SPNRD IMP

Meeting 2

South Platte Natural Resources District
Kimball Cheyenne Deuel
Nebraska Dept. of Natural Resources

TODAY'S AGENDA

- Welcome
- Administration
  - June meeting recap
  - Necessary information to be a successful stakeholder
- IMP Distinctions of Management Areas
- Robust Review Results
- 2nd Increment Discussion
  - Municipal Statute – 2026 Offsets
  - Conjunctive Management
- Public Comment

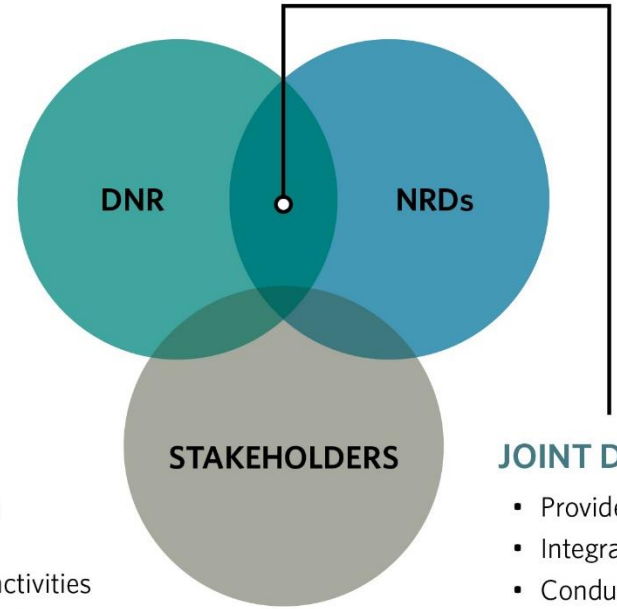
WELCOME

- Open Meeting Notice
- Safety & Logistics

Basin-Wide Plan Roles & Responsibilities

DNR'S INDIVIDUAL ROLES:

- Review, approve, and formally adopt the plan



NRD'S INDIVIDUAL ROLES:

- Review, approve, and formally adopt the plan

STAKEHOLDER ROLES:

- Provide input into the development of goals and objectives of the basin-wide plan
- Provide input on planning implementation activities
- Work toward consensus on the basin-wide plan

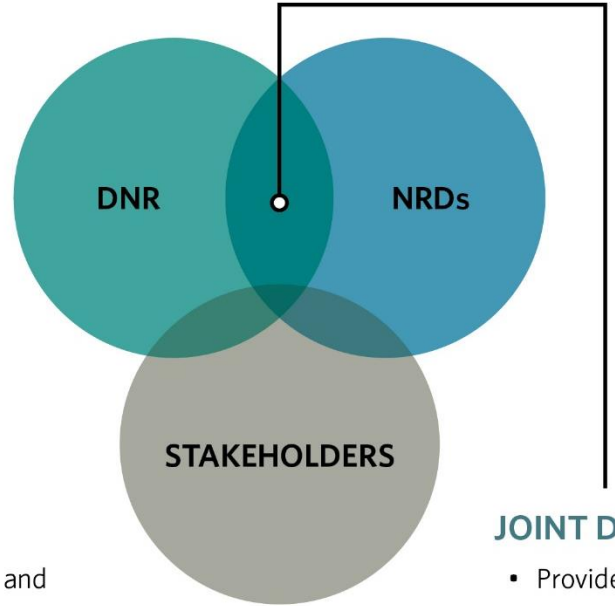
JOINT DNR/NRD ROLES:

- Provide a process for stakeholder engagement
- Integrate stakeholder input into the basin-wide plan
- Conduct public hearings on plan prior to adoption
- Provide a means for ongoing public input into the planning process

NRD IMPS Roles & Responsibilities

DNR'S INDIVIDUAL ROLES:

- Review, approve, and formally adopt the plan
- Implement and enforce any new **surface water** controls
- Provide reports on new water use and permitting activities to the NRD(s)
- Implement specific **surface water** monitoring or data collection activities outlined in the IMP



NRD'S INDIVIDUAL ROLES:

- Review, approve, and formally adopt the plan
- Implement and enforce any new **groundwater** controls
- Provide reports on new water use and permitting activities to the DNR
- Implement specific **groundwater** monitoring or data collection activities outlined in the IMP

STAKEHOLDER ROLES:

- Provide input into the development of goals and objectives of the plan
- Provide input on planning implementation activities
- Work toward consensus on the plan

JOINT DNR/NRD ROLES:

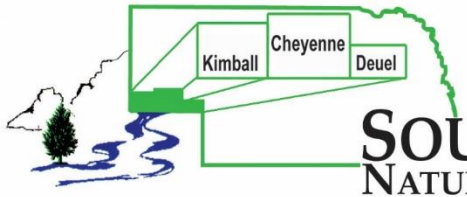
- Provide a process for stakeholder engagement
- Integrate stakeholder input into the plan
- Conduct public hearings on the IMP prior to adoption
- Provide a means for ongoing public input into the planning process
- Coordinate on plan implementation activities

ADMINISTRATION

June meeting recap

Necessary information to be a successful stakeholder

IMP DISTINCTION BETWEEN MANAGEMENT AREAS



SOUTH PLATTE
NATURAL RESOURCES DISTRICT

Integrated Management Plan (IMP)

Distinctions between Fully Appropriated, Overappropriated and Districtwide Ground Water Management Areas

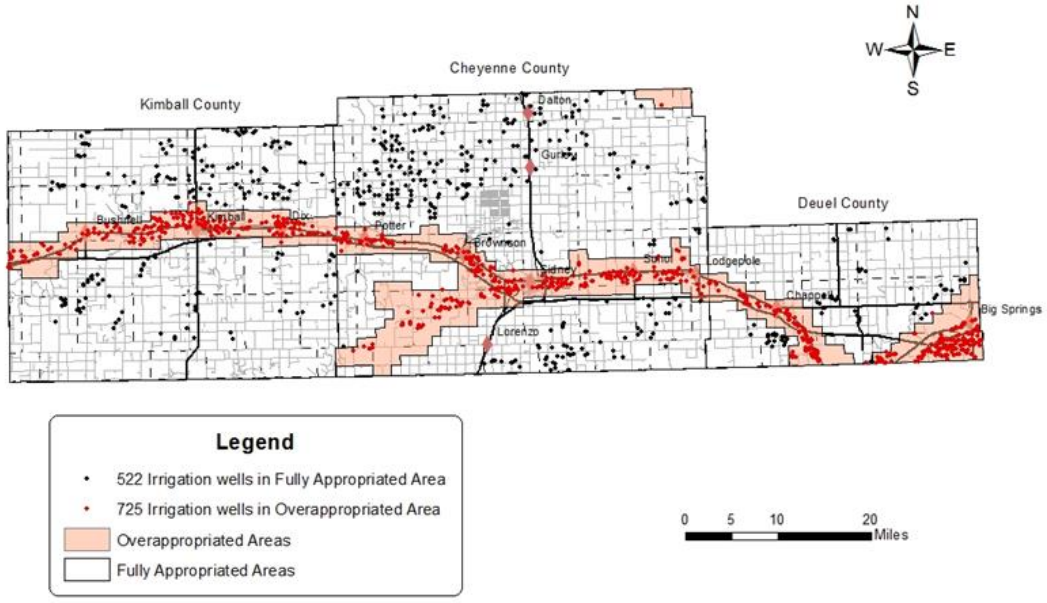
SPNRD IMP Stakeholders Group - 2nd Increment Meeting

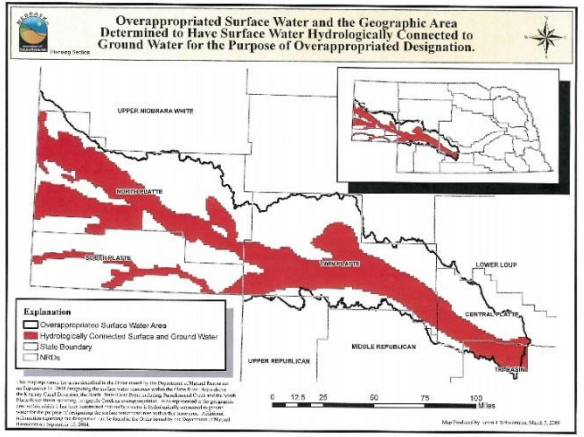
August 15, 2018
WNCC - Sidney Campus, Nebraska

SPNRD Upper Platte River Basin IMP Requirements

- SPNRD includes both Fully Appropriated and Overappropriated Areas
- Maintains consistency with the Upper Platte River Basin-Wide Plan
- SPNRD IMP streamflow depletion reduction requirements to return to Post 1997 levels of depletions within the first ten (10) year increment:
  - **Lodgepole Creek - 150 Acre-Feet/Year** by 2019
  - **North Platte River - 150 Acre-Feet/Year** by 2019
  - **South Platte River - 400 Acre-Feet/Year** by 2019
  - **Total** offset requirement = **700 Acre-Feet/Year** by 2019
- Our Post-1997 Results are very Positive!

South Platte NRD
Irrigation Wells in
Fully and Over Appropriated Areas



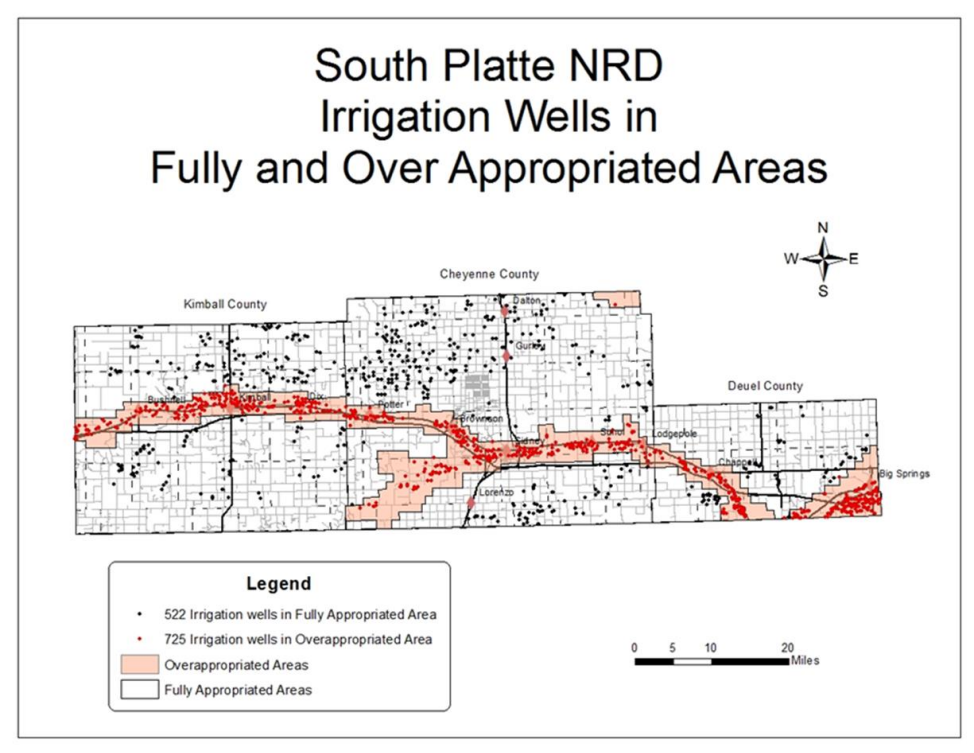


*Number of Irrigated Acres in Overappropriated and Fully Appropriated Areas

1. Overappropriated Areas
   a. LPC - 41,580 acres
   b. SPR - 9,950 acres
   c. Total = 51,530 acres

2. Fully Appropriated Areas including the NPR Area
   a. Total = 80,512 acres

3. Districtwide - Total = 132,042 Irrigated Acres



* Source: SPNRD 2017 Water Usage Report, Compiled by Travis Glanz, March 23, 2018

1st Increment - IMP Implementation Activities

SPNRD Non-Regulatory Actions

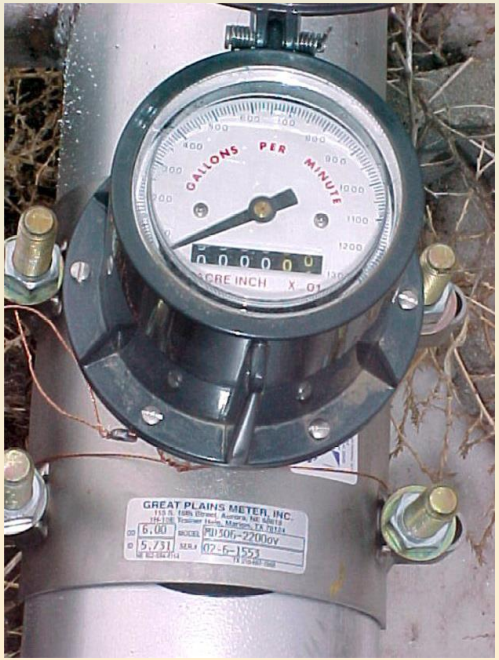
- Western Water Use Management Modeling (WWUMM) and Analyses for Agriculture, Municipal and Commercial/Industrial Water Usage Accounting
- Permanently and Temporarily Retiring/Decertifying Irrigated Acres
- Water Banking and Water Marketing Development Activities
- Oliver Reservoir Streamflow Enhancement Project
- South Platte River Augmentation/Recharge Projects
- Studies and Research
- Advisory Committees
- Information and Education

SPNRD Regulatory Actions

- Moratorium on Permits for Large Capacity Wells (50 gpm or greater) and on New or Expanded Uses

Outside the IMP - SPNRD Districtwide Ground Water Management Area Rules and Regulations

- SPNRD Regulatory Actions
  - Certification of Irrigated Acres
  - Installation of Flow Meters on all Irrigation Wells/Systems
  - Incorporated Allocations, Transfers and Pooling Procedures



