

## **NRD Water Management in Nebraska**

River Basin Natural Resource District  
Oversight Advisory Task Force  
State Capitol Building  
Pierre, South Dakota  
June 20, 2016  
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Executive Director  
Nebraska Association of Resources Districts

*"Protecting Lives, Protecting Property and Protecting the Future"*

## ***Presentation Overview***

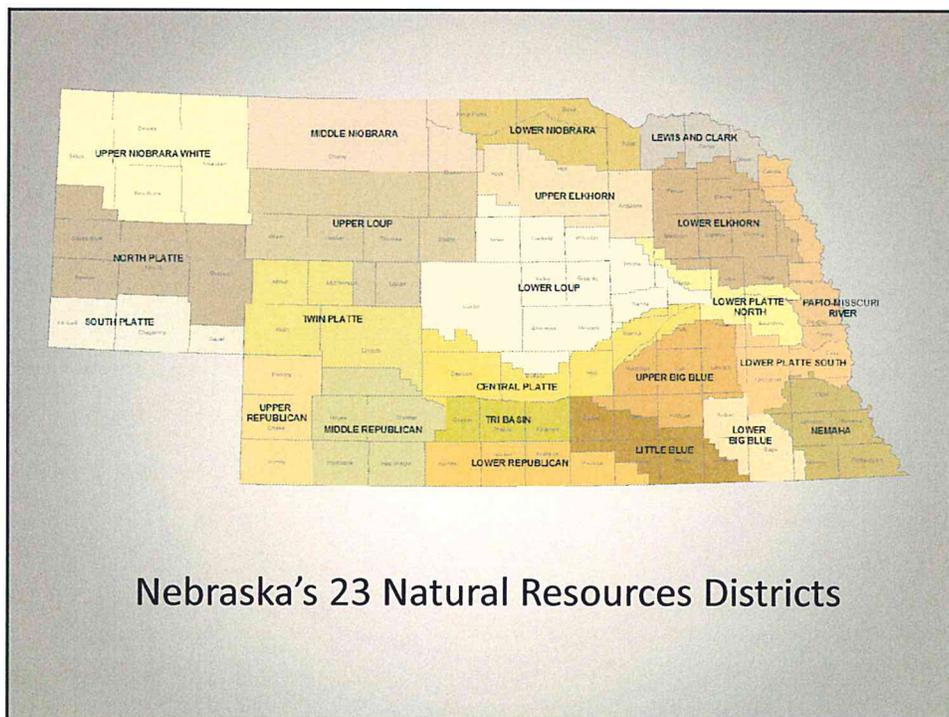
1. Nebraska Natural Resources Districts (NRDs)
2. Nebraska Water Law
3. NRD Groundwater Management for Quality and Quantity
4. Integrated Management Plans (IMPs)
5. Project Examples
6. Future Issues and Funding
7. Questions and Answers

## Creation of the NRD System

- In April 1969, four senators introduced LB1357 in order to consolidate 154 special-purpose districts into a series of multipurpose districts based on river basin boundaries.
- Unique to Nebraska
- Law became effective in 1972

Primary Sponsor of L.B. 1357:

- **Maurice Kremer** (Aurora)



Nebraska's 23 Natural Resources Districts

## NRD Boundaries

- Established by the Nebraska Natural Resources Commission in 1971.
- Stay close to basin boundaries but follow county roads so fields are not divided.
- Use county boundaries when possible to divide basins into NRDs
- Boundary can change 3 ways
  - 1) Landowner petition to local NRDs.
  - 2) NRD agreement with input from landowners.
  - 3) Landowner petition to the Commission.

## NRD Board Structure

- Locally elected at the general election
- Any eligible voter can run
- Board size – 5 -21 members (set by the local board)
- 323 board members total
- Elections by Sub districts and/or at large
- Statute allows for 3 to 1 ratio but most at 1 person – 1 vote

