

# An Overview of Water Management in Nebraska

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Water Planning



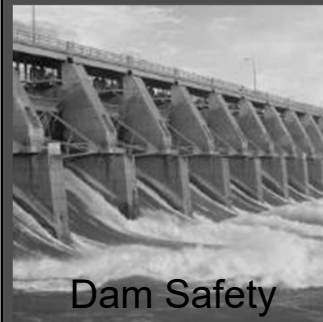
Surface Water



Groundwater



Floodplain  
Management



Dam Safety



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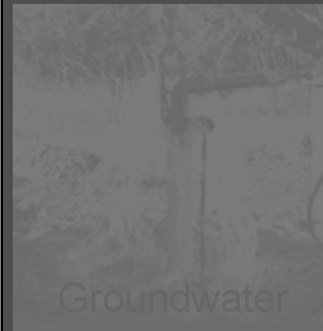
Providing the sound science and support for managing Nebraska's most precious resource.



Water Planning



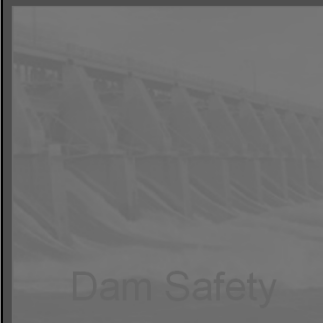
Surface Water



Groundwater



Floodplain Management



Dam Safety



# Overview

- Water Planning & Management
  - Why is it important?
  - Core goals of water planning in Nebraska
- Nebraska's Planning Approach
  - History/Statutes/Structure of Approach
  - Nebraska's Current Water Planning Framework
  - Integrated Water Management
- Current Status of Nebraska Water Planning
- Nebraska's Water Planning Future
  - Opportunities and Challenges



# Water Planning and Management

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# Why is water planning important?

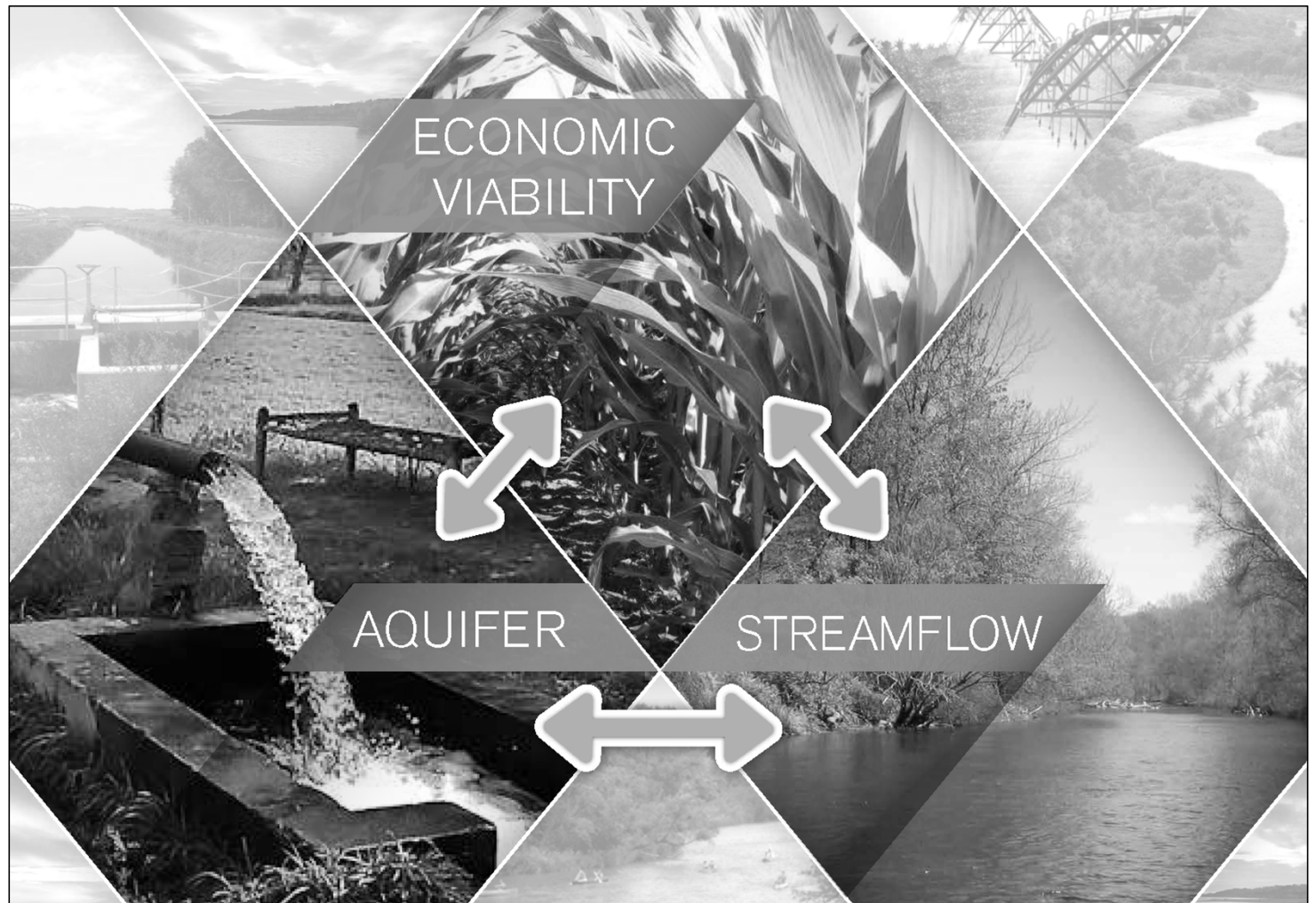
- Identifies and seeks to address uncertain attributes of water
    - Water is unevenly distributed in time and space
    - Droughts/floods
  - Reflects values water users place on certainty and distribution
    - Existing vs. future users
    - Types of users (agriculture, recreation, wildlife, municipal, etc.)
    - Differing sources (surface water/groundwater)
-

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# Why is water planning important?

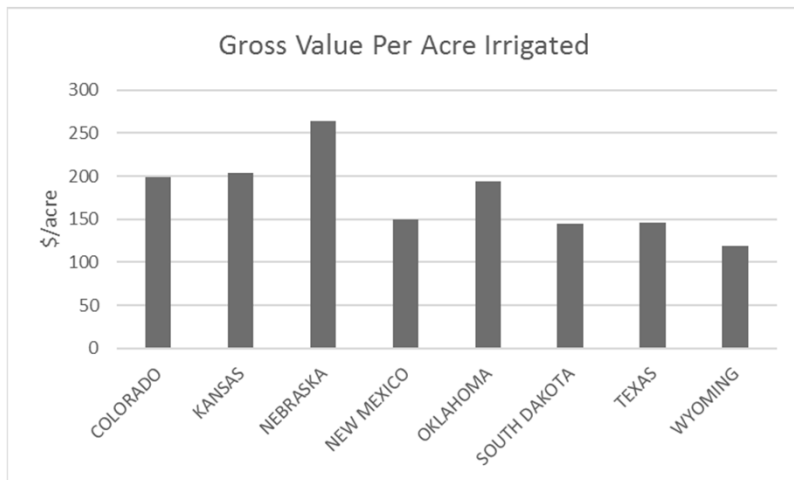
- Economic Viability
    - Water is for beneficial use (consumptive, non-consumptive, instream)
    - Maximize economic productivity of water related activities
  - Aquifer
    - Minimize long term impacts to aquifer quantity and quality
  - Streamflow
    - Highly variable (shortages and excesses)
    - Streams often provide established instream benefits
-

# Core Goals of Water Planning in Nebraska

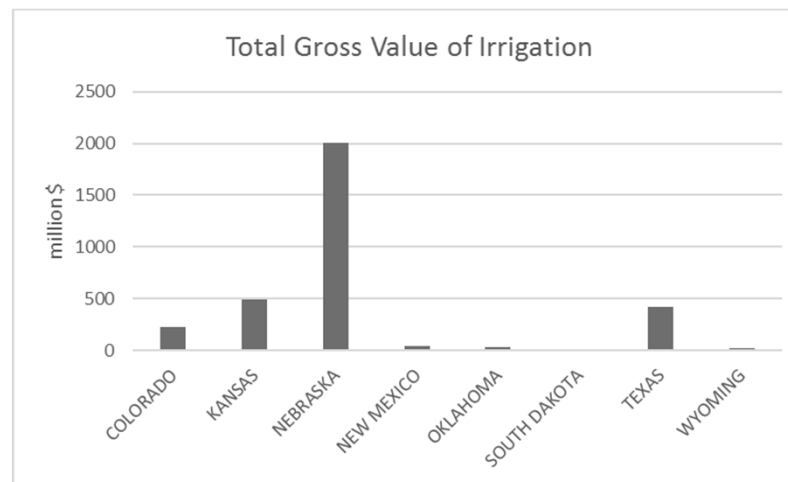




# Why is water planning important?



2012 NFB study indicated the value of irrigation to farmers and ranchers exceeded \$11B



\$2 Billion in Nebraska  
\$3.2 Billion across HPA

Richard Perrin, Lilyan Fulginiti, Federico Garcia, 2007

# Why is water planning important?

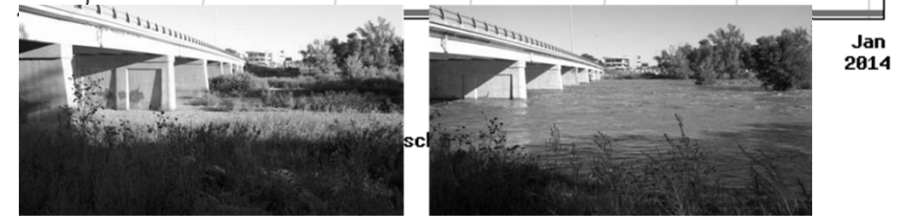
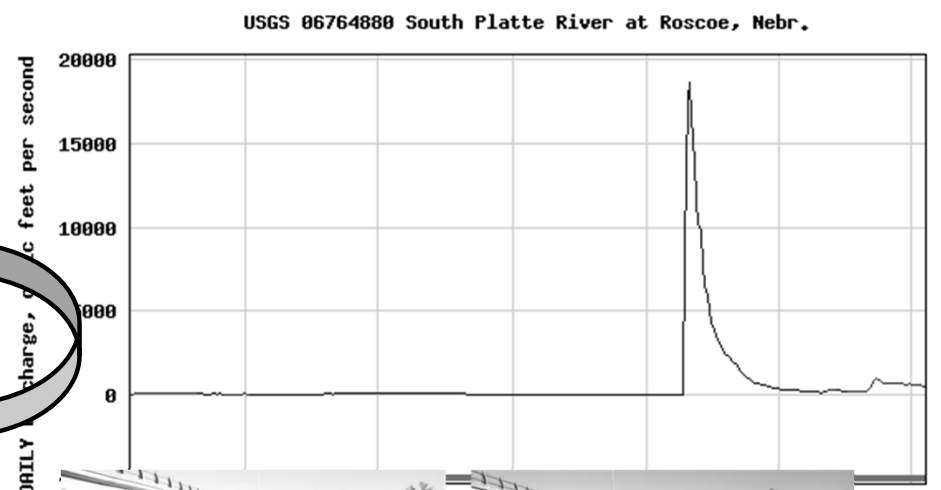
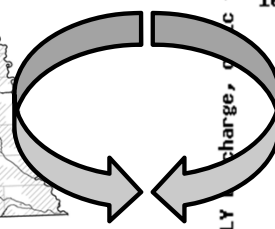
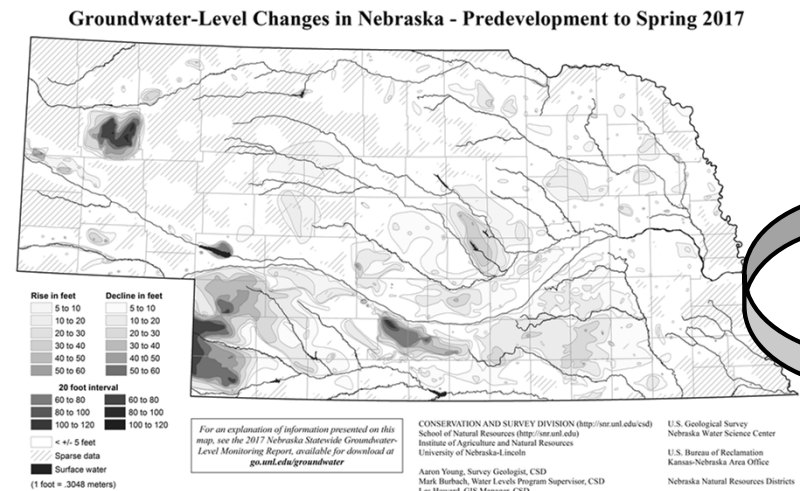


6 out of the top 10  
tourist attractions  
in Nebraska in 2017  
included recreational water



In 2017 more than  
1.7 million people visited  
Lake McConaughy,  
the second most-visited  
tourist attraction in Nebraska.

