



# Voluntary Integrated Management Plan for the Lower Platte South Natural Resources District

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Prepared Jointly by the District and the NE  
Department of Natural Resources and  
Presented by:

Glenn Johnson - General Manager, Lower  
Platte South NRD

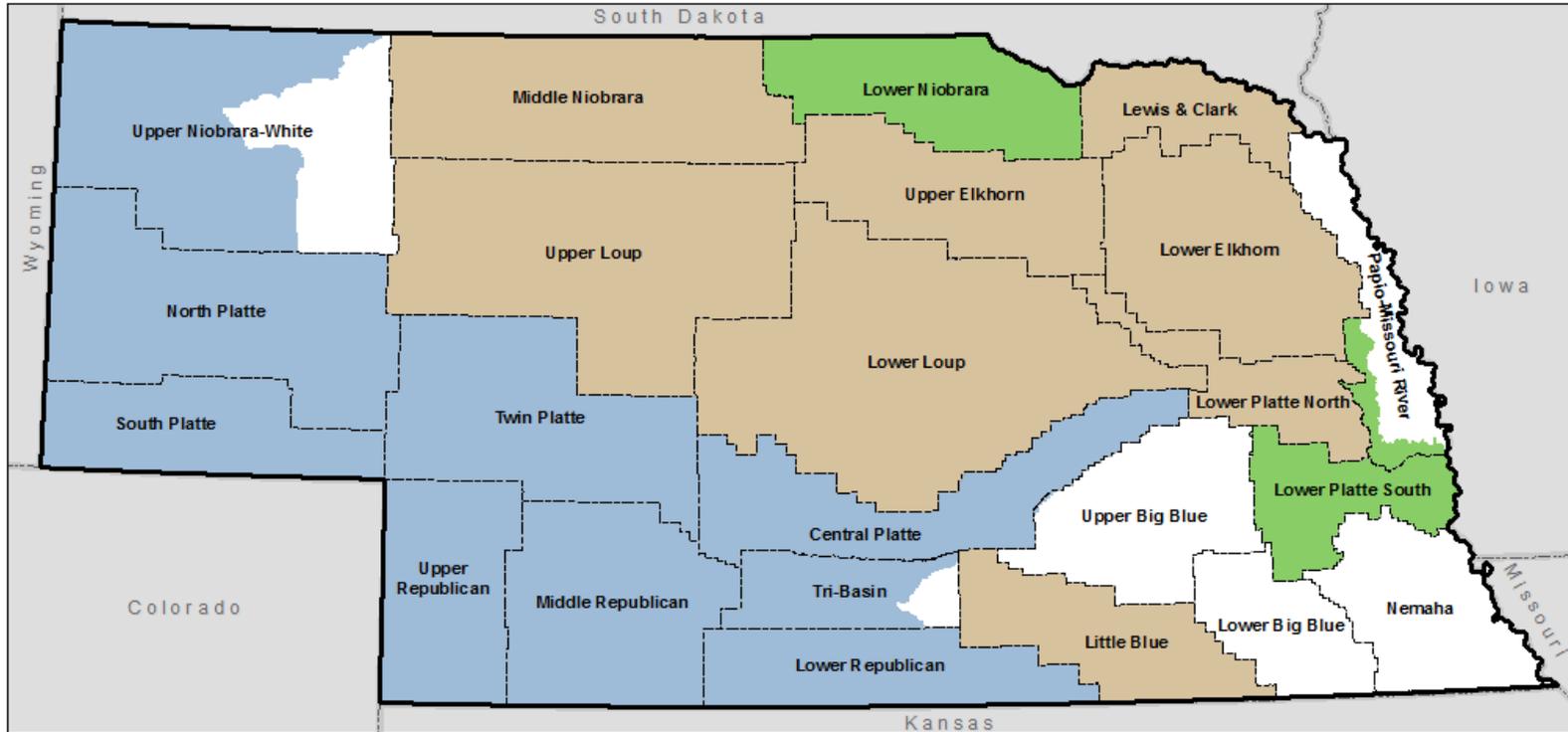
Amy Zoller – Integrated Water Management  
Coordinator, NE Department of Natural  
Resources

# LPSNRD/NDNR IMP Annual Review

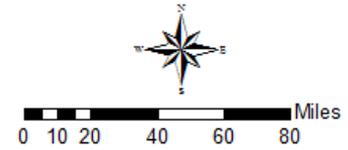
## Background on IMP Development and Implementation

# Status of IMPs in Nebraska

NRD Areas Involved in Integrated Management Planning: July 2015



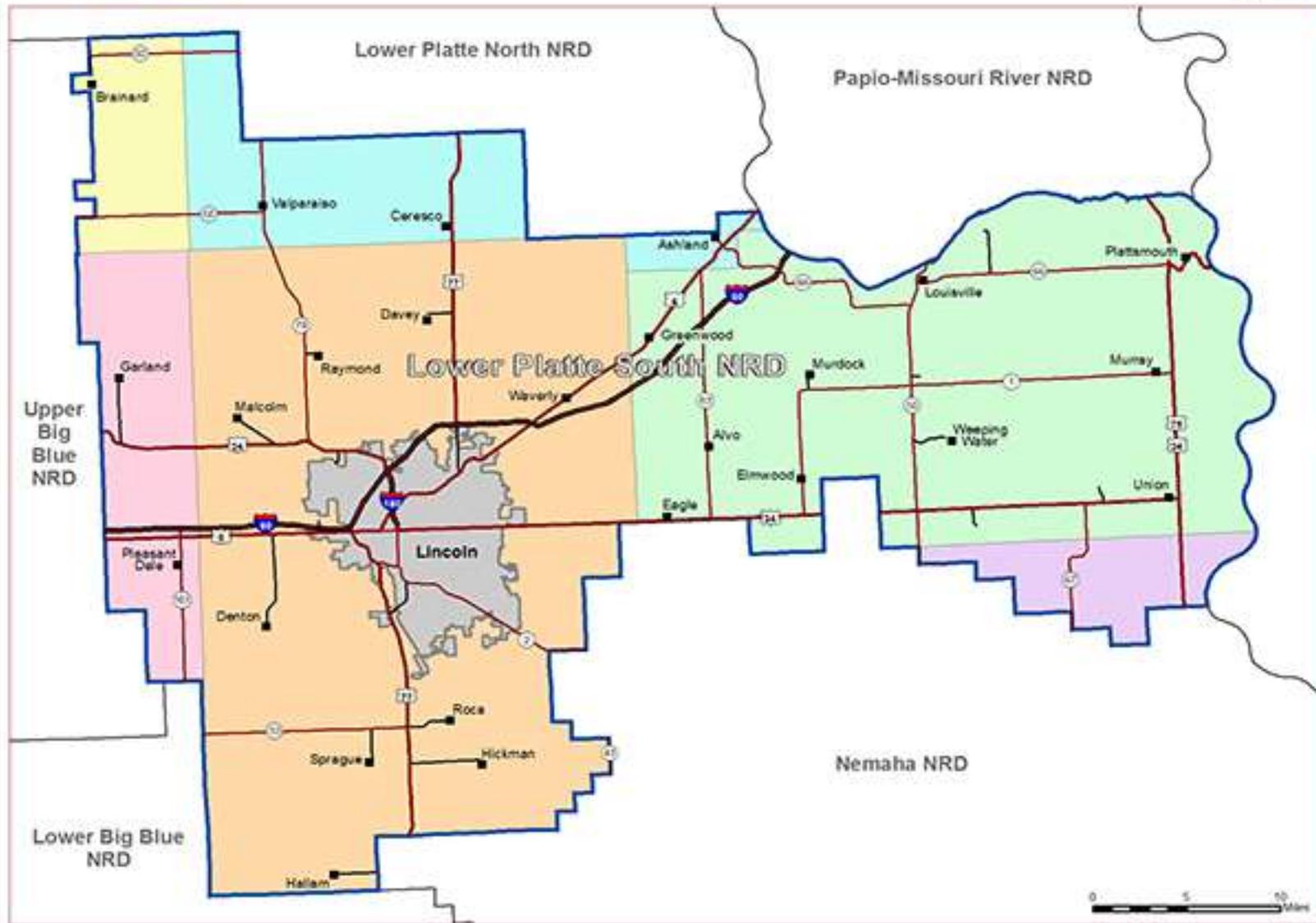
	Required, Adopted in 2005-2009		Voluntary, In Development
	Voluntary, Adopted in 2014		Natural Resource District





