

SPNRD Stakeholder Meeting #1 Minutes

Project: Stakeholder Advisory Committee Meeting to Jointly Develop 2nd Increment Integrated Management Plan (IMP) with South Platte NRD and Nebraska Department of Natural Resources

Subject: Stakeholder Meeting #1

Date: Wednesday, June 20, 2018, from 2:00 p.m. – 4:00 p.m.

Location: Western Nebraska Community College
371 College Drive, Sidney, NE

I. Welcome to the Meeting

- a. Stephanie White, Facilitator, HDR, opened the meeting at 2:02 p.m. MDT by stating a copy of the open meetings act was in the room and notice of the meeting was published in the Sidney Sun Telegraph (Attachment A).
- b. Bill Halligan, Chairman of the South Platte Natural Resources District (SPNRD) Board of Directors and a member of the Natural Resources Commission, welcomed the group by indicating this is the first of four meetings to develop the second increment Integrated Management Plan (IMP). The first IMP development process began ten years ago, and Bill indicated he feels more comfortable and informed at this stage of the second increment than he did at the beginning of the first increment development process. He stated it is a cooperative effort between SPNRD, Department of Natural Resources (NeDNR) and various water users representing the district. The District and the board of directors have been working on IMP implementation for the last 10 years. But, he said, we need your input and for you to indicate what you think has worked well, where we have risk, problems, what we are not getting done, what we are not aware of and need to address. You, the stakeholders are representing the water users of the three counties of SPNRD. Bill indicated the IMP is required to work with the Upper Platte River Basin-Wide second increment plan, due to be completed in the next few months. He then reviewed the legislative and legal impetus for the integrated management planning process. Bill summarized how the entire district is fully appropriated, and how the overappropriated area began as the area along Lodgepole Creek which was designated as a moratorium area by SPNRD's board. He introduces the members of the group who are participating in the second increment process of the Upper Platte River Basin-Wide planning; Bernie Fehringer, Carson Sisk; Kevin Derry, Jared Derry, and himself. He concluded by reiterating the IMP must be consistent with the basin-wide plan, and reminded the stakeholders how important it is to speak up about their concerns.
- c. Jennifer Schellpeper, NeDNR, thanked the stakeholder group for participating and mentioned state statute requires the participation of this group in the development of the IMP. She said that there would be quite a lot of background material presented to the group to inform their decision making process for improving the IMP. Focus of this group is to

make improvements to the IMP. Also today we will be going over what is in the current plan, and the current basin-wide plan.

- d. Stephanie White asked the group to introduce themselves. She asked how many were part of the first increment planning process, with about one-third indicating they were participants. Stephanie requested Rod Horn, Manager of the SPNRD, to introduce himself and his staff, including those that were present and those who had worked on preparation for the meeting: Ryan Reisdorff, Travis Glanz, Shelly Gerk, NaManet Keller.

Stakeholder attendees introduced themselves. The attendance sheet is included (Attachment B).

- e. Stephanie White went over the agenda (Attachment C), reiterated that this is a public meeting, noted that a copy of the Open Meetings Act was in the room, and stated that notice of the meeting was published in the Sidney Sun-Telegraph, Western Nebraska Observer (Kimball, NE), and the Chappell Register (Chappell, NE). She then went over safety procedures.
- f. Ryan Reisdorff, SPNRD, reviewed the binders provided to the group so that they would be familiar with its contents (table of contents of binders is in Attachment D).

II. Why are we here?

- a. Stephanie White reviewed stakeholder roles and responsibilities. She pointed out the roles and responsibilities are outlined in the Public Participation Plan, which is included in the binders, to provide clarity for the development of the second increment; consensus is the preferred outcome.
- b. Copies of all presentations are included (Attachment E).
- c. Jennifer Schellpeper presented a history of statutory requirements and how this relates to the NeDNR's determination of fully appropriated and overappropriated portions of basins. She explained that within these areas IMPs are required to be developed, and described where the hydrologically connected area is found and what that means. She detailed how goals and objectives should follow guidelines as described in statute, how interstate compacts affect this area, how it is relevant to the IMP process, and other statutory requirements for IMPs. Listing the differences between IMPs and basin-wide plans, she pointed out that there is a foundation of data and science which plan development and implementation are built upon. During plan implementation, the monitoring program provides for data collection which NeDNR and NRDs can use to evaluate progress made towards the goals and objectives, and, if needed, modify the plan to reach those goals and objectives.

III. How did we get here?

- a. Jennifer Schellpeper then covered the Upper Platte River Basin-Wide Plan, its planning process, how it relates to the overappropriated and fully appropriated areas, and the SPNRD's IMP. She reviewed the Platte River Recovery and Implementation Plan (PRRIP) and how it guides water management decisions that also work with the Upper Platte River Basin-Wide Plan's goals and objectives. The first increment of the UPBWP is winding down

and Jennifer reviewed the goals and objectives that are part of the second increment Upper Platte River Basin-Wide Plan, which is currently in the process of development.

IV. What has been done?

- a. **South Platte NRD Current IMP:** Rod Horn walked through the SPNRD's current IMP (first increment) and gave background on the current plan. He reviewed the outline and directed the stakeholder group to the SPNRD's Rules and Regulations and explained how the two documents work together. Rod explained that the duplication of rules and regulations language contained in the two documents, the IMP and the SPNRD's Rules and Regulations, has not been a good working process for the NRD.

Rod pointed out that the Lodgepole Creek watershed was mapped separately because it has been under a moratorium initiated by the SPNRD Board of Directors since 2002. He also outlined a statute that addresses responsibilities of providing offsets for increased municipal uses.

- b. **Stream Depletions:** Jennifer Schellpeper then presented a segment on "Stream Depletions 101." She outlined how water moves through the system and how modeling can indicate past impacts or predict effects of new impacts to streamflow depletions due to several factors. She demonstrated variables that affect stream depletions.
- c. **Data sets and modeling:** Thad Kuntz, Adaptive Resources, spoke about his work for SPNRD and NeDNR using the Western Water Use Model (WWUM). He explained that the WWUM uses three models and described two of them: (1) a water balance model that deals with crop consumptive use, pumping, and weather data, and (2) the groundwater model that simulates flow of water within the strata. In his presentation, he provided additional information about land use within the modeled areas and the geology and aquifer characteristics within the boundary of the SPNRD. Thad provided information regarding average annual recharge, stream hydrographs, groundwater well hydrographs, and change in modeled groundwater levels over time. The model is updated every few years, as new data is available, to understand positive effects to the river as a result of the management actions.

- i. Stakeholder Questions / Comments

- i) What does "saturated thickness" mean? Answer: water table, minus the bottom of the aquifer; or, how many feet are saturated below the ground.
- ii) Talk about your oil well data that you got used in the models. Answer: because the oil companies cased the wells too shallow, we were able to see and understand the geology data. 15,000 wells were examined and data added for each one. It changed our collective knowledge of the aquifer.

- d. **Lessons learned:** Rod Horn shared lessons from the first increment of their IMP. He started with the successes of offset targets that were met, and indicated that details will be shared with the group in subsequent meetings. The offset opportunities are limited because of the number of acres they are working with. Complexity of municipal and industrial accounting and baseline for use was a challenge. Rod mentioned the duplication of language in the rules and regulations and the current IMP, which resulted in problems due to inconsistencies. A large amount of financial resources went into the modeling efforts,

and may not be sustainable. Ongoing challenges include monitoring and defining sustainability while addressing economic viability. The first increment group supported keeping the groundwater allocations system separate from their IMP and feels it is a beneficial program.

e. **Stephanie White led a stakeholder input session and asked for topics that need to be discussed in future meetings for potential inclusion in the second increment of the plan:**

- Soil problems on pivots
- 2026 Municipal offsets
- Keep momentum going/education (two additional matching comments = **)
- New and innovative ways
- Keeping pace with technology (three additional matching comments = ***)
- CO/WY partnerships and education
- Increased partnership in South Platte River Basin
- Aggressive in relationships
- Consumptive use by tress
- Credit for progress (one additional matching comment = *)
- Better understand data
- Continue to enhance model
- Sustainability
- Improve timeliness of robust review
- 1997 goal history and progress
- Groundwater uses all the way to Kearney Canal
- Be realistic
- Keep allocations out of plan
- Considerations of irrigated acres when they dry up
- Waste water plants
- Collaborate with DEQ
- Actions don't adversely impact users in this process
- Upstream and downstream partnerships
- Paying attention to how integrated water is
- Power usage partnerships (invite Wheat Belt Public Power?)

f. A general group discussion was held regarding the length of future meetings; group consensus was to keep them at 2 hours' length.

g. **Public Comment:** No public comments were made.

h. **Closing Remarks:** Bill Halligan closed the meeting by stressing to the group that the SPNRD has been managing groundwater successfully, and have had a moratorium for the last 14 years without a lawsuit. But, he said, the way that happens is for stakeholders to provide guidance and give input to the IMP development process. He stated he has worked with producers in Wyoming and Colorado, and we are doing more to change their point of view by setting an example. An example of folks getting along with each other.

i. **Meeting adjourned:** 4:30 p.m.

j. **Next Meeting:** August 15, 2018.

Attachments to Minutes:

Attachment A- Affidavit of Publication of Notice of Meeting

Attachment B- Copy of attendance sheet

Attachment C- Agenda

Attachment D- Copies of all presentations

RECEIVED

JUN 16 2018

SPNRD PROOF OF PUBLICATION

STATE OF NEBRASKA }
COUNTY OF DEUEL } ss.

Amount \$ 11.41

Date Paid

I, Michael D. Talbott, hereby certify that I am publisher of The Chappell Register, a legal weekly newspaper, of general circulation, published in said Deuel County and State of Nebraska; and further certify that the notice, of which the one attached is a true copy, was published in the regular and entire issue of each number of the said The Chappell Register for consecutive issues, the first publication being on the 14th day of June 2018 and the last publication being on the day of 20.....

SUBSCRIBED in my presence and sworn to before me this

14th day of June 2018



Linda M Walmsley
NOTARY PUBLIC

PUBLIC NOTICE

The South Platte NRD and the Nebraska Department of Natural Resources (NeDNR) will hold a Stakeholders Advisory Committee meeting on June 20, 2018, beginning at 2:00 PM (Mountain Time) at Western Nebraska Community College, 371 College Drive, Sidney, Nebraska. The purpose of the meeting is to discuss and develop goals and objectives to support the second increment of the jointly developed integrated management plan. The public is welcome to attend this stakeholder meeting; there will be opportunity for public comment toward the end of the meeting. Individuals with disabilities may request auxiliary aids and services necessary for participation by contacting Beth Eckles at the Nebraska Department of Natural Resources, telephone 402-471-0661 or by email at beth.eckles@nebraska.gov, before 5 pm Central Time, Thursday, June 14, 2018. 31L

LEGAL # L18-367

AFFIDAVIT OF PUBLICATION

The undersigned, being duly sworn deposes and says that he is a Principal Clerk of the SIDNEY SUN-TELEGRAPH, a bi-weekly newspaper of general circulation in Cheyenne County, State of Nebraska, and that a notice entitled:

Stakeholders Meeting

a true copy of which is hereto attached and made a part hereof, was published in said newspaper 1 consecutive week(s) the first publication having been made the

13 day of June 2018

and the last publication having been made the

13 day of June 2018

that said newspaper has been published bi-weekly in the English language at the City of Sidney, within said county and state for more than fifty-two consecutive weeks, immediately prior to the first date of publication above, and twice every week successively since that day, and during all said times has had and now has a bona fide circulation of more than 300 copies weekly and during all said time has been and now is printed in whole or in part in an office maintained by the Publishers at the said place of publication.

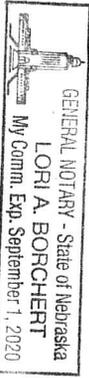
Lana Powell

Subscribed in my presence and sworn to before me this 13 day of June 2018

Notary Public Lori A Borichert

My commission expires 9.1.2020

(SEAL)



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Central Time, Thursday, June 14, 2018.
[Published in the Sidney Sun-Telegraph on June 13, 2018]

AFFIDAVIT OF PRINTER

STATE OF NEBRASKA

}SS.

COUNTY OF KIMBALL

I, Mary K Jenner, being duly sworn and under oath, say that I am an employee of Western Nebraska Observer, Company (a corporation), publishers of Western Nebraska Observer, an English Language weekly newspaper published in Kimball, Nebraska, with general circulation in both Kimball and Banner Counties, among others. I certify that said newspaper is a legal newspaper under the statutes of Nebraska, has a bona fide weekly circulation of at least 300, has been published at least 52 weeks prior to publication of this notice, that it holds a second class postage permit; and that to my personal knowledge, the attached clipping was printed in the regular and entire issue of the Western Nebraska Observer for one (1) week(s), beginning with the issue dated:

June 14, 2018
and ending with the issue dated:

June 14, 2018

Mary K Jenner

Signed

Subscribed and sworn to before me this:

14th day of June, 2018

Stacy J Burback
Notary Public

Printer's Fees:

\$ 12.77

 GENERAL NOTARY - State of Nebraska
STACY J BURBACK
My Comm. Exp. August 9, 2021

IMP Stakeholder Meeting June 20, 2018

Present	Name	Email	Best Contact Phone Number	Corrections
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X	Tim Maas	maasfam@vistabeam.com	308-249-0103	
X	Phil Grabowski	grabow65@ymail.com	308-249-6460	
X	Chris Meyer	meyerc673@hotmail.com	308-250-1745	
X	Kathy Narjes	rodekohr@hotmail.com	308-874-4371	
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X	Kevin Derry	derrykb@embarqmail.com	308-874-4240	

NRD, Integrated Management Planning Meeting

BCBS Sign-In Sheet

Date: June 20, 2018

Location: Sidney 116

	Print Name	Sign Name
1	Bill Helling	<i>[Signature]</i>
2	Brian Eckert	<i>[Signature]</i>
3	Jennifer Schnellpeper	<i>[Signature]</i>
4	Randy Zach - NPPD	<i>[Signature]</i>
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Agenda

Project: 2nd Increment Stakeholder Process for South Platte NRD Integrated Management Plan (IMP)

Subject: Stakeholder Meeting #1

Date: Wednesday, June 20, 2018 from 2:00 p.m. – 4:00 p.m.