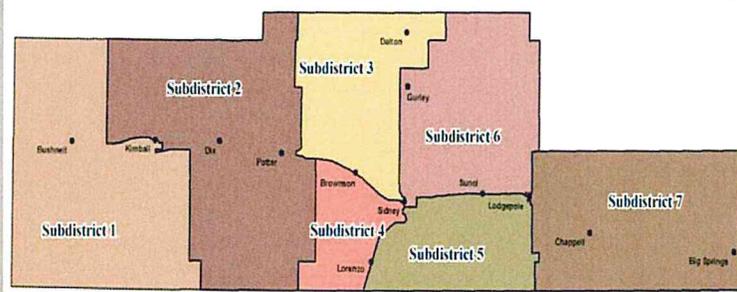


## South Platte NRD



Sub-districts are updated every 10 years from census data

South Platte NRD Board Subdistrict Area Map



## NRD Board Meetings

- Monthly Public Meetings
- Public Notice and follow the Open Meetings Act
- Public comment is allowed at each meeting
- Special hearings on development of regulations and plans – open to the public and public comments

## NRD Employees

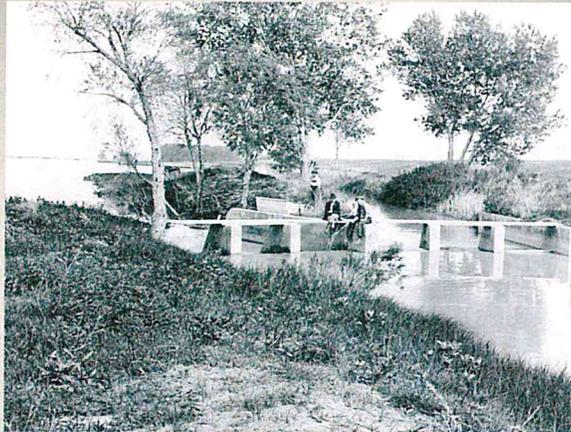
- 360 employees
- Various specialist – Business managers, groundwater technicians, engineers, hydrologist, soil conservationist.
- NARD provides some training and certification programs for employees
- All full-time employees are provided health insurance & retirement benefits.

## Nebraska Water Law

- The water owned by the state and is dedicated to the people of the state for beneficial purposes.
- Permits are granted for use by the Department of Natural Resources (DNR) and NRDs.
- Different doctrines and laws apply depending on the use.
- Preference system applies to all – 1) Domestic, 2) Agriculture, 3) Manufacturing, 4) Other

## Surface Water Rights





**Surface Water Rights – Prior Appropriation Doctrine**

- *Set up to encourage settlement of the territory and the State of Nebraska.*

**Surface Water Rights –  
Prior Appropriation  
Doctrine**

- *First in Time, First in Right*
- *Oldest water rights are 1895.*
- *Senior water rights (oldest) get's all of their right first.*
- *Preference may trump, and payment may be required.*
- *Administered by NDNR*



**Groundwater Rights -  
Correlative Rights  
Doctrine**

- *The right to use groundwater on the overlying land as long as it does not harm someone else.*
- *Permitted and regulated by local Natural Resources Districts (NRDs) with a few exceptions for municipal and interstate transfers.*
- *Amounts to 90% of the irrigation total and uses about 70% of the irrigation water.*



**Groundwater Rights -  
Correlative Rights  
Doctrine**

- *Nebraska has 8.3 million irrigated acres.*
- *Number 1 in the US.*
- *2015 Report -- 1% groundwater decline since pre-development*
- *2016 -- Probably above predevelopment.*



### Groundwater Rights - Correlative Rights Doctrine

- *All 23 NRDs have a Groundwater Management Plan approved by DNR and DEQ.*
- *Local NRD rules and regulations in place to manage for quantity and quality.*
- *Can go to allocations if declines in water tables are severe.*
- *Can impose regulations for quality.*



## Groundwater Quality Management Plans and Regulations

- Approved by NDEQ for Quality
- Developed with hearings and public meetings
- Implemented in Phases depending on issues
- Applies in subareas where problems exist
- Phase 1 - Basically educational programs. - Nitrates below 5 ppm.
- Phase 2 - Nitrates over 5 ppm but below 10 – mandatory soil testing, applicator certification, water testing, annual reports, ban on fall and or winter applications.

## Groundwater Quality Management Plans

- Phase 3 - Over 10 ppm Nitrates.
- Same requirements as Phase 2 plus:
- Management plans on fertilizer applications required. Must account for all existing nitrogen sources for the crop.
- Irrigation with high nitrate water can provide most of the nitrogen supply.
- Save farmers money and remediates the problem

## Groundwater Quality Management Plans and Regulations

- Phase 4 – Not implemented anywhere in Nebraska yet.
- Nitrates still increasing after Phase 3 implantation.
- All of Phase 2 & 3, plus it can include a complete ban on all commercial fertilizer applications.
- Provides incentives to producers, dealers and consultants to work on remediation.

