



# NPNRD IMP

## Meeting 2

# TODAY'S AGENDA

- Welcome
- Administration
  - June meeting recap
  - Decision making process
- Robust Review Results
- Second Increment Topics
  - Regulation
  - Conjunctive Management
- Public Comment

# WELCOME

- Open meeting notice
- Safety & logistics
- Introductions



# ADMINISTRATION

June meeting recap  
Decision making process



# ROBUST REVIEW RESULTS



# 2<sup>ND</sup> INCREMENT TOPICS

Regulation

Conjunctive Management



# REGULATION

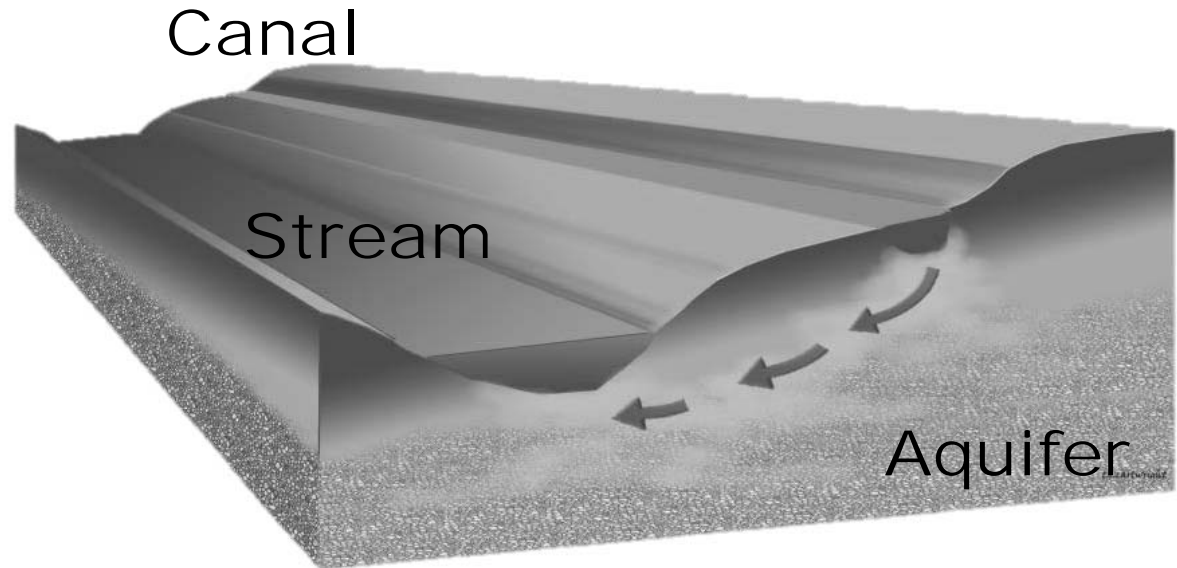