Path Forward

- Discussion concerning 2nd Increment IMP Goals, Objectives and Controls. Will need to be consistent with Basin-Wide Plan Goals.
- Provide and discuss updated estimates of Post-1997 depletion targets (Robust Review Results)
  - What are the SPNRD's options to meet its obligations?
    - Should the options be the same or different among LPC, SPR and NPR Areas?
      - Maintain Post-1997 depletion levels and add additional amounts
      - Maintain Post-1997 depletion levels and include drought mitigation plan and/or conjunctive management plan components
      - Maintain Post-1997 depletion levels and include compensation for lost hydropower generation
    - Should the LPC, SPR and NPR Areas have different controls
- Incrementally achieve and sustain a fully appropriated condition

ROBUST REVIEW RESULTS

Robust Review Analysis

SPNRD Results

SPNRD IMP Stakeholder Meeting #2

August 15, 2018

Robust Review Goals

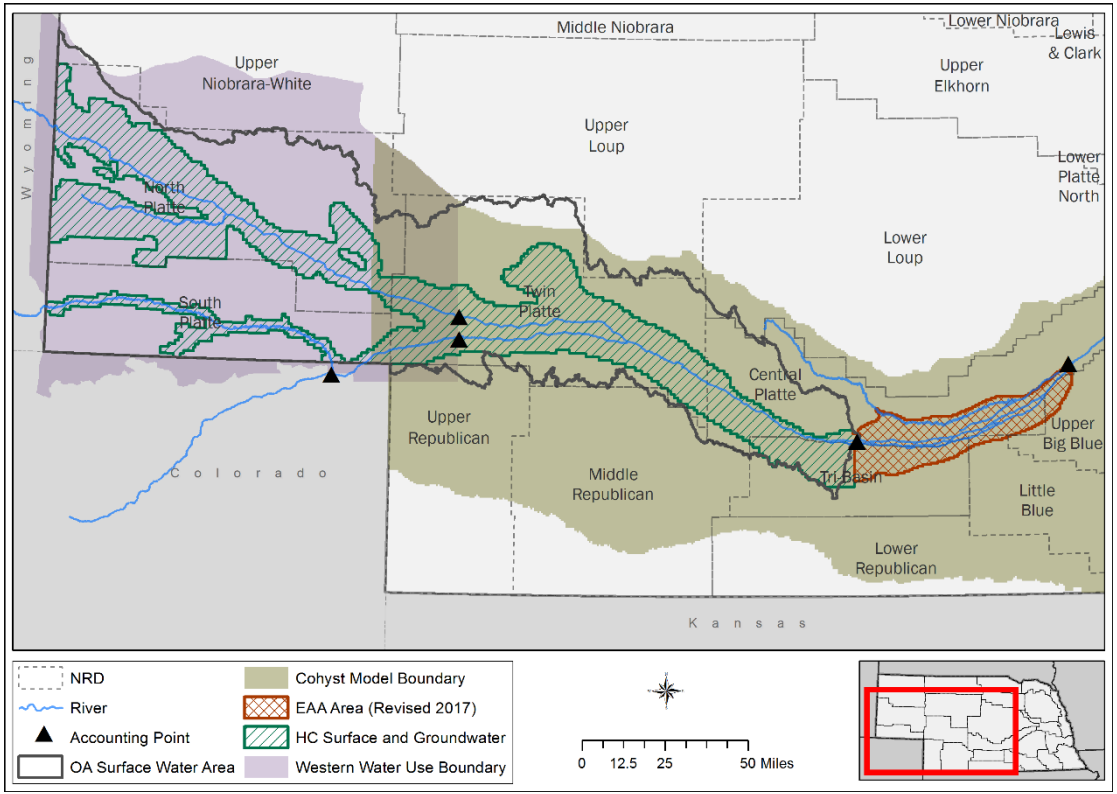
- **Complete monitoring activities outlined in the current IMP**
- **Assess progress on first increment goals and objectives**
- **Provide for more informed discussion of second increment objectives with the SPNRD IMP stakeholders**

Robust Review Model Simulation Setup

WWUMM Area Assumptions

- Used historical calibrated version of the groundwater and watershed models (Run 028/LU004/NIR set 2 for GW only lands)
- Model is simulated from 1953 – 2063
- Irrigation pumping repeats 2009-2013 in the baseline simulation and 1997 acres and crop types in the “1997” simulation with 2009-2013 weather repeated into the future
- Municipal and Industrial baseline simulation estimates use through time to 2013 and “1997” simulation is held constant
- Surface water and commingled acres remain constant in the baseline and 1997 simulations to cancel out commingled effects
- Results are summarized for three areas: 1) North Platte River; 2) South Platte River; and 3) Lodgepole Creek

Model Areas


Middle Niobrara
Lower Niobrara
Lewis & Clark
Upper Niobrara-White
Upper Elkhorn
Upper Loup
Lower Platte North
Lower Loup
North Platte
South Platte
Twin Platte
Central Platte
Upper Republican
Upper Big Blue
Middle Republican
Tri-Basin
Little Blue
Lower Republican
Wyoming
Colorado
Kansas
NRD
River
Accounting Point
OA Surface Water Area
Cohyst Model Boundary
EAA Area (Revised 2017)
HC Surface and Groundwater
Western Water Use Boundary
0
12.5
25
50 Miles

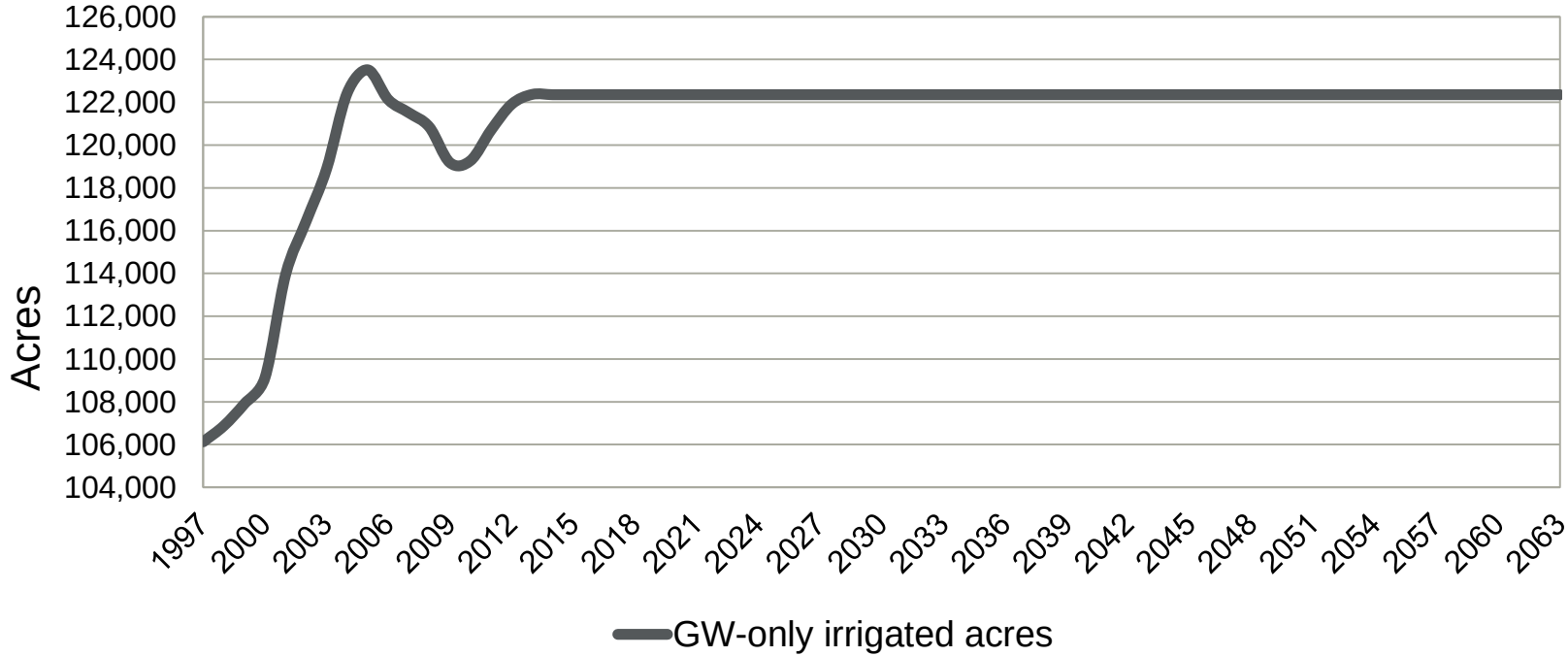
SPNRD Inputs
(Change in acres)

Change in groundwater-only irrigated acres 1997-2013

SPNRD	Total change (1997 to 2013)
District-Wide	**16,200 acres**
OA	**-1,200 acres**

SPNRD Inputs

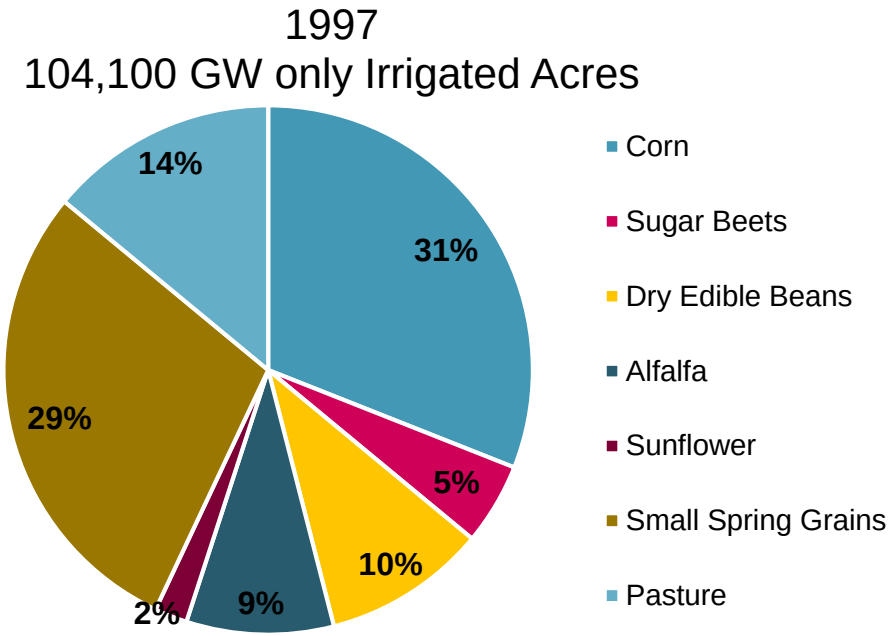
Groundwater-only irrigated acres from 1997, District-wide

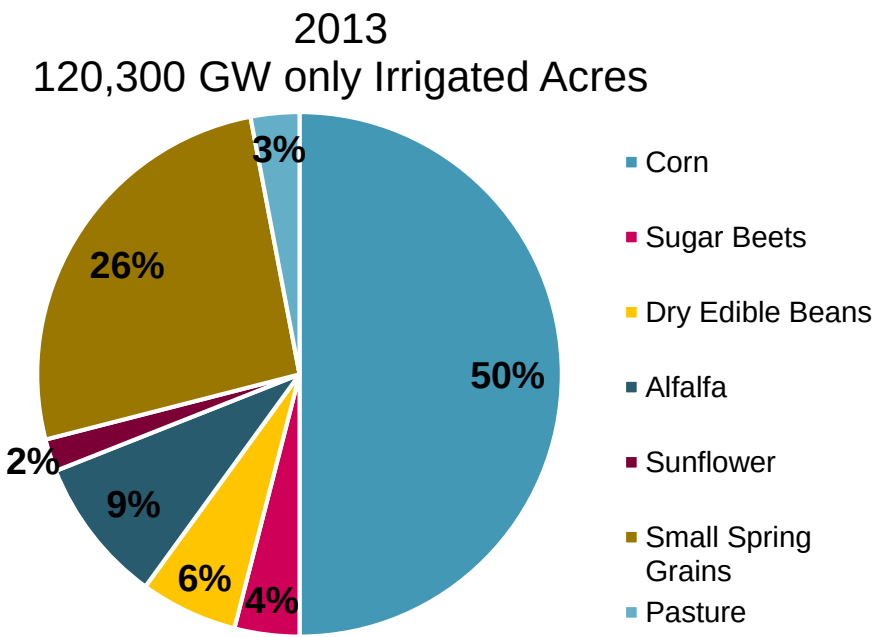


SPNRD Inputs

(Changes in crop type, District-wide)