## Groundwater Quality Management Chemigation Program

- NRDs issue permits and regulate Chemigation applications (injection of fertilizers or pesticides into irrigations systems).
- Incorporated into Groundwater Management Regulations
- Coordinated with NDEQ
- Applicators must have all check-valves and safety equipment.
- Applicators must be licensed – training by UNL and NRDs.
- Permit Fee set by the local NRD
- Fines for no permit can be up to \$5,000 a day.

## Groundwater Quantity Management Plans & Regulations

- All districts require certification of irrigated acres.
- What is listed as irrigated for FSA may not be listed as irrigated for property tax purposes.
- Crucial to get a true accounting of irrigated acres.
- All plans and regulations are developed with hearings and public meetings

## Groundwater Quantity Management Plans & Regulations

- Well permits over 50 gpm required by the NRD.
- Can require new wells to be drilled to a minimum depth
- Well spacing requirements to prevent interference with other users.
- NRDs can limit or ban additional development of irrigation in areas where water quantity problems exist.
- Groundwater levels are monitored to aid in management decisions.

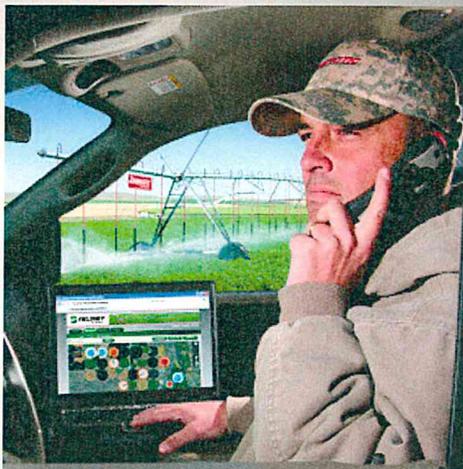
## Groundwater Quantity Management Plans & Regulations

- All plans have trigger levels based on groundwater levels for additional regulation.
- If levels decline
  - moratoriums on additional irrigated acres.
  - Allocations on use (3 or 5 year allocations)
  - Can require a reduction in irrigated acres



### NRD Programs -- Integrated Water Management Plans (IMPs)

- *Joint management plan between DNR and NRDs.*
- *Sustain a balance between basin water supplies and uses (both ground and surface water)...*
- *...to sustain the economic viability and environmental and social health, safety, and welfare of the basin...*
- *Includes Basin Management Plans to coordinate with all NRDs in the basin.*



### NRD Programs -- Integrated Water Management Plans (IMPs)

- Mandatory for fully or over appropriated as determined by the Nebraska Department of Natural Resources (10 of 23).
- Voluntary for NRDs not fully appropriated (11 of 13).
- 21 of 23 Districts have or are developing IMPs



## Plan Development -- IMP Stakeholders

- Irrigation and reclamation districts, mutual irrigation and canal companies
- Public power and irrigation districts
- Municipalities
- Groundwater irrigators
- Other stakeholders deemed appropriate by NRD or DNR
- Hearings and public meetings



## IMP Development

Data for decision making is crucial.

- UNL, USGS, other government entities
- Private sector – Engineering firms, consultants

Data must be constantly improved and updated.

- UNL, USGS, other government entities
- Private sector – Engineering firms, consultant

## Technical Study Support for IMPs

- What are the future impacts of current levels of development?
- What are the water supplies and how variable are those supplies?
- What are the demands on water supplies? (both current and future projections)
- What, if any, excess water supplies exist?
- What are the economic costs of the various uses of water?

## Integrated Management Plans Are Not Required to Include

- Restrictions on current users (allocations, reduced irrigated acres, etc).
- Moratoriums on new uses.
- Restrictions on municipal and industrial development.

## Monitoring Components of an IMP

- Must have measurable goals and objectives
- Annual meetings to report and review results.
- Hydrologic data crucial and must be updated and improved
- What changes are water users making on their own to improve efficiency and how can we create programs to encourage more.