Location: Western Nebraska Community College

Topics:

1. Welcome
2. Why are we here?
3. How did we get here?
4. What has been done?
5. South Platte NRD IMP
 - a. Stream Depletions 101
 - b. WWUM modeling
 - c. Datasets and modeling
 - d. Lessons learned
 - e. Next steps
6. Public comment

Next Meeting: August 15, 2018



SPNRD IMP

Meeting 1

TODAY'S AGENDA

- Welcome
- Why are we here?
- How did we get here?
- What has been done?
- South Platte NRD IMP
 - Stream Depletions 101
 - WWUM modeling
 - Datasets and modeling
 - Lessons learned
 - Next steps
- Public comment

WELCOME

- Open Meeting Notice
- Safety & Logistics
- Introductions



WHY ARE WE HERE?

Process Summary

PROCESS SUMMARY

Upper Platte Basin-Wide Planning

Statutory Authority

(How did we get here?)

Current Basin-Wide Plan

(What has been done?)

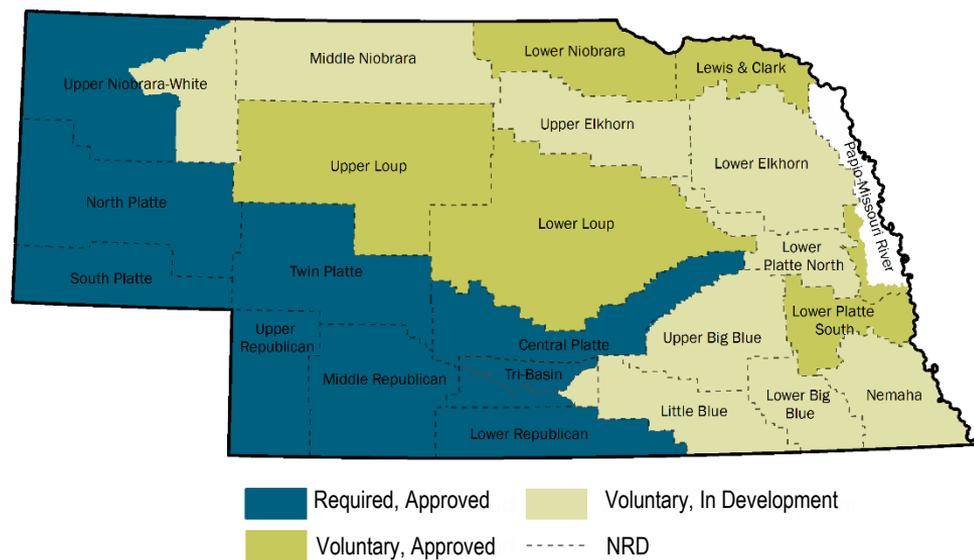
Basin-Wide Plan & IMPs

INTEGRATED WATER MANAGEMENT



INTEGRATED MANAGEMENT PLANNING IS A COLLABORATIVE PROCESS

- NeDNR + a Natural Resources District (NRD)
 - IMP development
 - Plan implementation
- Stakeholder Collaboration (seeking agreement)



STAKEHOLDER ROLES

- Convey local water issues/concerns
- Guide development of goals and objectives
- Disseminate information to local groups about IMP
- Attend meetings



NRD & NeDNR ROLES

- Acquire/disseminate information/data needed for stakeholder process
- Help formulate goals and objectives with stakeholders
- Coordinate with each other, stakeholders, facilitators throughout IMP process
- Help determine/convey feasible actions for plan implementation
- Write the Integrated Water Management Plan





HOW DID WE GET HERE?

Statutory Authority

STATUTORY DEFINITION § 46-713(4)(a)

Platte Overappropriated Area Basin-Wide Plan

Why?

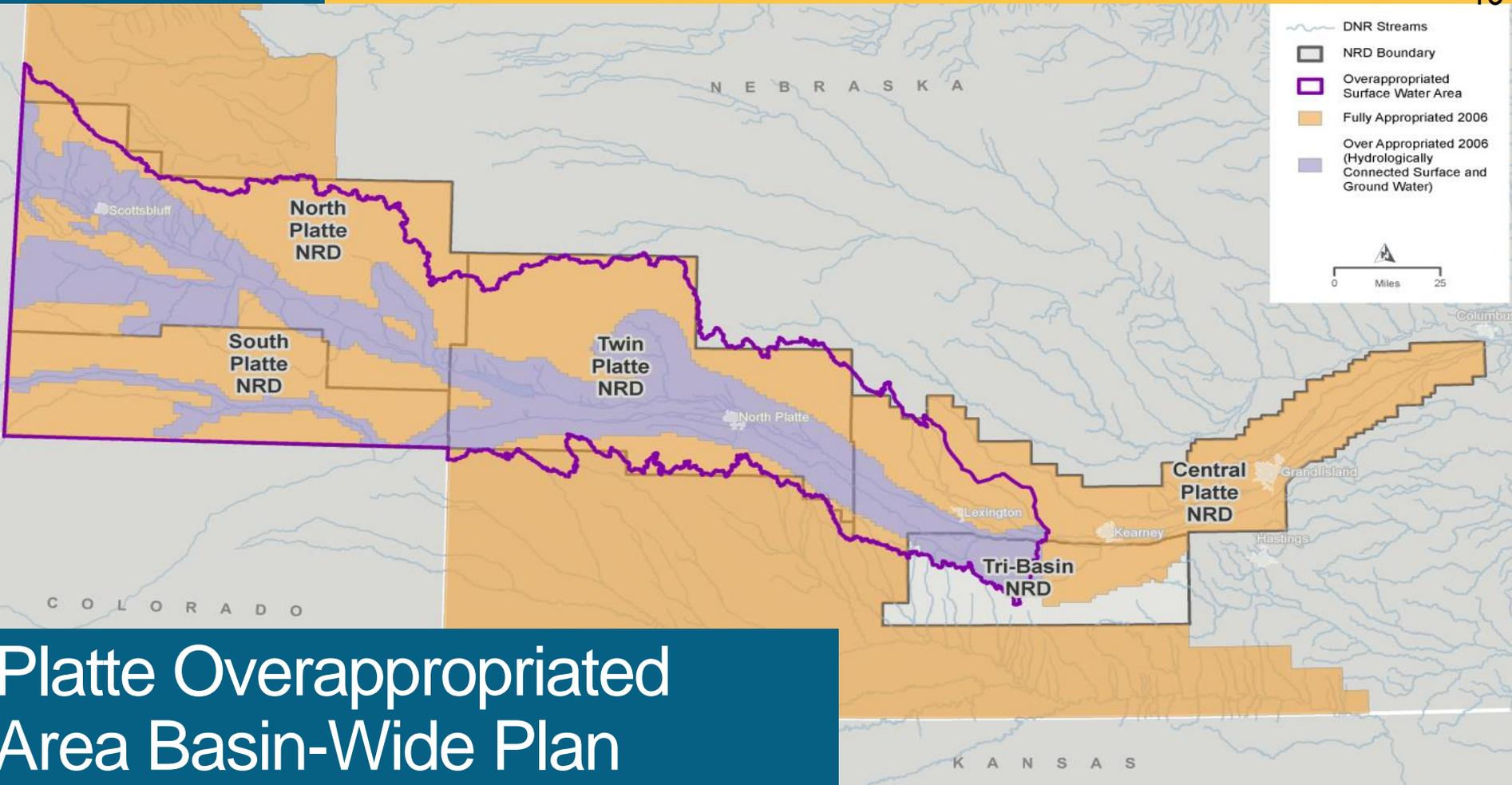
- Criteria for an overappropriated basin designation
 - Interstate agreement
 - Moratorium on surface water appropriations
 - Stays on well construction

When?

- Designated in September 2004

Where?

- Above Kearney Canal diversion



Platte Overappropriated Area Basin-Wide Plan

STATUTORY REQUIREMENTS § 46-715(2)(a)

The plan shall include **clear goals and objectives** with a purpose of sustaining a **balance** between water uses and water supplies so that the **economic** viability, **social** and **environmental** health, safety, and welfare of the basin can be achieved and maintained for both the **near term** and the **long term**.

STATUTORY REQUIREMENTS § 46-715(2)(b) – (e)

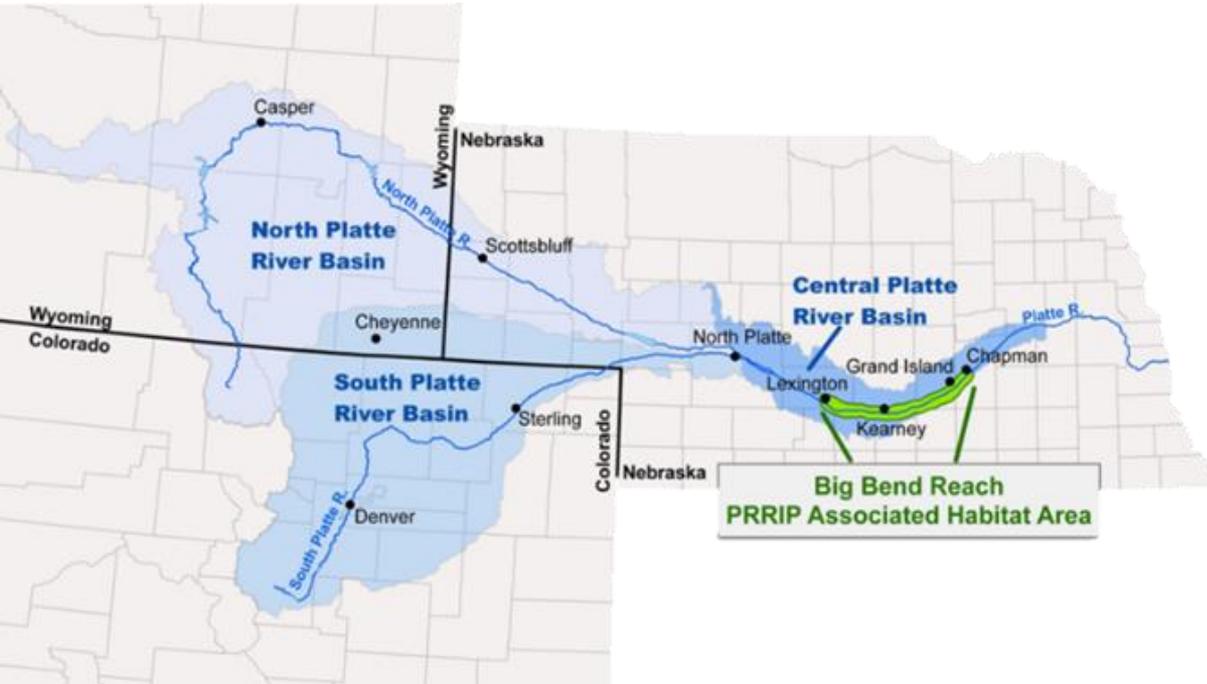
- A **map** of the area subject to the integrated management plan;
- At least one **ground water control** and at least one **surface water control**
- A **monitoring plan**
 - plan to gather and evaluate data, information, and methodologies to increase understanding of the surface water and hydrologically connected ground water system, and test the validity of the conclusions and information upon which the integrated management plan is based.

STATUTORY REQUIREMENTS § 46-715(4)

- Ground water and surface water controls shall
 - (a) Be consistent with the goals and objectives of the plan
 - (b) Ensure Nebraska compliance with interstate agreement
 - (c) Protect existing users (groundwater and surface water) from new uses

INTERSTATE AGREEMENT – PRRIP

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM; § 46-715(4)(b)



- Began January 1, 2007
- Basin-wide effort by Department of Interior, Colorado, Wyoming, and Nebraska
- Implementation of PRRIP is incremental.
 - The first increment is 13 years, through 2019.

INTERSTATE AGREEMENT – PRRIP

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM; § 46-715(4)(b)

▪ ENDANGERED SPECIES

- Improve habitat for four threatened and endangered species
 - Whooping Crane
 - Piping Plover
 - Least Tern
 - Pallid Sturgeon
- Provide ESA Section 7 and Section 9 coverage for all water users in the basin
 - Avoid use of alternative ESA enforcement measures

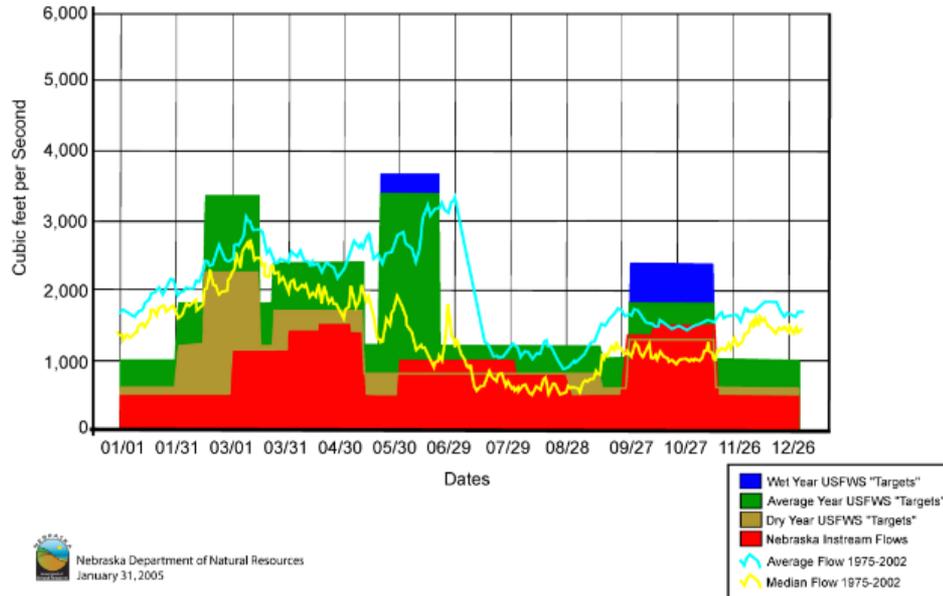


INTERSTATE AGREEMENT – PRRIP

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM; § 46-715(4)(b)

Comparison

USF&WS "Target Flows", Nebraska "Instream Flows",
Average and Median Flows/
Platte River at Grand Island



Nebraska Department of Natural Resources
January 31, 2005

- TARGET & STATE-PROTECTED FLOWS
 - Reducing deficits to FWS Target Flows by average annual of 130,000 to 150,000 AFY
 - “Pulse” Flows for Adaptive Management

INTERSTATE AGREEMENT – PRRIP

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM; § 46-715(4)(b)

- OFFSETS & MORATORIUMS

- Depletions to USFWS “target flows” and to “state-protected flows” because of groundwater and surface water uses begun or expanded between **July 1, 1997, and December 31, 2005**...will be offset in quantity, time, and location...