# Lower Platte South Natural Resources District General Location Map

Nebraska NRDs



- LPS NRD
- Butler County
- Cass County
- Lancaster County
- Otoe County
- Saunders County
- Seward County
- City
- Towns
- Interstate
- US Hwy
- Local Hwy
- Local Spur
- Other NRDs

Map Created By:  
Shavla D. Ross  
Date Created:  
January 2010



Sources:  
Lower Platte South NRD;  
Nebraska Dept of Nat Res  
Nebraska Dept Of Roads





# Background Studies

## Lower Platte South Natural Resources District Water Balance Study

April 24, 2012

Prepared for:

The Lower Platte South Natural Resources District

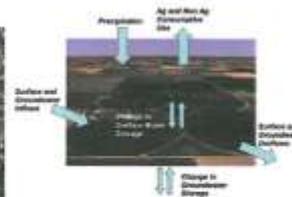
Prepared by:

Brown and Caldwell



In association with

H<sub>2</sub>Options Engineering, LLC





# Who is Involved & What is Their Goal?



## The Integrated Management Plan will:

- Develop a comprehensive inventory of all available ground and surface water supplies and all current water uses.
- Help to project future water needs.
- Identify potential sources and desired management and conservation programs.

### • IMP Subcommittee

- Responsible for overseeing the planning process and to meet statutory requirements. The Subcommittee's charge is to recommend an IMP for adoption by the LPSNRD Board of Directors and DNR.

### • Stakeholder Advisory Committee

- Ensures the planning process meets the goal of the Public Involvement Plan, provides a broad set of perspectives to ensure the IMP reflects diverse water management needs, makes recommendations to assist LPSNRD in meeting mandated requirements, engages stakeholders and encourages participation at public events.

### • DNR

- A partner in the development of the IMP and the planning process. The DNR's role is to collaborate in carrying out the actions of the IMP.

### • Agency Input/Public Input

- Throughout the process, both the general public and agencies in the District with water interests have been encouraged to participate and provide input regarding water uses, needs, demands, and future management for consideration by the IMP Subcommittee.



# Public Involvement Process

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- Comprehensive Public Involvement from start to adoption of Plan.
- Components:
  - Stakeholder Advisory Group (20 members)
  - Four Focus Groups
  - Agency coordination meetings
  - Virtual Town Hall meetings
  - Public Open House Prioritization Workshop
  - Social Media and Website

# Adoption of the IMP

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- Public Hearing on February 19, 2014
- NRD Board adoption
- NDNR adoption
- Effective Date of May 15, 2014

# VISION

“Water uses and water supplies are in a managed balance, supporting economic viability, environmental sustainability and safe living conditions.”

The plan will be instrumental in identifying available water supplies and managing water quantity to meet the future water needs in the District.



# Integrated Management Plan Goals

## Water Inventory

Water Inventory includes the inflow, precipitation, and water storage available to the District along with the water use and outflows from the District.

**Goal:** Ensure the District has sufficient data to enable the achievement of a water supply that is in balance with current and future water demands in the District.

## Water Supply Management

Water Supply Management is the management of water supply, both in and out of the District, through human efforts.

**Goal:** Ensure a sustainable water supply is available in the amounts and location of the demands through management actions to meet the District's short and long term needs.

## Water Use Management

Water Use Management is the management of how water is used and consumed while meeting current and future demands.

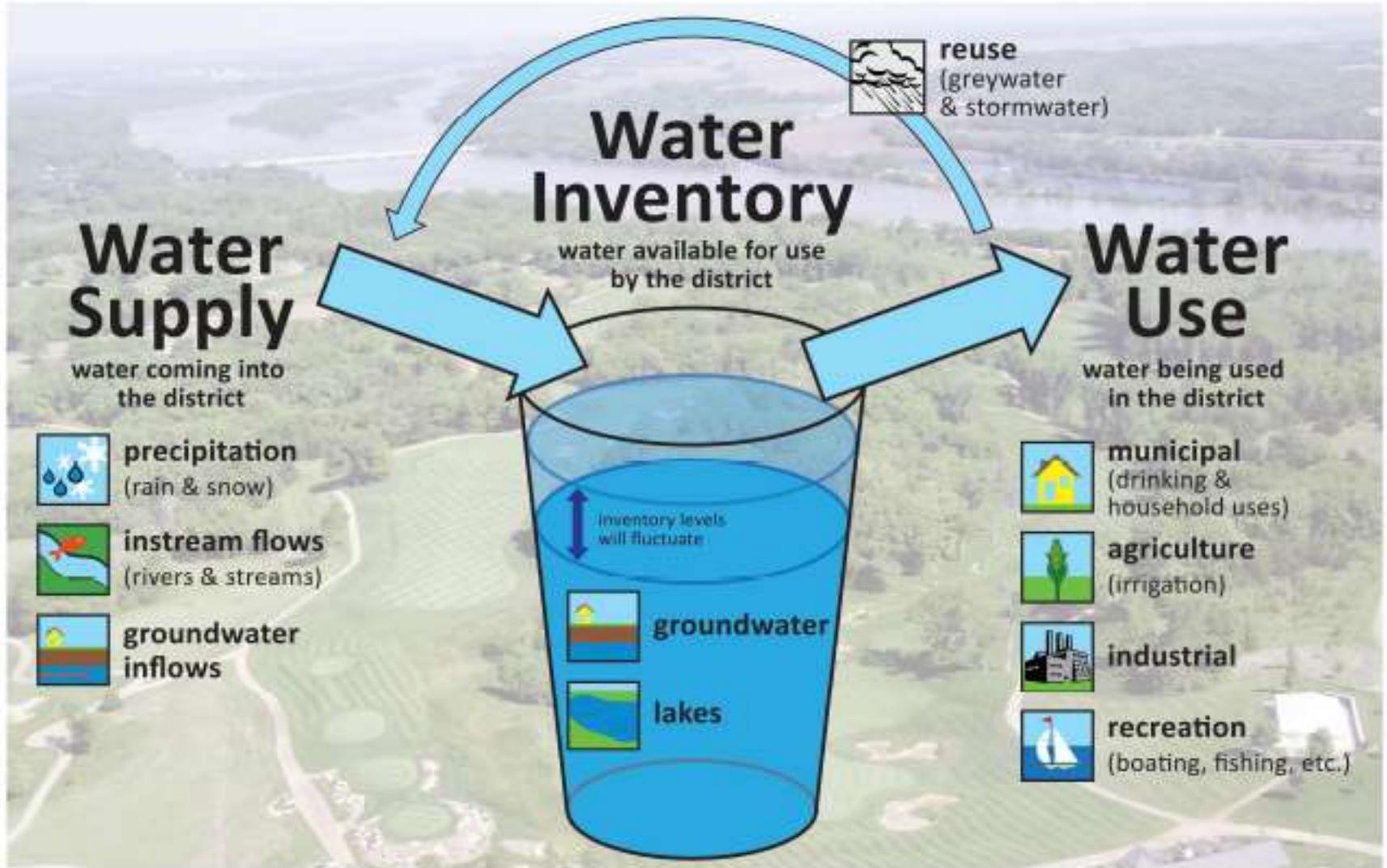
**Goal:** Encourage all water users to minimize water use while optimizing benefits.