## Implementing and IMP

- Must include a groundwater (NRD) and surface water (NDNR) control.
- NRD Groundwater Management Plans and Regulations are modified to meet the goals and objectives of the IMP.
- Measurable goals and objectives



**Water Challenges –  
Surface Water Irrigation**

- *1895 and later surface water rights encouraged waste.*
- *At least three acre-feet of water diversion allowed to provide 1 acre-foot of water.*
- *“As farmers use water more precisely, there’s less flooding on fields, reducing what water users call “return flows.”*
- *Return flows describe water that flows off a field back into an irrigation ditch, or goes back into creeks, streams, and the river where it is ready for use by other irrigators downstream”.*

**Western  
Confluence**

NATURAL RESOURCE SCIENCE AND MANAGEMENT IN THE WEST

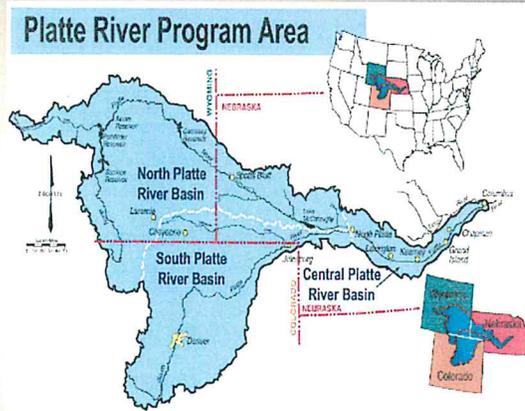
**One Irrigator’s Waste is Another’s Supply**

Dec 23, 2014

**Upstream Efficiencies Mean Less Water For Downstream Users in Nebraska’s Panhandle**

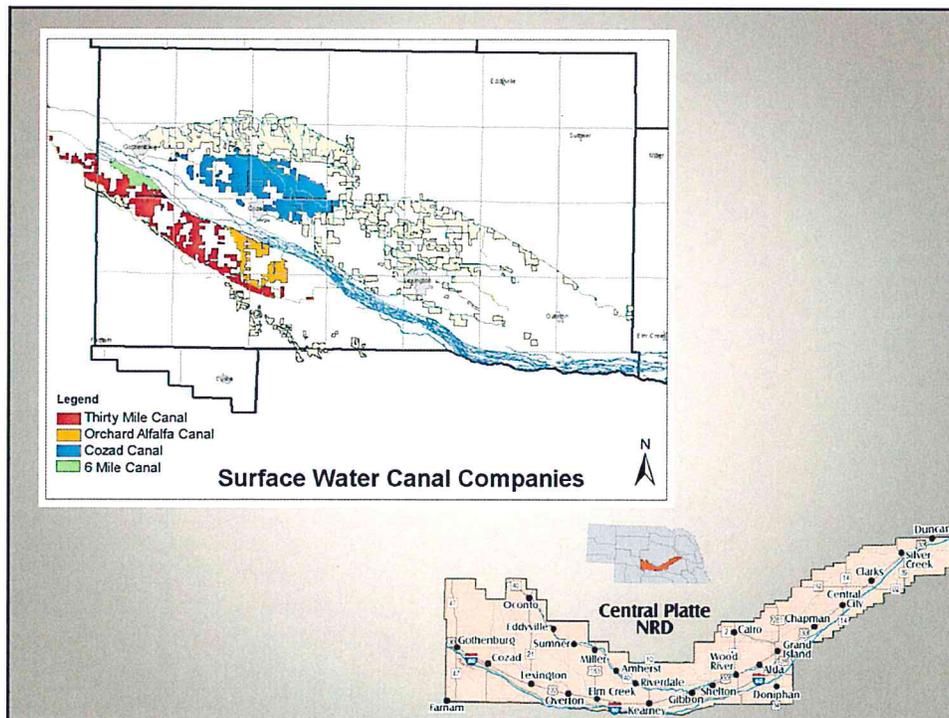
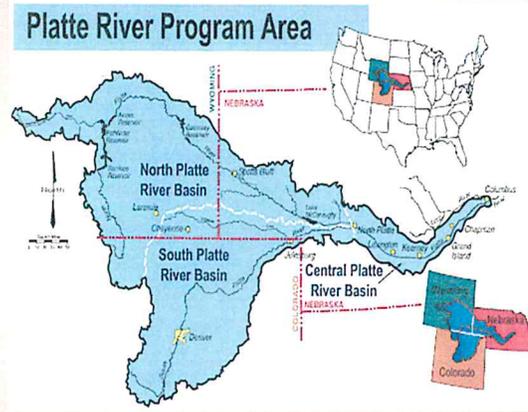
**Water Challenges – Platte River Recovery Program**