Change in groundwater-only irrigated acre crop types 1997-2013

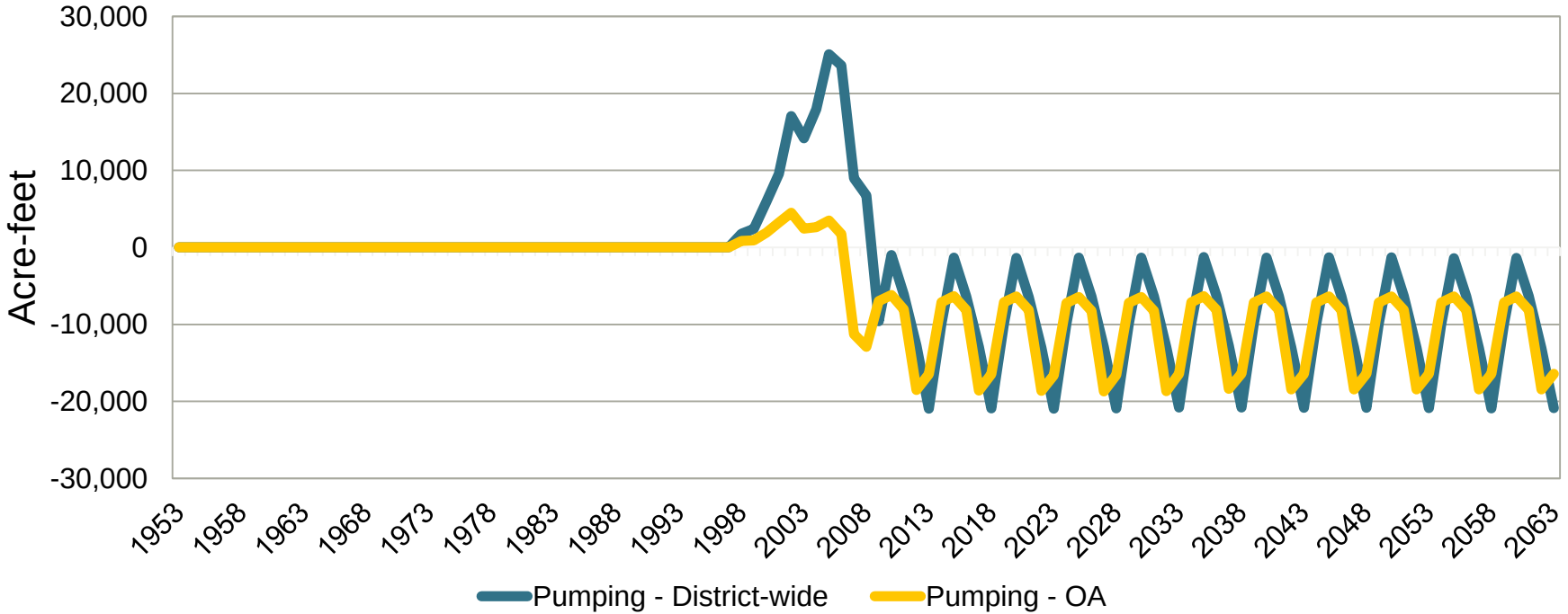




SPNRD Inputs

Changes to Post-1997 Pumping, District-Wide and OA

Groundwater-only irrigation pumping AND municipal/industrial pumping

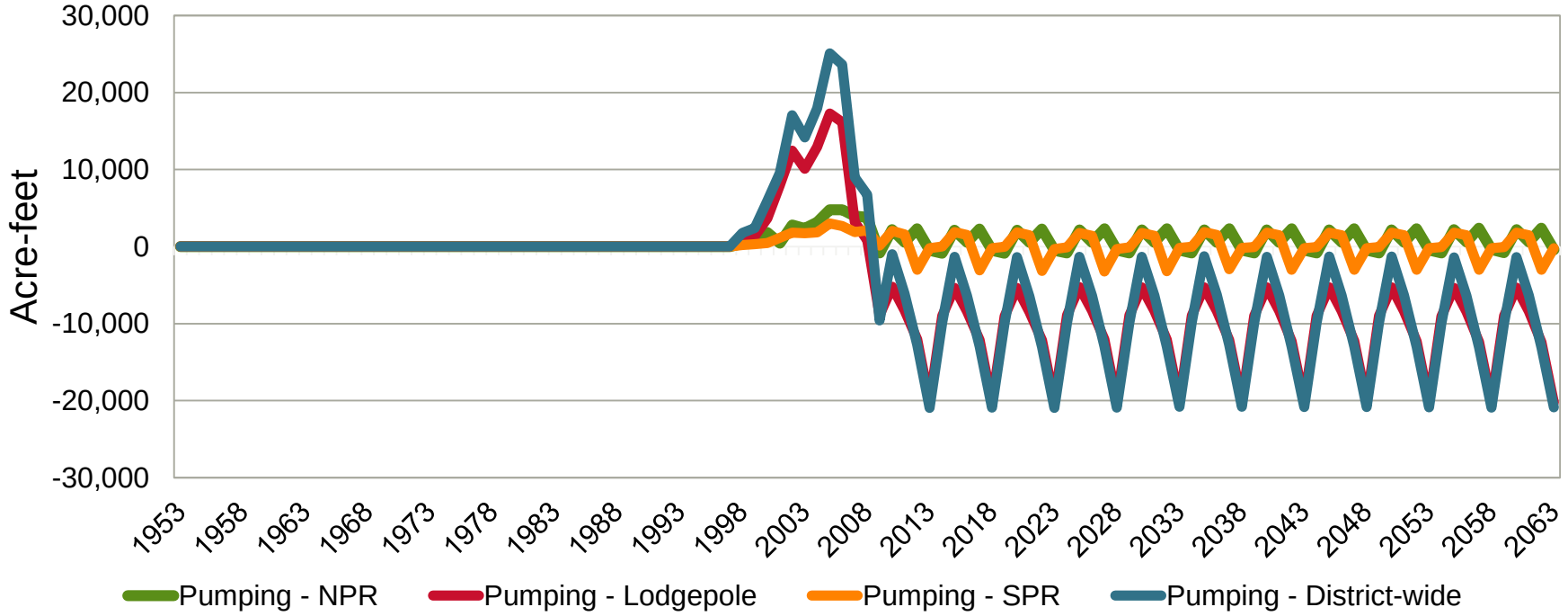


SPNRD Inputs

Current Estimates of Industrial and Municipal Pumping
Industrial average annual volume 2% greater (≈18 AF) compared to 1997
Municipal average annual volume 3% lower (≈80 AF) compared to 1997
1997 = 1,024 AF industrial 2,967 AF municipal
2013 = 1,136 AF industrial 2,441 AF municipal

Changes to Post-1997 Pumping, District-Wide

Groundwater-only irrigation pumping (16,200 acres) AND municipal/industrial pumping



SPNRD Inputs
(Groundwater Recharge)

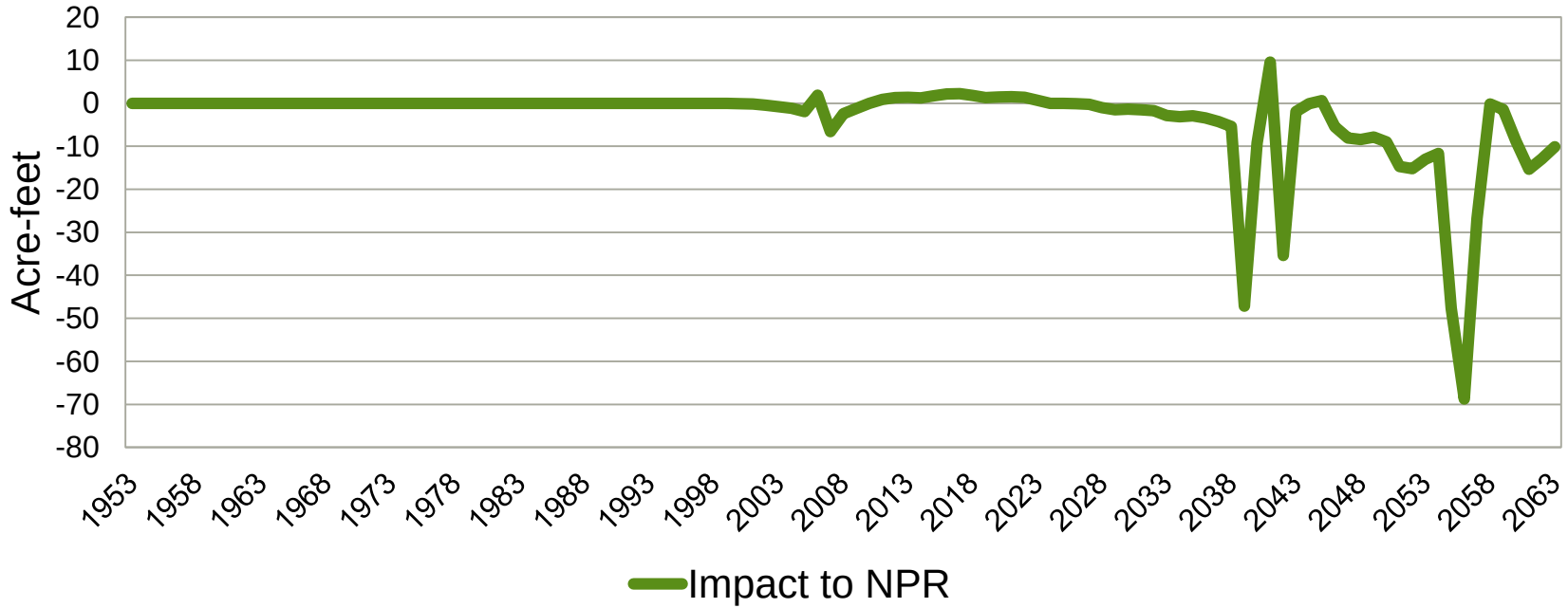
Excess Flows Diverted and Recharged into Western Canal

SPNRD	Acre-Feet of Excess Flow	
	Diversion	Recharge
2011	**5,127**	**2,104**
2013	**1,443**	**516**

*This project is shared 30/70 between the SPNRD and TPNRD, this data represents 30% of the diversion and recharge