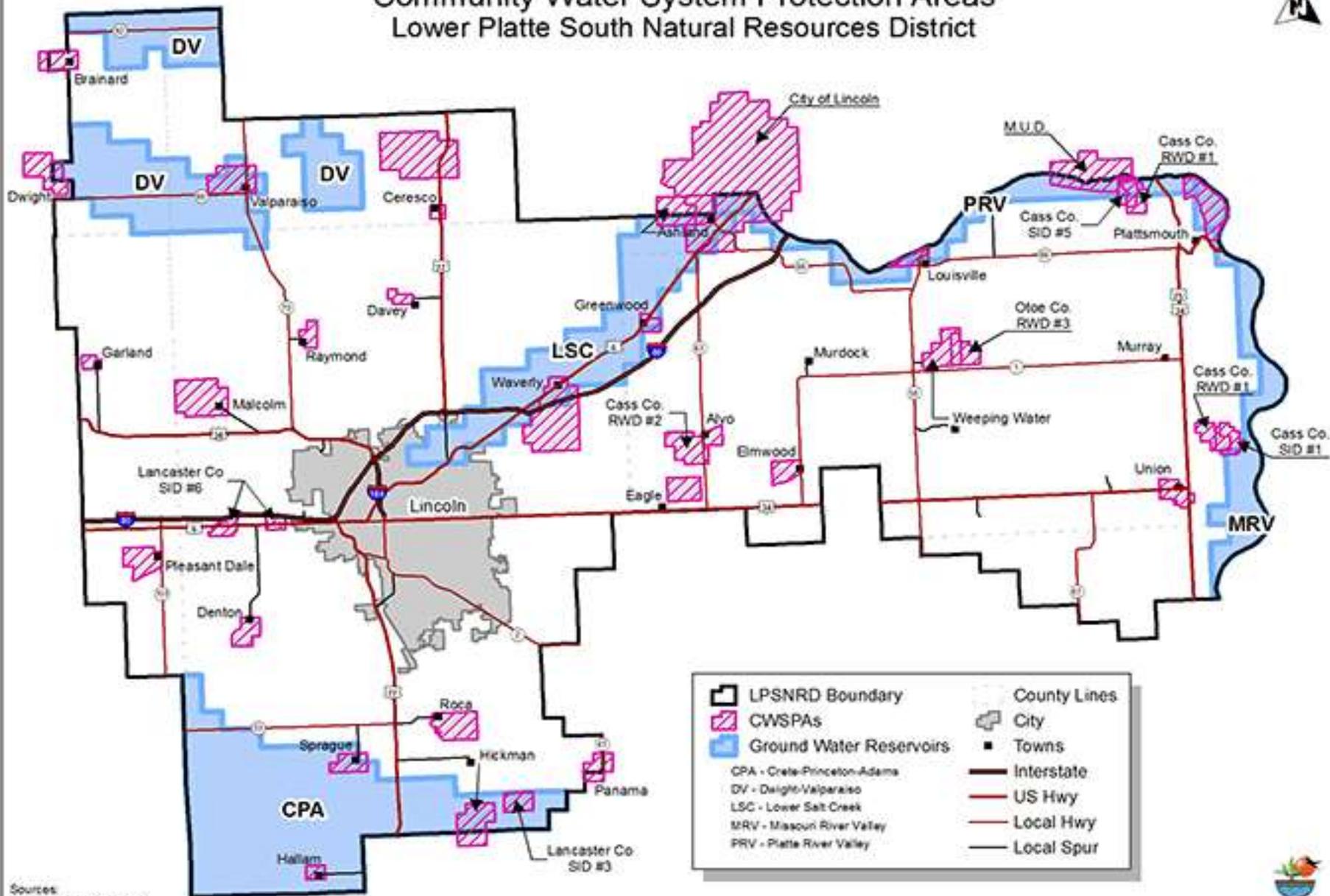
# ACTION ITEMS

- For each of the Objectives listed under the three Goals, the NRD and DNR identified specific actions. These were subsequently prioritized into High, Medium and Low.
- Three remaining planning components remained:
  - Municipal, rural water district, & Non-municipal water use and accounting
  - Tracking downstream depletions
  - Emergency Response/Drought Mitigation