INTERSTATE AGREEMENT – PRRIP

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM; § 46-715(4)(b)

- OFFSETS & MORATORIUMS

- **Surface Water** (administered by NeDNR)

- Moratorium (1993) on issuance of any new surface water appropriations upstream of the Loup River confluence
- No new direct diversions of surface water allowed without offset (2006)

- **Groundwater** (administered by NRDs)

- No new uses of groundwater within the 28/40 area will be allowed without offset (2006)
- Stays on new wells

STATUTORY REQUIREMENTS § 46-715(3)

- Process for economic development opportunities and economic sustainability,
- **Clear and transparent procedures** to track depletions and gains to streamflow utilizing the best available / generally accepted methods, information, data, and science
- Procedures the NRD / NeDNR use to report, consult, and otherwise **share information**
- Identify water available to mitigate new uses (i.e. water rights leases, interference agreements, augmentation projects, conjunctive use management, and use retirement)
- **Guidelines for consultation with other water users** to provide for economic development opportunities.
- **Rules to allow transfers** from an old use to a new use, and offsets, **as necessary**, for new uses that adversely affect existing users. Water banking may also be used when appropriate.

STATUTE § 46-715 INTERPRETATION

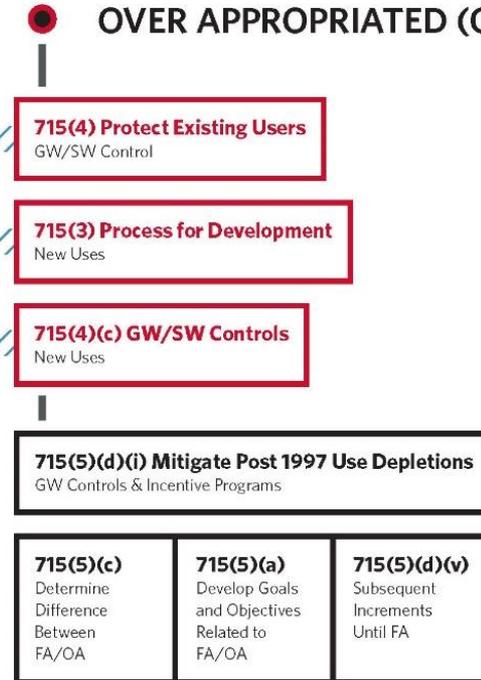
FULLY APPROPRIATED (FA) ●



NO ADDITIONAL
REQUIREMENTS



OVER APPROPRIATED (OA) ●



BASIN-WIDE PLAN VS. INTEGRATED MANAGEMENT PLAN

- Statute calls for a Basin-wide Plan (BWP) and individual Integrated Management Plans (IMP) in NRDs that have overappropriated area
- BWP is for the area designated as overappropriated
- IMP encompasses both overappropriated and fully appropriated areas
- Both BWP and IMPs must be adopted and take effect by September 2019
- 2nd increment Basin-wide Plan process began in 2016 with Stakeholders

THEY ARE SIMILAR BUT DIFFERENT

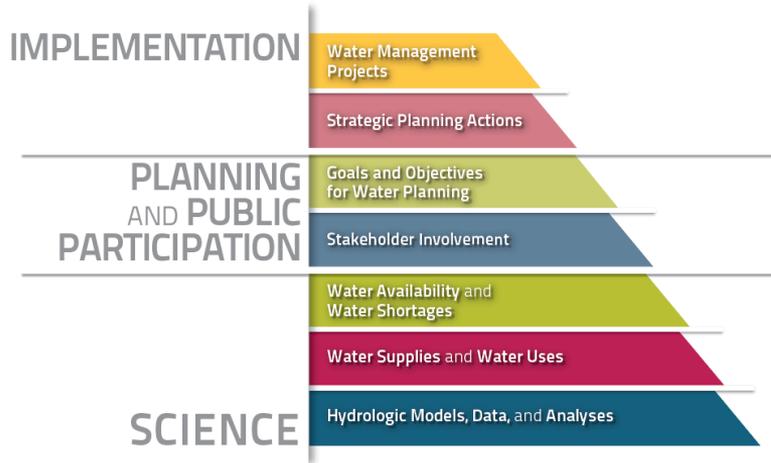
Basin-Wide Plan

- All basin NRDs & NeDNR
- Overappropriated Area
- Goals & objectives
 - Focused on regional, cross-boundary issues and opportunities
 - Consistency and collaboration among basin NRDs
 - A broad framework

Integrated Management Plan

- 1 NRD & NeDNR
- Overappropriated and fully appropriated areas
- Goals, objectives, & controls
 - Specific to one NRD
 - Tailored to local issues and opportunities
 - Specific targets and actions that each NRD will use to meet the goals of the Basin-Wide Plan as well as individual Integrated Management Plan goals

INTEGRATED MANAGEMENT PLANNING - SUMMARY



- Surface water and groundwater management
- Proactive
- Protects existing users



- Adaptive management
- Jointly developed between NRD and NeDNR
- Suited to local conditions

STAKEHOLDER CHARGE | What are you willing to do?



First Increment

- Costs have ranged from \$10's to \$1,000's per AF

Second Increment

- Most excess flows have been committed to projects in the first increment
- Incentive programs are willing seller/buyer
- Cost to maintain the projects that are currently in place

Overall

- Costs likely to increase



WHAT HAS BEEN DONE?

Current Plan

UPPER PLATTE BASIN-WIDE PLAN

- 1st increment basin-wide plan
 - Current plan went into effect in September 2009

- 2nd increment basin-wide plan
 - Current process to incorporate stakeholder input into 2nd increment basin-wide plan
 - Will present draft 2nd increment plan to stakeholders in September 2018
 - 2nd increment plan will go effect in September 2019

Goals	1: Incrementally achieve and sustain a fully appropriated condition	2: Prevent or mitigate human-induced reductions in the flow of a river or stream that would cause noncompliance with an interstate compact or decree or other formal state contract or agreement	3: Keep the Plan current
Objectives	Offset impacts of streamflow depletions... to the extent those depletions are due to water use initiated after July 1, 1997	Prevent human-induced streamflow depletions that would cause noncompliance by Nebraska with the Nebraska New Depletions Plan (NDP) included within the Platte River Recovery Implementation Program (Program), for as long as the Program exists.	Meet at least annually to review progress toward achieving the goals and objectives of this Plan...
	Maintain first increment mitigation efforts		Gather and evaluate data and information to measure the effectiveness of controls, incentives and/or other programs...
	Conduct a technical analysis...to determine whether the controls are sufficient...		
	Continue to refine the methodology to determine the difference between the current and fully appropriated levels of development...		
	Use available funds and actively pursue new funding opportunities to...implement this Plan		
	Update and continue implementing IMPs in each Platte River Basin NRD		

Goals	4: Work cooperatively to identify and investigate disputes between ground water users and surface water appropriators and, if determined appropriate, implement management solutions to address such issues	5: Partner with municipalities and industries to maximize conservation and water use efficiency	6: Work to maintain economic viability of the basin while implementing this plan
Objectives	Identify disputes between ground water users and surface water appropriators	Continue to collect data on water use and existing conservation plans of municipalities and industries within the Basin	Support managers and users in the basin by better understanding the economic impacts of supply variability
	Investigate and address issues between ground water users and surface water appropriators, based on investigation results	Invite municipalities and industries to the annual meetings	Management practices to improve sustainability/viability for surface water and groundwater uses
		Establish allocations for each municipal and industrial user by 2026 and the M&I will offset their new uses themselves rather than NRD	Drought Planning
			Discuss economic impacts and potential mitigation options at the annual meeting

INTEGRATED MANAGEMENT PLAN

- Map of the Areas
 - Overappropriated
 - Fully appropriated
- Incentives
- Water banking
- Monitoring
- Studies
- Controls
 - Moratorium/certified acres
 - Transfers
 - Municipal and industrial
- Post-1997 Depletion Targets (NPR:13 af; SP/LP:213 af)
 - Accomplished through first increment by EQIP program retirements

MANAGEMENT ACTIONS TAKEN

- Conjunctive Management
 - Recharge of Excess Flows
 - 2011 – 2013
 - Total diversion ~27,000 acre-feet
 - Total estimated recharge ~ **26,000** acre-feet



SOUTH PLATTE NRD IMP

Stream Depletions 101

WWUM modeling

Datasets and modeling

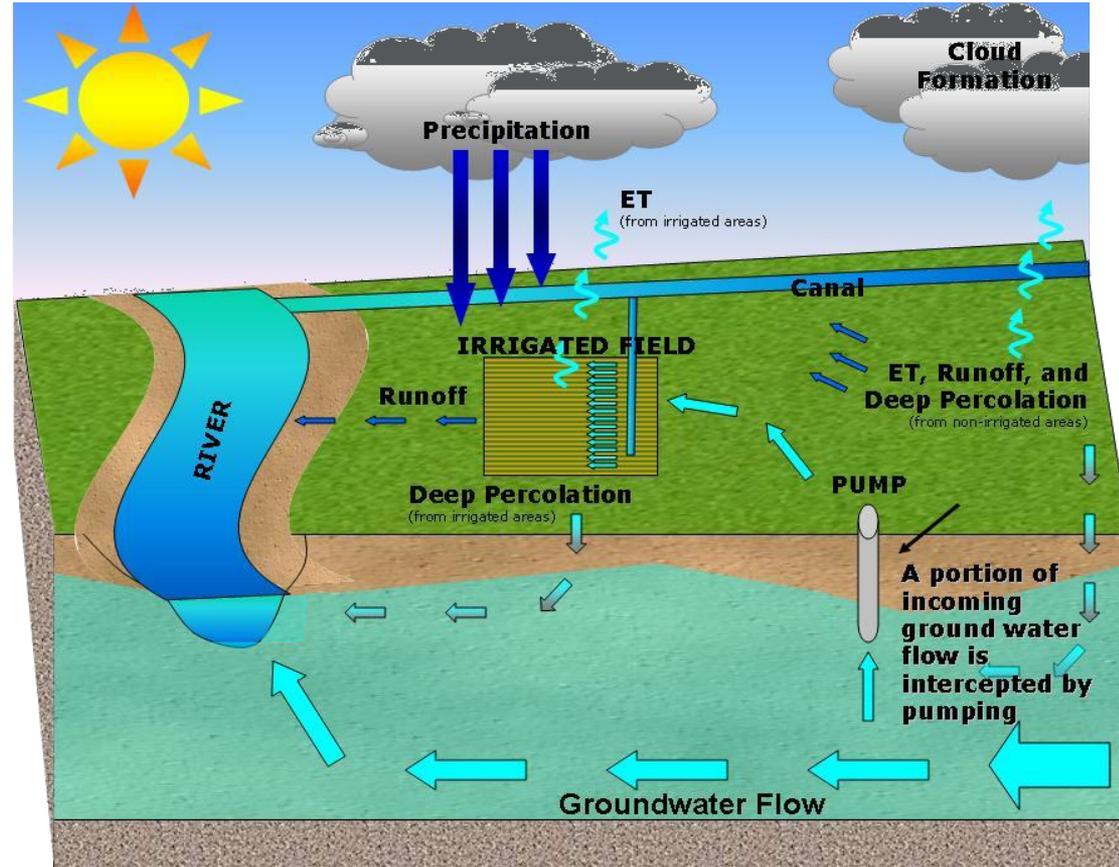
Lessons learned



STREAM DEPLETIONS 101

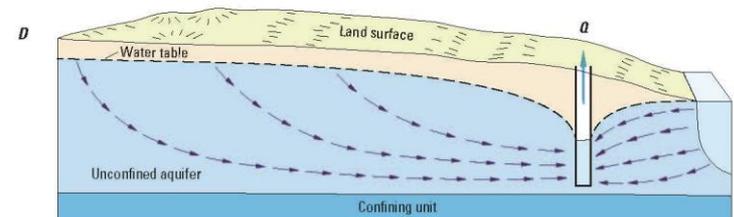
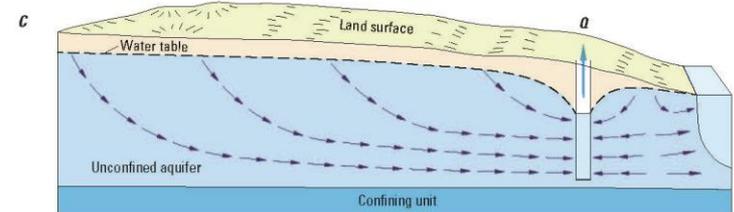
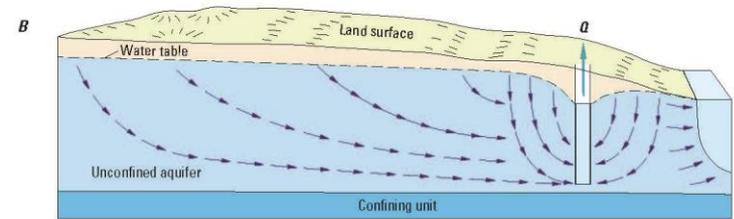
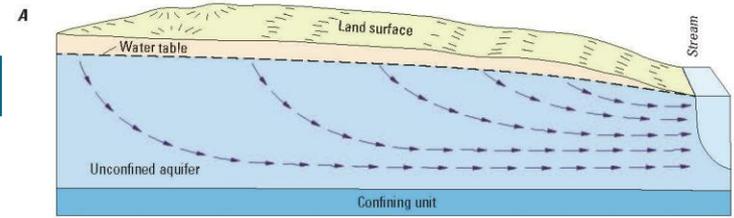
STREAM DEPLETIONS 101