- *Agreement between Wyoming, Colorado, Nebraska and the US Fish and Wildlife Service.*
- *Restore flows in the Platte River in Central Nebraska for endangered species because of large scale surface water dams and diversion projects in the three states.*
- *Only river in Nebraska determined over-appropriated.*



**Water Challenges – Platte River Recovery Program**

- *Central Nebraska Public Power and Irrigation District (CNPPID) needs to renew it's FERC licenses.*
- *CNPPID diverts 1.2 million acre-feet of Platte River water annually to generate electricity and irrigate 100,000 acres.*
- *All electricity generated by CNPPID is sold to Kansas City.*



## Six Mile Canal

### Agreements Completed

- Complete Buy-Out
  - Natural flow irrigation rights in process of being transferred to Thirty Mile Canal.
  - Recharge for groundwater supply or groundwater quality not necessary.



The Six Mile Irrigation Canal at its peak, provided irrigation water to approximately 1,700 acres and multiple landowners.



After the removal of the canal, field rows are longer which saves farmers time and fuel.

## Cozad Canal, 30 Mile & Orchard

### Agreements Completed

- Management/Lease
- 50-50 Ownership
- Long-term Inter-local Agreements
- Over 30,000 acre-feet back to the river with no reduction in irrigated acres.
- Project still provides groundwater recharge
- Divert flood water in off-irrigation season for recharge.



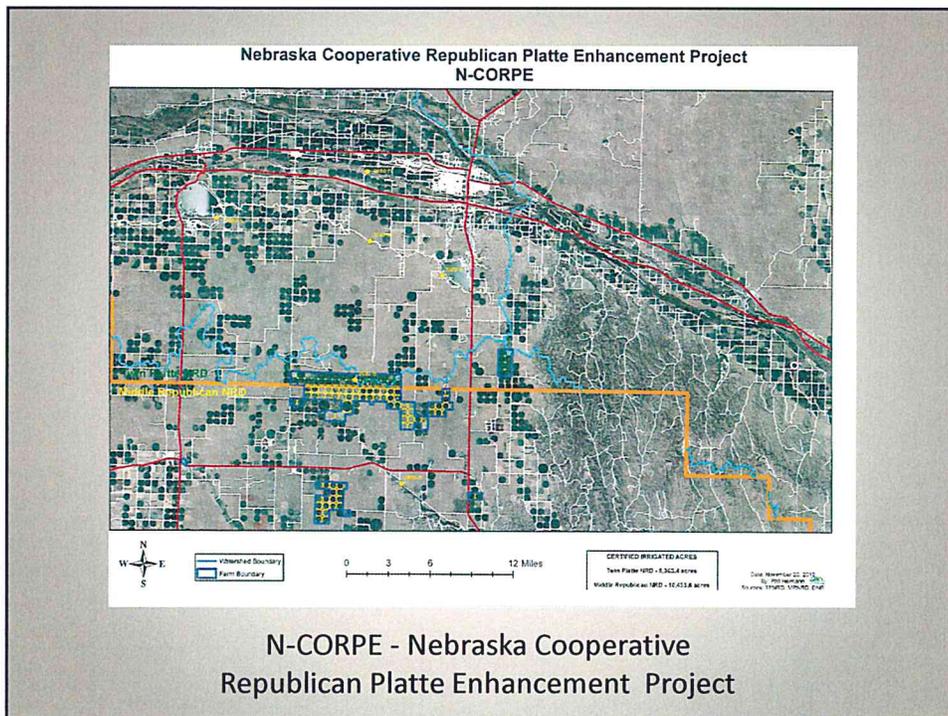
Cozad Canal before clean up.