# Water 101



# Community Water System Protection Areas Lower Platte South Natural Resources District



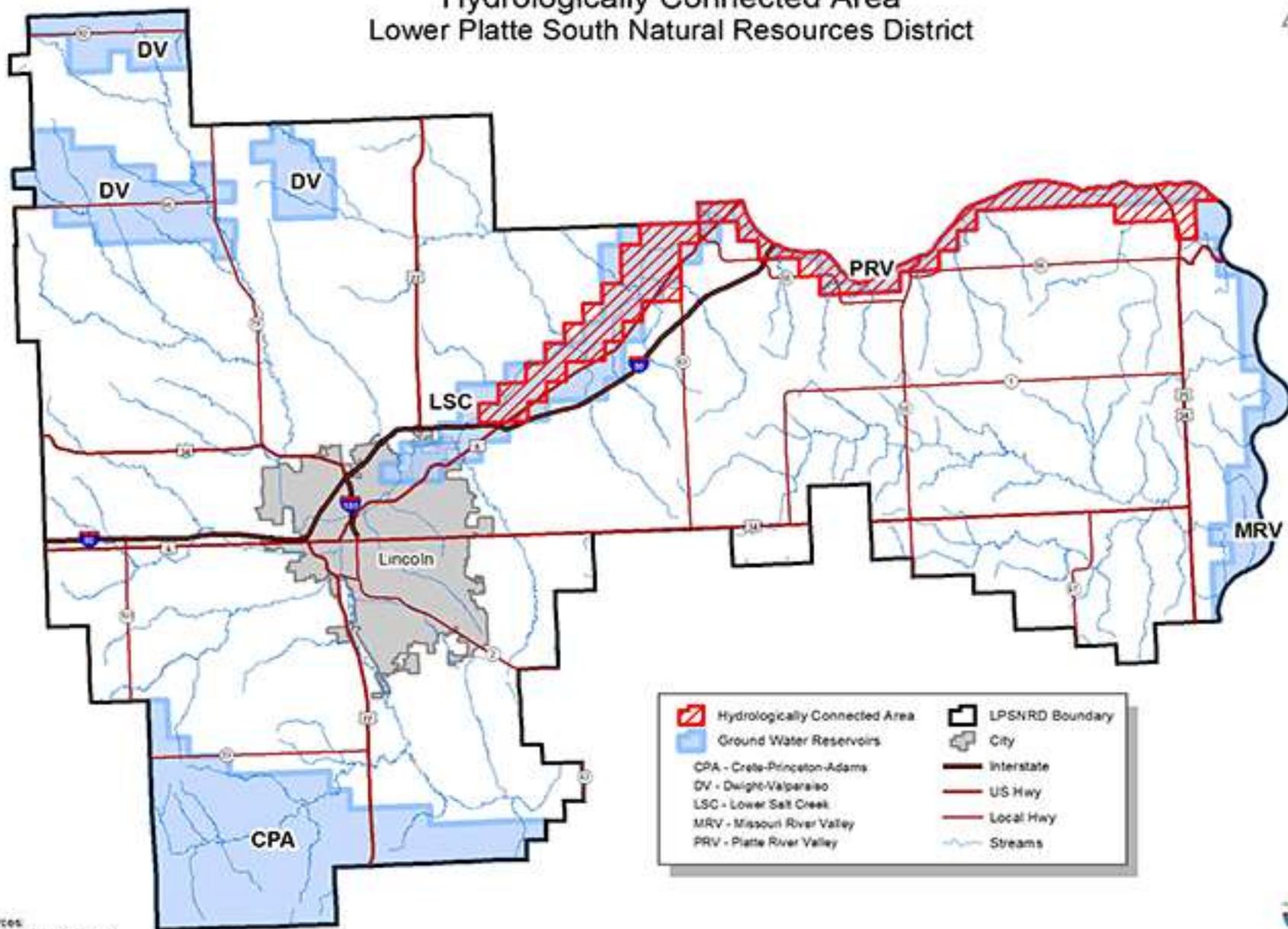
	LPSNRD Boundary		County Lines
	CWSPAs		City
	Ground Water Reservoirs		Towns
CPA - Crete-Princeton-Adams			Interstate
DV - Dwight-Valparaiso			US Hwy
LSC - Lower Salt Creek			Local Hwy
MRV - Missouri River Valley			Local Spur
PRV - Platte River Valley			

Sources:  
Lower Platte South NRD;  
Nebraska Dept. of Natural Resources;  
Nebraska Dept. of Roads



Map Created By: Shavla D. Ross  
Date Created: January 2014

# Hydrologically Connected Area Lower Platte South Natural Resources District



Sources:  
Lower Platte South NRD;  
Nebraska Dept. of Natural Resources;  
Nebraska Dept. of Roads



Map Created By: Shavla D. Ross  
Date Created: January 2011

Table 3-6. Components of the Average Annual Water Balance Based on Current Land Uses in the LPSNRD

	Amount (KAF)	Period of Assessment
<b>Inflows</b>		
Precipitation	2,729	1980-2010
Surface water inflow	0	
Subsurface inflows	0	
Imported Water	40	1988-2010
<b>Total</b>	<b>2,769</b>	
<b>Outflows</b>		
Consumption	2,220	1980-2010 (based on 2005 land use)
Surface water outflow	395	1980-2010
Minor tributary outflow	124	1980-2010
Subsurface outflow		
<b>Total</b>	<b>2,739</b>	
<b>Change in Storage</b>		
Groundwater storage	-4	2000-2010
Surface water storage	-1	1993-2010
<b>Total</b>	<b>-5</b>	
<b>Remainder</b>	<b>35</b>	



# WATER INVENTORY

- Comprehensive inventory of water supplies, uses and outflows
  - Study aquifers and connectivity to surface water
  - Estimate water use from unmetered wells
  - Estimate consumptive water uses
- Evaluate variations due to climate trends
- Study basin-wide inflows /outflows
- Project changes due to urban and rural growth
- Evaluate sources and effects of additional supplies
- Study extent of hydrologically connected waters



# WATER SUPPLY MANAGEMENT

- Optimize location and design of wells for aquifer characteristics
  - Identify areas of potential conflicts
- Research & implement additional supply and storage opportunities within District
  - Integrated surface & ground water storage
  - Regional and collaborative domestic water supply & distribution systems
  - Collaborate on proactive water management, including dry year leasing



# WATER SUPPLY MANAGEMENT

- Evaluate feasibility and benefits of water reuse
  - Rain barrels, stormwater and wastewater reuse
- Monitor impacts of vegetative growth on streamflows
- Collaborate in studies and planning to identify additional / regional water supplies outside the District



# WATER USE MANAGEMENT

- Determine best available irrigation technologies
  - Support BMPs, education, alternate crops, cover crops, technology innovations
  - Estimate future demands & consumptive uses
- Determine best available industrial technologies & practices
- Determine best applications of native & low water use landscapes
- Determine best indoor water conservation practices



# WATER USE MANAGEMENT

- Determine best water conservation programs, rates, & meters for all public water systems
- Evaluate benefits of greywater reuse, rainwater & stormwater harvesting & reuse, & reuse of irrigation water
  - Model sample watersheds for + and – impacts
  - Technology, support, & pilot projects
- Evaluate instream flow needs and benefits in the District



# WATER USE MANAGEMENT

- Manage expansion of new water uses so as not to adversely affect current users.
  - Develop thresholds for use expansion
  - Monitor changes in water use and land use
  - Effective communications with public water systems
- Expand education programs on water supplies and conservation measures
- Consider fees or incentives that encourage water conservation.



