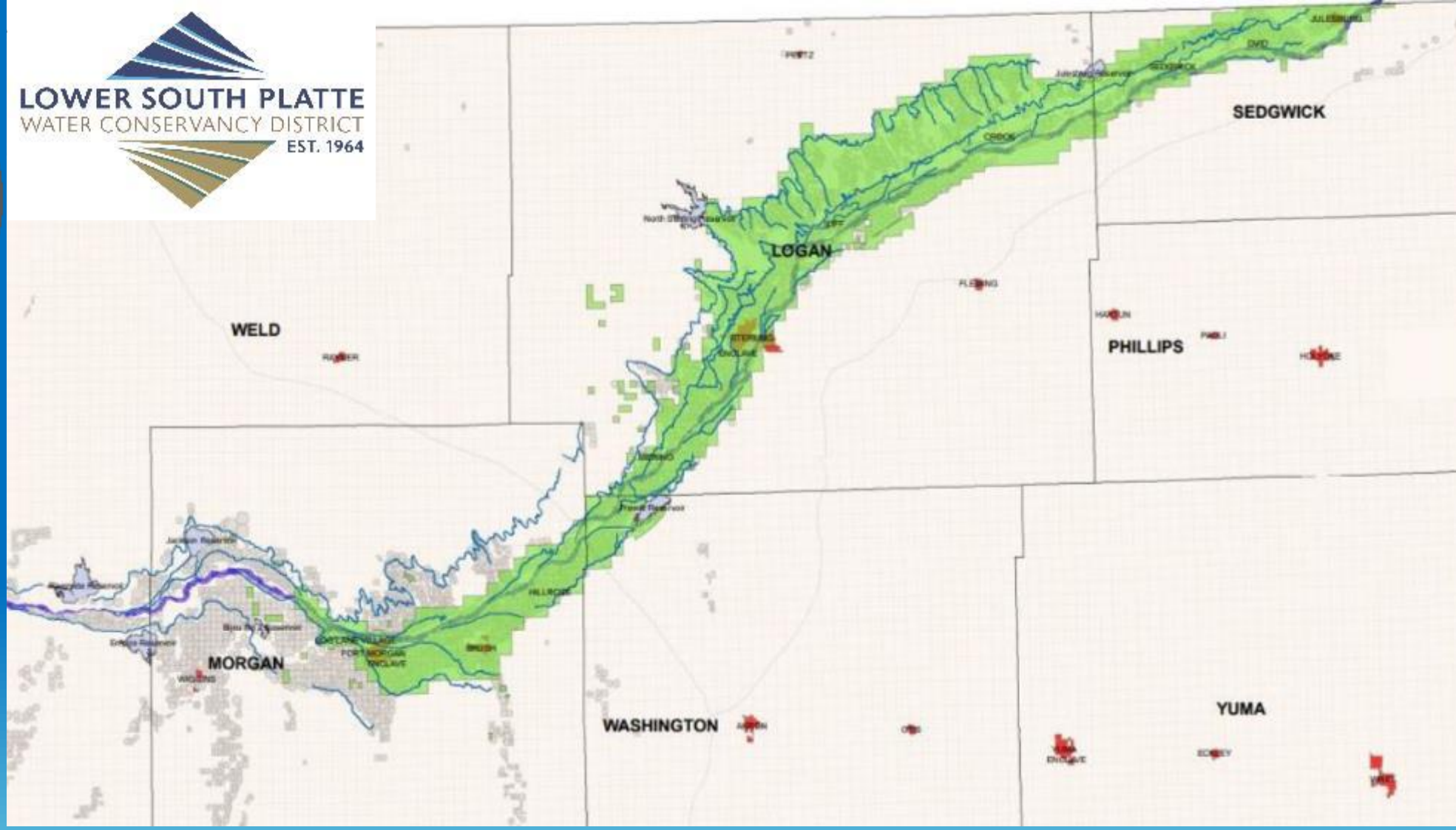
LOWER SOUTH PLATTE WATER CONSERVANCY DISTRICT EST. 1964

LSPWCD Service Area:

- Morgan, Logan, and Sedgwick Counties
- 406,000 Acres
- 30+ Ditches and Reservoirs

What we do:

- Water Supply Development
- Education/Outreach
- Policy and Advocacy
- District Services
  - Flow Monitoring
  - Aug Accounting,
  - Flow Meter Certification
  - Well Monitoring



Mission: To conserve, protect and enhance waters flowing in the South Platte River and its tributaries within the District boundaries; and to participate in water-related projects that will embody protection of water rights, thoughtful conservation, responsible growth, and beneficial water usage within the Lower South Platte Valley.

PROJECT OVERVIEW

- Launched in 2019 between Parker Water & Sanitation District and the Lower South Platte Water Conservancy District.
- An innovative, long-term water supply solution that will benefit both agricultural and municipal communities in the South Platte River Basin.
- A 50/50 undivided split – half of the water controlled by LSPWCD.