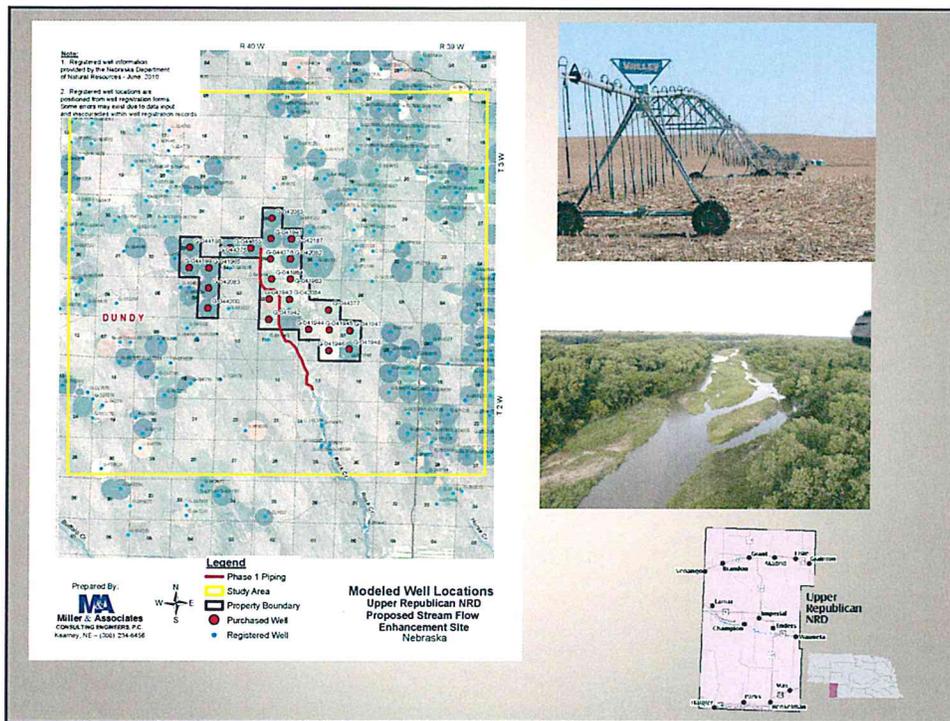


Cozad Canal after tree removal and cleanup.

## Water Challenges -- Republican River Compact

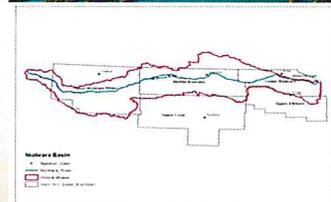
- Achieve and maintain compliance with a 1943 compact on the Republican River with Kansas and Colorado.
- Groundwater use was not included until 2002 Supreme Court Case.
- Stringent allocation requirements and large scale augmentation projects.
- NRDs have invested over \$180 million for projects in the basin in the last 10 years.





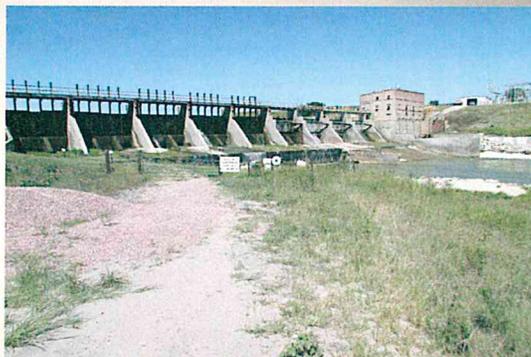
## Water Challenges – Niobrara River

- **Designated as a National Scenic River in Nebraska.**
- **Originates by Lusk, Wyoming**
- **500 miles across northern Nebraska**
- **Confluence with the Missouri River by Niobrara, NE**



### Water Challenges – Niobrara River

- *Nebraska Public Power District holds essentially all of the water rights (over 2,000 cfs) for a small power plant at the lower end of the river.*
- *The dam for the hydro is not stable enough to run both turbines at the same time.*
- *Annual electricity generation is about equal to one wind tower.*



## Significant Surface Water Rights

- Nebraska Public Power District (NPPD): 35 cubic feet per second (cfs); 1896, 1450 cfs; 1923 and 550 cfs 1942;
- Mirage Flats Irrigation District/US Bureau of Reclamation: 135.78 cfs, 1937, and 30.76 cfs, 1944
- Ainsworth Irrigation District: 495.41 cfs, 1953
- Administration is from WY-NE Stateline to Spencer

## NIOBRARA OTHER WATER DEMANDS

- 505,250 Groundwater Irrigated Acres
- 63,500 Surface water Irrigated acres
  - Mirage Flats Irrigation District Completed 1948
    - 11, 660 acres
  - Ainsworth Irrigation District Completed 1965
    - 35,000 acres
- Recreation
- Fish & Wildlife