- Typical elements of ground and surface water budgets

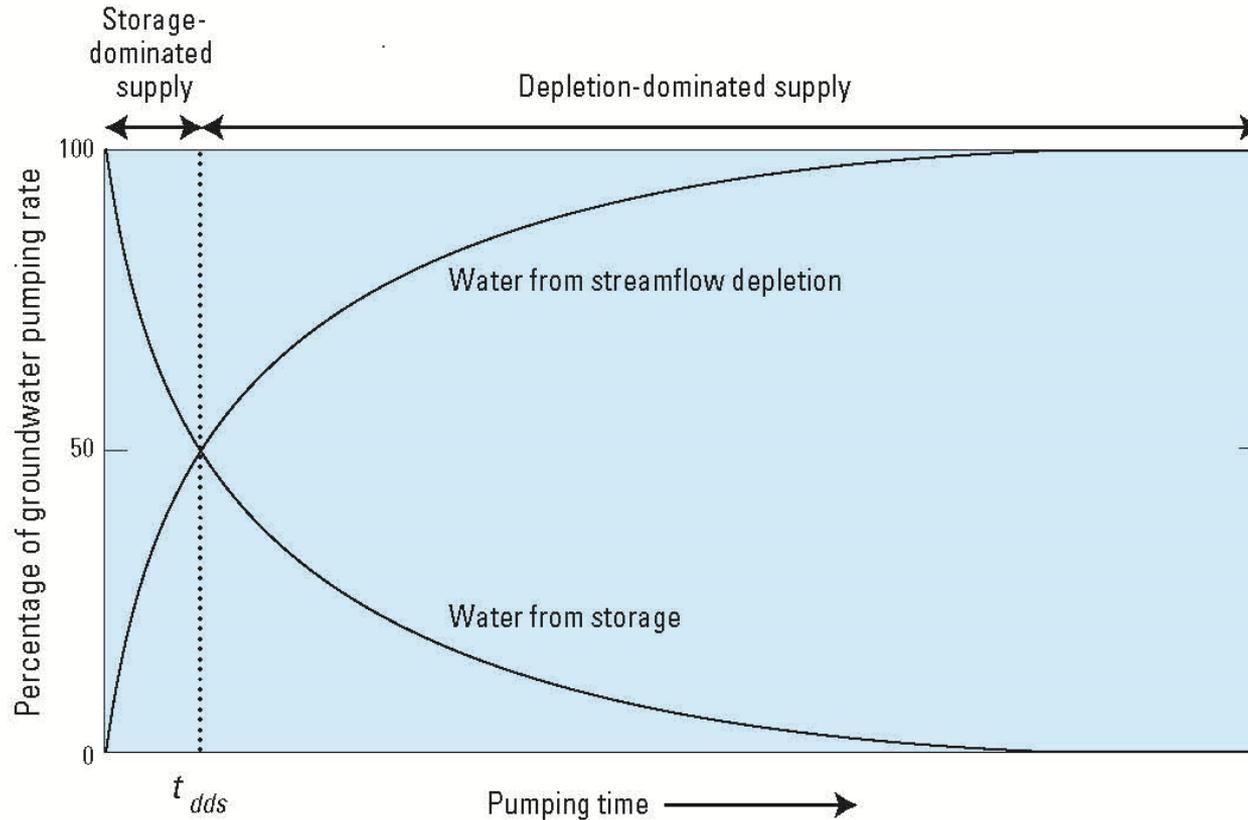


STREAM DEPLETIONS 101

- A. Pre-development conditions
- B. Pumping from aquifer storage
- C. Interception of groundwater baseflow
- D. Interception of groundwater baseflow and induced infiltration



STREAM DEPLETIONS 101

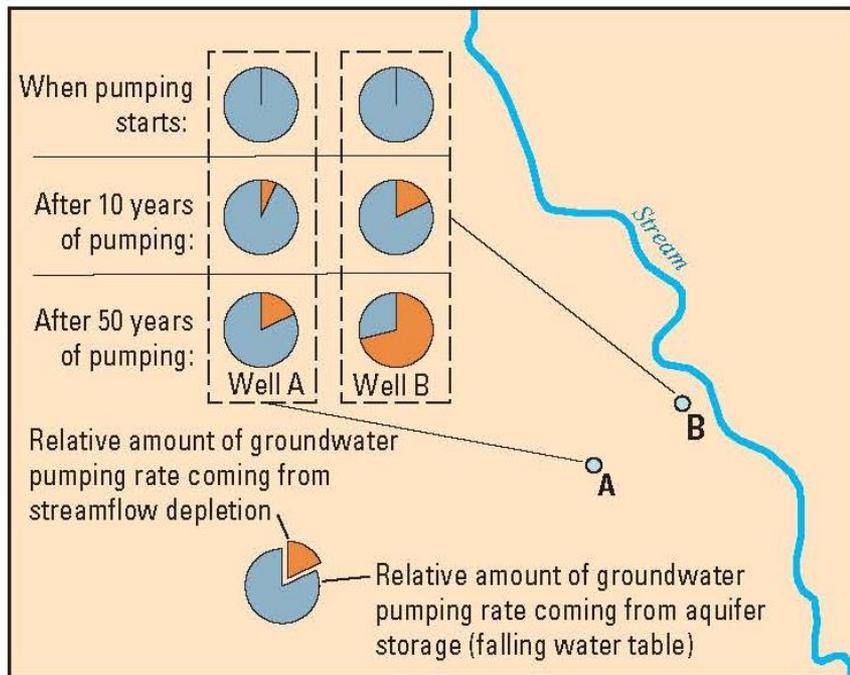


STREAM DEPLETIONS 101

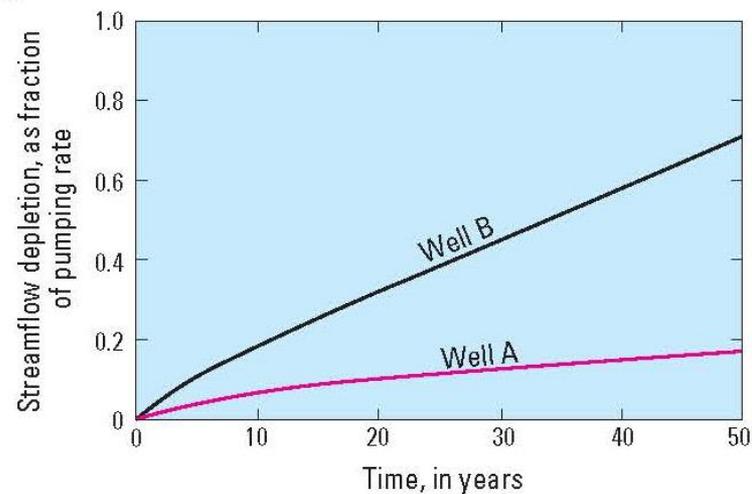
- Factors that affect timing, rates, and locations of streamflow depletion:
 - Geology and hydraulic properties of aquifer
 - Aquifer size/volume
 - Geometry of the surface water streams
 - Well location (vertical and horizontal distance from streams)
 - Pumping rates and operational characteristics

STREAM DEPLETIONS 101

A



B



STREAM DEPLETIONS SUMMARY

- Variability in aquifer properties across basin
 - Degree of ground/surface water connection
 - Number/distribution/capacity of wells
 - Timing of well impacts on surface water/aquifer
- Physical characteristics are included and considered in water resources planning and management



WWUM MODELING

Overview

WESTERN WATER USE MANAGEMENT MODELING

- Modeling was commissioned by:
 - North Platte NRD
 - South Platte NRD
 - Nebraska DNR

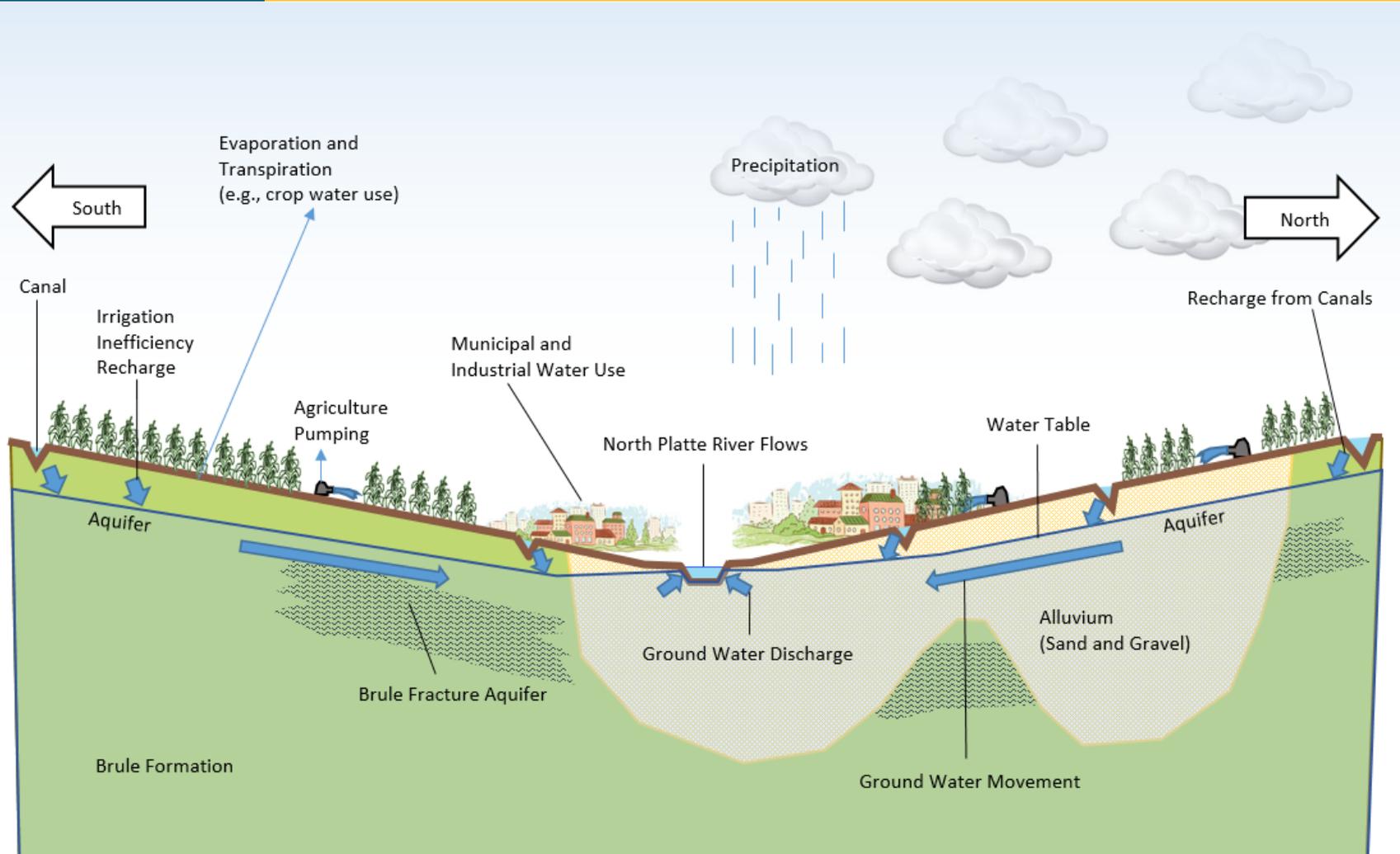
- Modeling started in 2009

WESTERN WATER USE MANAGEMENT MODELING CONT.

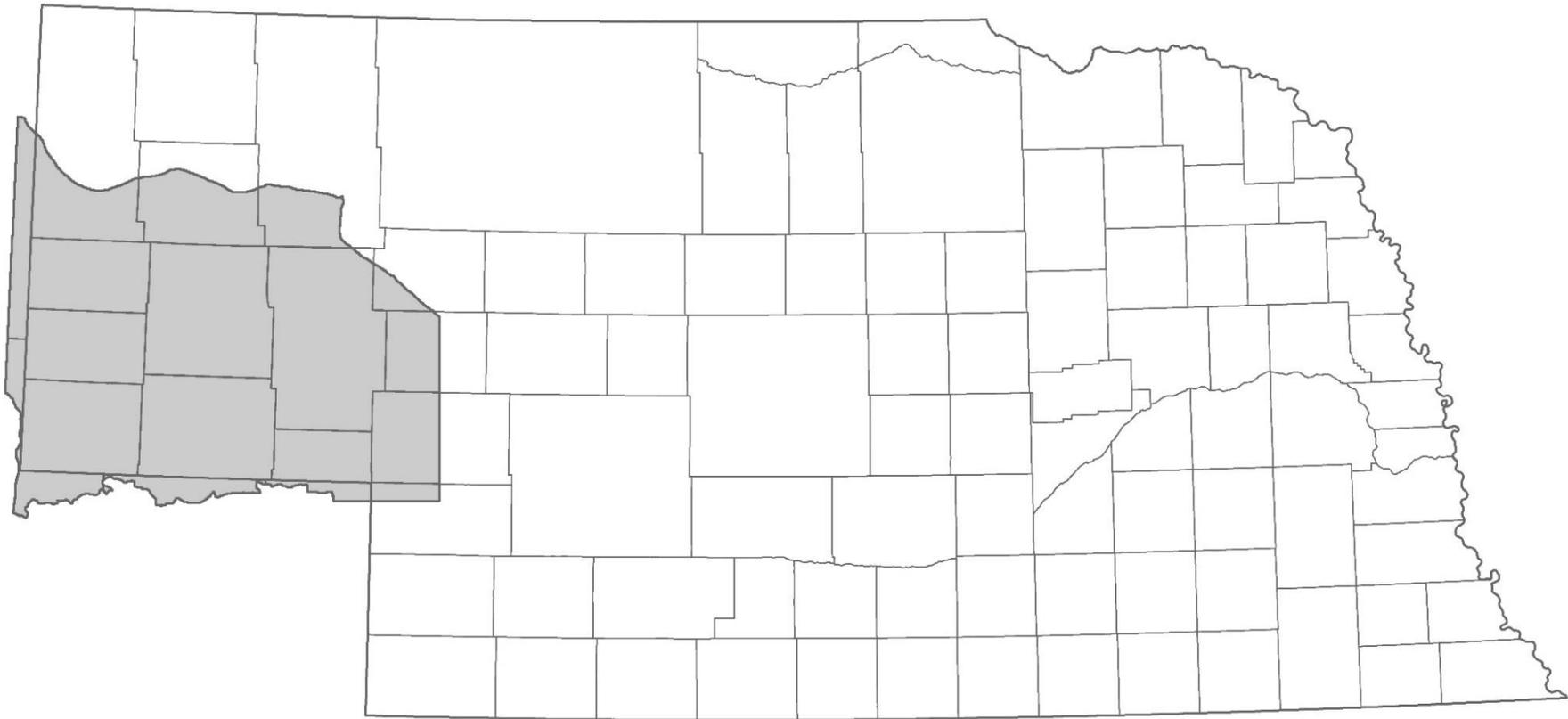
- **Purpose:** Data-centered and decision support modeling package to aid the South Platte NRD and the Nebraska DNR in water management decisions