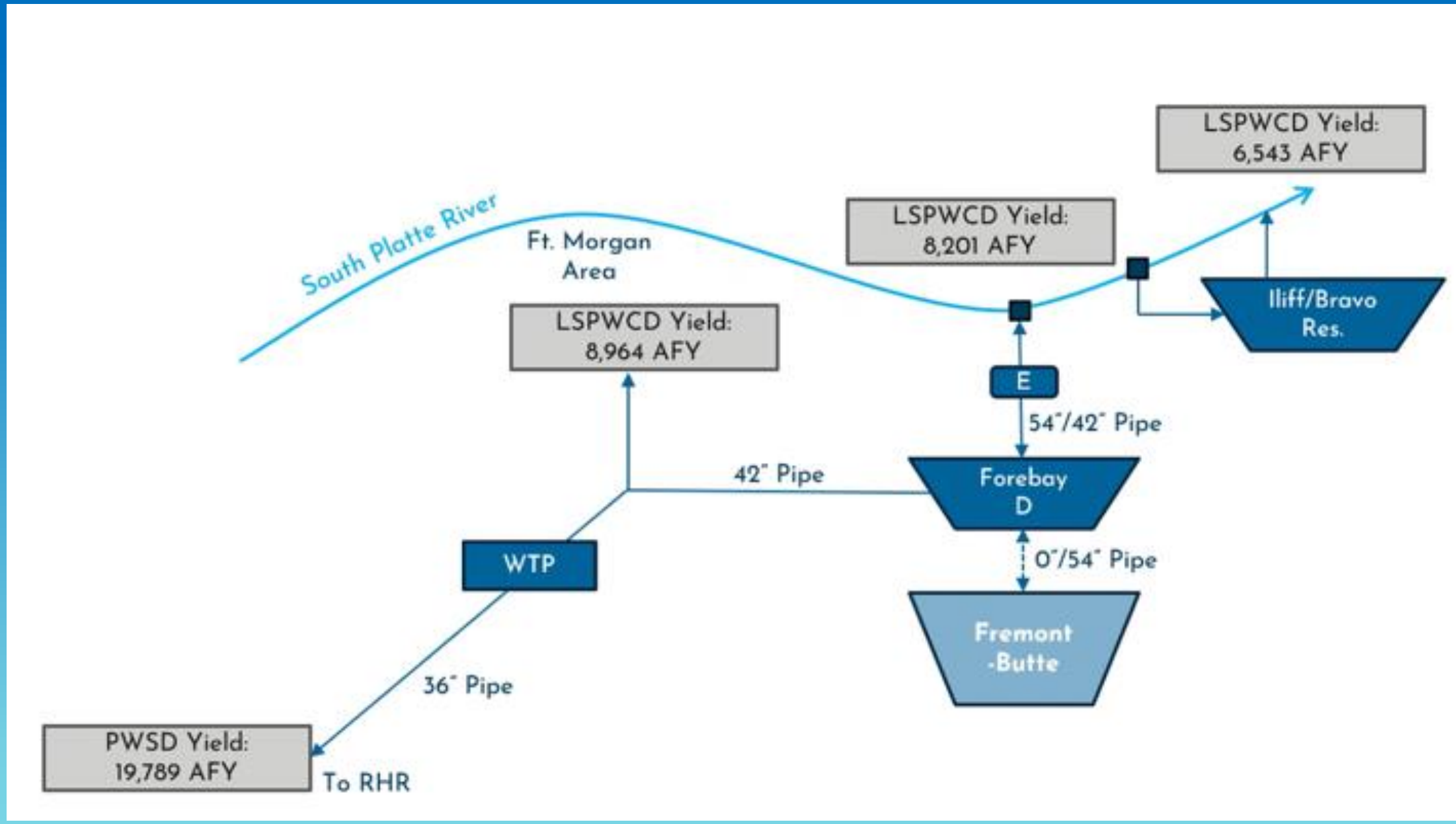
HOW PVWP WILL WORK

PVWP will create crucial water storage and the infrastructure to transport it. The project is currently in the planning phase, with construction anticipated to begin in the late 2030s, and water being conveyed in 2040.

KEY INFRASTRUCTURE

- *Small Storage Reservoir near Illiff (up to 6,500 acre-feet)*
- *PVWP Forebay Reservoir*
- *Pipeline and infrastructure for transport to Rueter-Hess Reservoir and delivery within LSPWCD*
- *Large Storage Reservoir near Akron (up to 72,000 acre-feet)*

PVWP CONFIGURATION



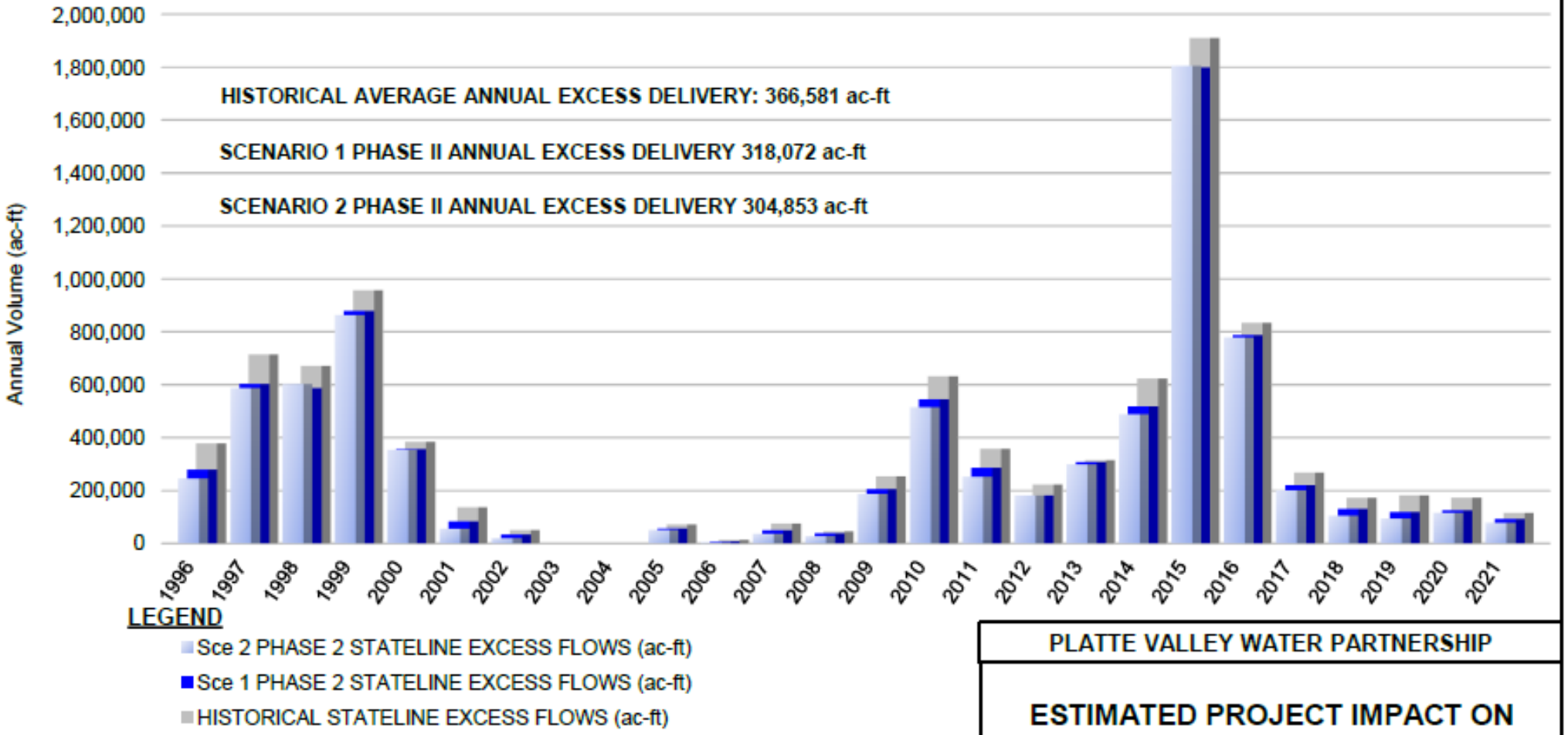
2019 Junior Water Right Example:

