



# Nebraska

## Department of Natural Resources

NEBRASKA'S WATER MANAGEMENT RESOURCE

Providing the sound science and support for managing  
Nebraska's most precious resource.

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## Canal Recharge Opportunities and Successes

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Nebraska Department of Natural Resources

# Outline

- Background
- 2011 Pilot Project
- 2013 South Platte Flooding
- 2015 Platte Flooding
- 2016 Platte Flooding



# BACKGROUND

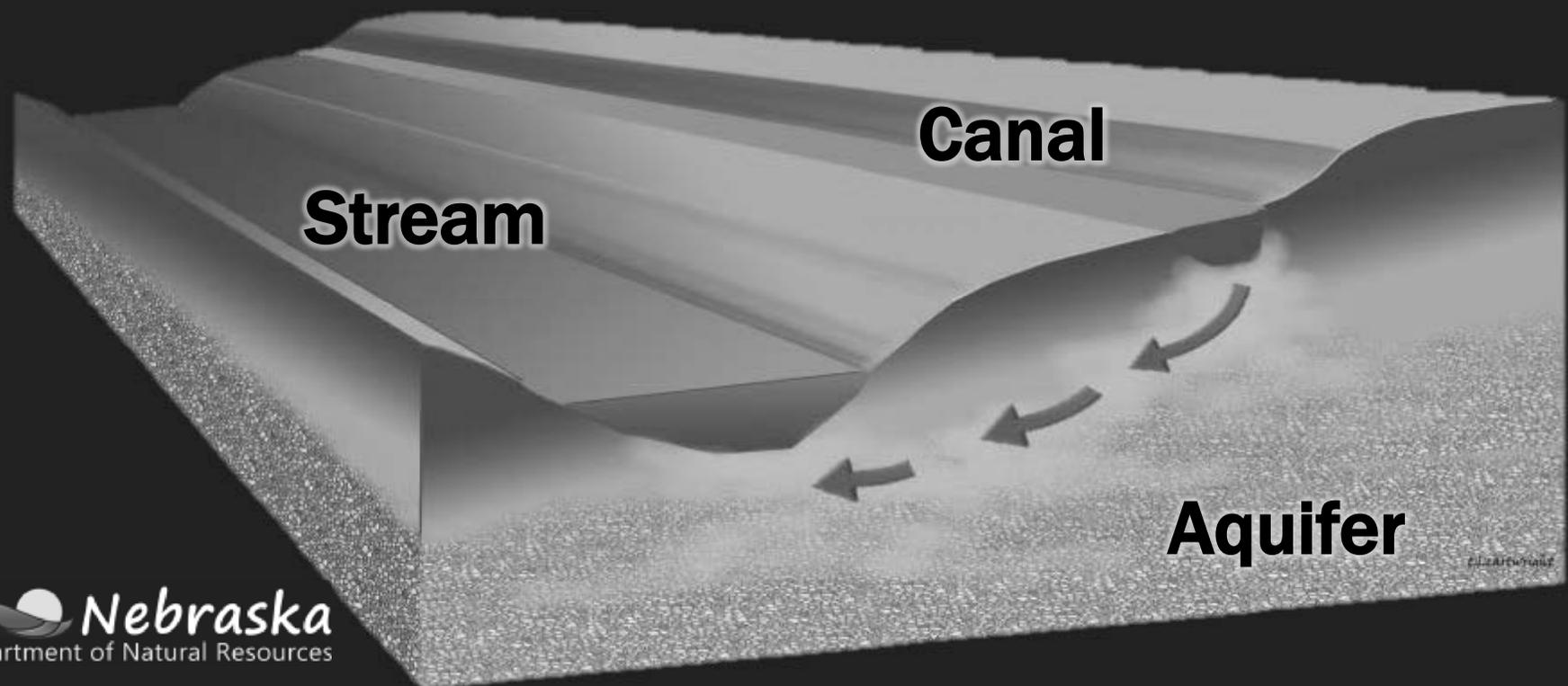
# Background

- Variable water supplies
- Existing groundwater and surface water uses
- Overappropriated basin
- Existing BWP and IMPs with goals and objectives

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.