### Water Challenges – Niobrara River

- *Agreement reached by NRDs, Nebraska Game and Parks and NPPD to purchase the water right and convert part to instream flow rights for fish, wildlife and recreation.*
- *All other existing water uses are protected.*
- *Excess water is available for other future water uses.*



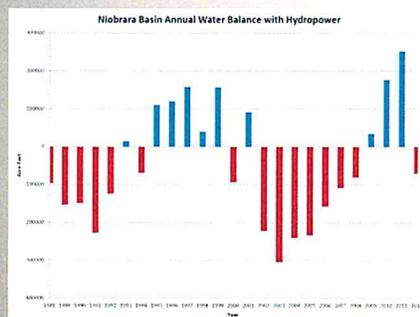
## NRD PURCHASE

Conversion of the HYDRO water rights to:

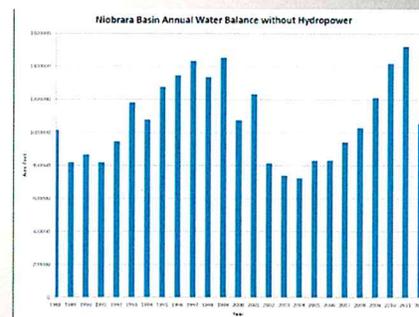
- Niobrara River NRDs and NE Game and Parks Commission jointly work together to get instream flows to protect fish and wildlife
- Honor existing subordination agreements for surface water irrigation,
- Protect Groundwater irrigation.
- Protect municipal and manufacturing uses.
- Provide water for future uses.

## WATER AVAILABLE

### WITH HYDRO

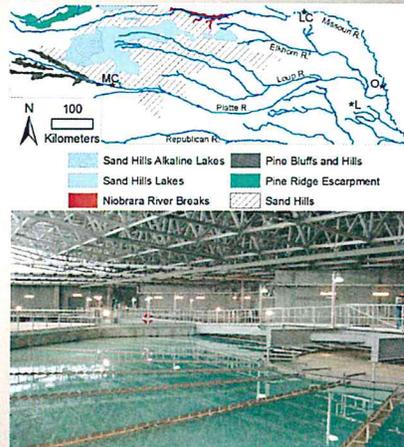


### WITHOUT HYDRO



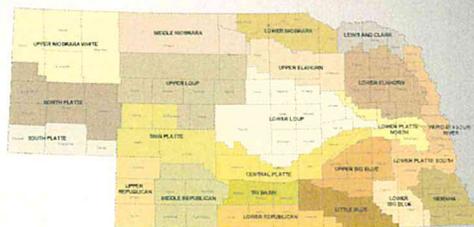
## Future Issues – Lincoln and Omaha Water Supply

- *Lincoln and Omaha are Nebraska's largest cities and have about half of the population in Nebraska.*
- *Both have cities have wellfields at the lower end of the Platte River.*
- *Loup and Elkhorn rivers flow into the Platte just above the wellfields.*



## Future Issues – Lincoln and Omaha Water Supply

- *Seven NRDs and DNR are in the process of developing a basin plan that includes all three basins to protect the existing users and look at storage and/or augmentation projects for drought years.*
- *The three basins cover one-third of the state and encompass seven NRDs.*

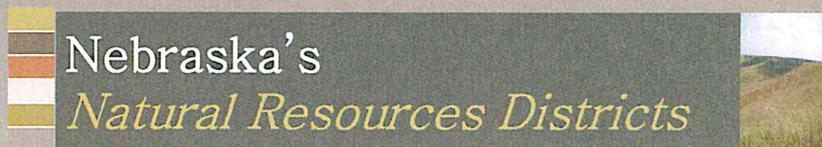


## Future Issues – Rural Water Systems

- Nebraska has over 400 communities of less than 1,000 population.
- Water supplies for many of these communities is a concern.
- The cost of treatment for quality and compliance with federal standards creates problems.
- Economies of scale with Rural Water Systems.
- Several NRDs operate Rural Water Systems.

## Funding

- NRD Property Tax Levy – up to 8.5 cents per \$100 as determined by the local board.
- NRD Occupation tax on irrigated land -- up to \$10/acre as determined by the local board.
- Expanding NRD bonding authority to allow more general obligation bond use.



**Nebraska #1 in irrigation & groundwater  
levels are at Pre-development levels -  
Thanks to local NRD management!**

Questions ?

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