# LPSNRD/NDNR IMP Annual Review

## Annual Report Highlights: Monitoring and Management Actions

# 2014 ANNUAL REPORT

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- Includes the actions and progress made towards IMP action by the LPSNRD and NDNR in 2014.
  - Data collected, ground and surface water permits, and changes in uses
  - Action items accomplished and progress towards goals and objectives
  - Future action steps for 2015 and 2016
  - Potential modifications to the IMP



# IMP Annual Report Highlights

## NDNR Monitoring and Management Actions

- Stream Gaging
- 2014 Permit Actions
- Surface Water Pump Checks
- Voluntary Water Use Reporting
- Set Restrictions on New Acres



# IMP Annual Report: Surface Water Monitoring

Agency	Site Number	Station Name	Begin Date	LPSNRD assist in funding?
USGS	6803000	Salt Creek at Roca, Nebr.	05/14/1951	yes
USGS	6803080	Salt Creek at Pioneers Boulevard at Lincoln, Nebr.	06/20/1994	yes
USGS	6803093	Haines Branch at SW 56th St at Lincoln, Nebr.	06/20/1994	yes
USGS	6803170	Middle Creek at SW 63rd St at Lincoln, Nebr.	06/20/1994	yes
USGS	6803486	Oak Creek at Air Park Road at Lincoln, Nebr.	05/21/1987	yes
USGS	6803495	Salt Creek at Fairgrounds at Lincoln, Nebr.	06/20/1994	no
USGS	6803500	Salt Creek at Lincoln, Nebr.	05/11/1942	yes
USGS	6803510	Little Salt Creek near Lincoln, Nebr.	10/14/1968	yes
USGS	6803513	Salt Creek at 70th Street at Lincoln, Nebr.	05/31/1994	yes
USGS	6803520	Stevens Creek near Lincoln, Nebr.	10/14/1968	yes
USGS	6803530	Rock Creek near Ceresco, Nebr.	04/01/1970	yes
USGS	6803555	Salt Creek at Greenwood, Nebr.	07/27/1971	no
USGS	6804700	Wahoo Creek at Ashland, Nebr.	02/22/1990	no
USGS	6806500	Weeping Water Creek at Union, Nebr.	01/11/1950	yes

USGS Stream Gages in LPSNRD--<http://waterdata.usgs.gov/>



# NDNR Monitoring and Management Actions

Appropriation Number	Approval Date	Use	Grant in CFS	Grant in AF
A-19143	1/10/2014	Irrigation	1.35	
A-19295	10/28/2014	Manufacturing	2.04	
A-19083	1/29/2014	Storage		24
A-19250	7/16/2014	Supplemental Storage		60

## Approved Permits

Type of Water Right	# of cancellations	Acres	Acre-Feet
Irrigation from Natural Flow	12	1008	
Irrigation from Storage	1	96	
Storage Permits	2		89
<b>Total</b>	<b>15</b>	<b>1104</b>	<b>89</b>

## Cancelled Water Rights

# NDNR Monitoring and Management Actions

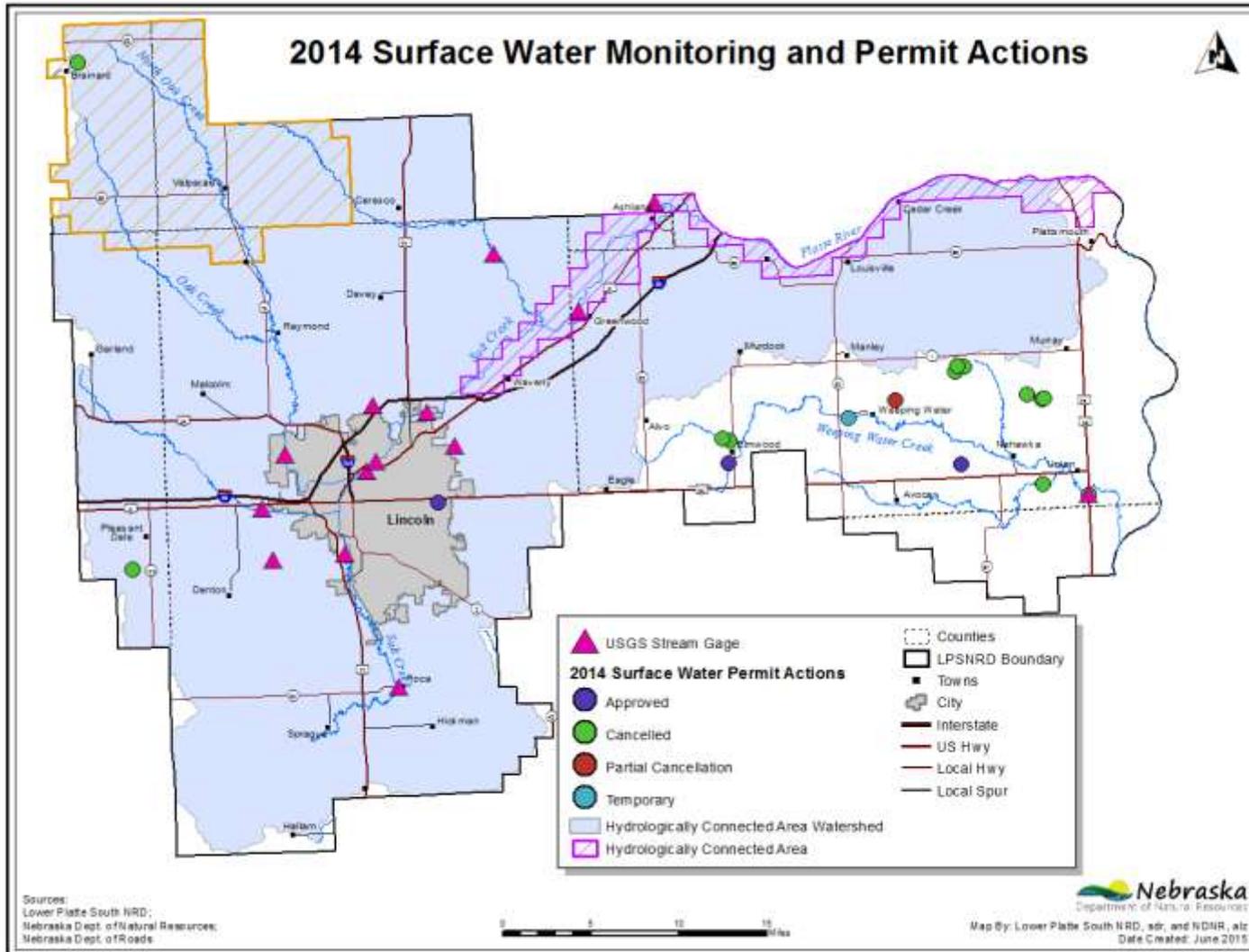
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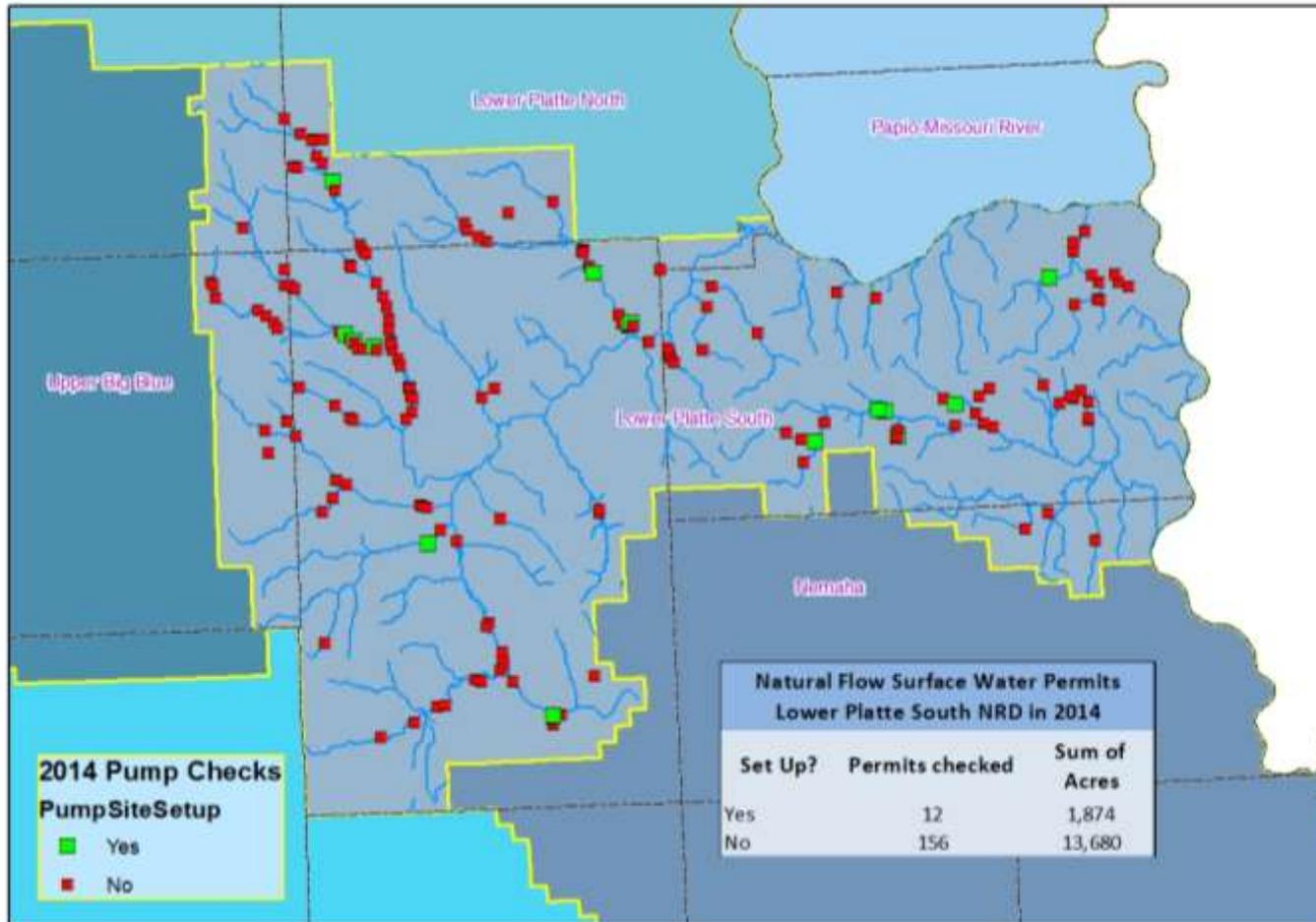
## Cancelled Water Rights