# CONJUNCTIVE MANAGEMENT



# 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

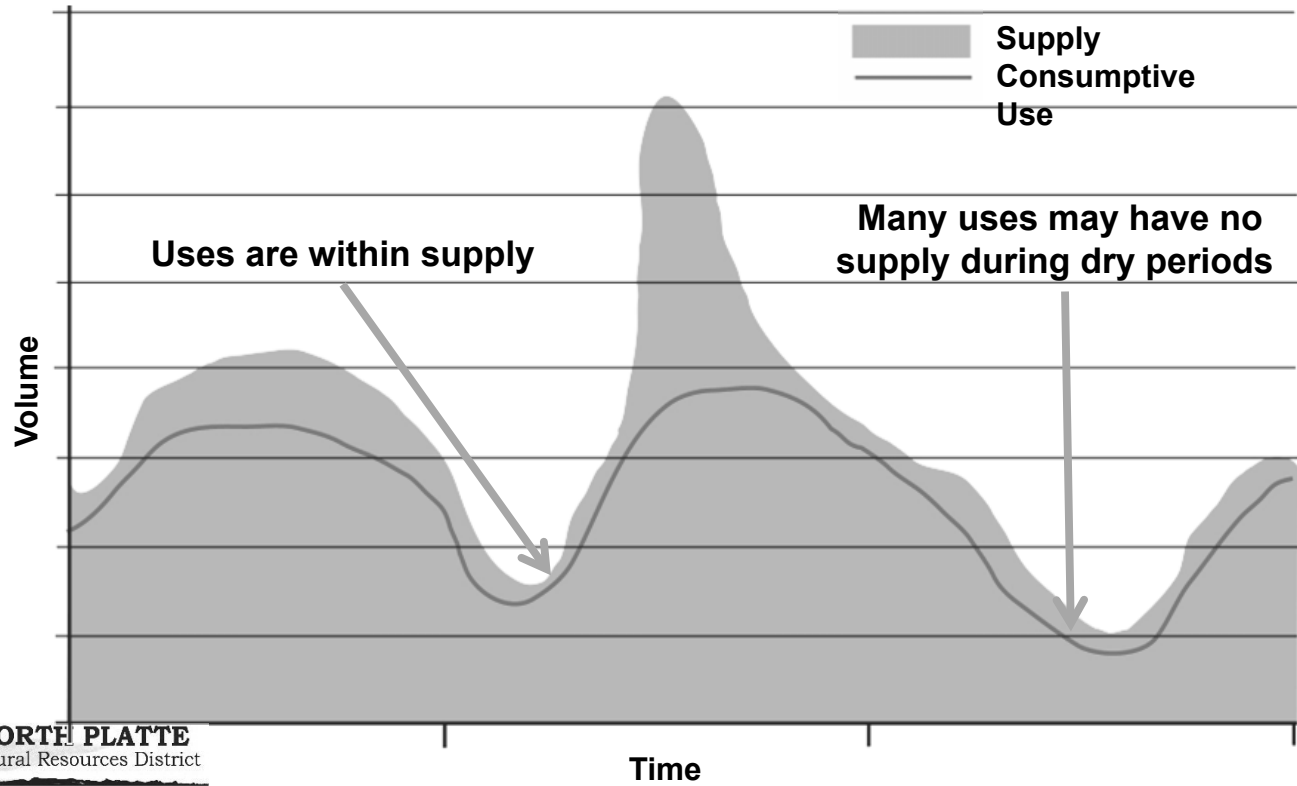


Conjunctive Water Management is an *adaptive process* that utilizes the *connection* between surface water and groundwater to *maximize water use*, while *minimizing impacts* to streamflow and groundwater levels in an effort to increase the overall water supply of a region and improve the reliability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