# Why is water planning important?



**Aquifer sustainability**

**Streamflow variability**

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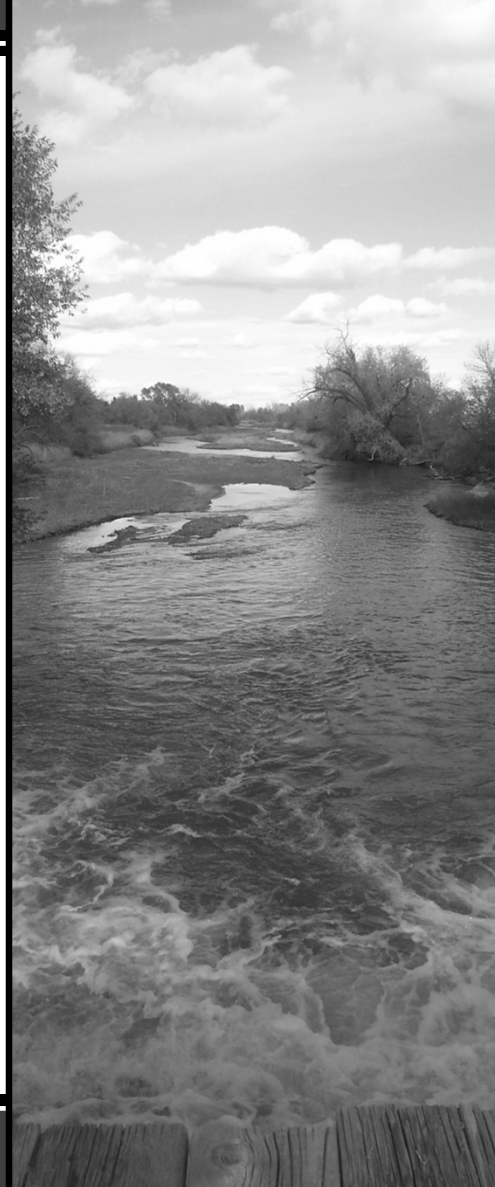
CONSERVATION AND SURVEY DIVISION (<http://sr.unl.edu/csd/>)  
 School of Natural Resources (<http://snr.unl.edu/>)  
 Institute of Agriculture and Natural Resources  
 University of Nebraska-Lincoln  
 Aaron Young, Survey Geologist, CSD  
 Mark Burbach, Water Levels Program Supervisor, CSD  
 Les Howard, GIS Manager, CSD

U.S. Geological Survey  
 Nebraska Water Science Center  
 Institute of Agriculture and Natural Resources  
 University of Nebraska-Lincoln  
 U.S. Bureau of Reclamation  
 Kansas-Nebraska Area Office  
 Nebraska Natural Resources Districts  
 Nebraska Natural Resources Districts  
 Central Nebraska Public Power and  
 Irrigation District

**December 2017**

**Disclaimer:** groundwater-level changes on this map are depicted at a small scale. They are intended to provide only a general overview of regional variation.

# Nebraska's Water Planning and Management Approach



# A Bit of History...

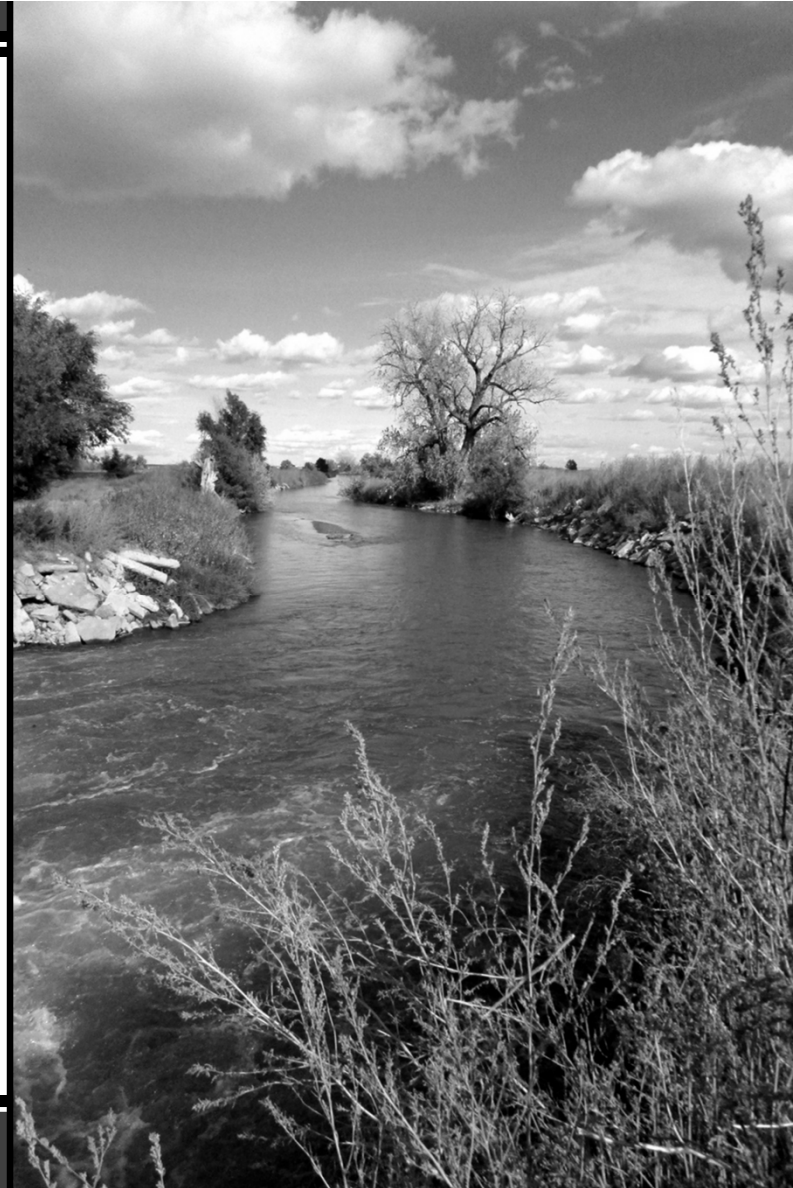
- The *NEBRASKA STATE WATER PLAN*
  - Development was initiated in 1967
- Then there was change:
  - Natural Resources Districts are created (1972)
  - The Clean Water Act (1972)
  - The Endangered Species Act (1973)
- In 1978 Legislature directs a re-examination of planning policies



***“Those involved in the state’s water planning activities have been attempting to correct the misconception that the State Water Plan would be a blueprint and present their work as a continuing process that would provide flexible guides for future decisions.”***

***“Experience has shown that published plans frequently become outdated rapidly, and some serve only to collect dust after a short time.”***

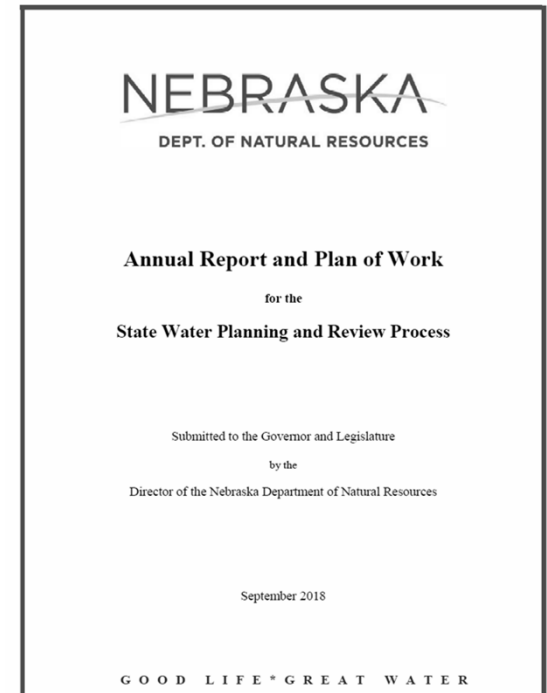
***“The agencies involved ... felt that it was necessary to eliminate any reference to a State Water Plan and concentrate on the Process.”***



# State water planning and review process

- Adopted by the Legislature through LB 326 in 1981 (Statutes 2-1599 – 2-15,106)
- Requires an Annual Report and Plan of Work
  - The 2018 report can be found at:

[https://dnr.nebraska.gov/sites/dnr.nebraska.gov/files/doc/water-planning/publications/20180912\\_AnnualReportToLeg\\_Final.pdf](https://dnr.nebraska.gov/sites/dnr.nebraska.gov/files/doc/water-planning/publications/20180912_AnnualReportToLeg_Final.pdf)



# State water planning and review process

- Policy Issue Studies
  - Completed 1981 through 1986
  - Many recommendations have been adopted
- State Initiated Problem Analyses and Area Planning
  - Emphasis on flexible studies done on a priority basis
  - Continues today within Water Planning and Integrated Management Division