# NDNR Monitoring and Management Actions



# NDNR Monitoring and Management Actions

## Surface Water Appropriation Use in Lower Platte South NRD 2014





# NDNR Voluntary Water Use Reporting

- NDNR sent 218 letters requesting voluntary water use reports
- 51 reports received (23%)
- Accounted for 2,700 acres in Cass, Lancaster, Saunders, and Seward counties.
  - 45 (88%) employed tillage conservation practices
  - 20 irrigated in 2014 (1,456 acres, or 55% of all acres reported.)
  - The most common crop types were corn (47%), soybeans (35%), other (16%), alfalfa (2%).

<http://data.dnr.nebraska.gov/wateruse>



# 2014 ACTIONS & PROGRESS

- Monitoring and data collection
  - 14 streamflow gages
  - Surface water appropriation permits (4 new; 15 cancelled; voluntary water use reporting)
  - Ground water (29 well permits/19 completed; water level monitoring in 139 wells, spring & fall with avg. declines of 1.12 feet; meters and water use reporting from 393 wells of 5.5+ M gals.)



# 2014 ACTIONS & PROGRESS

- Monitoring and data collection (continued)
  - Certified irrigated acres (HCA +48 to 3,172 acres; Remainder +1,636 to 23,058 acres)
  - Ground water rules variances (6 approved; one denied)
  - Water Banking / Transfers (no activity)



# 2014 ACTIONS & PROGRESS

- **Moratoriums:**
  - **Ground Water**
    - HCA limitation on increasing irrigated acres
    - DVB Special Management Area designated and moratorium lifted except for increasing irrigated acres
  - **Surface Water**
    - HCA limitation on increasing irrigated acres
- **Ground Water Allocations**
  - DVB SMA at 21 in/3 yrs/ac, not to exceed 9 in/yr for sprinkler irrigation and 30 in/3 yrs/ac, not to exceed 12 in/yr for gravity irrigation.