- **Uses two models:**
 1. Regionalized Soil Water Balance Model
 - Provides crop water use and other information

 2. Ground Water Model (MODFLOW)
 - Timing and movement of water through the aquifer



MODEL AREA

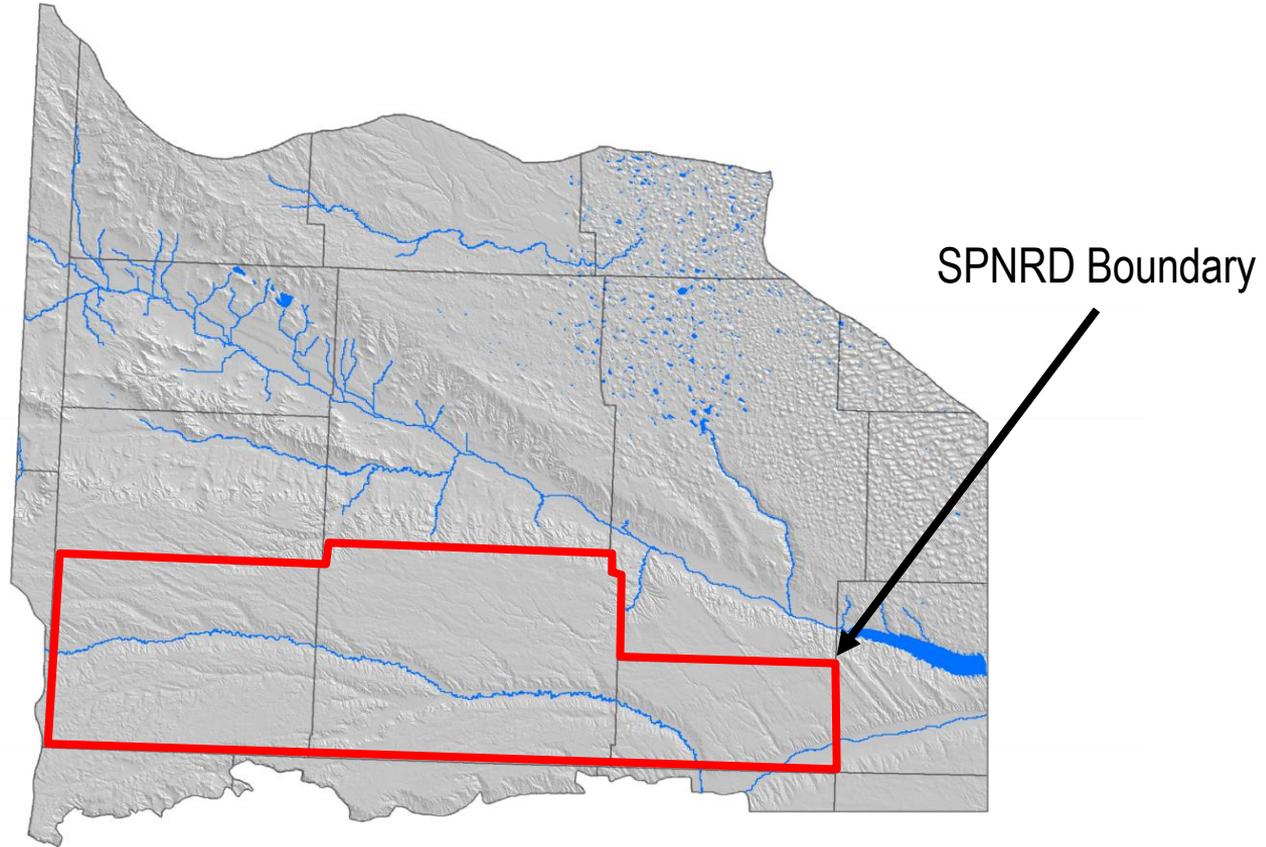




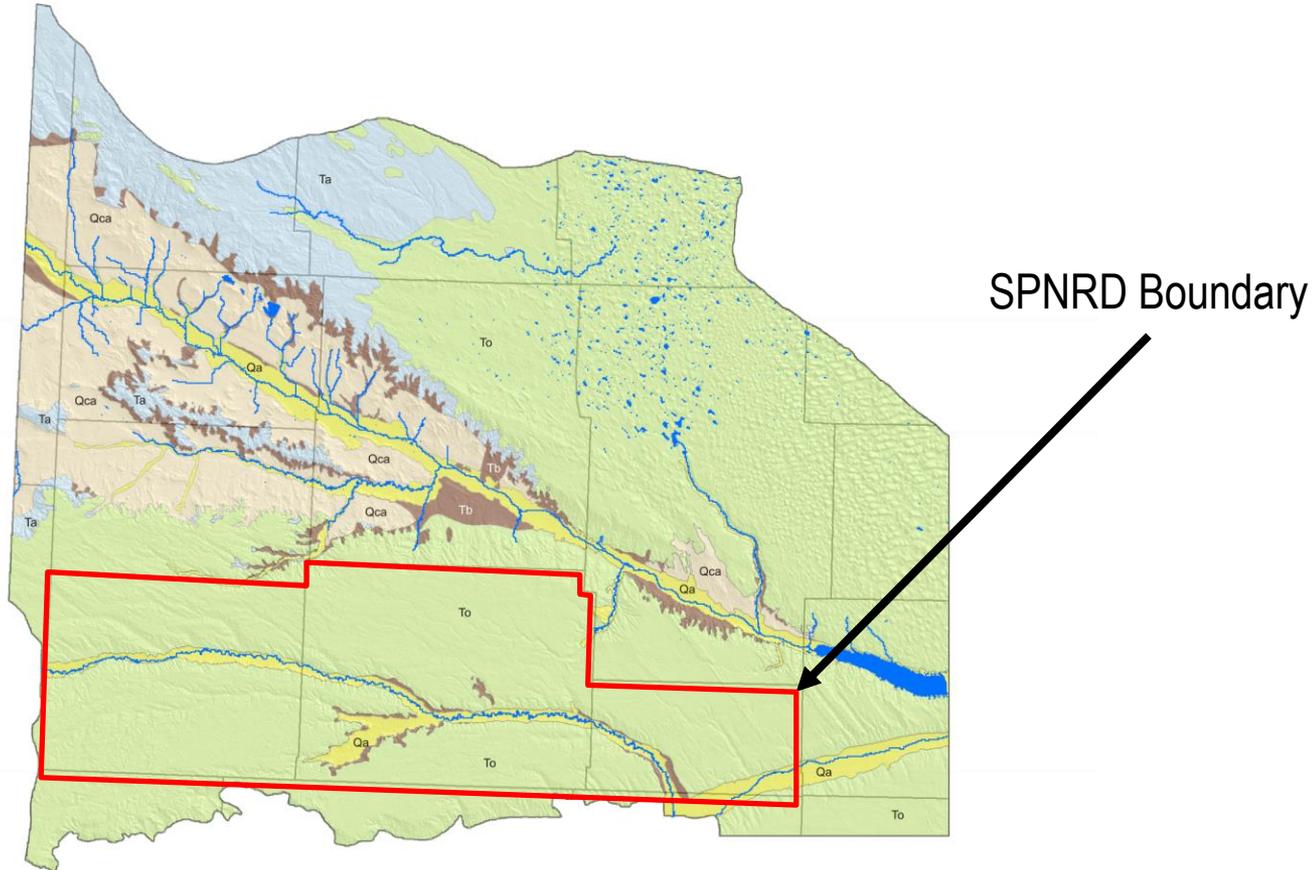
DATASETS AND MODELING

Overview

GROUND WATER MODEL AREA



GENERAL GEOLOGY IN THE MODEL AREA

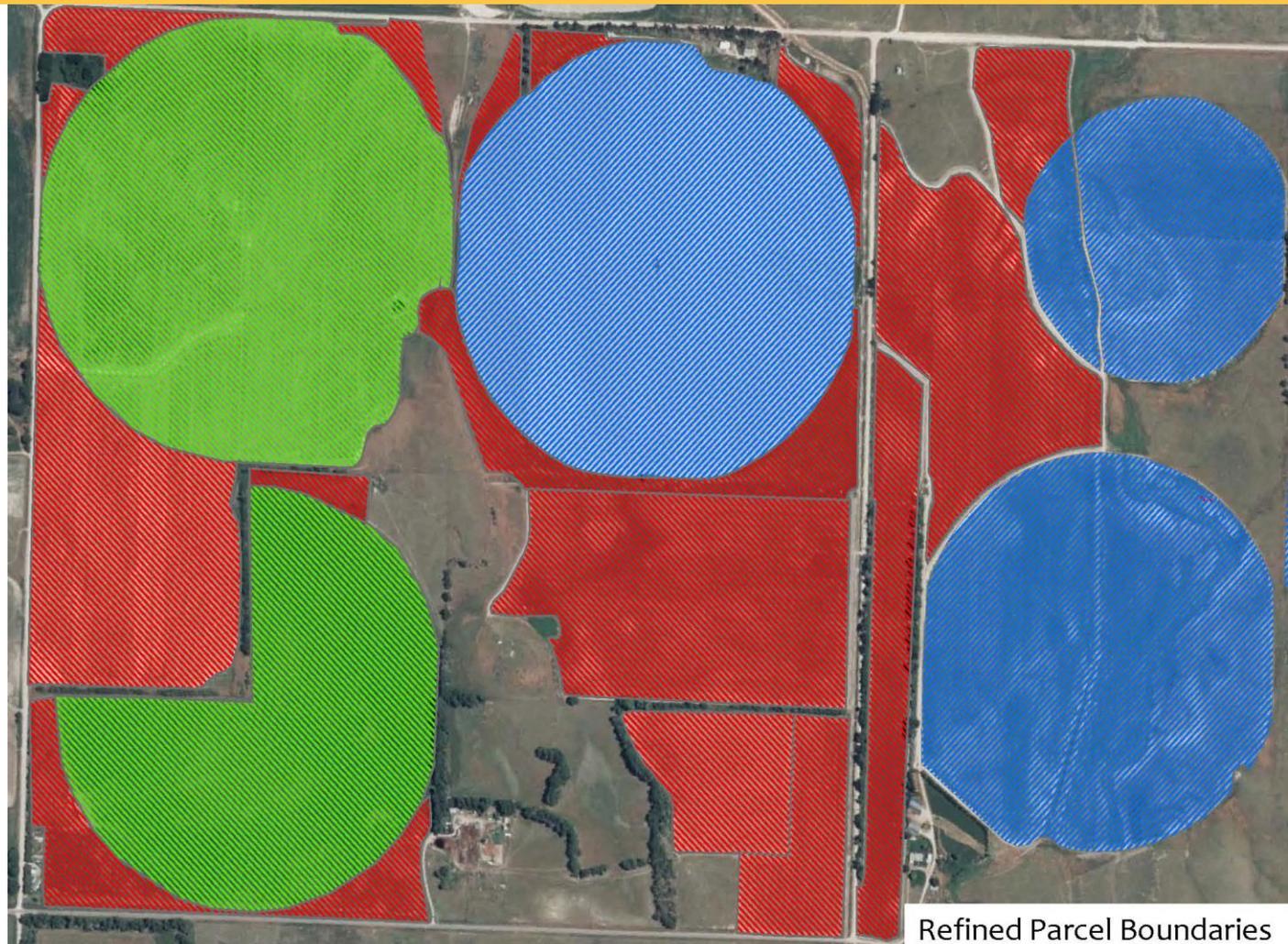


MODELING THROUGH 2013

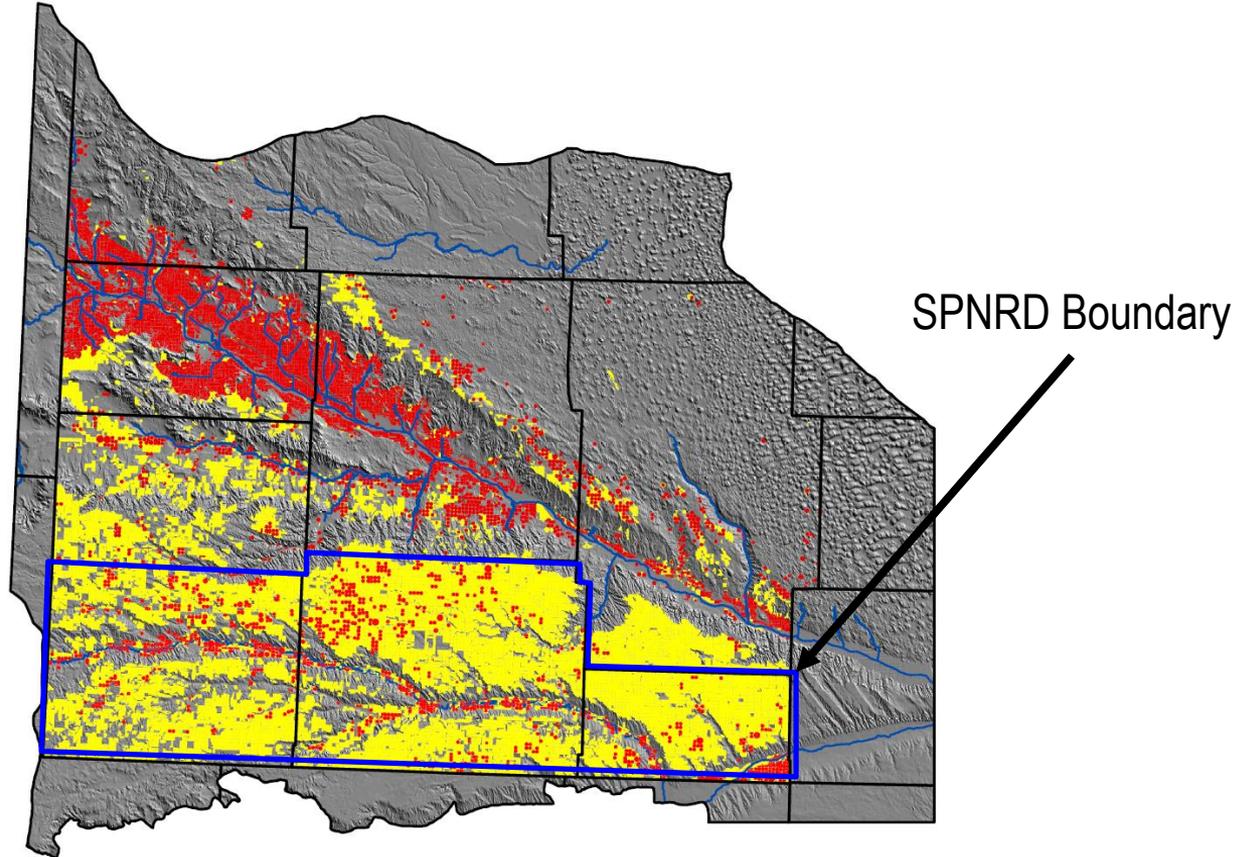
- Land Use – Yearly from 1953 - 2013
 - Aerial photo snap shot years
 - 1950s, 1970s, 1980s, 1993, 1997, 2001, 2003, 2005, 2009, 2010, 2012
 - Drew circles and squares around each parcel for each snapshot
 - Attributed With:
 - Crop type information
 - Irrigation water source from NPNRD and SPNRD
 - Flood or sprinkler irrigation method
 - Metered pumping information from each NRD