- *Project could have stored 55,000 AF in 2021-2023 if the project were online today* (limited by infrastructure size).

Model for Future Water Development

Project Benefits:

- No new Buy and Dry through PVWP infrastructure. Prohibition is locked into partner agreements.
- 50% of the PVWP yield remains in Northeast Colorado for uses within the LSPWCD service area including agricultural irrigation and augmentation.
- Collaborative Water Sharing Agreements allow farmers or other water users to temporarily lease water through the project.
    - Infrastructure has historically been a hurdle for this.
- The PVWP won't stop "Buy and Dry," but we want to be transparent up front about not allowing permanent Buy and Dry in this project. Water Right holders can still sell their water if they choose, and transfer through other projects.
- A Partner like PWSD that listens and adapts to the needs of Ag. Multiple benefits other than Ag, to include environmental, wildlife habitat and recreation.
- The variable Hydrology allows for this project to capture of newly appropriated water that was not able to be captured before.
- Municipal partners help make projects economically feasible for Ag.
- Securing renewable water supply to areas with non-renewable water
- Consistent with practices outlined in the Colorado Water Plan
- Support from diverse stakeholders including agricultural, environmental, municipal, political, and Western Slope groups.



NOTES:
1) Excess stateline flows are flows greater than 120 cfs during the irrigation season, and all flows during the non-irrigation season.
2) Stateline flows are measured at the Julesburg Gage where the South Platte River is anastamosing; therefore the total flow is calculated by summing 3 gages known as channels 1, 2 and 4.

PLATTE VALLEY WATER PARTNERSHIP

ESTIMATED PROJECT IMPACT ON ANNUAL EXCESS COMPACT FLOWS

File: AnnualStatelineFlows.xlsx		Date: 8/27/2024
Project No: 1489-20	Drawn by: AVE	Fig No: 16

SOUTH PLATTE COMPACT NEGOTIATIONS JAN-APR 1923

Robert A. Goodall
Jewelry and Music
Ogallala Nebraska

January 27, 1923.

Mr. Delph Carpenter,
Attorney at Law,
Greeley, Colorado.

My Dear Mr. Carpenter:

It was my pleasure to read over, with a great deal of interest, the proposed compact which you submitted to our State Irrigation Engineer for his approval.

The people in this locality are very desirous of seeingacompact entered into between the two states, as they realize that a permanent agreement will be of great benefit to all those interested in the waters of the South Platte.

Your proposition was discussed by a number of those who were vitally interested, in North Platte about two weeks ago. A great many of the paragraphs were agreeable but the one most important paragraph which has to do with guaranteeing the future water right to the proposed south divide project could not be accepted by those interested, for the reason that if it was accepted we would not have a chance in the world of ever selling our irrigation bonds for the construction of the project.

Before we can ever hope to sell these bonds, we will have to have an agreement which will guarantee to us, a prior right to the use of ~~all~~ 150 S.F. the flood waters of the south platte, Over all future the diversions in Colorado east of the line which is 51 miles west of the boundary line of the two states.

From the conversations I have had with you, Mr. Carpenter, I know that Colorado will not have any future use for this water, as there is no land tributary to that portion of the river which can be irrigated in Colorado.

Keith County Community Club
Boost for Keith County and Western Nebraska
OGALLALA, NEBRASKA

Officers: R. A. Goodall, Pres.; Rev. R. F. Scott, V. Pres.; C. H. Fisher, Secy.; S. L. Hostbeck, Treas.

2/3/23.

MR. D.E. CARPENTER.
GREELY. COLO.

DEAR MR. CARPENTER:

Will you kindly advise me what progress has been made toward the settlement of the Water Rights on the South Platte.

Our people are becoming very anxious to organize their district for the construction of the South Divide Canal, but of course, nothing can be done until a settlement IS agree upon., and of course that settlement has to be of such a nature, that will make our proposed bonds salable.