# LPSNRD/NDNR IMP Annual Review

## Annual Report Highlights: Data and Studies And Basin-wide Planning



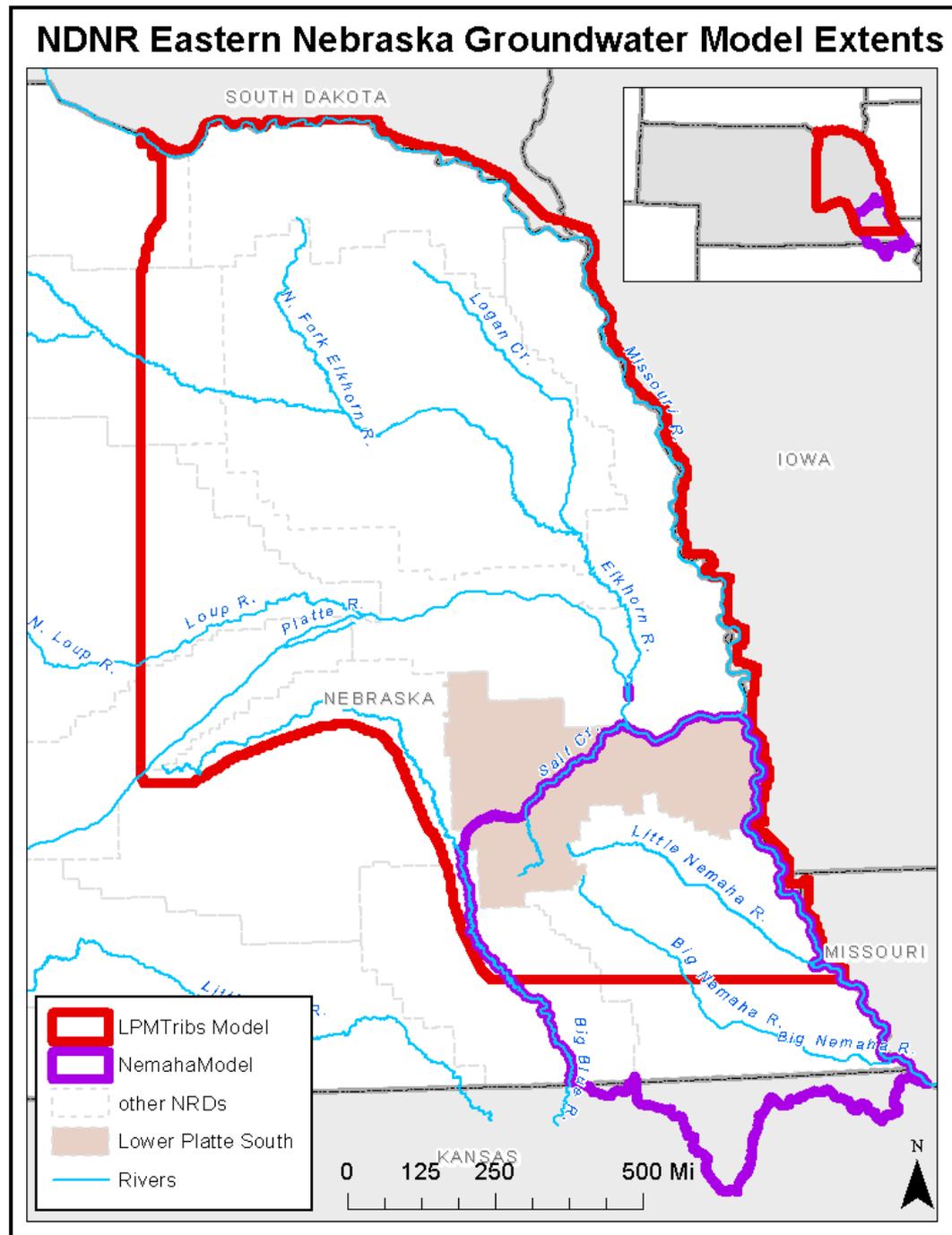
# 2014 ACTIONS & PROGRESS

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- Studies and Planning
  - Completion of remaining IMP components
  - ENWRA research & modeling, including collection of AEM data
  - LPRB Coalition basin-wide water mgmt planning, including water banking
  - LPMT Model development for ground water & hydrologically connected areas