# Canal Systems

- As part of normal operations, unlined irrigation canals provide groundwater recharge resulting in streamflow accretions





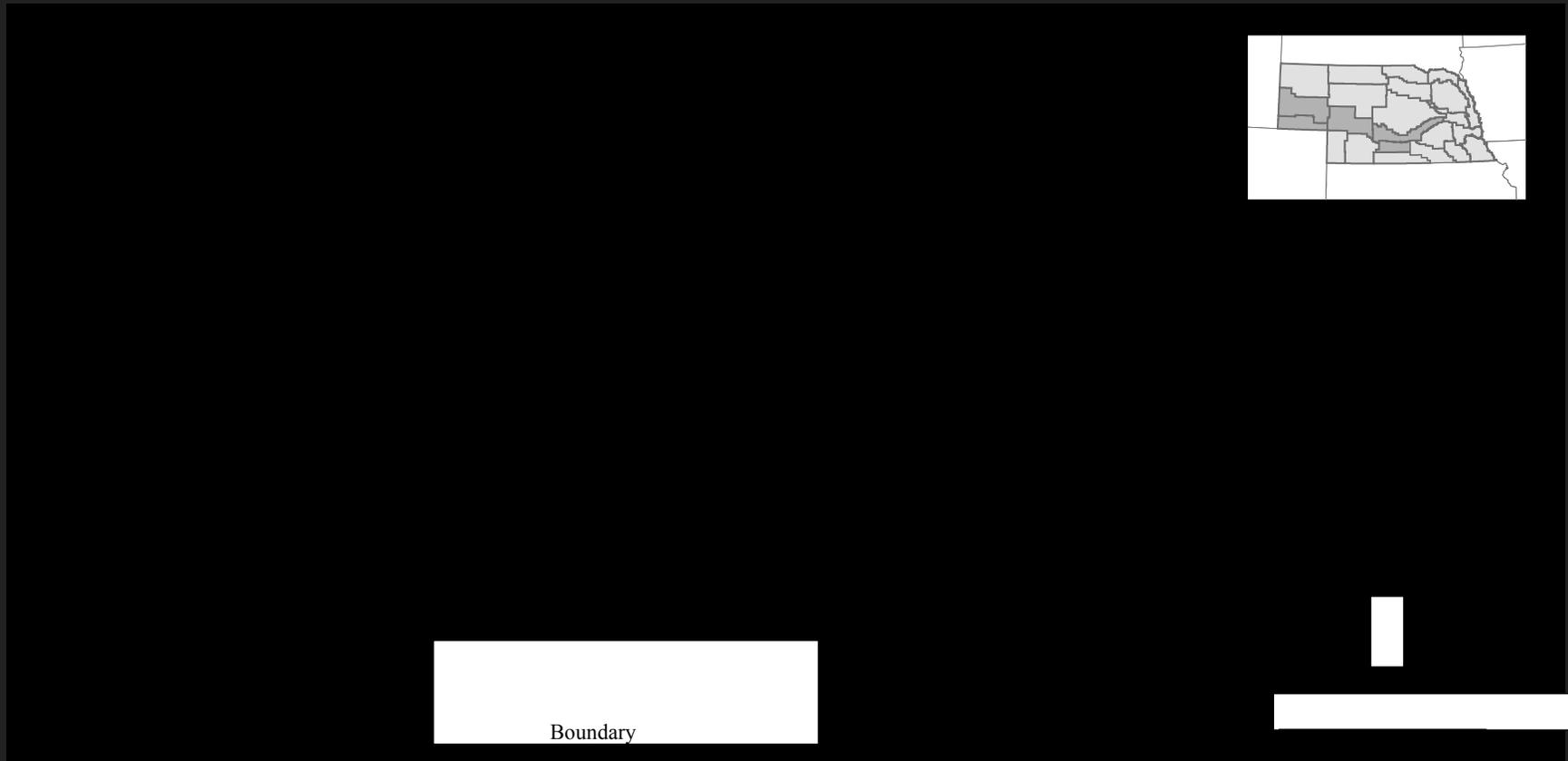
# CANAL RECHARGE PROJECTS

# 2011 Pilot Project

- High flows prior to irrigation season
- Work with NRDs, Irrigation Districts/Canal Companies to arrange permitting
- Diverted for groundwater recharge and flood reduction
- Monitor diversions and returns to estimate recharge