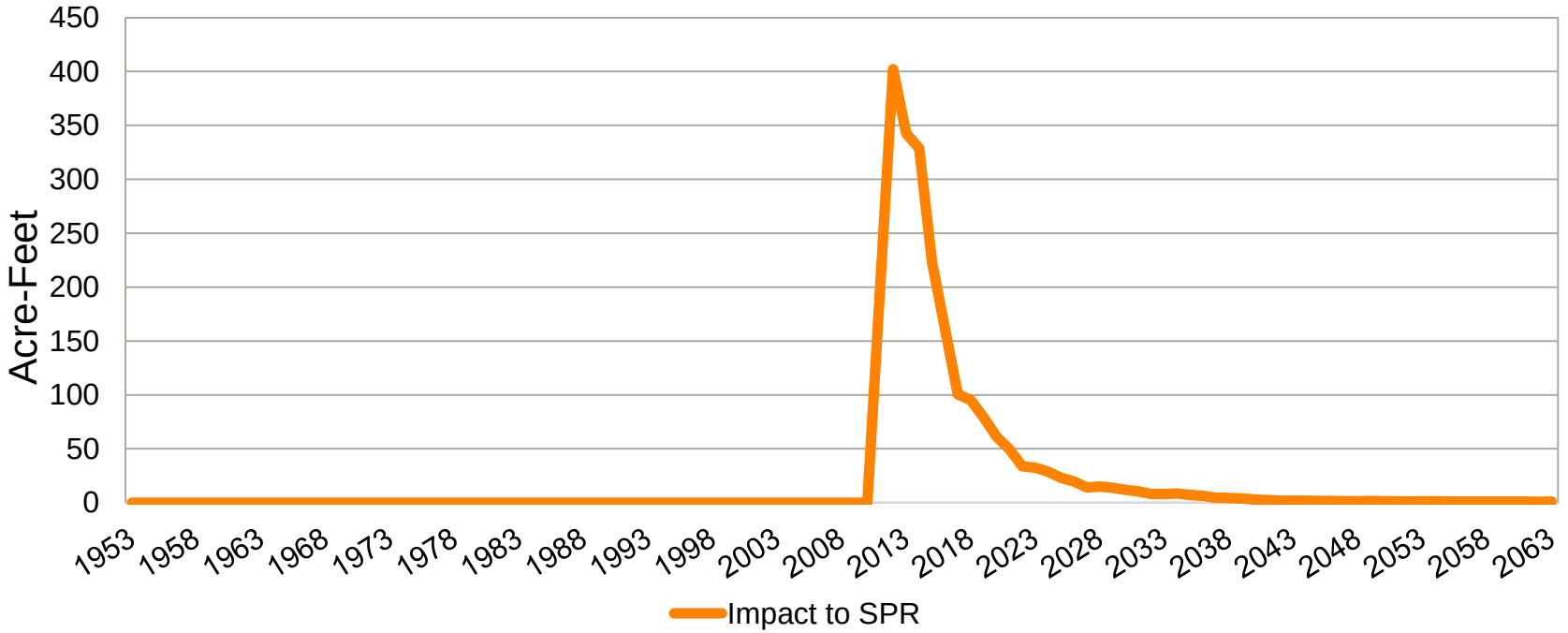
SPNRD Results

Impact to North Platte River in SPNRD, from the Post-1997 **Changes**



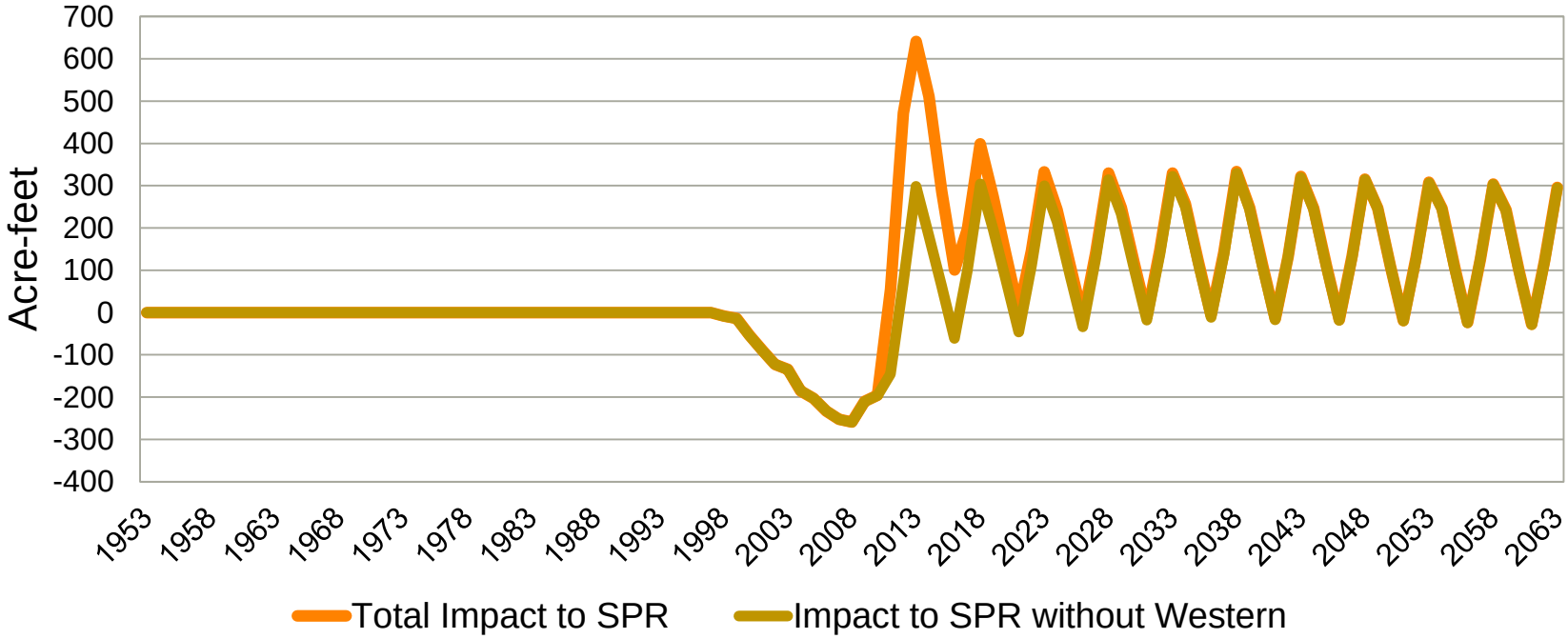
SPNRD Results

Impact to South Platte River in SPNRD from Western Canal Recharge



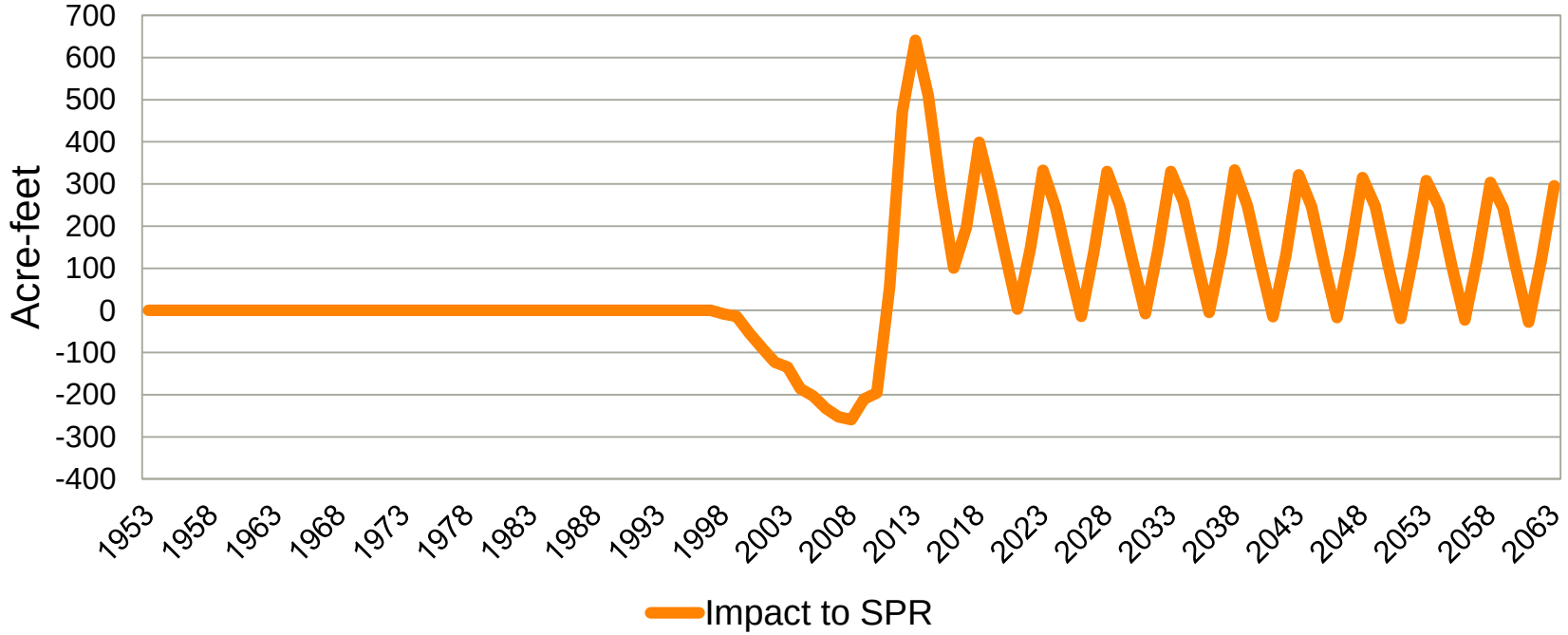
SPNRD Results

Total Impact from Post-1997 **Changes**, to the South Platte River in SPNRD (with Recharge) Compared to Impact from Pumping Changes



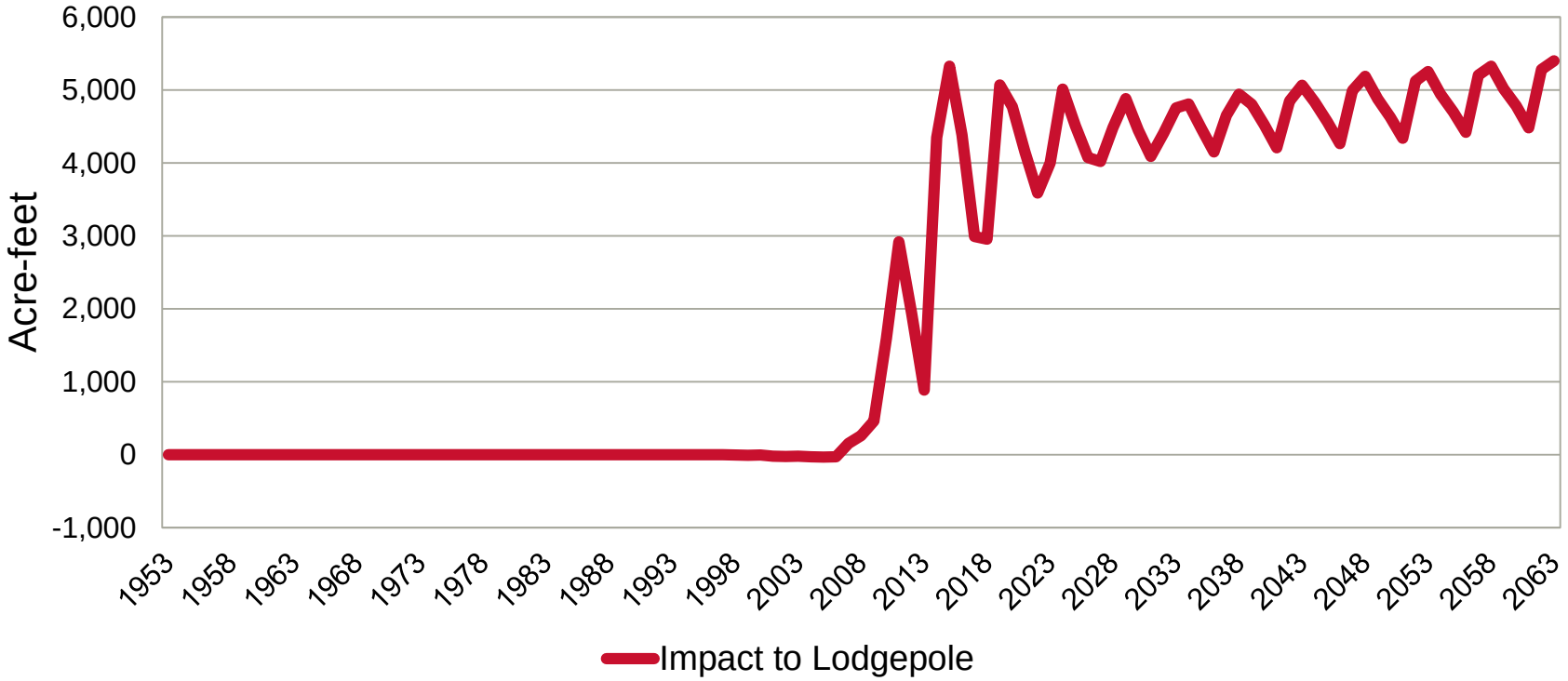
SPNRD Results

Impact to South Platte River in SPNRD, from Post-1997 **Changes** and Western Canal Recharge Events



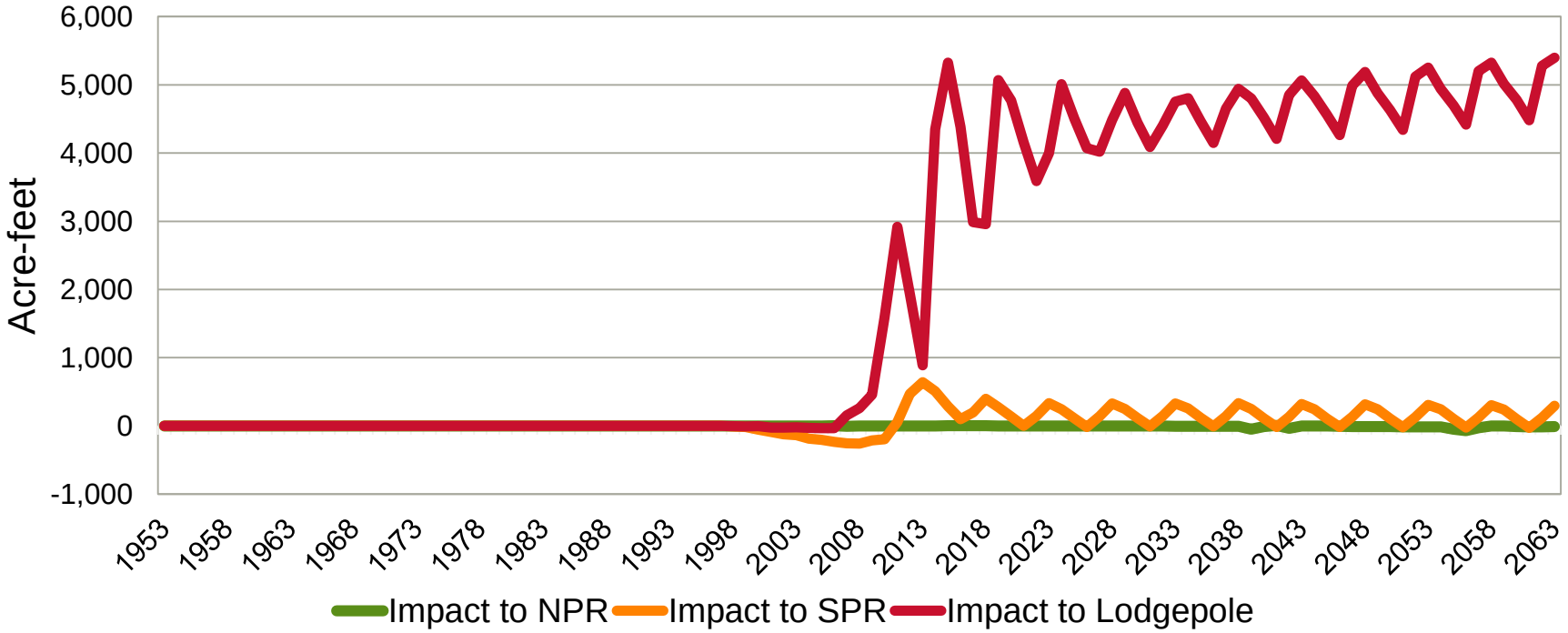
SPNRD Results

Impact to Lodgepole Creek in SPNRD from Post-1997 **Changes**



SPNRD Results

Impact to North Platte River, South Platte River, and Lodgepole Creek in SPNRD from Post-1997 **Changes** and Western Canal Recharge Events



SPNRD Results

Post-1997 estimates

	Year	2019	2029	50-year
North Platte River	**Current IMP**	-13		-150
	Updated Estimate	0	0	-10
South Platte River	**Current IMP**	-149.1		-400
	Updated Estimate	280	250	300
Lodgepole Creek	**Current IMP**	-63.9		-150
	Updated Estimate	5,070	4,880	5,400