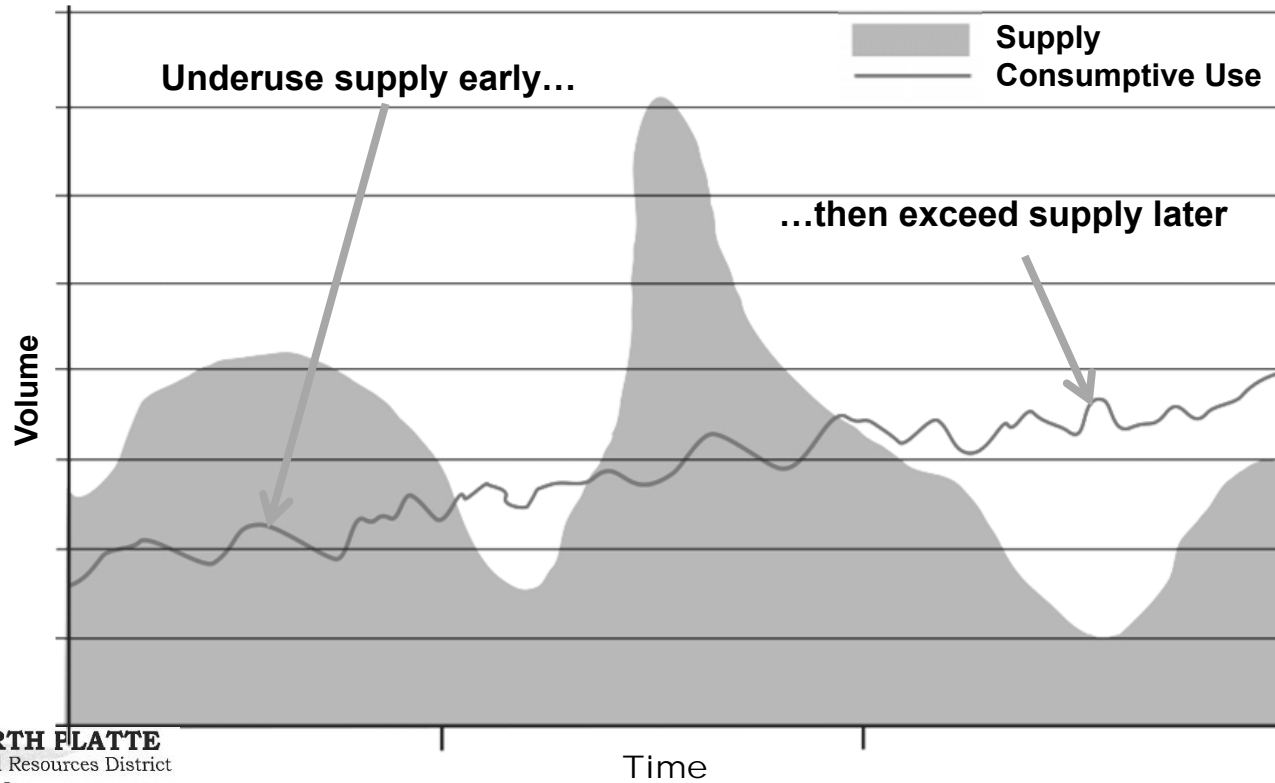
# HOW IS CWM ACCOMPLISHED?