In as much as there is no chance of your state ever using the water below Sterling, I can see no reason for withholding a prior right below that point. In case there might be some development at a later date below Sterling, could you not reserve a prior right to water enough to irrigate, say not over 5000 acres, in that territory. I feel sure that you will use your good office to hurry this along all you can so that we can get the matter before the two legislatures at their present session. As dry as it is in Western Nebr, now,would be the ideal time to put this proposition across. Will be glad to hear from you. Yours very truly,

Robt A Goodall.

Bridgeport, Nebraska.
A P R I L 5, 1923.

Honorable Delph E. Carpenter.
Greeley, Colorado,

My Dear Senator:

Just received a letter from Robert A. Goodall of Ogallala on the South Platte river treaty matter. He suggested a conference be held in Ogallala next week if you will be present.

Will you set an early date for a conference to be held in Ogallala that will be convenient for you?

Our legislature will likely be in session for all or nearly all of April.

Very truly yours,

DEPARTMENT OF PUBLIC WORKS,
CHIEF.
Bureau of Irr.,Power & Drain.

R.H.Willis
OB

POSTAL TELEGRAPH – COMMERCIAL CABLES
TELEGRAM
TELEGRAMS TO ALL AMERICA · CABLEGRAMS TO ALL THE WORLD

Send the following Telegram, subject to the terms on back hereof, which are hereby agreed to. Apr 28 1923

To Mr. A. J. McCune
State Engineer Denver Colorado

Confidential
South Platte compact signed to-day stop Goes to Nebraska legislature for ratification immediately stop Will remain here few days

Copy

Hosea

(Wording of this may not be exactly as sent)

Sent Western Union 10 AM Apr 28

ARTICLE VI

1. Rights for Nebraska to construct, maintain and operate Perkins Canal in CO.

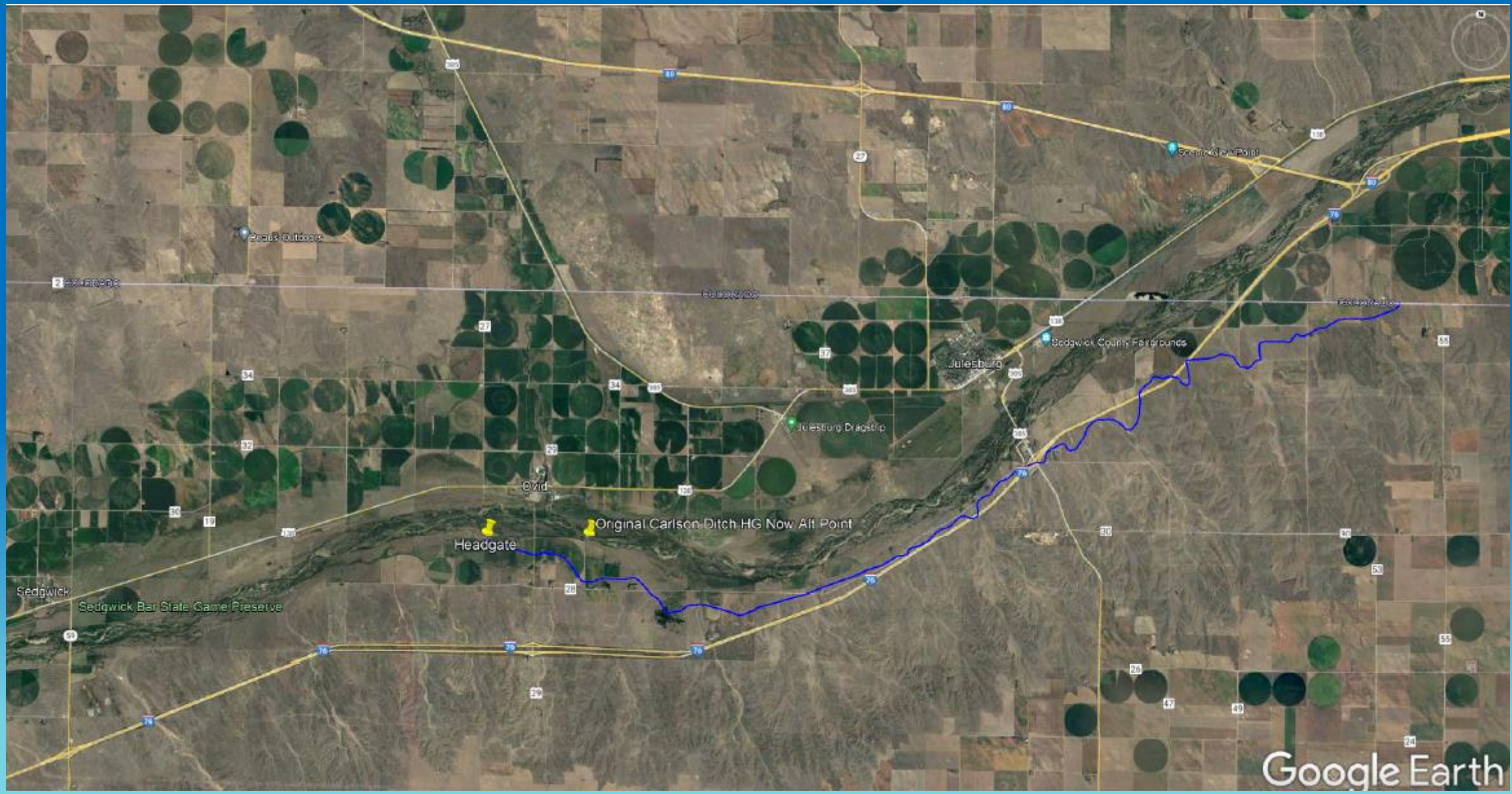
2. Perkins Canal may divert net future flow in Lower Section