# 2011 Canals



# 2011 Pilot Project

## ➤ Partners

- 23 Canals
- DNR
- South Platte
- Tri-Basin
- Twin Platte
- Central Platte
- North Platte

## ➤ Results:

- Diversion Total 142,000 a-f
- Recharge Total 64,700 a-f
- **10 year Accretion Total 15,500 a-f**

# 2013 Flood Flow Diversions

- Extreme rainfall event in Colorado September 2013
- South Platte flows reached Nebraska ~1 week later
- Experience allowed for quick coordination of diversions

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

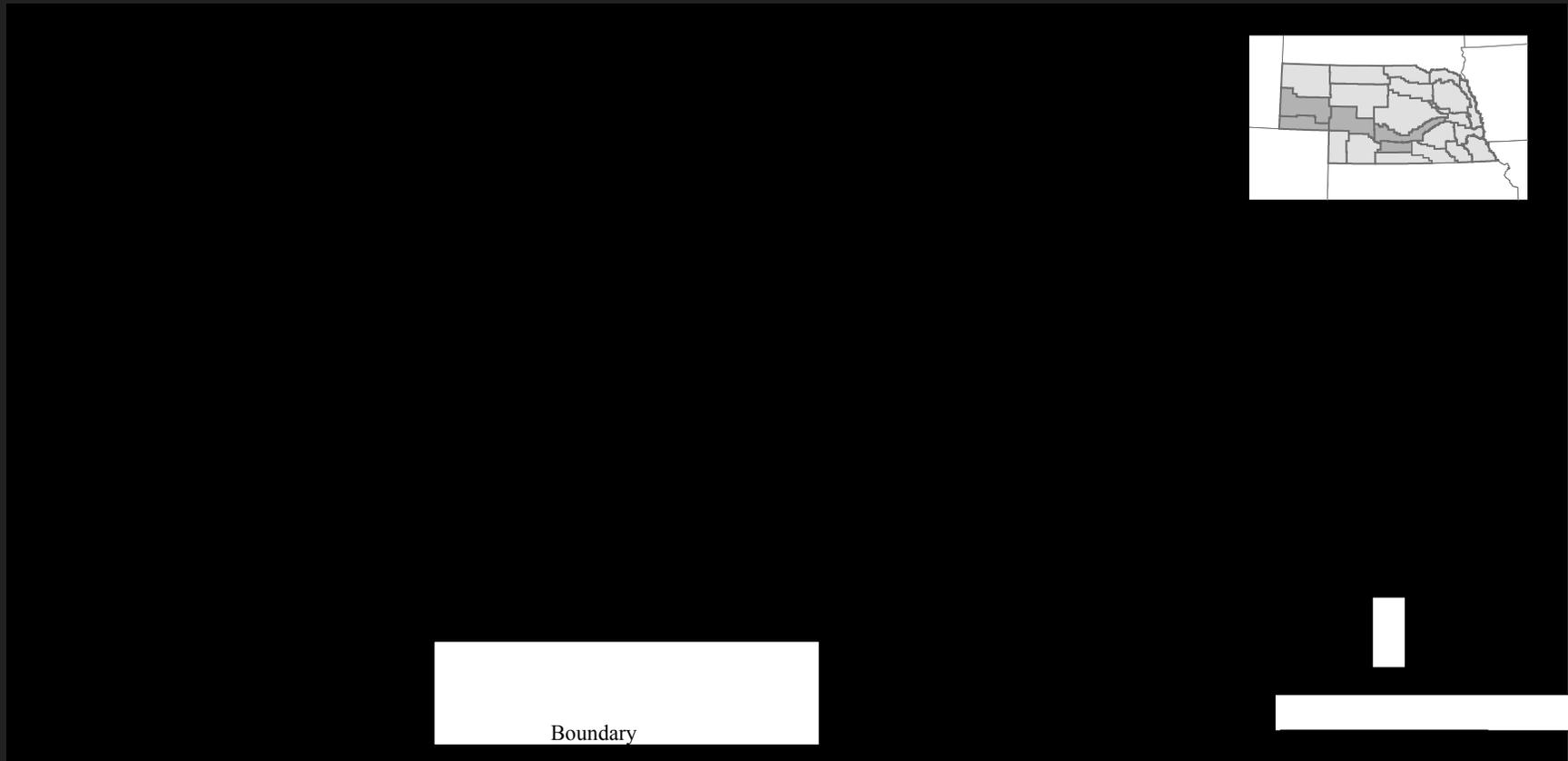
9/20/2013, 8:30 am



9/21/2013, 9:00 am



# 2013 Canals



# 2013 Flood Flow Diversions

## ➤ Partners

- 9 Canals
  - DNR
  - South Platte
  - Tri-Basin
  - Twin Platte
  - Central Platte

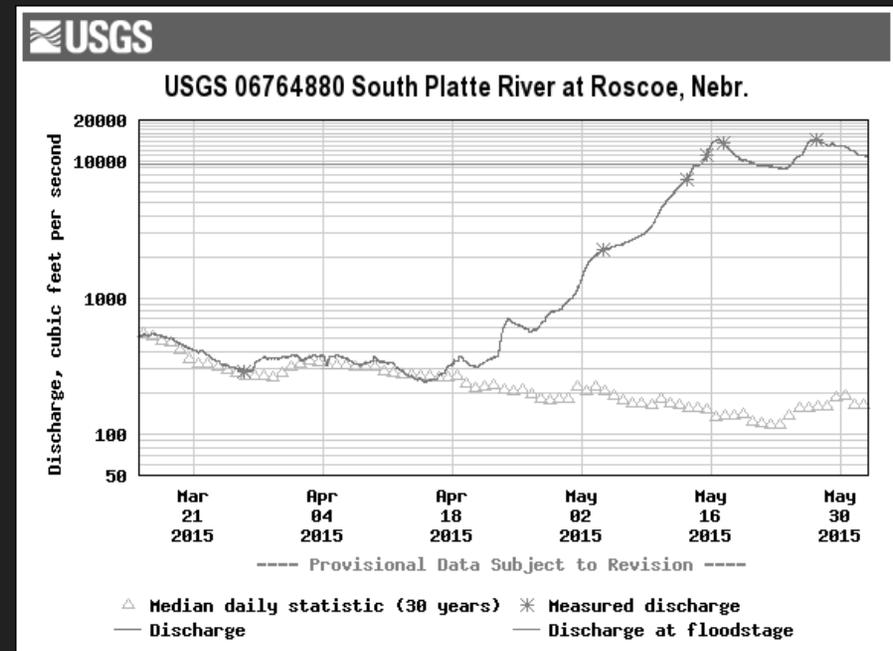
## ➤ Results:

- Diversion Total 24,200 a-f
- Recharge Total 14,700 a-f
- **10-year Accretion Total 4,400 a-f**

**Total Cost \$707,750**

# 2015 Spring Flood Flow Diversions

- Above average snowmelt and precip in CO
- Monitored flows to estimate timing
- Worked with irrigation districts and NRDs to get permits and contracts in place



# 2015 Spring Flood Flow Diversions

## ➤ Partners

- 7 Canals
- DNR
- South Platte
- Tri-Basin
- Twin Platte
- Central Platte

## ➤ Preliminary Spring Results:

- Diversion Total 16,000 a-f
- Recharge Total 6,500 a-f
- **10 year Accretion Total 2,700 a-f**

# 2016 Flood Flow Diversions

- Similar situation to spring 2015
  - Above average snowpack and reservoir levels in Wyoming
  - Generally wet conditions
- High flows prior to irrigation season
- All 5 NRDs able to participate
- Diverted for recharge and flood reduction

# 2016 Canals Utilized

- Farmers
- Enterprise
- Minatare
- Northport
- Castle rock
- Empire
- Lisco
- Mitchell
- Bridgeport
- Western
- Keith-Lincoln
- Paxton-Hershey
- Platte Valley
- O'Fallon's Pond
- Suburban
- E65
- Phelps
- Cozad
- Orchard-Alfalfa
- 30-Mile

# Summary

- Over 86,000 acre-feet of excess flows diverted in past 5 years
- Benefits will continue to reach river well into future
- General process in place for coordination of diversions
- Will continue to take advantage of excess flows whenever available



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# THANK YOU

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