- 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

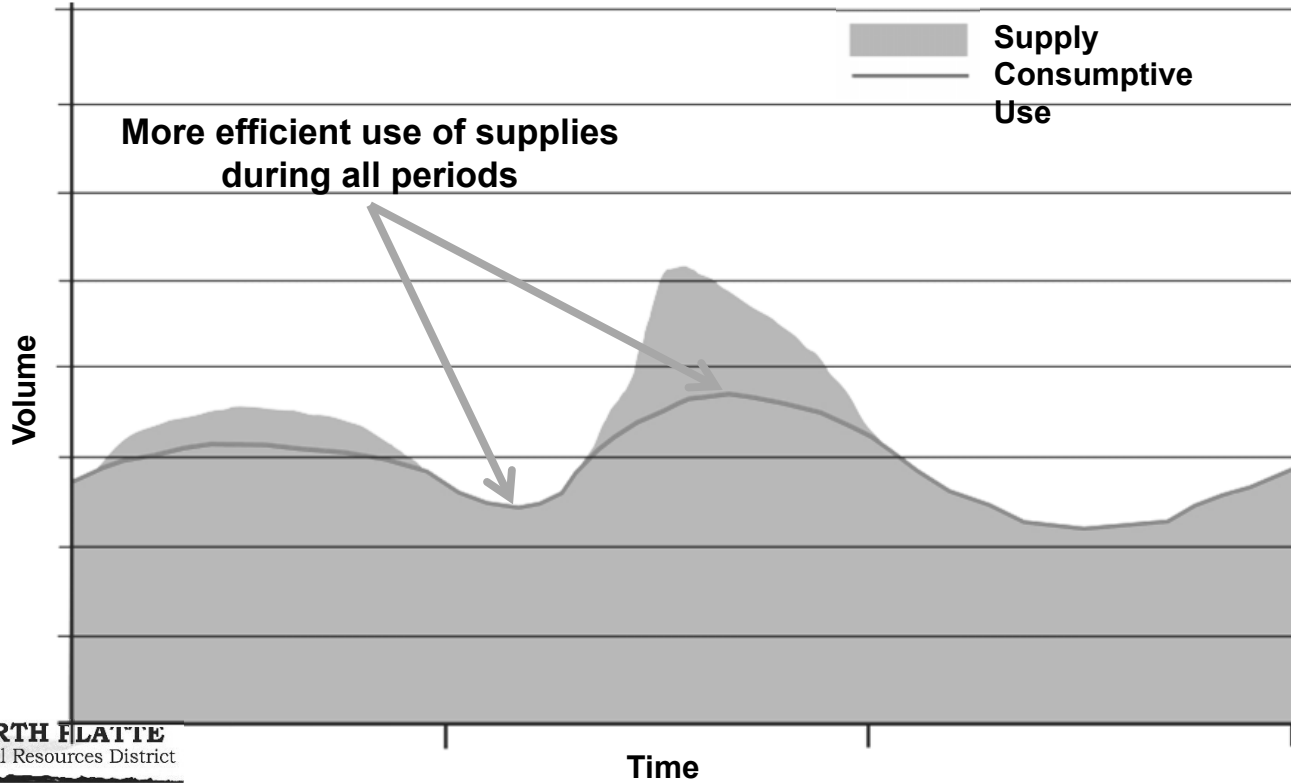
# SCENARIO 1: USING SURFACE WATER ONLY



# SCENARIO 2: USING GROUNDWATER ONLY



# SCENARIO 3: MANAGING SUPPLIES THROUGH CWM



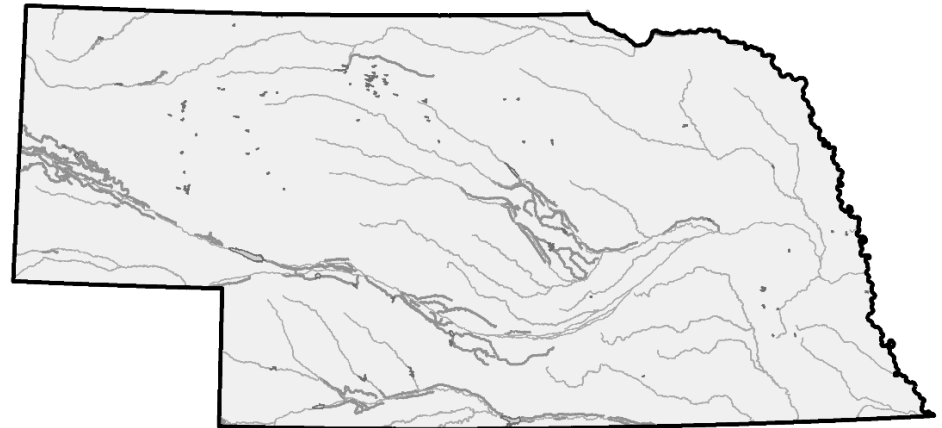
# COMPONENTS OF CWM

- 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

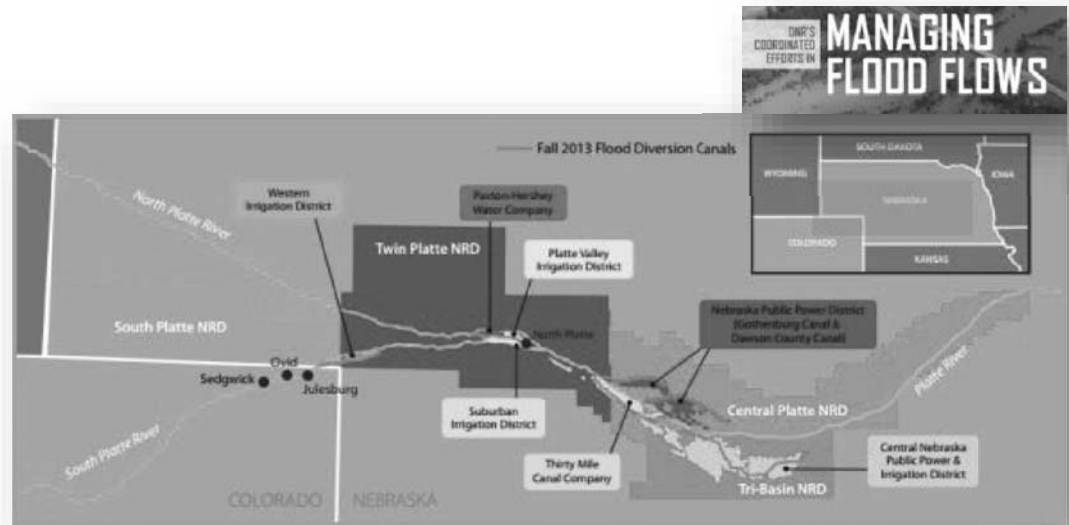


 Lake — Canal — Stream



# EXAMPLES OF CWM PROJECTS

- Augmentation projects