    a. Colorado reserves the prior, preferred, and superior right to store 35,000 AF

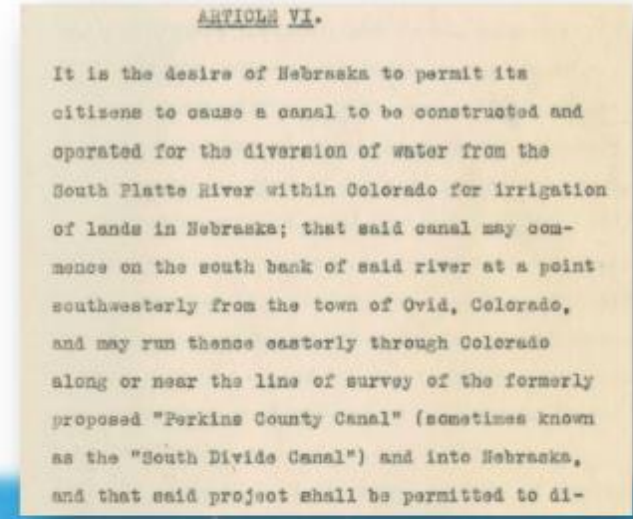
    b. Between Oct. 15 and April 1, Canal entitled to divert 500 c.f.s. under a Dec. 17,1921 appropriation date; no claim to water in Upper Section

3. No claim to water between April 1 and Oct. 15 other than surplus flows

PERKINS CANAL IN COLORADO



Article VI of South Platte Compact

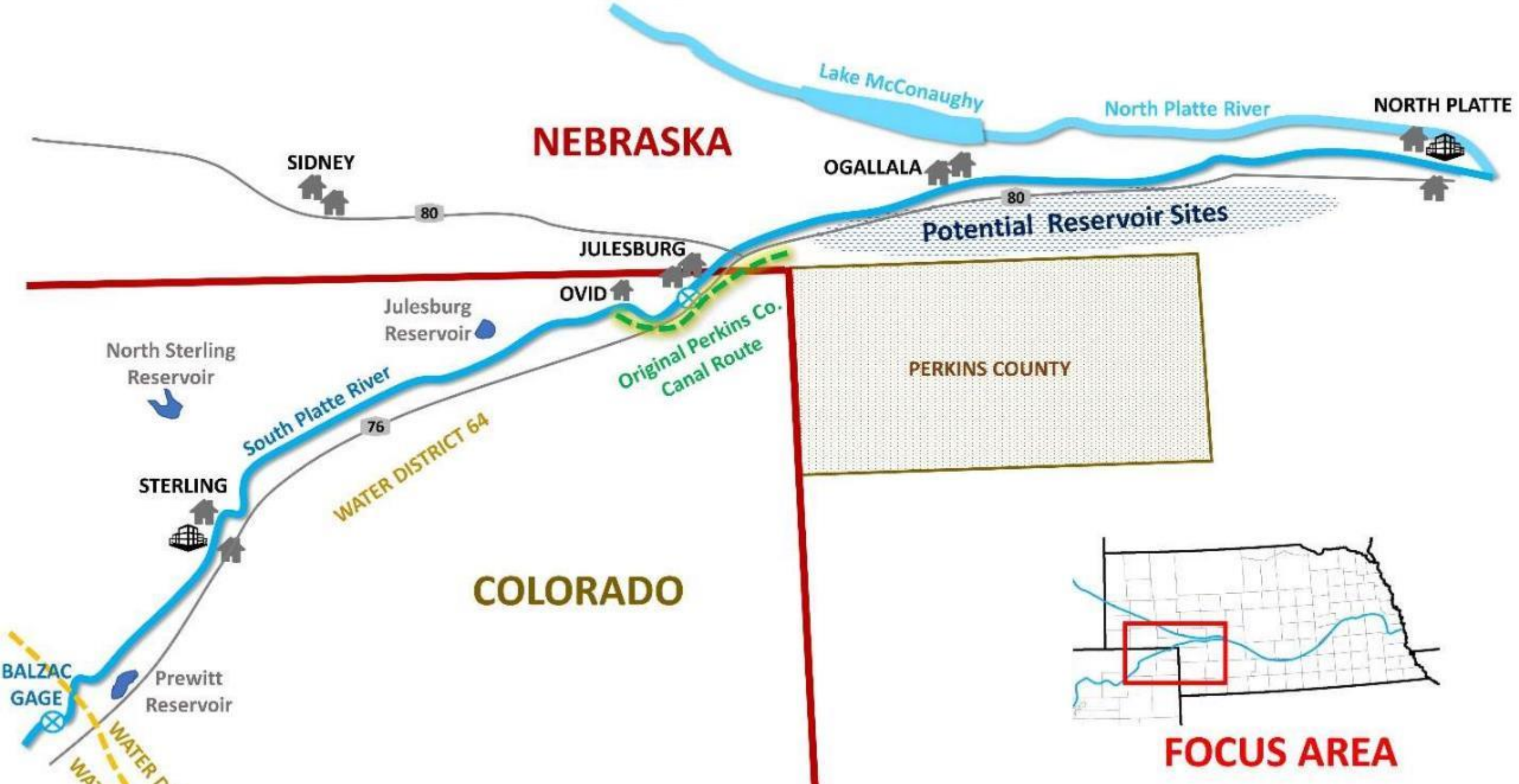


ARTICLE VI.

It is the desire of Nebraska to permit its citizens to cause a canal to be constructed and operated for the diversion of water from the South Platte River within Colorado for irrigation of lands in Nebraska; that said canal may commence on the south bank of said river at a point southwesterly from the town of Ovid, Colorado, and may run thence easterly through Colorado along or near the line of survey of the formerly proposed "Perkins County Canal" (sometimes known as the "South Divide Canal") and into Nebraska, and that said project shall be permitted to di-

"It is the desire of Nebraska to … cause a canal to be constructed and operated for the diversion of water from the South Platte River within Colorado, for irrigation of lands in Nebraska; … and that said project shall be permitted to divert waters of the river as hereinafter provided."