LAND USE DATASETS

1953 - 2013

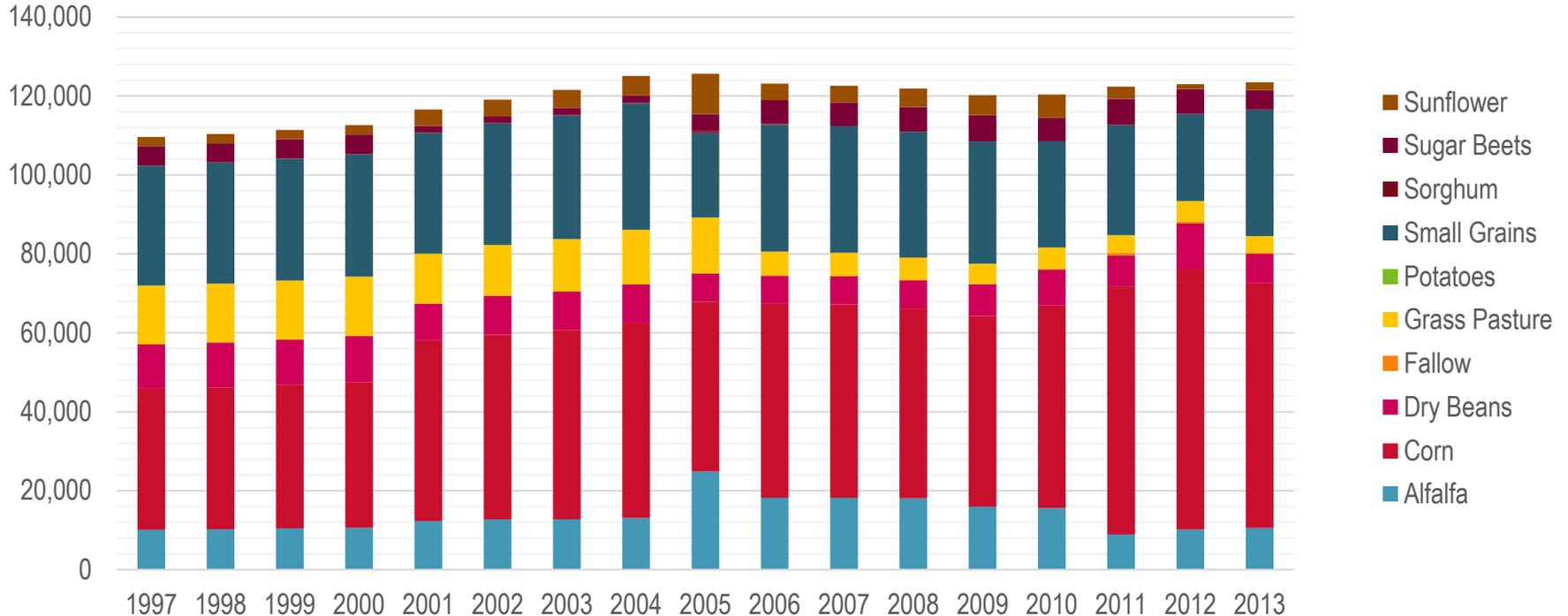


GENERAL GEOLOGY IN THE MODEL AREA



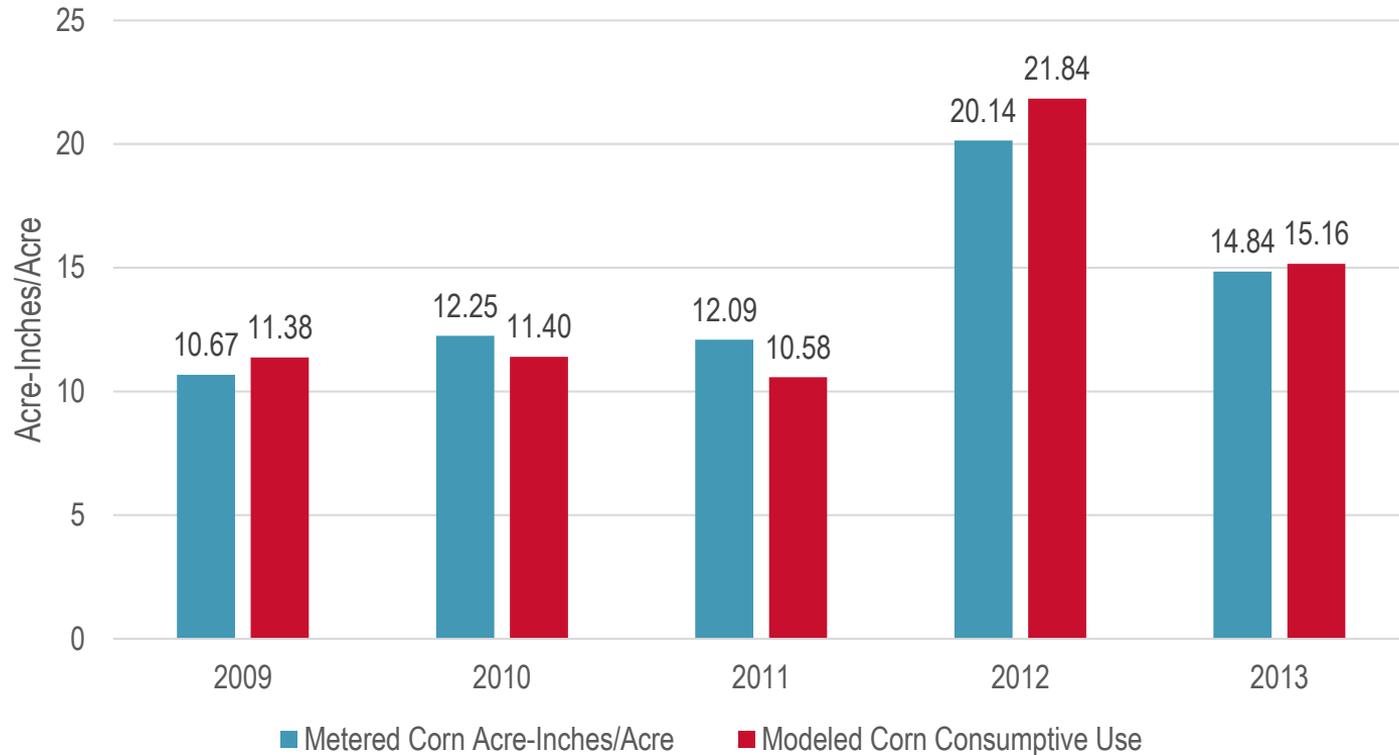
SPNRD ANNUAL CROP STATISTICS

1997 - 2013

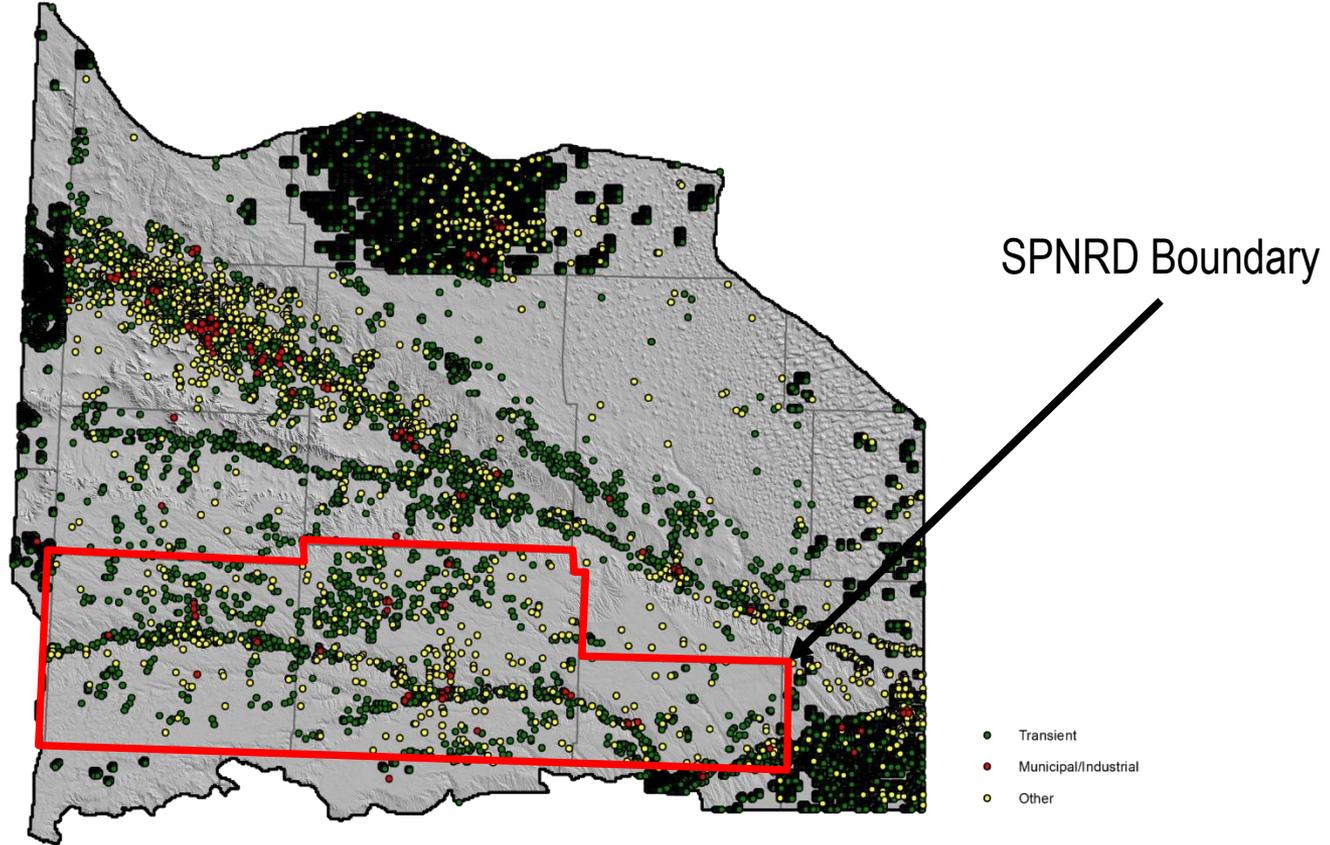


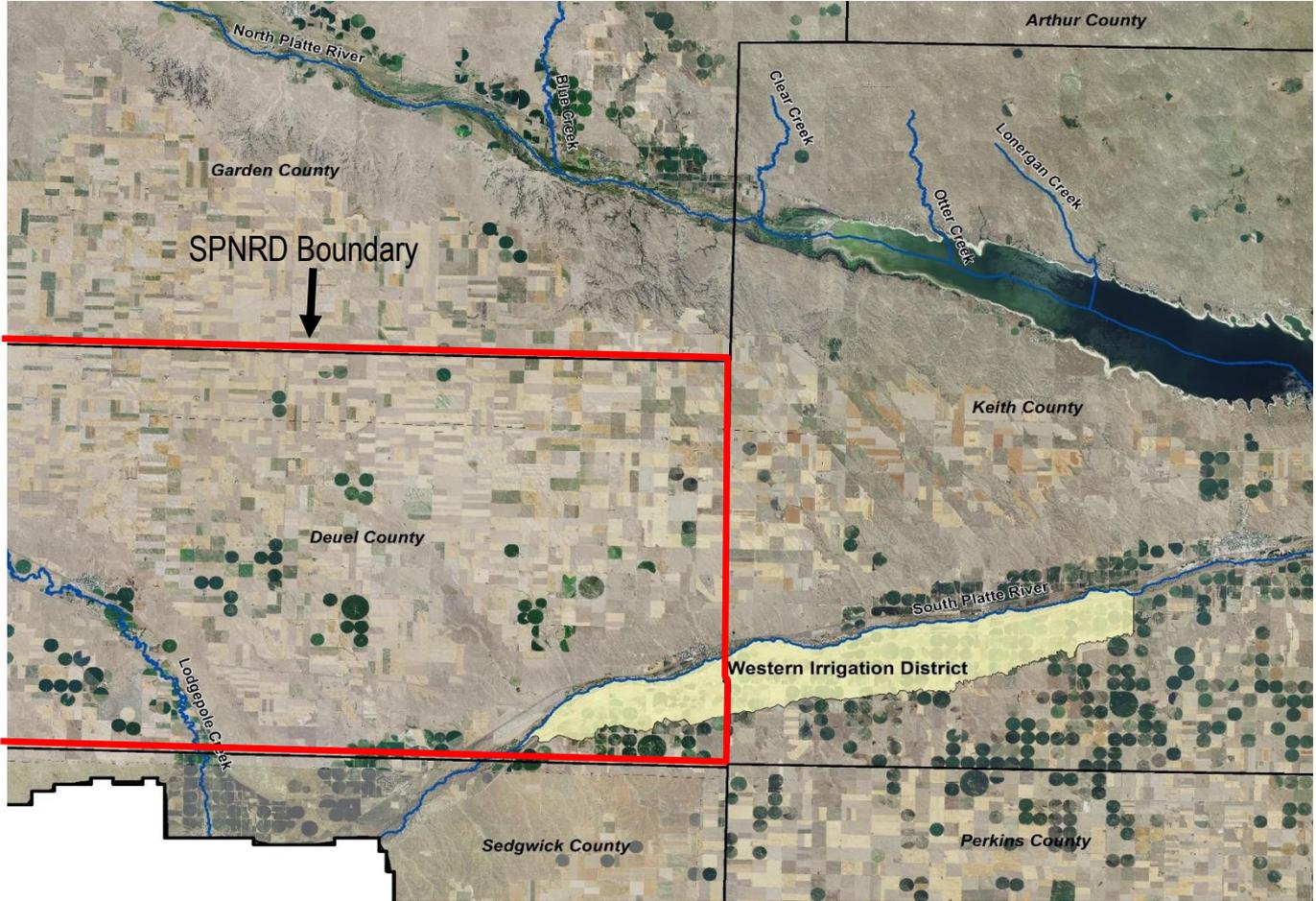
CORN ONLY LANDS METERED

CU vs. Modeled CU



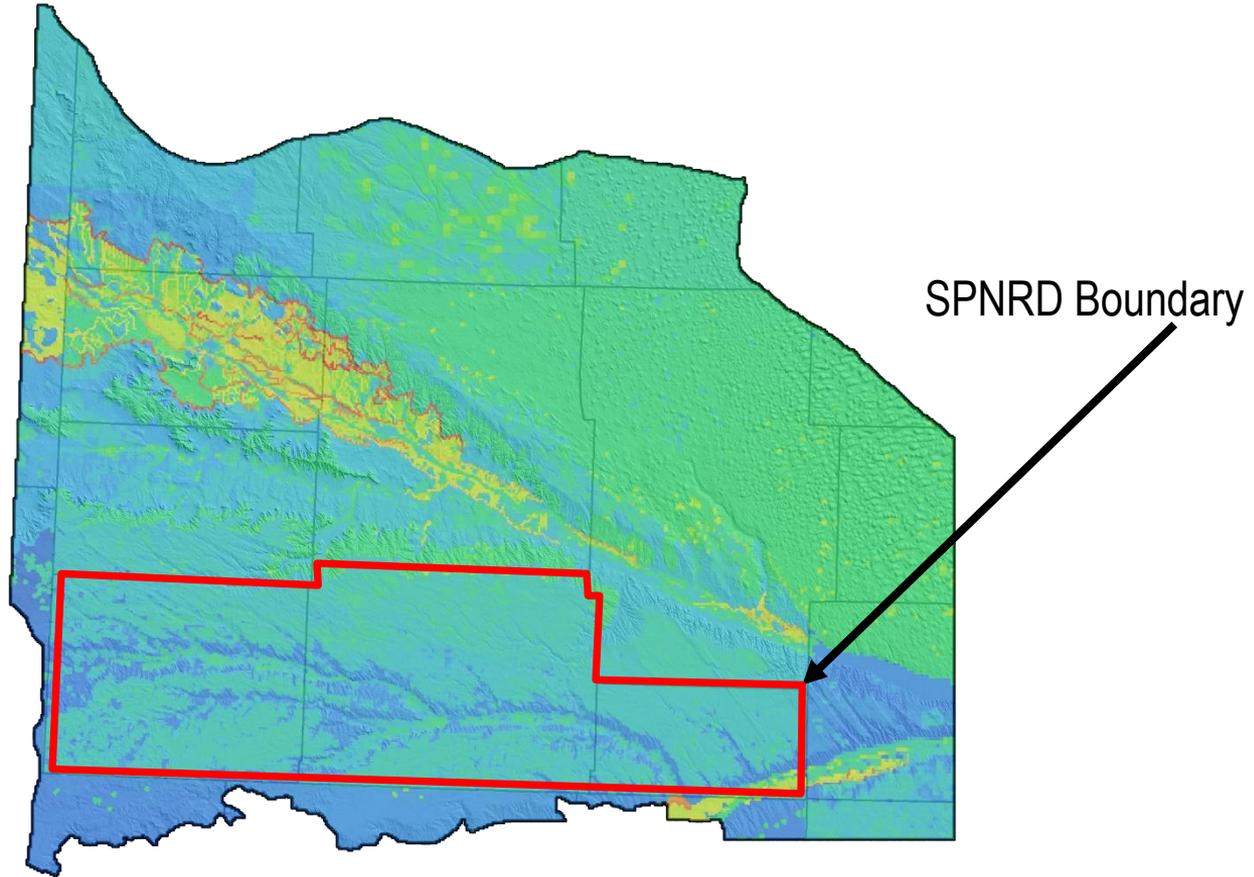
WELLS IN THE MODEL AREA



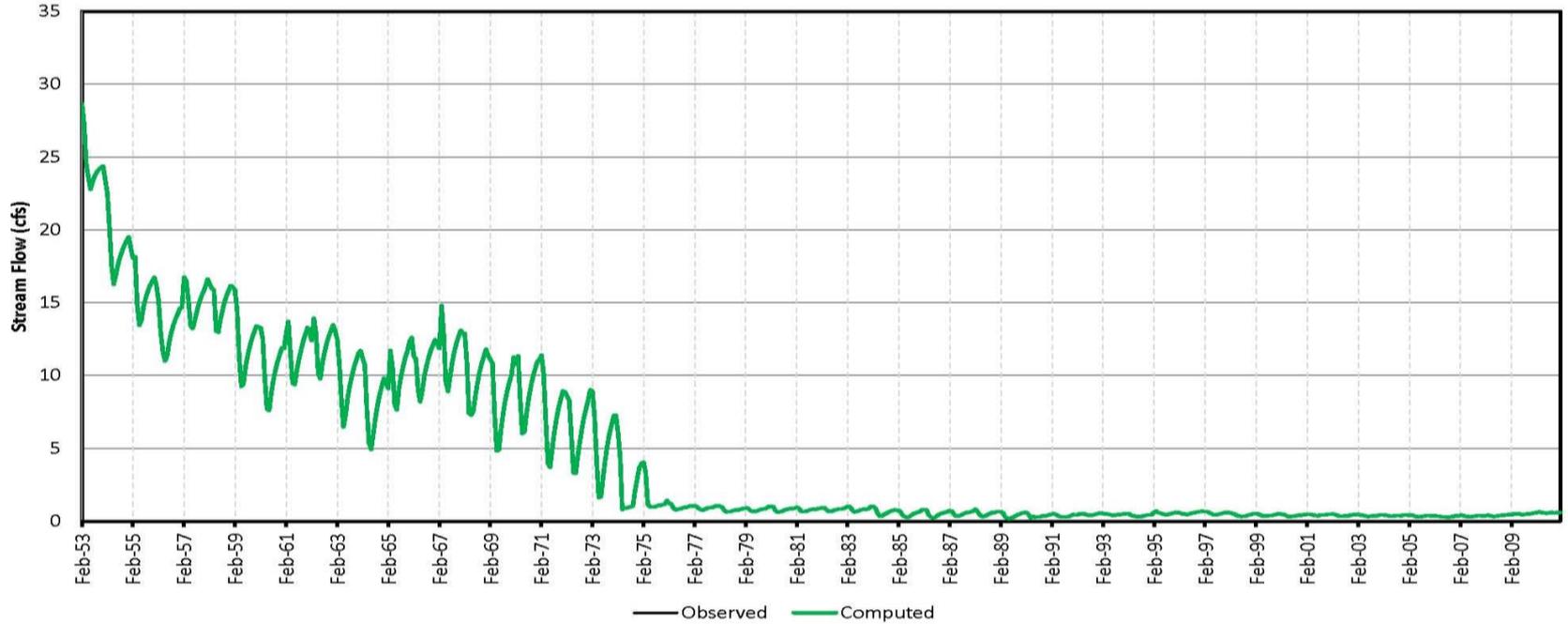


AVERAGE ANNUAL RECHARGE

0 - 0.7 FT D⁻¹ 1953 - 2014

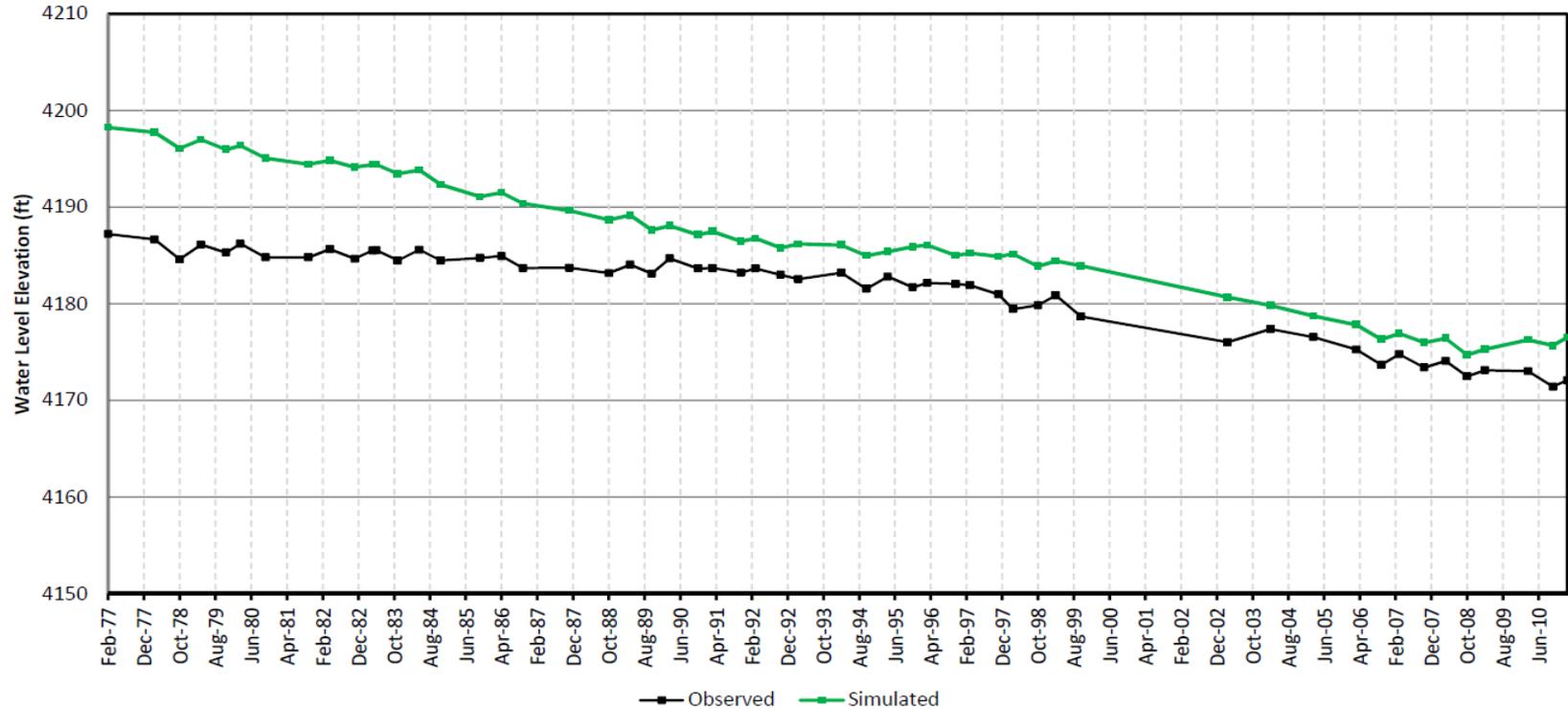


LODGEPOLE CREEK FLOW HYDROGRAPHS



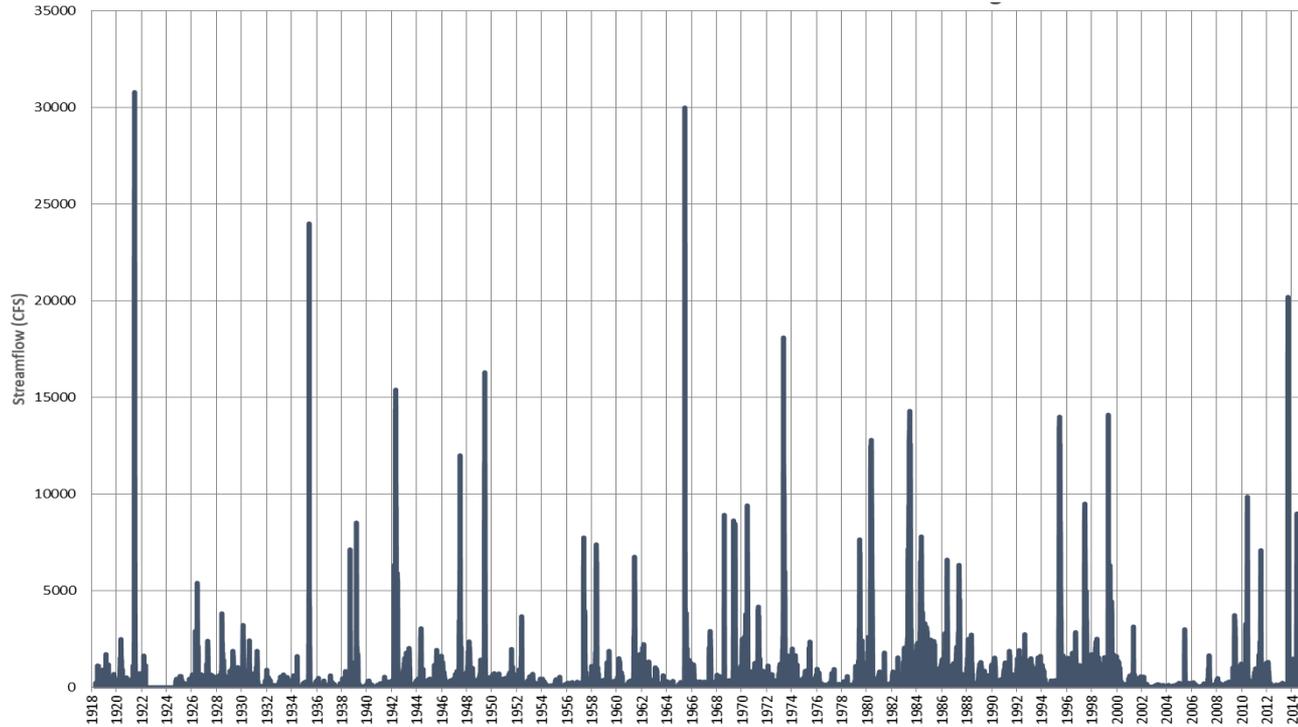
MONITOR WELL HYDROGRAPH

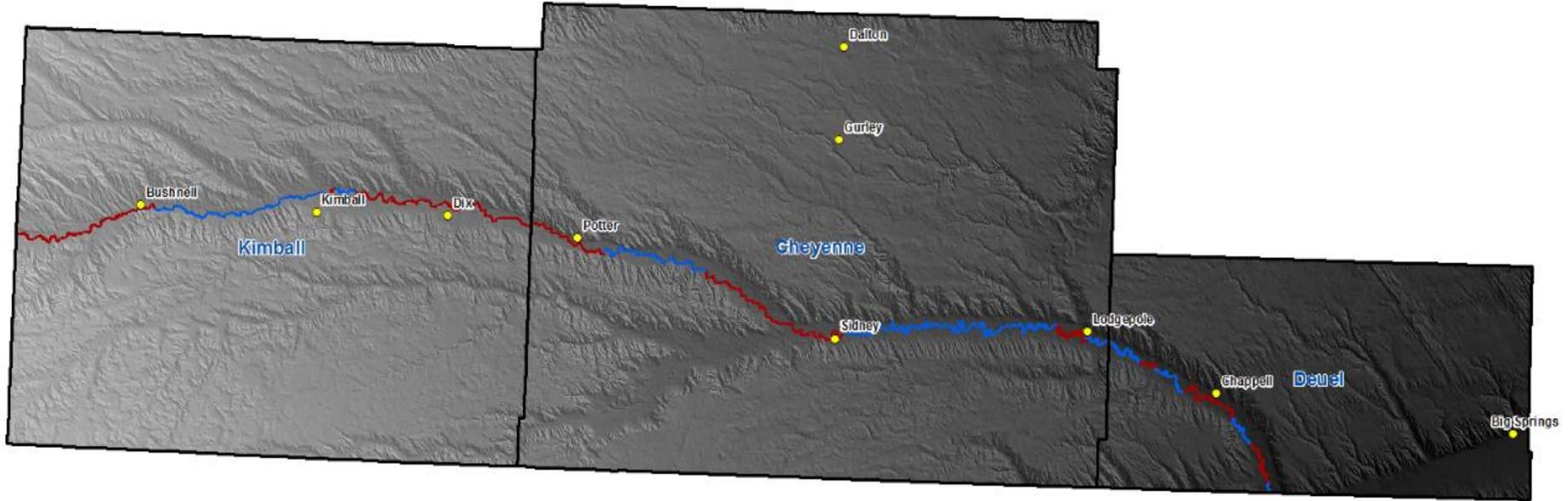
North Cheyenne County Tablelands



HISTORIC SOUTH PLATTE RIVER STREAMFLOW

Julesburg



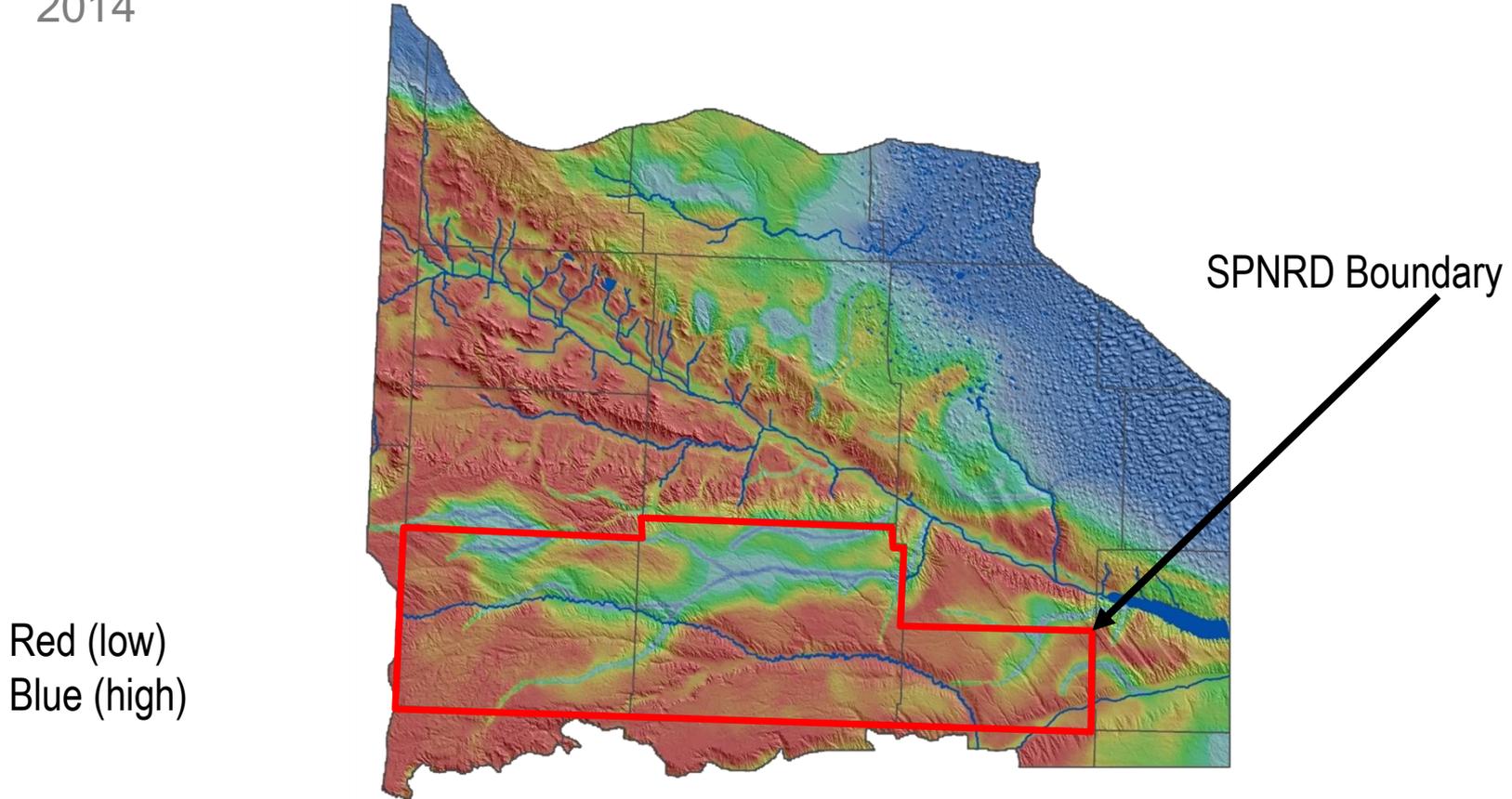


CURRENT MODELING

- Ground water modeling
 - 40 acre cell size
 - 177,780 active model cells
 - 874 head calibration targets
 - Mostly within NPNRD and SPNRD

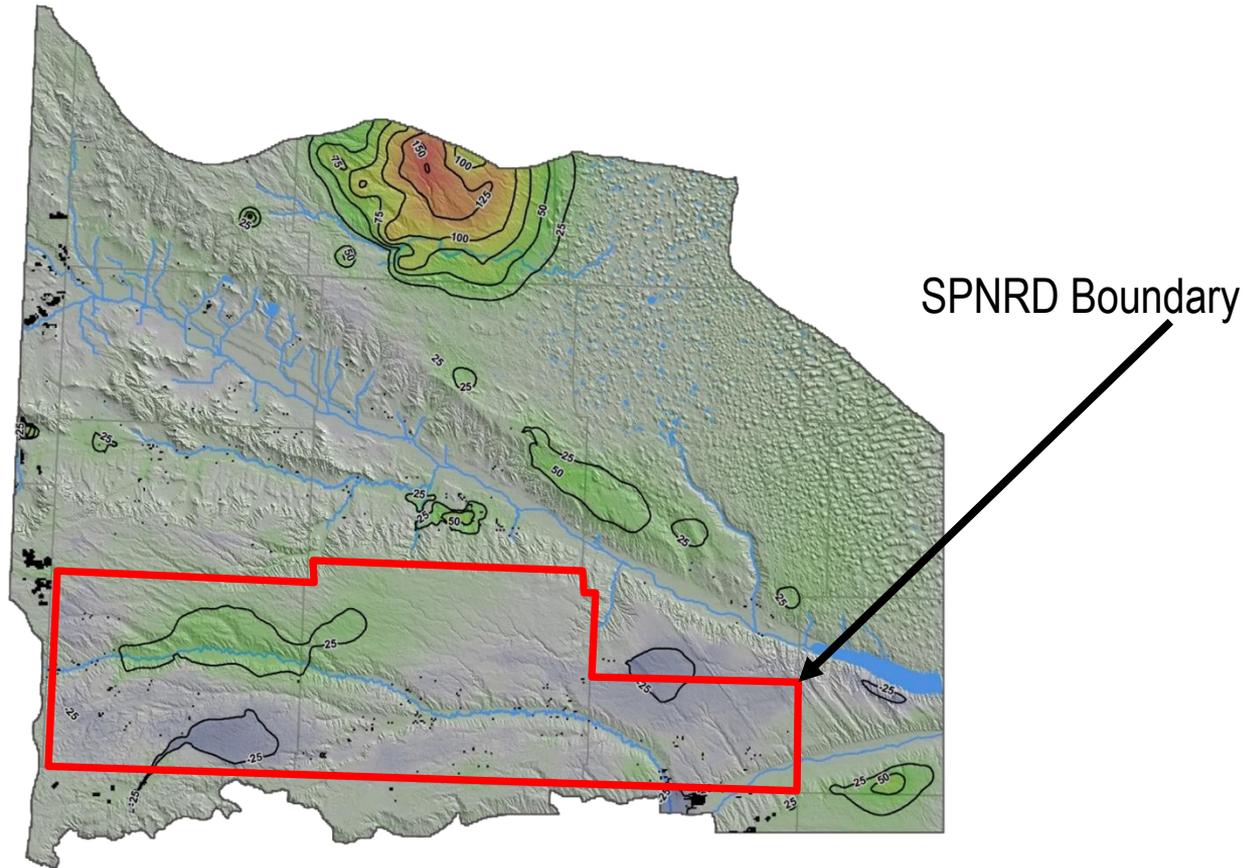
SATURATED THICKNESS IN MODEL AREA

2014



CHANGE IN MODELED WATER LEVEL

(Drawdown) 1953 - 2014





LESSONS LEARNED

From the First IMP

LESSONS LEARNED