- 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)



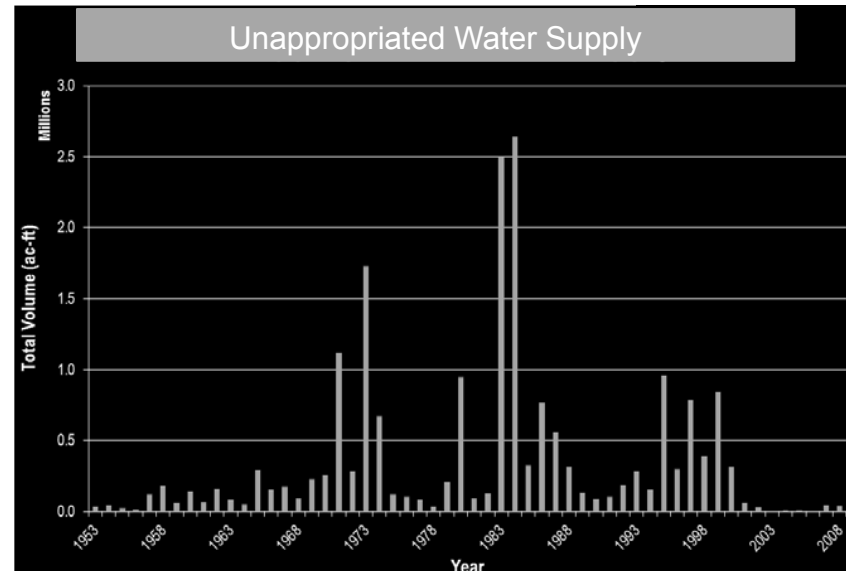
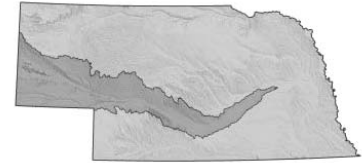
# APPLYING CONJUNCTIVE MANAGEMENT

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.
  - NPNRD Diversion Total 61,260 acre-ft.
  - NPNRD Recharge Total 28,739 acre-ft.



# 2013 FLOOD FLOWS

Friday, September 20, 2013



South Platte River Highway 83 Bridge, North Platte, NE

Saturday, September 21, 2013



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.