- All values in acre-feet/year

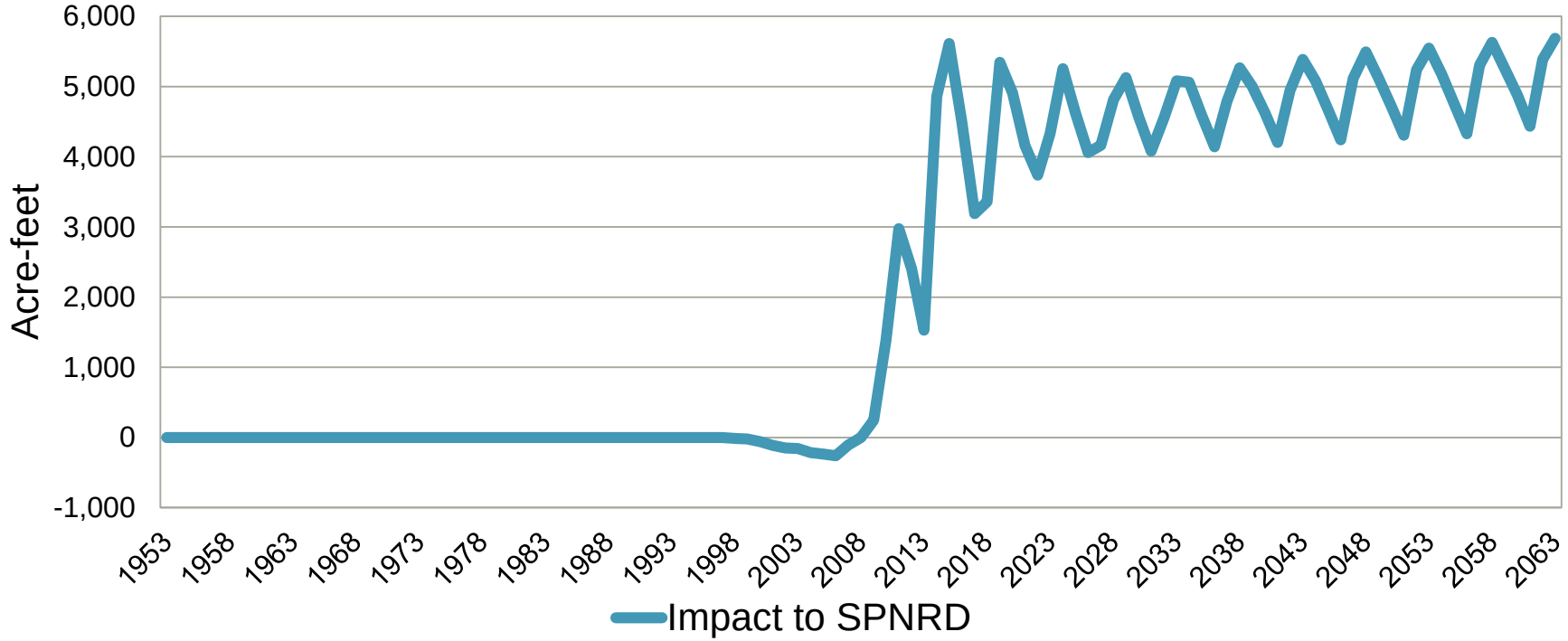
Robust Review Analysis

Was a requirement of the first increment
Must be maintained in the second increment
Deals with Post-1997 Changes and Management Actions
It is the first step toward reaching a fully appropriated condition

301 Centennial Mall South, 4th Floor
PO Box 94676
Lincoln, NE 68509-4676
402-471-2366

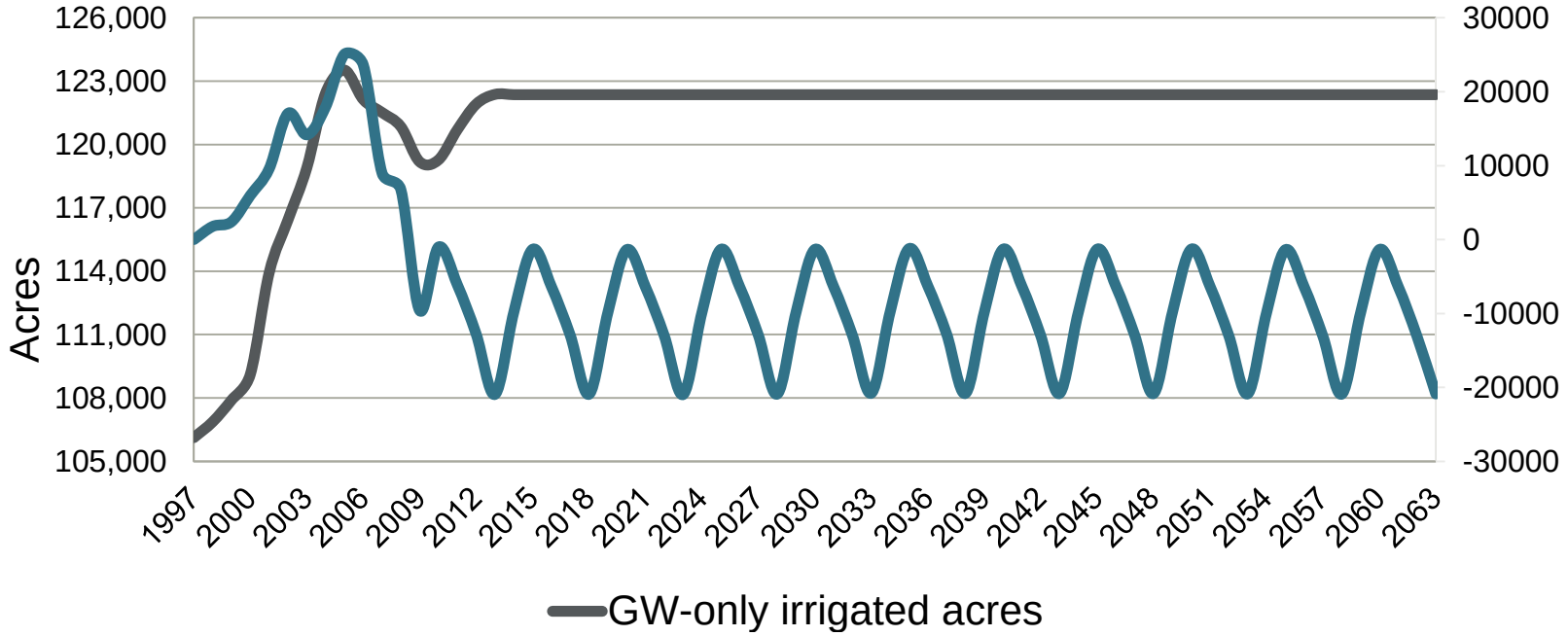
SPNRD Results

Impact to SPNRD

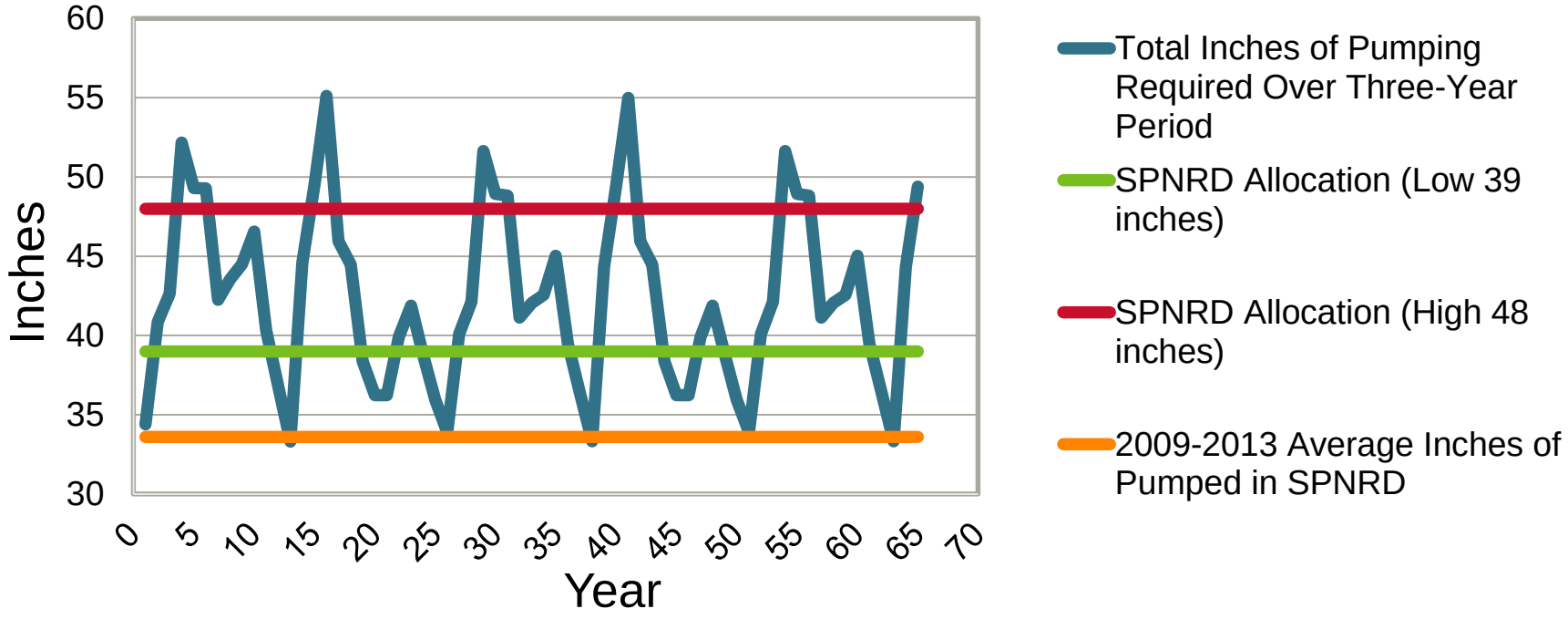


SPNRD Inputs

Change in groundwater-only irrigated acres and groundwater pumping for groundwater-only irrigated acres, municipal & industrial uses, from 1997, District-wide



Estimated Inches Necessary to Meet Full Crop Demand



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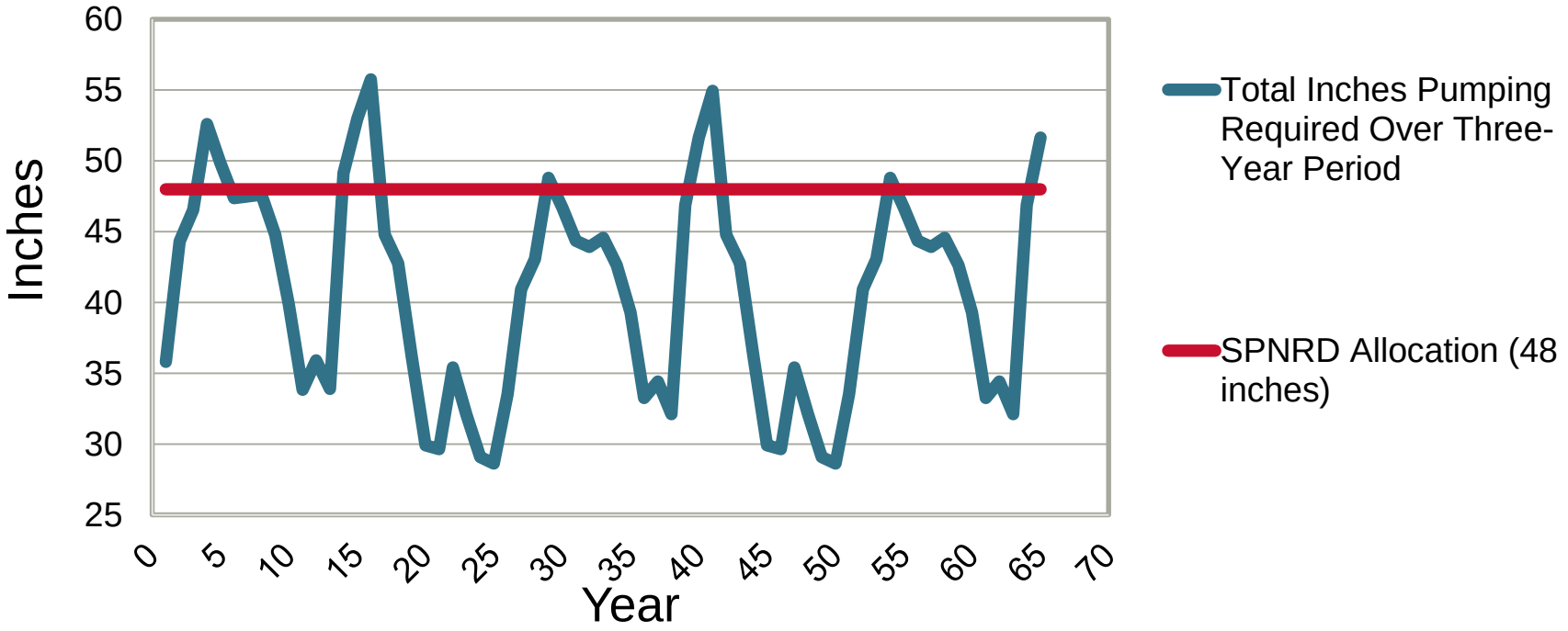
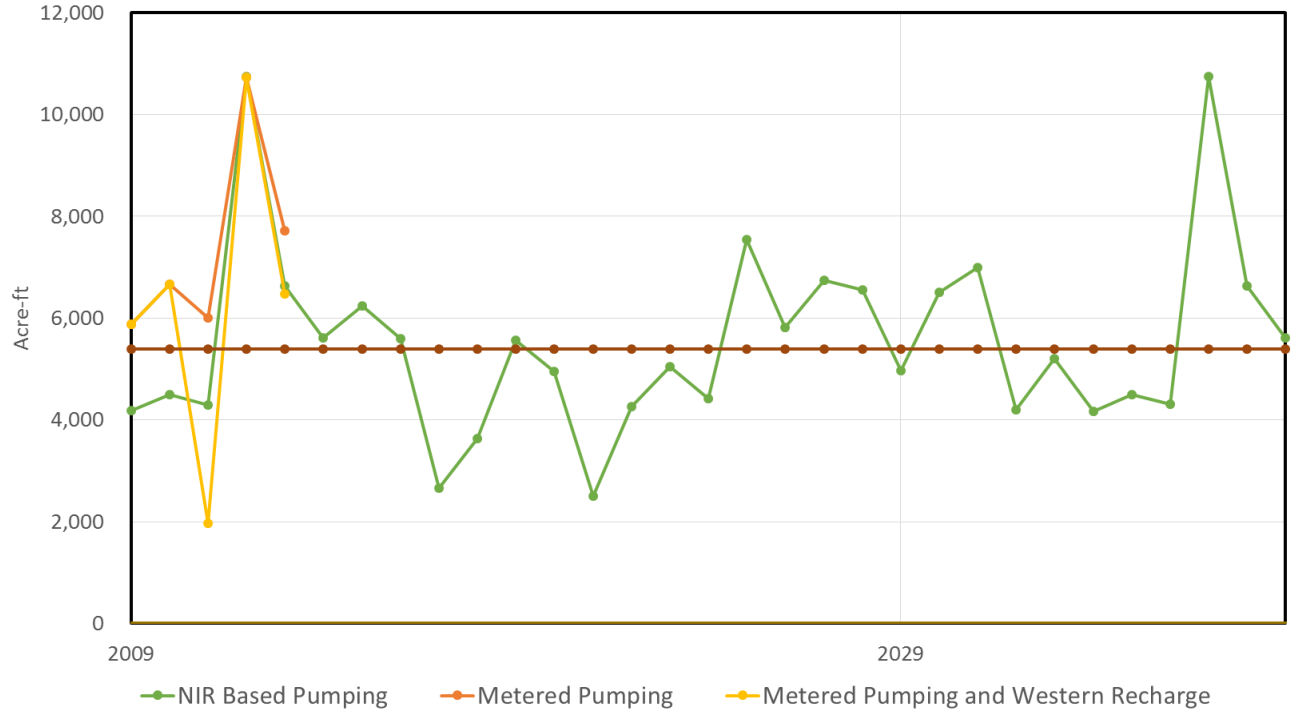