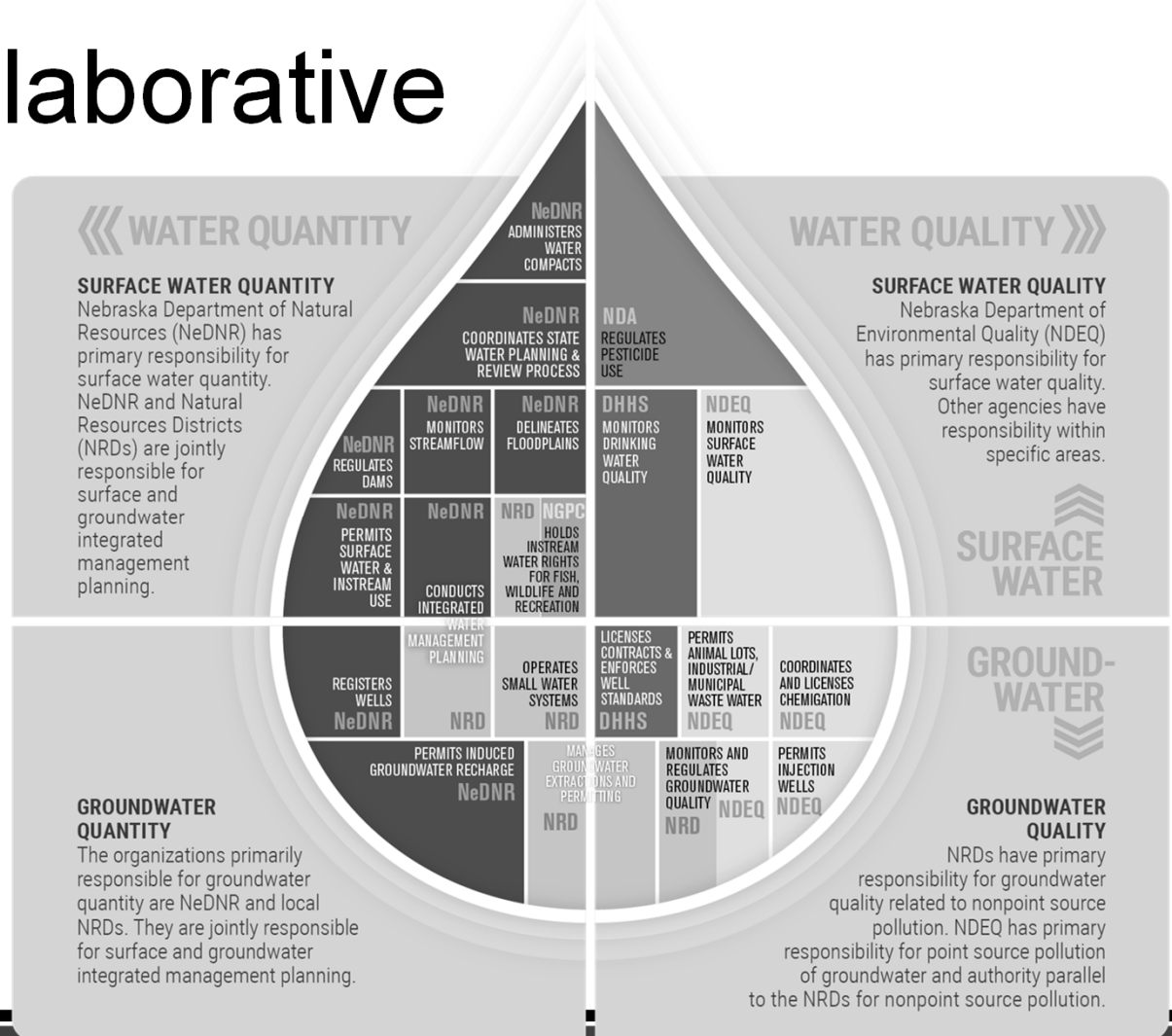


# Nebraska's Current Water Planning Approach



- Process over plan, Integrated Water Resources Management Planning
- Local control
  - Local NRDs have broad and flexible control in resource management
- Recognizes hydrological connection
- Decentralized approach distributes water management authorities over several agencies

# Current era of collaborative water planning

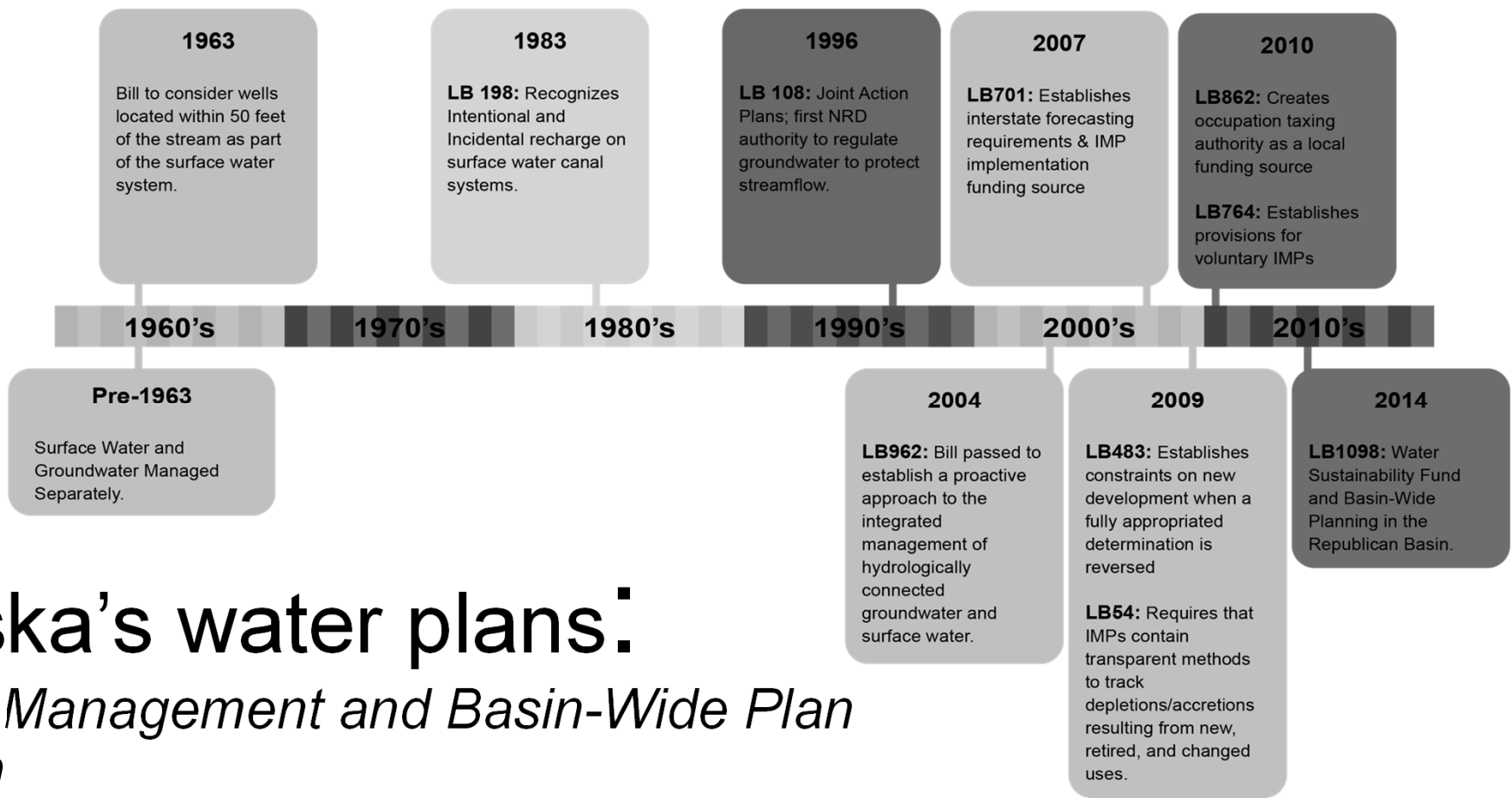


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# Nebraska's Water Planning: Integrated Water Management Activities





# Nebraska's water plans:

## *Integrated Management and Basin-Wide Plan Legislation*

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What Is Integrated Water Management In Nebraska?

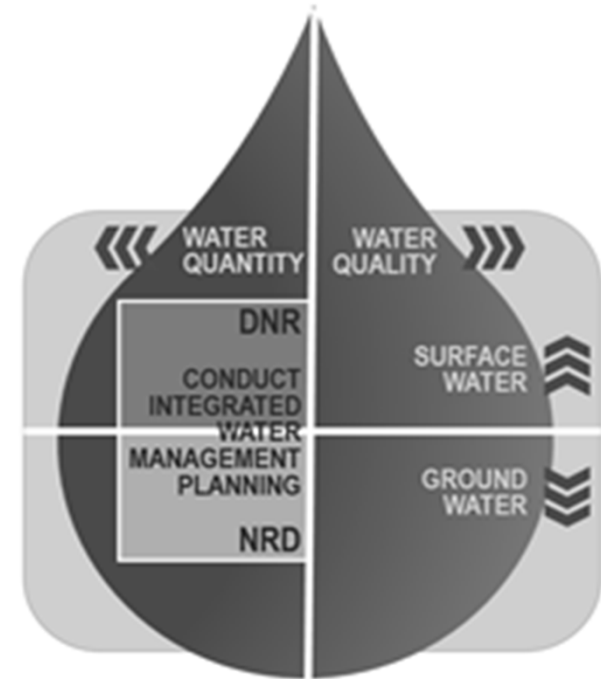
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# Nebraska's water plans:

## *Integrated Management and Basin-Wide Plans (LB 962)*

- Requires NRDs and NeDNR to jointly develop, adopt, and implement IMPs in fully and overappropriated areas
- Areas that have not designated fully or overappropriated are participating in voluntary IMPs
- NeDNR can designate areas fully appropriated through its “*Annual Evaluation of Availability of Hydrologically Connected Water Supplies*”



# Integrated Management Plan Essential Goals

***“Integrated water resources management is a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.”***

Global Water Partnership, 2000

- Protect investments of existing water users from adverse impacts of overuse
- Ensure State compliance with federal and state laws and interstate compacts and agreements
- Proactively monitor and manage basin water supplies before problems develop – process of maintaining a balance of water supplies and uses
- Develop a plan suited to the local values and physical conditions of the basin.

# Nebraska Department of Natural Resources Roles in Integrated Management Planning

## Implementation

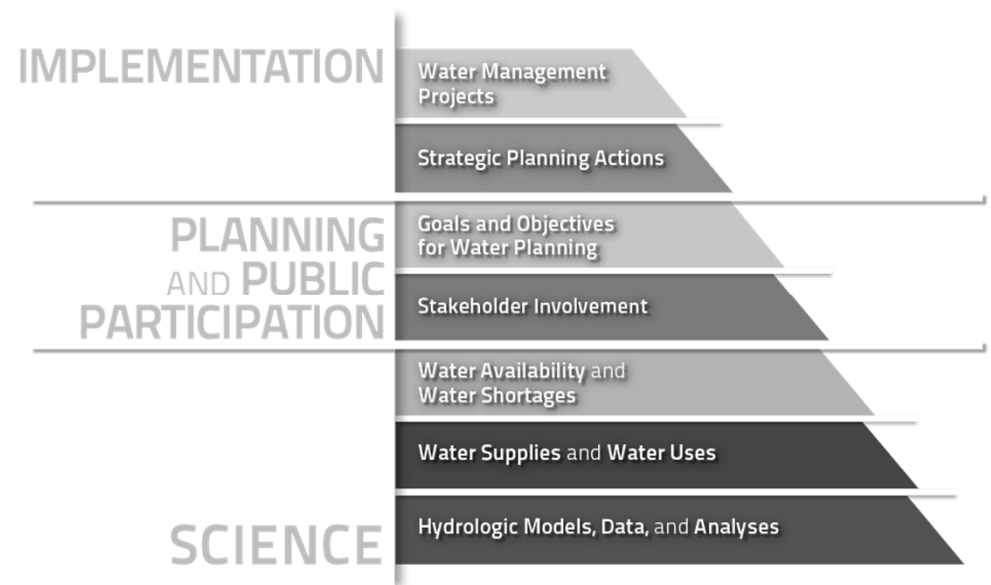
- Project conceptualization
- Funding
- Monitoring and Project Reviews

## Public participation and planning

- Facilitation
- Plan writing
- Goal setting

## Scientific foundation for decision making

- Models
- Landuse/Water use assessments
- Monitoring (canals/streams)