Perkins County Canal Project Area



Section 7. Future Basin Projects

The BRTs, along with other stakeholders, identified projects that will further progress toward achieving basin goals and meeting future water needs. The list of projects is managed in a database that was initially developed prior to the 2015 BIP and was updated in 2020 during the BIP update. The purpose of the projects database is to keep a record of the projects considered by the roundtables through the BIP process, both in the past and into the future. Table 9 provides a snapshot summary of the projects database at the conclusion of the current BIP update process.

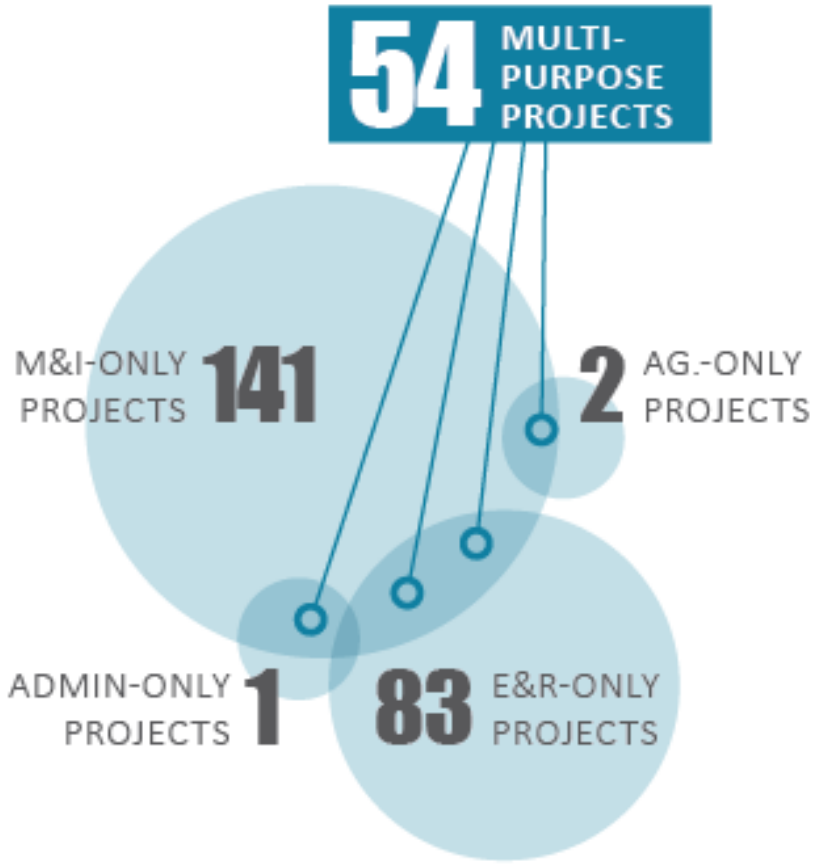
Total estimated costs for project implementation are more than $9.8 Billion

(for projects that have identified a project cost)

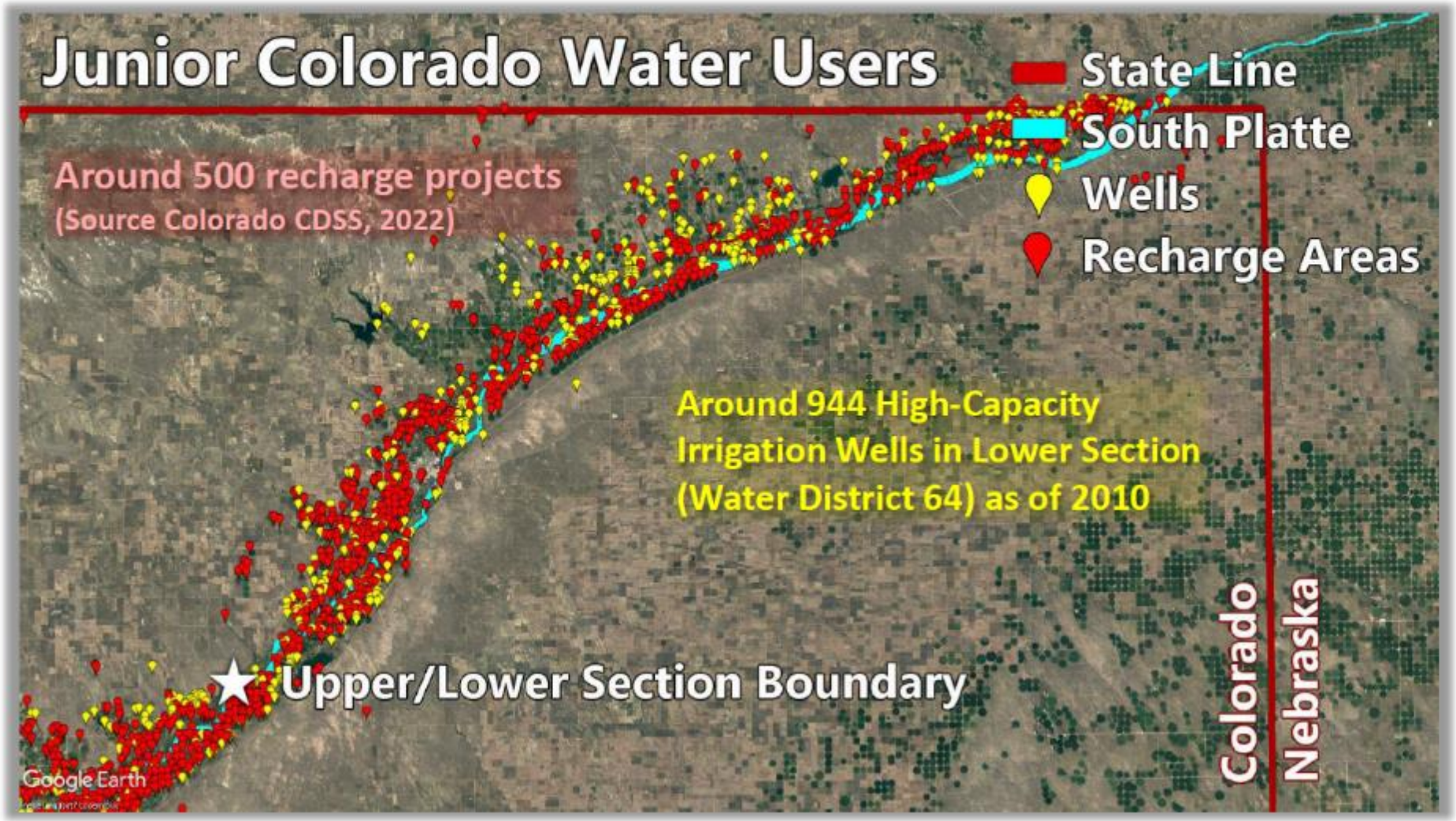
Table 9. Snapshot Summary of Basin Projects