Estimated Inches Necessary to Meet Full Crop Demand

- 25-year average NIR pumping requirement translates to 12.5” per year in the South Platte River OA Area or 37.5” over three-year allocation period
- 2009-2013 NIR pumping requirements averaged 15.5” per year
- 2009-2013 metered pumping average 15” or ~1000 ac-ft less for the 5-year period with most of the reduction occurring in 2012

SPNRD Allocation Analysis

(1997 Allowable Pumping Levels and 2009-2013 Metered Pumping)



- For the 2009-2013 period:
  - 6,100 ac-ft/year average for 1997 level of development
  - 7,400 ac-ft/year average of 2009-2013 metered pumping
  - 6,350 ac-ft/year average based on metered pumping and western recharge
  - ~ 250 ac-ft/year deficit during the 2009-2013 period

2ND INCREMENT TOPICS

Municipal Statute – 2026 Offsets
Conjunctive Management

2ND INCREMENT TOPICS

MUNICIPAL STATUTE – 2026 OFFSETS

PROPOSED MUNICIPAL / INDUSTRIAL CHANGES - FOR 2ND INCREMENT IMP

- 2 Parts to IMP Municipal and Industrial Changes
  - 1st part will cover 2019-2025
  - 2nd part will cover 2026 and after
- 2019-2025 IMP language will be revised to be similar to other Upper Platte Basin NRDs IMP language
  - The current language in the SPNRD IMP is very detailed and can be greatly simplified
  - Even though the language will be simplified, the reporting and tracking of municipal/industrial usage will not change
  - The simplified language could provide more flexible opportunities for offsetting water consumed over the municipal or industrial baseline

PROPOSED MUNICIPAL/INDUSTRIAL CHANGES FOR 2ND INCREMENT IMP

- Summary of current statute language
  - Neb. Stat. § 46-740 states that an IMP, rule, or order cannot limit the use of groundwater by a municipality or non-municipal commercial/industrial use within a designated fully or over appropriated area until January 1, 2026.
  - Prior to 2026 the NRD was responsible for offsetting any new or expanded consumptive use up to 25 million gallons/year

CHANGE #1

- Accounting Year
  - Currently: August 1st to July 31st
  - 2026: January 1st to December 31st
    - May be able to change sooner

- Reason:
  - Easier time frame to track
  - Matches irrigation season
    - Making transfers and offsets easier

CHANGE #2

- Municipal Baselines Updated
  - Currently: Single highest use year (pumped minus discharge) from 2001-2006 based on the August 1 – July 31 timeframe
  - 2026: Single highest use year (pumped minus discharge) from 2021-2025 plus 10% based on calendar year timeframe
- Reasons:
  - Original baselines were sometimes determined with estimated data. Now more accurate data exists.
  - Reflects changes that have occurred since the original baselines were set. Examples: increase/decrease in population; wastewater treatment plant (discharge) has been changed to full retention lagoons
  - Time frame is easier to manage

CHANGE #3

- Industrial Baselines Updated
  - Currently: Single highest use year (pumped minus discharge) from 2001-2006 based on the August 1 – July 31 timeframe. Had to have pumping in all 5 years to qualify for a baseline.
  - 2026: Single highest use year (pumped minus discharge) from 2002-2025 based on calendar year and also a long term average annual use will be calculates to determine the baseline
- Reasons:
  - The SPNRD has a variety of industries. Some are traditional industries that have pumping each year, others are more closely related to the oil or sand/gravel industries and pumping is more sporadic. By evaluating a longer timeframe we will not be punishing industries that are not currently using water, and we can also account for the more traditional industries that are experiencing growth or decline in water use.

CHANGE #4

- Any new Municipality or Industry that does not have an established baseline as of 2026 will be responsible for offsetting all new water use.
  - Currently: NRD is responsible for providing up to 25 million gallons offset for offsetting new consumptive uses.
  - 2026: Municipal or Industrial user will be responsible for offsetting all new consumptive uses.
- Reasons:
  - Several existing industrial wells and a few municipal wells do not have a baseline established currently, if those wells become active in the future they will need to obtain their own offsets.

CHANGE #5

- Offsets for new or expanded Municipal or Commercial/Industrial growth with an existing baseline
  - Currently: NRD is responsible for offsetting new or expanded consumptive water use if the baseline is exceeded up to 25 million gallons per year. Municipality or Industry is responsible for offsetting new or expanded consumptive water use if the baseline is exceeded by greater than 25 million gallons per year.
    - Example: Baseline is 10 million gallons; user pumps between 10 million and 35 million gallons the NRD has to offset; user pumps greater than 35 million gallons they have to offset.
  - 2026: Municipality or Industry is responsible for offsetting any new or expanded water use over the baseline. Will have to have an approved NRD offset in place within one year of the overage.
    - Example: Baseline is 10 million gallons; user pumps any amount over 10 million gallons they have to offset
- Reasons:
  - Fairness between all users. Irrigators are responsible for all offsets if their allocation is exceeded, now it will be the same for municipalities and industries.

CHANGE #6

- If a Municipality grows into irrigated acres then the reduced amount of consumptive use will accrue to the NRD's water bank to be used in whole or in part to offset future increased consumptive use of the municipality, or be used by the District to reach a fully appropriated status.
  - Current: same as above except the last part… "or be used by the District to reach a fully appropriated status".
- Reason:
  - Municipalities have grown into irrigated acres but have not expanded in population or commercial/industrial growth, so the NRD is proposing to use those acres to reach a fully appropriated status rather than have them sitting in a water bank.

CHANGE #7

- Reporting and Tracking of Municipal Water Use

- No real change will occur, but the language is just simplified from how it exists in the current plan.

- Reason:
  - Just makes the reporting of municipal water use easier for everyone to understand.
  - Helps clean up confusion about high capacity wells owned by a municipality that are used for things like irrigating golf courses/cemeteries, or industrial wells owned by a municipality that are not pumped into their potable water systems.

SUMMARY OF MAJOR CHANGES

- Accounting time frame changes to calendar year
- Most baselines will be changing
- All Municipalities and Industries will be handled the same without regard to the NNDP 28%/40-year area.
- NRD will not be responsible for offsetting uses over the updated baseline amount. User will have to have a plan in place to offset all uses over the baseline within one calendar year.
- Municipal baselines have no mention of per capita use, permanent population, or governmental uses.
- Remove the requirement for municipal water conservation plans after 2026.

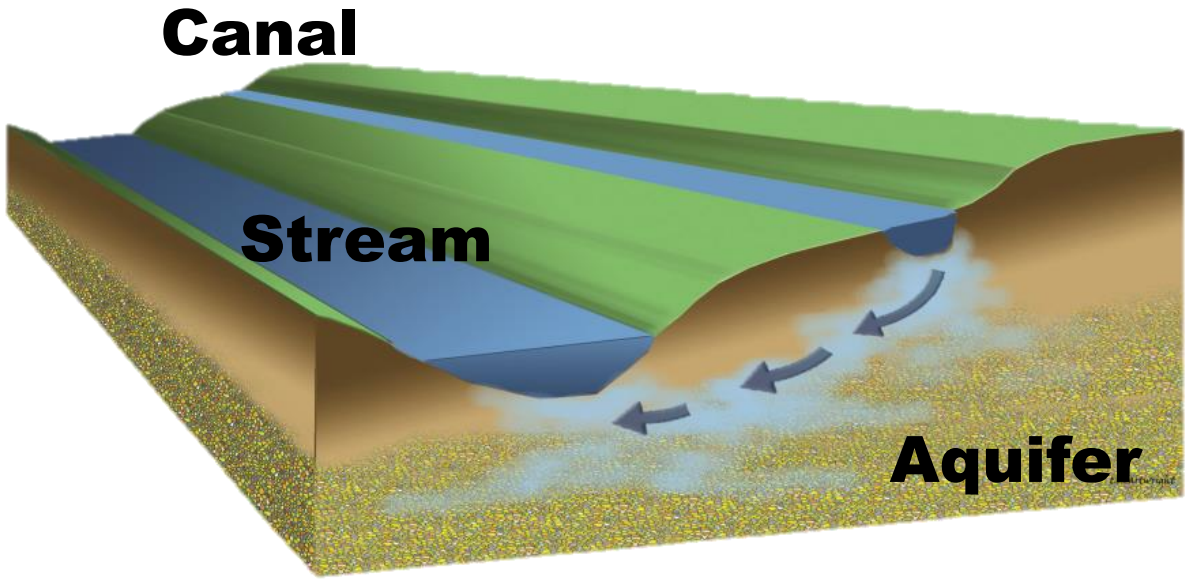
2ND INCREMENT TOPICS

CONJUNCTIVE MANAGEMENT

IN THE UPPER PLATTE RIVER BASIN

UNDERLYING CONCEPTS OF CONJUNCTIVE WATER MANAGEMENT (CWM)

- Surface and groundwater resources are interconnected
- Decisions to improve the management of one cannot be made properly without considering the other



Conjunctive Water Management is an ***adaptive process*** that utilizes the ***connection*** between surface water and groundwater to ***maximize water use***, while ***minimizing impacts*** to streamflow and groundwater levels in an effort to increase the overall water supply of a region and improve the reliability of that supply.

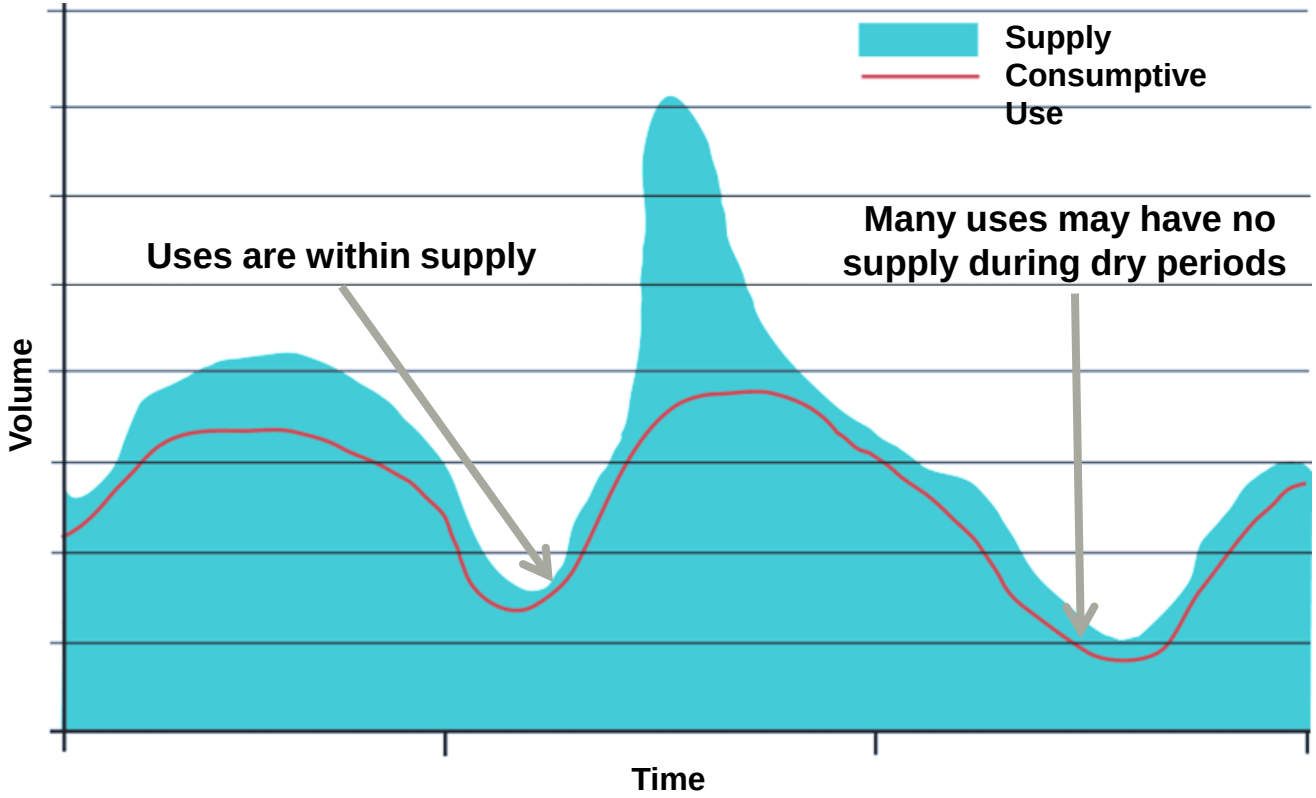
HOW IS CWM ACCOMPLISHED?