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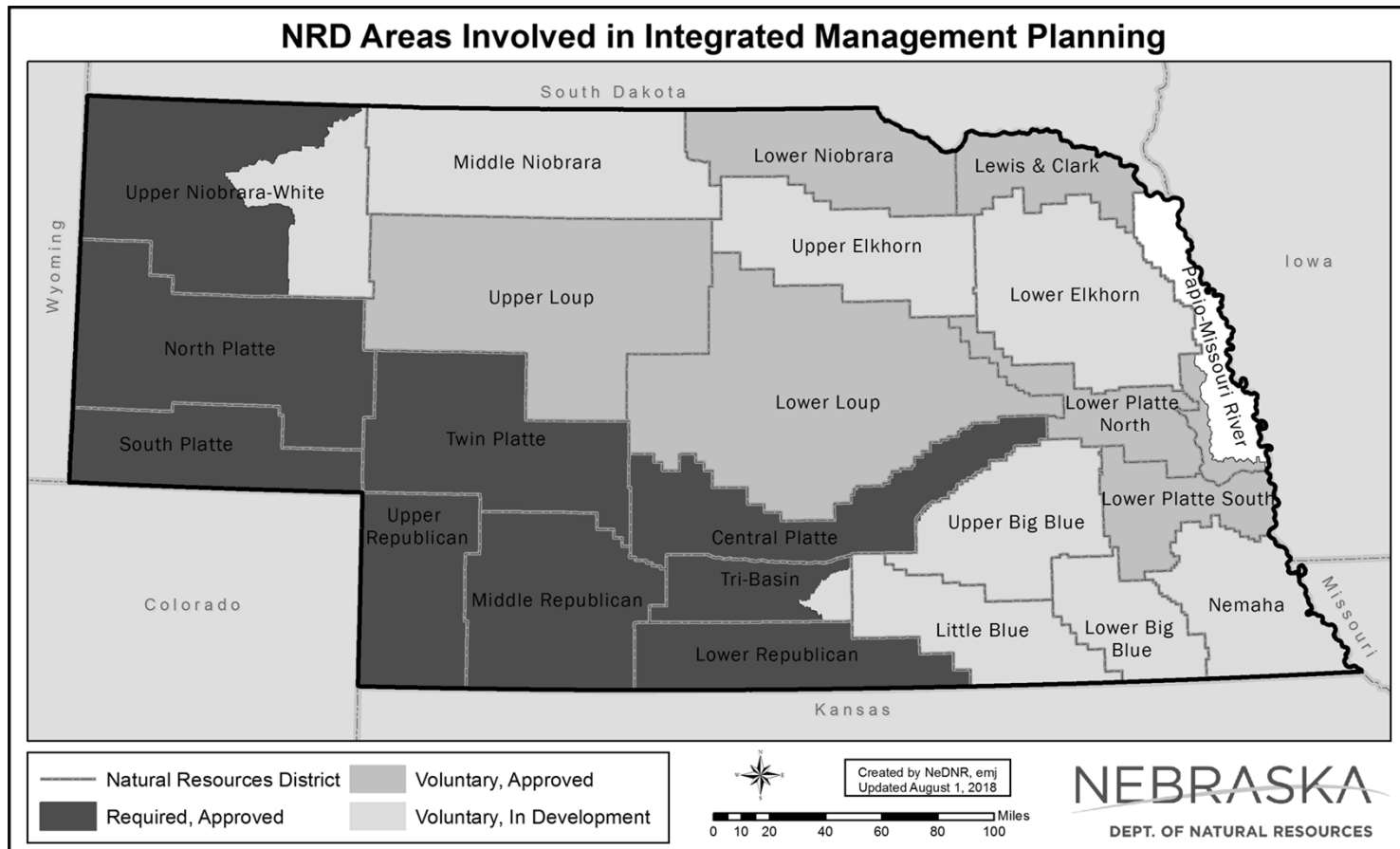
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Where is Integrated Water Management Occurring?

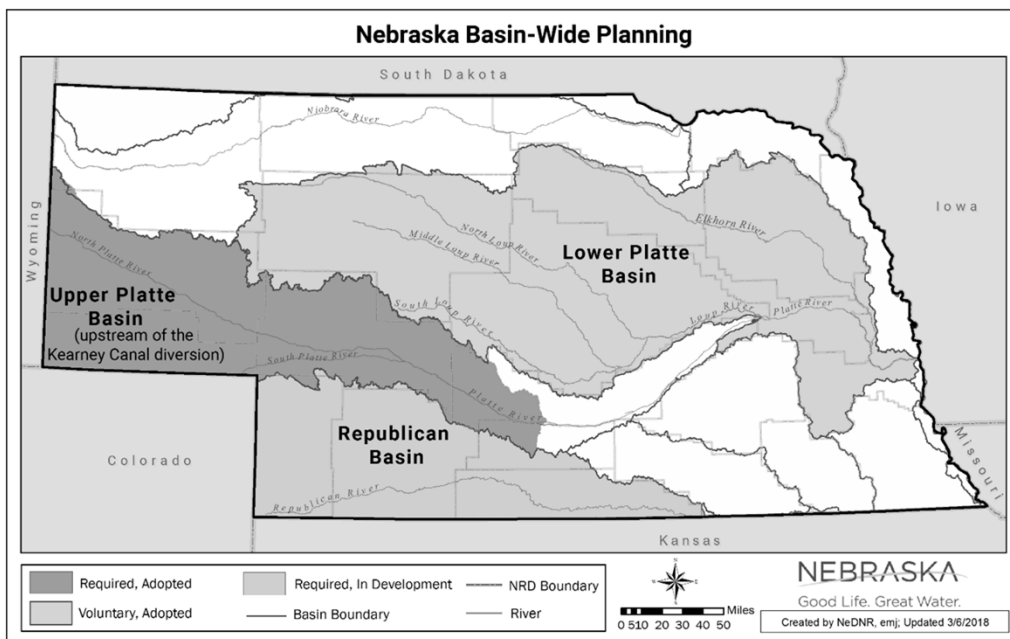
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# Nebraska's water plans: *Integrated Management Plans*

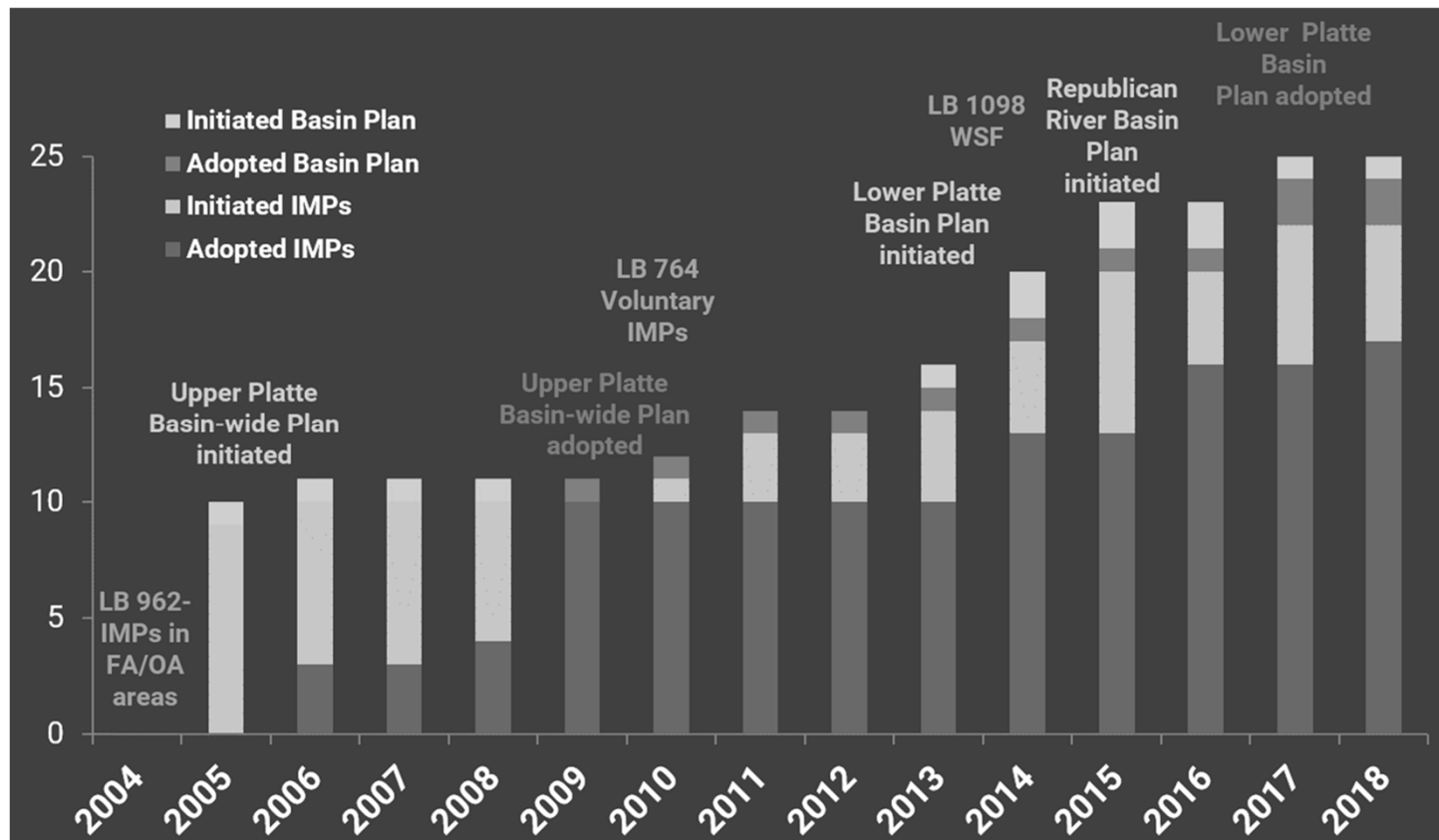


# Nebraska's water plans: Basin-wide plans



- Creates greater consistency between individual IMPs within a given basin
- For mandatory basin-wide plans, the individual NRD IMPs are required to be consistent with the basin-wide plan
- Voluntary basin-wide plans provide a means to collaborate with other NRDs in a given basin ahead of adopting a voluntary IMP and/or during IMP implementation