Total Projects	282
New projects added in 2020	185
Projects completed	17
Projects being implemented	81
Projects identified as meeting M&I needs	178
Projects identified as meeting Ag needs	44
Projects identified as meeting E&R needs	132
Projects identified as meeting Administrative needs	15
Tier 1 projects	39
Tier 2 projects	53
Tier 3 projects	135
Tier 4 projects	55
TOTAL COST OF ALL PROJECTS	**$9,870,000,000**
PERCENTAGE OF PROJECTS WITH AN ESTIMATED COST	**56%**

Projects that are concepts, planned, or are being implemented were the basis for the above data summary (with the exception of data specifically describing projects completed or being implemented)



Existing Junior Groundwater Wells and Augmentation Structures



These uses (as well as existing Colorado augmentation projects and groundwater wells) will be junior to the Canal.

THE LATEST FROM NEBRASKA

DNR: Nebraska soon will seek federal Perkins canal permit as urgency grows

Todd von Kampen
Nov 20, 2024

Nebraska should be ready in early 2025 to apply for federal permission to revive and complete the 1894 Perkins County Canal from Colorado, the state's acting top natural resources official said.

The Legislature set aside $629 million in 2022 and 2023 to revive the canal. As now conceived, it would cross southern Keith County after following the 1894 canal's original route from near Ovid, Colorado, across Sedgwick County.

DNR: Nebraska soon will seek federal Perkins canal permit as urgency grows

Todd von Kampen

Nov 20, 2024

Bradley estimated it'll take about two years to win federal officials' blessing to build the Perkins canal.

He said the U.S. Army Corps of Engineers has been designated the lead agency for Nebraska's permit request. The Corps will consult with other interested agencies, including the U.S. Fish and Wildlife Service.

Two 1980s explorations of reviving the canal — one by the North Platte-based Twin Platte Natural Resources District, the other by Imperial's Upper Republican NRD — were choked after several years by state or federal red tape.

This time, "we're obviously talking about a state-run process," Bradley said. "We want to protect (South Platte) flow and not use it."

Meanwhile, Perkins canal design work by Nebraska DNR engineers is nearing 30% completion. "Elements of the design are coming into pretty good view now," Bradley said.

THE LATEST FROM NEBRASKA

NEBRASKA
Good Life. Great Water.
DEPT. OF NATURAL RESOURCES

January 17, 2025

Certified Mail, Return Receipt Requested

NOTICE OF INTENT TO EXERCISE EMINENT DOMAIN AUTHORITY PURSUANT TO THE SOUTH PLATTE RIVER COMPACT AND OFFER TO PURCHASE IN LIEU OF EMINENT DOMAIN

The purpose of this letter is to extend an offer to purchase the Property from you through a negotiated agreement in lieu of the State's initiating formal condemnation proceedings. In the event we are not able to reach a negotiated purchase of the necessary property interests, this letter additionally serves the purpose of notifying you of the State's intention to initiate formal condemnation proceedings in U.S. District Court, consistent with the authority provided under the Compact and applicable federal law.

NEBRASKA
Good Life. Great Water.
DEPT. OF NATURAL RESOURCES

Jim Pillen, Governor

OFFICIAL ELECTRONIC MAIL SENT VIA EMAIL. NO HARD COPY TO FOLLOW

July 12, 2024

Mr. Jason Ullmann
State Engineer
Colorado Division of Water Resources
1313 Sherman Street, Suite 821
Denver, CO 80203