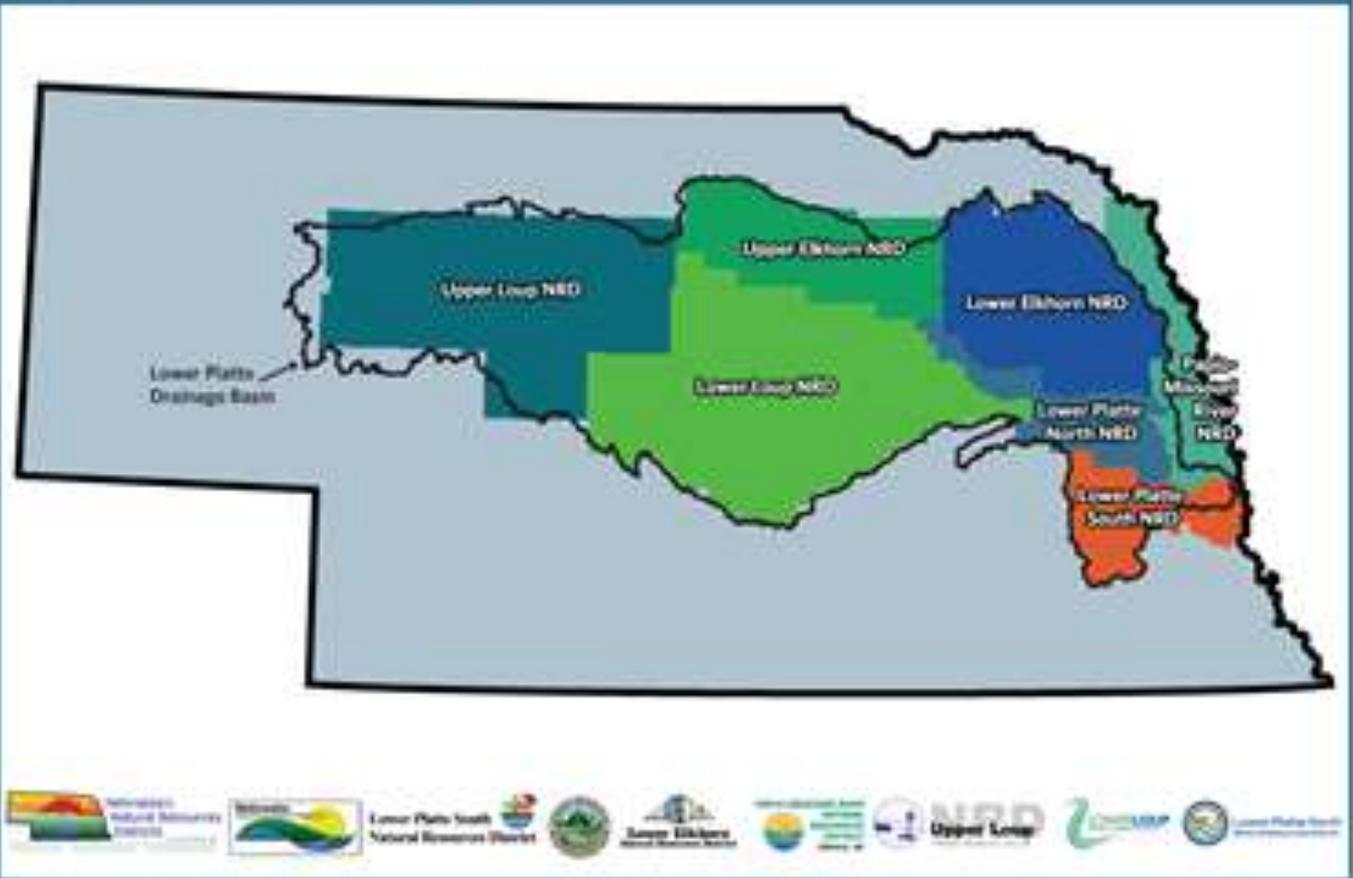


# NDNR Data and Studies: Eastern Nebraska Model Development

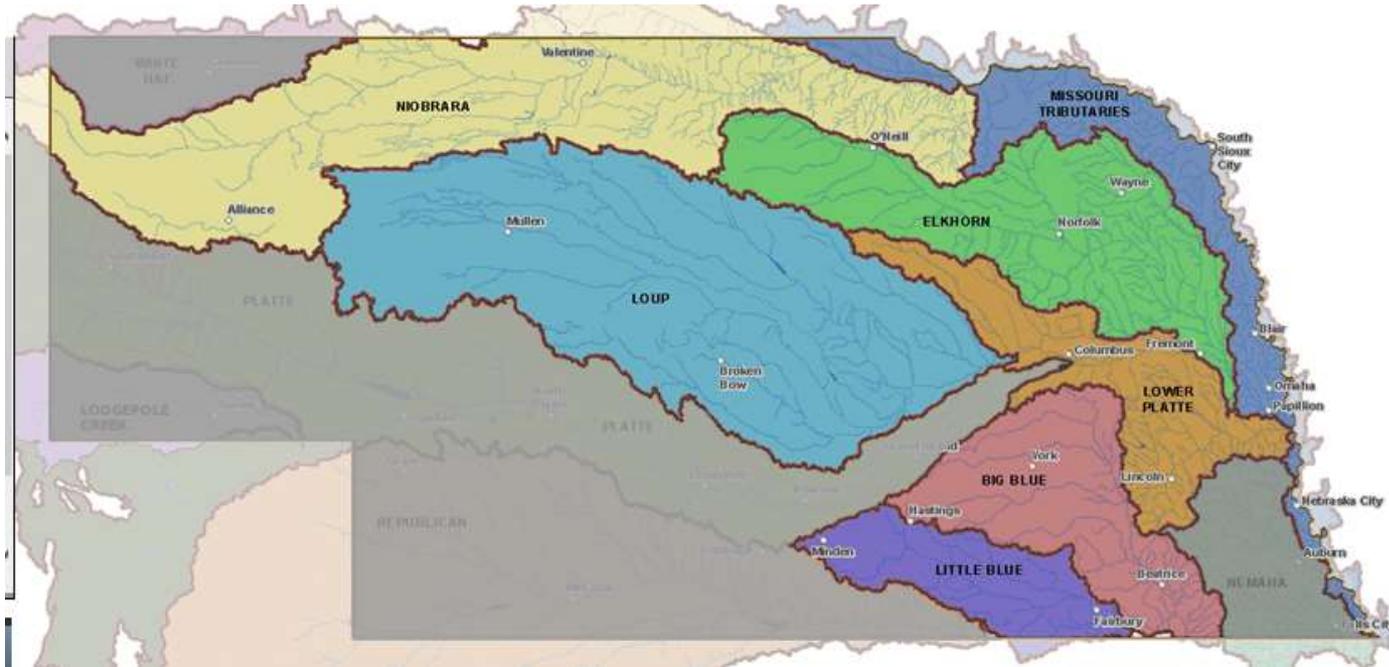


# NDNR Monitoring and Management Actions

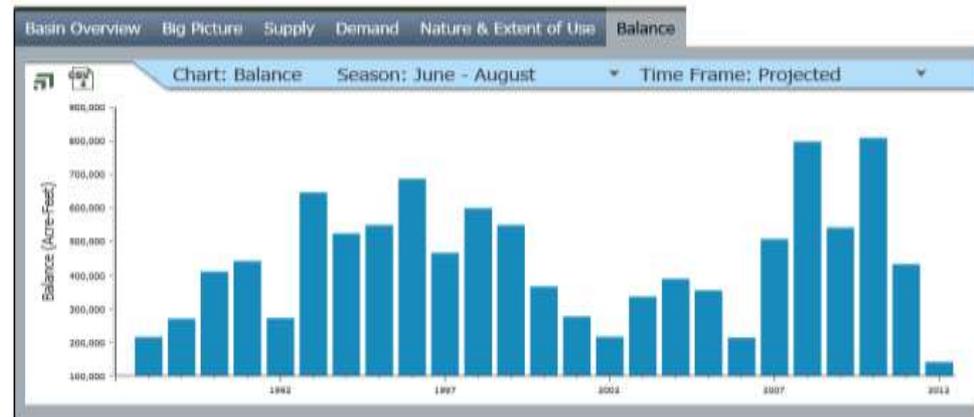
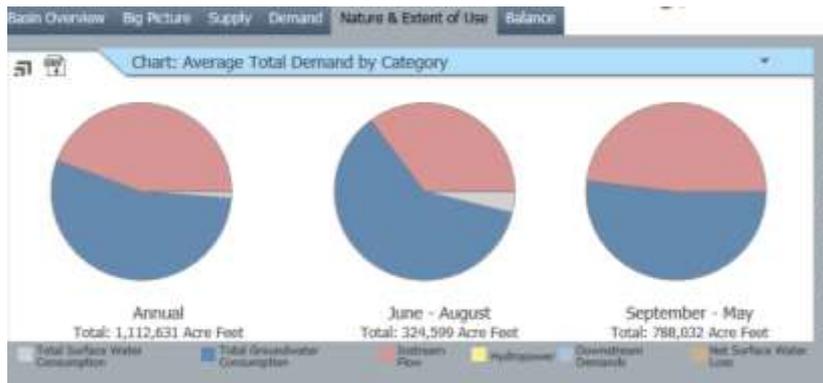
## Lower Platte River Basin Water Management Plan Coalition Map of Natural Resources Districts



# NDNR Data and Studies: INSIGHT



**INSIGHT**  
*An Integrated Network of Scientific Information & GeoHydrologic Tools*



# LPSNRD/NDNR IMP Annual Review

## Annual Report Highlights: Education and Outreach

# IMP Annual Report Highlights-Education/Outreach

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## NDNR Activities

- Earth Day
- WaterFest
- INSIGHT





# IMP Annual Report Highlights-Education/Outreach

## LPSNRD Activities

- Schools
- Irrigation Training
- BMPs
- Media
- Public Survey





# 2015 & 2016 ACTIONS

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- Expansion of INSIGHT tool
- Continued participation in ENWRA and LPRBC planning
- Continue public outreach
- Monitoring of surface water permits & water use
- Evaluate need for more streamgages
- Monitoring of ground water levels
- Meter wells & require water use reports



# 2015 & 2016 ACTIONS

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- Adopt & implement addtl IMP components
- Continue development of LPMT model
- Conduct study of effectiveness & feasibility of water conveyance via streams from upstream sources
- Develop recommendations for devmt & mgt of limited aquifers
- Continue discussions on regional water systems and water shortage action plans.

# IMP Annual Report Highlights-Education/Outreach



## QUESTIONS OR COMMENTS?

The Nebraska Department of Natural Resources and the Lower Platte South NRD are thrilled you attended tonight. **THANK YOU** and we appreciate your interest in our most precious resource.