# Timeline of Integrated Water Management Planning



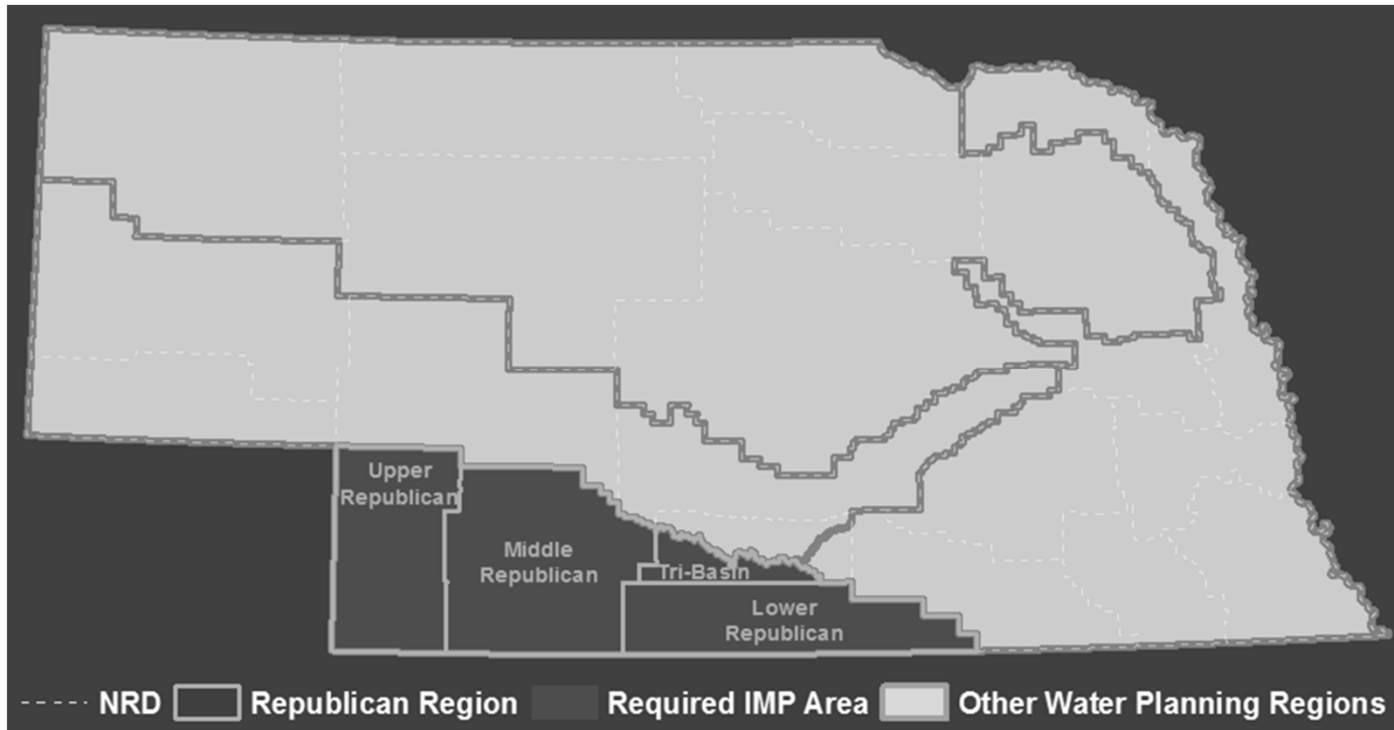
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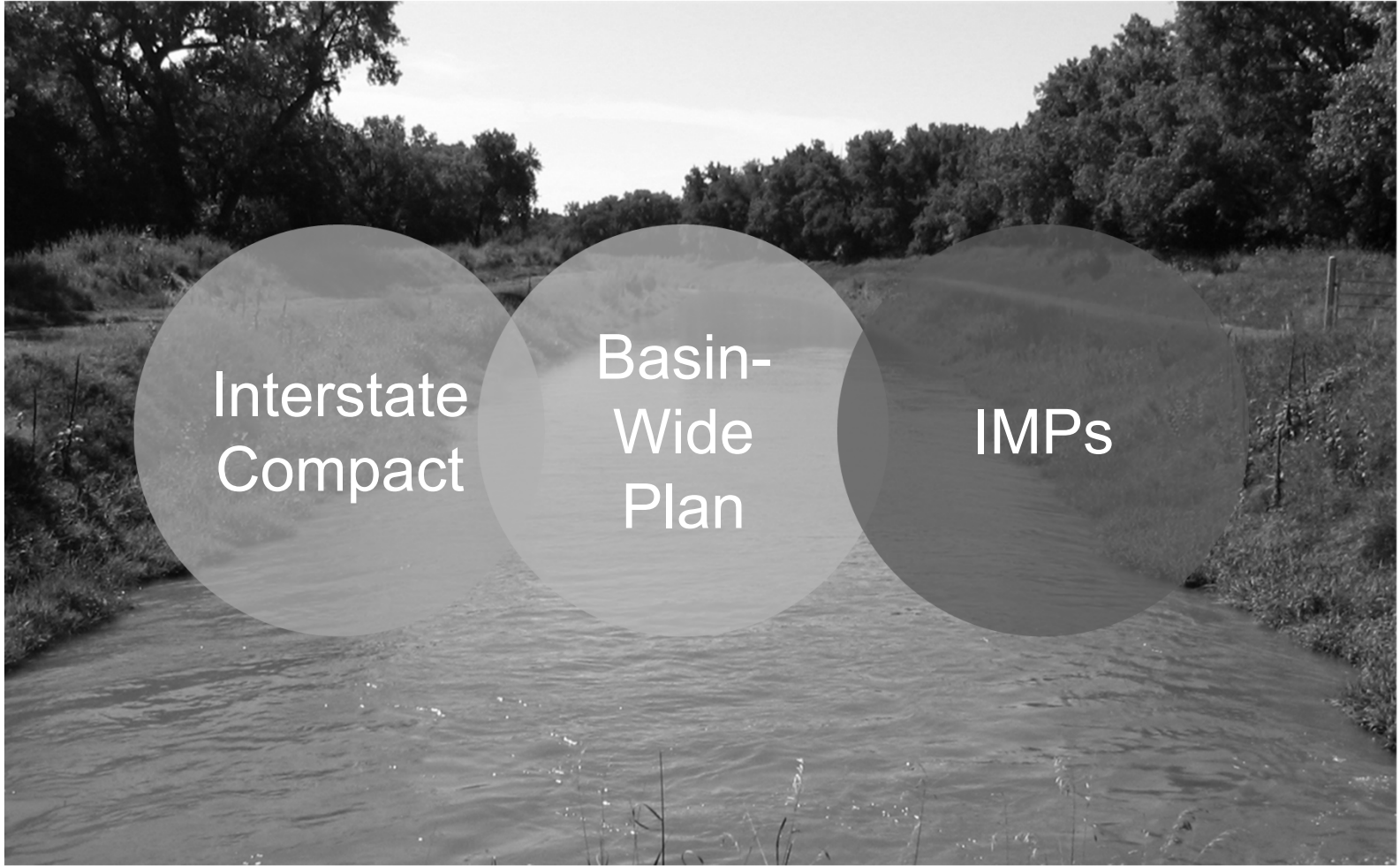
How is Integrated Water Management Applied?

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## Republican River Basin – A Closer Look



Interstate  
Compact

Basin-  
Wide  
Plan

IMPs

# Republican River Compact Background



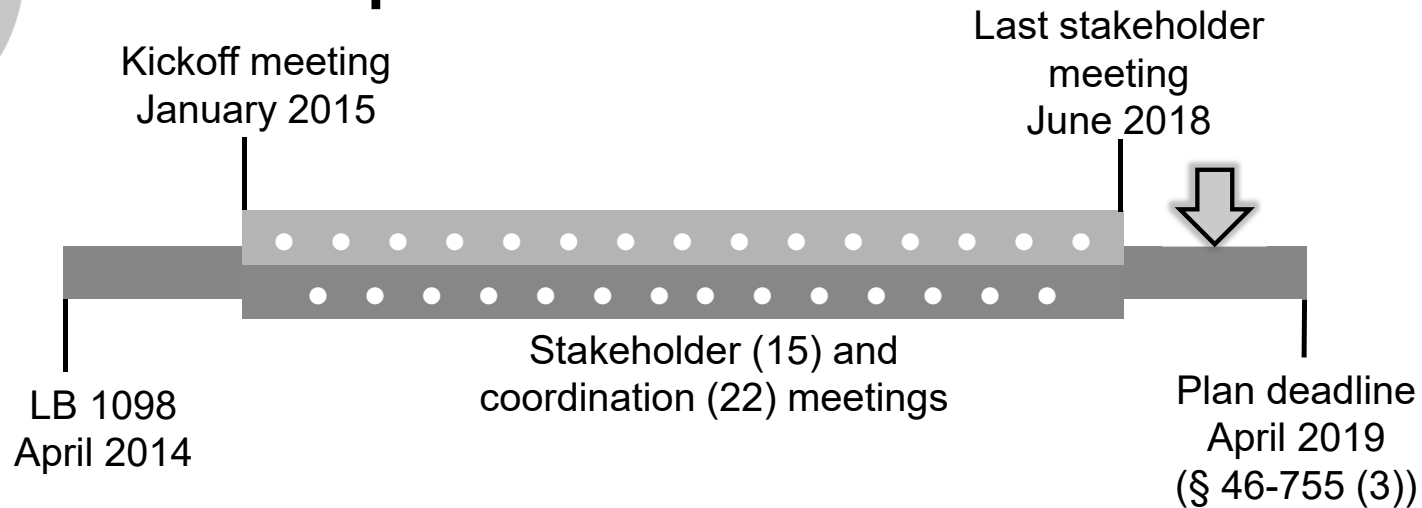
RRCA

- An interstate Compact between Kansas, Colorado, and Nebraska
- To provide for an equitable division of the basin's water among the three states
- Negotiated by the three states and a federal representative (early 1940s)
- Approved by Congress (1942)
- Ratified by each of the three states (1943)
  
- Final Settlement Stipulation (FSS)
  - To settle a 1998 lawsuit by Kansas to enforce the terms of the Compact
  - Defines how compliance with the Compact's requirements will be determined
  - Signed by the three states in 2002
  
- Ongoing resolutions to adapt to current situational factors



# Basin-Wide Plan

## Republican River Basin-Wide Plan Development Process



- ✓ Stakeholder process and public hearings concluded
- ✓ NeDNR and NRDs exchanged letters agreeing to adopt the plan

### What's next?

- Issue orders to adopt the plan
- Begin implementation

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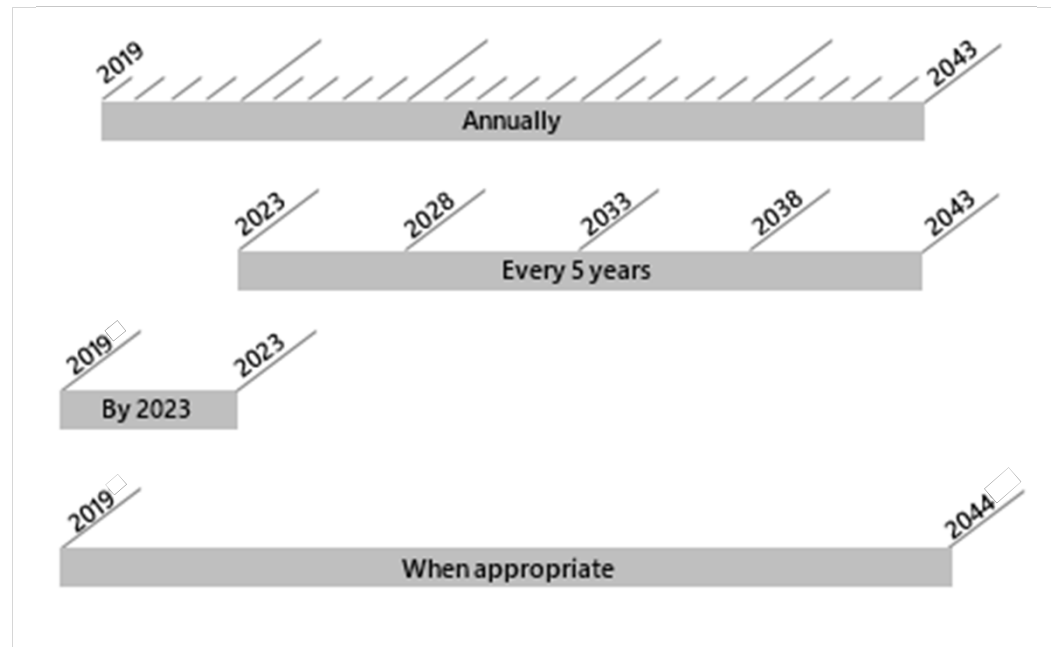
# Republican River Basin-Wide Plan Transparency and Building Trust

- NeDNR facilitation and project management:  
Emphasized transparency and building trust
  - March 2016 “listening meeting”
  - From this point forward, transparent and clear about how each step of development built upon stakeholder input from the previous meeting
  - Encouraged discussion of issues among various stakeholder interests
  - Stakeholders reported better understanding of other water users’ perspectives as process went on