- Typically, by:
  - Using or storing additional surface water when it is plentiful
  - Relying more heavily on groundwater during dry periods

- Can change the timing and location of water for more efficient use

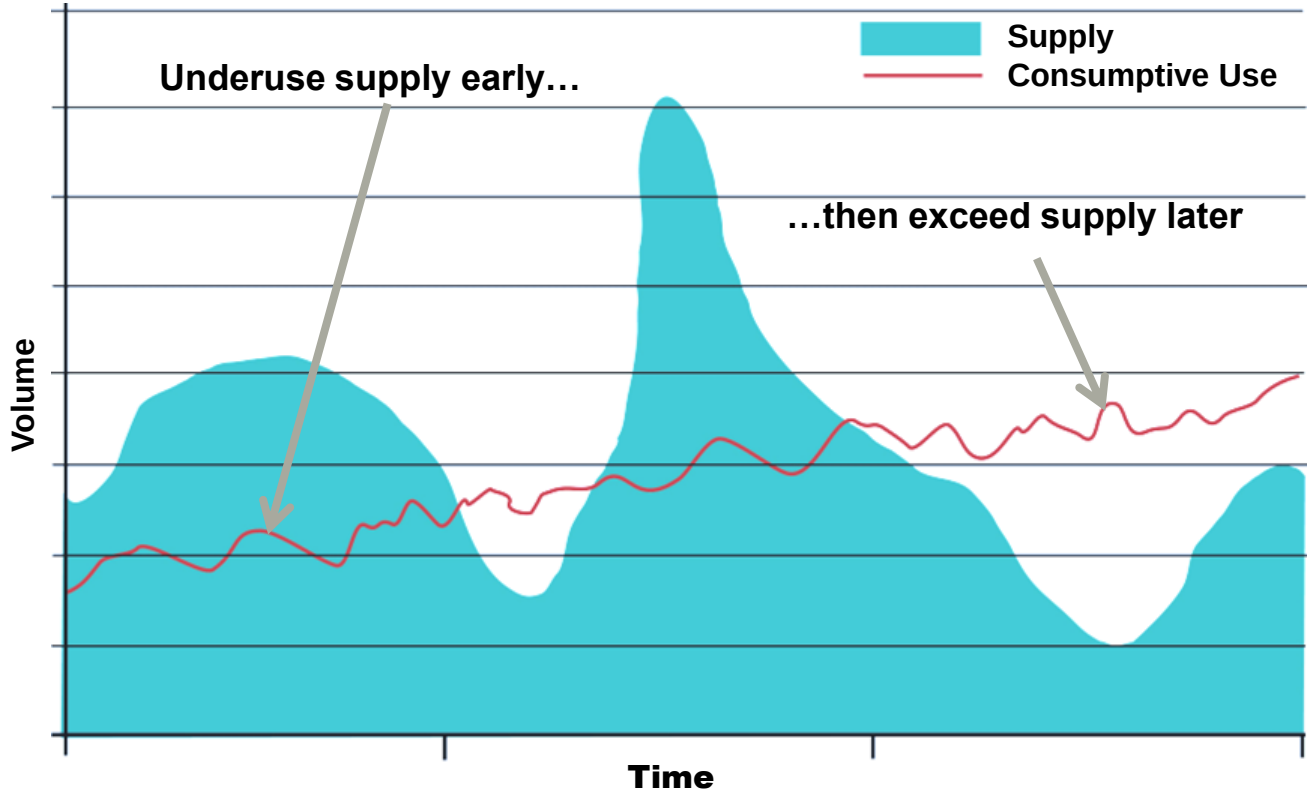
SCENARIO 1:

USING SURFACE WATER ONLY



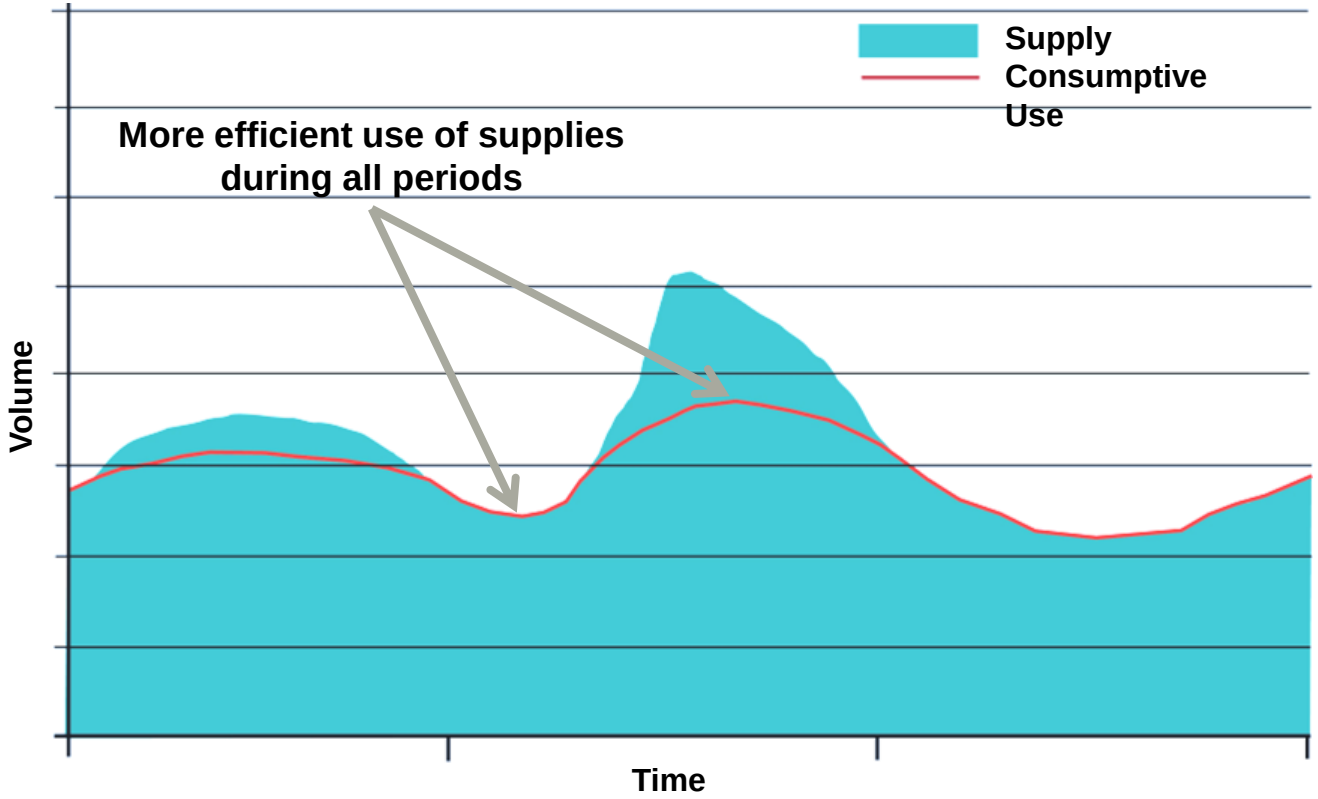
SCENARIO 2:

USING GROUNDWATER ONLY



SCENARIO 3:

MANAGING SUPPLIES THROUGH CWM

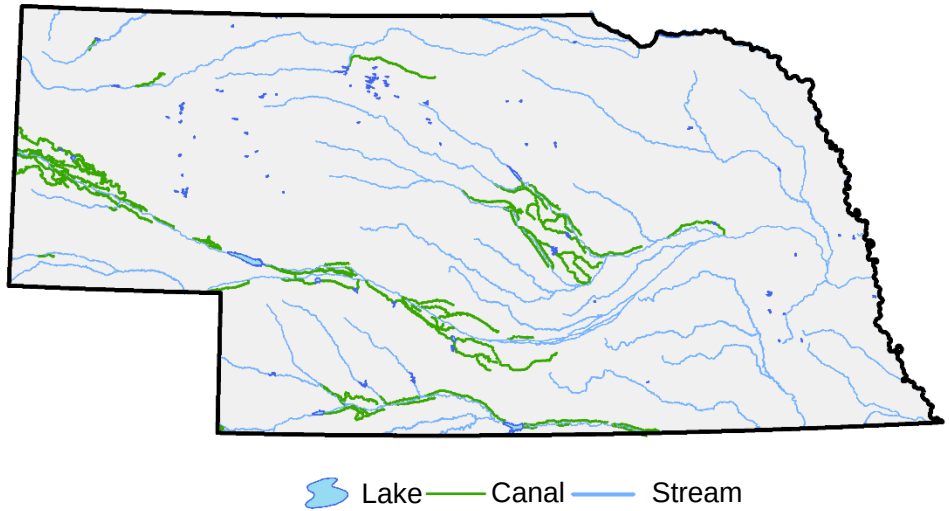


COMPONENTS OF CWM

- Surface water diversion and groundwater pumping
- Aquifer recharge
- Management of the timing of return flows
- Program for monitoring and evaluation

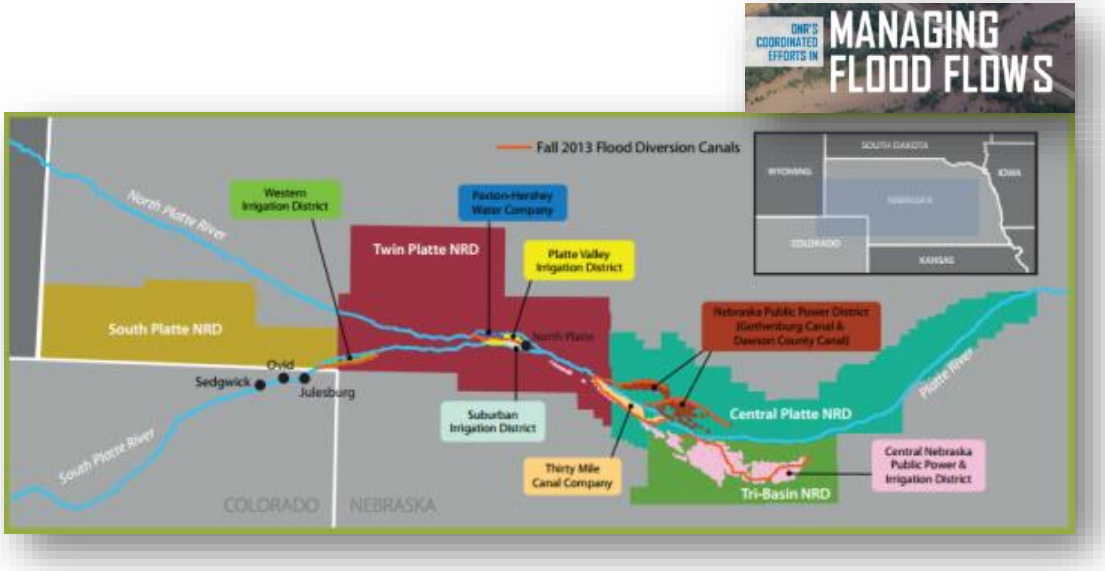
BENEFITS OF CWM

- Maximize available water supplies
- Leverage existing infrastructure
- Use existing planning framework
- Minimize the need for regulatory actions
- Customize to local opportunities or needs
- Maintain viability of existing uses



EXAMPLES OF CWM PROJECTS

- Augmentation projects such as N-CORPE
- Western canal conjunctive management study
- Water leasing arrangements
- CPNRD transfers and canal refurbishment
- Capturing excess flows using existing canal infrastructure (in partnership with irrigation districts)



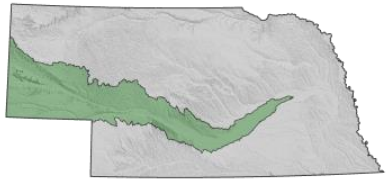
APPLYING CONJUNCTIVE MANAGEMENT

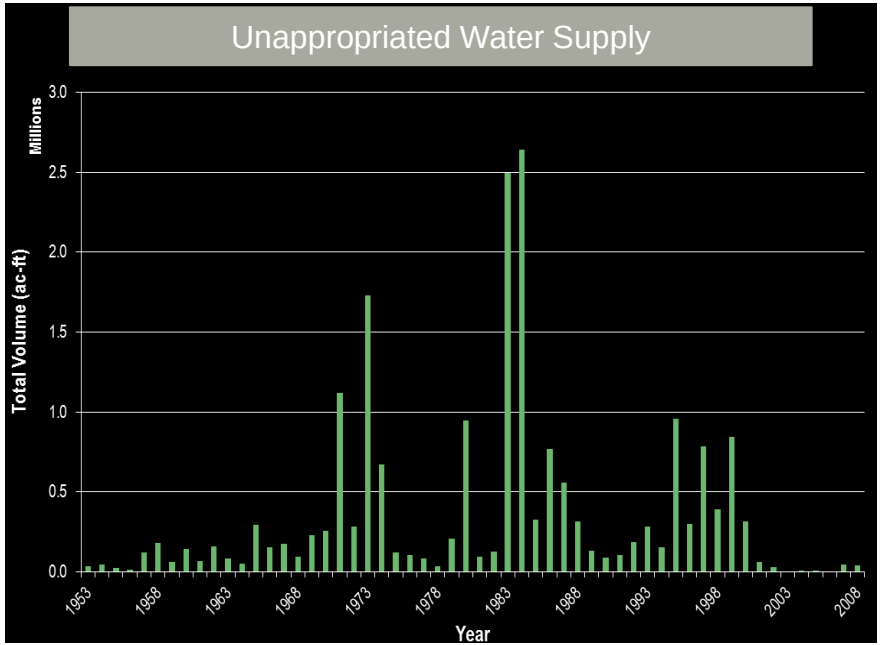
IN THE UPPER PLATTE RIVER BASIN

First Increment CWM Activities

UPPER PLATTE RIVER WATER SUPPLIES

- Receives average of 1 million ac-ft from snowmelt in Wyoming each year (North Platte Decree)
- More variable inflows in South Platte from Colorado
- Water is generally fully allocated, particularly above Elm Creek (overappropriated)
- Streamflows required to be shared under Endangered Species Act (Federal)
- Unappropriated water does occur during some very wet years, during shorter intervals, and outside of the irrigation season