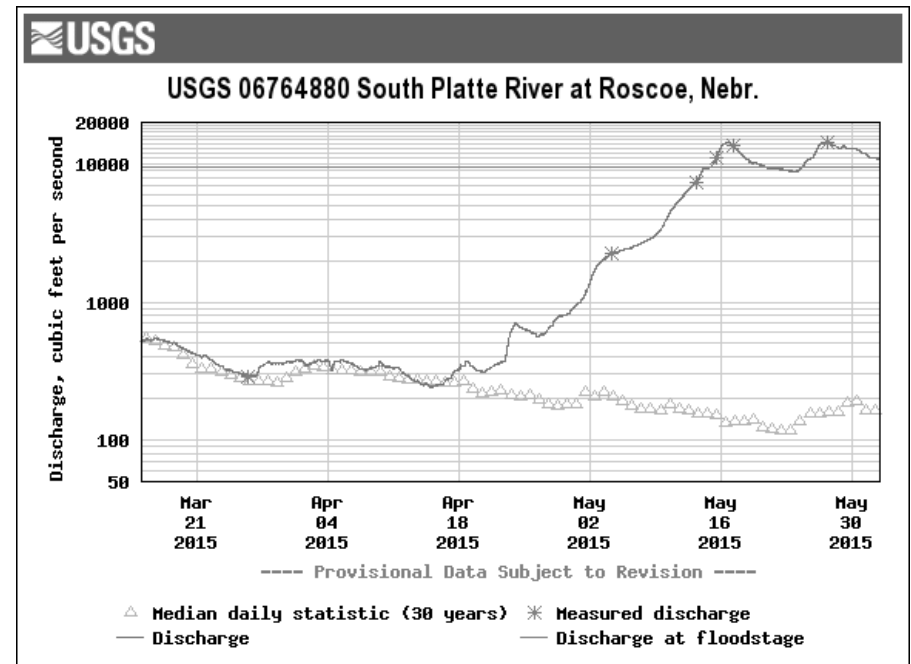


# 2015 FLOOD FLOWS

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



30-Mile Canal Headworks,  
June 2015





# 2015 FLOOD FLOWS

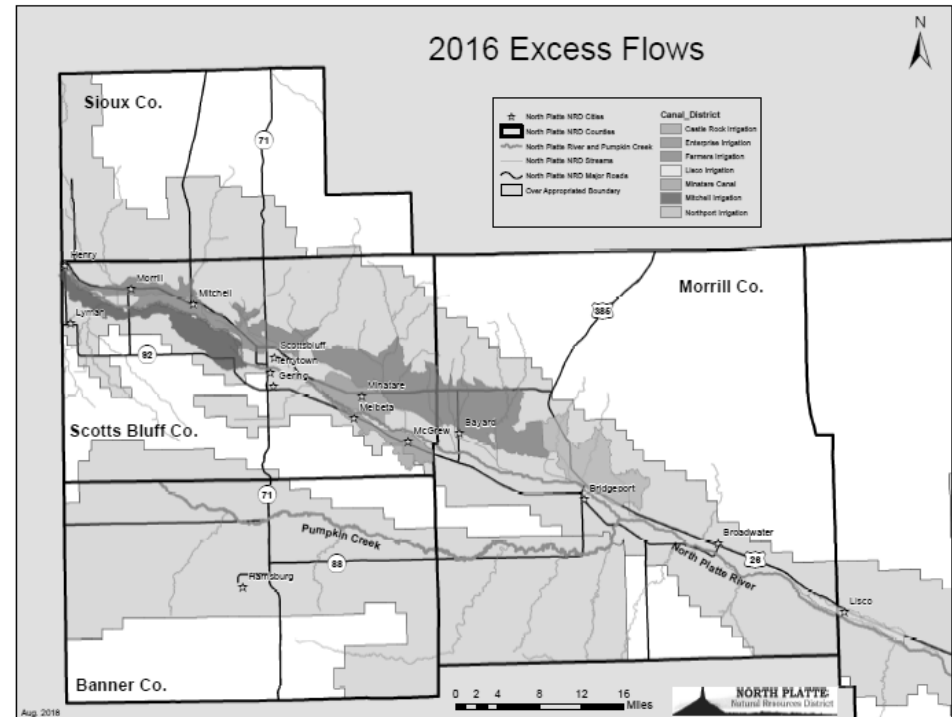
➤ 7 Canals and 4 NRDs

- **Diversion Total**                      17,700 ac-ft.
- **Recharge Estimate**                    7,600 ac-ft.