# Republican River Basin-Wide Plan Goals

- 1 Maintain Nebraska's compliance with the Republican River Compact and applicable state laws
- 2 Maximize Nebraska's efficient and beneficial consumptive use of its portion of the water supply, increase certainty for long-range planning of water supplies to reduce the need for regulatory actions, and increase collaborative efforts among water management entities and stakeholders across the Basin
- 3 Positive public relations, including information sharing, within and outside the Basin
- 4 When possible, pursue projects that not only benefit water supplies and uses, but also create benefits for fish, wildlife, recreation, and conveyance within the Republican River Basin

# Republican River Basin-Wide Plan Implementation Schedule



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# Republican River Basin-Wide Plan Improved Communication

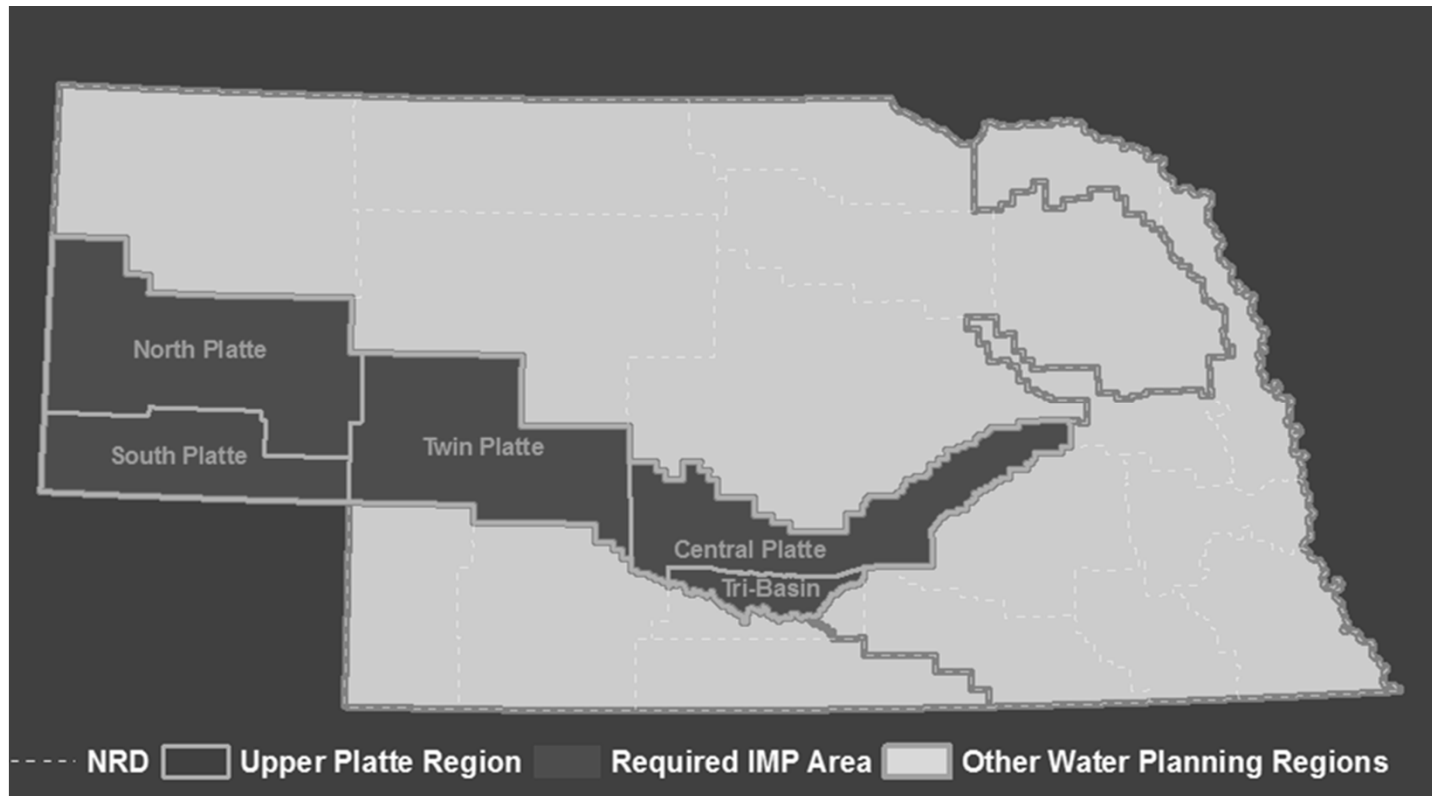
- Early in the process, 5 ongoing intrastate lawsuits in the basin hampered discussions and limited data sharing
  - Resolution of lawsuits +  
NeDNR's emphasis on transparency and trust
  - Discussions among various water interests improved considerably as process continued
  - No new lawsuits since the process began
-

# Integrated Management Plans

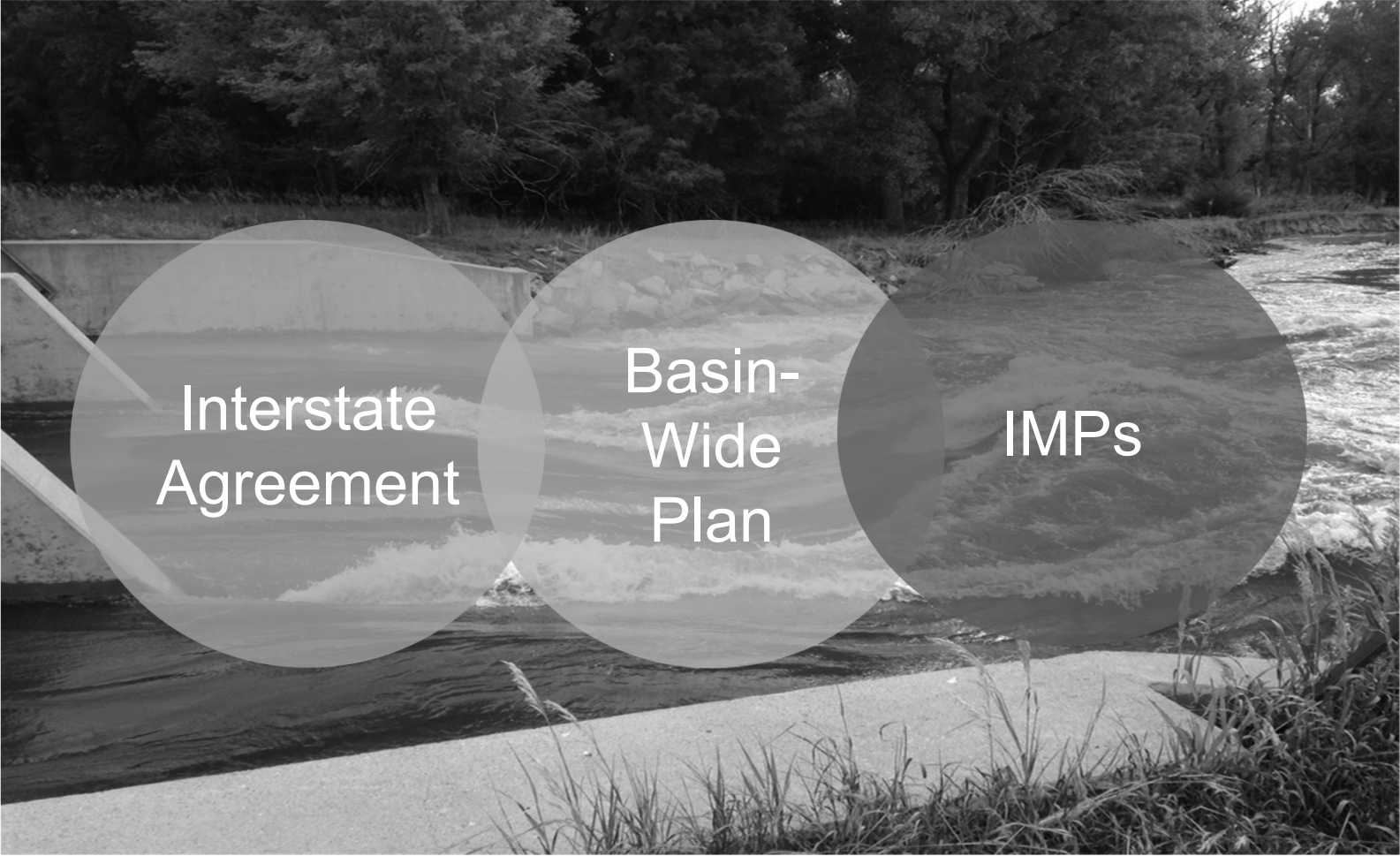


IMPs

- Allows each NRD to tailor the concepts from the Basin-Wide Plan to the unique climatic, hydrologic, geologic, and economic setting in their area
- Provide the mechanism for State and NRD coordination of Interstate Compact Activities
- Have the flexibility to allow for the creation of an streamflow augmentation project for purposes of Compact Compliance
- Each IMP developed following a stakeholder process
- Adaptive Planning
  - Update for consistency with new Republican River Compact resolutions
  - Update for consistency with basin-wide plan



## Upper Platte River Basin – A Closer Look



Interstate  
Agreement

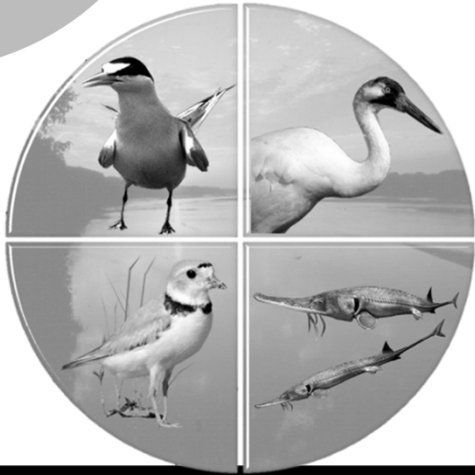
Basin-  
Wide  
Plan

IMPs



# Platte River Recovery Implementation Program Background

Interstate  
Agreement



- Agreement among 3 states, two federal agencies, and 5 water users in the Upper Platte Basin
- Formed to carryout Section 7 of the endangered species act
  - Protects species
  - Protects existing water users
  - Allows for new uses with offsets
  - Contains the Nebraska New Depletion Plan

# Upper Platte Basin-Wide Plan Development Process

PROJECT SCHEDULE



Majority  
Consensus

# Draft Upper Platte Basin-Wide Plan

## Goals

1

Incrementally achieve and sustain a fully appropriated condition while maintaining economic viability, social and environmental health, safety, and welfare of the basin.

2

Prevent or mitigate human-induced reductions in the flow of a river or stream that would cause non-compliance with an interstate compact or decree or other formal state contract or agreement.

3

Partner with municipalities and industries to maximize conservation and water use efficiency.

4

Work cooperatively to identify and investigate disputes between groundwater users and surface water appropriators and, if determined appropriate, implement management solutions to address such issues.