- Initial understanding of the average annual depletion rates to the South Platte River (400 Acre-Feet), Lodgepole Creek (150 Acre-Feet) and the North Platte River (150 Acre-Feet)
- Limited options to implement measures to offset depletions throughout the District. Challenges in SPNRD to obtain offset water
 - Limited surface water supplies of which to take advantage
 - Small amount of groundwater irrigation compared to other Upper Platte Basin NRDs

LESSONS LEARNED CONT.

- Complexity of the Municipal and Industrial Water Use Accounting and offset provisions
 - Engaged to simplify and standardize with other Upper Platte River Basin Natural Resources Districts

LESSONS LEARNED CONT.

- SPNRD districtwide ground water management area rules and regulations were identified
 - Duplication between the two documents created a problem when the District's rules and regulations were regularly amended and the same set of rules in the IMP were not changed, thus creating inconsistencies
 - Proposed remedy - the District's rules and regulations will be removed from the IMP with a comment(s) added referencing the District's Ground Water Management Area Rules and Regulations

LESSONS LEARNED CONT.

- Level(s) of funding for mitigation of depletions may not be sustainable.
- Challenge of identifying Fully-Appropriated (FA) and Overappropriated (OA) distinction and defining fully-appropriated
- Challenge of finding a water use and supply balance - defining possibility and sustainability
- Excess flows for Western Canal could not always be taken when available

LESSONS LEARNED CONT.

- Confusion regarding the allocation program being outside of the IMP process (only in the District's Districtwide Ground Water Management Area Rules and Regulations), and using the benefits of allocations to offset depletions through the IMP
- Modeling process - NeDNR and the SPNRD have struggled communicating on modeling tasks
 - Progress has been made in this area and hopefully continues into the 2nd increment
 - Timeliness of Robust Review Analysis needs improvement
 - Ongoing Education and Outreach efforts were not consistent during the course of the 1st increment and we would like to improve this in the 2nd



NEXT STEPS

MEETING DATES

- August 15, 2018
- November 14, 2018
- January 16, 2019



PUBLIC COMMENT

Thank you