# 2016 FLOOD FLOWS

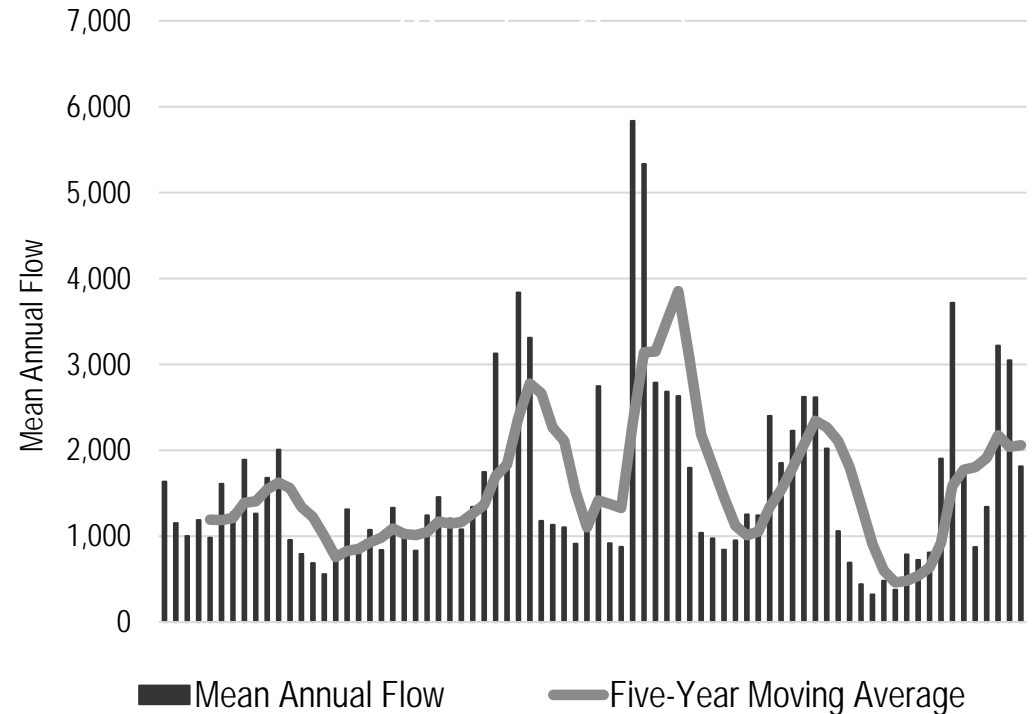
- 8 Irrigation Districts and Canal Companies
  - **NPNRD Diversion Total**  
30,369 ac-ft.
  - **NPNRD Recharge Estimate**  
13,812 ac-ft.



# 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

# CWM INFRASTRUCTURE EXAMPLES IN NPNRD

## Schaneman Recharge Pits

- Have leased just over 100 acres on Enterprise Irrigation District
- Planning and will ultimately construct recharge pits to be used for surface water infiltration
- Project design has the capability of handling the entire diversion rate of the presently contracted acres, but will also allow for the construction of one or more recharge pits to allow for expansion

# CWM INFRASTRUCTURE EXAMPLES IN NPNRD

## Everett / Meyers Return

- Have leased four shares (320 acres) on Minatare Canal Company and have continued to divert water that would normally be delivered to those farms, but have built a direct return back to the river to gain consumptive use credit toward our goals and obligations under the IMP
- Designed with expansion in mind
- Project to date has returned back to the North Platte River 920 acre feet of water that would have otherwise been consumptively used by crops
- Annual operating cost of approximately \$89,000.00 with 797 acre feet returned to the North Platte River in 2017
  - \$112 per af

# CWM INFRASTRUCTURE EXAMPLES IN NPNRD

## Ducks Unlimited/NPNRD Recharge Project

- Actively searching for lands to temporarily lease the surface water appropriation from in order to divert that appropriation into man made recharge sites
- Those sites will not only benefit the recharging of the aquifer but will also provide needed habitat for migrating water flow
- Consumptive use credit from the temporary idling of crop acres to help NPNRD meet goals and obligations under the IMP



# NEXT STEPS



# MEETING DATES

- November 15, 2018
- January 17, 2019



# PUBLIC COMMENT

Thank You