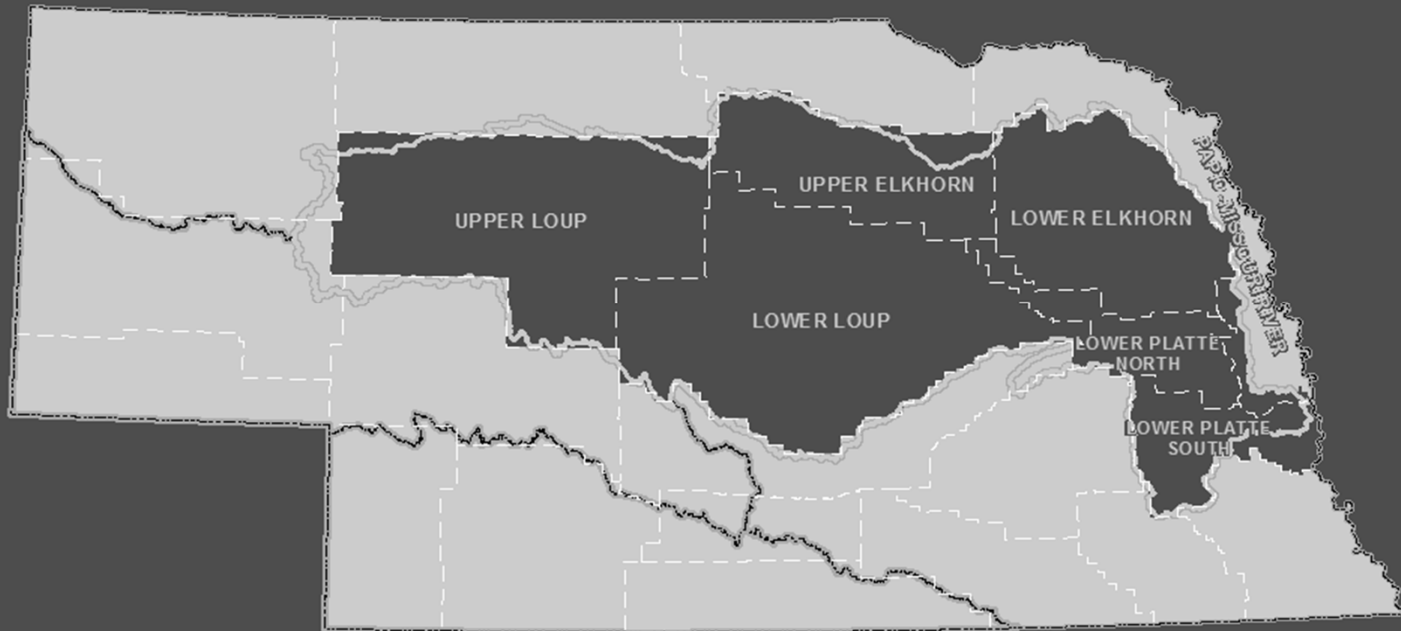
5

Keep the Upper Platte River Basin-Wide Plan current and keep stakeholders informed.

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# Draft Upper Platte Basin-Wide Plan Second Increment Themes

- Maintain previous increment mitigation efforts
  - Understand economic impacts of supply variability
  - Develop a drought contingency plan
  - Improve information sharing with stakeholders
  - Continue development of conjunctive management projects
    - NRD/Irrigation Canal partnerships to maximize water supplies and utilization
-



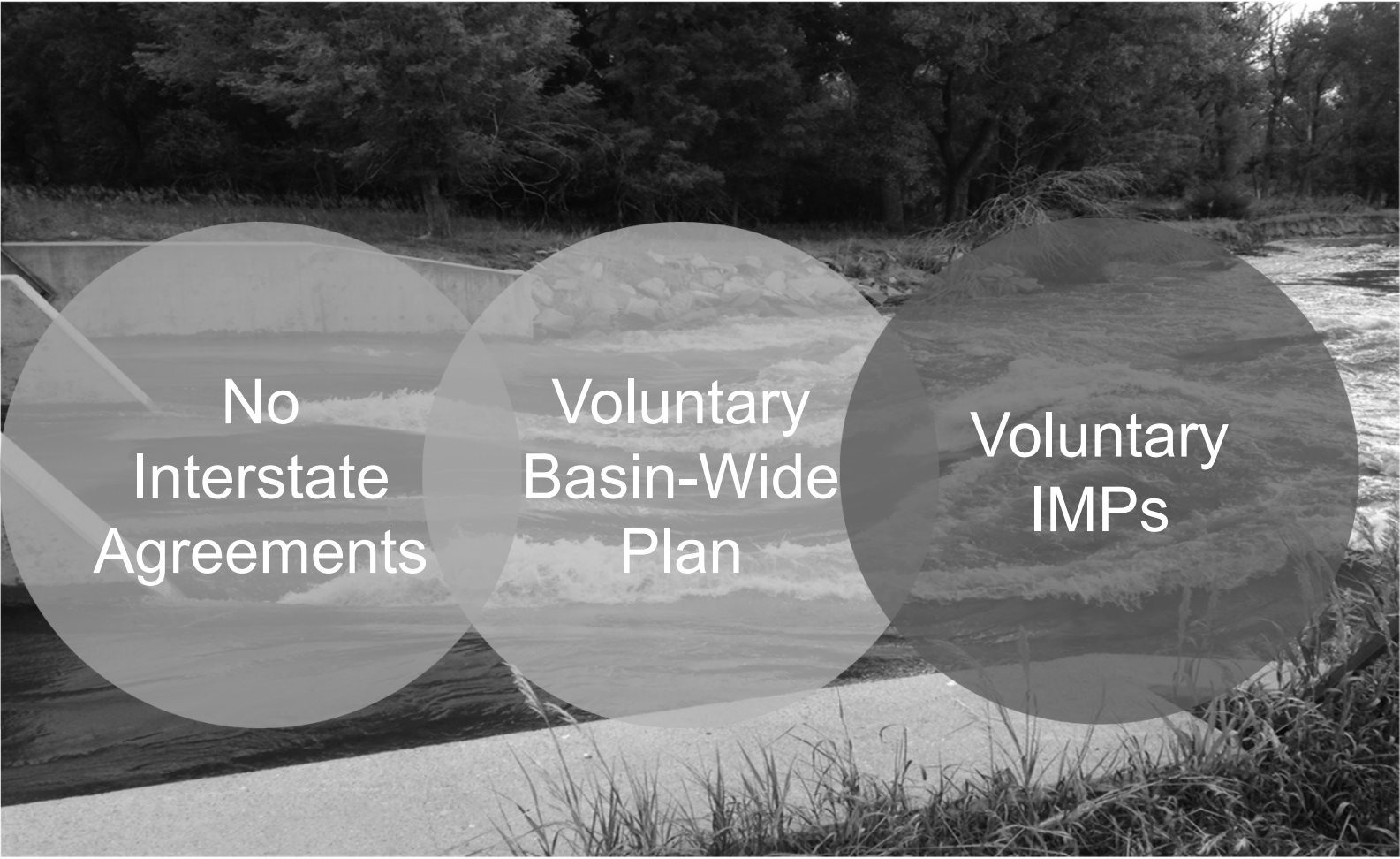
--- NRD

Lower Platte River Basin

Voluntary IMP, Adopted

Other Basin-Wide Planning Areas

# Lower Platte River Basin – A Closer Look



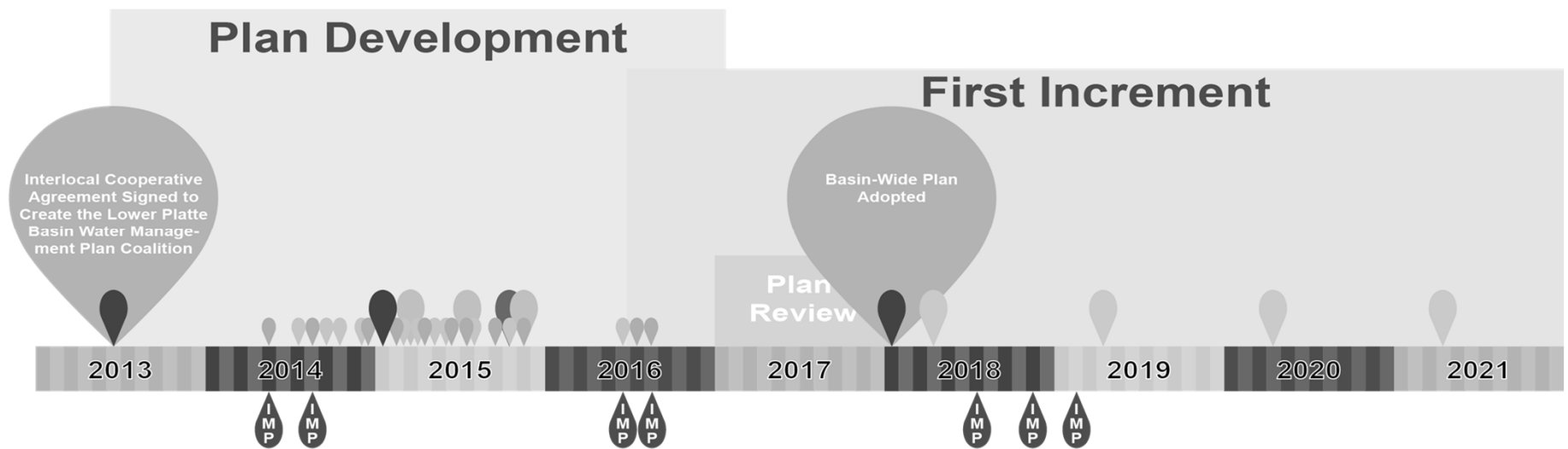
No  
Interstate  
Agreements

Voluntary  
Basin-Wide  
Plan

Voluntary  
IMPs

# Lower Platte Voluntary Basin-Wide Plan Development Process

Basin-Wide Plan



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# Lower Platte River Basin-Wide Plan Goals

- 1 Develop and maintain a water supply and use inventory based on the best available data and analysis.
  - 2 Implement a water management plan for the Lower Platte River Basin that maintains a balance between current and future water supplies and demands.
  - 3 Develop and implement water use policies and practices that contribute to the protection of existing surface and groundwater uses while allowing for future water development.
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# Integrated Water Management

- IWM Planning IS:
    - Proactive & Adaptable
    - Customizable
    - Optimizes use of streamflow supply
    - Multiple tools & approaches
      - Water budgets, hydrologic models, economic analyses
    - Data Intensive
    - Time Intensive
  - IWM Planning is NOT:
    - Static
    - One-Size-Fits-All
    - Mandatory Restrictions
-

# Successes

## Upper Platte Basin Planning

- Platte River Recovery Implementation Program
- Intra-State Goals
  - Achieve and Sustain A Balance
    - Offset Streamflow Depletions
    - Identify Projects to Enhance Water Supply
      - Conjunctive Management Projects
    - Develop Evaluation Methods and Data
- Collaboration over litigation

## Republican River Basin Planning

- Compact Compliance
  - 05-06 Non-Compliance
  - Conjunctive Management Projects
- 4 Generations of IMPs
- Investment over litigation
- Improved interstate relations

## State-wide Planning

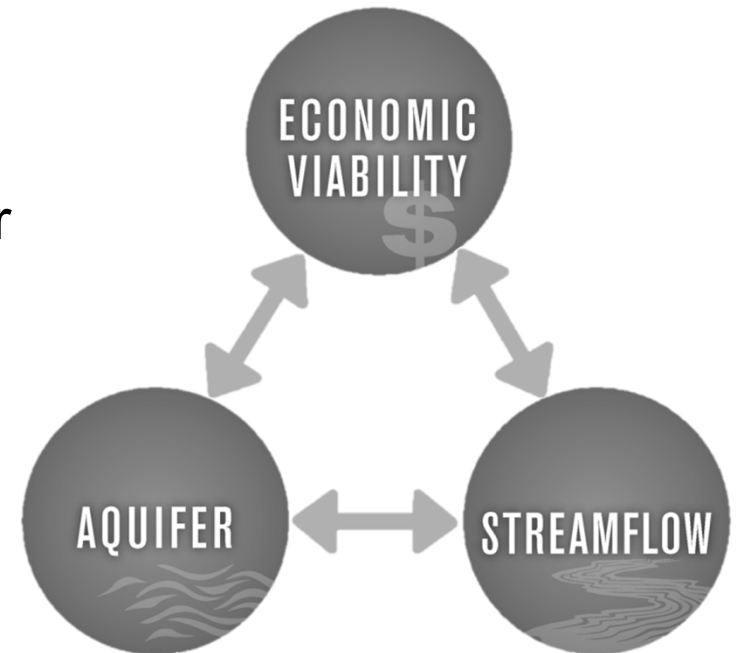
- All NRDs participating in IMPs
- Water Sustainability Funds
- Developing sound partnerships
- Continuing to develop and refine the science and data