RE: Water Administration on the South Platte River in Colorado

NEBRASKA
Good Life. Great Water.
DEPT. OF NATURAL RESOURCES

Jim Pillen, Governor

December 13, 2024

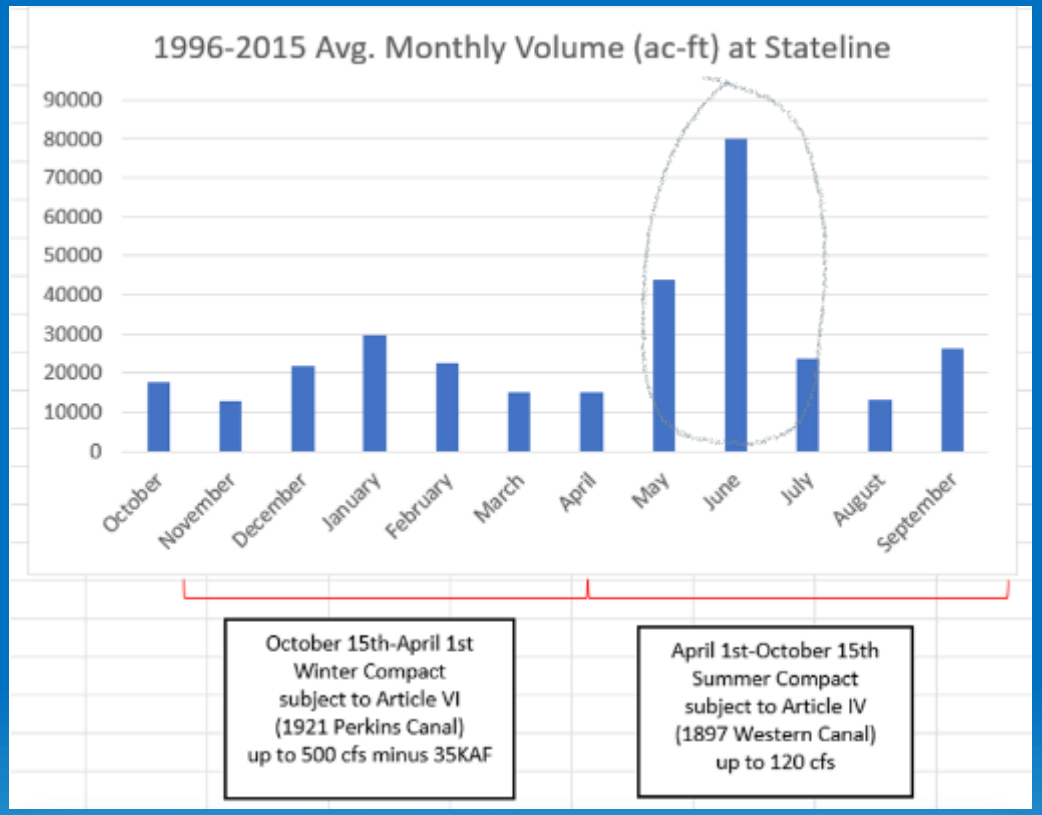
Transmission via email: Lauren.Ris@state.co.us

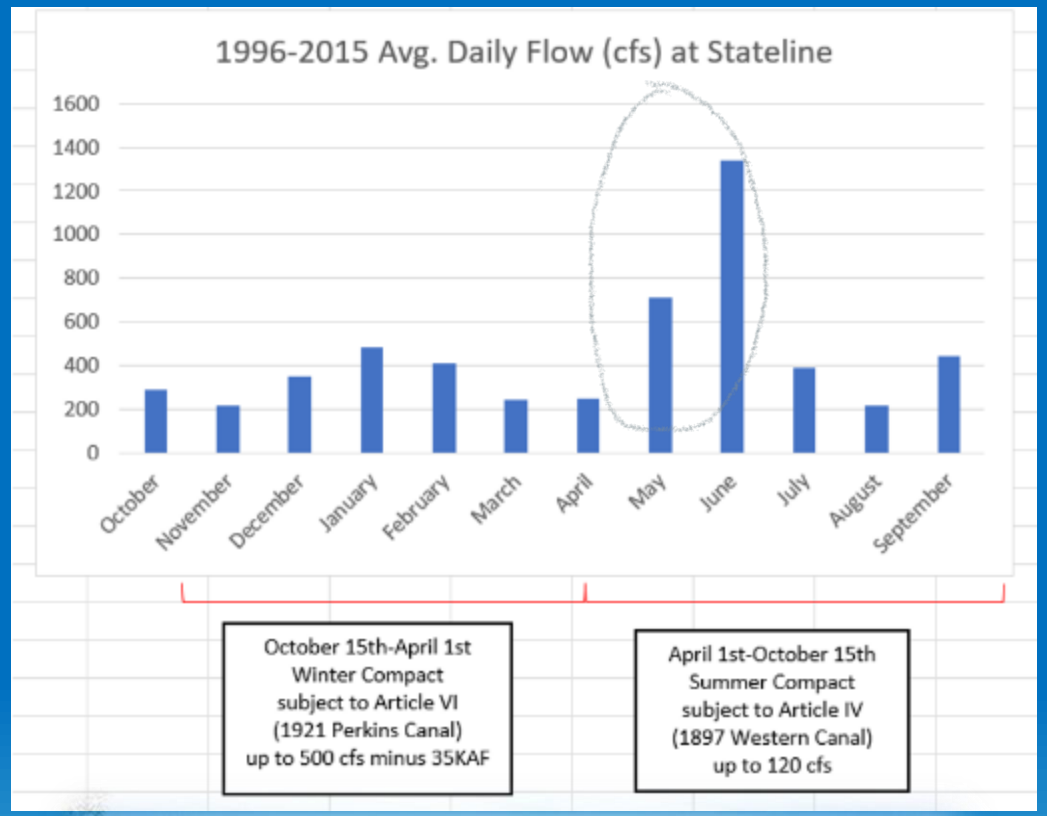
Lauren Ris, Director
Colorado Water Conservation Board
1313 Sherman Street, Room 718
Denver, CO 80203

Subject: Platte River Recovery and Implementation Program Second Increment Negotiations

As we proceed with discussion of the potential parameters of a Second Program Increment, Nebraska wants to be clear that the current status quo outlined in Colorado's Plan for Future Depletions, in combination with reliance on Nebraska water to mitigate Colorado development, without protections for non-irrigation season South Platte River flows crossing the State line into Nebraska ***will not be an acceptable arrangement into a Second Program Increment.***

AVERAGE SOUTH PLATTE FLOWS





South Platte River Summer 2022

South Platte River Summer 2023

QUESTIONS?