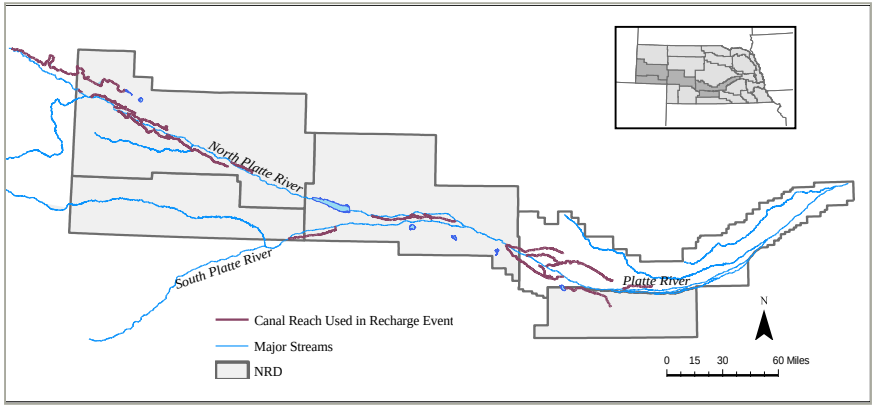


2011 PILOT PROJECT

- High flows in spring prior to irrigation season
- NeDNR coordinated with NRDs, Irrigation Districts/Canal Companies to divert excesses
- Acquisition of permits
- Contracts
- Monitor

2011 PILOT PROJECT

- 23 Canals and 5 NRDs
  - **Diversion Total** **142,000 acre-ft**
  - **Recharge Total** **64,000 acre-ft**
  - **2011-2019 Returns** **15,000 acre-ft**
  - **SPNRD Diversion Total** **5,127 acre-ft**
  - **SPNRD Recharge Total** **2,104 acre-ft**



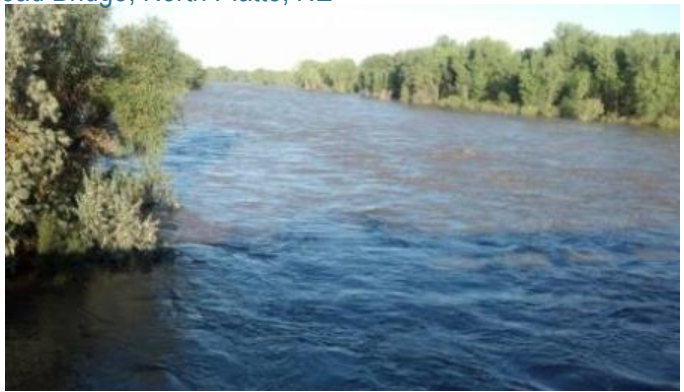
2013 FLOOD FLOWS

Friday, September 20, 2013

Saturday, September 21, 2013

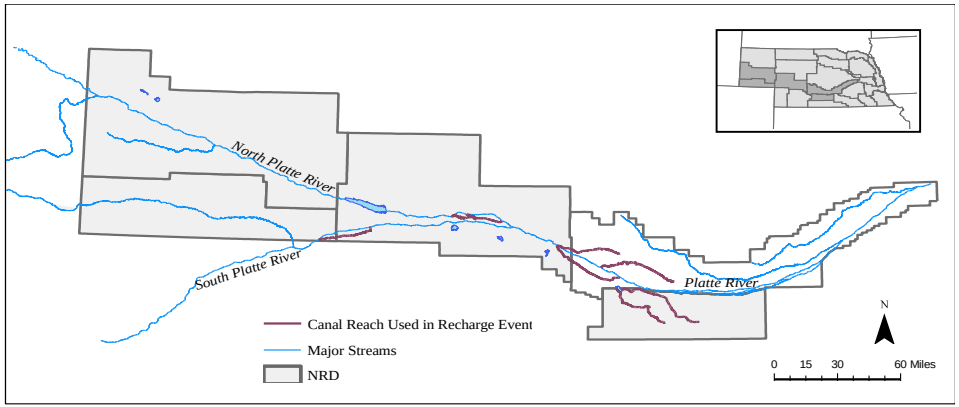
South Platte River Highway 83 Bridge, North Platte, NE

South Platte River Buffalo Bill Road Bridge, North Platte, NE



2013 FLOOD FLOWS

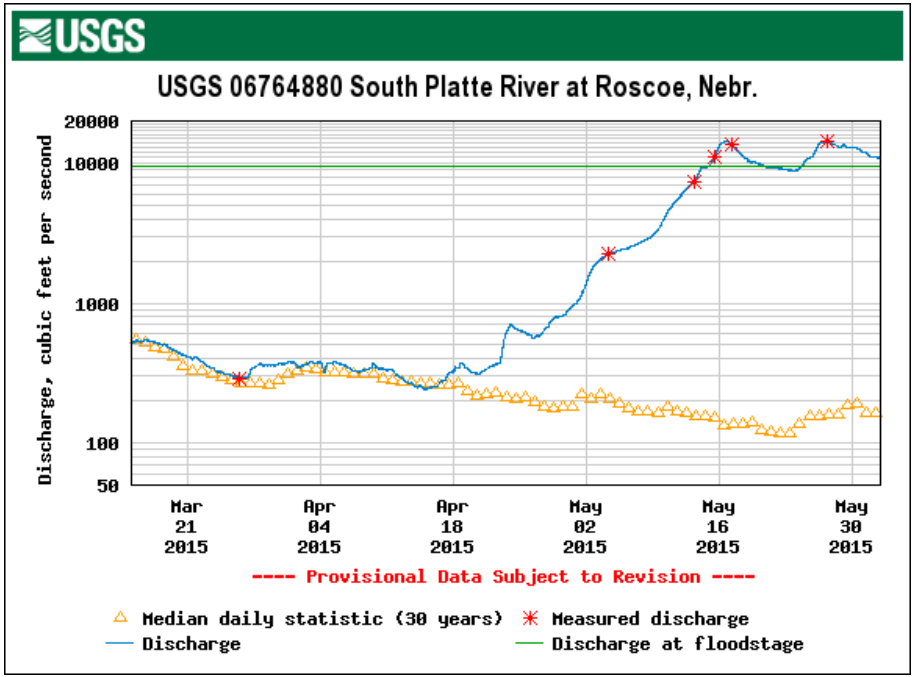
- 9 Canals and 4 NRDs
  - **Diversion Total** **44,000 ac-ft**
  - **Recharge Total** **27,000 ac-ft**
  - **2011-2019 Returns** **5,600 ac-ft**
  - **SPNRD Diversion Total** **1,443 acre-ft**
  - **SPNRD Recharge Total** **516 acre-ft**



2015 FLOOD FLOWS

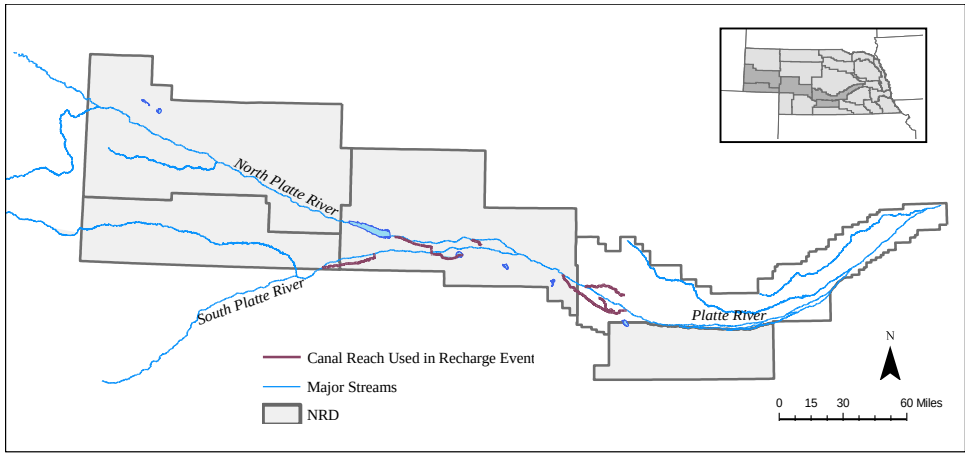
- Wet conditions during above average spring snowmelt
- Canals filled early
- Stored excess in lakes, reservoirs

30-Mile Canal Headworks,
June 2015



2015 FLOOD FLOWS

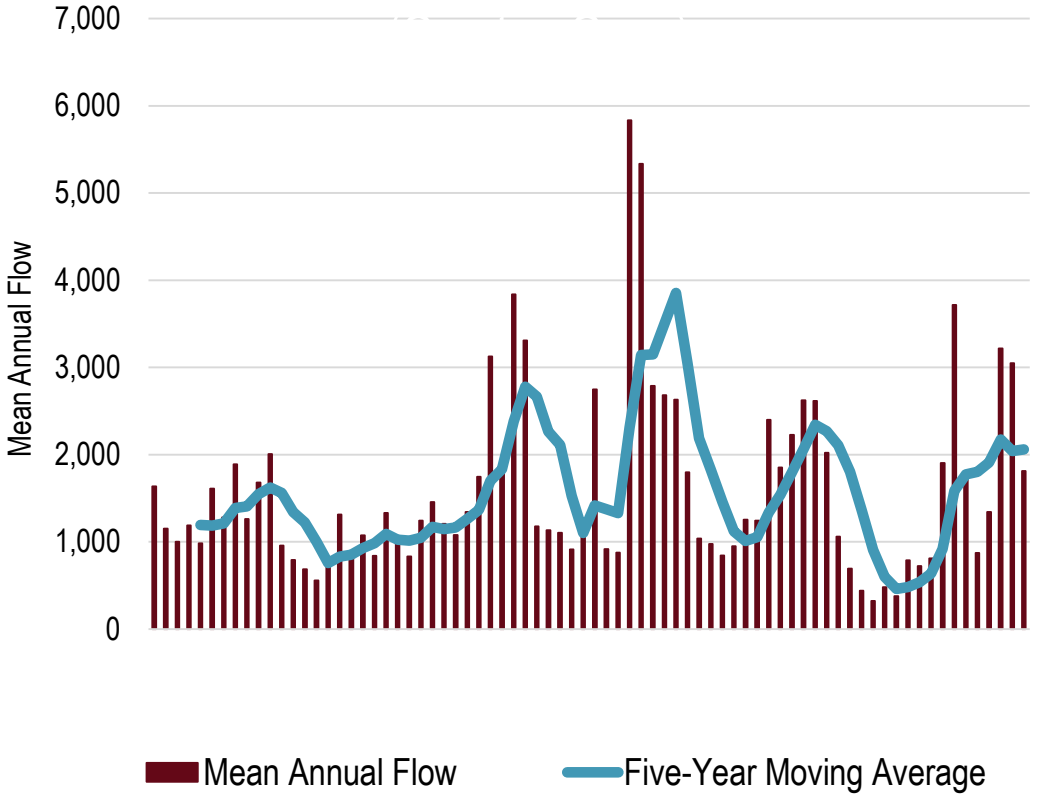
- 7 Canals and 4 NRDs
  - **Diversion Total** **17,700 ac-ft**
  - **Recharge Estimate** **7,600 ac-ft**
  - **SPNRD Diversion Total** **2,172 ac-ft**
  - **SPNRD Recharge Total** **673 ac-ft**



SUMMARY OF FLOOD FLOW DIVERSIONS

First Increment

- Over 200 Kaf of flood flows diverted since 2011
- Resulting recharge in excess of 100 Kaf
- Accretions will benefit Platte River flows for many years into the future
- Process in place for future successes
- Reduces the need for additional regulations
- Creates greater resiliency in future periods



CWM FUTURE ACTIVITIES

- Expand implementation of CWM projects
- Enhance adaptation strategies based on management goals
- Support continued investment in maintaining and enhancing infrastructure
- Ensure that sound science and monitoring are available to support management decisions

Cozad Canal, Gothenberg, NE

NEXT STEPS

MEETING DATES

- November 14, 2018
- January 16, 2019

PUBLIC COMMENT

Thank you

Documentation

- Slides 16-30 produced with data from
  - NPNRD_SPNRD_Acres_Summary
    - \\stndnrnas01.stone.ne.gov\Share\WaterPlanning\UpperPlatte\NRD\NorthPlatte\IMP\PlanImplementation\Meetings\20171217_Post1997Depletions
  - Copy of 2017_12_27_WWUM_pumpingchanges
    - \\stndnrnas01.stone.ne.gov\Share\WaterPlanning\UpperPlatte\NRD\SouthPlatte\IMP\PlanDevelopment\Plan2019\PublicInvolvement\StakeholderAdvisory\20180816.SPNRD.SACMtg2\Presentation\RobustReview
  - 20180807_WWUM_RobustReview_ResultsSummary
    - \\stndnrnas01.stone.ne.gov\Share\WaterPlanning\UpperPlatte\NRD\SouthPlatte\IMP\PlanDevelopment\Plan2019\PublicInvolvement\StakeholderAdvisory\20180816.SPNRD.SACMtg2\Presentation\RobustReview
  - 2017_12_07_updated_SPNRD_allocation_analysis
    - \\stndnrnas01.stone.ne.gov\Share\WaterPlanning\UpperPlatte\NRD\SouthPlatte\IMP\PlanDevelopment\Plan2019\PublicInvolvement\StakeholderAdvisory\20180816.SPNRD.SACMtg2\Presentation\RobustReview