# Future Opportunities and Challenges



# Nebraska's water future

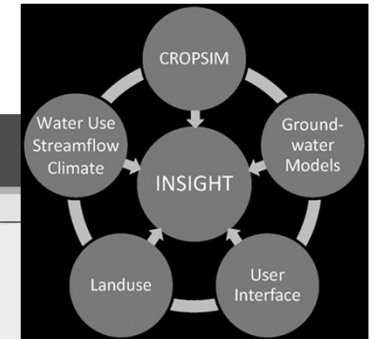
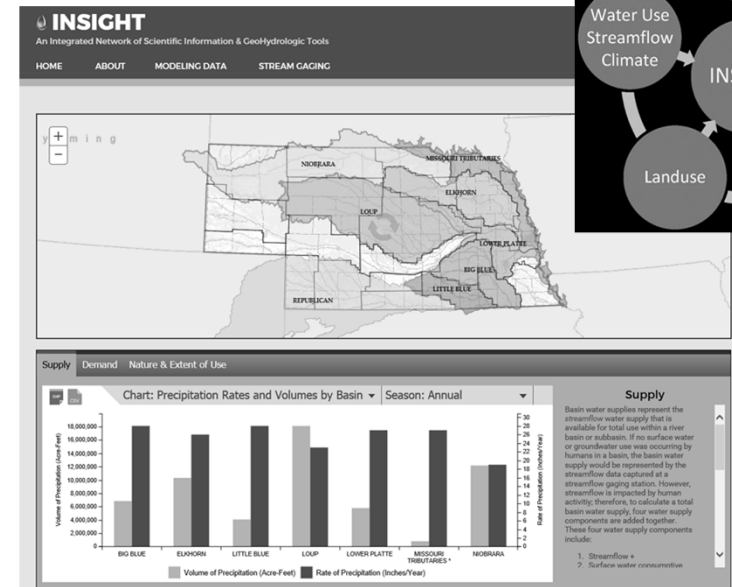
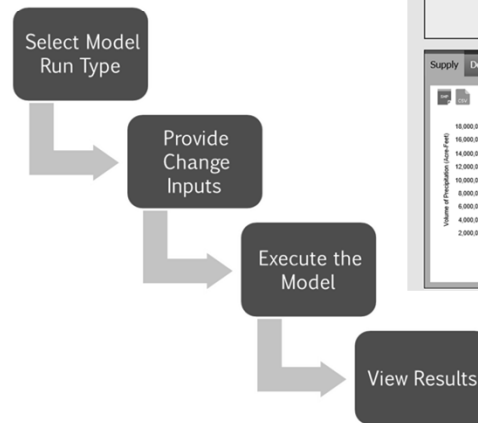
- What does water planning strive to do?
  - Ensure the best available science is used in decision making
  - Engage local stakeholder interest in key policy decisions
  - Develop approaches to provide a framework for sustainability of core management goals
  - Protect existing users of water
  - Work collaboratively with interstate and federal partners
  - Implement innovative water management solutions



# Nebraska's water future

## What does water planning strive to do?

- Develop the best available science
  - Models
  - Data integration
  - Data visualization
  - Applied research



# Nebraska's water future

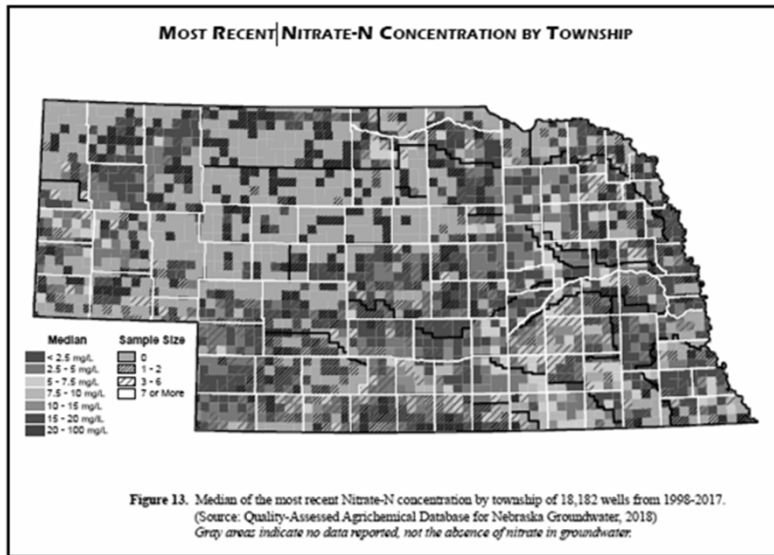
## What does water planning strive to do?

- Increase opportunities for public education and engagement
- Ensure tools are available for flexibility to redistribute and/or develop water for future beneficial uses
  - water markets/transfers/incentive programs

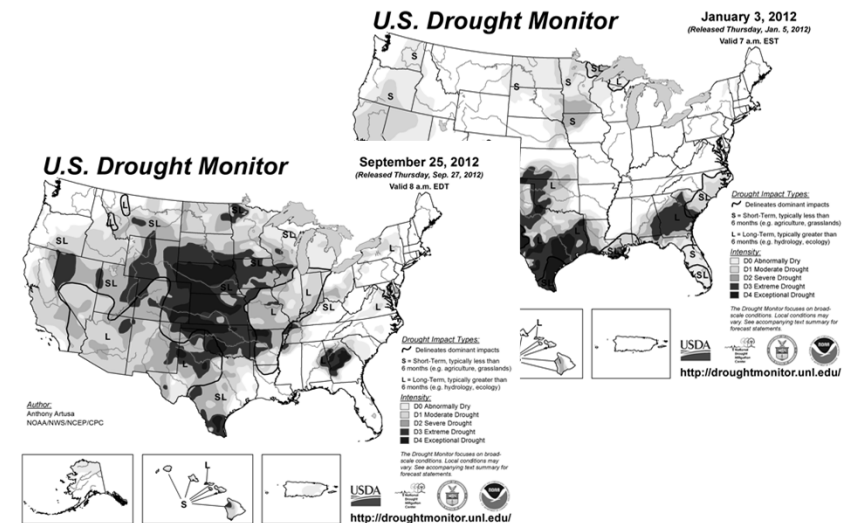


# Nebraska's water future

- What will water planning strive to do?



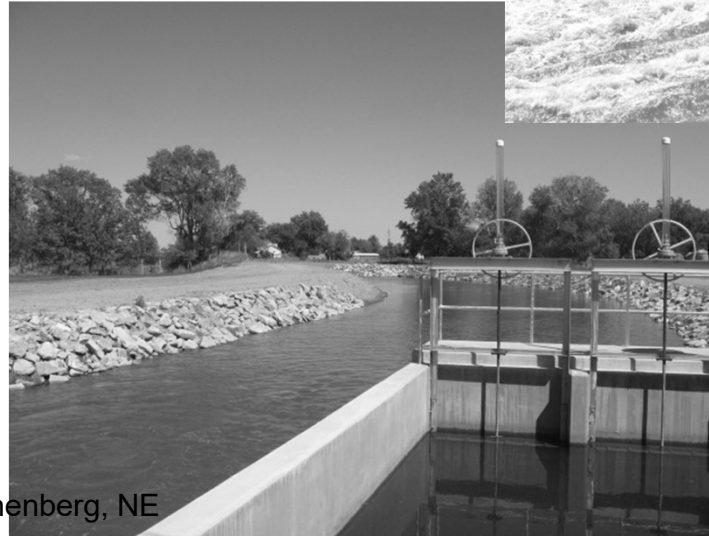
- Integrating planning efforts on water quality and water quantity



- Sharpen focus on drought planning

# Nebraska's water future

- What will water planning strive to do?
  - Expand implementation of projects such as conjunctive management/stream augmentation
  - Support producer and water manager level innovation
  - Pilot and implement innovative programs



Cozad Canal, Gothenberg, NE



**UNLTAPS**  
TESTING AG PERFORMANCE SOLUTIONS



# Ways to Work with NeDNR

- Internships for undergraduate/graduate students
- Funding and project opportunities to support graduate degrees
- Employment opportunities in technical and planning roles
- Research to support water planning



<https://dnr.nebraska.gov/>

NeDNR provides unique opportunities to be involved in the science, planning, policy, and public involvement aspects of Nebraska water planning

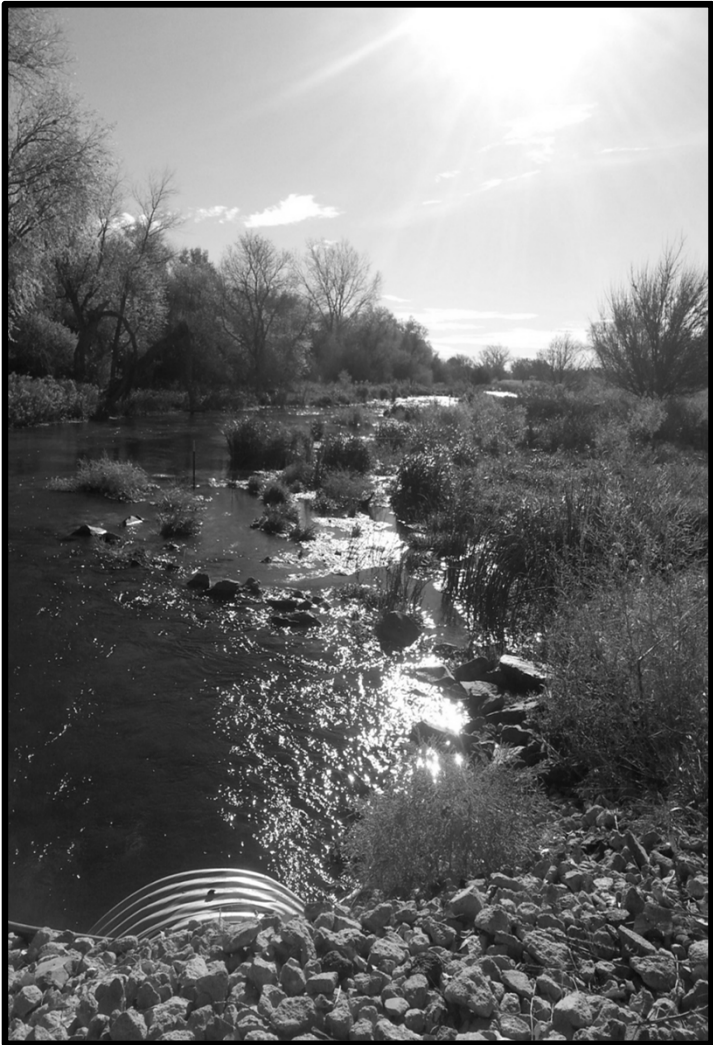


Questions?

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***<https://dnr.nebraska.gov>***



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